Hydrology and Hydraulic Study
For

Prepared For:

Imperial Beach Resort, LLC
10450 South Eastern Ave., Suite 100
Henderson, NV 89052
APN No. 625-380-27-00

Prepared By:

Michael Baker International
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Job Number:

149346

Prepared:

December 14, 2015

Revised:

February 16, 2017

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INTERNATIONAL

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Section 1 Project Description and Scope

1.1. Project Data

Project Owner: Imperial Beach Resort, LLC
10450 S. Eastern Ave., Suite #100
Henderson, NV 89052
Kenneth Knudsen

Project Site Address: 1060 Seacoast Dr., Imperial Beach, CA

APN Number(s): 625-380-27-00

Project Location: Latitude: 32.577025
Longitude: -117.132070

Project Site Area: 1.00 Acres

Adjacent Streets:
- North: Ebony Avenue
- South: Imperial Beach Boulevard
- East: Seacoast Drive
- West: None

Adjacent Land Uses:
- North: Residential
- South: Residential
- East: Residential/Commercial
- West: Public Beach

1.2. Scope of Report

This report addresses the Hydrologic and Hydraulic aspects of the project. This report does not discuss required water quality measures to be implemented on a permanent basis, nor does it address construction storm water issues. Post construction storm water issue discussions can be found under separate cover in the project "Storm Water Quality Management Plan".

1.3. Project Site Information

1.3.1 Project Location

The project is located in beautiful Imperial Beach, California. The project is located in the southwesterly portion of the City and is adjacent to the beach and Pacific Ocean. Please refer to Figure 1below for a Vicinity Map.

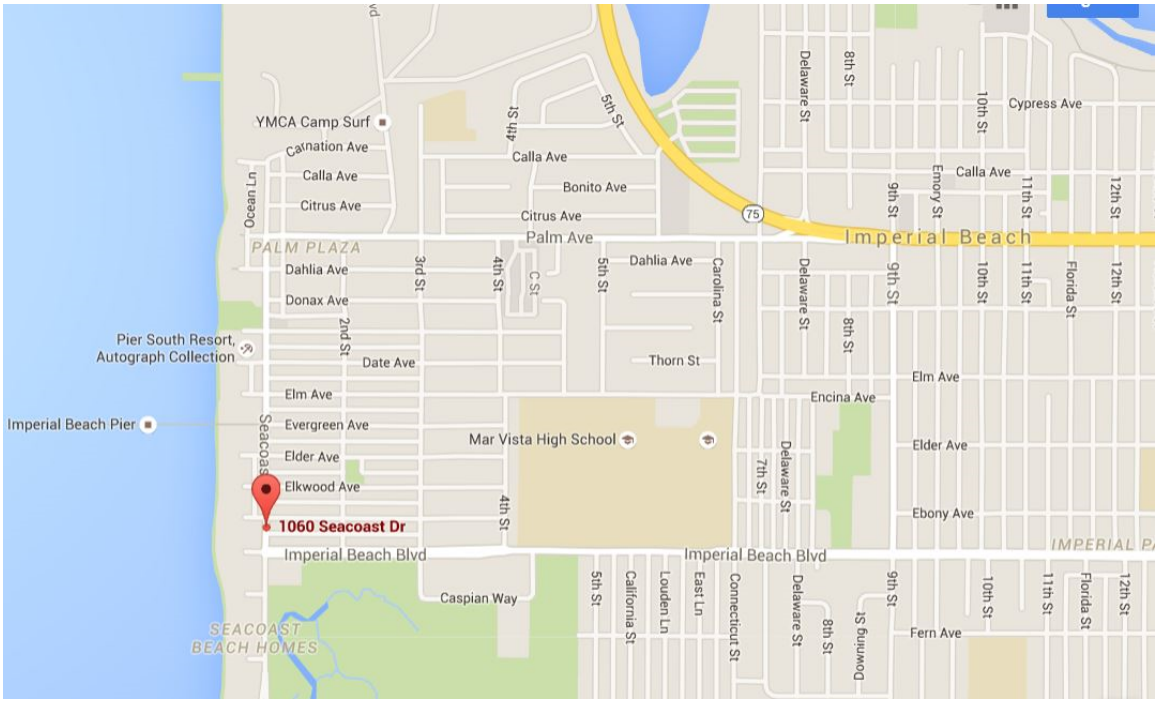

Figure 1: Vicinity Map

1.3.2 Project Description

The project proposes the construction of a 100 room hotel with underground parking. The project also proposes new underground utility services and access drives for the underground parking.

1.3.3 Site Topography

The project area is currently fully developed, and is home to multiple commercial buildings. Drainage from the site is broken down into 2 basins. Basin 1 encompasses the western half of the site, with runoff surface flowing southwest onto Imperial Beach Drive. Basin 2 encompasses the eastern half of the site with flows drainage towards Seacoast Drive. The site is flat with all slopes under 5%.

1.3.4 Land Use and Vegetation

The site has been partially graded for the preparation for the proposed project. There is no significant vegetation on site, and no native vegetation.

1.3.5 FEMA Information

The Federal Emergency Management Agency (FEMA) has mapped the floodplain site. The project does not lie within any mapped floodplain (FIRM Panel 0673C2134G). The project lies within Zone X Unshaded which is outside the 500-year floodplain.

a) Flood Zone Definitions

Zone A -- Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone AE -- Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone X (Shaded) – Areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.

Zone X (Unshaded) Areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood.

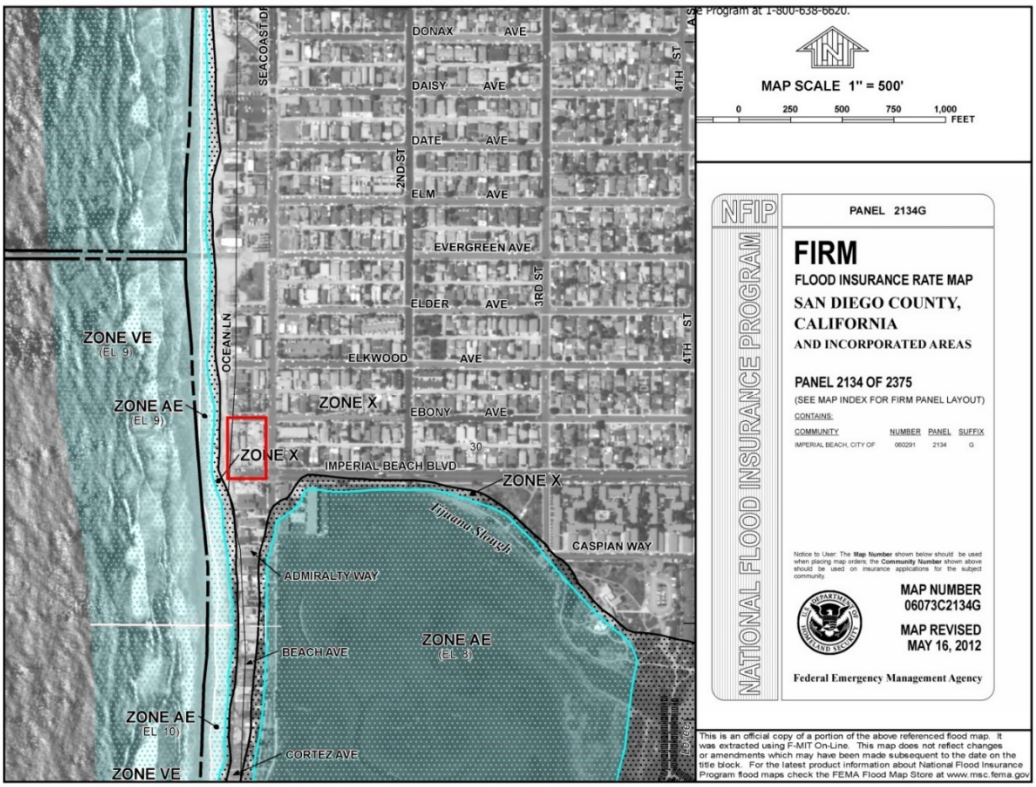

Figure 2: FEMA Firmette

1.3.6 Existing Drainage Improvements

There are no formal drainage improvements on site in the existing condition or the pre-demolition condition. Drainage from the project surface flows in all directions to the surrounding streets and beach.

1.3.7 Proposed Improvements

In the proposed condition, drainage will be collected in a series of catch basins and roof drains. Drainage will be routed to the parking garage where the flows will enter a storage tank capable of handling the 85th percentile rainfall. The flows from the storage tank will gravity flow through a modular wetland system (Proprietary Biofiltration Unit, BF-3), before flowing to a wet well. Flows are then pumped from the wet well to a curb pipe at the northwest corner of the site on Ebony Avenue. From this discharge point treated storm water comingles with street drainage before flowing westerly within the gutter and discharging to the beach via gutter. The pump system is being designed by a separate contractor. Drainage from the public sidewalks and surrounding public hardscape will continue to flow into the adjacent streets and flow untreated into the gutter before being discharged to the Pacific Ocean, as in the existing condition.

Section 2 Study Objectives

The specific objectives of this study are as follows:

- To provide hydrologic analysis of the project site for the 100-year, 6-hour storm event under existing and proposed conditions,
- To ensure that no additional runoff or downstream impacts occur due to this project.

Section 3 Methodology

3.1. Hydrology

Because the size of the site, the Rational Method was chosen for the analysis. The rational method is used for situations where the basin is less than 1 square mile, and the flow path for the drainage does not exceed 500 feet. Therefore the hydrologic analysis has been completed using the Rational Method (Q = CIA) (see County of San Diego Hydrology Manual, Section 3). Whereas,

Q = rate of flow in cubic feet per second

C = Coefficient of runoff,

I = intensity of rainfall based on the time of concentration and the 6-hour, 100-year precipitation

A=Area of the basin.

Runoff coeffecients were obtained using Table 3-1 of the County of San Diego Hydrology Manual. A value of 0.85 was chosen, which represents Office Proffesional/Commercial. Because the usage in both the existing condition and the proposed condition are similar, a similar coefficient was used for both conditions. Data was entered into an Excel Spreadsheet which calculates the runoff based on the County of San Diego methodology electronically (County of San Diego Figure 3-1), therefore reducing errors.

For the both the existing and proposed condition the intensity was calculated using the 6 hour and 24 hour 100 year rainfall events for the site area.

The following software packages were used in the analysis of the project:

- Microsoft Excel (Rational Method Hydrology)
- AES Software

Proposed improvements will increase the total peak flow runoff (as compared to existing conditions) in the unmitigated condition. However, through the use of a treatment storage tank and treatment system the project will reduce the peak flow from the site in the mitigated condition.

3.2. 100-Year Flow Control

Hydrographs of the 100-year storm were generated using the RatHydro program. The RatHydro program uses the method outlined in the County of San Diego Hydrology Manual to generate hydrographs consistent with the County of San Diego. These hydrographs were then entered into the Hydraflow Hydrographs as well as the data for the storage tank and outlet. The simulation showed that the 100-year flows were mitigated to below pre-project levels. A copy of the calculations has been included in the appendix of the report.

Section 4 Results

4.1. Hydrologic Results

The following tables summarize the hydrologic analysis of the project. A hydraulic summary of pipe sizing will be completed in conjunction with design of the pump system.

- **Table 1** - summarizes the existing hydrologic properties of the project site.
- **Table 2** - summarizes the proposed condition hydrology of the site in the unmitigated condition.
- **Table 3** - summarizes the proposed condition hydrology of the site in the mitigated condition.
- **Table 4** - compares the existing and proposed mitigated conditions

Table 1–Existing Condition

Sub Basin No.	Runoff Coefficient	Basin Intensity (in/hr)	Basin Area (acres)	Runoff (cfs)
Basin A	0.82	5.27	0.47	1.98
Basin B	0.82	5.27	0.53	2.23
TOTALS			**1.00**	**4.21**

Table 2–Proposed Condition (Unmitigated)

Sub Basin No.	Runoff Coefficient	Basin Intensity (in/hr)	Basin Area (acres)	Runoff (cfs)
Basin A	0.82	5.27	1.00	4.22
TOTALS			**1.00**	**4.22**

Table 3–Proposed Condition (Mitigated)

Sub Basin No.	Runoff Coefficient	Basin Intensity (in/hr)	Basin Area (acres)	Runoff (cfs)
Basin A	0.82	5.27	1.00	0.22
TOTALS			**1.00**	**0.22**

Table 4–Comparison of Flows (Mitigated)

Sub Basin No.	Existing Condition (cfs)	Proposed Condition (cfs)	Difference
Basin A	4.21	0.22	-3.99
TOTALS	**4.21**	**0.22**	**-3.99**

Section 5 Conclusions

As indicated in Table of Hydrologic Results, the proposed improvements will not increase the total 100-year, 6-hour peak flow rate. In the mitigated condition the flow rate will be 0.223 cfs, a rate less than in the existing condition.

There is not a significant concern for erosion as the site is previously developed. Potential for erosion for the proposed condition shall be minimized by following items listed in the Erosion Control Plan (part of the Rough Grading Plans). Runoff shall flow over relatively flat areas where scour is not a concern. Runoff is not proposed over any sloped areas.

Section 6 References

Imperial Beach Municipal Code

County of San Diego, 2003. Hydrology Manual (2003),

County of San Diego, 2014 Hydraulic Design Manual (2014).

FEMA, 1997. FEMA. (June 17, 1997). Flood Insurance Study, San Diego County.

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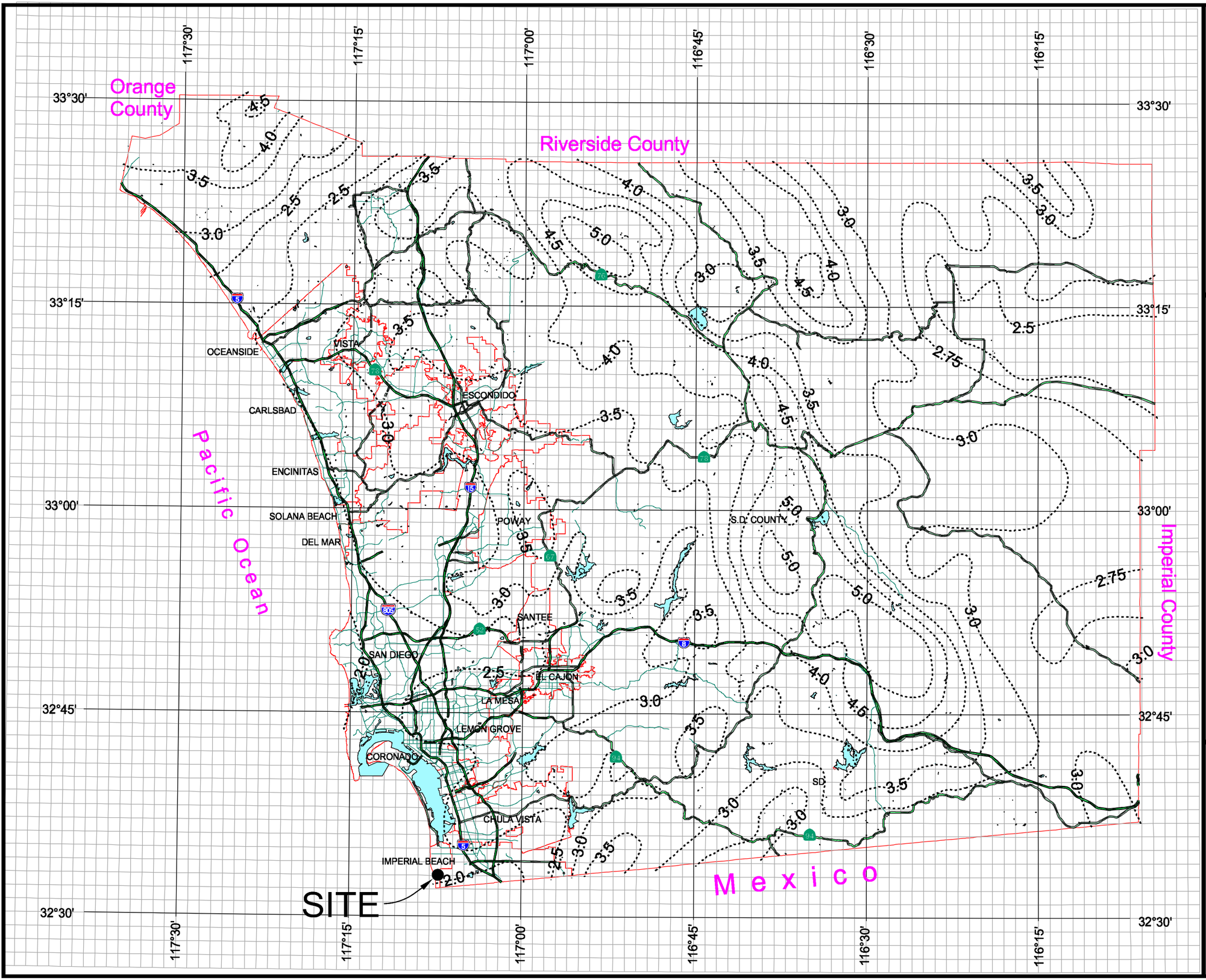
Appendix A
Rainfall Isopluvials

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)



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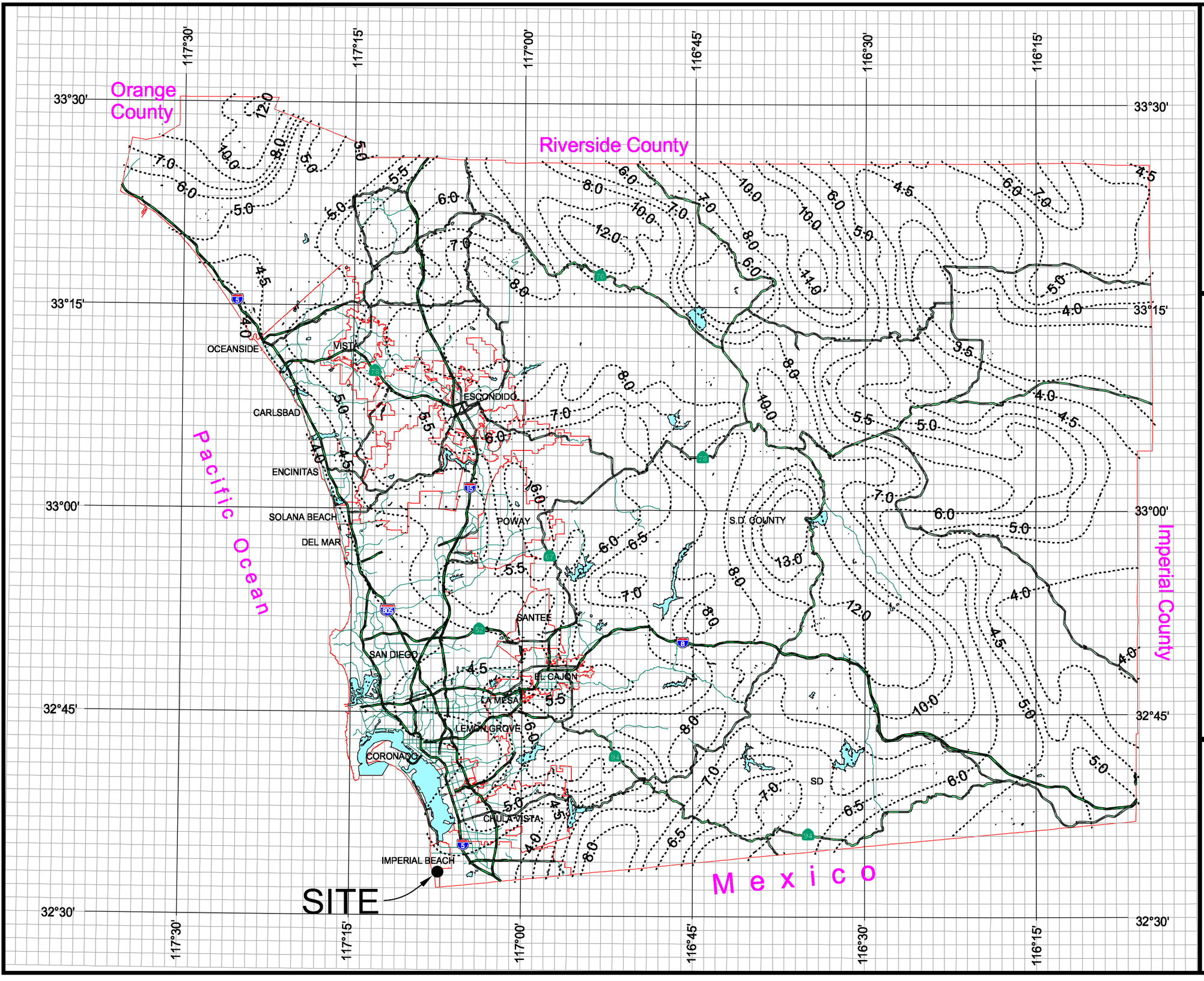
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)



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Department of Public Works
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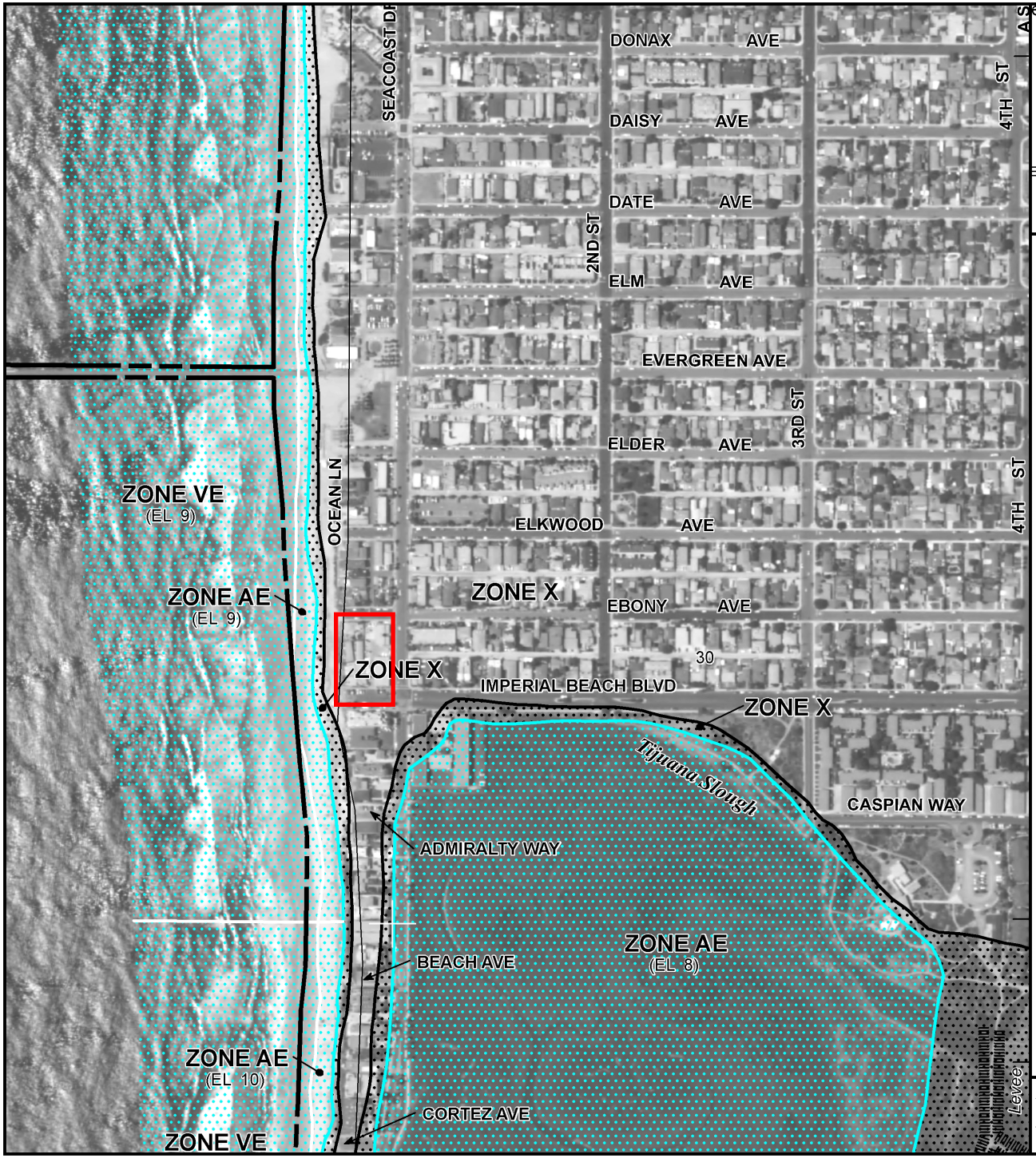
Appendix B
FEMA Flood Plain Maps



e Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2134G

FIRM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 2134 OF 2375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IMPERIAL BEACH, CITY OF	060291	2134	G

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
06073C2134G

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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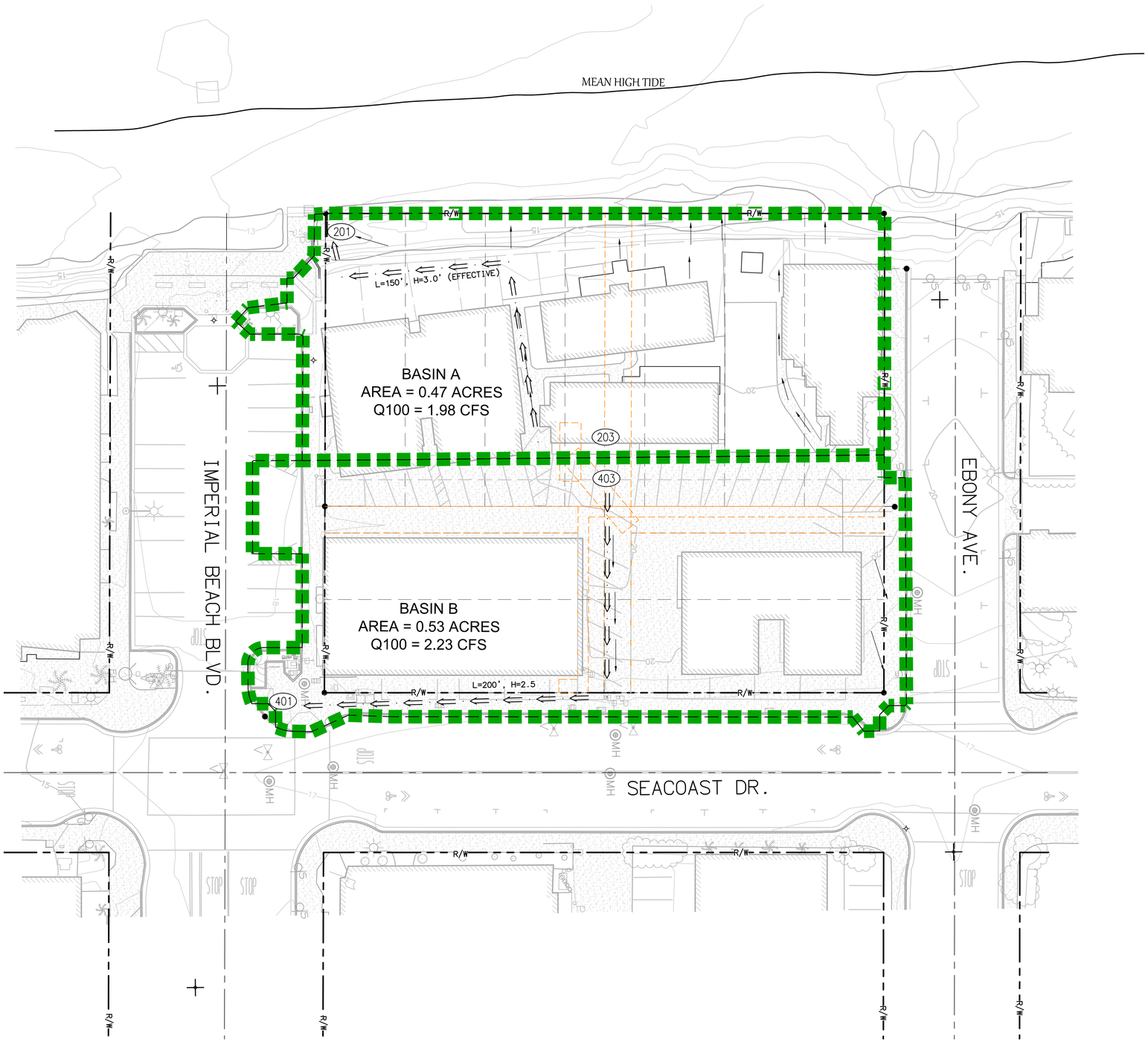
Appendix C
Existing Condition Hydrologic Work Map & Calculations



LEGEND

LIMITS OF OVERALL	
NODE	XXX
DRAINAGE BASIN FLOW DIRECTION	
EXISTING CONTOUR	400
EXISTING FIRE HYDRANT	
EXISTING STREET LIGHT	
EXISTING CURB	
FENCE LINE	
GATE	
SEWER MANHOLE	S
SEWER CLEAN OUT	
STORM DRAIN MANHOLE	
DRAIN INLET/CATCH BASIN	
FIRE HYDRANT	
ELECTRIC METER	
ELECTRIC PULL BOX	PB
POWER POLE	PP
AREA LIGHT	
STREET LIGHT	
BACK FLOW PREVENTER	BFP
TELEPHONE VAULT	TELVLT
ELECTRIC TRANSFORMER	TRANS
WATER VAULT	WVLT

IMPERIAL BEACH RESORT

1046 SEACOAST DR.
IMPERIAL BEACH, CA

EXISTING CONDITIONS DRAINAGE AREAS

02/16/17

SCALE: 1"=20

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

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San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

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****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2013 Advanced Engineering Software (aes)
             Ver. 20.0 Release Date: 06/01/2013  License ID 1264

                           Analysis prepared by:

                         Michael Baker International
                          9755 Clairemont Mesa Blvd.
                             San Diego, CA 92124


 ************************** DESCRIPTION OF STUDY **************************
* Imperial Beach Resort                                                   *
* 100-year Flows                                                          *
* February 16, 2017                                                       *
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  6-HOUR DURATION PRECIPITATION (INCHES) =   2.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

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  S.C.S. CURVE NUMBER (AMC II) =  92
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  UPSTREAM ELEVATION(FEET) =     21.00
  DOWNSTREAM ELEVATION(FEET) =     18.00
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           THE MAXIMUM OVERLAND FLOW LENGTH =    75.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.269
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.98
  TOTAL AREA(ACRES) =      0.47   TOTAL RUNOFF(CFS) =      1.98

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  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =     20.00
  DOWNSTREAM ELEVATION(FEET) =     17.50
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.003
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    63.75
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.269
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      2.23
  TOTAL AREA(ACRES) =      0.53   TOTAL RUNOFF(CFS) =      2.23
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  PEAK FLOW RATE(CFS)   =       2.23
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  END OF RATIONAL METHOD ANALYSIS
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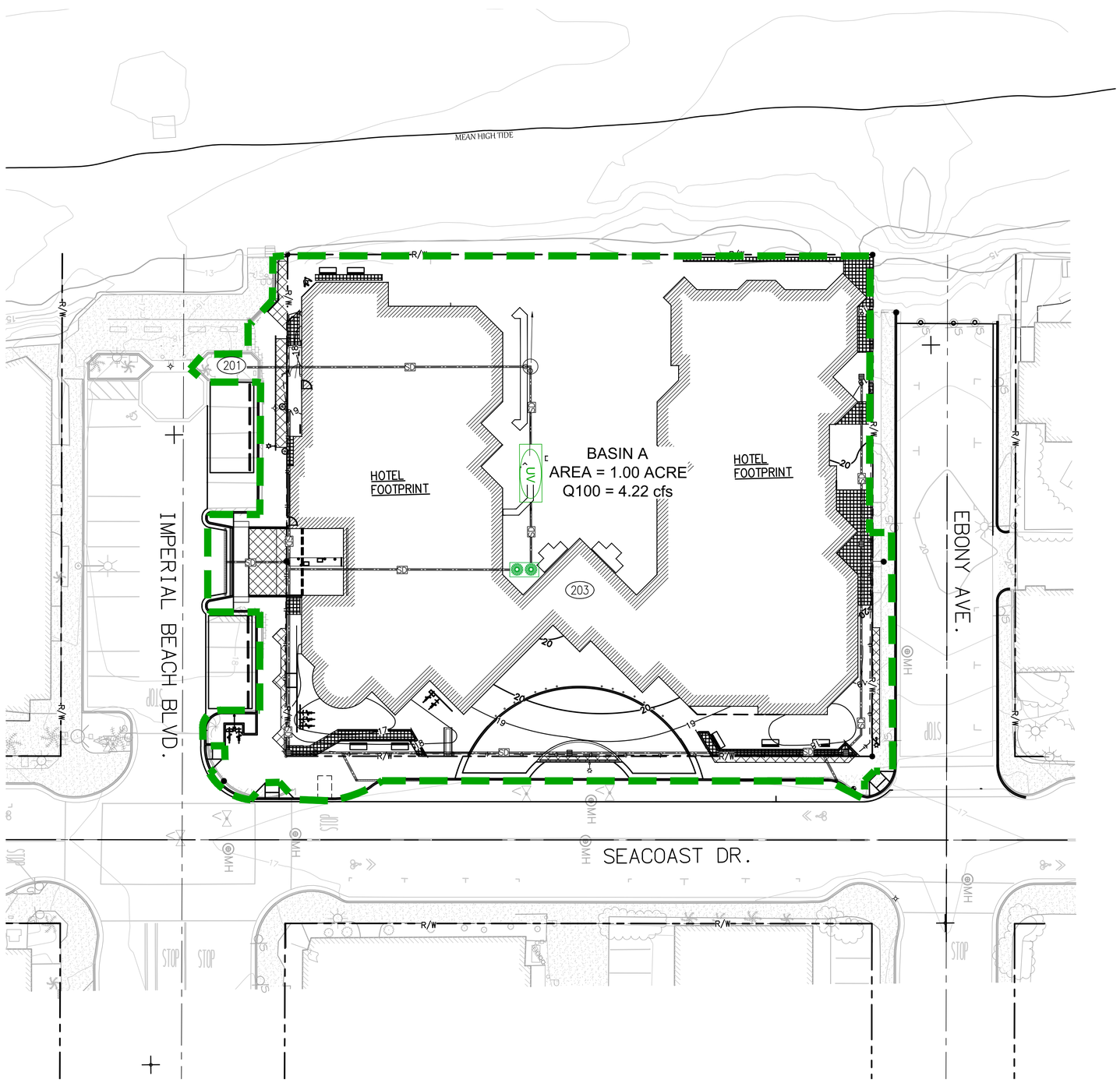
Appendix D
Proposed Condition Hydrologic Work Map & Calculations



LEGEND

LIMITS OF OVERALL	
NODE	XXX
DRAINAGE BASIN FLOW DIRECTION	
EXISTING CONTOUR	400
EXISTING FIRE HYDRANT	
EXISTING STREET LIGHT	
EXISTING CURB	
FENCE LINE	
GATE	
SEWER MANHOLE	S
SEWER CLEAN OUT	
STORM DRAIN MANHOLE	
DRAIN INLET/CATCH BASIN	
FIRE HYDRANT	
ELECTRIC METER	
ELECTRIC PULL BOX	PB
POWER POLE	PP
AREA LIGHT	
STREET LIGHT	
BACK FLOW PREVENTER	BFP
TELEPHONE VAULT	TELVLT
ELECTRIC TRANSFORMER	TRANS
WATER VAULT	WVLT

IMPERIAL BEACH RESORT

1046 SEACOAST DR.
IMPERIAL BEACH, CA

PROPOSED CONDITIONS DRAINAGE AREAS

02/16/17

SCALE: 1"=20'

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San Diego, CA 92124
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****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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         (c) Copyright 1982-2013 Advanced Engineering Software (aes)
             Ver. 20.0 Release Date: 06/01/2013  License ID 1264

                           Analysis prepared by:

                         Michael Baker International
                          9755 Clairemont Mesa Blvd.
                             San Diego, CA 92124


 ************************** DESCRIPTION OF STUDY **************************
* Imperial Beach Resort                                                   *
* 100-Year Flows                                                          *
* February 16, 2017                                                       *
 **************************************************************************

  FILE NAME: C:\IB\PR.DAT
  TIME/DATE OF STUDY: 14:41 02/16/2017
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
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  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8000
  SOIL CLASSIFICATION IS "B"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =     21.00
  DOWNSTREAM ELEVATION(FEET) =     19.00
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  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    60.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.269
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
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  PEAK FLOW RATE(CFS)   =       4.22
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
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RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 2/16/2017
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2 INCHES
BASIN AREA 1 ACRES
RUNOFF COEFFICIENT 0.82
PEAK DISCHARGE 4.22 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.1
TIME (MIN) = 10	DISCHARGE (CFS) = 0.1
TIME (MIN) = 15	DISCHARGE (CFS) = 0.1
TIME (MIN) = 20	DISCHARGE (CFS) = 0.1
TIME (MIN) = 25	DISCHARGE (CFS) = 0.1
TIME (MIN) = 30	DISCHARGE (CFS) = 0.1
TIME (MIN) = 35	DISCHARGE (CFS) = 0.1
TIME (MIN) = 40	DISCHARGE (CFS) = 0.1
TIME (MIN) = 45	DISCHARGE (CFS) = 0.1
TIME (MIN) = 50	DISCHARGE (CFS) = 0.1
TIME (MIN) = 55	DISCHARGE (CFS) = 0.1
TIME (MIN) = 60	DISCHARGE (CFS) = 0.1
TIME (MIN) = 65	DISCHARGE (CFS) = 0.1
TIME (MIN) = 70	DISCHARGE (CFS) = 0.1
TIME (MIN) = 75	DISCHARGE (CFS) = 0.1
TIME (MIN) = 80	DISCHARGE (CFS) = 0.1
TIME (MIN) = 85	DISCHARGE (CFS) = 0.1
TIME (MIN) = 90	DISCHARGE (CFS) = 0.1
TIME (MIN) = 95	DISCHARGE (CFS) = 0.1
TIME (MIN) = 100	DISCHARGE (CFS) = 0.1
TIME (MIN) = 105	DISCHARGE (CFS) = 0.1
TIME (MIN) = 110	DISCHARGE (CFS) = 0.1
TIME (MIN) = 115	DISCHARGE (CFS) = 0.1
TIME (MIN) = 120	DISCHARGE (CFS) = 0.1
TIME (MIN) = 125	DISCHARGE (CFS) = 0.2
TIME (MIN) = 130	DISCHARGE (CFS) = 0.2
TIME (MIN) = 135	DISCHARGE (CFS) = 0.2
TIME (MIN) = 140	DISCHARGE (CFS) = 0.2
TIME (MIN) = 145	DISCHARGE (CFS) = 0.2
TIME (MIN) = 150	DISCHARGE (CFS) = 0.2
TIME (MIN) = 155	DISCHARGE (CFS) = 0.2
TIME (MIN) = 160	DISCHARGE (CFS) = 0.2
TIME (MIN) = 165	DISCHARGE (CFS) = 0.2
TIME (MIN) = 170	DISCHARGE (CFS) = 0.2
TIME (MIN) = 175	DISCHARGE (CFS) = 0.2
TIME (MIN) = 180	DISCHARGE (CFS) = 0.2
TIME (MIN) = 185	DISCHARGE (CFS) = 0.2
TIME (MIN) = 190	DISCHARGE (CFS) = 0.3
TIME (MIN) = 195	DISCHARGE (CFS) = 0.3
TIME (MIN) = 200	DISCHARGE (CFS) = 0.3
TIME (MIN) = 205	DISCHARGE (CFS) = 0.3
TIME (MIN) = 210	DISCHARGE (CFS) = 0.3
TIME (MIN) = 215	DISCHARGE (CFS) = 0.4
TIME (MIN) = 220	DISCHARGE (CFS) = 0.4
TIME (MIN) = 225	DISCHARGE (CFS) = 0.5
TIME (MIN) = 230	DISCHARGE (CFS) = 0.6
TIME (MIN) = 235	DISCHARGE (CFS) = 0.9
TIME (MIN) = 240	DISCHARGE (CFS) = 1.3
TIME (MIN) = 245	DISCHARGE (CFS) = 4.22
TIME (MIN) = 250	DISCHARGE (CFS) = 0.7
TIME (MIN) = 255	DISCHARGE (CFS) = 0.5
TIME (MIN) = 260	DISCHARGE (CFS) = 0.4
TIME (MIN) = 265	DISCHARGE (CFS) = 0.3
TIME (MIN) = 270	DISCHARGE (CFS) = 0.3
TIME (MIN) = 275	DISCHARGE (CFS) = 0.2
TIME (MIN) = 280	DISCHARGE (CFS) = 0.2
TIME (MIN) = 285	DISCHARGE (CFS) = 0.2
TIME (MIN) = 290	DISCHARGE (CFS) = 0.2
TIME (MIN) = 295	DISCHARGE (CFS) = 0.2
TIME (MIN) = 300	DISCHARGE (CFS) = 0.2
TIME (MIN) = 305	DISCHARGE (CFS) = 0.2
TIME (MIN) = 310	DISCHARGE (CFS) = 0.1
TIME (MIN) = 315	DISCHARGE (CFS) = 0.1
TIME (MIN) = 320	DISCHARGE (CFS) = 0.1
TIME (MIN) = 325	DISCHARGE (CFS) = 0.1
TIME (MIN) = 330	DISCHARGE (CFS) = 0.1
TIME (MIN) = 335	DISCHARGE (CFS) = 0.1
TIME (MIN) = 340	DISCHARGE (CFS) = 0.1
TIME (MIN) = 345	DISCHARGE (CFS) = 0.1
TIME (MIN) = 350	DISCHARGE (CFS) = 0.1
TIME (MIN) = 355	DISCHARGE (CFS) = 0.1
TIME (MIN) = 360	DISCHARGE (CFS) = 0.1
TIME (MIN) = 365	DISCHARGE (CFS) = 0

Watershed Model Schematic

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

Legend

Hyd.	Origin	Description
1	Manual	Input Hydrograph
2	Reservoir	Outflow Hydrograph

Hydrograph Return Period Recap

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

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	-------	-------	-------	-------	-------	-------	4.220	Input Hydrograph
2	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	0.223	Outflow Hydrograph

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	4.220	5	245	5,826	------	------	------	Input Hydrograph
2	Reservoir	0.223	5	195	5,825	1	103.89	2,614	Outflow Hydrograph

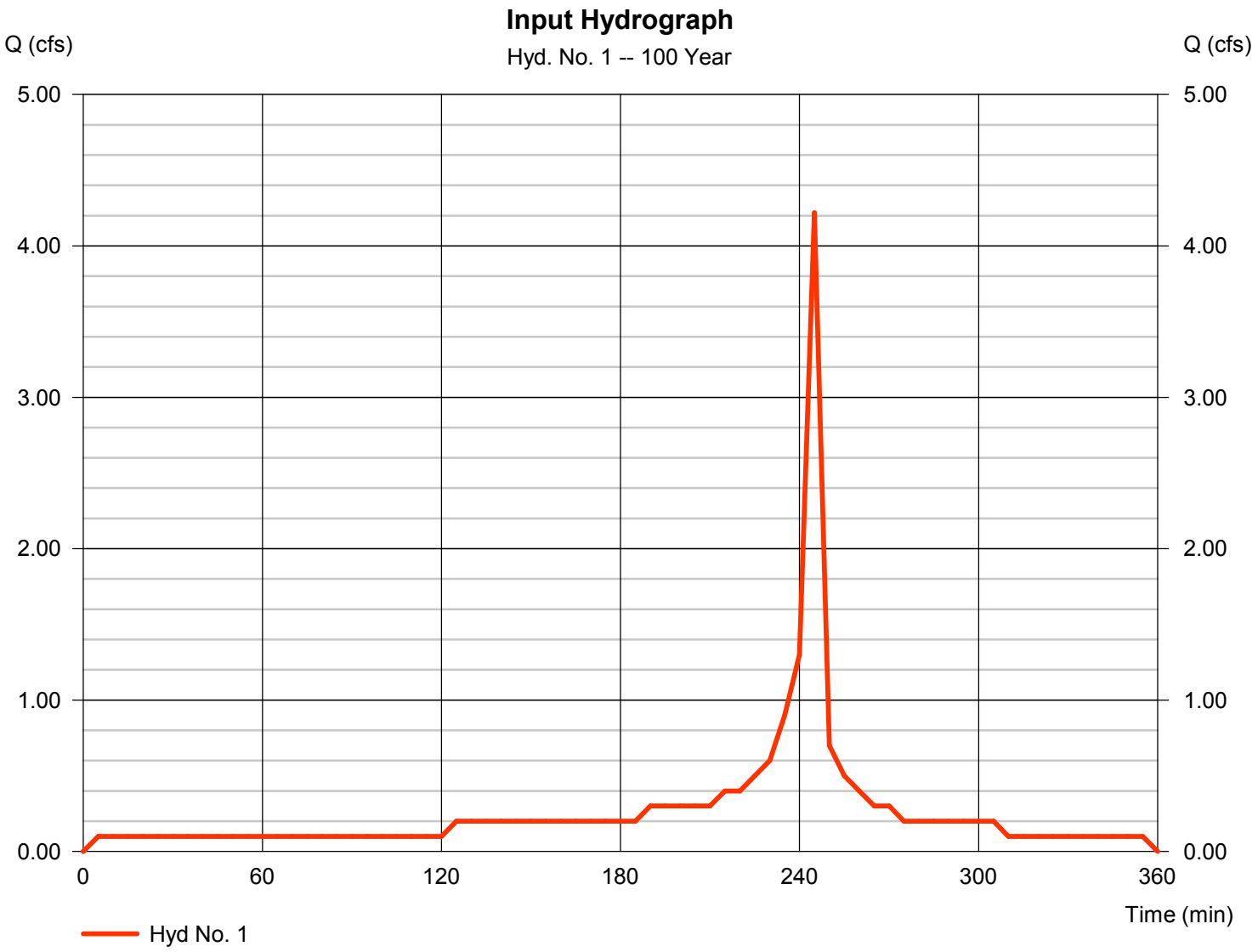
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Thursday, 02 / 16 / 2017

Hyd. No. 1

Input Hydrograph

Hydrograph type	= Manual	Peak discharge	= 4.220 cfs
Storm frequency	= 100 yrs	Time to peak	= 245 min
Time interval	= 5 min	Hyd. volume	= 5,826 cuft



Hydrograph Report

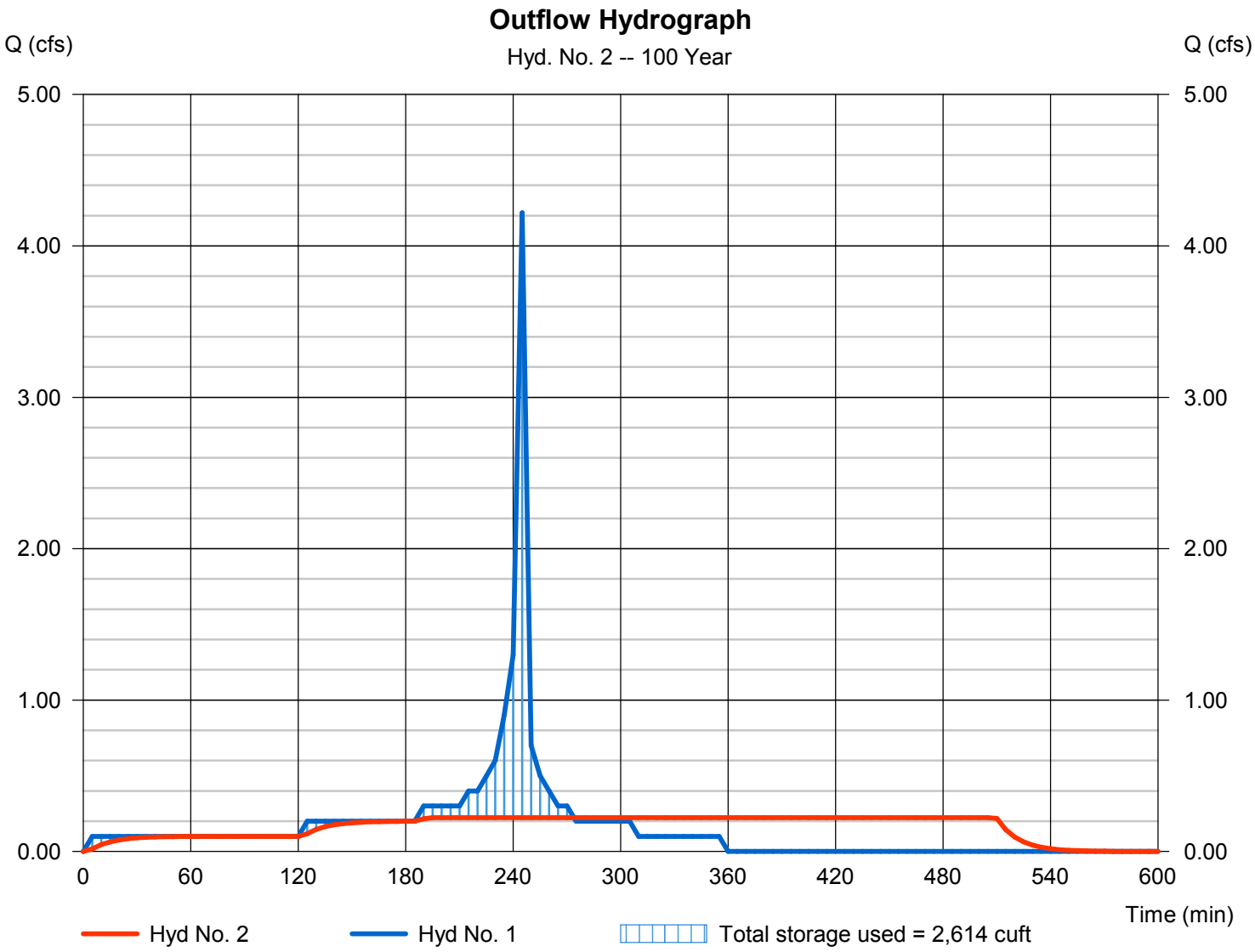
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Thursday, 02 / 16 / 2017

Hyd. No. 2

Outflow Hydrograph

Hydrograph type	= Reservoir	Peak discharge	= 0.223 cfs
Storm frequency	= 100 yrs	Time to peak	= 195 min
Time interval	= 5 min	Hyd. volume	= 5,825 cuft
Inflow hyd. No.	= 1 - Input Hydrograph	Max. Elevation	= 103.89 ft
Reservoir name	= Storage Tank	Max. Storage	= 2,614 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Thursday, 02 / 16 / 2017

Hyd. No. 1

Input Hydrograph

Hydrograph type	= Manual	Peak discharge	= 4.220 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 5 min	Hyd. volume	= 5,826 cuft

Hydrograph Discharge Table

(Printed values >= 1.00% of Qp.)

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
0.08	0.100	1.83	0.100	3.58	0.400	5.33	0.100
0.17	0.100	1.92	0.100	3.67	0.400	5.42	0.100
0.25	0.100	2.00	0.100	3.75	0.500	5.50	0.100
0.33	0.100	2.08	0.200	3.83	0.600	5.58	0.100
0.42	0.100	2.17	0.200	3.92	0.900	5.67	0.100
0.50	0.100	2.25	0.200	4.00	1.300	5.75	0.100
0.58	0.100	2.33	0.200	4.08	4.220	5.83	0.100
0.67	0.100	2.42	0.200	4.17	0.700	5.92	0.100
0.75	0.100	2.50	0.200	4.25	0.500	...End	
0.83	0.100	2.58	0.200	4.33	0.400		
0.92	0.100	2.67	0.200	4.42	0.300		
1.00	0.100	2.75	0.200	4.50	0.300		
1.08	0.100	2.83	0.200	4.58	0.200		
1.17	0.100	2.92	0.200	4.67	0.200		
1.25	0.100	3.00	0.200	4.75	0.200		
1.33	0.100	3.08	0.200	4.83	0.200		
1.42	0.100	3.17	0.300	4.92	0.200		
1.50	0.100	3.25	0.300	5.00	0.200		
1.58	0.100	3.33	0.300	5.08	0.200		
1.67	0.100	3.42	0.300	5.17	0.100		
1.75	0.100	3.50	0.300	5.25	0.100		

<<

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Thursday, 02 / 16 / 2017

Hyd. No. 2

Outflow Hydrograph

Hydrograph type	= Reservoir	Peak discharge	= 0.223 cfs
Storm frequency	= 100 yrs	Time to peak	= 3.25 hrs
Time interval	= 5 min	Hyd. volume	= 5,825 cuft
Inflow hyd. No.	= 1 - Input Hydrograph	Reservoir name	= Storage Tank
Max. Elevation	= 103.89 ft	Max. Storage	= 2,614 cuft

Storage Indication method used.

Hydrograph Discharge Table

(Printed values >= 1.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.08	0.100	100.04	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.017
0.17	0.100	100.10	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.045
0.25	0.100	100.14	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.064
0.33	0.100	100.17	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.076
0.42	0.100	100.19	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.084
0.50	0.100	100.20	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.090
0.58	0.100	100.21	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.093
0.67	0.100	100.21	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.095
0.75	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.097
0.83	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.098
0.92	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.099
1.00	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.099
1.08	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.099
1.17	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.25	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.33	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.42	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.50	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.58	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.67	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100

Continues on next page...

Outflow Hydrograph

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
1.75	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.83	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
1.92	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
2.00	0.100	100.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.100
2.08	0.200	100.26	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.117
2.17	0.200	100.33	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.145
2.25	0.200	100.37	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.164
2.33	0.200	100.39	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.176
2.42	0.200	100.41	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.184
2.50	0.200	100.43	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.190
2.58	0.200	100.43	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.193
2.67	0.200	100.44	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.195
2.75	0.200	100.44	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.197
2.83	0.200	100.44	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.198
2.92	0.200	100.45	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.199
3.00	0.200	100.45	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.199
3.08	0.200	100.45	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.199
3.17	0.300	100.49	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.217
3.25	0.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.33	0.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.42	0.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.50	0.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.58	0.400	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.67	0.400	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.75	0.500	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<

Outflow Hydrograph

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
3.83	0.600	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
3.92	0.900	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.00	1.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.08	4.220 <<	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.17	0.700	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.25	0.500	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.33	0.400	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.42	0.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.50	0.300	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.58	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.67	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.75	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.83	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
4.92	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.00	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.08	0.200	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.17	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.25	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.33	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<

Outflow Hydrograph

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
5.42	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.50	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.58	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.67	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.75	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.83	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
5.92	0.100	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.00	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.08	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.17	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.25	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.33	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.42	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.50	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.58	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.67	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.75	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.83	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
6.92	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<

Outflow Hydrograph

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
7.00	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.08	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.17	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.25	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.33	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.42	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.50	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.58	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.67	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.75	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.83	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
7.92	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.00	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.08	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.17	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.25	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.33	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.42	0.000	100.50 <<	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.223 <<
8.50	0.000	100.49	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.218

Continues on next page...

Outflow Hydrograph

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
8.58	0.000	100.32	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.144
8.67	0.000	100.21	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.095
8.75	0.000	100.14	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.063
8.83	0.000	100.09	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.041
8.92	0.000	100.06	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.027
9.00	0.000	100.04	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.018
9.08	0.000	100.03	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.012
9.17	0.000	100.02	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.008
9.25	0.000	100.01	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.005
9.33	0.000	100.01	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.003
9.42	0.000	100.01	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.002

...End

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Thursday, 02 / 16 / 2017

Pond No. 1 - Storage Tank

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 160.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.50	100.50	n/a	164	164
1.00	101.00	n/a	284	448
1.50	101.50	n/a	346	793
2.00	102.00	n/a	381	1,174
2.50	102.50	n/a	398	1,571
3.00	103.00	n/a	398	1,969
3.50	103.50	n/a	381	2,350
4.00	104.00	n/a	345	2,695
4.50	104.50	n/a	284	2,979
5.00	105.00	n/a	163	3,142

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	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 Contour)
TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	---	---	---	---	---	---	---	---	---	---	0.000
0.05	16	100.05	---	---	---	---	---	---	---	---	---	0.022	0.022
0.10	33	100.10	---	---	---	---	---	---	---	---	---	0.045	0.045
0.15	49	100.15	---	---	---	---	---	---	---	---	---	0.067	0.067
0.20	65	100.20	---	---	---	---	---	---	---	---	---	0.089	0.089
0.25	82	100.25	---	---	---	---	---	---	---	---	---	0.112	0.112
0.30	98	100.30	---	---	---	---	---	---	---	---	---	0.134	0.134
0.35	114	100.35	---	---	---	---	---	---	---	---	---	0.156	0.156
0.40	131	100.40	---	---	---	---	---	---	---	---	---	0.178	0.178
0.45	147	100.45	---	---	---	---	---	---	---	---	---	0.201	0.201
0.50	164	100.50	---	---	---	---	---	---	---	---	---	0.223	0.223
0.55	192	100.55	---	---	---	---	---	---	---	---	---	0.223	0.223
0.60	220	100.60	---	---	---	---	---	---	---	---	---	0.223	0.223
0.65	249	100.65	---	---	---	---	---	---	---	---	---	0.223	0.223
0.70	277	100.70	---	---	---	---	---	---	---	---	---	0.223	0.223
0.75	306	100.75	---	---	---	---	---	---	---	---	---	0.223	0.223
0.80	334	100.80	---	---	---	---	---	---	---	---	---	0.223	0.223
0.85	362	100.85	---	---	---	---	---	---	---	---	---	0.223	0.223
0.90	391	100.90	---	---	---	---	---	---	---	---	---	0.223	0.223
0.95	419	100.95	---	---	---	---	---	---	---	---	---	0.223	0.223
1.00	448	101.00	---	---	---	---	---	---	---	---	---	0.223	0.223
1.05	482	101.05	---	---	---	---	---	---	---	---	---	0.223	0.223
1.10	517	101.10	---	---	---	---	---	---	---	---	---	0.223	0.223
1.15	551	101.15	---	---	---	---	---	---	---	---	---	0.223	0.223
1.20	586	101.20	---	---	---	---	---	---	---	---	---	0.223	0.223
1.25	620	101.25	---	---	---	---	---	---	---	---	---	0.223	0.223
1.30	655	101.30	---	---	---	---	---	---	---	---	---	0.223	0.223
1.35	690	101.35	---	---	---	---	---	---	---	---	---	0.223	0.223
1.40	724	101.40	---	---	---	---	---	---	---	---	---	0.223	0.223
1.45	759	101.45	---	---	---	---	---	---	---	---	---	0.223	0.223
1.50	793	101.50	---	---	---	---	---	---	---	---	---	0.223	0.223
1.55	831	101.55	---	---	---	---	---	---	---	---	---	0.223	0.223

Continues on next page...

Storage Tank

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.60	869	101.60	---	---	---	---	---	---	---	---	---	0.223	0.223
1.65	907	101.65	---	---	---	---	---	---	---	---	---	0.223	0.223
1.70	945	101.70	---	---	---	---	---	---	---	---	---	0.223	0.223
1.75	984	101.75	---	---	---	---	---	---	---	---	---	0.223	0.223
1.80	1,022	101.80	---	---	---	---	---	---	---	---	---	0.223	0.223
1.85	1,060	101.85	---	---	---	---	---	---	---	---	---	0.223	0.223
1.90	1,098	101.90	---	---	---	---	---	---	---	---	---	0.223	0.223
1.95	1,136	101.95	---	---	---	---	---	---	---	---	---	0.223	0.223
2.00	1,174	102.00	---	---	---	---	---	---	---	---	---	0.223	0.223
2.05	1,214	102.05	---	---	---	---	---	---	---	---	---	0.223	0.223
2.10	1,253	102.10	---	---	---	---	---	---	---	---	---	0.223	0.223
2.15	1,293	102.15	---	---	---	---	---	---	---	---	---	0.223	0.223
2.20	1,333	102.20	---	---	---	---	---	---	---	---	---	0.223	0.223
2.25	1,373	102.25	---	---	---	---	---	---	---	---	---	0.223	0.223
2.30	1,412	102.30	---	---	---	---	---	---	---	---	---	0.223	0.223
2.35	1,452	102.35	---	---	---	---	---	---	---	---	---	0.223	0.223
2.40	1,492	102.40	---	---	---	---	---	---	---	---	---	0.223	0.223
2.45	1,532	102.45	---	---	---	---	---	---	---	---	---	0.223	0.223
2.50	1,571	102.50	---	---	---	---	---	---	---	---	---	0.223	0.223
2.55	1,611	102.55	---	---	---	---	---	---	---	---	---	0.223	0.223
2.60	1,651	102.60	---	---	---	---	---	---	---	---	---	0.223	0.223
2.65	1,691	102.65	---	---	---	---	---	---	---	---	---	0.223	0.223
2.70	1,731	102.70	---	---	---	---	---	---	---	---	---	0.223	0.223
2.75	1,770	102.75	---	---	---	---	---	---	---	---	---	0.223	0.223
2.80	1,810	102.80	---	---	---	---	---	---	---	---	---	0.223	0.223
2.85	1,850	102.85	---	---	---	---	---	---	---	---	---	0.223	0.223
2.90	1,890	102.90	---	---	---	---	---	---	---	---	---	0.223	0.223
2.95	1,929	102.95	---	---	---	---	---	---	---	---	---	0.223	0.223
3.00	1,969	103.00	---	---	---	---	---	---	---	---	---	0.223	0.223
3.05	2,007	103.05	---	---	---	---	---	---	---	---	---	0.223	0.223
3.10	2,045	103.10	---	---	---	---	---	---	---	---	---	0.223	0.223
3.15	2,083	103.15	---	---	---	---	---	---	---	---	---	0.223	0.223
3.20	2,121	103.20	---	---	---	---	---	---	---	---	---	0.223	0.223
3.25	2,159	103.25	---	---	---	---	---	---	---	---	---	0.223	0.223
3.30	2,197	103.30	---	---	---	---	---	---	---	---	---	0.223	0.223
3.35	2,235	103.35	---	---	---	---	---	---	---	---	---	0.223	0.223
3.40	2,274	103.40	---	---	---	---	---	---	---	---	---	0.223	0.223
3.45	2,312	103.45	---	---	---	---	---	---	---	---	---	0.223	0.223
3.50	2,350	103.50	---	---	---	---	---	---	---	---	---	0.223	0.223
3.55	2,384	103.55	---	---	---	---	---	---	---	---	---	0.223	0.223
3.60	2,419	103.60	---	---	---	---	---	---	---	---	---	0.223	0.223
3.65	2,453	103.65	---	---	---	---	---	---	---	---	---	0.223	0.223
3.70	2,488	103.70	---	---	---	---	---	---	---	---	---	0.223	0.223
3.75	2,522	103.75	---	---	---	---	---	---	---	---	---	0.223	0.223
3.80	2,557	103.80	---	---	---	---	---	---	---	---	---	0.223	0.223
3.85	2,591	103.85	---	---	---	---	---	---	---	---	---	0.223	0.223
3.90	2,626	103.90	---	---	---	---	---	---	---	---	---	0.223	0.223
3.95	2,660	103.95	---	---	---	---	---	---	---	---	---	0.223	0.223
4.00	2,695	104.00	---	---	---	---	---	---	---	---	---	0.223	0.223
4.05	2,723	104.05	---	---	---	---	---	---	---	---	---	0.223	0.223
4.10	2,752	104.10	---	---	---	---	---	---	---	---	---	0.223	0.223
4.15	2,780	104.15	---	---	---	---	---	---	---	---	---	0.223	0.223
4.20	2,809	104.20	---	---	---	---	---	---	---	---	---	0.223	0.223
4.25	2,837	104.25	---	---	---	---	---	---	---	---	---	0.223	0.223
4.30	2,865	104.30	---	---	---	---	---	---	---	---	---	0.223	0.223
4.35	2,894	104.35	---	---	---	---	---	---	---	---	---	0.223	0.223
4.40	2,922	104.40	---	---	---	---	---	---	---	---	---	0.223	0.223
4.45	2,951	104.45	---	---	---	---	---	---	---	---	---	0.223	0.223
4.50	2,979	104.50	---	---	---	---	---	---	---	---	---	0.223	0.223
4.55	2,995	104.55	---	---	---	---	---	---	---	---	---	0.223	0.223
4.60	3,012	104.60	---	---	---	---	---	---	---	---	---	0.223	0.223
4.65	3,028	104.65	---	---	---	---	---	---	---	---	---	0.223	0.223
4.70	3,044	104.70	---	---	---	---	---	---	---	---	---	0.223	0.223
4.75	3,061	104.75	---	---	---	---	---	---	---	---	---	0.223	0.223
4.80	3,077	104.80	---	---	---	---	---	---	---	---	---	0.223	0.223
4.85	3,093	104.85	---	---	---	---	---	---	---	---	---	0.223	0.223
4.90	3,110	104.90	---	---	---	---	---	---	---	---	---	0.223	0.223
4.95	3,126	104.95	---	---	---	---	---	---	---	---	---	0.223	0.223
5.00	3,142	105.00	---	---	---	---	---	---	---	---	---	0.223	0.223

...End

Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	23.4524	10.7000	0.8280	--------
3	0.0000	0.0000	0.0000	--------
5	41.1097	10.9000	0.8313	--------
10	49.7363	10.2000	0.8128	--------
25	69.7924	10.9000	0.8348	--------
50	280.3318	26.3001	1.0717	--------
100	728.0350	36.7000	1.2251	--------

File name: scripps-intensity.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.40	1.91	1.59	1.38	1.21	1.09	0.99	0.91	0.84	0.78	0.73	0.69
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	4.12	3.29	2.75	2.37	2.10	1.88	1.71	1.57	1.45	1.35	1.26	1.19
10	5.45	4.32	3.61	3.12	2.75	2.47	2.25	2.06	1.91	1.78	1.67	1.57
25	6.93	5.52	4.61	3.98	3.51	3.15	2.86	2.62	2.43	2.26	2.12	1.99
50	7.00	5.97	5.20	4.60	4.12	3.73	3.40	3.13	2.90	2.69	2.52	2.36
100	7.54	6.56	5.79	5.17	4.66	4.24	3.88	3.57	3.31	3.07	2.87	2.69

Tc = time in minutes. Values may exceed 60.

Precip. file name: precip.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	0.84	0.00	1.10	2.80	1.58	1.80	4.50
SCS 6-Hr	0.00	0.61	0.00	0.79	1.60	1.14	1.31	2.90
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00