

Vapor Barrier

We recommend that a ten-mil (or thicker) plastic vapor barrier and a 4-inch thick sand layer be used under floor slabs. The placement of the vapor barrier should be selected by either your Civil Engineer or Structural Engineer giving consideration to the factors discussed in ASTM E1643. Seams of the vapor barrier should be overlapped and sealed. Where pipes extend through the vapor barrier, the barrier should be sealed to the pipes. Tears or punctures in the moisture barrier should be completely repaired *prior* to placement of concrete. The sand should be classified as a clean sand (with less than 5% fines in accordance with ASTM D2488).

OBSERVATIONS AND TESTING

Please *advise* this office a minimum 24 hours *prior* to any required site visit. All approved plans, permits, and geotechnical reports must be at the job site and be made available during inspections.

- a. Review grading, foundation, and drainage plans to *verify* that the recommendations contained in this report have been properly interpreted and are incorporated into the project specifications. If we are not accorded the opportunity to review these documents, we can take no responsibility for misinterpretation of our conclusions and recommendations.
- b. Observe and advise during all grading activities, including site preparation, foundation and retaining wall excavation, and placement of fill, to confirm that suitable fill soils are placed upon competent material and to allow design changes if subsurface conditions differ from those anticipated prior to the start of construction.
- c. Observe the installation of all drainage devices.
- d. Test all fill placed for engineering purposes to confirm that suitable fill materials are used and properly compacted.

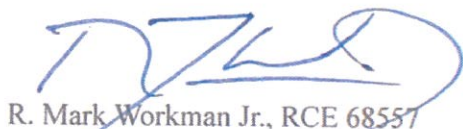
REMARKS

This report is issued to the owner with the understanding that it is the owner's responsibility or representative's responsibility to assure that the information and recommendations contained in this report are called to the attention of the designers and builders for the project. The conclusions and recommendations provided in this report should be reviewed by this office when the construction plans become available, and may need to be revised or modified after our review. Please be informed that the conclusions and soils engineering recommendations provided in this report are based on the surface conditions and findings and observations performed at the locations of the exploratory excavations. For the purposes of this report it can only be assumed by us that the subsurface conditions do not deviate significantly in the unexplored areas of the property from those at the exposed locations. If conditions are encountered during construction which are different from those observed at our exploratory excavations or as described in this report, we must be notified so that we can evaluate the site conditions and need for revisions or modifications to our recommendations.

Please call this office at (805) 850-2025 if you have any questions regarding this report. Thank you for the opportunity to be of professional service.

Respectfully submitted,

WORKMAN GEOTECHNICAL ENGINEERING & CONSULTING



R. Mark Workman Jr., RCE 68557
cc: addressee(3)



APPENDIX I**LABORATORY TEST RESULTS**

Bulk samples of the earth materials encountered in the exploratory excavations were tested to determine maximum dry density, optimum moisture, expansion index, in-situ moisture and density, and grain size. Test procedures and results are as follows.

Maximum Density-Optimum Moisture

Maximum dry density - optimum moisture data were determined for a representative sample of the on-site earth materials using the ASTM D 1557 compaction test method. The test results are presented below.

<u>Sample</u>	<u>Soil Description</u>	<u>Soil Type (USCS)</u>	<u>Maximum Dry Density (LBS./CU.FT)</u>	<u>Optimum Moisture (%)</u>
TP-1@0'-6'	Silty SAND	SM	125.0	10.5
TP-5@0'-4'	Silty SAND	SM	123.0	11.5

Expansion Test

An expansion index test was conducted on a representative soil sample obtained from the proposed building area and tested in accordance with ASTM 4829. This expansion index test method utilizes a restraining load of 144 lbs/sq.ft. An expansion index of 6 was determined for the sample tested.

Field Density (Ring Density Method)

In-situ dry density and moisture content were determined in accordance with ASTM test methods D2937 and D2216 for soil samples collected from the exploratory excavations and boring. The results of our laboratory testing are tabulated on the table below.

<u>Location and Depth (Ft)</u>	<u>Soil Type</u>	<u>Dry Density (LBS/CU.FT)</u>	<u>Moisture (%)</u>	<u>Relative Density (%)</u>
TP-3@3'	Native Soil	94.0	29.5	75.2
TP-1@5'	Alluvium	115.0	14.5	92.0

Consolidation Test

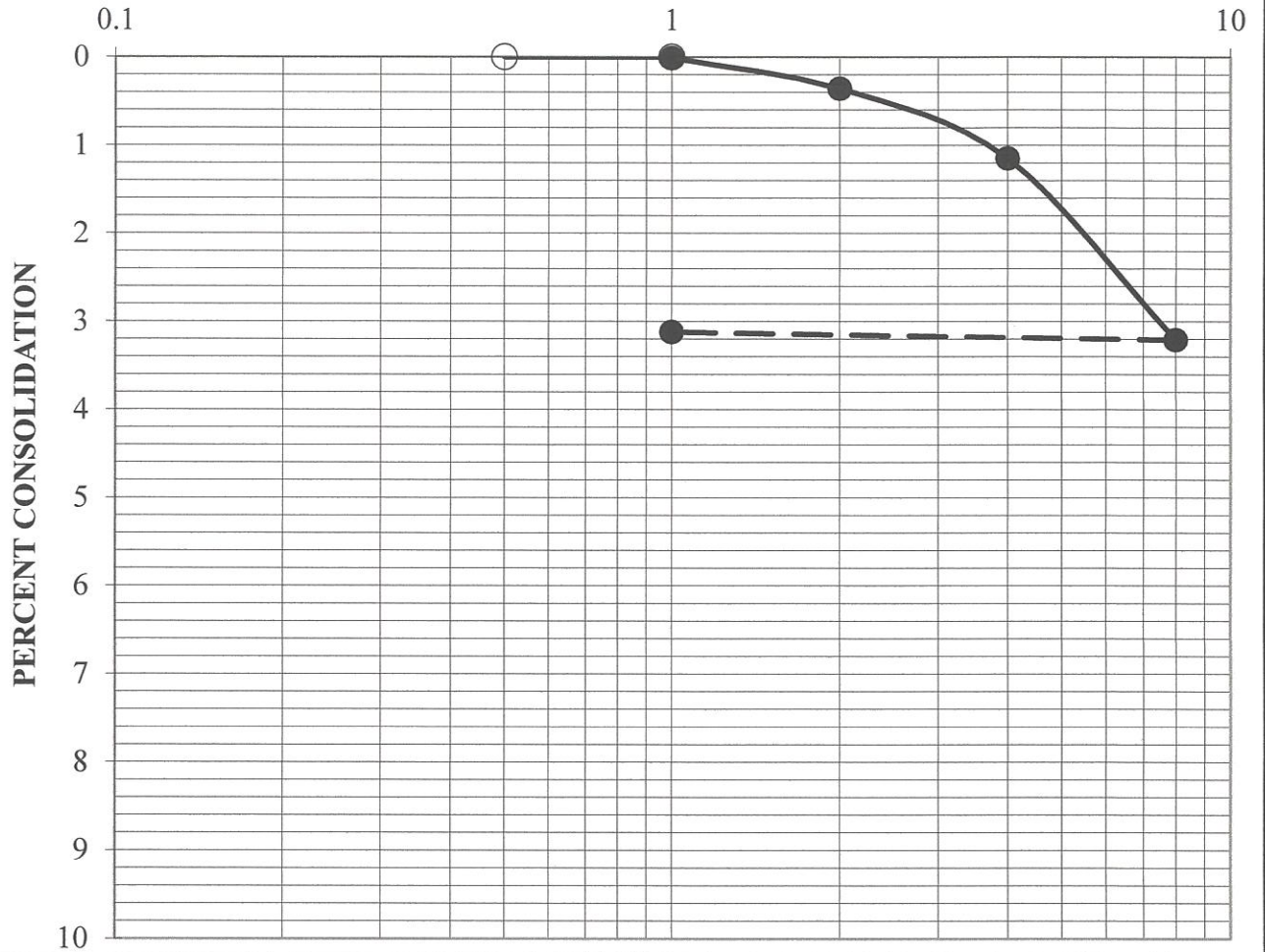
Consolidation tests were performed on in-situ samples in accordance with ASTM test methods D2435 for soil samples collected from the exploratory excavations. The results are included on Plate C-1.

Sieve Analysis

Sieve analysis tests were conducted on the on-site soils to determine the percent fines (% passing the #200 sieve) in general accordance with sieve analysis test procedure from ASTM Test Designation D422. This method covers the quantitative determination of the distribution of particle sizes in soils. The results are presented on the boring log for boring B-1, included as Plate 2.1 in Appendix II.

CONSOLIDATION TEST PLOT

NORMAL LOAD - kips per square foot



- sample at initial moisture content
- sample after saturation

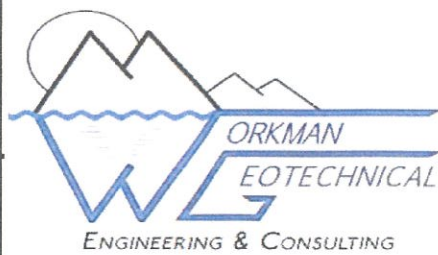
PROJECT	DATE
RWC, LLC	May-22
FILE NO.	PLATE
WE22-041299	C-1
TP-1 @ 5'	

APPENDIX II

FIGURES and PLATES



Base Map:
Google Earth (2022 Google)



SITE LOCATION MAP 4209 Carpinteria Avenue, Carpinteria	DATE 5/12/22
	FILE NO.: WE22-041299
FIGURE 1	



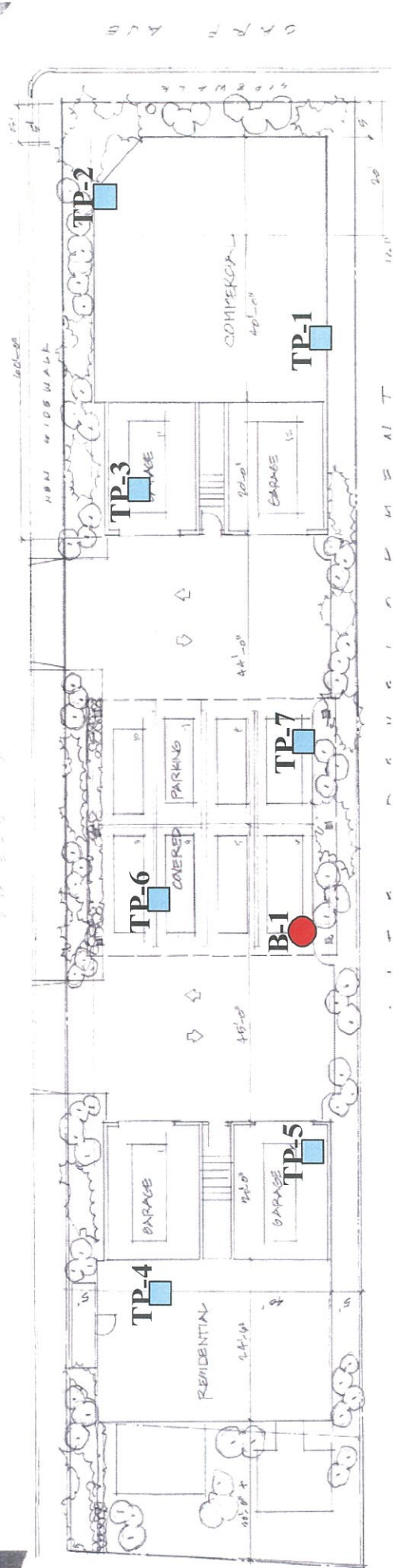
Geologic Map of the Carpinteria Quadrangle, Santa Barbara County, California 1986

Base Map:
Dibblee 1987



NORTH
Not to Scale

GEOLOGIC SITE LOCATION MAP	DATE 5/12/22
4209 Carpinteria Avenue, Carpinteria	FILE NO.: WE22-041299
FIGURE 2	



LEGEND

■ TP-7 Approximate Location of Test Pit

● B-1 Approximate Location of Exploratory Boring



NORTH
not to scale

Reference: Base Map Provided by RWC, LLC



Plot Plan

RWC, LLC

4209 Carpinteria Avenue, Carpinteria

FILE NO. WE22-041299

Plate 1



BORING LOG NO. 1

PLATE 2.1

PROJECT: RWC, LLC

FILE NO.: WE22-041299

ELEVATION: See Plate 1

DATE: 5/25/22

DRILLING RIG: 8" Hollow Stem Auger

DRILLING COMPANY: Choice Drilling

DEPTH (FT)	SAMPLES		BLOWCOUNT		SIEVE		IN-SITU		PLASTICITY INDEX	
	RING	SPT	FIELD N-VALUE	N(60)*	% PASSING # 200 SCREEN	% CLAY	MOISTURE %	DRY DENSITY		
0										Artificial Fill (0'-3'): Medium brown to light brown silty sand with gravel, poorly compacted, dry.
3										Native Soil (3'-4'): Brown to dark reddish brown silty sand, locally porous, slightly dense, moist to very moist.
4										Alluvium (4'-50'):
5		X		14.0	49.7				20.0	5': Groundwater stabilized. 5': Dark brown sandy clayey silt, medium dense, moist. 6': Groundwater encountered.
10		X		13.0	45.3				19.0	10': Medium to light brown silty clayey sand, medium dense, saturated.
15		X		21.0	46.6				NP	15': Light greenish to reddish brown clayey silty sand, medium dense to dense, saturated.
20		X		33.0	35.6				2.0	20': Light grayish brown slightly silty sand, dense, saturated.
25		X		15.0	69.9				7.0	25': Light grayish brown slightly silty sand, dense, saturated.
30		X		16.0	57.5				3.0	30': Medium grayish brown slightly clayey silty sand, dense, saturated.
35		X		11.0	56.4				13.0	35': Medium grayish brown clayey silty sand, dense, saturated.
40		X		19.0	37.1				NP	40': Dark grayish brown slightly silty sand, dense, saturated.
45		X		17.0	36.3				NP	45': Dark blueish gray slightly silty sand, dense, saturated.
50		X		26.0	26.0					50': Dark brown slightly brown slightly silty sand, dense, saturated.

COMMENTS: California Sampler was used for in-situ ring sampling.
SPT split tube with out liners used for SPT sampling.

TOTAL DEPTH: 50'
GROUND WATER: 5'

CAVING: NO
BACKFILLED: YES

WORKMAN GEOTECHNICAL

1141 East Main Street

Ventura, CA 93001

PROJECT : RWC, LLC TEST PIT LOG : TP-1 - TP-7
 FILE NO : WE22-041299 DATE : 5/6/22
 LOCATION : 4209 Carpinteria Avenue, Carpinteria LOGGED BY : JR

- 1. **Artificial Fill (Af):** Medium brown to light brown silty sand with gravel, poorly compacted, dry.
- 2. **Artificial Fill (Af):** Dark brown clayey silty sand, moderately compacted, moist.
- 3. **Native Soil (Ns):** Brown to dark reddish brown silty sand, locally porous, slightly dense, moist to very moist.
- 4. **Alluvium (Qa):** Brown to light brown clayey silty sand to silty sand, dense, very moist to saturated.

SCALE: 1"=5'

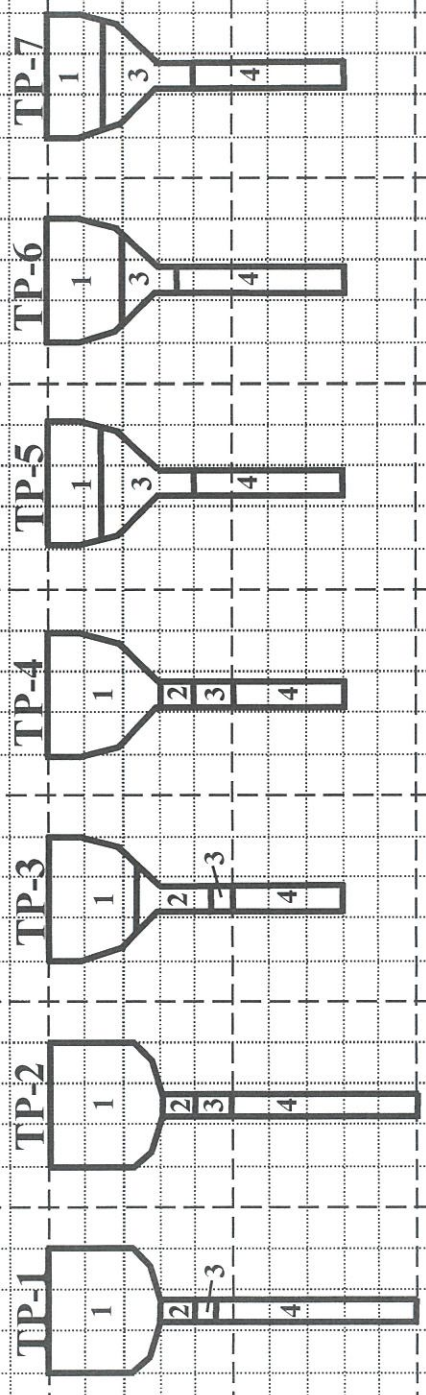


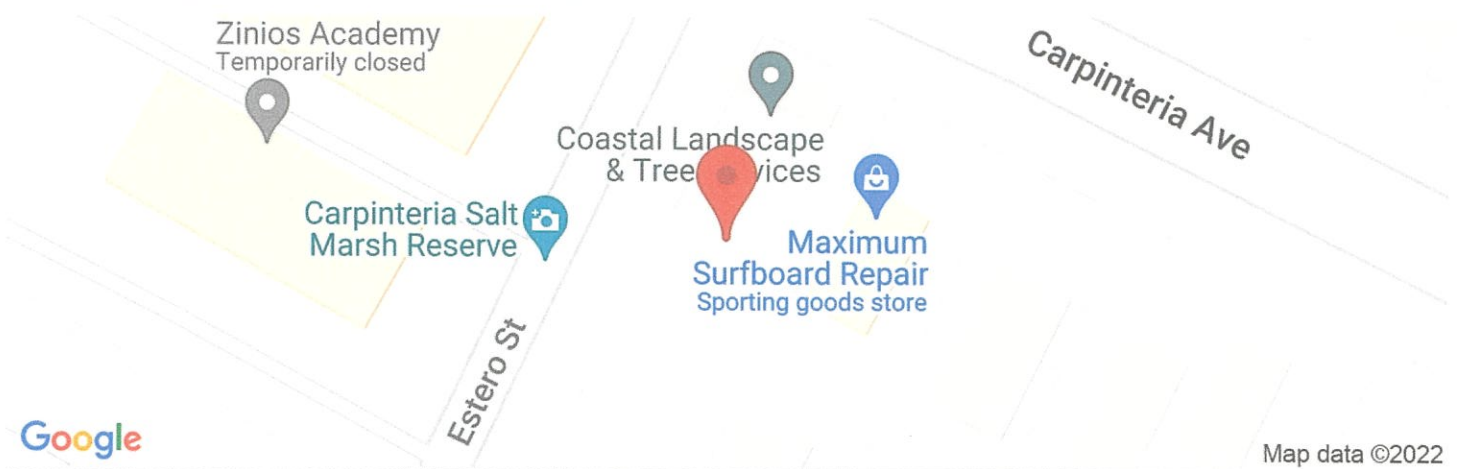
PLATE 3.1



1145 E. Main Street, Ventura, CA 93001



Latitude, Longitude: 34.40330554, -119.53281436



Date	6/6/2022, 10:41:54 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	2.266	MCE_R ground motion. (for 0.2 second period)
S_1	0.829	MCE_R ground motion. (for 1.0s period)
S_{MS}	2.266	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.51	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	1.003	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	1.103	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
$SsRT$	2.266	Probabilistic risk-targeted ground motion. (0.2 second)
$SsUH$	2.593	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.998	Factored deterministic acceleration value. (0.2 second)
$S1RT$	0.829	Probabilistic risk-targeted ground motion. (1.0 second)
$S1UH$	0.952	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S1D$	0.961	Factored deterministic acceleration value. (1.0 second)
$PGAd$	1.2	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.874	Mapped value of the risk coefficient at short periods
C_{R1}	0.87	Mapped value of the risk coefficient at a period of 1 s

Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr⁻¹
PGA ground motion: 1.0506047 g

Recovered targets

Return period: 2811.8235 yrs
Exceedance rate: 0.0003556411 yr⁻¹

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.05 %

Mean (over all sources)

m: 7.11
r: 5.74 km
 ϵ_0 : 1.18 σ

Mode (largest m-r bin)

m: 7.34
r: 4.79 km
 ϵ_0 : 0.96 σ
Contribution: 22.26 %

Mode (largest m-r- ϵ_0 bin)

m: 7.35
r: 4.21 km
 ϵ_0 : 0.74 σ
Contribution: 12.15 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
 ϵ : min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

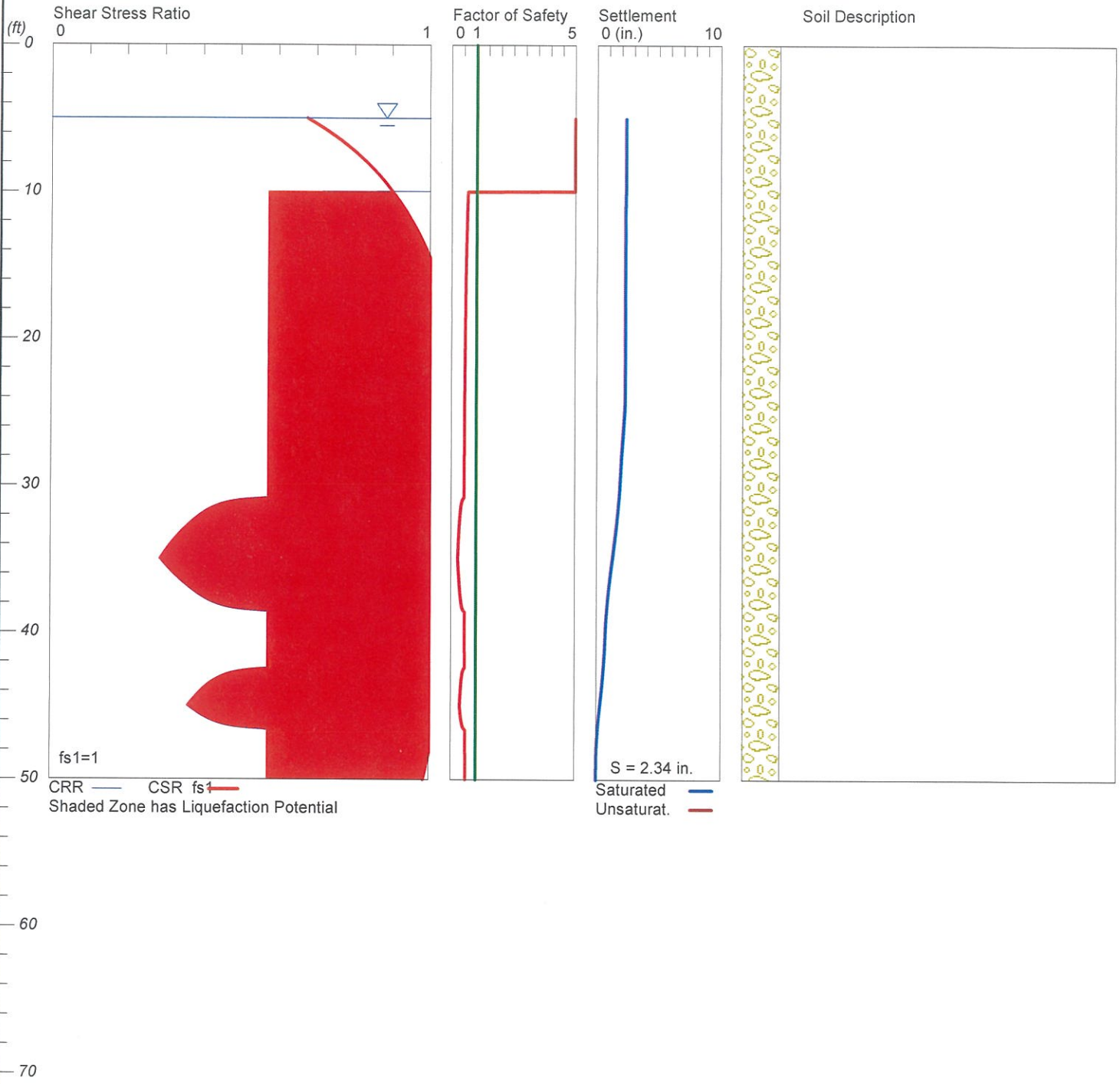
ϵ_0 : [-∞ .. -2.5)
 ϵ_1 : [-2.5 .. -2.0)
 ϵ_2 : [-2.0 .. -1.5)
 ϵ_3 : [-1.5 .. -1.0)
 ϵ_4 : [-1.0 .. -0.5)
 ϵ_5 : [-0.5 .. 0.0)
 ϵ_6 : [0.0 .. 0.5)
 ϵ_7 : [0.5 .. 1.0)
 ϵ_8 : [1.0 .. 1.5)
 ϵ_9 : [1.5 .. 2.0)
 ϵ_{10} : [2.0 .. 2.5)
 ϵ_{11} : [2.5 .. +∞]

LIQUEFACTION ANALYSIS

Finnigan

Hole No.=B-1 Water Depth=5 ft

Magnitude=7.11
Acceleration=1.05g



LiquefyPro CivilTech Software USA www.civiltch.com

*

LIQUEFACTION ANALYSIS SUMMARY
Copyright by CivilTech Software
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Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to Workman Geotechnical
Input File Name: C:\Liquefy5\Finnigan.4209CarpAve.liq
Title: Finnigan
Subtitle: 4209 Carpinteria Avenue

Surface Elev.=
Hole No.=B-1
Depth of Hole= 50.00 ft
Water Table during Earthquake= 5.00 ft
Water Table during In-Situ Testing= 5.00 ft
Max. Acceleration= 1.05 g
Earthquake Magnitude= 7.11

Input Data:

Surface Elev.=
Hole No.=B-1
Depth of Hole=50.00 ft
Water Table during Earthquake= 5.00 ft
Water Table during In-Situ Testing= 5.00 ft
Max. Acceleration=1.05 g
Earthquake Magnitude=7.11
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
 2. Settlement Analysis Method: Tokimatsu/Seed
 3. Fines Correction for Liquefaction: Stark/Olson et al.*
 4. Fine Correction for Settlement: During Liquefaction*
 5. Settlement Calculation in: All zones*
 6. Hammer Energy Ratio, Ce = 1.25
 7. Borehole Diameter, Cb= 1
 8. Sampling Method, Cs= 1.2
 9. User request factor of safety (apply to CSR) , User= 1
Plot one CSR curve (fs1=1)
 10. Use Curve Smoothing: Yes*
- * Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
5.00	14.00	120.00	NoLiq
10.00	13.00	120.00	NoLiq
15.00	21.00	120.00	47.00
20.00	33.00	120.00	36.00
25.00	15.00	120.00	70.00
30.00	16.00	120.00	58.00
35.00	11.00	120.00	56.00
40.00	19.00	120.00	37.00
45.00	17.00	120.00	26.00
50.00	26.00	120.00	26.00

Output Results:

Settlement of Saturated Sands=2.34 in.
 Settlement of Unsaturated Sands=0.00 in.
 Total Settlement of Saturated and Unsaturated Sands=2.34 in.
 Differential Settlement=1.172 to 1.547 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	2.00	0.67	5.00	2.34	0.00	2.34
5.05	2.00	0.68	5.00	2.34	0.00	2.34
5.10	2.00	0.68	5.00	2.34	0.00	2.34
5.15	2.00	0.68	5.00	2.34	0.00	2.34
5.20	2.00	0.69	5.00	2.34	0.00	2.34
5.25	2.00	0.69	5.00	2.34	0.00	2.34
5.30	2.00	0.69	5.00	2.34	0.00	2.34
5.35	2.00	0.70	5.00	2.34	0.00	2.34
5.40	2.00	0.70	5.00	2.34	0.00	2.34
5.45	2.00	0.70	5.00	2.34	0.00	2.34
5.50	2.00	0.71	5.00	2.34	0.00	2.34
5.55	2.00	0.71	5.00	2.34	0.00	2.34
5.60	2.00	0.71	5.00	2.34	0.00	2.34
5.65	2.00	0.72	5.00	2.34	0.00	2.34
5.70	2.00	0.72	5.00	2.34	0.00	2.34
5.75	2.00	0.72	5.00	2.34	0.00	2.34
5.80	2.00	0.73	5.00	2.34	0.00	2.34
5.85	2.00	0.73	5.00	2.34	0.00	2.34
5.90	2.00	0.73	5.00	2.34	0.00	2.34
5.95	2.00	0.73	5.00	2.34	0.00	2.34
6.00	2.00	0.74	5.00	2.34	0.00	2.34
6.05	2.00	0.74	5.00	2.34	0.00	2.34
6.10	2.00	0.74	5.00	2.34	0.00	2.34
6.15	2.00	0.75	5.00	2.34	0.00	2.34
6.20	2.00	0.75	5.00	2.34	0.00	2.34
6.25	2.00	0.75	5.00	2.34	0.00	2.34
6.30	2.00	0.75	5.00	2.34	0.00	2.34
6.35	2.00	0.76	5.00	2.34	0.00	2.34
6.40	2.00	0.76	5.00	2.34	0.00	2.34
6.45	2.00	0.76	5.00	2.34	0.00	2.34
6.50	2.00	0.76	5.00	2.34	0.00	2.34
6.55	2.00	0.77	5.00	2.34	0.00	2.34
6.60	2.00	0.77	5.00	2.34	0.00	2.34
6.65	2.00	0.77	5.00	2.34	0.00	2.34
6.70	2.00	0.77	5.00	2.34	0.00	2.34
6.75	2.00	0.78	5.00	2.34	0.00	2.34
6.80	2.00	0.78	5.00	2.34	0.00	2.34
6.85	2.00	0.78	5.00	2.34	0.00	2.34
6.90	2.00	0.78	5.00	2.34	0.00	2.34
6.95	2.00	0.79	5.00	2.34	0.00	2.34
7.00	2.00	0.79	5.00	2.34	0.00	2.34
7.05	2.00	0.79	5.00	2.34	0.00	2.34
7.10	2.00	0.79	5.00	2.34	0.00	2.34
7.15	2.00	0.80	5.00	2.34	0.00	2.34
7.20	2.00	0.80	5.00	2.34	0.00	2.34
7.25	2.00	0.80	5.00	2.34	0.00	2.34
7.30	2.00	0.80	5.00	2.34	0.00	2.34
7.35	2.00	0.80	5.00	2.34	0.00	2.34
7.40	2.00	0.81	5.00	2.34	0.00	2.34
7.45	2.00	0.81	5.00	2.34	0.00	2.34
7.50	2.00	0.81	5.00	2.34	0.00	2.34

7.55	2.00	0.81	5.00	2.34	0.00	2.34
7.60	2.00	0.82	5.00	2.34	0.00	2.34
7.65	2.00	0.82	5.00	2.34	0.00	2.34
7.70	2.00	0.82	5.00	2.34	0.00	2.34
7.75	2.00	0.82	5.00	2.34	0.00	2.34
7.80	2.00	0.82	5.00	2.34	0.00	2.34
7.85	2.00	0.83	5.00	2.34	0.00	2.34
7.90	2.00	0.83	5.00	2.34	0.00	2.34
7.95	2.00	0.83	5.00	2.34	0.00	2.34
8.00	2.00	0.83	5.00	2.34	0.00	2.34
8.05	2.00	0.83	5.00	2.34	0.00	2.34
8.10	2.00	0.84	5.00	2.34	0.00	2.34
8.15	2.00	0.84	5.00	2.34	0.00	2.34
8.20	2.00	0.84	5.00	2.34	0.00	2.34
8.25	2.00	0.84	5.00	2.34	0.00	2.34
8.30	2.00	0.84	5.00	2.34	0.00	2.34
8.35	2.00	0.85	5.00	2.34	0.00	2.34
8.40	2.00	0.85	5.00	2.34	0.00	2.34
8.45	2.00	0.85	5.00	2.34	0.00	2.34
8.50	2.00	0.85	5.00	2.34	0.00	2.34
8.55	2.00	0.85	5.00	2.34	0.00	2.34
8.60	2.00	0.85	5.00	2.34	0.00	2.34
8.65	2.00	0.86	5.00	2.34	0.00	2.34
8.70	2.00	0.86	5.00	2.34	0.00	2.34
8.75	2.00	0.86	5.00	2.34	0.00	2.34
8.80	2.00	0.86	5.00	2.34	0.00	2.34
8.85	2.00	0.86	5.00	2.34	0.00	2.34
8.90	2.00	0.87	5.00	2.34	0.00	2.34
8.95	2.00	0.87	5.00	2.34	0.00	2.34
9.00	2.00	0.87	5.00	2.34	0.00	2.34
9.05	2.00	0.87	5.00	2.34	0.00	2.34
9.10	2.00	0.87	5.00	2.34	0.00	2.34
9.15	2.00	0.87	5.00	2.34	0.00	2.34
9.20	2.00	0.88	5.00	2.34	0.00	2.34
9.25	2.00	0.88	5.00	2.34	0.00	2.34
9.30	2.00	0.88	5.00	2.34	0.00	2.34
9.35	2.00	0.88	5.00	2.34	0.00	2.34
9.40	2.00	0.88	5.00	2.34	0.00	2.34
9.45	2.00	0.88	5.00	2.34	0.00	2.34
9.50	2.00	0.89	5.00	2.34	0.00	2.34
9.55	2.00	0.89	5.00	2.34	0.00	2.34
9.60	2.00	0.89	5.00	2.34	0.00	2.34
9.65	2.00	0.89	5.00	2.34	0.00	2.34
9.70	2.00	0.89	5.00	2.34	0.00	2.34
9.75	2.00	0.89	5.00	2.34	0.00	2.34
9.80	2.00	0.89	5.00	2.34	0.00	2.34
9.85	2.00	0.90	5.00	2.34	0.00	2.34
9.90	2.00	0.90	5.00	2.34	0.00	2.34
9.95	2.00	0.90	5.00	2.34	0.00	2.34
10.00	0.57	0.90	0.64*	2.34	0.00	2.34
10.05	0.57	0.90	0.64*	2.34	0.00	2.34
10.10	0.57	0.90	0.63*	2.34	0.00	2.34
10.15	0.57	0.91	0.63*	2.34	0.00	2.34
10.20	0.57	0.91	0.63*	2.34	0.00	2.34
10.25	0.57	0.91	0.63*	2.34	0.00	2.34
10.30	0.57	0.91	0.63*	2.34	0.00	2.34
10.35	0.57	0.91	0.63*	2.34	0.00	2.34
10.40	0.57	0.91	0.63*	2.34	0.00	2.34
10.45	0.57	0.91	0.63*	2.33	0.00	2.33
10.50	0.57	0.92	0.63*	2.33	0.00	2.33
10.55	0.57	0.92	0.63*	2.33	0.00	2.33