



SOILS SOUTHWEST, INC.

SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS

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Project No. 23049-APPL

ASG Development Advisors
c/o Mr. Nasser Mustafa, President
21602 Surveyor Circle, Suite 100
Huntington Beach, California 92646

Subject: Opinion Letter-Applicability of the Existing Soils Report with
Updated Seismic Design Parameters as per 2022 CBC
Proposed Office/Warehouse Building
Vineyard Avenue
Rialto, San Bernardino, CA

Reference: Report of Geotechnical Exploration
Prepared by Leighton Consulting, Inc., dated November 30, 2017

Gentlemen:

Based on recent site visit, since no evidence is noted of new fill soils placement, or new cut to the grades that were used in the referenced soils report, it is our opinion that the referenced Report of Geotechnical Exploration, dated November 30, 2017 should be considered valid and applicable with the revised seismic design parameters as per 2022 CBC as attached. No supplemental geotechnical investigation or evaluation should be warranted.

Respectfully submitted,
Soils Southwest, Inc.

Malay Gupta, RCE 31708



Updated Seismic Design Parameters as per 2022 CBC

Based on current available seismic data, the San Jacinto-San Bernardino fault is located at approximately 2.67 miles from the subject site. The design spectrum was developed based on the 2022 CBC. Site Coordinates of latitude 34.14102° and longitude -117.40649°.

Seismic Design Coefficients

The San Jacinto-San Bernardino fault capable of generating an earthquake magnitude $M = 7.8$ and Peak Horizontal Ground Acceleration, PGA_M of 0.984g for foundation and structural design, the following seismic parameters are suggested based on the current 2022 CBC:

Recommended values are based upon the USGS ASCE 7-Hazard Reports Parameters and the California Geologic Survey: PSHA Ground Motion Interpolator Supplemental seismic parameters are provided in Appendix C of this report. The following presents the seismic design parameters as based on the available publications as currently published by the California Geological Survey and 2022 CBC. Supplemental seismic parameters are shown in Appendix A.

Seismic Design Parameters

CBC Chapter 16	2022 ASCE 7-16 Standard Seismic Design Parameters	Recommended Values
1613A.3.2	Site Class	D
1613A.3.1	The mapped spectral accelerations at short period	S_s
1613A.3.1	The mapped spectral accelerations at 1.0-second period	S_1
1613A.3.3(1)	Seismic Coefficient, S_s	2.179 g
1613A.3.3(2)	Seismic Coefficient, S_1	0.787 g
1613A.3.3(1)	Site Class D / Seismic Coefficient, F_a	1.000 g
1613A.3.3(2)	Site Class D / Seismic Coefficient, F_v	N/A
16A-37 Equation	Spectral Response Accelerations, $S_{Ms} = F_a S_s$	2.179 g
16A-38 Equation	Spectral Response Accelerations, $S_{M1} = F_v S_1$	N/A
16A-39 Equation	Design Spectral Response Accelerations, $S_{Ds} = 2/3 \times S_{Ms}$	1.453 g
16A-40 Equation	Design Spectral Response Accelerations, $S_{D1} = 2/3 \times S_{M1}$	N/A

Seismic Source Type

Based on California Geological Survey-PSHA Ground Motion Interpolator for Peak Horizontal Ground Acceleration (PGA) having a 10% probability of exceedance in a 50-year period is described as below:

Seismic Source Type / Appendix C	
Nearest Maximum Fault Magnitude	$M \geq 7.8$
Peak Horizontal Ground Acceleration (PGA_M)	0.984g

In design, vertical acceleration may be assumed to approximately 1/3 to 2/3 of the estimated horizontal ground accelerations described.

It should be noted that lateral force requirement in design by structural engineer should be intended to resist total structural collapse due to the described PGA_M of 0.984g or greater. However, during lifetime use of the improvements planned, it is our opinion that some structural damage may be anticipated requiring minor repair.

APPENDIX A

Supplemental Seismic Design Parameters



ASCE 7 Hazards Report

Address:

No Address at This Location

Standard:

ASCE/SEI 7-16

Latitude:

34.14101

Risk Category: III**Longitude:**

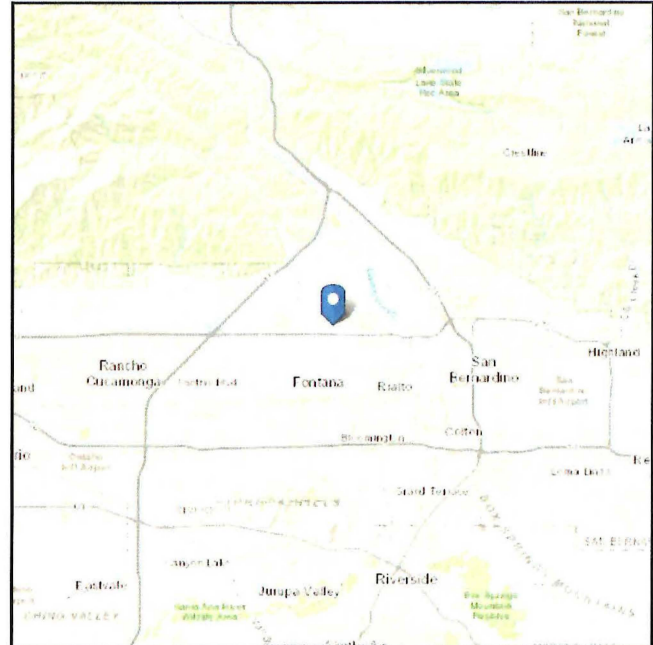
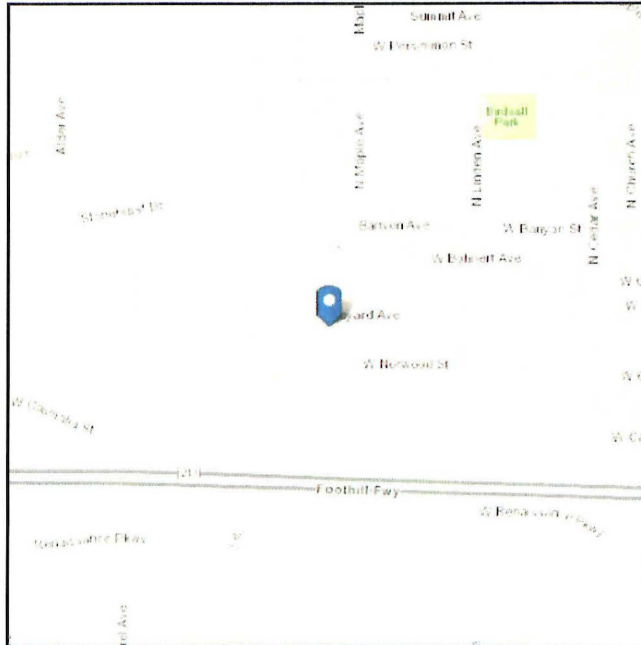
-117.40649

Soil Class:

D - Stiff Soil

Elevation:

1529.413407372986 ft
(NAVD 88)



Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	2.179	S_{D1} :	N/A
S_1 :	0.787	T_L :	12
F_a :	1	PGA :	0.895
F_v :	N/A	PGA _M :	0.984
S_{MS} :	2.179	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1.453	C_v :	1.5

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

Data Accessed: Wed Jul 05 2023

Date Source: [USGS Seismic Design Maps](#)

2008 National Seismic Hazard Maps – Source Parameters

[New Search](#)

Distance in Miles	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
2.67	San Jacinto;SBV+SJV+A+C	CA	n/a	90	V	strike slip	0	17	181
2.67	San Jacinto;SBV+SJV+A+CC+B+SM	CA	n/a	90	V	strike slip	0.1	15	241
2.67	San Jacinto;SBV+SJV	CA	n/a	90	V	strike slip	0	16	88
2.67	San Jacinto;SBV	CA	6	90	V	strike slip	0	16	45
2.67	San Jacinto;SBV+SJV+A+CC+B	CA	n/a	90	V	strike slip	0.1	15	215
2.67	San Jacinto;SBV+SJV+A+CC	CA	n/a	90	V	strike slip	0	16	181
2.67	San Jacinto;SBV+SJV+A	CA	n/a	90	V	strike slip	0	16	134
3.41	Cucamonga	CA	5	45	N	thrust	0	8	28
5.89	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
5.89	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
5.89	S. San Andreas;NSB+SSB+BG+CO	CA	n/a	79		strike slip	0.2	12	206
5.89	S. San Andreas;NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	13	213
5.89	S. San Andreas;NM+SM+NSB+SSB+BG	CA	n/a	83		strike slip	0	14	271
5.89	S. San Andreas;NM+SM+NSB+SSB+BG+CO	CA	n/a	84		strike slip	0.1	13	340
5.89	S. San Andreas;NSB	CA	22	90	V	strike slip	0	13	35
5.89	S. San Andreas;NSB+SSB	CA	n/a	90	V	strike slip	0	13	79

Fault Name

California

GEOMETRY

90

V

strike slip

0

17

180

181

MODEL VALUES

n/a

1

ELLSWORTH

HANKS

6.5

6.5

7.73

7.78

0.8

0.8

Fault Model	Deformation Model	Char Rate ¹	GR-a-value ¹	Weight
A priori	2.1	1.13e-03 / 1.13e-03	NA / NA	0.50
Moment Balanced	2.1	4.81e-04 / 4.81e-04	NA / NA	0.25
Moment Balanced	2.2	4.81e-04 / 4.81e-04	NA / NA	0.10
Moment Balanced	2.3	4.81e-04 / 4.81e-04	NA / NA	0.15

¹ 1st Value is based on Ellsworth relation and 2nd value is based on Hanks and Bakun relation