

APPENDIX E: GEOTECHNICAL INVESTIGATION REPORT

E.2 Langan Engineering and Environmental Services, Inc.,
Addendum 1 – Response to LADBS Grading Division Review Comment
Proposed Mixed-Use Multi-Family Development
400 South San Vicente Boulevard,
Los Angeles, California
February 6, 2023

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February 6, 2023

J.J. Abraham
400 S. San Vicente LLC
c/o TACMar Development, LLC
900 Cercis Place
Newport Beach, Ca 92660

**RE: Addendum 1 – Response to LADBS Grading Division Review Comment
Proposed Mixed-Use Multi-Family Development
400 South San Vicente Boulevard
Los Angeles, California
Langan Project No. 700109901
LADBS Log # 123970**

Dear Mr. Abraham:

We performed a geotechnical investigation for the proposed mixed-use multi-family development planned at 400 South San Vicente Boulevard in Los Angeles, California, and summarized the results in a report dated October 12, 2022.

Our report was submitted to the Los Angeles Department of Building and Safety (LADBS) Grading Division (Grading Division) for their review and comment and Grading Division issued review comments in a letter dated December 19, 2022 (Grading Division Log # 123970).

Grading Division's comments are presented below followed by our response.

Grading Division Review Comment 1

Provide complete liquefaction analysis calculations/computer printout, (include filed blow counts (N), CN, Ce, Cb, Cs, Cr stress reduction coefficient, etc.) and revise liquefaction analyses.

LANGAN Response to Grading Division Review Comment 1

Field blow counts, and factors CN, Ce, Cb, Cs, and Cr are included in our completed analysis.

Original field blow counts are included in our liquefaction analysis, but please note that samples were collected from the borings using modified California split-spoon samplers and Standard Penetration Tests (SPTs). California split-spoon sampler blow counts were converted to SPT-equivalent blow counts by multiplying the original blow counts by a factor of 0.65.

Also note that based on the current development concept, we anticipate that the bottom of foundation will be established approximately five feet below the lowest finished floor level or approximately 37 feet below the ground surface (bgs).

Soil layers above the lowest finished floor level and bottom of foundation are not subject to liquefaction.

The results of our liquefaction analysis indicate that soils below the planned foundation levels are subject to liquefaction settlement of less than 0.5 inches.

Complete liquefaction analysis calculations are presented in Attachment A.

Grading Division Review Comment 2

Clarify the SPT blow count intervals. It appears that the SPT blow counts intervals shown in the output results do not match with the SPT data shown in the boring logs (10 feet interval). The analysis shall be based on the 5 feet interval with SPT blow count at the middle of the layer. Revise liquefaction analyses accordingly.

LANGAN Response to Grading Division Review Comment 2

Samples were collected from the borings using modified California split-spoon samplers and we performed Standard Penetration Tests (SPTs), typically alternating between each sampler type in each boring.

Our liquefaction analysis was performed using blow counts and data from both sampling methods.

California split-spoon sampler blow counts were converted to SPT-equivalent blow counts by multiplying the field blow counts by a factor of 0.65 as presented in boring logs included in Attachment A.

Although SPT samples were typically collected at 10-foot intervals, there are typically 5-foot intervals between the alternating sample methods. As a result, SPT and/or SPT-equivalent blow count intervals used in our analysis are typically on the order of five feet.

In addition, the soil profiles used in our liquefaction analysis are based directly from our boring logs.

Our interpretations on soil contact depths are based on soils encountered during drilling are incorporated into our boring logs. Therefore, the depths of changes in soil type presented in our boring logs are the same as presented in our liquefaction analysis.

Our boring logs with soil contacts and associated blow counts used in our liquefaction analysis are presented in Attachment A.

The results of our liquefaction analysis indicate that the soils below the planned foundation levels are subject to liquefaction settlement of less than 0.5 inches. The results of our analysis are presented in Attachment A.

Grading Division Review Comment 3

Provide design calculations for cantilevered retaining wall, basement wall and seismic pressure recommendations provided on page 10-11 and Figure 10 & Figure 11 of the 10/12/2022 report to justify the recommendations. Note: Recommendations/calculations for hydrostatic design shall be clearly provided.

LANGAN Response to Grading Division Review Comment 3

We have revised our recommendations for permanent walls below grade and seismic pressure recommendations in accordance with LADBS Information Bulletin P/BC 2020-083 as presented herein.

Design calculations for permanent walls below grade including seismic pressure and hydrostatic design recommendations are presented in Attachment B.

Assuming that a permanent dewatering system is not planned, the building walls below grade will be subject to hydrostatic pressure below the current groundwater level and potentially below the historical high groundwater level (HHGWL) of ten feet bgs.

For static conditions, the below-grade building walls should be designed to resist a trapezoidal-shaped at-rest lateral earth pressure distribution equal to 38H psf above the HHGWL and 17H psf below the HHGWL as shown on Figure 10.

For seismic loading conditions, below-grade building walls should be designed to resist a triangular-shaped active lateral earth pressure distribution equal to 26H psf in conjunction with a triangular-shaped seismic lateral earth pressure distribution equal to 30H psf above the HHGWL and a triangular-shaped active lateral earth pressure distribution equal to 13H psf in conjunction with a triangular-shaped seismic lateral earth pressure distribution equal to 15H psf below the HHGWL and as shown on Figure 11.

The load combination (active and seismic earth pressure) and the shape of the seismic pressure distribution are each based on *Seismic Earth Pressures on Cantilevered Retaining Structures* (Atik and Sitar, 2010) and *Seismic Earth Pressures: Fact or Fiction* (Lew, Sitar, and Atik, 2010).

The upper 10 feet of the below-grade building walls should also be designed to resist a uniform lateral pressure of 100 psf to account for normal traffic loading as shown on Figures 10 and 11. The recommended value is based on a vertical applied traffic loading equal to 300 psf.

Although not currently planned, if the surface at the top of the wall is sloped, the recommended lateral earth pressures should be increased as indicated in Table 2.

Table 2 – Lateral Earth Pressures Increases

Slope Inclination at Top of Wall (H:V)	Increase in Lateral Earth Pressure (percent)
1:1	200
1.5:1	165
2:1	150

Grading Division Review Comment 4

Provide shoring calculations to justify the recommendations. Surcharge loads shall be included into design.

LANGAN Response to Grading Division Review Comment 4

We have revised our recommendations for temporary shoring as presented herein.

Design calculations for temporary shoring including seismic pressure and hydrostatic design recommendations are presented in Attachment B.

Typically, cantilevered shoring is feasible for retained heights of approximately 15 feet or less, and braced shoring typically becomes economical for retained heights exceeding 15 feet. Cantilevered shoring should be designed to resist a triangular lateral earth pressure distribution where the maximum value is 26H psf noting that the shoring will be installed after construction dewatering is performed.

Internally braced shoring should be designed to resist a trapezoidal earth pressure distribution where the maximum value is equal to 38H psf.

In addition to the lateral earth pressures from the weight of the retained soil, surcharge loading from the adjacent building located at 432 San Vicente should also be applied to temporary shoring along the portion of the south shoring line within the limits of the existing building.

We recommend a uniform lateral surcharge pressure equal to 750 psf for the existing commercial building be applied to the lateral earth pressures recommended above for the upper 10 feet of temporary shoring.

For cantilevered and braced shoring design, where the surface at the top of the shoring is sloped, the recommended lateral earth pressures should be increased as indicated in Table 2.

The design of temporary shoring walls should consider the location of construction cranes and other potentially heavy equipment or loads that may act against the shoring system.

An alternative to designing the south below-grade building wall to support surcharge loading due to the existing foundation is to provide direct support to the existing foundation using soldier piles (aka underpinning).

Please see Attachment B for shoring calculations and updated Figures 10 and 11 for shoring lateral earth pressure recommendations.

Grading Division Review Comment 5

The consolidation tests for the sample of native soil showed potential of excessive settlement. Provide settlement analyses to justify the expected settlements proposed on page 9 of the report.

LANGAN Response to Grading Division Review Comment 5

The proposed bottom of foundations will be established approximately 37 feet bgs. As a result, the soils at the planned foundation level will experience a pressure release on the order of approximately 4,500 psf.

DCI Engineers furnished us with an average applied bearing pressure of 1,700 psf for the proposed mat foundation.

Noting the average applied bearing pressure is approximately 2,800 psf less than the existing bearing pressure, the soils at the planned foundation level will not experience a net increase in pressure due to the proposed development.

As a result, the potential for excessive settlement is negligible.

Please see Attachment C for our settlement analyses.

CLOSING

We sincerely appreciate the opportunity to provide professional services for this project and look forward to working with you on this project. Please contact us at your convenience to discuss any questions you may have regarding this letter.

Sincerely,

Langan Engineering and Environmental Services, Inc.



Christal Constantino
Staff Engineer



Christopher J. Zadoorian
Senior Associate

Enclosures: Attachment A – Liquefaction Analysis
Attachment B – Lateral Earth Pressure Analysis and Figures
Attachment C – Static Settlement Analysis

ATTACHMENT A
Liquefaction Analyses

LANGAN

Log of Boring

B-5

Sheet 1 of 4

Project 400 South San Vicente Boulevard		Project No. 700109901	
Location 400 South San Vicente Boulevard		Elevation and Datum Approx. 151 (feet, MSL)	
Drilling Company SoCal Drilling		Date Started 1/6/22	Date Finished 1/6/22
Drilling Equipment Mayhew 1000		Completion Depth 76 ft	Rock Depth
Size and Type of Bit 4.75" Mud Rotary		Number of Samples	Disturbed 10 Undisturbed 9 Core -
Casing Diameter (in)	Casing Depth (ft)	Water Level (ft.) First ∇ 21.5	Completion ∇ 24 HR. ∇
Casing Hammer	Weight (lbs)	Drop (in)	Drilling Foreman
Sampler Bulk; 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod	Field Engineer		
Sampler Hammer Automatic	Weight (lbs) 140	Drop (in) 30	A. Nieblas

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MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist. BL/in			
	+151.0	AC = 4-inches thick, Base = 6-inches thick.	0							
	+150.2	Artificial Fill (af) CLAY with Sand (CL), dark brown and brown mottled, very stiff, moist to very moist, fine sand.	1							
	+144.0	Quaternary Young Alluvium (Qya) Sandy CLAY (CL), brown, very stiff, moist, some coarse sand.	7							
	+137.0	Quaternary San Pedro Formation (Qsp) Sandy SILT (ML), gray and grayish brown, very stiff, very moist, fine to medium sand, trace bivalve shells.	14							
	+134.0	SILT with Sand (ML), orangish brown, very stiff, very moist, trace fine sand.	17							
	+132.5	SILT (ML), bluish gray, very stiff, very moist, abundant rootlets.	19							
	+131.0		20							

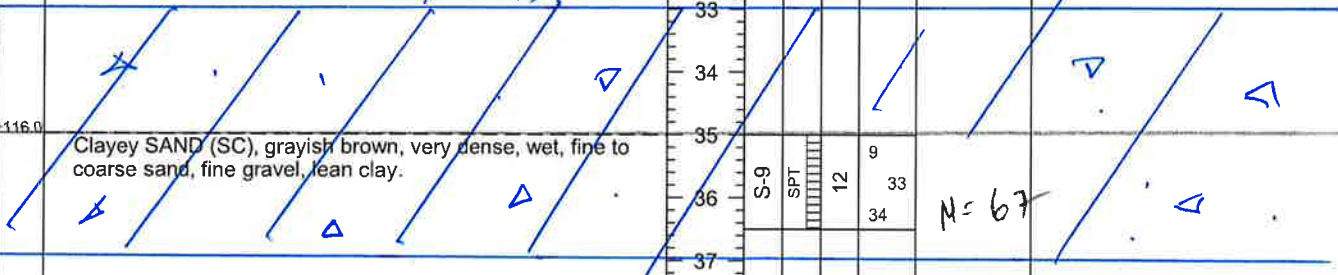
Sample	Depth (ft)	Number	Type	Recov. (in)	Penetr. resist. BL/in	Water Content	Remarks
S-1	5-6	CR	CR	15	5, 10, 11	N = 137	WC = 30.7% DD = 93.0 pcf
S-2	10-11	CR	CR	18	5, 11, 17	N _{pr} = 28.065 = 182 PI = 17	
S-3	12-13	SPT	SPT	18	4, 4, 5	N = 9	LL = 42, PL = 25, PI = 17 %Pass #200 = 67 PI = 17
S-4	15-16	CR	CR	18	9, 9, 7	N _{pr} = 10.4	WC = 23.0% DD = 103.4 pcf
S-5A/S-5B	18-19	SPT	SPT	15	5, 7, 9	N = 16	

Project 400 South San Vicente Boulevard	Project No. 700109901
Location 400 South San Vicente Boulevard	Elevation and Datum Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
				Number	Type	Recov. (in)	Penetr. resist. BL/in	Water Content		
[Hatched Pattern]	131.0	Sandy CLAY (CL), grayish brown and light grayish brown mottled, stiff, moist, fine to coarse sand, few fine gravel.	20	S-6	CR	14	4	6	N = 9.8 PI = 15	
	21		9							6
	22									
[Hatched Pattern]	128.0	Sandy CLAY (CL), grayish brown, stiff to very stiff, very moist, fine to coarse sand.	23	S-7	SPT	13	5	7	N = 16 PI = 9	
	24									
	25									
	26									
	27									
	28									
[Hatched Pattern]	116.0	Gray and light gray mottled, very stiff.	30	S-8	CR	12	6	12	N = 18.9	
			31							17
			32							
			33							
			34							
[Hatched Pattern]	113.0	Clayey SAND (SC), grayish brown, very dense, wet, fine to coarse sand, fine gravel, lean clay.	35	S-9	SPT	12	9	33	N = 67	
			36							34
			37							
[Dotted Pattern]	106.0	Gravelly SAND (SP), gray, very dense, wet, medium to coarse sand, fine to medium gravel.	38	S-10	CR	10.5	39	50/4.5	N = 77.50	
			39							
			40							
			41							
			42							
			43							

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LFRE = 33 ft bgs



Project 400 South San Vicente Boulevard	Project No. 700109901
Location 400 South San Vicente Boulevard	Elevation and Datum Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
				Number	Type	Recov. (in)	Penetr. resist. BL/in		Water Content
[Hatched Pattern]	+106.0	CLAY (CL), bluish gray, very stiff, very moist, coarse sand, fine gravel.	45	S-11	SPT	18	10	N=22	LL = 43, PL = 26, PI = 17
	46		11						
	47		11						
	48								
	49								
[Dotted Pattern]	+98.0	Light greenish gray and bluish gray mottled, hard, very friable, very old caliche.	50	S-12	CR	18	13	N=29.7	WC = 28.7% DD = 98.8 pcf
			51				26		
			52				20		
			53						
			54						
[Dotted Pattern]	+94.0	Sandy CLAY (CL), bluish gray with light bluish gray and gray mottled, hard, very moist.	55	S-13	SPT	14	11	N=46	
			56				21		
			57				25		
			58						
			59						
[Dotted Pattern]	+88.0	CLAY with Sand (CL), bluish gray, hard, very moist, fine to coarse sand.	60	S-14	CR	18	11	N=44 28.6	WC = 24.7% DD = 104.7 pcf
			61				21		
			62				23		
			63						
			64						
[Dotted Pattern]	+84.0	Clayey SAND (SC), bluish gray, very dense, very moist, very fine sand.	65	S-15	SPT	12	23	N=65	
			66				31		
			67				34		
			68						
			69						
[Dotted Pattern]	+84.0	Clayey SAND (SC) / Sandy CLAY with Gravel (CL), very dense to hard, very moist, very fine sand.	70						

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Project 400 South San Vicente Boulevard	Project No. 700109901
Location 400 South San Vicente Boulevard	Elevation and Datum Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL/6in	
[Symbol]	+81.0		70	S-16	CR	10	32	H7750
			71				50/5"	
[Symbol]	+78.0	Clayey SAND (SC), bluish gray, very dense, moist, very fine sand.	73					H7750
			74					
[Symbol]	+75.0	Total Depth = 76 feet Groundwater encountered at 21.5 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.	75	S-17	SPT	11	29	
			76				50/5"	
			77					
			78					
			79					
			80					
			81					
			82					
			83					
			84					
			85					
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			93					
			94					
			95					

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SPT Liquefaction Spreadsheet

JOB NAME **400 San Vicente**
 DATE 1/13/2023
 BY CC
 CHECKED BY CJZ
 DATE 1/13/2023
 Risk 2-in-50

Boring **B-5**
 y **120** pcf
 GW level **12** ft
 HHGWL **10** ft
 GS Elevation **151** msl
 Bot of Mat **113** msl
 Magnitude a max
6.77 **0.985**
 MSF 1.30

Total Settlement (Top 50 ft) **0.00 INCHES**

Total Settlement **0.00 INCHES**

PI Cutoff = 18

Elevation (MSL)	Depth (feet)	Soil Type	Nfield	PI => 18	σ _o ' (psf) current psf	σ _o ' (psf) HHGWL psf	Fines Correction					(N ₁) ₆₀	CRR 1998 eq. <N=30	Rd	CSR	FOS	SETTLEMENT	
							C _E energy	C _N stress	C _B 6" diam	C _S w/out liner	C _R rod						(N ₁) ₆₀ interim Corr.	%fines
150	1	CL	14		120	120	1.2	1.75	1.15	1.0	0.75	51						
149.5	1.5	CL	14		180	180	1.2	1.71	1.15	1	0.75	51						
149	2	CL	14		240	240	1.2	1.68	1.15	1	0.75	51						
148.5	2.5	CL	14		300	300	1.2	1.64	1.15	1	0.75	51						
148	3	CL	14		360	360	1.2	1.61	1.15	1	0.75	51						
147.5	3.5	CL	14		420	420	1.2	1.57	1.15	1	0.75	51						
147	4	CL	14		480	480	1.2	1.54	1.15	1	0.75	51						
146.5	4.5	CL	14		540	540	1.2	1.51	1.15	1	0.75	51						
146	5	CL	14		600	600	1.2	1.48	1.15	1	0.75	51						
145.5	5.5	CL	14		660	660	1.2	1.46	1.15	1	0.75	51						
145	6	CL	14		720	720	1.2	1.43	1.15	1	0.75	51						
144.5	6.5	CL	14		780	780	1.2	1.40	1.15	1	0.75	51						
144	7	CL	14		840	840	1.2	1.38	1.15	1	0.75	51						
143.5	7.5	CL	18		900	900	1.2	1.35	1.15	1	0.75	51						
143	8	CL	18		960	960	1.2	1.33	1.15	1	0.75	51						
142.5	8.5	CL	18		1020	1020	1.2	1.31	1.15	1	0.75	51						
142	9	CL	18		1080	1080	1.2	1.29	1.15	1	0.75	51						
141.5	9.5	CL	18		1140	1140	1.2	1.27	1.15	1	0.75	51						
141	10	CL	18		1200	1200	1.2	1.24	1.15	1	0.8	24.7	51					
140.5	10.5	CL	18		1260	1229	1.2	1.23	1.15	1	0.8	24.3	51					
140	11	CL	18		1320	1258	1.2	1.21	1.15	1	0.8	24.0	51					
139.5	11.5	CL	18		1380	1287	1.2	1.19	1.15	1	0.8	23.6	51					
139	12	CL	18		1440	1316	1.2	1.17	1.15	1	0.8	23.2	51					
138.5	12.5	CL	9		1469	1345	1.2	1.16	1.15	1	0.8	11.5	67					
138	13	CL	9		1498	1374	1.2	1.15	1.15	1	0.8	11.5	67					
137.5	13.5	CL	9		1527	1403	1.2	1.14	1.15	1	0.85	12.1	67					
137	14	CL	9		1556	1432	1.2	1.14	1.15	1	0.85	12.0	67					
136.5	14.5	ML	10		1585	1461	1.2	1.13	1.15	1	0.85	13.2	51					
136	15	ML	10		1614	1490	1.2	1.12	1.15	1	0.85	13.1	51					
135.5	15.5	ML	10		1643	1519	1.2	1.11	1.15	1	0.85	13.1	51					
135	16	ML	10		1672	1548	1.2	1.11	1.15	1	0.85	13.0	51					
134.5	16.5	ML	10		1701	1577	1.2	1.10	1.15	1	0.85	12.9	51					
134	17	ML	10		1730	1606	1.2	1.09	1.15	1	0.85	12.8	51					
133.5	17.5	ML	16		1759	1635	1.2	1.08	1.15	1	0.85	20.3	51					
133	18	ML	16		1788	1664	1.2	1.08	1.15	1	0.85	20.2	51					
132.5	18.5	ML	16		1817	1693	1.2	1.07	1.15	1	0.85	20.1	51					
132	19	ML	16		1846	1722	1.2	1.06	1.15	1	0.85	19.9	51					
131.5	19.5	ML	16		1875	1751	1.2	1.05	1.15	1	0.85	19.8	51					
131	20	ML	16		1904	1780	1.2	1.05	1.15	1	0.95	22.0	51					
130.5	20.5	CL	10		1933	1809	1.2	1.04	1.15	1	0.95	13.6	57					
130	21	CL	10		1962	1838	1.2	1.03	1.15	1	0.95	13.6	57					
129.5	21.5	CL	10		1991	1867	1.2	1.03	1.15	1	0.95	13.5	57					
129	22	CL	10		2020	1896	1.2	1.02	1.15	1	0.95	13.4	57					
128.5	22.5	CL	10		2049	1925	1.2	1.01	1.15	1	0.95	13.3	57					
128	23	CL	10		2078	1954	1.2	1.01	1.15	1	0.95	13.2	57					

127.5	23.5	CL	16	2107	1983	1.2	1.00	1.15	1	0.95	21.0	51	5.00	1.20	9.2	30	0.947	0.667	2.00
127	24	CL	16	2136	2012	1.2	1.00	1.15	1	0.95	20.9	51	5.00	1.20	9.2	30	0.945	0.670	2.00
126.5	24.5	CL	16	2165	2041	1.2	0.99	1.15	1	0.95	20.8	51	5.00	1.20	9.2	30	0.944	0.673	2.00
126	25	CL	16	2194	2070	1.2	0.98	1.15	1	0.95	20.6	51	5.00	1.20	9.1	30	0.942	0.676	2.00
125.5	25.5	CL	16	2223	2099	1.2	0.98	1.15	1	0.95	20.5	51	5.00	1.20	9.1	30	0.940	0.678	2.00
125	26	CL	16	2252	2128	1.2	0.97	1.15	1	0.95	20.4	51	5.00	1.20	9.1	29	0.938	0.681	2.00
124.5	26.5	CL	16	2281	2157	1.2	0.97	1.15	1	0.95	20.3	51	5.00	1.20	9.1	29	0.936	0.683	2.00
124	27	CL	16	2310	2186	1.2	0.96	1.15	1	0.95	20.1	51	5.00	1.20	9.0	29	0.934	0.685	2.00
123.5	27.5	CL	16	2339	2215	1.2	0.95	1.15	1	0.95	20.0	51	5.00	1.20	9.0	29	0.932	0.687	2.00
123	28	CL	16	2368	2244	1.2	0.95	1.15	1	0.95	19.9	51	5.00	1.20	9.0	29	0.930	0.689	2.00
122.5	28.5	CL	19	2397	2273	1.2	0.94	1.15	1	0.95	23.5	51	5.00	1.20	9.7	33	0.928	0.691	2.00
122	29	CL	19	2426	2302	1.2	0.94	1.15	1	0.95	23.4	51	5.00	1.20	9.7	33	0.925	0.693	2.00
121.5	29.5	CL	19	2455	2331	1.2	0.93	1.15	1	0.95	23.2	51	5.00	1.20	9.6	33	0.923	0.694	2.00
121	30	CL	19	2484	2360	1.2	0.93	1.15	1	0.95	23.1	51	5.00	1.20	9.6	33	0.921	0.695	2.00
120.5	30.5	CL	19	2513	2389	1.2	0.92	1.15	1	0.95	23.0	51	5.00	1.20	9.6	33	0.918	0.696	2.00
120	31	CL	19	2542	2418	1.2	0.92	1.15	1	0.95	22.8	51	5.00	1.20	9.6	32	0.915	0.697	2.00
119.5	31.5	CL	19	2571	2447	1.2	0.91	1.15	1	0.95	22.7	51	5.00	1.20	9.5	32	0.913	0.698	2.00
119	32	CL	19	2600	2476	1.2	0.91	1.15	1	0.95	22.6	51	5.00	1.20	9.5	32	0.910	0.698	2.00
118.5	32.5	CL	19	2629	2505	1.2	0.90	1.15	1	0.95	22.4	51	5.00	1.20	9.5	32	0.907	0.699	2.00
118	33	CL	19	2658	2534	1.2	0.90	1.15	1	1	23.5	51	5.00	1.20	9.7	33	0.904	0.699	2.00
117.5	33.5	CL	19	2687	2563	1.2	0.89	1.15	1	1	23.4	51	5.00	1.20	9.7	33	0.901	0.699	2.00
117	34	CL	19	2716	2592	1.2	0.89	1.15	1	1	23.2	51	5.00	1.20	9.6	33	0.897	0.699	2.00
116.5	34.5	CL	19	2745	2621	1.2	0.88	1.15	1	1	23.1	51	5.00	1.20	9.6	33	0.894	0.699	2.00
116	35	CL	19	2774	2650	1.2	0.88	1.15	1	1	23.0	51	5.00	1.20	9.6	33	0.891	0.699	2.00
115.5	35.5	SC	67	2803	2679	1.2	0.87	1.15	1	1	80.6	15	2.50	1.05	6.4	87	0.887	0.698	2.00
115	36	SC	67	2832	2708	1.2	0.87	1.15	1	1	80.1	15	2.50	1.05	6.4	86	0.883	0.698	2.00
114.5	36.5	SC	67	2861	2737	1.2	0.86	1.15	1	1	79.7	15	2.50	1.05	6.3	86	0.880	0.697	2.00
114	37	SP	50	2890	2766	1.2	0.86	1.15	1	1	59.2	0	0.00	1.00	0.0	59	0.876	0.696	2.00
113.5	37.5	SP	50	2919	2795	1.2	0.85	1.15	1	1	58.8	0	0.00	1.00	0.0	59	0.872	0.695	2.00
113	38	SP	50	2948	2824	1.2	0.85	1.15	1	1	58.5	0	0.00	1.00	0.0	59	0.868	0.694	2.00
112.5	38.5	SP	50	2977	2853	1.2	0.84	1.15	1	1	58.2	0	0.00	1.00	0.0	58	0.864	0.692	2.00
112	39	SP	50	3006	2882	1.2	0.84	1.15	1	1	57.9	0	0.00	1.00	0.0	58	0.860	0.691	2.00
111.5	39.5	SP	50	3035	2911	1.2	0.84	1.15	1	1	57.6	0	0.00	1.00	0.0	58	0.855	0.689	2.00
111	40	SP	50	3064	2940	1.2	0.83	1.15	1	1	57.3	0	0.00	1.00	0.0	57	0.851	0.688	2.00
110.5	40.5	SP	50	3093	2969	1.2	0.83	1.15	1	1	57.0	0	0.00	1.00	0.0	57	0.847	0.686	2.00
110	41	SP	50	3122	2998	1.2	0.82	1.15	1	1	56.7	0	0.00	1.00	0.0	57	0.842	0.684	2.00
109.5	41.5	SP	50	3151	3027	1.2	0.82	1.15	1	1	56.4	0	0.00	1.00	0.0	56	0.837	0.682	2.00
109	42	SP	50	3180	3056	1.2	0.81	1.15	1	1	56.2	0	0.00	1.00	0.0	56	0.833	0.680	2.00
108.5	42.5	SP	50	3209	3085	1.2	0.81	1.15	1	1	55.9	0	0.00	1.00	0.0	56	0.828	0.678	2.00
108	43	SP	50	3238	3114	1.2	0.81	1.15	1	1	55.6	0	0.00	1.00	0.0	56	0.823	0.675	2.00
107.5	43.5	SP	50	3267	3143	1.2	0.80	1.15	1	1	55.3	0	0.00	1.00	0.0	55	0.818	0.673	2.00
107	44	SP	50	3296	3172	1.2	0.80	1.15	1	1	55.0	0	0.00	1.00	0.0	55	0.814	0.670	2.00
106.5	44.5	SP	50	3325	3201	1.2	0.79	1.15	1	1	54.8	0	0.00	1.00	0.0	55	0.809	0.668	2.00
106	45	SP	50	3354	3230	1.2	0.79	1.15	1	1	54.5	0	0.00	1.00	0.0	55	0.804	0.665	2.00
105.5	45.5	CL	22	3383	3259	1.2	0.79	1.15	1	1	23.9	51	5.00	1.20	9.8	34	0.799	0.662	2.00
105	46	CL	22	3412	3288	1.2	0.78	1.15	1	1	23.7	51	5.00	1.20	9.7	33	0.794	0.659	2.00
104.5	46.5	CL	22	3441	3317	1.2	0.78	1.15	1	1	23.6	51	5.00	1.20	9.7	33	0.788	0.657	2.00
104	47	CL	22	3470	3346	1.2	0.77	1.15	1	1	23.5	51	5.00	1.20	9.7	33	0.783	0.654	2.00
103.5	47.5	CL	22	3499	3375	1.2	0.77	1.15	1	1	23.4	51	5.00	1.20	9.7	33	0.778	0.651	2.00
103	48	CL	22	3528	3404	1.2	0.77	1.15	1	1	23.3	51	5.00	1.20	9.7	33	0.773	0.648	2.00
102.5	48.5	CL	22	3557	3433	1.2	0.76	1.15	1	1	23.2	51	5.00	1.20	9.6	33	0.768	0.645	2.00
102	49	CL	22	3586	3462	1.2	0.76	1.15	1	1	23.1	51	5.00	1.20	9.6	33	0.763	0.641	2.00
101.5	49.5	CL	30	3615	3491	1.2	0.76	1.15	1	1	31.3	51	5.00	1.20	11.3	43	0.758	0.638	2.00
101	50	CL	30	3644	3520	1.2	0.75	1.15	1	1	31.2	51	5.00	1.20	11.2	42	0.753	0.635	2.00
100.5	50.5	CL	30	3673	3549	1.2	0.75	1.15	1	1	31.0	51	5.00	1.20	11.2	42	0.748	0.632	2.00
100	51	CL	30	3702	3578	1.2	0.75	1.15	1	1	30.9	51	5.00	1.20	11.2	42	0.743	0.629	2.00
99.5	51.5	CL	30	3731	3607	1.2	0.74	1.15	1	1	30.7	51	5.00	1.20	11.1	42	0.738	0.626	2.00
99	52	CL	30	3760	3636	1.2	0.74	1.15	1	1	30.6	51	5.00	1.20	11.1	42	0.733	0.622	2.00
98.5	52.5	CL	30	3789	3665	1.2	0.74	1.15	1	1	30.5	51	5.00	1.20	11.1	42	0.728	0.619	2.00
98	53	CL	30	3818	3694	1.2	0.73	1.15	1	1	30.3	51	5.00	1.20	11.1	41	0.723	0.616	2.00
97.5	53.5	CL	46	3847	3723	1.2	0.73	1.15	1	1	46.3	51	5.00	1.20	14.3	61	0.718	0.613	2.00
97	54	CL	46	3876	3752	1.2	0.73	1.15	1	1	46.1	51	5.00	1.20	14.2	60	0.713	0.609	2.00
96.5	54.5	CL	46	3905	3781	1.2	0.72	1.15	1	1	45.9	51	5.00	1.20	14.2	60	0.708	0.606	2.00
96	55	CL	46	3934	3810	1.2	0.72	1.15	1	1	45.7	51	5.00	1.20	14.1	60	0.703	0.603	2.00
95.5	55.5	CL	46	3963	3839	1.2	0.72	1.15	1	1	45.4	51	5.00	1.20	14.1	60	0.699	0.600	2.00
95	56	CL	46	3992	3868	1.2	0.71	1.15	1	1	45.2	51	5.00	1.20	14.0	59	0.694	0.597	2.00
94.5	56.5	CL	46	4021	3897	1.2	0.71	1.15	1	1	45.0	51	5.00	1.20	14.0	59	0.689	0.594	2.00
94	57	CL	46	4050	3926	1.2	0.71	1.15	1	1	44.8	51	5.00	1.20	14.0	59	0.685	0.591	2.00
93.5	57.5	CL	29	4079	3955	1.2	0.70	1.15	1	1	28.1	51	5.00	1.20	10.6	39	0.680	0.588	2.00
93	58	CL	29	4108	3984	1.2	0.70	1.15	1	1	28.0	51	5.00	1.20	10.6	39	0.676	0.585	2.00
92.5	58.5	CL	29	4137	4013	1.2	0.70	1.15	1	1	27.9	51	5.00	1.20	10.6	38	0.672	0.582	2.00

SPT-liq-B-5-011323-cc-cjz (002)

92	59	CL	29	4166	4042	1.2	0.69	1.15	1	1	27.8	51	5.00	1.20	10.6	38	0.668	0.579	2.00
91.5	59.5	CL	29	4195	4071	1.2	0.69	1.15	1	1	27.7	51	5.00	1.20	10.5	38	0.663	0.576	2.00
91	60	CL	29	4224	4100	1.2	0.69	1.15	1	1	27.5	51	5.00	1.20	10.5	38	0.659	0.573	2.00
90.5	60.5	CL	29	4253	4129	1.2	0.69	1.15	1	1	27.4	51	5.00	1.20	10.5	38	0.655	0.570	2.00
90	61	CL	29	4282	4158	1.2	0.68	1.15	1	1	27.3	51	5.00	1.20	10.5	38	0.651	0.568	2.00
89.5	61.5	CL	29	4311	4187	1.2	0.68	1.15	1	1	27.2	51	5.00	1.20	10.4	38	0.647	0.565	2.00
89	62	CL	29	4340	4216	1.2	0.68	1.15	1	1	27.1	51	5.00	1.20	10.4	37	0.644	0.562	2.00
88.5	62.5	CL	29	4369	4245	1.2	0.67	1.15	1	1	27.0	51	5.00	1.20	10.4	37	0.640	0.560	2.00
88	63	CL	29	4398	4274	1.2	0.67	1.15	1	1	26.9	51	5.00	1.20	10.4	37	0.636	0.557	2.00
87.5	63.5	SC	65	4427	4303	1.2	0.67	1.15	1	1	59.9	51	5.00	1.20	17.0	77	0.632	0.554	2.00
87	64	SC	65	4456	4332	1.2	0.67	1.15	1	1	59.7	51	5.00	1.20	16.9	77	0.629	0.552	2.00
86.5	64.5	SC	65	4485	4361	1.2	0.66	1.15	1	1	59.4	51	5.00	1.20	16.9	76	0.625	0.550	2.00
86	65	SC	65	4514	4390	1.2	0.66	1.15	1	1	59.2	51	5.00	1.20	16.8	76	0.622	0.547	2.00
85.5	65.5	SC	65	4543	4419	1.2	0.66	1.15	1	1	59.0	51	5.00	1.20	16.8	76	0.619	0.545	2.00
85	66	SC	65	4572	4448	1.2	0.65	1.15	1	1	58.7	51	5.00	1.20	16.7	75	0.616	0.543	2.00
84.5	66.5	SC	65	4601	4477	1.2	0.65	1.15	1	1	58.5	51	5.00	1.20	16.7	75	0.612	0.540	2.00
84	67	SC	65	4630	4506	1.2	0.65	1.15	1	1	58.2	51	5.00	1.20	16.6	75	0.609	0.538	2.00
83.5	67.5	SC	50	4659	4535	1.2	0.65	1.15	1	1	44.6	51	5.00	1.20	13.9	59	0.606	0.536	2.00
83	68	SC	50	4688	4564	1.2	0.64	1.15	1	1	44.4	51	5.00	1.20	13.9	58	0.603	0.534	2.00
82.5	68.5	SC	50	4717	4593	1.2	0.64	1.15	1	1	44.3	51	5.00	1.20	13.9	58	0.600	0.532	2.00
82	69	SC	50	4746	4622	1.2	0.64	1.15	1	1	44.1	51	5.00	1.20	13.8	58	0.597	0.530	2.00
81.5	69.5	SC	50	4775	4651	1.2	0.64	1.15	1	1	43.9	51	5.00	1.20	13.8	58	0.595	0.528	2.00
81	70	SC	50	4804	4680	1.2	0.63	1.15	1	1	43.7	51	5.00	1.20	13.7	57	0.592	0.526	2.00
80.5	70.5	SC	50	4833	4709	1.2	0.63	1.15	1	1	43.6	51	5.00	1.20	13.7	57	0.589	0.524	2.00
80	71	SC	50	4862	4738	1.2	0.63	1.15	1	1	43.4	51	5.00	1.20	13.7	57	0.587	0.522	2.00
79.5	71.5	SC	50	4891	4767	1.2	0.63	1.15	1	1	43.2	51	5.00	1.20	13.6	57	0.584	0.520	2.00
79	72	SC	50	4920	4796	1.2	0.62	1.15	1	1	43.1	51	5.00	1.20	13.6	57	0.582	0.519	2.00
78.5	72.5	SC	50	4949	4825	1.2	0.62	1.15	1	1	42.9	51	5.00	1.20	13.6	56	0.579	0.517	2.00
78	73	SC	50	4978	4854	1.2	0.62	1.15	1	1	42.7	51	5.00	1.20	13.5	56	0.577	0.515	2.00
77.5	73.5	SC	50	5007	4883	1.2	0.62	1.15	1	1	42.6	51	5.00	1.20	13.5	56	0.574	0.514	2.00
77	74	SC	50	5036	4912	1.2	0.61	1.15	1	1	42.4	51	5.00	1.20	13.5	56	0.572	0.512	2.00
76.5	74.5	SC	50	5065	4941	1.2	0.61	1.15	1	1	42.2	51	5.00	1.20	13.4	56	0.570	0.510	2.00
76	75	SC	50	5094	4970	1.2	0.61	1.15	1	1	42.1	51	5.00	1.20	13.4	55	0.568	0.509	2.00
75.5	75.5	SC	50	5123	4999	1.2	0.61	1.15	1	1	41.9	51	5.00	1.20	13.4	55	0.566	0.507	2.00
75	76	SC	50	5152	5028	1.2	0.61	1.15	1	1	41.8	51	5.00	1.20	13.4	55	0.563	0.506	2.00

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Project 400 South San Vicente Boulevard				Project No. 700109901			
Location 400 South San Vicente Boulevard				Elevation and Datum Approx. 149 (feet, MSL)			
Drilling Company SoCal Drilling				Date Started 1/6/22		Date Finished 1/7/22	
Drilling Equipment Mayhew 1000				Completion Depth 51.5 ft		Rock Depth -	
Size and Type of Bit 4.75" Mud Rotary				Number of Samples Disturbed 6		Undisturbed 7	Core -
Casing Diameter (in) -		Casing Depth (ft) -		Water Level (ft.) First ∇ 15.5		Completion ∇ -	24 HR. ∇ -
Casing Hammer -		Weight (lbs) -		Drop (in) -		Drilling Foreman A. Nieblas	
Sampler 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod				Field Engineer A. Nieblas			
Sampler Hammer Automatic		Weight (lbs) 140		Drop (in) 30			

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist. BL/6in	Water Content	
	+149.0	AC = 4-inches thick, Base = 6-inches thick.	0						
	+148.0	Artificial Fill (af) CLAY (CL), brown and light brown mottled, very stiff to hard, very moist, few medium sand.	1						
	+142.0	Quaternary Young Alluvium (Qya) CLAY with Some Sand (CL), brown and light brown mottled, stiff, moist, caliche.	7						
	+138.0	Sandy SILT (ML) , brown to orangish brown, soft, very moist, very fine sand.	11	S-2	CR	18	5	N = 6.5	WC = 39.4% DD = 85.8 pcf
	+135.0	Quaternary San Pedro Formation (Qsp) Sandy CLAY (CL), grayish brown with light grayish brown mottled, very stiff, very moist, few fine gravel, some iron oxide staining, very old caliche/rootlets.	14	S-3	SPT	18	1	N = 3	
			15	S-4	CR	0	5	N = 11.7	No sample recovery. Groundwater encountered at 15.5 feet.
			16				7		
			17				11		
			18	S-5	SPT	18	10	N = 27	LL = 37, PL = 22, PI = 15
			19				12		
			20				12		

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Project	400 South San Vicente Boulevard	Project No.	700109901
Location	400 South San Vicente Boulevard	Elevation and Datum	Approx. 149 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)								
				Number	Type	Recov. (in)	Penetr. resist BL/6in		Water Content							
[Diagonal Hatching]	129.0	Sandy CLAY (CL), orangish brown, very stiff, very moist, fine to coarse sand, moderate plasticity.	20	S-6	CR	18	6	N=15.6 PI=22	WC = 22.2% DD = 103.6 pcf LL = 49, PL = 27, PI = 22 Direct shear test. Consolidation test.							
	21		11													
	22		13													
	23															
	24															
	25															
	26															
	27															
	28															
	29															
[Diagonal Hatching]	121.0	Grayish brown mottled, moist, very fine to medium sand.	25	S-7	SPT	18	4	N=17 PI=12	LL = 36, PL = 24, PI = 12 %Pass #200 = 74							
	26		7													
	27		10													
	28															
	29															
	30															
	31															
	32															
	33															
	34															
[Diagonal Hatching]	116.0	Clayey SAND (SC), gray to grayish brown, very dense, wet.	30	S-8	CR	18	22	N=65	WC = 12.7% DD = 124.7 pcf							
	31		50													
	32		50													
	33															
	34															
	35															
	36															
	37															
	38															
	39															
[Diagonal Hatching]	112.0	SAND with Gravel and Clay (SW-SC), brown, very dense, wet, well graded sand.	35	S-9	SPT	9	22	N=55								
	36		32													
	37		23													
	38															
	39															
	40															
	41															
	42															
	43															
	44															
[Diagonal Hatching]	106.0	SAND with Some Gravel (SP), grayish brown, very dense, moist, well graded sand.	40	S-10	CR	11	28	N=50	WC = 9.6% DD = 129.6 pcf							
	41		50/5"													
	42															
	43															
	44															
	45															
	[Diagonal Hatching]		106.0				CLAY with Sand (CL), bluish gray, hard, very moist.			43						
			44													
			45													

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Project		Project No.						
400 South San Vicente Boulevard		700109901						
Location		Elevation and Datum						
400 South San Vicente Boulevard		Approx. 149 (feet, MSL)						
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (ft)	Penetr. resist BL/6in	
	+104.0		45	S-11	SPT	10	15	N = 39
			46				18 21	
	+101.0	Sandy CLAY (CL), greenish gray and bluish gray, very stiff, very moist, fine to medium sand, thin Clayey Sand (SC) lenses.	48					N = 20.8
			49					
	+97.5	Total Depth = 51.5 feet Groundwater encountered at 15.5 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.	50	S-12	CR	18	11 15	WC = 25.3% DD = 103.5 pcf LL = 35, PL = 19, PI = 16
			51				17	
			52					
			53					
			54					
			55					
			56					
			57					
			58					
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			68					
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			70					

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SPT Liquefaction Spreadsheet

JOB NAME **400 San Vicente**
 DATE 1/13/2023
 BY CC
 CHECKED BY CJZ
 DATE 1/13/2023
 Risk 2-in-50

Boring **B-6**
 y **120** pcf
 GW level **12** ft
 HHGWL **10** ft
 GS Elevation **151** msl
 Bot of Mat **113** msl
 Magnitude a max
6.77 **0.985**
 MSF 1.30

Total Settlement (Top 50 ft) 0.26 INCHES

Total Settlement 0.33 INCHES

PI CUTOFF = 18

Elevation (MSL)	Depth (feet)	Soil Type	Nfield	PI => 18 ?	σ _o ' (psf) <i>current psf</i>	σ _o ' (psf) <i>HHGWL psf</i>	Fines Correction					(N ₁) ₆₀	CRR <i>1998 eq.</i> <N=30	Rd	CSR	FOS	SETTLEMENT					
							C _E <i>energy</i>	C _N <i>stress</i>	C _B <i>6" diam</i>	C _S <i>w/out liner</i>	C _R <i>rod</i>						(N ₁) ₆₀ <i>interim Corr.</i>	%fines	Alpha	Beta	ΔN	(%)
150	1	CL	21		120	120	1.1	1.75	1.15	1.0	0.75	51	5.00	1.20		1.000	0.495	2.00				
149.5	1.5	CL	21		180	180	1.1	1.71	1.15	1	0.75	51	5.00	1.20		0.998	0.494	2.00				
149	2	CL	21		240	240	1.1	1.68	1.15	1	0.75	51	5.00	1.20		0.997	0.494	2.00				
148.5	2.5	CL	21		300	300	1.1	1.64	1.15	1	0.75	51	5.00	1.20		0.996	0.493	2.00				
148	3	CL	21		360	360	1.1	1.61	1.15	1	0.75	51	5.00	1.20		0.995	0.493	2.00				
147.5	3.5	CL	21		420	420	1.1	1.57	1.15	1	0.75	51	5.00	1.20		0.994	0.492	2.00				
147	4	CL	21		480	480	1.1	1.54	1.15	1	0.75	51	5.00	1.20		0.993	0.491	2.00				
146.5	4.5	CL	21		540	540	1.1	1.51	1.15	1	0.75	51	5.00	1.20		0.991	0.491	2.00				
146	5	CL	21		600	600	1.1	1.48	1.15	1	0.75	51	5.00	1.20		0.990	0.490	2.00				
145.5	5.5	CL	21		660	660	1.1	1.46	1.15	1	0.75	51	5.00	1.20		0.989	0.490	2.00				
145	6	CL	21		720	720	1.1	1.43	1.15	1	0.75	51	5.00	1.20		0.988	0.489	2.00				
144.5	6.5	CL	21		780	780	1.1	1.40	1.15	1	0.75	51	5.00	1.20		0.987	0.488	2.00				
144	7	CL	21		840	840	1.1	1.38	1.15	1	0.75	51	5.00	1.20		0.986	0.488	2.00				
143.5	7.5	CL	7		900	900	1.1	1.35	1.15	1	0.75	51	5.00	1.20		0.985	0.487	2.00				
143	8	CL	7		960	960	1.1	1.33	1.15	1	0.75	51	5.00	1.20		0.983	0.487	2.00				
142.5	8.5	CL	7		1020	1020	1.1	1.31	1.15	1	0.75	51	5.00	1.20		0.982	0.486	2.00				
142	9	CL	7		1080	1080	1.1	1.29	1.15	1	0.75	51	5.00	1.20		0.981	0.486	2.00				
141.5	9.5	CL	7		1140	1140	1.1	1.27	1.15	1	0.75	51	5.00	1.20		0.980	0.485	2.00				
141	10	CL	7		1200	1200	1.1	1.24	1.15	1	0.8	8.8	51	5.00	1.20	6.8	16	0.979	0.485	2.00		
140.5	10.5	CL	7		1260	1229	1.1	1.23	1.15	1	0.8	8.7	51	5.00	1.20	6.7	15	0.978	0.496	2.00		
140	11	CL	7		1320	1258	1.1	1.21	1.15	1	0.8	8.5	51	5.00	1.20	6.7	15	0.977	0.507	2.00		
139.5	11.5	ML	3		1380	1287	1.1	1.19	1.15	1	0.8	3.6	51	5.00	1.20	5.7	9	0.976	0.518	2.00		
139	12	ML	3		1440	1316	1.1	1.17	1.15	1	0.8	3.6	51	5.00	1.20	5.7	9	0.975	0.528	2.00		
138.5	12.5	ML	3		1469	1345	1.1	1.16	1.15	1	0.8	3.5	51	5.00	1.20	5.7	9	0.974	0.538	2.00		
138	13	ML	3		1498	1374	1.1	1.15	1.15	1	0.8	3.5	51	5.00	1.20	5.7	9	0.973	0.547	2.00		
137.5	13.5	ML	3		1527	1403	1.1	1.14	1.15	1	0.85	3.7	51	5.00	1.20	5.7	9	0.972	0.555	2.00		
137	14	ML	3		1556	1432	1.1	1.14	1.15	1	0.85	3.7	51	5.00	1.20	5.7	9	0.971	0.564	2.00		
136.5	14.5	CL	12		1585	1461	1.1	1.13	1.15	1	0.85	14.6	51	5.00	1.20	7.9	22	0.970	0.572	2.00		
136	15	CL	12		1614	1490	1.1	1.12	1.15	1	0.85	14.5	51	5.00	1.20	7.9	22	0.969	0.579	2.00		
135.5	15.5	CL	12		1643	1519	1.1	1.11	1.15	1	0.85	14.4	51	5.00	1.20	7.9	22	0.967	0.586	2.00		
135	16	CL	12		1672	1548	1.1	1.11	1.15	1	0.85	14.3	51	5.00	1.20	7.9	22	0.966	0.593	2.00		
134.5	16.5	CL	12		1701	1577	1.1	1.10	1.15	1	0.85	14.2	51	5.00	1.20	7.8	22	0.965	0.600	2.00		
134	17	CL	12		1730	1606	1.1	1.09	1.15	1	0.85	14.1	51	5.00	1.20	7.8	22	0.964	0.606	2.00		
133.5	17.5	CL	24		1759	1635	1.1	1.08	1.15	1	0.85	27.9	51	5.00	1.20	10.6	39	0.963	0.612	2.00		
133	18	CL	24		1788	1664	1.1	1.08	1.15	1	0.85	27.8	51	5.00	1.20	10.6	38	0.962	0.618	2.00		
132.5	18.5	CL	24		1817	1693	1.1	1.07	1.15	1	0.85	27.6	51	5.00	1.20	10.5	38	0.961	0.624	2.00		
132	19	CL	24		1846	1722	1.1	1.06	1.15	1	0.85	27.4	51	5.00	1.20	10.5	38	0.959	0.629	2.00		
131.5	19.5	CL	24		1875	1751	1.1	1.05	1.15	1	0.85	27.2	51	5.00	1.20	10.4	38	0.958	0.634	2.00		
131	20	CL	24		1904	1780	1.1	1.05	1.15	1	0.95	30.2	51	5.00	1.20	11.0	41	0.957	0.639	2.00		
130.5	20.5	CL	16	YES	1933	1809	1.1	1.04	1.15	1	0.95	20.0	51	5.00	1.20	9.0	29	0.956	0.643	2.00		
130	21	CL	16	YES	1962	1838	1.1	1.03	1.15	1	0.95	19.9	51	5.00	1.20	9.0	29	0.954	0.648	2.00		
129.5	21.5	CL	16	YES	1991	1867	1.1	1.03	1.15	1	0.95	19.8	51	5.00	1.20	9.0	29	0.953	0.652	2.00		
129	22	CL	16	YES	2020	1896	1.1	1.02	1.15	1	0.95	19.6	51	5.00	1.20	8.9	29	0.951	0.656	2.00		
128.5	22.5	CL	16	YES	2049	1925	1.1	1.01	1.15	1	0.95	19.5	51	5.00	1.20	8.9	28	0.950	0.660	2.00		
128	23	CL	16	YES	2078	1954	1.1	1.01	1.15	1	0.95	19.4	51	5.00	1.20	8.9	28	0.948	0.663	2.00		

SPT-liq-B-6-011323-cc-cjz (002)

127.5	23.5	CL	17	2107	1983	1.1	1.00	1.15	1	0.95	20.5	74	5.00	1.20	9.1	30	0.947	0.667	2.00			
127	24	CL	17	2136	2012	1.1	1.00	1.15	1	0.95	20.3	74	5.00	1.20	9.1	29	0.945	0.670	2.00			
126.5	24.5	CL	17	2165	2041	1.1	0.99	1.15	1	0.95	20.2	74	5.00	1.20	9.0	29	0.944	0.673	2.00			
126	25	CL	17	2194	2070	1.1	0.98	1.15	1	0.95	20.1	74	5.00	1.20	9.0	29	0.942	0.676	2.00			
125.5	25.5	CL	17	2223	2099	1.1	0.98	1.15	1	0.95	20.0	74	5.00	1.20	9.0	29	0.940	0.678	2.00			
125	26	CL	17	2252	2128	1.1	0.97	1.15	1	0.95	19.8	74	5.00	1.20	9.0	29	0.938	0.681	2.00			
124.5	26.5	CL	17	2281	2157	1.1	0.97	1.15	1	0.95	19.7	74	5.00	1.20	8.9	29	0.936	0.683	2.00			
124	27	CL	17	2310	2186	1.1	0.96	1.15	1	0.95	19.6	74	5.00	1.20	8.9	29	0.934	0.685	2.00			
123.5	27.5	CL	17	2339	2215	1.1	0.95	1.15	1	0.95	19.5	74	5.00	1.20	8.9	28	0.932	0.687	2.00			
123	28	CL	17	2368	2244	1.1	0.95	1.15	1	0.95	19.4	74	5.00	1.20	8.9	28	0.930	0.689	2.00			
122.5	28.5	SC	65	2397	2273	1.1	0.94	1.15	1	0.95	73.7	15	2.50	1.05	6.0	80	0.928	0.691	2.00			
122	29	SC	65	2426	2302	1.1	0.94	1.15	1	0.95	73.2	15	2.50	1.05	6.0	79	0.925	0.693	2.00			
121.5	29.5	SC	65	2455	2331	1.1	0.93	1.15	1	0.95	72.8	15	2.50	1.05	6.0	79	0.923	0.694	2.00			
121	30	SC	65	2484	2360	1.1	0.93	1.15	1	0.95	72.4	15	2.50	1.05	6.0	78	0.921	0.695	2.00			
120.5	30.5	SC	65	2513	2389	1.1	0.92	1.15	1	0.95	72.0	15	2.50	1.05	6.0	78	0.918	0.696	2.00			
120	31	SC	65	2542	2418	1.1	0.92	1.15	1	0.95	71.6	15	2.50	1.05	5.9	78	0.915	0.697	2.00			
119.5	31.5	SC	65	2571	2447	1.1	0.91	1.15	1	0.95	71.2	15	2.50	1.05	5.9	77	0.913	0.698	2.00			
119	32	SC	65	2600	2476	1.1	0.91	1.15	1	0.95	70.8	15	2.50	1.05	5.9	77	0.910	0.698	2.00			
118.5	32.5	SC	65	2629	2505	1.1	0.90	1.15	1	0.95	70.4	15	2.50	1.05	5.9	76	0.907	0.699	2.00			
118	33	SC	65	2658	2534	1.1	0.90	1.15	1	1	73.7	15	2.50	1.05	6.0	80	0.904	0.699	2.00			
117.5	33.5	SW	55	2687	2563	1.1	0.89	1.15	1	1	62.0	0	0.00	1.00	0.0	62	0.901	0.699	2.00			
117	34	SW	55	2716	2592	1.1	0.89	1.15	1	1	61.6	0	0.00	1.00	0.0	62	0.897	0.699	2.00			
116.5	34.5	SW	55	2745	2621	1.1	0.88	1.15	1	1	61.3	0	0.00	1.00	0.0	61	0.894	0.699	2.00			
116	35	SW	55	2774	2650	1.1	0.88	1.15	1	1	61.0	0	0.00	1.00	0.0	61	0.891	0.699	2.00			
115.5	35.5	SW	55	2803	2679	1.1	0.87	1.15	1	1	60.6	0	0.00	1.00	0.0	61	0.887	0.698	2.00			
115	36	SW	55	2832	2708	1.1	0.87	1.15	1	1	60.3	0	0.00	1.00	0.0	60	0.883	0.698	2.00			
114.5	36.5	SW	55	2861	2737	1.1	0.86	1.15	1	1	60.0	0	0.00	1.00	0.0	60	0.880	0.697	2.00			
114	37	SW	55	2890	2766	1.1	0.86	1.15	1	1	59.7	0	0.00	1.00	0.0	60	0.876	0.696	2.00			
113.5	37.5	SP	50	2919	2795	1.1	0.85	1.15	1	1	53.9	0	0.00	1.00	0.0	54	0.872	0.695	2.00			
113	38	SP	50	2948	2824	1.1	0.85	1.15	1	1	53.7	0	0.00	1.00	0.0	54	0.868	0.694	2.00			
112.5	38.5	SP	50	2977	2853	1.1	0.84	1.15	1	1	53.4	0	0.00	1.00	0.0	53	0.864	0.692	2.00			
112	39	SP	50	3006	2882	1.1	0.84	1.15	1	1	53.1	0	0.00	1.00	0.0	53	0.860	0.691	2.00			
111.5	39.5	SP	50	3035	2911	1.1	0.84	1.15	1	1	52.8	0	0.00	1.00	0.0	53	0.855	0.689	2.00			
111	40	SP	50	3064	2940	1.1	0.83	1.15	1	1	52.5	0	0.00	1.00	0.0	53	0.851	0.688	2.00			
110.5	40.5	SP	50	3093	2969	1.1	0.83	1.15	1	1	52.3	0	0.00	1.00	0.0	52	0.847	0.686	2.00			
110	41	SP	50	3122	2998	1.1	0.82	1.15	1	1	52.0	0	0.00	1.00	0.0	52	0.842	0.684	2.00			
109.5	41.5	SP	50	3151	3027	1.1	0.82	1.15	1	1	51.7	0	0.00	1.00	0.0	52	0.837	0.682	2.00			
109	42	SP	50	3180	3056	1.1	0.81	1.15	1	1	51.5	0	0.00	1.00	0.0	51	0.833	0.680	2.00			
108.5	42.5	SP	50	3209	3085	1.1	0.81	1.15	1	1	51.2	0	0.00	1.00	0.0	51	0.828	0.678	2.00			
108	43	SP	50	3238	3114	1.1	0.81	1.15	1	1	51.0	0	0.00	1.00	0.0	51	0.823	0.675	2.00			
107.5	43.5	CL	39	3267	3143	1.1	0.80	1.15	1	1	39.6	51	5.00	1.20	12.9	52	0.818	0.673	2.00			
107	44	CL	39	3296	3172	1.1	0.80	1.15	1	1	39.4	51	5.00	1.20	12.9	52	0.814	0.670	2.00			
106.5	44.5	CL	39	3325	3201	1.1	0.79	1.15	1	1	39.2	51	5.00	1.20	12.8	52	0.809	0.668	2.00			
106	45	CL	39	3354	3230	1.1	0.79	1.15	1	1	39.0	51	5.00	1.20	12.8	52	0.804	0.665	2.00			
105.5	45.5	CL	39	3383	3259	1.1	0.79	1.15	1	1	38.8	51	5.00	1.20	12.8	52	0.799	0.662	2.00			
105	46	CL	39	3412	3288	1.1	0.78	1.15	1	1	38.6	51	5.00	1.20	12.7	51	0.794	0.659	2.00			
104.5	46.5	CL	39	3441	3317	1.1	0.78	1.15	1	1	38.4	51	5.00	1.20	12.7	51	0.788	0.657	2.00			
104	47	CL	39	3470	3346	1.1	0.77	1.15	1	1	38.2	51	5.00	1.20	12.6	51	0.783	0.654	2.00			
103.5	47.5	CL	39	3499	3375	1.1	0.77	1.15	1	1	38.0	51	5.00	1.20	12.6	51	0.778	0.651	2.00			
103	48	CL	39	3528	3404	1.1	0.77	1.15	1	1	37.9	51	5.00	1.20	12.6	50	0.773	0.648	2.00			
102.5	48.5	CL	39	3557	3433	1.1	0.76	1.15	1	1	37.7	51	5.00	1.20	12.5	50	0.768	0.645	2.00			
102	49	CL	39	3586	3462	1.1	0.76	1.15	1	1	37.5	51	5.00	1.20	12.5	50	0.763	0.641	2.00			
101.5	49.5	CL	21	3615	3491	1.1	0.76	1.15	1	1	20.1	51	5.00	1.20	9.0	29	0.416	0.758	0.638	0.85	0.011	0.066
101	50	CL	21	3644	3520	1.1	0.75	1.15	1	1	20.0	51	5.00	1.20	9.0	29	0.410	0.753	0.635	0.84	0.011	0.066
100.5	50.5	CL	21	3673	3549	1.1	0.75	1.15	1	1	19.9	51	5.00	1.20	9.0	29	0.405	0.748	0.632	0.83	0.011	0.066
100	51	CL	21	3702	3578	1.1	0.75	1.15	1	1	19.8	51	5.00	1.20	9.0	29	0.400	0.743	0.629	0.83	0.011	0.066
99.5	51.5	CL	21	3731	3607	1.1	0.74	1.15	1	1	19.7	51	5.00	1.20	8.9	29	0.395	0.738	0.626	0.82	0.011	0.066

0.330

LANGAN

Project 400 South San Vicente Boulevard		Project No. 700109901	
Location 400 South San Vicente Boulevard		Elevation and Datum Approx. 151 (feet, MSL)	
Drilling Company SoCal Drilling		Date Started 1/7/22	Date Finished 1/7/22
Drilling Equipment Mayhew 1000		Completion Depth 76.5 ft	Rock Depth -
Size and Type of Bit 4.75" Mud Rotary		Number of Samples Disturbed 9 Undisturbed 9	Core -
Casing Diameter (in) -	Casing Depth (ft) -	Water Level (ft.) First ∇ 14 Completion \blacktriangledown -	24 HR. \blacktriangledown -
Casing Hammer -	Weight (lbs) -	Drop (in) -	
Sampler Bulk: 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod		Field Engineer A. Nieblas	
Sampler Hammer Automatic	Weight (lbs) 140	Drop (in) 30	

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MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL/6in		
	+151.0	AC = 8-inches thick, Base = 6-inches thick.	0						
	+149.8	Artificial Fill (af) Sandy CLAY (CL), dark brown and brown mottled, hard, moist.	1						Bulk sample collected from 0-10 feet bgs. Compaction test. Corrosivity and Chemical tests.
	+144.0	Quaternary Young Alluvium (Qya) CLAY (CL) to SILT (ML), orangish brown and light brown mottled, stiff, moist.	2						
	+139.0	CLAY with Sand (CL), brown and light brown mottled, stiff, very moist, caliche.	3						
	+134.0	Orangish brown, moist to very moist, no caliche.	4						
	+132.5	SILT (ML), brown, hard, moist, medium sand, manganese oxide staining.	5						
	+131.0	Quaternary San Pedro Formation (Qsp) Sandy CLAY (CL), gray brown, hard, moist, fine to coarse sand, some iron oxide staining.	6						

Sample No.	Type	Recov. (in)	Penetr. resist BL/6in	Water Content
S-1	CR	18	18	N=26
S-2	SPT	9	6	N=12
S-3	CR	12	5	N=6.5 PI=18
S-4	SPT	18	5	N=10 PI=8
S-5	CR	18	18	N=26

LANGAN

Project	400 South San Vicente Boulevard	Project No.	700109901
Location	400 South San Vicente Boulevard	Elevation and Datum	Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
				Number	Type	Recov. (ft)	Penetr. resist. BL/6in		Water Content
[Diagonal Hatching]	+131.0	CLAY (CL), brown, stiff, moist, scattered caliche.	20	S-6	SPT	15	4	N=12 PE=19	WC = 19.7% LL = 38, PL = 20, PI = 18
	21		6						
	22		6						
[Diagonal Hatching]	+128.0	CLAY with Sand (CL), brown, very stiff, moist, fine to medium sand, few caliche stringers.	23	S-7	CR	18	7	N=16 PI=20	WC = 25.9% DD = 100.2 pcf LL = 43, PL = 23, PI = 20 Consolidation test.
	24		12						
	25		13						
	26								
	27								
[Diagonal Hatching]	+123.0	CLAY (CL), brown, stiff, moist.	28	S-8	SPT	18	4	N=10 PE=26	LL = 49, PL = 23, PI = 26
	29		5						
	30		5						
	31								
	32								
	33								
[Diagonal Hatching]	+118.0	Clayey SAND (SC), brown, very dense, moist, iron oxide staining.	33	S-9	CR	18	17	N=46	WC = 17.2% DD = 113.9 pcf Direct shear test.
	34		33						
	35		38						
[Diagonal Hatching]	+115.0	SAND (SP/SW), gray, very dense, moist to wet, coarse sand.	36	S-10	CR	11	37	N=75	WC = 13.0% DD = 125.4 pcf
	37		50/5"						
[Diagonal Hatching]	+113.0	SAND with Gravel (SW), gray, very dense, wet, medium to coarse sand, fine gravel.	38						
	39								
[Diagonal Hatching]	+107.0	CLAY with Sand (CH), light bluish gray, stiff, moist to very moist, caliche.	40						
	41								
			42						
			43						
			44						
			45						

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Project	400 South San Vicente Boulevard	Project No.	700109901
Location	400 South San Vicente Boulevard	Elevation and Datum	Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
				Number	Type	Recov. (ft)	Penetr. resist BL/6in		Water Content
	+106.0		45	S-11	SPT	18	4	N=12 P=40	LL = 78, PL = 34, PI = 44
			46				6		
	+103.0	Sandy CLAY (CL), light greenish gray and bluish gray, hard, moist.	47	S-12	CR	18	17	N=41	WC = 24.6% DD = 106.2 pcf
			48				31		
			49				32		
			50						
			51						
			52						
			53						
			54						
			55						
			56						
	+93.0	Bluish gray, very moist, fine to coarse sand, quartzofeldspathic composition.	55	S-13	SPT	18	12	N=38	
			56				18		
			57				20		
			58						
			59						
			60						
			61						
			62						
			63						
			64						
	+83.0	CLAY (CL), bluish gray, hard, very moist.	58	S-14	CR	18	17	N=54	WC = 30.9% DD = 92.9 pcf
			59				38		
			60				45		
			61						
			62						
			63						
			64						
			65						
			66						
			67						
	+83.0	SILT (ML), bluish gray, hard, moist.	65	S-15	SPT	18	17	N=57	
			66				25		
			67				29		
			68						
			69						
			70						

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Log of Boring

B-5

Sheet 1 of 4

Project 400 South San Vicente Boulevard		Project No. 700109901	
Location 400 South San Vicente Boulevard		Elevation and Datum Approx. 151 (feet, MSL)	
Drilling Company SoCal Drilling		Date Started 1/6/22	Date Finished 1/6/22
Drilling Equipment Mayhew 1000		Completion Depth 76 ft	Rock Depth
Size and Type of Bit 4.75" Mud Rotary		Number of Samples	Disturbed 10 Undisturbed 9 Core -
Casing Diameter (in)	Casing Depth (ft)	Water Level (ft.) First ∇ 21.5	Completion ∇ 24 HR. ∇
Casing Hammer	Weight (lbs)	Drop (in)	Drilling Foreman
Sampler Bulk; 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod			Field Engineer
Sampler Hammer	Automatic	Weight (lbs) 140	Drop (in) 30

A. Nieblas

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist. BL/in	Water Content	
	+151.0	AC = 4-inches thick, Base = 6-inches thick.	0						
	+150.2	Artificial Fill (af) CLAY with Sand (CL), dark brown and brown mottled, very stiff, moist to very moist, fine sand.	1						
	+144.0	Quaternary Young Alluvium (Qya) Sandy CLAY (CL), brown, very stiff, moist, some coarse sand.	7						
	+137.0	Quaternary San Pedro Formation (Qsp) Sandy SILT (ML), gray and grayish brown, very stiff, very moist, fine to medium sand, trace bivalve shells.	14						
	+134.0	SILT with Sand (ML), orangish brown, very stiff, very moist, trace fine sand.	17						
	+132.5	SILT (ML), bluish gray, very stiff, very moist, abundant rootlets.	19						
	+131.0		20						

Sample	Depth (ft)	Number	Type	Recov. (in)	Penetr. resist. BL/in	Water Content
S-1	5-6	CR	CR	15	5, 10, 11	N = 137
S-2	10-11	CR	CR	18	5, 11, 17	N _{pr} = 28.065 = 182 PI = 17
S-3	12-13	SPT	SPT	18	4, 4, 5	N = 9 LL = 42, PL = 25, PI = 17 %Pass #200 = 67 PI = 17
S-4	15-16	CR	CR	18	9, 9, 7	N _{pr} = 10.4
S-5A/S-5B	18-19	SPT	SPT	15	5, 7, 9	N = 16

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SPT Liquefaction Spreadsheet

JOB NAME **400 San Vicente**
 DATE 1/13/2023
 BY CC
 CHECKED BY CJZ
 DATE 1/13/2023
 Risk 2-in-50

Boring **B-5**
 y **120** pcf
 GW level **12** ft
 HHGWL **10** ft
 GS Elevation **151** msl
 Bot of Mat **114** msl
 Magnitude a max
6.77 **0.985**
 MSF 1.30

Total Settlement (Top 50 ft) **0.00 INCHES**

Total Settlement **0.00 INCHES**

PI Cutoff = 18

Elevation (MSL)	Depth (feet)	Soil Type	Nfield	PI => 18	σ _o ' (psf) current psf	σ _o ' (psf) HHGWL psf	Fines Correction					(N ₁) ₆₀	CRR 1998 eq. <N=30	Rd	CSR	FOS	SETTLEMENT	
							C _E energy	C _N stress	C _B 6" diam	C _S w/out liner	C _R rod						(N ₁) ₆₀ interim Corr.	%fines
150	1	CL	14		120	120	1.2	1.75	1.15	1.0	0.75	51						
149.5	1.5	CL	14		180	180	1.2	1.71	1.15	1	0.75	51						
149	2	CL	14		240	240	1.2	1.68	1.15	1	0.75	51						
148.5	2.5	CL	14		300	300	1.2	1.64	1.15	1	0.75	51						
148	3	CL	14		360	360	1.2	1.61	1.15	1	0.75	51						
147.5	3.5	CL	14		420	420	1.2	1.57	1.15	1	0.75	51						
147	4	CL	14		480	480	1.2	1.54	1.15	1	0.75	51						
146.5	4.5	CL	14		540	540	1.2	1.51	1.15	1	0.75	51						
146	5	CL	14		600	600	1.2	1.48	1.15	1	0.75	51						
145.5	5.5	CL	14		660	660	1.2	1.46	1.15	1	0.75	51						
145	6	CL	14		720	720	1.2	1.43	1.15	1	0.75	51						
144.5	6.5	CL	14		780	780	1.2	1.40	1.15	1	0.75	51						
144	7	CL	14		840	840	1.2	1.38	1.15	1	0.75	51						
143.5	7.5	CL	18		900	900	1.2	1.35	1.15	1	0.75	51						
143	8	CL	18		960	960	1.2	1.33	1.15	1	0.75	51						
142.5	8.5	CL	18		1020	1020	1.2	1.31	1.15	1	0.75	51						
142	9	CL	18		1080	1080	1.2	1.29	1.15	1	0.75	51						
141.5	9.5	CL	18		1140	1140	1.2	1.27	1.15	1	0.75	51						
141	10	CL	18		1200	1200	1.2	1.24	1.15	1	0.8	24.7	51					
140.5	10.5	CL	18		1260	1229	1.2	1.23	1.15	1	0.8	24.3	51					
140	11	CL	18		1320	1258	1.2	1.21	1.15	1	0.8	24.0	51					
139.5	11.5	CL	18		1380	1287	1.2	1.19	1.15	1	0.8	23.6	51					
139	12	CL	18		1440	1316	1.2	1.17	1.15	1	0.8	23.2	51					
138.5	12.5	CL	9		1469	1345	1.2	1.16	1.15	1	0.8	11.5	67					
138	13	CL	9		1498	1374	1.2	1.15	1.15	1	0.8	11.5	67					
137.5	13.5	CL	9		1527	1403	1.2	1.14	1.15	1	0.85	12.1	67					
137	14	CL	9		1556	1432	1.2	1.14	1.15	1	0.85	12.0	67					
136.5	14.5	ML	10		1585	1461	1.2	1.13	1.15	1	0.85	13.2	51					
136	15	ML	10		1614	1490	1.2	1.12	1.15	1	0.85	13.1	51					
135.5	15.5	ML	10		1643	1519	1.2	1.11	1.15	1	0.85	13.1	51					
135	16	ML	10		1672	1548	1.2	1.11	1.15	1	0.85	13.0	51					
134.5	16.5	ML	10		1701	1577	1.2	1.10	1.15	1	0.85	12.9	51					
134	17	ML	10		1730	1606	1.2	1.09	1.15	1	0.85	12.8	51					
133.5	17.5	ML	16		1759	1635	1.2	1.08	1.15	1	0.85	20.3	51					
133	18	ML	16		1788	1664	1.2	1.08	1.15	1	0.85	20.2	51					
132.5	18.5	ML	16		1817	1693	1.2	1.07	1.15	1	0.85	20.1	51					
132	19	ML	16		1846	1722	1.2	1.06	1.15	1	0.85	19.9	51					
131.5	19.5	ML	16		1875	1751	1.2	1.05	1.15	1	0.85	19.8	51					
131	20	ML	16		1904	1780	1.2	1.05	1.15	1	0.95	22.0	51					
130.5	20.5	CL	10		1933	1809	1.2	1.04	1.15	1	0.95	13.6	57					
130	21	CL	10		1962	1838	1.2	1.03	1.15	1	0.95	13.6	57					
129.5	21.5	CL	10		1991	1867	1.2	1.03	1.15	1	0.95	13.5	57					
129	22	CL	10		2020	1896	1.2	1.02	1.15	1	0.95	13.4	57					
128.5	22.5	CL	10		2049	1925	1.2	1.01	1.15	1	0.95	13.3	57					
128	23	CL	10		2078	1954	1.2	1.01	1.15	1	0.95	13.2	57					

SPT Liquefaction Spreadsheet

JOB NAME **400 San Vicente**
 DATE 1/13/2023
 BY CC
 CHECKED BY CJZ
 DATE 1/13/2023
 Risk 2-in-50

Boring **B-7**
 y **120** pcf
 GW level **12** ft
 HHGWL **10** ft
 GS Elevation **151** msl
 Bot of Mat **113** msl
 Magnitude a max
6.77 **0.985**
 MSF 1.30

Total Settlement (Top 50 ft) 0.00 INCHES

Total Settlement 0.00 INCHES

PI Cutoff = 18

Elevation (MSL)	Depth (feet)	Soil Type	Nfield	PI >= 18	σ _o ' (psf) current psf	σ _o ' (psf) HHGWL psf	Fines Correction					(N ₁) ₆₀	CRR 1998 eq. <N=30	Rd	CSR	FOS	SETTLEMENT					
							C _E energy	C _N stress	C _B 6" diam	C _S w/out liner	C _R rod						(N ₁) ₆₀ interim Corr.	%fines	Alpha	Beta	ΔN	(%)
150	1	CL	26		120	120	1.1	1.75	1.15	1.0	0.75	51	5.00	1.20			1.000	0.495	2.00			
149.5	1.5	CL	26		180	180	1.1	1.71	1.15	1	0.75	51	5.00	1.20			0.998	0.494	2.00			
149	2	CL	26		240	240	1.1	1.68	1.15	1	0.75	51	5.00	1.20			0.997	0.494	2.00			
148.5	2.5	CL	26		300	300	1.1	1.64	1.15	1	0.75	51	5.00	1.20			0.996	0.493	2.00			
148	3	CL	26		360	360	1.1	1.61	1.15	1	0.75	51	5.00	1.20			0.995	0.493	2.00			
147.5	3.5	CL	26		420	420	1.1	1.57	1.15	1	0.75	51	5.00	1.20			0.994	0.492	2.00			
147	4	CL	26		480	480	1.1	1.54	1.15	1	0.75	51	5.00	1.20			0.993	0.491	2.00			
146.5	4.5	CL	26		540	540	1.1	1.51	1.15	1	0.75	51	5.00	1.20			0.991	0.491	2.00			
146	5	CL	26		600	600	1.1	1.48	1.15	1	0.75	51	5.00	1.20			0.990	0.490	2.00			
145.5	5.5	CL	26		660	660	1.1	1.46	1.15	1	0.75	51	5.00	1.20			0.989	0.490	2.00			
145	6	CL	26		720	720	1.1	1.43	1.15	1	0.75	51	5.00	1.20			0.988	0.489	2.00			
144.5	6.5	CL	26		780	780	1.1	1.40	1.15	1	0.75	51	5.00	1.20			0.987	0.488	2.00			
144	7	CL	26		840	840	1.1	1.38	1.15	1	0.75	51	5.00	1.20			0.986	0.488	2.00			
143.5	7.5	CL	12		900	900	1.1	1.35	1.15	1	0.75	51	5.00	1.20			0.985	0.487	2.00			
143	8	CL	12		960	960	1.1	1.33	1.15	1	0.75	51	5.00	1.20			0.983	0.487	2.00			
142.5	8.5	CL	12		1020	1020	1.1	1.31	1.15	1	0.75	51	5.00	1.20			0.982	0.486	2.00			
142	9	CL	12		1080	1080	1.1	1.29	1.15	1	0.75	51	5.00	1.20			0.981	0.486	2.00			
141.5	9.5	CL	12		1140	1140	1.1	1.27	1.15	1	0.75	51	5.00	1.20			0.980	0.485	2.00			
141	10	CL	12		1200	1200	1.1	1.24	1.15	1	0.8	15.1	51	5.00	1.20	8.0	23	0.979	0.485	2.00		
140.5	10.5	CL	12		1260	1229	1.1	1.23	1.15	1	0.8	14.9	51	5.00	1.20	8.0	23	0.978	0.496	2.00		
140	11	CL	12		1320	1258	1.1	1.21	1.15	1	0.8	14.6	51	5.00	1.20	7.9	23	0.977	0.507	2.00		
139.5	11.5	CL	12		1380	1287	1.1	1.19	1.15	1	0.8	14.4	51	5.00	1.20	7.9	22	0.976	0.518	2.00		
139	12	CL	12		1440	1316	1.1	1.17	1.15	1	0.8	14.2	51	5.00	1.20	7.8	22	0.975	0.528	2.00		
138.5	12.5	CL	7	YES	1469	1345	1.1	1.16	1.15	1	0.8	8.2	51	5.00	1.20	6.6	15	0.974	0.538	2.00		
138	13	CL	7	YES	1498	1374	1.1	1.15	1.15	1	0.8	8.2	51	5.00	1.20	6.6	15	0.973	0.547	2.00		
137.5	13.5	CL	7	YES	1527	1403	1.1	1.14	1.15	1	0.85	8.6	51	5.00	1.20	6.7	15	0.972	0.555	2.00		
137	14	CL	7	YES	1556	1432	1.1	1.14	1.15	1	0.85	8.6	51	5.00	1.20	6.7	15	0.971	0.564	2.00		
136.5	14.5	CL	10	YES	1585	1461	1.1	1.13	1.15	1	0.85	12.1	51	5.00	1.20	7.4	20	0.970	0.572	2.00		
136	15	CL	10	YES	1614	1490	1.1	1.12	1.15	1	0.85	12.1	51	5.00	1.20	7.4	19	0.969	0.579	2.00		
135.5	15.5	CL	10	YES	1643	1519	1.1	1.11	1.15	1	0.85	12.0	51	5.00	1.20	7.4	19	0.967	0.586	2.00		
135	16	CL	10	YES	1672	1548	1.1	1.11	1.15	1	0.85	11.9	51	5.00	1.20	7.4	19	0.966	0.593	2.00		
134.5	16.5	CL	10	YES	1701	1577	1.1	1.10	1.15	1	0.85	11.8	51	5.00	1.20	7.4	19	0.965	0.600	2.00		
134	17	CL	10	YES	1730	1606	1.1	1.09	1.15	1	0.85	11.7	51	5.00	1.20	7.3	19	0.964	0.606	2.00		
133.5	17.5	ML	26		1759	1635	1.1	1.08	1.15	1	0.85	30.3	51	5.00	1.20	11.1	41	0.963	0.612	2.00		
133	18	ML	26		1788	1664	1.1	1.08	1.15	1	0.85	30.1	51	5.00	1.20	11.0	41	0.962	0.618	2.00		
132.5	18.5	ML	26		1817	1693	1.1	1.07	1.15	1	0.85	29.9	51	5.00	1.20	11.0	41	0.961	0.624	2.00		
132	19	CL	26		1846	1722	1.1	1.06	1.15	1	0.85	29.7	51	5.00	1.20	10.9	41	0.959	0.629	2.00		
131.5	19.5	CL	26		1875	1751	1.1	1.05	1.15	1	0.85	29.5	51	5.00	1.20	10.9	40	0.958	0.634	2.00		
131	20	CL	26		1904	1780	1.1	1.05	1.15	1	0.95	32.7	51	5.00	1.20	11.5	44	0.957	0.639	2.00		
130.5	20.5	CL	12	YES	1933	1809	1.1	1.04	1.15	1	0.95	15.0	51	5.00	1.20	8.0	23	0.956	0.643	2.00		
130	21	CL	12	YES	1962	1838	1.1	1.03	1.15	1	0.95	14.9	51	5.00	1.20	8.0	23	0.954	0.648	2.00		
129.5	21.5	CL	12	YES	1991	1867	1.1	1.03	1.15	1	0.95	14.8	51	5.00	1.20	8.0	23	0.953	0.652	2.00		
129	22	CL	12	YES	2020	1896	1.1	1.02	1.15	1	0.95	14.7	51	5.00	1.20	7.9	23	0.951	0.656	2.00		
128.5	22.5	CL	12	YES	2049	1925	1.1	1.01	1.15	1	0.95	14.6	51	5.00	1.20	7.9	23	0.950	0.660	2.00		
128	23	CL	12	YES	2078	1954	1.1	1.01	1.15	1	0.95	14.5	51	5.00	1.20	7.9	22	0.948	0.663	2.00		

127.5	23.5	CL	16	YES	2107	1983	1.1	1.00	1.15	1	0.95	19.3	51	5.00	1.20	8.9	28	0.947	0.667	2.00			
127	24	CL	16	YES	2136	2012	1.1	1.00	1.15	1	0.95	19.1	51	5.00	1.20	8.8	28	0.945	0.670	2.00			
126.5	24.5	CL	16	YES	2165	2041	1.1	0.99	1.15	1	0.95	19.0	51	5.00	1.20	8.8	28	0.944	0.673	2.00			
126	25	CL	16	YES	2194	2070	1.1	0.98	1.15	1	0.95	18.9	51	5.00	1.20	8.8	28	0.942	0.676	2.00			
125.5	25.5	CL	16	YES	2223	2099	1.1	0.98	1.15	1	0.95	18.8	51	5.00	1.20	8.8	28	0.940	0.678	2.00			
125	26	CL	16	YES	2252	2128	1.1	0.97	1.15	1	0.95	18.7	51	5.00	1.20	8.7	27	0.938	0.681	2.00			
124.5	26.5	CL	16	YES	2281	2157	1.1	0.97	1.15	1	0.95	18.6	51	5.00	1.20	8.7	27	0.936	0.683	2.00			
124	27	CL	16	YES	2310	2186	1.1	0.96	1.15	1	0.95	18.5	51	5.00	1.20	8.7	27	0.934	0.685	2.00			
123.5	27.5	CL	16	YES	2339	2215	1.1	0.95	1.15	1	0.95	18.3	51	5.00	1.20	8.7	27	0.932	0.687	2.00			
123	28	CL	16	YES	2368	2244	1.1	0.95	1.15	1	0.95	18.2	51	5.00	1.20	8.6	27	0.930	0.689	2.00			
122.5	28.5	CL	10	YES	2397	2273	1.1	0.94	1.15	1	0.95	11.3	51	5.00	1.20	7.3	19	0.928	0.691	2.00			
122	29	CL	10	YES	2426	2302	1.1	0.94	1.15	1	0.95	11.3	51	5.00	1.20	7.3	19	0.925	0.693	2.00			
121.5	29.5	CL	10	YES	2455	2331	1.1	0.93	1.15	1	0.95	11.2	51	5.00	1.20	7.2	18	0.923	0.694	2.00			
121	30	CL	10	YES	2484	2360	1.1	0.93	1.15	1	0.95	11.1	51	5.00	1.20	7.2	18	0.921	0.695	2.00			
120.5	30.5	CL	10	YES	2513	2389	1.1	0.92	1.15	1	0.95	11.1	51	5.00	1.20	7.2	18	0.918	0.696	2.00			
120	31	CL	10	YES	2542	2418	1.1	0.92	1.15	1	0.95	11.0	51	5.00	1.20	7.2	18	0.915	0.697	2.00			
119.5	31.5	CL	10	YES	2571	2447	1.1	0.91	1.15	1	0.95	10.9	51	5.00	1.20	7.2	18	0.913	0.698	2.00			
119	32	CL	10	YES	2600	2476	1.1	0.91	1.15	1	0.95	10.9	51	5.00	1.20	7.2	18	0.910	0.698	2.00			
118.5	32.5	CL	10	YES	2629	2505	1.1	0.90	1.15	1	0.95	10.8	51	5.00	1.20	7.2	18	0.907	0.699	2.00			
118	33	CL	10	YES	2658	2534	1.1	0.90	1.15	1	1	11.3	51	5.00	1.20	7.3	19	0.904	0.699	2.00			
117.5	33.5	SC	46		2687	2563	1.1	0.89	1.15	1	1	51.8	15	2.50	1.05	5.0	57	0.901	0.699	2.00			
117	34	SC	46		2716	2592	1.1	0.89	1.15	1	1	51.5	15	2.50	1.05	5.0	57	0.897	0.699	2.00			
116.5	34.5	SC	46		2745	2621	1.1	0.88	1.15	1	1	51.3	15	2.50	1.05	5.0	56	0.894	0.699	2.00			
116	35	SC	46		2774	2650	1.1	0.88	1.15	1	1	51.0	15	2.50	1.05	5.0	56	0.891	0.699	2.00			
115.5	35.5	SC	46		2803	2679	1.1	0.87	1.15	1	1	50.7	15	2.50	1.05	4.9	56	0.887	0.698	2.00			
115	36	SC	46		2832	2708	1.1	0.87	1.15	1	1	50.4	15	2.50	1.05	4.9	55	0.883	0.698	2.00			
114.5	36.5	SP	46		2861	2737	1.1	0.86	1.15	1	1	50.2	0	0.00	1.00	0.0	50	0.880	0.697	2.00			
114	37	SP	46		2890	2766	1.1	0.86	1.15	1	1	49.9	0	0.00	1.00	0.0	50	0.876	0.696	2.00			
113.5	37.5	SP	46		2919	2795	1.1	0.85	1.15	1	1	49.6	0	0.00	1.00	0.0	50	0.872	0.695	2.00			
113	38	SP	46		2948	2824	1.1	0.85	1.15	1	1	49.4	0	0.00	1.00	0.0	49	0.868	0.694	2.00			
112.5	38.5	SW	50		2977	2853	1.1	0.84	1.15	1	1	53.4	0	0.00	1.00	0.0	53	0.864	0.692	2.00			
112	39	SW	50		3006	2882	1.1	0.84	1.15	1	1	53.1	0	0.00	1.00	0.0	53	0.860	0.691	2.00			
111.5	39.5	SW	50		3035	2911	1.1	0.84	1.15	1	1	52.8	0	0.00	1.00	0.0	53	0.855	0.689	2.00			
111	40	SW	50		3064	2940	1.1	0.83	1.15	1	1	52.5	0	0.00	1.00	0.0	53	0.851	0.688	2.00			
110.5	40.5	SW	50		3093	2969	1.1	0.83	1.15	1	1	52.3	0	0.00	1.00	0.0	52	0.847	0.686	2.00			
110	41	SW	50		3122	2998	1.1	0.82	1.15	1	1	52.0	0	0.00	1.00	0.0	52	0.842	0.684	2.00			
109.5	41.5	SW	50		3151	3027	1.1	0.82	1.15	1	1	51.7	0	0.00	1.00	0.0	52	0.837	0.682	2.00			
109	42	SW	50		3180	3056	1.1	0.81	1.15	1	1	51.5	0	0.00	1.00	0.0	51	0.833	0.680	2.00			
108.5	42.5	SW	50		3209	3085	1.1	0.81	1.15	1	1	51.2	0	0.00	1.00	0.0	51	0.828	0.678	2.00			
108	43	SW	50		3238	3114	1.1	0.81	1.15	1	1	51.0	0	0.00	1.00	0.0	51	0.823	0.675	2.00			
107.5	43.5	SW	50		3267	3143	1.1	0.80	1.15	1	1	50.7	0	0.00	1.00	0.0	51	0.818	0.673	2.00			
107	44	SW	50		3296	3172	1.1	0.80	1.15	1	1	50.5	0	0.00	1.00	0.0	50	0.814	0.670	2.00			
106.5	44.5	CL	12	YES	3325	3201	1.1	0.79	1.15	1	1	12.1	51	5.00	1.20	7.4	19	0.209	0.809	0.668	0.41	0.015	0.000
106	45	CL	12	YES	3354	3230	1.1	0.79	1.15	1	1	12.0	51	5.00	1.20	7.4	19	0.208	0.804	0.665	0.41	0.015	0.000
105.5	45.5	CL	12	YES	3383	3259	1.1	0.79	1.15	1	1	11.9	51	5.00	1.20	7.4	19	0.207	0.799	0.662	0.41	0.015	0.000
105	46	CL	12	YES	3412	3288	1.1	0.78	1.15	1	1	11.9	51	5.00	1.20	7.4	19	0.206	0.794	0.659	0.41	0.015	0.000
104.5	46.5	CL	12	YES	3441	3317	1.1	0.78	1.15	1	1	11.8	51	5.00	1.20	7.4	19	0.205	0.788	0.657	0.41	0.015	0.000
104	47	CL	12	YES	3470	3346	1.1	0.77	1.15	1	1	11.8	51	5.00	1.20	7.4	19	0.205	0.783	0.654	0.41	0.015	0.000
103.5	47.5	CL	12	YES	3499	3375	1.1	0.77	1.15	1	1	11.7	51	5.00	1.20	7.3	19	0.204	0.778	0.651	0.41	0.015	0.000
103	48	CL	12	YES	3528	3404	1.1	0.77	1.15	1	1	11.6	51	5.00	1.20	7.3	19	0.203	0.773	0.648	0.41	0.015	0.000
102.5	48.5	CL	41		3557	3433	1.1	0.76	1.15	1	1	39.6	51	5.00	1.20	12.9	53		0.768	0.645	2.00		
102	49	CL	41		3586	3462	1.1	0.76	1.15	1	1	39.4	51	5.00	1.20	12.9	52		0.763	0.641	2.00		
101.5	49.5	CL	41		3615	3491	1.1	0.76	1.15	1	1	39.2	51	5.00	1.20	12.8	52		0.758	0.638	2.00		
101	50	CL	41		3644	3520	1.1	0.75	1.15	1	1	39.0	51	5.00	1.20	12.8	52		0.753	0.635	2.00		
100.5	50.5	CL	41		3673	3549	1.1	0.75	1.15	1	1	38.9	51	5.00	1.20	12.8	52		0.748	0.632	2.00		
100	51	CL	41		3702	3578	1.1	0.75	1.15	1	1	38.7	51	5.00	1.20	12.7	51		0.743	0.629	2.00		
99.5	51.5	CL	41		3731	3607	1.1	0.74	1.15	1	1	38.5	51	5.00	1.20	12.7	51		0.738	0.626	2.00		
99	52	CL	41		3760	3636	1.1	0.74	1.15	1	1	38.3	51	5.00	1.20	12.7	51		0.733	0.622	2.00		
98.5	52.5	CL	41		3789	3665	1.1	0.74	1.15	1	1	38.2	51	5.00	1.20	12.6	51		0.728	0.619	2.00		
98	53	CL	41		3818	3694	1.1	0.73	1.15	1	1	38.0	51	5.00	1.20	12.6	51		0.723	0.616	2.00		
97.5	53.5	CL	41		3847	3723	1.1	0.73	1.15	1	1	37.8	51	5.00	1.20	12.6	50		0.718	0.613	2.00		
97	54	CL	41		3876	3752	1.1	0.73	1.15	1	1	37.6	51	5.00	1.20	12.5	50		0.713	0.609	2.00		
96.5	54.5	CL	38		3905	3781	1.1	0.72	1.15	1	1	34.7	51	5.00	1.20	11.9	47		0.708	0.606	2.00		
96	55	CL	38		3934	3810	1.1	0.72	1.15	1	1	34.6	51	5.00	1.20	11.9	46		0.703	0.603	2.00		
95.5	55.5	CL	38		3963	3839	1.1	0.72	1.15	1	1	34.4	51	5.00	1.20	11.9	46		0.699	0.600	2.00		
95	56	CL	38		3992	3868	1.1	0.71	1.15	1	1	34.3	51	5.00	1.20	11.9	46		0.694	0.597	2.00		

SPT-liq-B-7-011323-cc-cjz (002)

92	59	CL	54	4166	4042	1.1	0.69	1.15	1	1	47.4	51	5.00	1.20	14.5	62	0.668	0.579	2.00
91.5	59.5	CL	54	4195	4071	1.1	0.69	1.15	1	1	47.2	51	5.00	1.20	14.4	62	0.663	0.576	2.00
91	60	CL	54	4224	4100	1.1	0.69	1.15	1	1	47.0	51	5.00	1.20	14.4	61	0.659	0.573	2.00
90.5	60.5	CL	54	4253	4129	1.1	0.69	1.15	1	1	46.8	51	5.00	1.20	14.4	61	0.655	0.570	2.00
90	61	CL	54	4282	4158	1.1	0.68	1.15	1	1	46.6	51	5.00	1.20	14.3	61	0.651	0.568	2.00
89.5	61.5	CL	54	4311	4187	1.1	0.68	1.15	1	1	46.4	51	5.00	1.20	14.3	61	0.647	0.565	2.00
89	62	CL	54	4340	4216	1.1	0.68	1.15	1	1	46.2	51	5.00	1.20	14.2	60	0.644	0.562	2.00
88.5	62.5	CL	54	4369	4245	1.1	0.67	1.15	1	1	46.0	51	5.00	1.20	14.2	60	0.640	0.560	2.00
88	63	CL	54	4398	4274	1.1	0.67	1.15	1	1	45.8	51	5.00	1.20	14.2	60	0.636	0.557	2.00
87.5	63.5	CL	54	4427	4303	1.1	0.67	1.15	1	1	45.6	51	5.00	1.20	14.1	60	0.632	0.554	2.00
87	64	CL	54	4456	4332	1.1	0.67	1.15	1	1	45.5	51	5.00	1.20	14.1	60	0.629	0.552	2.00
86.5	64.5	CL	54	4485	4361	1.1	0.66	1.15	1	1	45.3	51	5.00	1.20	14.1	59	0.625	0.550	2.00
86	65	CL	54	4514	4390	1.1	0.66	1.15	1	1	45.1	51	5.00	1.20	14.0	59	0.622	0.547	2.00
85.5	65.5	CL	54	4543	4419	1.1	0.66	1.15	1	1	44.9	51	5.00	1.20	14.0	59	0.619	0.545	2.00
85	66	CL	54	4572	4448	1.1	0.65	1.15	1	1	44.7	51	5.00	1.20	13.9	59	0.616	0.543	2.00
84.5	66.5	CL	54	4601	4477	1.1	0.65	1.15	1	1	44.5	51	5.00	1.20	13.9	58	0.612	0.540	2.00
84	67	CL	54	4630	4506	1.1	0.65	1.15	1	1	44.4	51	5.00	1.20	13.9	58	0.609	0.538	2.00
83.5	67.5	CL	54	4659	4535	1.1	0.65	1.15	1	1	44.2	51	5.00	1.20	13.8	58	0.606	0.536	2.00
83	68	CL	54	4688	4564	1.1	0.64	1.15	1	1	44.0	51	5.00	1.20	13.8	58	0.603	0.534	2.00
82.5	68.5	ML	50	4717	4593	1.1	0.64	1.15	1	1	40.6	51	5.00	1.20	13.1	54	0.600	0.532	2.00
82	69	ML	50	4746	4622	1.1	0.64	1.15	1	1	40.4	51	5.00	1.20	13.1	53	0.597	0.530	2.00
81.5	69.5	ML	50	4775	4651	1.1	0.64	1.15	1	1	40.3	51	5.00	1.20	13.1	53	0.595	0.528	2.00
81	70	ML	50	4804	4680	1.1	0.63	1.15	1	1	40.1	51	5.00	1.20	13.0	53	0.592	0.526	2.00
80.5	70.5	ML	50	4833	4709	1.1	0.63	1.15	1	1	39.9	51	5.00	1.20	13.0	53	0.589	0.524	2.00
80	71	ML	50	4862	4738	1.1	0.63	1.15	1	1	39.8	51	5.00	1.20	13.0	53	0.587	0.522	2.00
79.5	71.5	ML	50	4891	4767	1.1	0.63	1.15	1	1	39.6	51	5.00	1.20	12.9	53	0.584	0.520	2.00
79	72	ML	50	4920	4796	1.1	0.62	1.15	1	1	39.5	51	5.00	1.20	12.9	52	0.582	0.519	2.00
78.5	72.5	ML	50	4949	4825	1.1	0.62	1.15	1	1	39.3	51	5.00	1.20	12.9	52	0.579	0.517	2.00
78	73	ML	50	4978	4854	1.1	0.62	1.15	1	1	39.2	51	5.00	1.20	12.8	52	0.577	0.515	2.00
77.5	73.5	SC	50	5007	4883	1.1	0.62	1.15	1	1	39.0	15	2.50	1.05	4.4	43	0.574	0.514	2.00
77	74	SC	50	5036	4912	1.1	0.61	1.15	1	1	38.9	15	2.50	1.05	4.4	43	0.572	0.512	2.00
76.5	74.5	SC	50	5065	4941	1.1	0.61	1.15	1	1	38.7	15	2.50	1.05	4.4	43	0.570	0.510	2.00
76	75	SC	50	5094	4970	1.1	0.61	1.15	1	1	38.6	15	2.50	1.05	4.4	43	0.568	0.509	2.00
75.5	75.5	SC	50	5123	4999	1.1	0.61	1.15	1	1	38.4	15	2.50	1.05	4.3	43	0.566	0.507	2.00
75	76	SC	50	5152	5028	1.1	0.61	1.15	1	1	38.3	15	2.50	1.05	4.3	43	0.563	0.506	2.00

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Project 400 South San Vicente Boulevard			Project No. 700109901		
Location 400 South San Vicente Boulevard			Elevation and Datum Approx. 151 (feet, MSL)		
Drilling Company 2R Drilling		Date Started 2/3/22		Date Finished 2/3/22	
Drilling Equipment CME-75 Short Tower Track Rig			Completion Depth 51.5 ft		Rock Depth -
Size and Type of Bit 8-inch O.D. Hollow Stem Auger			Number of Samples 7	Disturbed 7	Undisturbed 5
Casing Diameter (in) -		Casing Depth (ft) -	Water Level (ft.) First 20	Completion -	Core 24 HR. -
Casing Hammer -		Weight (lbs) -	Drop (in) -	Drilling Foreman A. Nieblas	
Sampler 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod			Field Engineer		
Sampler Hammer Automatic		Weight (lbs) 140	Drop (in) 30		

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MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	
	151.0		0						
	150.7	PCC = 4-inches thick. Welded wire mesh. Artificial Fill (af) Sandy CLAY (CL), dark brown, moist.	1						
	146.0	Quaternary Young Alluvium (Qya) SILT with Sand (ML), olive brown, stiff, slightly moist to moist.	5	S-1	SPT	18	4 5 9	N=14	
	143.0	Sandy CLAY (CL), olive brown, stiff, moist, fine to very coarse sand, scattered caliche.	8						
	138.0	CLAY (CL), brown, medium stiff, very moist.	13						
			10	S-2	CR	18	4 6 9	N=9,8	WC = 17.9% DD = 110.4 pcf Expansion Index.
			16	S-3	SPT	18	2 3 3	N=6	
			20						

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Project	400 South San Vicente Boulevard	Project No.	700109901
Location	400 South San Vicente Boulevard	Elevation and Datum	Approx. 151 (feet, MSL)

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MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL/6in	
[Hatched]	+131.0	Medium plasticity.	20	S-4	CR	18	3	Groundwater encountered at 20 feet. WC = 27.6% DD = 97.4 pcf M=9.1
			21				5	
[Hatched]	+128.0	CLAY with some Sand (CL), brown, stiff, very moist, some caliche.	23					LL = 44, PL = 20, PI = 20
			24					
[Hatched]	+125.0	CLAY with Sand (CL), gray with light gray mottled, stiff, very moist.	26	S-5	SPT	18	2	LL = 44, PL = 20, PI = 20 M=9 PS=20
			27				4	
[Hatched]	+122.0	CLAY (CH), bluish gray, stiff, very moist.	29	S-6	CR	18	5	Bulk sample collected from 27-30 feet. WC = 25.8% DD = 98.4 pcf LL = 37, PL = 22, PI = 15 M=11
			30				7	
[Hatched]	+120.3	Clayey SAND (SC) and SAND (SP), bluish gray, medium dense, very moist, medium to coarse sand.	31	S-7a/S-7b	SPT	18	3	LL = 51, PL = 26, PI = 25 M=12 PS=25
			32				5	
[Diagonal Lines]	+114.0	Quaternary San Pedro Formation (Qsp) Grayish brown, very dense, wet.	35	S-8	CR	18	17	WC = 12.2% DD = 124.6 pcf M=53
			36				27	
[Dotted]	+108.0	Silty SAND (SM), brown, medium dense, wet, fine to very coarse sand.	37					%Pass #200 = 14 M=28
			38					
[Dotted]		SAND with Silt (SP-SM), brown, dense, wet, trace gravel.	43	S-9	SPT	12	17	WC = 10.9% DD = 112.8 pcf %Pass #200 = 9 M=28
			44				14	
			45					

Project	400 South San Vicente Boulevard	Project No.	700109901
Location	400 South San Vicente Boulevard	Elevation and Datum	Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist. BL/6in	
	+106.0		45					
	+105.0		46			15	17	
		CLAY (CL), olive brown, dense, very moist.	47					WC = 23.1% DD = 104.7 pcf
	+103.0		48					
		Clayey SAND (SC) to Sandy CLAY (CL), light greenish gray to bluish gray, dense to hard, very moist to wet.	49					
			50					
			51	S-11	SPT	18	18	N = 38
	+99.5		52					
		Total Depth = 51.5 feet Groundwater encountered at 20 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.	53					
			54					
			55					
			56					
			57					
			58					
			59					
			60					
			61					
			62					
			63					
			64					
			65					
			66					
			67					
			68					
			69					
			70					

I:\LANGAN.COM\DATA\IR\DATA\91700109901\PROJECT DATA\DISCIPLINE\GEO\TECHNICAL\GINTLOGS\700109901 - GINT.GPJ ... 2/16/2022 8:54:15 AM ... Report: Log - LANGAN

SPT Liquefaction Spreadsheet

JOB NAME **400 San Vicente**
 DATE 1/13/2023
 BY CC
 CHECKED BY CJZ
 DATE 1/13/2023
 Risk 2-in-50

Boring **B-8**
 y **120** pcf
 GW level **20** ft
 HHGWL **10** ft
 GS Elevation **151** msl
 Bot of Mat **113** ft bgs
 Magnitude a max
6.77 **0.985**
 MSF 1.30

Total Settlement (Top 50 ft) 0.66 INCHES

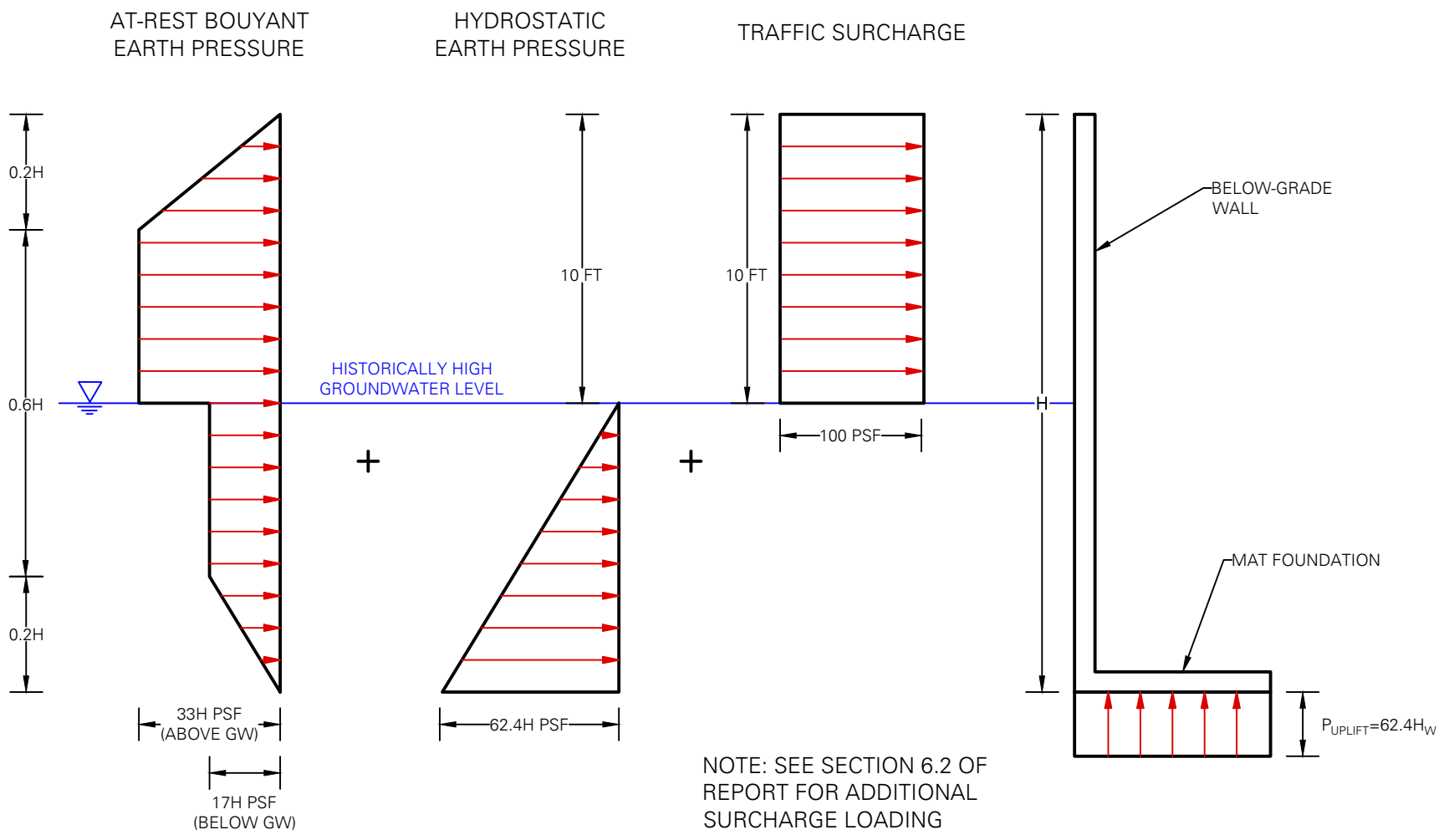
Total Settlement 0.66 INCHES

PI CUTOFF = 18

Elevation (MSL)	Depth (feet)	Soil Type	Nfield	PI => 18	σ _o ' (psf) current psf	σ _o ' (psf) HHGWL psf	Fines Correction					(N ₁) ₆₀	CRR 1998 eq. <N=30	Rd	CSR	FOS	SETTLEMENT					
							C _E energy	C _N stress	C _B 6" diam	C _S w/out liner	C _R rod						(N ₁) ₆₀ interim Corr.	%fines	Alpha	Beta	ΔN	(%)
150	1	CL	14		120	120	1.1	1.75	1.15	1.0	0.75	51	5.00	1.20		1.000	0.495	2.00				
149.5	1.5	CL	14		180	180	1.1	1.71	1.15	1	0.75	51	5.00	1.20		0.998	0.494	2.00				
149	2	CL	14		240	240	1.1	1.68	1.15	1	0.75	51	5.00	1.20		0.997	0.494	2.00				
148.5	2.5	CL	14		300	300	1.1	1.64	1.15	1	0.75	51	5.00	1.20		0.996	0.493	2.00				
148	3	CL	14		360	360	1.1	1.61	1.15	1	0.75	51	5.00	1.20		0.995	0.493	2.00				
147.5	3.5	CL	14		420	420	1.1	1.57	1.15	1	0.75	51	5.00	1.20		0.994	0.492	2.00				
147	4	CL	14		480	480	1.1	1.54	1.15	1	0.75	51	5.00	1.20		0.993	0.491	2.00				
146.5	4.5	CL	14		540	540	1.1	1.51	1.15	1	0.75	51	5.00	1.20		0.991	0.491	2.00				
146	5	CL	14		600	600	1.1	1.48	1.15	1	0.75	51	5.00	1.20		0.990	0.490	2.00				
145.5	5.5	ML	14		660	660	1.1	1.46	1.15	1	0.75	51	5.00	1.20		0.989	0.490	2.00				
145	6	ML	14		720	720	1.1	1.43	1.15	1	0.75	51	5.00	1.20		0.988	0.489	2.00				
144.5	6.5	ML	14		780	780	1.1	1.40	1.15	1	0.75	51	5.00	1.20		0.987	0.488	2.00				
144	7	ML	14		840	840	1.1	1.38	1.15	1	0.75	51	5.00	1.20		0.986	0.488	2.00				
143.5	7.5	ML	14		900	900	1.1	1.35	1.15	1	0.75	51	5.00	1.20		0.985	0.487	2.00				
143	8	ML	14		960	960	1.1	1.33	1.15	1	0.75	51	5.00	1.20		0.983	0.487	2.00				
142.5	8.5	CL	10		1020	1020	1.1	1.31	1.15	1	0.75	51	5.00	1.20		0.982	0.486	2.00				
142	9	CL	10		1080	1080	1.1	1.29	1.15	1	0.75	51	5.00	1.20		0.981	0.486	2.00				
141.5	9.5	CL	10		1140	1140	1.1	1.27	1.15	1	0.75	51	5.00	1.20		0.980	0.485	2.00				
141	10	CL	10		1200	1200	1.1	1.24	1.15	1	0.8	12.3	51	5.00	1.20	7.5	20	0.979	0.485	2.00		
140.5	10.5	CL	10		1260	1229	1.1	1.23	1.15	1	0.8	12.1	51	5.00	1.20	7.4	20	0.978	0.496	2.00		
140	11	CL	10		1320	1258	1.1	1.21	1.15	1	0.8	11.9	51	5.00	1.20	7.4	19	0.977	0.507	2.00		
139.5	11.5	CL	10		1380	1287	1.1	1.19	1.15	1	0.8	11.7	51	5.00	1.20	7.3	19	0.976	0.518	2.00		
139	12	CL	10		1440	1316	1.1	1.17	1.15	1	0.8	11.5	51	5.00	1.20	7.3	19	0.975	0.528	2.00		
138.5	12.5	CL	10		1500	1345	1.1	1.15	1.15	1	0.8	11.4	51	5.00	1.20	7.3	19	0.974	0.538	2.00		
138	13	CL	10		1560	1374	1.1	1.14	1.15	1	0.8	11.2	51	5.00	1.20	7.2	18	0.973	0.547	2.00		
137.5	13.5	CL	6		1620	1403	1.1	1.12	1.15	1	0.85	7.2	51	5.00	1.20	6.4	14	0.972	0.555	2.00		
137	14	CL	6		1680	1432	1.1	1.10	1.15	1	0.85	7.1	51	5.00	1.20	6.4	14	0.971	0.564	2.00		
136.5	14.5	CL	6		1740	1461	1.1	1.09	1.15	1	0.85	7.0	51	5.00	1.20	6.4	13	0.970	0.572	2.00		
136	15	CL	6		1800	1490	1.1	1.07	1.15	1	0.85	6.9	51	5.00	1.20	6.4	13	0.969	0.579	2.00		
135.5	15.5	CL	6		1860	1519	1.1	1.06	1.15	1	0.85	6.8	51	5.00	1.20	6.4	13	0.967	0.586	2.00		
135	16	CL	6		1920	1548	1.1	1.04	1.15	1	0.85	6.7	51	5.00	1.20	6.3	13	0.966	0.593	2.00		
134.5	16.5	CL	6		1980	1577	1.1	1.03	1.15	1	0.85	6.6	51	5.00	1.20	6.3	13	0.965	0.600	2.00		
134	17	CL	6		2040	1606	1.1	1.02	1.15	1	0.85	6.6	51	5.00	1.20	6.3	13	0.964	0.606	2.00		
133.5	17.5	CL	9		2100	1635	1.1	1.00	1.15	1	0.85	9.7	51	5.00	1.20	6.9	17	0.963	0.612	2.00		
133	18	CL	9		2160	1664	1.1	0.99	1.15	1	0.85	9.6	51	5.00	1.20	6.9	17	0.962	0.618	2.00		
132.5	18.5	CL	9		2220	1693	1.1	0.98	1.15	1	0.85	9.5	51	5.00	1.20	6.9	16	0.961	0.624	2.00		
132	19	CL	9		2280	1722	1.1	0.97	1.15	1	0.85	9.3	51	5.00	1.20	6.9	16	0.959	0.629	2.00		
131.5	19.5	CL	9		2340	1751	1.1	0.95	1.15	1	0.85	9.2	51	5.00	1.20	6.8	16	0.958	0.634	2.00		
131	20	CL	9		2400	1780	1.1	0.94	1.15	1	0.95	10.2	51	5.00	1.20	7.0	17	0.957	0.639	2.00		
130.5	20.5	CL	9		2429	1809	1.1	0.94	1.15	1	0.95	10.1	51	5.00	1.20	7.0	17	0.956	0.643	2.00		
130	21	CL	9		2458	1838	1.1	0.93	1.15	1	0.95	10.1	51	5.00	1.20	7.0	17	0.954	0.648	2.00		
129.5	21.5	CL	9		2487	1867	1.1	0.93	1.15	1	0.95	10.0	51	5.00	1.20	7.0	17	0.953	0.652	2.00		
129	22	CL	9		2516	1896	1.1	0.92	1.15	1	0.95	10.0	51	5.00	1.20	7.0	17	0.951	0.656	2.00		
128.5	22.5	CL	9		2545	1925	1.1	0.92	1.15	1	0.95	9.9	51	5.00	1.20	7.0	17	0.950	0.660	2.00		
128	23	CL	9	YES	2574	1954	1.1	0.91	1.15	1	0.95	9.8	51	5.00	1.20	7.0	17	0.948	0.663	2.00		

127.5	23.5	CL	9	YES	2603	1983	1.1	0.91	1.15	1	0.95	9.8	51	5.00	1.20	7.0	17	0.947	0.667	2.00			
127	24	CL	9	YES	2632	2012	1.1	0.90	1.15	1	0.95	9.7	51	5.00	1.20	6.9	17	0.945	0.670	2.00			
126.5	24.5	CL	9	YES	2661	2041	1.1	0.90	1.15	1	0.95	9.7	51	5.00	1.20	6.9	17	0.944	0.673	2.00			
126	25	CL	9	YES	2690	2070	1.1	0.89	1.15	1	0.95	9.6	51	5.00	1.20	6.9	17	0.942	0.676	2.00			
125.5	25.5	CL	9	YES	2719	2099	1.1	0.89	1.15	1	0.95	9.6	51	5.00	1.20	6.9	16	0.940	0.678	2.00			
125	26	CL	9	YES	2748	2128	1.1	0.88	1.15	1	0.95	9.5	51	5.00	1.20	6.9	16	0.938	0.681	2.00			
124.5	26.5	CL	11		2777	2157	1.1	0.88	1.15	1	0.95	11.6	51	5.00	1.20	7.3	19	0.936	0.683	2.00			
124	27	CL	11		2806	2186	1.1	0.87	1.15	1	0.95	11.5	51	5.00	1.20	7.3	19	0.934	0.685	2.00			
123.5	27.5	CL	11		2835	2215	1.1	0.87	1.15	1	0.95	11.5	51	5.00	1.20	7.3	19	0.932	0.687	2.00			
123	28	CL	11		2864	2244	1.1	0.86	1.15	1	0.95	11.4	51	5.00	1.20	7.3	19	0.930	0.689	2.00			
122.5	28.5	CL	11		2893	2273	1.1	0.86	1.15	1	0.95	11.4	51	5.00	1.20	7.3	19	0.928	0.691	2.00			
122	29	CL	11		2922	2302	1.1	0.85	1.15	1	0.95	11.3	51	5.00	1.20	7.3	19	0.925	0.693	2.00			
121.5	29.5	CH	12	YES	2951	2331	1.1	0.85	1.15	1	0.95	12.2	51	5.00	1.20	7.4	20	0.923	0.694	2.00			
121	30	CH	12	YES	2980	2360	1.1	0.84	1.15	1	0.95	12.2	51	5.00	1.20	7.4	20	0.921	0.695	2.00			
120.5	30.5	CH	12	YES	3009	2389	1.1	0.84	1.15	1	0.95	12.1	51	5.00	1.20	7.4	20	0.918	0.696	2.00			
120	31	CH	12	YES	3038	2418	1.1	0.83	1.15	1	0.95	12.0	51	5.00	1.20	7.4	19	0.915	0.697	2.00			
119.5	31.5	SC	12		3067	2447	1.1	0.83	1.15	1	0.95	12.0	12	1.55	1.03	1.9	14	0.913	0.698	2.00			
119	32	SC	12		3096	2476	1.1	0.83	1.15	1	0.95	11.9	12	1.55	1.03	1.9	14	0.910	0.698	2.00			
118.5	32.5	SC	12		3125	2505	1.1	0.82	1.15	1	0.95	11.9	12	1.55	1.03	1.9	14	0.907	0.699	2.00			
118	33	SC	12		3154	2534	1.1	0.82	1.15	1	1	12.4	12	1.55	1.03	1.9	14	0.904	0.699	2.00			
117.5	33.5	SC	12		3183	2563	1.1	0.81	1.15	1	1	12.3	12	1.55	1.03	1.9	14	0.901	0.699	2.00			
117	34	SC	12		3212	2592	1.1	0.81	1.15	1	1	12.3	12	1.55	1.03	1.9	14	0.897	0.699	2.00			
116.5	34.5	SC	12		3241	2621	1.1	0.81	1.15	1	1	12.2	12	1.55	1.03	1.9	14	0.894	0.699	2.00			
116	35	SC	12		3270	2650	1.1	0.80	1.15	1	1	12.2	12	1.55	1.03	1.9	14	0.891	0.699	2.00			
115.5	35.5	SC	53		3299	2679	1.1	0.80	1.15	1	1	53.8	12	1.55	1.03	3.3	57	0.887	0.698	2.00			
115	36	SC	53		3328	2708	1.1	0.79	1.15	1	1	53.5	12	1.55	1.03	3.2	57	0.883	0.698	2.00			
114.5	36.5	SC	53		3357	2737	1.1	0.79	1.15	1	1	53.2	12	1.55	1.03	3.2	56	0.880	0.697	2.00			
114	37	SC	53		3386	2766	1.1	0.79	1.15	1	1	53.0	12	1.55	1.03	3.2	56	0.876	0.696	2.00			
113.5	37.5	SM	28		3415	2795	1.1	0.78	1.15	1	1	27.7	14	2.20	1.04	3.4	31	0.872	0.695	2.00			
113	38	SM	28		3444	2824	1.1	0.78	1.15	1	1	27.6	14	2.20	1.04	3.4	31	0.868	0.694	2.00			
112.5	38.5	SM	28		3473	2853	1.1	0.77	1.15	1	1	27.4	14	2.20	1.04	3.4	31	0.864	0.692	2.00			
112	39	SM	28		3502	2882	1.1	0.77	1.15	1	1	27.3	14	2.20	1.04	3.4	31	0.860	0.691	2.00			
111.5	39.5	SM	28		3531	2911	1.1	0.77	1.15	1	1	27.2	14	2.20	1.04	3.4	31	0.855	0.689	2.00			
111	40	SM	28		3560	2940	1.1	0.76	1.15	1	1	27.0	14	2.20	1.04	3.4	30	0.851	0.688	2.00			
110.5	40.5	SM	28		3589	2969	1.1	0.76	1.15	1	1	26.9	14	2.20	1.04	3.3	30	0.847	0.686	2.00			
110	41	SM	28		3618	2998	1.1	0.76	1.15	1	1	26.8	14	2.20	1.04	3.3	30	0.842	0.684	2.00			
109.5	41.5	SM	28		3647	3027	1.1	0.75	1.15	1	1	26.7	14	2.20	1.04	3.3	30	0.467	0.837	0.682	0.89	0.011	0.066
109	42	SM	28		3676	3056	1.1	0.75	1.15	1	1	26.5	14	2.20	1.04	3.3	30	0.458	0.833	0.680	0.88	0.011	0.066
108.5	42.5	SM	28		3705	3085	1.1	0.75	1.15	1	1	26.4	14	2.20	1.04	3.3	30	0.450	0.828	0.678	0.86	0.011	0.066
108	43	SM	28		3734	3114	1.1	0.74	1.15	1	1	26.3	14	2.20	1.04	3.3	30	0.442	0.823	0.675	0.85	0.011	0.066
107.5	43.5	SP-SM	28		3763	3143	1.1	0.74	1.15	1	1	26.1	9	0.56	1.02	1.0	27	0.342	0.818	0.673	0.66	0.011	0.066
107	44	SP-SM	28		3792	3172	1.1	0.74	1.15	1	1	26.0	9	0.56	1.02	1.0	27	0.338	0.814	0.670	0.66	0.011	0.066
106.5	44.5	SP-SM	28		3821	3201	1.1	0.73	1.15	1	1	25.9	9	0.56	1.02	1.0	27	0.335	0.809	0.668	0.65	0.011	0.066
106	45	SP-SM	28		3850	3230	1.1	0.73	1.15	1	1	25.8	9	0.56	1.02	1.0	27	0.332	0.804	0.665	0.65	0.011	0.066
105.5	45.5	SP-SM	28		3879	3259	1.1	0.73	1.15	1	1	25.6	9	0.56	1.02	1.0	27	0.329	0.799	0.662	0.64	0.011	0.066
105	46	SP-SM	28		3908	3288	1.1	0.72	1.15	1	1	25.5	9	0.56	1.02	1.0	27	0.326	0.794	0.659	0.64	0.011	0.066
104.5	46.5	CL	28		3937	3317	1.1	0.72	1.15	1	1	25.4	51	5.00	1.20	10.1	35	0.788	0.657	2.00			
104	47	CL	28		3966	3346	1.1	0.72	1.15	1	1	25.3	51	5.00	1.20	10.1	35	0.783	0.654	2.00			
103.5	47.5	CL	28		3995	3375	1.1	0.71	1.15	1	1	25.2	51	5.00	1.20	10.0	35	0.778	0.651	2.00			
103	48	CL	28		4024	3404	1.1	0.71	1.15	1	1	25.1	51	5.00	1.20	10.0	35	0.773	0.648	2.00			
102.5	48.5	SC	38		4053	3433	1.1	0.71	1.15	1	1	33.9	51	5.00	1.20	11.8	46	0.768	0.645	2.00			
102	49	SC	38		4082	3462	1.1	0.70	1.15	1	1	33.8	51	5.00	1.20	11.8	46	0.763	0.641	2.00			
101.5	49.5	SC	38		4111	3491	1.1	0.70	1.15	1	1	33.6	51	5.00	1.20	11.7	45	0.758	0.638	2.00			
101	50	SC	38		4140	3520	1.1	0.70	1.15	1	1	33.5	51	5.00	1.20	11.7	45	0.753	0.635	2.00			
100.5	50.5	SC	38		4169	3549	1.1	0.69	1.15	1	1	33.4	51	5.00	1.20	11.7	45	0.748	0.632	2.00			
100	51	SC	38		4198	3578	1.1	0.69	1.15	1	1	33.2	51	5.00	1.20	11.6	45	0.743	0.629	2.00			
99.5	51.5	SC	38		4227	3607	1.1	0.69	1.15	1	1	33.1	51	5.00	1.20	11.6	45	0.738	0.626	2.00		0.660	

ATTACHMENT B
Lateral Earth Pressure Analysis and Figures



NOT TO SCALE

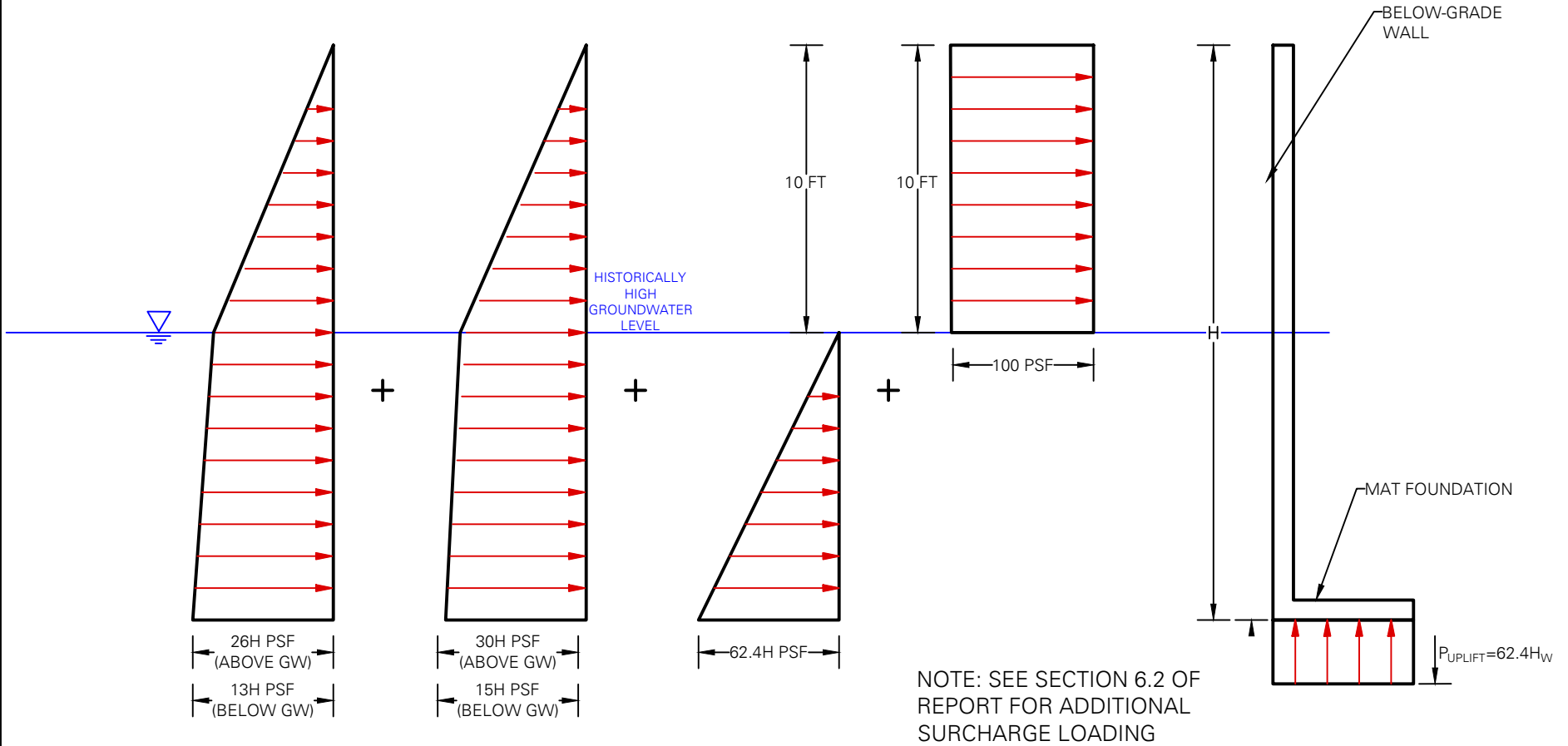
<p>LANGAN</p> <p>Langan Engineering and Environmental Services, Inc.</p> <p>18575 Jamboree Road, Suite 150 Irvine, CA 92612</p> <p>T: 949.561.9200 F: 949.561.9201 www.langan.com</p>	Project	Figure Title	Project No.	Figure No.
	400 SOUTH SAN VICENTE BOULEVARD	BOUYANT LATERAL EARTH PRESSURE	700109901	10
	LOS ANGELES COUNTY CALIFORNIA		Date	
			JANUARY 2023	
			Scale	
			NOT TO SCALE	
			Drawn By	
			CR	

ACTIVE LATERAL EARTH PRESSURE

SEISMIC LATERAL EARTH PRESSURE

HYDROSTATIC EARTH PRESSURE

TRAFFIC SURCHARGE



NOT TO SCALE

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	<p>Filename: \\langan.com\data\IRV\data9\700109901\Project Data\Discipline\Geotechnical\CAD\ - LATERAL EARTH PRESSURE\LATERAL EARTH PRESSURE - 2021.04.07.dwg Date: 1/25/2023 Time: 10:40 User: crangel Style Table: Langan.stb Layout: Active (no Adj Build)</p>			

Active and Passive Pressures

Reference: NAVFAC 7.2-62

Undrained Conditions (above ground water level)

Project Name: 400 San Vicente
 Job Number: 700109901
 By: NG
 Date: 1/6/2023
 Checked: 1/13/2023
 By: CJZ
 Material Properties

Unit Weight (pcf) 120
 Cohesion (psf) 400
 Friction Angle (deg) 31

Ka 0.32
 Kp 3.12
 Ka^{1/2} 0.57
 Kp^{1/2} 1.77

Passive Pressure

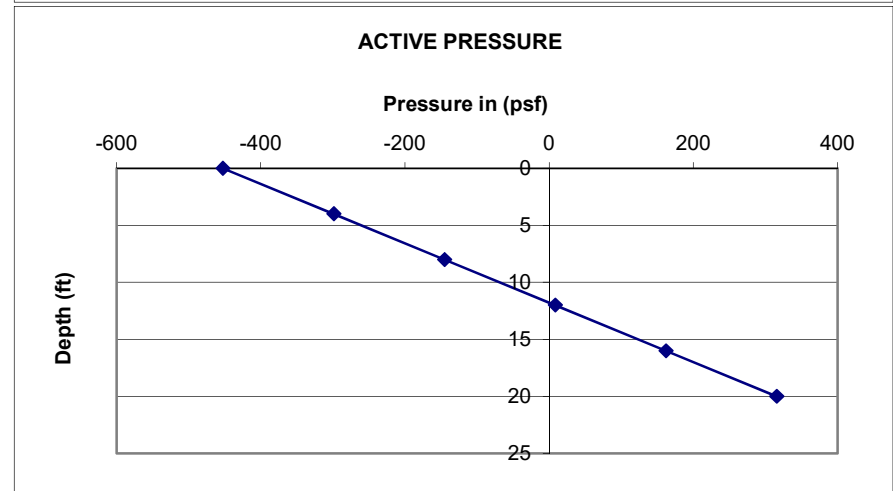
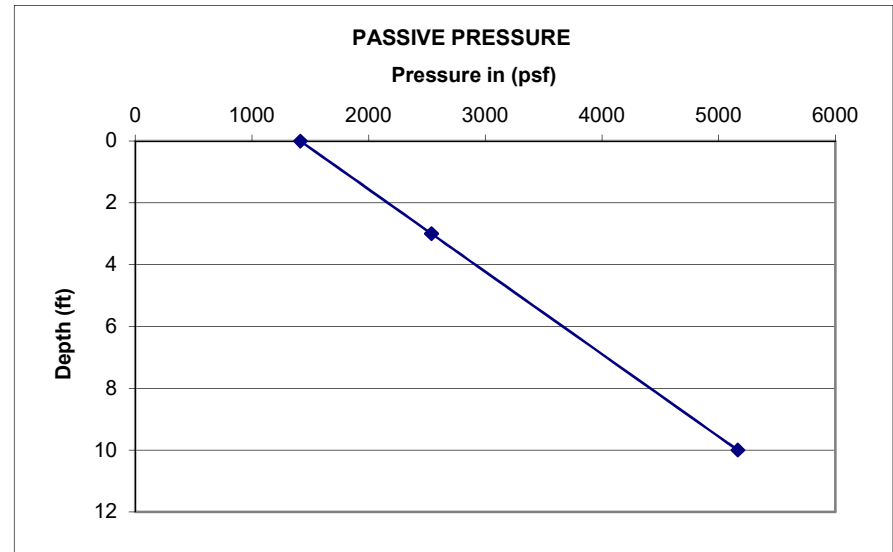
$$s_p = g * Z * K_a + 2 * C * \text{TAN}(45 + s/2)$$

Depth	s _p	
0	1414	
3	2539	846.2159494
10	5163	516.283733

Active Pressure

$$s_a = g * Z * K_a - 2 * C * \text{TAN}(45 - s/2)$$

Depth	s _p	Lat Earth Pressure (psf)
0	-453	
4	-299	-74.74269525
8	-145	-18.16541743
12	8	0.693675172
16	162	10.12322148
20	316	15.78094926
22	392	17.83830481
35	892	25.47991117
45	1276	28.35367766
50	1468	29.35949593
55	1660	30.18243816
60	1852	30.86822334

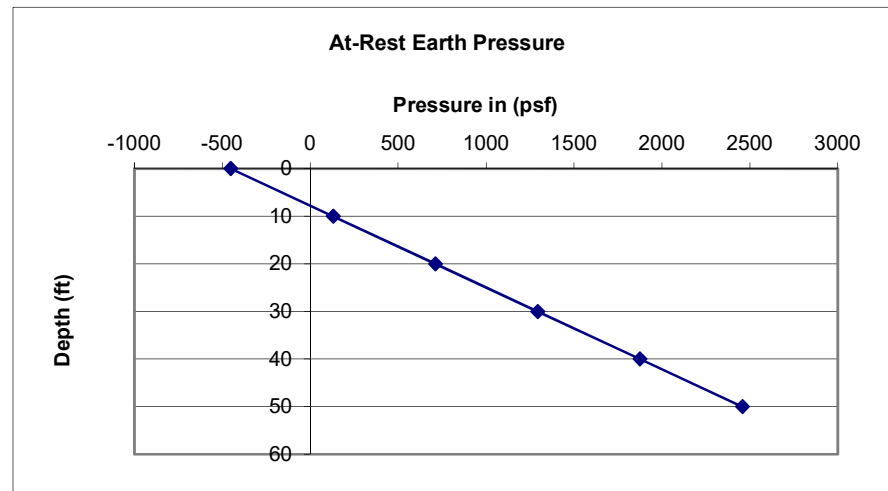


At-Rest Earth Pressure

$$s_a = g * Z * K_a - 2 * C * \text{TAN}(45 - s/2)$$

K0 0.4850

Depth	s_p	Lat Earth Pressure (psf)
0	-453	Triangular
10	129	12.93360876
20	711	35.56451988
30	1293	43.10815693
40	1875	46.87997545
50	2457	49.14306656
60	3039	50.65179397
70	3621	51.7294564



Active and Passive Pressures

Reference: NAVFAC 7.2-62

Undrained Conditions (below ground water level)

Project Name: 400 San Vicente
 Job Number: 700109901
 By: NG
 Date: 1/6/2023
 Checked: 1/13/2023
 By: CJZ

Material Properties

Unit Weight (pcf)	62.6	(buoyant)	Ka	0.32
Cohesion (psf)	400		Kp	3.12
Friction Angle (deg)	31		Ka ^{1/2}	0.57
			Kp ^{1/2}	1.77

Passive Pressure

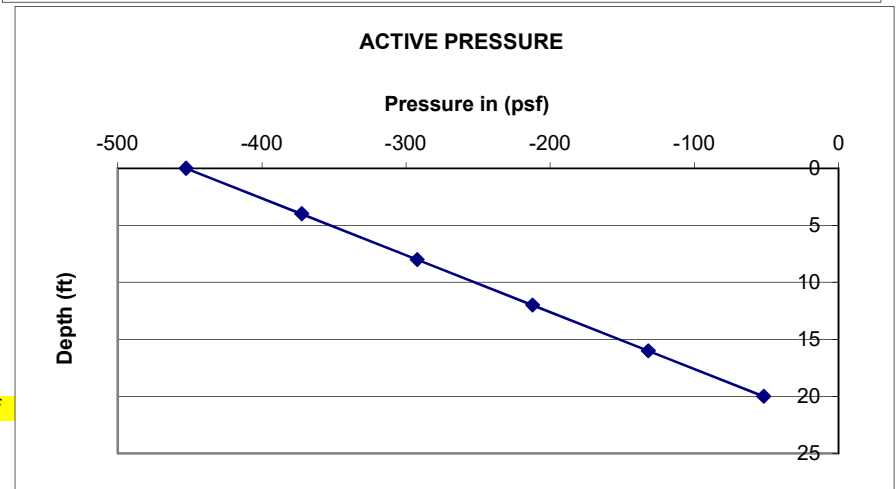
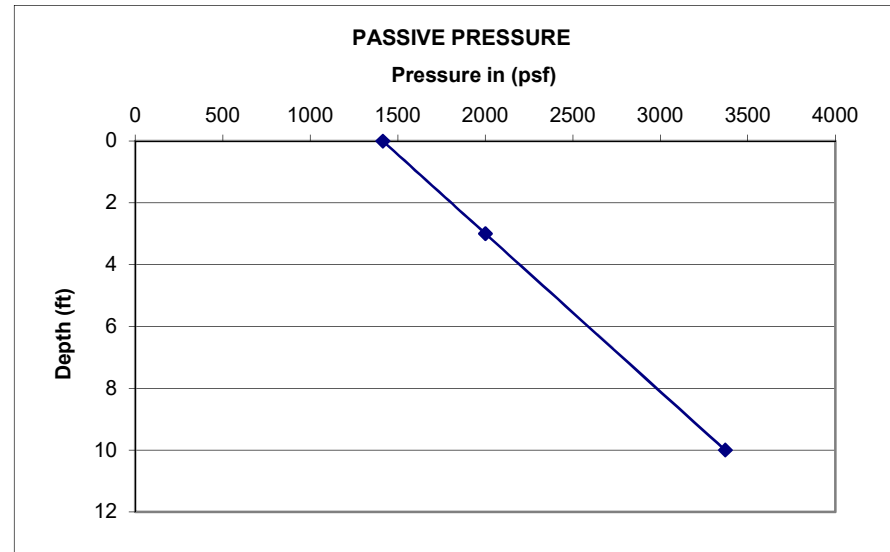
$$s_p = g * Z * K_a + 2 * C * \text{TAN}(45 + s/2)$$

Depth	s _p	
0	1414	
3	2001	666.8963348
10	3370	336.9641184

Active Pressure

$$s_a = g * Z * K_a - 2 * C * \text{TAN}(45 - s/2)$$

Depth	s _p	Lat Earth Pressure (psf)
0	-453	
4	-372	-93.11636847
8	-292	-36.53909065
12	-212	-17.67999805
16	-132	-8.250451742
20	-52	-2.59272396
22	-12	-0.535368403
35	249	7.106237952 Recommend 13H psf
45	449	9.980004444
50	549	10.98582272
55	649	11.80876494
60	750	12.49455012

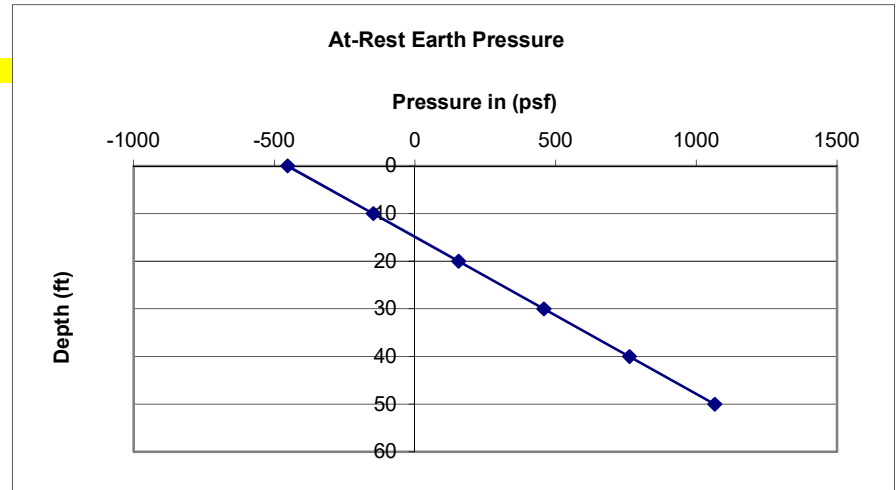


At-Rest Earth Pressure

$$s_a = g * Z * K_a - 2 * C * \text{TAN}(45 - s/2)$$

K0 0.4850

Depth	s_p	Lat Earth Pressure (psf)
0	-453	Triangular
10	-149	-14.90320574
20	155	7.727705383
30	458	15.27134243 Recommend 17H psf
40	762	19.04316095
50	1065	21.30625206
60	1369	22.81497947
70	1672	23.8926419



Seismic Lateral Earth Pressure Increment

$$J_{\text{seismic EFP}} = \frac{3}{4} K_h J_{\text{soil}} \quad (\text{LADBS P/BC 2020-083})$$

$$= \frac{3}{4} \left(\frac{1}{2} \cdot \frac{2}{3} \cdot P G A_n \right) J_{\text{soil}}$$

$$= \frac{3}{4} \left(\frac{1}{2} \cdot \frac{2}{3} \cdot 0.985 \right) (120)$$

$$= 30 \text{ pcf}$$

Mixed-Use Development
400 S. San Vicente

BY BW DATE 2/6/23
CKD. DATE

PROJ. NO. 700109901
SHEET 1 OF 1

ATTACHMENT C
Static Settlement Analysis

Project #: 700109901
 Project Name: 400 S San Vicente
 Client: The Rynders Corporation

Analysis: B-5
 by: CR
 Date: 1/10/2023

FOUNDATION PARAMETERS	
Location	Entire Building
B (ft)	308
L (ft)	110
Bearing Pressure (psf)	1,700
Embedment Depth (feet)	4.0

SUBSURFACE PARAMETERS	
Excavation Depth (feet)	30
Overburden from Excavation (psf)	2,477
Depth to GWT (ft)	12

Elevation levels	
Boring Elevation	151
LFFE	117
BOFE	113

$\Sigma \delta$:	0.00
r^{24}	0.80
Settlement (in)	0.00

Layer	USCS	Z^1_{bgs} (ft)		Z^2_{mid} (ft)	Z^3_{bf} (ft)	γ (pcf)	H^4 (ft)	σ^5_{vo} (psf)	σ^7_{hydro} (psf)	σ^8_{vo} (psf)	Boussinesq					$Cc^{17}/1+e_0$	$Cr^{18}/1+e_0$	N.C. ¹⁹ (yes/no)	O.C. ²⁰ Case	ϵ^{21}	δ^{22}_{inc} (in)	$\delta^{23}_{Cumulative}$ (in)		
		Top	Bottom								m^{10}_1	n^{11}_1	μ^{12}	$\Delta\sigma^{13}$ (psf)	σ^{14}_{vf} (psf)								σ^{15}_m (psf)	σ^{16}_c (psf)
1		0	1	0.5	above fnd	120	1	60	0	60	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
2		1	2	1.5	above fnd	120	1	180	0	180	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
3		2	3	2.5	above fnd	120	1	300	0	300	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
4		3	4	3.5	above fnd	120	1	420	0	420	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
5		4	5	4.5	above fnd	120	1	540	0	540	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
6		5	6	5.5	above fnd	120	1	660	0	660	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
7		6	7	6.5	above fnd	120	1	780	0	780	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
8		7	8	7.5	above fnd	120	1	900	0	900	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
9		8	9	8.5	above fnd	120	1	1,020	0	1,020	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
10		9	10	9.5	above fnd	120	1	1,140	0	1,140	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
11		10	11	10.5	above fnd	120	1	1,260	0	1,260	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
12		11	12	11.5	above fnd	120	1	1,380	0	1,380	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
13		12	13	12.5	above fnd	120	1	1,500	31	1,469	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
14		13	14	13.5	above fnd	120	1	1,620	94	1,526	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
15		14	15	14.5	above fnd	120	1	1,740	156	1,584	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
16		15	16	15.5	above fnd	120	1	1,860	218	1,642	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
17		16	17	16.5	above fnd	120	1	1,980	281	1,699	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
18		17	18	17.5	above fnd	120	1	2,100	343	1,757	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
19		18	19	18.5	above fnd	120	1	2,220	406	1,814	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
20		19	20	19.5	above fnd	120	1	2,340	468	1,872	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
21		20	21	20.5	above fnd	120	1	2,460	530	1,930	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
22		21	22	21.5	above fnd	120	1	2,580	593	1,987	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
23		22	23	22.5	above fnd	120	1	2,700	655	2,045	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
24		23	24	23.5	above fnd	120	1	2,820	718	2,102	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
25		24	25	24.5	above fnd	120	1	2,940	780	2,160	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
26		25	26	25.5	above fnd	120	1	3,060	842	2,218	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
27		26	27	26.5	above fnd	120	1	3,180	905	2,275	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
28		27	28	27.5	above fnd	120	1	3,300	967	2,333	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
29		28	29	28.5	above fnd	120	1	3,420	1,030	2,390	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
30		29	30	29.5	above fnd	120	1	3,540	1,092	2,448	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
31		30	31	30.5	above fnd	120	1	3,660	1,154	2,506	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
32		31	32	31.5	above fnd	120	1	3,780	1,217	2,563	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
33		32	33	32.5	above fnd	120	1	3,900	1,279	2,621	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
34		33	34	33.5	above fnd	120	1	4,020	1,342	2,678	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
35	CL	34	35	34.5	0.5	120	1	4,140	1,404	2,736	0.4	0.00	1.000	-777	1,959	0	2736	0.015		yes	1	-0.0021756	0.00	0.00
36	SC	35	36	35.5	1.5	120	1	4,260	1,466	2,794	0.4	0.01	1.000	-777	2,017	0	2794	0.007		yes	1	-0.0009905	0.00	0.00
37	SC	36	37	36.5	2.5	120	1	4,380	1,529	2,851	0.4	0.02	1.000	-777	2,074	0	2851	0.007		yes	1	-0.0009669	0.00	0.00
38	SC	37	38	37.5	3.5	120	1	4,500	1,591	2,909	0.4	0.02	1.000	-777	2,132	0	2909	0.007		yes	1	-0.0009444	0.00	0.00
39	SP	38	39	38.5	4.5	120	1	4,620	1,654	2,966	0.4	0.03	1.000	-777	2,190	0	2966	0.000		yes	1	0	0.00	0.00
40	SP	39	40	39.5	5.5	120	1	4,740	1,716	3,024	0.4	0.04	1.000	-776	2,248	0	3024	0.000		yes	1	0	0.00	0.00
41	SP	40	41	40.5	6.5	120	1	4,860	1,778	3,082	0.4	0.04	0.999	-776	2,305	0	3082	0.000		yes	1	0	0.00	0.00
42	SP	41	42	41.5	7.5	121	1	4,981	1,841	3,140	0.4	0.05	0.999	-776	2,364	1	3141	0.000		yes	1	0	0.00	0.00
43	SP	42	43	42.5	8.5	122	1	5,102	1,903	3,199	0.4	0.06	0.998	-776	2,423	2	3201	0.000		yes	1	0	0.00	0.00

44	SP	43	44	43.5	9.5	123	1	5,225	1,966	3,259	0.4	0.06	0.998	-775	2,484	3	3262	0.000		yes	1	0	0.00	0.00
45	SP	44	45	44.5	10.5	124	1	5,348	2,028	3,320	0.4	0.07	0.997	-775	2,545	4	3324	0.000		yes	1	0	0.00	0.00
46	CL	45	46	45.5	11.5	125	1	5,473	2,090	3,382	0.4	0.07	0.996	-774	2,608	5	3387	0.015		yes	1	-0.0016926	0.00	0.00
47	CL	46	47	46.5	12.5	126	1	5,598	2,153	3,445	0.4	0.08	0.995	-773	2,672	6	3451	0.015		yes	1	-0.0016554	0.00	0.00
48	CL	47	48	47.5	13.5	127	1	5,725	2,215	3,509	0.4	0.09	0.994	-772	2,737	7	3516	0.015		yes	1	-0.0016189	0.00	0.00
49	CL	48	49	48.5	14.5	128	1	5,852	2,278	3,574	0.4	0.09	0.993	-771	2,803	8	3582	0.015		yes	1	-0.0015831	0.00	0.00
50	CL	49	50	49.5	15.5	129	1	5,981	2,340	3,641	0.4	0.10	0.991	-770	2,871	9	3650	0.015		yes	1	-0.0015479	0.00	0.00
51	CL	50	51	50.5	16.5	130	1	6,110	2,402	3,708	0.4	0.11	0.989	-769	2,939	10	3718	0.015		yes	1	-0.0015135	0.00	0.00
52	CL	51	52	51.5	17.5	131	1	6,241	2,465	3,776	0.4	0.11	0.988	-767	3,009	11	3787	0.015		yes	1	-0.0014796	0.00	0.00
53	CL	52	53	52.5	18.5	132	1	6,372	2,527	3,845	0.4	0.12	0.986	-766	3,079	12	3857	0.015		yes	1	-0.0014465	0.00	0.00
54	CL	53	54	53.5	19.5	133	1	6,505	2,590	3,915	0.4	0.13	0.983	-764	3,151	13	3928	0.015		yes	1	-0.0014139	0.00	0.00
55	CL	54	55	54.5	20.5	134	1	6,638	2,652	3,986	0.4	0.13	0.981	-762	3,224	14	4000	0.015		yes	1	-0.001382	0.00	0.00
56	CL	55	56	55.5	21.5	135	1	6,773	2,714	4,058	0.4	0.14	0.978	-760	3,298	15	4073	0.015		yes	1	-0.0013506	0.00	0.00
57	CL	56	57	56.5	22.5	136	1	6,908	2,777	4,131	0.4	0.15	0.975	-758	3,374	16	4147	0.015		yes	1	-0.0013199	0.00	0.00
58	CL	57	58	57.5	23.5	137	1	7,045	2,839	4,205	0.4	0.15	0.972	-755	3,450	17	4222	0.015		yes	1	-0.0012898	0.00	0.00
59	CL	58	59	58.5	24.5	138	1	7,182	2,902	4,280	0.4	0.16	0.969	-753	3,528	18	4298	0.015		yes	1	-0.0012603	0.00	0.00
60	CL	59	60	59.5	25.5	139	1	7,321	2,964	4,357	0.4	0.17	0.966	-750	3,606	19	4376	0.015		yes	1	-0.0012313	0.00	0.00
61	CL	60	61	60.5	26.5	140	1	7,460	3,026	4,434	0.4	0.17	0.962	-748	3,686	20	4454	0.015		yes	1	-0.0012029	0.00	0.00
62	CL	61	62	61.5	27.5	141	1	7,601	3,089	4,512	0.4	0.18	0.959	-745	3,767	21	4533	0.015		yes	1	-0.0011751	0.00	0.00
63	CL	62	63	62.5	28.5	142	1	7,742	3,151	4,591	0.4	0.19	0.955	-742	3,849	22	4613	0.015		yes	1	-0.0011478	0.00	0.00
64	SC	63	64	63.5	29.5	143	1	7,885	3,214	4,671	0.4	0.19	0.951	-739	3,932	23	4694	0.007		yes	1	-0.0005232	0.00	0.00
65	SC	64	65	64.5	30.5	144	1	8,028	3,276	4,752	0.4	0.20	0.947	-735	4,017	24	4776	0.007		yes	1	-0.000511	0.00	0.00
66	SC	65	66	65.5	31.5	145	1	8,173	3,338	4,834	0.4	0.20	0.942	-732	4,102	25	4859	0.007		yes	1	-0.0004991	0.00	0.00
67	SC	66	67	66.5	32.5	146	1	8,318	3,401	4,917	0.4	0.21	0.938	-728	4,189	26	4943	0.007		yes	1	-0.0004874	0.00	0.00
68	SC	67	68	67.5	33.5	147	1	8,465	3,463	5,001	0.4	0.22	0.933	-725	4,277	27	5028	0.007		yes	1	-0.0004759	0.00	0.00
69	SC	68	69	68.5	34.5	148	1	8,612	3,526	5,086	0.4	0.22	0.928	-721	4,365	28	5114	0.007		yes	1	-0.0004648	0.00	0.00
70	SC	69	70	69.5	35.5	149	1	8,761	3,588	5,173	0.4	0.23	0.923	-717	4,455	29	5202	0.007		yes	1	-0.0004538	0.00	0.00
71	SC	70	71	70.5	36.5	150	1	8,910	3,650	5,260	0.4	0.24	0.918	-713	4,546	30	5290	0.007		yes	1	-0.0004431	0.00	0.00
72	SC	71	72	71.5	37.5	151	1	9,061	3,713	5,348	0.4	0.24	0.913	-709	4,638	31	5379	0.007		yes	1	-0.0004327	0.00	0.00
73	SC	72	73	72.5	38.5	152	1	9,212	3,775	5,437	0.4	0.25	0.908	-705	4,731	32	5469	0.007		yes	1	-0.0004224	0.00	0.00
74	SC	73	74	73.5	39.5	153	1	9,365	3,838	5,527	0.4	0.26	0.903	-701	4,826	33	5560	0.007		yes	1	-0.0004125	0.00	0.00
75	SC	74	75	74.5	40.5	154	1	9,518	3,900	5,618	0.4	0.26	0.897	-697	4,921	34	5652	0.007		yes	1	-0.0004027	0.00	0.00
76	SC	75	76	75.5	41.5	155	1	9,673	3,962	5,710	0.4	0.27	0.892	-693	5,017	35	5745	0.007		yes	1	-0.0003932	0.00	0.00

Settlement Analysis Notes

1. Depth Below Ground Surface

2. Depth at Mid Point of Layer Below Ground Surface

3. Depth at Mid Point Below Foundation Bottom

4. Thickness of Layer

5. Initial Overburden

6. Initial Net Overburden (minus excavated soil)

7. Hydrostatic Pressure

8. Initial Effective Overburden

9. Initial Net Effective Overburden (minus excavated soil)

10. L/B

11. $Z_{bf}/(2/B)$

12. Influence Factor

13. Induced Foundation Load

14. Final Load (overburden + foundation load)

15. Over Consolidation Margin

16. Preconsolidation Stress

17. Compression Index

18. Recompression Index

19. Enter "yes" for Normally Consolidated Soils

20. Overconsolidation Case:

1. $\sigma'_{vf} < \sigma'_c$

2. $\sigma'_{vo} < \sigma'_c < \sigma'_{vf}$

21. Incremental Strain

22. Incremental Settlement

23. Cummulative Settlement

24. Rigidity Factor

Note: Column AA has been altered such that anything settlement less than 0 is automatrally zeroed out

Project #: 700109901
 Project Name: 400 S San Vicente
 Client:

Analysis: B-6
 by: CR
 Date: 1/10/2023

FOUNDATION PARAMETERS	
Location	Entire Building
B (ft)	308
L (ft)	110
Bearing Pressure (psf)	1,700
Embedment Depth (feet)	4.0

SUBSURFACE PARAMETERS	
Excavation Depth (feet)	30
Overburden from Excavation (psf)	2,477
Depth to GWT (ft)	12

Elevation levels	
Boring Elevation	149
LFFE	117
BOFE	113

$\Sigma \delta$:	0.00
r^{24}	0.80
Settlement (in)	0.00

Layer	USCS	Z^1_{bgs} (ft)		Z^2_{mid} (ft)	Z^3_{bf} (ft)	γ (pcf)	H^4 (ft)	σ^5_{vo} (psf)	σ^7_{hydro} (psf)	σ^8_{vo} (psf)	Boussinesq					$Cc^{17}/1+e_0$	$Cr^{18}/1+e_0$	N.C. ¹⁹ (yes/no)	O.C. ²⁰ Case	ϵ^{21}	δ^{22}_{inc} (in)	$\delta^{23}_{Cumulative}$ (in)		
		Top	Bottom								m^{10}_1	n^{11}_1	μ^{12}	$\Delta\sigma^{13}$ (psf)	σ^{14}_{vf} (psf)								σ^{15}_m (psf)	σ^{16}_c (psf)
1		0	1	0.5	above fnd	120	1	60	0	60	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
2		1	2	1.5	above fnd	120	1	180	0	180	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
3		2	3	2.5	above fnd	120	1	300	0	300	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
4		3	4	3.5	above fnd	120	1	420	0	420	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
5		4	5	4.5	above fnd	120	1	540	0	540	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
6		5	6	5.5	above fnd	120	1	660	0	660	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
7		6	7	6.5	above fnd	120	1	780	0	780	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
8		7	8	7.5	above fnd	120	1	900	0	900	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
9		8	9	8.5	above fnd	120	1	1,020	0	1,020	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
10		9	10	9.5	above fnd	120	1	1,140	0	1,140	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
11		10	11	10.5	above fnd	120	1	1,260	0	1,260	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
12		11	12	11.5	above fnd	120	1	1,380	0	1,380	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
13		12	13	12.5	above fnd	120	1	1,500	31	1,469	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
14		13	14	13.5	above fnd	120	1	1,620	94	1,526	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
15		14	15	14.5	above fnd	120	1	1,740	156	1,584	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
16		15	16	15.5	above fnd	120	1	1,860	218	1,642	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
17		16	17	16.5	above fnd	120	1	1,980	281	1,699	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
18		17	18	17.5	above fnd	120	1	2,100	343	1,757	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
19		18	19	18.5	above fnd	120	1	2,220	406	1,814	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
20		19	20	19.5	above fnd	120	1	2,340	468	1,872	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
21		20	21	20.5	above fnd	120	1	2,460	530	1,930	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
22		21	22	21.5	above fnd	120	1	2,580	593	1,987	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
23		22	23	22.5	above fnd	120	1	2,700	655	2,045	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
24		23	24	23.5	above fnd	120	1	2,820	718	2,102	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
25		24	25	24.5	above fnd	120	1	2,940	780	2,160	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
26		25	26	25.5	above fnd	120	1	3,060	842	2,218	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
27		26	27	26.5	above fnd	120	1	3,180	905	2,275	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
28		27	28	27.5	above fnd	120	1	3,300	967	2,333	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
29		28	29	28.5	above fnd	120	1	3,420	1,030	2,390	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
30		29	30	29.5	above fnd	120	1	3,540	1,092	2,448	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
31		30	31	30.5	above fnd	120	1	3,660	1,154	2,506	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
32		31	32	31.5	above fnd	120	1	3,780	1,217	2,563	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
33		32	33	32.5	above fnd	120	1	3,900	1,279	2,621	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
34		33	34	33.5	above fnd	120	1	4,020	1,342	2,678	0.4	above fnd	above fnd	above fnd	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
35	SW-SC	34	35	34.5	0.5	120	1	4,140	1,404	2,736	0.4	0.00	1.000	-777	1,959	0	2736	0.007		yes	1	-0.0010153	0.00	0.00
36	SW-SC	35	36	35.5	1.5	120	1	4,260	1,466	2,794	0.4	0.01	1.000	-777	2,017	0	2794	0.007		yes	1	-0.0009905	0.00	0.00
37	SW-SC	36	37	36.5	2.5	120	1	4,380	1,529	2,851	0.4	0.02	1.000	-777	2,074	0	2851	0.007		yes	1	-0.0009669	0.00	0.00
38	SP	37	38	37.5	3.5	120	1	4,500	1,591	2,909	0.4	0.02	1.000	-777	2,132	0	2909	0.000		yes	1	0	0.00	0.00
39	SP	38	39	38.5	4.5	120	1	4,620	1,654	2,966	0.4	0.03	1.000	-777	2,190	0	2966	0.000		yes	1	0	0.00	0.00
40	SP	39	40	39.5	5.5	120	1	4,740	1,716	3,024	0.4	0.04	1.000	-776	2,248	0	3024	0.000		yes	1	0	0.00	0.00
41	SP	40	41	40.5	6.5	120	1	4,860	1,778	3,082	0.4	0.04	0.999	-776	2,305	0	3082	0.000		yes	1	0	0.00	0.00
42	SP	41	42	41.5	7.5	121	1	4,981	1,841	3,140	0.4	0.05	0.999	-776	2,364	1	3141	0.000		yes	1	0	0.00	0.00
43	SP	42	43	42.5	8.5	122	1	5,102	1,903	3,199	0.4	0.06	0.998	-776	2,423	2	3201	0.000		yes	1	0	0.00	0.00

44	CL	43	44	43.5	9.5	123	1	5,225	1,966	3,259	0.4	0.06	0.998	-775	2,484	3	3262	0.015		yes	1	-0.0017694	0.00	0.00
45	CL	44	45	44.5	10.5	124	1	5,348	2,028	3,320	0.4	0.07	0.997	-775	2,545	4	3324	0.015		yes	1	-0.0017306	0.00	0.00
46	CL	45	46	45.5	11.5	125	1	5,473	2,090	3,382	0.4	0.07	0.996	-774	2,608	5	3387	0.015		yes	1	-0.0016926	0.00	0.00
47	CL	46	47	46.5	12.5	126	1	5,598	2,153	3,445	0.4	0.08	0.995	-773	2,672	6	3451	0.015		yes	1	-0.0016554	0.00	0.00
48	CL	47	48	47.5	13.5	127	1	5,725	2,215	3,509	0.4	0.09	0.994	-772	2,737	7	3516	0.015		yes	1	-0.0016189	0.00	0.00
49	CL	48	49	48.5	14.5	128	1	5,852	2,278	3,574	0.4	0.09	0.993	-771	2,803	8	3582	0.015		yes	1	-0.0015831	0.00	0.00
50	CL	49	50	49.5	15.5	129	1	5,981	2,340	3,641	0.4	0.10	0.991	-770	2,871	9	3650	0.015		yes	1	-0.0015479	0.00	0.00
51	CL	50	51	50.5	16.5	130	1	6,110	2,402	3,708	0.4	0.11	0.989	-769	2,939	10	3718	0.015		yes	1	-0.0015135	0.00	0.00
52	CL	51	52	51.5	17.5	131	1	6,241	2,465	3,776	0.4	0.11	0.988	-767	3,009	11	3787	0.015		yes	1	-0.0014796	0.00	0.00

Settlement Analysis Notes

- | | | |
|--|---|----------------------------|
| 1. Depth Below Ground Surface | 14. Final Load (overburden + foundation load) | 22. Incremental Settlement |
| 2. Depth at Mid Point of Layer Below Ground Surface | 15. Over Consolidation Margin | 23. Cummulative Settlement |
| 3. Depth at Mid Point Below Foundation Bottom | 16. Preconsolidation Stress | 24. Rigidity Factor |
| 4. Thickness of Layer | 17. Compression Index | |
| 5. Initial Overburden | 18. Recompression Index | |
| 6. Initial Net Overburden (minus excavated soil) | 19. Enter "yes" for Normally Consolidated Soils | |
| 7. Hydrostatic Pressure | 20. Overconsolidation Case: | |
| 8. Initial Effective Overburden | 1. $\sigma'_{vf} < \sigma'_c$ | |
| 9. Initial Net Effective Overburden (minus excavated soil) | 2. $\sigma'_{v0} < \sigma'_c < \sigma'_{vf}$ | |
| 10. L/B | 21. Incremental Strain | |
| 11. $Z_{bf}/(2/B)$ | | |
| 12. Influence Factor | | |
| 13. Induced Foundation Load | | |

Note: Column AA has been altered such that anything less than 0 is automatically zeroed out

Project #: 700109901
 Project Name: 400 S San Vicente
 Client:

Analysis: B-7
 by: CR
 Date: 1/10/2023

FOUNDATION PARAMETERS	
Location	Entire Building
B (ft)	308
L (ft)	110
Bearing Pressure (psf)	1,700
Embedment Depth (feet)	4.0

SUBSURFACE PARAMETERS	
Excavation Depth (feet)	30
Overburden from Excavation (psf)	2,477
Depth to GWT (ft)	12

Elevation levels	
Boring Elevation	151
LFFE	117
BOFE	113

$\Sigma \delta:$	0.00
r^{24}	0.80
Settlement (in)	0.00

Layer	USCS	Z^1_{bgs} (ft)		Z^2_{mid} (ft)	Z^3_{bf} (ft)	γ (pcf)	H^4 (ft)	σ^5_{vo} (psf)	σ^7_{hydro} (psf)	σ^8_{vo} (psf)	Boussinesq						$Cc^{17}/1+e_0$	$Cr^{18}/1+e_0$	N.C. ¹⁹ (yes/no)	O.C. ²⁰ Case	ϵ^{21}	δ^{22}_{inc} (in)	$\delta^{23}_{Cumulative}$ (in)	
		Top	Bottom								m^{10}_1	n^{11}_1	l^{12}	$\Delta\sigma^{13}$ (psf)	σ^{14}_{vf} (psf)	σ^{15}_m (psf)								σ^{16}_c (psf)
1		0	1	0.5	above fnd	120	1	60	0	60	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
2		1	2	1.5	above fnd	120	1	180	0	180	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
3		2	3	2.5	above fnd	120	1	300	0	300	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
4		3	4	3.5	above fnd	120	1	420	0	420	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
5		4	5	4.5	above fnd	120	1	540	0	540	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
6		5	6	5.5	above fnd	120	1	660	0	660	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
7		6	7	6.5	above fnd	120	1	780	0	780	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
8		7	8	7.5	above fnd	120	1	900	0	900	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
9		8	9	8.5	above fnd	120	1	1,020	0	1,020	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
10		9	10	9.5	above fnd	120	1	1,140	0	1,140	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
11		10	11	10.5	above fnd	120	1	1,260	0	1,260	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
12		11	12	11.5	above fnd	120	1	1,380	0	1,380	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
13		12	13	12.5	above fnd	120	1	1,500	31	1,469	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
14		13	14	13.5	above fnd	120	1	1,620	94	1,526	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
15		14	15	14.5	above fnd	120	1	1,740	156	1,584	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
16		15	16	15.5	above fnd	120	1	1,860	218	1,642	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
17		16	17	16.5	above fnd	120	1	1,980	281	1,699	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
18		17	18	17.5	above fnd	120	1	2,100	343	1,757	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
19		18	19	18.5	above fnd	120	1	2,220	406	1,814	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
20		19	20	19.5	above fnd	120	1	2,340	468	1,872	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
21		20	21	20.5	above fnd	120	1	2,460	530	1,930	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
22		21	22	21.5	above fnd	120	1	2,580	593	1,987	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
23		22	23	22.5	above fnd	120	1	2,700	655	2,045	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
24		23	24	23.5	above fnd	120	1	2,820	718	2,102	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
25		24	25	24.5	above fnd	120	1	2,940	780	2,160	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
26		25	26	25.5	above fnd	120	1	3,060	842	2,218	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
27		26	27	26.5	above fnd	120	1	3,180	905	2,275	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
28		27	28	27.5	above fnd	120	1	3,300	967	2,333	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
29		28	29	28.5	above fnd	120	1	3,420	1,030	2,390	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
30		29	30	29.5	above fnd	120	1	3,540	1,092	2,448	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
31		30	31	30.5	above fnd	120	1	3,660	1,154	2,506	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
32		31	32	31.5	above fnd	120	1	3,780	1,217	2,563	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
33		32	33	32.5	above fnd	120	1	3,900	1,279	2,621	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
34		33	34	33.5	above fnd	120	1	4,020	1,342	2,678	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
35	SC	34	35	34.5	0.5	120	1	4,140	1,404	2,736	0.4	0.00	1.000	-777	1,959	0	2736	0.007	yes	1	-0.001015	0.00	0.00	
36	SC	35	36	35.5	1.5	120	1	4,260	1,466	2,794	0.4	0.01	1.000	-777	2,017	0	2794	0.007	yes	1	-0.00099	0.00	0.00	
37	SP/SW	36	37	36.5	2.5	120	1	4,380	1,529	2,851	0.4	0.02	1.000	-777	2,074	0	2851	0.000	yes	1	0	0.00	0.00	
38	SP/SW	37	38	37.5	3.5	120	1	4,500	1,591	2,909	0.4	0.02	1.000	-777	2,132	0	2909	0.000	yes	1	0	0.00	0.00	
39	SW	38	39	38.5	4.5	120	1	4,620	1,654	2,966	0.4	0.03	1.000	-777	2,190	0	2966	0.000	yes	1	0	0.00	0.00	

40	SW	39	40	39.5	5.5	120	1	4,740	1,716	3,024	0.4	0.04	1.000	-776	2,248	0	3024	0.000	yes	1	0	0.00	0.00
41	SW	40	41	40.5	6.5	120	1	4,860	1,778	3,082	0.4	0.04	0.999	-776	2,305	0	3082	0.000	yes	1	0	0.00	0.00
42	SW	41	42	41.5	7.5	121	1	4,981	1,841	3,140	0.4	0.05	0.999	-776	2,364	1	3141	0.000	yes	1	0	0.00	0.00
43	SW	42	43	42.5	8.5	122	1	5,102	1,903	3,199	0.4	0.06	0.998	-776	2,423	2	3201	0.000	yes	1	0	0.00	0.00
44	SW	43	44	43.5	9.5	123	1	5,225	1,966	3,259	0.4	0.06	0.998	-775	2,484	3	3262	0.000	yes	1	0	0.00	0.00
45	CH	44	45	44.5	10.5	124	1	5,348	2,028	3,320	0.4	0.07	0.997	-775	2,545	4	3324	0.015	yes	1	-0.001731	0.00	0.00
46	CH	45	46	45.5	11.5	125	1	5,473	2,090	3,382	0.4	0.07	0.996	-774	2,608	5	3387	0.015	yes	1	-0.001693	0.00	0.00
47	CH	46	47	46.5	12.5	126	1	5,598	2,153	3,445	0.4	0.08	0.995	-773	2,672	6	3451	0.015	yes	1	-0.001655	0.00	0.00
48	CH	47	48	47.5	13.5	127	1	5,725	2,215	3,509	0.4	0.09	0.994	-772	2,737	7	3516	0.015	yes	1	-0.001619	0.00	0.00
49	CL	48	49	48.5	14.5	128	1	5,852	2,278	3,574	0.4	0.09	0.993	-771	2,803	8	3582	0.015	yes	1	-0.001583	0.00	0.00
50	CL	49	50	49.5	15.5	129	1	5,981	2,340	3,641	0.4	0.10	0.991	-770	2,871	9	3650	0.015	yes	1	-0.001548	0.00	0.00
51	CL	50	51	50.5	16.5	130	1	6,110	2,402	3,708	0.4	0.11	0.989	-769	2,939	10	3718	0.015	yes	1	-0.001513	0.00	0.00
52	CL	51	52	51.5	17.5	131	1	6,241	2,465	3,776	0.4	0.11	0.988	-767	3,009	11	3787	0.015	yes	1	-0.00148	0.00	0.00
53	CL	52	53	52.5	18.5	132	1	6,372	2,527	3,845	0.4	0.12	0.986	-766	3,079	12	3857	0.015	yes	1	-0.001446	0.00	0.00
54	CL	53	54	53.5	19.5	133	1	6,505	2,590	3,915	0.4	0.13	0.983	-764	3,151	13	3928	0.015	yes	1	-0.001414	0.00	0.00
55	CL	54	55	54.5	20.5	134	1	6,638	2,652	3,986	0.4	0.13	0.981	-762	3,224	14	4000	0.015	yes	1	-0.001382	0.00	0.00
56	CL	55	56	55.5	21.5	135	1	6,773	2,714	4,058	0.4	0.14	0.978	-760	3,298	15	4073	0.015	yes	1	-0.001351	0.00	0.00
57	CL	56	57	56.5	22.5	136	1	6,908	2,777	4,131	0.4	0.15	0.975	-758	3,374	16	4147	0.015	yes	1	-0.00132	0.00	0.00
58	CL	57	58	57.5	23.5	137	1	7,045	2,839	4,205	0.4	0.15	0.972	-755	3,450	17	4222	0.015	yes	1	-0.00129	0.00	0.00
59	CL	58	59	58.5	24.5	138	1	7,182	2,902	4,280	0.4	0.16	0.969	-753	3,528	18	4298	0.015	yes	1	-0.00126	0.00	0.00
60	CL	59	60	59.5	25.5	139	1	7,321	2,964	4,357	0.4	0.17	0.966	-750	3,606	19	4376	0.015	yes	1	-0.001231	0.00	0.00
61	CL	60	61	60.5	26.5	140	1	7,460	3,026	4,434	0.4	0.17	0.962	-748	3,686	20	4454	0.015	yes	1	-0.001203	0.00	0.00
62	CL	61	62	61.5	27.5	141	1	7,601	3,089	4,512	0.4	0.18	0.959	-745	3,767	21	4533	0.015	yes	1	-0.001175	0.00	0.00
63	CL	62	63	62.5	28.5	142	1	7,742	3,151	4,591	0.4	0.19	0.955	-742	3,849	22	4613	0.015	yes	1	-0.001148	0.00	0.00
64	CL	63	64	63.5	29.5	143	1	7,885	3,214	4,671	0.4	0.19	0.951	-739	3,932	23	4694	0.015	yes	1	-0.001121	0.00	0.00
65	CL	64	65	64.5	30.5	144	1	8,028	3,276	4,752	0.4	0.20	0.947	-735	4,017	24	4776	0.015	yes	1	-0.001095	0.00	0.00
66	CL	65	66	65.5	31.5	145	1	8,173	3,338	4,834	0.4	0.20	0.942	-732	4,102	25	4859	0.015	yes	1	-0.001069	0.00	0.00
67	CL	66	67	66.5	32.5	146	1	8,318	3,401	4,917	0.4	0.21	0.938	-728	4,189	26	4943	0.015	yes	1	-0.001044	0.00	0.00
68	CL	67	68	67.5	33.5	147	1	8,465	3,463	5,001	0.4	0.22	0.933	-725	4,277	27	5028	0.015	yes	1	-0.00102	0.00	0.00
69	CL	68	69	68.5	34.5	148	1	8,612	3,526	5,086	0.4	0.22	0.928	-721	4,365	28	5114	0.015	yes	1	-0.000996	0.00	0.00
70	CL	69	70	69.5	35.5	149	1	8,761	3,588	5,173	0.4	0.23	0.923	-717	4,455	29	5202	0.015	yes	1	-0.000972	0.00	0.00
71	CL	70	71	70.5	36.5	150	1	8,910	3,650	5,260	0.4	0.24	0.918	-713	4,546	30	5290	0.015	yes	1	-0.00095	0.00	0.00
72	CL	71	72	71.5	37.5	151	1	9,061	3,713	5,348	0.4	0.24	0.913	-709	4,638	31	5379	0.015	yes	1	-0.000927	0.00	0.00
73	CL	72	73	72.5	38.5	152	1	9,212	3,775	5,437	0.4	0.25	0.908	-705	4,731	32	5469	0.015	yes	1	-0.000905	0.00	0.00
74	SC	73	74	73.5	39.5	153	1	9,365	3,838	5,527	0.4	0.26	0.903	-701	4,826	33	5560	0.007	yes	1	-0.000412	0.00	0.00
75	SC	74	75	74.5	40.5	154	1	9,518	3,900	5,618	0.4	0.26	0.897	-697	4,921	34	5652	0.007	yes	1	-0.000403	0.00	0.00
76	SC	75	76	75.5	41.5	155	1	9,673	3,962	5,710	0.4	0.27	0.892	-693	5,017	35	5745	0.007	yes	1	-0.000393	0.00	0.00
77	SC	76	77	76.5	42.5	156	1	9,828	4,025	5,803	0.4	0.28	0.886	-688	5,115	36	5839	0.007	yes	1	-0.000384	0.00	0.00

Settlement Analysis Notes

- | | | |
|--|---|----------------------------|
| 1. Depth Below Ground Surface | 14. Final Load (overburden + foundation load) | 22. Incremental Settlement |
| 2. Depth at Mid Point of Layer Below Ground Surface | 15. Over Consolidation Margin | 23. Cummulative Settlement |
| 3. Depth at Mid Point Below Foundation Bottom | 16. Preconsolidation Stress | 24. Rigidity Factor |
| 4. Thickness of Layer | 17. Compression Index | |
| 5. Initial Overburden | 18. Recompression Index | |
| 6. Initial Net Overburden (minus excavated soil) | 19. Enter "yes" for Normally Consolidated Soils | |
| 7. Hydrostatic Pressure | 20. Overconsolidation Case: | |
| 8. Initial Effective Overburden | 1. $\sigma'_{vf} < \sigma'_c$ | |
| 9. Initial Net Effective Overburden (minus excavated soil) | 2. $\sigma'_{vo} < \sigma'_c < \sigma'_{vf}$ | |
| 10. L/B | 21. Incremental Strain | |
| 11. $Z_{bf}/(2/B)$ | | |
| 12. Influence Factor | | |
| 13. Induced Foundation Load | | |

Note: Column AA has been altered such that anything less than 0 is automatically zeroed out

Project #: 700109901
 Project Name: 400 S San Vicente
 Client:

Analysis: B-8
 by: CR
 Date: 1/10/2023

FOUNDATION PARAMETERS	
Location	Entire Building
B (ft)	308
L (ft)	110
Bearing Pressure (psf)	1,700
Embedment Depth (feet)	4.0

SUBSURFACE PARAMETERS	
Excavation Depth (feet)	30
Overburden from Excavation (psf)	2,477
Depth to GWT (ft)	12

Elevation levels	
Boring Elevation	151
LFFE	117
BOFE	113

$\Sigma\delta:$	0.00
r^{24}	0.80
Settlement (in)	0.00

Layer	USCS	Z^1_{bgs} (ft)		Z^2_{mid} (ft)	Z^3_{bf} (ft)	γ (pcf)	H^4 (ft)	σ^5_{vo} (psf)	σ^7_{hydro} (psf)	σ^8_{vo} (psf)	Boussinesq						$Cc^{17}/1+e_0$	$Cr^{18}/1+e_0$	N.C. ¹⁹ (yes/no)	O.C. ²⁰ Case	ϵ^{21}	δ^{22}_{inc} (in)	$\delta^{23}_{Cumulative}$ (in)	
		Top	Bottom								m^{10}_1	n^{11}_1	l^{12}	$\Delta\sigma^{13}$ (psf)	σ^{14}_{vf} (psf)	σ^{15}_m (psf)								σ^{16}_c (psf)
1		0	1	0.5	above fnd	120	1	60	0	60	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
2		1	2	1.5	above fnd	120	1	180	0	180	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
3		2	3	2.5	above fnd	120	1	300	0	300	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
4		3	4	3.5	above fnd	120	1	420	0	420	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
5		4	5	4.5	above fnd	120	1	540	0	540	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
6		5	6	5.5	above fnd	120	1	660	0	660	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
7		6	7	6.5	above fnd	120	1	780	0	780	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
8		7	8	7.5	above fnd	120	1	900	0	900	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
9		8	9	8.5	above fnd	120	1	1,020	0	1,020	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
10		9	10	9.5	above fnd	120	1	1,140	0	1,140	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
11		10	11	10.5	above fnd	120	1	1,260	0	1,260	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
12		11	12	11.5	above fnd	120	1	1,380	0	1,380	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
13		12	13	12.5	above fnd	120	1	1,500	31	1,469	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
14		13	14	13.5	above fnd	120	1	1,620	94	1,526	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
15		14	15	14.5	above fnd	120	1	1,740	156	1,584	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
16		15	16	15.5	above fnd	120	1	1,860	218	1,642	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
17		16	17	16.5	above fnd	120	1	1,980	281	1,699	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
18		17	18	17.5	above fnd	120	1	2,100	343	1,757	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
19		18	19	18.5	above fnd	120	1	2,220	406	1,814	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
20		19	20	19.5	above fnd	120	1	2,340	468	1,872	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
21		20	21	20.5	above fnd	120	1	2,460	530	1,930	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
22		21	22	21.5	above fnd	120	1	2,580	593	1,987	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
23		22	23	22.5	above fnd	120	1	2,700	655	2,045	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
24		23	24	23.5	above fnd	120	1	2,820	718	2,102	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
25		24	25	24.5	above fnd	120	1	2,940	780	2,160	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
26		25	26	25.5	above fnd	120	1	3,060	842	2,218	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
27		26	27	26.5	above fnd	120	1	3,180	905	2,275	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
28		27	28	27.5	above fnd	120	1	3,300	967	2,333	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
29		28	29	28.5	above fnd	120	1	3,420	1,030	2,390	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
30		29	30	29.5	above fnd	120	1	3,540	1,092	2,448	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
31		30	31	30.5	above fnd	120	1	3,660	1,154	2,506	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
32		31	32	31.5	above fnd	120	1	3,780	1,217	2,563	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
33		32	33	32.5	above fnd	120	1	3,900	1,279	2,621	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
34		33	34	33.5	above fnd	120	1	4,020	1,342	2,678	0.4	above fnd	above fnd	bove fn	above fnd	0	above fnd			yes	above fnd	0	0.00	0.00
35	SP	34	35	34.5	0.5	120	1	4,140	1,404	2,736	0.4	0.00	1.000	-777	1,959	0	2736	0.000	yes	1	0	0.00	0.00	
36	SP	35	36	35.5	1.5	120	1	4,260	1,466	2,794	0.4	0.01	1.000	-777	2,017	0	2794	0.000	yes	1	0	0.00	0.00	
37	SP	36	37	36.5	2.5	120	1	4,380	1,529	2,851	0.4	0.02	1.000	-777	2,074	0	2851	0.000	yes	1	0	0.00	0.00	
38	SP	37	38	37.5	3.5	120	1	4,500	1,591	2,909	0.4	0.02	1.000	-777	2,132	0	2909	0.000	yes	1	0	0.00	0.00	
39	SP	38	39	38.5	4.5	120	1	4,620	1,654	2,966	0.4	0.03	1.000	-777	2,190	0	2966	0.000	yes	1	0	0.00	0.00	

40	SP	39	40	39.5	5.5	120	1	4,740	1,716	3,024	0.4	0.04	1.000	-776	2,248	0	3024	0.000	yes	1	0	0.00	0.00
41	SP	40	41	40.5	6.5	120	1	4,860	1,778	3,082	0.4	0.04	0.999	-776	2,305	0	3082	0.000	yes	1	0	0.00	0.00
42	SP	41	42	41.5	7.5	121	1	4,981	1,841	3,140	0.4	0.05	0.999	-776	2,364	1	3141	0.000	yes	1	0	0.00	0.00
43	SP	42	43	42.5	8.5	122	1	5,102	1,903	3,199	0.4	0.06	0.998	-776	2,423	2	3201	0.000	yes	1	0	0.00	0.00
44	CL	43	44	43.5	9.5	123	1	5,225	1,966	3,259	0.4	0.06	0.998	-775	2,484	3	3262	0.015	yes	1	-0.001769	0.00	0.00
45	CL	44	45	44.5	10.5	124	1	5,348	2,028	3,320	0.4	0.07	0.997	-775	2,545	4	3324	0.015	yes	1	-0.001731	0.00	0.00
46	SP	45	46	45.5	11.5	125	1	5,473	2,090	3,382	0.4	0.07	0.996	-774	2,608	5	3387	0.000	yes	1	0	0.00	0.00
47	CL	46	47	46.5	12.5	126	1	5,598	2,153	3,445	0.4	0.08	0.995	-773	2,672	6	3451	0.015	yes	1	-0.001655	0.00	0.00
48	CL	47	48	47.5	13.5	127	1	5,725	2,215	3,509	0.4	0.09	0.994	-772	2,737	7	3516	0.015	yes	1	-0.001619	0.00	0.00
49	SC/CL	48	49	48.5	14.5	128	1	5,852	2,278	3,574	0.4	0.09	0.993	-771	2,803	8	3582	0.007	yes	1	-0.000739	0.00	0.00
50	SC/CL	49	50	49.5	15.5	129	1	5,981	2,340	3,641	0.4	0.10	0.991	-770	2,871	9	3650	0.007	yes	1	-0.000722	0.00	0.00
51	SC/CL	50	51	50.5	16.5	130	1	6,110	2,402	3,708	0.4	0.11	0.989	-769	2,939	10	3718	0.007	yes	1	-0.000706	0.00	0.00
52	SC/CL	51	52	51.5	17.5	131	1	6,241	2,465	3,776	0.4	0.11	0.988	-767	3,009	11	3787	0.007	yes	1	-0.00069	0.00	0.00

Settlement Analysis Notes

- | | | |
|--|---|----------------------------|
| 1. Depth Below Ground Surface | 14. Final Load (overburden + foundation load) | 22. Incremental Settlement |
| 2. Depth at Mid Point of Layer Below Ground Surface | 15. Over Consolidation Margin | 23. Cumulative Settlement |
| 3. Depth at Mid Point Below Foundation Bottom | 16. Preconsolidation Stress | 24. Rigidity Factor |
| 4. Thickness of Layer | 17. Compression Index | |
| 5. Initial Overburden | 18. Recompression Index | |
| 6. Initial Net Overburden (minus excavated soil) | 19. Enter "yes" for Normally Consolidated Soils | |
| 7. Hydrostatic Pressure | 20. Overconsolidation Case: | |
| 8. Initial Effective Overburden | 1. $\sigma'_{vf} < \sigma'_c$ | |
| 9. Initial Net Effective Overburden (minus excavated soil) | 2. $\sigma'_{vo} < \sigma'_c < \sigma'_{vf}$ | |
| 10. L/B | 21. Incremental Strain | |
| 11. $Z_{bf}/(2/B)$ | | |
| 12. Influence Factor | | |
| 13. Induced Foundation Load | | |

Note: Column AA has been altered such that anything less than 0 is automatically zeroed out