PRELIMINARY HYDROLOGY, HYDRAULICS,
& STORMWATER TREATMENT STUDY

FOR

LA COSTA HOTEL

COMMERCIAL DEVELOPMENT
18-188 MIN/DR/CDP

516 LA COSTA AVENUE
ENCINITAS, CA 92024

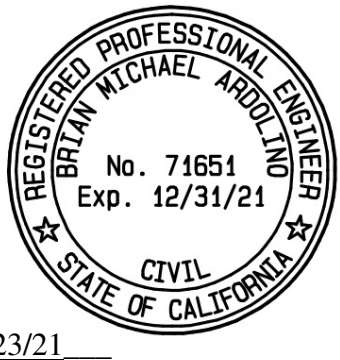
PREPARED FOR:

DM LA COSTA AVENUE, LLC
1650 N. COAST HIGHWAY 101
ENCINITAS CA 92024

DATE:
JULY 2021

PREPARED BY:

PASCO LARET SUITER & ASSOCIATES
535 NORTH HIGHWAY 101, SUITE A
SOLANA BEACH, CA 92075



7/23/21

BRIAN M. ARDOLINO, RCE 71651 DATE

TABLE OF CONTENTS

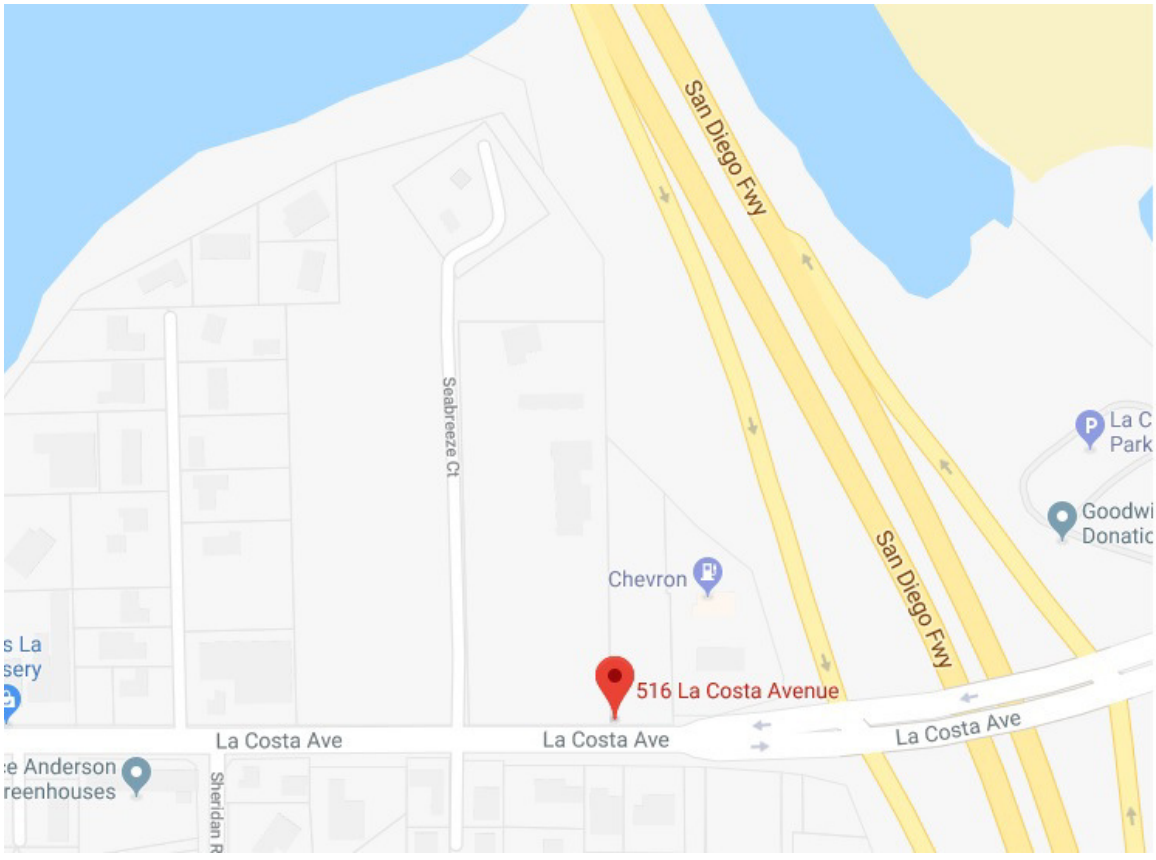
1.0 EXECUTIVE SUMMARY

1.1 Introduction

This Hydrology Study for the La Costa Hotel project has been prepared to analyze the hydrologic and hydraulic characteristics of the existing and proposed project site. This report intends to present both the methodology and the calculations used for determining the runoff from the project site in both the pre-developed (existing) conditions and the post-developed (proposed) conditions produced by the 100 year 6 hour storm. In addition, this report will propose the sizing of all necessary storm drain facilities and storm drain piping necessary for the storm drain system to safely convey the runoff from the 100-year rainfall event.

1.2 Existing Conditions

The project site is located at 516 La Costa Ave, and is bound by a gas station to the east, Batiquitos Lagoon to the North, residential homes and green houses to the west, and La Costa Avenue to the south as shown on the Vicinity Map.



Vicinity Map
Not to scale

The existing project site is an undeveloped tree farm. The drainage characteristics of the site consist generally of sheet flow from south to north, and ultimately discharges north into the Batiquitos Lagoon. A steep slope along the northern edge of the property drains east toward the Interstate 5 freeway which then discharges into an existing earthen ditch in the Interstate 5 corridor where it is ultimately conveyed north to the Batiquitos Lagoon.

1.3 Proposed Project

The intent of the proposed project is to develop a hotel with restaurant. The proposed development consists of grading to create pads suitable for the construction of structures, new driveway and parking area, stormwater treatment basin, curb and associated hardscape and landscape, and associated underground utilities.

A bioretention basin is proposed on the north end of the site. In general, the site will drain south to north either along proposed curb or will sheet flow into proposed stormdrain that will discharge into the Bioretention Basin. The basin will be lined and has an overflow inlet to discharge out via a PVC pipe that outlets to two proposed MaxWell IV infiltration pits by Torrent where the water will infiltrate on site. In the instance of an emergency, where stormwater will not infiltrate, an emergency overflow pipe directly connected to the infiltration pit will gravity drain stormwater to the La Costa 48 project to the west. The stormdrain pipe will be connected to the La Costa 48 project's drainage inlet B, the emergency overflow inlet located on the easterly portion of the site.

1.4 Hydrologic Unit Contribution

As identified by the San Diego Basin Plan, the proposed project site drains within Carlsbad Hydrologic Unit, specifically the San Marcos Hydrologic Sub Area (904.51).

According to the California 2010 USEPA 303d list published by the San Diego Regional Water Quality Control Board, there are no impaired water bodies downstream of the project site that are associated with the Pacific Ocean Shoreline in this basin.

Drainage from the site ultimately discharges to the Pacific Ocean, but the site does not directly discharge into the ocean itself. The path of discharge from the pre-developed is as follows: initially collected and conveyed to the north edge of the site, conveyed either along the Interstate 5 corridor earthen ditch to the Bataquitos Lagoon or directly northwest to Bataquitos Lagoon, ultimately discharging into the Pacific Ocean. The path of discharge from the post-developed project is as follows: initially collected and conveyed to the north edge of the site, and then routed to an infiltration pit system.

1.5 Preliminary Hydrology Calculations

The existing 100 year peak discharge is 1.09 cfs, and is associated with a time of concentration (Tc) of 12.6 minutes and a total area of 1.2 acres.

The post-developed condition peak discharge is 1.22 cfs, and is associated with a Tc of 14.45 minutes and a total area of 1.0 acres.

1.6 Conclusions

The proposed development and proposed storm drain design will be capable of not only safely conveying the 100-year storm runoff flow, but has included many instruments into the storm drain system design to ensure that the discharge from the project site is of the best possible quality and will not pose any significant impact or threats to the water quality of the Pacific Ocean, or the public storm drain system. In addition, the proposed development and storm drain improvements will not significantly alter the existing drainage patterns. Any increase in storm water runoff will be detained and will not increase the potential for flooding or create an increase in erosion.

This project has been deemed a Priority Project and therefore is subject to Hydromodification criteria. See section 3.5 for Hydromodification Analysis note.

It is with these above reasons that it can be concluded that there will be no negative impact to the downstream storm drain facilities or an increased potential of flooding. Since a major goal of this project is to ensure that all storm water quality issues are addressed to the maximum extent practical, the peak discharge for the proposed site will be utilized to adequately size the components of the storm drain system for this project.

1.7 References

"San Diego County Hydrology Manual", revised June 2003, County of San Diego, Department of Public Works, Flood Control Section.

"Drainage Design Manual", City of San Diego, April 1984, addendum March 1989.

"Grading, Erosion and Sediment Control Ordinance/Chapter", City of Encinitas, Engineering Services and Community Development Department, revised November 2002.

2.0 METHODOLOGY

2.1 Introduction

The hydrologic model used to perform the hydrologic analysis presented in this report utilizes the Ration Method (RM) equation, Q=CIA. The RM formula estimates the peak rate of runoff based on the variables of area, runoff coefficient, and rainfall intensity. The rainfall intensity (I) is equal to:

$$I = 7.44 \times P_6 \times D^{-0.645}$$

Where:

I = Intensity (in/hr)
P_6 = 6-hour precipitation (inches)
D = duration (minutes – use Tc)

Using the Time of Concentration (Tc), which is the time required for a given element of water that originates at the most remote point of the basin being analyzed to reach the point at which the runoff from the basin is being analyzed. The RM equation determines the storm water runoff rate (Q) for a given basin in terms of flow (typically in cubic feet per second (cfs) but sometimes as gallons per minute (gpm)). The RM equation is as follows:

$$Q = CIA$$

Where:

Q= flow (in cfs)
C = runoff coefficient, ratio of rainfall that produces storm water runoff (runoff vs. infiltration/evaporation/absorption/etc)
I = average rainfall intensity for a duration equal to the Tc for the area, in inches per hour.
A = drainage area contributing to the basin in acres.

The RM equation assumes that the storm event being analyzed delivers precipitation to the entire basin uniformly, and therefore the peak discharge rate will occur when a raindrop that falls at the most remote portion of the basin arrives at the point of analysis. The RM also assumes that the fraction of rainfall that becomes runoff or the runoff coefficient C is not affected by the storm intensity, I, or the precipitation zone number.

2.2 County of San Diego Criteria

As defined by the County Hydrology Manual dated June 2003, the rational method is the preferred equation for determining the hydrologic characteristics of basins up to approximately one square mile in size. The County of San Diego has developed its own tables, nomographs, and methodologies for analyzing storm water runoff for areas within the county. The County has also developed precipitation isopluvial contour maps that show even lines of rainfall anticipated from a given storm event (i.e. 100-year, 6-hour storm).

One of the variables of the RM equation is the runoff coefficient, C. The runoff coefficient is dependent only upon land use and soil type and the County of San Diego has developed a table of Runoff Coefficients for Urban Areas to be applied to basin located within the County of San Diego. The table categorizes the land use, the associated development density (dwelling units per acre) and the percentage of impervious area. Each of the categories listed has an associated runoff coefficient, C, for each soil type class.

The County has also illustrated in detail the methodology for determining the time of concentration, in particular the initial time of concentration. The County has adopted the Federal Aviation Agency's (FAA) overland time of flow equation. This equation essentially limits the flow path length for the initial time of concentration to lengths under 100 feet, and is dependent on land use and slope.

2.3 City of Encinitas Standards

The City of Encinitas has additional requirements for hydrology reports which are outlined in the Grading, Erosion and Sediment Control Ordinance. Please refer to this manual for further details.

2.4 Runoff Coefficient Determination

As stated in section 2.2, the runoff coefficient is dependent only upon land use and soil type and the County of San Diego has developed a table of Runoff Coefficients for Urban Areas to be applied to basin located within the County of San Diego. The table, included at the end of this section, categorizes the land use, the associated development density (dwelling units per acre) and the percentage of impervious area. Weighted runoff coefficients were calculated based on the existing and proposed impervious areas for each basin per the County Hydrology Manual section 3.1.2. See section 3.0 and hydrologic node maps for calculations.

3.0 HYDROLOGY MODEL OUTPUT

Rational Method Parameters

Runoff Coefficient C= 0.9 x (% Impervious) + Cp (1-% Impervious)*
Cp=0.25* for existing condition pervious type "B" soils
100 Year 6 Hour Storm Precipitation (P6)=2.5 in (see rainfall isopluvial*)
Ti=[11.9(L/Mi)3/ΔH]0.385
Tt = Ti + Tc
I= Intensity in/hr, I=7.44xP6xD-0.645*
Duration (D)= Time of Concentration, Tc
Q=Peak Runoff, Q=C*I*A (cfs)
*From San Diego County Hydrology Manual, June 2003 Revision

3.1 Pre-Developed Hydrologic Model Output

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

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

                              Analysis prepared by:

                           Pasco Laret Suiter & Associates

 ************************* DESCRIPTION OF STUDY *************************
* 2882 LA COSTA HOTEL                                                   *
* 100 YEAR PRE-DEVELOPED ANALYSIS                                       *
* NOVEMEBER 2019                                                        *
 ************************************************************************

  FILE NAME: 2882E100.DAT
  TIME/DATE OF STUDY: 12:32 11/26/2019
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  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

```
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

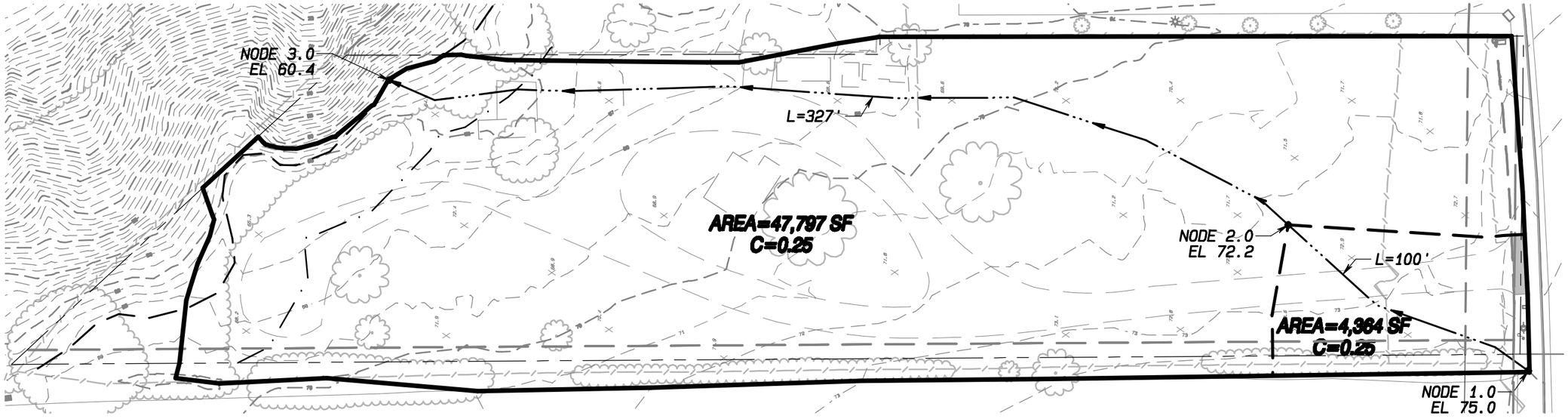
****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =     75.00
  DOWNSTREAM ELEVATION(FEET) =     72.20
  ELEVATION DIFFERENCE(FEET) =      2.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.692
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    97.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.034
  SUBAREA RUNOFF(CFS) =      0.10
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.10

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     72.20  DOWNSTREAM(FEET) =     60.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   327.00   CHANNEL SLOPE =  0.0361
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.10
  FLOW VELOCITY(FEET/SEC) =   2.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =   12.60
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     427.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.628
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
  SUBAREA AREA(ACRES) =    1.10   SUBAREA RUNOFF(CFS) =    1.00
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       1.09
  TC(MIN.) =   12.60
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.2  TC(MIN.) =     12.60
  PEAK FLOW RATE(CFS)   =       1.09
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HYDROLOGIC NODE MAP
516 LA COSTA AVENUE

PRE-DEVELOPMENT MAP



'C' CALCULATION

PER COUNTY HYDROLOGY MANUAL 3.1.2
C= 0.9 x (% IMPERVIOUS) + Cp x (1-% IMPERVIOUS)

Cp = 0.25 FOR TYPE 'B' SOIL

LEGEND

BASIN BOUNDARY

SUB-AREA

FLOWLINE

IMPERVIOUS AREA — 95 SF

SCALE: 1"=40'

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 11/26/2019
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 13 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 1.2 ACRES
RUNOFF COEFFICIENT 0.25
PEAK DISCHARGE 1.09 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 13	DISCHARGE (CFS) = 0
TIME (MIN) = 26	DISCHARGE (CFS) = 0
TIME (MIN) = 39	DISCHARGE (CFS) = 0
TIME (MIN) = 52	DISCHARGE (CFS) = 0
TIME (MIN) = 65	DISCHARGE (CFS) = 0.1
TIME (MIN) = 78	DISCHARGE (CFS) = 0.1
TIME (MIN) = 91	DISCHARGE (CFS) = 0.1
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TIME (MIN) = 117	DISCHARGE (CFS) = 0.1
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TIME (MIN) = 143	DISCHARGE (CFS) = 0.1
TIME (MIN) = 156	DISCHARGE (CFS) = 0.1
TIME (MIN) = 169	DISCHARGE (CFS) = 0.1
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TIME (MIN) = 195	DISCHARGE (CFS) = 0.1
TIME (MIN) = 208	DISCHARGE (CFS) = 0.1
TIME (MIN) = 221	DISCHARGE (CFS) = 0.1
TIME (MIN) = 234	DISCHARGE (CFS) = 0.2
TIME (MIN) = 247	DISCHARGE (CFS) = 0.3
TIME (MIN) = 260	DISCHARGE (CFS) = 1.09
TIME (MIN) = 273	DISCHARGE (CFS) = 0.2
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TIME (MIN) = 299	DISCHARGE (CFS) = 0.1
TIME (MIN) = 312	DISCHARGE (CFS) = 0.1
TIME (MIN) = 325	DISCHARGE (CFS) = 0.1
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TIME (MIN) = 351	DISCHARGE (CFS) = 0.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0
TIME (MIN) = 377	DISCHARGE (CFS) = 0

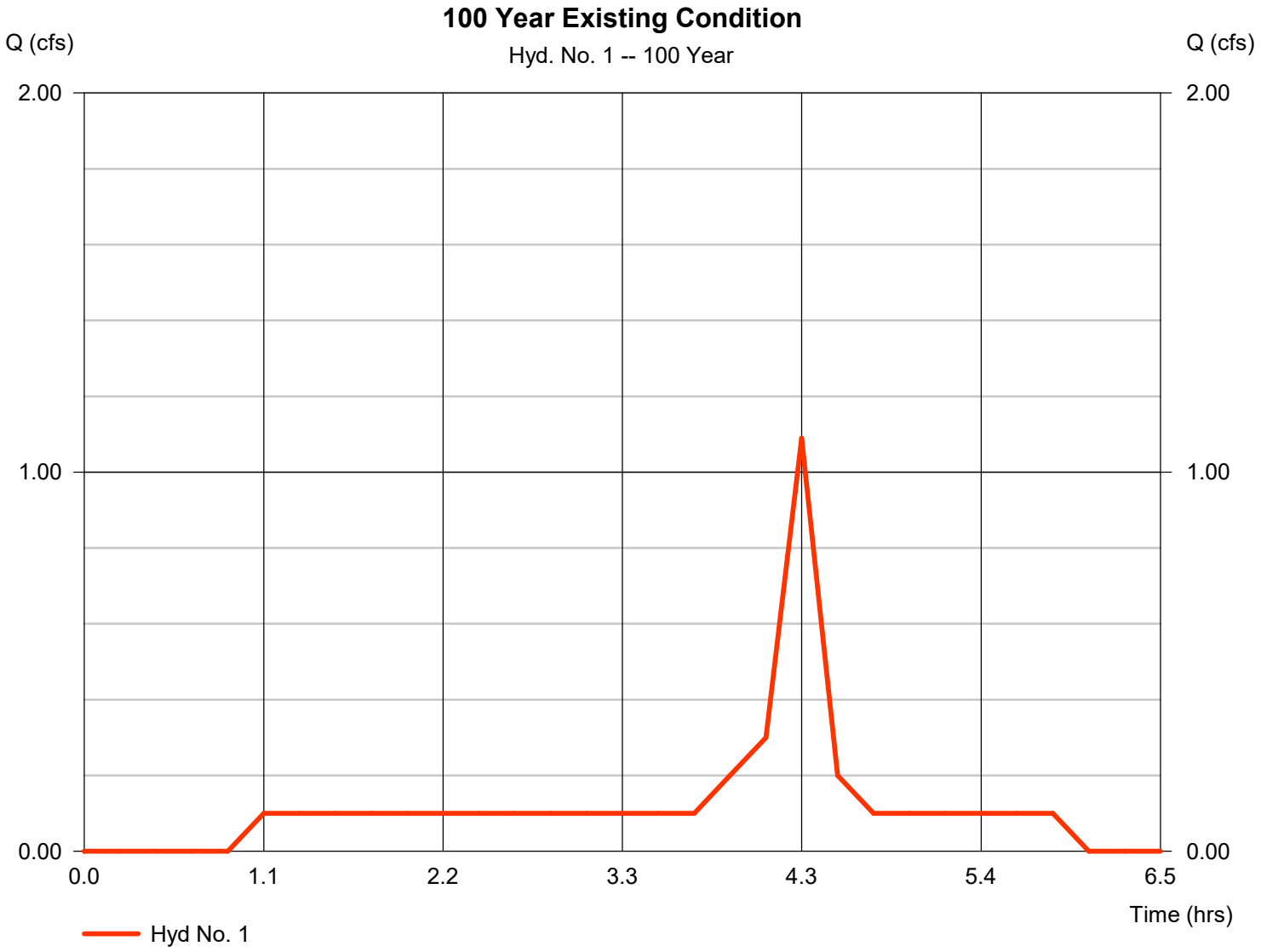
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Tuesday, 11 / 26 / 2019

Hyd. No. 1

100 Year Existing Condition

Hydrograph type	= Manual	Peak discharge	= 1.090 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.33 hrs
Time interval	= 13 min	Hyd. volume	= 2,878 cuft



3.2 Post-Developed Hydrologic Model Output

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

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

                              Analysis prepared by:

                           Pasco Laret Suiter & Associates

 ************************** DESCRIPTION OF STUDY **************************
* 2882 LA COSTA HOTEL                                                     *
* 100 YEAR POST-DEVELOPED ANALYSIS                                        *
* October 2020                                                            *
 ****************************************************************************

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  TIME/DATE OF STUDY: 13:44 09/25/2020
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  2003 SAN DIEGO MANUAL CRITERIA

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  6-HOUR DURATION PRECIPITATION (INCHES) =   2.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   3.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   168.00
  UPSTREAM ELEVATION(FEET) =     73.20
  DOWNSTREAM ELEVATION(FEET) =     70.50
  ELEVATION DIFFERENCE(FEET) =      2.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   10.859
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    69.11
```

```
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.994
 SUBAREA RUNOFF(CFS) =      0.11
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.11

****************************************************************************
 FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     70.50  DOWNSTREAM(FEET) =     65.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =   155.00   CHANNEL SLOPE =  0.0323
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.11
 FLOW VELOCITY(FEET/SEC) =   2.69 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   11.82
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     323.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.782
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2500
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2500
 SUBAREA AREA(ACRES) =    0.15   SUBAREA RUNOFF(CFS) =    0.14
 TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       0.25
 TC(MIN.) =   11.82

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    64.80  DOWNSTREAM(FEET) =    62.01
 FLOW LENGTH(FEET) =    98.00   MANNING'S N =  0.009
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   1.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.14
 ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.25
 PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   12.14
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =     421.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.718
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5100
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2857
 SUBAREA AREA(ACRES) =    0.04   SUBAREA RUNOFF(CFS) =    0.08
 TOTAL AREA(ACRES) =        0.3   TOTAL RUNOFF(CFS) =       0.33
 TC(MIN.) =   12.14
```

```
****************************************************************************
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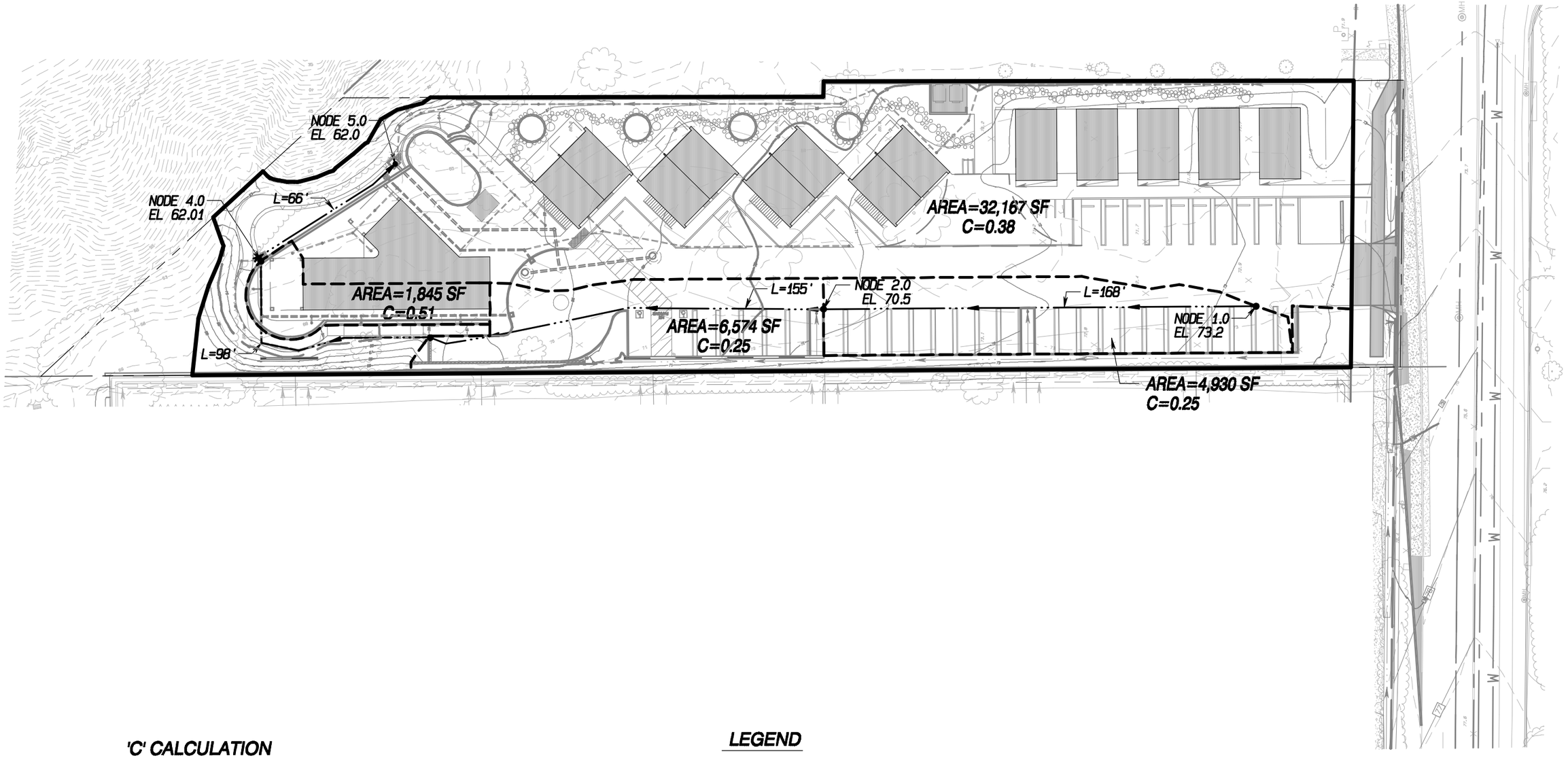
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     62.01  DOWNSTREAM(FEET) =     62.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =    66.00   CHANNEL SLOPE =  0.0002
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 NOTE: CHANNEL SLOPE OF .001 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.33
 FLOW VELOCITY(FEET/SEC) =   0.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.32   Tc(MIN.) =   14.45
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =     487.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.321
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .3800
 S.C.S. CURVE NUMBER (AMC II) =   0
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3524
 SUBAREA AREA(ACRES) =    0.74   SUBAREA RUNOFF(CFS) =    0.93
 TOTAL AREA(ACRES) =        1.0   TOTAL RUNOFF(CFS) =       1.22
 TC(MIN.) =   14.45
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.0  TC(MIN.) =     14.45
 PEAK FLOW RATE(CFS)   =       1.22
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

HYDROLOGIC NODE MAP
516 LA COSTA AVENUE

POST-DEVELOPMENT MAP



'C' CALCULATION

PER COUNTY HYDROLOGY MANUAL 3.1.2
C= 0.9 x (% IMPERVIOUS) + Cp x (1-% IMPERVIOUS)

Cp = 0.25 FOR TYPE 'B' SOIL

LEGEND

BASIN BOUNDARY

SUB-AREA

FLOWLINE

IMPERVIOUS AREA — 8,704 SF (7,266 SF ON-SITE + 1,438 SF OFF-SITE)

SCALE: 1"=40'

RATIONAL METHOD HYDROGRAPH PROGRAM
COPYRIGHT 1992, 2001 RICK ENGINEERING COMPANY

RUN DATE 9/25/2020
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 14 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 1 ACRES
RUNOFF COEFFICIENT 0.35
PEAK DISCHARGE 1.22 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 14	DISCHARGE (CFS) = 0.1
TIME (MIN) = 28	DISCHARGE (CFS) = 0.1
TIME (MIN) = 42	DISCHARGE (CFS) = 0.1
TIME (MIN) = 56	DISCHARGE (CFS) = 0.1
TIME (MIN) = 70	DISCHARGE (CFS) = 0.1
TIME (MIN) = 84	DISCHARGE (CFS) = 0.1
TIME (MIN) = 98	DISCHARGE (CFS) = 0.1
TIME (MIN) = 112	DISCHARGE (CFS) = 0.1
TIME (MIN) = 126	DISCHARGE (CFS) = 0.1
TIME (MIN) = 140	DISCHARGE (CFS) = 0.1
TIME (MIN) = 154	DISCHARGE (CFS) = 0.1
TIME (MIN) = 168	DISCHARGE (CFS) = 0.1
TIME (MIN) = 182	DISCHARGE (CFS) = 0.1
TIME (MIN) = 196	DISCHARGE (CFS) = 0.1
TIME (MIN) = 210	DISCHARGE (CFS) = 0.2
TIME (MIN) = 224	DISCHARGE (CFS) = 0.2
TIME (MIN) = 238	DISCHARGE (CFS) = 0.3
TIME (MIN) = 252	DISCHARGE (CFS) = 1.22
TIME (MIN) = 266	DISCHARGE (CFS) = 0.2
TIME (MIN) = 280	DISCHARGE (CFS) = 0.1
TIME (MIN) = 294	DISCHARGE (CFS) = 0.1
TIME (MIN) = 308	DISCHARGE (CFS) = 0.1
TIME (MIN) = 322	DISCHARGE (CFS) = 0.1
TIME (MIN) = 336	DISCHARGE (CFS) = 0.1
TIME (MIN) = 350	DISCHARGE (CFS) = 0.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0.1
TIME (MIN) = 378	DISCHARGE (CFS) = 0

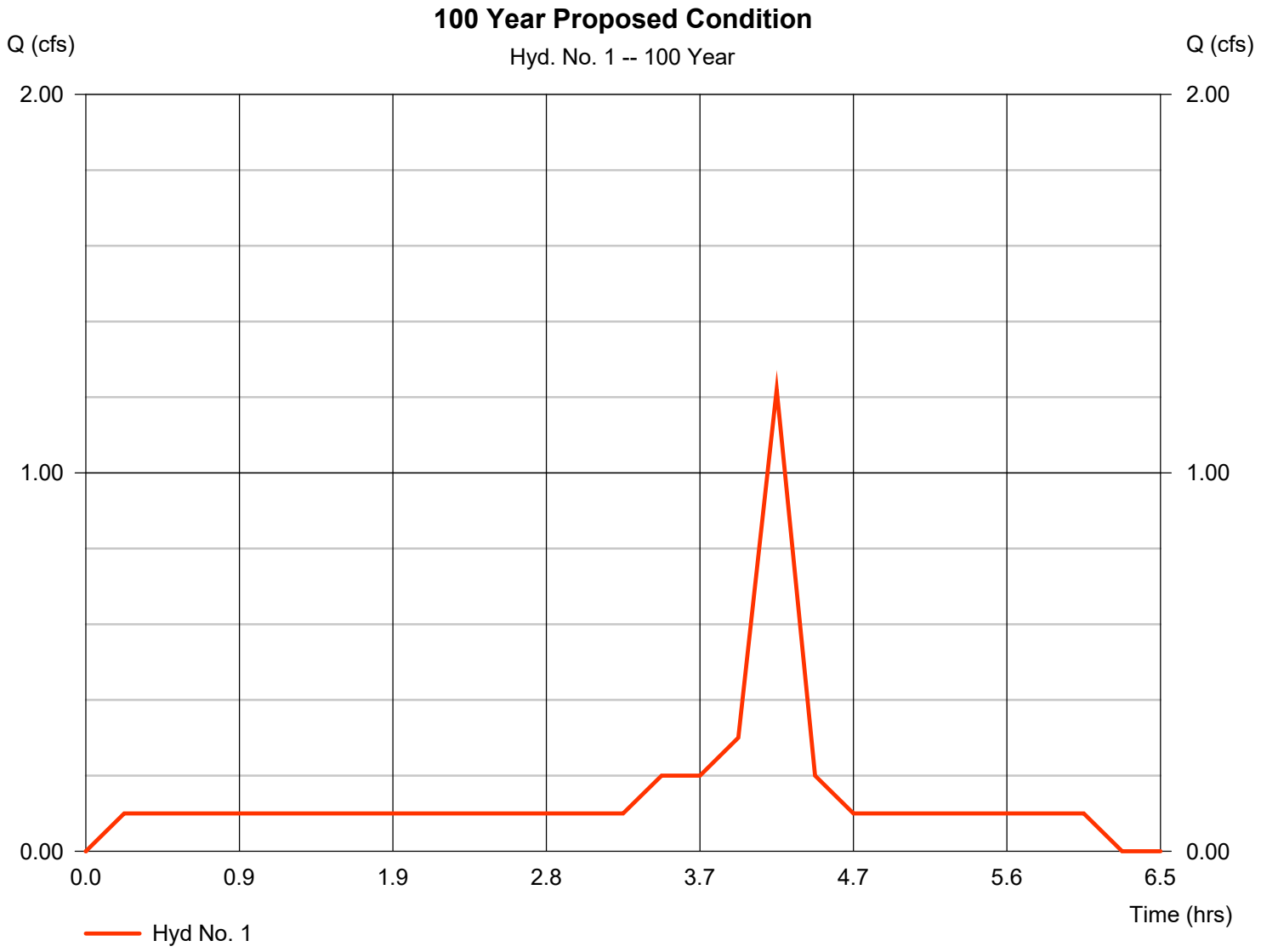
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Friday, 09 / 25 / 2020

Hyd. No. 1

100 Year Proposed Condition

Hydrograph type	= Manual	Peak discharge	= 1.220 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 14 min	Hyd. volume	= 3,545 cuft



3.3 Hydraulic Calculations

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Sep 25 2020

4 inch PVC at 2%

Circular

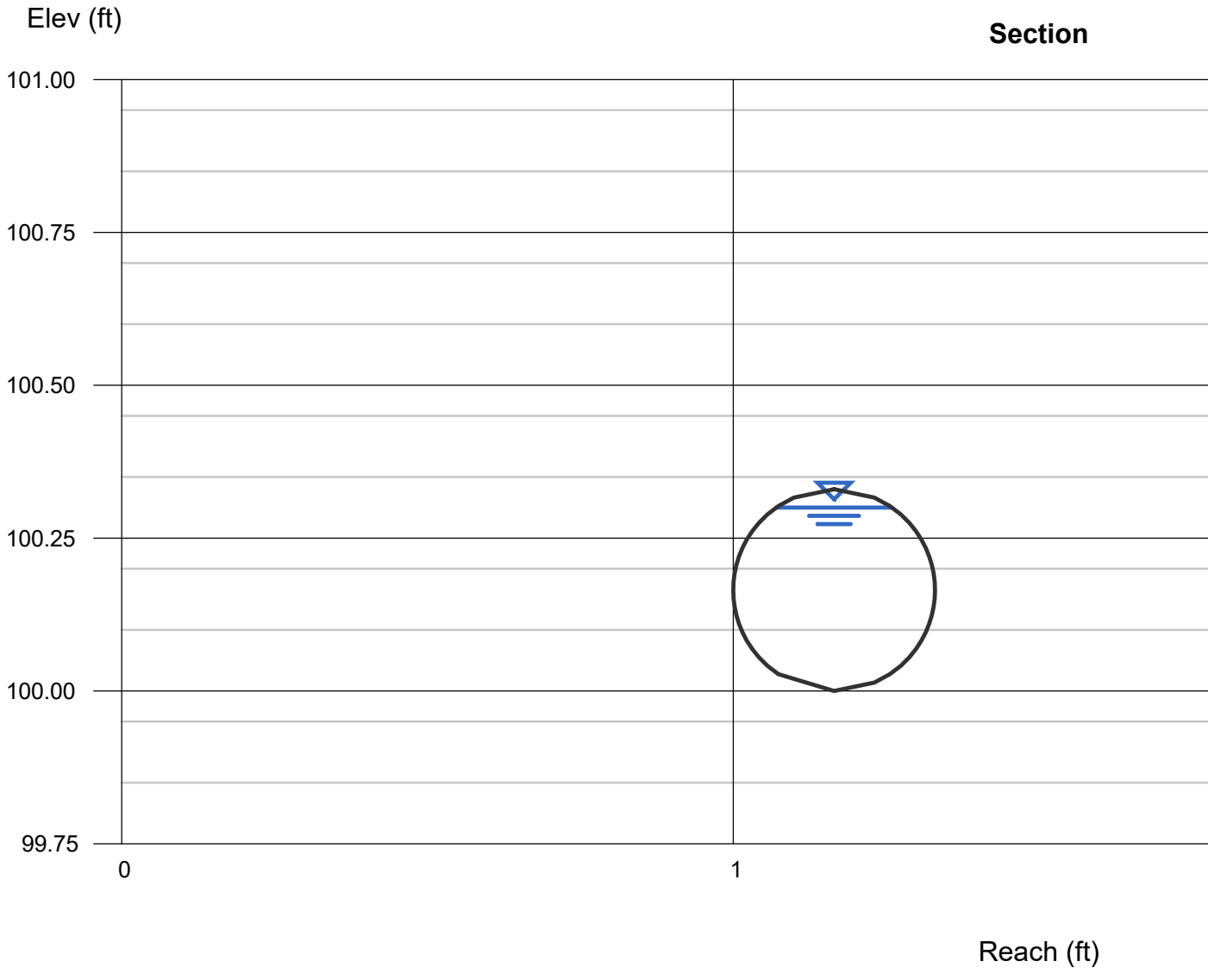
Diameter (ft)	= 0.33
Invert Elev (ft)	= 100.00
Slope (%)	= 2.00
N-Value	= 0.009

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 0.30

Highlighted

Depth (ft)	= 0.30
Q (cfs)	= 0.405
Area (sqft)	= 0.08
Velocity (ft/s)	= 4.95
Wetted Perim (ft)	= 0.83
Crit Depth, Yc (ft)	= 0.32
Top Width (ft)	= 0.19
EGL (ft)	= 0.68



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Sep 25 2020

6 inch PVC at 1.5%

Circular

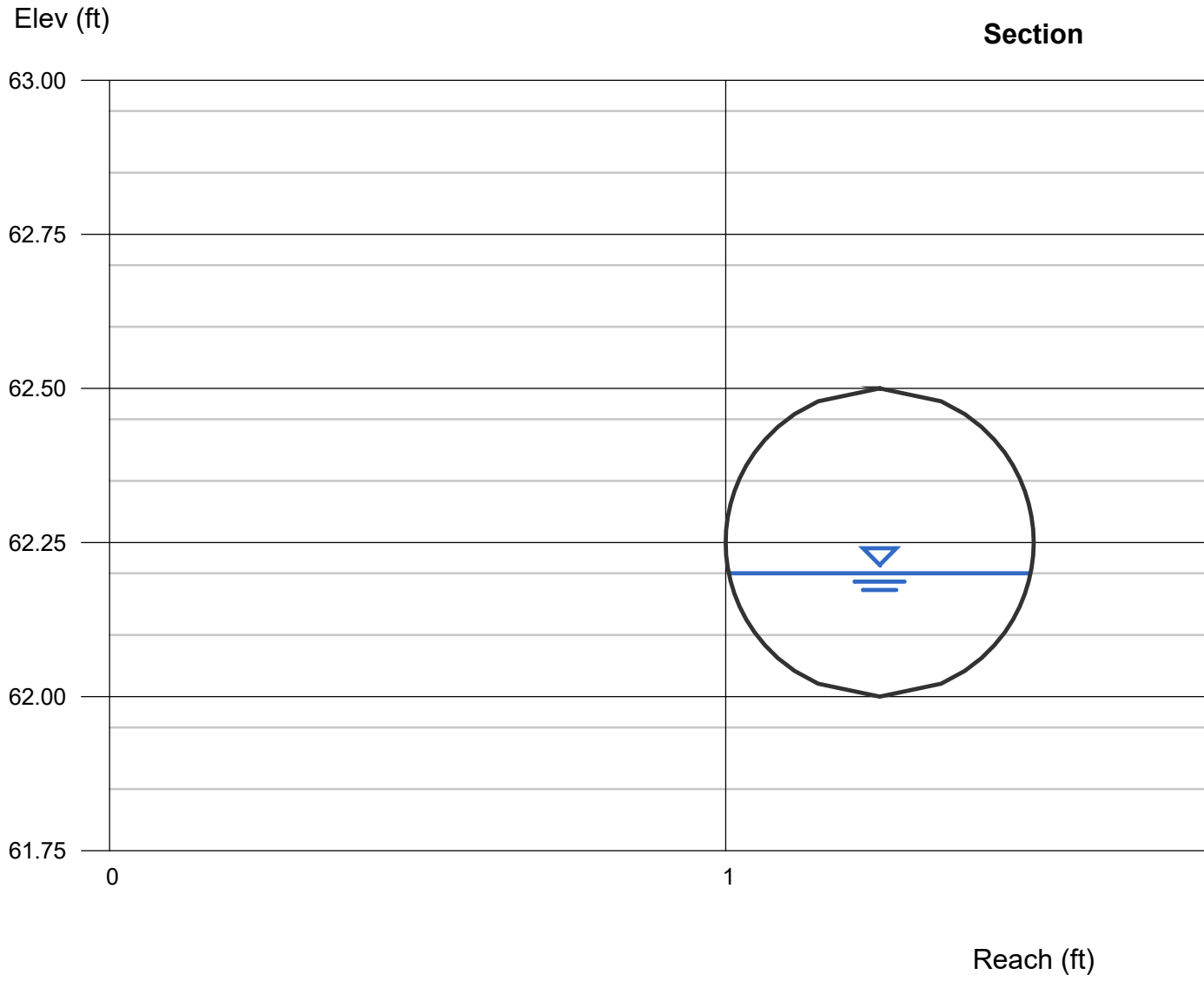
Diameter (ft)	= 0.50
Invert Elev (ft)	= 62.00
Slope (%)	= 1.50
N-Value	= 0.009

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.33

Highlighted

Depth (ft)	= 0.20
Q (cfs)	= 0.330
Area (sqft)	= 0.07
Velocity (ft/s)	= 4.50
Wetted Perim (ft)	= 0.68
Crit Depth, Yc (ft)	= 0.30
Top Width (ft)	= 0.49
EGL (ft)	= 0.51



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Sep 25 2020

8 inch PVC at 1%

Circular

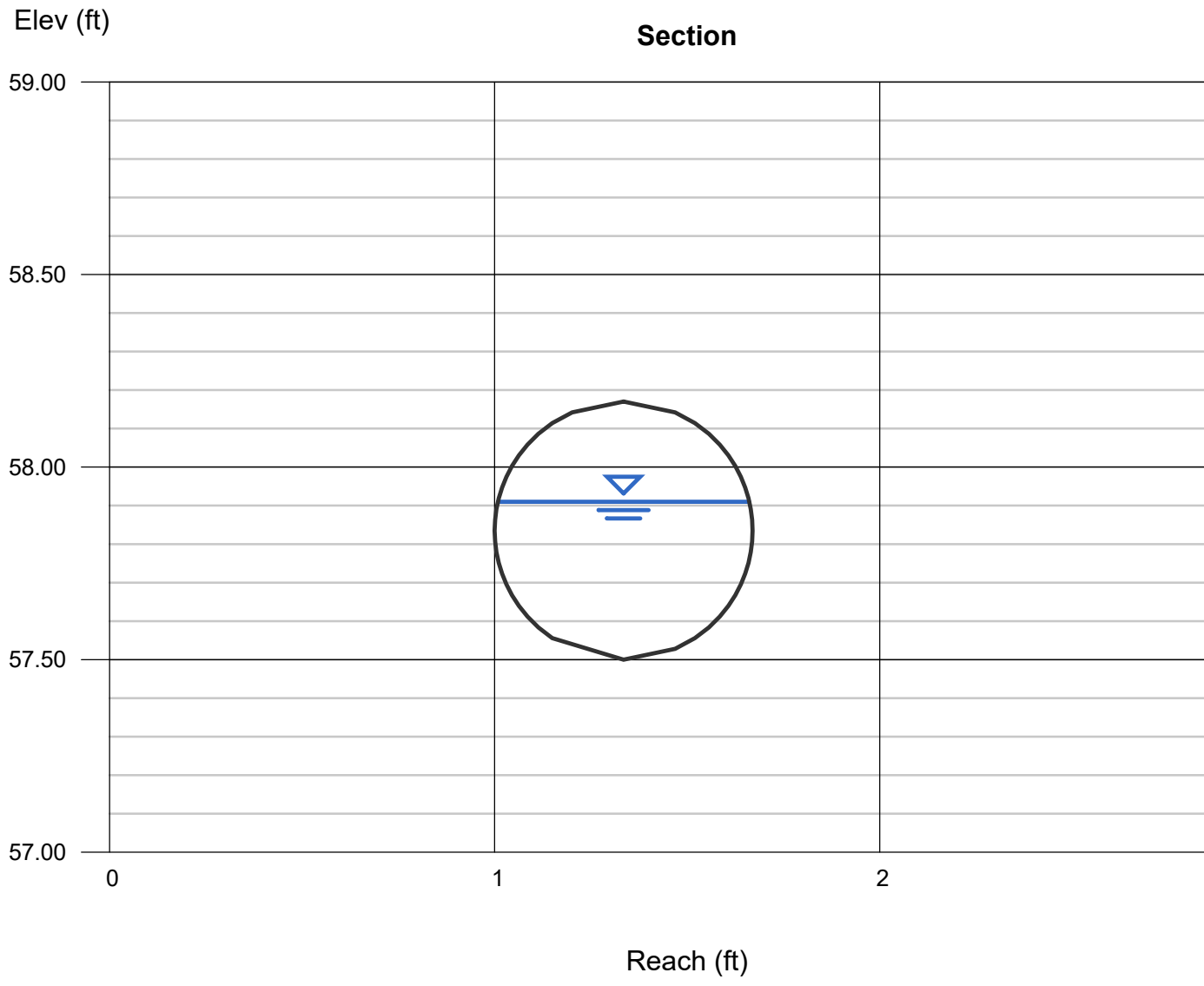
Diameter (ft)	= 0.67
Invert Elev (ft)	= 57.50
Slope (%)	= 1.00
N-Value	= 0.009

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.22

Highlighted

Depth (ft)	= 0.41
Q (cfs)	= 1.220
Area (sqft)	= 0.23
Velocity (ft/s)	= 5.38
Wetted Perim (ft)	= 1.21
Crit Depth, Yc (ft)	= 0.53
Top Width (ft)	= 0.65
EGL (ft)	= 0.86



3.4 Volume Sizing Requirements

Basin Sizing

DMA Name	*DMA Area (square feet)*	*Post-project surface type*	*DMA Runoff factor*	*DMA Area × runoff factor*	*Soil Type:*	*IMP Name*		
					B	*BMP A*		
1	*7004*	*Roof*	*1.0*	*7,004*				
2	*262*	*PCC*	*1.0*	*262*				
3	*7,215*	*PP*	*0.1*	*722*				
4	*14,498*	*L*	*0.1*	*1450*				
5	*628*	*DG*	*0.1*	*63*	*LID Sizing factor*	*Minimum Area*	*Proposed Area*	
6	*15,449*	*PP*	*0.1*	*1545*				
			Total	***11,045***	***0.03***	***332***	***453***	***IMP Area***

Volume Sizing Requirement

Design Capture Volume (Per City of Encinitas BMP Design Manual Appendix B.1, February 2016):

DCV = R_F x d x A x 1/12 in/ft
R_F = Runoff factor (unitless)
d = 85th percentile, 24-hour storm event rainfall depth (inches)
A = Tributary area (sf)

R_F = [(7,266*0.9) + (15,126*0.3)+(22,664*0.1]/45,056
R_F = 0.30
d = 0.56 inches
A = 45,056 sf = 1.03 acres

DCV = 0.30*0.56 in*45,056 sf x 1/12 in/ft
=631 CF Required

100-Year Storage volume required to infiltrate = 3,545 cf ← Governs

Paver Parking & Drive Aisle Area Volume Proposed

Area = 15,449 sf
Gravel Layers = 12 inch (1')
Gravel Void Ratio Factor = 0.4
Factor of Safety = 2

Paver Volume Proposed = (15,449 sf * 1 ft * 0.4) / 2
= 3,089 cf

Basin Volume Proposed

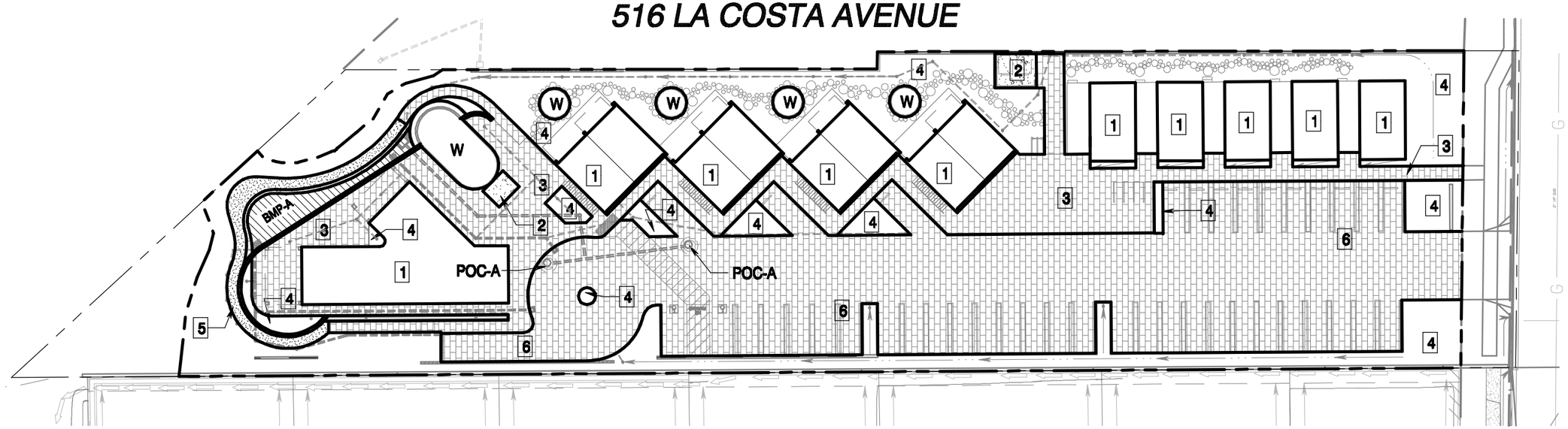
Area	= 453 sf
Ponding Depth	= 6 inch (0.5')
Engineered Soil Layer	= 18 inch (1.5')
Soil Void Ratio	= 0.2
Gravel Layers	= 18 inch (1.5')
Gravel Void Ratio Factor	= 0.4

Basin Volume Proposed = (453 sf * 0.5 ft)+(453 sf *1.5 ft * 0.2) + (453 sf * 1.5 ft * 0.4)
= 226 cf + 136 cf + 271 cf
= 633 cf

Maxwell IV Drywell Storage = 2 x 584 cf
= 1,169 cf (See attached calculations from Torrent Resources)

Total Proposed Storage Volume = Paver Parking Volume + Basin Volume + Drywell Storage
= 3,089 cf + 633 cf + 1,169 cf
= 4,891 cf

DMA/HMP EXHBIIT
516 LA COSTA AVENUE



NOTES:

1. DEPTH TO GROUNDWATER > 20 FEET.

POTENTIAL POLLUTANT SOURCE	SOURCE CONTROL
ONSITE STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! FLOWS TO OCEAN" OR SIMILAR. MAINTAIN AND PERIODICALLY REPAINT OR REPLACE INLET MARKINGS. PROVIDE STORM WATER POLLUTION PREVENTION INFORMATION TO NEW SITE OWNERS, LESSEES, OR OPERATORS. INCLUDE THE FOLLOWING IN LEASE AGREEMENTS: "TENANT SHALL NOT ALLOW ANYONE TO DISCHARGE ANYTHING TO STORM DDRAINS OR TO STORE OR DEPOSIT MATERIALS SO AS TO CREATE A POTENTIAL DISCHARG TO STORM DRAINS."
LANDSCAPE/OUTDOOR PESTICIDE USE	FINAL LANDSCAPE PLANS SHALL: PRESERVE EXISTING DROUGHT TOLERANT TREES, SHRUBS, AND GROUND COVER TO THE MAXIMUM EXTENT POSSIBLE. BE DESIGNED TO MINIMIZE IRRIGATION AND RUNOFF, PROMOTE SURFACE INFILTRATION WHERE APPROPRIATE, AND MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES. SPECIFY PLANTS THAT ARE TOLERANT OF PERIODIC SATURATED SOIL CONDITIONS FOR AREAS TO RETAIN OR DETAIN STORMWATER. CONSIDER THE USE OF PEST-RESISTANT PLANTS, ESPECIALLY ADJACENT TO HARDSCAPE. SELECT PLANTS APPROPRIATE TO SITE SOILS, SLOPES, CLIMATE, SUN, WIND, RAIN, LAND USE, AIR MOVEMENT, ECOLOGICAL CONSISTENCY, AND PLANT INTERACTIONS. MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES.
PLAZA, SIDEWALKS, AND PARKING LOTS	PLAZAS, SIDEWALKS, AND PARKING LOTS SHALL BE SWEPT REGULARLY TO PREVENT THE ACCUMULATIONS OF LITTER AND DEBRIS. DEBRIS FROM PRESSURE WASHING SHALL BE COLLECTED TO PREVENT ENTRY INTO THE STORM DRAIN SYSTEM. WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER SHALL BE COLLECTED AND DISCHARGED TO THE SANITARY SEWER AND NOT DISCHARGED TO A STORM DRAIN.

BASIN A WQV SIZING

DMA NAME	DMA AREA	PPST	DMA RF	RF * AREA	SOIL TYPE	IMP NAME
1	7,004	BLDG	1.0	7,004	B	BMP-A
2	262	PCC	1.0	262		
3	7,215	PP	0.1	722		
4	14,498	L	0.1	1450		
5	628	DG	0.1	63		
6	15,449	PP	0.1	1545		
			TOTAL	11,045	IMP SF: 0.03	MIN AREA: 332 / PROP AREA: 453 / IMP AREA

SCALE: 1"=40'

3.5 Hydromodification Analysis

See project Storm Water Quality Management Plan (SWQMP) prepared by Pasco Laret Suiter & Associates, dated October 2020 for HydroCAD Modeling for Hydromodification Compliance and general cross section of the HMP Biofiltration Basin and supporting calculations.

4.0 ATTACHMENTS


117° 18' 3" W
117° 17' 58" W
471900
471920
471940
471960
471980
472000
472020
472040
33° 5' 8" N
33° 5' 2" N
3660820
3660800
3660780
3660760
3660740
3660720
3660700
3660680
3660660
3660640
TeF
MIC
La Costa
Soil Map may not be valid at this scale.
Map Scale: 1:984 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 10 20 40 60
Feet
0 45 90 180 270
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

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

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MIC	Marina loamy coarse sand, 2 to 9 percent slopes	B	1.5	99.8%
TeF	Terrace escarpments		0.0	0.2%
Totals for Area of Interest			**1.5**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

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

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

DRAFT

Maxwell® IV Drainage System Calculations Prepared on December 10, 2019

Project: **La Costa Hotel-100YR - Encinitas**

Contact: Tara Goldberg at PLSA Engineering - Solana Beach, CA

Given:

Measured Infiltration Rate	9.50	in/hr
Safety Factor	3.00	
Design Infiltration Rate	3.17	in/hr
Mitigated Volume	3,570	ft^3
Required Drawdown Time	96	hours
Min. Depth to Infiltration	10	ft
Groundwater Depth for Design	62	ft

Proposed:

Drywell Rock Shaft Diameter	6	ft
Drywell Chamber Depth	15	ft
Rock Porosity	40	%
Depth to Infiltration	11	ft
Drywell Bottom Depth	50	ft

Apply Safety Factor to get Design Rate.

$9.50 \ \frac{in}{hr} \div 3 = 3.17 \ \frac{in}{hr}$

Convert Design Rate from in/hr to ft/sec.

$3.17 \ \frac{in}{hr} \times \frac{1 \ ft}{12 \ in} \times \frac{1 \ hr}{3600 \ sec} = 0.000073 \ \frac{ft}{sec}$

A 6 foot diameter drywell provides 18.85 SF of infiltration area per foot of depth, plus 28.27 SF at the bottom.

For a 50 foot deep drywell, infiltration occurs between 11 feet and 50 feet below grade. This provides 39 feet of infiltration depth in addition to the bottom area. Infiltration area per drywell is calculated below.

$39 \ ft \times 18.85 \frac{ft^2}{ft} + 28.27 \ ft^2 = 763 \ ft^2$

Combine design rate with infiltration area to get flow (disposal) rate for each drywell.

$0.000073 \frac{ft}{sec} \times 763 \ ft^2 = 0.05596 \frac{ft^3}{sec}$

Volume of disposal for each drywell based on various time frames are included below.

96 hrs: 0.056 CFS x 96 hours x $\frac{3600 \ sec}{1 \ hr}$ = 19,340 cubic feet of retained water disposed of.

Chamber diameter = 4 feet. Drywell rock shaft diameter = 6 feet.

Volume provided in each drywell with chamber depth of 15 feet.

$15 \ ft \times 12.57 \ ft^2 + 35 \ ft \times 28.27 \ ft^2 \times 40 \ \% = 584 \ ft^3$

The MaxWell System is composed of 2 drywell(s) .

Total volume provided = 1,169 ft^3

Total 96 hour infiltration volume = 38,679 ft^3

Total infiltration flowrate = 0.11192 $\frac{ft^3}{sec}$

Based on the total mitigated volume of 3570 CF, after subtracting the volume stored in the MaxWell System, the residual volume of 2401 CF could be stored in a separate detention system and connected to the drywell system.

For any questions, please contact Jason Dupre at 626-250-4724 or via email at JDupre@TorrentResources.com

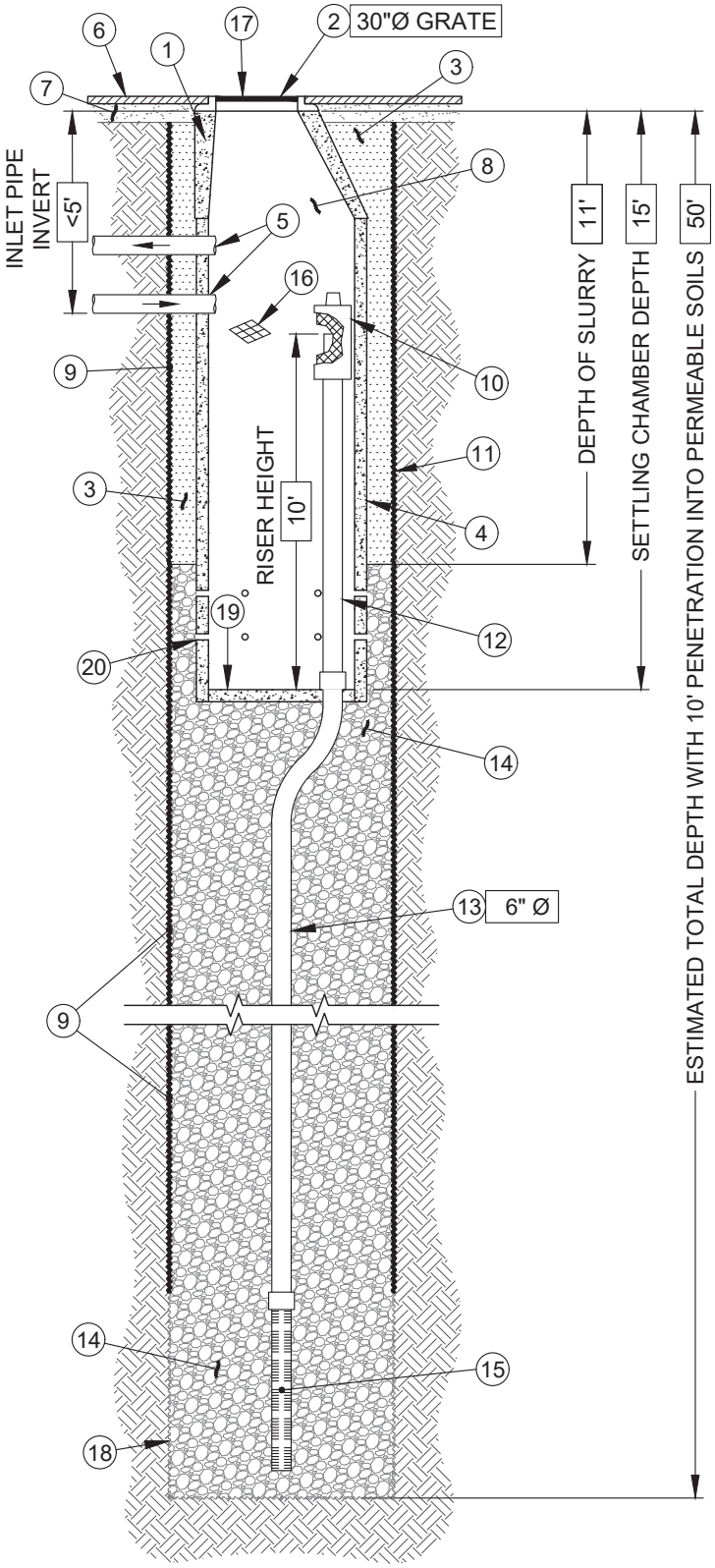
Torrent Resources (CA) Incorporated
9950 Alder Avenue
Bloomington, CA 92316
Phone 909-829-0740

The MaxWell® IV

DRAINAGE SYSTEM DETAILS AND SPECIFICATIONS

La Costa Hotel

Encinitas, CA



ITEM NUMBERS

1. **MANHOLE CONE** - MODIFIED FLAT BOTTOM.
2. **BOLTED RING & GRATE/COVER** - DIAMETER & TYPE AS SHOWN. CLEAN CAST IRON WITH WORDING **"STORM WATER ONLY"** IN RAISED LETTERS. **BOLTED IN 2 LOCATIONS** AND SECURED TO CONE WITH MORTAR. RIM ELEVATION ±0.02' OF PLANS.
3. **STABILIZED BACKFILL** - TWO-SACK SLURRY MIX.
4. **PRE-CAST LINER -** 4000 PSI CONCRETE 48" ID. X 54" OD. **CENTER IN HOLE** AND ALIGN SECTIONS **TO MAXIMIZE BEARING SURFACE.**
5. **INLET PIPE/OUTLET PIPE (BY OTHERS).** SEE SEPARATE PLAN FOR INVERT ELEVATIONS.
6. **GRADED BASIN OR PAVING** (BY OTHERS).
7. **COMPACTED BASE MATERIAL**, IF REQUIRED (BY OTHERS).
8. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE SETTLING CHAMBER DEPTH AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE RISER PIPE.
9. **NON-WOVEN GEOTEXTILE SLEEVE** - MIRAFI 140 NL. MIN. 6 FT Ø. HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
10. **PUREFLO® DEBRIS SHIELD** - ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL 0.265" MAX. SWO FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. **FUSION BONDED EPOXY COATED**.
11. **MIN. 6' Ø DRILLED SHAFT.**
12. **RISER PIPE** - SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
13. **DRAINAGE PIPE** - ADS HIGHWAY GRADE OR SCH. 40 PVC WITH TRI-A COUPLER. SUSPEND PIPE DURING BACKFILL OPERATIONS. DIAMETER AS NOTED.
14. **ROCK** - WASHED, SIZED BETWEEN 3/8" AND 1-1/2".
15. **FLOFAST® DRAINAGE SCREEN** - SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT. OVERALL LENGTH VARIES, UP TO 120" WITH TRI-B COUPLER.
16. **ABSORBENT** - HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL, 2 PER CHAMBER.
17. **FABRIC SEAL** - U.V. RESISTANT GEOTEXTILE - **TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION. GRATED ONLY.
18. **MIN. 6' Ø DRILLED SHAFT.**
19. **BASE SEAL** - CONCRETE SLURRY.
20. **6 PERFORATIONS MINIMUM PER FOOT, 2 ROWS MINIMUM.**

AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363
CA Lic. 886759, C-42, C-57, HAZ.
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County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

$P_6 = 2.5$

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
SITE
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'
33°30' 33°15' 33°00' 32°45' 32°30'

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N W E S

3 0 3 Miles