3.4 Building Construction - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.03	0.34	0.22	0.00	0.02	0.01	0.03	0.00	0.01	0.01		55.35		0.00		55.38
Worker	0.09	0.09	1.01	0.00	0.20	0.01	0.21	0.01	0.01	0.01		167.03		0.01		167.24
Total	**0.12**	**0.43**	**1.23**	**0.00**	**0.22**	**0.02**	**0.24**	**0.01**	**0.02**	**0.02**		**222.38**		**0.01**		**222.62**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.20	16.33	10.77	0.02		1.04	1.04		1.04	1.04	0.00	1,945.40		0.20		1,949.52
Total	**2.20**	**16.33**	**10.77**	**0.02**		**1.04**	**1.04**		**1.04**	**1.04**	**0.00**	**1,945.40**		**0.20**		**1,949.52**

3.4 Building Construction - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.03	0.34	0.22	0.00	0.02	0.01	0.03	0.00	0.01	0.01		55.35		0.00		55.38
Worker	0.09	0.09	1.01	0.00	0.20	0.01	0.21	0.01	0.01	0.01		167.03		0.01		167.24
Total	**0.12**	**0.43**	**1.23**	**0.00**	**0.22**	**0.02**	**0.24**	**0.01**	**0.02**	**0.02**		**222.38**		**0.01**		**222.62**

3.5 Architectural Coating - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.77					0.00	0.00		0.00	0.00						0.00
Off-Road	0.49	2.96	1.94	0.00		0.27	0.27		0.27	0.27		281.19		0.04		282.10
Total	**4.26**	**2.96**	**1.94**	**0.00**		**0.27**	**0.27**		**0.27**	**0.27**		**281.19**		**0.04**		**282.10**

3.5 Architectural Coating - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.02	0.02	0.23	0.00	0.05	0.00	0.05	0.00	0.00	0.00		38.55		0.00		38.59
Total	**0.02**	**0.02**	**0.23**	**0.00**	**0.05**	**0.00**	**0.05**	**0.00**	**0.00**	**0.00**		**38.55**		**0.00**		**38.59**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.77					0.00	0.00		0.00	0.00						0.00
Off-Road	0.49	2.96	1.94	0.00		0.27	0.27		0.27	0.27	0.00	281.19		0.04		282.10
Total	**4.26**	**2.96**	**1.94**	**0.00**		**0.27**	**0.27**		**0.27**	**0.27**	**0.00**	**281.19**		**0.04**		**282.10**

3.5 Architectural Coating - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.02	0.02	0.23	0.00	0.05	0.00	0.05	0.00	0.00	0.00		38.55		0.00		38.59
Total	**0.02**	**0.02**	**0.23**	**0.00**	**0.05**	**0.00**	**0.05**	**0.00**	**0.00**	**0.00**		**38.55**		**0.00**		**38.59**

3.6 Paving - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.32	14.52	9.76	0.02		1.20	1.20		1.20	1.20		1,408.52		0.21		1,412.88
Paving	0.00					0.00	0.00		0.00	0.00						0.00
Total	**2.32**	**14.52**	**9.76**	**0.02**		**1.20**	**1.20**		**1.20**	**1.20**		**1,408.52**		**0.21**		**1,412.88**

3.6 Paving - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.12	0.12	1.40	0.00	0.28	0.01	0.29	0.01	0.01	0.02		231.27		0.01		231.56
Total	**0.12**	**0.12**	**1.40**	**0.00**	**0.28**	**0.01**	**0.29**	**0.01**	**0.01**	**0.02**		**231.27**		**0.01**		**231.56**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.32	14.52	9.76	0.02		1.20	1.20		1.20	1.20	0.00	1,408.52		0.21		1,412.88
Paving	0.00					0.00	0.00		0.00	0.00						0.00
Total	**2.32**	**14.52**	**9.76**	**0.02**		**1.20**	**1.20**		**1.20**	**1.20**	**0.00**	**1,408.52**		**0.21**		**1,412.88**

3.6 Paving - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.12	0.12	1.40	0.00	0.28	0.01	0.29	0.01	0.01	0.02		231.27		0.01		231.56
Total	**0.12**	**0.12**	**1.40**	**0.00**	**0.28**	**0.01**	**0.29**	**0.01**	**0.01**	**0.02**		**231.27**		**0.01**		**231.56**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.82	2.03	8.31	0.01	1.42	0.09	1.51	0.05	0.09	0.14		1,381.31		0.07		1,382.86
Unmitigated	0.82	2.03	8.31	0.01	1.42	0.09	1.51	0.05	0.09	0.14		1,381.31		0.07		1,382.86
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	118.62	128.88	109.26	395,501	395,501
Total	118.62	128.88	109.26	395,501	395,501

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Condo/Townhouse	12.70	7.00	9.50	40.20	19.20	40.60

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
NaturalGas Unmitigated	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
Condo/Townhouse	1263.52	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Total		**0.01**	**0.12**	**0.05**	**0.00**		**0.00**	**0.01**		**0.00**	**0.01**		**148.65**		**0.00**	**0.00**	**149.55**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
Condo/Townhouse	1.26352	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Total		**0.01**	**0.12**	**0.05**	**0.00**		**0.00**	**0.01**		**0.00**	**0.01**		**148.65**		**0.00**	**0.00**	**149.55**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.87	0.11	7.51	0.01		0.00	0.96		0.00	0.96	127.02	326.71		0.51	0.01	466.76
Unmitigated	2.87	0.11	7.51	0.01		0.00	0.96		0.00	0.96	127.02	326.71		0.51	0.01	466.76
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.09					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.81					0.00	0.00		0.00	0.00						0.00
Hearth	1.92	0.09	5.96	0.01		0.00	0.95		0.00	0.95	127.02	324.00		0.50	0.01	463.99
Landscaping	0.05	0.02	1.55	0.00		0.00	0.01		0.00	0.01		2.71		0.00		2.77
Total	**2.87**	**0.11**	**7.51**	**0.01**		**0.00**	**0.96**		**0.00**	**0.96**	**127.02**	**326.71**		**0.50**	**0.01**	**466.76**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.09					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.81					0.00	0.00		0.00	0.00						0.00
Hearth	1.92	0.09	5.96	0.01		0.00	0.95		0.00	0.95	127.02	324.00		0.50	0.01	463.99
Landscaping	0.05	0.02	1.55	0.00		0.00	0.01		0.00	0.01		2.71		0.00		2.77
Total	**2.87**	**0.11**	**7.51**	**0.01**		**0.00**	**0.96**		**0.00**	**0.96**	**127.02**	**326.71**		**0.50**	**0.01**	**466.76**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

Hilel Townhomes

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Condo/Townhouse	18	Dwelling Unit

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Utility Company**	Southern California Edison
Climate Zone	8	**Precipitation Freq (Days)**	33		

1.3 User Entered Comments

Project Characteristics -

Land Use - 0.94 acre ; 41,039 square feet

Construction Phase - Painting to occur simultaneous with building construction on completed already completed structures.

Construction Off-road Equipment Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	6.73	19.76	14.14	0.03	0.91	1.48	1.95	0.42	1.48	1.49	0.00	2,472.00	0.00	0.27	0.00	2,477.60
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	6.73	19.76	14.14	0.03	0.43	1.48	1.80	0.16	1.48	1.49	0.00	2,472.00	0.00	0.27	0.00	2,477.60
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.87	0.11	7.51	0.01		0.00	0.96		0.00	0.96	127.02	326.71		0.51	0.01	466.76
Energy	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Mobile	0.87	2.22	8.17	0.01	1.42	0.09	1.51	0.05	0.09	0.14		1,296.97		0.07		1,298.33
Total	**3.75**	**2.45**	**15.73**	**0.02**	**1.42**	**0.09**	**2.48**	**0.05**	**0.09**	**1.11**	**127.02**	**1,772.33**		**0.58**	**0.01**	**1,914.64**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.87	0.11	7.51	0.01		0.00	0.96		0.00	0.96	127.02	326.71		0.51	0.01	466.76
Energy	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Mobile	0.87	2.22	8.17	0.01	1.42	0.09	1.51	0.05	0.09	0.14		1,296.97		0.07		1,298.33
Total	**3.75**	**2.45**	**15.73**	**0.02**	**1.42**	**0.09**	**2.48**	**0.05**	**0.09**	**1.11**	**127.02**	**1,772.33**		**0.58**	**0.01**	**1,914.64**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

3.2 Site Preparation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.53	0.00	0.53	0.00	0.00	0.00						0.00
Off-Road	1.72	12.58	8.68	0.01		0.81	0.81		0.81	0.81		1,402.64		0.15		1,405.88
Total	**1.72**	**12.58**	**8.68**	**0.01**	**0.53**	**0.81**	**1.34**	**0.00**	**0.81**	**0.81**		**1,402.64**		**0.15**		**1,405.88**

3.2 Site Preparation - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.04	0.04	0.37	0.00	0.08	0.00	0.08	0.00	0.00	0.01		59.52		0.00		59.59
Total	**0.04**	**0.04**	**0.37**	**0.00**	**0.08**	**0.00**	**0.08**	**0.00**	**0.00**	**0.01**		**59.52**		**0.00**		**59.59**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.20	0.00	0.20	0.00	0.00	0.00						0.00
Off-Road	1.72	12.58	8.68	0.01		0.81	0.81		0.81	0.81	0.00	1,402.64		0.15		1,405.88
Total	**1.72**	**12.58**	**8.68**	**0.01**	**0.20**	**0.81**	**1.01**	**0.00**	**0.81**	**0.81**	**0.00**	**1,402.64**		**0.15**		**1,405.88**

3.2 Site Preparation - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.04	0.04	0.37	0.00	0.08	0.00	0.08	0.00	0.00	0.01		59.52		0.00		59.59
Total	**0.04**	**0.04**	**0.37**	**0.00**	**0.08**	**0.00**	**0.08**	**0.00**	**0.00**	**0.01**		**59.52**		**0.00**		**59.59**

3.3 Grading - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.75	0.00	0.75	0.41	0.00	0.41						0.00
Off-Road	2.00	13.91	9.51	0.02		1.04	1.04		1.04	1.04		1,476.12		0.18		1,479.88
Total	**2.00**	**13.91**	**9.51**	**0.02**	**0.75**	**1.04**	**1.79**	**0.41**	**1.04**	**1.45**		**1,476.12**		**0.18**		**1,479.88**

3.3 Grading - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.07	0.08	0.74	0.00	0.15	0.01	0.16	0.01	0.01	0.01		119.03		0.01		119.19
Total	**0.07**	**0.08**	**0.74**	**0.00**	**0.15**	**0.01**	**0.16**	**0.01**	**0.01**	**0.01**		**119.03**		**0.01**		**119.19**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.28	0.00	0.28	0.15	0.00	0.15						0.00
Off-Road	2.00	13.91	9.51	0.02		1.04	1.04		1.04	1.04	0.00	1,476.12		0.18		1,479.88
Total	**2.00**	**13.91**	**9.51**	**0.02**	**0.28**	**1.04**	**1.32**	**0.15**	**1.04**	**1.19**	**0.00**	**1,476.12**		**0.18**		**1,479.88**

3.3 Grading - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.07	0.08	0.74	0.00	0.15	0.01	0.16	0.01	0.01	0.01		119.03		0.01		119.19
Total	**0.07**	**0.08**	**0.74**	**0.00**	**0.15**	**0.01**	**0.16**	**0.01**	**0.01**	**0.01**		**119.03**		**0.01**		**119.19**

3.4 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.20	16.33	10.77	0.02		1.04	1.04		1.04	1.04		1,945.40		0.20		1,949.52
Total	**2.20**	**16.33**	**10.77**	**0.02**		**1.04**	**1.04**		**1.04**	**1.04**		**1,945.40**		**0.20**		**1,949.52**

3.4 Building Construction - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.03	0.36	0.25	0.00	0.02	0.01	0.03	0.00	0.01	0.01		54.96		0.00		54.99
Worker	0.09	0.10	0.96	0.00	0.20	0.01	0.21	0.01	0.01	0.01		154.74		0.01		154.94
Total	**0.12**	**0.46**	**1.21**	**0.00**	**0.22**	**0.02**	**0.24**	**0.01**	**0.02**	**0.02**		**209.70**		**0.01**		**209.93**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.20	16.33	10.77	0.02		1.04	1.04		1.04	1.04	0.00	1,945.40		0.20		1,949.52
Total	**2.20**	**16.33**	**10.77**	**0.02**		**1.04**	**1.04**		**1.04**	**1.04**	**0.00**	**1,945.40**		**0.20**		**1,949.52**

3.4 Building Construction - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.03	0.36	0.25	0.00	0.02	0.01	0.03	0.00	0.01	0.01		54.96		0.00		54.99
Worker	0.09	0.10	0.96	0.00	0.20	0.01	0.21	0.01	0.01	0.01		154.74		0.01		154.94
Total	**0.12**	**0.46**	**1.21**	**0.00**	**0.22**	**0.02**	**0.24**	**0.01**	**0.02**	**0.02**		**209.70**		**0.01**		**209.93**

3.5 Architectural Coating - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.77					0.00	0.00		0.00	0.00						0.00
Off-Road	0.49	2.96	1.94	0.00		0.27	0.27		0.27	0.27		281.19		0.04		282.10
Total	**4.26**	**2.96**	**1.94**	**0.00**		**0.27**	**0.27**		**0.27**	**0.27**		**281.19**		**0.04**		**282.10**

3.5 Architectural Coating - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.02	0.02	0.22	0.00	0.05	0.00	0.05	0.00	0.00	0.00		35.71		0.00		35.76
Total	**0.02**	**0.02**	**0.22**	**0.00**	**0.05**	**0.00**	**0.05**	**0.00**	**0.00**	**0.00**		**35.71**		**0.00**		**35.76**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.77					0.00	0.00		0.00	0.00						0.00
Off-Road	0.49	2.96	1.94	0.00		0.27	0.27		0.27	0.27	0.00	281.19		0.04		282.10
Total	**4.26**	**2.96**	**1.94**	**0.00**		**0.27**	**0.27**		**0.27**	**0.27**	**0.00**	**281.19**		**0.04**		**282.10**

3.5 Architectural Coating - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.02	0.02	0.22	0.00	0.05	0.00	0.05	0.00	0.00	0.00		35.71		0.00		35.76
Total	**0.02**	**0.02**	**0.22**	**0.00**	**0.05**	**0.00**	**0.05**	**0.00**	**0.00**	**0.00**		**35.71**		**0.00**		**35.76**

3.6 Paving - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.32	14.52	9.76	0.02		1.20	1.20		1.20	1.20		1,408.52		0.21		1,412.88
Paving	0.00					0.00	0.00		0.00	0.00						0.00
Total	**2.32**	**14.52**	**9.76**	**0.02**		**1.20**	**1.20**		**1.20**	**1.20**		**1,408.52**		**0.21**		**1,412.88**

3.6 Paving - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.13	0.14	1.33	0.00	0.28	0.01	0.29	0.01	0.01	0.02		214.26		0.01		214.54
Total	**0.13**	**0.14**	**1.33**	**0.00**	**0.28**	**0.01**	**0.29**	**0.01**	**0.01**	**0.02**		**214.26**		**0.01**		**214.54**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.32	14.52	9.76	0.02		1.20	1.20		1.20	1.20	0.00	1,408.52		0.21		1,412.88
Paving	0.00					0.00	0.00		0.00	0.00						0.00
Total	**2.32**	**14.52**	**9.76**	**0.02**		**1.20**	**1.20**		**1.20**	**1.20**	**0.00**	**1,408.52**		**0.21**		**1,412.88**

3.6 Paving - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.13	0.14	1.33	0.00	0.28	0.01	0.29	0.01	0.01	0.02		214.26		0.01		214.54
Total	**0.13**	**0.14**	**1.33**	**0.00**	**0.28**	**0.01**	**0.29**	**0.01**	**0.01**	**0.02**		**214.26**		**0.01**		**214.54**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.87	2.22	8.17	0.01	1.42	0.09	1.51	0.05	0.09	0.14		1,296.97		0.07		1,298.33
Unmitigated	0.87	2.22	8.17	0.01	1.42	0.09	1.51	0.05	0.09	0.14		1,296.97		0.07		1,298.33
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	118.62	128.88	109.26	395,501	395,501
Total	118.62	128.88	109.26	395,501	395,501

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Condo/Townhouse	12.70	7.00	9.50	40.20	19.20	40.60

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
NaturalGas Unmitigated	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
Condo/Townhouse	1263.52	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Total		**0.01**	**0.12**	**0.05**	**0.00**		**0.00**	**0.01**		**0.00**	**0.01**		**148.65**		**0.00**	**0.00**	**149.55**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
Condo/Townhouse	1.26352	0.01	0.12	0.05	0.00		0.00	0.01		0.00	0.01		148.65		0.00	0.00	149.55
Total		**0.01**	**0.12**	**0.05**	**0.00**		**0.00**	**0.01**		**0.00**	**0.01**		**148.65**		**0.00**	**0.00**	**149.55**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.87	0.11	7.51	0.01		0.00	0.96		0.00	0.96	127.02	326.71		0.51	0.01	466.76
Unmitigated	2.87	0.11	7.51	0.01		0.00	0.96		0.00	0.96	127.02	326.71		0.51	0.01	466.76
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.09					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.81					0.00	0.00		0.00	0.00						0.00
Hearth	1.92	0.09	5.96	0.01		0.00	0.95		0.00	0.95	127.02	324.00		0.50	0.01	463.99
Landscaping	0.05	0.02	1.55	0.00		0.00	0.01		0.00	0.01		2.71		0.00		2.77
Total	**2.87**	**0.11**	**7.51**	**0.01**		**0.00**	**0.96**		**0.00**	**0.96**	**127.02**	**326.71**		**0.50**	**0.01**	**466.76**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.09					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.81					0.00	0.00		0.00	0.00						0.00
Hearth	1.92	0.09	5.96	0.01		0.00	0.95		0.00	0.95	127.02	324.00		0.50	0.01	463.99
Landscaping	0.05	0.02	1.55	0.00		0.00	0.01		0.00	0.01		2.71		0.00		2.77
Total	**2.87**	**0.11**	**7.51**	**0.01**		**0.00**	**0.96**		**0.00**	**0.96**	**127.02**	**326.71**		**0.50**	**0.01**	**466.76**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

Greenhouse Gas Emission Worksheet

N20 Mobile Emissions Hilel Townhomes

From CalEEMod Vehicle Fleet Mix Output:

Annual VMT: 395,501

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)*	CH4 Emission (g/mile)**	N2O Emission Factor (g/mile)*	N2O Emission (g/mile)**
Light Auto	48.6%	0.04	0.01944	0.04	0.01944
Light Truck < 3750 lbs	10.9%	0.05	0.00545	0.06	0.00654
Light Truck 3751-5750 lbs	21.8%	0.05	0.0109	0.06	0.01308
Med Truck 5751-8500 lbs	9.6%	0.12	0.01152	0.2	0.0192
Lite-Heavy Truck 8501-10,000 lbs	1.7%	0.12	0.00204	0.2	0.0034
Lite-Heavy Truck 10,001-14,000 lbs	0.7%	0.09	0.00063	0.125	0.000875
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.06	0.0006	0.05	0.0005
Heavy-Heavy Truck 33,001-60,000 lbs	0.9%	0.06	0.00054	0.05	0.00045
Other Bus	0.1%	0.06	0.00006	0.05	0.00005
Urban Bus	0.1%	0.06	0.00006	0.05	0.00005
Motorcycle	3.5%	0.09	0.00315	0.01	0.00035
School Bus	0.1%	0.06	0.00006	0.05	0.00005
Motor Home	1.0%	0.09	0.0009	0.125	0.00125
Total	**100.0%**		**0.05535**		**0.065235**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	21	GWP
N2O	310	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
N20 Emissions:	0.0258	metric tons N2O	**8**	metric tons CO2e
		Project Total:	***8 metric tons CO2e***	

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

*** From URBEMIS 2007 results for mobile sources

Appendix B

Oak Tree Study

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Thousand Oaks, Calif. 91359

OAK TREE REPORT

CHESEBRO-PALO COMADO

March 28, 2012

Aitan Hillel
4834 Densmore Avenue
Encino, California 91436

Attn.: Aitan

SUBJECT SITE:

**CHESEBRO-PALO COMADO PROPERTY
AT CHESEBRO ROAD AND PALO COMADO CANYON ROAD
IN THE "OLD AGOURA" AREA OF THE CITY OF AGOURA HILLS**

GENERAL STATEMENT:

On March 24, 2012, an Oak Tree "survey" was conducted at the Subject Site. A ground level field inventory and external details (caliper size, physical and aesthetic character) were recorded, based upon the existing conditions. Ten (10) on-site and off-site Oak Trees (HOT-1, HOT-2, HOT-3, HOT-4, HOT-5, HOT-6, HOT-7, HOT-8, HOT-9 and HOT-10) were "surveyed" and evaluated for their present condition based on the Owner's concern for the Trees' general health and any potential impacts from the proposed site clearing, grading and construction activities for Multi-Family Residential Project at Chesebro Road and Palo Comado Canyon Road. The Oak Trees evaluated are fast growing young Quercus agrifolia (Coast Live Oak) and Quercus lobata (Valley Oak) located along the southerly property line. These "guarded" Oak Trees are not included in this Report. Three of the Oak Trees are adjacent to tubular metal security fence. At least four of the young Trees must be removed for the proposed site clearing, grading and construction activities for the proposed new Multi-Family Residential Project. Other Oak Trees were observed near the Site, within the 250' "reporting area", but these are "guarded" by off-site roads or buildings. For identification purposes, each of the trees has been "tagged" with an aluminum flag at d.b.h. (4'-6") above grade with its corresponding report number (HOT-1, HOT-2, HOT-3, HOT-4, HOT-5, HOT-6, HOT-7, HOT-8, HOT-9 and HOT-10) on the northerly side of each Tree. The caliper size of each Tree has been measured at the City required 3'-6" above grade. The results of the "survey" are shown on the attached Tree Evaluation Forms, Oak Tree Map and as outlined herein.

The American Society of Landscape Architects founded 1899

PURPOSE AND SCOPE OF CITY ORDINANCE

The purpose and scope of this report, in accordance with the City of Agoura Hills Zoning Ordinance #9657 and #9657.5, Appendix A, Oak Tree Preservation Guidelines, is to identify native and "planted" Oak Tree species and evaluate their present condition. A report on impacts and proposed encroachment and mitigation measures, is required, for an Oak Tree Permit submittal to the City of Agoura Hills Department of Planning and Community Development, if any work is planned to take place in or within the "Protected Zone" of any Quercus genus two (2") inches in diameter and over @ 42".

SITE CONDITIONS

The Site of this Oak Tree is located at the corner of Chesebro Road and Palo Comado Canyon Road, in the "Old Agoura" area of the City of Agoura Hills. The site, at the location of Oak Trees HOT-1 thru HOT-7 and HOT-8 thru HOT-10, is moderately to steeply sloping downward from south to north, along the easterly section of the southerly property line. Oak Tree HOT-7 is in an off-site-adjacent parking lot planter at the southwest corner of the property. These Oak Tees are all within the "Reporting Distance" spelled-out in the City Oak Tree Ordinance.

Oak trees HOT-1, HOT-2 and HOT-4 are young native Oak Trees adjacent to a tubular fence, along the southerly boundary, at the common property line between the adjacent Neighborhood Office Building and the Chevron Station. Oak Trees HOT-5 and HOT-6 are semi-mature nursery stock trees, planted on a steep downslope of the adjacent Chevron Station Site. Oak Tree HOT-7 is a nursery stock tree located in an off-site-adjacent parking lot planter at the southwest corner of the property. On-site Oak Trees HOT-3, HOT-8, HOT-9 and HOT-10 are young native Oak Trees growing on a moderately steep downslope, along the easterly section of the southerly property line. There are developed residential properties across Palo Comado Canyon Road, to the north, a Gas Station across Palo Comado Canyon Road to the east, a Chevron Station and Office Building to the south and a Multi-Family Complex and Day Care School across Chesebro Road to the west. The Site is covered with "disc harrowed" native and volunteer grasses and broadleaf vegetation emerging. Irrigated landscape plantings of the Neighborhood Office Building and Chevron Station adjoin the southerly boundary.

Oak Tree HOT-1 is a young native Valley Oak Tree located ±3' north of the Neighborhood Office Building tubular metal fence. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroach into the "Protected Zone" of this Oak Tree and some clearance pruning may be required.

Oak Tree HOT-2 is a young native Coast Live Oak Tree located ±5' east of the Neighborhood Office Building tubular metal fence. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will not encroach into the "Protected Zone" of this Oak Tree and no clearance pruning will be required.

Oak Tree HOT-3 is a young native Coast Live Oak Tree located ±8' north of the Neighborhood Office Building tubular metal fence. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroach into the "Protected Zone" of this Oak Tree and will require removal of this Oak Tree.

Oak Tree HOT-4 is a young native Valley Live Oak Tree located ±2' east of the Neighborhood Office Building tubular metal fence. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will not encroach into the "Protected Zone" of this Oak Tree and no clearance pruning will be required.

Oak Tree HOT-5 is a maturing planted Coast Live Oak Tree located on the southerly steep off-site slope. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroach into the "Protected Zone" of this Oak Tree but no clearance pruning will be required.

Oak Tree HOT-6 is a mature planted Coast Live Oak Tree located at the top of the southerly steep off-site slope. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroach into the "Protected Zone" of this Oak Tree but no clearance pruning will be required.

Oak Tree HOT-7 is a young planted Coast Live Oak Tree located in an off-site office building entry planter. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroaching into the "Protected Zone" of this Oak Tree but no clearance pruning will be required.

Oak Tree HOT-8 is a young native Coast Live Oak Tree located on a moderate on-site slope. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroaching into the "Protected Zone" of this Oak Tree and will require the removal of this Tree.

Oak Tree HOT-9 is a young native Coast Live Oak Tree located on a moderate on-site slope. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroaching into the "Protected Zone" of this Oak Tree and will require the removal of this Tree.

Oak Tree HOT-10 is a young native Coast Live Oak Tree located on a moderate on-site slope. Proposed site clearing, grading and construction activities for a Multi-Family Residential Project will encroaching into the "Protected Zone" of this Oak Tree and will require the removal of this Tree.

WORK PROCEDURES (AS APPLICABLE)

All applicable work (construction/maintenance activity) around existing Oak Tree(s) shall follow this work procedure program. This program has been developed to minimize the impacts to each Tree and protect them from unscheduled damage and unauthorized treatment.

1. All work within the Oak Tree aerial/root zone, Protected Zone, shall be observed by the Oak Tree Preservation Specialist.

2. The extent of all new construction work affecting Oak Trees shall be staked, where applicable, by field survey and reviewed with the Oak Tree Preservation Specialist.

3. Any approved pruning shall be done by a qualified Tree Trimmer, and observed by the Oak Tree Preservation Specialist.

4. Hand dig vertical trenches or fence post(s) at the final cut line to final grade and "bridge-over," move footing/fence post(s) or cleanly cut any and all roots encountered and seal with approved tree sealer (This procedure will protect the root system from unnecessary damage by power tools or excavation equipment).

5. All footings for wall construction shall be designed to "L" in an outward direction away from the Tree so as to provide minimal impact. Any excavation in the 'root zone" of an Oak Tree shall be filled backfilled with amended soil or imported topsoil, as approved by the Oak Tree Preservation Specialist.

6. A minimum height five (5') foot temporary chain link fence, per agency ordinance, shall be constructed at the limit of the approved/permitted work, as directed, to protect the Trees from further unauthorized damage and remain in place until completion of construction. A Fencing Plan shall be submitted prior to the preconstruction meeting. The fence must be in place prior to any work on-site and shall have four (4) "warning signs" located equidistant from each other around each Tree of group of Trees. For groves of Oak Trees, the "warning signs" must be no further than fifty feet (50') apart around the grove.

   The 'warning signs" must be two feet (2') square and contain the following language:

WARNING
THIS FENCE SHALL NOT BE REMOVED OR RELOCATED WITHOUT THE WRITTEN AUTHORIZATION FROM THE CITY OF AGOURA HILLS DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

7. No further work within the aerial/root zone, Protected Zone, shall be done beyond that which was approved/permitted, without obtaining written approval prior to proceeding.

8. The area within the chain link fence shall not be used for material or equipment storage or parking at any time.

9. **No chemicals or herbicides shall be applied within 100' of an Oak Tree's aerial/root zone,** Protected Zone.

10. Copies of the following shall be maintained on the site during any work to or around the Oak Tree, as applicable:

OAK TREE REPORT
OAK TREE PERMIT
ENGINEERING PLANS
PROJECT CONDITIONS
INSPECTION TICKET
OAK TREE ORDINANCE #9657
OAK TREE ORDINANCE #9657.5
APPROVED SITE PLAN

11. Oak Tree preservation devices, such as ventilation systems, tree wells, drain lines, special paving and branch cabling, if called for by the Oak Tree Preservation Specialist, shall be installed prior to completion of grading and prior to the construction phase.

12. A utilities trenching pathway plan must be submitted prior to completion of grading and prior to start of construction phase in order to avoid unnecessary damage to Tree root systems. The plan

shall indicate the routing of all trenching, including, but not limited to storm drains, sub-drains, easements, area drains, gas lines, electrical service, cable TV, water mains, irrigation main/lateral lines, and any other underground installations.

13. In areas where Oak Trees are in or adjacent to walkways or parking areas, pervious pavers shall be employed to mitigate the effects of root air-space reduction, as approved.

14. Oak Tree removals shall be replaced as follows:

Commercial properties — For dead or hazardous Trees, one (1) thirty-six inch (36") Box Oak Tree shall be planted in site for each unhealthy Oak Tree approved for removal. For healthy Trees, two (2) twenty-four inch (24") Box and one (1) thirty-six inch (36") Box specimen Oak Trees shall be planted on site for each healthy Oak Tree approved for removal. For Landmark Trees (forty-eight inches (48") in diameter and larger), a nursery grown Oak Tree of equivalent diameter to the Tree removed or two (2) nursery container grown sixty inch (60") Box Oak Trees shall be planted on site for each healthy Oak Tree approved for removal.

Residential properties — For dead or hazardous Trees, one (1) thirty-six inch (36") Box Oak Tree shall be planted in site for each unhealthy Oak Tree approved for removal. However, in cases where houses currently exist on the property, the requirement for replacement shall be one (1) fifteen gallon Oak Tree to be planted on site for each unhealthy Tree approved for removal. For healthy Trees, two (2) twenty-four inch (24") Box and one (1) thirty-six inch (36") Box specimen Oak Trees shall be planted on site for each healthy Oak Tree approved for removal. For Landmark Trees (forty-eight inches (48") in diameter or larger), one (1) nursery container grown sixty inch (60") Box Oak Tree shall be planted on site for each healthy Oak Tree approved for removal.

In cases of Oak Trees which are candidate for transplant, a refundable cash deposit in the amount equal to the cost of purchasing, planting and guaranteeing an equivalent nursery grown Oak Tree specimen, shall be made with the City. The deposit will be refunded after twelve (12) months if, in the opinion of the City's Oak Tree Consultant, the transplanted Tree has survived and is considered to be in good health. Should the Tree be in marginal health or physical condition, the deposit will be retained for an additional twelve (12) months. At the end of the second twelve month period, should the Tree continue to be in a marginal or poor health condition, then the Tree shall be removed and replaced with an equivalent sizes nursery grown Oak Tree and the deposit will be retained for at least an additional twelve (12) months.

15. Whenever any construction work is being performed contrary to the provisions of the Oak Tree Permit/Ordinance, a City Inspector may issue a written notice to the responsible party, to stop work on a project on which the violation occurred or upon which danger exists. The "Stop Work Order" will state the nature of the violation or danger and no work may proceed until the violation has been rectified and approved by the code enforcement officer or City Oak Tree Consultant.

    During any construction and/or treatment, Tree work and impacts must be monitored to further mitigate shock symptoms, should they occur. Temporary water must be provided to irrigate the Trees and to wash the dust from the foliage, if needed.

PROTECTION

To preserve Oak Trees in a construction area, a five (5') foot high chain link fence must be installed at a continuous "clear" dimension of five (5') feet beyond the dripline, minimum fifteen (15') feet from the trunk, prior to any clearing, grubbing, demolition, construction and/or treatment, in order to protect the sensitive "Z.O.N.E.." during all work operations. The Oak Tree Preservation Specialist must "function" as the fence for any work necessary within the Z.O.N.E. fenced area, while directing or observing work in and near any Oak Tree.

Z.O.N.E = "Zone Of Nutraire Endemic" (the area of natural or amended planting medium which may extend to or beyond the dripline of a native Tree). An Oak Tree care and maintenance guideline, as provided by the City of Agoura Hills, should be followed, as well as regular monitoring throughout each Tree's life cycle, by a qualified Oak Tree Preservation Specialist.

EVALUATION CRITERIA

In evaluating Oak Trees, as with any other trees, the reporting format records the external observation of the Trees at the time of the "survey", including sizes of trunk by diameter at breast height (d.b.h.), or 4'-6" (52") above grade, spread of the branching system to the outer dripline, approximate height of the Tree, surface observation of the Tree's conditions and other pertinent information. The rating designation assigns health and aesthetic values for each Tree. Ratings from "A" to "F" are used, with "A" as the indicator of a tree exhibiting the best condition of the species in the area, and the lower letters indicating lesser values. The "B" value represents an above average condition for the species. The "C" value represents an average condition for the species.

The "D" value represents a below average condition for the species. And, the "F" value rating means that the tree is a candidate for removal for health or hazard reasons. Plus (+) and minus (-) sub-values are assigned where a clear letter designation is not appropriate. The letter "E" is not used in order to avoid confusion with the term "excellent."

CARE AND SAFETY

It must be noted that the Trees referred to in this report are living organisms, and therefore are subject to change. And since internal, crown or subsurface systems were not investigated, no warranties, neither expressed nor implied are made that these Trees will be in any condition other than as observed and reported herein, beyond the date of the inventory walk–thru ("survey"). Information for the care and maintenance of Oak Trees is available from the City for use in providing guidelines for the "on-going" maintenance of Oak Trees. The preferred maintenance procedure used in caring for native Oak Trees is to leave them in their "natural" state and to promote and encourage proper vigor within the Tree's own living systems. In this way, the Tree's natural defenses are better able to ward-off pests and diseases.

MAINTENANCE PROCEDURES

According to the "City" Oak Tree Ordinance #9657 and #9657.5 all work, should it be necessary within the "Protected Zone" (that area enclosed by a line five (5') feet beyond the "dripline" of the Oak Tree and/or a minimum of fifteen (15') feet from the trunk) shall be done using hand tools under the observation of the Oak Tree Preservation Specialist. This also includes pruning/trimming for clearance. Pruning for aesthetics is not allowed or included in the Ordinance.

Current maintenance procedures for the Oak Trees at Chesebro Road and Palo Comado Canyon Road consist of the following (refer to the Tree Evaluation Form and Oak Tree Map for graphics and additional notes):

GENERAL

HOT-1

CONDITON:

Oak Tree HOT-1 is a fast growing healthy specimen with its canopy overhanging the proposed site clearing, grading and construction activities for a Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-1 may require clearance pruning for the proposed site clearing, grading and construction activities for a proposed new Multi-Family Residential Project. The Oak Tree Preservation Specialist is to monitor all site clearing, grading and construction activities.

HOT-2

CONDITON:

Oak Tree HOT-2 is a fast growing healthy specimen with its canopy south of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-2 will not require clearance pruning for the proposed site clearing, grading and construction activities for a proposed new Multi-Family Residential Project. The Oak Tree Preservation Specialist is to monitor all demolition, grading and construction activities.

HOT-3

CONDITON:

Oak Tree HOT-3 is a fast growing healthy specimen with its canopy on the site of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-3 is within the site clearing, grading and construction activities for a proposed new Multi-Family Residential Project and must be removed.

HOT-4

CONDITON:

Oak Tree HOT-4 is a fast growing healthy specimen with its canopy south of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-4 will not require clearance pruning for the proposed site clearing, grading and construction activities for a proposed new Multi-Family Residential Project. The Oak Tree Preservation Specialist is to monitor all demolition, grading and construction activities.

HOT-5

CONDITON:

Oak Tree HOT-5 is a fast growing healthy specimen with its canopy south of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-5 will not require clearance pruning for the proposed site clearing, grading and construction activities for a proposed new Multi-Family Residential Project.

The Oak Tree Preservation Specialist is to monitor all demolition, grading and construction activities.

HOT-6

CONDITON:

Oak Tree HOT-6 is a fast growing healthy specimen with its canopy south of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-6 will not require clearance pruning for the proposed site clearing, grading and construction activities for a proposed new Multi-Family Residential Project. The Oak Tree Preservation Specialist is to monitor all demolition, grading and construction activities.

HOT-7

CONDITON:

Oak Tree HOT-7 is a fast growing healthy specimen with its canopy south of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-7 will not require clearance pruning for the proposed site clearing, grading and construction activities for a proposed new Multi-Family Residential Project. The Oak Tree Preservation Specialist is to monitor all demolition, grading and construction activities.

HOT-8

CONDITON:

Oak Tree HOT-8 is a fast growing healthy specimen with its canopy on the site of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-8 is within the site clearing, grading and construction activities for a proposed new Multi-Family Residential Project and must be removed.

HOT-9

CONDITON:

Oak Tree HOT-9 is a fast growing healthy specimen with its canopy on the site of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-9 is within the site clearing, grading and construction activities for a proposed new Multi-Family Residential Project and must be removed.

HOT-10

CONDITON:

Oak Tree HOT-10 is a fast growing healthy specimen with its canopy on the site of a proposed new Multi-Family Residential Project.

TREATMENT AND/OR MITIGATION:

Oak Tree HOT-10 is within the site clearing, grading and construction activities for a proposed new Multi-Family Residential Project and must be removed.

SUMMARY EVALUATIONS:

TREE HOT-1 (Quercus lobata)

Trunk diameter is 6 3/4"; spread 12'-14', height ±30', health B, aesthetic conformity B+. The general conditions observed regarding this off-site Oak Tree include branches adjacent to a tubular metal fence and on the ground.

TREE HOT-2 (Quercus agrifolia)

Trunk diameter is 3 5/8", spread 6'-10', height ±12', health B, aesthetic conformity B. The general conditions observed regarding this off-site Oak Tree include branches adjacent to a tubular metal fence and on the ground.

TREE HOT-3 (Quercus agrifolia)

Trunk diameter is 8", 3", spread 15'-19', height ±35', health B+, aesthetic conformity B+. The general conditions observed regarding this on-site Oak Tree include branches on the ground and its location in the proposed new Multi-Family Residential Project.

TREE HOT-4 (Quercus lobata)

Trunk diameter is 3 5/8", spread 6'-10', height ±14', health B+, aesthetic conformity B+. The general conditions observed regarding this off-site Oak Tree include branches adjacent to a tubular metal fence and on the ground.

TREE HOT-5 (Quercus agrifolia)

Trunk diameter is 15 1/4", spread 27'-34', height ±50', health B-, aesthetic conformity B+. The general conditions observed regarding this off-site Oak Tree include guy wires girdling trunk, codominant scaffolds and deadwood.

TREE HOT-6 (Quercus agrifolia)

Trunk diameter is 29", spread 31'-43', height ±60', health B-, aesthetic conformity B+. The general conditions observed regarding this off-site Oak Tree include weak branch connections, water trap and branches on ground.

TREE HOT-7 (Quercus agrifolia)

Trunk diameter is 5 1/4", spread 11'-12', height ±16', health A, aesthetic conformity A. The general conditions observed regarding this off-site Oak Tree include prior pruning.

TREE HOT-8 (Quercus agrifolia)

Trunk diameter is 5", 4 1/8", spread 13'-15', height ±24', health C-, aesthetic conformity C+. The general conditions observed regarding this on-site Oak Tree include codominant trunks, its location in the proposed new Multi-Family Residential Project and branches on ground on the ground.

TREE HOT-9 (Quercus agrifolia)

Trunk diameter is 2 1/2", spread 6'-8', height ±14', health B, aesthetic conformity B. The general conditions observed regarding this on-site Oak Tree include lopsided canopy, its location in the proposed new Multi-Family Residential Project and branches on ground on the ground.

TREE HOT-10 (Quercus agrifolia)

Trunk diameter is 2 1/2", spread 7'-10', height ±18', health C-, aesthetic conformity C+. The general conditions observed regarding this on-site Oak Tree include its location in the proposed new Multi-Family Residential Project and branches on ground on the ground.

TREATMENT RECOMMENDATION

It is our recommendation that the following treatment(s) be implemented at this time:

Remove Oak Trees HOT-3, HOT-8, HOT-9 and HOT-10 and mitigate with replacement Oak Trees per City requirements.

Final determination of treatment(s) will be as directed in the field by the Oak Tree Preservation specialist. In addition to these procedures, a periodic (at least quarterly) monitoring for declining branching systems is recommended.

Please review this report, the attached Oak Tree Map and Tree Evaluation Forms, and return your questions and/or comments to:

Richard W. Campbell, ASLA, BSLA
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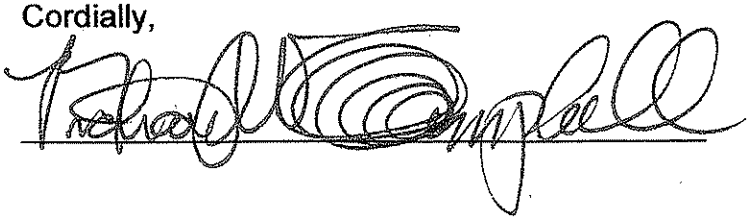
Thousand Oaks, California 91359
Telephone/Fax: (805) 375-1010
E-Mail: rwcampbellasla@verizon.net
Web Site: www.richardwcampbellasla.com

Cordially,



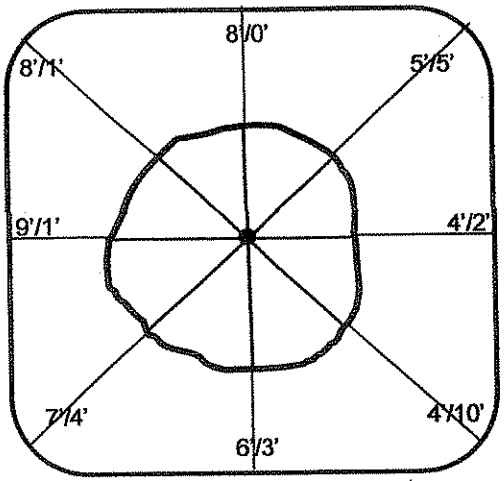
Richard W. Campbell, A.S.L.A., B.S.L.A.
Landscape Architect and Tree Preservation Specialist
California License # 1099, Nevada License # 14

OAK TREE EVALUATIONS

tree evaluation form

CHESEBRO APARTMENTS

CHESEBRO ROAD & PALO COMADO CANYON ROAD



SPECIES: Quercus lobata

Appearance (A-F): B+
Health: (A-F): B
No. of Trunk(s): 1
Diameter of Trunk(s): 6 3/4"

Date: 3-24-12
Inspector: RWC
Height: ± 30'

TREE #

HOT-1

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ● LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ● CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ◎ COJOINED TRUNKS
- ● INCLUDED BARK

PESTS:

- ◎ BORERS / TERMITES
- ◎ GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ● GALLS
- ◎ WITCHES BROOM
- ● PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ◎

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ● ON OFF-SITE SLOPE
- ● FILL ON TRUNK
- ● INTERTWIND IN HOT-2 & HOT-3
- ● ADJACENT TO METAL FENCE

GRAPHIC:

REMARKS / RECOMMENDATIONS

NO TREATMENT REQUIRED AT THIS TIME.

MONITOR AND DIRECT PROTECTION DURING ALL SITE CLEARING, GRADING AND CONSTRUCTION ACTIVITIES.

FINAL DETERMINATION OF PRUNING AND TREATMENT(S) WILL BE AS PER THE CITY OAK TREE PERMIT AND AS DIRECTED IN THE FIELD BY THE OAK TREE PRESERVATION SPECIALIST.

RICHARD W. CAMPBELL, ASLA, BSLA
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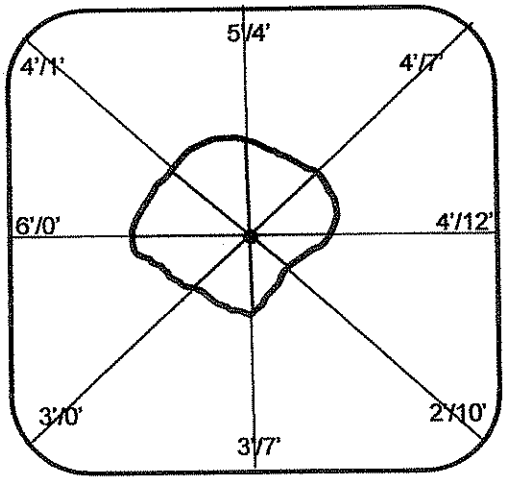
THOUSAND OAKS, CALIFORNIA 91359
www.richardwcampbellasla.com

tree evaluation form

CHESEBRO APARTMENTS

CHESEBRO ROAD & PALO COMADO CANYON ROAD



SPECIES: Quercus agrifolia

Appearance (A-F): B
Health: (A-F): B
No. of Trunk(s): 1
Diameter of Trunk(s): 3 5/8"

Date: 3-24-12
Inspector: RWC
Height: ± 12'

TREE #

HOT-2

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ◎ GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ● ON OFF-SITE SLOPE
- ● FILL ON TRUNK
- ● INTERTWINED IN HOT-1
- ● ADJACENT TO METAL FENCE

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ● LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ◎ COJOINED TRUNKS
- ◎

GRAPHIC:

REMARKS / RECOMMENDATIONS

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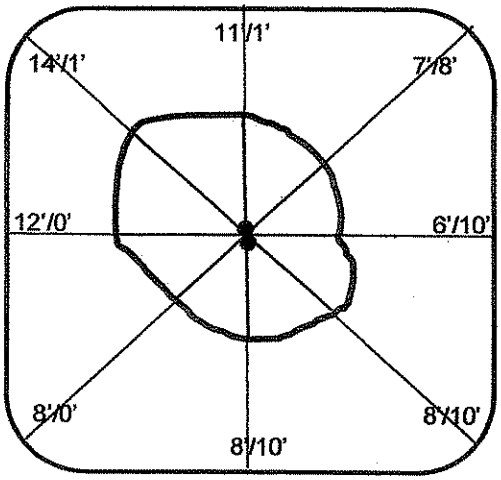

SPECIES: Quercus agrifolia

Appearance (A-F): B+ **Date:** 3-24-12
Health: (A-F): B+ **Inspector:** RWC
No. of Trunk(s): 2 **Height:** ± 35'
Diameter of Trunk(s): 8", 3"

TREE #

HOT-3

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ◎ GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ◎ NEST IN TREE
- ◎ FILL ON TRUNK
- ● INTWINED IN HOT-1
- ● LOCATED ON MODERATE ON-SITE SLOPE

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ● LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ● WEAK BRANCH CONNECTION
- ● LEANS TO NORTHWEST
- ● INCLUDED BARK

GRAPHIC:

REMARKS / RECOMMENDATIONS

REMOVE THIS TREE FOR SITE CONSTRUCTION AND MITIGATE WITH CITY REQUIRED REPLACEMENT TREES.

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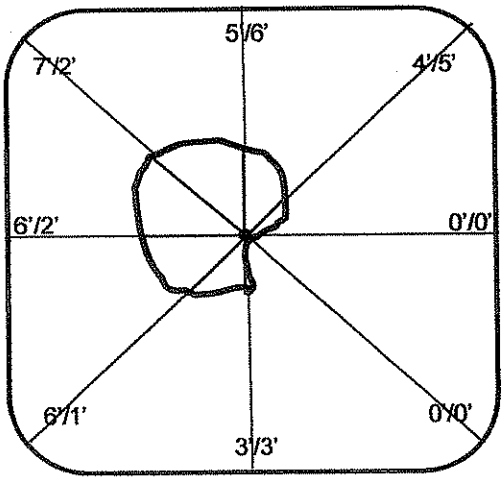

SPECIES: Quercus lobata

Appearance (A-F): B+ **Date:** 3-24-12
Health: (A-F): B+ **Inspector:** RWC
No. of Trunk(s): 1 **Height:** ± 14'
Diameter of Trunk(s): 3 5/8"

TREE #

HOT-4

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ● LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ● LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ◎ COJOINED TRUNKS
- ◎

PESTS:

- ◎ BORERS / TERMITES
- ◎ GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ● GALLS
- ◎ WITCHES BROOM
- ● PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ◎

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ● WOODRAT NEST TO EAST
- ● OVERHANGS NEIGHBORS' PROPERTY
- ● INTERTWINED IN METAL FENCE
- ● ADJACENT TO METAL FENCE

GRAPHIC:

REMARKS / RECOMMENDATIONS

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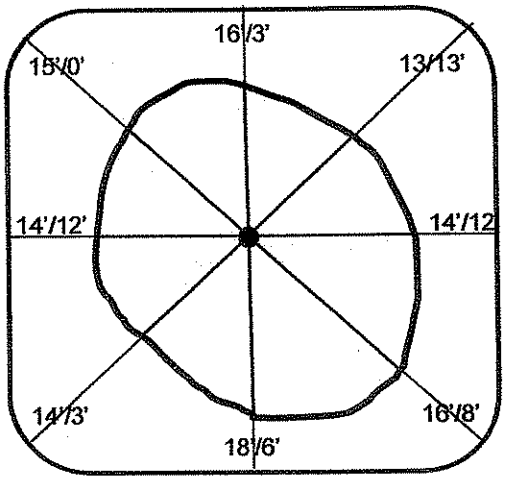

SPECIES: Quercus agrifolia

Appearance (A-F): B+ **Date:** 3-24-12
Health: (A-F): B- **Inspector:** RWC
No. of Trunk(s): 1 **Height:** ± 50'
Diameter of Trunk(s): 15 1/4"

TREE #

HOT-5

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ● DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ● GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ● WOODRAT NEST IN "DUFF"
- ● FILL ON TRUNK
- ● ON OFF-SITE SLOPE
- ◎ BRANCHES OVERHANG METAL FENCE

STRUCTURE:

- ◎ BROKEN BRANCHES
- ● PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ◎ LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY -- TRUNK
- ◎ CAVITY -- BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ● CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ● GUY WIRES GIRDLING TRUNK
- ● NURSERY GROWN OAK TREE

GRAPHIC:

REMARKS / RECOMMENDATIONS

REMOVE GUY WIRES FROM AROUND TRUNK.

REMOVE DEADWOOD.

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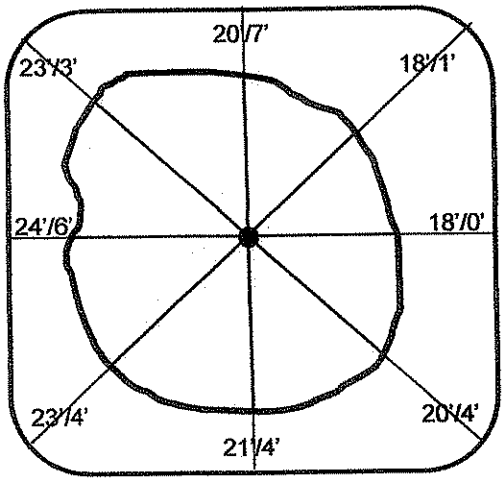

SPECIES: Quercus agrifolia

Appearance (A-F): B-
Health: (A-F): B-
No. of Trunk(s): 1
Diameter of Trunk(s): 29"

Date: 3-24-12
Inspector: RWC
Height: ±60

TREE #

HOT-6

VIGOR:

- ◎ CHLOROSIS
- ● RAPID SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ◎ GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ◎ NEST IN TREE
- ◎ FILL ON TRUNK
- ● ON OFF-SITE SLOPE
- ● OVERHANGS CHEVRON PARKING

STRUCTURE:

- ◎ BROKEN BRANCHES
- ● PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ◎ LOW BRANCHING
- ● WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ● WEAK BRANCH CONNECTIONS
- ● NURSERY GROWN OAK TREE

GRAPHIC:

REMARKS / RECOMMENDATIONS

REMOVE DEADWOOD.

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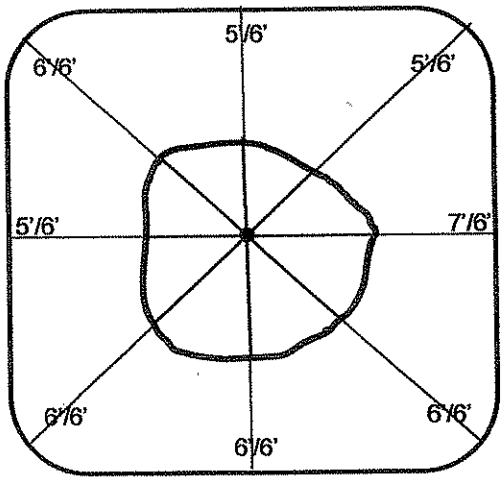

SPECIES: Quercus agrifolia

Appearance (A-F): A
Health: (A-F): A
No. of Trunk(s): 1
Diameter of Trunk(s): 5 1/4"

Date: 3-24-12
Inspector: RWC
Height: ± 16'

TREE #

HOT-7

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ● GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ◎

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ◎ NEST IN TREE
- ◎ OVERHANGS NEIGHBORS' PROPERTY
- ◎ OVERHANGS PROPOSED ARENA
- ● LOCATED IN OFF-SITE OFFICE BUILDING PLANTER

STRUCTURE:

- ◎ BROKEN BRANCHES
- ● PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ◎ LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ◎ BRANCHES ON GROUND
- ◎ COJOINED TRUNKS
- ● NURSERY GROWN OAK TREE

GRAPHIC:

REMARKS / RECOMMENDATIONS

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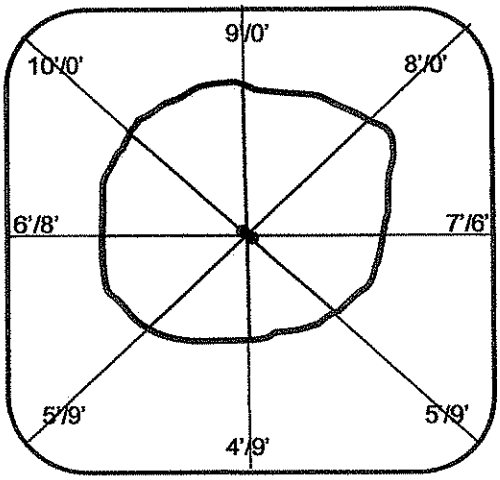


SPECIES: Quercus agrifolia

Appearance (A-F): C+ **Date:** 3-24-12
Health: (A-F): C- **Inspector:** RWC
No. of Trunk(s): 2 **Height:** ± 24'
Diameter of Trunk(s): 5", 4 1/8"

TREE #

HOT-8

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ● LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ● CODOMINANT TRUNKS
- ● INCLUDED BARK

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ◎ GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

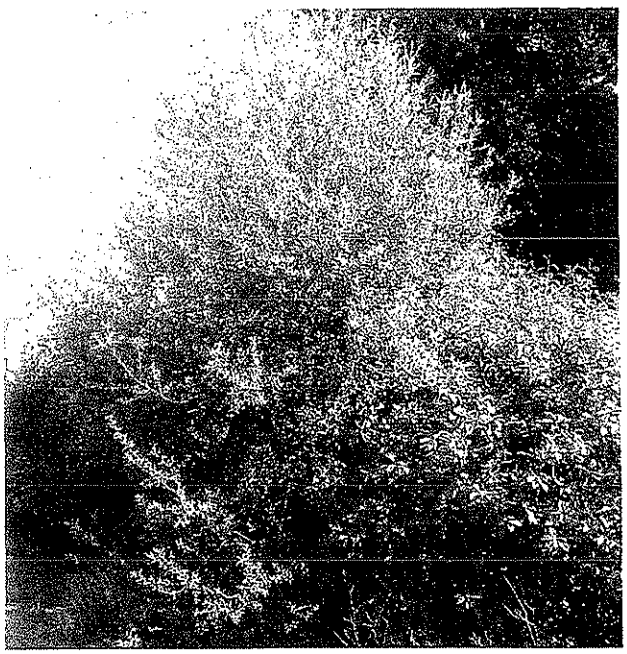
DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ◎ OAK SEEDLINGS IN "DUFF"
- ◎ NEST IN TREE
- ◎ OVERHANGS NEIGHBORS' PROPERTY
- ◎ OVERHANGS PROPOSED ARENA
- ● LOCATED ON MODERATE ON-SITE SLOPE

GRAPHIC:



REMARKS / RECOMMENDATIONS

REMOVE THIS TREE FOR SITE CONSTRUCTION AND MITIGATE WITH CITY REQUIRED REPLACEMENT TREES.

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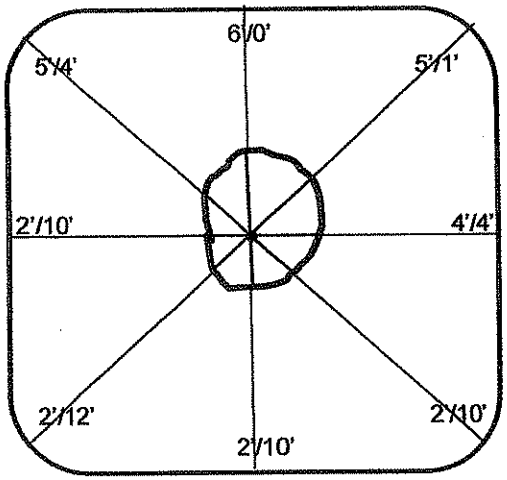


SPECIES: Quercus agrifolia

Appearance (A-F): B
Health: (A-F): B
No. of Trunk(s): 1
Diameter of Trunk(s): 2 1/2"

Date: 3-24-12
Inspector: RWC
Height: ± 14'

TREE #

HOT-9

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH
- ◎

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ◎ GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ● OAK SEEDLINGS IN "DUFF"
- ◎ NEST IN TREE
- ◎ OVERHANGS NEIGHBORS' PROPERTY
- ◎ OVERHANGS PROPOSED ARENA
- ● LOCATED ON MODERATE ON-SITE SLOPE

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ● LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ● LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ◎ COJOINED TRUNKS
- ◎

GRAPHIC:

REMARKS / RECOMMENDATIONS

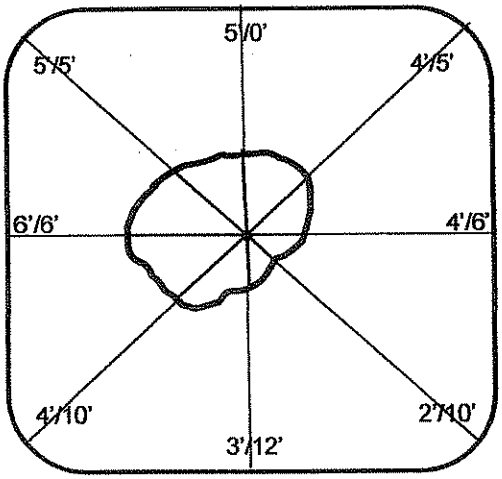
REMOVE THIS TREE FOR SITE CONSTRUCTION AND MITIGATE WITH CITY REQUIRED REPLACEMENT TREES.

RICHARD W. CAMPBELL, ASLA, BSLA
P. O. BOX 6192 - Ph./Fax(805) 375-1010
THOUSAND OAKS, CALIFORNIA 91359
www.richardwcampbellasla.com

tree evaluation form

CHESEBRO APARTMENTS

CHESEBRO ROAD & PALO COMADO CANYON ROAD



SPECIES: Quercus agrifolia

Appearance (A-F): B
Health: (A-F): B
No. of Trunk(s): 1
Diameter of Trunk(s): 2 1/2"

Date: 3-24-12
Inspector: RWC
Height: ± 18'

TREE #

HOT-10

VIGOR:

- ◎ CHLOROSIS
- ● GOOD SHOOT GROWTH
- ◎ DIEBACK
- ◎ MINOR DEADWOOD
- ◎ THINNING OF CROWN
- ◎ EPICORMIC GROWTH

STRUCTURE:

- ◎ BROKEN BRANCHES
- ◎ PRIOR PRUNING
- ◎ MECHANICAL INJURY
- ◎ WIRE / NAILS / SPIKES
- ◎ TORN BRANCH SCARS
- ◎ LOW BRANCHING
- ◎ WATER TRAP
- ◎ CAVITY – TRUNK
- ◎ CAVITY – BRANCH
- ◎ LOPSIDED CANOPY
- ◎ EXCESS HORIZONTAL GROWTH
- ◎ DECAY / ROT SUSPECTED
- ◎ FIRE / LIGHTNING DAMAGE
- ◎ EXPOSED ROOTS
- ◎ HAZARDOUS CONDITION
- ◎ CROSSING BRANCHES
- ◎ CODOMINANT SCAFFOLDS
- ● BRANCHES ON GROUND
- ◎ COJOINED TRUNKS
- ◎

PESTS:

- ◎ BORERS / TERMITES
- ● GIRDLERS
- ◎ ANTS
- ◎ WOODPECKERS
- ◎ GALLS
- ◎ WITCHES BROOM
- ◎ PIT-SCALE
- ◎ PLANT PARASITES
- ◎ OAK SCALE
- ● LEAF MINERS

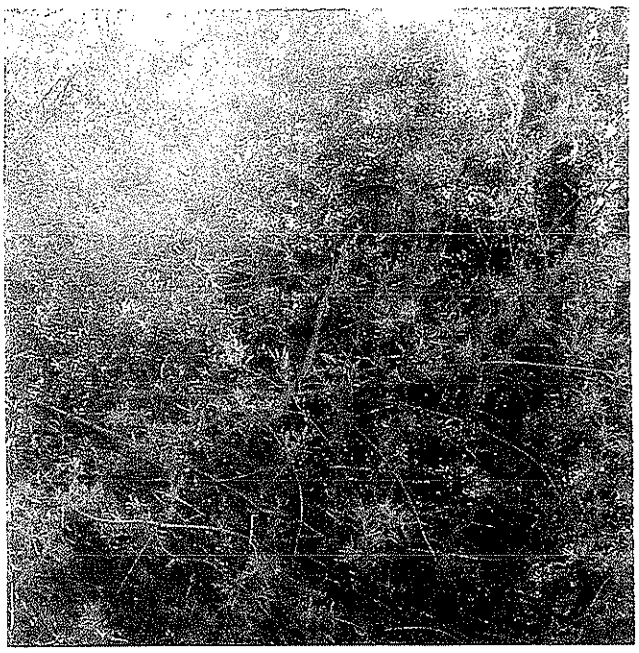
DISEASE:

- ◎ MARGINAL LEAF SCORCH
- ◎ EXFOLIATION
- ◎ LESIONS
- ◎ EXUDATION STAINS
- ◎ CANKERS

ENVIRONMENT:

- ● OAK SEEDLINGS IN "DUFF"
- ◎ NEST IN TREE
- ◎ OVERHANGS NEIGHBORS' PROPERTY
- ◎ OVERHANGS PROPOSED ARENA
- ● LOCATED ON MODERATE ON-SITE SLOPE

GRAPHIC:



REMARKS / RECOMMENDATIONS

REMOVE THIS TREE FOR SITE CONSTRUCTION AND MITIGATE WITH CITY REQUIRED REPLACEMENT TREES.

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Appendix C

Geotechnical Report
(Appendices on file with the City of Agoura Hills)

C. Y. GEOTECH, INC.

Engineering Geology and Geotechnical Engineering

9428 Eton Avenue, Unit M, Chatsworth, CA 91311
Tel: (818) 341-1899 Fax: (818) 341-1897 Email: cygeotech@sbcglobal.net

UPDATE GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED 18 UNITS TOWNHOUSES
APN: 2052-008-017 AND 2052-008-019
PORTIONS OF LOTS 17 AND 18, TRACT 8451
SOUTHEAST CORNER OF CHESEBRO ROAD AND
DRIVER AVENUE, AGOURA HILLS, CALIFORNIA

FOR

MR. AITAN HILLEL

FEBRUARY 2, 2012
PROJECT NO. CYG-04-3877

February 2, 2012 P. N. CYG-04-3877

Mr. Aitan Hillel
164 W. Del Mar Boulevard
Pasadena, California 91105

Subject: Update Geotechnical Engineering Investigation,
Proposed 18 Units of Townhouses, APN: 2052-008-017 and
2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast
Corner of Chesebro Road and Driver Avenue, Agoura Hills, California

Dear Mr. Hillel,

Per your request, C. Y. Geotech (CYG), Inc. has prepared an update geotechnical engineering report for the subject project. The purposes of this investigation are to update the referenced CYG reports, to evaluate the geologic and engineering conditions of onsite earth materials which may affect the proposed development and to provide recommendations for the design and construction of the proposed 18 units of townhouses.

PROPOSED DEVELOPMENT

Information regarding the proposed development was provided by you, and was used as the guide for the field exploration and report preparation. Based on the information provided, it is our understanding that 18 units of townhouses are to be constructed on the subject site. A site plan showing the site, property lines and propose townhouses is shown on Plate 1. Two geotechnical cross sections (A-A' and B-B') showing the site, property lines, proposed townhouses and subsurface earth materials are shown on Plate 2. As shown on the site plan and geotechnical cross sections, 18 units of townhouses are to be built on the site. A retaining wall up to 10 feet high is to be built along most portion of the north property line, east portion of subject site and east portion of west property line.

Formal grading, architectural, structural plans have not been prepared and await for the conclusions and recommendations of this investigation.

PREVIOUS INVESTIGATION

The subject site was investigated by CYG in 2004 to 2006 for the construction of an auto wash center on the site. Seven (7) exploratory borings were drilled to a maximum depth of 31 feet for soil sampling, liquefaction evaluation and engineering evaluations. Laboratory tests were performed to determine the engineering properties of onsite earth materials. Slope stability analyses were performed to evaluate the stability of surrounding slopes, to determine the lateral forces for retaining wall design and to evaluate the stability of temporary excavation. Liquefaction evaluation was performed to evaluate the susceptibility of onsite soils to liquefaction. The findings and conclusions of the investigation were presented in the referenced CYG reports dated December 30, 2004, February 3, 2006 and August 8, 2006.

It is recommended that a set of the referenced CYG reports be submitted in together with this report to the City of Agoura Hills for city review.

ADDITIONAL FIELD EXPLORATION AND LABORATORY TESTING

The site was visited by one of our engineers and one of our geologist on September 24, 2011. Site conditions has essentially no change since the CYG's 2004 investigation. The geologic and geotechnical data in the referenced CYG reports are adequate for the preparation of this update report. Therefore, no additional field exploration or laboratory testing was performed for the preparation of this update report.

EARTH MATERIAL

Earth materials within the site consisted of artificial fill, alluvium and bedrock. Descriptions of onsite earth materials are shown on the boring logs enclosed in Appendix A of the referenced CYG report dated December 30, 2004.

Artificial Fill

Artificial fill was encountered from the ground surface and to a depth of approximately 2 feet in some borings. The fill soil consists of mottled brown clayey sandy silt and sandy clayey silt. The fill soil is not suitable for foundation or slab support.

Alluvium (Qa)

Alluvium was encountered from the ground surface in some borings and underlying fill soil in some opther borings. The maximum depth of the alluvial soil encountered was approximately 26 feet. The alluvial soil consisted primarily of dark brown silty clay, brown silty sandy clay and clayey sandy silt and light brown clayey sandy silt, clayey silty sand and gravelly sand. The laboratory expansion index test indicated an expansion index of 61 for the tested alluvial soil. Soils with an expansion index in the range of 51 to 90 are considered as medium expansive soils.

The chemical tests indicated that the tested alluvial soil has a PH value of 7.5, a resistivity of 6320 Ohm-cm, a chloride concentration of 80 mg/kg, and a sulfate concentration of 496 mg/kg. The results of chemical tests indicated that onsite alluvial soil has a moderate corrosion effect on concrete works and underground utility lines.

Bedrock (Ttuc)

Bedrock of the Upper Topanga Formation was encountered underlying the alluvial soil in all borings except B-6. The bedrock consisted of light gray to bluish gray siltstone and claystone. The bedding plan measured on the street cut along the northeast side of Palo Comado Canyon Road strikes N50W to N55W and dips 40N to 45N. The northeast-dipping bedding is considered geologically favorable to the gross stability of the west-facing slope within the site.

SLOPE STABILITY

The potential of circular slope failure was evaluated by CYG and the results were presented in Appendix B of the referenced CYG report dated December 30, 2004. The analyses indicated factors of safety greater than the minimum code requirements for both static and seismic conditions.

The lateral force (equivalent fluid pressure) for the design of retaining wall was evaluated by CYG and the The results of the analyses are presented in Appendix B of the referenced CYG report dated December 30,

2004. Additional wedge slope stability analyses were performed to calculate the equivalent fluid pressure so that new and update requirements for retaining wall design are incorporated into the evaluation. The results of the analyses are presented in Figures 1 and 2. In accordance with the update analyses, it is recommended that the proposed retaining wall be designed for an equivalent fluid pressure of 60 pounds per square foot per foot of depth.

Additional wedge slope stability analyses using the Feebody Diagram Method were performed to evaluate the stability of a 5-foot, 7-foot and 12-foot high temporary excavations. The lowest peak shear strength parameters of onsite soils were used in the analyses. The analyses indicated factors of safety greater than the minimum code requirement for 5-foot and 7-foot high temporary excavation, but a factor of safety less than the minimum code requirement for the 12-foot high temporary excavation. The results of the analyses are shown in Figures 3, 4 and 5.

CONCLUSIONS

Based upon the findings of this investigation, the development of the proposed 18 units of townhouses at the subject site is feasible from a geotechnical engineering viewpoint provided the recommendations in this report are incorporated into design and implemented during construction. Conventional spread footings entirely supported by compacted fill or entirely supported by competent alluvium which was encountered approximately 5 feet below the ground surface can be used to support the proposed townhouses.

111 STATEMENT

Provided the recommendations in this report are properly incorporated into design and implemented during construction, the proposed 18 units of townhouses will be safe from geologic hazards including settlement, landsliding, slippage and liquefaction and the proposed development will not adversely affect the geologic stability of adjacent properties.

RECOMMENDATIONS

The recommendations in the following sections should be incorporated into the design of the proposed 18 units of townhouses and retaining wall and implemented during construction.

1.0 Foundation System

Conventional spread footings entirely supported by compacted fill or entirely supported by competent alluvium which was encountered approximately 5 feet below the ground surface can be used to support the proposed townhouses. Conventional spread footings embedded into compacted fill, competent alluvium or bedrock can be used to support the proposed retaining walls. The conventional spread footings to support retaining wall in the transitional zone area should be provided with additional steel reinforcement.

2.0 Footing Setback from Descending Slope

The City of Agoura Hills building code requires that any foundation and structural footing be a sufficient depth to provide an adequate horizontal setback from any adjacent descending slope which is steeper than 3:1. The required footing setback is ½ of the height of the adjacent descending slope with a minimum of 5 feet and a maximum of 40 feet measured horizontally from the base of the foundation to the face of the adjacent descending slope.

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:
CYG-04-3877 10 feet Retaining Wall / Level Backfill (Alluvium)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	10 feet
Slope Angle of Retained Slope	=	0 degree
Dip Angle of Critical Wedge	=	53 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	141 pcf
Cohesion	=	180 psf
Friction Angle	=	22 degree
Mobilized Cohesion	=	120.0 psf
Mobilized Friction Angle	=	15.1 degree

REQUIRED FACTOR OF SAFETY = 1.5

RESULTS

Dip Angle of Critical Slip Surface	=	53 degree
Total Weight of Active Wedge	=	5313 lbs
Frictional Resistance (Cm * L)	=	1503 lbs
Required External Force for Wall	=	2300 lbs
Required Equivalent Fluid Pressure	=	46.0 psf/ft

** Rankine Wedge is not the most critical wedge **

RECOMMENDED EFP VALUE:

Triangular-Distributed EFP	=	60 psf/ft

Figure 1

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:
CYG-04-3877 10 feet Retaining Wall / Level Backfill / Seismic (Alluvium)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	10 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	45 degree
Length of Slip Surface	=	11.35 ft
Depth of Tension Crack	=	1.97 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	123 pcf
Cohesion (C)	=	180 psf
Friction Angle (ϕ)	=	22 degree
Mobilized Cohesion (Cm)	=	163.6 psf
Mobilized Friction Angle (ϕm)	=	20.2 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.235
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 45 degree

Total Weight of Critical Wedge = 5911 lbs

Frictional Resistance (Cm × L) = 163.6×11.35 = 1858 lbs

Unbalanced Lateral Force
= [5911 - 1858 × Cos(45)] × Tan(45 - 20.2) - 1858 × Sin(45) + 5911 × 0.235
= 2199 lbs

Stabilization Force for Seismic Condition > 0
EFP for Seismic Condition = 2 × 2199 / (10 × 10) = 44 psf/ft
(EFP for Recommended Static Condition = 60 psf/ft)

EFP for static condition is critical than seismic condition

Figure 2

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:
CYG-04-3877 5 feet Temporary Cut / Level Backfill (Soil)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	5 feet
Slope Angle of Retained Slope	=	0 degree
Dip Angle of Critical Wedge	=	55 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	127 pcf
Cohesion	=	200 psf
Friction Angle	=	25 degree
Mobilized Cohesion	=	160.0 psf
Mobilized Friction Angle	=	20.5 degree

REQUIRED FACTOR OF SAFETY = 1.25

RESULTS

Dip Angle of Critical Slip Surface	=	55 degree
Total Weight of Active Wedge	=	1112 lbs
Frictional Resistance (Cm * L)	=	977 lbs
Required External Force for Wall	=	-346 lbs
Required Equivalent Fluid Pressure	=	-27.7 psf/ft

** Rankine Wedge is not the most critical wedge **

Figure 3

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:
CYG-04-3877 7 feet Temporary Cut / Level Backfill (Soil)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	7 feet
Slope Angle of Retained Slope	=	0 degree
Dip Angle of Critical Wedge	=	55 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	127 pcf
Cohesion	=	200 psf
Friction Angle	=	25 degree
Mobilized Cohesion	=	160.0 psf
Mobilized Friction Angle	=	20.5 degree

REQUIRED FACTOR OF SAFETY = 1.25

RESULTS

Dip Angle of Critical Slip Surface	=	55 degree
Total Weight of Active Wedge	=	2179 lbs
Frictional Resistance (Cm * L)	=	1367 lbs
Required External Force for Wall	=	-55 lbs
Required Equivalent Fluid Pressure	=	-2.3 psf/ft

** Rankine Wedge is not the most critical wedge **

Figure 4

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:
CYG-04-3877 12 feet Temporary Cut / Level Backfill (Soil)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	12 feet
Slope Angle of Retained Slope	=	0 degree
Dip Angle of Critical Wedge	=	55 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	127 pcf
Cohesion	=	200 psf
Friction Angle	=	25 degree
Mobilized Cohesion	=	160.0 psf
Mobilized Friction Angle	=	20.5 degree

REQUIRED FACTOR OF SAFETY = 1.25

RESULTS

Dip Angle of Critical Slip Surface	=	55 degree
Total Weight of Active Wedge	=	6403 lbs
Frictional Resistance (Cm * L)	=	2344 lbs
Required External Force for Wall	=	1741 lbs
Required Equivalent Fluid Pressure	=	24.2 psf/ft

** Rankine Wedge is not the most critical wedge **

Figure 5

3.0 Building Clearance from Ascending Slope

The City of Agoura Hills building code requires that building structure be provided with a level building clearance between the building structure and the toe of an ascending slope which is steeper than 3:1. The required building clearance is ½ of the height of the adjacent ascending slope with a minimum of 5 feet and a maximum of 40 feet measured horizontally from the building to the toe of the adjacent ascending slope.

4.0 Site Preparation

The upper layer of onsite soils, at their present conditions, are not suitable for foundation support. Soils removal and recompaction will be required if conventional spread footings and/or concrete slabs-on-grade supported by compacted fill are proposed.

The following recommendations should be incorporated into design and implemented during construction if compacted fill is to be used for foundation or slab support:

a. If conventional spread footings founded into compacted fill are to be used for building support, the existing soil in the building pad area should be removed to a minimum of 5 feet below the existing ground surface or a minimum of 2 feet below the bottom of the footings, whichever is deeper, and then recompacted to be compacted fill for building support. The removal and recompaction should be extended a minimum of 5 feet beyond the perimeter footings in all directions. The removal and recompaction can be limited to property lines.

b. If interior concrete slab-on-grade supported by compacted fill is proposed, the existing soil in the interior concrete slab area should be removed to a minimum of 5 feet below the existing ground surface or a minimum of 2 feet below the bottom of concrete slab, whichever is deeper, and then recompacted to be compacted fill for slab support. The removal and recompaction can be limited to surrounding footings.

c. If cement concrete driveway supported by compacted fill is proposed, the existing soil in the area of the cement concrete driveway should be removed to a minimum of 5 feet below the existing ground surface or a minimum of 2 feet below the bottom of the cement concrete driveway, whichever is deeper, and then recompacted to be compacted fill for driveway support. The removal and recompaction should be extended a minimum of 5 feet beyond the boundaries of the cement concrete driveway in all directions. The removal and recompaction can be limited to property lines.

d. If exterior concrete slab-on-grade supported by compacted fill is proposed, the existing soil in the exterior concrete slab area, except the concrete driveway area, should be removed to a minimum of 2 feet below the existing ground surface or a minimum of 2 feet below the bottom of the exterior concrete slab, whichever is deeper, and then recompacted to be compacted fill for slab support. The removal and recompaction should be extended a minimum of 2 feet beyond the boundaries of the exterior concrete slab in all directions. The removal and recompaction can be limited to property lines. The exterior concrete slabs should be designed as floating slab.

e. If asphalt concrete pavement supported by compacted fill is proposed, the existing soil in the area of the asphalt concrete pavement should be removed to a minimum of 2 feet below the existing ground surface or a minimum of 2 feet below the bottom of the asphalt concrete pavement, whichever is deeper, and then recompacted to be compacted fill for pavement support. The removal and recompaction should be extended a minimum of 2 feet beyond the boundaries of the asphalt concrete pavement in all directions. The removal and recompaction can be limited to property lines.

f. If deep loose soil was found during grading, the loose soil should be over-excavated to underlying competent soil as determined by CYG, and then recompacted to be compacted fill for foundation and slab support.

5.0 Seismic Factor

For projects submitted after January 1, 2008, the City of Agoura Hills requires the use of California Building Code (CBC) in structural design. The seismic factors listed in the following table which were determined based on the findings of field exploration and in accordance with the 2010 California Building Code can be used in structural design.

Seismic Factors for IBC System	Value	Reference, IBC
Site Class	C	Table 1613.5.2
Mapped SRA at 0.2 Second Period (Ss)	1.613g	Figure 1613.5 (3)
Mapped SRA at 1.0 Second Period (S_1)	0.665g	Figure 1613.5 (4)
Site Coefficient Fa	1.0	Table 1613.5.3 (1)
Site Coefficient Fv	1.3	Table 1613.5.3 (2)
Maximum Considered Earthquake SRA at 0.2 Second Period (Sms)	1.613g	Equation 16-36
Maximum Considered Earthquake SRA at 1.0 Second Period (S_{M1})	0.865g	Equation 16-37
Design SRA at 0.2 Second Period (SDs)	1.075g	Equation 16-38
Design SRA at 1.0 Second Period (SD_1)	0.577g	Equation 16-39
Seismic Design Category	D	Tables 1613.5.6 (1) & 1613.5.6 (2)

SRA : Spectral Response Acceleration

6.0 Conventional Spread Footings for Building Structure

Conventional spread footings either entirely supported by compacted fill or entirely supported by competent alluvium can be used to support the proposed building structures provided the following recommendations are incorporated into the design and implemented during construction.

a. Conventional spread footings should be either entirely supported by compacted fill or entirely supported by competent alluvium which is approximately 5 feet below the existing round surface.

b. Continuous spread footings should have a minimum width of 12 inches and a minimum embedment depth 24 inches into compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

c. Isolated footings should have a minimum width of 24 inches and a minimum embedment depth of 24 inches into compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

d. An allowable vertical bearing pressure of 2000 pounds per square foot (psf), including dead and frequently applied live loads, can be used in the design of footings with the minimum footing width and embedment depth. The allowable bearing capacity can be increased by 250 psf for each additional foot

of footing width or embedment depth, to a maximum bearing capacity of 3000 psf. The vertical bearing capacities can be increased by one-third (1/3) when considering short duration wind or seismic loads.

e. Lateral force can be resisted by frictional resistance and passive earth pressure. An allowable friction coefficient of 0.28 and an allowable passive earth pressure of 300 pounds per square foot per foot of depth (psf/ft), to a maximum of 1500 psf, can be used to resist lateral loads. When combining passive earth pressure and frictional resistance, the passive earth pressure component should be reduced by 1/3.

f. All footings should have a minimum reinforcement of two No.4 steel bars near the top and two No.4 steel bars near the bottom. Where footing and stem wall height exceeds a combined depth of 3 feet, one No.4 steel bar should be placed vertically every 3 feet. These parameters should be reviewed by the Project Structural Engineer and revised as required to accommodate intended use.

g. Prior to the placing steel in footing excavations, an inspection should be made by the representative of CYG to ensure that the footing excavation exposes competent compacted fill or competent alluvium, and free of loose or disturbed soil.

h. The City Inspector should be notified to inspect and approve footing excavations prior to pouring concrete.

7.0 Conventional Spread Footings for Retaining Walls

Conventional spread footings supported by compacted fill, competent alluvium or bedrock can be used to support the proposed retaining walls provided the following recommendations are incorporated into the design and implemented during construction.

a. Conventional spread footings should be supported by bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing round surface. Conventional spread footings in the transitional zone areas should be provided with additional steel reinforcement.

b. Continuous spread footings should have a minimum width of 12 inches and a minimum embedment depth 24 inches into bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

c. Isolated footings should have a minimum width of 24 inches and a minimum embedment depth of 24 inches into bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

d. An allowable vertical bearing pressure of 2000 psf, including dead and frequently applied live loads, can be used in the design of footings with the minimum footing width and embedment depth. The allowable bearing capacity can be increased by 250 psf for each additional foot of footing width or embedment depth, to a maximum bearing capacity of 3000 psf. The allowable vertical bearing capacities can be increased by one-third (1/3) when considering short duration wind or seismic loads.

e. Lateral force can be resisted by frictional resistance and passive earth pressure. An allowable friction coefficient of 0.28 and an allowable passive earth pressure of 250 psf/ft, to a maximum of 1500 psf, can be used to resist lateral loads. When combining passive earth pressure and frictional resistance, the passive earth pressure component should be reduced by 1/3.

f. All footings should have a minimum reinforcement of two No.4 steel bars near the top and two No.4 steel bars near the bottom. Where footing and stem wall height exceeds a combined depth of 3 feet, one No.4 steel bar should be placed vertically every 3 feet. These parameters should be reviewed by the Project Structural Engineer and revised as required to accommodate intended use.

g. Prior to the placement of steel in footing excavation, an inspection should be made by the representative of CYG to ensure that the footing excavation exposes competent bedrock, compacted fill or competent alluvium.

h. The City Inspector should be notified to inspect and approve the footing excavation prior to pouring concrete.

8.0 Retaining Wall

The following recommendations can be used in the design of the proposed retaining walls.

a. Conventional spread footings supported be bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing ground surface can be used to support the proposed retaining wall. The conventional spread footings to support retaining wall in the transitional zone area should be provided with additional steel reinforcement.

b. A triangular-distributed equivalent fluid pressure of 60 psf/ft can be used in the design of the proposed retaining wall. Any anticipated superimposed loading within a 2:1 plane projected upward from the wall bottom, except retained earth materials, should be considered as surcharge and provided for in the design. The Project Structural Engineer should incorporate any anticipated superimposed loading in the design of the basement retaining wall.

c. The retaining wall should be constructed with weep holes or a perforated PVC pipe in a gravel envelope at and behind the bottom of the wall. The subdrain system for the retaining wall should be inspected and approved by the representative of CYG and the City Inspector prior to placing wall backfill.

d. If PVC pipe in a gravel envelope is to be used for subdrain system, a one-foot thick zone of clean, granular soil should be placed behind the wall to 2 feet below the finished grade. The upper 2 feet should be backfilled with less permeable soil. Retaining wall backfill must be compacted to a minimum dry density of 90% of the maximum density as determined by ASTM Standard D-1557-09.

e. Retaining walls should be provided with a proper waterproofing system to prevent the migration of subsurface water to the front face of retaining walls.

f. Retaining walls retain ascending slope should be provided with a minimum of one (1) foot of freeboard and a V-shaped concrete swale behind the wall.

Gravels should not be used as fill soil for retaining wall backfill wider than 2 feet unless the use of gravel for retaining wall backfill is evaluated and approved by CYG and approved by the City of Agoura Hills. All gravel backfill should be mechanically compacted. The mechanical vibration of the gravel backfill should be observed by the representative of CYG. The compacted gravels should be tested by the representative of CYG if gravels backfill is wider than 2 feet. A minimum dry density of 90% of the maximum dry density as determined by ASTM Standard D-1557-09 will be used in field density tests for gravel backfill.

9.0 Foundation Settlement and Uplifting

The total and differential settlements of the proposed townhouses supported by conventional spread footings as recommended are anticipated to be within tolerable limits. Total settlement of the foundation is expected to be less than ½ inch. Differential settlement should be less than ½ inch in a span of 20 feet.

It should be noted that the evaluation of foundation settlement is based on the assumption that the proposed development and surrounding areas will be provided with adequate surface and subsurface drainage devices and that the drainage systems will be properly and constantly maintained. Additional foundation settlement caused by local bearing failure and/or soil lubrication may occur if the foundation soil is saturated or nearly saturated. Laboratory expansion index test indicated an expansion index of 61 for the tested alluvial soil. Due to the high expansion potential of onsite soil, foundation uplifting caused by soil swelling may also occur if the foundation soil is saturated or nearly saturated.

The differential movement of foundation soils caused by soil settlement and soil swelling may cause the distress of building foundation and structural elements. In order to avoid the migration of a significant amount of surface and subsurface water to foundation soil, the recommendations in the section of "Drainage Control" should be incorporated into the design and implemented during construction.

10.0 Slab-On-Grade

Concrete slabs-on-grade should be either entirely supported by compacted fill or entirely supported by competent alluvium which was encountered approximately 5 feet below the existing ground surface. Otherwise, concrete slabs should be designed as structural slabs and supported by surrounding footings. If concrete slabs are to be supported by compacted fill, the recommendations in the section of "Site preparation" should be implemented during construction.

Concrete slab-on-grade should be designed for a minimum thickness of 5 inches, reinforced with No.4 bars at 12 inches on centers, both ways. Reinforcement should be properly supported to assure desired mid-height placement. A 10-mil plastic vapor barrier should be placed below the floor slabs in moisture sensitive areas. The vapor barrier should be sandwiched by two 2-inch sand layers to protect the vapor barrier from punctures and to aid in the concrete cure. The vapor barriers should be properly sealed in the joint areas.

Concrete decking, slabs and walkways are likely to experience cracking as the results of the curing process of the concrete. The occurrence, amount and locations of shrinkage cracks can be affected to a major and minor degree by the following factors: type of cement, type of aggregate, mix proportions, concrete strength, steel reinforcement, methods of placing and curing, temperature and humidity. Shrinkage cracks are very difficult to prevent from occurring. Expansion joints are commonly installed within exterior decks in an effort to control the location of the inevitable cracks. Interior slabs however are typically not provided with expansion joint, making cracking more random. The recommended steel reinforcement is intended to reduce the severity of cracking and must be properly installed to ensure proper performance. Rigid or brittle floor covering, such as tile or marble may also experience cracking during the curing process of the concrete slab underneath and/or minor settlement. Providing a slip sheet between the slab and floor covering will help to reduce cracking of the floor covering.

It should be noted that concrete slabs can be uneven to a major and minor degree caused by the following reasons: 1) built-in deflection caused by construction, 2) static soil settlement caused by structural loading, 3) additional static soil settlement and swelling caused by saturation or near saturation of foundation soil, and 4) earthquake-induced settlement. The built-in deflection will not cause the distress of concrete slab after the construction of concrete slab. However, the deflections caused by static settlement, earthquake-

induced settlement and ground movement of adjacent slope or retaining wall may cause the occurrence of new cracks and degradation of shrinkage cracks.

Concrete slabs should have proper water ratio and sand/gravel ratio. The bearing subgrade of concrete slab should not be significantly disturbed during the placement of steel reinforcement and vapor barrier. Non-shrinkage cement can be used to minimize the occurrence of shrinkage cracks. The degradation of shrinkage cracks and the occurrence of new cracks can be minimized by providing the site with a proper surface and subsurface drainage control, including the design and maintenance of drainage system.

11.0 Asphalt Concrete Pavement

Asphalt concrete pavement should be entirely supported by compacted fill. If asphalt concrete pavement supported by compacted fill is proposed, the existing soil in the asphalt concrete pavement area should be removed to a minimum depth of 2 feet below the existing ground surface or a minimum of 2 feet below the bottom of the asphalt concrete pavement, whichever is deeper, and then recompacted to be certified fill. The removal and recompaction for asphalt concrete pavement should be extended horizontally a minimum of 2 feet beyond the boundaries of asphalt concrete pavement in all directions. The removal and recompaction for asphalt concrete pavement can be limited to property lines.

Structural section calculations for asphalt concrete pavement were performed and presented in the referenced CYG report dated December 30, 2004. The structural sections can be used in the design of asphalt concrete pavement. The structural sections for a traffic index of 4 is recommended for passenger car area and the structural sections for a traffic index of 5 is recommended for delivery of working zones and truck area. Compaction tests will be required for the aggregate base. A minimum relative compaction of 95% is required for aggregate base.

Traffic Index	Asphalt Concrete	Aggregate Base
4	3.0	4.0
5	4.0	4.0

12.0 Fill Placement and Soil Compaction

Fill placement and soil compaction will be required for retaining wall backfill and the preparation of bearing soils for footings, slabs and pavements. The following general guidelines can be used as a basis for quality control of fill placement and soil compaction.

a. All grading work and fill placement should be performed in conformance with the current grading ordinances of the City of Agoura Hills.

b. Remove vegetation, loose soils, construction debris and all other deleterious materials in the fill placement area prior to the placement of fill soil.

c. The bottom to receive fill soil should be inspected and approved by the representative of CYG prior to the placement of any fill soil. The bottom to receive fill soil should also be inspected and approved by the City Inspector prior to the placement of fill soil.

d. The bottom to receive fill soil should be scarified a minimum of 6 inches, thoroughly moistened and mixed to near 120% of the optimum moisture content and then properly compacted prior to placing fill.

e. Fill materials should be placed in controlled layers which when compacted, should not exceed 6 inches in thickness. Rock greater than 6 inches in the longest side should not be placed in compacted fill.

f. All compacted fill should be thoroughly moistened and mixed to near 120% of the optimum moisture content and then compacted to a minimum dry density 90% of the maximum dry density as determined by ASTM Standard D-1557-09.

g. At least one soil density test should be performed for every two (2) feet of vertical lift. Both sand cone method and nuclear gauge method will be required for field density tests. If the test indicates a dry density less than 90% of the maximum dry density, the tested layer should be removed, recompacted and retested until a minimum dry density of 90% of the maximum dry density is achieved.

It should be noted that it is the responsibility of you, your representative or your contractor to perform the required fill placement and soil compaction, and to notify CYG to perform the required inspection and density testing.

All lines and grades for the proposed development, include the extent of fill placement, should be provided by you, the general contractor or the grader. CYG should not be assumed any responsibility for lines and grades. If the locations of the structures to be supported by compacted fill are changed after the completion of fill placement, additional soil removal, fill placement and soil compaction may be required. CYG should be notified to evaluate the necessity of additional soil removal, fill placement and soil compaction if the locations of the structures to be supported by compacted fill are changed.

A soil compaction report and a certificate for compacted fill will be requested by the City of Agoura Hills for the fill placement and soil compaction. Therefore, the soil compaction report and a certificate for compacted fill should be submitted to the City of Agoura Hills after the completion of fill placement and soil compaction.

13.0 Temporary Excavation

Three wedge slope stability analyses using the Free Body Diagram method were performed to evaluate the stability of 5, 7 and 12 feet high temporary excavations. The results of the analyses are presented in Figures 3, 4 and 5. The analyses indicated factors of safety greater than the minimum code requirement for 5 and 10 feet high temporary excavations.

One slot cut calculation was performed to evaluate the stability of a 12-foot high and 8-foot wide A/B/C slot cut. The results of the calculation are shown on Figure 6. The calculation indicated a factor of safety greater than the minimum code requirement.

Based on the findings of slope stability analyses, the recommendations in the following table can be used in the preliminary design of temporary excavations which will not remove lateral support from adjacent property and structure.

Height of Excavation (H), ft	Excavation and/or Shoring System
$0 < H \leq 7$	vertical
$7 < H \leq 12$	vertical for lower 7 feet and 1:1 trimming for above 7 feet
> 12 ft	additional evaluations are required

CYG-04-3877 12' High 8' Wide A/B/C Slot Cut

Height	Spacing	Surcharge	Unit Wt.	Cohesion	Friction Angle	Delta	Length	Weight	Sliding Force	RF1	RF2	RF3	FS
H = ft	*S = ft*	*q = lbs/ft*	*pcf*	*C = psf*	*ϕ = degree*	*δ = degree*	*L = ft*	*W = lbs*	*SF = lbs*	*lbs*	*lbs*	*lbs*	
12	8	0	127	200	25	35	20.9	104472	59923	39906	33474	41131	1.91
12	8	0	127	200	25	36	20.4	100685	59181	37984	32665	39640	1.86
12	8	0	127	200	25	37	19.9	97076	58422	36152	31903	38219	1.82
12	8	0	127	200	25	38	19.5	93630	57645	34405	31186	36862	1.78
12	8	0	127	200	25	39	19.1	90335	56850	32736	30509	35565	1.74
12	8	0	127	200	25	40	18.7	87179	56038	31141	29870	34323	1.70
12	8	0	127	200	25	41	18.3	84152	55209	29615	29266	33131	1.67
12	8	0	127	200	25	42	17.9	81244	54363	28154	28694	31986	1.63
12	8	0	127	200	25	43	17.6	78446	53500	26753	28153	30884	1.60
12	8	0	127	200	25	44	17.3	75751	52621	25409	27639	29823	1.57
12	8	0	127	200	25	45	17.0	73152	51726	24120	27153	28800	1.55
12	8	0	127	200	25	46	16.7	70642	50816	22883	26691	27812	1.52
12	8	0	127	200	25	47	16.4	68215	49890	21694	26253	26856	1.50
12	8	0	127	200	25	48	16.1	65866	48948	20552	25836	25932	1.48
12	8	0	127	200	25	49	15.9	63590	47992	19454	25440	25035	1.46
12	8	0	127	200	25	50	15.7	61382	47021	18398	25064	24166	1.44
12	8	0	127	200	25	51	15.4	59237	46036	17384	24706	23322	1.42
12	8	0	127	200	25	52	15.2	57153	45037	16408	24365	22501	1.40
12	8	0	127	200	25	53	15.0	55124	44024	15469	24041	21702	1.39
12	8	0	127	200	25	54	14.8	53148	42998	14567	23733	20924	1.38
12	8	0	127	200	25	55	14.6	51222	41958	13700	23439	20166	1.37
12	8	0	127	200	25	56	14.5	49342	40906	12866	23159	19426	1.36
12	8	0	127	200	25	57	14.3	47505	39841	12065	22893	18703	1.35
12	8	0	127	200	25	58	14.2	45710	38765	11295	22640	17996	1.34
12	**8**	**0**	**127**	**200**	**25**	**59**	**14.0**	**43954**	**37676**	**10556**	**22399**	**17305**	**1.33**
12	**8**	**0**	**127**	**200**	**25**	**60**	**13.9**	**42234**	**36576**	**9847**	**22170**	**16628**	**1.33**
12	**8**	**0**	**127**	**200**	**25**	**61**	**13.7**	**40549**	**35465**	**9167**	**21952**	**15964**	**1.33**
12	**8**	**0**	**127**	**200**	**25**	**62**	**13.6**	**38896**	**34343**	**8515**	**21745**	**15313**	**1.33**
12	**8**	**0**	**127**	**200**	**25**	**63**	**13.5**	**37273**	**33210**	**7891**	**21549**	**14674**	**1.33**
12	**8**	**0**	**127**	**200**	**25**	**64**	**13.4**	**35679**	**32068**	**7293**	**21362**	**14047**	**1.33**
12	8	0	127	200	25	65	13.2	34111	30915	6722	21185	13430	1.34
12	8	0	127	200	25	66	13.1	32569	29754	6177	21017	12823	1.34
12	8	0	127	200	25	67	13.0	31051	28583	5658	20858	12225	1.36
12	8	0	127	200	25	68	12.9	29555	27403	5163	20708	11636	1.37
12	8	0	127	200	25	69	12.9	28080	26215	4693	20566	11055	1.39
12	8	0	127	200	25	70	12.8	26625	25019	4246	20432	10482	1.41
12	8	0	127	200	25	71	12.7	25188	23816	3824	20306	9917	1.43
12	8	0	127	200	25	72	12.6	23769	22605	3425	20188	9358	1.46
12	8	0	127	200	25	73	12.5	22365	21388	3049	20077	8805	1.49
12	8	0	127	200	25	74	12.5	20976	20163	2696	19974	8258	1.53
12	8	0	127	200	25	75	12.4	19601	18933	2366	19877	7717	1.58
12	8	0	127	200	25	76	12.4	18239	17697	2058	19788	7181	1.64
12	8	0	127	200	25	77	12.3	16888	16456	1772	19705	6649	1.71
12	8	0	127	200	25	78	12.3	15549	15209	1507	19629	6122	1.79

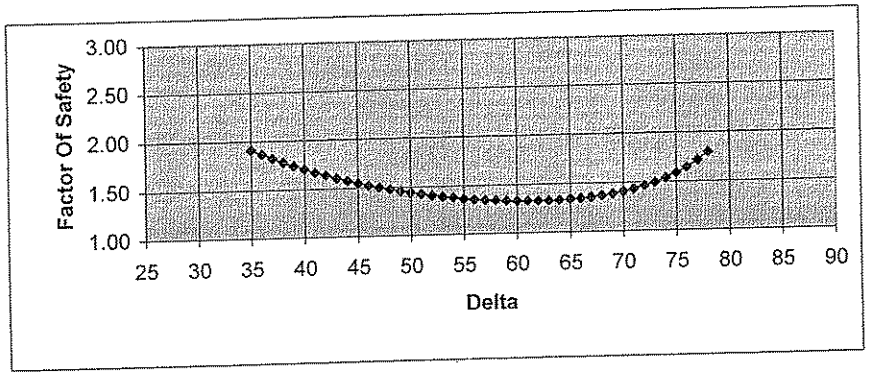


Figure 6

Temporary excavation below the 1:1 lines projected downward from the bottom of adjacent structures will be considered as the removal of vertical and lateral support from the adjacent structures. Temporary excavation below the 1:1 lines projected downward from the boundary of public street will be considered as the removal of vertical and lateral support from the public street. If temporary excavation removes vertical or lateral support of any adjacent structure or public street, the temporary excavation should be protected by a shoring system or be conducted using the A/B/C slot cutting method.

If A/B/C slot cut is required to protect temporary excavations, the following procedures can be used in the preliminary design of A/B/C slot cutting:

a. Excavate banks to a 1:1 gradient (45 degrees). The maximum height of the bank is 15 feet.

b. Excavate the vertical slots, using the A-B-C-A-B-C sequence, first excavating the "A" slots. Slot cut may be excavated to a maximum of 8 feet in width.

c. Construct the wall sections in the "A" slots. Provide proper waterproofing and backfill between the wall sections and the bank with gravel or approved compacted fill.

d. Excavate the "B" slots after the wall sections in the "A" slots have been constructed and backfilled.

e. Construct the wall sections in the "B" slots. Provide proper waterproofing and backfill between the wall sections and the bank with gravel or approved compacted fill.

f. Excavate the "C" slots after the wall sections in the "B" slots have been constructed and backfilled.

The design of A/B/C slot cutting should be reviewed and approved by CYG. The temporary excavation for A/B/C slot cutting should be inspected by the representative of CYG. The representative of CYG should be notified to observe the temporary excavations.

All excavations should be stabilized within 30 days of initial excavation. Water should not be allowed to pond on top of the excavations nor to flow toward it. It should be noted that it is your responsibility to notify CYG to inspect the temporary excavation.

14.0 Soil Corrosion

The chemical tests indicated that the tested onsite soil has a PH value of 7.5, a resistivity of 6320 Ohm-cm, a chloride concentration of 80 mg/kg, and a sulfate concentration of 496 mg/kg (see Appendix A). The results of chemical tests indicated that onsite soil has a moderate corrosion effect on underground utility lines. It is recommended that an corrosion engineer be consulted for the protection of underground utility lines from soil corrosion. Sulfate-resisting cement such as Type V Portland Cement should be considered for all concrete works.

15.0 Pre-Moistening of Foundation Soil

Due to the high expansion potential of onsite soils, it is recommended that the subgrades for footings and concrete slabs be pre-moistened to a minimum depth of 18 inches below the lowest adjacent grades prior to placing concrete. The pre-moistening should achieve a minimum of 120% of the optimum moisture content. The pre-moistening can be conducted simultaneously during soil removal and recompaction. The pre-moistening of bearing soils for footing and slabs should be inspected, tested and approved by the representative of CYG.

16.0 Drainage Control

Final grading should provide a positive drainage to divert surface water away from the building foundation and footings in non-erosive devices to the street or other acceptable areas. Yard areas and planter areas should be provided with adequate area drains to intercept surface water. Landscape watering should be kept to the minimum amount required for vegetation growth. Surface water is not allowed to flow on the slope in an uncontrolled concentrated manner.

The building structures should be properly provided with roof gutters and downspouts. The outlets of downspouts should be connected to area drains or be extended a minimum of 5 feet away from the building foundation and footings. Underground utility pipes should be absolutely leak free. Retaining walls should be provided with subdrain system as recommended.

Proper drainage should be provided to divert surface water away from the foundation and footing areas during construction. This is especially important when construction takes place during rainy seasons.

The purpose of providing recommendations for drainage control in this section is to remind you, your representative, general contractor and the designer drainage system designer that the foundation pad and adjacent area should be provided with adequate surface drainage devices so that adverse impacts of surface and subsurface water on the stability of building foundation and footings can be avoided or reduced. It should be noted that it is the responsibility of the designer of drainage system to evaluate and design surface and subsurface drainage systems.

The design of drainage system is beyond the scope of services provided by soils engineers and geologists. The inspection and approval of surface and subsurface drainage, except retaining wall subdrain, are beyond the scope of services provided by soils engineers and geologists. Therefore, it is strongly recommended that drainage system designer be notified to inspect and approve the final conditions of surface and subsurface drainage system prior to the completion of the project.

You should be aware that it is your responsibility to ensure that the recommendations for drainage control are incorporated into the design and implemented during construction. The home owner should also be aware that it is the responsibility of the home owner to maintain the drainage devices.

17.0 Plan Review

In accordance with the City of Agoura Hills, grading plans, foundation plans and retaining wall plans should be reviewed and approved by the project soils engineer to ensure that the recommendations in the geotechnical engineering reports and the requirements in the city approval letter are properly incorporated into the design.

Engineering for the proposed project should not be finalized until approval of this geotechnical engineering report is obtained from the City of Agoura Hills as significant changes in the design and recommendations may result from the city review process. Formal plans ready for submittal to the City of Agoura Hills must be reviewed by CYG. Any change in scope of the project may require additional work.

18.0 Field Inspection and Testing

In accordance with the City of Agoura Hills regulations, the following field inspections and testings should be performed by the representative of CYG to ensure that the recommendations and requirements in the design plans, CYG report and city approval letters are properly implemented during grading and construction.

a. Inspect and approve the bottoms of footing trenches for conventional spread footings.

b. Inspect and approve the subdrain system of retaining walls.

c. Inspect and approve temporary excavations which remove lateral support from adjacent structures.

d. Inspect and approve bottoms to receive fill soil.

e. Perform fill placement observation and field density test.

It is the responsibility of you, your representative or your contractor to perform all required fill placement and soil compaction, to notify CYG to perform the required inspections and field density tests and to notify the City Inspector to perform the required inspection. It is recommended that CYG be notified at least 24 hours prior to any required plan review, site inspection and field testing. All approved plans and permits must be at the job site and available.

OTHER RECOMMENDATIONS

This report is considered as an update geotechnical engineering report of the referenced CYG reports. Therefore, the recommendations in the referenced CYG reports dated December 30, 2004, February 3, 2006, and August 8, 2006, unless superseded by this report, are still applicable and should be incorporate into design and implemented during construction.

REPORT SUBMITTAL

This report is considered as an update report of the referenced CYG reports dated December 30, 2004, February 3, 2006 and August 8, 2006. Therefore, it is recommended that a set of the referenced CYG reports and the city review letters be submitted in together with this report to City of Agoura Hills for city review.

LIMITS AND LIABILITY

The findings, conclusions and recommendations submitted in this report are based on the findings of our data research, subsurface exploration, laboratory testing, geologic evaluations, engineering evaluations and engineering analyses. The nature and extent of variations in subsurface conditions may not become evident until construction. If variations of site conditions were observed during grading and construction, CYG should be notified immediately. If variations appear evident and significant, it will be necessary to reevaluate the recommendations of this report. It should be noted that it is the responsibility of you and your representative to notify CYG the variations immediately after the variation is observed.

This report is issued with the understanding that it is the responsibility of the Owner, or of his representative to ensure that the recommendations of this report are properly incorporated into the design plan and that the necessary steps are taken to see that the contractors carry out such recommendations in the field.

CYG is neither the Project Grading Engineer nor the Project Survey. Therefore, CYG should not be assumed for any liability for lines and grades of the subject project. The finish grade and the extent of soil removal

and recompaction should be provided by the General Contractor, Grader and/or Project Surveyor. CYG is neither the Project Civil Engineer, Project Architect nor the Project Drainage system designer. Therefore, CYG should not be assumed any liability for the evaluations, designs and inspections of surface and subsurface drainage systems.

This report submitted has been prepared in accordance with generally accepted geologic and geotechnical engineering practices. The conclusions and recommendations presented herein are partly based on the evaluations of geotechnical information gathered from limited field exploration and laboratory tests, partly on experience, and partly on professional judgement. The conclusions and recommendations should be considered "advices". Other consultants could arrive at different conclusions and recommendations. No warranty, either expressed or implied, is made or intended in connection with the above exploration or by the furnishing of this report or by any other oral or written statement.

This report was prepared by CYG for the exclusive use of the client and authorized agent and should not be considered transferable.

ENDING

We appreciate the opportunity for providing this professional service. If you have any questions regarding this report, please do not hesitate to contact us.

Very truly yours,
C. Y. Geotech, Inc.

John T. Tsao
RCE 46886/CEG 1783

Encl: References
Appendix A, Results of Chemical Tests

cc: (5) Addressee

REFERENCES

1. C. Y. Geotech, Inc., December 30, 2004, Geotechnical Engineering Investigation, Proposed Chesebro Wash Center, APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California.

2. City of Agoura Hills Review Letter Dated August 30, 2005.

3. C. Y. Geotech, Inc., February 3, 2006, Response to City of Agoura Hills Review Letter Dated August 30, 2005, Proposed Chesebro Auto Wash Center, APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California.

4. City of Agoura Hills Review Letter Dated February 20, 2006.

5. C. Y. Geotech, Inc., August 8, 2006, Response to City of Agoura Hills Review Letter Dated February 20, 2006, Proposed Chesebro Auto Wash Center, APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California

APPENDIX A

RESULTS OF CHEMICAL TESTS

GEOSYSTEMS, INC.

ENVIRONMENTAL
ENGINEERING-GEOLOGY
GEOTECHNICAL ENGINEERING

December 20, 2004
GS04-C1205

C. Y. Geotech, Inc.,
21430 Strathern Street, Unit O
Canoga Park, CA 91304

Attn. Mr. P.C. Cai

SUBJECT: Laboratory Testing Results: Soil Corrosivity Test for Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California.

At your request, this letter provides the results of a Soil Corrosivity Test performed for the soil sample submitted to our laboratory for the subject site located at Southeast corner of chesebro Road and Driver Avenue, Agoura Hills, California.

Chemical tests for pH, chloride content, sulfate content and minimum resistivity were performed per the California Test Method (CTM) on a sample submitted to this office. Minimum resistivity testing was conducted on a saturated sample. The laboratory test results based on CTM are presented below:

Sample Location	pH CTM 532	Chloride Content CTM 422 (ppm)	Sulfate Content CTM 417 (ppm)	Minimum Resistivity CTM 532 (ohm-cm)
On-Site Soil	**7.5**	**80.0**	**495.6**	**6320**

1545 VICTORY BLVD. 2ND FLOOR GLENDALE CALIFORNIA 91201-9240 PH. 818 - 500 - 9533 FAX 818 - 500 - 0134

Services performed by this facility for the on-site soil were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other warranties are expressed or implied. The opportunity to provide professional services is greatly appreciated.

Please feel free to call if you have any questions.

GEOSYSTEMS, INC.

Sean Chi-Hsin Lin, Ph.D., Senior Engineer
RCE 67109, Exp. 9-30-06

CC: 5 to Client

SCL/SST

Company:\ GS04-C1205\ As-built report\ Zanja2_c.cyg.wpd

C. Y. GEOTECH, INC.

Engineering Geology and Geotechnical Engineering

21430 Strathern Street, Unit O, Canoga Park, CA 91304
Tel: (818) 888-1499 Fax: (818) 888-1498

August 8, 2006 P. N. CYG-04-3877

Mr. Aitan Hillel
164 W. Del Mar Boulevard
Pasadena, California 91105

Subject: Response to City of Agoura Hills Review Letter Dated February 20, 2006
Proposed Chesebro Auto Wash Center, APN: 2052-008-017 and
2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner
of Chesebro Road and Driver Avenue, Agoura Hills, California

Dear Aitan,

As requested, C. Y. Geotech (CYG), Inc. has prepared this addendum report in response to the City of Agoura Hills review letter dated February 20, 2006. A copy of the city review sheet is attached at the end of this report. For your convenience, the responses are presented following each review comment.

City Review Comment 1:
Signs and monuments could have relatively large lateral loads and moments on foundations, which could cause significant deformation at the foundation level. The consultant should discuss and evaluate lateral deformation of foundation under the prevailing loads and moments. Mitigation measures should be recommended as necessary.

Response to City Review Item 1:
Based on the information provided by you, it is our understanding that the height of the monument is only 3 feet high. There is no structural engineer for this project at this moment. Therefore, the structural information for the design of sign and monument are not available at this moment. In order to answer this city review comment, the potential lateral deformation of the foundation to support he proposed sigh and monument was analyzed for the following conditions provided by the Project Structural Engineer:

Lateral Load (case 1 and case 3) : 2000 to 10000 pounds per linear foot of width
Lateral Load (case 2 and case 4) : 2000 to 10000 pounds per linear foot of width
Foundation for Sign or Monument : skin friction pile
Height of Sign = 20 ft
Height of Monument = 3 ft
Pile Diameter : 2 feet
Pile Length : 8 feet (case 1 and case 2)
Pile Length : 16 feet (case 3 and case 4)

The results of the foundation deformation calculations are shown on Figure 1 through Figure 4. Based on the calculations, the total lateral displacement of sign and monument which may be caused by the applied lateral force and moment varies from 0.11 to 0.73 inches.

The potential foundation deformation presented above should be considered as the results of the preliminary evaluations using assumed values of lateral force and sign/monument dimensions. The actual potential foundation deformation should be verified when actual loads and dimensions of the sign/monument are available. The potential foundation deformation should also be considered by the Project Structural Engineer in the structural design. It is our opinion that no special geotechnical mitigation measure is required for the proposed sign and monument.

City Review Comment 2:
The consultant provides foundation setback from adjacent slopes that complies with the Uniform Building Cods (UBC). The City of Agoura Hills has more stringent setback requirements. The consultant should revise foundation setback from adjacent slopes recommendations to comply with the City of Agoura Hills requirements.

Response to City Review Item 2:
The recommendations in the following subsections for footing setback and building clearance should be incorporated into design and implemented during construction.

Footing Setback from Descending Slope
The City of Agoura Hills building code requires that any foundation and structural footing be a sufficient depth to provide an adequate horizontal setback from any adjacent descending slope which is steeper than 3:1. The required footing setback is ½ of the height of the adjacent descending slope with a minimum of 5 feet and a maximum of 40 feet measured horizontally from the base of the foundation to the face of the adjacent descending slope.

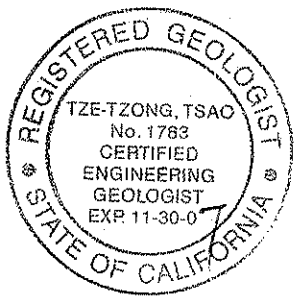
Building Clearance from Ascending Slope
The City of Agoura Hills building code requires that building structure be provided with a level building clearance between the building structure and the toe of an ascending slope which is steeper than 3:1. The required building clearance is ½ of the height of the adjacent ascending slope with a minimum of 5 feet and a maximum of 40 feet measured horizontally from the building to the toe of the adjacent ascending slope.

ENDING

We appreciate the opportunity for providing the professional service. If you have any questions regarding this report, please do not hesitate to contact us.

Very truly yours,
C. Y. Geotech, Inc.

John T. Tsao
RCE 46886/CEG 1783



Encl: References
City of Agoura Hills Review Letter Dated February 20, 2006

cc: (5) Addressee

REFERENCES

1. C. Y. Geotech. Inc., December 30, 2004, Geotechnical Engineering Investigation, Proposed Chesebro Wash Center, APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California.

2. City of Agoura Hills Review Letter Dated August 30, 2005.

3. C. Y. Geotech. Inc., February 3, 2006, Response to City of Agoura Hills Review Letter Dated August 30, 2005, Proposed Chesebro Auto Wash Center, APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California.

4. City of Agoura Hills Review Letter Dated February 20, 2006.

CALCULATION FOR LATERAL DEFLECTION OF PILE (CASE 1)

Earth Material for Lateral Support : Alluvium (medium dense to dense)
Applied Lateral Force = 2000 lbs
Diameter of Pile (Circular Pile) = 2 ft
Pile Length = 8 ft
Height of Sign/Monument = 20 ft

Lateral Subgrade Reaction Coefficient (f) : 70 lbs/in^3
$30 \times (2000 / 1728) \times (8/2) / 2 = 70$ lbs/in^3

Modulus of Elasticity of Pile (E) = 3×10^6 lbs/in^2

Moment of Inertial (I) = $0.25 \times 3.1416 \times (24/2)^4 = 16286$

Relative Stiffness Factor of Pile/Bedrock (T) = $(E \times I / f)^{1/5}$
$= (3 \times 10^6 \times 16286 / 70)^{1/5} = 59$ inch

Selection of Deflection Coefficient Curve (L/T) = 8 / (59/12) = 1.6
Use Curve of L/T = 2

Deflection Coefficient for Applied Lateral Force at Fixity Point (Fs) = 4.4

Deflection Coefficient for Applied Moment at Fixity Point (Fm) = 3.2

Lateral Deflection Due to Applied Lateral Force (see Figure 5)
$4.4 \times (2000 \times 59^3) / (3 \times 10^6 \times 16286) = 0.037$ in

Lateral Deflection Due to Applied Moment (see Figure 5)
$3.2 \times (2000 \times 240 \times 59^2) / (3 \times 10^6 \times 16286) = 0.109$ in

Total Deflection Due to Applied Lateral Force and Moment
$= 0.037 + 0.109 = 0.146$ inch Say 0.15 inch

Figure 1

CALCULATION FOR LATERAL DEFLECTION OF PILE (CASE 2)

Earth Material for Lateral Support : Alluvium (medium dense to dense)
Applied Lateral Force = 10000 lbs
Diameter of Pile (Circular Pile) = 2 ft
Pile Length = 8 ft
Height of Sign/Monument = 20 ft

Lateral Subgrade Reaction Coefficient (f) : 70 lbs/in^3
$30 \times (2000 / 1728) \times (8/2) / 2 = 70$ lbs/in^3

Modulus of Elasticity of Pile (E) = 3×10^6 lbs/in^2

Moment of Inertial (I) = $0.25 \times 3.1416 \times (24/2)^4 = 16286$

Relative Stiffness Factor of Pile/Bedrock (T) = $(E \times I / f)^{1/5}$
$= (3 \times 10^6 \times 16286 / 70)^{1/5} = 59$ inch

Selection of Deflection Coefficient Curve (L/T) = 8 / (59/12) = 1.6
Use Curve of L/T = 2

Deflection Coefficient for Applied Lateral Force at Fixity Point (Fs) = 4.4

Deflection Coefficient for Applied Moment at Fixity Point (Fm) = 3.2

Lateral Deflection Due to Applied Lateral Force (see Figure 5)
$4.4 \times (10000 \times 59^3) / (3 \times 10^6 \times 16286) = 0.185$ in

Lateral Deflection Due to Applied Moment (see Figure 5)
$3.2 \times (10000 \times 240 \times 59^2) / (3 \times 10^6 \times 16286) = 0.547$ in

Total Deflection Due to Applied Lateral Force and Moment
$= 0.185 + 0.547 = 0.732$ inch Say 0.73 inch

Figure 2

CALCULATION FOR LATERAL DEFLECTION OF PILE (CASE 3)

Earth Material for Lateral Support : Alluvium (medium dense to dense)
Applied Lateral Force = 2000 lbs
Diameter of Pile (Circular Pile) = 2 ft
Pile Length = 16 ft
Height of Sign/Monument = 20 ft

Lateral Subgrade Reaction Coefficient (f) : 140 lbs/in^3
$30 \times (2000 / 1728) \times (16/2) / 2 = 140$ lbs/in^3

Modulus of Elasticity of Pile (E) = 3×10^6 lbs/in^2

Moment of Inertial (I) = $0.25 \times 3.1416 \times (24/2)^4 = 16286$

Relative Stiffness Factor of Pile/Bedrock (T) = $(E \times I / f)^{1/5}$
$= (3 \times 10^6 \times 16286 / 140)^{1/5} = 51$ inch

Selection of Deflection Coefficient Curve (L/T) = 8 / (51/12) = 1.88
Use Curve of L/T = 2

Deflection Coefficient for Applied Lateral Force at Fixity Point (Fs) = 4.4

Deflection Coefficient for Applied Moment at Fixity Point (Fm) = 3.2

Lateral Deflection Due to Applied Lateral Force (see Figure 5)
$4.4 \times (2000 \times 51^3) / (3 \times 10^6 \times 16286) = 0.024$ in

Lateral Deflection Due to Applied Moment (see Figure 5)
$3.2 \times (2000 \times 240 \times 51^2) / (3 \times 10^6 \times 16286) = 0.082$ in

Total Deflection Due to Applied Lateral Force and Moment
$= 0.024 + 0.082 = 0.106$ inch Say 0.11 inch

Figure 3

CALCULATION FOR LATERAL DEFLECTION OF PILE (CASE 4)

Earth Material for Lateral Support : Alluvium (medium dense to dense)
Applied Lateral Force = 10000 lbs
Diameter of Pile (Circular Pile) = 2 ft
Pile Length = 16 ft
Height of Sign/Monument = 20 ft

Lateral Subgrade Reaction Coefficient (f) : 140 lbs/in^3
$30 \times (2000 / 1728) \times (16/2) / 2 = 140$ lbs/in^3

Modulus of Elasticity of Pile (E) = 3×10^6 lbs/in^2

Moment of Inertial (I) = $0.25 \times 3.1416 \times (24/2)^4 = 16286$

Relative Stiffness Factor of Pile/Bedrock (T) = $(E \times I / f)^{1/5}$
$= (3 \times 10^6 \times 16286 / 140)^{1/5} = 51$ inch

Selection of Deflection Coefficient Curve (L/T) = 8 / (51/12) = 1.88
Use Curve of L/T = 2

Deflection Coefficient for Applied Lateral Force at Fixity Point (Fs) = 4.4

Deflection Coefficient for Applied Moment at Fixity Point (Fm) = 3.2

Lateral Deflection Due to Applied Lateral Force (see Figure 5)
$4.4 \times (20000 \times 51^3) / (3 \times 10^6 \times 16286) = 0.119$ in

Lateral Deflection Due to Applied Moment (see Figure 5)
$3.2 \times (20000 \times 240 \times 51^2) / (3 \times 10^6 \times 16286) = 0.409$ in

Total Deflection Due to Applied Lateral Force and Moment
$= 0.119 + 0.409 = 0.528$ inch Say 0.53 inch

Figure 4

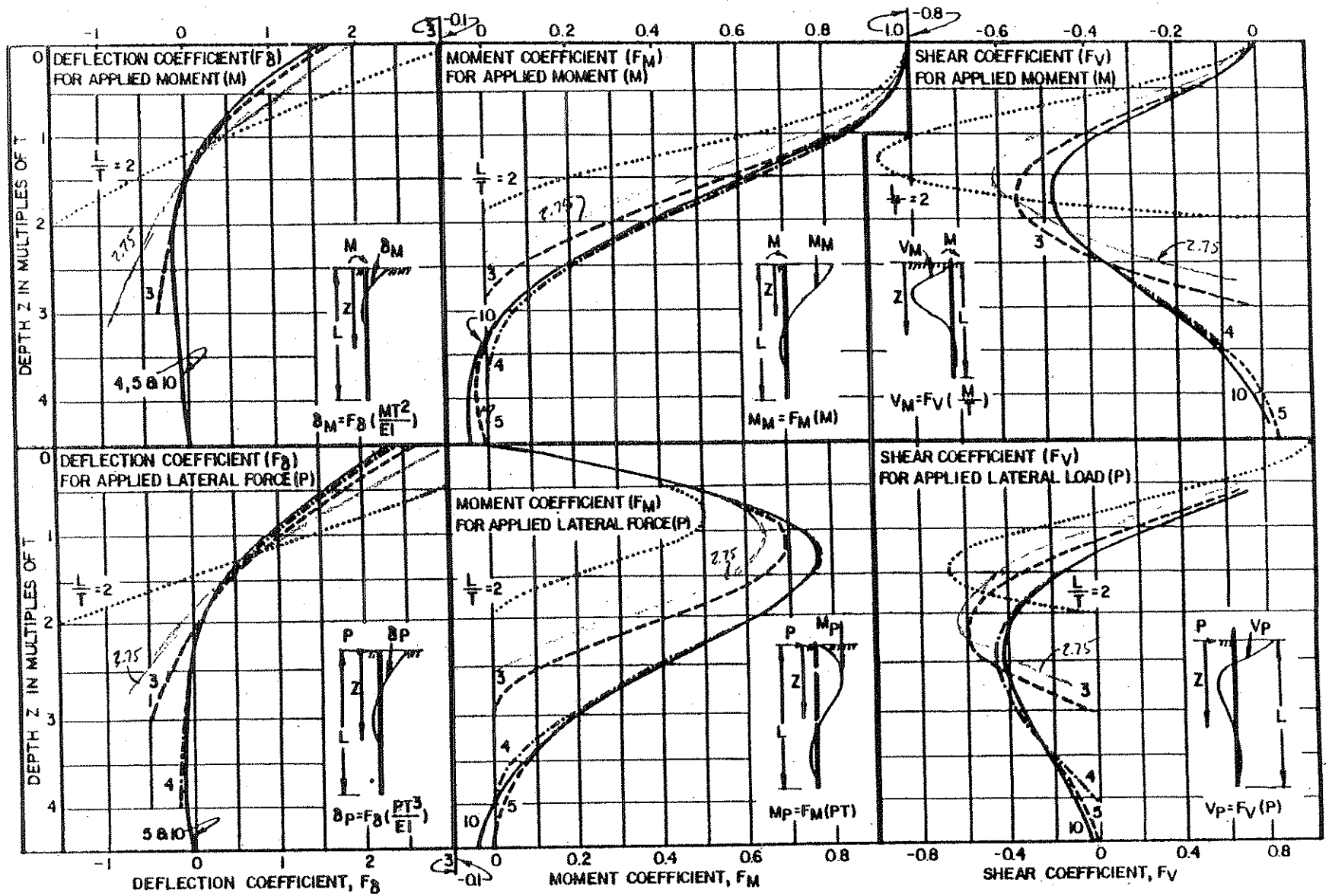


FIGURE 11
Influence Values for Pile with Applied Lateral Load and Moment
(Case I. Flexible Cap or Hinged End Condition)

Figure 5

Date: February 20, 2006
GDI #: 05.00103.0133

CITY OF AGOURA HILLS - GEOTECHNICAL REVIEW SHEET

To:	Valerie Darrouzet
Project Location:	Portions of Lots 17 & 18, Tract 6451, SWC of Chesebro Road & Driver Avenue, Agoura Hills, California.
Planning Case #:	05-SPR-018/05-OTP-023/05-SP-024/Hillel
Building & Safety #:	None
Geotechnical Report:	C. Y. Geotech, Inc. (2004), "Geotechnical Engineering Investigation, Proposed Chesebro Auto Wash, APN: 2052-008-017 and 2052-008-019, Portions of Lots 17 and 18, Tract 6451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California," Project No. CYG-04-3877, dated December 30, 2004.
Plans:	Allan O'Connor AIA, "Architectural Plans, Chesbro Auto Wash," various Scales, undated.
Previous Reviews:	August 30, 2005

FINDINGS

Planning/Feasibility Issues

- ☒ Acceptable as Presented
- ☐ Response Required

Geotechnical Report

- ☐ Acceptable as Presented
- ☒ Response Required

REMARKS

C. Y. Geotech, Inc. (CYG; consultant) provided a response to the geotechnical review letter by the City of Agoura Hills regarding the Chesebro Auto Wash proposed at the site located at the southeast corner of Chesebro Road and Driver Avenue, City of Agoura Hills, California. The site constitutes portions of Lots 17 and 18 of Tract 3451. The proposed development includes the construction of an auto wash center. The auto wash center consists of retail and office buildings, a service canopy with lube and detail bays, an auto wash tunnel, and access and parking areas.

The City of Agoura Hills – Planning Department reviewed the referenced report from a geotechnical perspective for compliance with applicable codes, guidelines, and standards of practice. GeoDynamics, Inc. (GDI) performed the geotechnical review on behalf of the City. Based upon the City's review, the referenced reports are acceptable as presented with regard to planning and feasibility issues. We recommend the Planning Commission consider approval of Case No. 05-SPR-018 from a geotechnical perspective. The consultant, however, should respond to the following report review comments prior to Building Plan Check approval. Plan-Check comments should be addressed in Building & Safety Plan Check, and a separate geotechnical submittal is not required for plan-check comments.

Report Review Comments

1. Signs and monuments could have relatively large lateral loads and moments on foundations, which could cause significant deformation at the foundation level. The consultant should discuss and evaluate lateral deformation of foundations under the prevailing loads and moments. Mitigation measures should be recommended as necessary.
2. The consultant provides foundation setback from adjacent slopes that complies with the Uniform Building Code (UBC). The City of Agoura Hills has more stringent setback requirements. The

consultant should revise foundation setback from adjacent slopes recommendations to comply with the City of Agoura Hills requirements.

Plan-Check Comments

1. The name, address, and phone number of the Consultant and a list of all the applicable geotechnical reports shall be included on the building/grading plans.
2. The grading plan should include the limits and depths of overexcavation of the building pad and flatwork areas as recommended by the Consultant.
3. The following note must appear on the grading and foundation plans: *"Tests shall be performed prior to pouring footings and slabs to determine the expansion index of the supporting soils, and foundation and slab plans should be reviewed by the Geotechnical Consultant and revised, if necessary, accordingly."*
4. The following note must appear on the grading and foundation plans: *"Excavations shall be made in compliance with Cal/OSHA Regulations."*
5. The following note must appear on the foundation plans: *"All foundation excavations must be observed and approved, in writing, by the Project Geotechnical Consultant prior to placement of reinforcing steel."*
6. Foundation plans and foundation details shall clearly depict the embedment material and minimum depth of embedment for the foundations.
7. Drainage plans depicting all surface and subsurface non-erosive drainage devices, flow lines, and catch basins shall be included on the building plans.
8. Final grading, drainage, and foundation plans shall be reviewed, signed, and wet stamped by the consultant.
9. Provide a note on the grading and foundation plans that states: *"An as-built report shall be submitted to the City for review. This report prepared by the Geotechnical Consultant must include the results of all compaction tests as well as a map depicting the limits of fill, locations of all density tests, outline and elevations of all removal bottoms, keyway locations and bottom elevations, locations of all subdrains and flow line elevations, and location and elevation of all retaining wall backdrains and outlets. Geologic conditions exposed during grading must be depicted on an as-built geologic map."*

If you have any questions regarding this review letter, please contact GeoDynamics, Inc. at (805) 218-6760.

Respectfully Submitted,

GeoDynamics, INC.

Ali Abdel-Hadi
Geotechnical Engineering Reviewer
GE 2308 (exp. 12/31/07)

Christopher J. Sexton
Engineering Geologic Reviewer
CEG 1441 (exp. 11/30/06)

C. Y. GEOTECH, INC.

Engineering Geology and Geotechnical Engineering

21430 Strathern Street, Unit O, Canoga Park, CA 91304
Tel: (818) 888-1499 Fax: (818) 888-1498

GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED CHESEBRO AUTO WASH
APN: 2052-008-017 AND 2052-008-019
PORTIONS OF LOTS 17 AND 18, TRACT 8451
SOUTHEAST CORNER OF CHESEBRO ROAD AND
DRIVER AVENUE, AGOURA HILLS, CALIFORNIA

FOR

MR. AITAN HILLEL

DECEMBER 30, 2004
PROJECT NO. CYG-04-3877

December 30, 2004

P. N. CYG-04-3877

Mr. Aitan Hillel
164 W. Del Mar Boulevard
Pasadena, California 91105

Subject: Geotechnical Engineering Investigation, Proposed Chesebro Wash Center, APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451, Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California

Dear Mr. Hillel,

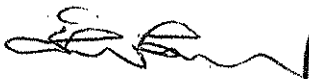
Per your request, C. Y. Geotech (CYG), Inc. has performed a geotechnical engineering investigation for the subject project. The purposes of this investigation are to evaluate the engineering properties of onsite earth materials which may affect the proposed development and to provide recommendations for the design and construction of the proposed Chesebro Auto Wash Center.

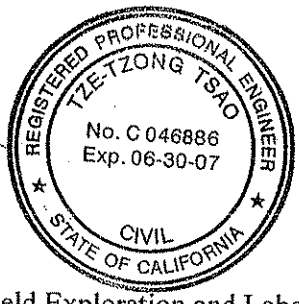
The accompanying report presents the findings and conclusions of this geotechnical engineering investigation and the recommendations for the design and construction of the proposed Chesebro Auto Wash Center.

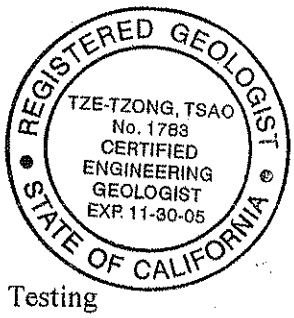
Based upon the findings of this investigation, the development of the proposed Chesebro Auto Wash Center at the subject site is feasible from a soil engineering viewpoint. Conventional spread footings entirely supported by compacted fill or entirely supported by competent alluvium can be used to support the proposed building structures. Conventional spread footings supported entirely by compacted fill, competent alluvium or bedrock can be used to support the proposed retaining walls. The conventional spread footings to support retaining wall in the transitional zone area should be provided with additional steel reinforcement.

We appreciate the opportunity for providing this professional service. If you have any questions regarding this report, please do not hesitate to contact us.

Very truly yours,
C. Y. Geotech, Inc.







John T. Tsao
RCE 46886/CEG 1783

Encl: Appendix A, Field Exploration and Laboratory Testing
Appendix B, Slope Stability Analyses
Appendix C, Liquefaction Evaluation

cc: (5) Addressee

GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed Chesebro Auto Wash Center
APN: 2052-008-017 and 2052-008-019, Portions of Lot 17 and 18, Tract 8451
Southeast Corner of Chesebro Road and Driver Avenue, Agoura Hills, California

As requested, CYG has performed a geotechnical engineering investigation for the subject project. The purposes of this investigation are to evaluate the engineering properties of onsite earth materials which may affect the proposed development and to provide recommendations for the design and construction of the proposed Chesebro Auto Wash Center.

1.0 SCOPE OF WORK

The following field, laboratory and engineering works have been performed for this investigation:

a. Data research and review of available geotechnical data of the site and its vicinity. A site location map is shown on Figure 1.

b. Logging and sampling seven (7) exploratory borings to a maximum depth of 31 feet at selected locations as shown on Figure 2. Boring logs are presented in Appendix A.

c. Perform laboratory tests to determine the engineering properties of onsite earth materials. The results of laboratory tests are presented in Appendix A and summarized in Section 5.4.

d. Perform faulting study and seismic evaluation. The potential of earthquake-induced geologic hazards which may affect the stability of the site was evaluated. The building code seismic factors for structural design were evaluated.

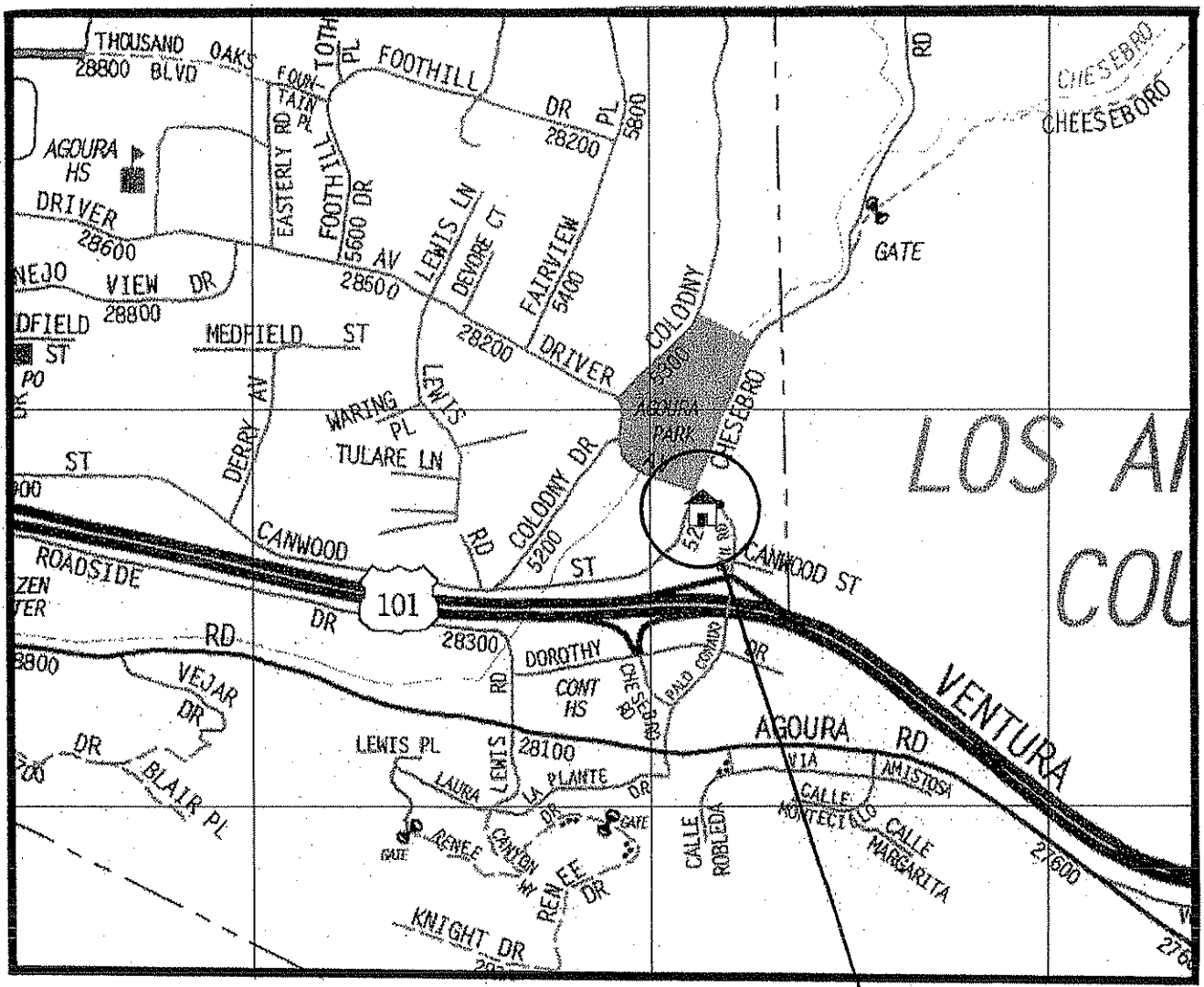
e. Perform geotechnical engineering evaluation and analyses. Circular slope stability analyses were performed to evaluate the stability of the west-facing slope. Wedge slope stability analyses were performed to evaluate the stability of temporary excavations and to calculate the equivalent fluid pressures for retaining wall design.

f. Prepare this geotechnical engineering report to present the findings and conclusions of this investigation and to provide recommendations for the design and construction of the proposed Chesebro Auto Wash Center.

2.0 SITE DESCRIPTION

The subject site is located at the southeast corner of Chesebro Drive and Driver Avenue, Agoura Hills, California. The legal description of the site is Portions of Lots 17 and 18, Tract 8451. A site location map is shown on Figure 1. The site is bounded on the west by Chesebro Drive, on the north by Driver Avenue, on the northeast by Palo Comado Canyon Road and on the south by commercial buildings.

The site is roughly triangular-shaped and currently vacant. The west portion of the site is fairly level while the east portion of the site consists of a west-facing slope up to 11 feet high. The gradient of the west-facing slope is approximately 5:1 to 6:1 (horizontal:vertical).

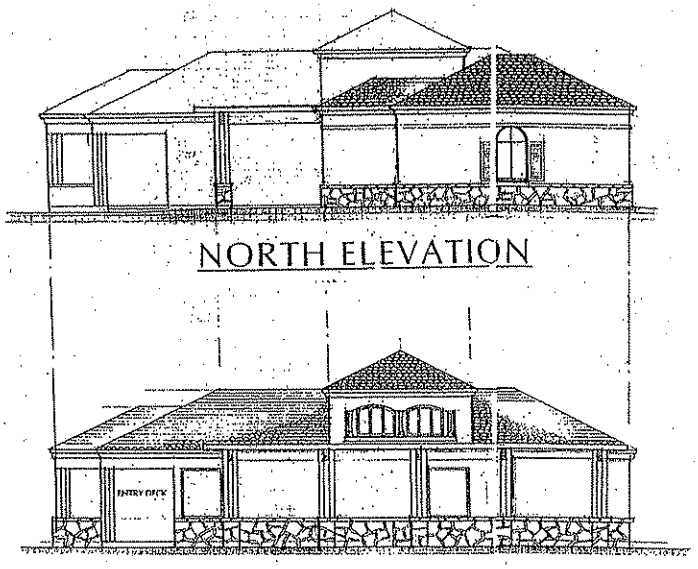


Subject Site

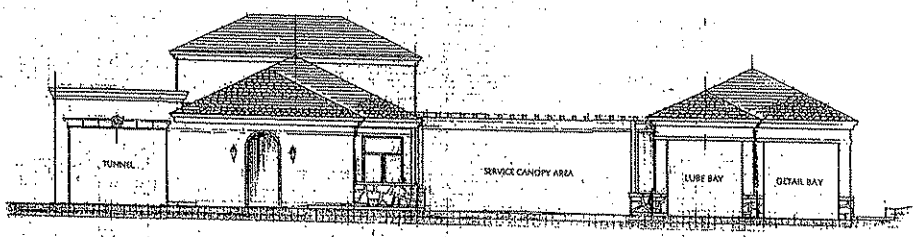
(Adopted from Thomas Brothers CD-ROM, 1999)

Scale 1"= 1200'

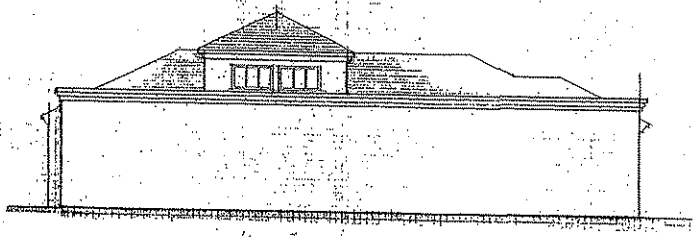
C. Y. GEOTECH, INC. Engineering Geology and Geotechnical Engineering	**Site Location Map**	
	CYG-04-3877	**Figure 1**



NORTH ELEVATION



EAST ELEVATION



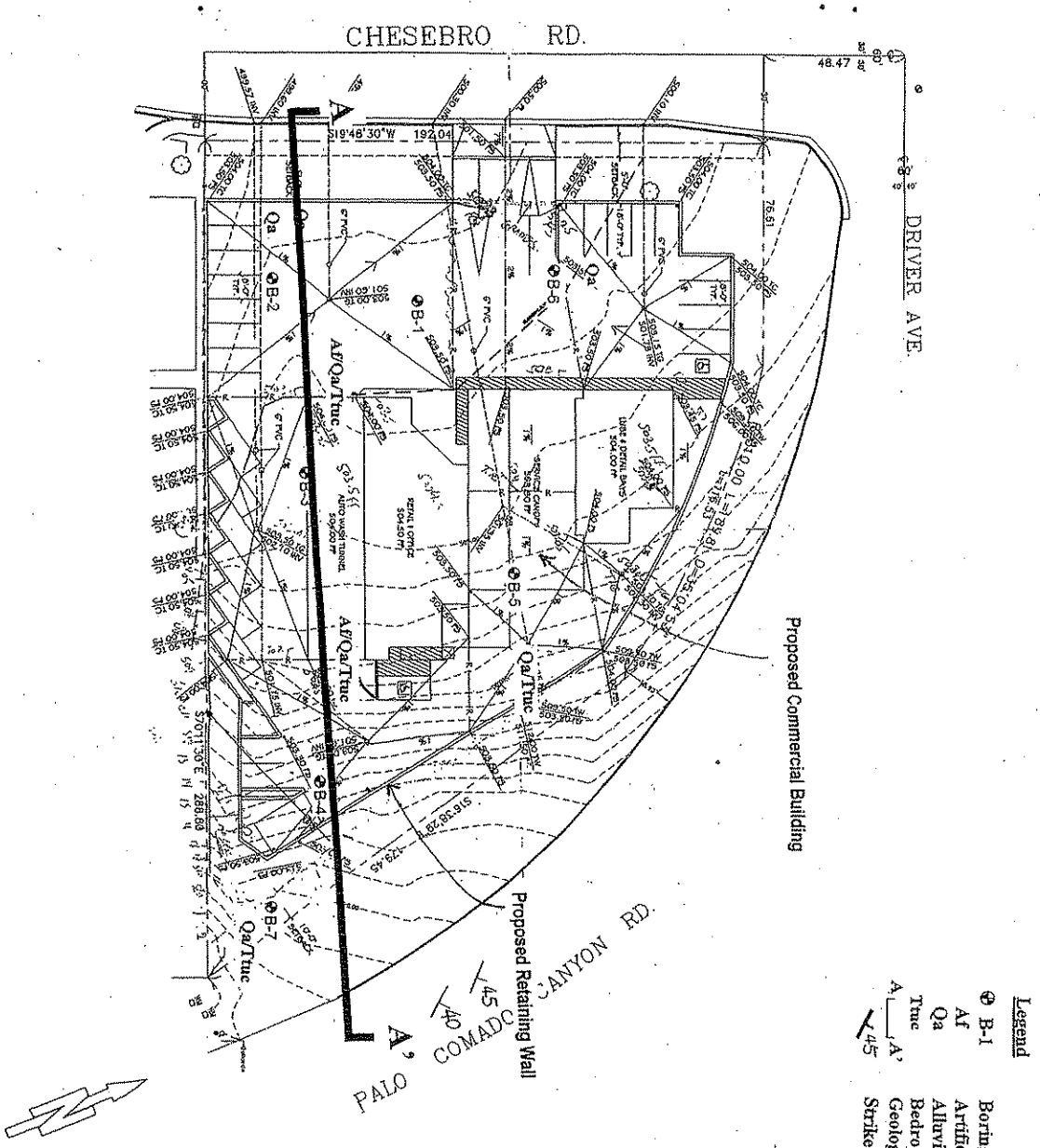
Scale 1"=20'

Architectural Sections Showing the Proposed Developments

CYG-04-3877 | **Figure 4**

C. Y. GEOTECH, INC.

ENGINEERING GEOLOGY & GEOTECHNICAL ENGINEERING

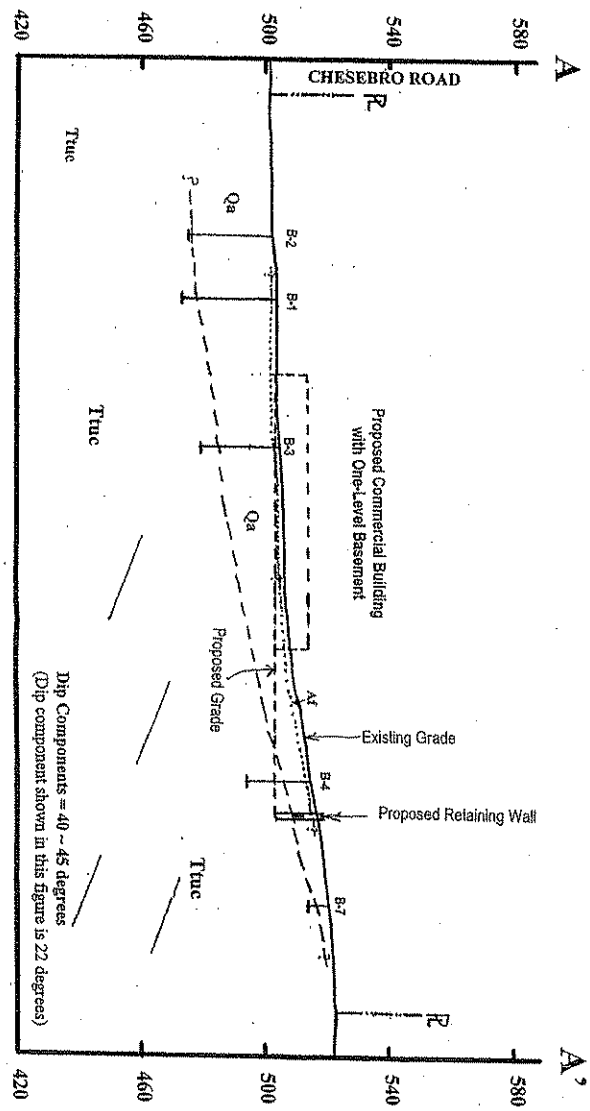


Topographic Map Showing Proposed Developments

C. Y. GEOTECH, INC.

ENGINEERING GEOLOGY & GEOTECHNICAL ENGINEERING

CYG-04-3877 | **Figure 2**



Geologic Cross Sections A-A'		C. Y. GEOTECH, INC. ENGINEERING GEOLOGY & GEOTECHNICAL ENGINEERING
CYG-04-3877	Figure 3	

A site plan showing the site, the property lines, the ground relief, the distribution of earth materials, the location of exploratory borings and the proposed commercial building development is shown on Figure 2. One geologic cross section showing the subsurface conditions of the site and the west-facing slope is shown on Figure 3.

3.0 PROPOSED DEVELOPMENT

Information regarding the proposed development was provided by you, and was used as a guide for the field exploration and report preparation. It is our understanding that the site is to be developed as an auto wash center (Chesebro Auto Wash Center). The auto wash center will consist of a retail and office building, a service canopy with lube and detail bays, auto wash tunnel and surrounding parking areas. A retaining wall is to be constructed along the east and north sides of the property to enlarge the level pad area. Freestanding walls are to be constructed in the west side of the property to divide the parking area and landscaping area.

A site plan showing the proposed development is shown on Figure 2. Two architectural cross sections showing the proposed development are shown on Figure 4.

Formal architectural and structural plans have not been prepared and await the findings, conclusions and recommendations of this investigation.

4.0 FIELD EXPLORATION AND LABORATORY TESTING

Field exploration was performed by one of our geologists on December 13, 2004 with the aid of hollow-stem drill rig and hand laborers. Seven (7) borings were drilled to a maximum depth of 31 feet at the locations as shown on Figure 2. The borings were logged by the geologist and backfilled on the same day of drilling. The boring logs are presented in Appendix A.

The earth materials encountered in the borings were sampled by using a split-tube soil sampler and a SPT soil sampler. The SPT soil samples were collected by using a 140-pound hammer to drive the SPT standard tube 18 inches into the soil. The falling head for SPT hammer was 30 inches. The blow count values were taken for every 6-inch penetration. The total blow count for the last 12 inches of penetrating distance was recorded as SPT N value. The SPT samples of onsite earth materials were logged and then retained in plastic bags for laboratory particle size tests.

The ring samples of onsite earth materials were logged and then retained in a series of brass rings, each having an inner diameter of 2.4 inches and a height of 1 inch. The ring samples and brass rings were retained in plastic, close-fitting, moisture-tight containers. Two bulk samples of onsite soils were collected for laboratory compaction test and expansion index test.

Laboratory testing was performed after the review of field data and in consideration of the proposed development and the probable foundation and footing system to be utilized. The testing procedures of ASTM (American Society for Testing and Materials) Standards were followed in laboratory testing.

The following engineering properties of onsite earth materials were determined: 1) field density and field moisture content, 2) maximum dry density and optimum moisture content, 3) cohesion and friction angle, 4) compressibility and hydroconsolidation, 5) expansion index test, and 6) grain size distribution. The results of laboratory tests are presented in Appendix A and summarized in Section 5.4.

Chemical tests were performed on one representative sample of alluvial soil to determine it PH value, Resistivity and concentrations of sulfate and chloride. Chemical tests were performed by GeoSystems, Inc. The method of CTM532 were used to determine PH value and resistivity. The method of CTM 417 and 422 were used to determine the concentrations of sulfate and chloride, respectively. The results of the chemical tests are also presented in Appendix A.

5.0 EARTH MATERIAL

Earth materials encountered in the borings consisted of artificial fill, alluvium and bedrock. Descriptions of the earth materials encountered are shown on the boring logs enclosed in Appendix A. The engineering properties of onsite earth materials are shown in Appendix A and summarized in Section 5.4. A regional geologic map showing the site and site vicinity adopted from Dibblee Geologic Map is shown on Figure 5.

5.1 Artificial Fill

Artificial fill was encountered from the ground surface and to a depth of approximately 2 feet in borings B-1, B-3 and B-4. The fill soil consists of mottled brown clayey sandy silt and sandy clayey silt in a moist and firm condition. The fill soil, in its present condition, is not suitable for foundation or slab support.

5.2 Alluvium (Qa)

Alluvium was encountered underlying fill soil in boirngs B-1, B-3 and B-4, and from the ground surface in borings B-2, B-4, B-5, B-6 and B-7. The maximum depth of the alluvial soil was encountered at a depth of 26 feet in boring. The alluvial soil dark brown silty clay, brown silty sandy clay and clayey sandy silt and light brown clayey sandy silt, clayey silty sand and gravelly sand. The alluvial soil encountered was in a moist to wet and stiff to firm and moderately dense to dense condition.

Laboratory tests indicated that the dry density of the tested alluvial soil varied from 90 to 113 pounds per cubic foot (pcf). The expansion index test indicated that an expansion index of 61 for the tested alluvial soil. Soils with an expansion index in the range of 51 to 90 are considered as medium expansive soils.

The chemical tests indicated that the tested onsite soil has a PH value of 7.5, a resistivity of 6320 Ohm-cm, a chloride concentration of 80 mg/kg, and a sulfate concentration of 496 mg/kg. The results of chemical tests indicated that onsite alluvial soil has a moderate corrosion effect on underground utility lines.

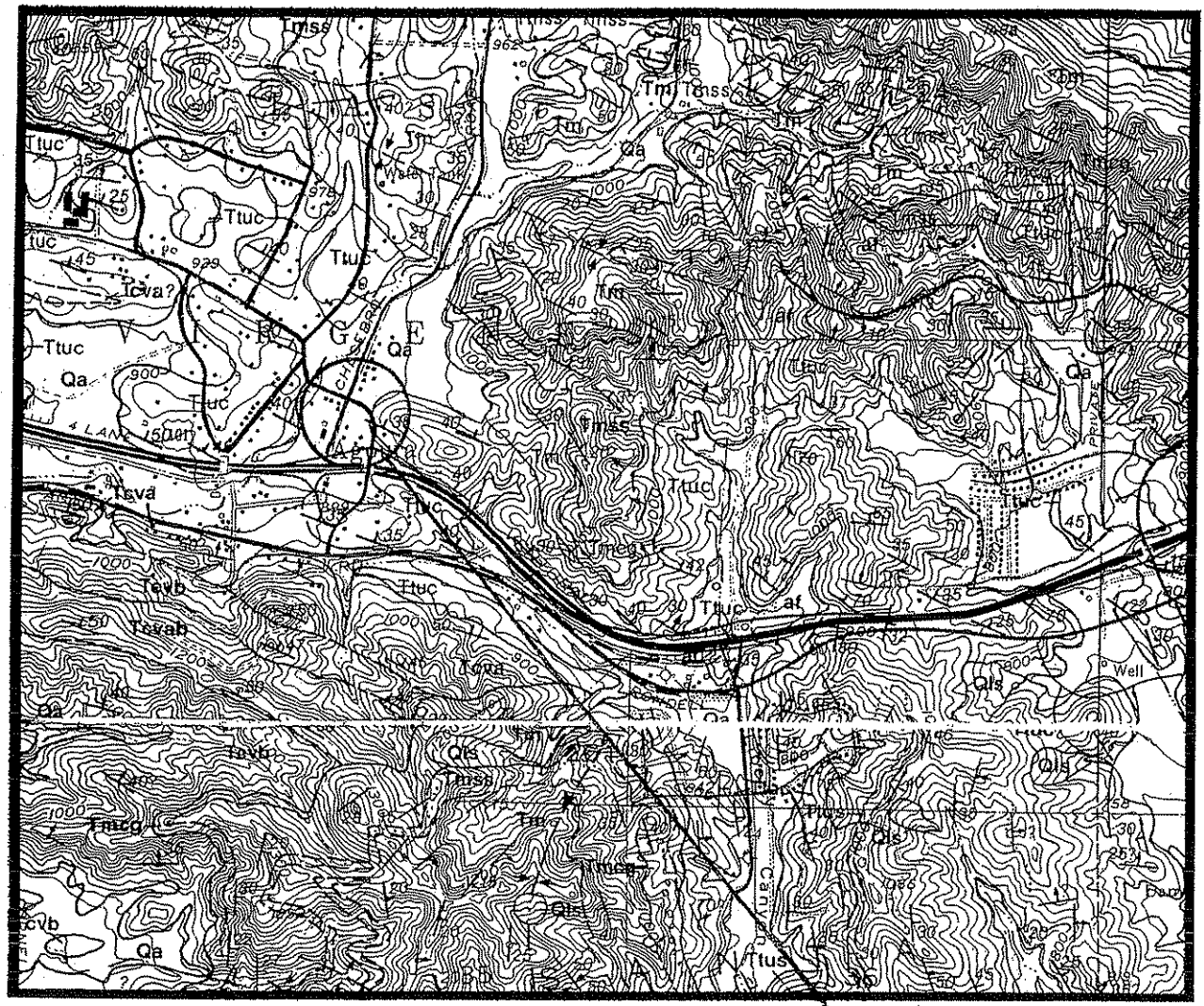
5.3 Bedrock (Ttuc)

Bedrock of Upper Topanga Formation was encountered underlying the alluvial soil in all borings except B-6. The bedrock consisted of light gray to bluish gray siltstone and claystone in a moist and moderately hard to hard condition. The bedding plan measured on the street cut along the northeast side of Palo Comado Canyon Road strikes N50W to N55W and dips 40N to 45N.

The type of bedrock observed are generally consistent with the Dibblee Geologic Map (see Figure 5). The northeast-dipping bedding is considered geologically favorable to the gross stability of the west-facing slope within the site.

5.4 Engineering Property

The engineering properties of onsite soils determined from laboratory tests are presented in Appendix A and summarized below:



Legend

Ttuc — UPPER TOPANGA FORMATION
gray claystone, bedded; crumbly with ellipsoidal fracture

Qa — SURFICIAL SEDIMENTS
alluvium: gravel, sand and clay of valley areas, includes gravel and sand of stream channels, gravel and sand of alluvial fans, and slope wash; undissected to slightly dissected

N

Scale 1" = 2000'

(Adopted from Geologic Map of the Calabasas Quadrangles, Los Angeles county, California, Dibblee, 1992)

C. Y. GEOTECH, INC.
Engineering Geology
and Geotechnical Engineering

Regional Geologic Map

CYG-04-3877

Figure 5

Field Dry Density (Qa):	90 - 113 pcf
Field Dry Density (Ttuc):	89 - 109 pcf
Field Moisture Content (Qa):	5 - 25 %
Field Moisture Content (Ttuc):	20 - 33 %
Maximum Dry Density (Qa):	113.5 pcf
Optimum Moisture Content (Qa):	11.5 %
Cohesion (Qa, peak):	210 - 680 psf
Cohesion (Qa, ultimate):	180 - 560 psf
Cohesion (Ttuc, peak):	720 psf
Cohesion (Ttuc, ultimate):	320 psf
Friction Angle (Qa, peak):	23 - 29.5 deg
Friction Angle (Qa, ultimate):	21 - 24.5 deg
Friction Angle (Ttuc, peak):	34.5 deg
Friction Angle (Ttuc, ultimate):	30.5 deg
Compressibility (Qa):	See Plates CS-1 through CS-8
Hydroconsolidation (Qa):	0 %
Swelling (Qa):	0.1 - 1.1 %
Expansion Index (Qa):	EI = 61

5.5 Chemical Tests

The chemical properties of the alluvial soil determined from laboratory tests by Geosystems are presented in Appendix A. The chemical tests indicated that the tested onsite soil has a PH value of 7.9, a resistivity of 21488 Ohm-cm, a chloride concentration of 580 mg/kg, and a sulfate concentration of 44 mg/kg. The results of chemical tests indicated that onsite soil has a moderate corrosion effect on underground utility lines.

6.0 SURFACE AND SUBSURFACE WATER

No surface water was observed within the site during field exploration. Surface water within the site is limited to the precipitation falling directly on the site and minor sheet flow runoff from the west-facing slope.

Groundwater was encountered in the borings approximately 18 to 20 feet below the existing ground surface. As shown on the CDMG (California Division of Mining and Geology) Historically Highest Ground Water Contour Map (see Figure 6), the historically highest groundwater underlying the site is approximately 20 feet below the existing ground surface.

The level of groundwater observed in the borings is consistent with the CDMG historically highest groundwater contour map. In our opinion, the groundwater underlying the site is at depth and does not appear to be close enough to the ground surface to significantly affect the stability of the site.

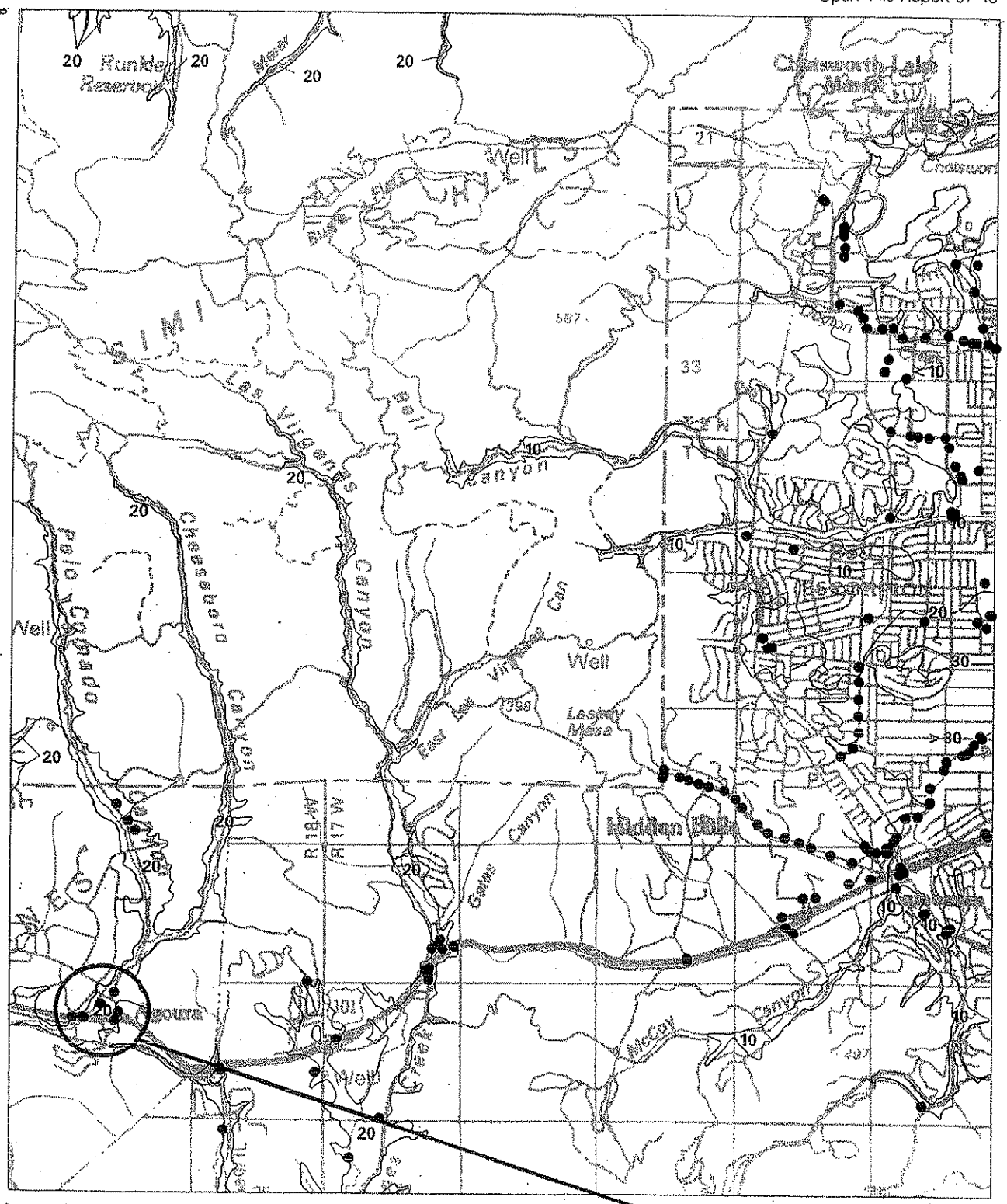


Plate 1.2 Depth to historically high ground water, and locations of boreholes used in this study, Calabasas 7.5-minute Quadrangle, California

● Borehole Site — 30 — Depth to ground water in feet — ONE MILE SCALE

Figure 6

7.0 FAULTING AND SEISMICITY STUDY

The computer programs of EQFAULT and FRISK89 were used in the faulting and seismicity studies. EQFAULT is a computer program for the deterministic prediction of peak horizontal acceleration from digitized California faults. FRISK89 is a computer program for the probabilistic estimation of peak acceleration and uniform hazard spectra using 3-D faults as earthquake sources.

7.1 Faulting Study

The faulting study indicated that the site is not located within any of the mapped Alquist-Priolo Special Studies Zones and no fault trace of any known active or potentially active fault passes through the site. However, the site, as all of the Southern California areas, is located within a seismically active region and will experience slight to very intense ground shaking as the result of movement along various active faults in the region. Thirty two (32) fault systems are located within a search radius of 50 miles from the site. The fault systems which are near the site and may significantly affect the stability of the site are Malibu Coast fault, Simi Santa Rosa fault, Northridge Hills fault, Santa Monica-Hollywood fault and Palos Verde fault.

The Alquist-Priolo Special Studies Zones Act was signed into law on December 22, 1972, and went into effect in March of 1973. The purpose of this Act is to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate thereby the hazard of fault-rupture. The development permits for development projects within the special study zones will be withheld by the city or county until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting.

7.2 Seismicity Study

The seismicity study indicates that the largest credible and probable peak ground accelerations (mean (m) + 1 standard deviation (σ)) which may impact the site are 0.67g (g:gravity) and 0.42g, respectively. The largest credible and probable repeatable high ground accelerations ($m+\sigma$) which may impact the site are 0.43g and 0.27g, respectively. The peak and repeatable high ground accelerations ($m+\sigma$) for a 50-year exposure and 10% exceedance are approximately 0.38g and 0.25g, respectively. The maximum credible magnitude, the maximum credible peak ground acceleration and the maximum credible repeatable high ground acceleration which may impact the subject site caused by the most significant fault systems and the San Andreas fault are shown in the following table.

Fault Name	Distance from the Site, km	Maximum Credible Magnitude	Maximum Credible Peak Ground Acceleration	Maximum Credible Repeatable High Ground Acceleration
Malibu Coast fault	12	7.5	0.67g	0.43g
Simi-Santa Rosa fault	15	7.0	0.46g	0.30g
Northridge Hills fault	19	6.5	0.28g	0.18g
Santa Monica-Hollywood fault	19	7.5	0.51g	0.33g
Palos Verde fault	20	7.5	0.39g	0.26g
San Andreas fault	64	8.3	0.18g	0.18g

As shown on Figures 7 and 8, the CDMG Seismic Hazard Evaluation Report indicated that the 10% exceed in 50 years peak ground acceleration for the subject site is approximately 0.47g for alluvium condition and 0.42g for soft rock condition. The findings of the seismicity study are generally consistent with the CDMG Seismic Hazard Evaluation Report.

7.3 Seismic Factors

As shown on Figure 9, the subject site is located within the 5-kilometer and 10-kilometer near-source zones of Malibu Coast fault. The seismic factors listed in the following table for structural design were determined based on the findings of data research and seismic evaluation and in accordance with California Building Code, Uniform Building Code and CDMG Active Fault Near-Source Zone Maps.

Seismic Factor	Value	Reference
Seismic Zone	Zone 4	Figure 16-2, 1997 UBC
Seismic Zone Factor	0.40	Table 16-I, 1997 UBC
Soil Profile Type	Sd	Table 16-J, 1997 UBC
Seismic Source Type (Malibu Coast fault)	B	Table 16-U, 1997 UBC
Near Source Factor, Na (Malibu Coast fault)	1.0	Table 16-S, 1997 UBC
Near Source Factor, Nv (Malibu Coast fault)	1.1	Table 16-T, 1997 UBC
Seismic Response Coefficient, Ca	0.44 Na	Table 16-Q, 1997 UBC
Seismic Response Coefficient, Cv	0.64 Nv	Table 16-R, 1997 UBC

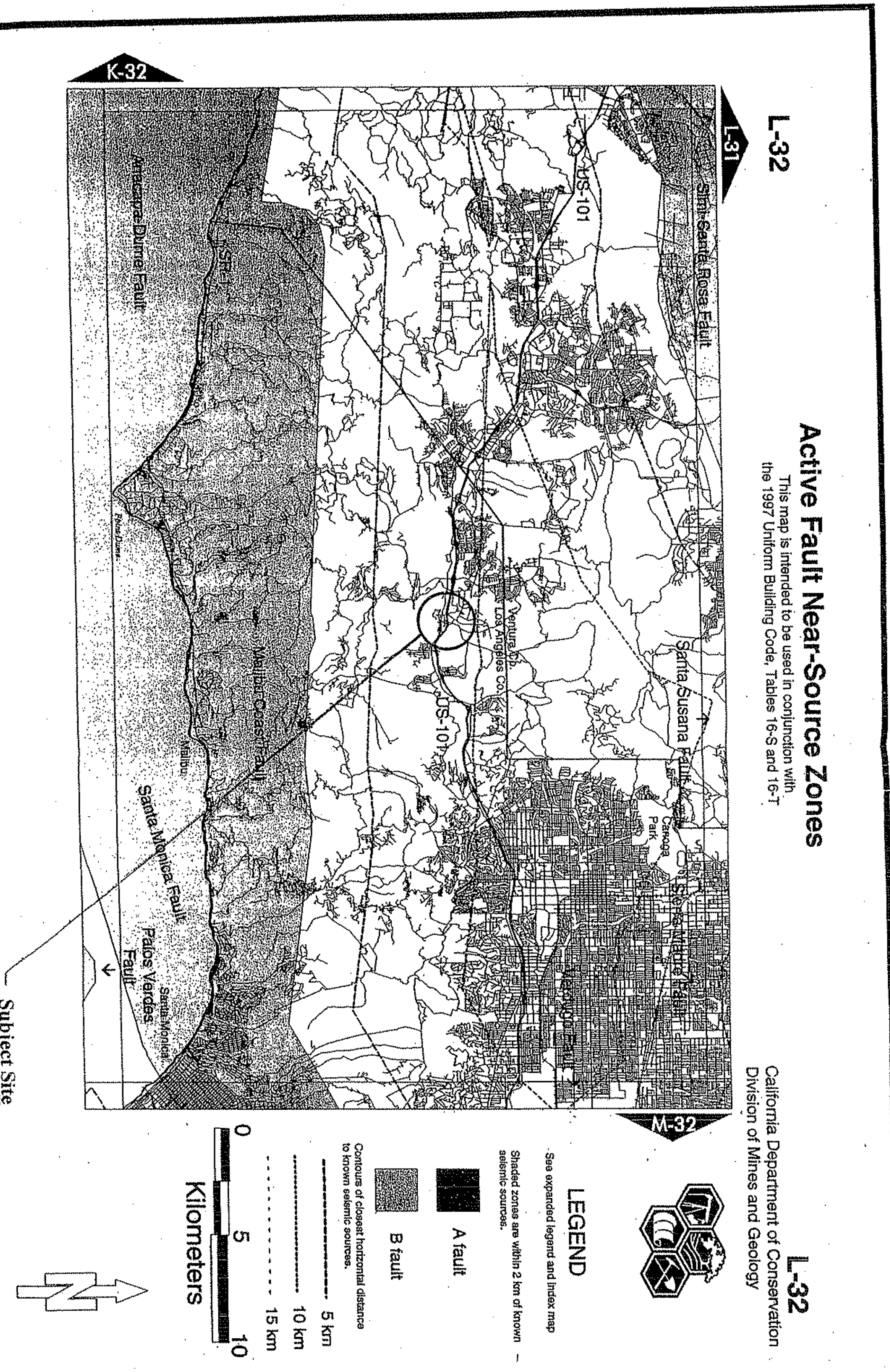
7.4 Earthquake-Induced Geologic Hazards

Based on the findings of field exploration, faulting and seismicity study and liquefaction evaluation, it is our opinion that the occurrence of earthquake-induced geologic hazards such as lurching, landslide and liquefaction within the site is unlikely. Onsite soils may be susceptible to minor earthquake-induced settlement. If a strong earthquake occurs in the vicinity of the subject site, structural distress and minor foundation disturbance caused by earthquake induced shaking will be the major causes of damage.

The potential of earthquake-induced geologic hazards such as liquefaction, ground rupture, landslides, seiches, tsunamis, lurching, and seismically induced settlement are discussed below:

7.4.1 Liquefaction

Liquefaction describes a phenomenon in which cyclic stresses produced by ground shaking induced excess pore water pressures in the cohesionless soils. These soils may thereby acquire a high degree of mobility leading to damaging deformations. In general, this phenomenon only occurs below the water table, but after liquefaction has developed, it can propagate upward into overlying non-saturated soil as excess pore water pressure. In general, liquefaction has four major effects: 1) the consolidation of loose sediments with resultant settlement of the ground surface, 2) lateral sliding or spreading, and 3) sand boiling. Liquefaction susceptibility under a given earthquake is related to the gradation and relative density characteristics of the soil, the in-situ stresses prior to ground motion, and the depth to the water table, as well as other factors.



Active Fault Near-Source Zones	C. Y. GEOTECH, INC. ENGINEERING GEOLOGY & GEOTECHNICAL ENGINEERING
CYG-04-3877 / Figure 9	

THOUSAND OAKS 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

SOFT ROCK CONDITIONS

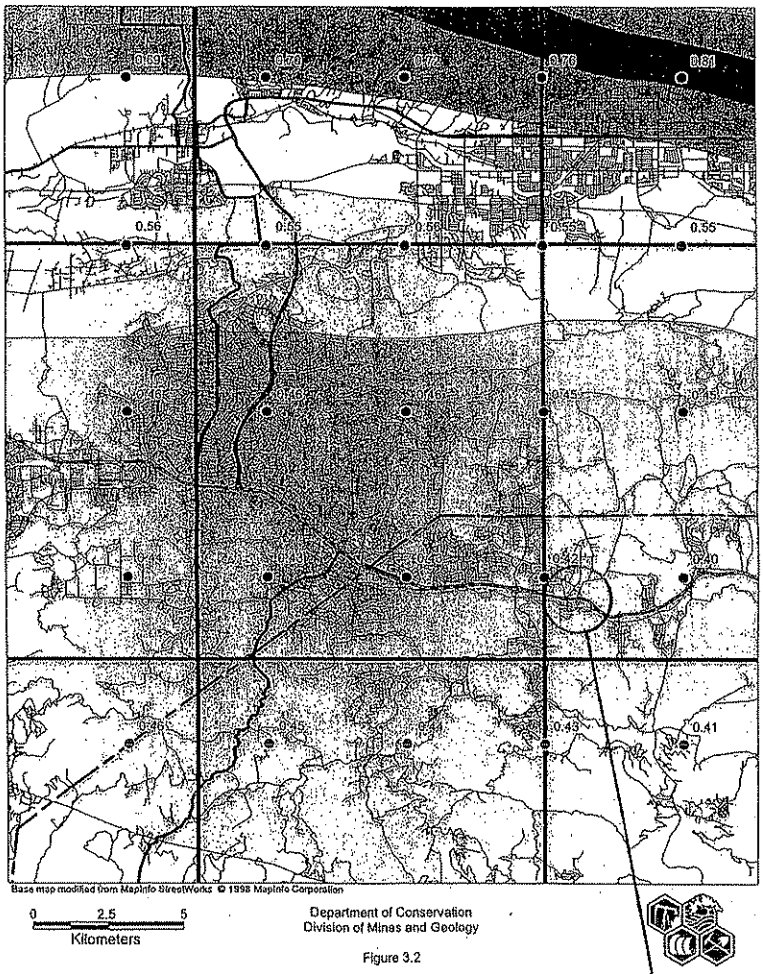


Figure 3.2

Peak Ground Acceleration (g) Soft Rock Conditions	C. Y. GEOTECH, INC. ENGINEERING GEOLOGY & GEOTECHNICAL ENGINEERING
CYG-04-3877 | Figure 8	

THOUSAND OAKS 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

ALLUVIUM CONDITIONS

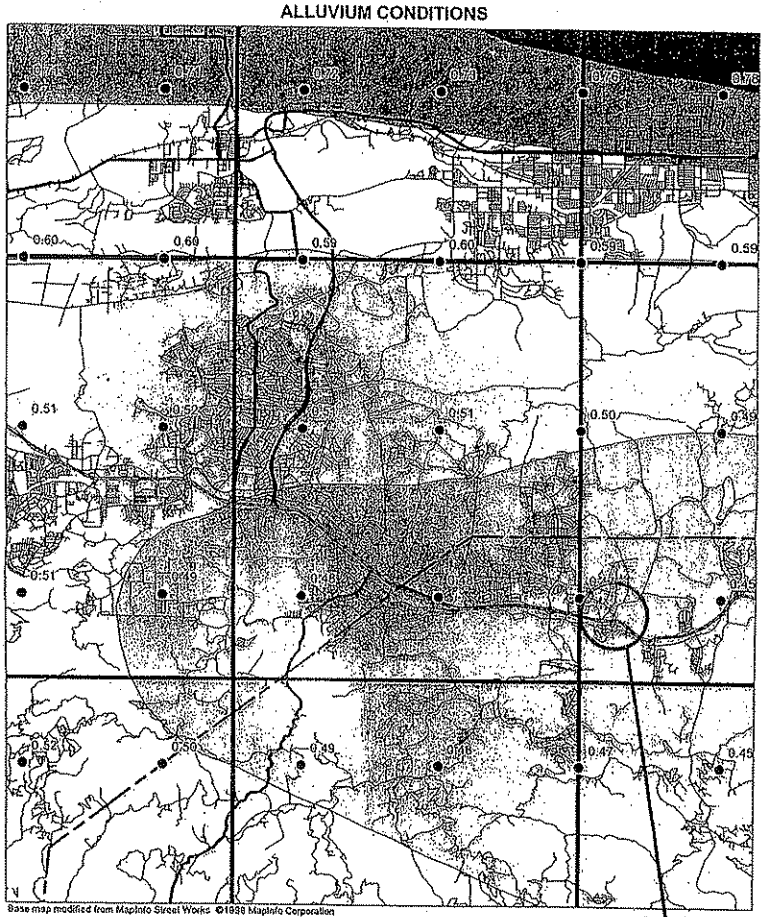


Figure 3.3

Subject Site

N

Peak Ground Acceleration (g) Alluvium Conditions	
CYG-04-3877	Figure 7

C. Y. GEOTECH, INC.

ENGINEERING GEOLOGY &
GEOTECHNICAL ENGINEERING

A site that is susceptible to liquefaction should have the following four principal conditions: 1) the site is located within a seismically active zone, 2) the site should have layers of soils that are cohesionless and contain less than 15% of clay size particles and are greater than 3 feet in thickness, 3) groundwater exists within 30 feet of the ground surface or records indicate that the recent water table has been higher than 30 feet or there is a likelihood that groundwater will rise above 30 feet, and 4) soil should have relative densities between 50% to 70%.

As shown on Figure 10, the site is located within one of the liquefaction susceptible zones as mapped in the CDMG Seismic Hazards Maps. Therefore, a liquefaction evaluation was performed for the subject site. The maximum credible magnitude of the Malibu Coast fault and the peak ground acceleration ($m+\sigma$) for a 50-year exposure and 10% exceedance were used in liquefaction evaluation. The seismic parameters used in liquefaction evaluation are shown in the following table.

Fault Simulated	Maximum Credible Magnitude	Peak Horizontal Ground Acceleration 50-year exposure and 10% exceedance
Malibu Coast fault	7.5	0.47g (alluvium condition)

The liquefaction evaluation method introduced by Seed and Idriss (1982) was used in the calculation of the factor of safety for liquefaction potential. The factor of safety is defined as the ratio of the cyclic stress ratio to cause liquefaction to the earthquake-induced cyclic stress ratio. When the factor of safety exceeds the high end of the empirical range, the factor of safety is defined as "Infinite".

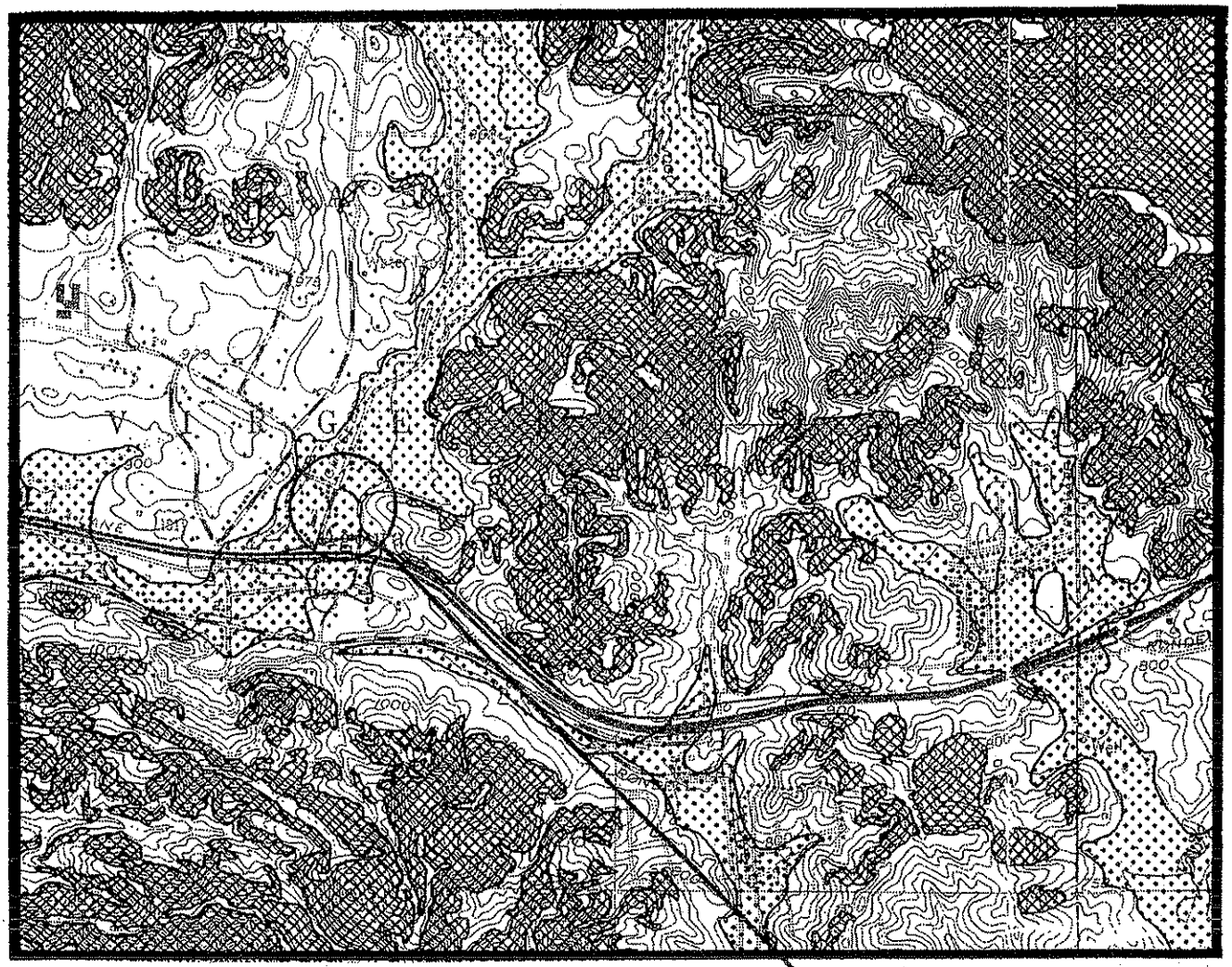
Groundwater was encountered in the borings approximately 18 to 20 feet below the existing ground surface during field exploration. The CDMG Historically Highest Ground Water Contour Map indicated that the historically highest groundwater underlying the site is approximately 20 feet below the existing ground surface. Therefore, a groundwater of 18 feet was used in the liquefaction evaluation. The results of the liquefaction analysis are presented in Appendix C and summarized in the following table.

The analysis indicates that the occurrence of liquefaction within the site is unlikely due to high clay content, the high SPT blow count of onsite soil and/or the occurrence of bedrock.

Depth (ft)	Water Table =18 ft	Remarks
0' - 18'	Not Susceptible	not susceptible due to above groundwater
18' - 25'	Not Susceptible	not susceptible due to high SPT blow count
> 25'	Not Susceptible	not susceptible due to occurrence of bedrock

7.4.2 Potential of Shallow Ground Rupture

Ground rupture describes a phenomenon in which a gap or rupture of the ground surface occurs during earthquake movement along the intersection of the upper edge of the fault zone and the ground surface. As addressed in Section 7.1, the site is not located within any of the mapped Alquist-Priolo Special Studies Zones and no fault trace of any known active or potentially active fault passes through the site. In our opinion, the potential of on-site ground rupture or cracking due to shaking from local seismic events is low.



Subject Site

Legend

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such as that mitigation as defined in Public Resources Code section 2693 (c) would be required

Earthquake-Induced Landslide

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code section 2693 (c) would be required

N

Scale 1" = 2000'

(Adopted from State of California Seismic Hazard Zones.)

C. Y. GEOTECH, INC.

Engineering Geology
and Geotechnical Engineering

Seismic Hazard Map

CYG-04-3877

Figure 10

7.4.3 Landsliding and Lateral Spreading

Earthquake-induced landsliding describes a phenomenon in which slopes fails or distress during earthquake shaking. Earthquake-induced lateral spreading describes a phenomenon in which ground surface has lateral movement during earthquake shaking. Lateral spreading can act as a subsequent phenomenon of liquefaction. The slope stability analyses indicated the factor of safety for seismic condition is greater than the minimum code requirement and the liquefaction analysis indicated that the site is not susceptible to liquefaction. Therefore, the site is not subjected to earthquake-induced landsliding or lateral spreading.

7.4.4 Ground Lurching

Ground lurching is defined as earthquake motion at right angles to nature or artificial slopes that results in a series of more or less parallel cracks separating the ground into rough blocks. Lurching is also sometimes used to describe undulating surface waves in the soils. Materials which are most susceptible to lurching effects are unconsolidated with low cohesion. Cracking of the ground surface due to shaking from distant seismic events is not considered a significant hazard, although it is a possibility at any site. The laboratory tests indicated that onsite soils are consolidated with high cohesion. Therefore, it is our opinion that the site is not susceptible to ground lurching. Suitable site processing can eliminate compressible materials of low relative density and, thereby, will tend to reduce the potential for ground lurching.

7.4.5 Seiches and Tsunamis

Seiches are an oscillation of the surface of an inland body of water that varies in period from a few minutes to several hours. Seismic excitations can induce such oscillations. Tsunamis are large sea waves produced by submarine earthquakes or volcanic eruptions. Since the site is not located close to an inland body of water and is at an elevation sufficiently above sea level to be outside the zone of a tsunami runup, the risk of these two hazards is not pertinent to this site.

7.4.6 Settlement Due to Seismic Shaking

Granular soils are considered susceptible to earthquake-induced settlement, whether the soils are saturated or dry. The potential and amount of earthquake-induced settlement will be affected by the magnitude of earthquake, the strength of soils and the occurrence of groundwater. Field exploration and laboratory testing indicated that onsite soils consist of primarily cohesive soil. In our opinion, onsite shallow soils may be subjected to minor earthquake-induced settlement. However, the settlement will not affect the integrity and competency of the building structure.

8.0 SLOPE STABILITY

As shown on Figure 10, the site is not located with any of the earthquake-induced liquefaction zones as mapped in the CDMG seismic hazard maps. No evidence of deep-seated slope failure or other type slope failure was observed within the site during our field exploration. The site is not located within any of the landslide areas mapped in the available public geologic maps.

Circular slope stability analyses using the Simplified Bishop's method were performed to determine the static and seismic (pseudo-static) stability conditions of the rear yard ascending slope as shown on the geologic cross section A-A'. A seismic coefficient of 0.15g was used in seismic slope stability analyses. The lowest ultimate and peak shear strength parameters of onsite soils were used in static and seismic slope stability analyses, respectively. The analyses indicated factors of safety greater than the minimum code requirements for both static and seismic conditions . The results of the analyses are presented in Appendix B.

Three wedge slope stability analyses using the Free Body Diagram method were performed to calculate the equivalent fluid pressures required for the design of 5-foot, 10-foot and 15-foot high retaining walls. The lowest ultimate shear strength parameters of onsite soil were used in analyses. The analysis indicated that the equivalent fluid pressure listed in the following table can be used in the design of the proposed rear yard retaining wall. The results of the analysis are presented in Appendix B.

Wall Height (H) ft	Back Slope (horizontal:vertical)	Distribution Shape * of Lateral Force	EFP psf/ft
$0 < H \leq 5$	Level	Triangular-Distributed EFP	30
$5 < H \leq 10$	Level	Triangular-Distributed EFP	46
$10 < H \leq 15$	Level	Triangular-Distributed EFP	59

Two wedge slope stability analyses using the Free Body Diagram method were performed to evaluate a 10-foot high temporary cut in soil and a 7-foot 1:1 trimming overlying a 10-foot high vertical cut in soil. The lowest peak shear strength parameters of onsite soil were used in analyses. The analyses indicated factors of safety greater than the minimum code requirement. The results of the analyses are shown in Appendix B.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this soils engineering investigation, the development of the proposed Chesebro Auto Wash Center at the subject site is feasible from a geologic and geotechnical engineering viewpoint provided the recommendations in this report are incorporated in to the design and implemented during construction.

Conventional spread footings entirely supported by compacted fill or entirely supported by competent alluvium can be used to support the proposed building structures. Conventional spread footings supported by compacted fill, competent alluvium or bedrock can be used to support the proposed retaining walls. The conventional spread footings to support retaining wall in the transitional zone area should be provided with additional steel reinforcement.

9.1 111 Statement

Provided the recommendations in this report are properly incorporated into design and implemented during construction, the proposed Chesebro Auto Wash Center will be safe from geologic hazards including settlement, landsliding, slippage and liquefaction and the proposed development will not adversely affect the geologic stability of adjacent properties.

9.2 Site Preparation

The upper 5 feet of existing soils, at their present condition, are not suitable for the support of footings for building and retaining wall support. If footings are to be supported by compacted fill, the existing soils in areas of the proposed footings should be removed to a minimum depth of 5 feet below the existing ground surface or a minimum of 2 feet below the bottom of footings, whichever is deeper, and then recompacted to be compacted fill for footing support. The removal and recompaction should be extended horizontally a minimum of 5 feet beyond the exterior footings in all directions.

The upper 5 feet of existing soils, at their present condition, are not suitable for the support of interior concrete slabs. If interior concrete slabs are to be supported by compacted fill, the existing soils in areas of interior concrete slab area should be removed to a minimum depth of 5 feet below the existing ground surface or 2 feet below the bottom of concrete slab, whichever is deeper, and then recompacted to be compacted fill for slab support. The removal and recompaction for interior concrete slabs can be limited to surrounding footings.

The upper 2 feet of existing soils, at their present condition, are not suitable for the support of exterior concrete slabs. If exterior concrete slabs are to be supported by compacted fill, the existing soils in areas of exterior concrete slabs should be removed to a minimum depth of 2 feet below the existing ground surface or 2 feet below the bottom of exterior concrete slab and then recompacted to be compacted fill for slab support. The removal and recompaction for exterior concrete slabs should be extended horizontally a minimum of 2 feet beyond the boundaries of concrete slabs in all directions. The removal and recompaction for interior concrete slabs can be limited to property lines. Exterior concrete pavement should be deigned as floating slabs.

The upper 2 feet of existing soils, at their present condition, are not suitable for the support of asphalt concrete pavement. If asphalt concrete pavement are to be supported by compacted fill, the existing soils in areas of asphalt concrete pavement should be removed to a minimum depth of 2 feet below the existing ground surface or 2 feet below the bottom of asphalt concrete pavement and then recompacted to be compacted fill for pavement support. The removal and recompaction for asphalt concrete pavement should be extended horizontally a minimum of 2 feet beyond the boundaries of asphalt concrete pavement in all directions. The removal and recompaction for asphalt concrete pavement can be limited to property lines.

9.3 Conventional Spread Footings for Building Structure

Conventional spread footings entirely supported by compacted fill or entirely supported by competent alluvium can be used to support the proposed building structures provided the following recommendations are incorporated into the design and implemented during construction.

a. Conventional spread footings should be either entirely supported by compacted fill or entirely supported by competent alluvium which is approximately 5 feet below the existing round surface.

b. Continuous spread footings should have a minimum width of 12 inches and a minimum embedment depth 24 inches into compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

c. Isolated footings should have a minimum width of 24 inches and a minimum embedment depth of 24 inches into compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

d. An allowable vertical bearing pressure of 2000 pounds per square foot (psf), including dead and frequently applied live loads, can be used in the design of footings with the minimum footing width and embedment depth. The allowable bearing capacity can be increased by 250 psf for each additional foot of footing width or embedment depth, to a maximum bearing capacity of 3000 psf. The allowable vertical bearing capacities can be increased by one-third (1/3) when considering short duration wind or seismic loads.

e. Lateral force can be resisted by frictional resistance and passive earth pressure. An allowable friction coefficient of 0.28 and an allowable passive earth pressure of 300 pounds per square foot per foot of depth (psf/ft), to a maximum of 1500 psf, can be used to resist lateral loads. When combining passive earth pressure and frictional resistance, the passive earth pressure component should be reduced by 1/3. The calculations of friction coefficient and passive earth pressure are shown on Figure 11.

f. All footings should have a minimum reinforcement of two No.4 steel bars near the top and two No.4 steel bars near the bottom. Where footing and stem wall height exceeds a combined depth of 3 feet, one No.4 steel bar should be placed vertically every 3 feet. These parameters should be reviewed by the Project Structural Engineer and revised as required to accommodate intended use.

g. Prior to the placement of steel in footing excavation, an inspection should be made by the City Inspector and the representative of CYG to ensure that the footing excavation exposes competent compacted fill or competent alluvium.

9.4 Conventional Spread Footings for Retaining Walls

Conventional spread footings supported entirely by compacted fill, competent alluvium or bedrock can be used to support the proposed retaining walls provided the following recommendations are incorporated into the design and implemented during construction.

a. Conventional spread footings should be supported by bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing round surface. The conventional spread footings to support retaining wall in the transitional zone area should be provided with additional steel reinforcement.

b. Continuous spread footings should have a minimum width of 12 inches and a minimum embedment depth 24 inches into bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

c. Isolated footings should have a minimum width of 24 inches and a minimum embedment depth of 24 inches into bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing round surface.

d. An allowable vertical bearing pressure of 2000 pounds per square foot (psf), including dead and frequently applied live loads, can be used in the design of footings with the minimum footing width and embedment depth. The allowable bearing capacity can be increased by 250 psf for each additional foot of footing width or embedment depth, to a maximum bearing capacity of 3000 psf. The allowable vertical bearing capacities can be increased by one-third (1/3) when considering short duration wind or seismic loads.

e. Lateral force can be resisted by frictional resistance and passive earth pressure. An allowable friction coefficient of 0.28 and an allowable passive earth pressure of 250 pounds per square foot per foot of depth (psf/ft), to a maximum of 1500 psf, can be used to resist lateral loads. When combining passive earth pressure and frictional resistance, the passive earth pressure component should be reduced by 1/3. The calculations of friction coefficient and passive earth pressure are shown on Figure 11.

Calculation of Passive Bearing Capacity

Version 4.0

Unit Weight =	125	psf
Cohesion =	380	psf
Friction Angle =	23	degrees

Allowable Lateral Passive Earth Pressure = 300 lb/ft^2 per additional foot of footing width or embedment depth

Frictional coefficient = 0.28

$Kp = Tan^2(45+FA/2)$ = 2.28

$Tan(45+FA/2)$ = 1.51

$$P_p = 0.5 \times \gamma \times D^2 \times Tan^2(45+\phi/2) + 2 \times C \times D \times Tan(45+\phi/2)$$

$$F_p = Tan(\phi)$$

where:

P_p : Passive Earth Pressure

F_p : Friction Resistance

D: Embedment Depth

C: Cohesion

Embedment Depth = 2 feet Passive Earth Pressure = 600 psf

Pp = 0.5 x 125 x 2 x 2 x 2.28 + 2 x 380 x 2 x 1.51 = 2867 lbs/ft

Recommended Passive Lateral Resistance = 0.5 x 300 x 2 x 2 = 600 lbs/ft

FS for Passive Lateral Resistance = 2867 / 600 = 4.78 >1.5 OK

Embedment Depth = 5 feet Passive Earth Pressure = 1500 psf

Pp = 0.5 x 125 x 5 x 5 x 2.28 + 2 x 380 x 5 x 1.51 = 9308 lbs/ft

Recommended Passive Lateral Resistance = 0.5 x 300 x 5 x 5 = 3750 lbs/ft

FS for Passive Lateral Resistance = 9308 / 3750 = 2.48 >1.5 OK

Frictional Coefficient = Tan (23) / 0.28 = 1.52 OK

Figure 11

f. All footings should have a minimum reinforcement of two No.4 steel bars near the top and two No.4 steel bars near the bottom. Where footing and stem wall height exceeds a combined depth of 3 feet, one No.4 steel bar should be placed vertically every 3 feet. These parameters should be reviewed by the Project Structural Engineer and revised as required to accommodate intended use.

g. Prior to the placement of steel in footing excavation, an inspection should be made by the representative of CYG to ensure that the footing excavation exposes competent bedrock, compacted fill or competent alluvium. The City Inspector should be notified to inspect and approve the footing excavation prior to pouring concrete.

9.5 Retaining Wall

The following recommendations can be used in the design of the proposed retaining wall.

a. Conventional spread footings supported be bedrock, compacted fill or competent alluvium which is approximately 5 feet below the existing ground surface can be used to support the proposed retaining wall. The conventional spread footings to support retaining wall in the transitional zone area should be provided with additional steel reinforcement.

b. The triangular-distributed equivalent fluid pressures listed in the following table can be used in the design of the retaining wall. Any anticipated superimposed loading within a 2:1 plane projected upward from the wall bottom, except retained earth materials, should be considered as surcharge and provided for in the design. The Project Structural Engineer should incorporate any anticipated superimposed loading in the design of the basement retaining wall.

Wall Height (H) ft	Back Slope (horizontal:vertical)	Distribution Shape * of Lateral Force	EFP psf/ft
$0 < H \leq 5$	Level	Triangular-Distributed EFP	30
$5 < H \leq 10$	Level	Triangular-Distributed EFP	46
$10 < H \leq 15$	Level	Triangular-Distributed EFP	59

c. The retaining wall should be constructed with weep holes or a perforated PVC pipe in a gravel envelope at and behind the bottom of the wall. The subdrain system should be designed by the Project Civil Engineer or Structural Engineer. The subdrain system for the retaining wall should be inspected and approved by the representative of CYG and the City Inspector prior to placing wall backfill.

d. If PVC pipe in a gravel envelope is to be sued for subdrain system, a one-foot thick zone of clean, granular soil should be placed behind the wall to 2 feet of the finished grade. The upper 2 feet should be backfilled with less permeable soil. Retaining wall backfill must be compacted to a minimum dry density of 90% of the maximum density as determined by ASTM Standard D-1557-02.

9.6 Foundation Settlement and Uplifting

The total and differential settlements of the proposed Chesebro Auto Wash Center supported by conventional spread footings founded into compacted fill, competent alluvium or bedrock as recommended are anticipated

to be within tolerable limits. Total settlement of the foundation is expected to be less than ½ inch. Differential settlement should be less than ½ inch in a span of 20 feet.

It should be noted that the evaluation of settlement is based on the assumption that the proposed development and surrounding areas will be provided with adequate surface and subsurface drainage devices and that the drainage systems will be properly and constantly maintained. Additional settlement caused by local bearing failure and/or soil lubrication may occur if the foundation soil is saturated.

Laboratory expansion index test indicated an expansion index of 61 for the tested alluvial soil. Due to the high expansion potential of onsite soil, foundation uplifting caused by soil swelling may also occur if the foundation soil is saturated or nearly saturated.

The differential movement of foundation soils caused by soil settlement and soil swelling may cause the distress of building foundation and structural elements. In order to avoid the migration of a significant amount of surface and subsurface water into the foundation soil, the recommendations in the section of "Drainage Control" should be incorporated into the design and implemented during construction.

9.7 Slab-On-Grade

Concrete slabs-on-grade should be either entirely supported by compacted fill or entirely supported by competent alluvium which was encountered approximately 5 feet below the existing ground surface. Otherwise, concrete slabs should be designed as structural slabs and supported by surrounding footings. If concrete slabs are to be supported by compacted fill, the recommendations for soil removal and recompaction for the preparation of slab subgrade are presented in Section 9.2.

The upper 5 feet of existing soils, at their present condition, are not suitable for the support of interior concrete slabs. If interior concrete slabs are to be supported by compacted fill, the existing soils in areas of interior concrete slab area should be removed to a minimum depth of 5 feet below the existing ground surface or 2 feet below the bottom of concrete slab, whichever is deeper, and then recompacted to be compacted fill for slab support. The removal and recompaction for interior concrete slabs can be limited to surrounding footings.

The upper 2 feet of existing soils, at their present condition, are not suitable for the support of exterior concrete slabs. If exterior concrete slabs are to be supported by compacted fill, the existing soils in areas of exterior concrete slabs should be removed to a minimum depth of 2 feet below the existing ground surface or 2 feet below the bottom of exterior concrete slab and then recompacted to be compacted fill for slab support. The removal and recompaction for exterior concrete slabs should be extended horizontally a minimum of 2 feet beyond the boundaries of concrete slabs in all directions. The removal and recompaction for interior concrete slabs can be limited to property lines. Exterior concrete pavement should be deigned as floating slabs.

Concrete slab-on-grade should be designed for a minimum thickness of 5 inches, reinforced with No.4 bars at 12 inches on centers, both ways. Reinforcement should be properly supported to assure desired mid-height placement. A 10-mil plastic vapor barrier should be placed below the floor slabs in moisture sensitive areas. The vapor barrier should be sandwiched by two 2-inch sand layers to protect the vapor barrier from punctures and to aid in the concrete cure.

Decking, slabs and walkways are likely to experience cracking as the results of the curing process of the concrete. Shrinkage cracks are very difficult to prevent from occurring. Expansion joints are commonly installed within exterior decks in an effort to control the location of the inevitable cracks. Interior slabs however are typically not provided with expansion joint, making cracking more random. The recommended steel reinforcement is intended to reduce the severity of cracking and must be properly installed to ensure proper performance. Rigid or brittle floor covering, such as tile or marble may also experience cracking during the curing process of the concrete slab underneath and/or minor settlement. Providing a slip sheet between the slab and floor covering will help to reduce cracking of the floor covering.

9.8 Asphalt Concrete Pavement

Asphalt concrete pavement should be entirely supported by compacted fill. If asphalt concrete pavement supported by compacted fill is proposed, the existing soil in the asphalt concrete pavement area should be removed to a minimum depth of 2 feet below the existing ground surface or a minimum of 2 feet below the bottom of the asphalt concrete pavement, whichever is deeper, and then recompacted to be certified fill. The removal and recompaction for asphalt concrete pavement should be extended horizontally a minimum of 2 feet beyond the boundaries of asphalt concrete pavement in all directions. The removal and recompaction for asphalt concrete pavement can be limited to property lines.

Structural section calculations for asphalt concrete pavement are based on the method introduced in "Flexible Pavement Structural Section Design Guide for California Cities and Counties," third edition, January 1979. A R-Value of 25 and traffic indexes of 4 to 5 were assumed in the calculation of structural sections. The results of calculations are shown on Figures 12 and 13 and summarized in the following Table. A traffic index of 4 is recommended for passenger car area and a traffic index of 5 is recommended for delivery of working zones and truck area.

Traffic Index	Asphalt Concrete	Aggregate Base
4	3.0	4.0
5	4.0	4.0

Compaction tests will be required for the aggregate base. A minimum relative compaction of 95% is required for aggregate base. If the asphalt and block concrete pavements are to be supported by compacted fill, the fill soil should be compacted to a minimum of 90% of the maximum dry density per ASTM D-1557-02.

9.9 Fill Placement and Soil Compaction

Fill placement and soil compaction will be required for retaining wall backfill and preparation of slab and pavement subgrades. The following general guidelines can be used as a basis for quality control of fill placement and soil compaction.

a. All grading work and fill placement should be performed in conformance with the current grading ordinances of the City of Agoura Hills.

b. Remove vegetation, loose soils, construction debris and all other deleterious materials in the fill placement area prior to the placement of fill soil.