Preliminary Water Quality Management Plan (PWQMP)

For compliance with Santa Ana Regional Water Quality Control Board

Order Number R8-2010-0036 (NPDES Permit No. CAS618036)

for

Project Name:	**5355 Airport Drive**
Ontario Project #:	
Project Description:	**Proposed Industrial Building**
Applicant Name:	**Prologis (John Carter)**
Applicant Address:	**3546 Concours St. #100, Ontario Ca 91764**
Project Address:	**5355 E. Airport Dr. Ontario, CA 91761**
Size of Development:	**12.85 Acres**

Submittal Date: March 2022

Preliminary Water Quality Management Plan (PWQMP)

1. Introduction

The Preliminary Water Quality Management Plan (PWQMP) is a planning tool to improve integration of required water quality elements, stormwater management, water conservation, rainwater harvesting and re-use, and flood management in land use planning and the City's development process. The Preliminary WQMP will assist project applicants and planners in properly designing and laying out project sites so that water quality may be incorporated in the most effective manner and at the lowest cost for the developer.

The San Bernardino County Municipal Separate Storm Sewer System Permit (MS4 Permit) requires project-specific Water Quality Management plans (WQMP) to be prepared for all priority new development and significant redevelopment projects listed in Section 2 of this document. The MS4 Permit stipulates that the City of Ontario require priority project applicants to submit a Preliminary project-specific WQMP, as early as possible, during the environmental review or planning phase of a development project and that the Preliminary WQMP be approved prior to the issuance of land use entitlement.

2. Priority Projects (requiring a Preliminary WQMP)

Land Use entitlement shall not be issued for any of the listed projects, below, until a Preliminary WQMP has been approved by the City's Engineering Department. For construction projects not going through entitlement, a Preliminary and Final project-specific WQMP shall be approved, prior to the issuance of construction permits:

Check the appropriate project category below, for this project:

Check below	**Project Categories**
	1. All significant re-development projects. Significant re-development is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site subject to discretionary approval of the Permittee. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing developed site, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed below applies only to the addition or replacement, and not to the entire developed site. Where redevelopment results in an increase of fifty percent or more of the impervious surfaces of a previously existing developed site, the numeric sizing criteria applies to the entire development (new and existing).

Check below	Project Categories
✓	2. New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single family home subdivisions, multi-family attached subdivisions or townhomes, condominiums, apartments, etc.), mixed-use, and public projects. This category includes development projects on public and private land, which fall under the planning and building authority of the permitting agency.
	3. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532- 7534, 7536-7539).
	4. Restaurants and Food Service Establishments where the land area of development is 5,000 square feet or more.
	5. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas (ESA's) such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.
✓	6. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary storage of motor vehicles.
	7. Retail Gasoline Outlets (RGOs) that are either 5,000 sq ft or more, or have a projected average daily traffic of 100 or more vehicles per day.
	8. *This project is not covered under any of the categories listed above.

* If the development is not covered under any of the project categories listed in Section 2, the project is not required to design and install Site Design/LID BMPs or Treatment Control BMPs to treat the design storm event (Design Capture Volume) described in Section 4.

3. Preliminary WQMP Objectives

Through a combination of Site Design/LID BMPs (where feasible), Source Control, and/or Treatment Control BMPs, project-specific WQMPs shall address all identified pollutants and hydrologic conditions of concern from new development and significant re-development projects for the categories of projects (priority projects) listed in Section 2. Under each type of BMP, listed below, please indicate which BMPs are planned to be implemented and included in the Final WQMP for the project:

A. Site Design/LID (Low Impact Design) for Reducing Stormwater Runoff:

The MS4 Permit requires each priority development project to infiltrate, harvest and use, evapotranspire, or bio-treat the runoff from a 2-yr, 24-hour storm event (Design Capture Volume). If site conditions do not permit infiltration, harvest and use, evapotranspiration, and/or bio-treatment of the entire Design Capture Volume, at the project site, Site Design/LID techniques are required to be implemented to the Maximum Extent Practicable, at the project site, and the remainder of the DCV shall be infiltrated, harvested, bio-treated or treated by alternative measures.

Project applicants shall submit a Preliminary WQMP that documents the LID/Site Design BMPs, proposed for the project. Please indicate, in the table below, which Site Design/LID BMPs will be utilized on this project to accomplish this requirement:

Site Design/LID Practice	Planned	Not Planned
Provide at least the minimum effective area required for LID BMPs, to comply with the WQMP (see Table 3-1 below).	✓	
Grade parking lot areas/drive aisles/roof drains to sheet flow runoff into landscaped swales, via curb cuts or zero-face curbs or otherwise disconnect direct drainage from MS4.		✓
Design landscaped areas as swales and grade to accept runoff from building roofs, parking lots and project roadways.		✓
Install surface retention basins or infiltration trenches to receive impervious area runoff.		✓
Install pervious pavement in parking stalls, alleys, driveways, gutters, walkways, trails or patios.		✓
Install underground stormwater retention chambers where downstream landscaped areas are limited.	✓	
Install approved Stormwater Drywells in detention areas.		✓
Construct streets, sidewalks, and parking lot stalls to the minimum widths necessary.	✓	
Install on-site Biotreatment basins/trenches with underdrains, where soil type is poorly draining.		✓
Install “Engineered Soil” to increase uptake/soil storage capacity and/or evapotranspiration.		✓
Install Rainwater Harvesting/Use Equipment.		✓
Utilize approved off-site retention/infiltration, biotreatment or proprietary treatment, where it is infeasible to install, on-site.		✓

Table 3-1 Minimum Effective Area[1] Required for LID BMPs (surface + subsurface facilities) for Project WQMP to Demonstrate Infeasibility[2] (% of site)

Project Type	New Development	Re-Development
SF/MF Residential < 7 du/ac	10%	5%
SF/MF Residential < 7 - 18 du/ac	7%	3.5%
SF/MF Residential > 18 du/ac	5%	2.5%
Mixed Use, Commercial/Industrial w/FAR< 1.0	10%	5%

Mixed Use, Commercial/Industrial w/FAR 1.0-2.0	7%	3.5%
Mixed Use, Commercial/Industrial w/FAR> 2.0	5%	2.5%
Podium (parking under > 75% of project)	3%	1.5%
Zoning allowing development to property lines	2%	1%
Transit Oriented Development[3]	5%	2.5%
Parking	5%	2.5%

[1] "Effective area" is defined as land area which 1) is suitable for a retention/infiltration BMP (based on infeasibility criteria) and 2) is located down-gradient from building roof or paved areas, so that it may receive gravity flow runoff.

[2] Criteria only required if the project WQMP seeks to demonstrate that the full DCV cannot be feasibly managed on-site.

[3] Transit oriented development is defined as a project with development center within one half mile of a mass transit center.

Key: du/ac = dwelling units/acre, FAR = Floor Area Ratio = ratio of gross floor area of building to gross lot area, MF = Multi Family, SF = Single Family

B. Source Control BMPs – The following BMPs are designed to control stormwater pollutants and runoff water at the location where it is generated. Please indicate which of the listed BMPs are planned to be implemented for the project:

Source Control BMPs	Planned	Not Planned
Minimize non-stormwater site runoff through efficient irrigation system design and controllers.	✓	
Minimize trash and debris in storm runoff through a regular parking lot, storage yard and roadway sweeping program.	✓	
Provide proper covers/roofs and secondary containment for outside material storage & work areas.	✓	
Provide solid roofs over all trash enclosures.	✓	
Site Owner(s)/Property Manager/HOA or POA will be familiar with the project WQMP and stormwater BMPs.	✓	
Owner or HOA or POA to provide Education/Training of site occupants and employees on stormwater BMPs.	✓	
Install stormwater placards/stenciled messages with a "No Dumping" message on all on-site/off-site storm drain inlets.	✓	
Provide contained equipment/vehicle wash rack areas that discharge to sanitary sewer.		✓

C. Treatment Control BMPs – The following BMPs are designed to control stormwater pollutants where it is not feasible to install on-site Site Design/LID BMPs, with the requisite capacity to treat the Design Capture Volume for identified Pollutants of Concern or where pretreatment of stormwater runoff is required, ahead of infiltration BMPs. Please indicate which of the listed BMPs are planned to be implemented for the project:

Treatment Control BMP	Planned	Not Planned
Gravity Separator devices for pretreatment of sediment, trash/litter or Oil & Grease	✓	
Proprietary Biofiltration vaults/devices		✓
Media Cartridge Filtration Vaults		✓
Proprietary Filter Inserts for on-site storm drain inlets or retention basin/trench overflow drains	✓	
Regional Treatment facilities are installed or are planned for installation, off-site, and provide a superior level of treatment or clear advantage to on-site treatment BMPs		✓

4. Volume-based calculation (approximate) for sizing on-site or off-site Stormwater Retention/Infiltration, Harvest & Re-Use or Biotreatment facilities

1) Calculate the "Watershed Imperviousness Ratio", i, which is equal to the percent of impervious area in the BMP Drainage Area divided by 100.

2) Calculate the composite runoff coefficient C_{BMP} for the Drainage Area above using the following equation:

$$\mathbf{C_{BMP} = 0.858i^3 - 0.78i^2 + 0.774i + 0.04}$$

where: $\mathbf{C_{BMP}}$ = composite runoff coefficient; and,

i = watershed imperviousness ratio.

3) Determine the area-averaged "6-hour Mean Storm Rainfall", P_6, for the Drainage Area. This is calculated by multiplying the area averaged 2-year 1-hour value (0.55"-0.6") by the appropriate regression coefficient from Table 1 (1.4807). The 2-yr, 1-hr value for southern Ontario is approximately to 0.5" (P_6 = 0.5*1.4807 = 0.74 and northern Ontario is approximately 0.6" in/hr (P_6 = 0.6*1.4807 = 0.89).

4) Determine the appropriate drawdown time. Use the regression constant a = 1.582 for 24 hours and a = 1.963 for 48 hours. *Note: Regression constants are provided for both 24 hour and 48 hour drawdown times; however, 48 hour drawdown times should be used in most areas of California. Drawdown times in excess of 48 hours should be used with caution as vector breeding can be a problem after water has stood in excess of 72 hours. (Use of the 24 hour drawdown time should be limited to drainage areas with coarse soils (Class 'A' soils, that readily drain.)*

5) Calculate the "Maximized Detention Volume", P_0, using the following equation:

$$\mathbf{P_0 = a \cdot C_{BMP} \cdot P_6}$$

where: $\mathbf{P_0}$ = Maximized Detention Volume, in inches

a = 1.582 for 24 hour and a = 1.963 for 48 hour drawdown,

C_{BMP} = composite runoff coefficient; and,

P_6 = 6-hour Mean Storm Rainfall, in inches

6) Calculate the "Target Capture Volume", V_0, using the following equation:

$$\mathbf{V_0 = (P_0 \cdot A) / 12}$$

where: **V_0** = Target Capture Volume, in acre-feet

P_0 = Maximized Detention Volume, in inches; and,

A = BMP Drainage Area, in acres

Project Volume-based calculation (approximate) for planned on-site or off-site Stormwater Retention/Infiltration, Harvest & Re-Use or Biotreatment facilities:

Variable	Factor/Formula	Area 1 Result	Area 2 Result	Area 3 Result	Area 4 Result
Ratio of impervious surface/total site surface	(i)	89%			
C_{BMP}= runoff coefficient	$0.858i^3 – 0.78i^2 + 0.774i + 0.04$ =	0.716			
P_6	**P_6 = 2-yr,1- hr depth*1.4807 =	0.78			
Detention Volume-acre inches	P_0 = a * C_{BMP} * P_6 =	1.09			
Drawdown rate of basin/trench (a)	1.582 for 24-hr drawdown or 1.963 for 48-hr drawdown =	1.963			
Project Total Area (ac)	(A)	12.85			
Design Capture Volume, cu. ft. (DCV)	$V_0 = [(P_0 * A)/12]*43560$ =	51,054			
Water Volume infiltrated in first 3 hrs of storm	Vol= in/hr/12 x ft^2 of infiltration area x 3 hrs	N/A			
Retention/treatment Volume provided, cu. ft.	Retention capacity of basins, trenches, underground system or biotreatment proposed	140,009			

**For P_6 value, use site coordinates and NOAA website to determine project's average 2-yr, 1-hr rainfall depth, at: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html .

5. Hydrologic Conditions of Concern (HCOC) and use of the on-line San Bernardino County HCOC Map for determining necessary mitigation steps necessary if there are HCOCs downstream of a project:

Project applicants may access the on-line HCOC Map at: http://sbcounty.permitrack.com/WAP/ . The map will indicate any hydrology concerns with downstream waterways that are hydraulically connected to the project and will indicate if there are any approved regional projects downstream that could be utilized for off-site mitigation of HCOCs. Please indicate here if the project will or will not be able to retain/infilter, harvest and use or biotreat and detain the DCV, on-site, as calculated in Section 4 and if there are HCOCs identified downstream of the project:

Retain or Harvest/Use the DCV on site?	Yes	✓	No	
Biotreat the DCV but not infilter the runoff?	Yes		No	✓
HCOCs identified downstream of site?	Yes		No	✓

If the entire DCV will not be retained on site, the DCV is biotreated but not infiltered or additional detention capacity is needed to address identified HCOCs, downstream of the site, please list here, what additional mitigation measures will be utilized (on-site or off-site) to address HCOCs (see Section 4.2.1-4.2.3 of the SB County WQMP Technical Guidance):

The entire DCV is retained on site.

6. Site Plan and Conceptual Grading/Drainage Plan requirements for submission with the Preliminary WQMP:

Provide a Site Plan and Conceptual Grading/Drainage Plan along with this Preliminary WQMP, which conceptually shows the proposed locations of buildings, homes, parking lots, parks, new paved roadways, landscaped areas, drainage patterns and drainage sub-areas, methods of conveyance, proposed retention/infiltration, harvest & use or biotreatment facilities that are planned for installation. Where it is determined to be infeasible to capture and detain design storm runoff volumes, on-site, please include other design features, as described in Section 3, above. Include numbered or lettered notes on the Site Plan with a legend detailing other BMPs, as described in Section 3.

Appendices

Appendix A – Preliminary WQMP Exhibit

Appendix B – WAP Report

Appendix C – Soils Map

Appendix D – NOAA Precipitation Data

Appendix E – Preliminary BMP Details

Appendix F – Infiltration Report

Appendix G – Preliminary Grading Plan

APPENDIX A

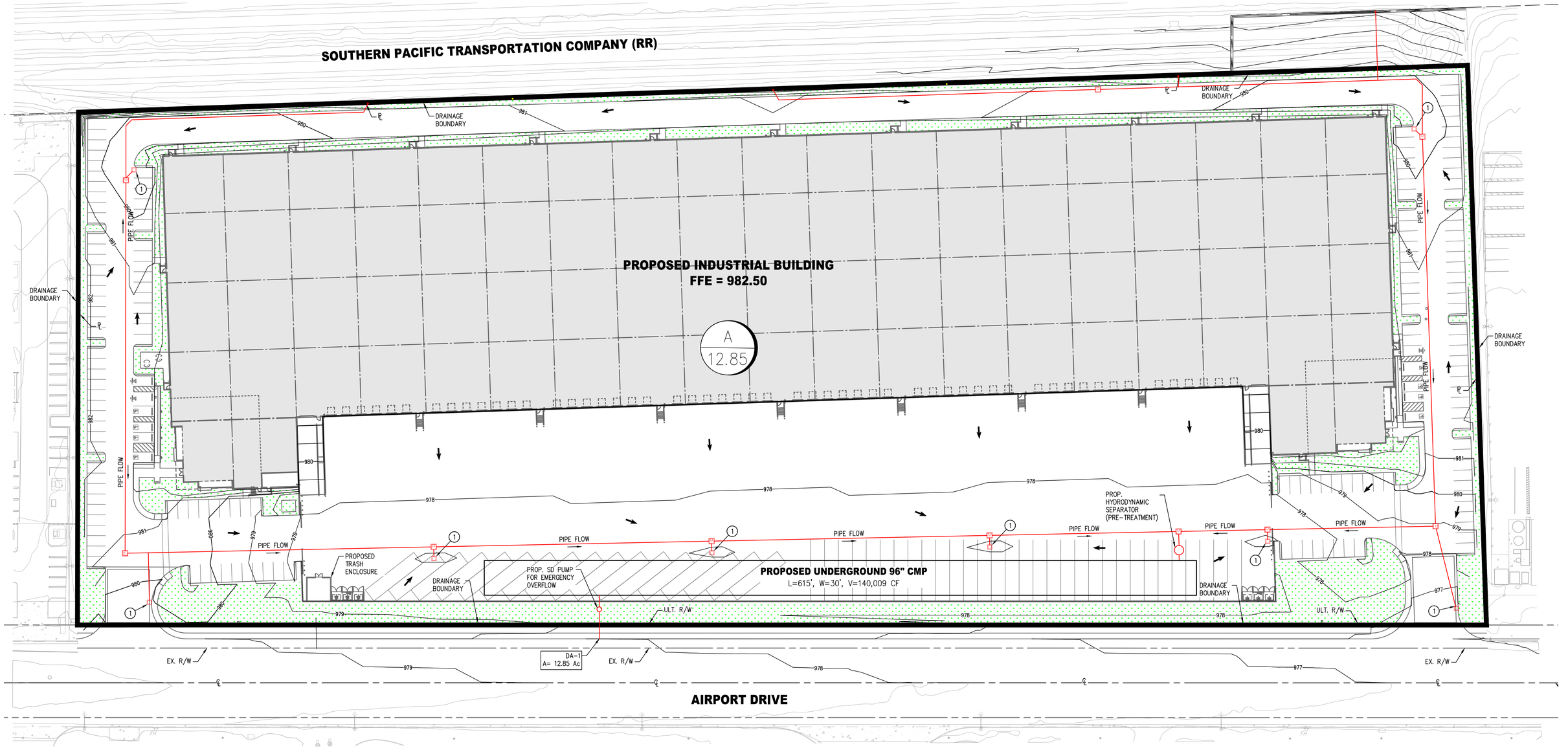
PRELIMINARY WQMP EXHIBIT

SITE VICINITY MAP

WestLAND Group, Inc.
Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

Job Number: 2021-502
Date: 03/23/2022
Scale: NOT TO SCALE

Drawing Name: P:\Year_2021\2021-502 5355 Airport - Prologis - John Carter\06 Engineering\Exhibits\1_Aerial View Map\2021-502_EXH_AERIAL.dwg



GENERAL NOTES

1. SEE PRELIMINARY WQMP REPORT, PREPARED BY LANGAN ENGINEERING, FOR THE COMPLETE DESIGN CAPTURE VOLUME AND INFILTRATION BASIN CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE SAN BERNARDINO TECHNICAL GUIDANCE DOCUMENT FOR WATER QUALITY MANAGEMENT PLANS – SANTA ANA RIVER.
3. PROPOSED ON-SITE DRAINAGE SYSTEM LAYOUT IS PRELIMINARY.
4. PROPOSED OFF-SITE WQMP WILL BE DESIGNED AND SHOWN ON THE FINAL WQMP REPORT.
5. PRELIMINARY DETAILS OF THE INFILTRATION CHAMBERS AND CDS UNITS ARE IN THE PRELIMINARY WQMP REPORT.
6. FIELD INFILTRATION RATES WERE OBTAINED FROM INFILTRATION REPORT, PREPARED BY SOUTHERN CALIFORNIA GEOTECHNICAL, INC., DATED MARCH 9, 2022.

ABBREVIATIONS

CF	CUBIC FEET
CL OR ℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
DA	DRAINAGE AREA
EX	EXISTING
FS	FINISHED SURFACE ELEVATION
HR	HOUR
IN	INCH/INCHES
INV	INVERT ELEVATION
L	LENGTH
R/W	RIGHT OF WAY
PL OR ℄	PROPERTY LINE
PROP	PROPOSED
SD	STORM DRAIN
TYP	TYPICAL
ULT	ULTIMATE
V	VOLUME
W	WIDTH

PROJECT SITE SUMMARY

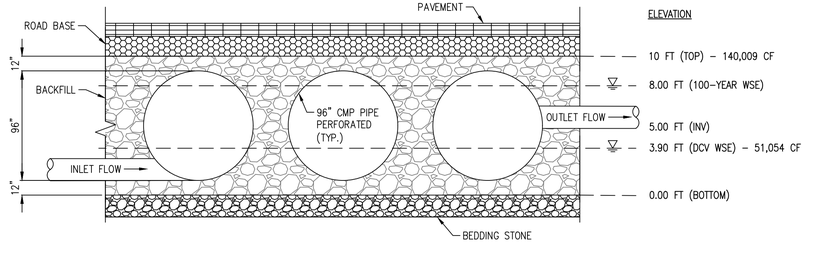
AREA A

SITE AREA:	12.85 ACRE	
SOIL GROUP:	A	(PER USDA WEB SOIL SURVEY)
IMPERVIOUS:	89%	(POST-DEVELOPMENT)
ISOHYETALS:	0.526"	(2-YEAR 1 HOUR)
CN NUMBER:	32	(SOIL GROUP A)
FREQUENCY:	100 YEAR	(FOR STORM DRAIN DESIGN)
METHOD:	SAN BERNARDINO COUNTY TGD - SANTA ANA RIVER	

LEGEND

- PROJECT DRAINAGE BOUNDARY/PROPERTY LINE
- SUB-AREA BOUNDARY
- FLOW PATH
- PROPOSED STORM DRAIN (PRELIMINARY)
- SUB-DRAINAGE AREA ID
- X / X — SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)
- FLOW ARROW
- (10) SURFACE FLOW NODE
- PROPOSED BUILDING AREA
- PROPOSED LANDSCAPE AREA
- PROPOSED CHAMBER AREA
- (1) PROPOSED CATCH BASIN WITH PROPRIETARY FILTER INSERT

CHAMBER SECTION DETAIL



BMP SUMMARY TABLE

DMA ID	SURFACE AREA		BMP TYPE	IMPERVIOUS FRACTION	C_{BMP}	FIELD INFILTRATION BASIN (IN/HR)	DESIGN PERCOLATION RATE (IN/HR)	DESIGN CAPTURE VOLUME (CU-FT)	PROPOSED CHAMBER VOLUME (CU-FT)	DESIGN CAPTURE VOLUME PONDING DEPTH (FT)	DRAWDOWN (HR)
	SF	ACRES									
A	559,755	12.85	UNDERGROUND INFILTRATION CHAMBER	89%	0.89	3.00	1.50	51,054	140,009	3.90	31.2

NOTE:
1. 2 YEAR, 1 HOUR RAINFALL DEPTH = 0.526 (NOAA ATLAS 14)
2. REGRESSION COEFFICIENT = 1.4807 (SB COUNTY TGD SECTION 4.1)
3. 48 HOUR DRAWDOWN COEFFICIENT = 1.963 (SB COUNTY TGD SECTION 4.1)

PREPARED BY:
WestLAND Group, Inc. Land Surveyors • Civil Engineers • GIS
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
JOB NO: 2021-502

INDUSTRIAL BUILDING

POST-DEVELOPMENT WQMP EXHIBIT

5355 AIRPORT DRIVE

CITY OF ONTARIO

DATE: Mar 2022

FIGURE NO. 1

APPENDIX B

WAP REPORT

WQMP Project Report

County of San Bernardino Stormwater Program

Santa Ana River Watershed Geodatabase

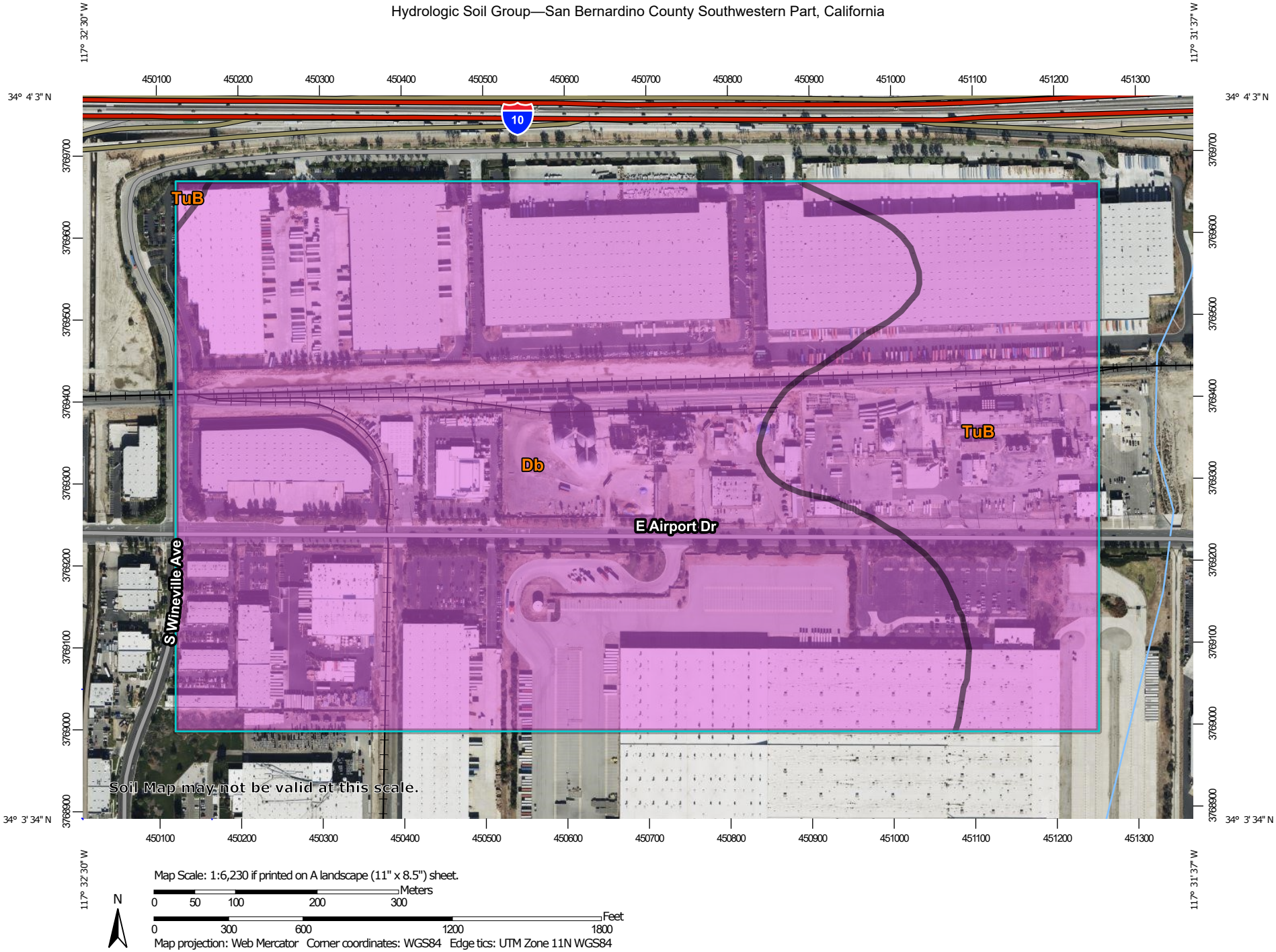
Tuesday, March 22, 2022

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):	023805229, 023805208, 023805220
Project Site Acreage:	35.408
HCOC Exempt Area:	Yes. Verify that the project is completely with the HCOC exemption area.
Closest Receiving Waters: (Applicant to verify based on local drainage facilities and topography.)	**System Number** - 701 **Facility Name** - Lower Etiwanda Creek Channel **Owner** - OTHERS
Closest channel segment's susceptibility to Hydromodification:	EHM
Highest downstream hydromodification susceptibility:	EHM
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?	No
Are there unlined downstream waterbodies?	No
Project Site Onsite Soil Group(s):	A
Environmentally Sensitive Areas within 200':	Grassland/Remanent RAFSS,DELHI SANDS
Groundwater Depth (FT):	-329
Parcels with potential septic tanks within 1000':	No
Known Groundwater Contamination Plumes within 1000':	Yes
Studies and Reports Related to Project Site:	City of Ontario Water Quality Report Chino Basin Recharge Master Plan Chino Basin Water Master 32nd Annual Report Sphere of Influence General Plan Amendment CSDP Project No. 1 CSDP 1 Comprehensive Storm Drain CSDP Drainage Study Calculations Review Report of the District Engineer Proposed East Etiwanda Channel Planning Study San Sevaine - Boyle Map 0001 San Sevaine - Boyle Map 0002 San Sevaine - Boyle Map 0003 SBCounty CSDP Project No.2 Volume 1 SBCounty CSDP Project No.2 Volume 2 Volume 2 Map SBCounty CSDP Project No.3 Volume I SBCounty CSDP Project No.3 Volume II

Appendix C

SOILS MAP



Map Scale: 1:6,230 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

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 Bernardino County Southwestern Part, California
Survey Area Data: Version 13, Sep 13, 2021

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

Date(s) aerial images were photographed: Dec 5, 2020—Feb 6, 2021

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
Db	Delhi fine sand	A	143.7	76.2%
TuB	Tujunga loamy sand, 0 to 5 percent slopes	A	44.9	23.8%
Totals for Area of Interest			**188.6**	**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

Appendix D

NOAA PRECIPITATION DATA

NOAA Atlas 14, Volume 6, Version 2
Location name: Ontario, California, USA*
Latitude: 34.0635°, Longitude: -117.5335°
Elevation: 983.19 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	0.104 (0.087-0.126)	0.137 (0.114-0.166)	0.181 (0.150-0.220)	0.216 (0.178-0.265)	0.265 (0.210-0.336)	0.302 (0.235-0.392)	0.341 (0.258-0.454)	0.381 (0.281-0.522)	0.436 (0.307-0.623)	0.479 (0.326-0.710)
10-min	0.149 (0.124-0.180)	0.196 (0.164-0.238)	0.259 (0.215-0.315)	0.310 (0.255-0.380)	0.379 (0.302-0.482)	0.433 (0.337-0.562)	0.488 (0.370-0.650)	0.546 (0.402-0.748)	0.624 (0.441-0.894)	0.686 (0.467-1.02)
15-min	0.180 (0.150-0.218)	0.237 (0.198-0.288)	0.313 (0.260-0.381)	0.375 (0.308-0.460)	0.459 (0.365-0.583)	0.524 (0.408-0.680)	0.591 (0.448-0.787)	0.660 (0.486-0.905)	0.755 (0.533-1.08)	0.830 (0.565-1.23)
30-min	0.270 (0.225-0.327)	0.356 (0.297-0.432)	0.470 (0.390-0.571)	0.562 (0.463-0.690)	0.689 (0.548-0.875)	0.786 (0.612-1.02)	0.886 (0.672-1.18)	0.991 (0.730-1.36)	1.13 (0.800-1.62)	1.25 (0.848-1.85)
60-min	0.399 (0.332-0.483)	0.526 (0.438-0.638)	0.693 (0.576-0.843)	0.830 (0.683-1.02)	1.02 (0.808-1.29)	1.16 (0.903-1.51)	1.31 (0.993-1.74)	1.46 (1.08-2.00)	1.67 (1.18-2.39)	1.84 (1.25-2.73)
2-hr	0.598 (0.498-0.724)	0.777 (0.647-0.943)	1.01 (0.838-1.23)	1.20 (0.986-1.47)	1.45 (1.15-1.84)	1.65 (1.28-2.14)	1.84 (1.40-2.45)	2.05 (1.51-2.80)	2.32 (1.64-3.32)	2.54 (1.73-3.76)
3-hr	0.757 (0.631-0.917)	0.979 (0.815-1.19)	1.26 (1.05-1.54)	1.49 (1.23-1.83)	1.80 (1.43-2.29)	2.04 (1.58-2.64)	2.27 (1.72-3.02)	2.51 (1.85-3.45)	2.84 (2.00-4.06)	3.09 (2.11-4.58)
6-hr	1.08 (0.898-1.31)	1.39 (1.16-1.69)	1.79 (1.49-2.18)	2.11 (1.73-2.58)	2.52 (2.01-3.21)	2.84 (2.21-3.68)	3.15 (2.39-4.20)	3.47 (2.55-4.75)	3.89 (2.74-5.56)	4.20 (2.86-6.24)
12-hr	1.42 (1.18-1.72)	1.85 (1.54-2.24)	2.39 (1.98-2.90)	2.81 (2.31-3.45)	3.36 (2.67-4.26)	3.76 (2.93-4.88)	4.15 (3.15-5.53)	4.55 (3.35-6.23)	5.06 (3.57-7.24)	5.43 (3.70-8.06)
24-hr	1.89 (1.67-2.18)	2.51 (2.22-2.89)	3.27 (2.89-3.79)	3.87 (3.39-4.51)	4.64 (3.93-5.59)	5.20 (4.31-6.39)	5.74 (4.65-7.24)	6.28 (4.95-8.13)	6.97 (5.27-9.40)	7.48 (5.47-10.4)
2-day	2.31 (2.04-2.66)	3.13 (2.77-3.61)	4.17 (3.68-4.83)	4.99 (4.37-5.82)	6.07 (5.14-7.32)	6.87 (5.70-8.45)	7.66 (6.21-9.66)	8.46 (6.66-11.0)	9.50 (7.18-12.8)	10.3 (7.52-14.3)
3-day	2.52 (2.23-2.91)	3.47 (3.07-4.01)	4.70 (4.14-5.44)	5.68 (4.97-6.63)	6.99 (5.92-8.43)	7.98 (6.62-9.82)	8.98 (7.27-11.3)	9.99 (7.87-12.9)	11.3 (8.58-15.3)	12.4 (9.05-17.3)
4-day	2.76 (2.44-3.18)	3.84 (3.39-4.43)	5.23 (4.62-6.06)	6.36 (5.57-7.42)	7.89 (6.68-9.51)	9.05 (7.51-11.1)	10.2 (8.29-12.9)	11.4 (9.01-14.8)	13.1 (9.88-17.6)	14.3 (10.5-20.0)
7-day	3.24 (2.87-3.74)	4.54 (4.02-5.24)	6.26 (5.52-7.24)	7.66 (6.70-8.93)	9.57 (8.10-11.5)	11.0 (9.16-13.6)	12.6 (10.2-15.8)	14.1 (11.1-18.3)	16.2 (12.3-21.9)	17.9 (13.1-25.0)
10-day	3.50 (3.10-4.03)	4.93 (4.36-5.69)	6.83 (6.03-7.91)	8.40 (7.35-9.80)	10.6 (8.93-12.7)	12.2 (10.1-15.0)	13.9 (11.3-17.6)	15.7 (12.4-20.4)	18.2 (13.8-24.5)	20.1 (14.7-28.1)
20-day	4.07 (3.60-4.69)	5.82 (5.15-6.72)	8.18 (7.22-9.47)	10.2 (8.89-11.9)	12.9 (10.9-15.6)	15.1 (12.5-18.6)	17.4 (14.1-21.9)	19.8 (15.6-25.6)	23.2 (17.5-31.2)	25.8 (18.9-36.1)
30-day	4.80 (4.25-5.54)	6.90 (6.10-7.96)	9.75 (8.60-11.3)	12.2 (10.6-14.2)	15.6 (13.2-18.8)	18.3 (15.2-22.5)	21.2 (17.1-26.7)	24.2 (19.1-31.4)	28.5 (21.6-38.5)	32.0 (23.4-44.6)
45-day	5.71 (5.05-6.58)	8.17 (7.22-9.43)	11.6 (10.2-13.4)	14.5 (12.6-16.9)	18.6 (15.7-22.4)	21.9 (18.2-27.0)	25.5 (20.6-32.1)	29.3 (23.1-37.9)	34.7 (26.3-46.8)	39.1 (28.6-54.6)
60-day	6.64 (5.88-7.65)	9.42 (8.33-10.9)	13.3 (11.7-15.4)	16.6 (14.5-19.4)	21.4 (18.1-25.8)	25.3 (21.0-31.1)	29.5 (23.9-37.1)	33.9 (26.7-44.0)	40.4 (30.5-54.5)	45.7 (33.4-63.7)

[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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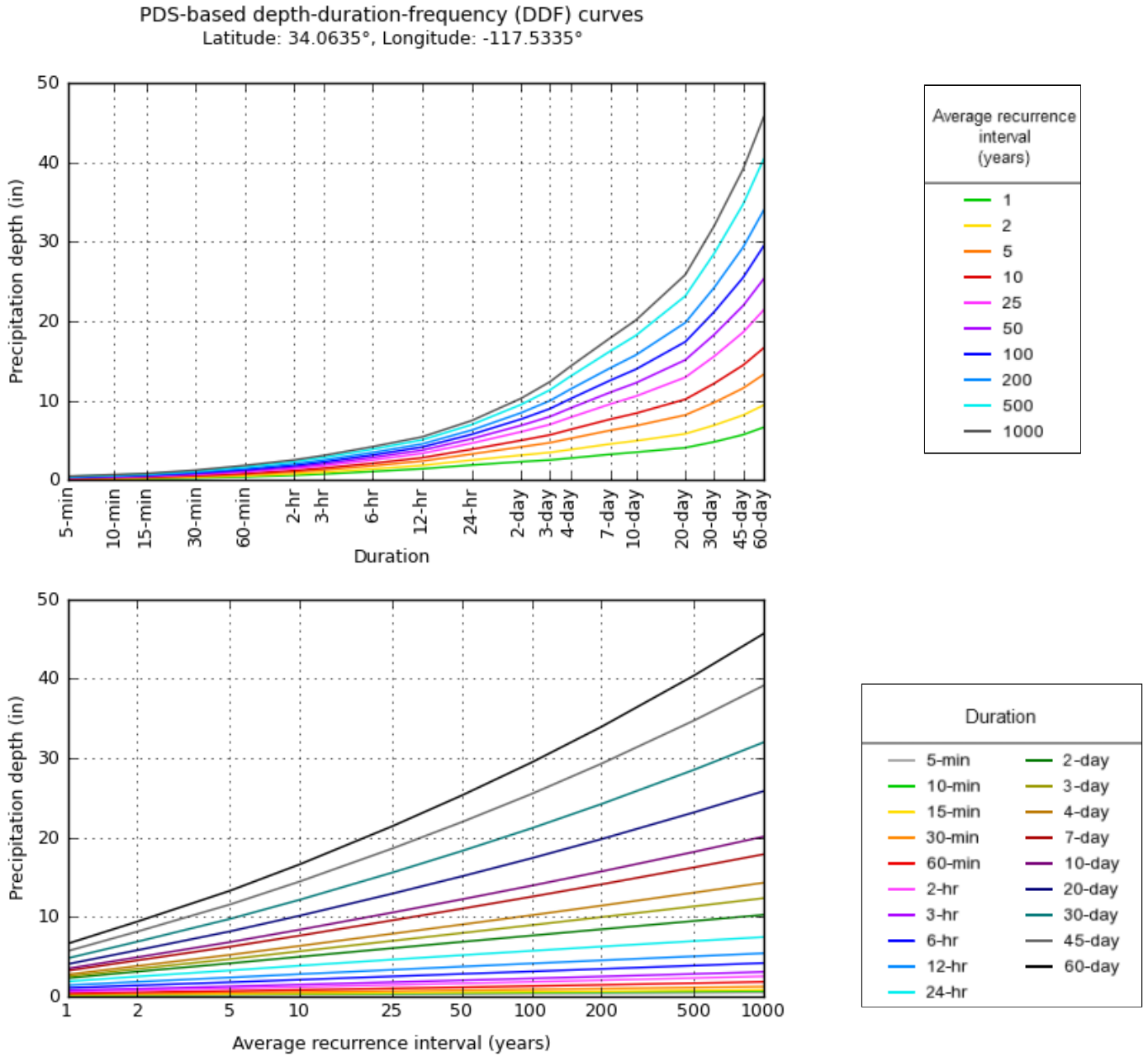
PF graphical



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Tue Mar 1 22:56:03 2022

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Maps & aerials

Small scale terrain

APPENDIX E

PRELIMINARY BMP DETAILS

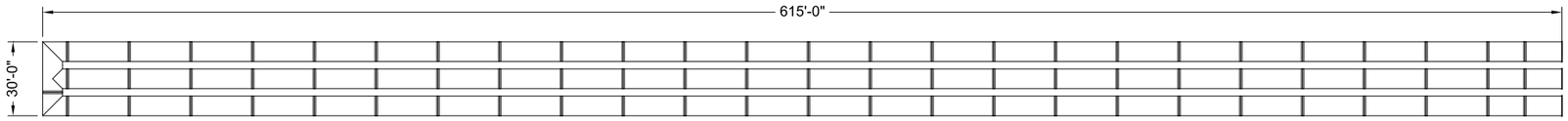
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,851 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 140,000 CF
- PIPE STORAGE VOLUME = 93,041 CF
- BACKFILL STORAGE VOLUME = 46,967 CF
- TOTAL STORAGE PROVIDED = 140,009 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 24"
- ABOVE PIPE = 12"
- WIDTH AT SIDES = 24"
- BELOW PIPE = 12"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 60'

DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO14828 5355 Airport Drive
Underground Infiltration Chamber #1
Ontario, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
9371	14828	3/23/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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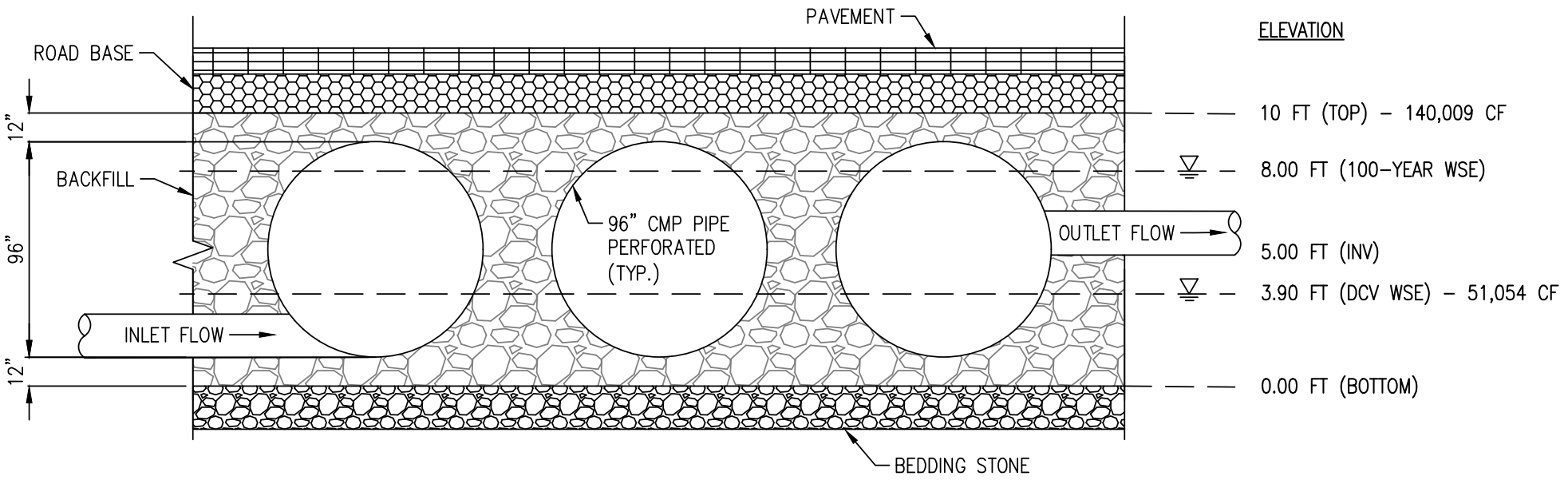
CHAMBER SECTION DETAIL



CONTECH ENGINEERED SOLUTIONS

CMP: Underground Detention System
Storage Volume Estimation

Date: 03-22-2022
Project Name: 5355 Airport Drive

City / County: Ontario
State: California

Designed By: JL
Company: WLG
Telephone:

=Adjustable Input Cells

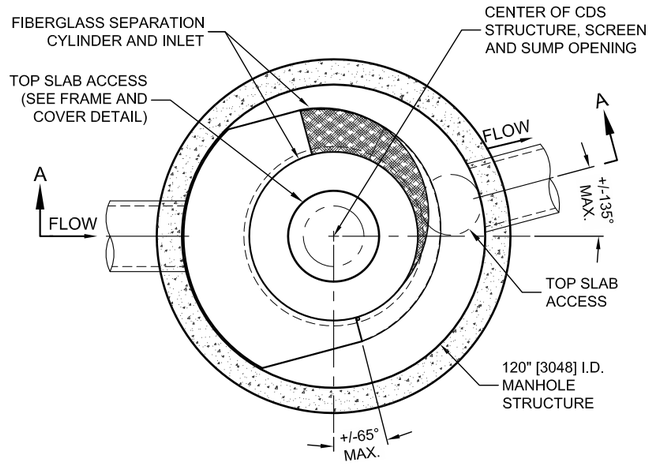
Contech Engineered Solutions, LLC is pleased to offer the following estimate of storage volume for the above named project. The results are submitted as an estimate only, without liability on the part of Contech Engineered Solutions, LLC for accuracy or suitability to any particular applicaton and are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

Summary of Inputs

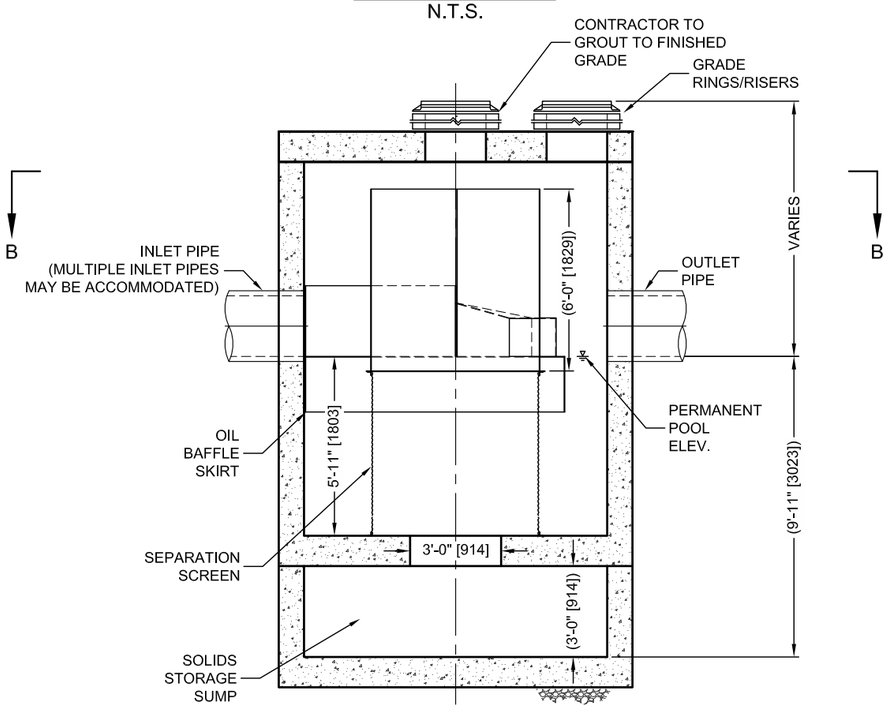
System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	615.0	Backfill Porosity (%):	40%	System Diameter (in):	96
Out-to-out width (ft):	30.0	Depth Above Pipe (in):	12.0	Pipe Spacing (in):	2
Number of Manifolds (ea):	1.0	Depth Below Pipe (in):	12.0	Incremental Analysis (in):	2
Number of Barrels (ea):	3.0	Width At Ends (ft):	2.0	System Invert (Elevation):	966
		Width At Sides (ft):	2.0		

Storage Volume Estimation

System		Pipe		Stone		Total System		Miscellaneous		Staging	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Percent Open Storage (%)	Ave. Surface Area (sf)	Cumulative Storage (Ac-ft)	Outflow (cfs)
0.00	966.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	8,418.4		
0.17	966.16	0.0	0.0	1,403.1	1,403.1	1,403.1	1,403.1	0.0%	8,418.4		
0.33	966.33	0.0	0.0	1,403.1	2,806.1	1,403.1	2,806.1	0.0%	8,418.4		
0.50	966.50	0.0	0.0	1,403.1	4,209.2	1,403.1	4,209.2	0.0%	8,418.4		
0.67	966.66	0.0	0.0	1,403.1	5,612.3	1,403.1	5,612.3	0.0%	8,418.4		
0.83	966.83	0.0	0.0	1,403.1	7,015.3	1,403.1	7,015.3	0.0%	8,418.4		
1.00	967.00	0.0	0.0	1,403.1	8,418.4	1,403.1	8,418.4	0.0%	8,418.4	0.19	0.00
1.17	967.16	472.0	472.0	1,214.3	9,632.7	1,686.3	10,104.7	4.7%	10,956.4		
1.33	967.33	854.5	1,326.5	1,061.3	10,693.9	1,915.8	12,020.4	11.0%	11,969.2		
1.50	967.50	1,094.7	2,421.2	965.2	11,659.1	2,059.9	14,080.3	17.2%	12,719.7		
1.67	967.66	1,282.1	3,703.3	890.2	12,549.4	2,172.3	16,252.6	22.8%	13,329.7		
1.83	967.83	1,437.8	5,141.1	827.9	13,377.3	2,265.8	18,518.4	27.8%	13,846.6		
2.00	968.00	1,571.5	6,712.6	774.5	14,151.7	2,346.0	20,864.4	32.2%	14,295.1	0.48	0.00
2.17	968.16	1,688.4	8,401.0	727.7	14,879.5	2,416.1	23,280.5	36.1%	14,690.0		
2.33	968.33	1,791.8	10,192.8	686.4	15,565.8	2,478.1	25,758.6	39.6%	15,040.7		
2.50	968.50	1,883.9	12,076.6	649.5	16,215.3	2,533.4	28,292.0	42.7%	15,354.1		
2.67	968.66	1,966.3	14,042.9	616.5	16,831.9	2,582.8	30,874.8	45.5%	15,634.9		
2.83	968.83	2,040.2	16,083.2	587.0	17,418.9	2,627.2	33,502.0	48.0%	15,886.9		
3.00	969.00	2,106.5	18,189.7	560.4	17,979.3	2,667.0	36,169.0	50.3%	16,112.9	0.83	0.00
3.17	969.16	2,166.0	20,355.7	536.7	18,516.0	2,702.6	38,871.7	52.4%	16,315.0		
3.33	969.33	2,219.0	22,574.7	515.5	19,031.5	2,734.5	41,606.1	54.3%	16,495.2		
3.50	969.50	2,266.2	24,840.9	496.6	19,528.1	2,762.8	44,368.9	56.0%	16,654.8		
3.67	969.66	2,307.8	27,148.7	479.9	20,008.0	2,787.8	47,156.7	57.6%	16,795.1		
3.83	969.83	2,344.2	29,492.9	465.4	20,473.4	2,809.6	49,966.3	59.0%	16,916.9		
4.00	970.00	2,375.6	31,868.4	452.8	20,926.2	2,828.4	52,794.7	60.4%	17,021.1	1.21	0.00
4.17	970.16	2,402.1	34,270.6	442.2	21,368.4	2,844.3	55,639.0	61.6%	17,108.2		
4.33	970.33	2,424.0	36,694.6	433.5	21,801.9	2,857.5	58,496.5	62.7%	17,178.9		
4.50	970.50	2,441.4	39,136.0	426.5	22,228.4	2,867.9	61,364.4	63.8%	17,233.5		
4.67	970.66	2,454.4	41,590.4	421.3	22,649.7	2,875.7	64,240.1	64.7%	17,272.3		
4.83	970.83	2,463.0	44,053.4	417.9	23,067.6	2,880.9	67,121.0	65.6%	17,295.5		
5.00	971.00	2,467.3	46,520.7	416.2	23,483.7	2,883.4	70,004.4	66.5%	17,303.2	1.61	4.00
5.17	971.16	2,467.3	48,988.0	416.2	23,899.9	2,883.4	72,887.9	67.2%	17,295.5		
5.33	971.33	2,463.0	51,451.0	417.9	24,317.7	2,880.9	75,768.7	67.9%	17,272.3		
5.50	971.50	2,454.4	53,905.4	421.3	24,739.0	2,875.7	78,644.4	68.5%	17,233.5		
5.67	971.66	2,441.4	56,346.8	426.5	25,165.5	2,867.9	81,512.4	69.1%	17,178.9		
5.83	971.83	2,424.0	58,770.8	433.5	25,599.0	2,857.5	84,369.8	69.7%	17,108.2		
6.00	972.00	2,402.1	61,173.0	442.2	26,041.2	2,844.3	87,214.2	70.1%	17,021.1	2.00	4.00
6.17	972.16	2,375.6	63,548.5	452.8	26,494.1	2,828.4	90,042.6	70.6%	16,916.9		
6.33	972.33	2,344.2	65,892.7	465.4	26,959.4	2,809.6	92,852.2	71.0%	16,795.1		
6.50	972.50	2,307.8	68,200.5	479.9	27,439.4	2,787.8	95,639.9	71.3%	16,654.8		
6.67	972.66	2,266.2	70,466.7	496.6	27,936.0	2,762.8	98,402.7	71.6%	16,495.2		
6.83	972.83	2,219.0	72,685.8	515.5	28,451.4	2,734.5	101,137.2	71.9%	16,315.0		
7.00	973.00	2,166.0	74,851.7	536.7	28,988.1	2,702.6	103,839.8	72.1%	16,112.9	2.38	4.00
7.17	973.16	2,106.5	76,958.3	560.4	29,548.6	2,667.0	106,506.8	72.3%	15,886.9		
7.33	973.33	2,040.2	78,998.5	587.0	30,135.5	2,627.2	109,134.0	72.4%	15,634.9		
7.50	973.50	1,966.3	80,964.8	616.5	30,752.1	2,582.8	111,716.9	72.5%	15,354.1		
7.67	973.66	1,883.9	82,848.6	649.5	31,401.6	2,533.4	114,250.2	72.5%	15,040.7		
7.83	973.83	1,791.8	84,640.4	686.4	32,088.0	2,478.1	116,728.4	72.5%	14,690.0		
8.00	974.00	1,688.4	86,328.8	727.7	32,815.7	2,416.1	119,144.5	72.5%	14,295.1	2.74	4.00
8.17	974.16	1,571.5	87,900.3	774.5	33,590.2	2,346.0	121,490.4	72.4%	13,846.6		
8.33	974.33	1,437.8	89,338.1	827.9	34,418.1	2,265.8	123,756.2	72.2%	13,329.7		
8.50	974.50	1,282.1	90,620.2	890.2	35,308.3	2,172.3	125,928.5	72.0%	12,719.7		
8.67	974.66	1,094.7	91,714.9	965.2	36,273.5	2,059.9	127,988.4	71.7%	11,969.2		
8.83	974.83	854.5	92,569.4	1,061.3	37,334.8	1,915.8	129,904.2	71.3%	10,956.4		
9.00	975.00	472.0	93,041.4	1,214.3	38,549.0	1,686.3	131,590.4	70.7%	8,418.4	3.02	4.00



PLAN VIEW B-B
N.T.S.



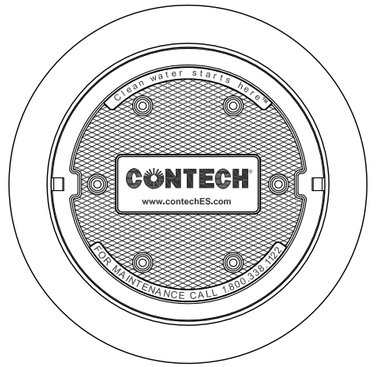
ELEVATION A-A
N.T.S.

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,766,849; 6,641,720; 6,511,595; 6,581,792; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

CDS5653-10-C DESIGN NOTES

THE STANDARD CDS5653-10-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechEScom
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET HS20 (AASHTO M 306) AND BE CAST WITH THE CONTECH LOGO.
6. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS5653-10-C
INLINE CDS
STANDARD DETAIL

APPENDIX F

INFILTRATION REPORT

March 9, 2022

Prologis
17777 Center Court Drive North, Suite 100
Cerritos, California 90703

Attention: Mr. John Carter
Director, Project Management

Project No.: **22G128-2**

Subject: **Results of Infiltration Testing**
Proposed Warehouse
5355 East Airport Drive
Ontario, California

Reference: Geotechnical Investigation, Proposed Warehouse, 5355 East Airport Drive, Ontario, California, prepared by Southern California Geotechnical, Inc. (SCG) for Prologis, SCG Project No. 22G128-1, dated March 9, 2022.

Dear Mr. Carter:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in general accordance with our Proposal No. 22P129, dated January 21, 2022. The scope of services included site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the on-site soils. The infiltration testing was performed in general accordance with the guidelines published in the Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, prepared for the Riverside County Department of Environmental Health (RCDEH), dated December, 2013. The San Bernardino County standards defer to the guidelines published by the RCDEH.

Site and Project Description

The subject site is located on the north side of East Airport Drive, 1,310± feet east of the intersection of South Wineville Avenue and East Airport Drive in Ontario, California. The site is also referenced by the street address 5355 East Airport Drive. The site is bounded to the north by Union Pacific railroad tracks, to the east and west by an industrial development, and to the south by East Airport Drive. The general location of the site is illustrated on the Site Location Map, enclosed as Plate 1 of this report.

The site consists of an irregular-shaped property, 14.58± acres in size. The site is developed to manufacture and store animal feed grains. The development includes several buildings and shed structures ranging in size from 2,200± ft^2 to 20,175± ft^2, and several silos and above-ground

storage tanks (ASTs) primarily located in the north-central region of the site. The existing structures are generally of concrete tilt-up and/or metal-framed construction, and are presumed to be supported on conventional shallow foundations with concrete slab-on-grade floors. The existing structures are generally surrounded by asphaltic concrete (AC) pavements, with isolated areas of Portland cement concrete (PCC), aggregate base pavements, and exposed soils in the south-central portion of the site. The existing pavements are in poor condition, with moderate to severe cracking throughout. Two medium-size trees are present in the south-central region of the site.

Detailed topographic information was not available at the time of this report. Based on elevations obtained from Google Earth and visual observations made at the time of the subsurface investigation, the site slopes gently to the south-southeast at a gradient of less than 1 percent.

Proposed Development

A preliminary site plan, identified as Scheme 01 and prepared by RGA, for the proposed development was provided to our office by the client. Based on this plan, the subject site will be developed with a 259,189± ft² warehouse, located in the north-central region of the site. Dock-high doors will be constructed along a portion of the south building wall. The proposed building is expected to be surrounded by AC pavements in the parking and drive areas, PCC pavements in the loading dock area, and concrete flatwork and landscaped planters throughout the site.

We understand that the proposed development will include on-site stormwater infiltration. Based on our experience with similar projects in the area, the infiltration systems are expected to be below-grade chambers. The bottoms of the infiltration systems are expected to be 10 to 12± feet below the existing site grades.

Concurrent Study

SCG concurrently conducted a geotechnical investigation at the subject site, referenced above. As a part of this study, five (5) borings (identified as Boring Nos. B-1 through B-5) were advanced to depths of 20 to 30± feet below the existing site grades.

AC pavements were encountered at the ground surface of Boring Nos. B-1 through B-4. The pavement sections generally consist of 0 to 2½± inches of AC, underlain by 1 to 3½± inches of aggregate base. Artificial fill soils were encountered beneath the existing pavements at Boring Nos. B-1 through B-4 and at the ground surface at Boring No. B-5, extending to depths of 2½ to 6½± feet below the existing site grades. The fill soils generally consist of loose to medium dense sands and silty sands, with occasional dense silty sands. Native alluvium was encountered beneath the artificial fill soils at all of the boring locations, extending to at least the maximum depth explored of 30± feet. The near-surface alluvium generally consists of loose to medium dense sands and sandy silts, extending to depths of 6½ to 12± feet. At greater depths, the alluvium generally consists of medium dense to dense sands, silty sands and sandy silts. Boring No. B-3 encountered a stratum of dense silty sands at a depth of 14½ to 17± feet. Boring No. B-5 encountered a stratum of loose well-graded sands at a depth of 12 to 17± feet.

Groundwater

Free water was not encountered during the drilling of any of the borings. Based on the lack of any water within the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth in excess of 30± feet at the time of the subsurface exploration.

As part of our research, we reviewed available groundwater data in order to determine groundwater levels for the site. Water level data was obtained from the California Department of Water Resources Water Data Library website, https://wdl.water.ca.gov/waterdatalibrary/. The nearest monitoring well on record (identified as State Well Number: 01S06W29H001S) is located 3,400± feet southeast of the project site. Water level readings within this monitoring well indicate a high groundwater level of 277± feet below the ground surface in April 2019.

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of six (6) infiltration test borings, advanced to depths of 10 to 12± feet below the existing site grades. The infiltration borings were advanced using a truck-mounted drilling rig, equipped with 8-inch-diameter hollow-stem augers and were logged during drilling by a member of our staff. The approximate locations of the infiltration test borings (identified as I-1 through I-6) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Upon the completion of the infiltration borings, the bottom of each test boring was covered with 2± inches of clean ¾-inch gravel. A sufficient length of 3-inch-diameter perforated PVC casing was then placed into each test hole so that the PVC casing extended from the bottom of the test hole to the ground surface. Clean ¾-inch gravel was then installed in the annulus surrounding the PVC casing.

Geotechnical Conditions

AC pavements were encountered at the ground surface of Infiltration Test Nos. I-1 through I-5. The pavement sections generally consist of 0 to 6± inches of AC, underlain by 0 to 9± inches of aggregate base. An 8±-inch-thick PCC section was encountered at the ground surface at Infiltration Test Nos. I-6. Steel reinforcement was not encountered at this location. Artificial fill soils were encountered beneath the existing pavements at all of the infiltration boring location, extending to depths of 3 to 4± feet below the existing site grades. The fill soils generally consist of medium dense to dense silty sands, with occasional loose sands. The fill soils possess a disturbed mottled appearance resulting in their classification as artificial fill. Native alluvial soils were encountered beneath the fill soils at all of the infiltration boring locations, extending to at least the maximum depth explored of 12± feet. The alluvium generally consists of loose sands, silty sands and silty sands to sandy silts, with occasional medium dense silty sands. The Boring Logs, which illustrate the conditions encountered at the boring locations, are included with this report.

Infiltration Testing

As previously mentioned, the infiltration testing was performed in general accordance with the guidelines published in Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, which apply to San Bernardino County.

Pre-soaking

In accordance with the county infiltration standards for sandy soils, all infiltration test borings were pre-soaked 2 hours prior to the infiltration testing or until all of the water had percolated through the test holes. The pre-soaking process consisted of filling test borings by inverting a full 5-gallon bottle of clear water supported over each hole so that the water flow into the hole holds constant at a level at least 5 times the hole's radius above the gravel at the bottom of each hole. Pre-soaking was completed after all of the water had percolated through the test holes.

Infiltration Testing

Following the pre-soaking process of the infiltration test borings, SCG performed the infiltration testing. Each test hole was filled with water to a depth of at least 5 times the hole's radius above the gravel at the bottom of the test holes. In accordance with the Riverside County guidelines, since "sandy soils" (where 6 inches of water infiltrated into the surrounding soils in less than 25 minutes for two consecutive readings) were encountered at the bottom of the infiltration test borings, readings were taken at 10-minute intervals for a total of 1 hour. After each reading, water was added to the borings so that the depth of the water was at least 5 times the radius of the hole. The water level readings are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rates from the tests are tabulated in inches per hour. In accordance with the typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration tests be used as the design infiltration rate. The rates are summarized below:

Infiltration Test No.	Depth (feet)	Soil Description	Infiltration Rate (inches/hour)
I-1	10	Silty fine Sand, little medium Sand	3.9
I-2	12	Silty fine to medium Sand	3.0
I-3	12	Silty fine to medium Sand, trace coarse Sand	4.6
I-4	12	Silty fine Sand to fine Sandy Silt, trace medium Sand	3.1
I-5	10	Silty fine Sand, little medium Sand, trace fine Gravel	3.5
I-6	10	Silty fine Sand to fine Sandy Silt, trace medium Sand, trace fine Gravel	3.0

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples within the borings were determined in accordance with ASTM D-2216 and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the base of each infiltration test boring have been determined using a range of wire mesh screens. These tests were performed in general accordance with ASTM D-422 and/or ASTM D-1140. The weight of the portion of the sample retained on each screen is recorded and the percentage finer or coarser of the total weight is calculated. The results of these tests are presented on Plates C-1 through C-6 of this report.

Design Recommendations

Six (6) infiltration tests were performed at the subject site. As noted above, the infiltration rates at these locations vary from 3.0 to 4.6 inches per hour. The major factor affecting the difference in infiltration rates at the infiltration test locations is the presence of silt in the soils at the tested depths. Based on the infiltration test results, we recommend an infiltration rate of 3.0 inches per hour be used in the design of the infiltration systems, if the bottom of the infiltration systems extend between 10 to 12± feet below the existing site grades.

The design of the storm water infiltration systems should be performed by the project civil engineer, in accordance with the City of Ontario and/or County of San Bernardino guidelines. It is recommended that the system be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the systems. The presence of such materials would decrease the effective infiltration rates. **It is recommended that the project civil engineer apply an appropriate factor of safety. The infiltration rates recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rate.** It should be noted that the recommended infiltration rates are based on infiltration testing at six (6) discrete locations and that the overall infiltration rates of the proposed infiltration systems could vary considerably.

Infiltration Rate Considerations

The infiltration rates presented herein was determined in accordance with the San Bernardino County guidelines and are considered valid only for the time and place of the actual test. Varying subsurface conditions will exist in other areas of the site, which could alter the recommended infiltration rates presented above. The infiltration rates will decline over time between maintenance cycles as silt or clay particles accumulate on the BMP surface. The infiltration rate is highly dependent upon a number of factors, including density, silt and clay content, grainsize distribution throughout the range of particle sizes, and particle shape. Small changes in these factors can cause large changes in the infiltration rates.

Infiltration rates are based on unsaturated flow. As water is introduced into soils by infiltration, the soils become saturated and the wetting front advances from the unsaturated zone to the saturated zone. Once the soils become saturated, infiltration rates become zero, and water can only move through soils by hydraulic conductivity at a rate determined by pressure head and soil permeability. Changes in soil moisture content will affect the infiltration rate. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Construction Considerations

The infiltration rates presented in this report are specific to the tested locations and tested depths. Infiltration rates can be significantly reduced if the soils are exposed to excessive disturbance or compaction during construction. Compaction of the soils at the bottom of the infiltration system can significantly reduce the infiltration ability of the basins. Therefore, the subgrade soils within proposed infiltration system areas should not be over-excavated, undercut or compacted in any significant manner. **It is recommended that a note to this effect be added to the project plans and/or specifications.**

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration systems to identify the soil classification at the base of each system. It should be confirmed that the soils at the base of the proposed infiltration systems correspond with those presented in this report to ensure that the performance of the systems will be consistent with the rates reported herein.

We recommend that scrapers and other rubber-tired heavy equipment not be operated on the basin bottom, or at levels lower than 2 feet above the bottom of the system, particularly within basins. As such, the bottom 24 inches of the infiltration systems should be excavated with non-rubber-tired equipment, such as excavators.

Basin Maintenance

The proposed project may include infiltration basins. Water flowing into these basins will carry some level of sediment. Wind-blown sediments and erosion of the basin side walls will also contribute to sediment deposition at the bottom of the basin. This layer has the potential to significantly reduce the infiltration rate of the basin subgrade soils. Therefore, a formal basin maintenance program should be established to ensure that these silt and clay deposits are removed from the basin on a regular basis. Appropriate vegetation on the basin sidewalls and bottom may reduce erosion and sediment deposition.

Basin maintenance should also include measures to prevent animal burrows, and to repair any burrows or damage caused by such. Animal burrows in the basin sidewalls can significantly increase the risk of erosion and piping failures.

Location of Infiltration Systems

The use of on-site storm water infiltration systems carries a risk of creating adverse geotechnical conditions. Increasing the moisture content of the soil can cause the soil to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Overlying structures and pavements in the infiltration area could potentially be damaged due to saturation of the subgrade soils. **The proposed infiltration systems for this site should be located at least 25 feet away from any structures, including retaining walls.** Even with this provision of locating the infiltration system at least 25 feet from the building(s), it is possible that infiltrating water into the subsurface soils could have an adverse effect on the proposed or existing structures. It should also be noted that utility trenches which happen to collect storm water can also serve as conduits to transmit storm water toward the structure, depending on the slope of the utility trench. Therefore, consideration should also be given to the proposed locations of underground utilities which may pass near the proposed infiltration system.

The infiltration system designer should also give special consideration to the effect that the proposed infiltration systems may have on nearby subterranean structures, open excavations, or descending slopes. In particular, infiltration systems should not be located near the crest of descending slopes, particularly where the slopes are comprised of granular soils. Such systems will require specialized design and analysis to evaluate the potential for slope instability, piping failures and other phenomena that typically apply to earthen dam design. This type of analysis is beyond the scope of this infiltration test report, but these factors should be considered by the infiltration system designer when locating the infiltration systems.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The design of the proposed storm water infiltration system is the responsibility of the civil engineer. The role of the geotechnical engineer is limited to determination of infiltration rate only. By using the design infiltration rate contained herein, the civil engineer agrees to indemnify, defend, and hold harmless the geotechnical engineer for all aspects of the design and performance of the proposed storm water infiltration system. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted. The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

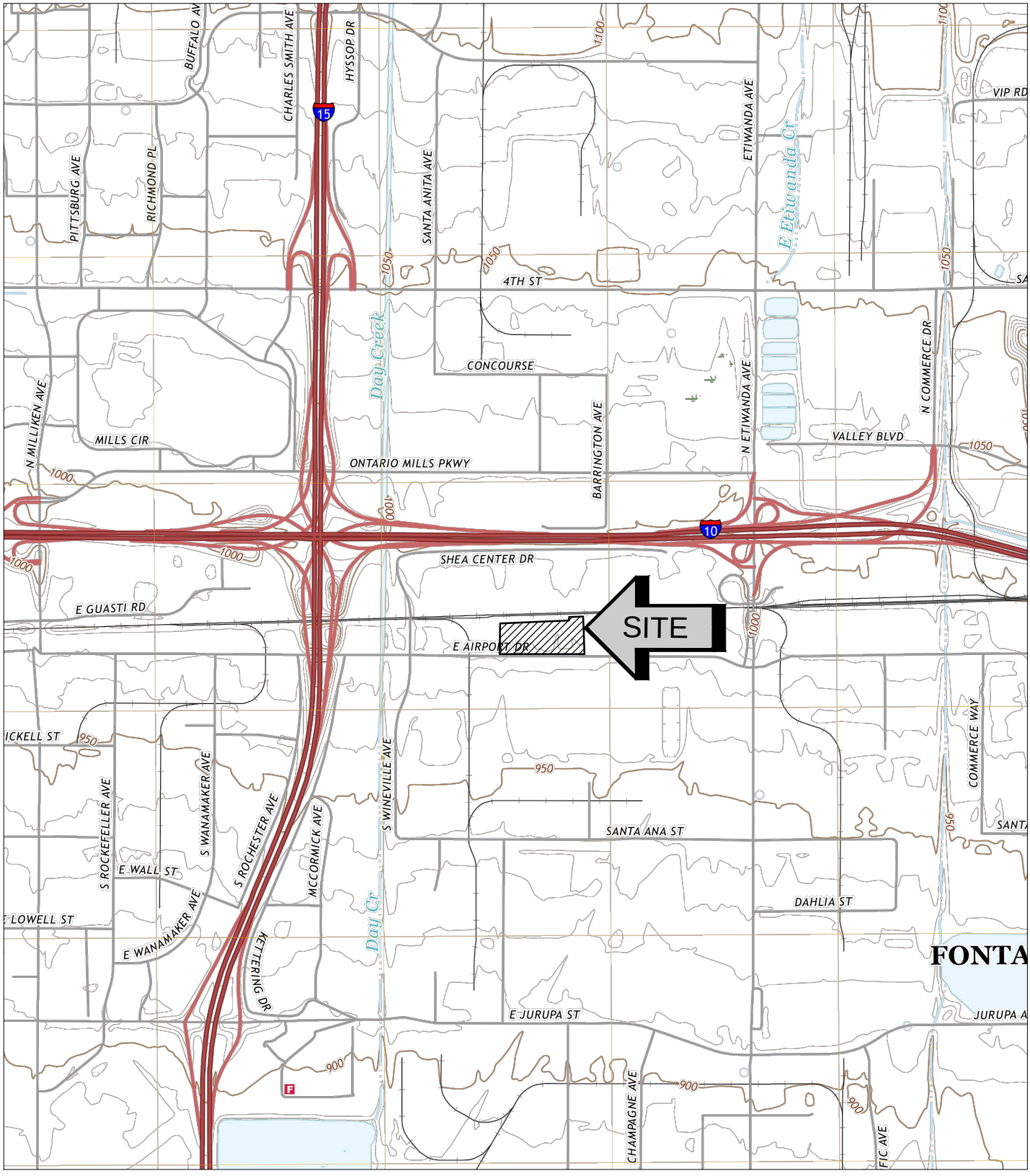
SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Joseph Lozano Leon
Staff Engineer

Robert G. Trazo, GE 2655
Principal Engineer

Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Boring Log Legend and Logs (8 pages)
Infiltration Test Results Spreadsheets (6 pages)
Grain Size Distribution Graphs (6 pages)



SOURCE: USGS TOPOGRAPHIC MAP OF THE GUASTI QUADRANGLE, SAN BERNARDINO COUNTY, CALIFORNIA, 2021.

SITE LOCATION MAP

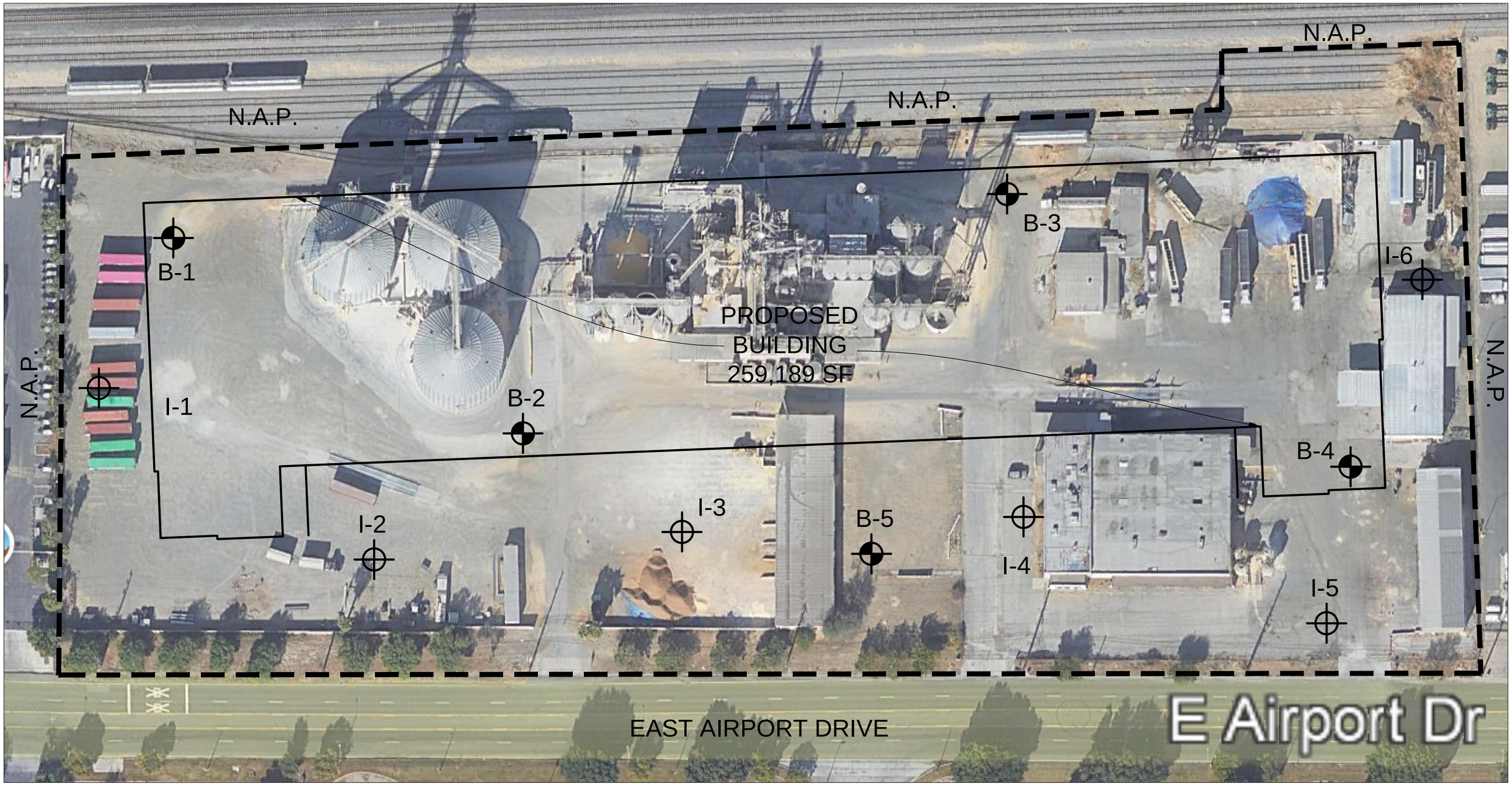
PROPOSED WAREHOUSE

ONTARIO, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: JLL CHKD: RGT	
SCG PROJECT 22G128-2	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



GEOTECHNICAL LEGEND

- APPROXIMATE INFILTRATION TEST LOCATION
- APPROXIMATE BORING LOCATION FROM CONCURRENT STUDY (SCG PROJECT NO. 22G128-1)
- PROPERTY LINE

NORTH

SoCalGeo

NOTE: PRELIMINARY SITE PLAN PREPARED BY RGA.
AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH.

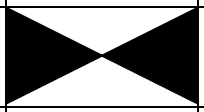
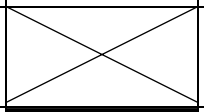
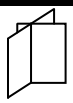
INFILTRATION TEST LOCATION PLAN

PROPOSED WAREHOUSE

ONTARIO, CALIFORNIA

SCALE: 1" = 80'	SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: JLL CHKD: RGT	
SCG PROJECT 22G128-2	
PLATE 2	

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

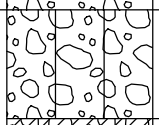
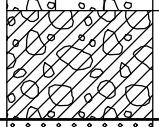
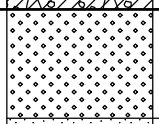
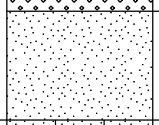
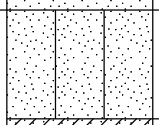
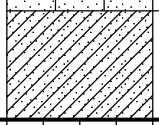
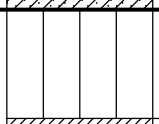
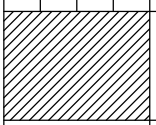
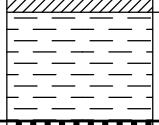
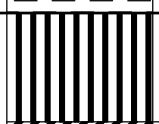
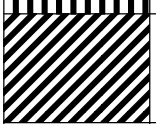
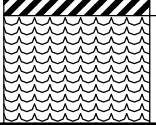
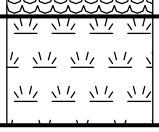
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-1

JOB NO.: 22G128-2
PROJECT: Proposed Warehouse
LOCATION: Ontario, California

DRILLING DATE: 2/10/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joseph Lozano Leon

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					8± inches Aggregate Base							
		26			FILL: Gray Brown Silty fine to coarse Sand, little fine Gravel, medium dense-moist		10					
					ALLUVIUM: Light Brown to Brown Silty fine Sand, loose-damp							
5		7					4					
		9			@ 8½ feet, little medium Sand		5			31		
10					Boring Terminated at 10'							

TBL 22G128-2.GPJ SOCALGEO.GDT 3/9/22

TEST BORING LOG

PLATE B-1

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 22G128-2
PROJECT: Proposed Warehouse
LOCATION: Ontario, California

DRILLING DATE: 2/10/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joseph Lozano Leon

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					5½± inches Aggregate Base							
		30			FILL: Brown Silty fine Sand, little medium Sand, trace coarse Sand, trace fine Gravel, dense-dry to damp		2					
		4			ALLUVIUM: Gray Brown Silty fine Sand, little medium Sand, trace coarse Sand, loose-damp		6					
5												
		6			Brown Silty fine Sand, trace medium Sand, loose-damp to moist		7					
					Brown Silty fine to medium Sand, medium dense-moist							
10		23					8			33		
					Boring Terminated at 12'							

TBL 22G128-2.GPJ SOCALGEO.GDT 3/9/22

TEST BORING LOG **PLATE B-2**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-3

JOB NO.: 22G128-2
PROJECT: Proposed Warehouse
LOCATION: Ontario, California

DRILLING DATE: 2/10/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joseph Lozano Leon

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					6± inches Asphaltic Concrete							
		8			FILL: Brown fine to medium Sand, little Silt, loose-damp to moist		7					
		4			ALLUVIUM: Brown fine to medium Sand, little Silt, loose-damp		5					
5		7					5					
10		6			Brown to Dark Brown Silty fine to medium Sand, trace coarse Sand, loose-damp to moist		7			20		
					Boring Terminated at 12'							

TBL 22G128-2.GPJ SOCALGEO.GDT 3/9/22

TEST BORING LOG

PLATE B-3

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-4

JOB NO.: 22G128-2
PROJECT: Proposed Warehouse
LOCATION: Ontario, California

DRILLING DATE: 2/10/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joseph Lozano Leon

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					3± inches Asphaltic Concrete, 9± inches of Aggregate Base							
		19			FILL: Gray Brown Silty fine to medium Sand, trace coarse Sand, medium dense-damp		5					
		4			ALLUVIUM: Gray Brown Silty fine Sand, little medium Sand, loose, damp to moist		7					
5		9					7					
10		6			Gray Brown Silty fine Sand to fine Sandy Silt, trace medium Sand, loose-very moist		13			52		
					Boring Terminated at 12'							

TBL 22G128-2.GPJ SOCALGEO.GDT 3/9/22

TEST BORING LOG

PLATE B-4

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-5

JOB NO.: 22G128-2
PROJECT: Proposed Warehouse
LOCATION: Ontario, California

DRILLING DATE: 2/10/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joseph Lozano Leon

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					2½± inches Asphaltic Concrete, 3½± inches of Aggregate Base							
		12			FILL: Brown Silty fine Sand, trace to little medium Sand, trace coarse Sand, medium dense-moist		8					
5		4			ALLUVIUM: Brown Silty fine Sand, trace to little medium Sand, loose-damp		6					
		9			Gray Brown to Dark Gray Brown Silty fine Sand to fine Sandy Silt, loose-very moist		14					
10					Gray Brown Silty fine Sand, little medium Sand, trace fine Gravel, loose-moist		9			24		
					Boring Terminated at 10'							

TBL 22G128-2.GPJ SOCALGEO.GDT 3/9/22

TEST BORING LOG

PLATE B-5

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-6

JOB NO.: 22G128-2
PROJECT: Proposed Warehouse
LOCATION: Ontario, California

DRILLING DATE: 2/10/22
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Joseph Lozano Leon

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					8± inches Portland Cement Concrete							
		43			FILL: Gray Brown Silty fine Sand, little medium Sand, trace coarse Sand, dense-moist		9					
5		8			ALLUVIUM: Gray Brown Silty fine Sand, trace medium Sand, loose-moist		9					
		6			Gray Brown Silty fine Sand to fine Sandy Silt, trace medium Sand, trace fine Gravel, loose-very moist		14			43		
10					Boring Terminated at 10'							

TBL 22G128-2.GPJ SOCALGEO.GDT 3/9/22

TEST BORING LOG

PLATE B-6

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Ontario, California
Project Number	22G128-2
Engineer	Caleb Brackett

Test Hole Radius	4	(in)
Test Depth	10.20	(ft)

Infiltration Test Hole	I-1

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	8:28 AM	25.00	8.10	24.00	YES	SANDY SOILS
	Final	8:53 AM		10.10			
2	Initial	8:55 AM	25.00	8.10	24.00	YES	SANDY SOILS
	Final	9:20 AM		10.10			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	9:21 AM	10.00	8.20	0.80	1.60	5.43
	Final	9:31 AM		9.00			
2	Initial	9:31 AM	10.00	8.20	0.70	1.65	4.62
	Final	9:41 AM		8.90			
3	Initial	9:41 AM	10.00	8.20	0.60	1.70	3.86
	Final	9:51 AM		8.80			
4	Initial	9:51 AM	10.00	8.30	0.60	1.60	4.08
	Final	10:01 AM		8.90			
5	Initial	10:01 AM	10.00	8.20	0.60	1.70	3.86
	Final	10:11 AM		8.80			
6	Initial	10:11 AM	10.00	8.20	0.60	1.70	3.86
	Final	10:21 AM		8.80			
7	Initial	10:21 AM	10.00	8.20	0.60	1.70	3.86
	Final	10:31 AM		8.80			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Ontario, California
Project Number	22G128-2
Engineer	Caleb Brackett

Test Hole Radius	4	(in)
Test Depth	12.00	(ft)

Infiltration Test Hole	I-2

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:07 AM	25.00	9.00	24.00	YES	SANDY SOILS
	Final	7:32 AM		11.00			
2	Initial	7:33 AM	25.00	9.00	22.80	YES	SANDY SOILS
	Final	7:58 AM		10.90			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	7:58 AM	10.00	9.00	0.80	2.60	3.47
	Final	8:08 AM		9.80			
2	Initial	8:09 AM	10.00	9.00	0.80	2.60	3.47
	Final	8:19 AM		9.80			
3	Initial	8:20 AM	10.00	9.00	0.70	2.65	2.98
	Final	8:30 AM		9.70			
4	Initial	8:30 AM	10.00	9.00	0.80	2.60	3.47
	Final	8:40 AM		9.80			
5	Initial	8:40 AM	10.00	9.00	0.70	2.65	2.98
	Final	8:50 AM		9.70			
6	Initial	8:50 AM	10.00	9.00	0.70	2.65	2.98
	Final	9:00 AM		9.70			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Ontario, California
Project Number	22G128-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.40	(ft)

Infiltration Test Hole: I-3

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	10:15 AM	25.00	10.40	24.00	YES	SANDY SOILS
	Final	10:40 AM		12.40			
2	Initial	10:42 AM	25.00	10.40	24.00	YES	SANDY SOILS
	Final	11:07 AM		12.40			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	11:08 AM	10.00	10.40	0.80	1.60	5.43
	Final	11:18 AM		11.20			
2	Initial	11:20 AM	10.00	10.40	0.90	1.55	6.29
	Final	11:30 AM		11.30			
3	Initial	11:31 AM	10.00	10.40	0.80	1.60	5.43
	Final	11:41 AM		11.20			
4	Initial	11:42 AM	10.00	10.40	0.80	1.60	5.43
	Final	11:52 AM		11.20			
5	Initial	11:55 AM	10.00	10.40	0.70	1.65	4.62
	Final	12:05 PM		11.10			
6	Initial	12:06 PM	10.00	10.40	0.70	1.65	4.62
	Final	12:16 PM		11.10			
7	Initial	12:18 PM	10.00	10.40	0.70	1.65	4.62
	Final	12:28 PM		11.10			
8	Initial	12:29 PM	10.00	10.40	0.70	1.65	4.62
	Final	12:39 PM		11.10			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Ontario, California
Project Number	22G128-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	11.70	(ft)

Infiltration Test Hole	I-4

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:56 AM	25.00	10.00	20.40	YES	SANDY SOILS
	Final	8:21 AM		11.70			
2	Initial	8:22 AM	25.00	10.00	20.40	YES	SANDY SOILS
	Final	8:47 AM		11.70			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	8:48 AM	10.00	10.30	0.50	1.15	4.56
	Final	8:58 AM		10.80			
2	Initial	8:59 AM	10.00	10.30	0.40	1.20	3.51
	Final	9:09 AM		10.70			
3	Initial	9:10 AM	10.00	10.30	0.30	1.25	2.54
	Final	9:20 AM		10.60			
4	Initial	9:20 AM	10.00	10.30	0.20	1.30	1.64
	Final	9:30 AM		10.50			
5	Initial	9:31 AM	10.00	10.10	0.50	1.35	3.96
	Final	9:41 AM		10.60			
6	Initial	9:42 AM	10.00	10.10	0.40	1.40	3.06
	Final	9:52 AM		10.50			
7	Initial	9:24 AM	10.00	10.10	0.40	1.40	3.06
	Final	9:34 AM		10.50			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Ontario, California
Project Number	22G128-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	10.20	(ft)

Infiltration Test Hole	I-5

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:42 AM	25.00	8.10	20.40	YES	SANDY SOILS
	Final	8:07 AM		9.80			
2	Initial	8:08 AM	25.00	8.10	21.60	YES	SANDY SOILS
	Final	8:33 AM		9.90			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	8:35 AM	10.00	8.30	0.80	1.50	5.76
	Final	8:45 AM		9.10			
2	Initial	8:46 AM	10.00	8.80	0.60	1.10	5.68
	Final	8:56 AM		9.40			
3	Initial	8:57 AM	10.00	8.80	0.50	1.15	4.56
	Final	9:07 AM		9.30			
4	Initial	9:08 AM	10.00	8.80	0.50	1.15	4.56
	Final	9:18 AM		9.30			
5	Initial	9:19 AM	10.00	8.80	0.40	1.20	3.51
	Final	9:29 AM		9.20			
6	Initial	9:30 AM	10.00	8.80	0.40	1.20	3.51
	Final	9:40 AM		9.20			
7	Initial	9:42 AM	10.00	8.80	0.40	1.20	3.51
	Final	9:52 AM		9.20			
8	Initial	9:53 AM	10.00	8.80	0.40	1.20	3.51
	Final	10:03 AM		9.20			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse
Project Location	Ontario, California
Project Number	22G128-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	10.20	(ft)

Infiltration Test Hole	I-6

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:49 AM	25.00	8.10	19.20	YES	SANDY SOILS
	Final	8:14 AM		9.70			
2	Initial	8:15 AM	25.00	8.10	20.40	YES	SANDY SOILS
	Final	8:40 AM		9.80			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	10:17 AM	10.00	8.10	0.60	1.80	3.66
	Final	10:27 AM		8.70			
2	Initial	10:28 AM	10.00	8.10	0.70	1.75	4.38
	Final	10:38 AM		8.80			
3	Initial	10:39 AM	10.00	8.10	0.50	1.85	2.98
	Final	10:49 AM		8.60			
4	Initial	10:50 AM	10.00	8.10	0.60	1.80	3.66
	Final	11:00 AM		8.70			
5	Initial	11:05 AM	10.00	8.10	0.50	1.85	2.98
	Final	11:15 AM		8.60			
6	Initial	11:16 AM	10.00	8.10	0.50	1.85	2.98
	Final	11:26 AM		8.60			
7	Initial	11:27 AM	10.00	8.10	0.50	1.85	2.98
	Final	11:37 AM		8.60			

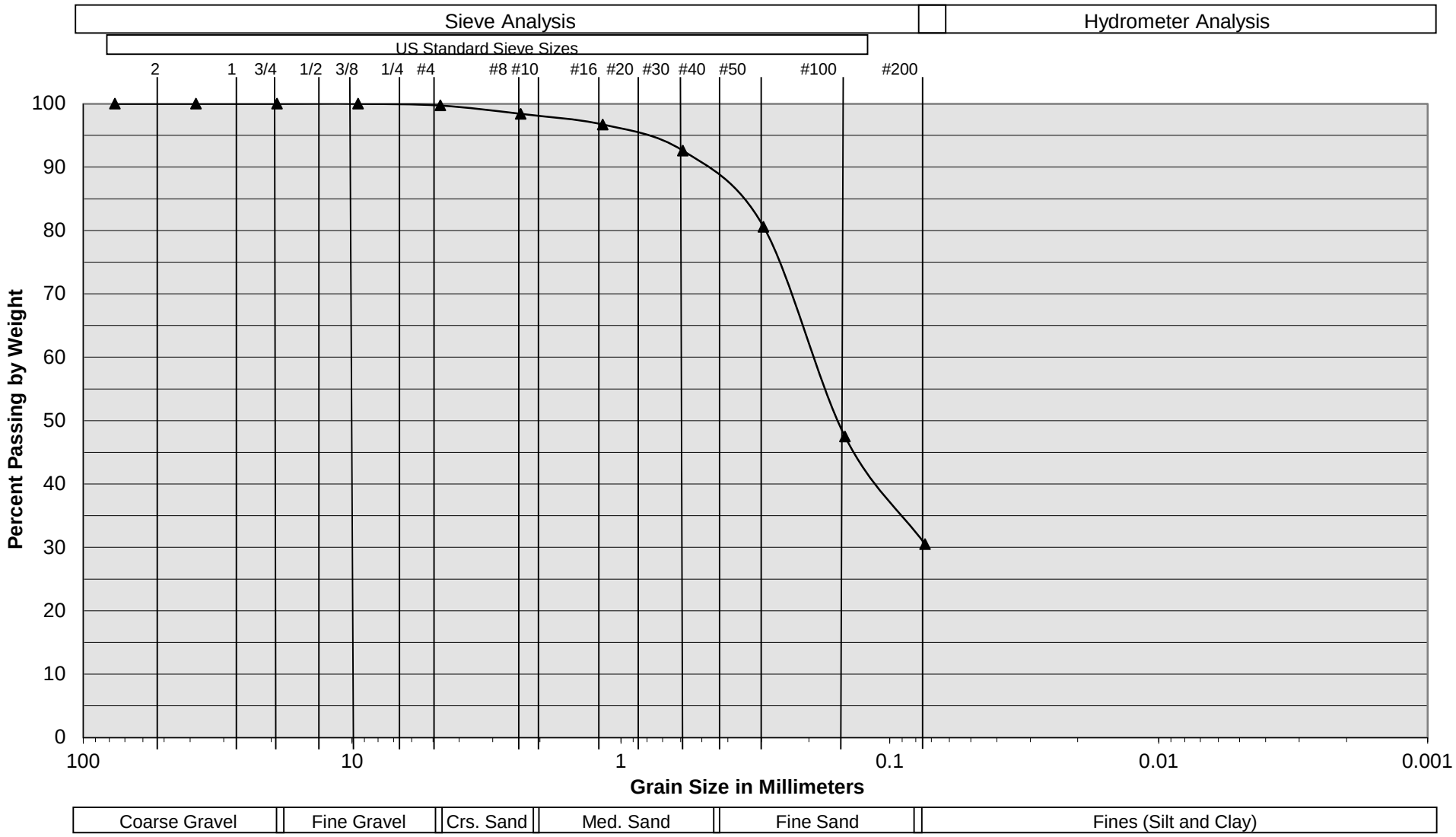
Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

Grain Size Distribution



Sample Description	I-1 @ 8½'
Soil Classification	Light Brown to Brown Silty fine Sand, little medium Sand

Proposed Warehouse
Ontario, California
Project No. 22G128-2
PLATE C- 1

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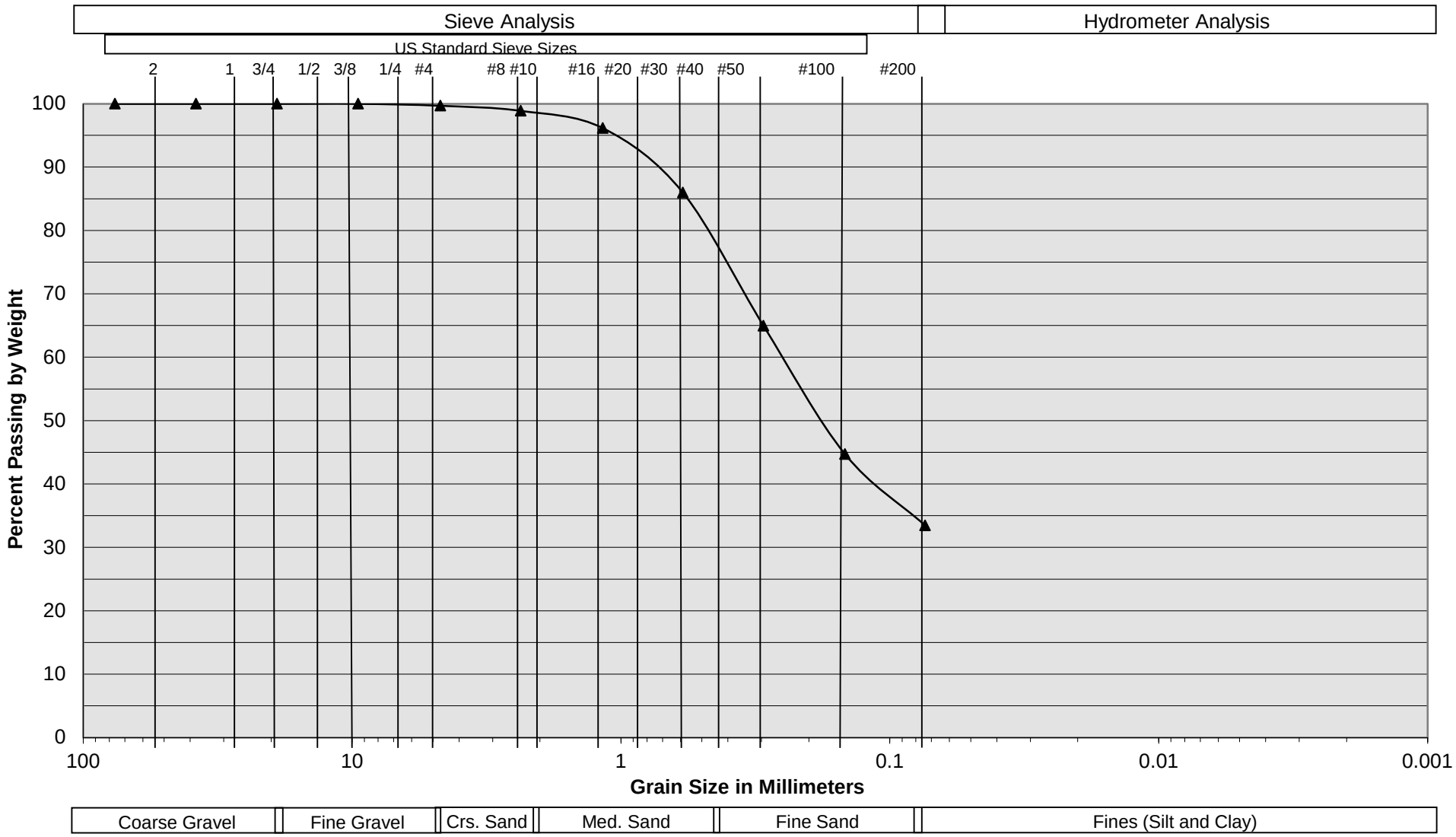
Grain Size Distribution



Sample Description	I-2 @ 10½'
Soil Classification	Brown Silty fine to medium Sand

Proposed Warehouse
Ontario, California
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PLATE C- 2

SoCalGeo
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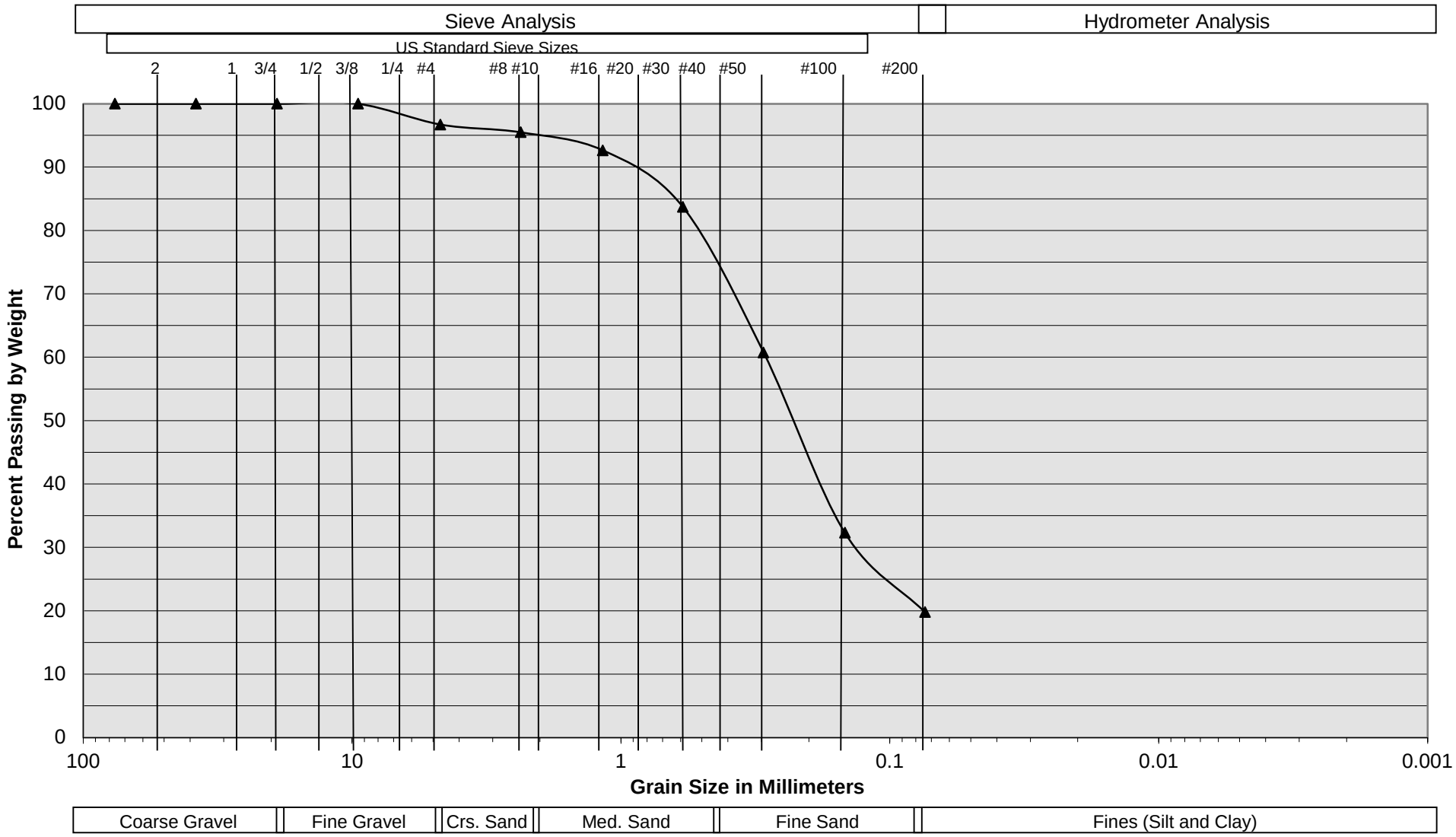
Grain Size Distribution



Sample Description	I-3 @ 10½'
Soil Classification	Brown to Dark Brown Silty fine to medium Sand, trace coarse Sand

Proposed Warehouse
Ontario, California
Project No. 22G128-2
PLATE C- 3

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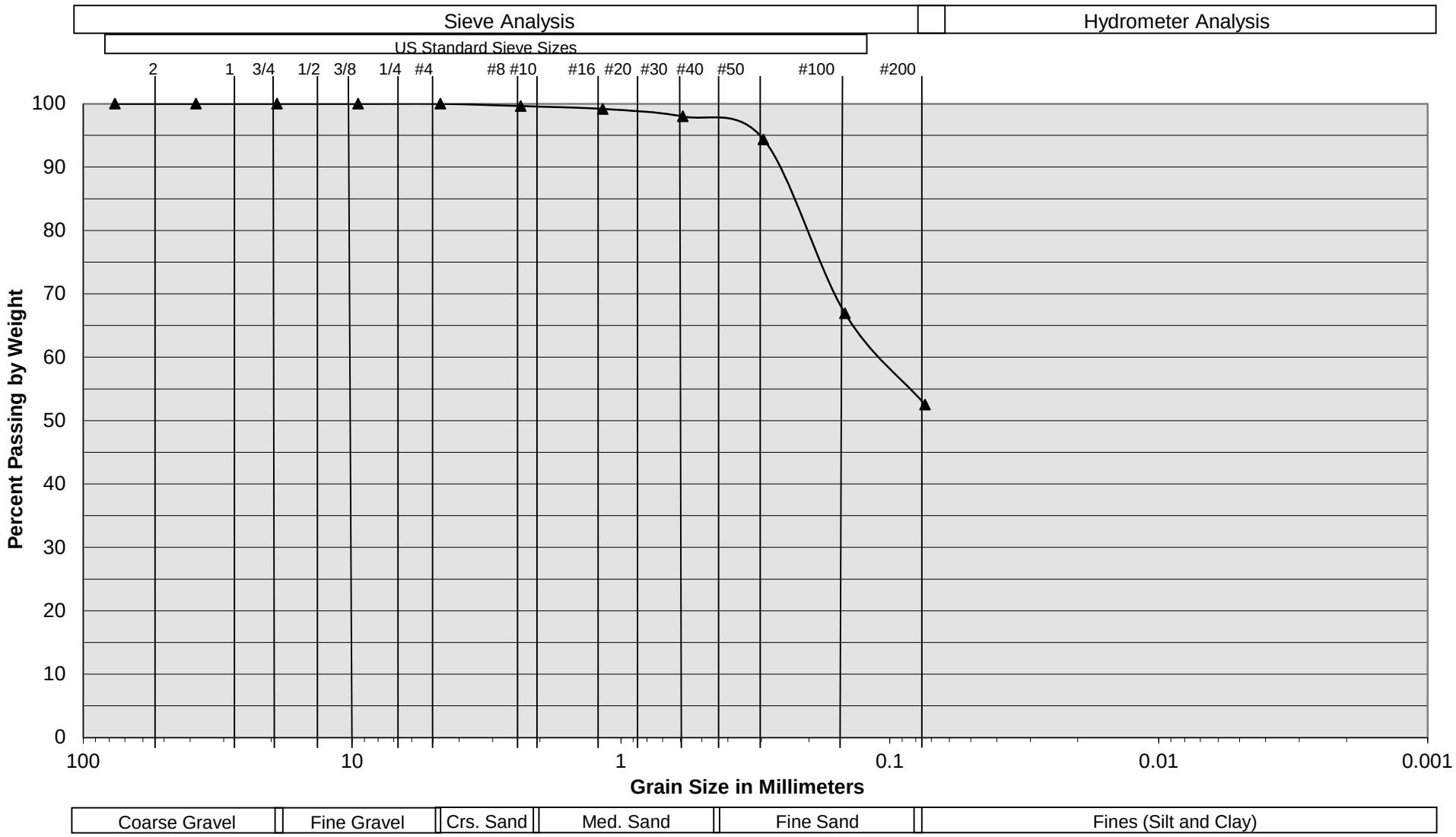
Grain Size Distribution



Sample Description	I-4 @ 10½'
Soil Classification	Gray Brown Silty fine Sand to fine Sandy Silt, trace medium Sand

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PLATE C- 4

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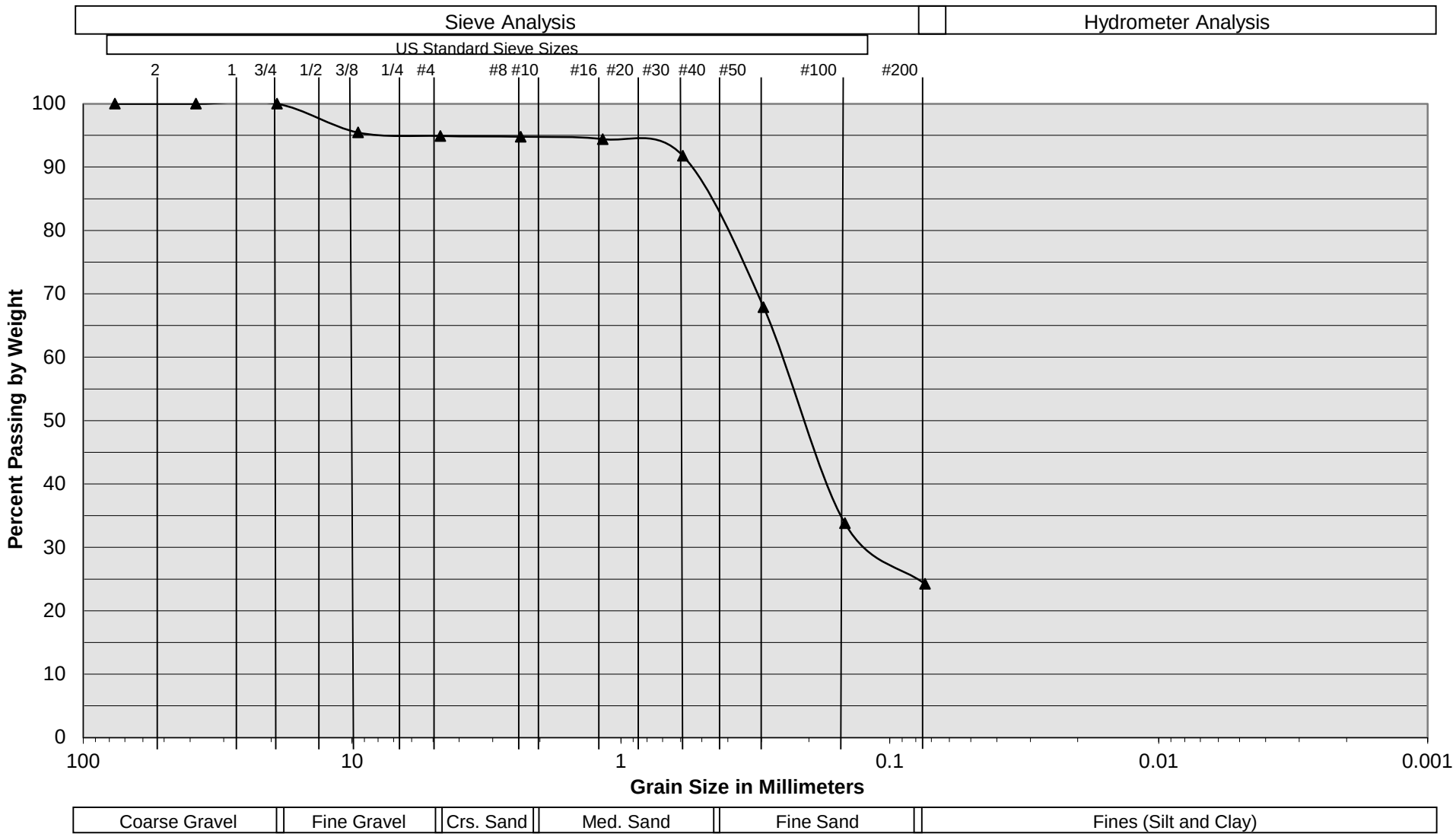
Grain Size Distribution



Sample Description	I-5 @ 9½'
Soil Classification	Gray Brown Silty fine Sand, little medium Sand, trace fine Gravel

Proposed Warehouse
Ontario, California
Project No. 22G128-2
PLATE C- 5

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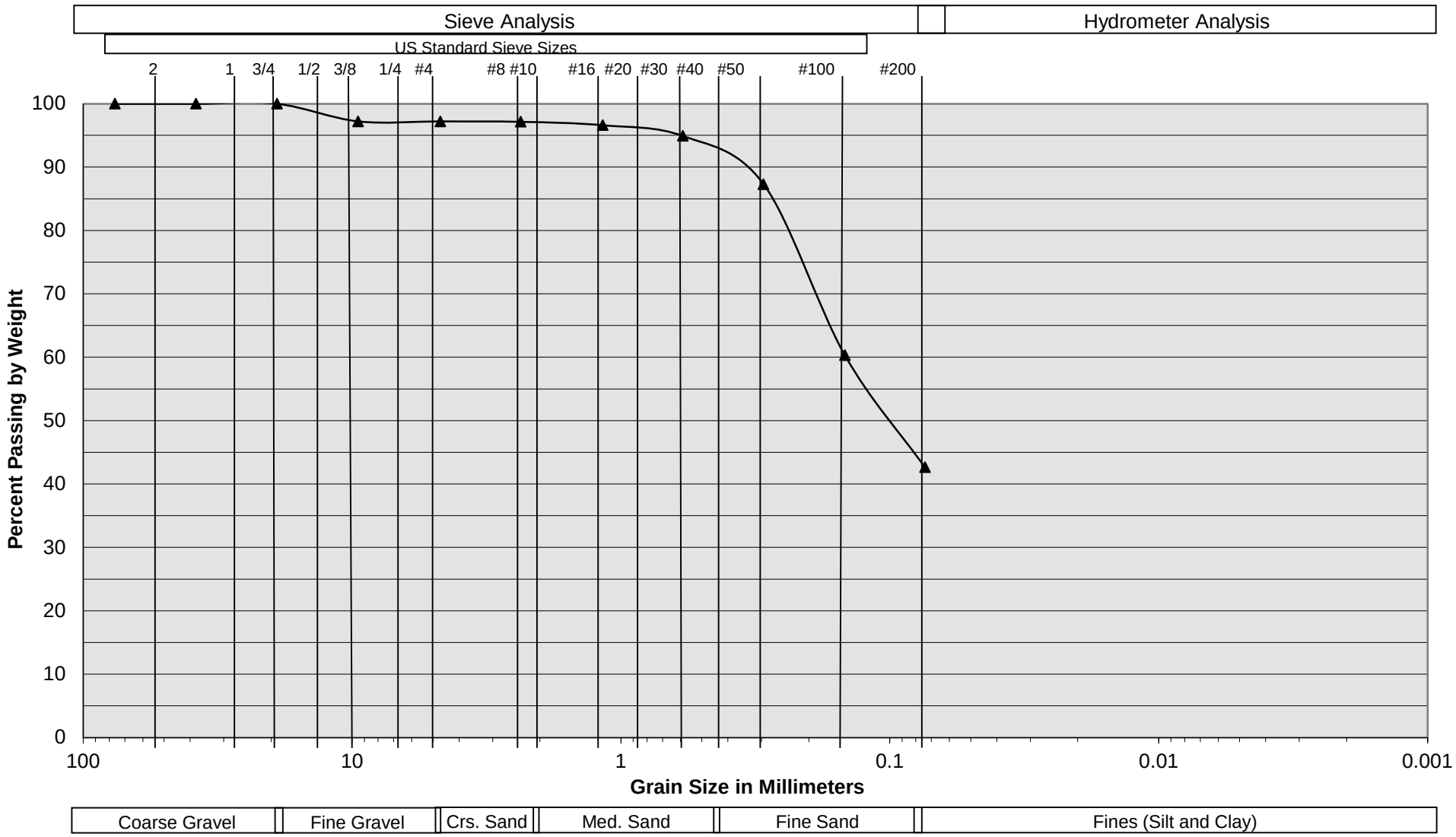
Grain Size Distribution



Sample Description	I-6 @ 8½'
Soil Classification	Gray Brown Silty fine Sand to fine Sandy Silt, trace medium Sand, trace fine Gravel

Proposed Warehouse
Ontario, California
Project No. 22G128-2
PLATE C- 6

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APPENDIX G

PRELIMINARY GRADING PLAN