APPENDIX G

HYDROLOGY SUMMARY

Hydrology Summary

for

Orange Coast Memorial Medical Center Parking Structure

APN: 157-511-01

Tract No. 12107, Lot 1

9920 Talbert Avenue

Fountain Valley, CA.

March 11, 2024

This Hydraulic Summary has been prepared by, and under the direction of, the undersigned, a duly Registered Civil Engineer in the State of California. Except as noted, the undersigned attests to the technical information contained herein, and has judged to be acceptable the qualifications of any technical specialists providing engineering data for this report, upon which findings, conclusions, and recommendations are based.

_____

Ryan Haskin, P.E.
Registered Civil Engineer No. 84850
Exp.: 03/31/24

Prepared for:

Orange Coast Memorial Medical Center
9920 Talbert Ave.
Fountain Valley, CA. 92708
(714) 378-7000

Prepared by:

Tait & Associates, Inc.
701 N. Parkcenter Drive
Santa Ana, CA 92705
(714) 560-8200

TAIT JOB #**SP7911**

Table of Contents

Appendices

Section 1 Purpose and Scope

This hydrology summary presents an analysis of the hydrologic effects of the development of a 2.20 acre Orange Coast Memorial Medical Center Parking Structure, in the City of Fountain Valley, California.

This hydrology summary addresses runoff from the project site and its impact to the existing downstream storm drainage system. This study includes calculations for the 2-year and 25-year storm events for both the existing and proposed conditions. The study also details the general project characteristics, the design, criteria and methodology applied to the analysis of the project. The report provides a design analysis for the drainage facilities proposed as part of the project, with the drainage improvements being designed to mitigate all rainfall event frequencies up to a 24-hour, 25-year storm event.

This Hydrology Summary fulfills the requirements of the Orange County Drainage Area Management Plan (DAMP 2011) and the Orange County Hydrology Manual (October 1986 and 1996 Addendum).

The plans and specifications in the Hydrology Summary are not for construction purposes; the contractor shall refer to final approved construction documents for plans and specifications.

Section 2 Project Information

2.1 Project Description

The proposed construction involves the development of approximately 2.20 acres of commercial development including a parking structure and landscape areas.

2.1.1 Project Location

The project is located in the City of Fountain Valley, California, on the corner of Talbert Avenue and Foster Street, as graphically shown in Figure 1, below.

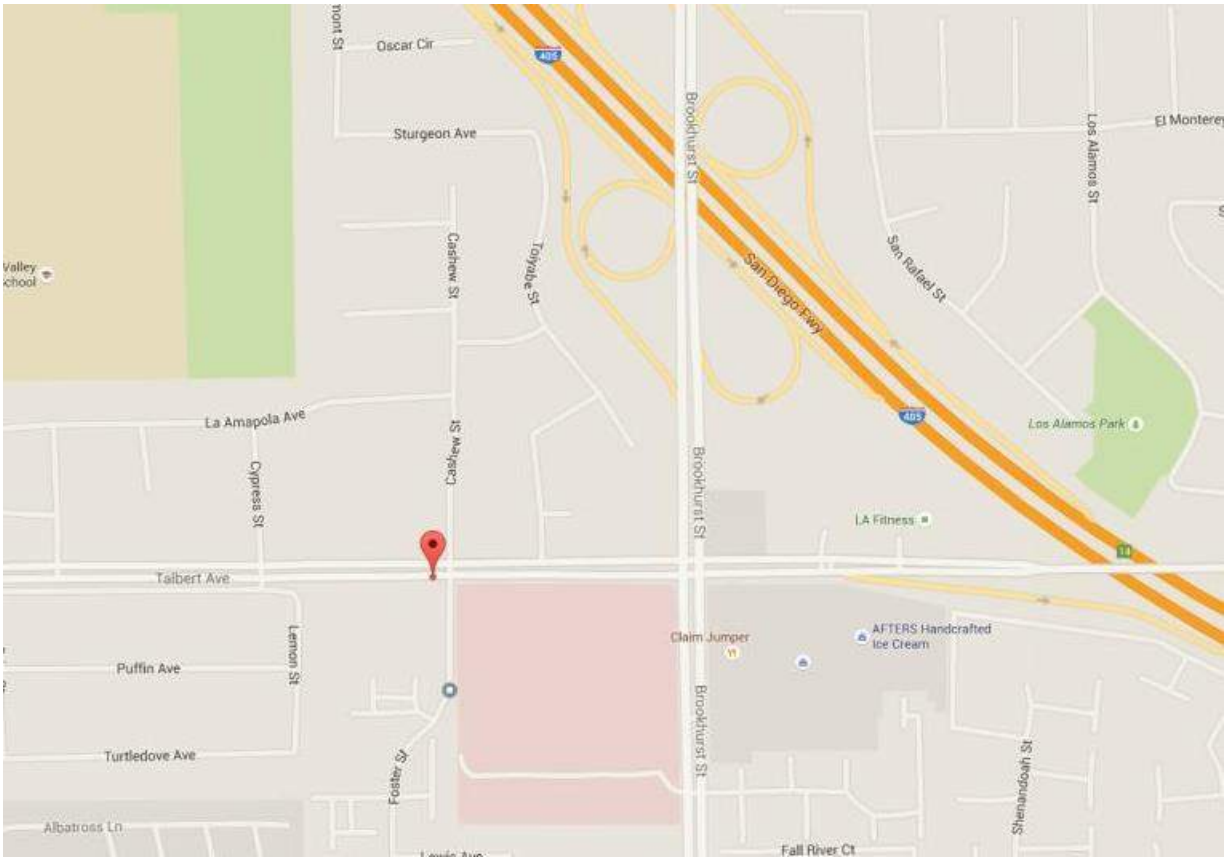


Figure 1 – Vicinity Map (Not To Scale)

2.2 Hydrologic Setting

This section summarizes the project's size and location in the context of the larger watershed perspective, topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.

The project site drains to City of Fountain Valley Storm Drain on Talbert Avenue, tributary to the Talbert Channel, tributary to Huntington Beach State Park, listed on the 303-d list for PCBs.

The topography of the project site is relatively flat, ranging in elevation from 27.5' to 24.8' above sea level. There are existing water, sanitary sewer, and gas lines north of the site in Talbert Avenue, as well as an existing water line east of the site in Foster Street.

The project is bounded by Talbert Ave. to the north and Foster St. to the east. The remaining south and west portions are bounded by residential.

In accordance with the Natural Resources Conservation Service Soil Survey, published in 2006, the project site is located within the hydrology soil group of A.

The project will discharge to the existing catch basin at the northeast of the site tributary to the 45" storm drain north of the site in Talbert Avenue.

The existing drainage pattern consists of two drainage areas. One drainage area sheet flows to the parkway drain at the Northwest of the site, tributary to Talbert Avenue, tributary to the downstream curb inlet, which connects directly to an existing 45" storm drain line north of the site. The other drainage area sheet flows to a catch basin at the Northeast of the site, which connects the back of an existing catch basin on Talbert Avenue, which connects directly to the existing 45" storm drain line north of the site.

The proposed parking structure will sheet flow to roof drains on the north and south side of the parking structure that will be discharged underground and flow into the proposed 12" storm drain which will discharge into a Modular Wetland System for treatment. The Modular Wetland System outflow will discharge to the existing catch basin at the northeast of the site tributary to the 45" storm drain north of the site in Talbert Avenue.

The proposed site is 76% impervious. The proposed site consists of 1.67 acres of impervious area, which includes the parking structure, drive entries, and walkways. The project will implement bio-treatment proprietary BMP's in the form of a Modular Wetland System.

Section 3 Design Criteria and Methodology

This section summarizes the design criteria and methodology applied during the drainage analysis of the project site. The design criteria and methodology follow the City of Fountain Valley requirements which enforces the Orange County Hydrology Manual.

3.1 Design Criteria

3.1.1 Drainage Design Criteria

The project storm drain facilities (inlets, culverts, detention, etc.) have been designed to conform to Orange County Hydrology Manual.

3.1.2 Flow-Based Numeric Sizing

The 2-year and 25-year storm events were used to analyze the proposed condition.

3.1.3 Runoff Calculation Method

Runoff calculations for this study were accomplished using the rational method in accordance with the recommendations of the Orange County Hydrology Manual. The 100-year/24-hour intensity is related to the time of concentration determined form the Nomograph available in the Orange Country Hydrology Manual. See attached calculations, Nomograph, and PF Tabular chart.

$$[(Q = C \times I \times A)]$$

where:

Q = runoff (cfs)
C = runoff coefficient representing the ratio of runoff to rainfall
I = the time-averaged rainfall intensity in inches per hour corresponding to the time of

concentration
A = drainage area (acres).

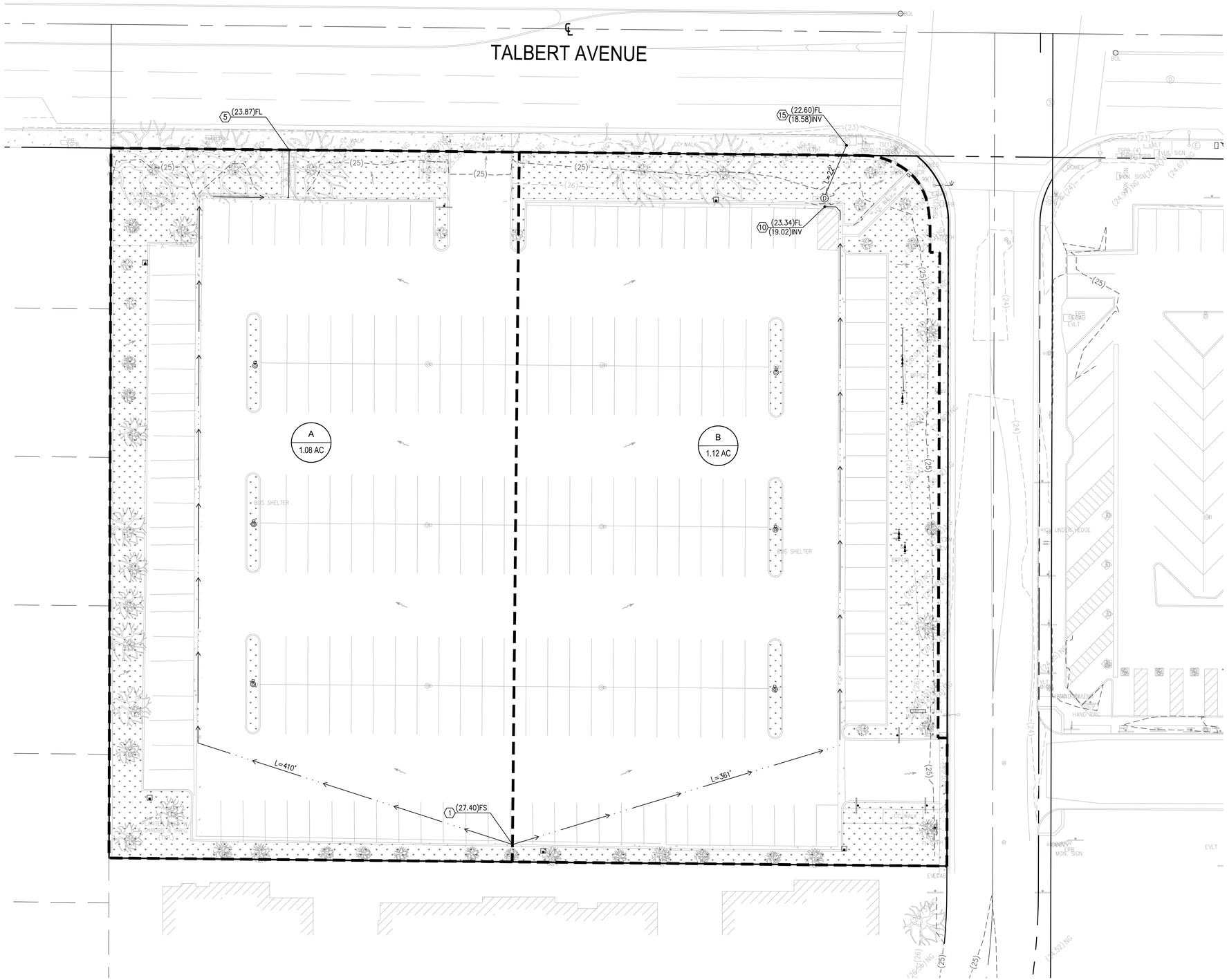
Section 4 Hydrology and Drainage Analysis

This section summarizes the quantitative hydrologic analysis of the existing and proposed conditions of the site.

4.1 Summary of Results

In conclusion, for the 2-year storm event, the proposed project site has a calculated flow rate of 2.91 cfs which is less than the existing calculated flow rate of 3.14 cfs. For the 25-year storm event, the proposed project site has a calculated flow rate of 6.62 cfs which is less than the existing calculated flow rate of 6.97 cfs. Due to the proposed flows being less than the existing flows, the project will not have an adverse effect to downstream drainage infrastructure.

APPENDIX



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Jun 09, 2023 - 12:22pm by jhorris K:\Drawings\SP\SP7911 - OCMMA\ENG\Hydrology\SP7911-HYD_PRE.dwg

Know what's below Call before you dig.

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BASIS OF BEARINGS:
BEARINGS BASED ON ...

BENCH MARK:
NGS BENCH MARK ...

NO.	DESCRIPTION	REVISIONS	BY	DATE

TAIT & ASSOCIATES
Since 1964
701 North Parkcenter Drive
Santa Ana, CA 92705
p: 714.560.8200
www.tait.com
ENGINEERING ENVIRONMENTAL BUILDING LAND
Santa Ana Sacramento Denver Dallas
San Diego Riverside Boise Atlanta

EXISTING HYDROLOGY MAP

ORANGE COAST MEMORIAL MEDICAL CENTER PARKING STRUCTURE
9920 TALBERT AVENUE
FOUNTAIN VALLEY, CA 92708

SCALE 1" = 20'

PREPARED UNDER THE SUPERVISION OF TAIT & ASSOCIATES, INC.

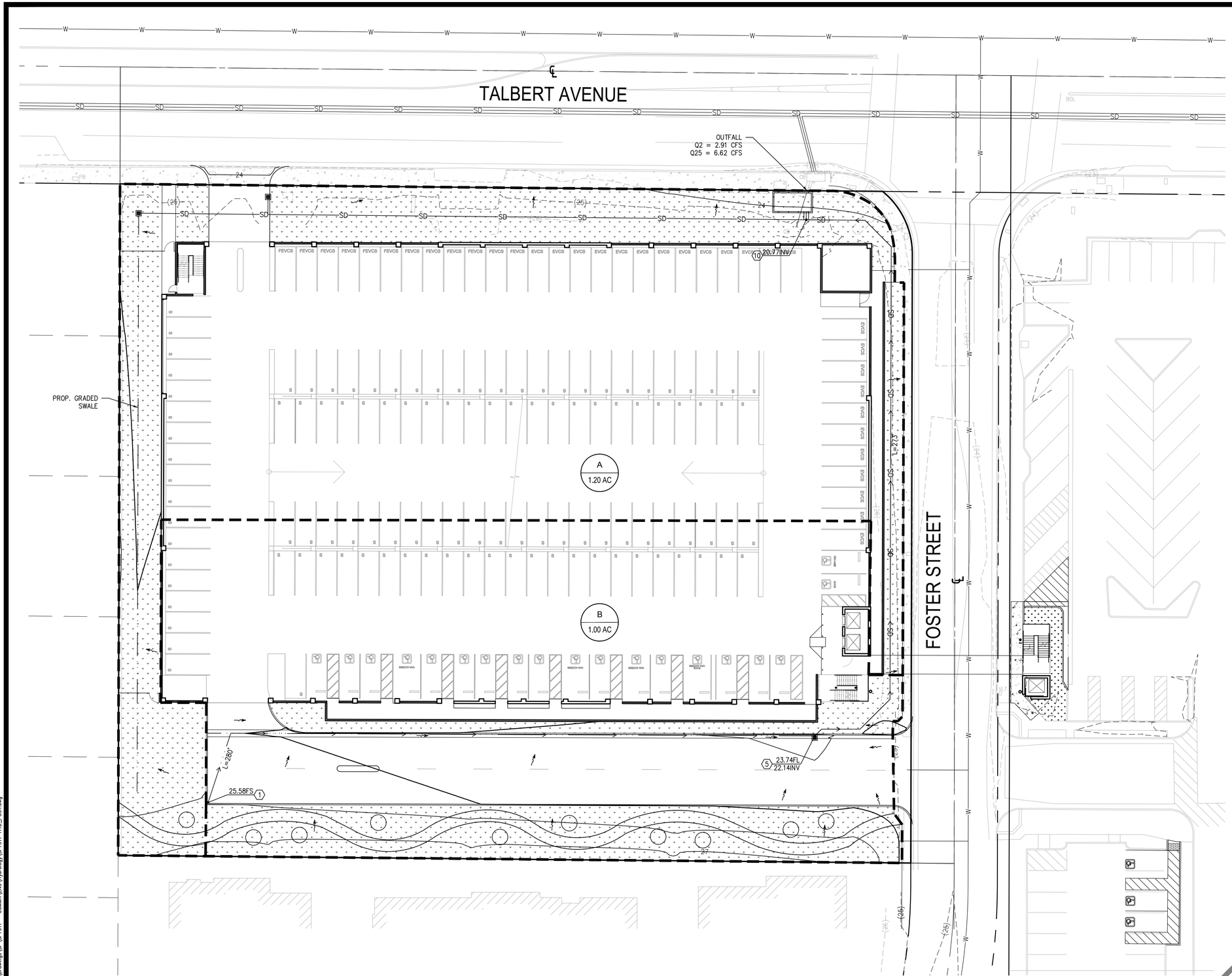
REGISTERED PROFESSIONAL ENGINEER
RYAN HASKIN
No. 84850
Exp. 3/31/24
CIVIL
STATE OF CALIFORNIA

RYAN HASKIN, P.E. CA P.E. #84850 DATE

DRAWN: JM
DATE: 6/9/23
CHECKED: RH
DATE: 6/9/23
REVISION #:
DATE:
JOB NO: SP7911

1 OF 2

6/9/2023 Internal Review #1



LEGEND

- EXISTING CONTOUR
- FLOW LINE
- SLOPE
- AREA BOUNDARY
- SUB-AREA BOUNDARY
- NODE
- AREA ID / AREA (AC)

NO.	DESCRIPTION	REVISIONS	BY	DATE

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PROPOSED HYDROLOGY MAP

ORANGE COAST MEMORIAL MEDICAL CENTER PARKING STRUCTURE
9920 TALBERT AVENUE
FOUNTAIN VALLEY, CA 92708

DRAWN: JM
DATE: 6/9/23
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DATE: 6/9/23
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DATE:
JOB NO: SP7911

2 OF 2

5/15/2019 Internal Review #1

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REGISTERED PROFESSIONAL ENGINEER
RYAN HASKIN
No. 84850
Exp. 3/31/24
CIVIL
STATE OF CALIFORNIA

RYAN HASKIN, P.E. CA P.E. #84850 DATE

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BENCH MARK:
NGS BENCH MARK ...

Mar 12, 2024 - 8:20am by rhaskin K:\Drawings\SP\SP7911 - OCMA\ENG\Hydrology\SP7911-HYD_POST.dwg

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

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
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    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
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   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
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  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.729
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.644
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   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.86      0.40     0.100    17    8.73
  URBAN GOOD COVER
  "TURF"                     A        0.22      0.40     1.000    17   20.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.283
  SUBAREA RUNOFF(CFS) =      1.49
  TOTAL AREA(ACRES) =      1.08   PEAK FLOW RATE(CFS) =      1.49
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  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
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  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
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       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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  URBAN GOOD COVER
  "TURF"                     A        0.22      0.40     1.000    17   18.18
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.277
  SUBAREA RUNOFF(CFS) =      1.65
  TOTAL AREA(ACRES) =      1.12   PEAK FLOW RATE(CFS) =      1.65

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  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.63
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.65
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  EFFECTIVE AREA(ACRES) =      1.12  AREA-AVERAGED Fm(INCH/HR)=  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.277
  PEAK FLOW RATE(CFS)   =       1.65
==============================================================================
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  END OF RATIONAL METHOD ANALYSIS

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  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

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

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

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  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.519
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.86      0.40     0.100    32    8.73
  URBAN GOOD COVER
  "TURF"                     A        0.22      0.40     1.000    33   20.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.283
  SUBAREA RUNOFF(CFS) =      3.31
  TOTAL AREA(ACRES) =      1.08   PEAK FLOW RATE(CFS) =      3.31
========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.1  TC(MIN.) =      8.73
  EFFECTIVE AREA(ACRES) =      1.08  AREA-AVERAGED Fm(INCH/HR)=  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.283
  PEAK FLOW RATE(CFS)   =       3.31
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  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

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

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

 ************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE     10.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   361.00
  ELEVATION DATA: UPSTREAM(FEET) =     27.40  DOWNSTREAM(FEET) =     23.24

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.826
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.743
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.90      0.40     0.100    32    7.83
  URBAN GOOD COVER
  "TURF"                     A        0.22      0.40     1.000    33   18.18
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.277
  SUBAREA RUNOFF(CFS) =      3.66
  TOTAL AREA(ACRES) =      1.12   PEAK FLOW RATE(CFS) =      3.66

 ************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     15.00 IS CODE =  31
 ------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    19.02  DOWNSTREAM(FEET) =    18.58
  FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.85
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.66
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    7.88
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     15.00 =     383.00 FEET.
 ========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.1  TC(MIN.) =      7.88
  EFFECTIVE AREA(ACRES) =      1.12  AREA-AVERAGED Fm(INCH/HR)=  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.277
  PEAK FLOW RATE(CFS)   =       3.66
 ========================================================================
 ========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
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          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                        Analysis prepared by:
```

PROPOSED 2 YEAR STORM

```
--------------------------------------------------------------------------
  FILE NAME: 7911Q2.DAT
  TIME/DATE OF STUDY: 08:13 03/12/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

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

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

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      5.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   280.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =     25.58  DOWNSTREAM(FEET) =     23.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.911
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.740
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.80      0.40     0.100    17    7.91
  URBAN GOOD COVER
  "TURF"                     A        0.20      0.40     1.000    17   18.37
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.280
  SUBAREA RUNOFF(CFS) =      1.46
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      1.46

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE     10.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    22.14  DOWNSTREAM(FEET) =    20.77
  FLOW LENGTH(FEET) =   273.00   MANNING'S N =  0.011
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.63
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.46
  PIPE TRAVEL TIME(MIN.) =   1.25    Tc(MIN.) =    9.16
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     10.00 =     553.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.16
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.599
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.87      0.40     0.100    17
  URBAN GOOD COVER
  "TURF"                     A        0.33      0.40     1.000    17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.347
  SUBAREA AREA(ACRES) =    1.20      SUBAREA RUNOFF(CFS) =    1.58
  EFFECTIVE AREA(ACRES) =      2.20   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =        2.2       PEAK FLOW RATE(CFS) =       2.91
```

```
===========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.2  TC(MIN.) =      9.16
  EFFECTIVE AREA(ACRES) =      2.20  AREA-AVERAGED Fm(INCH/HR)=  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.317
  PEAK FLOW RATE(CFS)   =       2.91
===========================================================================
===========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:
```

PROPOSED 25 YEAR STORM

```
--------------------------------------------------------------------------
  FILE NAME: 7911Q25.DAT
  TIME/DATE OF STUDY: 17:51 03/11/2024
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

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

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

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      5.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   280.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =     25.58  DOWNSTREAM(FEET) =     23.74

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.911
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.721
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.80      0.40     0.100    32    7.91
  URBAN GOOD COVER
  "TURF"                     A        0.20      0.40     1.000    33   18.37
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.280
  SUBAREA RUNOFF(CFS) =      3.25
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      3.25

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE     10.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    22.14  DOWNSTREAM(FEET) =    20.77
  FLOW LENGTH(FEET) =   273.00   MANNING'S N =  0.011
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.42
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.25
  PIPE TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =    8.94
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     10.00 =     553.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.94
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.472
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.87      0.40     0.100    32
  URBAN GOOD COVER
  "TURF"                     A        0.33      0.40     1.000    33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.347
  SUBAREA AREA(ACRES) =    1.20      SUBAREA RUNOFF(CFS) =    3.60
  EFFECTIVE AREA(ACRES) =      2.20   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =        2.2       PEAK FLOW RATE(CFS) =       6.62
```

```
===========================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.2  TC(MIN.) =      8.94
  EFFECTIVE AREA(ACRES) =      2.20  AREA-AVERAGED Fm(INCH/HR)=  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.40  AREA-AVERAGED Ap = 0.317
  PEAK FLOW RATE(CFS)   =       6.62
===========================================================================
===========================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Map Scale: 1:753 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

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: Orange County and Part of Riverside County, California
Survey Area Data: Version 16, Sep 6, 2022

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

Date(s) aerial images were photographed: Apr 14, 2022—Apr 23, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
158	Hueneme fine sandy loam, drained	A	2.4	100.0%
Totals for Area of Interest			**2.4**	**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