EXHIBIT C

Structural Calculations

BSE STRUCTURAL ENGINEERS

Project El Segundo Rec Park Skatepark Project No. 26-002

Calc. By HDL Checked By JM Date 1/16/2026

STRUCTURAL CALCULATIONS FOR :

El Segundo Rec Park Skatepark
El Segundo, CA

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BSE STRUCTURAL ENGINEERS

Project El Segundo Skatepark Project No. 26-002

Calc. By HDL Checked By JM Date 1/16/2026

Skatepark Design Criteria

Slab Load = 100 psf (CBC 2022 TABLE 1607.1 "RECREATIONAL USES")

Impact Load = 250lbs x 1.5 = 375lbs (or 50plf) (CBC 2022 1607.9.1 & 1607.9.1.1)

5" Concrete Slab = 150 pcf x 5in/(12in/ft) = 62.5 psf

150 pcf (NORMAL WEIGHT CONCRETE) 5" Thickness

250lbs or 50plf on NON-GRIND RAILS (CBC 2022 1607.9.1 & 1607.9.1.1)

California Building Code 2022 (Vol 1 & 2)

Section 1607 Live Loads

1607.1 General

Live loads are those loads defined in Chapter 2 of this code.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS

	OCCUPANCY OR USE		UNIFORM (psf)	CONCENTRATED (pounds)	ALSO SEE SECTION
1.	Apartments (see residential)		—	—	—
2.	Access floor systems	Office use	50	2,000	—
		Computer use	100	2,000	—
3.	Armories and drill rooms		150[b]	—	—
4.	Assembly areas	Fixed seats (fastened to floor)	60[a]	—	—
		Follow spot, projections and control rooms	50		
		Lobbies	100[a]		
		Movable seats	100[a]		
		Stage floors	150[b]		
		Platforms (assembly)	100[a]		
		Bleachers, folding and telescopic seating and grandstands	100[a] (See Section 1607.19)		
		Stadiums and arenas with fixed seats (fastened to the floor)	60[a] (See Section 1607.19)		
		Other assembly areas	100[a]		
5.	Balconies and decks		1.5 times the live load for the area served, not required to exceed 100	—	—
6.	Catwalks for maintenance and service access		40	300	—
7.	Cornices		60	—	—
8.	Corridors	First floor	100	—	—
		Other floors	Same as occupancy served except as indicated		
9.	Dining rooms and restaurants		100[a]	—	—
10.	Dwellings (see residential)		—	—	—
11.	Elevator machine room and control room grating (on area of 2 inches by 2 inches)		—	300	—
12.	Finish light floor plate construction (on area of 1 inch by 1 inch)		—	200	—
13.	Fire escapes		100	—	—
		On single-family dwellings only	40		
14.	Fixed ladders		See Section 1607.17		—

15.	Garages	Passenger vehicles only	40[c]	See Section 1607.7	—
		Trucks and buses	See Section 1607.8		
16.	Handrails, guards and grab bars		See Section 1607.9		—
17.	Helipads		See Section 1607.6		—
18.	Hospitals	Corridors above first floor	80	1,000	—
		Operating rooms, laboratories	60	1,000	
		Patient rooms	40	1,000	
19.	Hotels (see residential)		—	—	—
20.	Libraries	Corridors above first floor	80	1,000	—
		Reading rooms	60	1,000	—
		Stack rooms	150[b]	1,000	Section 1607.18
21.	Manufacturing	Heavy	250[b]	3,000	—
		Light	125[b]	2,000	
22.	Marquees, except one- and two-family dwellings		75	—	—
23.	Office buildings	Corridors above first floor	80	2,000	—
		File and computer rooms shall be designed for heavier loads based on anticipated occupancy	—	—	
		Lobbies and first-floor corridors	100	2,000	
		Offices	50	2,000	
24.	Penal institutions	Cell blocks	40	—	—
		Corridors	100		
25.	Recreational uses RECREATIONAL USES HIGHLIGHTED ARE MOST SIMILAR TO SKATEPARK USE	Bowling alleys, poolrooms and similar uses	75[a]	—	—
		Dance halls and ballrooms	100[a]		
		Gymnasiums	100[a]		
		Ice skating rinks	250[b]		
		Roller skating rinks	100[a]		
26.	Residential	One- and two-family dwellings:		—	Section 1607.22
		Uninhabitable attics without storage	10		
		Uninhabitable attics with storage	20		
		Habitable attics and sleeping areas	30		
		Canopies, including marquees	20		
		All other areas	40		
		Hotels and multifamily dwellings:			
		Private rooms and corridors serving them	40		
		Public rooms[a] and corridors serving them	100		

27.	Roofs	Ordinary flat, pitched, and curved roofs (that are not occupiable)	20	—	Section 1607.14.2
		Roof areas used for assembly purposes	100[a]	—	
		Roof areas used for occupancies other than assembly	Same as occupancy served	—	
		Vegetative and landscaped roofs:		—	
		Roof areas not intended for occupancy	20	—	
		Roof areas used for assembly purposes	100[a]	—	
		Roof areas used for other occupancies	Same as occupancy served	—	
		Awnings and canopies:		—	
		Fabric construction supported by a skeleton structure	5[a]	—	
		All other construction, except one- and two-family dwellings	20	—	
		Primary roof members exposed to a work floor:			Section 1607.15.2
		Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages	—	2,000	
		All other primary roof members	—	300	
		All roof surfaces subject to maintenance workers	—	300	
28.	Schools	Classrooms	40	1,000	—
		Corridors above first floor	80	1,000	
		First-floor corridors	100	1,000	
29.	Scuttles, skylight ribs and accessible ceilings		—	200	—
30.	Sidewalks, vehicular driveways and yards, subject to trucking		250[b]	8,000	Section 1607.20
31.	Stairs and exits	One- and two-family dwellings	40	300	Section 1607.21
		All other	100	300	Section 1607.21
32.	Storage areas above ceilings		20	—	—
33.	Storage warehouses (shall be designed for heavier loads if required for anticipated storage)	Heavy	250[b]	—	—
		Light	125[b]		
34.	Stores	Retail:			—
		First floor	100	1,000	
		Upper floors	75	1,000	
		Wholesale, all floors	125[b]	1,000	
35.	Vehicle barriers		See Section 1607.10		—
36.	Walkways and elevated platforms (other than exitways)		60	—	—

37.	Yards and terraces, pedestrian	100[a]	—	—
38.	***[OSHPD 1R, 2 & 5]*** *Storage racks and wall-hung cabinets.*	*Total loads[d]*	—	—

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm^2, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kN/m^2, 1 pound = 0.004448 kN, 1 pound per cubic foot = 16 kg/m^3.

a. Live load reduction is not permitted.

b. Live load reduction is only permitted in accordance with Section 1607.12.1.2 or Item 1 of Section 1607.12.2.

c. Live load reduction is only permitted in accordance with Section 1607.12.1.3 or Item 2 of Section 1607.12.2.

d. ***[OSHPD 1R, 2 & 5]*** *The minimum vertical design live load shall be as follows:*

Paper media:

12-inch-deep (305 mm) shelf 33 pounds per lineal foot (482 N/m)

15-inch-deep (381 mm) shelf 41 pounds per lineal foot (598 N/m), or

33 pounds per cubic foot (5183 N/m^3) per total volume of the rack or cabinet, whichever is less.

Film media:

18-inch-deep (457 mm) shelf 100 pounds per lineal foot (1459 N/m), or

50 pounds per cubic foot (7853 N/m^3) per total volume of the rack or cabinet, whichever is less.

Other media:

20 pounds per cubic foot (311 N/m^3) or 20 pounds per square foot (958 Pa), whichever is less, but not less than actual loads.

1607.2 Loads Not Specified

For occupancies or uses not designated in Section 1607, the live load shall be determined in accordance with a method approved by the building official.

1607.3 Uniform Live Loads

The live loads used in the design of buildings and other structures shall be the maximum loads expected by the intended use or occupancy but shall not be less than the minimum uniformly distributed live loads given in Table 1607.1.

1607.4 Concentrated Live Loads

Floors, roofs and other similar surfaces shall be designed to support the uniformly distributed live loads prescribed in Section 1607.3 or the concentrated live loads, given in Table 1607.1, whichever produces the greater load effects. Unless otherwise specified, the indicated concentration shall be assumed to be uniformly distributed over an area of $2^1/_2$ feet by $2^1/_2$ feet (762 mm by 762 mm) and shall be located so as to produce the maximum load effects in the structural members.

1607.5 Partition Loads

In office buildings and in other buildings where partition locations are subject to change, provisions for partition weight shall be made, whether or not partitions are shown on the construction documents, unless the specified live load is 80 psf (3.83 kN/m^2) or greater. The partition load shall be not less than a uniformly distributed live load of 15 psf (0.72 kN/m^2).

1607.6 Helipads

Helipads shall be designed for the following live loads:

shall be not less than 50 psf (2.9 kN/m^2). This live load shall not be reduced.

1607.8.4 Forklifts and Movable Equipment

Where a structure is intended to have forklifts or other movable equipment present, the structure shall be designed for the total vehicle or equipment load and the individual wheel loads for the anticipated vehicles as specified by the owner of the facility. These loads shall be posted in accordance with Section 1607.8.5.

1607.8.4.1 Impact and Fatigue

Impact loads and fatigue loading shall be considered in the design of the supporting structure. For the purposes of design, the vehicle and wheel loads shall be increased by 30 percent to account for impact.

1607.8.5 Posting

The maximum weight of vehicles allowed into or on a garage or other structure shall be posted by the owner or the owner's authorized agent in accordance with Section 106.1.

1607.9 Loads on Handrails, Guards, Grab Bars, Shower Seats, Dressing Room Bench and Seats

Handrails and guards shall be designed and constructed for the structural loading conditions set forth in Section 1607.9.1. Grab bars, shower seats and accessible benches shall be designed and constructed for the structural loading conditions set forth in Section 1607.9.2.

1607.9.1 Handrails and Guards

Handrails and guards shall be designed to resist a linear load of 50 pounds per linear foot (plf) (0.73 kN/m) in accordance with Section 4.5.1.1 of ASCE 7. Glass handrail assemblies and guards shall comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated load required by Section 1607.9.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an occupant load less than 50, the minimum load shall be 20 pounds per foot (0.29 kN/m).

1607.9.1.1 Concentrated Load

Handrails and guards shall be designed to resist a concentrated load of 200 pounds (0.89 kN) in accordance with Section 4.5.1 of ASCE 7.

DUE TO ENGINEERING JUDGEMENT AND USAGE OF RAILS WITHIN SKATEPARK, BSE HAS INCREASED THE MIN. CONCENTRATED LOAD USED TO 250 LBS.

1607.9.1.2 Guard Component Loads

Balusters, panel fillers and guard infill components, including all rails except the handrail and the top rail, shall be designed to resist a concentrated load of 50 pounds (0.22 kN) in accordance with Section 4.5.1.2 of ASCE 7.

1607.9.2 Grab Bars, Shower Seats and Accessible Benches

Grab bars, shower seats and accessible benches shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point on the grab bar, shower seat, or seat of the accessible bench so as to produce the maximum load effects. ***[DSA-AC & HCD 1-AC]*** *See Chapter 11A, Section 1127A.4 and Chapter 11B, Sections 11B-609.8, 11B-610.4 and 11B-903.6 for grab bars, shower seats and dressing room bench seats, as applicable.*

1607.10 Vehicle Barriers

Vehicle barriers for passenger vehicles shall be designed to resist a concentrated load of 6,000 pounds (26.70 kN) in accordance with Section 4.5.3 of ASCE 7. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provisions for traffic railings.

1607.11 Impact Loads

The live loads specified in Sections 1607.3 through 1607.10 shall be assumed to include adequate allowance for ordinary impact conditions. Provisions shall be made in the structural design for uses and loads that involve unusual vibration and impact forces.

250 LB CONCENTRATED LOAD HAS BEEN INCREASED BY SAFETY FACTOR OF 1.5 FOR SKATE ELEMENT DESIGN TO ACCOUNT UNUSUAL VIBRATION AND IMPACT FORCES.

1607.11.1 Elevators

Members, elements and components subject to dynamic loads from elevators shall be designed for impact loads and deflection limits prescribed by ASME A17.1/CSA B44.

1607.11.2 Machinery

For the purpose of design, the weight of machinery and moving loads shall be increased as follows to allow for impact:

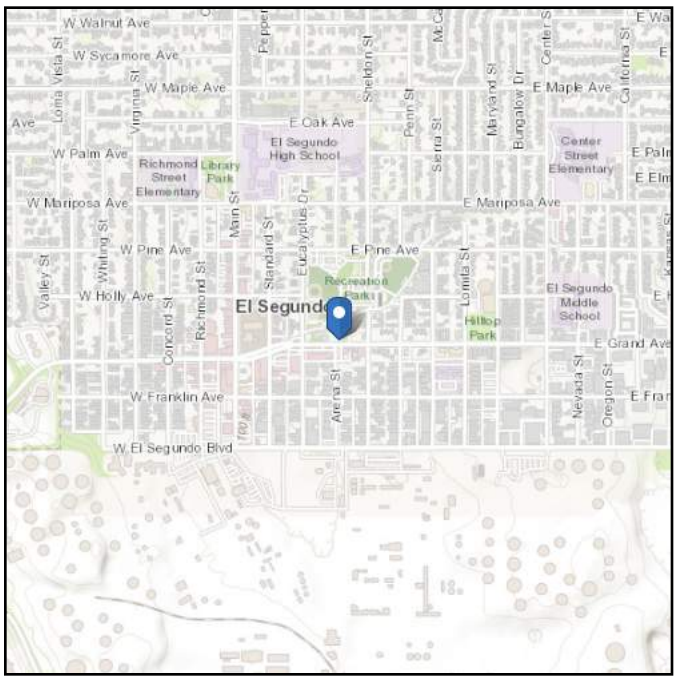
1. Light machinery, shaft- or motor-driven, 20 percent.

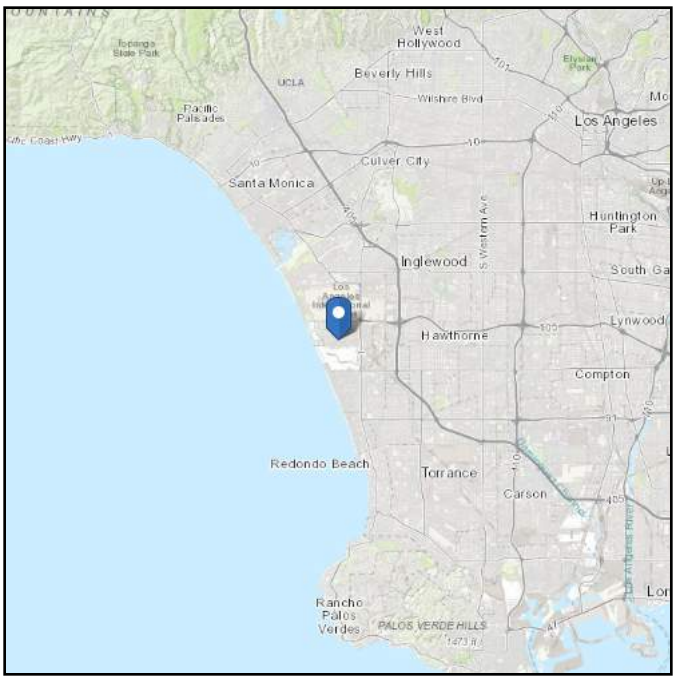
ASCE Hazards Report

Address:
El Segundo Skate Park - 405 East Grand Avenue
El Segundo,

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Latitude: 33.919535
Longitude: -118.41228
Elevation: 116.89743405895925 ft (NAVD 88)





Wind

Results:

Wind Speed	94 Vmph
10-year MRI	65 Vmph
25-year MRI	71 Vmph
50-year MRI	76 Vmph
100-year MRI	81 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Wed Jan 14 2026

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.869	S_{D1} :	N/A
S_1 :	0.66	T_L :	8
F_a :	1.2	PGA :	0.807
F_v :	N/A	PGA_M :	0.968
S_{MS} :	2.243	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.495	C_v :	1.474

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed Jan 14 2026

Date Source: USGS Seismic Design Maps

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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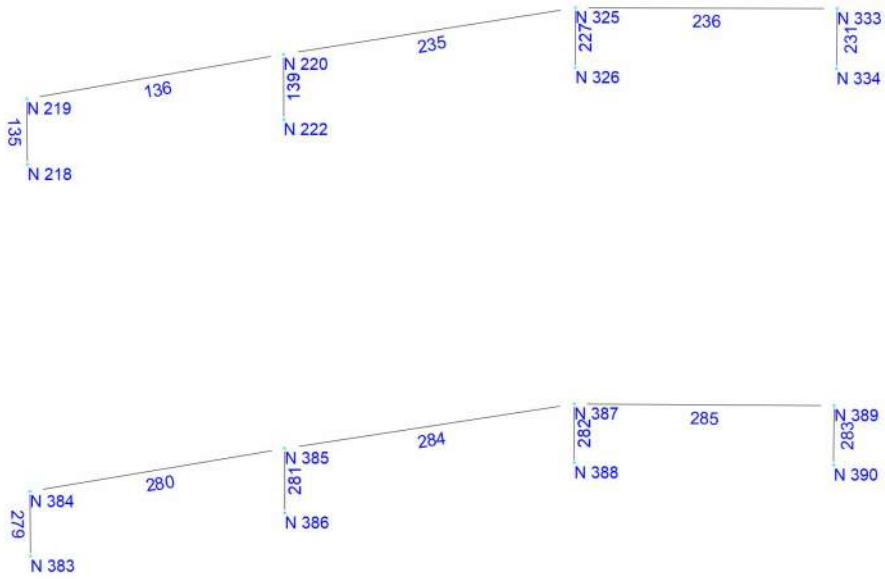
SINGLE KINKED SQUARE GRIND RAIL
NODES AND MEMBER NUMBERS



RAM Elements

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SINGLE KINKED SQUARE GRIND RAIL

Geometry data

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
218	0.00	0.00	0.00	0
219	0.00	1.667	0.00	0
220	6.50	2.813	0.00	0
222	6.50	1.1667	0.00	0
325	13.8333	4.00	0.00	0
326	13.8333	2.50	0.00	0
333	20.375	4.00	0.00	0
334	20.375	2.50	0.00	0
383	0.00	-10.00	0.00	0
384	0.00	-8.333	0.00	0
385	6.50	-7.187	0.00	0
386	6.50	-8.8333	0.00	0
387	13.8333	-6.00	0.00	0
388	13.8333	-7.50	0.00	0
389	20.375	-6.00	0.00	0
390	20.375	-7.50	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
218	1	1	1	1	1	1
222	1	1	1	1	1	1
326	1	1	1	1	1	1
334	1	1	1	1	1	1
383	1	1	1	1	1	1
386	1	1	1	1	1	1
388	1	1	1	1	1	1
390	1	1	1	1	1	1

Members

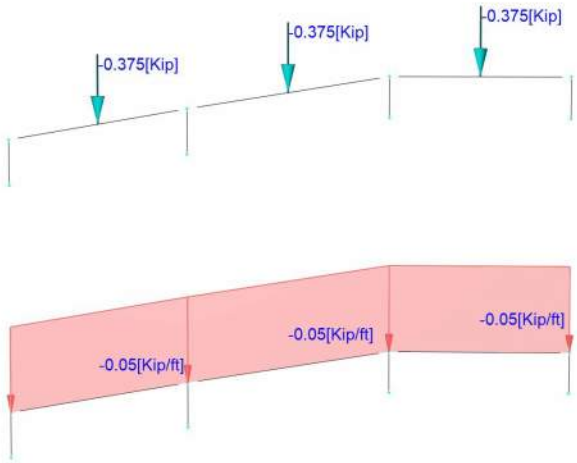
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
135	218	219		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
136	219	220		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
139	220	222		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
227	325	326		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
231	333	334		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
235	220	325		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
236	325	333		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
279	383	384		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
280	384	385		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
281	385	386		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
282	387	388		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
283	389	390		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
284	385	387		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00
285	387	389		STube 3x3x1_4	A53 GrB	0.00	0.00	0.00

Glossary

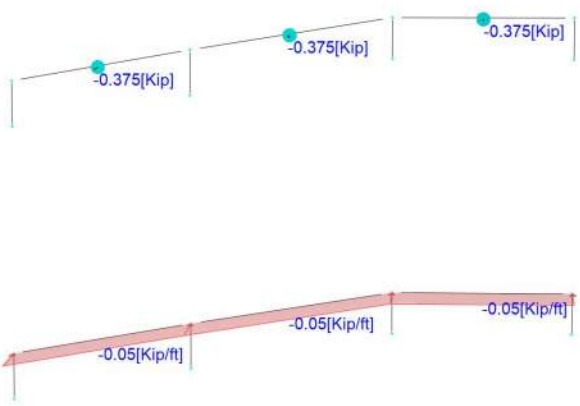
Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

SINGLE KINKED SQUARE GRIND RAIL
LIVE LOAD

Loads
- Distributed user loads - Members
- Concentrated user loads - Members



SINGLE KINKED SQUARE GRIND RAIL
LIVE LOAD OUT OF PLANE



RAM Elements

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SINGLE KINKED SQUARE GRIND RAIL

Steel Code Check

Summary - Group by member

Load conditions to be included in design :

D3=1.4DL

D4=1.2DL+1.6LL+1.6LLoop

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	STube 3x3x1_4	**135**	D4 at 0.00%	0.09	OK	
		136	D4 at 100.00%	0.16	OK	
		139	D4 at 100.00%	0.14	OK	
		227	D4 at 100.00%	0.13	OK	
		231	D4 at 100.00%	0.07	OK	
		235	D4 at 100.00%	**0.17**	**OK**	
		236	D4 at 0.00%	0.17	OK	
		279	D4 at 0.00%	0.07	OK	
		280	D4 at 100.00%	0.10	OK	
		281	D4 at 100.00%	0.13	OK	
		282	D4 at 100.00%	0.12	OK	
		283	D4 at 100.00%	0.06	OK	
		284	D4 at 100.00%	0.11	OK	
		285	D4 at 0.00%	0.10	OK	

RAM Elements

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SINGLE KINKED SQUARE GRIND RAIL

Steel Code Check
Comprehensive Report

AISC 360-2016 LRFD (Hot-rolled)

Member : 235 - OK

Section information

Section name: STube 3x3x1_4 **(US)**

Dimensions

a	=	3.000	[in]	Height
b	=	3.000	[in]	Width
t	=	0.250	[in]	Thickness

Properties	Unit	Major axis	Minor axis
Gross area of the section. (Ag)	[in2]	2.750	
Moment of Inertia (local axes) (I)	[in4]	3.473	3.473
Moment of Inertia (principal axes) (I')	[in4]	3.473	3.473
Bending constant for moments (principal axis) (J')	[in]	0.000	0.000
Radius of gyration (local axes) (r)	[in]	1.124	1.124
Radius of gyration (principal axes) (r')	[in]	1.124	1.124
Saint-Venant torsion constant. (J)	[in4]	5.199	
Section warping constant. (Cw)	[in6]	0.036	
Distance from centroid to shear center (principal axis) (xo,yo)	[in]	0.000	0.000
Top elastic section modulus of the section (local axis) (Ssup)	[in3]	2.316	2.316
Bottom elastic section modulus of the section (local axis) (Sinf)	[in3]	2.316	2.316
Top elastic section modulus of the section (principal axis) (S'sup)	[in3]	2.316	2.316
Bottom elastic section modulus of the section (principal axis) (S'inf)	[in3]	2.316	2.316
Plastic section modulus (local axis) (Z)	[in3]	2.836	2.836
Plastic section modulus (principal axis) (Z')	[in3]	2.836	2.836
Polar radius of gyration. (ro)	[in]	1.589	
Area for shear (Aw)	[in2]	1.375	1.375
Torsional constant. (C)	[in3]	3.781	

Material : A53 GrB

Properties	Unit	Value
Yield stress (Fy):	[Kip/in2]	35.00
Tensile strength (Fu):	[Kip/in2]	60.00
Elasticity Modulus (E):	[Kip/in2]	29000.00
Shear modulus for steel (G):	[Kip/in2]	11153.85

Design Criteria

Description	Unit	Value
Length for tension slenderness ratio (L)	[ft]	7.43

Distance between member lateral bracing points

Length (Lb) [ft]	
Top	Bottom
7.43	7.43

Laterally unbraced length

Length [ft]			Effective length factor		
Major axis(L33)	Minor axis(L22)	Torsional axis(Lt)	Major axis(K33)	Minor axis(K22)	Torsional axis(Kt)
7.43	7.43	7.43	1.0	1.0	1.0

Additional assumptions

Continuous lateral torsional restraint	No
Tension field action	No
Continuous flexural torsional restraint	No
Effective length factor value type	None
Major axis frame type	Sway
Minor axis frame type	Sway

Design Checks

Axial Tension Design

Axial tension

Ratio	:	0.00			
Capacity	:	86.63 [Kip]	Reference	:	Cl.D2
Demand	:	0.00 [Kip]	Ctrl Eq.	:	D3 at 0.00%

Intermediate results	Unit	Value	Reference
Factored axial tension capacity (ϕP_n):	[Kip]	86.63	Cl.D2
Nominal axial tension capacity (P_n)	[Kip]	96.25	Eq.D2-1

Axial Compression Design

Compression in the major axis 33

Ratio	:	0.01			
Capacity	:	62.77 [Kip]	Reference	:	Cl.E3
Demand	:	0.40 [Kip]	Ctrl Eq.	:	D4 at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Non slender	
Unstiffened element slenderness (λ)	--	9.00	
Unstiffened element limiting slenderness (λ_r)	--	40.30	Table.B4.1a.Case6
Stiffened element classification	--	Non slender	
Stiffened element slenderness (λ)	--	9.00	
Stiffened element limiting slenderness (λ_r)	--	40.30	Table.B4.1a.Case6
Factored flexural buckling strength (ϕP_{n33}):	[Kip]	62.77	Cl.E3
Effective length (KL_{33})	[ft]	7.43	Cl.E2
Effective slenderness ($(KL/r)_{33}$)	--	79.32	Cl.E2
Elastic critical buckling stress (F_{e33})	[Kip/in2]	45.49	Eq.E3-4
Effective area of the cross section based on the effective width (A_{eff33})	[in2]	2.75	
Critical stress for flexural buckling (F_{cr33})	[Kip/in2]	25.36	Eq.E3-2
Nominal flexural buckling strength (P_{n33})	[Kip]	69.75	Eq.E3-1

Compression in the minor axis 22

Ratio	:	0.01			
Capacity	:	62.77 [Kip]	Reference	:	Cl.E3
Demand	:	0.40 [Kip]	Ctrl Eq.	:	D4 at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Non slender	
Unstiffened element slenderness (λ)	--	9.00	
Unstiffened element limiting slenderness (λ_r)	--	40.30	Table.B4.1a.Case6
Stiffened element classification	--	Non slender	
Stiffened element slenderness (λ)	--	9.00	
Stiffened element limiting slenderness (λ_r)	--	40.30	Table.B4.1a.Case6
Factored flexural buckling strength (ϕP_{n22}):	[Kip]	62.77	Cl.E3
Effective length (KL 22)	[ft]	7.43	Cl.E2
Effective slenderness ((KL/r) 22)	--	79.32	Cl.E2
Elastic critical buckling stress (F e22)	[Kip/in2]	45.49	Eq.E3-4
Effective area of the cross section based on the effective width (A eff22)	[in2]	2.75	
Critical stress for flexural buckling (F cr22)	[Kip/in2]	25.36	Eq.E3-2
Nominal flexural buckling strength (P n22)	[Kip]	69.75	Eq.E3-1

Flexural Design

Bending about major axis, M33

Ratio	:	0.08			
Capacity	:	7.44 [Kip*ft]	Reference	:	Cl.F7.1
Demand	:	-0.60 [Kip*ft]	Ctrl Eq.	:	D4 at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Compact	
Unstiffened element slenderness (λ)	--	9.00	
Limiting slenderness for noncompact unstiffened element (λ_r)	--	164.07	
Limiting slenderness for compact unstiffened element (λ_p)	--	69.66	
Stiffened element classification	--	Compact	
Stiffened element slenderness (λ)	--	9.00	
Limiting slenderness for noncompact stiffened element (λ_r)	--	40.30	
Limiting slenderness for compact stiffened element (λ_p)	--	32.24	
Factored yielding strength (ϕM_n):	[Kip*ft]	7.44	Cl.F7.1
Yielding (M n)	[Kip*ft]	8.27	Eq.F7-1

Bending about minor axis, M22

Ratio	:	0.08			
Capacity	:	7.44 [Kip*ft]	Reference	:	Cl.F7.1
Demand	:	-0.62 [Kip*ft]	Ctrl Eq.	:	D4 at 100.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Compact	
Unstiffened element slenderness (λ)	--	9.00	
Limiting slenderness for noncompact unstiffened element (λ_r)	--	164.07	
Limiting slenderness for compact unstiffened element (λ_p)	--	69.66	
Stiffened element classification	--	Compact	
Stiffened element slenderness (λ)	--	9.00	
Limiting slenderness for noncompact stiffened element (λ_r)	--	40.30	
Limiting slenderness for compact stiffened element (λ_p)	--	32.24	

Factored yielding strength about a geometric axis (ϕM_n):	[Kip*ft]	7.44	Cl.F7.1
Yielding (M_n)	[Kip*ft]	8.27	Eq.F7-1

Shear Design

Shear in major axis 33

Ratio	: 0.01		
Capacity	: 25.99 [Kip]	Reference	: Cl.G1
Demand	: 0.31 [Kip]	Ctrl Eq.	: D4 at 50.00%

Intermediate results	Unit	Value	Reference
Factored shear capacity (ϕV_n):	[Kip]	25.99	Cl.G1
Web buckling coefficient (k_v)	--	5.00	Cl.G4
Web buckling coefficient (C_v)	--	1.00	Eq.G2-9
Nominal shear strength (V_n)	[Kip]	28.88	Eq.G4-1

Shear in minor axis 22

Ratio	: 0.01		
Capacity	: 25.99 [Kip]	Reference	: Cl.G1
Demand	: 0.34 [Kip]	Ctrl Eq.	: D4 at 0.00%

Intermediate results	Unit	Value	Reference
Factored shear capacity (ϕV_n):	[Kip]	25.99	Cl.G1
Web buckling coefficient (k_v)	--	5.00	Cl.G4
Web buckling coefficient (C_v)	--	1.00	Eq.G2-9
Nominal shear strength (V_n)	[Kip]	28.88	Eq.G4-1

Torsion Design

Torsion

Ratio	: 0.00		
Capacity	: 5.96 [Kip*ft]	Reference	: Cl.H3.1
Demand	: 0.01 [Kip*ft]	Ctrl Eq.	: D4 at 0.00%

Intermediate results	Unit	Value	Reference
Factored torsion capacity (ϕT_n):	[Kip*ft]	5.96	Cl.H3.1
Critical torsional buckling stress (F_{cr})	[Kip/in2]	21.00	Eq.H3-3
Nominal torsion capacity (T_n)	[Kip*ft]	6.62	Eq.H3-1

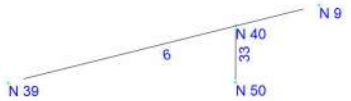
Combined Actions Design

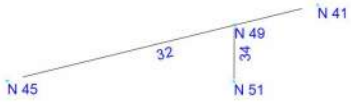
Combined flexure and axial

Ratio	: 0.17		
Ctrl Eq.	: D4 at 100.00%	Reference	: Eq.H1-1b

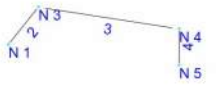
Intermediate results	Unit	Value	Reference
Interaction of flexure and axial force :	--	0.17	Eq.H1-1b
Available flexural strength about strong axis (M_{c33})	[Kip*ft]	7.44	Cl.H1.1
Available flexural strength about weak axis (M_{c22})	[Kip*ft]	7.44	Cl.H1.1
Available axial strength (P_c)	[Kip]	62.77	Cl.H1.1

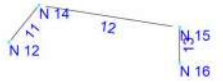
PANNED LAUNCH RAMP
NODES AND MEMBER NUMBERS

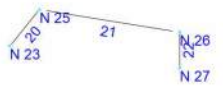


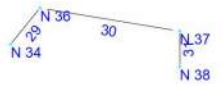


RAKED PANNED GRIND LEDGE
NODES AND MEMBER NUMBERS









RAM Elements

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PANNED LAUNCH RAMP &
RAKED PANNED GRIND LEDGE

Geometry data

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	-0.42	0.00	0
3	1.83	1.83	0.00	0
4	10.42	0.50	0.00	0
5	10.42	-1.67	0.00	0
9	32.00	1.0208	0.00	0
12	0.00	-10.42	0.00	0
14	1.83	-8.17	0.00	0
15	10.42	-9.50	0.00	0
16	10.42	-11.67	0.00	0
23	0.00	-20.42	0.00	0
25	1.83	-18.17	0.00	0
26	10.42	-19.50	0.00	0
27	10.42	-21.67	0.00	0
34	0.00	-30.42	0.00	0
36	1.83	-28.17	0.00	0
37	10.42	-29.50	0.00	0
38	10.42	-31.67	0.00	0
39	24.5208	-0.833	0.00	0
40	30.00	0.5251	0.00	0
41	32.00	-8.9792	0.00	0
45	24.5208	-10.833	0.00	0
49	30.00	-9.4749	0.00	0
50	30.00	-0.833	0.00	0
51	30.00	-10.833	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	1	1	1
5	1	1	1	1	1	1
12	1	1	1	1	1	1
16	1	1	1	1	1	1
23	1	1	1	1	1	1
27	1	1	1	1	1	1
34	1	1	1	1	1	1
38	1	1	1	1	1	1
39	1	1	1	1	1	1
40	1	1	1	1	1	1
45	1	1	1	1	1	1
50	1	1	1	1	1	1
51	1	1	1	1	1	1

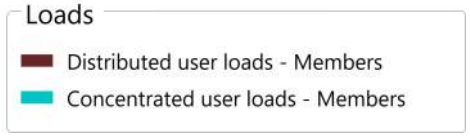
Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
2	1	3		B 5x24	C 4-60	0.00	0.00	0.00
3	3	4		B 5x24	C 4-60	0.00	0.00	0.00
4	4	5		B 5x24	C 4-60	0.00	0.00	0.00
6	39	9		B 6x48	C 4-60	0.00	0.00	0.00
11	12	14		B 5x24	C 4-60	0.00	0.00	0.00
12	14	15		B 5x24	C 4-60	0.00	0.00	0.00
13	15	16		B 5x24	C 4-60	0.00	0.00	0.00
20	23	25		B 5x24	C 4-60	0.00	0.00	0.00
21	25	26		B 5x24	C 4-60	0.00	0.00	0.00
22	26	27		B 5x24	C 4-60	0.00	0.00	0.00
29	34	36		B 5x24	C 4-60	0.00	0.00	0.00
30	36	37		B 5x24	C 4-60	0.00	0.00	0.00
31	37	38		B 5x24	C 4-60	0.00	0.00	0.00
32	45	41		B 6x48	C 4-60	0.00	0.00	0.00
33	40	50		B 6x48	C 4-60	0.00	0.00	0.00
34	49	51		B 6x48	C 4-60	0.00	0.00	0.00

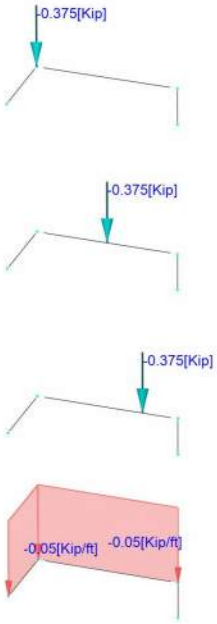
Glossary

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

PANNED LAUNCH RAMP &
RAKED PANNED GRIND LEDGE
LIVE LOAD



RAKED PANNED GRIND LEDGE



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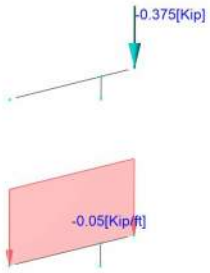
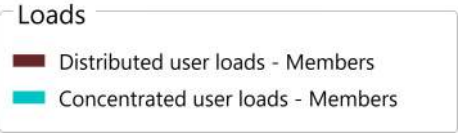
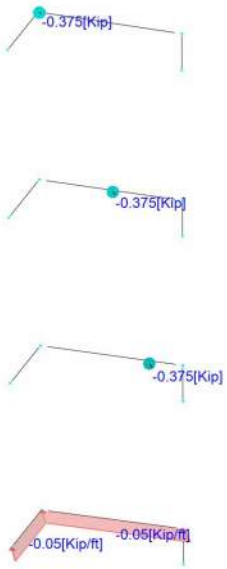


PANNED LAUNCH RAMP &
RAKED PANNED GRIND LEDGE
LIVE LOAD OUT OF PLANE



RAKED PANNED GRIND LEDGE



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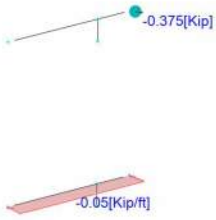
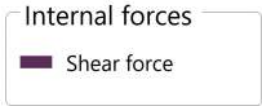
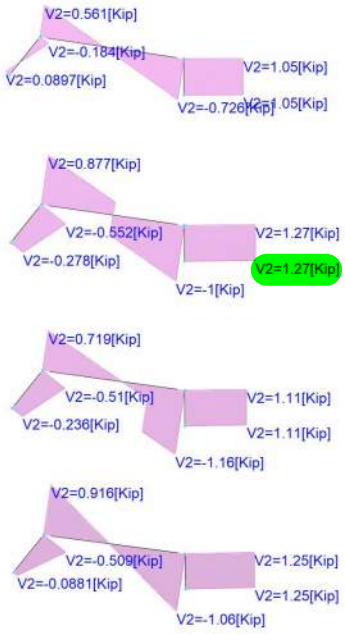


PANNED LAUNCH RAMP &
RAKED PANNED GRIND LEDGE
SHEAR



RAKED PANNED GRIND LEDGE



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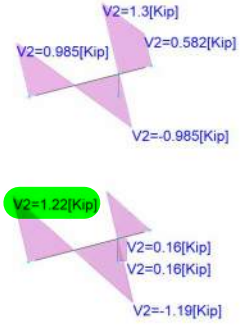
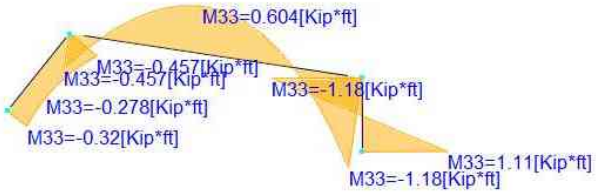


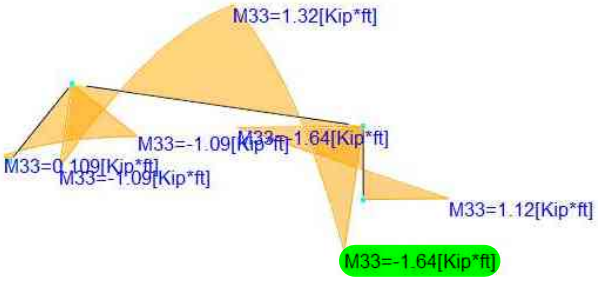
PANNED LAUNCH RAMP &
RAKED PANNED GRIND LEDGE
MOMENT

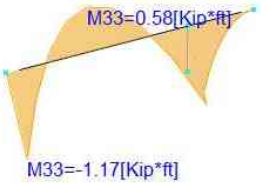
Internal forces
Bending moments

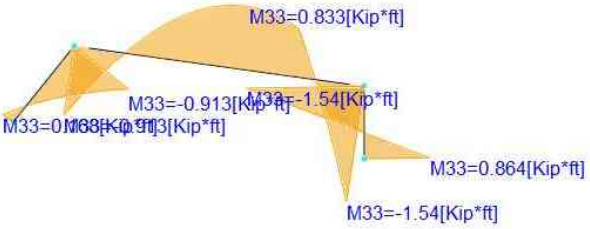
RAKED PANNED GRIND LEDGE

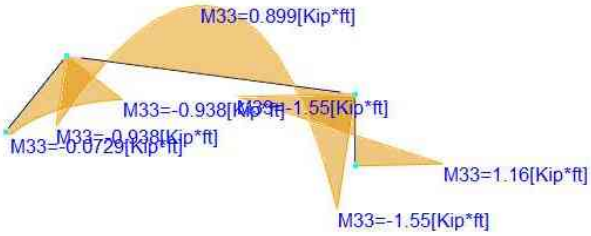


PANNED LAUNCH RAMP







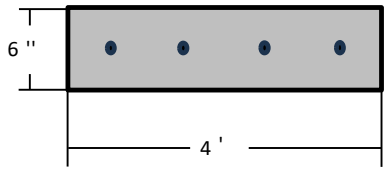


BSE STRUCTURAL ENGINEERS

Project El Segundo Rec Project No. 26-002

Calc. By HDL Checked By JM Date 1/13/2026

PANNED RAMP CALCULATIONS



$\phi M_n = 0.9 A_s f_y (d - a/2)$

$a = A_s f_y / (0.85 * f'_c b)$

	Bars	*	Area per bar				
A_s =	4	*	0.20 in	=	0.80 in^2	h =	6.00 in
						b =	48.00 in
a =	0.29 in					d =	2.50 in
						L =	2.00 ft
ϕM_n =	8.47 k-ft					f'_c =	4000 psi
						f_y =	60 ksi

$\phi V_c = 0.75 * 2 * \sqrt{(f'_c)} * b_w * d$

ϕV_c = 11.38 kip

FROM RAM ELEMENTS

M_{max} = 1.94 k-ft < ϕM_n **O.K.**

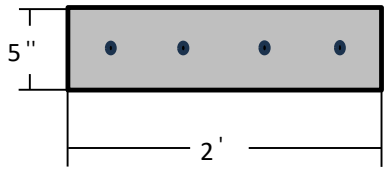
V_{max} = 1.27 kip < ϕV_c **O.K.**

BSE STRUCTURAL ENGINEERS

Project El Segundo Rec Project No. 26-002

Calc. By HDL Checked By JM Date 1/13/2026

PANNED LEDGE CALCULATIONS



$\phi M_n = 0.9 A_s f_y (d - a/2)$

$a = A_s f_y / (0.85 * f'_c b)$

h = 5.00 in

b = 24.00 in

d = 2.50 in

L = 5.00 ft

f'_c = 4000 psi

f_y = 60 ksi

	Bars	*	Area per bar		
A_s =	4	*	0.11 in	=	0.44 in^2

a = 0.32 in

ϕM_n = 4.63 k-ft

$\phi V_c = 0.75 * 2 * \sqrt{(f'_c)} * b_w * d$

ϕV_c = 5.69 kip

FROM RAM ELEMENTS

M_{max} = 1.64 k-ft < ϕM_n **O.K.**

V_{max} = 1.27 kip < ϕV_c **O.K.**

BANKED EXTENSION
NODES AND MEMBER NUMBERS

RAM Elements

Current Date: 1/14/2026 10:19 AM
Units system: English
File name: G:\2026\26-002 El Segundo Rec Park Skatepark - El Segundo, CA\Calculations\RAM\Concrete\26-002 Concrete Elements Pt 2.retx

BANKED EXTENSION

Geometry data

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
52	0.00	0.00	0.00	0
53	0.00	6.00	0.00	0
54	15.00	0.00	0.00	0
55	15.00	6.00	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
52	1	1	1	1	1	1
54	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
41	52	53	3' Strip of Conc	B 132x6	C 4-60	0.00	0.00	0.00
42	54	55	3' Strip of Conc	B 132x6	C 4-60	0.00	0.00	0.00

Orientation of local axes

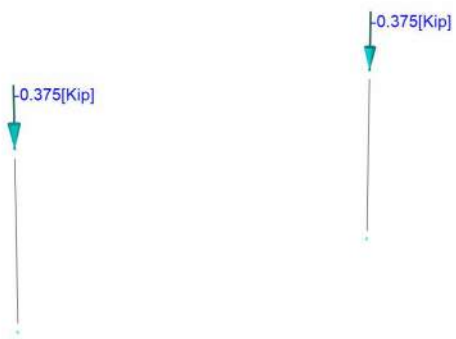
Member	Rotation [Deg]	Axes23	NX	NY	NZ
41	90.00	0	0.00	0.00	0.00
42	90.00	0	0.00	0.00	0.00

Glossary

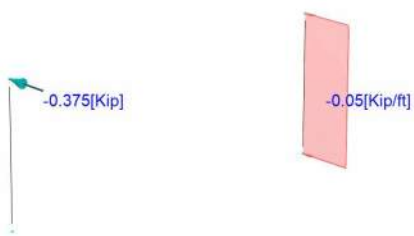
Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
lg factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2

LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

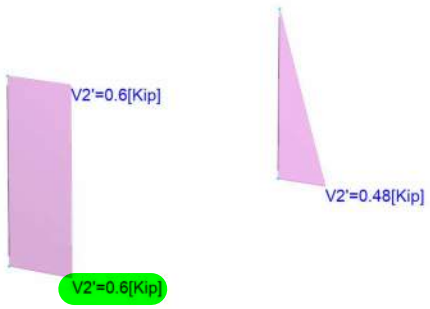
BANKED EXTENSION
LIVE LOAD



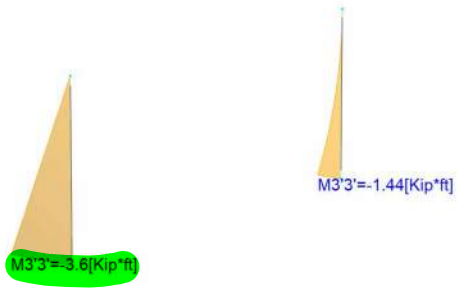
BANKED EXTENSION
LIVE LOAD OUT OF PLANE



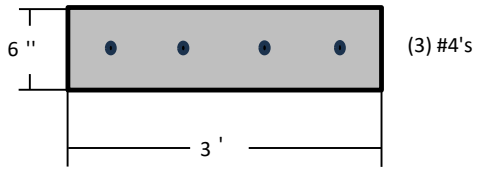
BANKED EXTENSION
SHEAR



BANKED EXTENSION MOMENT



BANKED EXTENSION CALCULATIONS



$\phi M_n = 0.9 A_s f_y (d - a/2)$

$a = A_s f_y / (0.85 * f'_c b)$

	Bars	*	Area per bar			
A_s =	4	*	0.20 in	=	0.80 in^2	
a =	0.39 in					
ϕM_n =	8.29 k-ft					

h =	6.00 in
b =	36.00 in
d =	2.50 in
L =	2.00 ft
f'_c =	4000 psi
f_y =	60 ksi

$\phi V_c = 0.75 * 2 * \sqrt{(f'_c)} * b_w * d$

ϕV_c = 8.54 kip

FROM RAM ELEMENTS

M_{max} =	3.60 k-ft	<	ϕM_n	**O.K.**
V_{max} =	0.60 kip	<	ϕV_c	**O.K.**

BSE STRUCTURAL ENGINEERS

Project El Segundo Skatepark Project No. 26-002

Calc. By HDL Checked By JM Date 1/16/2026

GEOFOAM CALCULATIONS

Slab Weight 63 psf

Slab Load 100 psf

Impact Load 375 psf

Q_{max} = 438 psf

Q_1 = Slab Weight + Slab Load = 163 psf

Q_2 = Slab Weight + Impact Load = 438 psf

FROM THERMAL FOAMS TECHNICAL DATA

Q_{max} < Q_{all} = 520 psf **O.K.**

BSE STRUCTURAL ENGINEERS

Project El Segundo Skatepark Project No. 26-002

Calc. By HDL Checked By JM Date 1/16/2026

Slab Capacity Checks for Single Concentrated Load

Location / Case:

Case #1: 375 lb Point Load on 1" x 1" Slab Section

Factors:

Dead Load =	0.00 kips	
Live Load =	0.38 kips	
Total Load =	0.38 kips	
P_u=	0.60 kips	(Maximum LRFD factored load, 1.4D v 1.2D+1.6L)
Width =	1.00 in.	(Leg short dimension)
Height =	1.00 in.	(Leg long dimension)
Plate Width=	1.00 in.	(Plate short dimension)
Plate Height=	1.00 in.	(Plate long dimension)
Average Width=	1.00 in.	(Average short dimension)
Average Height=	1.00 in.	(Average long dimension)
β=	1	(Ratio of long side to short side of column)
f'_c=	4000.00 psi	(Concrete compressive strength) (Min based on cylinder b
h =	5.00 in.	(Thickness of slab)
d=	2.50 in.	(Depth of steel. For unreinforced use d = 0)
α_s=	20	(40 for interior, 30 for edge, 20 for corner)
b_o=	14.00 in.	(Perimeter of punchout shear area)
LW Conc. Factor=	1	(1.0 for normal, 0.75 for lightweight)
ϕv=	0.6	(LRFD Factor for Shear)
ϕbrg=	0.65	(LRFD Factor for Bearing)

ACI 318 Reinforced Concrete Punching Shear Capacity:

V_c=	13.28 kips	(ACI 318-11 Equation 11-31)
V_c=	12.33 kips	(ACI 318-11 Equation 11-32)
V_c=	8.85 kips	(ACI 318-11 Equation 11-33)
Governing V_c=	8.85 kips	
Governing ϕV_c=	5.31 kips	**Plain Punching Shear Governs**

ACI 318 Plain Concrete Punching Shear Capacity:

h_{eff} =	5.00 in.	***Slab depth is measured and kept constant**
b_o =	24.00 in.	(Perimeter of punchout shear area)
β =	1	
Gov Factor	2.67	
V_c=	20.24 kips	(ACI 318-14 Table 14.5.5.1)
ϕV_c=	12.14 kips	**O.K.**

Column Bearing Check:

P_n =	6.80 kips	(ACI 318-14 Table 14.5.6.1)

ΦP_n =	4.42 kips	**O.K.**

Slab Bending Strength Based on Shentu Method

Subgrade Modulus, K =	50.00 pci	(Worst Case)
R_1 =	0.50 in.	(SQRT(Avg. Width*Avg. Height) / 2)
E_c=	3604996.5 psi	(57000*SQRT(f'c))
F_t'=	474.3 psi	(7.5*SQRT(f'c)
P_n=	76.1 psi	$(1.72*((K*R_1/E_c)*10000+3.60)*F_t'*h^{\wedge 2})$
Safety Factor, SF =	4.0	
Allowable Load. Pn/SF =	19.04 kips	**O.K.**
Poisson ratio =	0.15	
Radius of Relative Stiffness, b =	29.61 in.	
Minimum Spacing Btw. Loads, 3B =	88.82 in.	
Spacing Between Similar Loads =	90.00 in.	**O.K.**

Concrete Cracking Check:

Soil Bearing =	1500.00 psf	
Required Area =	0.25 ft^2	
Side Dimension =	0.50 ft.	
Cantilever Arm =	0.21 ft.	
M_a =	16.28 #-ft	
4/3 *M_a =	21.70 #-ft	
M_{cr} =	988.21 #-ft	**O.K.**

Overall Slab Design = Slab Design Adequate for Loading

Back Check Structural Calculations

For

405 East Grand Ave

El Segundo, CA 90245

December 17, 2025

Provided to Tighe Architecture

Provided by

Michael Zahn, SE

9119 Hargis Street,

Los Angeles, CA 90034

Table of Contents

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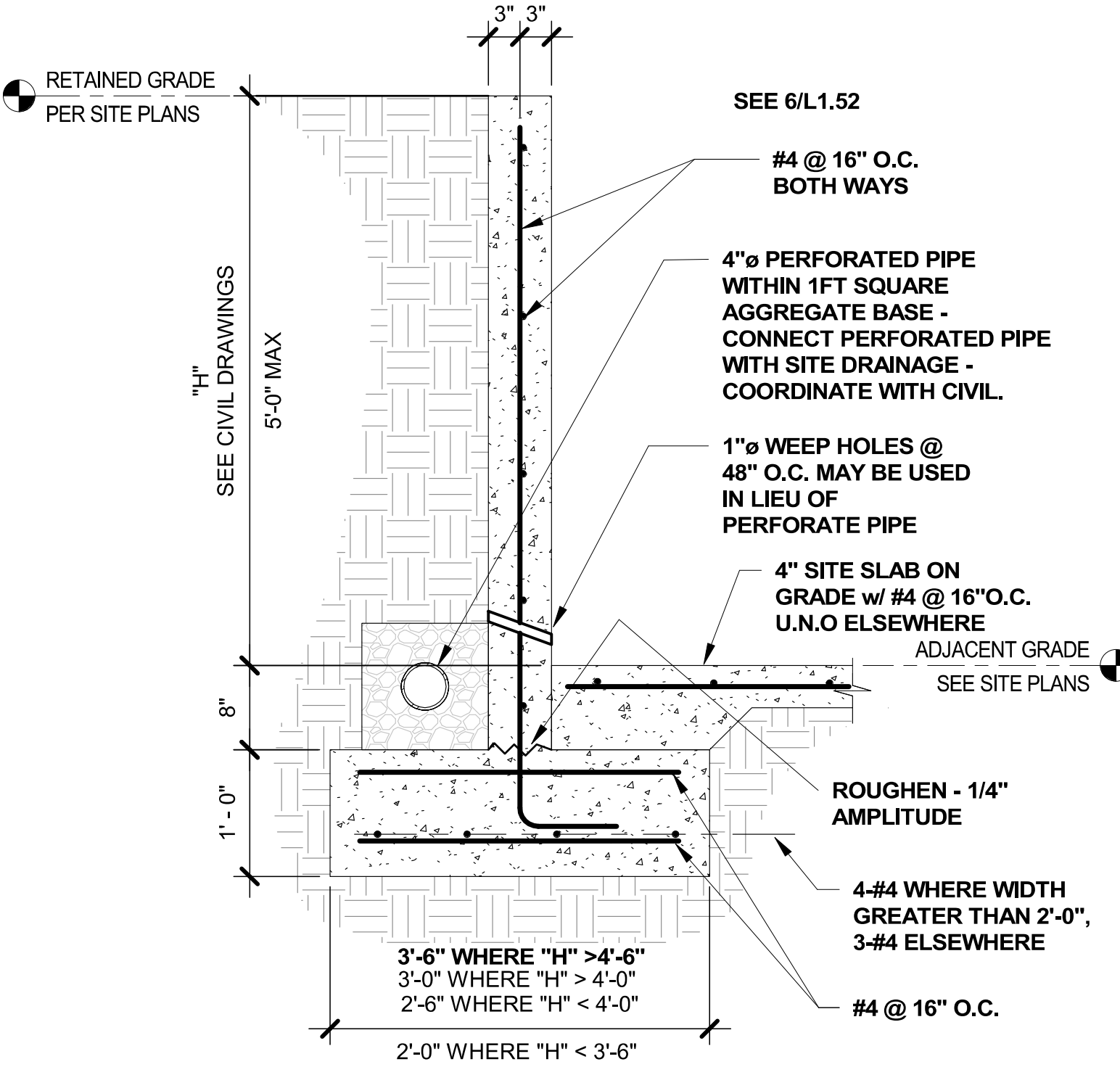
1. Site Retaining Wall



14 SITE CANTILEVER RETAINING WALL WITH DRAINAGE

3/4" = 1'-0"

less than 1.0 inch. Differential settlement is expected to be up to one-half of the total settlement over a 30-foot span.

8.1.4 Dynamic Increases

Bearing values indicated above are for total dead load and frequently applied live loads. The above vertical bearing may be increased by 33% for short durations of loading which will include the effect of wind or seismic forces. The allowable passive pressure may be increased by 33% for lateral loading due to wind or seismic forces.

8.2 Lateral Earth Pressures and Resistance to Lateral Loads

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

8.2.1 Active Earth Pressures

The active earth pressure behind any buried wall or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The lateral earth pressures are presented in the following tables.

Table No. 4, Active and At-Rest Earth Pressures

Loading Conditions	Lateral Earth Pressure (psf)
Active earth conditions (wall is free to deflect at least 0.001 radian)	35
At-rest (wall is restrained)	55

These pressures assume a level ground surface around the structure for a distance greater than the structure height, no surcharge, and no hydrostatic pressure.

If water pressure is allowed to build up behind the walls, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the walls. Cantilever retaining walls greater than 6 feet, as measured from the surface, should be designed to resist additional earth pressure caused by seismic ground shaking. A dynamic earth pressure of 20H (psf), based on an inverted triangular distribution, can be used for design of wall.

8.3 Modulus of Subgrade Reaction

8.0 DESIGN RECOMMENDATIONS

The various design recommendations provided in this section are based on the assumptions that in preparing the site, the earthwork and site grading recommendations provided in this report will be followed.

8.1 Shallow Foundations for Proposed Retaining Walls

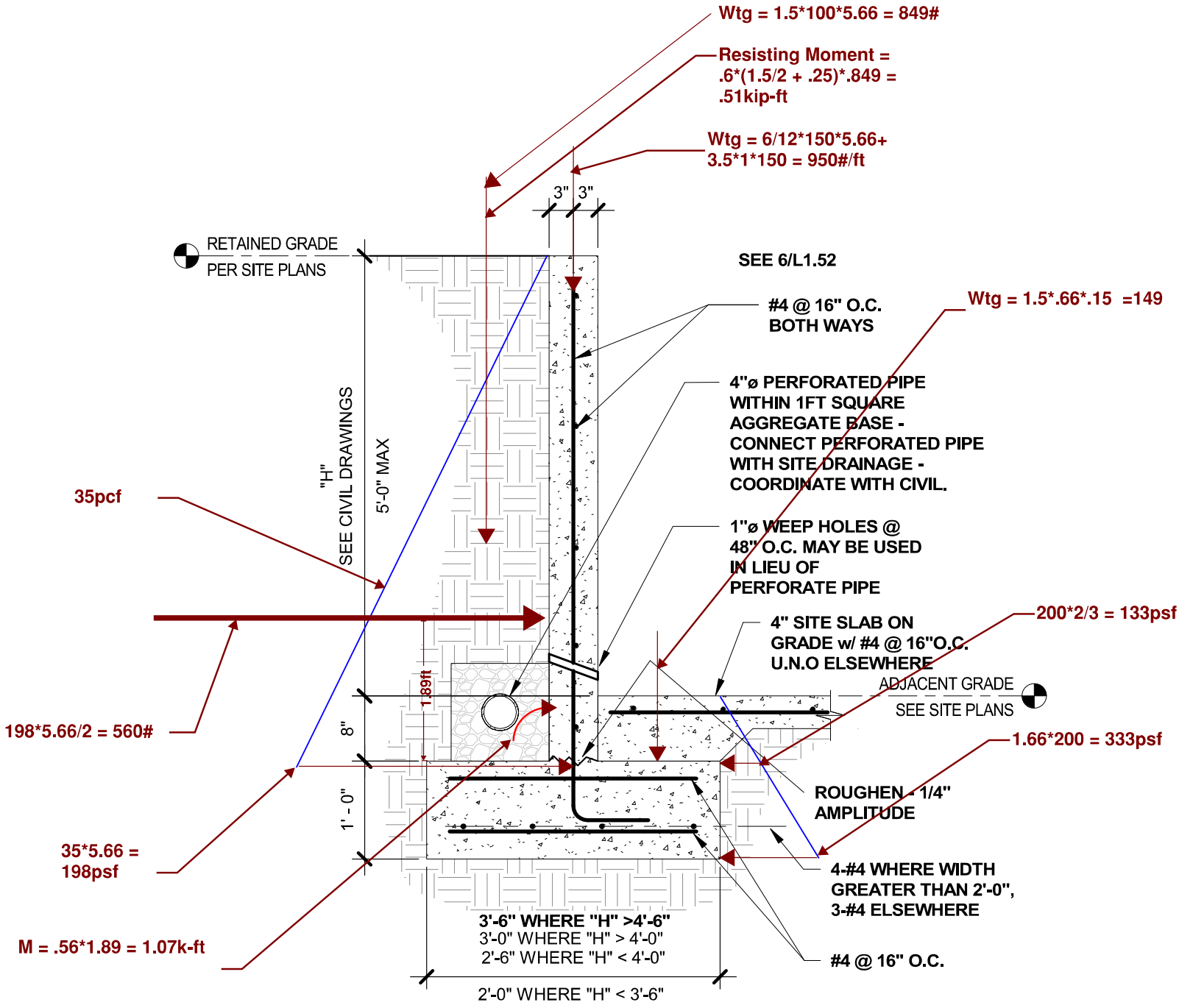
8.1.1 Vertical Capacity

The proposed improvements can be supported by conventional shallow footings. We recommend continuous and square footings be founded at least 18 inches below lowest adjacent final grade entirely into compacted fill or into native soil. A minimum footing width of 24 inches is recommended for square footings and 18 inches for continuous footings. The allowable bearing value for footings with above minimum sizes founded on compacted fill and competent native soils may be designed for a net bearing pressure of 2,000 pounds per square foot (psf) for dead-plus-live-loads. The net allowable bearing pressure can be increased by 500 psf for each additional foot of excavation depth and by 300 psf for each additional foot of excavation width up to a maximum value of 3,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity.

8.1.2 Lateral Capacity

Resistance to lateral loads can be provided by friction acting at the base of the foundation and by passive earth pressure. A coefficient of friction of 0.3 may be assumed with normal dead load forces. An allowable passive earth pressure of 200 psf per foot of depth up to a maximum of 2,000 psf may be used for footings poured against properly compacted fill. The values of coefficient of friction and allowable passive earth pressure include a factor of safety of 1.5.



14 SITE CANTILEVER RETAINING WALL WITH DRAINAGE

3/4" = 1'-0"

11

Check soil bearing pressure:
Mdesign = 1.07 - .51 kip-ft = 0.56 kip-fg
P = .6*.95 = 0.57 kip
e = .56/.57 = .98ft
a = 3.5/2 - .98 = 0.77
pressure = 2/3*.57/.77 = 0.49 ksf = 590psf, which is less than 1500psf

Check overturning:
1.07 kip-ft from lateral soil pressure;

0.6*Mresist = .6*.95*1.75 + .6*.849*(3.5-.75) = 2.48 kip-ft > 1.07 kips, therefore okay.

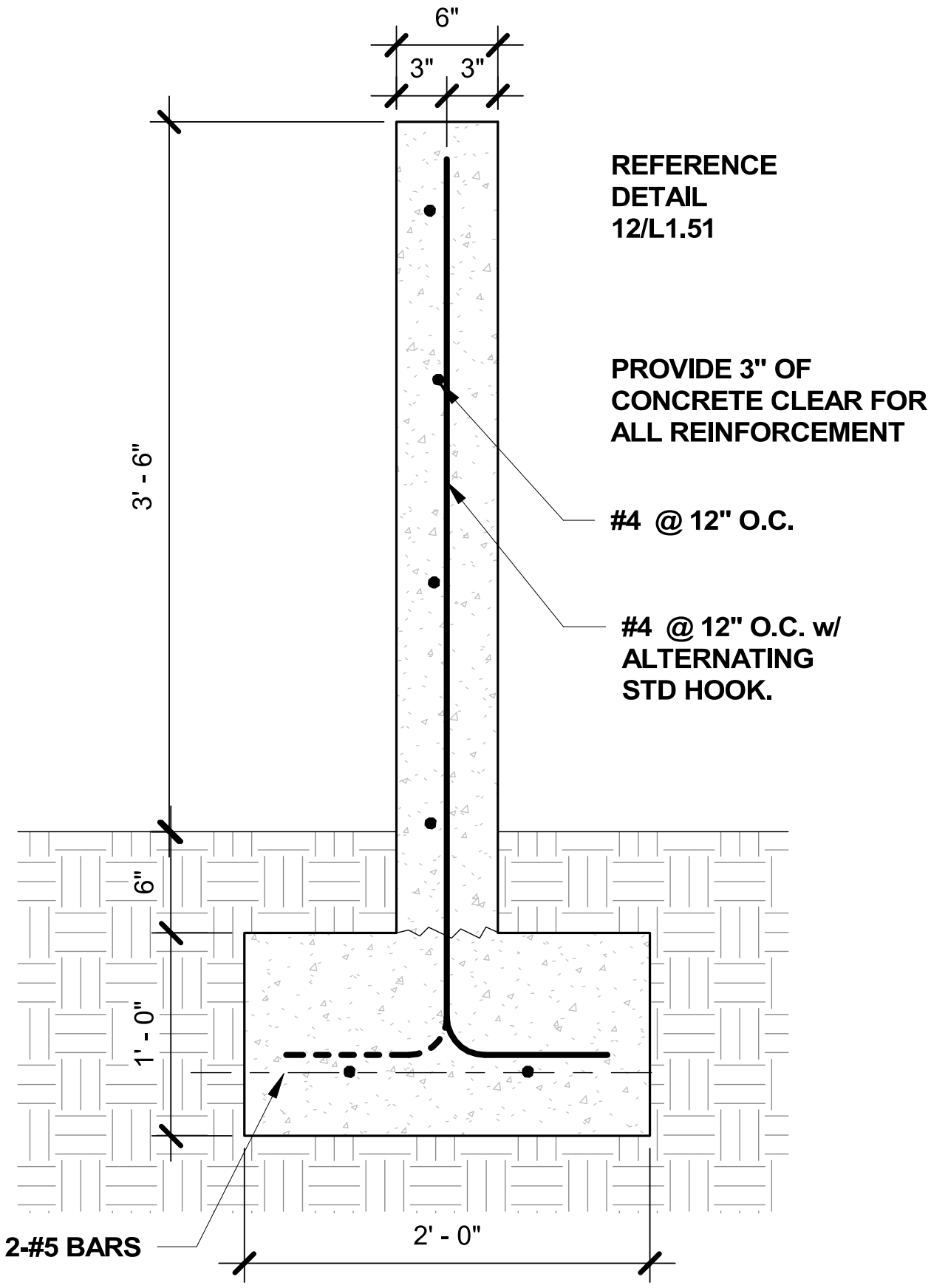
Check sliding:

0.6P = 0.6*(.95+.849+.149) = 1.17 kips

Friction = .3*0.6P = 351#
Passive pressure = (133+333) / 2 = 233#/ft

Total lateral load = 351 + 233 = 584#

2. Stand Alone Site Wall



10 CIP MONUMENT SIGN

1" = 1'-0"

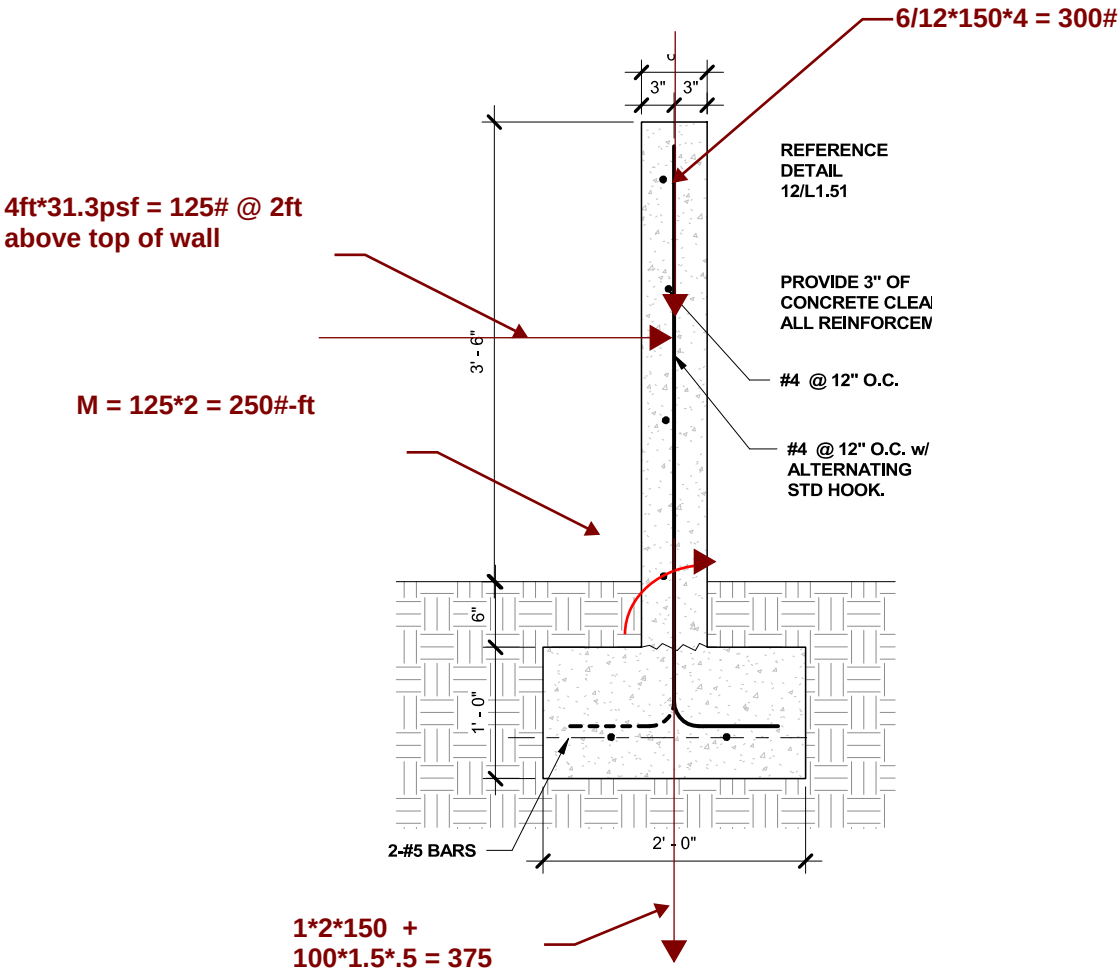
Lateral load:

Seismic:
Sds = 1.491
Wp = 6/12*150 = 75
Fp = .4*ap*Sds/(Rp/Ip)*(1 + 2*z/H)*Wp
= .4*2.5*1.491/(2.5/1) * 75 = .60Wp = 45 psf
ASD: 0.7E = 31.3 psf

Wind:
q = .00256*KzKztKd*V^2 - .00256*.85*1.0*.85*95^2 = 16.7psf

s/h = 1.0
B/s = 5
Cf = 1.35
G = .85

P = 16.7*1.35*.85 = 19.2 psf
ASD: 0.6*19.2 = 11.52 << 0.7E = 31.3 psf



Footing Bearing Pressure:

P = Wtg = 300+300 = 675#
0.6P = 405

e = M/.6P = 250/405 = 0.62ft
a = 2/1 - .62 = 0.38

Pressure = 2/3*405 /.38 /1 = 710 psf << 1500 PSF

Overturning

Lateral Force = 125# @ 2ft
M = 125*2 = 250#-ft

M resistance = 0.6Wtf*e
= .6* 675*2/2 = 405#-ft > M = 250

Sliding

Lateral Force = 125#

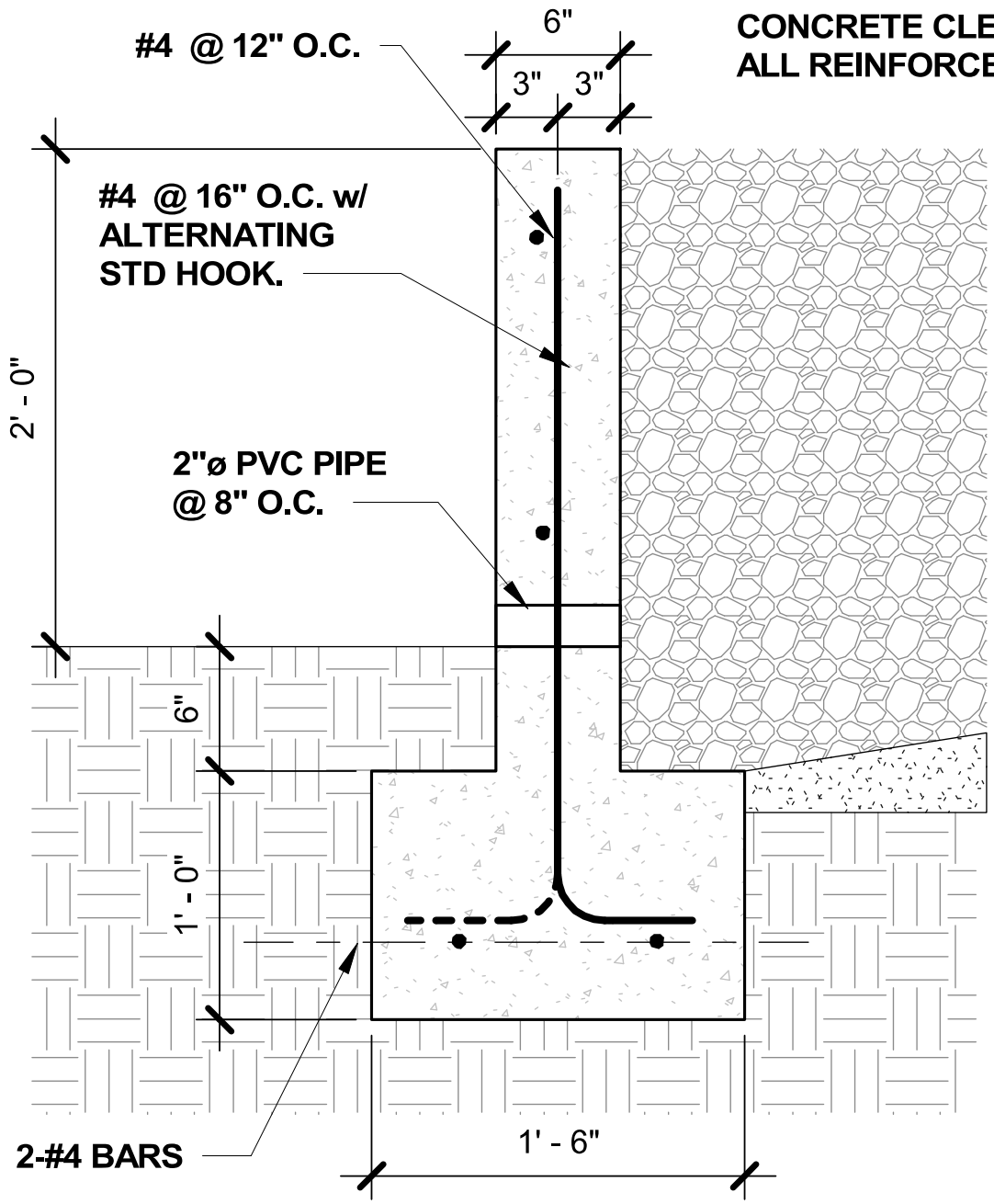
0.6Weight = .6*675 = 405#

Friction resistance = 0.3*405 = 122#
Passive Pressure: Average passive pressure = 0(+ 1.5*200)/2 = 150#/ft

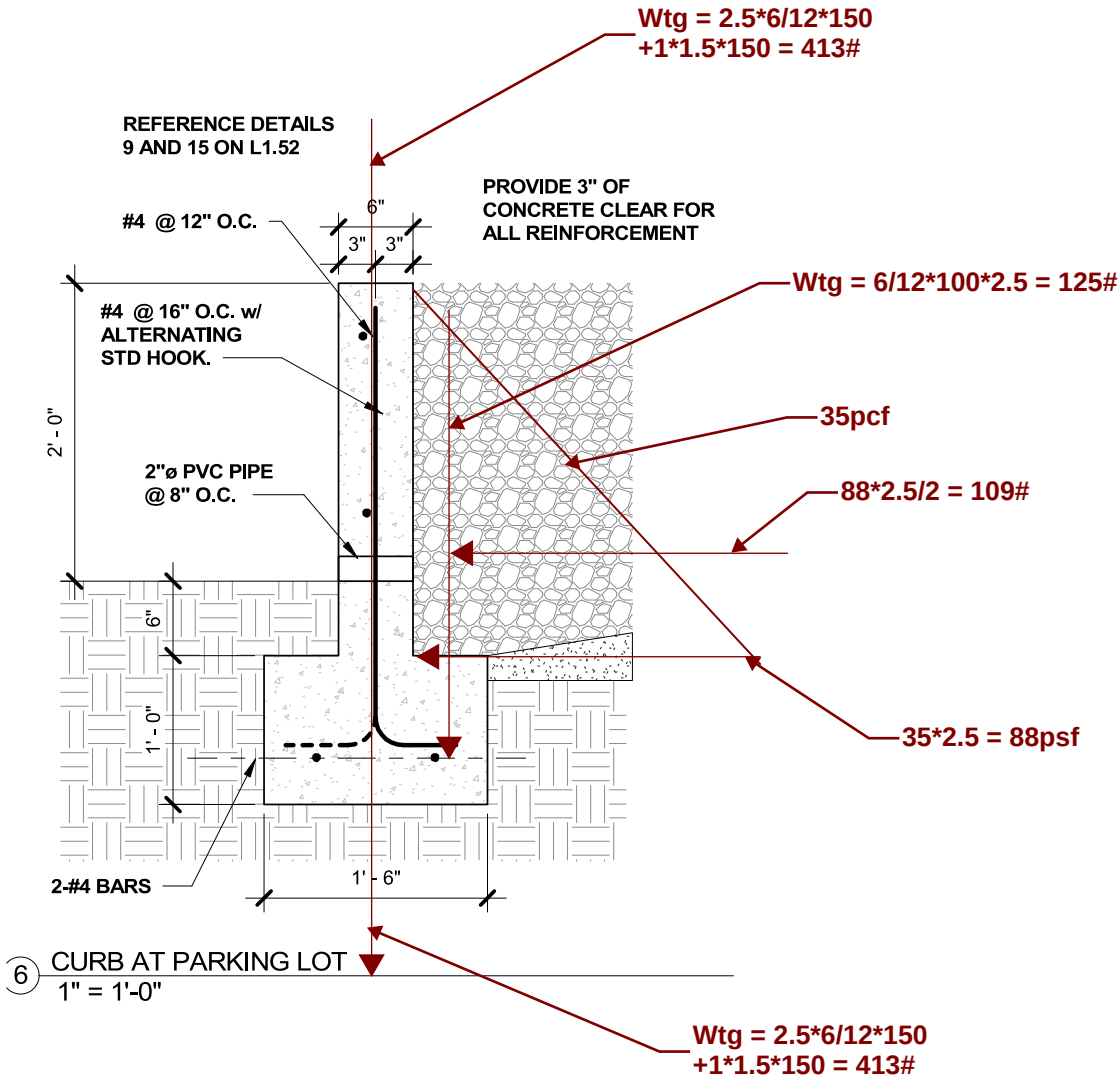
Friction plus passive = 122 + 150 = 272#/ft >

3. Short Curb Wall at Parking Lot

REFERENCE DETAILS
9 AND 15 ON L1.52



6 CURB AT PARKING LOT
1" = 1'-0"



Check soil bearing pressure:
Moverturning = 109*2.5/3 = 91#/ft

0.6P = .6*413 = 248#/ft

e = 91/248 = 0.37
a = .75 - .37 = .38
Pressure = 2/3*248/.38 = 435 psf

Check sliding:

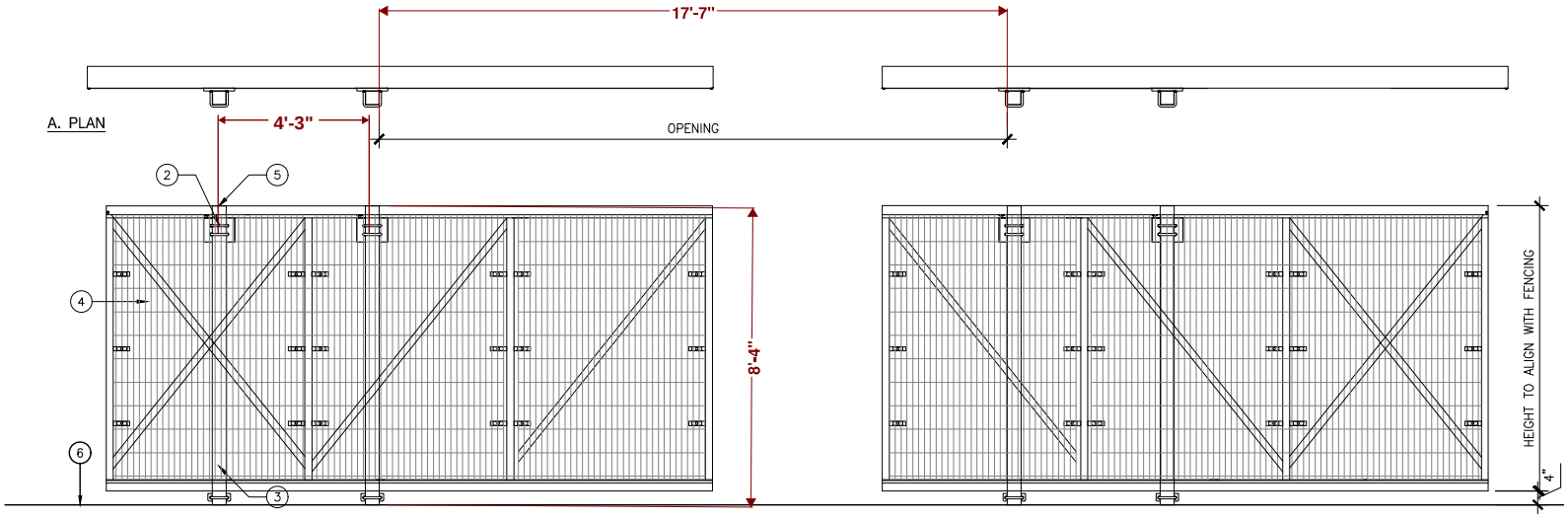
Lateral Force = 109#
Friction = 0.3 * .6 * 413 = 74#

Average Passive pressure = (.5*200+1.5*200)/2 = 200

Total resistance = 274# > 109#

Check overturning:
Moverturning = 109*2.5/3 = 91#/ft
Mresist = 0.6 * 413*.75 = 186#/ft > Mot

4. Gate Post Support Details



LEGEND

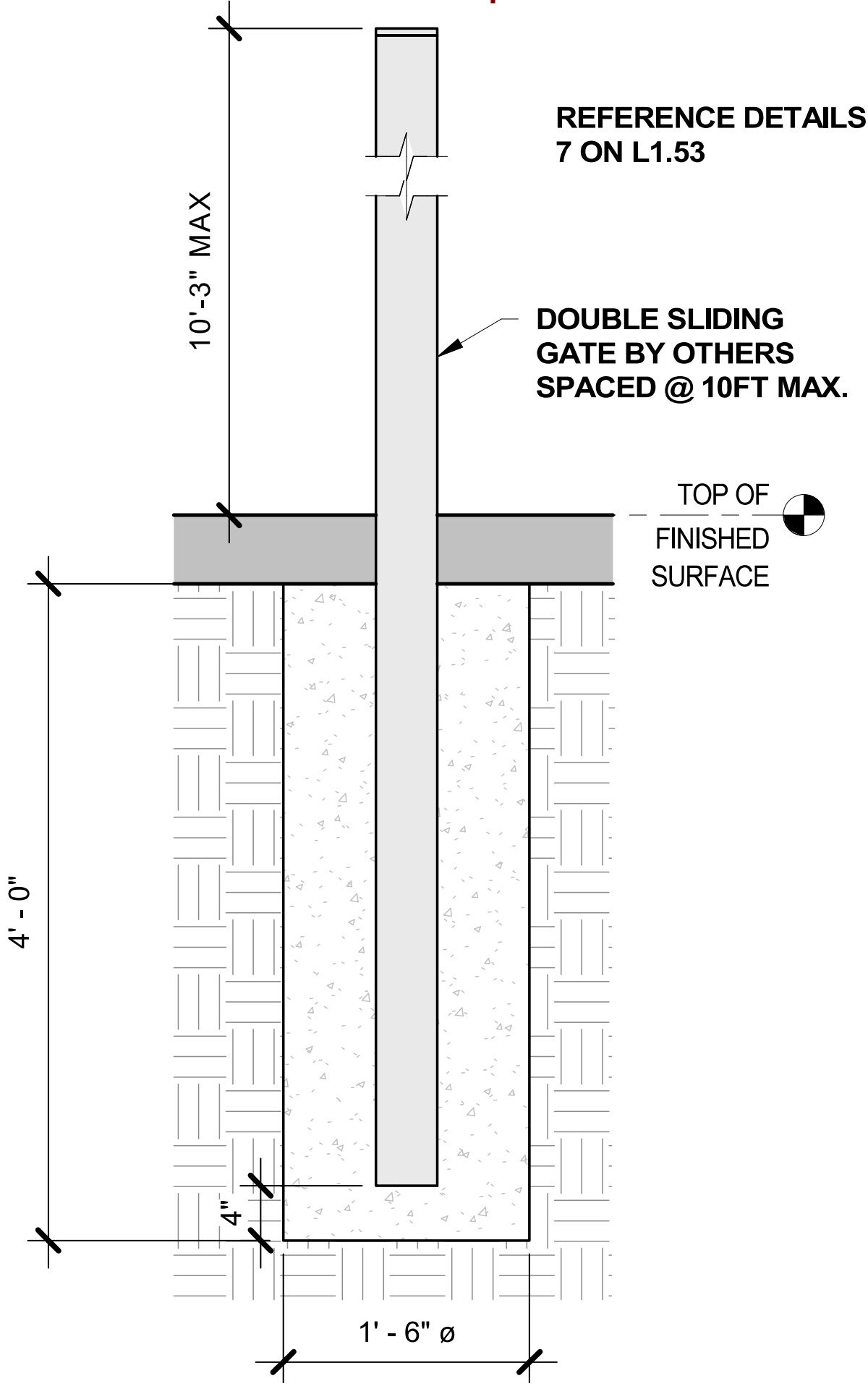
1. SLIDING GATE.
2. TOP TRACK.
3. BASE TRACK.
4. SUPPORT BRACING.
5. 4"X4" POST.
6. FINISHED SURFACE.

NOTES

A. CONTRACTOR TO SUBMIT COMPLETE SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
B. REFER TO STRUCTURAL DETAIL 15/S2.01 FOR FOOTING AND REINFORCING.

7 DOUBLE-SLIDING GATE

SCALE: 1/2" = 1'-0"



15 DOUBLE SLIDING GATE
3/4" = 1'-0"

check 10.25ft pole with
4.25/2 + 17.5/2 = 10.9"ft of trib

q = .00256*KzKztKd*v^2
= .85*1.0*.85*95^2 = 16.7
P = 1.4*16.7 = 23.4 psf

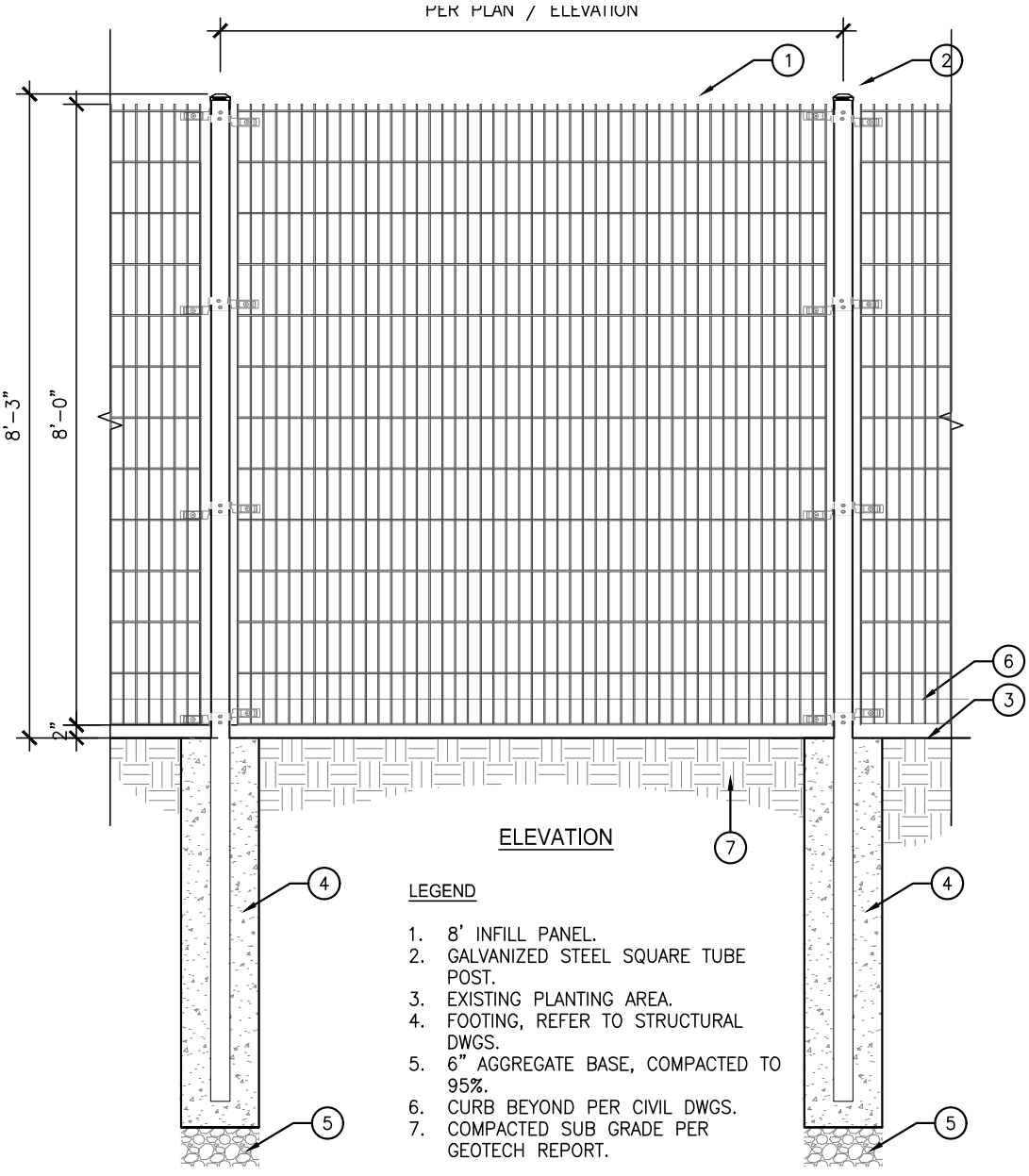
FORCE = 23.4*10.25*10.9 =
2.614 KIPS @ 5.125FT

M = 2.614*61.5 = 160.1 kip-in
Z = 160.1*1.67/46 =4.84

HSS4x4x3/8 or HSS5x5x3/6

	Constrained Cylindrical footing			
			Equation 18-2 of CBC	
			dtrial	4.25
	lateral bearing pressure:			400
ateral bearing pressure with 1/3 increase:				533.3333
			P	2164
			h	5.125
			S3	1700
			b	1.5
			d =	4.30

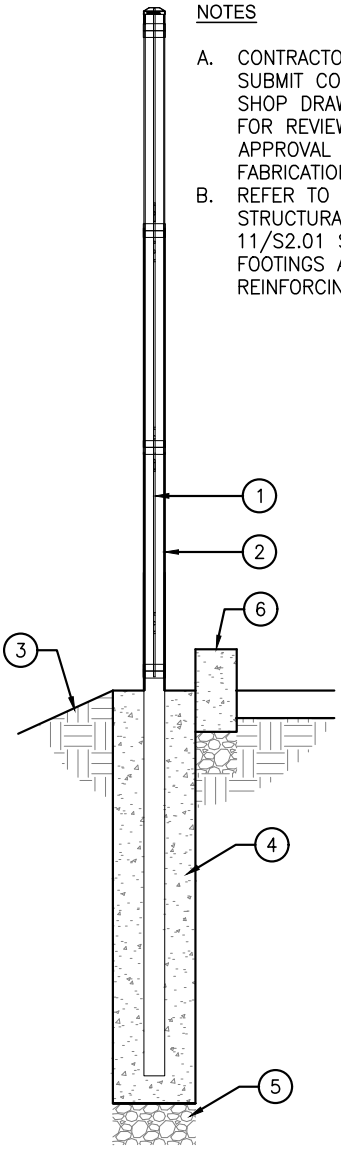
5. 10.25 ft High Fence Post



ELEVATION

LEGEND

1. 8' INFILL PANEL.
2. GALVANIZED STEEL SQUARE TUBE POST.
3. EXISTING PLANTING AREA.
4. FOOTING, REFER TO STRUCTURAL DWGS.
5. 6" AGGREGATE BASE, COMPACTED TO 95%.
6. CURB BEYOND PER CIVIL DWGS.
7. COMPACTED SUB GRADE PER GEOTECH REPORT.



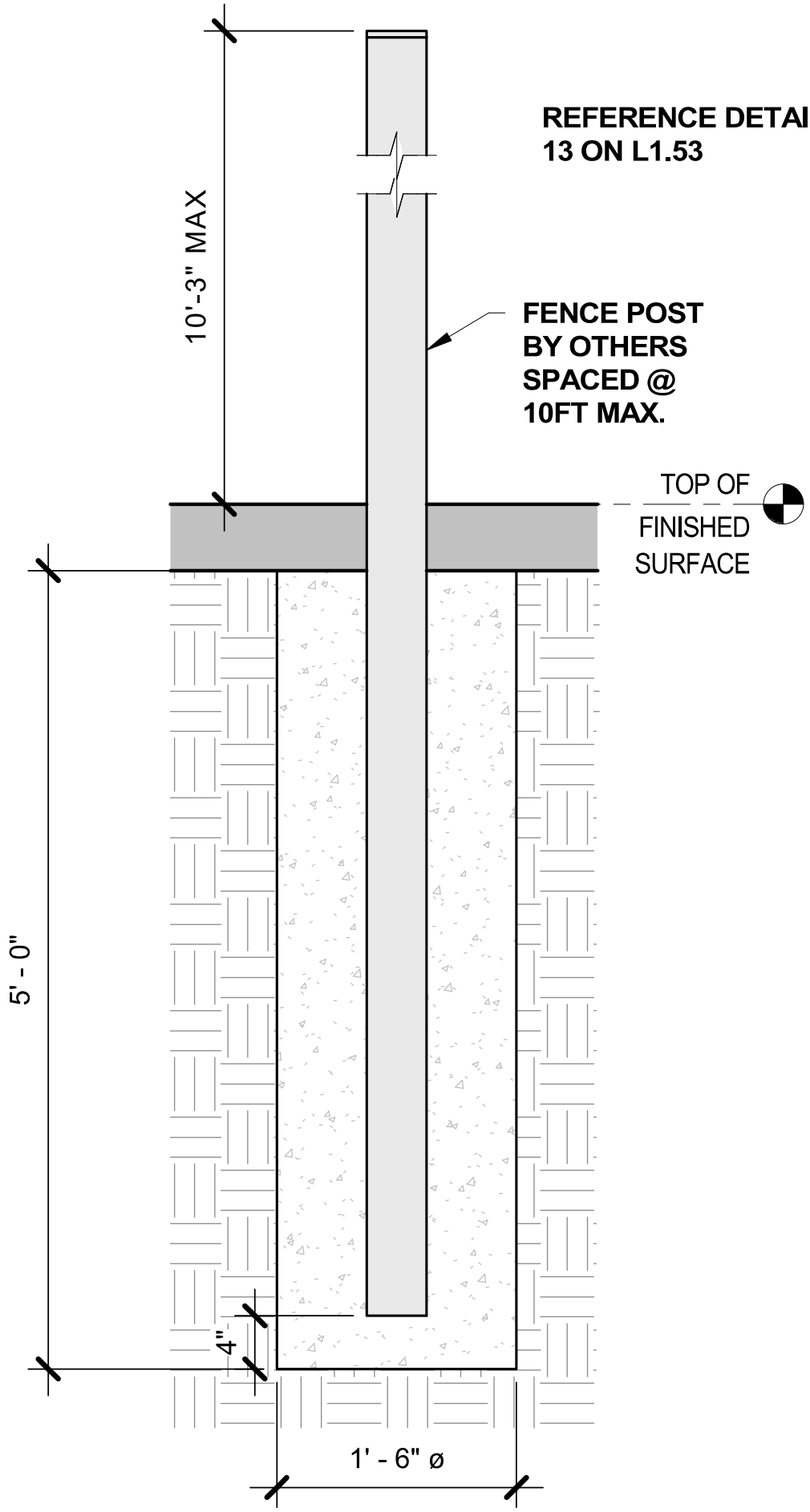
SECTION

NOTES

A. CONTRACTOR TO SUBMIT COMPLETE SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
B. REFER TO STRUCTURAL DETAIL 11/S2.01 SIM. FOR FOOTINGS AND REINFORCING.

13 8' HIGH OMEGA FENCE

SCALE: 3/4" = 1'-0"



11 10FT HIGH FENCE POST FOUNDATION
3/4" = 1'-0"

Lateral load:

Wind:
q = .00256*KzKztKd*V^2 - .00256*.85*1.0*.85*95^2 = 16.7psf

s/h = 1.0
B/s = 5
Cf = 1.35
G = .85

P = 16.7*1.35*.85 = 19.2 psf
ASD: 0.6*19.2 = 11.52

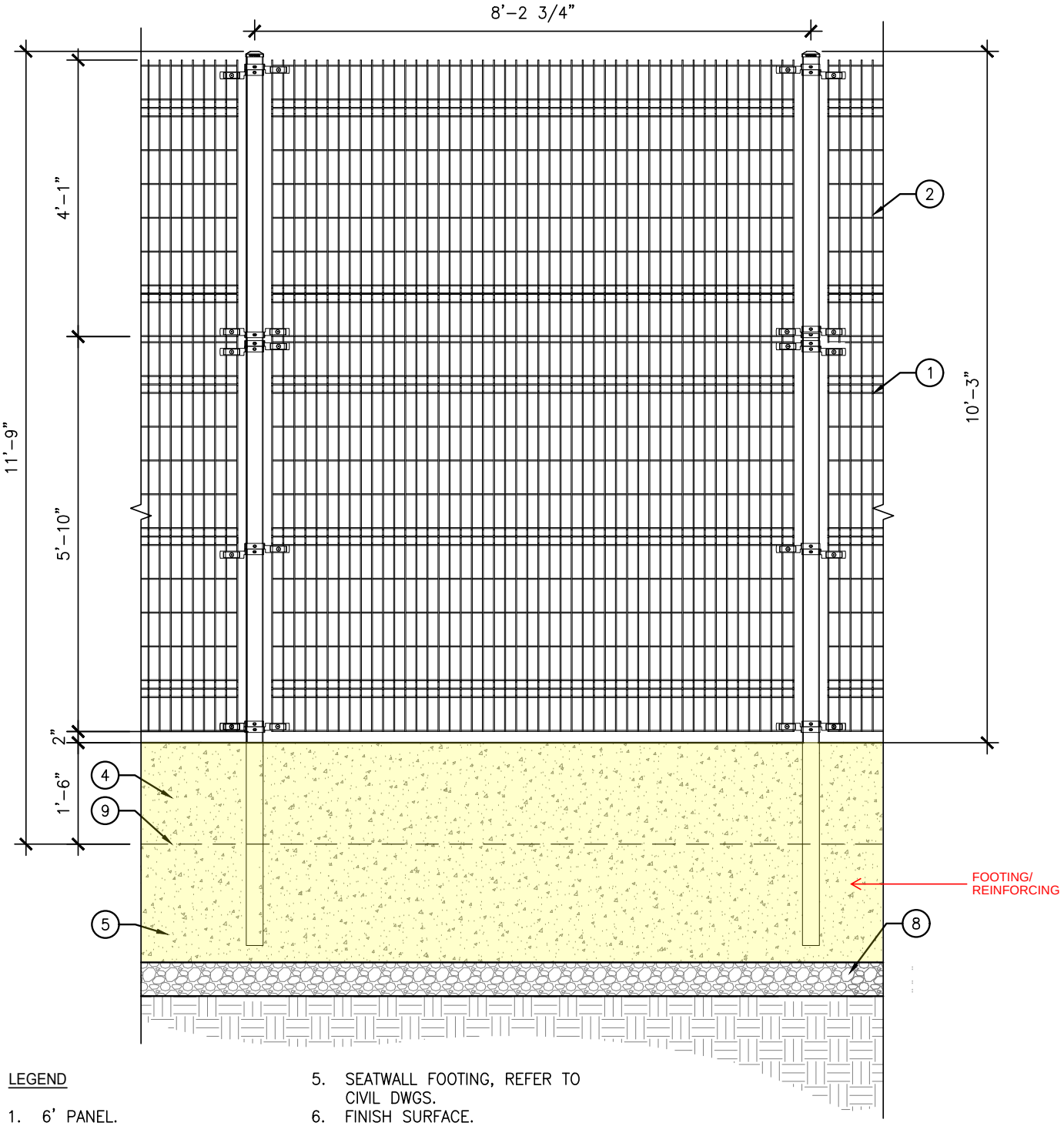
Seismic:
Sds = 1.491
Wp = 6/12*150 = 75
Fp = .4*ap*Sds/(Rp/Ip)*(1 + 2*z/H)*Wp
= .4*2.5*1.491/(2.5/1) * 75 = .60Wp = 11.52
Wp = 11.52/.6 = 19.2 psf.
The fence is not more than 18psf.

ASD DESIGN PRESSURE = 11.52PSF
FORCE = 11.52*10*10.25 = 1181 @ 5.125

Constrained Cylindrical footing	
Equation 18-2 of CBC	
dtrial	5
lateral bearing pressure:	400
lateral bearing pressure with 1/3 increase:	533.3333
P	1181
h	5.125
S3	2000
b	1.5
d =	2.93

FOOTING CAN BE 5FT DEEP X 18" IN DIAMETER.

6.12ft high fence post with spread footing

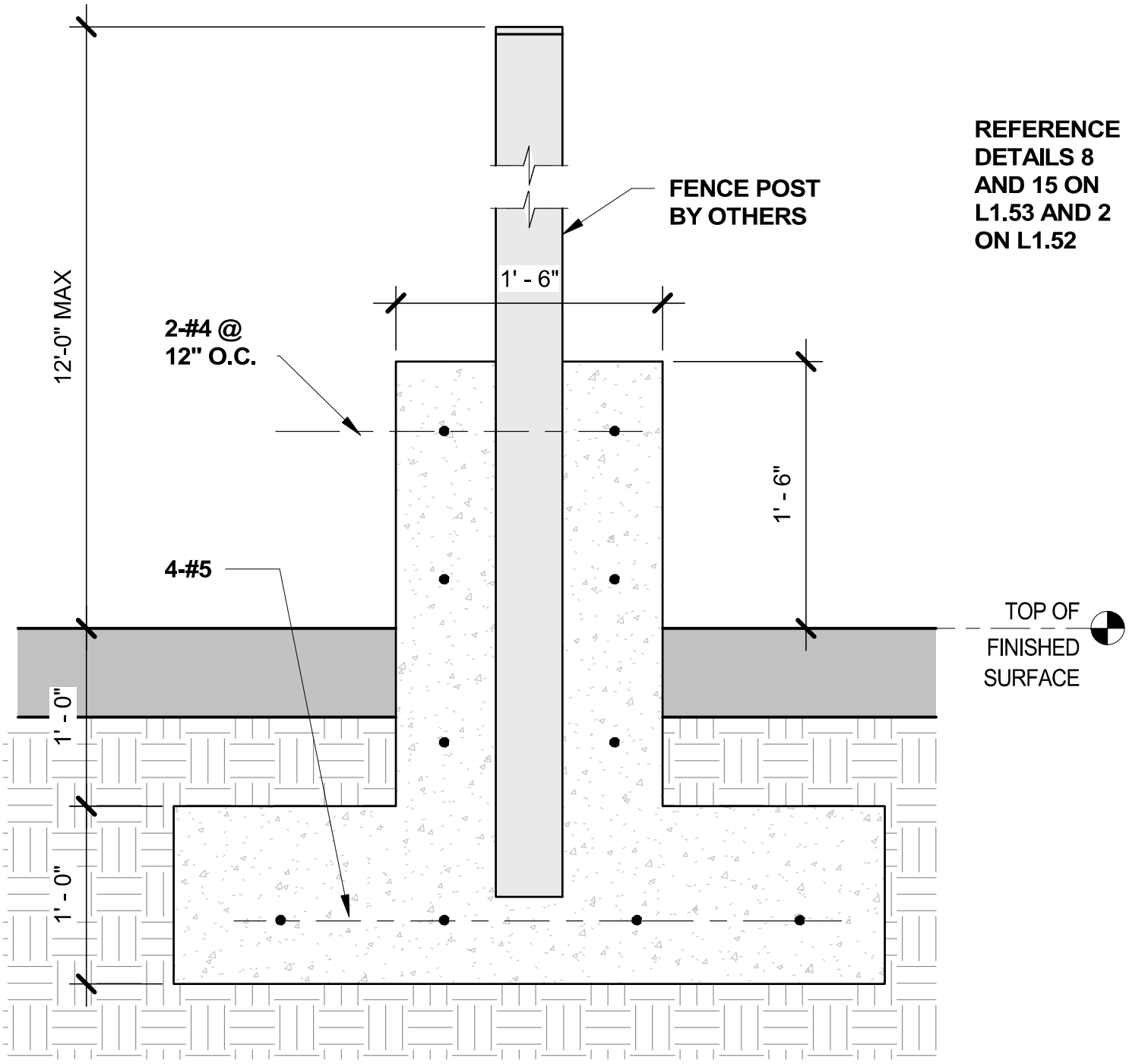


LEGEND

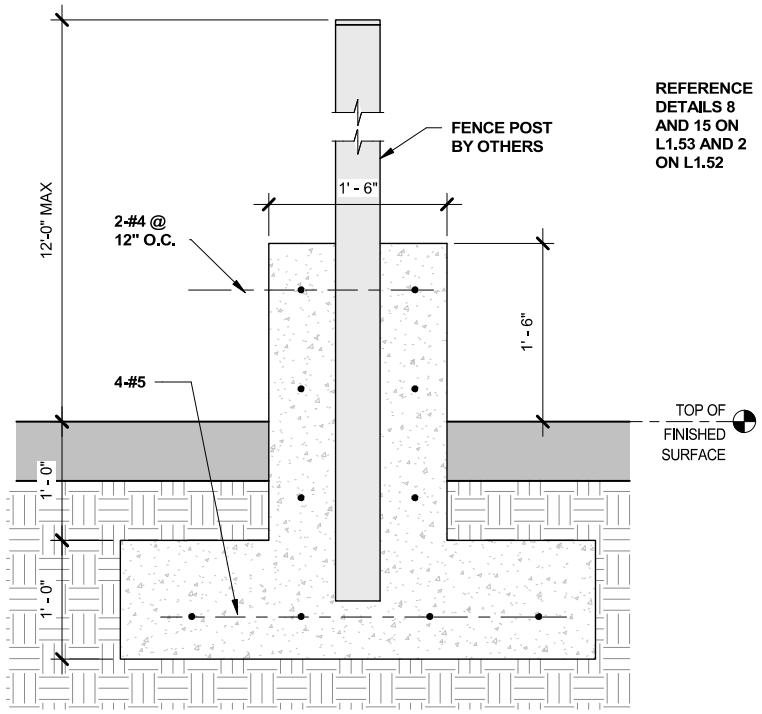
1. 6' PANEL.
2. 4' PANEL.
3. 10'3" HIGH GALVANIZED STEEL SQUARE TUBE POST.
4. SEATWALL.
5. SEATWALL FOOTING, REFER TO CIVIL DWGS.
6. FINISH SURFACE.
7. FOOTING, REFER TO CIVIL DWGS.
8. 6" AGGREGATE BASE.
9. FINISH SURFACE BEYOND.

15 10' HIGH OMEGA FENCE

SCALE: 3/4" = 1'–0"



7 FENCE AT SEATWALL
1" = 1'-0"



7 FENCE AT SEATWALL
1" = 1'-0"

Lateral load:

Wind:
q = .00256*KzKztKd*V^2 - .00256*.85*1.0*.85*95^2 = 16.7psf

s/h = 1.0
B/s = 5
Cf = 1.35
G = .85

P = 16.7*1.35*.85 = 19.2 psf
ASD: 0.6*19.2 = 11.52

Force = 11.52*12 = 138#/ft
M overturning = 138*6 = 829

Weight = 1.5*2.5*150 + 1*150*L

Overturning:

M ot =	829
L =	3.5
Weight =	1087.5
06P =	652.5
Mres =	1142

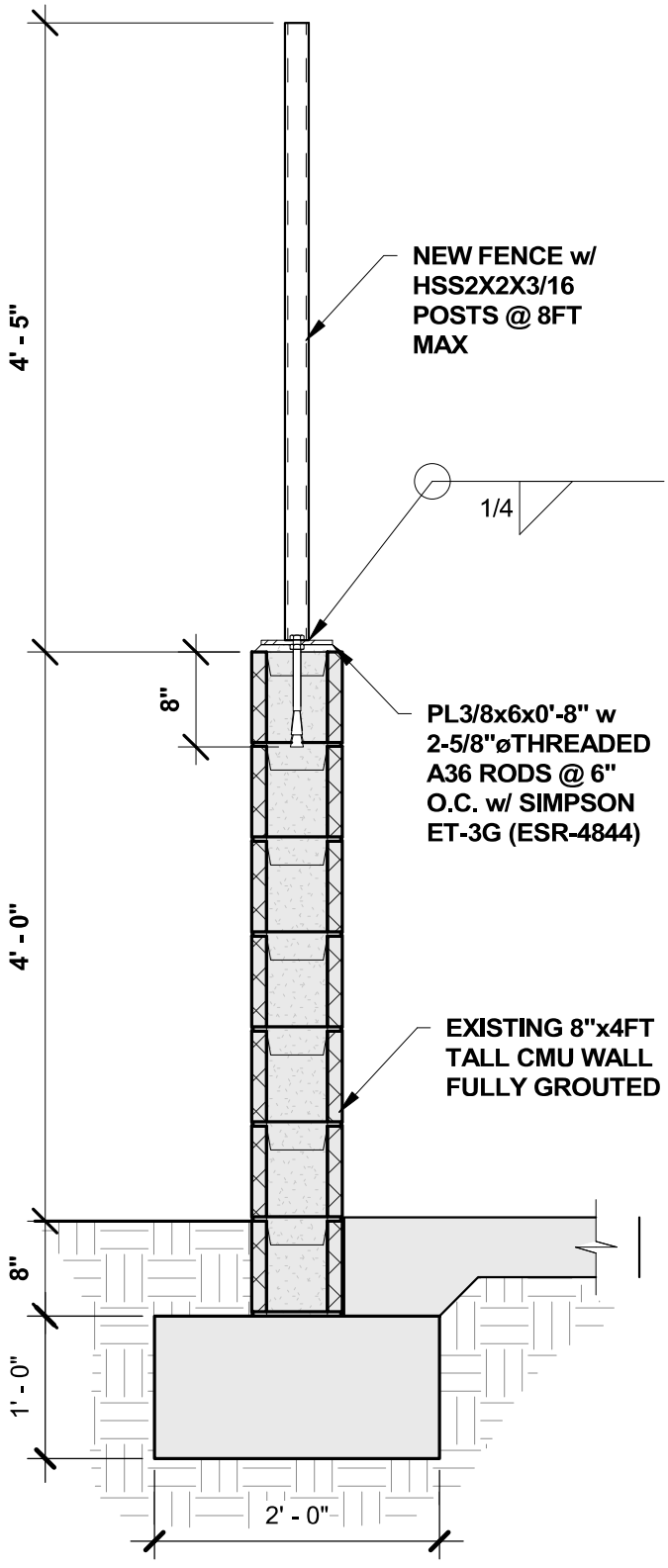
M resist > M overtuting. Make footing 3.5ft wide.

Bearing:

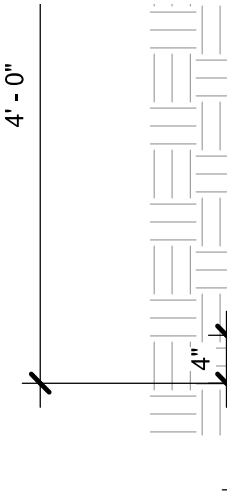
M ot =	829
L =	3.5
Weight =	1087.5
06P =	652.5
Mres =	1142
e =	1.270498
a =	0.479502
Pressure =	907.1914

Siding:
Lateral force = 138#/ft
Passive pressure = (0+2*200)/2 = 200psf = 400#/ft > 138#/ft

7 New Fence on Existing CMU Wall



26 STAND ALONE CMU PLANTER WALL ADJACENT TO CONCRETE
3/4" = 1'-0"



15 DOUBLE SLID
3/4" = 1'-0"

Lateral load at top of footing

Seismic:
Sds = 1.491
Wp = 6/12*150 = 75
Fp = .4*ap*Sds/(Rp/Ip)*(1 + 2*z/H)*Wp
= .4*2.5*1.491/(2.5/1) * 84 = .60Wp = 50.4 psf
ASD: 0.7E = 35.3psf for Masonry
For fence with Wp = 10psf
0.7E = 3.6 psf for Fence
Force = 3.6*4.4 + 35.3*4.66 = 164.5#/ft
M = = 35.3*4.66^2/2 + 3.6*4.4*(4.66+4.4/2) = 492 <= controls

Wind:
q = .00256*KzKztKd*V^2 - .00256*.85*1.0*.85*95^2 = 16.7psf

s/h = 1.0
B/s = 5
Cf = 1.35
G = .85

P = 16.7*1.35*.85 = 19.2 psf
ASD: 0.6*19.2 = 11.52
Force = 8.4*11.52 = 97
M = 97*8.4/2 = 406

Lateral load at top of wall

Seismic will not govern because fence is light.

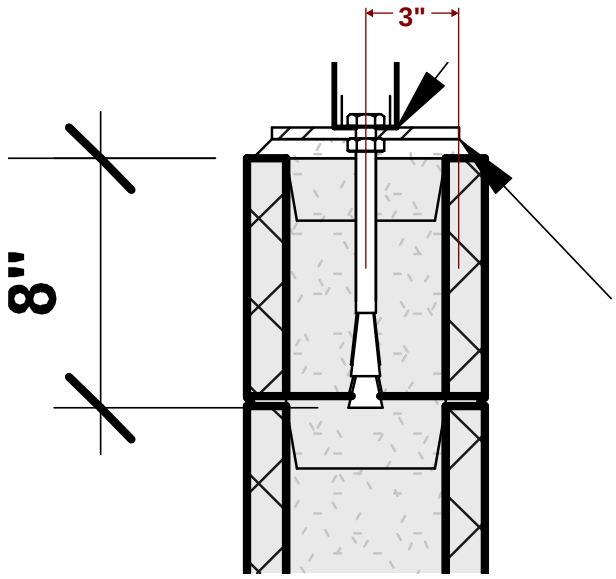
Wind:
q = .00256*KzKztKd*V^2 - .00256*.85*1.0*.85*95^2 = 16.7psf

s/h = 1.0
B/s = 5
Cf = 1.35
G = .85

P = 16.7*1.35*.85 = 19.2 psf
ASD: 0.6*19.2 = 11.52
Force = 4.4*11.52 = 51
M = 51*4.4/2 = 112#/ft = 892#-ft/psot

M = 892#-ft = .892kip-ft = 10.7 kip-in/post

CHECK ANCHORAGE
R = 10.7/3/2/.6 = 3.57 kip/2 bolts = 1.78 kips/ bolt > 2.22kips per following page



CHECK PLATE

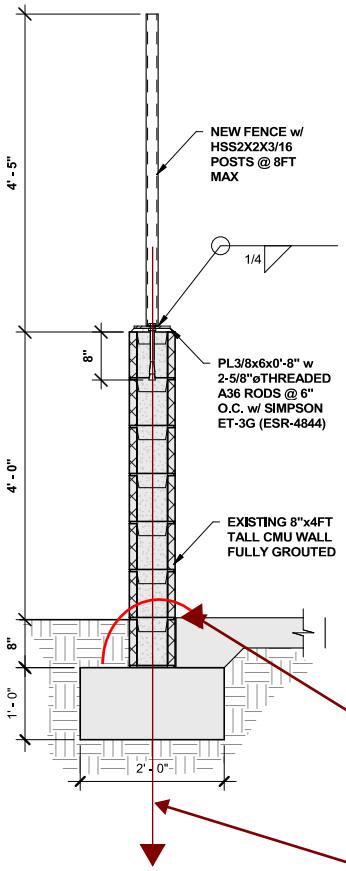
M = 10.7
z = 10.7*1.67/36 = .49
b = 8, d = .41

CHANGE PLATE TO 1/2" ON DRAWINGS.

CHECK HSS SECTION
Z = 10.7*1.67 / 46 = .388

HSS2x2x3/16 HAS THIS.

CHECK WELD FROM HSS TO PLATE: S = 2^2*4/3 = 5.33
rw = 10.7/5.33= 2.06
Rw/oMEGA = .3&70*.25/(2^.5) = 3.71



M = 492#-ft/ft

Wtg = 84*4.66+1*L*150 + 1.33*.66*100 = L*150 + 479

Per 1605.2.1 of CBC

Critical Load Combination can be 0.9D + E/1.4 = 0.9D + .714E

Footing Bearing Pressure:

P = .9D = .9*779 = 701
M = 492*.714/.7 = 501#-ft

M ot =	502
L =	2
Weight =	779
0.9P =	701.1
e =	0.716
a =	0.284
Pressure =	1646

L = 2ft

Allowable pressure = 2000psf per soils report

Overturning

M ot = 501#-ft

M resistance = 701#*2/1 = 701#-ft

Mresistance > M ot.

Sliding

Lateral Force = 165#*.714/.7 = 168#

0.9Weight = 701

Friction resistance = 0.3*701 = 210#

Friction is greater than force

Tensile Strength of an Anchor Bolt

Anchor Bolt Used:	5/8	KB TZ: ICC 1917
f'_c =	2000	STRONG BOLT 2: ICC 3037
Embedment in field, hef:	8	SIMPSON SET XP: ICC 2508 LARR 25744
1.5hef =	12	
Min spacing of anchor bolts =	6	put 12 if only one anchor
is the concrete light weight ?	no	
Is the anchor within 1.5hef from three or more sides?	no	
is the anchor post-installed?	yes	
is the anchor utilizing adhesive?	yes	
is the anchor designed for uncracked concrete only?	no	always say no
is there supplementary reinforcing controlling splitting?	no	as far as I know, this is only concerned with Ψcp,N
is reinforcing developed on both sides of the breakout surface?	no	
are these anchors resisting seismic forces?	no	
is there a plate at the embeded end of an anchor?	no	if yes, then need to adjust width and length of Anc
if there is a plate, what is the side dimension, assuming a square?	0	put 0 if no plate.
is the anchor being installed into the underside of a metal deck?	no	
e'_N =	0	This is the eccentricity of the force relative to the center of anchorage.
ca1 =	3.81	For tension conditions, ca1 is the smallest distance to an edge.
ca2 =	15	For shear conditions, ca1 is the distance to an edge in the direction of the shear.
ca3 =	12	ca2 is the distance to the edge that is perpendicular to ca1.
ca4 =	12	
ca,max =	12	
ca,min =	3.81	
c_{ac} **=	32	this is for post installed anchors only, where its an uncracked condition, which won't happen.
Embedment for design, hef:	8	

			$A_{se,N\ ICC}$			futa	
Steel Strength in Tension		ø	Hilti KBTZ	Strong Bolt 2	Set XP	Hilti KBTZ	Simpson SB2
Anchor diameter:	0.625	1/4"		0.0255			120
$A_{se,N\ CALC'D}$ =	0.307	3/8"	0.052	0.0514	0.078	115	100
$A_{se,N\ ICC}$ =	0.226	1/2"	0.101	0.105	0.142	115	115
$A_{se,N\ DESIGN}$ =	0.226	5/8"	0.162	0.166	0.226	115	108
Number of anchors ,n =	1	3/4"	0.237	0.27	0.334	105	95
futa =	36						
D5.1 Nsa =	8.14						
ϕ =	0.80	This value is always 0.8.					
ϕNsa =	6509 #						

Concrete Breakout Strength in Tension

Ψed,N =	1	
Ψc,N =	1	1.0 for regions of cracking, 1.25 for cast-in anchors with no cracking, 1.4 for post installed anchors with no cracking.
Ψcp,N =	1	Ψc,N is never going to be anything but 1.0 because cracking is alsways assumed. Therefore,
Ψec,N =	1	Ψcp,N will always be 1.0.
width of allowable breakout area*:	7.625	
length of allowable breakout area*:	15	
A_{Nc} =	114.375	
A_{Nco} =	576	17.6.2.1.4
* max value is 3*hef =	24	
k_c =	17	get this from icc report based on 355.2
λ =	1	
λa =	1	ACI318-19
Nb =	17203	17.6.2.2.1
Nb =	22897	16.6.2.2.3 only for cast in bolts where hef>11 and hef< 25
Ncb =	3416	17.6.2.1a
Ncbg =	3416	17.6.2.1b
Condition:	B	Condition A is where you have supplementary reinforcement that is present, but not for pullout or pryout strengths
Category:	low	low sensitivity to installation /medium/high
step 1 ϕ1 =	0.75	
step 2 ϕ2 =	0.65	
fina ϕ =	0.65	
ϕNcb =	2220 #	
ϕNcbg =	2220 #	
0.75ϕNcb =	-- #	
0.75ϕNcbg =	-- #	

2220#/ bolt

Concrete Pullout Strength in Tension

Ψc,P =	1	1.0 for regions of cracking, 1.4 for regions with no cracking.
Post Installed Anchor		
Np =	50000	Get from ICC report per 355.2 for post-installed
ϕNpn =ϕΨc,P Np=	32500	expansion and undercut anchors

Headed Stud	
Bolt Diameter:	0.625
A_{shank} =	0.307
Diameter of head =	1.25
Area of Head =	1.227
A_{brg} =	0.920
Np =	14719
ϕNpn =ϕΨc,P Np=	10303
Typical Bolt	
A_{brg} =	0.920
Np =	14719 #
ϕNpn =ϕΨc,P Np=	10303 #

cac**:critical edge distance required to develop the basic concrete breakout strength of a post-installed anchor in uncracked concrete without supplementary reinforcement to control splitting. 0

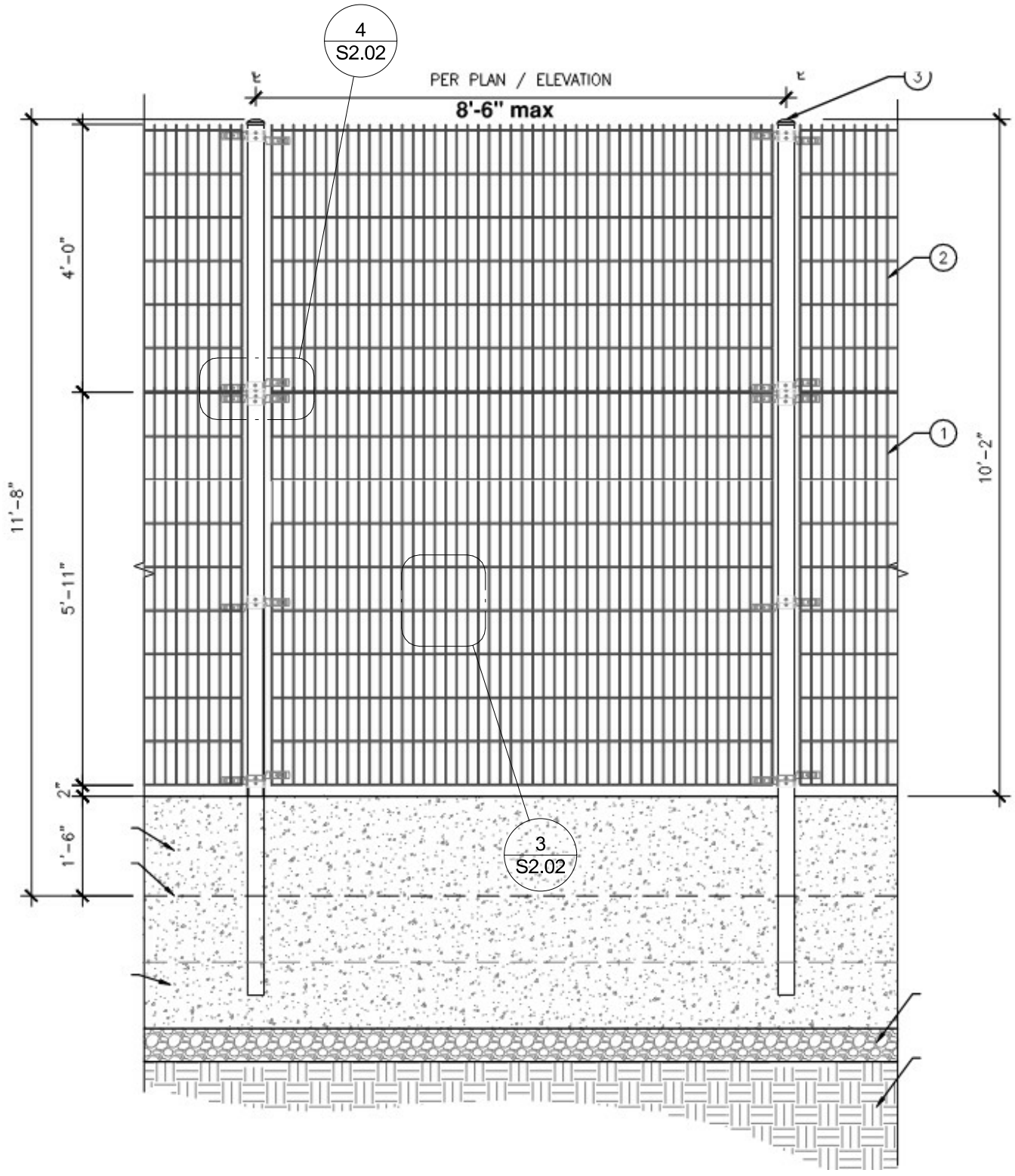
Bond strength of adhesive anchor in tension

				HILTI		SIMPSON	
				500 RE		SET XP	
				ESR-2322		ESR-2508	
hef =	8		ø	τcr	τuncr	τcr	τuncr
da =	0.5		3/8"	770	1590	1025	1330
τcr =	750	Need this from ESR.	1/2"	740	1570	880	1985
τuncr =	1830		5/8"	740	1505	750	1830
λ =	1		3/4"	700	1455	665	1670
λa =	1		7/8"	645	1405	610	1525
Nba =	22985		1"	600	1355	595	1360
cNa =	6.4		1¼"	510	1230	595	1070
Width of Area =	7.63						
Length of Area =	12.898203						
Ana =	98.3						
ANao =	166.4						
e'N =	0						
Ψec,Na =	1						
ca, min =	3.81						
Ψed,Na =	0.88						
Ψcp,Na =	1	Ψcp,Na will always be 1.0 because we have to assume a cracked condition					
Na =	11920						
ϕ =	0.65						
ϕNa =	7748	#					
Min tensile Strength =	6509	#					

Table 3.2. Anchor Rod Concr

Rod Diameter, in.	Rod Area, A_r, in²	Bearing Area, in²
⅝	0.307	0.689
¾	0.442	0.906
⅞	0.601	1.22
1	0.785	1.50
1⅛	0.994	1.81
1¼	1.23	2.24
1½	1.77	3.13
1¾	2.41	4.17
2	3.14	5.35
2¼	3.98	6.69
2½	4.91	8.17
2¾	5.94	9.80
3	7.07	11.4
3¼	8.30	13.3
3½	9.62	15.3
3¾	11.0	17.5
4	12.6	19.9

8 Fence design



2 FENCE ELEVATION
N.T.S

Lateral load:

Seismic:
Weight of fence is very light. Wind governs.

Wind:
q = .00256*KzKztKd*V^2 - .00256*.85*1.0*.85*95^2 = 16.7psf

s/h = 1.0
B/s = 5
Cf = 1.35
G = .85

P = 16.7*1.35*.85 = 19.2 psf
ASD: 0.6*19.2 = 11.52

Wire shall resist 50% of their trib weight, based on drag. Fence, in fact, quite open.

ASD: 11.52*50% = 5.76psf

Fence spanning from left to right per detail 3/S2.02.

Horizontal wires are at 8" o.c.

w = 8/12*5.76 = 3.84#/ft

Horizontal wires are at 8" o.c.

w = 8/12*5.76 = 3.84#/ft

Span = 8.25ft

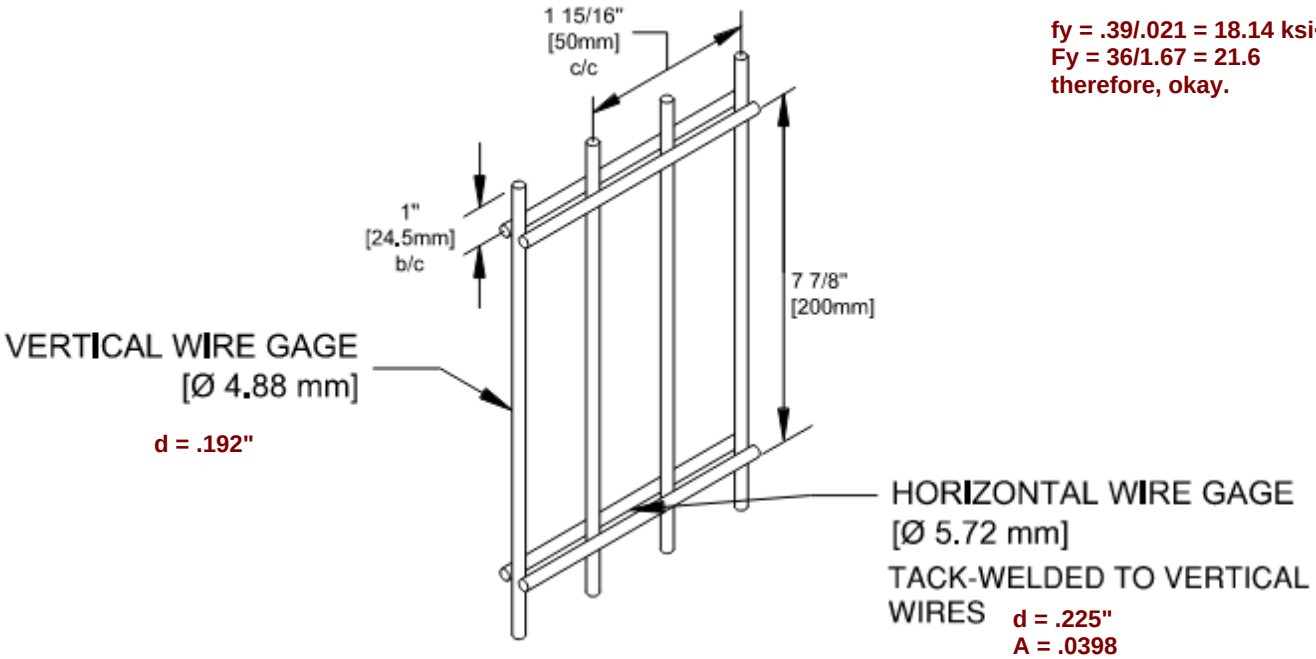
M = 8.25^2/8*12/1000 = .39 kip-in

Fy Wire =

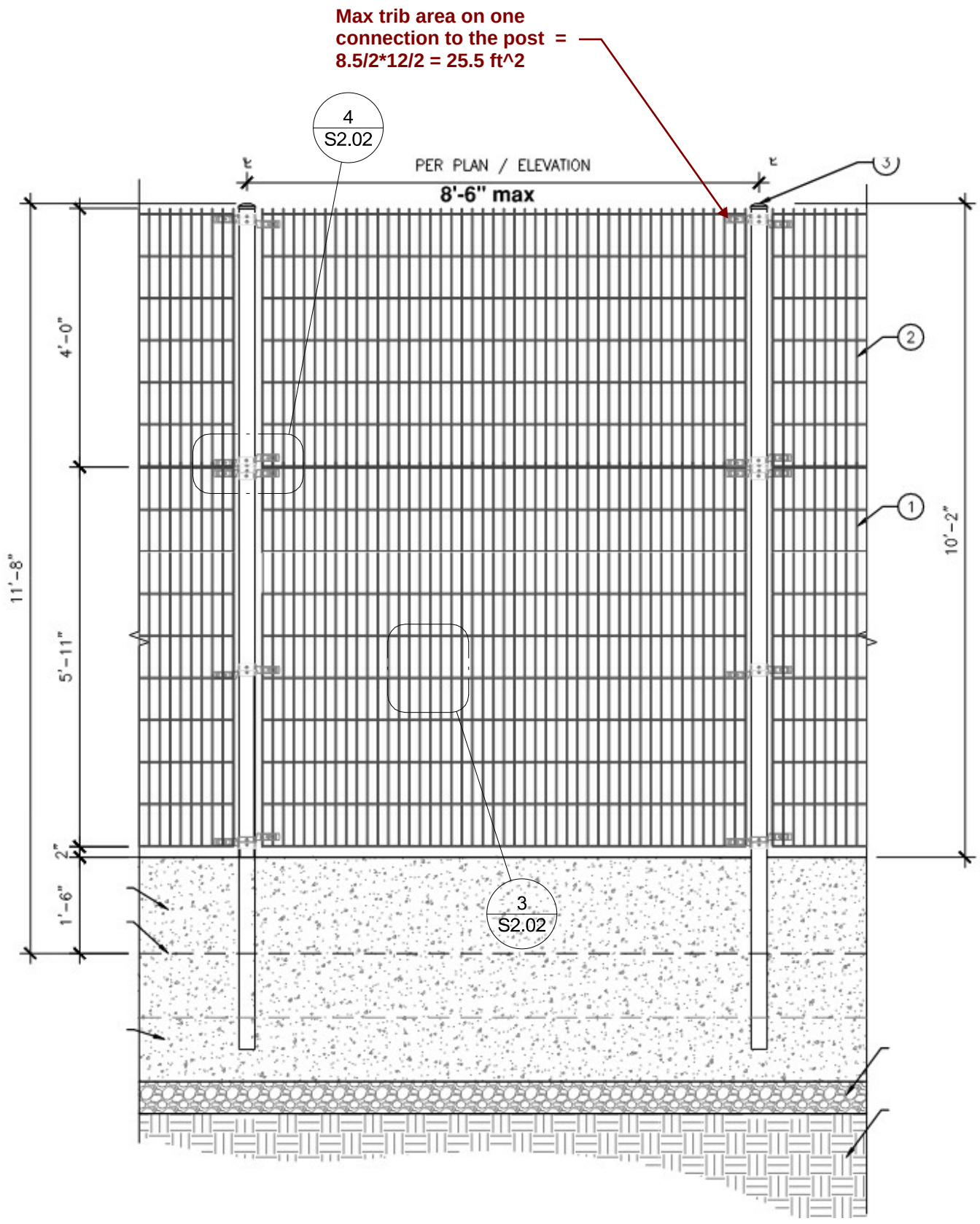
A = .0398

d' = .192 + .225= .417
I = .0398*.417^2 = .0069
S = .0069/(.192/2+.225)
= .021

fy = .39/.021 = 18.14 ksi<
Fy = 36/1.67 = 21.6
therefore, okay.



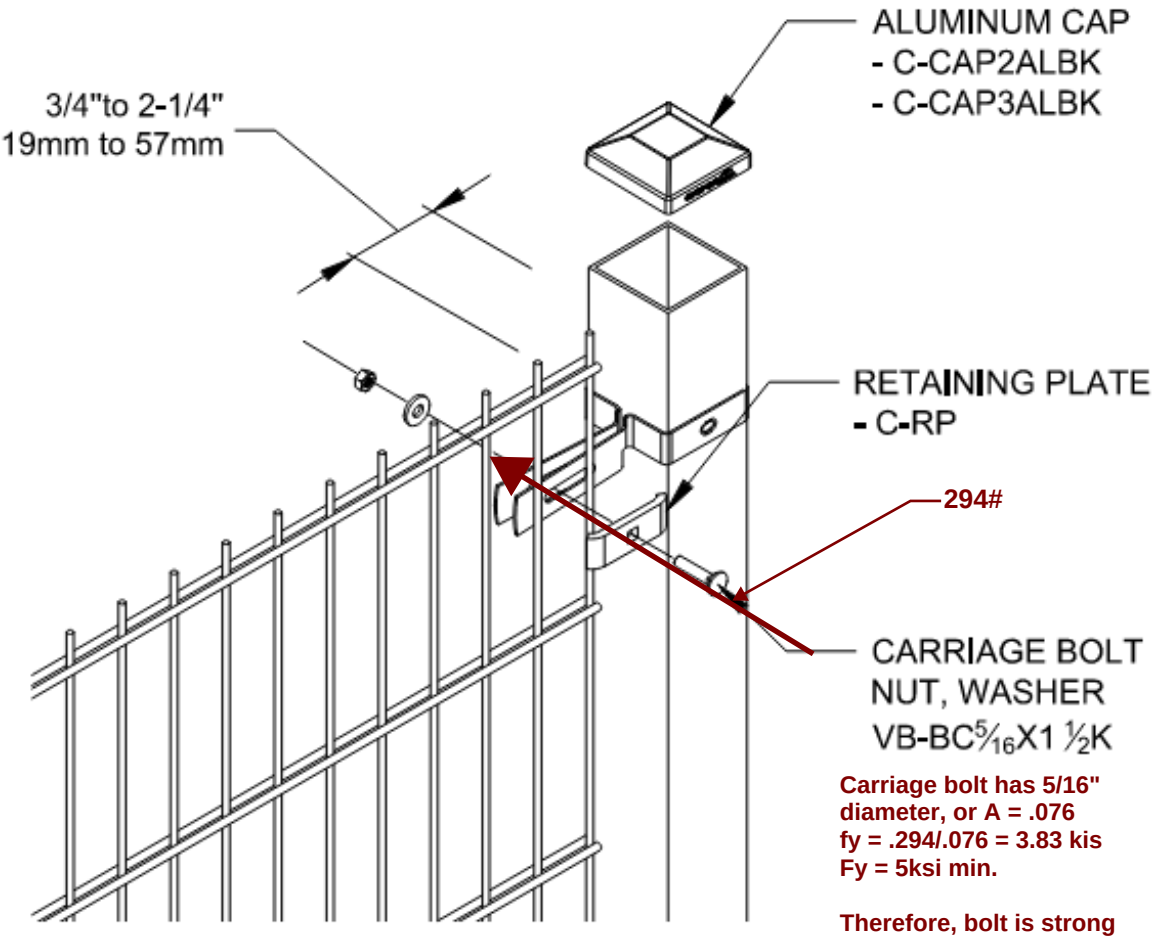
3 FENCE DETAIL
N.T.S



2 FENCE ELEVATION
N.T.S

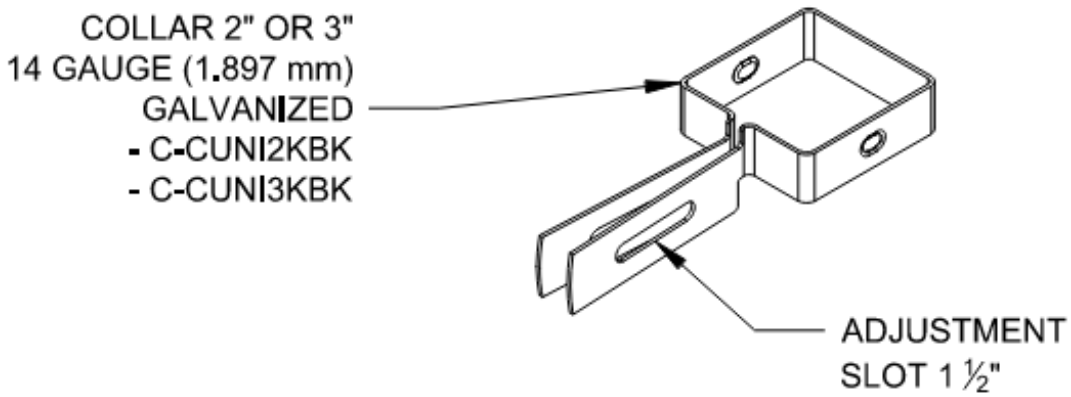
Max trib area on connection = 25.5psf
Wind force = 11.52psf

Force = 25.5*11.52 = 294#

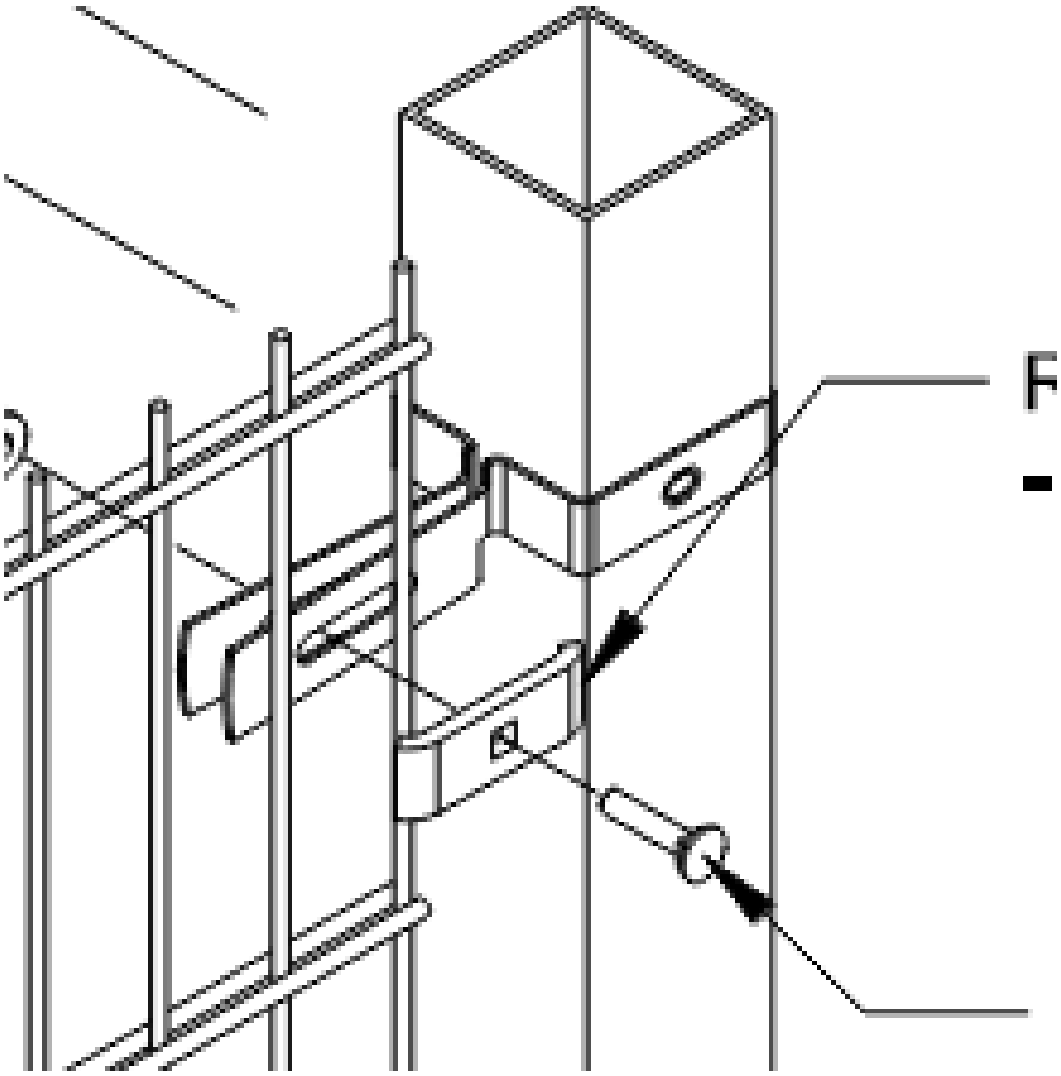


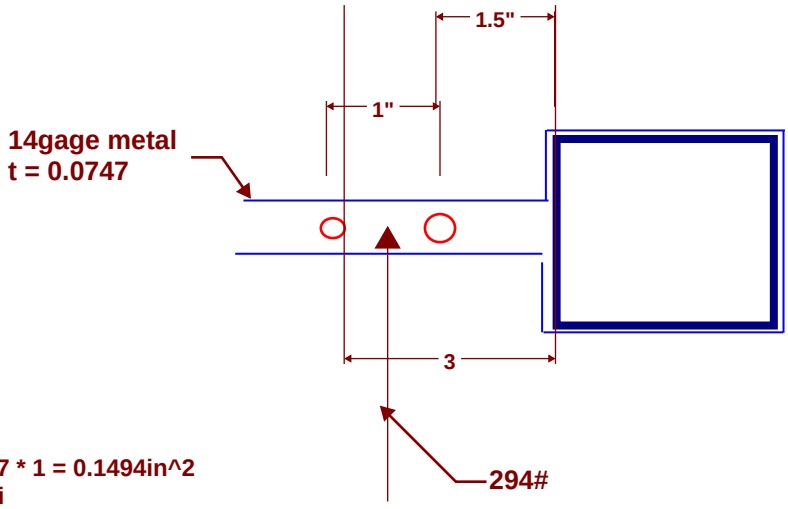
Carriage bolt has 5/16" diameter, or A = .076
fy = .294/.076 = 3.83 kis
Fy = 5ksi min.

Therefore, bolt is strong enough



4 FENCE CONNECTION TO POST
N.T.S





V = 294#
A = 2 * .0747 * 1 = 0.1494in^2
fv = 1.97 ksi

Fv = 36/2 = 18 ksi

While the steel will likely bend a bit, it will not shear, and the fence mat will continue to be supported.

EXHIBIT D
LID Report
&
ATTACHMENT I
Geotechnical Report

PRELIMINARY LOW IMPACT DEVELOPMENT REPORT (PLID)

FOR EL SEGUNDO RECREATION TEEN CENTER AND PLAZA
405 E. GRAND AVENUE, EL SEGUNDO, CA 90245

PREPARED FOR:
City of El Segundo
350 Main Street
El Segundo, CA 90245

PREPARED BY:
BKF ENGINEERS
4675 MacArthur Court, Suite 400
Newport Beach, CA 92660
(949) 526-8460

PREPARED:
June 2025

REVISED:
November 2025

Bruce Kirby, PE
R.C.E. No. 42393

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APPENDIX D – HYDROCALC OUTPUT - 85TH PERCENTILE STORM

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APPENDIX G – BMP OPERATIONS & MAINTENANCE MANUAL

APPENDIX H – COVENANT AND AGREEMENT

APPENDIX I – GEOTECHNICAL REPORT (FOR REFERENCE ONLY)

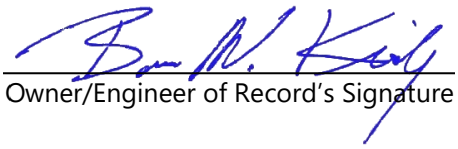
OWNER'S CERTIFICATION

This Low Impact Development Report (LID) for El Segundo Teen Center and Teen Plaza Project was prepared for the City of El Segundo by BKF Engineers. This LID Report is intended to comply with the requirements of the City of El Segundo, County of Los Angeles, requiring the preparation of a project specific LID Report.

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for the gathered information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Los Angeles County Stormwater Quality Management Plan (SWQMP), and the intent of the stormwater and urban runoff NPDES Permit and Waste Discharge Requirements for the County of Los Angeles, Los Angeles County Flood Control District and the incorporated Cities of Los Angeles County under the jurisdiction of the Los Angeles Regional Water Quality Control Board. A copy of this LID Report will be maintained at the project site/office.

This LID Report will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party having responsibility for implementing portions of this LID Report. At least one copy of the approved and certified copy of this LID Report shall be available on the subject property in perpetuity. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the LID Report.



Owner/Engineer of Record's Signature

BKF Engineers

Company

Bruce Kirby, P.E. , Associate Principal

Printed Name/Title

4675 MacArthur Court, Suite 400
Newport Beach, CA 92660

Company Address

(949) 526-8460

Telephone No.

11/14/2025

Date

1.0 INTRODUCTION

This Low Impact Development Report (LID) summarizes storm water protection requirements for the El Segundo Recreation Teen Center and Teen Plaza Project (herein referred to as "the project").

This LID Report describes the permanent storm water Best Management Practices (BMPs) that will be incorporated into the project in order to mitigate the impacts of pollutants in storm water runoff from the proposed project. For the purposes of post-construction storm water quality management, the project will follow the guidelines and requirements set forth in the County of Los Angeles "Low Impact Development Standards Manual" dated February 2014 (herein "LID Manual").

Project Applicant: MIG
360 East Second Street, Suite 675
Los Angeles, CA 90012

1.1 SITE AND PROJECT DESCRIPTION

The subject site is located in El Segundo, California. The proposed site is located on El Segundo Teen Center on Grand Avenue between Arena Street and Sheldon Street. The project is bounded by a slope and parking lot to the north, Grand Avenue to the south, a driveway and restaurant to the east, and the El Segundo Scout House to the west. The 0.39-acre site is currently occupied by an existing skate park and recreation building with a basement that will be renovated. The proposed project will consist of:

- Removal of asphalt and concrete pavement, fencing, skate park, and landscaping
- Construction of a new skate park, basketball court, accessible parking and walkways, and bike racks
- Installation of a storm drain system with infiltration vault located off-site

The existing development is generally flat, but slopes to the north and west and has an average slope of 5% slope. Infiltration is feasible for this project as it has an infiltration rate of 2.49 in/hr.

1.2 LOW IMPACT DEVELOPMENT STRATEGIES AND GOALS

The LA County LID guidelines aim to reduce and/or eliminate the altered project area of the post-development hydrograph by reducing the peak discharge rate and volume using site design and stormwater quality control measures and conducting trash capture. The benefits of reduced stormwater runoff volume include reduced pollutant loadings and increased groundwater recharge and evapotranspiration rates.

The LID strategy used to address the stormwater management goals of the county include the installation of an ADS StormTech SC-310 infiltration chambers that will serve to mitigate peak flows and infiltrate design storm water volume for the developed site and ADS Connector Pipe Screens for trash capture.

2.0 DESIGNATED PROJECT REQUIREMENT

Requirements for permanent BMPs are determine based on the criteria set forth in the LID Manual. Projects are identified by four categories:

- Designated Project
- Non-Designated Project
- Small-Scale Non-Designated Project
- Large-Scale Non-Designated Project

2.1 DETERMINATION FOR PERMANENT BMP REQUIREMENT

The project is considered a "Designated Project," based on the LID Manual. The project meets the following requirements to be a Designated Project:

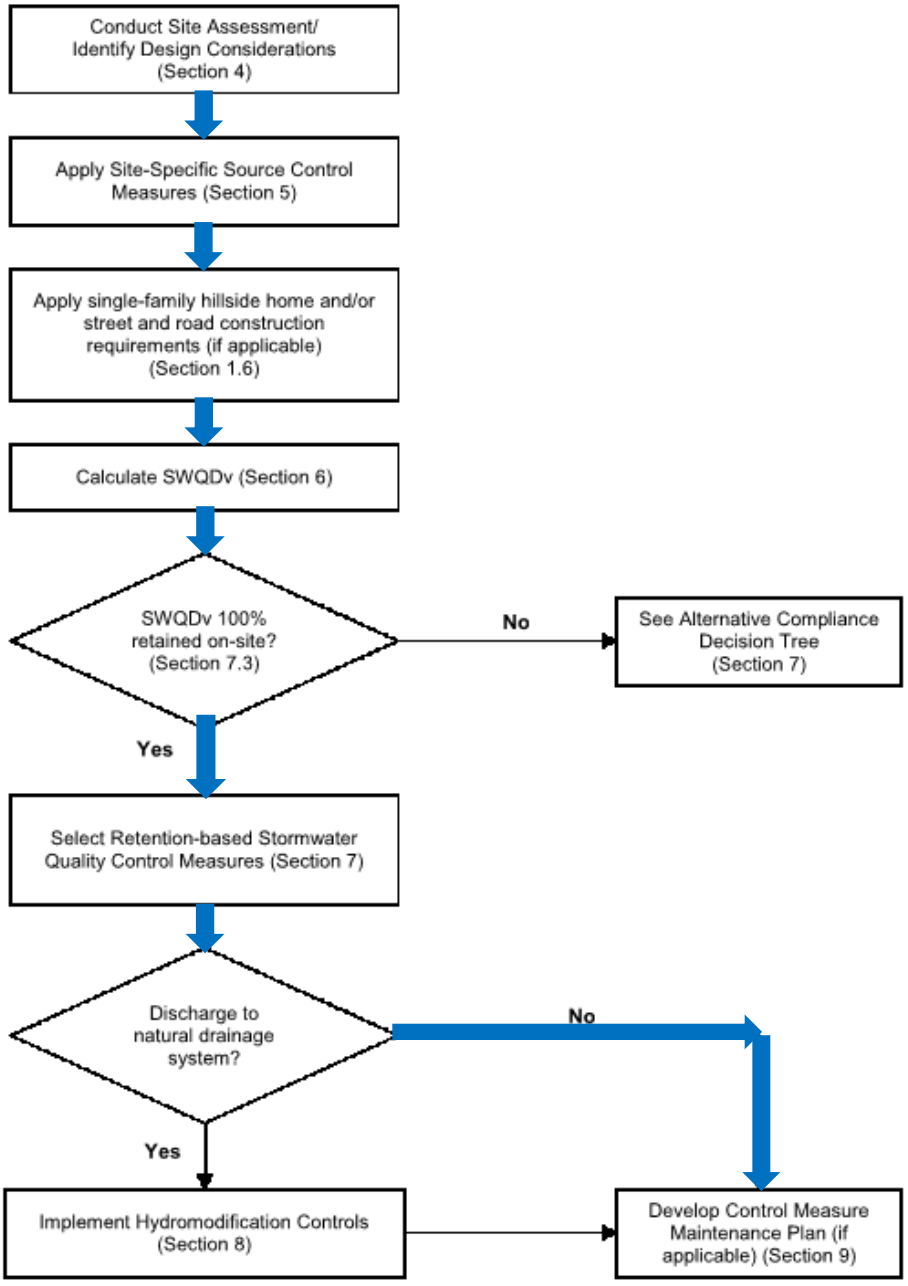
- Redevelopment projects, which are developments that result in creation or addition or replacement of either: (1) 5,000 square feet or more of impervious surface on a site that was previously developed; or (2) 10,000 square feet or more of impervious surface area on a site that was previous developed as a single-family home.

All "Designated Projects" must retain 100 percent of the Storm Water Quality Design Volume (SWQDv) on-site through infiltration, evapotranspiration, stormwater runoff harvest and use, or a combination thereof unless it is demonstrated that it is technically infeasible to do so.

Based on the geotechnical investigation, infiltration is feasible as the site has an infiltration rate of 2.49 in/hr. The proposed project will use ADS StormTech SC-310 chamber infiltration system for infiltration and ADS Connector Pipe Screens for trash capture.

See Section 5.0, Section 6.0 and Appendix E for more information and calculations.

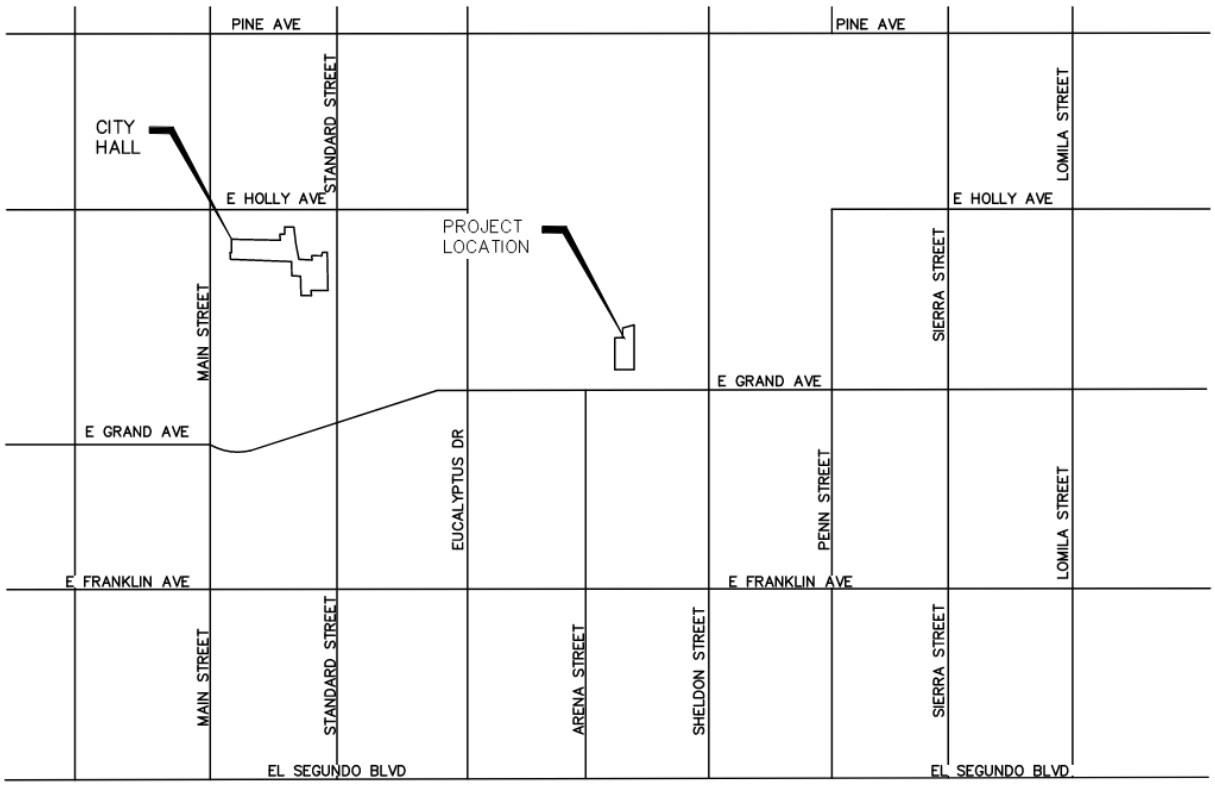
2.2 DESIGN PROCESS CHART BREAKDOWN



3.0 SITE ASSESSMENT AND DESIGN CONSIDERATIONS

This section discusses the steps taken for assessing the project site conditions and identifying design considerations to determine appropriate stormwater quality control measures for the project.

3.1 VICINITY MAP



3.2 PROJECT SUMMARY INFORMATION

PRE-PROJECT

The existing land use for the project is an existing recreation center building with a parking lot, skate park, basketball court, and landscaping. The northern side of the project site is a slope with stairs to an adjacent parking lot that serves both this project and parks nearby. There are no offsite drainage areas that discharge storm water onto the project site in the pre-project condition.

The existing site is generally flat, but slopes to the north and west with an average slope of 5%. Stormwater south of the existing recreation center at the parking lot surface flows offsite into the gutter along Grand Avenue. Stormwater to the west and north of the building surface flows to an area drain that flows down to a curb outlet at an adjacent parking lot to the north. This offsite curb outlet then flows over the surface to an offsite valley gutter which intersects Eucalyptus Drive.

POST-PROJECT

In the post-project conditions, the project site consists of a renovated building along with associated improvements include accessible walkways, landscaping, underground utilities, and an ADS StormTech SC-310 stormwater infiltration chambers system with ADS Connector Pipe Screens for trash capture.

SUMMARY OF IMPERVIOUS AREAs

Condition	Impervious Area Acres (SF)	Pervious Area Acres (SF)	Percent Impervious (%)
Pre-Project	0.39 (17,041)	0 (0)	100%
Post-Project	0.39 (16698)	0.006 (290)	98%

3.3 WATERSHED

The proposed development is located within the San Gabriel Watershed, located within Region 4 – Los Angeles Regional Water Quality Control Board (LARWQCB). Surface flow from the project enters the municipal storm drain system and ultimately discharges into the Pacific Ocean.

Region:	Los Angeles Regional Water Quality Control Board (LARWQCB)
Receiving Water:	Ballona Creek
Watershed:	Ballona Creek and other Urban Watersheds
303(d) Listing:	DDT, Toxicity, Cadmium, Chlordane, Copper, Lead, PCBs, Silver, Zinc, DDE, PAHs, Indicator Bacteria

3.4 GEOTECHNICAL CONDITIONS

Geotechnical information outlined below was taken from the Geotechnical Evaluation by Converse Consultants dated November 12th, 2024.

Topography: The project site ranges from 114 feet to 121 feet above mean sea level and surface drainage sheet flows across the existing site to the north and to the west with a 5% slope.

Geologic Setting: Fill soils were encountered in all borings and ranged from approximately 3 to 5 ft. in thickness under concrete and base layer. The fill generally consisted of brown moist silty sand.

Groundwater: Groundwater was not encountered in all borings to 5ft. Fluctuations in groundwater levels may occur due to variations in precipitation, ground surface topography, subsurface stratification, irrigation, groundwater pumping, and other factors that may not have been evident at the time of the field evaluation. According to the groundwater contours compiled by the CDMG (1988), the historical high depth to groundwater is mapped at the site as approximately 2 to 24 ft. below the ground surface.

See Appendix I for additional information.

3.5 GEOTECHNICAL HAZARDS

Geotechnical information outlined below was taken from the Geotechnical Evaluation by Converse Consultants dated November 12th, 2024.

The project site is situated in a seismically active region although not currently designated as a State of California Earthquake Fault Zone. The project site is not located within a potential liquefaction zone per the State of California Seismic Hazard Zones Map. Due to the relatively flat nature of the project site, the risk of lateral spreading is negligible.

See Appendix I for additional information.

3.6 SITE DESIGN PRINCIPLES

Site design can protect sensitive environmental features. The intention of site design principles is to reduce stormwater peak flows and volumes and other impacts associated with land development. The following text discusses the low impact development BMPs outlined in the LID Manual with respect to the project. Italicized text is taken directly from the LID Manual and reproduced for this report. Portions of the italicized text are condensed from the LID Manual. Immediately following and written in regular text, will be the response as it applies to the project.

Site Planning

- *Project applicants must implement a holistic approach to site design in order to develop a more hydraulically-functional site, help to maximize the effectiveness of on-site retention, and integrate stormwater management throughout the project site. Early project site planning can identify physical site constraints, reduce costs of downstream stormwater quality control measures, and prevent potential project site re-design.*

  Response:
  The project site layout conforms to natural landforms.

PROTECT AND RESTORE NATURAL AREAS

- *Conservation of natural areas, soils, and vegetation helps to retain numerous functions of pre-development hydrology, including rainfall interception, infiltration, and evapotranspiration. Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Sensitive areas, such as streams and their buffers, floodplains, wetlands, steep slopes, and highly-permeable soils, should be protected and/or restored. Slopes can be a major source of sediment and should be properly protected and stabilized. Locating development in less sensitive areas of a project site and conserving naturally vegetated areas can minimize environmental impacts from stormwater runoff.*

  Response:
  The project is to protect as much of the existing landscaping as feasible.

MINIMIZE IMPERVIOUS AREA

- *The potential for discharge of pollutants in stormwater runoff from a project site increases as the percentage of impervious area within the project site increases because impervious areas increase the volume and rate of stormwater runoff. Pollutants deposited on impervious areas are easily mobilized and transported by stormwater runoff. Minimizing impervious area through site design is an important method to reducing the pollutant load in stormwater runoff. In addition to the environmental and aesthetic benefits, a highly pervious site may allow reduction of potential downstream conveyance and stormwater quality control measures, yielding savings in development costs. Minimizing impervious area will also reduce the stormwater runoff coefficient, which is directly proportional to the volume of stormwater runoff that must be retained on-site.*

Response:
The project minimizes additional impervious area to the full extent possible.

4.0 SOURCE CONTROL MEASURES

Source control measures are designed to prevent pollutants from contacting stormwater runoff or prevent discharge of contaminated stormwater runoff to the storm drain system and/or receiving water. This section describes structural type, source control measures that will be considered for implementation in conjunction with appropriate non-structural source control measures. The following text discusses the source control measures BMPs from the LID Manual with respect to the project. Italicized text is taken directly from the LID Manual, and reproduced for this report. Portions of the italicized text are condensed from the LID Manual. Immediately following and written in regular text, will be the response as it applies to the project. For more information regarding the Source Control Measures outlined below, see Appendix D from the LID Manual.

S-1: STORM DRAIN MESSAGE AND SIGNAGE

- *Signs with language and/or graphical icons that prohibit illegal dumping, must be posted at designated public access points along channels and streams within the project area. Consult with Los Angeles County Department of Public Works (LACDPW) staff to determine specific signage requirements for channels and streams.*

- *Storm drain message markers, placards, concrete stamps, or stenciled language/icons (e.g., "No Dumping – Drains to the Ocean") are required at all storm drain inlets and catch basins within the project area to discourage illegal or inadvertent dumping. Signs should be placed in clear sight facing anyone approaching the storm drain inlet or catch basin from either side (see Figure D-1 and Figure D-2). LACDPW staff should be contacted to determine specific requirements for types of signs and methods of application. A stencil can be purchased for a nominal fee from LACDPW Building and Safety Office by calling (626) 458-3171. All storm drain inlet and catch basin locations must be identified on the project site map.*

  Response:
  Catch basins for the project shall be marked with "No Dumping – Drains to Ocean".

S-2: OUTDOOR MATERIAL STORAGE

- *Design specifications for material storage areas are regulated by local building and fire codes, ordinances, and zoning requirements. Source control measures presented in the LID Manual are intended to enhance and be consistent with local code and ordinance requirements while addressing stormwater runoff concerns. The design specifications, presented in Table D-2 in the LID Manual, must be incorporated into the design of outdoor material storage areas when stored materials could contribute pollutants to the storm drain system. The level of controls required varies relative to the risk category of the material stored.*

  Response:
  The project does not propose any outdoor material storage areas. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-3: OUTDOOR TRASH STORAGE AND WASTE HANDLING AREA

- *Wastes from commercial and industrial sites are typically hauled away for disposal by either public or commercial carriers that may have design or access requirements for waste storage areas. Design specifications for waste handling areas are regulated by local building and fire codes and by current County ordinances and zoning requirements. The design specifications, listed below in Table D-3, are recommendations and are not intended to conflict with requirements established by the waste hauler. The design specifications are intended to enhance local codes and ordinances while addressing stormwater runoff concerns. The waste hauler should be contacted prior to the design of trash storage and collection areas to determine established and accepted guidelines for designing trash collection areas. All hazardous waste must be handled in accordance with the legal requirements established in Title 22 of the California Code of Regulations. Conflicts or issues should be discussed with LACDPW staff.*

  Response:
  The project site does not propose storage areas for trash compactors. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor trash storage and waste handling will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-4: OUTDOOR LOADING/UNLOADING DOCK AREA

- *Design specifications for outdoor loading/unloading dock areas are regulated by local building and fire codes and by current County ordinances and zoning requirements. Additionally, individual businesses may have their own design or access requirements for loading docks. Design specifications presented in this fact sheet are intended to enhance and be consistent with these code and ordinance requirements while addressing stormwater runoff concerns. The design specifications presented in Table D-4 are not intended to conflict with requirements established by individual businesses, but should be followed to the maximum extent practicable.*

  Response:
  The project does not propose any outdoor loading and unloading dock areas. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-5: OUTDOOR VEHICLE/EQUIPMENT REPAIR/MAINTENANCE AREA

- *Design specifications for vehicle and equipment repair/maintenance areas are regulated by local building and fire codes and by current County ordinances and zoning requirements. The design specifications presented in this fact sheet are intended to enhance and be consistent with these code and ordinance requirements while addressing stormwater runoff concerns. The design specifications required for vehicle and equipment repair/maintenance areas are presented in Table D-5. All wash water and hazardous and toxic wastes must be prevented from entering the storm drain system.*

  Response:
  The project does not propose any outdoor vehicle equipment repair areas, or outdoor vehicle maintenance areas. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-6: OUTDOOR VEHICLE/EQUIPMENT/ACCESSORY WASHING AREA

- *Design specifications for vehicle/equipment/accessory washing areas are regulated by local building and fire codes and current County ordinances and zoning requirements. The design specifications presented in Table D-6 are intended to enhance and be consistent with these requirements while addressing stormwater runoff concerns. All wash water and hazardous and toxic wastes must be prevented from entering the storm drain system.*

  Response:
  The project does not propose any outdoor vehicle equipment areas or outdoor vehicle accessory washing areas. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-7: FUEL AND MAINTENANCE AREA

- *Design specifications for fuel and maintenance areas are regulated by local building and fire codes and current County ordinances and zoning requirements. The design specifications presented in Table D-7 are intended to enhance and be consistent with these code and ordinance requirements while addressing stormwater runoff concerns.*

  Response:
  The project does not propose any fuel and maintenance areas. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-8: LANDSCAPE IRRIGATION PRACTICES

- *Choose plants that minimize the need for fertilizer and pesticides.*
- *Group plants with similar water requirements and water accordingly.*
- *Use mulch to minimize evaporation and erosion.*
- *Include a vegetative boundary around project site to act as a filter.*
- *Design the irrigation system to only water areas that need it.*
- *Install an approved subsurface drip, pop-up, or other irrigation system. The irrigation system should employ effective energy dissipation and uniform flow spreading methods to prevent erosion and facilitate efficient dispersion.*
- *Install rain sensors to shut off the irrigation system during and after storm events.*
- *Include pressure sensors to shut off flow-through system in case of sudden pressure drop. A sudden pressure drop may indicate a broken irrigation head or water line.*
- *If the hydraulic conductivity in the soil is not sufficient for the necessary water application rate, implement soil amendments to avoid potential geotechnical hazards (i.e., liquefaction, landslide, collapsible soils, and expansive soils).*
- *For sites located on or within 50 feet of a steep slope (15% or greater), do not irrigate landscape within three days of a storm event to avoid potential geotechnical instability.*
- *Implement Integrated Pest Management practices*
- *For additional guidelines and requirements, refer to the Los Angeles County Department of Health Services.*

Response:
The project does not propose any irrigation due to the small footprint of each landscaping area.

S-9: BUILDING MATERIAL SELECTION

Lumber

- *Decks and other house components constructed using pressure-treated wood that is typically treated using arsenate, copper, and chromium compounds are hazardous to the environment. Pressure-treated wood may be replaced with cement-fiber or vinyl.*

Roofs, Fencing, and Metals

- *Minimizing the use of copper and galvanized (zinc-coated) metals on buildings and fencing can reduce leaching of these pollutants into stormwater runoff. The following building materials are conventionally made of galvanized metals:*
    - *Metal roofs*
    - *Chain-link fencing and siding*
    - *Metal downspouts, vents, flashing, and trim on roofs.*
- *Architectural use of copper for roofs and gutters should be avoided. As an alternative to copper and galvanized materials, coated metal products are available for both roofing and gutter application. Vinyl-coated fencing is an alternative to traditional galvanized chain-link fences. These products eliminate contact of bare metal with precipitation or stormwater runoff, and reduce the potential for stormwater runoff contamination. Roofing materials are also made of recycled rubber and plastic. Green roofs may be an option. Green roofs use vegetation such as grasses and other plants as an exterior surface. The plants reduce the velocity of stormwater runoff and absorb water to reduce the*

volume of stormwater runoff. One potential problem with using green roofs in the Los Angeles County area is the long, hot and dry summers, which may kill the plants if they are not watered. See the Green Roof Fact Sheet (RET- 7) in Appendix E of the LID Manual.

Response:
Building material selection will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-10: ANIMAL CARE AND HANDLING FACILITIES

- *Site barns, corrals, and pastures on property that drains away from the storm drain system and receiving waters.*
- *Locate animal washing areas, pastures, horse riding areas, stalls, or cages at least 50 feet away from storm drains, domestic wells, septic tank or leach field sites, and receiving waters.*
- *Design berms, gutters, or grassed ditches to divert stormwater runoff away from animal area, storm drain system, and receiving waters.*
- *Cover animal enclosures (i.e., stables) to protect them from precipitation.*
- *Prevent animals from entering sensitive environmental areas.*
- *Regularly sweep or shovel animal holding areas.*

Response:
The project does not propose any animal care or handling facilities. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

S-11: OUTDOOR HORTICULTURE AREAS

- *Do not allow wash water from the horticulture area to drain directly to the storm drain system or receiving waters*

Response:
The project does not propose outdoor horticulture areas. If these conditions change, it is the responsibility of the project site owner/operator to ensure that outdoor materials storage will be designed pursuant to the guidelines outlined above and in the LID Manual.

5.0 STORMWATER QUALITY DESIGN VOLUME CALCULATIONS

Current water quality requirements are based on treating a specific volume of stormwater runoff from the project site (stormwater quality design volume [SWQDv]). By treating the SWQDv, it is expected that pollutant loads, which are typically higher during the beginning of storm events, will be reduced in the discharge to or prevented from reaching the receiving waters.

5.1 DESIGN STORM EVENT

The design storm, for which the SWQDv is calculated, is defined as the greater of:

- *The 0.75-inch, 24-hour rain-event; or*
- *The 85th percentile, 24-hour rain event as determined from the Los Angeles County 85th percentile precipitation isohyet map.*

It was determined that the 85th percentile, 24-hour rain event will be the design storm for which the SWQDv will be calculated for this project site as shown below.

The 85th percentile, 24-hour rain = 0.90 in. > 0.75-inches **[Use 85th percentile]**

Note:
The 85th percentile, 24-hour rain event precipitation was found using the Los Angeles County Hydrology Map GIS Viewer, see Appendix C.

5.2 STORMWATER QUALITY DESIGN VOLUME (SWQDV)

The project site was determined to be a Designated Project; therefore, the project site is required to retain 100% of the SWQDv on-site. The SWQDv for the site was calculated using the HydroCalc software developed by Los Angeles County Department of Public Works (LACDPW). The software completes the full MODRAT calculation process and produces the peak stormwater runoff flow rates and volumes for single subareas. HydroCalc is limited to watersheds and project areas up to 40 acres.

Using the following inputs in HydroCalc, a SWQDv of 1,200 CF is determined:

- *Area = 0.39 Acres*
- *85th percentile Rainfall Depth = 0.90 in*
- *Percent Impervious = 98%*
- *Soil Type = 010*

6.0 STORMWATER QUALITY CONTROL MEASURES

Stormwater quality control measures are required to augment site design principles and source control measures to reduce the volume of stormwater runoff and potential pollution loads in stormwater runoff to the maximum extent practicable. Stormwater quality control measures are designed to handle the frequent, smaller storm events, or the initial volume of stormwater runoff from larger storm events (typically referred to as first flush events). The first flush of larger storm events is the initial period of the storm where stormwater runoff typically carries the highest concentration and loads of pollutants. Small, frequent storm events represent most of the total annual average precipitation in the County. The LID Ordinance requires that all Designated Projects retain the SWQDv on-site using retention-based stormwater quality control measures (infiltration and/or stormwater runoff harvest and use) or biofiltrate 1.5 times the SWQDv if infiltration is not feasible.

The stormwater quality control measures outlined in the LID Manual were evaluated. It was determined that the most practicable treatment BMP for the project will be the following:

- *Infiltration Basin (RET-2)*

6.1 INFILTRATION VAULT SIZING

Stormwater runoff drains away from the building on the north, east, and west then sheet flows to a network of inlets and into the proposed stormwater treatment and detention system. The ADS SC-310 infiltration chamber system is designed to treat the SWQDv of 1,200 CF. Overflow of excess stormwater beyond the SWQDv will bubble up from a grated drop inlet adjacent to the ADS Nyloplast drain basin and will enter a valley gutter which flows downstream to a catch basin on Eucalyptus Drive.

Calculations for the infiltration vault is available in Appendix E.

7.0 HYDROMODIFICATION

All Designated projects located within natural drainage systems that have not been improved or drainage systems that are tributary to a natural drainage system are required to implement hydromodification controls.

Projects may be exempt from implementation of hydromodification control measures where assessments of downstream channel conditions and proposed discharge hydrology indicate adverse hydromodification effects to beneficial uses of natural drainage systems are unlikely.

The proposed project has been determined to be **EXEMPT** from hydromodification requirements since it is not located within a natural drainage system and is a redevelopment of a previously developed site in an urbanized area that does not decrease the infiltration capacity compared to the pre-project conditions.

8.0 STORMWATER QUALITY CONTROL MEASURE MAINTENANCE

Continued effectiveness of stormwater quality control measures specified in the LID Standards Manual depends on on-going inspection and maintenance. All publicly maintained stormwater quality control measures must have easements for access and maintenance or be in lots dedicated to the County in fee title. To ensure that such maintenance is provided, LACDPW may require the submittal of a Maintenance Plan and execution of a Maintenance Agreement with the owner/operator of stormwater quality control measures. The property owner or his/her designee is responsible for complying with the Maintenance Agreement outlined in the LID Manual. A copy of the Maintenance Agreement is provided in Appendix H.

8.1 MAINTENANCE RESPONSIBILITY

The Owner of the project site is the site operator and will be the party responsible to ensure implementation and funding of maintenance of permanent BMPs.

It is anticipated that the owner of the project will manage multiple separate maintenance contracts for different types of maintenance (e.g., landscape maintenance vs. maintenance of the BMPs). Throughout this section, the owner of the project is the "party responsible to ensure implementation and funding of maintenance of permanent BMPs." The party who actually performs the activities is the "inspector," "maintenance contractor," or "maintenance operator."

8.2 INSPECTION AND MAINTENANCE FOR SOURCE CONTROL MEASURES

The following source control measures for the project requires permanent maintenance:

- *None*

8.3 INSPECTION AND MAINTENANCE FOR STORM QUALITY MEASURES

The following storm quality measure for the project requires permanent maintenance:

- *Underground infiltration vaults*

The discussions below provide inspection criteria, maintenance indicators, and maintenance activities for the above listed storm quality measure that require permanent maintenance according to manufacturer recommendations. These proprietary systems shall be inspected and maintained per manufacturer specifications and recommendations. See Appendix G for the Operations and Maintenance of each BMP listed above.

8.4 INSPECTION AND MAINTENANCE FREQUENCY

The Table below lists the BMPs to be inspected and maintained and the minimum frequency of inspection and maintenance activities.

BMP	Inspection Frequency	Maintenance Frequency
Landscape Irrigation Practices	Monthly	Routine trimming and trash removal; monthly non-routine maintenance as-needed based on maintenance indicators in Section 8.2.
Underground Infiltration Vaults	Semiannually and after major storm events	Routine maintenance to clean the underground detention chamber of sediments, trash, and debris. Routine maintenance semiannually. Inspect sediment in Inspection Port and Isolator Row Plus and clean with JetVac.
FlexStorm Connector Pipe Screen Trash Capture	Semiannually and after major storm events	Routine maintenance of removing trash and sediment from initial trash capture.

The frequencies given in the Summary Table of Inspection and Maintenance Frequency are minimum recommended frequencies for inspection and maintenance activities for the project. Typically, the frequency of maintenance required for permanent BMPs is site and drainage area specific. If it is determined during the regularly scheduled inspection and/or routine maintenance that a BMP requires more frequent maintenance (e.g., to remove accumulated trash) it may be necessary to increase the frequency of inspection and/or routine maintenance. If it is determined during the regularly scheduled inspection that the maintenance thresholds are consistently met or exceeded, it may be necessary to increase the frequency of inspection and routine maintenance.

8.5 RECORD KEEPING REQUIREMENTS

The party responsible to ensure implementation and funding of maintenance of permanent BMPs shall maintain records documenting the inspection and maintenance activities. The records must be kept a minimum of 5 years and shall be made available to the City of El Segundo for inspection upon request at any time.

9.0 SUMMARY

This Low Impact Development Report (LID) summarizes the permanent storm water management features proposed for the project site that will collectively meet the requirements set forth in the LID Manual. The project meets the hydromodification exemption criteria and is not required to implement hydromodification management facilities as discussed in Section 7.0 of this report.

The project is a "Designated Project," based on the LID Manual as discussed in Section 2.1.

Based on the "anticipated" pollutants of concern that may be generated on-site and identification of receiving waters that are listed as impaired on the 2010 CWA Section 303(d) List of Water Quality Limited Segments, the following are the project pollutants of concern: Trash, DDT, Toxicity, Cadmium, Chlordane, Copper, Lead, Copper, Lead, PCBs, Silver, Zinc, DDE, PAHs, and Indicator Bacteria.

In addition to treatment control BMPs, the project will incorporate source control BMPs which are described in Section 4.0 and Section 6.0.

The project includes a proposed network of storm water management features that will utilize source control measures to meet the requirements for stormwater quality design measure. The following list provides a summary of stormwater quality design measures selected for the project site:

- *Infiltration Basin (RET-2)*

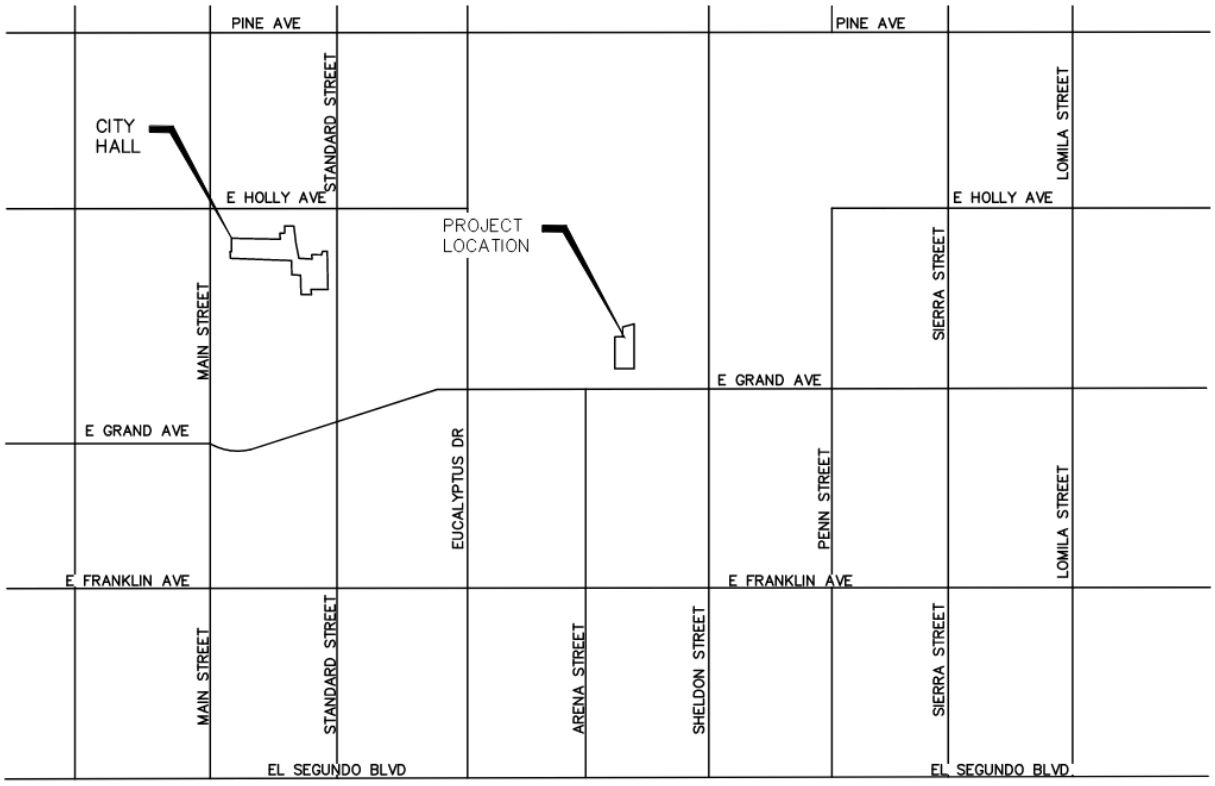
The above stormwater quality design measure was selected for the project and provide "High" removal efficiency for the targeted pollutants of concern as discussed in Section 3.3 and Section 6.1.

The stormwater quality design measure maintenance in Section 8.0 of this report provides inspection criteria, maintenance indicators, and maintenance activities for the above-listed BMPs that require permanent maintenance.

This report accompanies a set of construction drawings and specifications which detail the construction, operation, and maintenance of the proposed Low Impact Development (LID) design elements for this site.

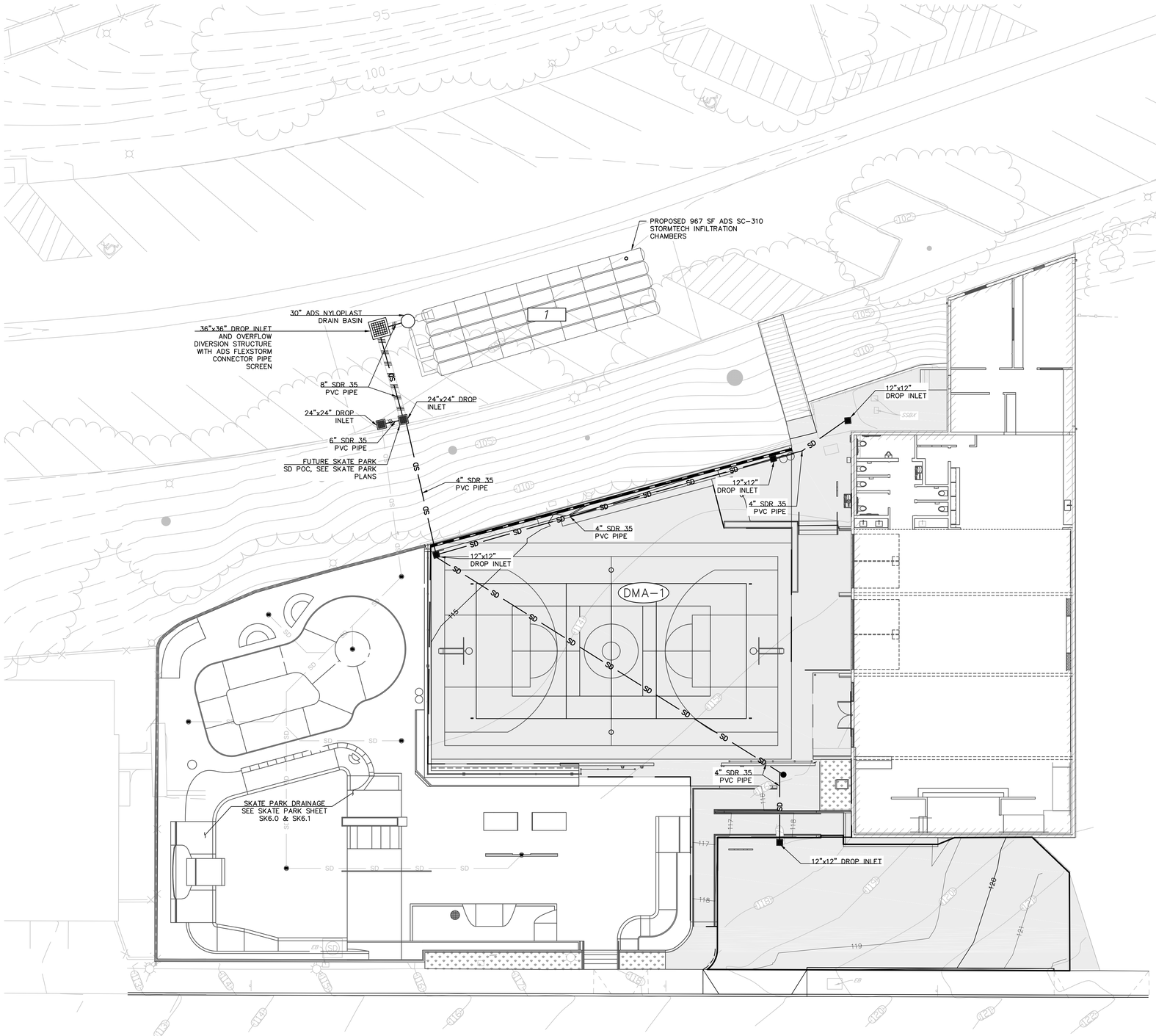
APPENDIX A

VICINITY MAP



APPENDIX B

LID EXHIBIT



LEGEND:

- PROPOSED IMPERVIOUS AREA
- PROPOSED PERVIOUS AREA
- DRAINAGE MANAGEMENT AREA BOUNDARY
- DMA-X — DRAINAGE MANAGEMENT AREA ID
- X — TREATMENT CONTROL MEASURE ID

NOTICE TO CONTRACTOR

PERCOLATION TESTING FOR THE PROPOSED STORM WATER INFILTRATION SYSTEM HAS NOT BEEN CONDUCTED AT THE INSTALLATION LOCATION. SEE GEOTECHNICAL REPORT FOR PERCOLATION TEST LOCATIONS.

THE PERFORMANCE OF THE STORMWATER INFILTRATION SYSTEM IS DEPENDENT ON SOIL INFILTRATION RATES AT THE TRUE INSTALLATION SITE.

THE CONTRACTOR SHALL PERFORM PERCOLATIONS TESTS AT THE PROPOSED INFILTRATION DEVICE LOCATION IN ACCORDANCE TO REQUIREMENTS FROM THE CITY OF EL SEGUNDO. SUBMIT PERCOLATION TESTS RESULTS TO THE ENGINEER OF RECORD AND CITY OF EL SEGUNDO FOR REVIEW PRIOR TO INSTALLATION. INFILTRATION SYSTEM SHALL NOT BE INSTALLED UNTIL THE PERCOLATION RESULTS ARE REVIEWED AND CONCURRENCE IS GRANTED BY THE CITY OF EL SEGUNDO AND ENGINEER OF RECORD. THE ENGINEER SHALL ASSUME NO RESPONSIBILITY OR LIABILITY FOR SYSTEM UNDER-PERFORMANCE OR FAILURE DUE TO UNTESTED SOIL CONDITIONS.

DMA SUMMARY:

DMA	AREA (AC)	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS %	PERVIOUS %	85TH PERCENTILE STORM DEPTH (IN)	SOIL TYPE	TREATMENT VOLUME REQUIRED (FT^3)	TREATMENT DEPTH REQUIRED (IN)	PROPOSED BMP	TREATMENT VOLUME PROVIDED (FT^3)
1	0.39	16,751	290	98%	2%	0.90	10	1,130	16	ADS SC-310 STORMTECH INFILTRATION CHAMBERS	1200

NORTH

10 0 10 20
scale 1" = 10' feet

M I G
360 East Second Street
Suite 675
Los Angeles, CA 90012
213-694-3800
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REGISTERED PROFESSIONAL ENGINEER — BRUCE W. FERRINI — No. C-42393 — CIVIL — STATE OF CALIFORNIA

CITY OF EL SEGUNDO

350 Main St, El Segundo, CA 90245

EL SEGUNDO RECREATION PARK PHASE 1 IMPROVEMENT PROJECT

TEEN CENTER AND TEEN PLAZA

405 E Grand Ave, El Segundo, CA 90245

BKF ENGINEERS
4675 MACARTHUR CT.
SUITE 400
NEWPORT BEACH, CA 92660
(949) 526-8460
www.bkf.com

Issue dates

#	Date	Description
	01/15/25	50% DD SUBMITTAL
	04/18/25	100% DD SUBMITTAL
	06/06/25	50% CD SUBMITTAL
	08/20/25	90% CD SUBMITTAL
	10/17/25	PLAN CHECK
		RESUBMITTAL #1

Sheet title:

LID PLAN

Designed by:	RFE/ML/MG
Drawn by:	ML/MG
Checked by:	RFE/BK
Project number:	124011

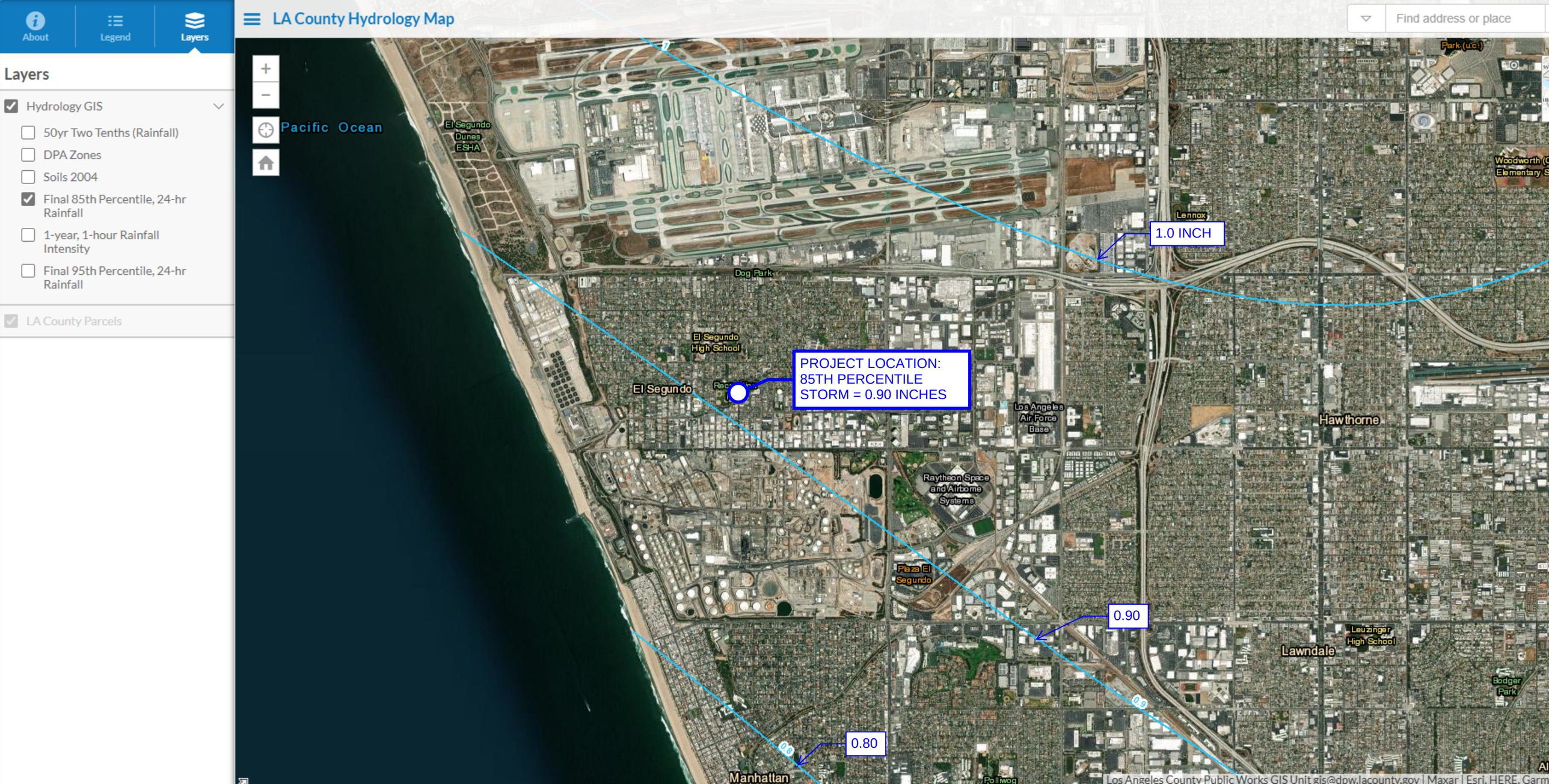
C6.01

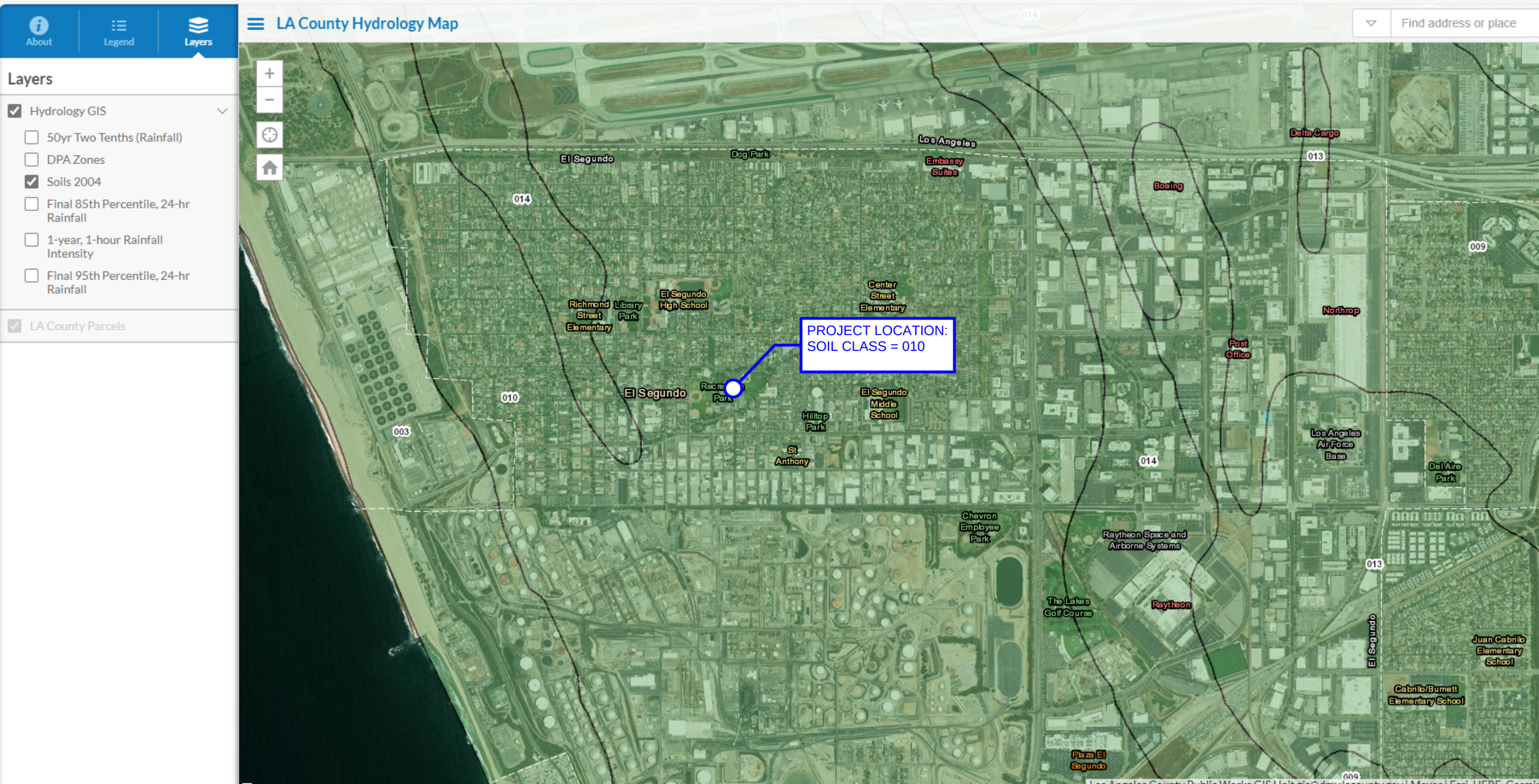
100% CD SUBMITTAL (10/17/2025)

Plotted by: mlappi Nov. 06, 2025 10:42 AM \\BKF-NB\vol4\2024\240033_El_Segundo_Recreational_Park\-10_TeenCtr_TeenPlaza\ENG-LV\03-CD\Teen_Center\Sheets\C6.01 PRELIMINARY LID PLAN.dwg

APPENDIX C

COUNTY OF LOS ANGELES HYDROLOGY MAPS


About
Legend
Layers
LA County Hydrology Map
Find address or place
Layers
Hydrology GIS
50yr Two Tenths (Rainfall)
DPA Zones
Soils 2004
Final 85th Percentile, 24-hr Rainfall
1-year, 1-hour Rainfall Intensity
Final 95th Percentile, 24-hr Rainfall
LA County Parcels
Pacific Ocean
El Segundo Dunes ESHA
Dog Park
El Segundo High School
El Segundo
Los Angeles Air Force Base
Raytheon Space and Airborne Systems
Plaza El Segundo
Manhattan
Lennox
Hawthorne
Lawndale
Leuzinger High School
Bodger Park
Park (u.c.)
Woodworth (G) Elementary S
PROJECT LOCATION:
85TH PERCENTILE
STORM = 0.90 INCHES
1.0 INCH
0.90
0.80
1
0.9
0.8
Los Angeles County Public Works GIS Unit gis@dpw.lacounty.gov | Maxar | Esri, HERE, Garm


About
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LA County Hydrology Map
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Hydrology GIS
50yr Two Tenths (Rainfall)
DPA Zones
Soils 2004
Final 85th Percentile, 24-hr Rainfall
1-year, 1-hour Rainfall Intensity
Final 95th Percentile, 24-hr Rainfall
LA County Parcels
PROJECT LOCATION:
SOIL CLASS = 010
El Segundo
Los Angeles
Dog Park
Embassy Suites
Delta Cargo
Boeing
Richmond Street Elementary
Library Park
El Segundo High School
Center Street Elementary
Northrop
Post Office
Recreation Park
El Segundo Middle School
Hilltop Park
St. Anthony
Los Angeles Air Force Base
Del Aire Park
Chevron Employee Park
Raytheon Space and Airborne Systems
The Lakes Golf Course
Raytheon
Juan Cabrillo Elementary School
Cabrillo/Burnett Elementary School
Plaza El Segundo
014
013
009
010
003

APPENDIX D

HYDROCALC OUTPUT – 85TH PERCENTILE STORM

Peak Flow Hydrologic Analysis

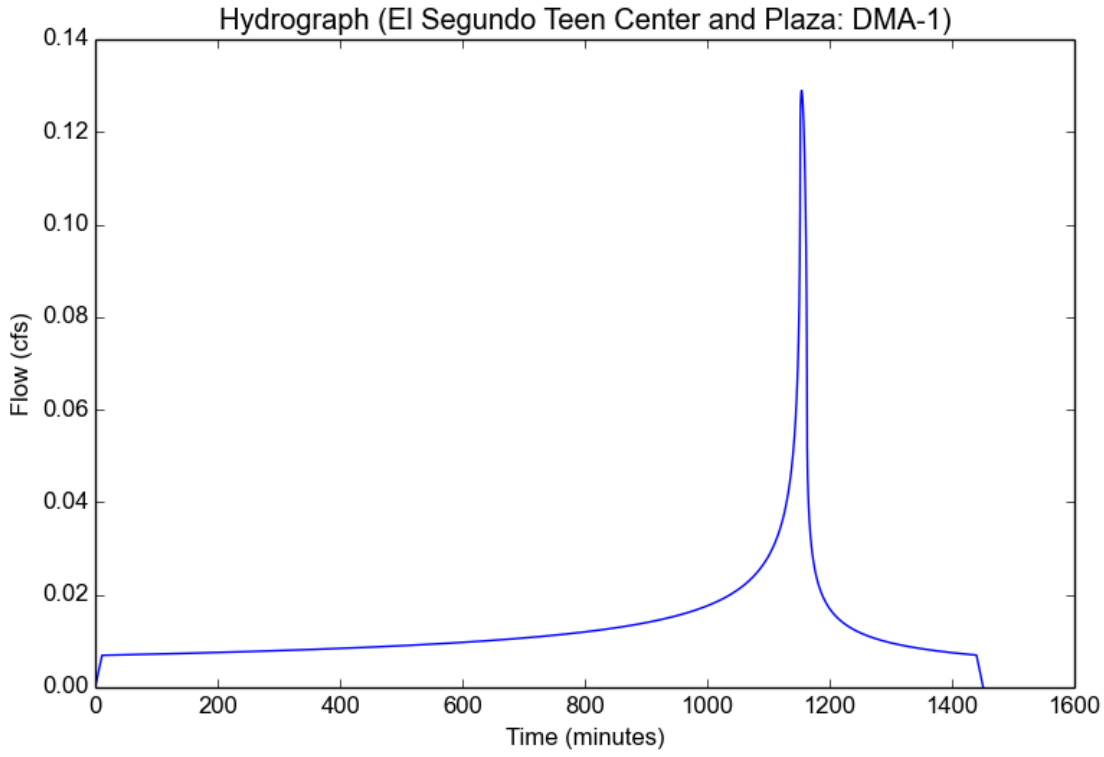
File location: //BKF-NB/vol4/2024/240033_El_Segundo_Recreational_Park/-10_TeenCtr_TeenPlaza/DOC/05-Design/Reports_Calcs/Stormwater/LID/25_
Version: HydroCalc 1.0.3

Input Parameters

Project Name	El Segundo Teen Center and Plaza
Subarea ID	DMA-1
Area (ac)	0.39
Flow Path Length (ft)	160.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	0.9
Percent Impervious	0.99
Soil Type	10
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.9
Peak Intensity (in/hr)	0.3707
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.892
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.129
Burned Peak Flow Rate (cfs)	0.129
24-Hr Clear Runoff Volume (ac-ft)	0.0259
24-Hr Clear Runoff Volume (cu-ft)	1127.1329



APPENDIX E

STORMWATER QUALITY DESIGN MEASURE CALCULATIONS

Stormwater Quality Design Measure Calculations

Date: 6/4/2025
Job No.:
Project:

Description and Assumptions:

** Based on County of Los Angeles Low Impact Development Standard Manual*

Design Frequency = 85th Percentile, 24-Hour Rain Event = 0.90 in

STORMWATER QUALITY DESIGN CALCS FOR BMP #1

Area Summary

Surface Type	Area (sf)	Area (acres)
Impervious	16,751	0.38
Pervious	290	0.01
TOTAL	**17,041**	**0.39**

Step 1: Determine the Stormwater Quality Design Volume (SWQDv)

85th Percentile SWQDv per HydroCalc Output in Appendix D= 1,130 ft^3

HydroCalc Design Volume (SWQDv) output is an accepted value per section 6.3 in the LA County Low Impact Development Standards Manual
(See Appendix D for Hydrocalc Analysis)

Step 2: Determine the design infiltration rate

$f_{design} = f_{measured}/FS$

$f_{measured}$ =	2.49	in/hr
FS =	2	
f_{design} =	1.25	**in/hr**

Step 3: Determine the BMP surface area

$d_{max} = f_{design}/12 \times t$

Where:

d_{max}= Maximum depth of water that can be infiltrated within the max detention time [ft]
f_{design} = Design infiltration rate [in/hr]
t = Maximum retention time (max 96 hrs) [hr]

d_{max}= 9.96 ft

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Select a ponding depth less than the maximum ponding depth

$d_{max} \geq d_p$

Where:

d_{max} = Maximum depth of water that can be infiltrated within the maximum detention time [ft]

d_p = Ponding depth [ft]

d_p = 1.33 ft

Calculate the infiltrating surface area (bottom of the bioretention area) required

$A = SWQDv / d_p$

A= 850 sf

Calculate infiltration surface area provided

Treatment Volume Provided =	1200	cf
d_p =	1.33	ft
Area Provided=	900	sf

Advanced Drainage Systems (ADS) provided calculations for drawdown time with a factor of safety of 2

Surface Area (SF)	$f_{design\ (in/hr)}$	Volume (CF)	Max Drawdown
900	1.24	1200	96hrs

Drawdown (hr)= 12.13hr < Max Drawdown

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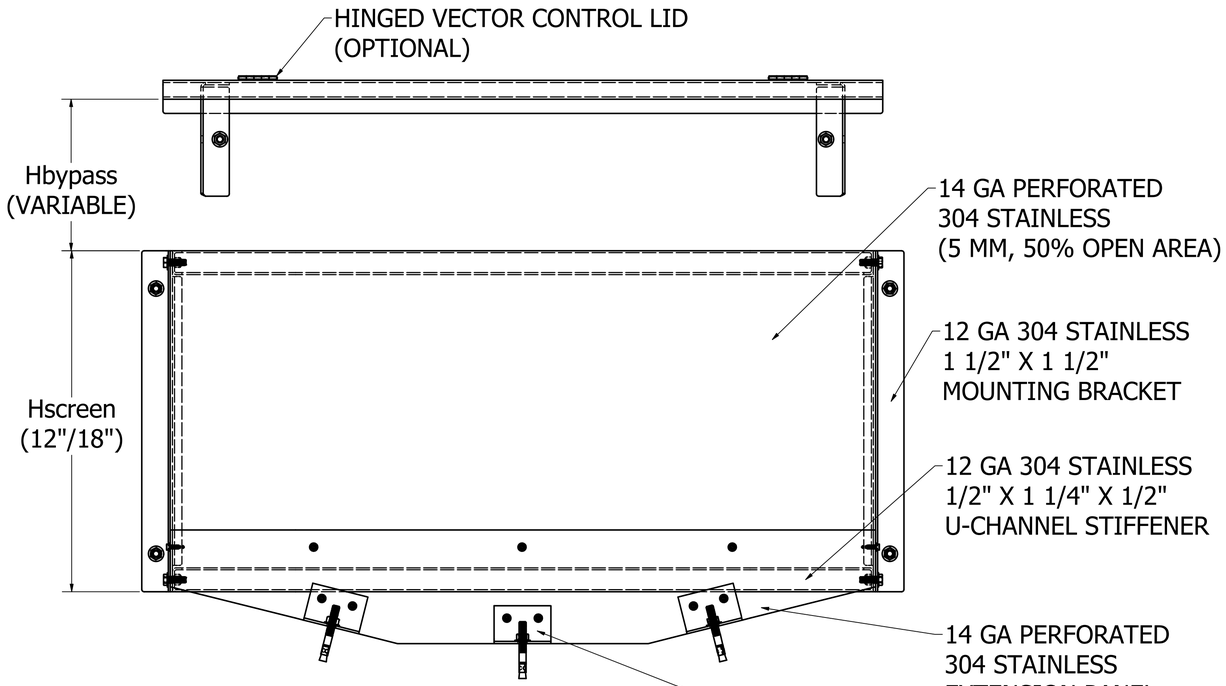
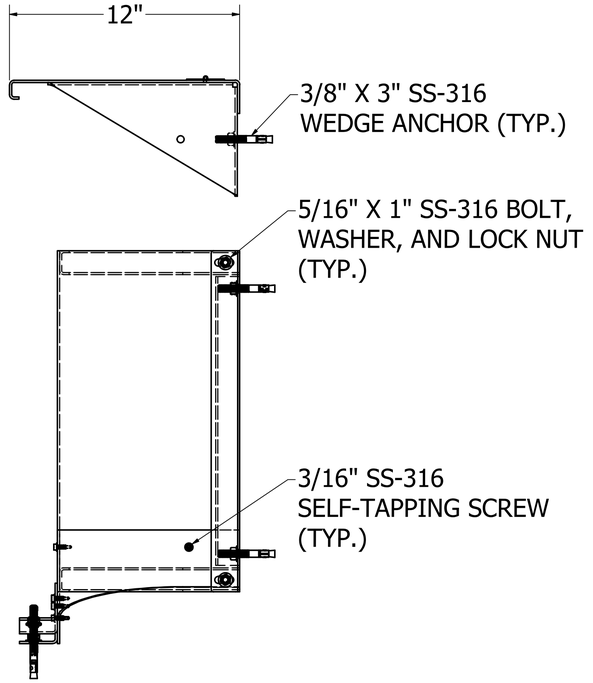
APPENDIX F

BMP MANUFACTURERS BROCHURES

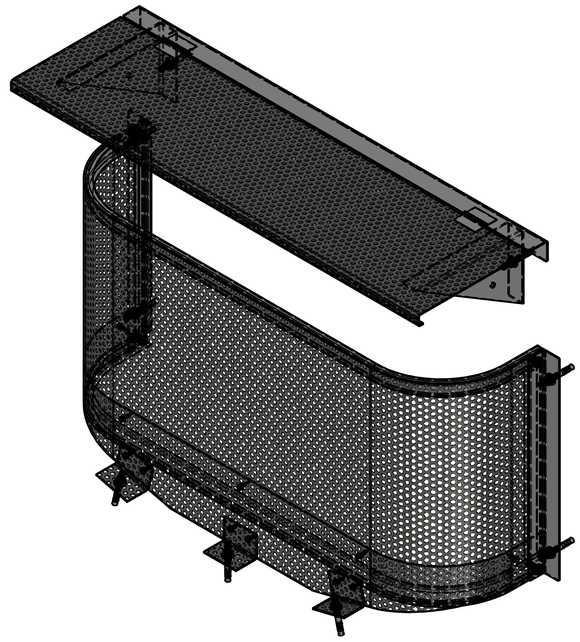
ADS FLEXSTORM U-SHAPE CONNECTOR PIPE SCREENS (CPS)



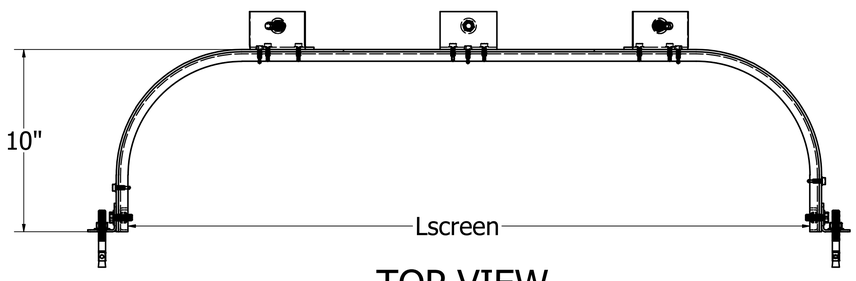
FRONT VIEW



SIDE VIEW



REFERENCE VIEW



TOP VIEW

DESCRIPTION	P/N
SMALL CPS (< 4' SCREEN LENGTH)	62CPSHD-S
LARGE CPS (> 4' SCREEN LENGTH)	62CPSHD-L

NOTES:

1. CONNECTOR PIPE SCREEN AND LID ASSEMBLIES CONSTRUCTED OF 304 STAINLESS AND 316 STAINLESS HARDWARE.
2. TOTAL BYPASS CAPACITY, TREATED FLOW RATES, AND CONTAINMENT WILL VARY WITH EACH SIZE DRAINAGE STRUCTURE AND APPLICABLE SCREEN SIZE SELECTED.
3. UPON ORDERING, A CPS ORDER FORM MUST BE COMPLETED DICTATING SPECIFIC MODEL SIZING, OPTIONAL COMPONENTS/FEATURES, AND INLET IDENTIFICATION.
4. VECTOR CONTROL HINGED LIDS, EXTENSION PANELS (FOR UNEVEN, TROUGHED, OR SLOPED FLOORS), AND BASE SUPPORT BRACKETS OPTIONAL OR WHEN REQUIRED.
5. CPS ARE NOT APPLICABLE FOR MANHOLES OR BASINS WITH SUMPS.
6. FOR WRITTEN SPECIFICATIONS, INSTALLATION, AND MAINTENANCE GUIDELINES VISIT WWW.ADSPIPE.COM.

ALL PRODUCTS MANUFACTURED
BY ADVANCED DRAINAGE SYSTEMS
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PH. 1-800-821-6710

Our reason is water.™

SIZE	DATE	DWG NO	REV
C	06/16/2023	ADS FLEXSTORM CPS-U	A
SCALE N/A		SHEET 1 OF 1	

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

TEEN CENTER AND TEEN PLAZA

EL SEGUNDO, CA, USA

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 325 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

1. STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 3" (80 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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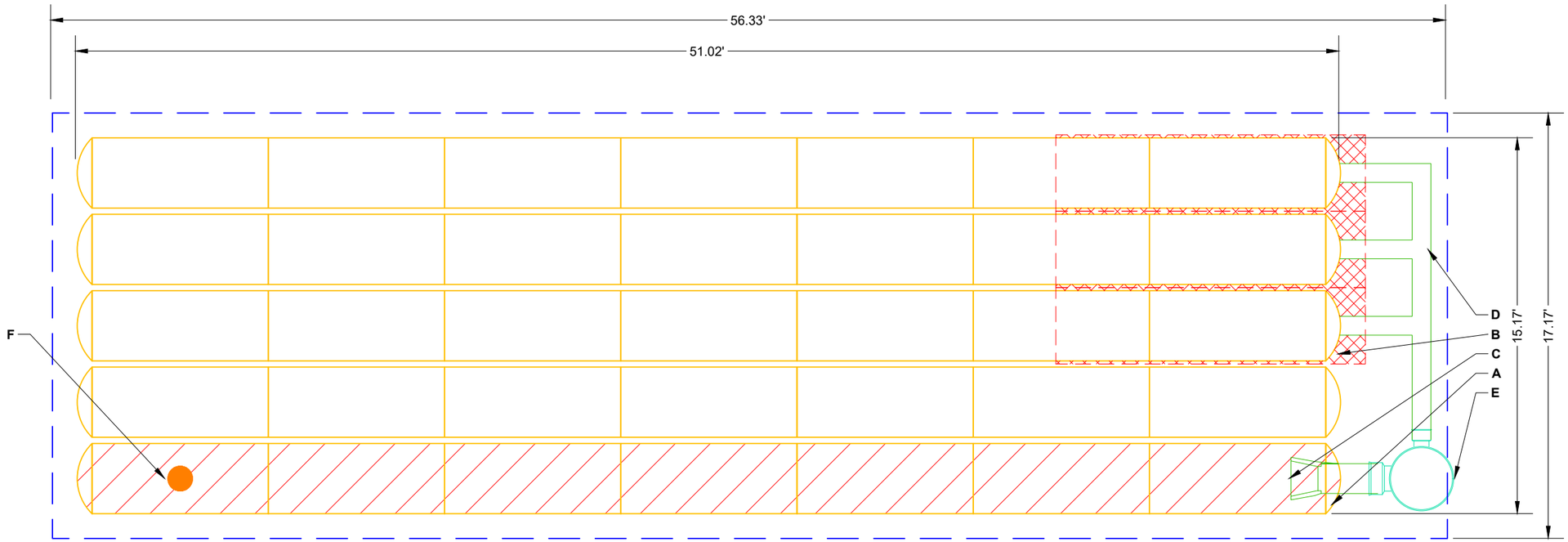
PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS	
35	STORMTECH SC-310 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	9.83
10	STORMTECH SC-310 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	3.67
6	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	3.17
6	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	3.17
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	3.17
1213	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	2.33
		TOP OF SC-310 CHAMBER:	1.83
		8" x 8" TOP MANIFOLD INVERT:	0.79
		12" ISOLATOR ROW PLUS INVERT:	0.57
967	SYSTEM AREA (SF)	BOTTOM OF SC-310 CHAMBER:	0.50
147.0	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	12" BOTTOM PREFABRICATED EZ END CAP, PART#: SC310ECEZ / TYP OF ALL 12" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	0.90"	
PRE-CORED END CAP	B	8" TOP PRE-CORED END CAP, PART#: SC310EPE08TPC / TYP OF ALL 8" TOP CONNECTIONS	3.50"	
FLAMP	C	INSTALL FLAMP ON 12" ACCESS PIPE / PART#: SC31012RAMP		
MANIFOLD	D	8" x 8" TOP MANIFOLD, MOLDED FITTINGS	3.50"	
NYLOPLAST (INLET W/ ISO PLUS ROW)	E	30" DIAMETER (24.00" SUMP MIN)		2.3 CFS IN
INSPECTION PORT	F	4" SEE DETAIL		



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 12.50' OF ADSPLUS625 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

TEEN CENTER AND TEEN PLAZA
EL SEGUNDO, CA, USA
DATE: 05/20/2025 | DRAWN: TZ | CHECKED: N/A
PROJECT #:

DESCRIPTION	CHK	DRW	DATE

THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS/STORMTECH UNDER THE DIRECTION OF THE PROJECT'S ENGINEER OF RECORD ("EOR") OR OTHER PROJECT REPRESENTATIVE. THIS DRAWING IS NOT INTENDED FOR USE IN BIDDING OR CONSTRUCTION WITHOUT THE EOR'S PRIOR APPROVAL. EOR SHALL REVIEW THIS DRAWING PRIOR TO BIDDING AND/OR CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE EOR TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

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Chamber System
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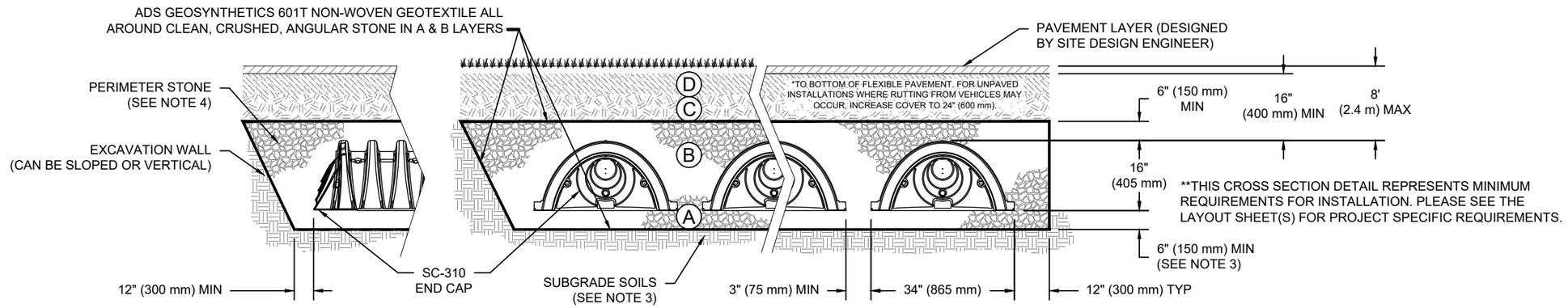
0 5 10

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (460 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE5	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE5	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 325 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

TEEN CENTER AND TEEN PLAZA
EL SEGUNDO, CA, USA
DATE: 05/20/2025 | DRAWN: TZ | CHECKED: N/A
PROJECT #:

DATE	DESCRIPTION	CHK	DRW

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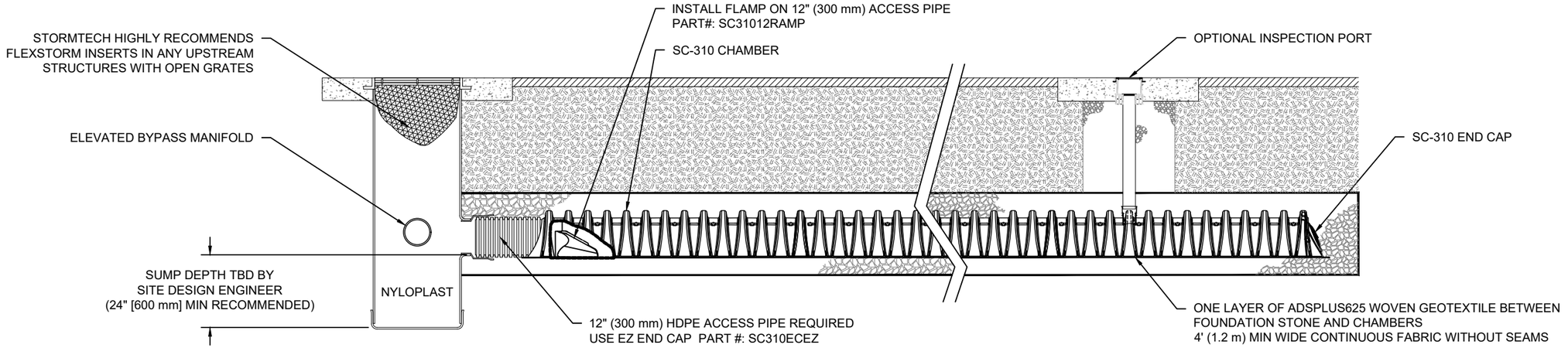


SC-310 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

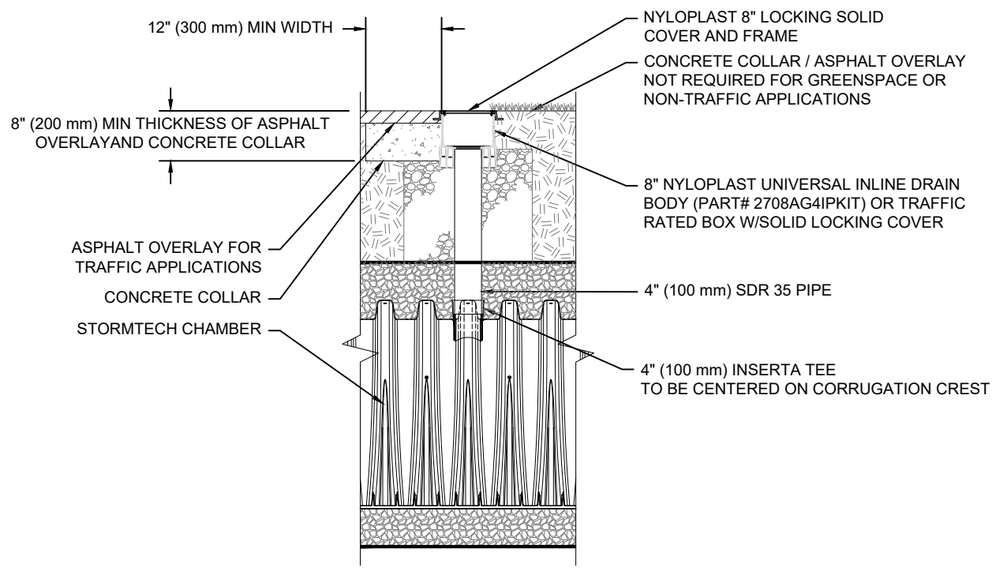
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL
(SC SERIES CHAMBER)
NTS

TEEN CENTER AND TEEN PLAZA
EL SEGUNDO, CA, USA
DATE: 05/20/2025 | DRAWN: TZ | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

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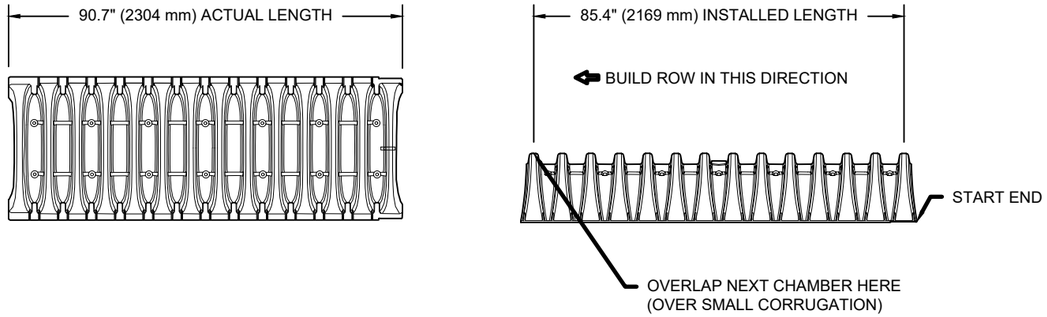
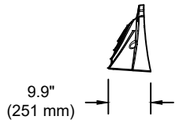
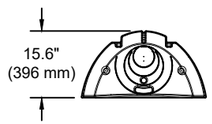
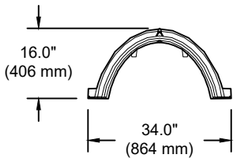
SC-310 TECHNICAL SPECIFICATION

NTS







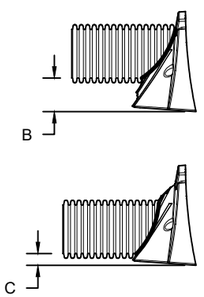


NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	29.3 CUBIC FEET	(0.83 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND 3" (75 mm) BETWEEN CHAMBERS

PART #	STUB	B	C
SC310EPE06TPC	6" (150 mm)	5.8" (147 mm)	---
SC310EPE06BPC		---	0.5" (13 mm)
SC310EPE08TPC	8" (200 mm)	3.5" (89 mm)	---
SC310EPE08BPC		---	0.6" (15 mm)
SC310EPE10TPC	10" (250 mm)	1.4" (36 mm)	---
SC310EPE10BPC		---	0.7" (18 mm)
SC310ECEZ*	12" (300 mm)	---	0.9" (23 mm)



ALL STUBS, EXCEPT FOR THE SC310ECEZ ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310ECEZ THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL; PRE-CORED END CAPS END WITH "PC"

TEEN CENTER AND TEEN PLAZA
EL SEGUNDO, CA, USA
DATE: 05/20/2025 | DRAWN: TZ | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

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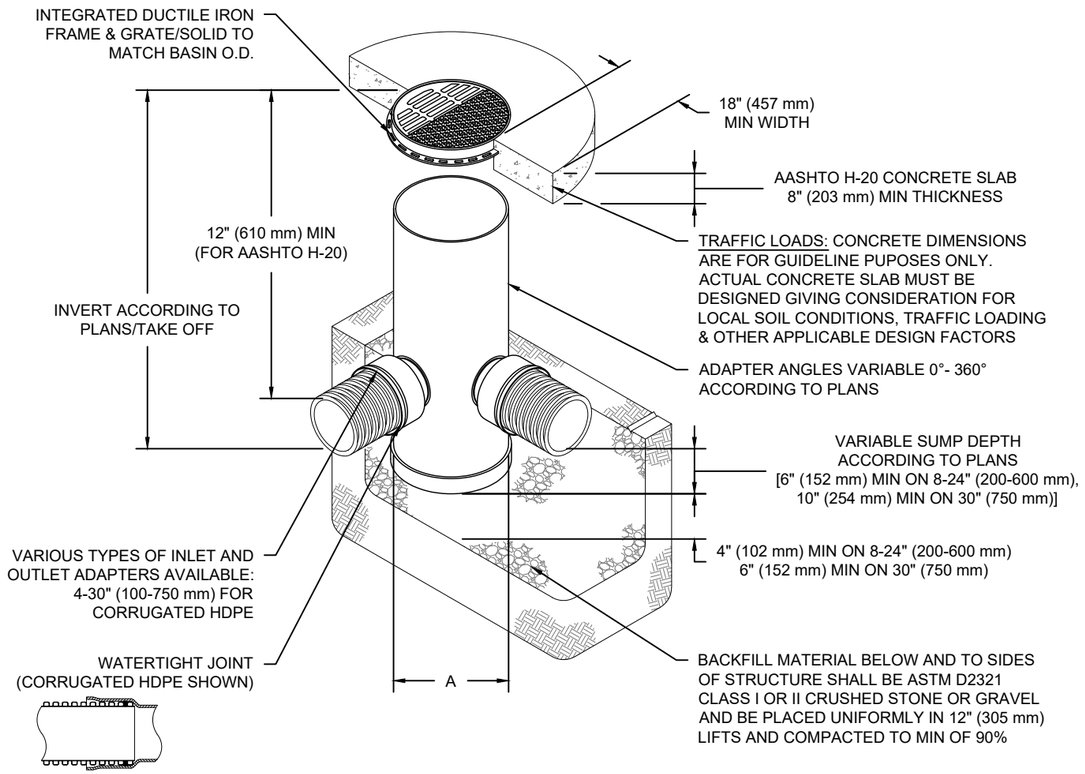
NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

TEEN CENTER AND TEEN PLAZA

EL SEGUNDO, CA, USA

DATE: 05/20/2025 | DRAWN: TZ | CHECKED: N/A

PROJECT #:

DATE	DRW	CHK	DESCRIPTION

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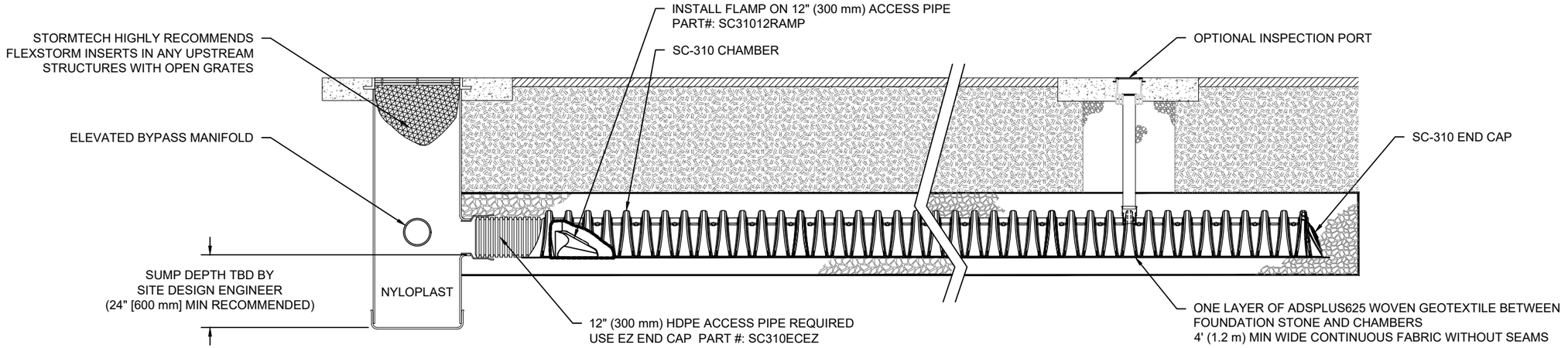
APPENDIX G

BMP OPERATION & MAINTENANCE



SC-310 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
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  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

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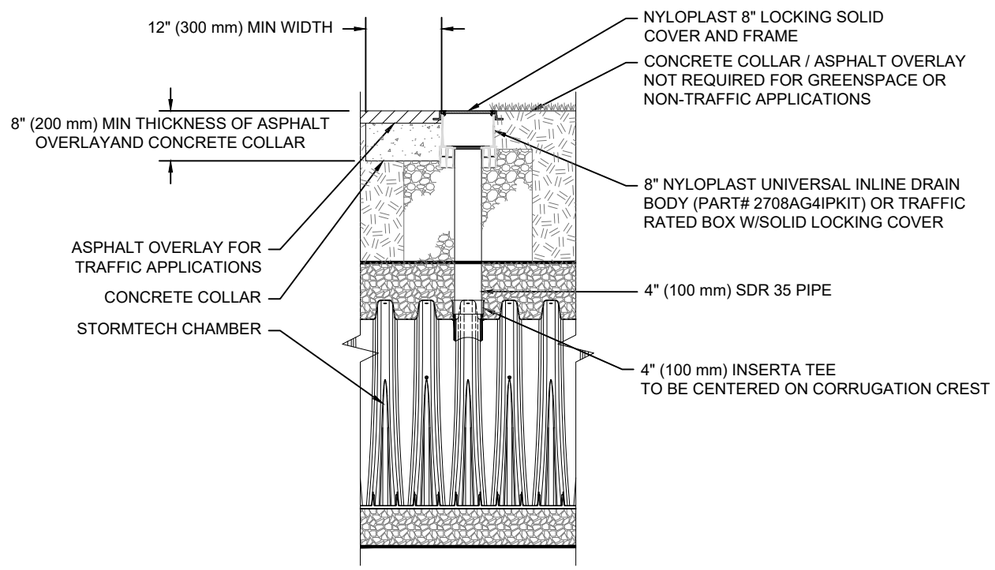

NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL
(SC SERIES CHAMBER)
NTS

TEEN CENTER AND TEEN PLAZA
EL SEGUNDO, CA, USA
DATE: 05/20/2025 | DRAWN: TZ | CHECKED: N/A
PROJECT #:

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APPENDIX H

COVENANT AND AGREEMENT

City of El Segundo to provide covenant and agreement.

APPENDIX I

GEOTECHNICAL REPORT (FOR REFERENCE ONLY)

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL INVESTIGATION AND PERCOLATION REPORT

CITY OF EL SEGUNDO RECREATION PARK RENOVATION PROJECT-PHASE 1
401 SHELDON STREET
EL SEGUNDO, CALIFORNIA 90245

CONVERSE PROJECT NO. 24-31-126-01

Prepared For:
MIG
Mr. Steve Lang, PLA
Principal
109 West Union Avenue
Fullerton, California 92832

Presented By:
CONVERSE CONSULTANTS
717 South Myrtle Avenue
Monrovia, California 91016
626-930-1200

November 12, 2024

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

November 12, 2024

Mr. Steve Lang, PLA
Principal
MIG
109 West Union Avenue
Fullerton, California 92832

Subject: **GEOTECHNICAL INVESTIGATION AND PERCOLATION REPORT**
City of El Segundo Recreation Park Renovation Project-Phase 1
401 Sheldon Street, City of El Segundo
Los Angeles County, California 90245
Converse Project No. 24-31-126-01

Dear Mr. Lang:

Converse Consultants (Converse) has prepared this geotechnical investigation report to present the findings, conclusions, and recommendations of our geotechnical Investigation for the City of El Segundo Recreation Park Renovation Project-Phase 1, located at City of El Segundo, Los Angeles County, California.

Converse evaluated the nature and engineering properties of the subsurface soils to provide geotechnical recommendations for site earthwork, foundation design and construction for the proposed project development. Our services were performed in accordance with our proposal dated January 29, 2024.

We appreciate the opportunity to be of service to you. If you have any questions, please do not hesitate to contact us at (626) 930-1275.

Sincerely,

CONVERSE CONSULTANTS

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
Senior Vice President/Principal Engineer

PROFESSIONAL CERTIFICATION

This report for the City of El Segundo Recreation Park Renovation Project-Phase 1, located in the city of El Segundo, Los Angeles, California, has been prepared by the staff of Converse under the professional supervision of the individuals whose seals and signatures appear hereon.

The findings, recommendations, specifications, or professional opinions contained in this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice in this area of Southern California. There is no warranty, either expressed or implied.

In the event that changes to the property occur, or additional, relevant information about the property is brought to our attention, the conclusions contained in this report may not be valid unless these changes and additional relevant information are reviewed, and the recommendations of this report are modified or verified in writing.

Robin C. Diaz, PhD
Project Engineer/Geologist

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
President/Principal Engineer

EXECUTIVE SUMMARY

The following is a summary of our geotechnical study, findings, conclusions, and recommendations, as presented in the body of this report. Please refer to the appropriate sections of the report for complete conclusions and recommendations. In the event of a conflict between this summary and the report, or an omission in the summary, the report shall prevail.

- The project site is located at 401 Seldon St, City of El Segundo, Los Angeles California. The project will include new grass turf and irrigation with the possibility of improved drainage and a percolation testing. Identification of old buried tile, and demolition and construction of a new skateboard field.

- A total of eighteen (18) exploratory borings were drilled at three separate locations within the park as follows: Three (3) concrete core extractions with boreholes at five feet deep at the existing skateboard field, four (4) five feet borings including one (1) for percolation testing at the softball field, and eleven (11) exploration borings at three feet to locate the presence of old buried tiles. All boreholes were advanced using a hand auger, within the project site between October 16 and 17, 2024.

- The earth materials encountered during our investigation consist of existing fill soils placed during previous site grading operations, old tile fragments at the Brett Field and natural alluvial soils to a maximum depth of 5 feet bgs. The fill soils encountered consisted primarily of sands and silty sands. The native alluvial soil deposits below the fills primarily consists of sands, and silty sands.

- Groundwater was not encountered during our subsurface exploration.

- The project site is not located within a currently designated State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zones) for surface fault rupture. No surface faults are known to project through or towards the site.

- The site is not located within a mapped Seismic Hazard Zone for liquefaction.

- Over-excavation and re-compaction of the fill soils and upper alluvium sediments is recommended. The minimum depth of over-excavation should be 3 feet below the ground surface or at least 2 feet below bottom of proposed shallow foundations, whichever is deeper. The over-excavation and re-compaction are recommended to extend 3 feet beyond the edges of the building structure foundations.

- If loose or soft soils are encountered, over-excavate an additional 18 inches deep, and then place 18-inch-thick compacted base material (CAB or equivalent) to bridge the soft bottom. Base should be compacted to 95% relative compaction. An

additional layer of geofabric may be needed on top of base depending on the actual site conditions.

- Site soils tested have “negligible” concentrations of water-soluble sulfates, which is considered “non-corrosive” to concrete.

- The pH value and chloride content of the sample tested is in the “non-corrosive” range. However, the resistivity is in the “corrosive” range to ferrous metals at the project site.

- The proposed improvements may be supported by shallow foundations founded on compacted fill.

- Percolation test was performed for the subject project site and the results are presented in Appendix C.

Results of our study indicate that the site is suitable from a geotechnical standpoint for the proposed development, provided that the recommendations contained in this report are incorporated into the design and construction of the project.

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APPENDICES

Appendix A ..... Field Exploration
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1.0 INTRODUCTION

This report contains the findings and recommendations of our geotechnical study performed at the proposed site of the planned phase 1 of City of El Segundo Recreation Park Renovation-Project, demolition and reconstruction of the skate park, new turf and irrigation with the possibility of improved drainage, and the identification of old buried tiles at Brett Field at El Segundo Recreation Park located in El Segundo, Los Angeles, California, as shown on Figure No. 1, *Site Location Map*.

This report is written for the project described herein and is intended for use solely by MIG Engineers and its design team. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

2.0 SITE AND PROJECT DESCRIPTION

2.1 Site Description

The project site is in City of El Segundo Recreation Park, Los Angeles, California. The proposed project area is located between E. Pine Avenue, and Sheldon Street as shown in Figure No.1, *Site Location Map*.

2.2 Project Description

The proposed project consists of demolition and reconstruction of the skate park, new turf and the possibility of a new irrigation system, also the project includes the identification of existing old tiles buried within Brett Field, and a water infiltration study. An existing skateboard park infrastructure that has exceeded its useful life will be replaced with a new Skateboard Park.

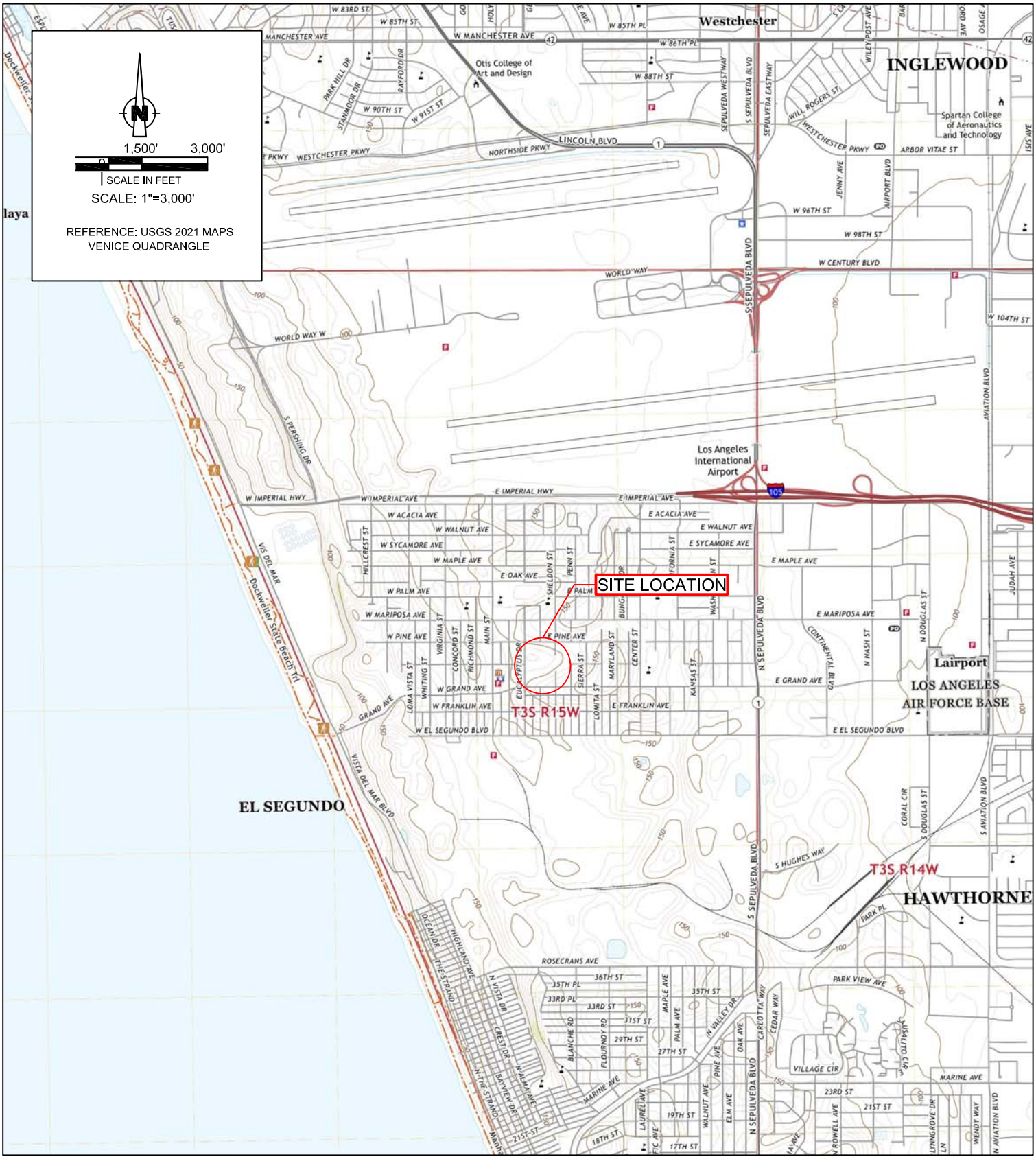
3.0 SCOPE OF WORK

The scope of our work included project set-up, subsurface exploration with soil sampling, laboratory testing, engineering analysis, and preparation of this report.

3.1 Project Set-up

The project set-up consisted of the following tasks.

- Plot the proposed borings on the exhibit showing the locations of the proposed improvements.
- Coordinated with client to schedule the field investigation.
- Marked the boring locations as shown on the exhibit.



SITE LOCATION MAP

Recreation Park Renovation Project
El Segundo Parks and Recreation
401 Sheldon Street, El Segundo, California 90245

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24-31-126-01

Figure No.
1

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- Notified Underground Service Alert (USA) to clear the boring locations of conflict with underground utilities.
- Arranged for drilling and sampling of the exploratory borings.

3.2 Subsurface Exploration

Eighteen (18) exploratory borings were drilled at three separate locations within the park as follows: Three (3) concrete core extractions with boreholes at five feet deep at the existing skateboard field, four (4) five feet borings including one (1) for percolation testing at the softball field, and eleven (11) exploration borings at three feet to locate the presence of old buried tiles. Each boring was visually logged by a Converse engineer and sampled at regular intervals and at changes in subsurface soils. Detailed descriptions of the field exploration and sampling program are presented in Appendix A, *Field Exploration*.

Relatively undisturbed ring and bulk samples of the subsurface soils were obtained at frequent intervals in pre-selected boring sites. The undisturbed samples were obtained using a Modified California Steel Sampler (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The sampler was driven into the bottom of the boreholes with successive drops of a 40-pound hammer falling 12 inches by hand. The number of successive drops of the driving weight ("blows") required for every 6-inch of penetration of the sampler are shown on the Logs of Borings in the "blows" column.

The borings were backfilled with gravel and soil cuttings, groundwater was not encountered.

The approximate locations of the exploratory borings are shown in Figure No. 2, *Approximate Boring Locations Map.* For a description of the field exploration and sampling program see Appendix A, *Field Exploration*.

3.3 Tiles Buried at George Brett Field

We drilled shallow three (3) feet deep boreholes at Brett Field, the purpose of these exploration boreholes was to determine the existence of buried tiles underneath the field, and to obtain unaltered ring samples for laboratory testing.

We found pieces of tile at four different locations (GB-4, GB-8, GB-10, and GB-11), see Figure No. 2. It is possible that there are tile pieces scattered all over the field, despite our sampling didn't find samples at all locations, possibly, a more thorough exploration would find pieces of tile all over the field, but that would create a significant disturbance in the field that should not be necessary.

Approximate Boring Locations Map

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-George Brett Field
-Boring Location
-Recreation Park
-Boring Location
-Skate Park
-Boring Location

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Figure No. 2

3.3 Laboratory Testing

Representative samples of the site soils were tested in the laboratory to aid in their classification, and to evaluate relevant engineering properties. The tests performed included:

- *In situ* moisture contents and dry densities (ASTM Standard D2216)
- Soil Corrosivity Tests (Caltrans 643, 422, 417)
- Grain size analysis (ASTM Standard D422)
- Maximum dry density and optimum-moisture content relationship (ASTM Standard D1557)
- Direct shear (ASTM Standard D3080)

3.4 Analyses and Report

Data obtained from the exploratory fieldwork and laboratory-testing program were analyzed and evaluated with respect to the planned construction. This report was prepared to provide the findings, conclusions and recommendations developed during our study and evaluation.

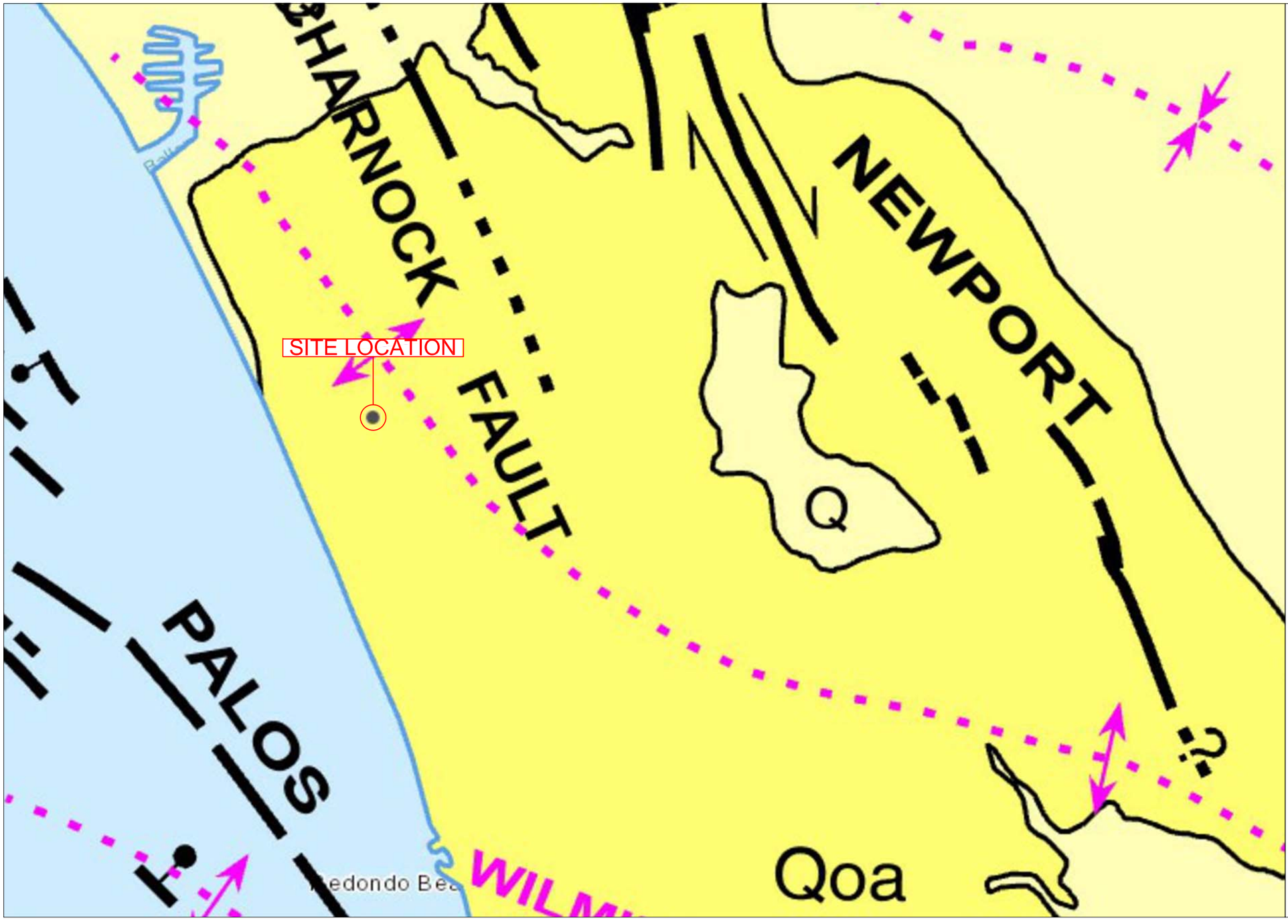
4.0 GEOLOGIC CONDITIONS

4.1 Regional Geologic Setting

The project site lies within 1.2 miles east from the Pacific Ocean, less than one mile south of Los Angeles International Airport (LAX), soils almost in its entirely are comprised of Old sand dune deposits (Qos), overlying older alluvium gray to light brown, pebble-gravel, sand and silt-clay, elevated and dissected; Baldwin Hills designated as Baldwin Hills (Qoa) lies in the southern coastal ranges. The site is located in the southern half of the Coast Ranges geomorphic province of California. The Coast Ranges province extends approximately 600 miles from the Oregon border to the Santa Ynez River in the south.

The faults are generally northwest trending and parallel the San Andreas fault system. Local and regional faults include Palos Verdes and Palos Verdes Connected (6.54 mk), Newport Inglewood alt 1 and Newport Inglewood alt 1 Connected (7.02 km), Santa Monica Alt 2 (13.3 km) Santa Monica Alt 1 (14.03 km), are the nearest faults within 15 km from the project site, a Summary of the faults within 50 km of the project site are summarized in Table No. 1.

Figure No. 3, *Regional Geologic Map*, has been prepared to show the location of El Segundo Park and Recreation with respect to the geologic units comprising the site and units that surround it. The site is located over upper Pleistocene to old Quaternary sand dune deposits (Qos) in contact with alluvial gray to light brown pebble-gravel, sand and silt deposits (Qae), both units overlay older alluvium of gray to light brown pebble-gravel, sand and silt-clay surficial sediments (Qoa). (map DF-322 Venice-Inglewood NGMDB).



QUATERNARY DEPOSITS

- Qs — Extensive marine and nonmarine sand deposits, generally near the coast or desert playas
- Q — Alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated
- Qls — Selected large landslides
- Qg — Glacial till and moraines. Found at high elevations mostly in the Sierra Nevada and Klamath Mountains
- Qoa — Older alluvium, lake, playa, and terrace deposits
- QPc — Pleistocene and/or Pliocene sandstone, shale, and gravels deposits; mostly loosely consolidated

QUATERNARY VOLCANIC ROCKS

- Qrv — Recent (Holocene) volcanic flow rocks; minor pyroclastic deposits
- Qrv^{d} — Recent (Holocene) pyroclastic and volcanic mudflow deposits
- Qv — Quaternary volcanic flow rocks; minor pyroclastic deposits
- Qv^{d} — Quaternary pyroclastic and volcanic mudflow deposits

TERTIARY SEDIMENTARY ROCKS

- Tc — Undivided Tertiary nonmarine sandstone, shale, conglomerate, breccia, and ancient lake deposits
- P — Pliocene marine sandstone, siltstone, shale, and conglomerate; mostly moderately consolidated
- M — Miocene marine sandstone, shale, siltstone, conglomerate, and breccia; moderately to well consolidated
- Mc — Miocene nonmarine sandstone, shale, conglomerate, and fanglomerate; moderately to well consolidated
- Os — Oligocene marine sandstone, shale, and conglomerate; mostly well consolidated
- Osc — Oligocene nonmarine sandstone, shale, and conglomerate; mostly well consolidated
- E — Eocene marine shale, sandstone, conglomerate, and minor limestone; mostly well consolidated
- Ec — Eocene nonmarine sandstone, shale, and conglomerate; moderately to well consolidated
- Ep — Paleocene marine sandstone, shale, and conglomerate; mostly well consolidated

TERTIARY VOLCANIC ROCKS

- Tv — Tertiary volcanic flow rocks; minor pyroclastic deposits
- Tv^{d} — Tertiary pyroclastic and volcanic mudflow deposits.
- Ti — Tertiary intrusive rocks; mostly shallow (hypabyssal) plugs and dikes

TERTIARY PLUTONIC ROCKS

- gr^{Ks} — Cenozoic (Tertiary) granitic rocks - quartz monzonite, quartz latite, and minor monzonite, granodiorite, and granite; found in the Kingston, Panamint, Amargosa, and Greenwater Ranges in southeastern California

MESOZOIC SEDIMENTARY AND METASEDIMENTARY ROCKS

- TK — Sandstone, shale, and minor conglomerate in coastal belt of northwestern California. Previously considered Cretaceous, but now known to contain early Tertiary microfossils in places
- K — Undivided Cretaceous sandstone, shale, and conglomerate; minor nonmarine rocks in Peninsular Ranges
- Ku — Upper Cretaceous sandstone, shale, and conglomerate
- Kl — Lower Cretaceous sandstone, shale, and conglomerate
- KJf — Franciscan Complex: Cretaceous and Jurassic sandstone with smaller amounts of shale, chert, limestone, and conglomerate. Includes Franciscan melange, except where separated
- KJf$_{m}$ — Melange of fragmented and sheared Franciscan Complex rocks
- KJf$_{s}$ — Blueschist and semi-schist of Franciscan Complex
- J — Jurassic shale and sandstone; minor conglomerate, chert, slate, limestone, and pyroclastic rocks

SYMBOL EXPLANATION

Contact between geologic units - approximately located

Fault traces - solid where well located, dashed where approximately located or inferred, dotted where concealed, and queried where continuation or existence is uncertain. Ball and bar on downthrown side (relative or apparent). Arrows indicate direction of lateral movement (relative or apparent)

Thrust fault (barbs on upper plate)

Regional strike and dip of stratified rocks

Regional strike and dip of stratified rocks (overturned)

NOT TO SCALE

REGIONAL GEOLOGIC MAP

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Figure No. 3

Geologic active faults nearby; Palos Verdes, Newport-Inglewood, Santa Monica, Puente Hills, Malibu faults and other active local and regional faults were included as active faults modeled for the probabilistic seismic hazard analysis.

4.2 Subsurface Profile of Project Site

The earth materials encountered during our investigation consist of existing fill soils placed during previous site grading operations and natural alluvial soils to a maximum explored depth of 5 feet bgs. The fill encountered consists primarily of sands and silty sands. The alluvial soil deposits below the fill primarily consist of sands, and silty sands. The park lies at the border with El Segundo Oil Gas Field, alluvial deposits are all consistent with the described Old Sand Dune Deposits (Qos), the project site is relatively flat, with old dune deposits that form small hills along the coastal plains of Inglewood, Lennox and Hawthorne and further South Redondo Beach and Torrance

For a detailed description of the materials encountered during our exploration, see Appendix A*, Field Exploration.*

4.3 Groundwater

During our field exploration, groundwater was not encountered. Historically highest groundwater contours compiled by the CDMG (1988) for the Venice 7.5-minute quadrangle, closest water level contour is about 4.5 miles from the project site, it shows water levels at 5 feet below ground level. Data from the California Department of Water Resources, shows the three closest wells to the project site, indicate historic high levels of 2.22, 7.65 and 24.31 feet below ground level (Table No. 1).

Table No. 1, Wells Near the Site for Historic Height

Site Code	Well Name	Location Coordinates	Measured Depth Range (feet bgs)	Measurement Date Range
339528N1183824W001	02S14W31H001S	33.9528 -118.3824	7.65	1997
339118N1183671W002	03S14W17G004S	33.9118 -118.3671	24.31-24.49	1999
339670N1183597W002	Inglewood1_4	33.9666963 -118.359669	2.22-4.81	1998-2002

In general, groundwater levels fluctuate with the seasons, and local zones of perched groundwater may be present within the near-surface deposits due to local conditions or during rainy seasons. Groundwater conditions below any given site vary depending on numerous factors including seasonal rainfall, local irrigation, storm water recharge and groundwater pumping, among other factors.

4.4 Subsurface Variations

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the project site should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material at the site, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations. If, during construction, subsurface conditions differ significantly from those presented in this report, this office should be notified immediately so that recommendations can be modified, if necessary.

5.0 FAULTING AND SEISMIC HAZARDS

Discussion of faulting and seismicity is presented in the following sections.

5.1 Faulting

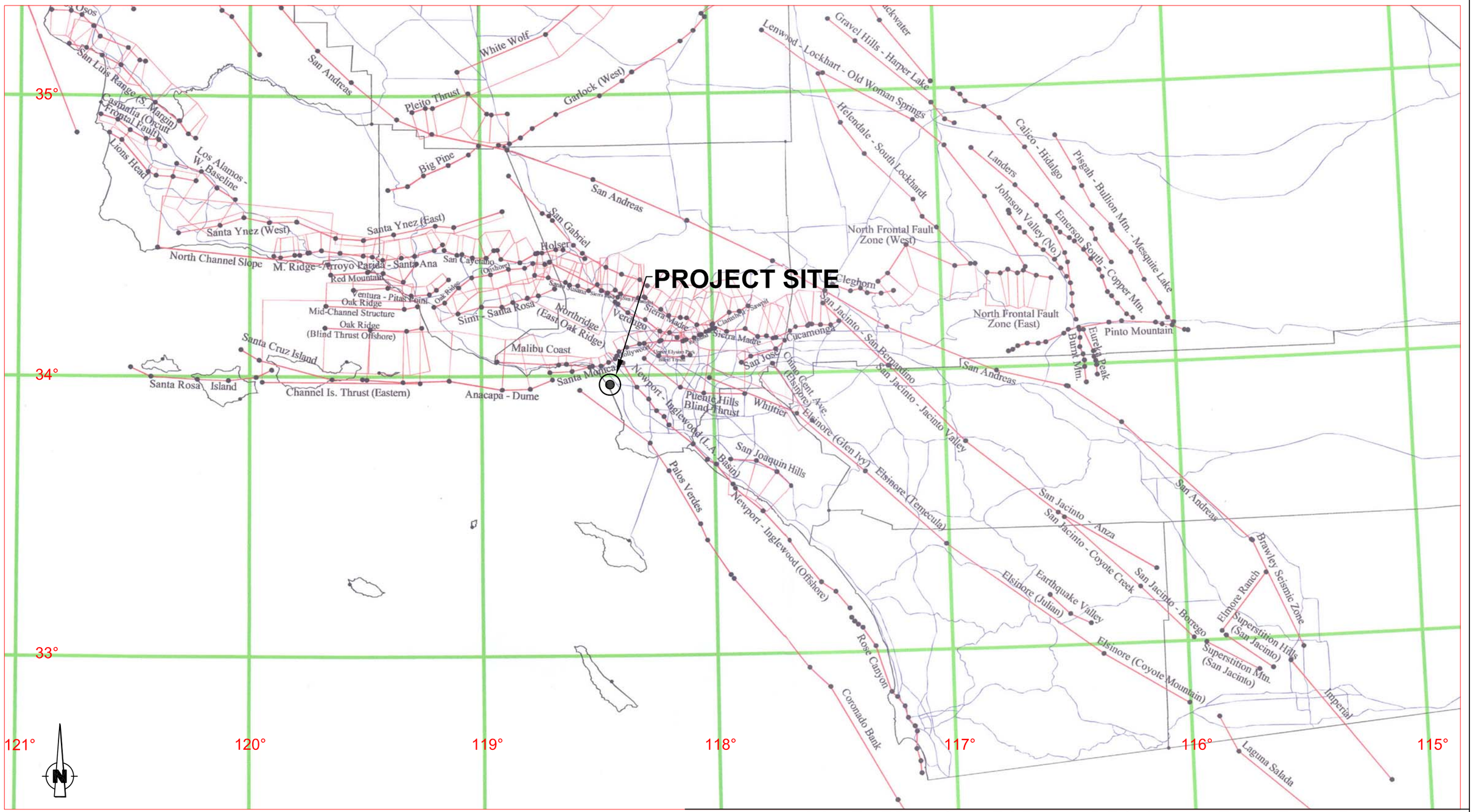
In California, the Alquist-Priolo Earthquake Fault Zoning Act regulates development in the vicinity of active faults. For purposes of the Act, California defines an active fault as one which has had surface displacement within Holocene time, or about the last 11,000 years. The site is currently not located within a currently designated State of California Earthquake Fault Zone. The California Geologic Survey (CGS) for the 7.5 minute Venice Quadrangle indicates that there are no faults mapped toward or within the project site,

The proposed site is situated in a seismically active region. As is the case for most areas of California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site. Please see Figure Nos. 4 and 5.

The following table contains a list of active and potentially active faults within 50 kilometers of the subject site based on site coordinates of 33.922369° North (latitude) and 118.4114588° West (longitude).

Table No. 2, Summary of Regional Faults

Name	Distance (km)	Maximum Moment Magnitude (Mmax)	Pref Slip Rate (mm/yr)
Palos Verdes Connected	6.54	7.7	3
Palos Verdes	6.54	7.3	3
Newport Inglewood Connected alt 1	7.02	7.5	1.3
Newport-Inglewood, alt 1	7.02	7.2	1
Newport Inglewood Connected alt 2	8.33	7.5	1.3
Santa Monica Connected alt 2	13.3	7.4	2.4



REFERENCE: PORTION OF CGS 2002 CALIFORNIA FAULT MODEL MODIFIED FOR USE WITH FRISKSP AND EQFAULT BY THOMAS F. BLAKE, AUGUST 2004

FAULT SOURCES

BLIND THRUST FAULT, POLYGONS INDICATE RUPTURE PLANES AND DIP DIRECTION

SOUTHERN CALIFORNIA REGIONAL FAULT MAP

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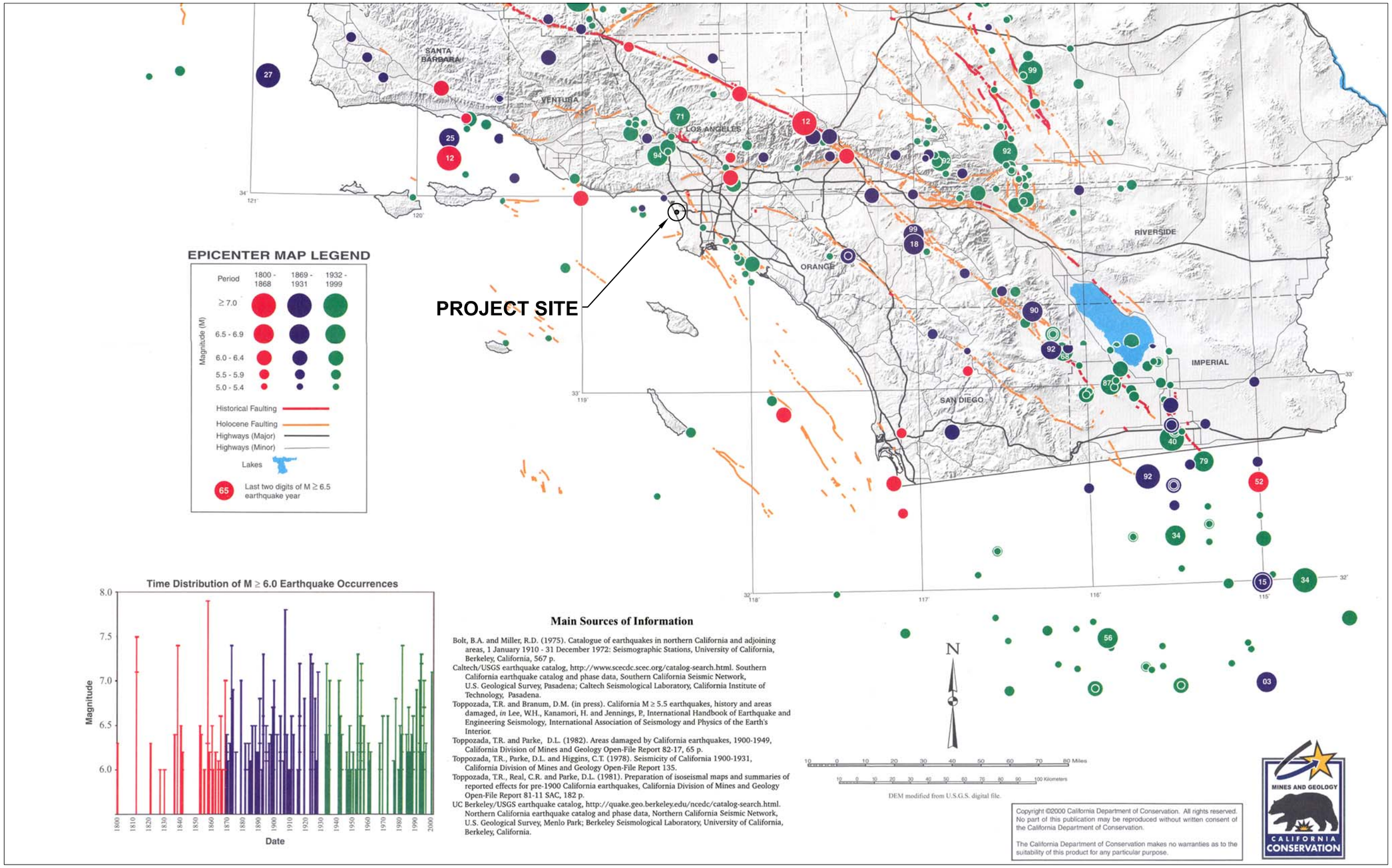
401 Sheldon Street, El Segundo, California 90245

Project No. 24-31-126-01
Figure No. 4
Date OCTOBER 2024



REFERENCE: PORTION OF EPICENTERS AND AREAS DAMAGED BY M≥5 CALIFORNIA EARTHQUAKES, 1800-1999 CALIFORNIA DEPARTMENT OF CONSERVATION, MAP SHEET 49 DATED 2000.

EPICENTER MAP OF SOUTHERN CALIFORNIA EARTHQUAKES (1800–1999)

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Figure No. 5

Name	Distance (km)	Maximum Moment Magnitude (Mmax)	Pref Slip Rate (mm/yr)
Santa Monica, alt 1	14.03	6.6	1
Puente Hills (LA)	14.26	7	0.7
Malibu Coast, alt 1	16.07	6.7	0.3
Malibu Coast, alt 2	16.07	7	0.3
Anacapa-Dume, alt 2	17.2	7.2	3
Hollywood	18.21	6.7	1
Elysian Park (Upper)	22.99	6.7	1.3
Puente Hills (Santa Fe Springs)	25.18	6.7	0.7
Anacapa-Dume, alt 1	27.26	7.2	3
Raymond	28.27	6.8	1.5
Verdugo	31	6.9	0.5
Puente Hills (Coyote Hills)	34.04	6.9	0.7
Elsinore;W	34.5	7.03	2.5
Elsinore;W+GI	34.5	7.27	n/a
Elsinore;W+GI+T	34.5	7.48	n/a
Elsinore;W+GI+T+J	34.5	7.72	n/a
Elsinore;W+GI+T+J+CM	34.5	7.79	n/a
Sierra Madre Connected	38.18	7.3	2
Sierra Madre	38.18	7.2	2
Sierra Madre (San Fernando)	40.2	6.7	2
Northridge	43.33	6.9	1.5
Santa Susana, alt 1	43.99	6.9	5
San Gabriel	45.74	7.3	1
Clamshell-Sawpit	47.51	6.7	0.5

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

5.2 Seismic History

An analysis of the seismic history of the site was conducted using the computer program EQSEARCH, (Blake, 2000), and attenuation relationships proposed by Boore et al. (1997) for stiff soil conditions. The Southern California Earthquake Catalog with the Southern California Earthquake Center was also utilized (SCEC, 2011).

Based on the analysis of seismic history, the number of earthquakes with a moment magnitude of 5.0 or greater occurring within a distance of 100 kilometers was 171, since the year 1800. Based on the analysis, the largest earthquake-induced ground acceleration affecting the sites since the year 1800 is a 7.0 magnitude earthquake in 1858 with a calculated ground acceleration of 0.154g at the sites.

5.3 Surface Fault Rupture

The project site is not located within a currently designated State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zones) for surface fault rupture. The Alquist-Priolo Earthquake Fault Zoning Act requires the California Geological Survey to zone “active faults” within the State of California. An “active fault” has exhibited surface displacement with Holocene time (within the last 11,000 years) hence constituting a potential hazard to structures that may be located across it. Public school structures are required to be set-back at least 50 feet from an active fault. The active fault set-back distance is measured perpendicular from the dip of the fault plane. Based on a review of existing geologic information, no known active faults project through or toward the site. The potential for surface rupture resulting from the movement of the nearby major faults is considered remote.

5.4 Liquefaction and Seismically-Induced Settlement

Liquefaction is the sudden decrease in the strength of cohesionless soils due to dynamic or cyclic shaking. Saturated soils behave temporarily as a viscous fluid (liquefaction) and, consequently, lose their capacity to support the structures founded on them. The potential for liquefaction decreases with increasing clay and gravel content but increases as the ground acceleration and duration of shaking increase. Liquefaction potential has been found to be the greatest where the groundwater level and loose sands occur within 50 feet of the ground surface.

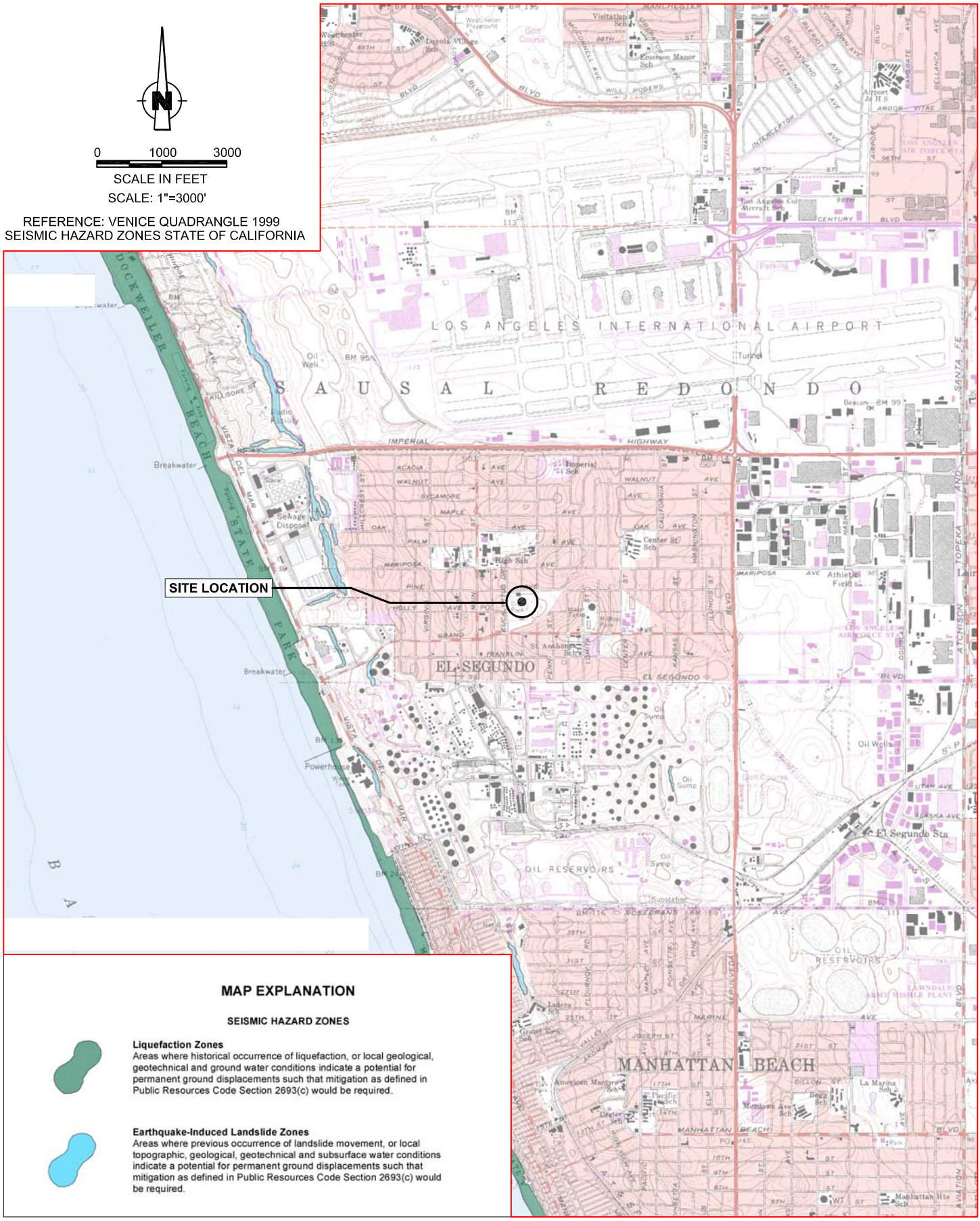
The site is not located within potential liquefaction zones per the State of California Seismic Hazard Zones Map for the South Gate Quadrangle as shown in Figure No. 6 *Seismic Hazard Zones Map*.

5.5 Lateral Spreading

Seismically induced lateral spreading involves primarily lateral movement of earth materials due to ground shaking. It differs from the slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. The topography at the project sites and in the immediate vicinity of the sites is relatively flat, with no significant nearby slopes or embankments. Under these circumstances, the potential for lateral spreading at the subject site is considered negligible.

5.6 Seismically-Induced Slope Instability

Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The project sites are also not shown with any earthquake-induced landslide areas due to the relatively flat condition of the site topography. In the



SEISMIC HAZARD ZONES MAP

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Figure No. 6

absence of significant ground slopes, the potential for seismically induced landslides to affect the proposed site is considered to be very low.

5.7 Earthquake-Induced Flooding

Review of the Flood Insurance Rate Map (FIRM), Panel 1725 of 2350, from the FEMA Map Service Center Viewer, indicates that the sites are in an area designated as Zone D, "Areas in which flood hazards are undetermined, but possible." Due to the absence of groundwater at shallow depths, distance of the subject site from large bodies of water and regional flood control structures, the potential for flooding at the subject site is considered remote.

5.8 Tsunami and Seiches

Tsunamis are seismic sea waves generated by fault displacement or major ground movement. Based on the location of the sites from the ocean (about 1.2 miles), tsunamis can be considered a hazard. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Based on site location, the proximity to the ocean, and the absence of natural barriers, the possibility of flooding due to a tidal wave exists.

5.9 Volcanic Eruption Hazard

There are no known volcanoes near the sites. According to Jennings (1994), the nearest potential hazards from future volcanic eruptions is the Amboy Crater-Lavic Lake area located in the Mojave Desert more than 120 miles east/northeast of the site. Volcanic eruption hazards are not present.

6.0 SEISMIC ANALYSIS

6.1 CBC Seismic Design Parameters

Seismic parameters based on the 2022 California Building Code are calculated using the United States Geological Survey *U.S. Seismic Design Maps* website application and the site coordinates for (33.9564 degrees North Latitude, 118.2436 degrees West Longitude). These coordinates are in reference to the project area. The seismic parameters are presented below.

Table No. 3, CBC Seismic Design Map Parameters

Seismic Parameters	ASCE7-16
Site Class	D
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_S	1.864 g
Mapped 1-second Spectral Response Acceleration, S_1	0.658 g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.2
Site Coefficient (from Table 1613.5.3(2)), F_v	1.7

Seismic Parameters	ASCE7-16
(1) MCE 0.2-sec period Spectral Response Acceleration, S_{MS}	2.236 g
(1) MCE 1-second period Spectral Response Acceleration, S_{M1}	1.6779 g
Design Spectral Response Acceleration for short period, S_{DS}	1.4912 g
Design Spectral Response Acceleration for 1-second period, S_{D1}	1.1186 g
Long-Period (TL)	8
(2)PGAm	0.964 g
Seismic Design Category	D

Notes:
(1) MCE_R stands for Risk-Targeted Maximum Considered Earthquake.
(2) MCE_G PGA stands for Maximum Considered Earthquake Geometric Mean Peak Ground Acceleration.
* See requirements of ASCE 7-16 Section 11.4.8

7.0 EARTHWORK AND SITE GRADING RECOMMENDATIONS

7.1 General Evaluation

Based on our field exploration, laboratory testing, and analyses of subsurface conditions at the sites, remedial grading will be required to prepare the sites for support of the proposed structures that are constructed with conventional shallow footings. To reduce differential settlement, variations in the soil type, degree of compaction, and thickness of the compacted fill, the thickness of compacted fill placed underneath the footings should be kept uniform.

Site grading recommendations provided below are based on our experience with similar projects in the area and our evaluation of this investigation.

Site preparation for the proposed structures may require removal of existing asphalt pavements, concrete curbs, improvements, and other existing underground manmade structures and utilities.

The site soils can be excavated utilizing conventional heavy-duty earth-moving equipment. The excavated site soils, free of vegetation, shrub and debris, and oversize rock materials may be placed as compacted fill in structural areas after proper processing. Rocks larger than three (3) inches in the largest dimension should not be placed as fill.

On-site clayey soils with an expansion index (EI) exceeding 20 should not be re-used for compaction within 5 feet below the proposed foundations. Select granular, non-expansive soil materials may have to be selectively stockpiled during excavation or imported to provide suitable subgrade materials with an expansion index less than 20. Soils containing organic materials should not be used as structural fill. The extent of removal should be determined by the geotechnical representative based on soil observation during grading.

7.2 Over-Excavation

To provide uniform support for the proposed foundations, the existing soils should be over-excavated and replaced with engineered fill to a minimum depth of 2 feet below the bottom of foundations and other planned improvements. The over-excavation and re-compaction should extend laterally at least 3 feet beyond the footprints of the foundations. The over-excavation and re-compaction should be deepened as needed to remove any existing fill, and soft, disturbed or saturated soils. All undocumented fill should be removed and replaced with compacted fill below structures. The bottom of excavations should be scarified to a depth of 8-inches, moisture conditioned, mixed and compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM D1557 test method.

Native alluvial soils below the pavement should be over-excavated and recompacted to a minimum depth of 12 inches below the pavement subgrade. The bottoms of the excavations should be scarified to an additional 6 inches below the over-excavation and recompacted to at least 90 percent of the laboratory maximum dry density. The upper 12 inches of soils beneath pavement subgrade should be compacted to at least 95 percent of the laboratory maximum dry density. The over-excavation and re-compaction should extend to at least 3 feet beyond the edge of the pavement.

Variations in the depths and lateral extent of over-excavations will be based on observations made by the geotechnical consultant during grading and should be anticipated. The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill or structures. If isolated pockets of very soft, loose, or pumping subgrade are encountered, the over-excavation should be locally deepened, as needed, to expose undisturbed, firm, and unyielding soils. Over-excavation should not undermine adjacent off-site improvements or structures that are to remain and be protected in place.

If loose, soft, disturbed or yielding soil conditions are encountered at the excavation bottoms, the following options can be considered.

- Over-excavate until a firm bottom is reached.
- Scarify or over-excavate an additional 18 inches deep, and then place at least 18-inch thick layer of compacted aggregate base material (CAB or equivalent) to bridge the soft bottom. Base material should be compacted to a minimum 95% relative compaction.
- Over-excavate an additional 18-inches deep, and then place a layer of geotextile reinforcement (i.e., Mirafi HP570, or equivalent), then place an 18-inch-thick layer of compacted base material (CAB or equivalent) to bridge the soft bottom. Base materials should be compacted to a minimum 95% relative compaction. An

additional layer of geotextile reinforcement may be needed on top of the compacted base materials depending on the actual site conditions.

The actual depth of removal should be based on recommendations and observations made during grading by the project geotechnical engineer or his designated representative. Therefore, some variations in the depth and lateral extent of over-excavation recommended in this report should be anticipated.

7.3 Structural Fill

Following observation of the excavation bottom, subgrade soil surfaces should be scarified to a depth of at least six inches. The scarified soil should be moisture-conditioned to within three (3) percent of optimum moisture for granular soils and to approximately three (3) percent above the optimum moisture for fine-grained clay soil. Scarified soil shall be compacted to a minimum 90 percent of the laboratory maximum dry density as determined by the ASTM Standard D1557 test method.

Any import fill should be tested and approved by Project Geotechnical Consultant. The import fill should have an expansion index (EI) less than 20. Select granular, non-expansive soil materials may have to be imported to provide suitable subgrade materials with an expansion index (EI) less than 20 depending on soil conditions encountered during grading. The imported materials should be thoroughly mixed, and moisture conditioned within three (3) percent above the optimum moisture. All fill, if not specified otherwise elsewhere in this report, should be compacted to at least 90 percent of the laboratory dry density in accordance with the ASTM Standard D1557 test method.

Where the fill is not within the areas specified above or is not to support any structures, excavated site soils, free of deleterious materials and rock particles larger than three inches in the largest dimension, should be suitable for placement as compacted fill. The site materials should be thoroughly mixed, and moisture conditioned to approximate three percent above the optimum moisture, and then compacted to at least 90 percent of relative compaction.

7.4 Excavatability

Based on our field exploration, the earth materials at the site should be excavatable with conventional heavy-duty earth moving and trenching equipment. Some gravel, cobbles and possible boulders should be expected during excavation.

7.5 Expansive Soil Mitigation

Expansive soils are characterized by their ability to undergo significant volume change (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may cause unacceptable settlement or heave

of structures, concrete slabs supported-on-grade, or pavements supported over these materials.

According to the results of our exploration work, the subsurface soils are comprised of sands, silty sands and according of our geologic research some instances of gravel, but we did not find any, nonetheless gravel layers might exist beyond the limits of our maximum boring exploration depth (5 feet).

During construction, grading will mix and relocate the site soils, and additional fill soils may be added. The expansion potential of the finish-grade soils should be tested at the completion of grading.

The recommendations contained in this report are based on the anticipated expansion soil conditions. Any proposed import fill should have an expansion index less than 20 and should be evaluated and approved by Converse prior to import to the site.

7.6 Shrinkage and Subsidence

Soil shrinkage and/or bulking as a result of remedial grading depends on several factors including the depth of over-excavation, and the grading method and equipment utilized, and average relative compaction. For preliminary estimation, bulking and shrinkage factors for various units of earth material at the site may be taken as presented below:

- The approximate shrinkage factor for the native alluvial soils is estimated to range from five (5) to fifteen (15) percent.
- For estimation purposes, ground subsidence may be taken as 0.15 feet as a result of remedial grading.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

7.7 Subgrade Preparation

Final subgrade soils for structures should be uniform and non-yielding. To obtain a uniform subgrade, soils should be well mixed and uniformly compacted. The subgrade soils should be non-expansive and well-drained. The near-surface site soils should be free draining. We recommend that at least the upper two (2) inches of subgrade soils underneath the slab-on-grade should be comprised of well-drained granular soils such as sands, gravel or crushed aggregate satisfying the following criteria:

- Maximum size $\leq$ 1.5 inches
- Percent passing U.S. #200 sieve $\leq$ 12 percent
- Sand equivalent $\geq$ 30

On-site soil may be utilized if it satisfies the above criteria. The subgrade soils should be moisture conditioned before placing concrete.

8.0 DESIGN RECOMMENDATIONS

The various design recommendations provided in this section are based on the assumptions that in preparing the site, the earthwork and site grading recommendations provided in this report will be followed.

8.1 Shallow Foundations for Proposed Retaining Walls

8.1.1 Vertical Capacity

The proposed improvements can be supported by conventional shallow footings. We recommend continuous and square footings be founded at least 18 inches below lowest adjacent final grade entirely into compacted fill or into native soil. A minimum footing width of 24 inches is recommended for square footings and 18 inches for continuous footings. The allowable bearing value for footings with above minimum sizes founded on compacted fill and competent native soils may be designed for a net bearing pressure of 2,000 pounds per square foot (psf) for dead-plus-live-loads. The net allowable bearing pressure can be increased by 500 psf for each additional foot of excavation depth and by 300 psf for each additional foot of excavation width up to a maximum value of 3,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity.

8.1.2 Lateral Capacity

Resistance to lateral loads can be provided by friction acting at the base of the foundation and by passive earth pressure. A coefficient of friction of 0.3 may be assumed with normal dead load forces. An allowable passive earth pressure of 200 psf per foot of depth up to a maximum of 2,000 psf may be used for footings poured against properly compacted fill. The values of coefficient of friction and allowable passive earth pressure include a factor of safety of 1.5.

8.1.3 Settlement

The static settlement of structures supported on continuous and/or spread footings founded on compacted fill and native soil will depend on the actual footing dimensions and the imposed vertical loads. Most of the footing settlement at the project site is expected to occur immediately after the application of the load. Based on the maximum allowable net bearing pressures presented above, static settlement is anticipated to be

less than 1.0 inch. Differential settlement is expected to be up to one-half of the total settlement over a 30-foot span.

8.1.4 Dynamic Increases

Bearing values indicated above are for total dead load and frequently applied live loads. The above vertical bearing may be increased by 33% for short durations of loading which will include the effect of wind or seismic forces. The allowable passive pressure may be increased by 33% for lateral loading due to wind or seismic forces.

8.2 Lateral Earth Pressures and Resistance to Lateral Loads

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

8.2.1 Active Earth Pressures

The active earth pressure behind any buried wall or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The lateral earth pressures are presented in the following tables.

Table No. 4, Active and At-Rest Earth Pressures

Loading Conditions	Lateral Earth Pressure (psf)
Active earth conditions (wall is free to deflect at least 0.001 radian)	35
At-rest (wall is restrained)	55

These pressures assume a level ground surface around the structure for a distance greater than the structure height, no surcharge, and no hydrostatic pressure.

If water pressure is allowed to build up behind the walls, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the walls. Cantilever retaining walls greater than 6 feet, as measured from the surface, should be designed to resist additional earth pressure caused by seismic ground shaking. A dynamic earth pressure of 20H (psf), based on an inverted triangular distribution, can be used for design of wall.

8.3 Modulus of Subgrade Reaction

For the subject project, design of the structures supported on compacted fill subgrade prepared in accordance with the recommendations provided in this report may be based on a soil modulus of subgrade reaction of (k_s) of 100 pounds per square inch per inch.

8.4 Slabs-on-Grade

Slabs-on-grade should have a minimum thickness of four inches nominal for support of normal ground-floor live loads. Minimum reinforcement for slabs-on-grade should be No. 4 reinforcing bars, spaced at 18 inches on-center each way. The thickness and reinforcement of more heavily loaded slabs will be dependent upon the anticipated loads and should be designed by a structural engineer. A static modulus of subgrade reaction equal to 100 pounds per square inch per inch may be used in structural design of concrete slabs-on-grade.

It is critical that the exposed subgrade soils should not be allowed to desiccate prior to the slab pour. Care should be taken during concrete placement to avoid slab curling. Slabs should be designed and constructed as promulgated by the ACI and Portland Cement Association (PCA). Prior to the slab pour, all utility trenches should be properly backfilled and compacted.

In areas where a moisture-sensitive floor covering (such as vinyl tile or carpet) is used, a 10-mil-thick moisture retarder/barrier between the bottom of slab and subgrade that meets the performance criteria of ASTM E1745 Class A material. Retarder/barrier sheets should be overlapped a minimum of six inches and should be taped or otherwise sealed per the product specifications.

8.5 Soil Corrosivity Evaluation

Converse retained EGL Engineering and Testing, Inc., located in Pasadena, California, to test one (1) bulk soil sample taken in the general area of the proposed structures. The tests included minimum resistivity, pH, soluble sulfates, and chloride content, with the results summarized on the following table:

Table No. 5, Soil Corrosivity Test Results

Boring No.	Sample Depth (feet)	pH (Caltrans 643)	Soluble Chlorides (Caltrans 422) ppm	Soluble Sulfate (Caltrans 417) (%)	Minimum Resistivity (Caltrans 643) Ohm-cm
S-3	2-5	7.29	100	0.002	1,550

In accordance with the Caltrans Corrosive Guidelines (2021), the pH value, and chloride content of the sample tested is in the “non-corrosive” range. However, the resistivity is in the “corrosive” range to ferrous metals at the site.

Soluble sulfate concentrations tested for this project are less than 2,000 ppm in the soil. Mitigation measures to protect concrete in contact with the soils are not anticipated. Type I or II Portland Cement may be used for the construction of the foundations and slabs.

In general, conventional corrosion mitigation measures may include the following:

- Steel and wire concrete reinforcement should have at least three inches of concrete cover where cast against soil, unformed.
- Below-grade ferrous metals should be given a high-quality protective coating, such as 18-mil plastic tape, extruded polyethylene, coal-tar enamel, or Portland cement mortar.
- Below-grade metals should be electrically insulated (isolated) from above-grade metals by means of dielectric fittings in ferrous utilities and/or exposed metal structures breaking grade.

The test results presented herein are considered preliminary. If advanced corrosivity study is desired by the design team, a corrosion engineer can be consulted for appropriate mitigation procedures and construction design.

8.6 Site Drainage

Adequate positive drainage should be provided away from the structures to prevent ponding and to reduce percolation of water into structural backfill. We recommend that the landscape area immediately adjacent to the foundation shall be designed sloped away from the building with a minimum 5% slope gradient for at least 10 feet measured perpendicular to the face of the wall. Impervious surfaces within 10 feet of the foundation shall have a minimum 2 percent slope away from the building per 2022 CBC.

Planters and landscaped areas adjacent to the building perimeter should be designed to minimize water infiltration into the subgrade soils.

9.0 CONSTRUCTION CONSIDERATIONS

9.1 General

Site soils should be excavatable using conventional heavy-duty excavating equipment. Temporary sloped excavation is feasible if performed in accordance with the slope ratios provided in Section 9.2, *Temporary Excavations*. Existing utilities should be accurately located and either protected or removed as required.

9.2 Temporary Excavations

Based on the sandy materials encountered in the exploratory borings, sloped temporary excavations (if necessary) may be constructed according to the slope ratios presented in Table No. 6, *Slope Ratios for Temporary Excavations*. Any loose utility trench backfills or other fill encountered in excavations will be less stable than the native soils. Temporary cuts encountering loose fill or loose dry sand may have to be constructed at a flatter gradient than presented in the following table:

Table No. 6, Slope Ratios for Temporary Excavations

Maximum Depth of Cut (feet)	Maximum Slope Ratio* (horizontal: vertical)
0 – 4	vertical
4 – 8	1:1

*Slope ratio assumed to be uniform from top to toe of slope.

Surfaces exposed in slope excavations should be kept moist but not saturated to minimize raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction, should not be placed within five (5) feet of the unsupported trench edge. The above maximum slopes are based on a maximum height of six (6) feet of stockpiled soils placed at least five (5) feet from the trench edge.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act of 1987 and current amendments, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the project's geotechnical consultant. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

9.3 Slot Cut Recommendations

Temporary excavations during possible improvements should not extend below a 1:1 horizontal:vertical (H:V) plane extending beyond and down from the bottom of the existing foundations, utility lines or structures. The remedial grading excavations should not cause loss of bearing and/or lateral support for adjacent foundations, utilities or structures.

If remedial grading excavations extend below a 1:1 horizontal:vertical (H:V) plane extending beyond and down from the bottom of adjacent off-site utility lines or structure foundations, shoring or slot cutting shall be employed. The ABC slot cutting method for over-excavation could be a possible option as an alternative to shoring for excavation less than 8 feet in width and depth or with cohesive soils. In general, for structures it is not recommended for slot cutting if the height of excavation exceeds more than 8 feet or into sandy soils and with surcharging load. Backfill should be accomplished in the shortest period of time possible and in alternating sections.

9.4 Geotechnical Services During Construction

This report has been prepared to aid in the site preparation and site grading plans and specifications, and to assist the architect, civil and structural engineers in the design of the proposed structure. It is recommended that this office be provided an opportunity to

review final design drawings and specifications to verify that the recommendations of this report have been properly implemented.

Recommendations presented herein are based upon the assumption that adequate earthwork monitoring will be provided by Converse. Excavation bottoms should be observed by a Converse representative prior to the placement of compacted fill. Structural fill and backfill should be placed and compacted during continuous observation and testing by this office. Footing excavations should be observed by Converse prior to placement of steel and concrete so that footings are founded on satisfactory materials and excavations are free of loose and disturbed materials.

During construction, the geotechnical engineer and/or their authorized representatives should be present at the site to provide a source of advice to the client regarding the geotechnical aspects of the project and to observe and test the earthwork performed. Their presence should not be construed as an acceptance of responsibility for the performance of the completed work, since it is the sole responsibility of the contractor performing the work to ensure that it complies with all applicable plans, specifications, ordinances, etc.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations and cannot be responsible for other than our own personnel on the site; therefore, the safety of others is the responsibility of the contractor. The contractor should notify the owner if he considers any recommended actions presented herein to be unsafe.

10.0 CLOSURE

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice. We make no other warranty, either expressed or implied. Our conclusions and recommendations are based on the results of the field and laboratory investigations, combined with an interpolation and extrapolation of soil conditions between and beyond boring locations. If conditions encountered during construction appear to be different from those shown by the borings, this office should be notified.

Design recommendations given in this report are based on the assumption that the earthwork and site grading recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the final site grading and actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

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Appendix A

Field Exploration

APPENDIX A: FIELD EXPLORATION

Field exploration included an initial site reconnaissance, and subsurface drilling. During the site reconnaissance, surface conditions were noted, and the locations of the test borings were determined. Borings were approximately located using existing features as a guide.

Field exploration consisted of drilling eighteen (18) borings as follows: 3 concrete core extractions using a core extractor and hand auger to five (5) feet below ground surface (bgs) (S-1, S-2 and S-3), four boreholes at five (5) feet (bgs), one of them used for percolation assessment at the softball field (SoF-1 through SoF-4), and eleven (11) boreholes (BH-1 thru BH11) at three (3) feet depth at Brett Field O during October 16 and 17, 2024. Soils were continuously logged and classified in the field by visual/manual examination, in accordance with the Unified Soil Classification System. Field descriptions have been modified, where appropriate, to reflect laboratory test results.

Relatively undisturbed ring and bulk samples of the subsurface soils were obtained at frequent intervals in the borings. The undisturbed samples were obtained using a California Steel Sampler (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The sampler was driven into the bottom of the boreholes with successive drops of a 40-pound hammer falling 24 inches by means of a mechanically driven pulley. The number of successive drops of the driving weight ("blows") required for every 6-inch of penetration of the sampler are shown on the Logs of Borings in the "blows" column.

The soil was retained in brass rings (2.4 inches in diameter and one inch in height). The central portion of the sample was retained and carefully sealed in waterproof plastic containers for shipment to the laboratory. Bulk soil samples were also collected in plastic bags and brought to the laboratory.

It should be noted that the exact depths at which material changes occur cannot always be established accurately. Changes in material conditions that occur between driven samples are indicated in the logs at the top of the next drive sample. A key to soil symbols and terms is presented as Drawing Nos. A-1a and A1b, *Soil Classification Chart*. The logs of the exploratory boring are presented in Drawing Nos. A-2 through A-3, *Log of Borings.*

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	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
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	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
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	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
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	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

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 4546)
CP	Compaction Curve (ASTM D 1557)
CR	Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeablility (ASTM D 2434)
PA	Particle Size Analysis (ASTM D 6913 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301)
SE	Sand Equivalent (ASTM D 2419)
SG	Specific Gravity (ASTM D 854)
SW	Swell Potential (ASTM D 4546)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166)
	Unconfined Compression - Rock (ASTM D 7012)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850)
UW	Unit Weight (ASTM D 2937)

BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

DRILLING METHOD SYMBOLS

Auger Drilling | Mud Rotary Drilling | Dynamic Cone or Hand Driven | Diamond Core

SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Drawing No. **A-1a**

Template: KEY

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	SPT Blow Counts	Pocket Penetrometer (tsf)	CA Sampler	Torvane (tsf)	Field Approximation
Very Soft	<0.25	< 2	<0.25	<3	<0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	2 - 4	0.25 - 0.50	3 - 6	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	5 - 8	0.50 - 1.0	7 - 12	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	9 - 15	1.0 - 2.0	13 - 25	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	16 - 30	2.0 - 4.0	26 - 50	1.0 - 2.0	Readily indented by thumbnail
Hard	>4.0	>30	>4.0	>50	>2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60}- Value (blows / foot)	CA Sampler
Very Loose	<4	<5
Loose	4- 10	5 - 12
Medium Dense	11 - 30	13 - 35
Dense	31 - 50	36 - 60
Very Dense	>50	>60

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OF PROPORTION OF SOILS

Descriptor	Criteria
Trace (fine)/ Scattered (coarse)	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION/ Induration

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Log of Boring No. George Brett Field GB-01

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 93.5 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		TOP SOIL **SAND (SP):** with small percent of silt, moist, medium brown.						
		End of boring 2 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-2

Log of Boring No. George Brett Field GB-02

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 93.5 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** moist, dark to medium brown.						
		End of boring 3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-3

Log of Boring No. George Brett Field GB-03

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 93 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		TOP SOIL **SAND (SP):** moist, dark brown. ~@8": sand with some reddish material, possible iron oxide.						
		End of boring 3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-4

Log of Boring No. George Brett Field GB-04

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 93.5 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SILTY SAND (SM):** moist, medium brown. ~8": tile fragments.	■	▨	40-12"	4	102.7	
		End of boring 2 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-5

Log of Boring No. George Brett Field GB-05

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 93 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** with reddish-brown colors, possible iron oxides.	■	▨	20-16"	9	104.3	ds
		End of boring 3.3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-6

Log of Boring No. George Brett Field GB-06

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 93 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** moist, reddish-brown.						
		End of boring 3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-7

Log of Boring No. George Brett Field GB-07

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 118 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** moist, dark brown.			30-13"	8	113.2	
		End of boring 3.1 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-8

Log of Boring No. George Brett Field GB-08

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 91 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** moist, dark brown. ~8": tile fragments.	■	▨	10-12"	11	108.6	
		End of boring 3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-9

Log of Boring No. George Brett Field GB-09

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 92 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** with reddish-brown colors, possible iron oxides.						
		End of boring 3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-10

Log of Boring No. George Brett Field GB-10

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 92 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** moist, reddish-brown. ~8"-12" tile fragments.						
		End of boring 3 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-11

Log of Boring No. George Brett Field GB-11

Dates Drilled: 10/17/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 92 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** with low presence of silt, medium brown. ~@8" tile fragments.						
		End of boring 4 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/17/2024.						

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Project No. 24-31-126-01

Drawing No. A-12

Log of Boring No. Recreation Park SoF-01

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 78 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		TOP SOIL **SAND (SP):** very moist, various shades of brown.						
5		End of boring 5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-13

Log of Boring No. Recreation Park SoF-02

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 78 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		TOP SOIL **SAND (SP):** with low silt content, very moist, dark brown.						
5		End of boring 5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-14

Log of Boring No. Recreation Park SoF-03

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 78 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		TOP SOIL **SILTY SAND (SM):** reddish-brown.						
5		End of boring 5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-15

Log of Boring No. Recreation Park SoF-04

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 79 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		TOP SOIL **SAND (SP):** with small silt content, reddish-brown.						
5		End of boring 5 feet bgs. No groundwater encountered. Borehole used for Percolation Testing. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-16

Log of Boring No. Skate Park S-01

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 110 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		6.5" Concrete, 6.5" Base						
		ALLUVIUM **SILTY SAND (SM):** fine-grained, moist, dark brown.						ma
5		End of boring 5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-17

Log of Boring No. Skate Park S-02

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 110 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		6.5" Concrete, 5" Base						
		ALLUVIUM						
		SILTY SAND (SM): moist, dark to medium brown.						max
5		End of boring 5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-18

Log of Boring No. Skate Park S-03

Dates Drilled: 10/16/2024 Logged by: Robin Diaz Checked By: Siva Sivathasan

Equipment: Hand Auger Driving Weight and Drop: 40 lbs / 12 in

Ground Surface Elevation (ft): 112 ft Depth to Water (ft, bgs): N/A

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		6.5" Concrete, 6.5" Base						
		SILTY SAND (SM): fine-grained, moist, dark brown.						
5		End of boring 5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and capped with gravel and soil cuttings to match field conditions on 10/16/2024.						

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Project No. 24-31-126-01

Drawing No. A-19

Appendix B

Laboratory Testing Program

APPENDIX B: LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. The amount and selection of tests were based on the geotechnical requirements of the project. Test results are presented herein and on the Logs of Borings in Appendix A, *Field Exploration*. The following is a summary of the laboratory tests conducted for this project.

Moisture Content

Results of moisture content and dry density tests performed on relatively undisturbed ring samples were used to aid in the classification of the soils and to provide quantitative measure of the *in situ* dry density. Data obtained from this test provides qualitative information on strength and compressibility characteristics of site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Grain-Size Analysis

To assist in classification of soils, mechanical grain-size analysis was performed on one (1) selected sample. Testing was performed in general accordance with the ASTM Standard D6913 test method. Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results*.

Maximum Dry Density Test

A laboratory maximum dry density-moisture content relationship test was performed on one (1) representative bulk sample. The test was conducted in accordance with ASTM Standard D1557 laboratory procedure. The test result is presented on Drawing No. B-2, *Moisture-Density Relationship Results*.

Direct Shear

Direct shear tests were performed on one (1) relatively undisturbed soil sample. The test was performed at soaked moisture conditions. For this test the sample, contained in brass sampler rings, was placed directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The sample was then sheared at a constant strain rate of 0.004 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Maximum strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3, *Direct Shear Test Results,* and in the following table:

Table No. B-1, Direct Shear Test Results

Boring No.	Depth (feet)	Soil Classification	Ultimate Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
GB-5	3	Silty Sand (SM)	28	180

Soil Corrosivity

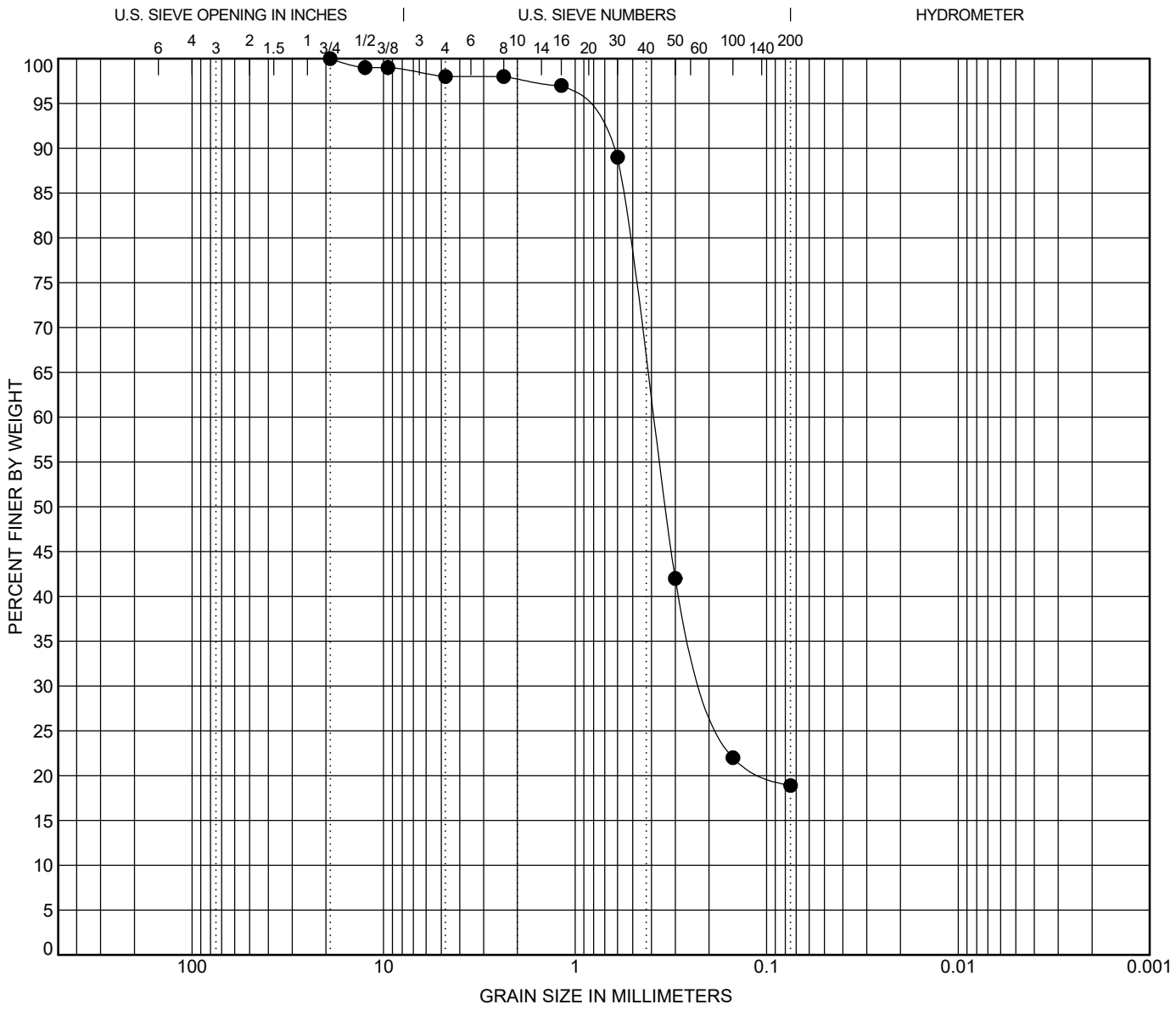
Converse retained EGL Engineering and Testing, Inc., located in Pomona, California, to test one (1) bulk soil sample taken in the general area of the proposed structures. The tests included minimum resistivity, pH, soluble sulfates, and chloride content, with the results summarized on the following table:

Table No. B-2, Corrosivity Test Result

Boring No.	Sample Depth (feet)	pH (Caltrans 643)	Soluble Chlorides (Caltrans 422) ppm	Soluble Sulfate (Caltrans 417) (%)	Minimum Resistivity (Caltrans 643) Ohm-cm
S-3	2-5	7.29	100	0.002	1,550

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
Skate Park BH-01	2	**POORLY GRADED SAND WITH SOME SILT (SP)**					

Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Skate Park BH-01	2	**19**	**0.391**	**0.198**		**2.0**	**79.1**	**18.9**	

GRAIN SIZE DISTRIBUTION RESULTS

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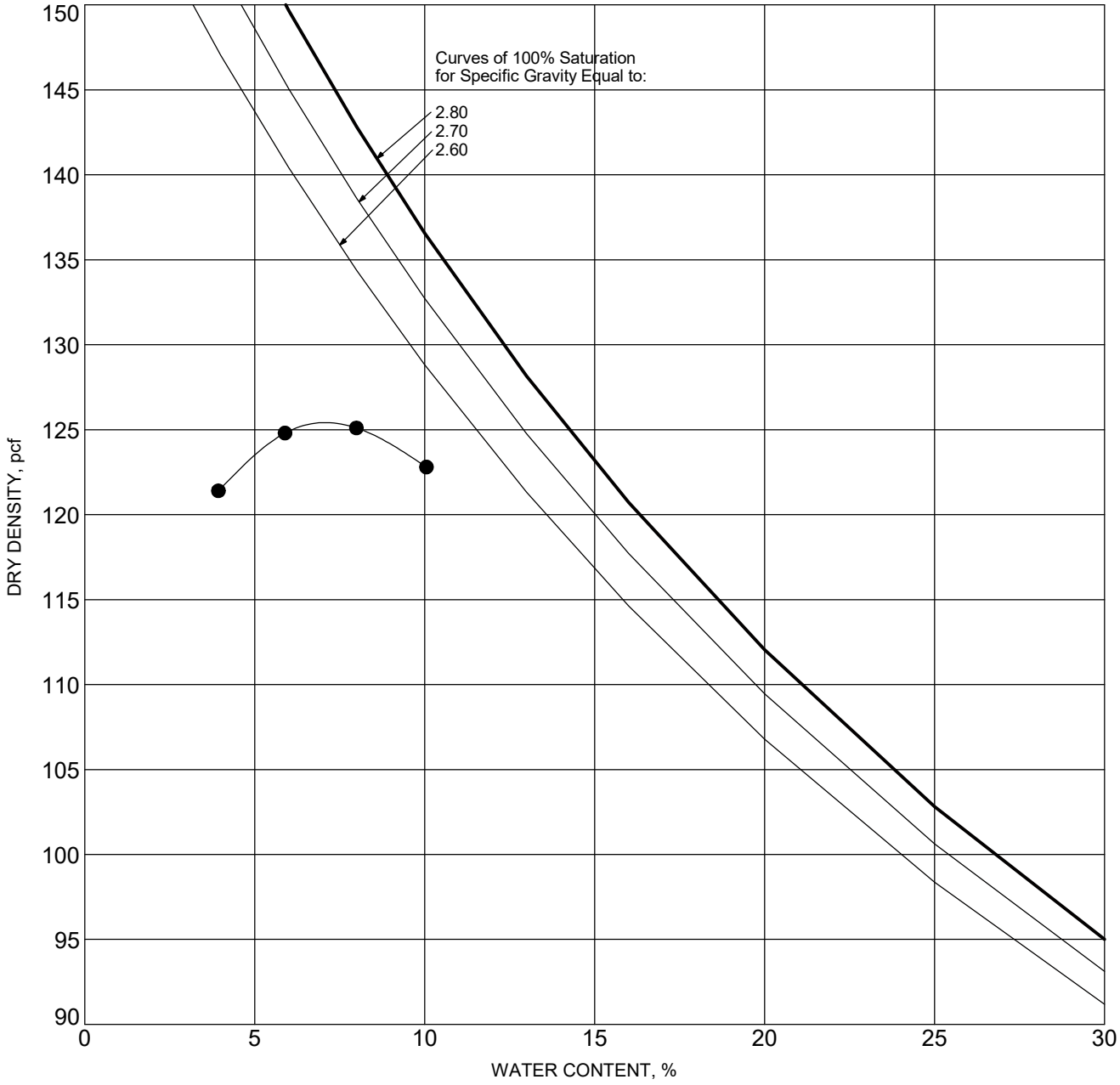
Project No. **24-31-126-01**

Drawing No. **B-1**



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**Skate Park BH-02**	**2**	**SILTY SAND (SM)**	**D1557 Method B**	**6.9**	**126.4**

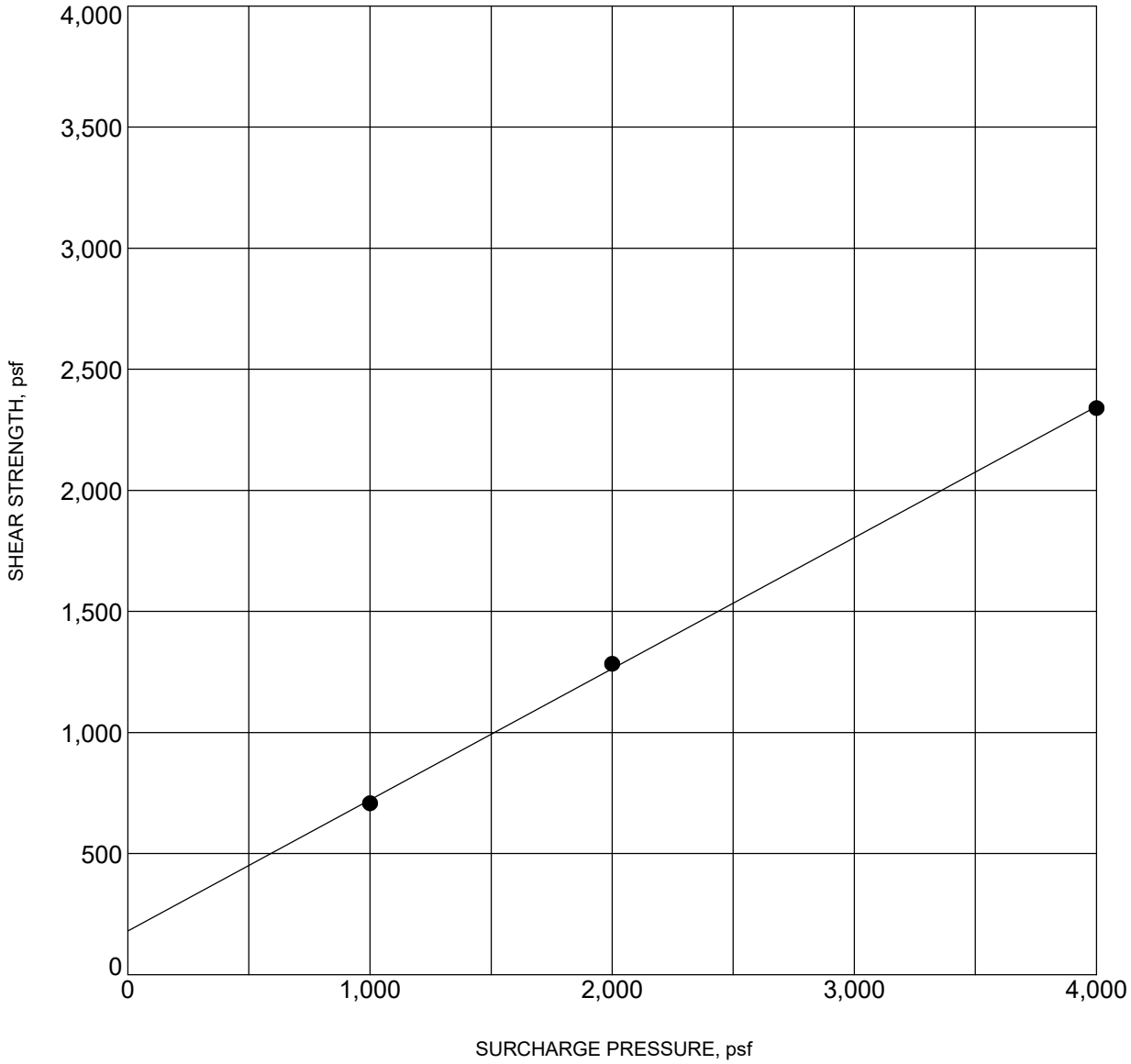
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Recreation Park Renovation Project
401 Sheldon Street
El Segundo, California 90245

Project No.
24-31-126-01

Drawing No.
B-2



BORING NO. : **George Brett Field BH-5**		DEPTH (ft):	**3**
DESCRIPTION : **POORLY GRADED SAND WITH TRACES OF SILT (SP)**			
COHESION (psf) : **180**		FRICTION ANGLE (degrees):	**28**
MOISTURE CONTENT (%) : **9.0**		DRY DENSITY (pcf) :	**104.3**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Recreation Park Renovation Project
401 Sheldon Street
El Segundo, California 90245

Project No. **24-31-126-01**

Drawing No. **B-3**

Appendix C

Percolation Testing

APPENDIX C: PERCOLATION TESTING

Percolation testing was performed utilizing exploratory boring SoF-4 on October 17, 2022. The continuous pre-soak falling-head test method for water percolation testing was utilized to evaluate soil infiltration rates of the soils encountered between depths of 0 to 5 feet below the ground surface at the respective boring location in accordance with Los Angeles County (2021), Administrative Manual--Guidelines for Design, Investigation, and Reporting Low Impact Development Storm Water Infiltration. The test location was prepared by placing a perforated 2-inch diameter PVC pipe surrounded by pea gravel after drilling. Water was filled to the ground surface elevation to pre-soak prior to testing.

The boring was cased using a two-inch diameter perforated PVC casing. Water was added to the bore hole until the water level was as near the ground surface as could be achieved and allowed to pre-soak, the pre-soaked hole did not drain entirely. After pre-soak, water was added to the bore hole until the water level was as near the ground surface as could be achieved. The water level was measured to the nearest 1/8-inch. The results of the percolation tests are tabulated in the tables below. Calculations of data presented in the table C-1 are attached to this appendix.

Administrative Manual GS200.1 indicates the test should be continued for 180 minutes (3 hours), and having achieved a consistent infiltration rate. Project site is close to the coastal line and there are no natural barriers from the ocean, which would explain the predominant presence of sands and silty sands at the project site.

These factors, contribute to a fast percolation and we determined taking lectures every 30 minutes would not provide accurate data, given around 90% of the infiltration rate was occurring within the first 10 minutes each time.

We sampled for a total of three hours, but used the results of the first 10 minutes per individual test and computed the results of the last three lectures shown in table C-1

Table No. C-1, Percolation Testing Results

Boring No.	Depth of Boring* (feet)	Predominant Soil Types (USCS)	Average Percolation Rate (inches/hour)	Lowest Percolation Rate (inches/hour)	Design Percolation Rate** (inches/hour)
SoF-4	5	Sand (SP)	2.44	2.21	2.49

**Design Percolation Rate is calculated as the average of the final three percolation test readings.

In accordance with County of Los Angeles requirements, the minimum percolation rate for design of infiltration systems for storm water management is 0.3 inches per hour. Design Engineer can use the field percolation readings attached in Appendix C and calculate the percolation rates. It should be noted that per Los Angeles County Low Impact Development, Best Management Practices Guidelines, any planned infiltration systems should be at least 10 feet above historically highest groundwater levels. The

project Civil Engineer shall review the percolation rates presented for design of the proposed infiltration system. Additional details about bioswale design and requirements can be found in the Low Impact Development Manual, County of Los Angeles Department of Public Works, latest edition. The infiltration system should be properly maintained periodically to minimize sedimentation in the infiltration system.

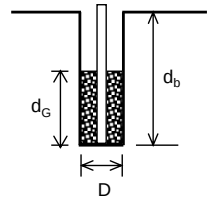
Table No. C-2, Infiltration Setback Requirements per Los Angeles County

Setback from	Distance
Property lines and public right of way	10 feet
Any foundation	15 feet or within 1:1 plane drawn up from the bottom of foundation, whichever greater
Face of any slope	H/2, 5 feet minimum (H is height of slope)
Water wells used for drinking water	100 feet
Historically highest groundwater levels	10 feet above

Percolation Testing

Job Name: 401 Sheldon Street Recreation Park, Softball Field
Job No.: 24-31-126-01
Location: City of El Segundo, Los Angeles, California
Test Date: October 17, 2024

Test Boring No. **SoF-4**
Depth of Boring (d_b): 5.0 feet
Diameter of Boring (D): 0.33 feet
Diameter of Casing (d_c): 0.1667 feet
Percolation Test Zone: 1 feet bgs
Test Performer: RD



Time of Testing			Water Level Measurement		Water Level Calculations				Infiltration Rate Calculations			
Initial Time	Final Time	Time Interval	Initial depth to water	Final depth to water	Initial Height of water column	Final Height of water column	Drop in Height	Average height of water column	Pre-adjusted Percolation Rate	Reduction Factor	Adjusted Percolation Rate	Infiltration Rate by Porchet Method*
T_i	T_f	ΔT	d_1	d_2	d_i	d_f	$\Delta d = d_i - d_f$	L_{ave}	$P_i = \Delta d / \Delta T$	R_f	$k = P_i / R_f$	$I = \Delta dD / [2\Delta T(D/2+2L_{ave})R_f]$
		(hr)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(inch/hr)		(inch/hr)	(inch/hr)
Percolation Test												
12:35	12:45	0.17	0.00	4.30	5.00	0.70	4.30	2.85	310.84	4.0	77.71	2.21
13:07	13:17	0.17	0.00	4.60	5.00	0.40	4.60	2.70	332.53	4.0	83.13	2.49
13:38	13:48	0.17	0.00	4.60	5.00	0.40	4.60	2.70	332.53	4.0	83.13	2.49
14:10	14:20	0.17	0.00	4.60	5.00	0.40	4.60	2.70	332.53	4.0	83.13	2.49
14:44	14:54	0.17	0.00	4.60	5.00	0.40	4.60	2.70	332.53	4.0	83.13	2.49
15:16	15:26	0.17	0.00	4.60	5.00	0.40	4.60	2.70	332.53	4.0	83.13	2.49

Reference: Adminstrative Manual - County of Los Angeles Public Works Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stomrwater Infiltration, dated 6/30/21
* Inverse Borehole Method

Reduction Factors:

RF_t (small diameter boring) = 1
RF_v (site variability) = 1
RF_s (siltation, plugging) = 2

Total Reduction Factor (RF) = RFt +RFv +RFs 4

Design Infiltration Rate = 2.49 inch/hr

Note: Design Infiltration Rate = Average of last three adjusted precolation rate readings

EXHIBIT E

City Construction and Demolition Debris Waste Management Plan (WMP) Form

City of El Segundo
Public Works Department
(310) 524-2300

Construction and Demolition Debris Waste Management Plan (WMP) PUBLIC WORKS PROJECTS (including MUNICIPAL ROAD CONSTRUCTION, OVERLAY, SIDEWALK REPAIR OR LAND CLEARING PROJECTS) INSTRUCTIONS

Pursuant to the California Green Building Code of 2016 (2016 CALGreen), the City of El Segundo requires **diversion (repurposed, reused, or recycled) of at least 65%** of non-hazardous construction and demolition (C&D) debris from Public Works projects.

A C&D Waste Management Plan must be submitted to the Public Works Department for municipal projects or projects on public property. The contents of this packet, when completed, constitute a C&D Debris Waste Management Plan (WMP). This packet is designed to track the amount of C&D debris diverted or disposed from your City-related (i.e. Public Works) project.

If you believe your project cannot achieve the required diversion, you must complete and submit **Form PW-D,** the **EXEMPTION REQUEST** form, to the City (i.e. your Project Manager) explaining the circumstances, and requesting an exemption from the requirements.

Step 1: Complete Forms PW-A and PW-B

Form PW-A is the **PROJECT INFORMATION** form. This form asks for basic project information, such as name, type, description, location, and contractor contact information.

Form PW-B is the **PRE-PROJECT WORKSHEET** form. This form asks for estimated amounts of debris that will be generated by the project.

Option 1: If you are electing to contract with hauler(s) from the **Authorized Hauler** list who will handle recycling compliance on your behalf, complete **Form PW-B** (short form).

Option 2: If you will be handling all waste management activities (through direct hauling or use of own bins), complete **Form PW-B1**. Estimate the weight of the C&D debris, by material type, that will be recycled, reused, salvaged, disposed and/or transformed from your project.

You must complete either **Form PW-B** or **PW-B1**.

Step 2: Submit Forms to Public Works

Forms PW-A and **PW-B** (or **PW-B1**) must be submitted to your Public Works Project Manager and approved prior to commencing work.

Step 3: Complete POST-PROJECT SUMMARY - FORM PW-C

At least 5 business days prior to contractor requesting release of final project retention, submit a completed **FORM PW-C** to your Public Works Project Manager.

NOTE A **FACILITY INFO** list showing nearby companies that accept C&D materials for recycling is included in this packet. This list was developed to assist you in finding local facilities to use as an alternative to disposal. If you use a certified mixed C&D processing facility, your project will meet the diversion requirements.

There are authorized haulers that do business in El Segundo. The **HAULER LIST** showing companies that are authorized to collect solid waste inEl Segundo is included in this packet. You must use one of these haulers if contracting for waste removal service.

For your convenience, there are electronic versions of the forms that will automatically calculate waste generation, disposal, and diversion based on the data entered.

City of El Segundo
Public Works Department
(310) 524-2300

Date: _____
PW Project Manager: _____
PW Project Name: _____

FORM PW-A - PROJECT INFORMATION

Submit this form to the Public Works Department prior to commencing your project for all municipal projects subject to compliance, or projects on public property.

Project Name: _____ **Project Address / Location:** _____

Contractor Name: _____

Mailing Address: _____ **City / State / Zip:** _____

Ofc Phone No.: _____ **Cell No:** _____ **Email:** _____

Project Type: Mark appropriate box in each column with an "X":

- ☐ **Road** (construction, overlay, repair)
- ☐ **Facility Improvement** (renovation, alteration, or addition) → USE FORMS PROVIDED BY EL SEGUNDO COMMUNITY DEVELOPMENT DEPT
- ☐ **Land Clearing** (trail, grading, etc.)
- ☐ **Other** _____

Estimated Project Start Date: _____ **Estimated Project End Date:** _____

Request for Exemption: ☐ (If you are requesting an exemption, fill out Form PW-D: Exemption Request)

To the best of my knowledge, the above information is an accurate representation of the proposed project. I have been made aware of the 2016 CALGreen requirements and will comply with all requirements.

Print Name **Title** **Signature** **Date**

PW OFFICE USE ONLY - Approval Status

- ☐ **Approved**
- ☐ **Denied**
- ☐ **Further Explanation Needed**
- ☐ **Exempt Due to Infeasibility**

Reviewed By **Date**

City of El Segundo
Public Works Department
(310) 524-2300

Date: _____
PW Project Manager: _____
PW Project Name: _____

FORM PW-B - PRE-PROJECT WORKSHEET - PUBLIC WORKS PROJECTS

This form must be completed and approved or a demolition / building permit will not be issued.

Instead of completing a detailed accounting of the types and quantities of C&D debris that will be generated from this project (FORM PW-B1), you have the option to select one of El Segundo's authorized waste haulers. These haulers can handle your project's debris in such a way as to comply with CALGreen standards.

If you elect this option, please specify which authorized hauler(s) and/or facility(ies) you will be using and sign the acknowledgement below. El Segundo authorized hauler(s) and/or facility(ies) can be found on the City's website:
https://www.elsegundo.org/government/departments/public-works/trash-recycling

It is your responsibility to ensure that the hauler knows you are contracting for "C&D Recycling Service" so that the material is properly handled and waste diverted. You need to obtain weight tickets from the hauler indicating the type and weight of the material collected.

In order to comply with the requirements of the WMP, I will contract with the following hauler(s):

Hauler: _____

I understand that I am responsible for obtaining copies of any and all weight tickets from all haulers and/or facilities which receive debris from this project and that I will submit a Post-Project Summary (FORM PW-C) at least 5 business days prior to final inspection.

Print Name _____ **Signature** _____ **Date** _____

City of El Segundo
Public Works Department
(310) 524-2300

Date: _____
PW Project Manager: _____
PW Project Name: _____

FORM PW-B1 - PRE-PROJECT WORKSHEET - PUBLIC WORKS PROJECTS

[This form is to be completed only if you plan to use your own company-owned bins/trucks for disposition of material]

This form must be completed and approved or a demolition / building permit will not be issued.

In the table below, list estimated weight or cubic yards of debris that will be generated, recycled, reused, salvaged, disposed, and/or transformed by this project. You must include all recyclers, salvage companies, recycle facilities, mixed-use material recovery facilities, landfills, and/or transformation facilties that will be used for the project.

List of materials to be generated from the project:

ex. wood, metal, concrete, asphalt, drywall, cardboard, mixed C&D debris, etc.

	TONS	CUBIC YARDS	Facilities to be Used
Reused/Salvaged/Donated *Ex.: Habitat for Humanity, Thirft Stores, regrind onsite, reuse fixtures, reuse dirt/concrete/asphalt*			
Recycled *A facility that accepts 100% recyclable materials to be turned into other products.*			
Delivered to Mixed C&D Recycling *Facilties that recover some materials for recycling*			
Disposed/Landfilled/Transformed *Transfer station, landfill, or SERRF*			
Generated (total of above)			

_____ Initial Here — I or my company elect not to use an authorized hauler because I or my company own containers (bins or roll-off boxes) and/or dump vehicles and will not be contracting for debris removal services.

_____ Initial Here — I understand that I am responsible for obtaining copies of any and all weight tickets from all haulers and/or facilities which receive debris from this project and that I will submit a Post-Project Summary (FORM PW-C) at least 5 business days prior to final inspection.

Print Name _____ **Signature** _____ **Date**

City of El Segundo
Public Works Department
(310) 524-2300

Form PW-C - Post Project Summary

Project Name: _____ **Project Address:** _____

Contractor Name: _____ **Project Manager:** _____

Project Number: _____ **Date:** _____

This form must be submitted to the Public Works Department at least 5 business days prior to project finalization. Provide facility name, material, and total tonnage disposed and/or diverted. Documentation must be attached (i.e. weight tickets). If an approved mixed waste processing facility was used, a report by the facility for this project is preferred. Return the completed form to the Public Works Department. You may use additional sheets if necessary.

USE OF AUTHORIZED HAULERS OR FACILITIES

If you used one of the City's authorized haulers or facilities, complete this section, then skip to the SIGNATURE section below.

I used _____ to meet the recycling requirements. Weight tickets are attached.
(List haulers and/or facilities that were used)

SUMMARY

I. FACILITIES

Please list all facilities (i.e. landfill and/or transformation, recycling/reuse/salvage, mixed C&D debris processing, materals recovery) used for this

FACILITY NAME	TONS DELIVERED	TONS DIVERTED	TONS DISPOSED	DIVERSION RATE
1				
2				
3				
4				
Other (reused on site)				
TOTALS	(A)	(B)	(C)	

PROJECT DIVERSION

Please enter disposal and diversion totals for each item below, according to letter. Totals reported must match those listed in Section I:

TOTAL GENERATED _____ (A) **TOTAL DIVERTED** _____ (B) **TOTAL DISPOSED** _____ (C)

OVERALL PROJECT DIVERSION RATE (B/A)*100 **0.00%** %

To the best of my knowledge, the above information is an accurate representation of the disposition of the construction and demolition materials generated on the jobsite. I understand that the City of El Segundo may audit disposal and recycling documentation for this project.

_____ _____
Print Name Signature

PW OFFICE USE ONLY

Diversion Requirement Met: ☐ **Yes** ☐ **No** **Exemption:** ☐ **Yes** ☐ **No**

Reviewed and Approved by: _____ **Date:** _____

City of El Segundo
Public Works Department
(310) 524-2300

Form PW-D - Exemption Request

Project Name: _____ **Project Address:** _____

Contractor Name: _____ **Project Manager:** _____

Project Number: _____ **Date:** _____

If it is infeasible for you to comply with all of the requirements set forth by the Construction and Demolition Debris Recycling Form and you are requesting an infeasibilty exemption, please use the following space to explain why your project should be considered exempt from recycling requirements.

PW OFFICE USE ONLY

Exemption Approved: ☐ **Yes** ☐ **No**

Reviewed by: _____ **Date:** _____