Goodman
&ASSOCIATES

Drainage Report

For

Industrial Way Warehouse

5705 Industrial Parkway
San Bernardino, CA
APN 0266-041-74

For

Dedeaux Properties
1430 S. Eastman Ave
Los Angeles, CA 90023
323-981-8293

July 15, 2022

Douglas L. Goodman

2079 Sky View Drive • Colton, Ca 92324 • (909) 824-2775 • FAX (909) 824-2807
email • doug@goodman-assoc.com

LD_____, THR_____

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Site Description

The proposed project will be a logistics facility along the northeast side of Industrial Parkway, with the Interstate 215 Freeway to the northeast, Cable Creek Channel to the east, existing industrial uses to the north and south, in the City of San Bernardino. The project site is approximately 7 acres.

Project Description

The proposed project is a logistics shipping facility on one parcel. A portion of the property is developed as an industrial use and will remain and is not a part of this development. The proposed developed portion of the property is currently vacant with native vegetation.

Existing runoff is generally from north to south. Most of the existing drainage crosses and leaves the property as surface sheet flow out to the southwest onto Industrial Parkway. A smaller portion drains to the existing developed portion of the site and toward Cable Creek to the east.

One truck terminal building is proposed with loading docks, access, parking and landscaping. Proposed runoff will maintain the predominant existing drainage patterns. For the purposes of stormwater quality, an underground infiltration system is proposed. All runoff will be collected in a series of inlets and piped to a clarifier for pre-treatment and then into the underground system. Once the system fills up, flows will build up and be discharged out onto Industrial Parkway via a parkway drain proposed at the southwest corner of the site. Runoff will not exceed the existing condition.

Hydrologic Criteria and Modeling Approach

The hydrologic conditions of the site were analyzed using the Rational Method and the Small Area Synthetic Unit Hydrograph Method as described in the *San Bernardino County Flood Control District Hydrology Manual (Manual)*, using AES software.

The following hydrologic parameters were used:

Rational Method

AMC III (100-year analysis)
Soil Group: A, D
Curve Number (Proposed Condition): 52 (Residential or Commercial Landscaping, "A" Soil)
91 (Residential or Commercial Landscaping, "D" Soil)

Pct. Impervious Cover (Proposed Condition): 90%
100-year, 1-hour rainfall: 2.07 inches
100-year, 24-hour rainfall: 8.32 inches
Log-Log Slope: 0.60

Proposed Conditions

The proposed condition consists of a few small subareas, all directed to one project outlet, generally mimicking the historic runoff.

Hydrologic Calculations and Results: 100-year

Results of the analysis are summarized in Table 1 below.

Table 1: Hydrology Results

Recurrence Interval	Existing Condition (cfs)	Proposed Condition (cfs)
100-year	30.6	30.5

Proposed Storm Drains

On-site drainage will be conveyed via surface sheet flow to inlets, and then via pipes to the infiltration system BMP, with overflows draining out via a pipe and parkway drain onto Industrial Parkway.

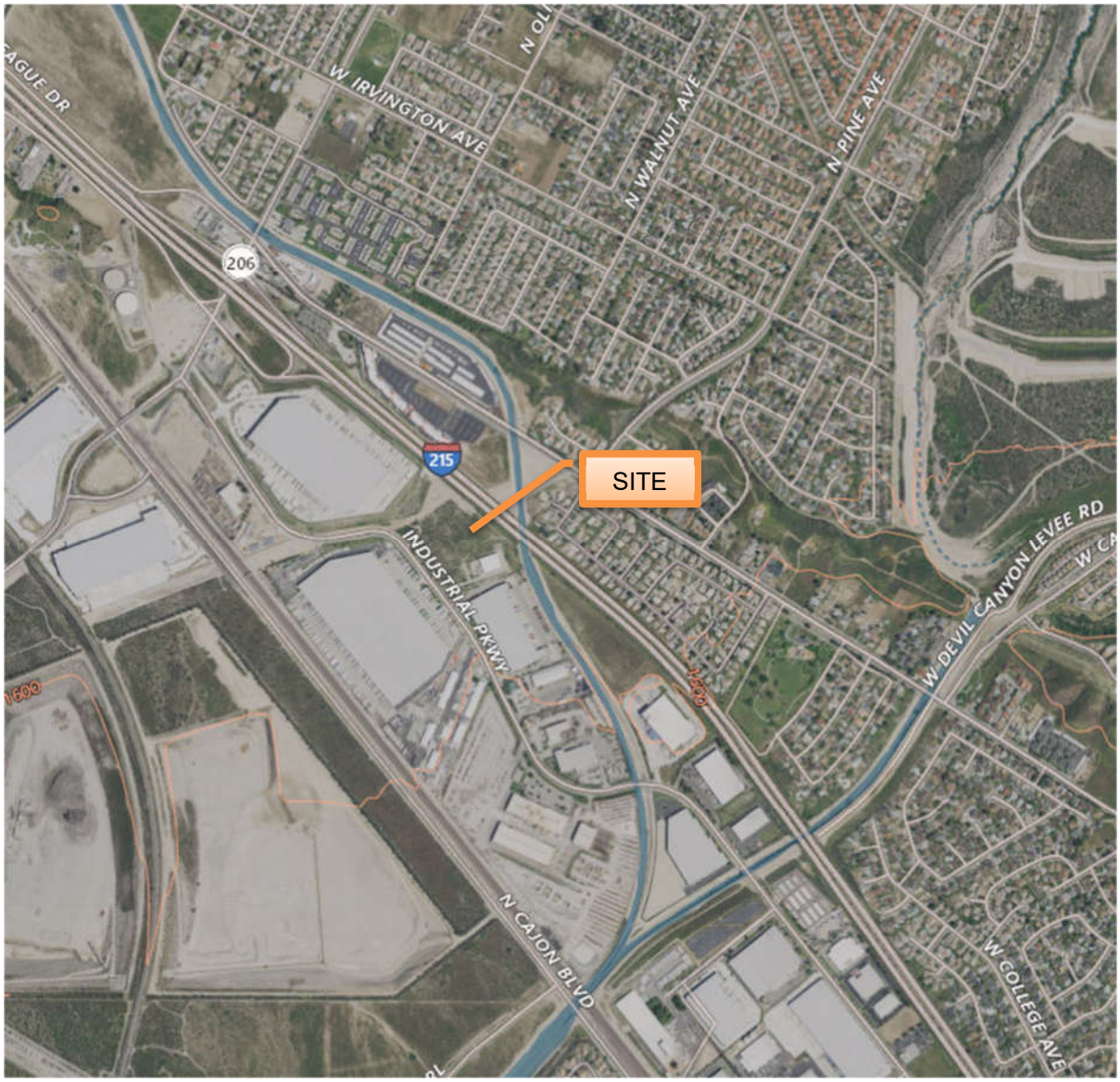
Conclusions

The results above are derived from standard hydraulic models and calculation methods, and are subject to the limitations of those methods.

Limitations

This drainage report is for assessing the drainage facility requirements due to the proposed development as shown on the grading plan. Goodman & Associates shall not be held responsible for any unauthorized application of this report and the contents herein. The opinions expressed in this report have been derived in accordance with current standards of civil engineering practice. No other warranty is expressed or implied.

Exhibit A: Vicinity Map



Source: USGS TNM

APPENDICES

Hydrology Data Sources and Results

Hydrology Maps (In Map Pocket)


STORMWATER FACILITY MAPPING TOOL
TOC
Choose search item from list
Enter Value
Locate
Clear
Clear All
Metadata
Non-EHM (low)
Non-EHM (medium)
Non-EHM (high)
Non-EHM (default-high)
2006 - 303d/TMDL
Water Storage Facility
Interim
Ultimate
Other
Drainage Area Boundaries
HCOC Exempt Areas
City Storm Drains
Ground Water Basins
Ground Water Contours
Septic
Plumes
Soils
Soils - Hydro Group A
Soils - Hydro Group B
Soils - Hydro Group C
Soils - Hydro Group D
Soils - No Hydro Group
FRIANT ROCK OUTCROP

WQMP Project Report

County of San Bernardino Stormwater Program

Santa Ana River Watershed Geodatabase

Tuesday, July 12, 2022

Note: The information provided in this report and on the Stormwater Geodatabase for the County of San Bernardino Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification.

Project Site Parcel Number(s):	026604174
Project Site Acreage:	10.013
HCOC Exempt Area:	No
Closest Receiving Waters: (Applicant to verify based on local drainage facilities and topography.)	**System Number** - 309 **Facility Name** - Cable Creek Channel **Owner** - SBCFCD
Closest channel segment's susceptibility to Hydromodification:	EHM
Highest downstream hydromodification susceptibility:	High
Is this drainage segment subject to TMDLs?	No
Are there downstream drainage segments subject to TMDLs?	No
Is this drainage segment a 303d listed stream?	No
Are there 303d listed streams downstream?	Yes
Are there unlined downstream waterbodies?	No
Project Site Onsite Soil Group(s):	A, D
Environmentally Sensitive Areas within 200':	None
Groundwater Depth (FT):	-188
Parcels with potential septic tanks within 1000':	No
Known Groundwater Contamination Plumes within 1000':	Yes
Studies and Reports Related to Project Site:	Preliminary Report on Proposed North SBFCP School Site Map Comprehensive Storm Drain Plan SBVMWD High Groundwater / Pressure Zone Area

NOAA Atlas 14, Volume 6, Version 2
Location name: San Bernardino, California, USA*
Latitude: 34.1851°, Longitude: -117.3549°
Elevation: 1643.62 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.147 (0.122-0.178)	0.197 (0.164-0.240)	0.265 (0.220-0.324)	0.323 (0.265-0.397)	0.403 (0.320-0.514)	0.468 (0.364-0.609)	0.536 (0.406-0.715)	0.610 (0.449-0.837)	0.714 (0.504-1.02)	0.799 (0.544-1.19)
10-min	0.210 (0.175-0.256)	0.283 (0.235-0.344)	0.381 (0.315-0.464)	0.463 (0.380-0.569)	0.578 (0.459-0.736)	0.671 (0.521-0.873)	0.769 (0.582-1.02)	0.874 (0.643-1.20)	1.02 (0.722-1.47)	1.15 (0.780-1.70)
15-min	0.254 (0.211-0.309)	0.342 (0.284-0.416)	0.460 (0.381-0.561)	0.559 (0.459-0.688)	0.699 (0.555-0.890)	0.812 (0.630-1.06)	0.930 (0.704-1.24)	1.06 (0.778-1.45)	1.24 (0.873-1.77)	1.39 (0.943-2.06)
30-min	0.376 (0.312-0.457)	0.505 (0.419-0.615)	0.680 (0.563-0.829)	0.826 (0.678-1.02)	1.03 (0.820-1.32)	1.20 (0.931-1.56)	1.37 (1.04-1.83)	1.56 (1.15-2.14)	1.83 (1.29-2.62)	2.05 (1.39-3.04)
60-min	0.565 (0.470-0.687)	0.760 (0.631-0.924)	1.02 (0.846-1.25)	1.24 (1.02-1.53)	1.55 (1.23-1.98)	1.80 (1.40-2.35)	2.07 (1.56-2.75)	2.35 (1.73-3.22)	2.75 (1.94-3.94)	3.08 (2.10-4.56)
2-hr	0.839 (0.698-1.02)	1.09 (0.906-1.33)	1.43 (1.18-1.75)	1.71 (1.41-2.11)	2.11 (1.67-2.68)	2.42 (1.88-3.15)	2.75 (2.08-3.67)	3.10 (2.28-4.25)	3.59 (2.53-5.14)	3.98 (2.71-5.91)
3-hr	1.05 (0.872-1.27)	1.35 (1.12-1.64)	1.75 (1.45-2.13)	2.08 (1.71-2.56)	2.54 (2.02-3.23)	2.90 (2.25-3.78)	3.28 (2.48-4.38)	3.68 (2.71-5.05)	4.24 (2.99-6.06)	4.68 (3.19-6.94)
6-hr	1.53 (1.27-1.86)	1.95 (1.62-2.37)	2.50 (2.07-3.05)	2.95 (2.42-3.63)	3.58 (2.84-4.55)	4.06 (3.15-5.28)	4.55 (3.45-6.07)	5.07 (3.73-6.96)	5.78 (4.08-8.28)	6.34 (4.32-9.41)
12-hr	2.03 (1.69-2.47)	2.61 (2.17-3.18)	3.36 (2.78-4.09)	3.96 (3.25-4.87)	4.77 (3.78-6.07)	5.39 (4.18-7.01)	6.02 (4.56-8.02)	6.66 (4.90-9.13)	7.52 (5.30-10.8)	8.19 (5.57-12.1)
24-hr	2.73 (2.42-3.14)	3.56 (3.15-4.11)	4.62 (4.08-5.35)	5.48 (4.79-6.39)	6.61 (5.60-7.97)	7.47 (6.20-9.18)	8.32 (6.74-10.5)	9.19 (7.24-11.9)	10.3 (7.83-14.0)	11.2 (8.21-15.7)
2-day	3.33 (2.95-3.84)	4.43 (3.92-5.11)	5.87 (5.18-6.78)	7.02 (6.15-8.19)	8.58 (7.27-10.3)	9.77 (8.10-12.0)	11.0 (8.88-13.8)	12.2 (9.61-15.8)	13.8 (10.5-18.7)	15.1 (11.1-21.1)
3-day	3.54 (3.14-4.08)	4.79 (4.24-5.53)	6.43 (5.68-7.44)	7.78 (6.81-9.07)	9.61 (8.14-11.6)	11.0 (9.15-13.6)	12.5 (10.1-15.7)	14.0 (11.0-18.1)	16.0 (12.1-21.6)	17.6 (12.9-24.6)
4-day	3.73 (3.30-4.30)	5.11 (4.52-5.89)	6.92 (6.11-8.01)	8.42 (7.37-9.82)	10.5 (8.88-12.6)	12.1 (10.0-14.9)	13.7 (11.1-17.3)	15.5 (12.2-20.0)	17.8 (13.5-24.0)	19.7 (14.4-27.5)
7-day	4.14 (3.67-4.77)	5.76 (5.10-6.65)	7.93 (6.99-9.17)	9.72 (8.50-11.3)	12.2 (10.3-14.7)	14.1 (11.7-17.4)	16.2 (13.1-20.3)	18.3 (14.4-23.6)	21.2 (16.0-28.6)	23.5 (17.2-32.8)
10-day	4.55 (4.03-5.24)	6.39 (5.66-7.38)	8.86 (7.82-10.3)	10.9 (9.55-12.7)	13.8 (11.7-16.6)	16.0 (13.3-19.7)	18.4 (14.9-23.1)	20.8 (16.4-27.0)	24.3 (18.3-32.7)	27.0 (19.7-37.7)
20-day	5.66 (5.01-6.52)	8.05 (7.12-9.29)	11.3 (9.96-13.1)	14.0 (12.3-16.3)	17.8 (15.1-21.5)	20.9 (17.3-25.7)	24.1 (19.5-30.4)	27.5 (21.7-35.6)	32.3 (24.4-43.5)	36.1 (26.4-50.4)
30-day	6.68 (5.92-7.69)	9.51 (8.41-11.0)	13.4 (11.8-15.5)	16.6 (14.5-19.4)	21.2 (18.0-25.6)	24.9 (20.7-30.7)	28.8 (23.4-36.3)	33.0 (26.0-42.7)	38.9 (29.4-52.5)	43.7 (32.0-61.0)
45-day	8.10 (7.17-9.33)	11.4 (10.1-13.2)	16.0 (14.1-18.5)	19.9 (17.4-23.1)	25.4 (21.5-30.6)	29.8 (24.8-36.7)	34.6 (28.0-43.6)	39.7 (31.3-51.4)	46.9 (35.5-63.3)	52.9 (38.7-73.8)
60-day	9.54 (8.45-11.0)	13.3 (11.7-15.3)	18.4 (16.2-21.3)	22.8 (19.9-26.6)	29.1 (24.6-35.0)	34.2 (28.4-42.1)	39.6 (32.1-49.9)	45.5 (35.9-58.9)	54.0 (40.8-72.8)	60.9 (44.5-85.0)

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

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

Please refer to NOAA Atlas 14 document for more information.

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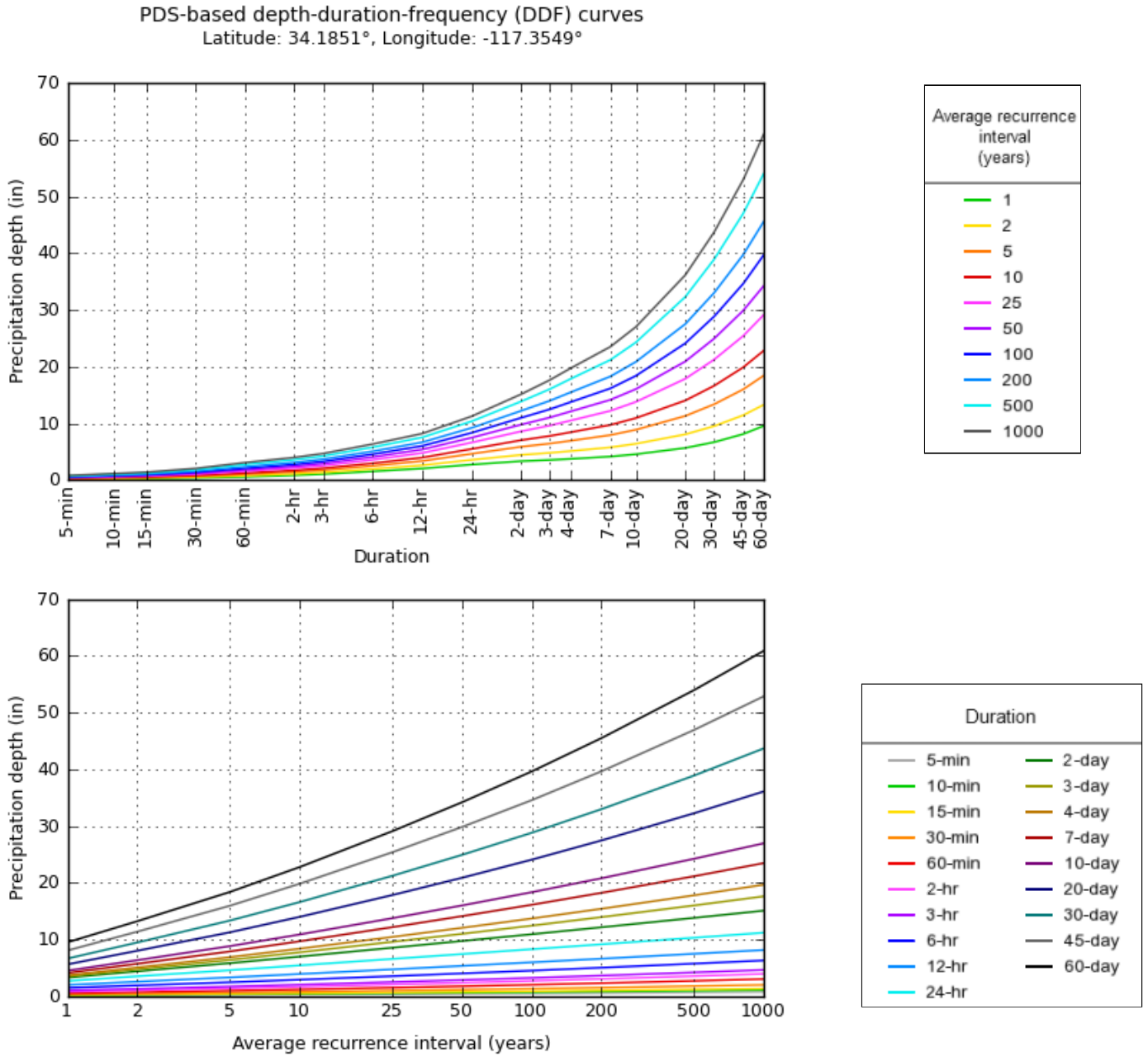
PF graphical



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Tue Jul 12 18:32:20 2022

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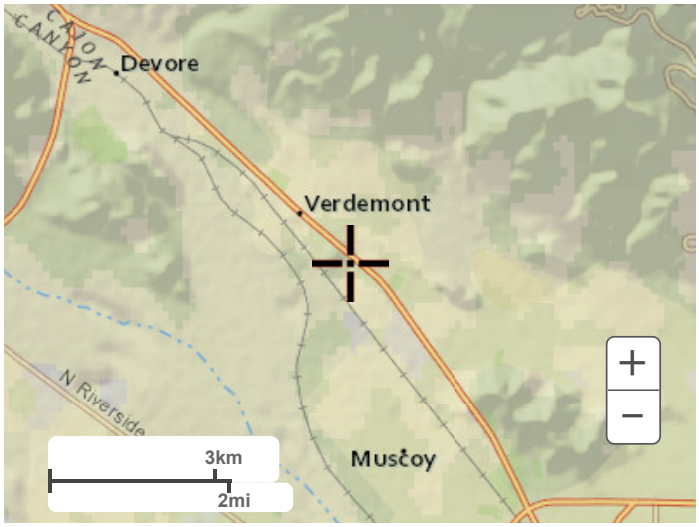
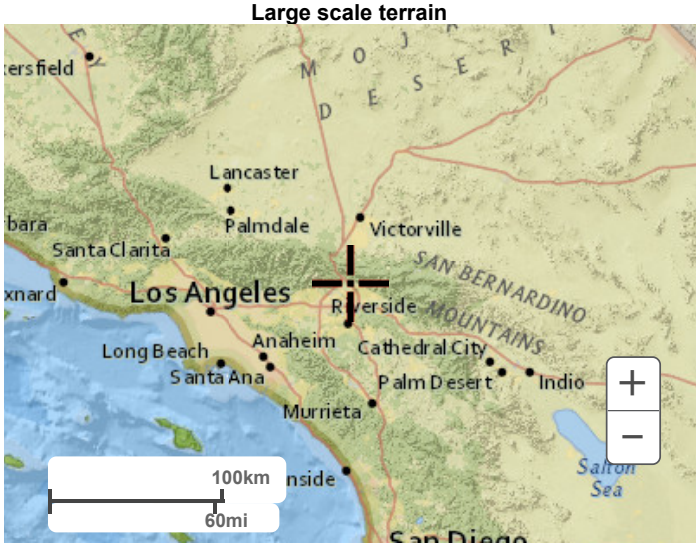
Maps & aerials

Small scale terrain

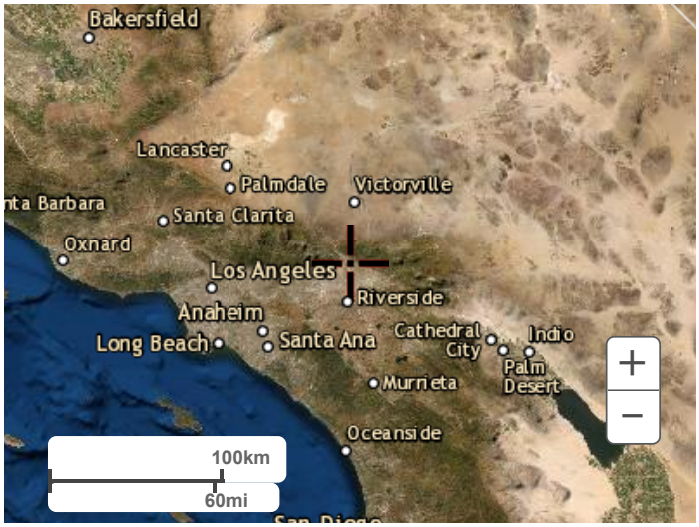


Large scale terrain



Large scale map

Large scale aerial



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

Disclaimer

RATIONAL METHOD

HYDROLOGY

- **Existing condition**
- **Developed condition**

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_______________________________________________________________________________
*******************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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            Ver. 19.0  Release Date: 06/01/2012  License ID 1584

                           Analysis prepared by:

                         ENCOMPASS ASSOCIATES, INC.
                             5699 Cousins Place
                         Rancho Cucamonga CA 91737
                    909-684-0093 askeers@encompasscivil.com

 ************************** DESCRIPTION OF STUDY **************************
* 5705 INDUSTRIAL PARKWAY DP WAREHOUSE - SB                                 *
* UNDEVELOPED HYDROLOGY                                                     *
* 100-YEAR                                                                  *
 ***************************************************************************

  FILE NAME: X:\FTP\AES\INDIIE00.DAT
  TIME/DATE OF STUDY: 17:24 07/13/2022
===============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
===============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 2.0700

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

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

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

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  FLOW PROCESS FROM NODE      0.10 TO NODE      0.20 IS CODE =  21
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  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

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  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   647.00
  ELEVATION DATA: UPSTREAM(FEET) =   1642.00  DOWNSTREAM(FEET) =   1615.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.196
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.136
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL POOR COVER
  "GRASS"                    A        4.57      0.30     1.000    85   13.20
  NATURAL POOR COVER
  "GRASS"                    D        2.34      0.08     1.000    98   13.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.22
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     30.56
  TOTAL AREA(ACRES) =      6.91   PEAK FLOW RATE(CFS) =     30.56
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.9  TC(MIN.) =     13.20
  EFFECTIVE AREA(ACRES) =      6.91  AREA-AVERAGED Fm(INCH/HR)=  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.22  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      30.56
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
_____
*****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2012 Advanced Engineering Software (aes)
            Ver. 19.0  Release Date: 06/01/2012  License ID 1584

                          Analysis prepared by:

                        ENCOMPASS ASSOCIATES, INC.
                            5699 Cousins Place
                        Rancho Cucamonga CA 91737
                   909-684-0093 askeers@encompasscivil.com

 ************************* DESCRIPTION OF STUDY *************************
* 5705 INDUSTRIAL PARKWAY DP WAREHOUSE - SB                              *
* DEVELOPED HYDROLOGY                                                    *
* 100-YEAR                                                               *
 ************************************************************************

  FILE NAME: X:\FTP\AES\INDIID00.DAT
  TIME/DATE OF STUDY: 17:23 07/13/2022
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  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 2.0700

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

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

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

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =   1638.00  DOWNSTREAM(FEET) =   1632.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.110
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  8.151
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.37      0.74     0.100    52    6.11
  COMMERCIAL                 D        0.57      0.21     0.100    91    6.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.42
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      6.86
  TOTAL AREA(ACRES) =      0.94   PEAK FLOW RATE(CFS) =      6.86

********************************************************************************
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  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1628.00  DOWNSTREAM(FEET) =  1613.00
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.32
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.86
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    6.36
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      6.00 =     500.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =    6.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  7.957
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.28      0.74     0.100    52
  COMMERCIAL                 D        0.20      0.21     0.100    91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.52
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.48      SUBAREA RUNOFF(CFS) =    3.42
  EFFECTIVE AREA(ACRES) =      1.42   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.45  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4       PEAK FLOW RATE(CFS) =      10.11

********************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      4.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
```
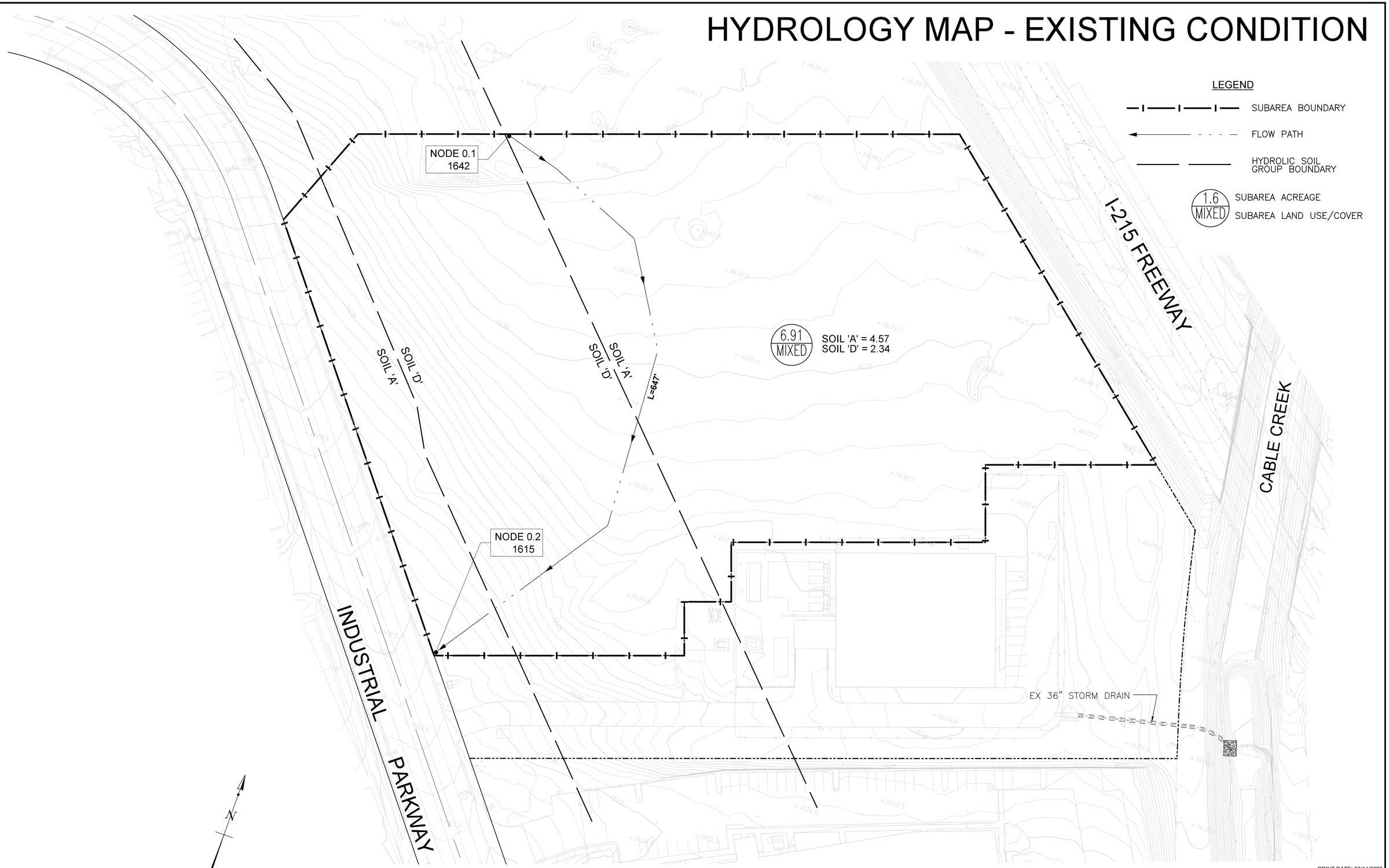

```
 ELEVATION DATA: UPSTREAM(FEET) =  1613.00  DOWNSTREAM(FEET) =  1612.00
 FLOW LENGTH(FEET) =    67.00   MANNING'S N =  0.010
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.70
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.11
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    6.48
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =     567.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.48
 RAINFALL INTENSITY(INCH/HR) =   7.87
 AREA-AVERAGED Fm(INCH/HR) =  0.05
 AREA-AVERAGED Fp(INCH/HR) =  0.45
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.42
 TOTAL STREAM AREA(ACRES) =       1.42
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.11

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      3.50 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   830.00
 ELEVATION DATA: UPSTREAM(FEET) =   1638.00  DOWNSTREAM(FEET) =   1631.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.623
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.542
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 A        1.39      0.74      0.100    52   11.62
 COMMERCIAL                 D        0.08      0.21      0.100    91   11.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      7.24
 TOTAL AREA(ACRES) =      1.47   PEAK FLOW RATE(CFS) =      7.24

****************************************************************************
 FLOW PROCESS FROM NODE      3.50 TO NODE      4.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1631.00  DOWNSTREAM ELEVATION(FEET) = 1624.00
 STREET LENGTH(FEET) =   555.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 30.00
```

```
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.53
   HALFSTREET FLOOD WIDTH(FEET) =   21.70
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.82
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.02
 STREET FLOW TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   14.05
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.947
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        2.53      0.74     0.100    52
 COMMERCIAL                 D        1.49      0.21     0.100    91
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.54
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    4.02      SUBAREA RUNOFF(CFS) =   17.70
 EFFECTIVE AREA(ACRES) =      5.49    AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.59  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        5.5        PEAK FLOW RATE(CFS) =      24.15

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  28.27
 FLOW VELOCITY(FEET/SEC.) =  4.12   DEPTH*VELOCITY(FT*FT/SEC.) =   2.46
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  555.0 FT WITH ELEVATION-DROP =   7.0 FT, IS   23.0 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE      4.00
 LONGEST FLOWPATH FROM NODE      3.00 TO NODE      4.00 =    1385.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.05
 RAINFALL INTENSITY(INCH/HR) =   4.95
 AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.59
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       5.49
 TOTAL STREAM AREA(ACRES) =       5.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      24.15

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
```

```
    1       10.11    6.48    7.872  0.45( 0.05) 0.10       1.4       1.00
    2       24.15   14.05    4.947  0.59( 0.06) 0.10       5.5       3.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       27.91    6.48    7.872  0.54( 0.05) 0.10       4.0       1.00
      2       30.48   14.05    4.947  0.56( 0.06) 0.10       6.9       3.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      30.48    Tc(MIN.) =    14.05
  EFFECTIVE AREA(ACRES) =       6.91   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.56  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.9
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE      4.00 =    1385.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        6.9  TC(MIN.) =     14.05
  EFFECTIVE AREA(ACRES) =      6.91  AREA-AVERAGED Fm(INCH/HR)=  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.56  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      30.48

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       27.91    6.48    7.872  0.54( 0.05) 0.10       4.0       1.00
      2       30.48   14.05    4.947  0.56( 0.06) 0.10       6.9       3.00
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

HYDROLOGY MAP - EXISTING CONDITION



PRINT DATE: 07/14/2022

BENCHMARK: CITY OF S.B. HI - 1

A 3" STANDARD BRASS DISK STAMPED "T-1445-1989", SET VERTICALLY IN THE NORTHERLY FACE OF THE NORTHEAST COLUMN OF THE PALM AVENUE OVERPASS OF I-215, 4.9 FEET ABOVE THE GROUND.

ELEVATION = 1705.55 (NAVD 88)

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS L. GOODMAN
No. 28500
CIVIL
Expires 3-31-24
STATE OF CALIFORNIA

Goodman & ASSOCIATES
2079 SKY VIEW DRIVE
COLTON, CA 92324
(909) 824-2775

DOUGLAS L. GOODMAN
RCE 28500, 3-31-2024

DATE

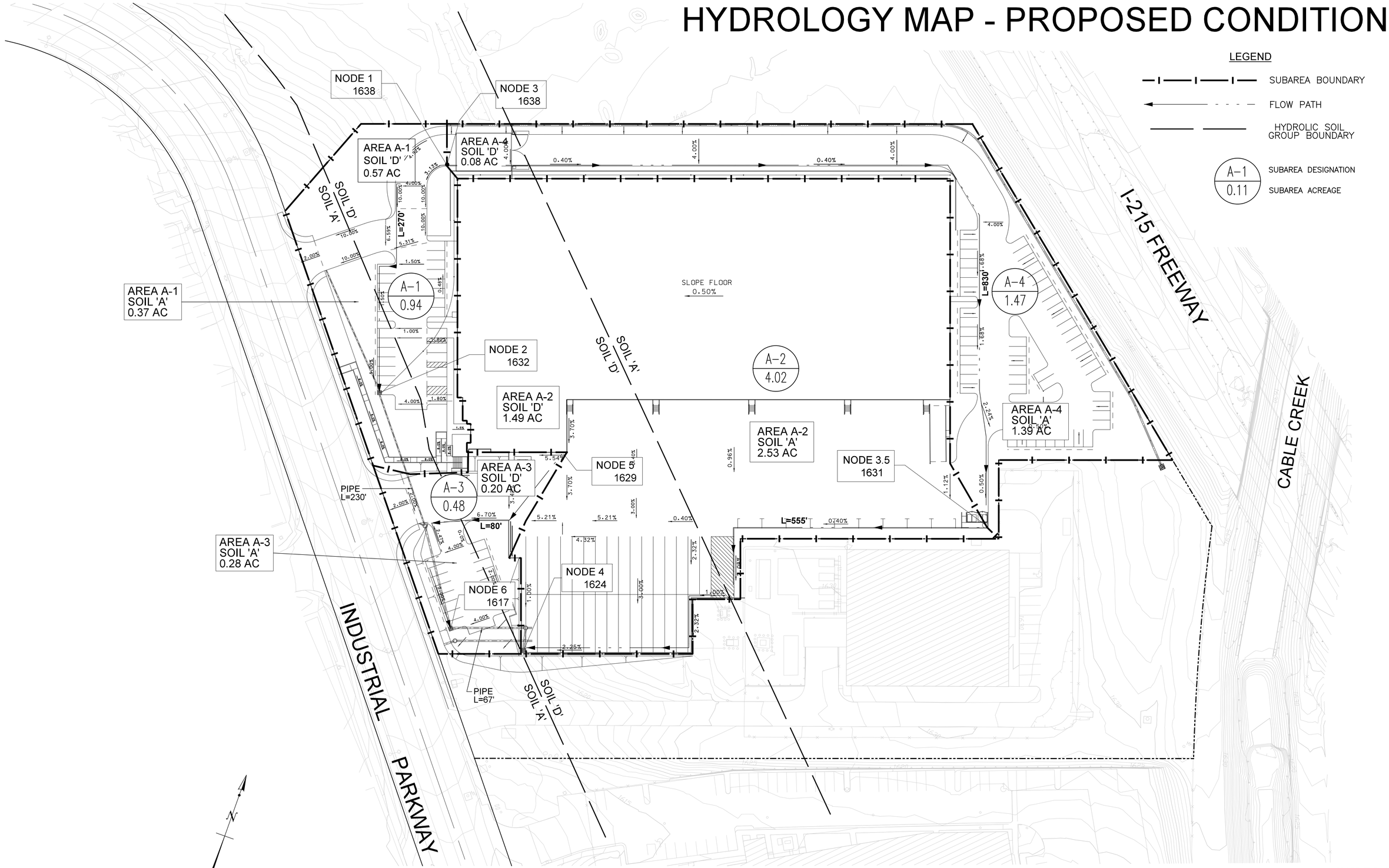
IN THE CITY OF SAN BERNARDINO

HYDROLOGY MAP - EXISTING CONDITION

PREPARED FOR DEDEAUX PROPERTIES
INDUSTRIAL WAY WAREHOUSE
5705 N. INDUSTRIAL PARKWAY
APN 0266-041-74

SCALE: AS SHOWN
DUE DATE: JULY 15, 2022
G&A JOB NO.: 1/1

HYDROLOGY MAP - PROPOSED CONDITION



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