Key to Soil and Bedrock Symbols and Terms

PETRA

Unified Soil Classification System

Coarse-grained Soils > 1/2 of materials is larger than #200 sieve	The No. 200 U.S. Standard Sieve is about the smallest particle visible to the naked eye	**GRAVELS** more than half of coarse fraction is larger than #4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
			Gravels with fines	GM	Silty Gravels, poorly-graded gravel-sand-silt mixtures
				GC	Clayey Gravels, poorly-graded gravel-sand-clay mixtures
		SANDS more than half of coarse fraction is smaller than #4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
			Sands with fines	SM	Silty Sands, poorly-graded sand-gravel-silt mixtures
				SC	Clayey Sands, poorly-graded sand-gravel-clay mixtures
Fine-grained Soils > 1/2 of materials is smaller than #200 sieve		**SILTS & CLAYS** Liquid Limit Less Than 50		ML	Inorganic silts & very fine sands, silty or clayey fine sands, clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts & clays of low plasticity
		SILTS & CLAYS Liquid Limit Greater Than 50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silt
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic silts and clays of medium-to-high plasticity
Highly Organic Soils				PT	Peat, humus swamp soils with high organic content

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		>12"	>12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19"	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized to
Fines		Passing #200	<0.0029"	Flour-sized and smaller

Modifiers

Trace	< 1 %
Few	1 - 5%
Some	5 - 12 %
Numerous	12 - 20 %

Laboratory Test Abbreviations

MAX	Maximum Dry Density	MA	Mechanical (Particle Size) Analysis
EXP	Expansion Potential	AT	Atterberg Limits
SO4	Soluble Sulfate Content	#200	#200 Screen Wash
RES	Resistivity	DSU	Direct Shear (Undisturbed Sample)
pH	Acidity	DSR	Direct Shear (Remolded Sample)
CON	Consolidation	HYD	Hydrometer Analysis
SW	Swell	SE	Sand Equivalent
CL	Chloride Content	OC	Organic Content
RV	R-Value	COMP	Mortar Cylinder Compression

Bedrock Hardness

Soft	Can be crushed and granulated by hand; "soil like" and structureless
Moderately Hard	Can be grooved with fingernails; gouged easily with butter knife; crumbles under light hammer blows
Hard	Cannot break by hand; can be grooved with a sharp knife; breaks with a moderate hammer blow
Very Hard	Sharp knife leaves scratch; chips with repeated hammer blows

Sampler and Symbol Descriptions


Approximate Depth of Groundwater Encountered


Approximate Depth of Standing Groundwater


Modified California Split Spoon Sample


No Recovery in Mod. Calif. Split Spoon Sample


Standard Penetration Test


Shelby Tube Sample


Bulk Sample


No Recovery in SPT Sampler


No Recovery in Shelby Tube

Notes:

Blows Per Foot: Number of blows required to advance sampler 1 foot (unless a lesser distance is specified). Samplers in general were driven into the soil or bedrock at the bottom of the hole with a standard (140 lb.) hammer dropping a standard 30 inches unless noted otherwise in Log Notes. Drive samples collected in bucket auger borings may be obtained by dropping non-standard weight from variable heights. When a SPT sampler is used the blow count conforms to ASTM D-1586

EXPLORATION LOG

Project:	**T.T. 38921**		Boring No.: **B-1**
Location:	**La Sierra and Victoria, Riverside**		Elevation: **839±**
Job No.:	**23-341**	Client: **Warmington**	Date: **2/29/24**
Drill Method:	**8" Hollow Stem Auger**	Driving Weight: **140 lbs / 30"**	Logged By: **SS**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**ARTIFICIAL FILL (af)**							
		Silty Sand (SM): Light brown to brown, moist, loose, fine- to coarse-grained, some gravel.		3 2 2	■		13.6	93.3	
		Silty Sand to Sandy Silt (SM-ML): Brown to pale red, moist, soft, fine- to coarse-grained, no gravel.		2 2 3	■		8.4	100.7	
5		firm, fine- to medium-grained, trace course sand.		2 4 4	■		7.2	105.8	DS
		YOUNGER ALLUVIUM (Qya)							
		Sandy Silt (ML): Light brown to pale yellow, slightly moist to moist, stiff, fine- to medium-grained, trace course sand.		4 6 8	■		4.1	101.9	
		dry to slightly moist.		6 10 13	■		5.1	106.3	
15		slightly moist, firm.		2 3 4	◪				
20		**OLDER ALLUVIUM (Qoal)**							
		Sandy Silt (ML): Light brown to brown, dry, hard, fine- to medium-grained, weakly cemented.		11 18 30	◪				
		Total Depth - 21.5' No groundwater encountered Boring was backfilled with cuttings.							
25									
30									

PLATE A-1

Petra Geosciences, Inc.

EXPLORATION LOG

Project:	**T.T. 38921**		Boring No.: **B-2**
Location:	**La Sierra and Victoria, Riverside**		Elevation: **839±**
Job No.:	**23-341**	Client: **Warmington**	Date: **2/29/24**
Drill Method:	**8" Hollow Stem Auger**	Driving Weight: **140 lbs / 30"**	Logged By: **SS**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**ARTIFICIAL FILL (af)**							
		Silty Sand to Sandy Silt (SM-ML): Light brown to brown, moist, soft, fine- to coarse-grained, some gravel.							
		no gravel.		2 3 3	■	■	11.1	100.9	EI, CHEM, RS
		YOUNGER ALLUVIUM (Qya)							
5		Sandy Silt (ML): Light brown to pale red, moist, soft, fine- to medium-grained.		2 3 3	■	■	8.6	104.4	
		firm, trace course sand.		3 3 4	■		10.2	109.6	
				3 4 6	■		9.7	105.2	
10		stiff, fine- to coarse-grained.		6 10 8	■		6.1	105.8	
15		Brown to pale red, fine-grained.		5 7 8	◪				
20		**OLDER ALLUVIUM (Qoal)**		13 22 37	◪				
		Sandy Silt (ML): Brown to pale yellow, slightly moist, hard, fine- to medium-grained, weakly cemented.							
		Total Depth - 21.5'							
		No groundwater encountered							
		Boring was backfilled with cuttings.							
25									
30									

PLATE A-2

Petra Geosciences, Inc.

EXPLORATION LOG

Project:	**T.T. 38921**		Boring No.: **B-3**
Location:	**La Sierra and Victoria, Riverside**		Elevation: **839±**
Job No.:	**23-341**	Client: **Warmington**	Date: **2/29/24**
Drill Method:	**8" Hollow Stem Auger**	Driving Weight: **140 lbs / 30"**	Logged By: **SS**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**ARTIFICIAL FILL (af)** Silty Sand to Sandy Silt (SM-ML): Light brown to brown, moist, soft, fine- to coarse-grained, trace gravel.		4 6 7	■		15.4	102.5	
		stiff, fine- to medium-grained, trace course sand, no gravel.							
		moist to very moist, firm.		2 3 4	■		10.7	104.9	
5		**YOUNGER ALLUVIUM (Qya)** Sandy Silt (ML): Light brown to pale red, moist, soft, fine- to medium-grained, trace course sand.		3 3 3	■		11.9	106.7	
		firm, fine- to coarse-grained.		2 4 4	■		12.3	112.4	
		Silty Sand (SM): Light brown to pale red, moist, firm, fine- to coarse-grained.		4 5 6	■		9.3	111.5	
10									
15		Sandy Silt (ML): Brown to pale red, moist, very stiff, fine-grained.		6 10 18	◪				
		OLDER ALLUVIUM (Qoal) Sandy Silt (ML): Brown to pale yellow, slightly moist, hard, fine- to medium-grained, weakly cemented.							
20				50/2"	▨				
		Total Depth - 21.5' No groundwater encountered Boring was backfilled with cuttings.							
25									
30									

PLATE A-3

Petra Geosciences, Inc.

EXPLORATION LOG

Project:	**T.T. 38921**		Boring No.: **B-4**
Location:	**La Sierra and Victoria, Riverside**		Elevation: **840±**
Job No.:	**23-341**	Client: **Warmington**	Date: **2/29/24**
Drill Method:	**8" Hollow Stem Auger**	Driving Weight: **140 lbs / 30"**	Logged By: **SS**

Depth (Feet)	Lith-ology	Material Description	WATER	Samples: Blows per 6 in.	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0		**ARTIFICIAL FILL (af)**							
		Silty Sand to Sandy Silt (SM-ML): Light brown to brown, moist, soft, fine- to coarse-grained, trace gravel.							
		fine- to medium-grained, trace course sand, no gravel.		4 3 3			13.9	97.5	
		YOUNGER ALLUVIUM (Qya)							
5		Sandy Silt (ML): Light brown to pale red, moist, soft, fine- to medium-grained, trace course sand.		2 2 3			11.6	105.0	
		firm.		3 3 4			11.2	103.4	
		slightly moist to moist.		4 5 5			9.0	115.2	
10		Silty Sand (SM): Light brown to pale red, slightly moist to moist, medium dense, fine- to coarse-grained, some gravel, trace broken cobble.		7 7 7			5.9	110.0	
15		Sandy Silt (ML): Brown to pale red, slightly moist, very stiff, fine-grained.		4 9 13					
20		**OLDER ALLUVIUM (Qoal)**							
		Sandy Silt (ML): Light brown to pale yellow, dry to slightly moist, hard, weakly cemented.		15 28 30					
		Total Depth - 21.5'							
		No groundwater encountered							
		Boring was backfilled with cuttings.							
25									
30									

PLATE A-4

Petra Geosciences, Inc.

GEOTECHNICAL BORING LOGS

Drill Hole No. B-1

Date: January 17, 2014
Drilling Company: WDI
Hole Diameter: 8" **Drive Weight:** 140 lbs. **Drop:** 30"

Project No. 13167-01
Type of Rig: B-61
Elevation: 816±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: GL SAMPLED BY: GL
1	Alluvium					SM	**SILTY SAND:** Light brown, fine to coarse grained, dry, medium dense
2							
3							Dry, medium dense, micaceous
4			4/8/10	108.4	3.4		% Passing No. 200 Sieve = 43 SE = 18
5							
6			3/4/4	-	-		Slightly moist, loose
7							
8							
9							
10							
11			3/6/4	-	-		Medium dense
12							
13							
14							
15							
16			7/9/11	-	-	ML	**SANDY SILT:** Light brown, slightly moist, stiff
17							
18							
19							
20							
21	Bedrock		15/37/50	-	-	SM	**SILTY SAND:** Light brown, fine to coarse grained, very dense
22							
23							Very dense
24							TOTAL DEPTH = 25 FEET NO GROUNDWATER
25			19/39/50				NO CAVING BORING BACKFILLED

GEOTECHNICAL BORING LOGS

Drill Hole No. B-2

Date: January 17, 2014
Drilling Company: WDI
Hole Diameter: 8" **Drive Weight:** 140 lbs. **Drop:** 30"

Project No. 13167-01
Type of Rig: B-61
Elevation: 818.5±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: GL SAMPLED BY: GL
1	Alluvium					SM	**SILTY SAND:** Light brown, fine to medium grained, slightly moist, loose, micaceous
2							
3							
4		X	2/2/2	-	-		Loose SE = 29
5							
6		■	3/4/4	113.3	13.1	ML	**SANDY SILT:** Light brown, moist, loose, micaceous % Passing No. 200 Sieve = 59
7							
8							
9							
10							
11		X	2/3/3	-	-		Loose
12							
13							
14						CL-ML	**SILTY CLAY:** Light brown, moist, stiff
15		X	7/9/13	-	-		
16							TOTAL DEPTH = 15 FEET NO GROUNDWATER NO CAVING BORING BACKFILLED
17							
18							
19							
20							
21							
22							
23							
24							
25							

GEOTECHNICAL BORING LOGS

Drill Hole No. B-3

Date: January 17, 2014
Drilling Company: WDI
Hole Diameter: 8" **Drive Weight:** 140 lbs. **Drop:** 30"

Project No. 13167-01
Type of Rig: B-61
Elevation: 822.5±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: GL SAMPLED BY: GL
1	Alluvium					SM	**SILTY SAND:** Light brown, fine to medium grained, dry, loose
2							
3							
4							
5							
6		X	3/4/4	-	-		
7							
8							
9							
10							
11		X	5/6/7	-	-	ML	**SANDY SILT:** Light brown, moist, stiff
12							
13							
14							
15							
16	Bedrock	X	7/9/13	-	-	SM	**SILTY SAND:** Light gray, weathered, medium dense
17							
18							
19							
20		X	9/17/22	-	-		
21							TOTAL DEPTH = 20 FEET NO GROUNDWATER NO CAVING BORING BACKFILLED
22							
23							
24							
25							

GEOTECHNICAL BORING LOGS

Drill Hole No. B-4

Date: January 17, 2014
Drilling Company: WDI
Hole Diameter: 8" **Drive Weight:** 140 lbs. **Drop:** 30"

Project No. 13167-01
Type of Rig: B-61
Elevation: 824±

DEPTH (feet)	TYPE OF TEST	SAMPLE TEST	BLOWS PER 6 INCH	DRY DENSITY (%)	MOISTURE (%)	SOIL CLASSIFICATION USCS	GEOTECHNICAL DESCRIPTION LOGGED BY: GL SAMPLED BY: GL
1	Alluvium					SM	**SILTY SAND:** Light brown, fine to medium grained, slightly moist, loose
2							
3							
4							
5							
6		X	3/4/5	-	-		Loose
7							
8							
9							
10							
11		X	5/5/5	-	-		Medium dense
12							
13							
14							
15							
16		X	5/8/11	-	-	ML	**SANDY SILT:** Light brown, slightly moist, stiff
17							
18							
19							
20	Bedrock	X	27/33/39	-	-	SM	**SILTY SAND:** Light brown, fine to coarse grained, very dense
21							TOTAL DEPTH = 20 FEET NO GROUNDWATER NO CAVING BORING BACKFILLED
22							
23							
24							
25							

APPENDIX B

LABORATORY TEST PROCEDURES

LABORATORY DATA SUMMARY
PETRA and 2014 SEC

LABORATORY TEST PROCEDURES

Soil Classification

Soils encountered within the exploration borings were initially classified in the field in general accordance with the visual-manual procedures of the Unified Soil Classification System (ASTM D 2488). The samples were re-examined in the laboratory and the classifications reviewed and then revised where appropriate.

In-Situ Moisture and Density

Moisture content and unit dry density of in-place soil were determined in representative strata and are depicted on the Exploration Logs, Appendix A.

Maximum Dry Density and Optimum Moisture

Maximum dry density and optimum moisture content were determined for a selected sample of soil and bedrock in accordance with Method A of ASTM D 1557 and the test data is presented on Plate B-1.

Expansion Index

An expansion index test was performed on a selected sample of soil in accordance with ASTM D 4829. The expansion potential classification was determined from 2010 CBC Section 1802.3.2 on the basis of the expansion index value. The test result and expansion potentials are presented on Plate B-1.

Soil Corrosivity

Chemical analyses were performed on a selected sample of soil to determine concentrations of soluble sulfate and chloride, as well as pH and resistivity. These tests were performed in accordance with California Test Method Nos. 417 (sulfate), 422 (chloride) and 643 (pH and resistivity). Test results are included on Plate B-1.

Direct Shear

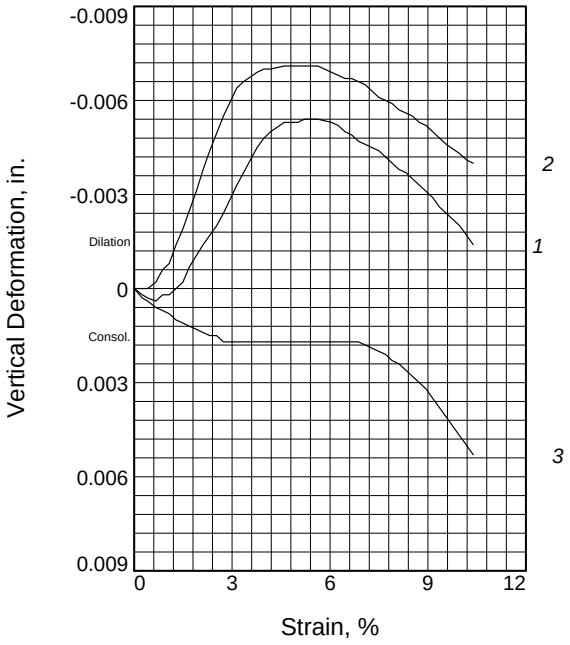
The Coulomb shear strength parameters, i.e., angle of internal friction and cohesion, were determined for a both a remolded sample of onsite soil and an undisturbed sample of onsite soil. The tests were performed in general accordance with the current version of Test Method ASTM D 3080. Three specimens were prepared for each test. The test specimens were inundated and then sheared under various normal loads at a constant strain rate of 0.005 inch per minute. The results of the direct shear test are graphically presented on Plates B-2 and B-3.

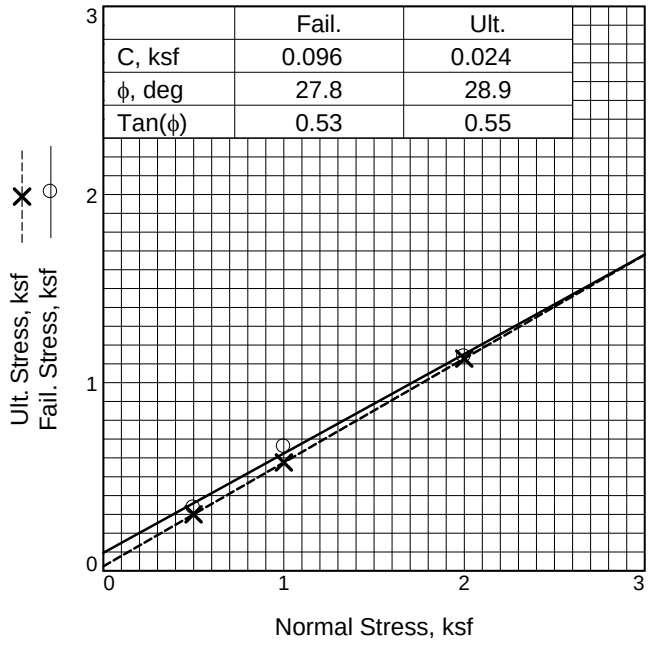
LABORATORY DATA SUMMARY*													
Boring Number	Sample Depth (ft)	Soil Description	Max. Dry Density [1] (pcf)	Optimum Moisture[1] (%)	Expansion Index[2]	USCS Soil Classification[3]	Atterberg Limits[4]			Sulfate Content[5] (%)	Chloride Content[6] (mg/L)	pH[7]	Minimum Resistivity[7] (ohm-cm)
							LL	PL	PI				
B-2	0-5	Silty Sand-Sandy Silt	130.5	8.0	0	SM-ML	--	--	--	0.010	247	8.2	14,000

(--) Tests Not Performed

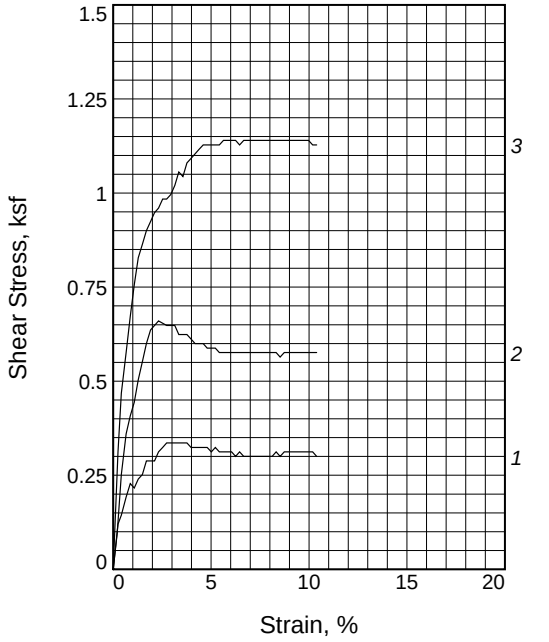
Test Procedures:

[1] Per ASTM Test Method D 1557
[2] Per ASTM Test Method D 4829
[3] Per ASTM Test Method D 2487
[4] Per ASTM Test Method D 4318
[5] Per Caltrans Test Method 417
[6] Per Caltrans Test Method 422
[7] Per Caltrans Test Method 643





	Fail.	Ult.
C, ksf	0.096	0.024
ϕ, deg	27.8	28.9
Tan(ϕ)	0.53	0.55



Sample No.		1	2	3
Initial	Water Content, %	7.2	7.2	7.2
	Dry Density, pcf	106.2	112.3	106.9
	Saturation, %	34.4	40.6	35.1
	Void Ratio	0.5578	0.4725	0.5471
	Diameter, in.	2.416	2.416	2.416
	Height, in.	1.004	1.009	1.000
At Test	Water Content, %	19.5	16.2	17.9
	Dry Density, pcf	108.3	114.5	110.9
	Saturation, %	97.8	96.5	96.5
	Void Ratio	0.5274	0.4449	0.4913
	Diameter, in.	2.416	2.416	2.416
	Height, in.	0.984	0.990	0.964
Normal Stress, ksf		0.500	1.000	2.000
Fail. Stress, ksf		0.336	0.660	1.140
Strain, %		3.8	2.3	10.0
Ult. Stress, ksf		0.300	0.576	1.128
Strain, %		10.4	10.4	10.4
Strain rate, in./min.		0.040	0.040	0.040

Sample Type: Undisturbed
Description: Brown Silty Fine to Coarse Sand

Specific Gravity= 2.65
Remarks:

Figure B-2

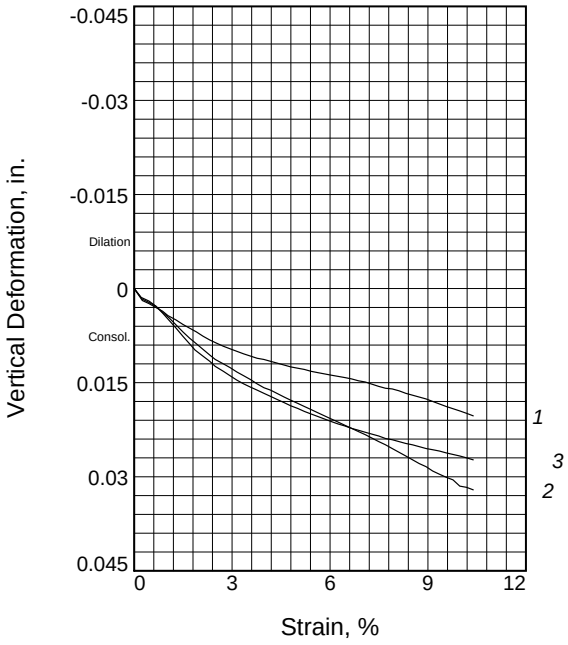
Client: Warmington

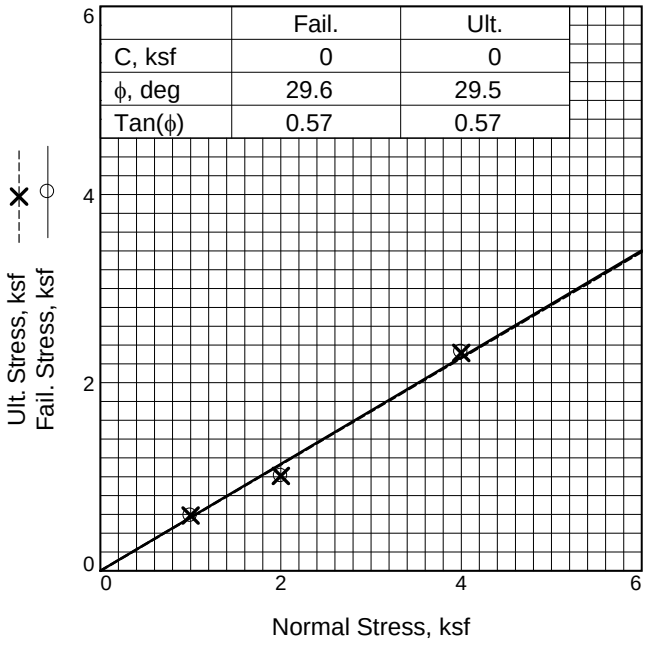
Project: La Sierra and Victoria

Source of Sample: 24L038 **Depth:** 5
Sample Number: B-1
Proj. No.: 23-341 **Date Sampled:**

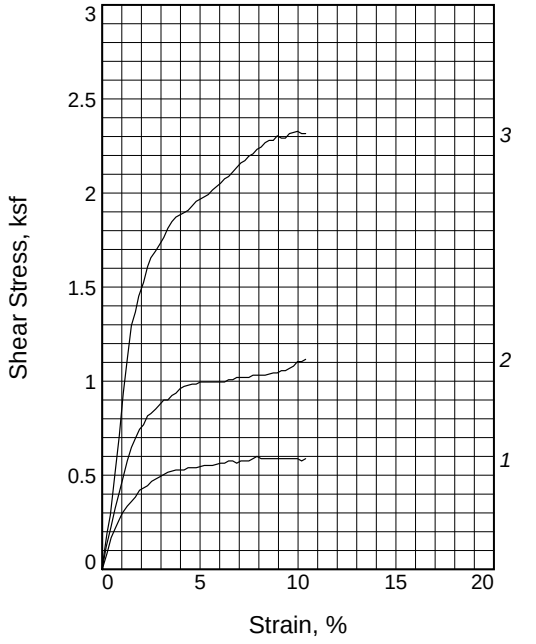
PETRA GEOSCIENCES INC.

Tested By: DI





	Fail.	Ult.
C, ksf	0	0
ϕ, deg	29.6	29.5
Tan(ϕ)	0.57	0.57



Sample No.		1	2	3
Initial	Water Content, %	8.0	8.0	8.0
	Dry Density, pcf	117.5	117.7	117.5
	Saturation, %	52.0	52.1	52.0
	Void Ratio	0.4075	0.4061	0.4075
	Diameter, in.	2.416	2.416	2.416
	Height, in.	1.001	1.000	1.001
At Test	Water Content, %	14.6	13.1	12.6
	Dry Density, pcf	118.7	121.1	121.8
	Saturation, %	98.4	95.0	93.2
	Void Ratio	0.3933	0.3662	0.3584
	Diameter, in.	2.416	2.416	2.416
	Height, in.	0.991	0.972	0.966
Normal Stress, ksf		1.000	2.000	4.000
Fail. Stress, ksf		0.588	1.008	2.328
Strain, %		10.0	6.5	10.0
Ult. Stress, ksf		0.588	1.008	2.316
Strain, %		10.4	6.5	10.4
Strain rate, in./min.		0.040	0.040	0.040

Sample Type: Remold
Description: Brown Silty Fine to Coarse Sand

Specific Gravity= 2.65
Remarks: Brown Silty Fine to Coarse Sand

Client: Warmington

Project: La Sierra and Victoria

Source of Sample: 24L038 **Depth:** 0-5
Sample Number: B-2
Proj. No.: 23-341 **Date Sampled:**

PETRA GEOSCIENCES INC.

Figure B-3

Tested By: DI

LABORATORY TEST RESULTS

SEC of Victoria Avenue and La Sierra Avenue
City of Riverside, California

SIEVE SIZE	B-1 @ 2.5' % PASSING	B-2 @ 5' % PASSING
3/8"	100	-
No. 4	99.5	100
No. 8	98	98
No. 16	93	91
No. 30	86	83
No. 50	78	77
No. 100	65	69
No. 200	43	59
SIEVE ANALYSIS TEST DATA		

B-1 @ 2.5'	B-2 @ 2.5'
18	29
SAND EQUIVALENT TEST DATA	

APPENDIX C

SEISMIC AND LIQUEFACTION PARAMETERS

PETRA GEOSCIENCES INC.

SITE CLASSIFICATION DETERMINATION BASED ON N-SPT FOR SEISMIC DESIGN

Per Table 20.3-1 and Section 20.4.2 of ASCE 7-16

J.N: 23-341 **Project:** Warmington; Victoria & La Sierra **Date:** 12/7/2023

Boring: B-1 Total Depth of Boring: 25 feet SPT Test Interval: every 5 feet

Layer No. (i)	Depth to Soil/Rock Layer		Layer Thickness (d_i)	$\sum_{i=1}^{n} d_i$	Mod. Cal. Sampler Blow Counts[1]	Equivalent N-SPT[2] (N_i)	N-SPT[3] (N_i)	$\sum_{i=1}^{n} \frac{d_i}{N_i}$
	Top	Bottom						
	ft	ft	ft	ft	blows/ft	blows/ft	blows/ft	
1	0	4.5	4.5	4.5	18	12		0.38
2	4.5	8	3.5	8.0			8	0.81
3	8	13	5	13.0			10	1.31
4	13	20	7	20.0			20	1.66
5	20	23.5	3.5	23.5			87	1.70
6	23.5	100	76.5	100.0			89	2.56
7	0	0	0	0.0		0	0	0.00
8	0	0	0	0.0		0	0	0.00
9	0	0	0	0.0		0		0.00
10	0	0	0	0.0		0		0.00
11	0	0	0	0.0		0		0.00
12	0	0	0	0.0		0		0.00
13	0	0	0	0.0		0		0.00
14	0	0	0	0.0		0		0.00
15	0	0	0	0.0		0		0.00

Average Field Standard Penetration Resistance (blows/ft)		Site Classification Per Table 20.3-1
$\bar{N} = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{N_i}}$	= 39	D

1 Modified California sampler blow counts as directly measured in the field without corrections.

2 Equivalent SPT blow counts are calculated from field measured Modified California sampler blow counts using the standard Burmister formula (Burmister, 1948).
Eq. N-SPT = 0.651 x (Mod. Cal. Sampler Blow Counts)

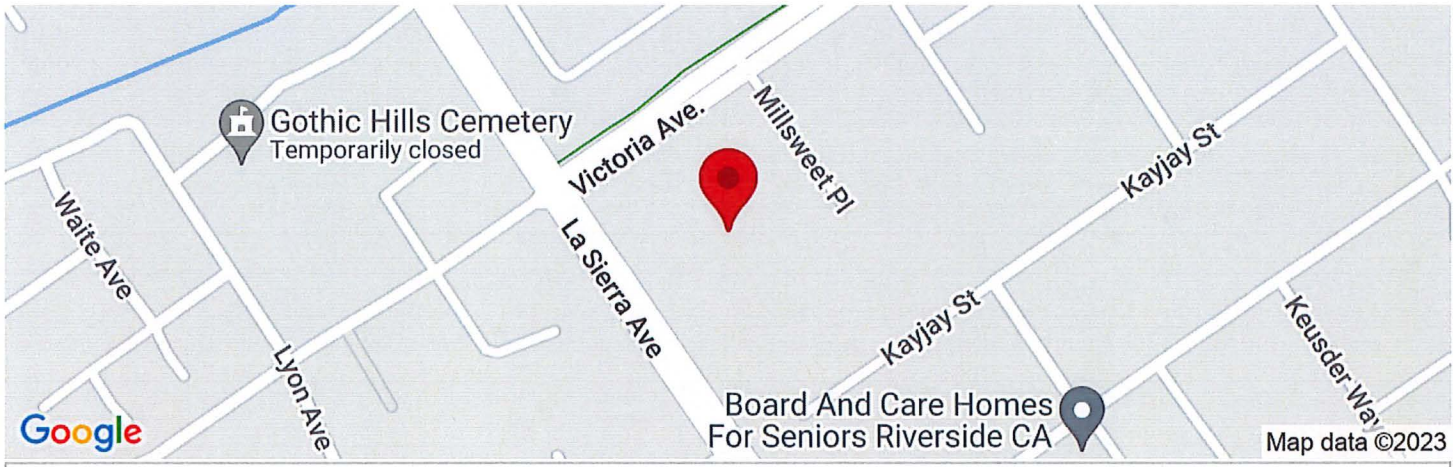
3 Standard penetration resistance (ASTM D1586) not to exceed 100 blows /ft (305 blows /m) as directly measured in the field without corrections. When Refusal is met for a rock layer, this value shall be taken as 100 blows /ft (305 blows /m).

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

Warmington; Victoria & La Sierra

Latitude, Longitude: 33.8875, -117.4618



Date	12/7/2023, 5:53:05 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.5	MCE_R ground motion. (for 0.2 second period)
S_1	0.597	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.5	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.571	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.628	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.669	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.776	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.597	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.649	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.571	Factored deterministic acceleration value. (Peak Ground Acceleration)

Type	Value	Description
PGA_{UH}	0.682	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.94	Mapped value of the risk coefficient at short periods
C_{R1}	0.92	Mapped value of the risk coefficient at a period of 1 s
C_V	1.4	Vertical coefficient

DISCLAIMER

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

33.8875

Time Horizon

Return period in years

2475

Longitude

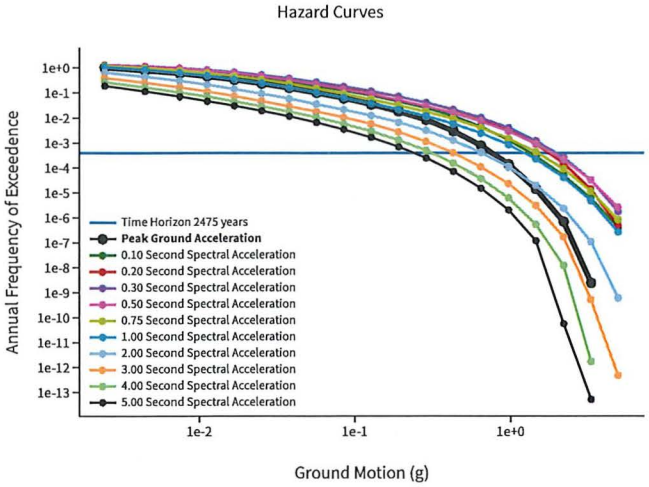
Decimal degrees, negative values for western longitudes

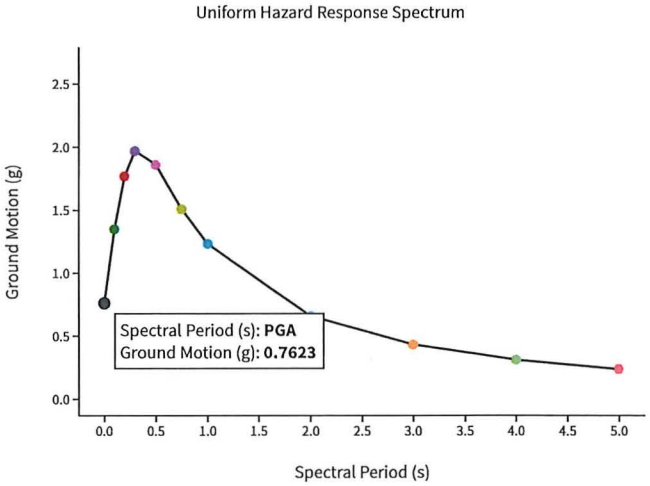
-117.4618

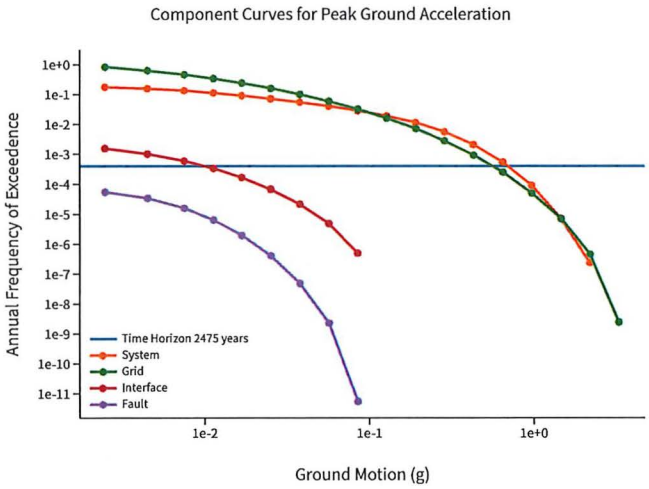
Site Class

259 m/s (Site class D)

Hazard Curve





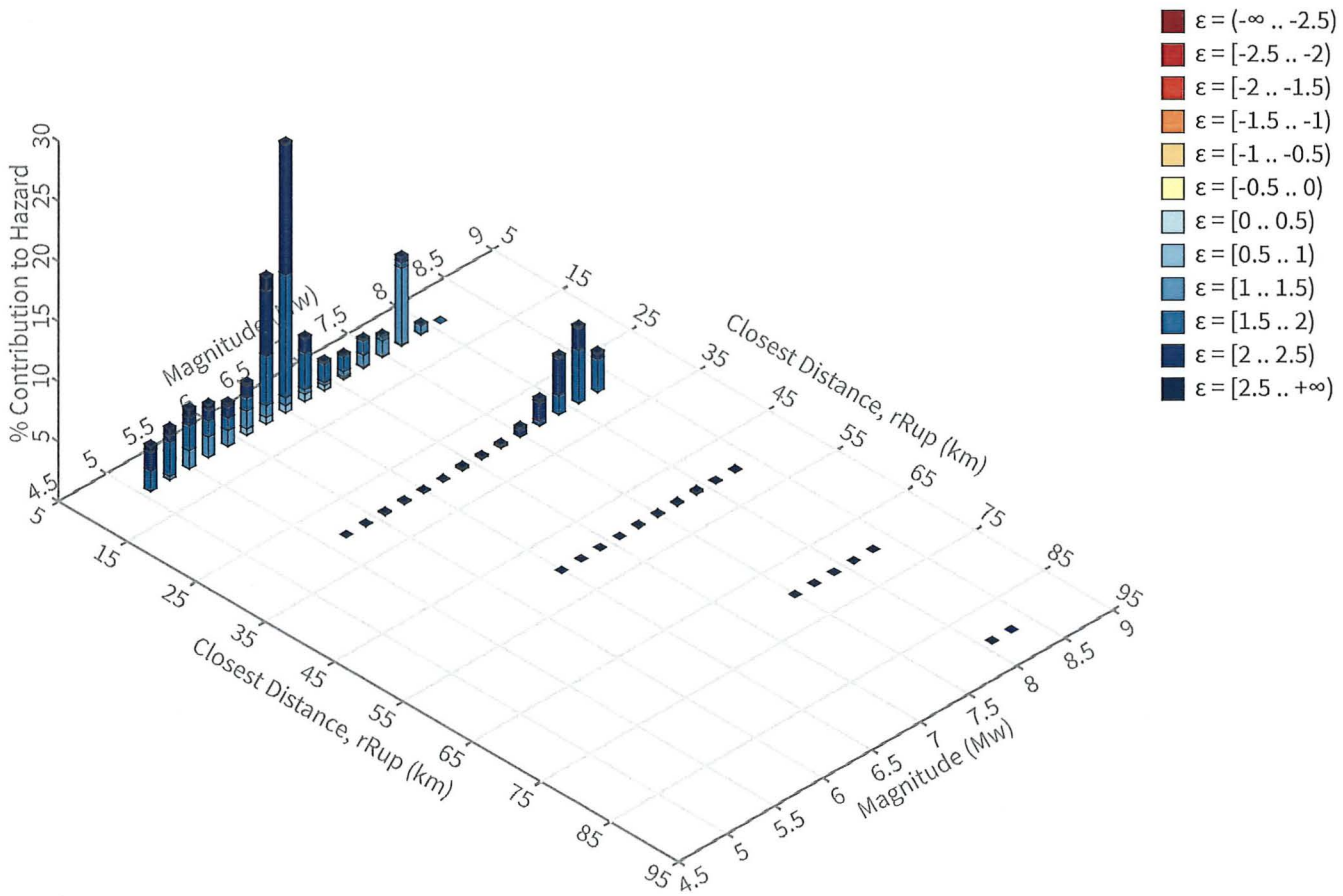


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.76227737 g

Recovered targets

Return period: 2968.3067 yrs
Exceedance rate: 0.00033689241 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.09 %

Mean (over all sources)

m: 6.68
r: 14.01 km
ε_0: 1.86 σ

Mode (largest m-r bin)

m: 6.47
r: 11.3 km
ε_0: 1.96 σ
Contribution: 22.37 %

Mode (largest m-r-ε_0 bin)

m: 6.46
r: 11.73 km
ε_0: 2.17 σ
Contribution: 10.83 %

Discretization

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

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM32	System							33.33
Elsinore (Glen Ivy) rev [0]		11.58	6.82	1.83	117.545°W	33.811°N	222.12	20.06
San Jacinto (San Bernardino) [4]		25.11	8.06	1.88	117.257°W	34.036°N	48.85	5.07
San Andreas (San Bernardino N) [5]		36.17	7.99	2.24	117.269°W	34.171°N	29.36	2.00
Elsinore (Glen Ivy) rev [1]		11.78	6.60	1.96	117.531°W	33.799°N	213.05	1.61
Elsinore (Glen Ivy) rev [2]		14.46	6.29	2.33	117.481°W	33.759°N	186.91	1.30
UC33brAvg_FM31	System							33.18
Elsinore (Glen Ivy) rev [0]		11.58	6.80	1.84	117.545°W	33.811°N	222.12	19.92
San Jacinto (San Bernardino) [4]		25.11	8.06	1.87	117.257°W	34.036°N	48.85	5.11
San Andreas (San Bernardino N) [5]		36.17	7.99	2.24	117.269°W	34.171°N	29.36	1.98
Elsinore (Glen Ivy) rev [1]		11.78	6.57	1.97	117.531°W	33.799°N	213.05	1.50
Elsinore (Glen Ivy) rev [2]		14.46	6.29	2.33	117.481°W	33.759°N	186.91	1.26
UC33brAvg_FM31 (opt)	Grid							16.90
PointSourceFinite: -117.462, 33.919		6.11	5.68	1.47	117.462°W	33.919°N	0.00	3.22
PointSourceFinite: -117.462, 33.919		6.11	5.68	1.47	117.462°W	33.919°N	0.00	3.22
PointSourceFinite: -117.462, 33.937		7.06	5.85	1.57	117.462°W	33.937°N	0.00	2.59
PointSourceFinite: -117.462, 33.937		7.06	5.85	1.57	117.462°W	33.937°N	0.00	2.59
UC33brAvg_FM32 (opt)	Grid							16.60
PointSourceFinite: -117.462, 33.919		6.11	5.69	1.47	117.462°W	33.919°N	0.00	3.16
PointSourceFinite: -117.462, 33.919		6.11	5.69	1.47	117.462°W	33.919°N	0.00	3.16
PointSourceFinite: -117.462, 33.937		7.06	5.85	1.57	117.462°W	33.937°N	0.00	2.58
PointSourceFinite: -117.462, 33.937		7.06	5.85	1.57	117.462°W	33.937°N	0.00	2.58

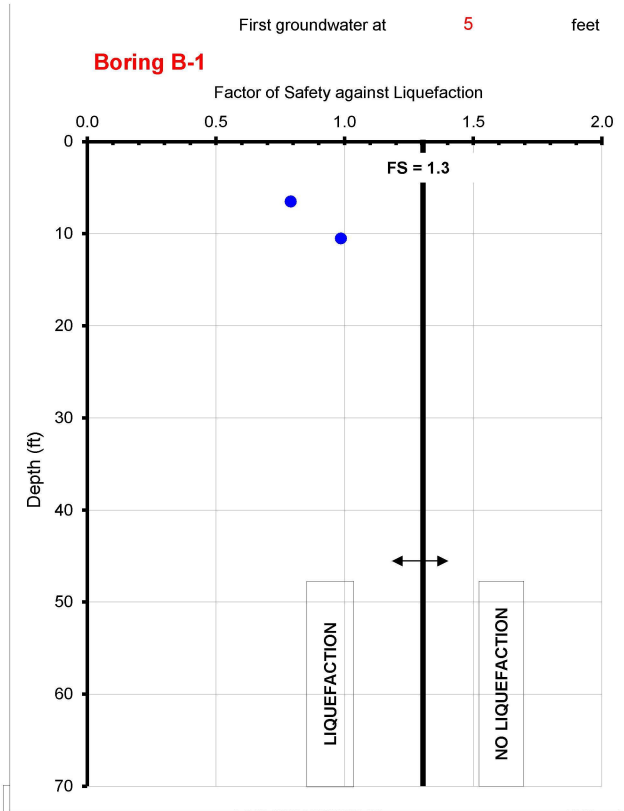
SPT Liquefaction Analysis

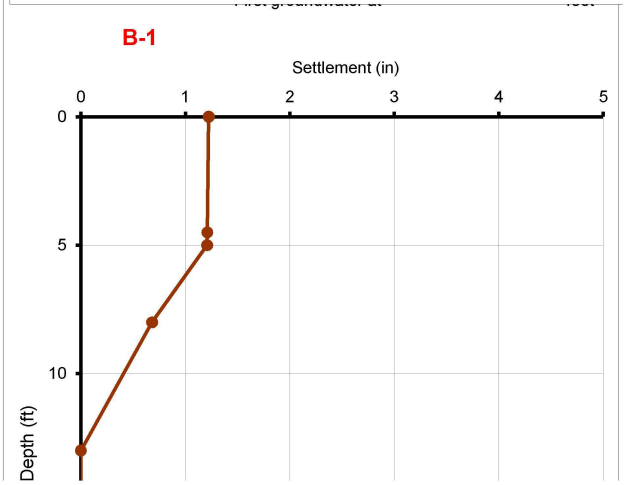
References:
T.L.Youd, I.M.Idriss - Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils
D. Pradel - Procedure to Evaluate Earthquake-Induced Settlements in Dry Sandy Soils
K.Tokimatsu, H.B.Seed - Evaluation of Settlements in Sands Due to Earthquake Shaking, ASCE JGE Vol.113, No.8, August 1986
G.Zhang, P.K.Robertson, R.W.I.Brachman - Estimating Liquefaction-Induced Ground Settlements From CPT for Level Ground (CGJ39,2002)

Boring	B-1	Summary of analysis		
		Total liquefaction settlement	1.21	inches
		Total dry sand settlement	0.02	inches
		Total earthquake-induced settlement	1.22	inches
		Number of evaluated intervals	7	
		Number of potentially liquefiable intervals	2	
		Average Factor of Safety	0.89	
		Depth to first groundwater	5.00	feet
		Total thickness of evaluated profile	100.00	feet
		Profile thickness susceptible to liquefaction	8.00	feet

Earthquake loading: M 6.8
PGA 0.628

Depth to Layer Top	Depth to Layer Bottom	SPT - N	Fines %	$FS_{SPT,cs,K\sigma}$	Interpreted Factor of Safety against liquefaction		Settlement
feet	feet						in
0	4.5	12	43	no liq	Not liquefiable	- no groundwater	0.01
4.5	5	12	43	no liq	Not liquefiable	- no groundwater	0.00
5	8	8	20	0.79	0.79	- liquefieable - FS < 1.3	0.53
8	13	10	20	0.99	0.99	- liquefieable - FS < 1.3	0.68
13	20	20	30	no liq	Not liquefiable	- too dense	0.00
20	23.5	87	20	no liq	Not liquefiable	- too dense	0.00
23.5	100	89	20	no liq	Not liquefiable	- too dense	0.00





J.N. 23-341

APPENDIX D

STANDARD GRADING SPECIFICATIONS

STANDARD GRADING SPECIFICATIONS

These specifications present the usual and minimum requirements for projects on which Petra Geosciences, Inc. (Petra) is the geotechnical consultant. No deviation from these specifications will be allowed, except where specifically superseded in the preliminary geology and soils report, or in other written communication signed by the Soils Engineer and Engineering Geologist of record (Geotechnical Consultant).

I. GENERAL

A. The Geotechnical Consultant is the Owner's or Builder's representative on the project. For the purpose of these specifications, participation by the Geotechnical Consultant includes that observation performed by any person or persons employed by, and responsible to, the licensed Soils Engineer and Engineering Geologist signing the soils report.

B. The contractor should prepare and submit to the Owner and Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" and the estimated quantities of daily earthwork to be performed prior to the commencement of grading. This work plan should be reviewed by the Geotechnical Consultant to schedule personnel to perform the appropriate level of observation, mapping, and compaction testing as necessary.

C. All clearing, site preparation, or earthwork performed on the project shall be conducted by the Contractor in accordance with the recommendations presented in the geotechnical report and under the observation of the Geotechnical Consultant.

D. It is the Contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Geotechnical Consultant and to place, spread, mix, water, and compact the fill in accordance with the specifications of the Geotechnical Consultant. The Contractor shall also remove all material considered unsatisfactory by the Geotechnical Consultant.

E. It is the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of compaction to project specifications. Sufficient watering apparatus will also be provided by the Contractor, with due consideration for the fill material, rate of placement, and time of year.

F. After completion of grading a report will be submitted by the Geotechnical Consultant.

II. SITE PREPARATION

A. Clearing and Grubbing

1. All vegetation such as trees, brush, grass, roots, and deleterious material shall be disposed of offsite. This removal shall be concluded prior to placing fill.

2. Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines, etc., are to be removed or treated in a manner prescribed by the Geotechnical Consultant.

STANDARD GRADING SPECIFICATIONS

III. FILL AREA PREPARATION

A. Remedial Removals/Overexcavations

1. Remedial removals, as well as overexcavation for remedial purposes, shall be evaluated by the Geotechnical Consultant. Remedial removal depths presented in the geotechnical report and shown on the geotechnical plans are estimates only. The actual extent of removal should be determined by the Geotechnical Consultant based on the conditions exposed during grading. All soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as determined by the Geotechnical Consultant.

2. Soil, alluvium, or bedrock materials determined by the Soils Engineer as being unsuitable for placement in compacted fills shall be removed from the site. Any material incorporated as a part of a compacted fill must be approved by the Geotechnical Consultant.

3. Should potentially hazardous materials be encountered, the Contractor should stop work in the affected area. An environmental consultant specializing in hazardous materials should be notified immediately for evaluation and handling of these materials prior to continuing work in the affected area.

B. Evaluation/Acceptance of Fill Areas

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide sufficient survey control for determining locations and elevations of processed areas, keys, and benches.

C. Processing

After the ground surface to receive fill has been declared satisfactory for support of fill by the Geotechnical Consultant, it shall be scarified to a minimum depth of 6 inches and until the ground surface is uniform and free from ruts, hollows, hummocks, or other uneven features which may prevent uniform compaction.

The scarified ground surface shall then be brought to optimum moisture, mixed as required, and compacted to a minimum relative compaction of 90 percent.

D. Subdrains

Subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, and/or with the recommendations of the Geotechnical Consultant. (Typical Canyon Subdrain details are given on Plate SG-1).

E. Cut/Fill & Deep Fill/Shallow Fill Transitions

In order to provide uniform bearing conditions in cut/fill and deep fill/shallow fill transition lots, the cut and shallow fill portions of the lot should be overexcavated to the depths and the horizontal limits discussed in the approved geotechnical report and replaced with compacted fill. (Typical details are given on Plate SG-7.)

STANDARD GRADING SPECIFICATIONS

IV. COMPACTED FILL MATERIAL

A. General

Materials excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Geotechnical Consultant. Material to be used for fill shall be essentially free of organic material and other deleterious substances. Roots, tree branches, and other matter missed during clearing shall be removed from the fill as recommended by the Geotechnical Consultant. Material that is spongy, subject to decay, or otherwise considered unsuitable shall not be used in the compacted fill.

Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

B. Oversize Materials

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches in diameter, shall be taken offsite or placed in accordance with the recommendations of the Geotechnical Consultant in areas designated as suitable for rock disposal (Typical details for Rock Disposal are given on Plate SG-4).

Rock fragments less than 12 inches in diameter may be utilized in the fill provided, they are not nested or placed in concentrated pockets; they are surrounded by compacted fine grained soil material and the distribution of rocks is approved by the Geotechnical Consultant.

C. Laboratory Testing

Representative samples of materials to be utilized as compacted fill shall be analyzed by the laboratory of the Geotechnical Consultant to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Geotechnical Consultant as soon as possible.

D. Import

If importing of fill material is required for grading, proposed import material should meet the requirements of the previous section. The import source shall be given to the Geotechnical Consultant at least 2 working days prior to importing so that appropriate tests can be performed and its suitability determined.

V. FILL PLACEMENT AND COMPACTION

A. Fill Layers

Material used in the compacting process shall be evenly spread, watered, processed, and compacted in thin lifts not to exceed 6 inches in thickness to obtain a uniformly dense layer. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Geotechnical Consultant.

B. Moisture Conditioning

Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly above optimum moisture content.

C. Compaction

Each layer shall be compacted to 90 percent of the maximum density in compliance with the testing method specified by the controlling governmental agency. (In general, ASTM D 1557-02, will be used.)

If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use or expansive soils condition, the area to received fill compacted to less than 90 percent shall either be delineated on the grading plan or appropriate reference made to the area in the soils report.

D. Failing Areas

If the moisture content or relative density varies from that required by the Geotechnical Consultant, the Contractor shall rework the fill until it is approved by the Geotechnical Consultant.

E. Benching

All fills shall be keyed and benched through all topsoil, colluvium, alluvium or creep material, into sound bedrock or firm material where the slope receiving fill exceeds a ratio of 5 horizontal to 1 vertical, in accordance with the recommendations of the Geotechnical Consultant.

VI. SLOPES

A. Fill Slopes

The contractor will be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes, buttresses, and stabilization fills. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure that produces the required compaction.

B. Side Hill Fills

The key for side hill fills shall be a minimum of 15 feet within bedrock or firm materials, unless otherwise specified in the soils report. (See detail on Plate SG-5.)

C. Fill-Over-Cut Slopes

Fill-over-cut slopes shall be properly keyed through topsoil, colluvium or creep material into rock or firm materials, and the transition shall be stripped of all soils prior to placing fill. (see detail on Plate SG-6).

D. Landscaping

All fill slopes should be planted or protected from erosion by other methods specified in the soils report.

E. Cut Slopes

1. The Geotechnical Consultant should observe all cut slopes at vertical intervals not exceeding 10 feet.

2. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be evaluated by the Geotechnical Consultant, and recommendations shall be made to treat these problems (Typical details for stabilization of a portion of a cut slope are given in Plates SG-2 and SG-3.).

3. Cut slopes that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erodible interceptor swale placed at the top of the slope.

4. Unless otherwise specified in the soils and geological report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

5. Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Consultant.

VII. GRADING OBSERVATION

A. General

All cleanouts, processed ground to receive fill, key excavations, subdrains, and rock disposals must be observed and approved by the Geotechnical Consultant prior to placing any fill. It shall be the Contractor's responsibility to notify the Geotechnical Consultant when such areas are ready.

B. Compaction Testing

Observation of the fill placement shall be provided by the Geotechnical Consultant during the progress of grading. Location and frequency of tests shall be at the Consultants discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations may be selected to verify adequacy of compaction levels in areas that are judged to be susceptible to inadequate compaction.

C. Frequency of Compaction Testing

In general, density tests should be made at intervals not exceeding 2 feet of fill height or every 1000 cubic yards of fill placed. This criteria will vary depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verify that the required compaction is being achieved.

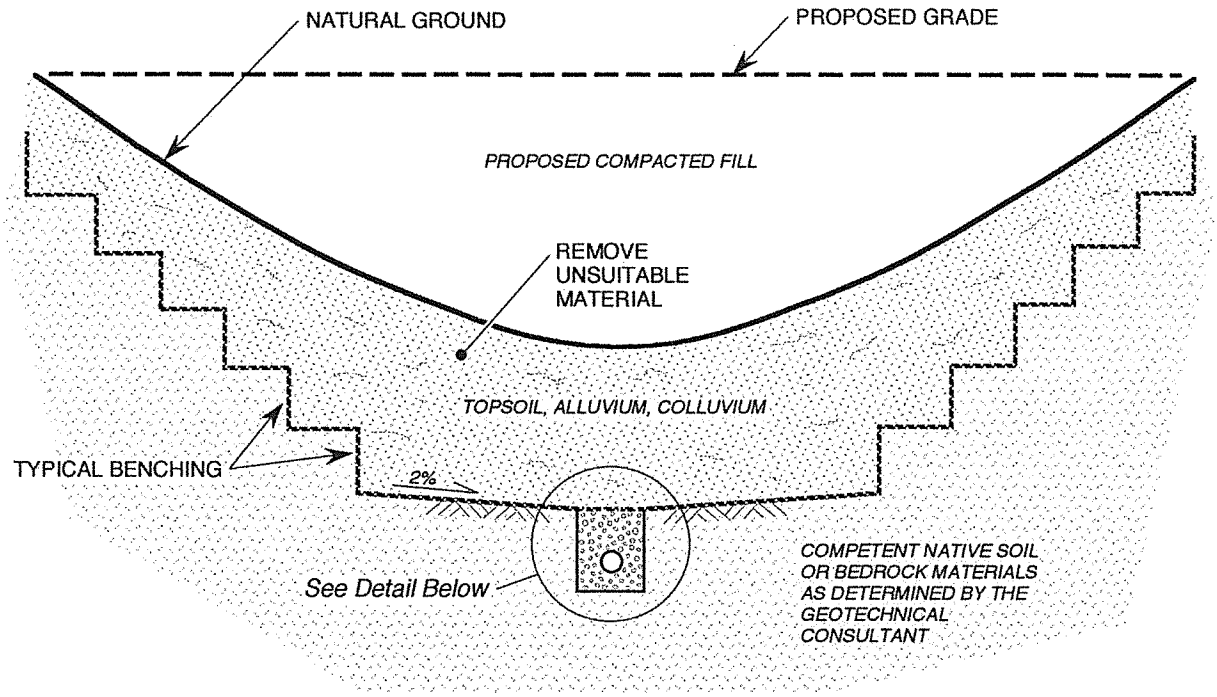
VIII. CONSTRUCTION CONSIDERATIONS

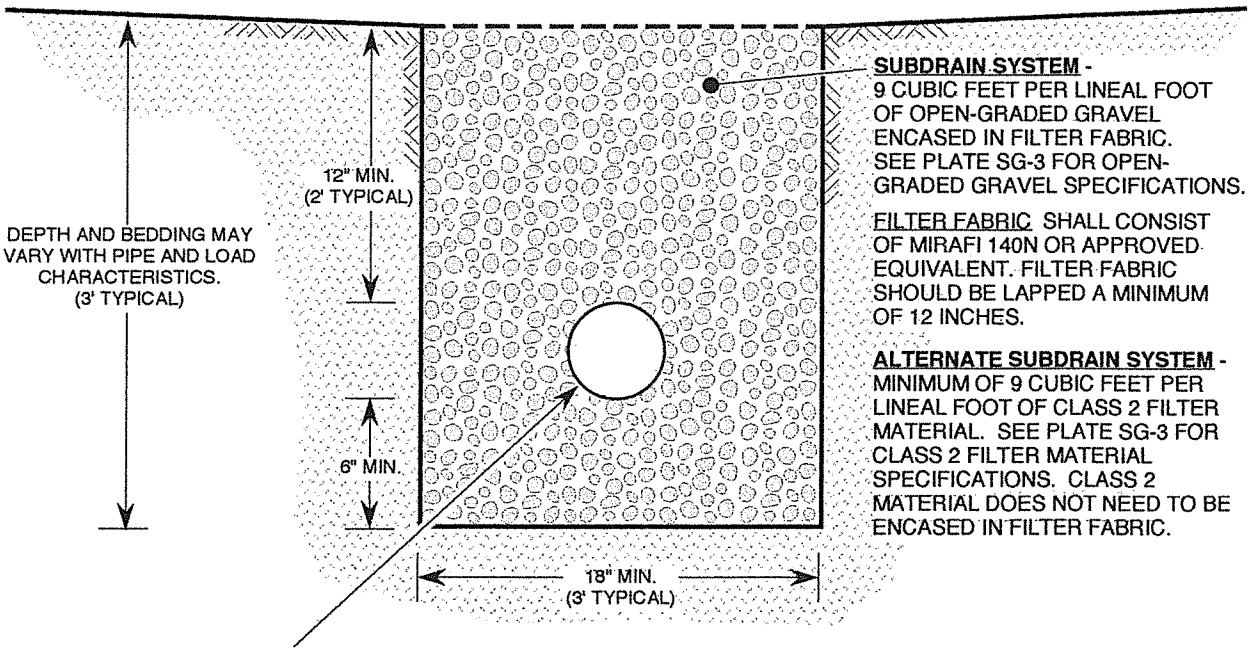
A. Erosion control measures, when necessary, shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

B. Upon completion of grading and termination of observations by the Geotechnical Consultant, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Geotechnical Consultant.

C. Care shall be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of permanent nature on or adjacent to the property.

S:\!BOILERS-WORK\REPORT INSERTS\STANDARD GRADING SPECS





SUBDRAIN SYSTEM - 9 CUBIC FEET PER LINEAL FOOT OF OPEN-GRADED GRAVEL ENCASED IN FILTER FABRIC. SEE PLATE SG-3 FOR OPEN-GRADED GRAVEL SPECIFICATIONS.

FILTER FABRIC SHALL CONSIST OF MIRAFI 140N OR APPROVED EQUIVALENT. FILTER FABRIC SHOULD BE LAPPED A MINIMUM OF 12 INCHES.

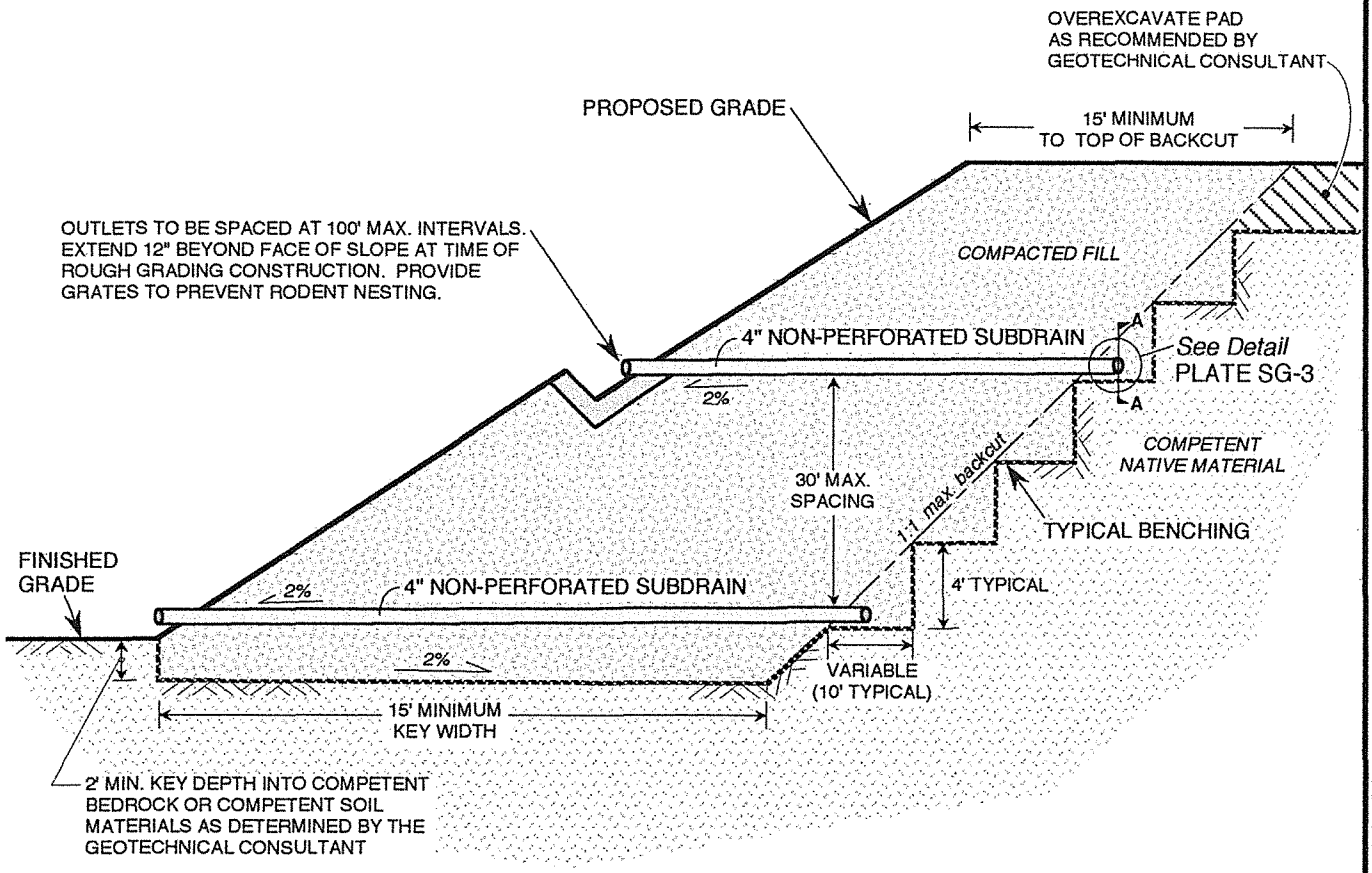
ALTERNATE SUBDRAIN SYSTEM - MINIMUM OF 9 CUBIC FEET PER LINEAL FOOT OF CLASS 2 FILTER MATERIAL. SEE PLATE SG-3 FOR CLASS 2 FILTER MATERIAL SPECIFICATIONS. CLASS 2 MATERIAL DOES NOT NEED TO BE ENCASED IN FILTER FABRIC.

MINIMUM 6-INCH DIAMETER PVC SCHEDULE 40, OR ABS SDR-35 WITH A MINIMUM OF EIGHT 1/4-INCH DIAMETER PERFORATIONS PER LINEAL FOOT IN BOTTOM HALF OF PIPE. PIPE TO BE LAID WITH PERFORATIONS FACING DOWN.

NOTES:

1. FOR CONTINUOUS RUNS IN EXCESS OF 500 FEET USE 8-INCH DIAMETER PIPE.
2. FINAL 20 FEET OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE-GRAINED MATERIAL.

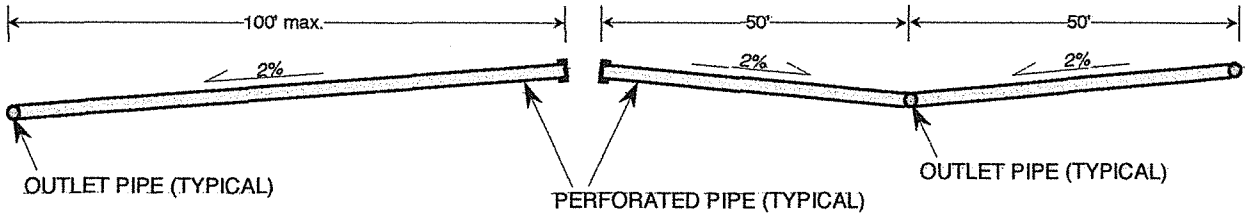
PETRA	CANYON SUBDRAIN DETAIL	PLATE SG-1



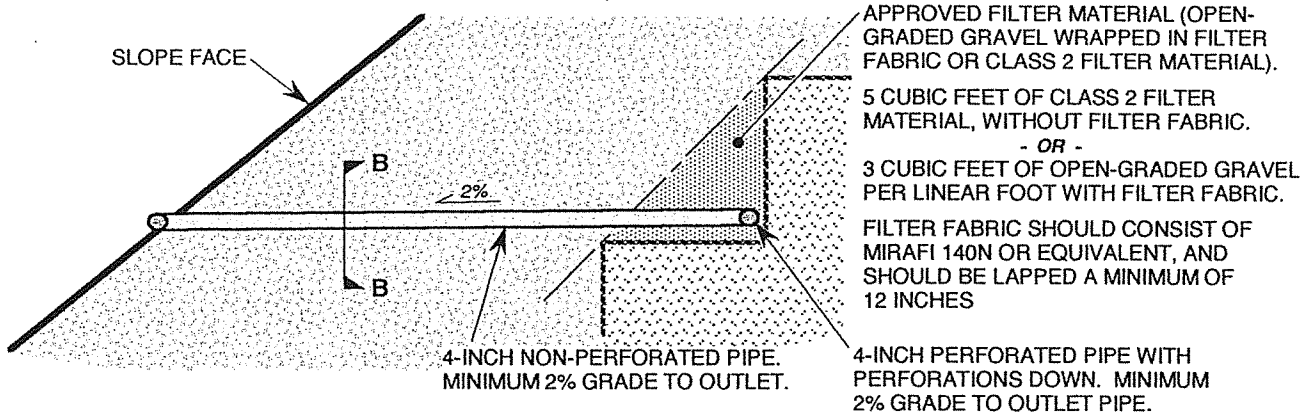
NOTES:

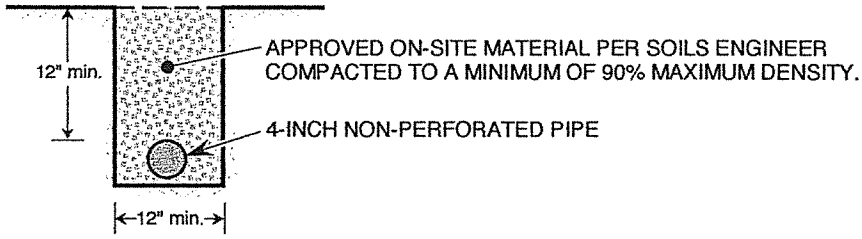
1. 30' MAXIMUM VERTICAL SPACING BETWEEN SUBDRAIN SYSTEMS.
2. 100' MAXIMUM HORIZONTAL DISTANCE BETWEEN NON-PERFORATED OUTLET PIPES. *(See Below)*
3. MINIMUM GRADIENT OF 2% FOR ALL PERFORATED AND NON-PERFORATED PIPE.

SECTION A-A (PERFORATED PIPE PROFILE)



PETRA	BUTTRESS OR STABILIZATION FILL DETAIL	PLATE SG-2





SECTION B-B (OUTLET PIPE)

PIPE SPECIFICATIONS:

1. 4-INCH MINIMUM DIAMETER, PVC SCHEDULE 40 OR ABS SDR-35.
2. FOR PERFORATED PIPE, MINIMUM 8 PERFORATIONS PER FOOT ON BOTTOM HALF OF PIPE.

FILTER MATERIAL/FABRIC SPECIFICATIONS:

OPEN-GRADED GRAVEL ENCASED IN FILTER FABRIC.
(MIRAFI 140N OR EQUIVALENT)

OPEN-GRADED GRAVEL

SIEVE SIZE	PERCENT PASSING
1 1/2-INCH	88 - 100
1-INCH	5 - 40
3/4-INCH	0 - 17
3/8-INCH	0 - 7
No. 200	0 - 3

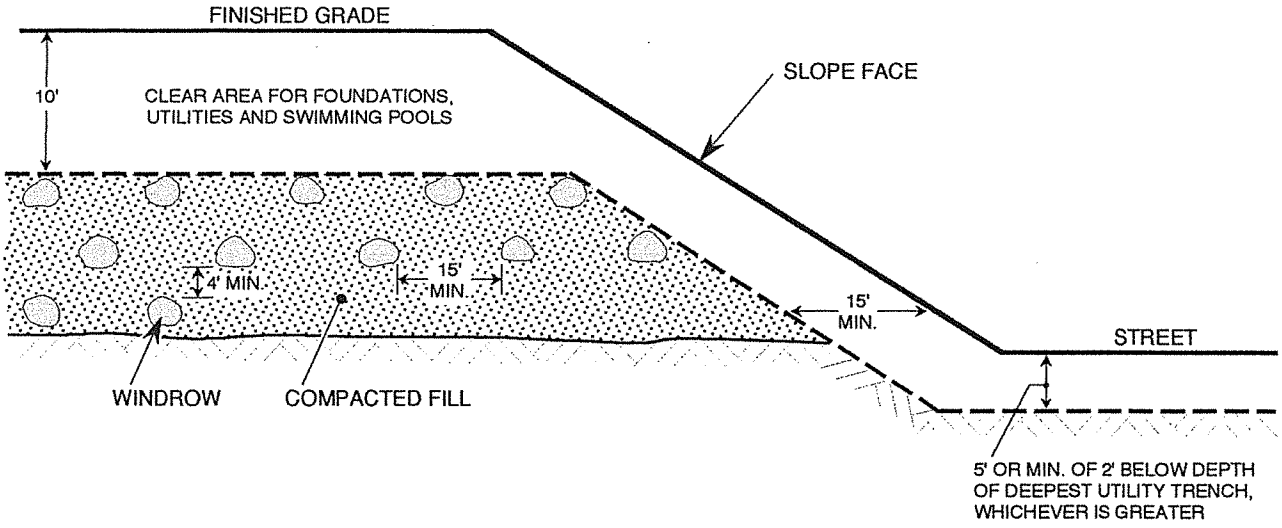
ALTERNATE:

CLASS 2 PERMEABLE FILTER MATERIAL PER CALTRANS STANDARD SPECIFICATION 68-1.025.

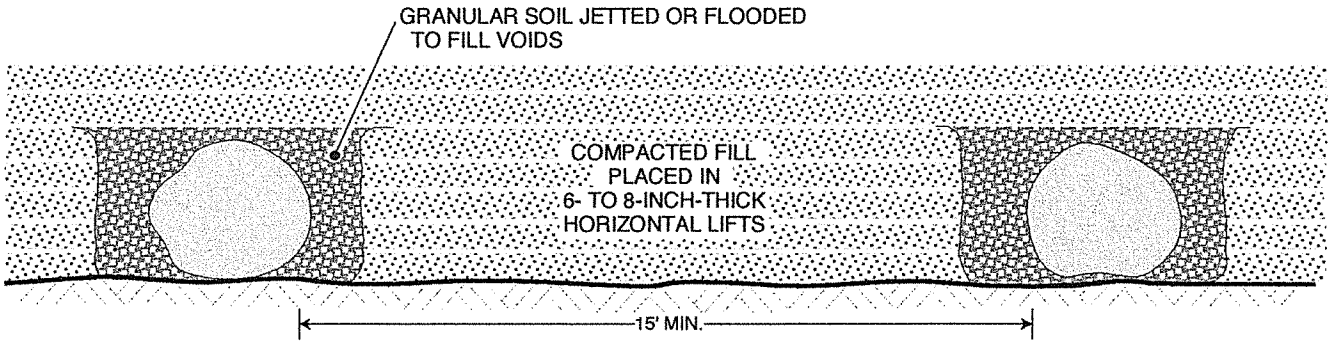
CLASS 2 FILTER MATERIAL

SIEVE SIZE	PERCENT PASSING
1-INCH	100
3/4-INCH	90 - 100
3/8-INCH	40 - 100
No. 4	25 - 40
No. 8	18 - 33
No. -30	5 - 15
No. -50	0 - 7
No. 200	0 - 3

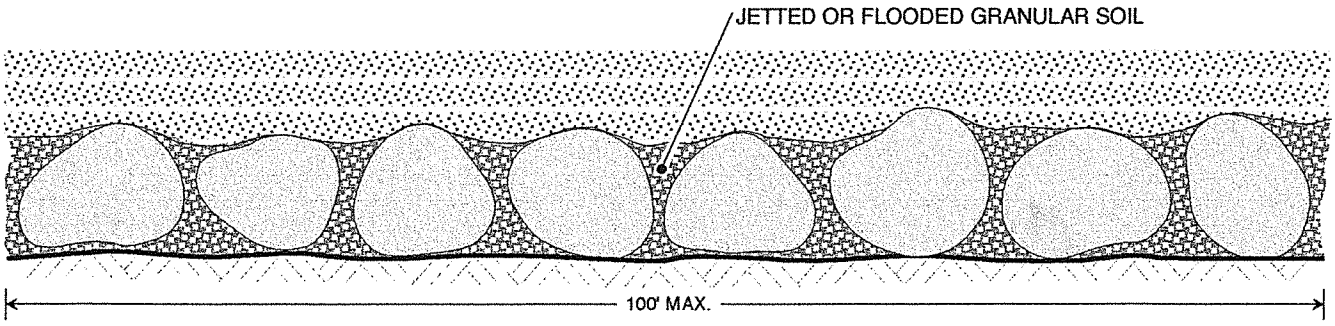
PETRA	BUTTRESS OR STABILIZATION FILL SUBDRAIN	PLATE SG-3



TYPICAL WINDROW DETAIL (END VIEW)

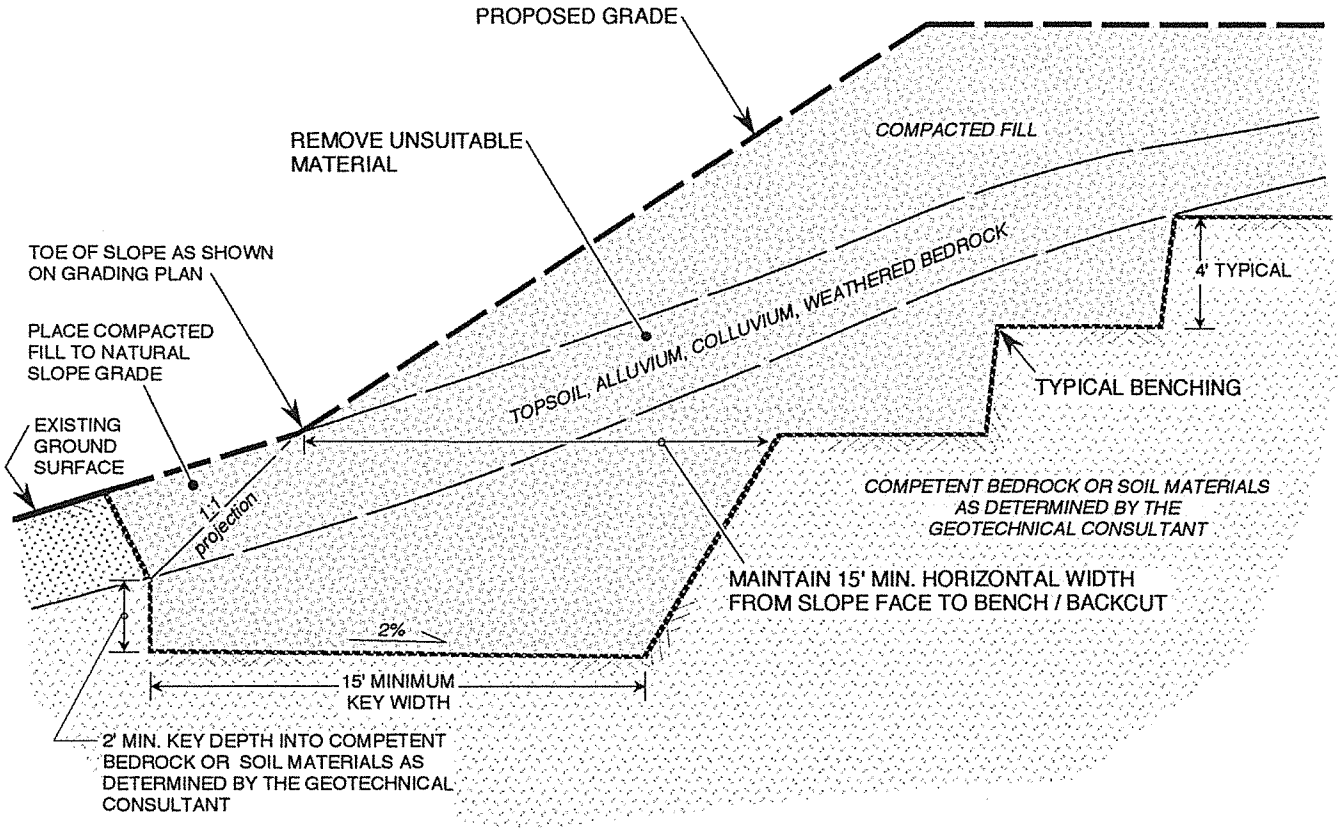


TYPICAL WINDROW DETAIL (PROFILE VIEW)



NOTE: OVERSIZE ROCK IS DEFINED AS CLASTS HAVING A MAXIMUM DIMENSION OF 12" OR LARGER

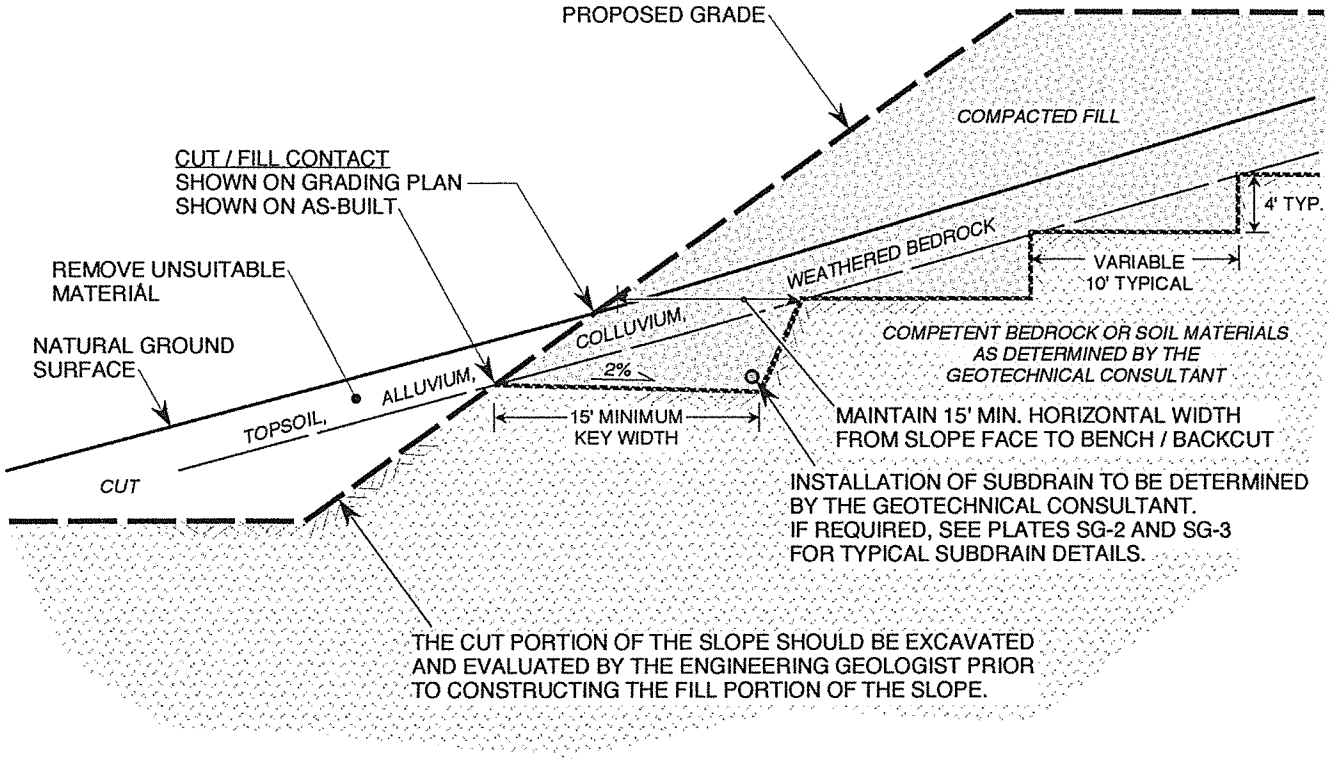
PETRA	TYPICAL ROCK DISPOSAL DETAIL	PLATE SG-4



NOTES:

1. WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, BENCHING IS NOT NECESSARY; HOWEVER, FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.
2. SOILS ENGINEER TO DETERMINE IF SUBDRAIN IS REQUIRED.

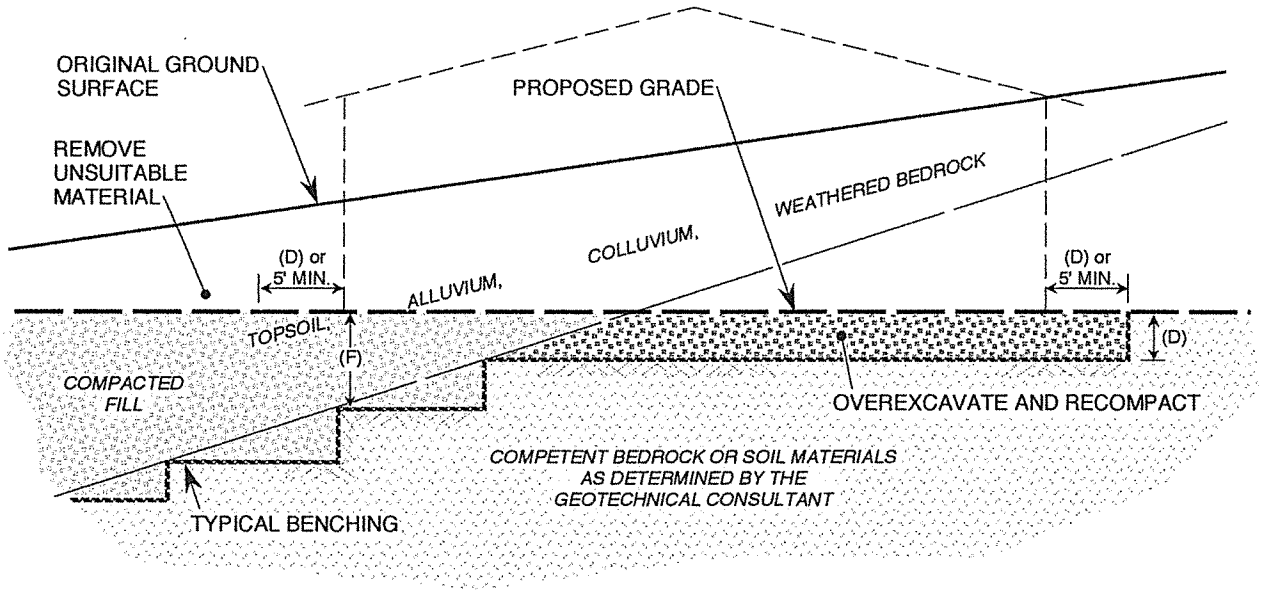
PETRA	FILL SLOPE ABOVE NATURAL SLOPE	PLATE SG-5



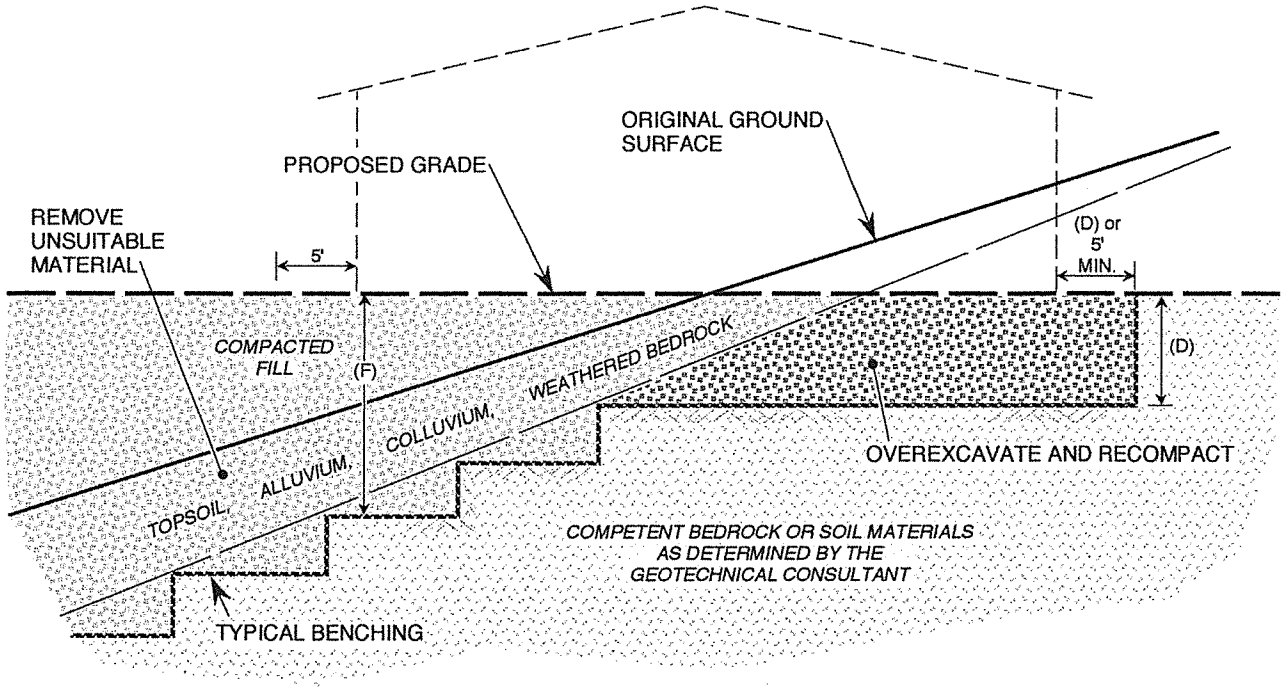
PETRA	FILL SLOPE ABOVE CUT SLOPE	PLATE SG-6

CUT LOT

UNSUITABLE MATERIAL EXPOSED IN PORTION OF CUT PAD

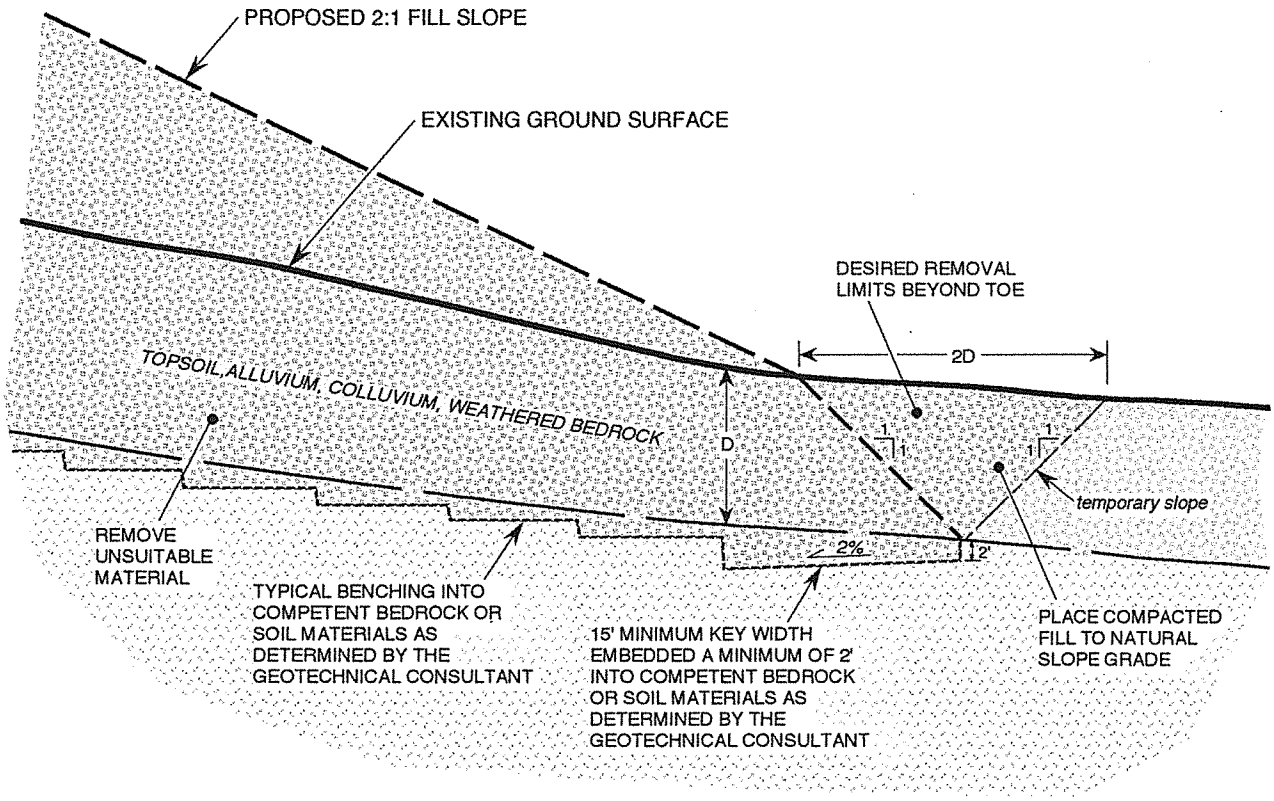


CUT-FILL TRANSITION LOT



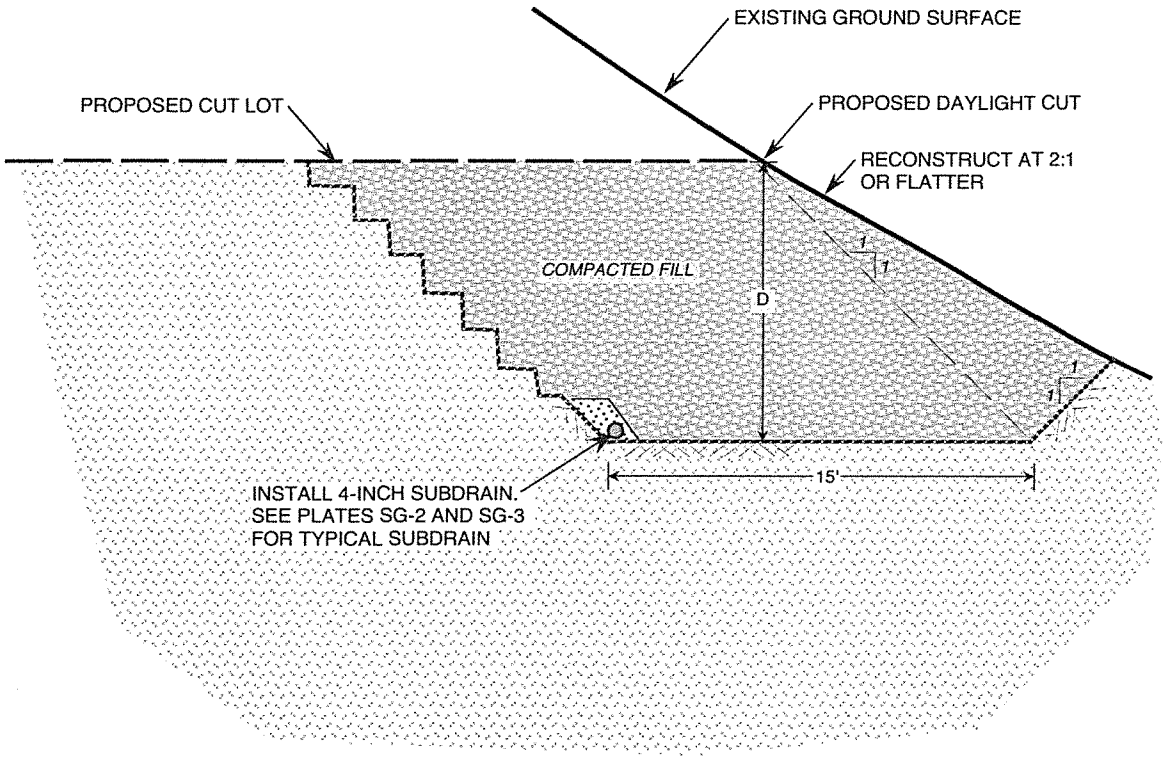
MAXIMUM FILL THICKNESS (F)	DEPTH OF OVEREXCAVATION (D)
FOOTING DEPTH TO 3 FEET	EQUAL DEPTH
3 TO 6 FEET	3 FEET
GREATER THAN 6 FEET	1/2 THE THICKNESS OF DEEPEST FILL PLACED WITHIN THE "FILL" PORTION (F) TO 15 FEET MAXIMUM

PETRA	CUT LOTS AND CUT-FILL TRANSITION LOTS	PLATE SG-7



D = RECOMMENDED DEPTH OF REMOVAL PER GEOTECHNICAL REPORT

PETRA	TYPICAL REMOVALS BEYOND TOE OF PROPOSED FILL SLOPE	PLATE SG-8



NOTE:

1. "D" SHALL BE 10 FEET MINIMUM OR AS DETERMINED BY SOILS ENGINEER.

PETRA	SHEAR KEY ON DAYLIGHT CUT LOTS	PLATE SG-9

5261 West Imperial Highway
Los Angeles, California 90045
Telephone: 310-854-6300
Toll-free: 888-705-6300
Fax: 310-854-0199

Phase I Environmental Site Assessment and Limited Soil Investigation Report

EFI Global Project No.: 045.02270

Tentative Tract Map (TTM) 37764

Southeast Corner of Victoria Avenue and La Sierra Avenue
Riverside, California 92503

Date of Issuance: December 19, 2019

Prepared For:

Murow Development Consultants

1151 Duryea Avenue
Irvine, California 92614

TABLE OF CONTENTS

TABLE OF APPENDICES

EXECUTIVE SUMMARY

EFI Global, Inc. has performed a Phase I Environmental Site Assessment (Phase I) and Limited Soil Investigation for Murow Development Consultants (Client) for a agricultural property located at the southeast corner of Victoria Avenue and La Sierra Avenue, in Riverside County, and the City of Riverside, California, Assessor's Parcel Number (APN): 136-220-016. The research conducted for this study and the report prepared are in conformance with the United States Environmental Protection Agency (USEPA) All Appropriate Inquiry (AAI) standard and the American Society for Testing and Materials (ASTM) E 1527-13 scope of work.

SITE DESCRIPTION

According to our research and information provided by the Client, the subject property is located at the southeast corner of Victoria Avenue and La Sierra Avenue, Riverside, California, and is described by the APN 136-220-016. According to the Riverside County Assessor's Office, no physical address is currently associated with the subject property. The subject property is approximately 8.81 acres in size and is currently utilized as an orchard. According to the Client, the subject property is identified as by Tentative Tract Map (TTM) 37764, and the proposed future use will include a residential development. The surrounding area consists of residential structures and agricultural land. Groundwater is estimated to be approximately 35 feet below ground surface in the area of the site and is assumed to flow towards the west.

- The subject property is mostly covered with orange trees and grasses; therefore, limiting the observation of all surface areas of the property. No other significant limitations were encountered during our reconnaissance of the subject property.

- No significant hazardous material storage or recognized environmental conditions were observed at the site. Those interviewed, as persons familiar with the site were not aware of any negative environmental conditions associated with the property.

HISTORICAL LAND USE

According to EFI Global, Inc.'s interpretation of the historical research data, the subject property has been utilized for agricultural purposes since at least 1931. By at least 2009, a concrete-paved walk way was constructed and a trailer was stationed on the eastern portion. The subject property has remained in this configuration through the present. Additionally, since the subject property has never been developed with any structures, no physical address has been identified by EFI Global, Inc. during the course of this investigation. A physical address is often utilized in the historical research process in order to identify any address-specific information, such as regulatory and enforcement actions. However, based on the reliability of other data sources, the lack of a physical address is not expected to significantly alter the findings of this investigation.

- The subject property has been utilized for agricultural purposes since at least 1931 through the present. There is a potential that agricultural chemicals, such as pesticides, herbicides, and fertilizers, were and are continued to be used on site. Agricultural chemicals tend to accumulate in the near surface soils. The types of pesticides and herbicides used prior to the present time are not known. As the subject property has never been developed, the potential for residual agricultural chemicals such as pesticides, herbicides, and fertilizers cannot be

ruled out. Based on the forgoing and the proposed future residential development of the subject property, the historic and current agricultural use is considered to be a potential environmental concern for the subject property. Therefore, a limited soil investigation was performed as part of this assessment. The results of the investigation are provided in the Limited Soil Investigation Section below.

- The earliest historical resource obtained during this investigation was an aerial photograph from 1931, which indicated development of the subject property for agricultural use. The lack of historical data sources for the subject property dating back to first developed uses represents historical data source failure. However, it is assumed that prior to 1931, the subject property would have been developed for agricultural use, if not undeveloped. Based on this notion, this limitation is not expected to significantly alter the findings of this investigation.

ENVIRONMENTAL DATA SEARCH

- **TTM 36713 (Intersection of La Sierra Avenue and Victoria Avenue)** - The subject property is listed on the National Pollutant Discharge Elimination System (NPDES), California Integrated Water Quality System (CIWQS), and California Environmental Reporting System (CERS) databases. According to the NPDES and CIWQS listings, the subject property was permitted for the collection of storm water on site in 2017. No other information was provided. According to the CERS listing, the subject property was listed as having a compliance evaluation inspection completed in 2018; however, no construction occurred on site at that time. No further information was provided. Local regulatory research was conducted with the appropriate regulatory agencies with regard to the aforementioned listings. The results of those inquiries are summarized below.

- There are no properties within 100-feet of the subject property where a release is considered likely or a known release has occurred.

- In our opinion, none of the other sites listed on the regulatory database report pose a significant threat to the subject property as there is no indication of a release at the respective sites, a release has occurred but groundwater has not been impacted, a release has occurred but the case is closed, or the sites are located cross or down gradient of the subject property and in excess of 1/10 mile from the subject property.

The Santa Ana Regional Water Quality Control Board (SARWQCB), Department of Toxic Substances Control (DTSC), South Coast Air Quality Management District (SCAQMD), Riverside City Clerk's Office (RCCO), and Riverside County Department of Environmental Health (RCDEH) were contacted regarding permits, air emissions, site investigation files, hazardous materials, underground storage tank, and industrial waste discharge records for the subject property. Additionally, the State Water Resources Control Board (SWRCB) GeoTracker and California Integrated Water Quality System (CIWQS) Storm Water Multiple Applications and Report Tracking System (SMARTS), DTSC's Hazardous Waste Tracking System (HWTS) and EnviroStor, SCAQMD's Facility Information Detail (FIND), and Riverside County Information Technology (RCIT) online databases were reviewed for information pertaining to the subject property.

- According to responses to our requests from the SARWQCB, DTSC, SCAQMD, RCCO, and RCDEH, there are no files for the subject property APN 136-220-016. Furthermore, a review of the GeoTracker, EnviroStor, HWTS, FIND, and RCIT online databases found no files for the subject property.

- According to the review of the CIWQS SMARTS database, the current property owner, La Sierra Victoria Development LLC, was issued a Notice of Intent (NOI) by the CIWQS for the general permit to discharge storm water since October 2018, for the future residential construction of the subject property. The subject property was listed under TTM 36713. The permit remained active until October 2019. The CIWQS records included Annual Reports from 2016 to 2019. No violations were identified for the subject property. Based on the nature of the listing, lack of documented discharges, and good housekeeping practices observed during the site reconnaissance, this listing is not expected to represent a significant environmental concern for the subject property at this time.

- The Division of Oil, Gas, and Geothermal Resources (DOGGR) Online Mapping System was reviewed for information pertaining to oil and gas exploration on or nearby the subject property. No oil wells were identified within 500 feet of the subject property.

- No significant data gaps were encountered during our agency file reviews.

- The User was not aware of any environmental cleanup liens or activity and use limitations encumbering the subject property. The User provided EFI Global, Inc. with a Preliminary Report prepared by Pacific Coast Title Company, dated October 15, 2019, for the subject property which was reviewed by EFI Global, Inc. No environmental cleanup liens or activity and use limitations encumbering the subject property were identified in our review. Furthermore, based on our review the DTSC EnviroStor Database, no environmental liens enforced by the DTSC were identified.

LIMITED SOIL INVESTIGATION

EFI Global conducted a Limited Soil Investigation to further evaluate site soils for the presence (or absence) of potential chemicals of concern associated with the onsite agricultural use. . The scope of work consisted of collecting soil samples at 18 locations throughout the subject property to evaluate near-surface soils for potential chemicals of concern that include organochlorine pesticides (OCPs) and arsenic. All environmental sampling for this assessment was performed on December 5, 2019.

Analytical results from the shallow soil samples collected during this investigation detected low concentrations of OCPs (alpha-Chlordane, 4,4´-DDD, 4,4´-DDE, 4,4´-DDT, and Dieldrin) and arsenic in soil beneath the subject property. The detected concentrations were compared to the Department of Toxic Substances Control (DTSC) Modified Soil Screening Levels (DTSC-SLs) for a residential land use scenario. All detected concentrations of OCPs were below their respective residential screening levels, while the detected arsenic concentrations appear to represent background or a trace concentration inherent to soil in the site vicinity. Therefore, it is EFI Global's opinion that the detected concentrations of OCPs and arsenic represent a *de minimis condition* and no additional environmental assessment is warranted at this time.

Additional Issues

- As there are no structures on the subject property, the potential for asbestos-containing building materials (ACMs) and lead-based paint are considered to be low.
- According to research the potential for radon at this property is low.
- As there are no structures on the subject property, a mold inspection was not conducted as part of this assessment.
- Based on our research, the property is not known to be located in proximity (within 1,000 feet) to any active or abandoned oil wells or landfills. Therefore, the potential for methane risk at the subject property is considered low.

CONCLUSIONS

EFI Global, Inc. has performed a Phase I Environmental Site Assessment and Limited Soil Investigation in conformance with the scope and limitations of ASTM Practice 1527-13, for a vacant property located at the southeast corner of Victoria Avenue and La Sierra Avenue, Riverside, California, the subject property. Any exceptions to or deletions from this practice are described in the individual sections of this report. This assessment has revealed no evidence of recognized environmental conditions or *de minimis* conditions in connection with the subject property, except for the following:

Recognized Environmental Conditions (REC)

In our opinion, no RECs were identified during the course of this assessment.

Historical Recognized Environmental Conditions (HREC)

In our opinion, no HRECs were identified during the course of this assessment.

Controlled Recognized Environmental Conditions (CREC)

In our opinion, no CRECs were identified during the course of this assessment.

De Minimis Conditions

The low levels of OCPs and arsenic detected in near-surface soils as part of our Limited Soil Investigation are considered to be a *de minimis condition* for the subject property. However, EFI Global notes that based on the subject property's historical agricultural use, it is possible that buried/concealed/hidden agricultural by-products, both above and below ground may have existed or exists on the subject property. Any buried trash/debris or other waste encountered during future subject property development should be evaluated by an experienced environmental consultant prior to removal. If stained or suspicious soil is encountered during future grading operations, the material should be evaluated and if deemed necessary, characterized for property disposal.

RECOMMENDATIONS

Based on the foregoing, no additional investigation is recommended at this time.

1.0 INTRODUCTION

EFI Global, Inc. has performed a Phase I Environmental Site Assessment (Phase I) and Limited Soil Investigation for the property located at the southeast corner of Victoria Avenue and La Sierra Avenue, in Riverside County, and the City of Riverside, California (Subject Property). This report has been prepared for the sole use of Murow Development Consultants (Client).

The research conducted for this study and the report prepared are in general conformance with the EPA "All Appropriate Inquiries" standard and the ASTM 1527-13 "Standard Practices for Environmental Site Assessments: Phase I Environmental Site Assessment Process". The primary purpose for performing a Phase I ESA is to "...permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations (commonly known as landowner liability protections) on Comprehensive Environmental Response Compensation and Liability Act (CERCLA) liability." (ASTM, 2013) An environmental site assessment meeting or exceeding this practice and completed less than 180 days prior to the date of acquisition is presumed to be valid under this standard. In order to maintain landowner liability protections, the User also has a "continuing obligation to not interfere with activity and use limitations associated with the property," must take "reasonable steps to prevent releases" and must "comply with legal release reporting obligations." (ASTM, 2013) Further, it is the goal of this study to identify business risks related to the property associated with environmental conditions. This investigation is not an environmental compliance audit and is not designed to determine if the operations of an existing facility are in compliance with applicable environmental laws and regulations.

The goal of this process is to identify any (1) recognized environmental conditions (RECs), (2) historic recognized environmental conditions (HRECs), (3) controlled recognized environmental conditions (CRECs), and/or (4) *de minimis* conditions associated with the subject property.

- A **recognized environmental condition** is defined as "...the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment." This definition does not include de minimis conditions defined as "a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies" (ASTM, 2013).

- A **historical recognized environmental condition** is defined as "a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)." (ASTM, 2013). The HREC designation requires the comparison of residual contamination concentrations, if any, to current regulatory standards.

- A **controlled recognized environmental condition** is defined as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or

equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)" (ASTM, 2013).

- A ***de minimis condition*** is defined as "a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* conditions are not recognized environmental conditions nor controlled recognized environmental conditions" (ASTM, 2013).

In order to identify environmental conditions at the site, the Phase I ESA includes a site inspection, interviews with parties familiar with the property, historical research into the past uses of the property, and an environmental records search with regard to the subject property, adjoining and immediately surrounding properties, and the surrounding area. In addition, EFI Global, Inc. provides an opinion regarding the potential for asbestos containing materials, lead-based paints, mold, radon, oil and gas exploration, and methane as they relate to the subject property. Reviewing those documents that are publicly available, reasonably ascertainable, and practically reviewable controls the completeness of this assessment. The inability to review documents which do not exist or are not publicly available, reasonably ascertainable, or practically reviewable may result in a data gap.

1.1 Significant Assumptions

While this report provides an overview of potential environmental concerns, both past and present, the environmental assessment is limited by the availability of information at the time of the assessment. It is possible that unreported disposal of waste or illegal activities impairing the environmental status of the property may have occurred which could not be identified. The conclusions and recommendations regarding environmental conditions that are presented in this report are based on a scope of work authorized by the Client. Note, however, that virtually no scope of work, no matter how exhaustive, can identify all contaminants or all conditions above and below ground.

1.2 Limitations and Exceptions

This report has been prepared in accordance with generally accepted environmental methodologies referred to in ASTM 1527-2013, and contains all of the limitations inherent in these methodologies. No other warranties, expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report. The conclusions of this report are based in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the site in locations not specifically investigated. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site that were unavailable for direct observation, reasonably beyond the control of EFI Global, Inc. The objective of this report was to assess environmental conditions at the site, within the context of our contract and existing environmental regulations within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial, and federal government laws and regulations was not included in our contract for services. Our observations relating to the condition of environmental media at the site are described in this report. It should be noted that compounds or materials other than those described could be present in the site environment.

1.3 Reliance

This report has been prepared for the sole use of Murow Development Consultants. The contents should not be relied upon by any other parties without the express written consent of Murow Development Consultants and EFI Global, Inc.

1.4 User Responsibilities

The United States Environmental Protection Agency (USEPA) All Appropriate Inquiry (AAI) and ASTM E 1527-13 Phase I Standards require that the User conduct independent research and consider certain information before purchasing a property:

- Obtain a recent (less than 180 days old) title report prepared for the subject property. The report should be reviewed to obtain information regarding environmental clean-up liens or activity and use limitations (AULs) with regard to the subject property. If environmental cleanup liens or AULs encumbering the subject property or in connection with the subject property are identified, the User should provide that information to the Environmental Professional (EFI Global, Inc.). If the User has actual knowledge of environmental cleanup liens or AULs encumbering the subject property or in connection with the subject property, the User should provide that information to the Environmental Professional (EFI Global, Inc.).

- The User should provide the Environmental Professional (EFI Global, Inc.) with any specialized knowledge the User has with regard to recognized environmental conditions in connection with the property.

- If the User is aware of any commonly known information in the community about the subject property with respect to recognized environmental conditions, the User should provide the information to the Environmental Professional (EFI Global, Inc.).

- If this Phase I ESA was prepared as due diligence for a property transaction, it is the responsibility of the User to consider the relationship of the purchase price to the fair market value of the property. If the purchase price is significantly lower than the fair market value, the User should identify the alternate reason for the low purchase price if the lower purchase price is not related to the property being affected by hazardous substances or petroleum products.

2.0 SITE DESCRIPTION

EFI Global, Inc. has performed a Phase I and Limited Soil Investigation for a agricultural property located at the southeast corner of Victoria Avenue and La Sierra Avenue, in Riverside County, and the City of Riverside, California. The subject property is approximately 8.81 acres in size and is currently utilized as an orchard. According to the Client, the subject property is identified as by Tentative Tract Map (TTM) 37764, and the proposed future use will include a residential development.

The subject property is located within the jurisdiction of the Southern California Gas Company, Southern California Edison, and the City of Riverside for natural gas, electrical, potable water, and sewer services, respectively. However, as of the date of completion of this report, no structures were located on the subject property.

2.1 Current and Historical Addresses

According to our research and information provided by the Client and the County of Riverside, no physical address has been assigned to the subject property.

2.2 Legal Description

According to the Riverside County Assessor's Office, the subject property is located in the City of Riverside, and is described by the Assessor's Parcel Number: 136-220-016.

2.3 Physical Setting

The elevation of the subject property is approximately 825 feet above sea level (United States Geological Survey Riverside West, California 7.5 minute topographic quadrangle). Based on our review of the GeoCheck Section of the Environmental Data Resources, Inc. (EDR) Radius report, the subject property is not situated within a 100-year Federal Environmental Management Agency (FEMA) Flood Zone. No wetlands were identified at the property or adjoining/immediately surrounding properties. Based on our review of groundwater data presented in the State Water Resources Control Board (SWRCB) GeoTracker website, groundwater was detected at a leaking underground storage tank site (2292 La Sierra Avenue) approximately 1,650 feet southwest of the subject property at approximately 35 feet below ground surface. However, perched and semi-perched aquifers may be present beneath the site. Based on regional groundwater data, the regional groundwater flow direction is estimated to be towards the west; however, local groundwater flow direction may vary.

3.0 SITE RECONNAISSANCE/INTERVIEWS

3.1 Site Reconnaissance

On December 4, 2019, Mr. Raul Gaina of EFI Global, Inc. conducted a site reconnaissance of the subject property. The site inspection was conducted to attempt to identify current site use(s), current hazardous materials storage, and evidence of past site uses and hazardous material storage and to identify evidence of other recognized environmental conditions. The following table summarizes our Site Reconnaissance observations:

Yes	No	Observed Feature(s)
	✔	Hazardous Substances and Petroleum Products Containers
	✔	Underground and/or Aboveground Storage Tanks
	✔	Drains/Sumps/Clarifiers/Sewer Interceptors/Septic Systems
	✔	Stained or Corroded Surfaces/Stained Soil or Stressed Vegetation
	✔	Pits/Ponds/Lagoons/Wetlands
	✔	Electrical Equipment with the Potential to contain Fluids
	✔	Production or Monitoring Wells
	✔	Evidence of Solid Waste Disposal/Dumping/Fill Areas

3.1.1 Exterior Observations

Given the site is used as an orchard, the exterior portions of the site consist of dense vegetation. The land is mostly flat throughout the subject property. The southeastern portion of the subject property included remnants of a park and playground area. The eastern portion of the site included a storage trailer and a wooden fence. Orange trees were planted throughout the other portions of the subject property. Additionally, one windmill is located in the central portion of the orchard, which appeared to not be in operation during the time of our site reconnaissance. One pad-mounted electrical transformer was observed on the southern portion and three pole-mounted electrical transformers on a singular pole were observed on the central portion of the subject property. No stains or spills were observed on the surface area beneath the transformers. Based on the good condition of the equipment, the transformers are not expected to represent a significant environmental concern for the subject property.

No recognized environmental conditions were observed in the exterior portions of the subject property.

3.1.2 Interior Observations

As there are no structures on the subject property, no interior observations were made.

3.1.3 Reconnaissance Limitations

The subject property is mostly covered with orange trees and grasses; therefore, limiting the observation of all surface areas of the property. No other significant limitations were encountered during our reconnaissance of the subject property.

3.2 Adjoining and Immediately Surrounding Properties

The adjoining and immediately surrounding properties (within 100-feet of the subject property boundary) were visually and physically observed from public right-of ways and the subject property in an attempt to identify recognized environmental conditions. Our observations are summarized in the following table:

Location	Address(es)	Uses/Observations
Northeast	2615-2689 (odd) Millsweet Place	Residential
Southeast	11025-11095 (odd) Kayjay Street	Residential
Southwest	2531, 2550, and 2551 Wildcat Lane	Residential
West	2765 and 2779 Wildcat Lane	Residential
Northwest	10968-10998 (even) Stonehenge Place	Residential

- No recognized environmental conditions were readily observable at the adjoining/ immediately surrounding properties.

3.3 Surrounding Area Observations

3.3.1 Surrounding Property Uses

The surrounding area is developed with residential structures and agricultural land.

3.3.2 Surrounding Geography

The surrounding area is mostly flat with a slight topographic slope to the west. No nearby hills or bedrock outcroppings were observed in the area of the site. No lakes, ponds, rivers or streams were observed in the surrounding area.

3.4 Interviews

3.4.1 Property Owner

During the course of the site reconnaissance of the site conducted on December 5, 2019, the Property Owner was unavailable for an interview.

3.4.2 Key Site Manager

During the course of the site reconnaissance of the site conducted on December 5, 2019, the Key Site Manager was unavailable for an interview.

3.4.3 Property Occupants

No occupants were available for interview during the completion of this report.

3.4.4 Past Owners, Operators and Occupants

Past owners, operators and occupants were not able to be identified for an interview for this report.

3.4.5 Prospective Purchaser

Mr. Bret Ilich of Murow Development Consultants, the representative of the prospective purchaser, was interviewed in preparation for the site reconnaissance conducted on December 5, 2019. Mr. Ilich was unaware of any environmental conditions associated with the property. According to Mr. Ilich, the planned future use of the subject property will be for residential purposes.

3.4.6 Neighboring Property Owners/Tenants

Per ASTM, an attempt to interview neighboring property owners/tenants should be conducted when the subject property is vacant and unsecured land.

No owners/tenants of adjoining properties were available for interview during the site reconnaissance as the properties are residential.

3.5 User Provided Information

The United States Environmental Protection Agency (USEPA) All Appropriate Inquiry (AAI) and ASTM 1527-13 Phase I Standards require that the Report User conduct independent research and consider certain information before purchasing a property. EFI Global, Inc. recommends that the User documents completion of the following items:

3.5.1 Lien Search

The User is required to obtain a recent (less than 180 days old) title report prepared for the subject property. The report should be reviewed to obtain information regarding environmental clean-up liens or activity and use limitations with regard to the subject property. If environmental cleanup liens or activity and use limitations encumbering the subject property or in connection with the subject property are identified, the User should provide that information to the Environmental Professional (EFI Global, Inc.). If the User has actual knowledge of environmental cleanup liens or activity and use limitations encumbering the subject property or in connection with the subject property, the User should provide that information to the Environmental Professional (EFI Global, Inc.).

- The User was not aware of any environmental cleanup liens or activity and use limitations encumbering the subject property. The User provided EFI Global, Inc. with a Preliminary Report prepared by Pacific Coast Title Company, dated October 15, 2019, for the subject property which was reviewed by EFI Global, Inc. No environmental cleanup liens or activity and use limitations encumbering the subject property were identified in our review. Furthermore, based on our review the Department of Toxic Substances Control (DTSC) EnviroStor Database, no environmental liens enforced by the DTSC were identified.

3.5.2 Specialized Knowledge

The User should provide the Environmental Professional (EFI Global, Inc.) with any specialized knowledge the User has with regard to recognized environmental conditions in connection with the property.

- The User has no specialized knowledge with respect to recognized environmental conditions in connection with the property.

3.5.3 Commonly Known or Reasonably Ascertainable Information

If the User is aware of any commonly known information in the community about the subject property with respect to recognized environmental conditions, the User should provide the information to the Environmental Professional (EFI Global, Inc.).

- The User is not aware of any commonly known information in the community about the subject property with respect to recognized environmental conditions.

3.5.4 Property Valuation

If this Phase I ESA was prepared as due diligence for a property transaction, it is the responsibility of the User to consider the relationship of the purchase price to the fair market value of the property. If the purchase price is significantly lower than the fair market value, the User should identify the alternate reason for the low purchase price if the lower purchase price is not related to the property being affected by hazardous substances or petroleum products.

- At the issuance of this report, a completed environmental questionnaire has not been returned by the prospective purchaser to determine if the purchase price reflects the fair market value.

3.5.5 Purpose of Performing Phase I ESA

According to the User, the User is a prospective purchaser of the subject property and the Phase I is being performed to qualify for landowner liability protections under CERCLA as well as identify business risks related to the property associated with environmental conditions.

3.6 User Provided Documents

Preliminary Report - Vacant Land APN: 136-220-016, Riverside, California 92503 - performed by Pacific Coast Title Company (Order No. 10130083) - dated October 15, 2019 - The User provided EFI Global, Inc. with this Preliminary Report for the subject property. Please refer to 3.5.1 for more information.

4.0 HISTORICAL LAND USE

A review of historical data derived from standard historical resources is provided in this section. The objective of consulting historical sources is to develop a history of the previous uses of the property and surrounding area, in order to help identify the likelihood of past uses having led to recognized environmental conditions in connection with the property. During our historical review, acute attention is paid to the subject property. Data relating to the adjoining and immediately surrounding properties (within 100-feet of the subject property boundary) and the surrounding area is reviewed to the extent that it is revealed in the course of researching the property itself.

4.1 Aerial Photography Review

Aerial Photography of many portions of the United States dates back to the 1920's. Items searched for in each photograph included, but were not limited to: evidence of tanks, gas stations, industrial site usage, water drainage pathways, areas which show evidence of drums or excessive debris, discolored or stained soils, areas of distressed vegetation, et cetera.

Aerial Photograph Coverage was available from EDR for the years: 1931, 1938, 1948, 1953, 1961, 1967, 1975, 1985, 1990, 1994, 2006, 2009, 2012, and 2016. A summary of our observations is presented in the following table.

Year	Subject Property	Notable Adjoining Property Observations	Notable Observations of the Surrounding Area
1931, 1938, 1948, 1953, 1961, 1967, and 1975	The subject property appears to be developed for agricultural purposes.	Northeast: Agricultural land Southeast: Agricultural land (across unpaved road) Southwest: Agricultural land (across La Sierra Avenue) West: Agricultural land (across La Sierra Avenue and Victoria Avenue) Northwest: Agricultural land (across Victoria Avenue)	The surrounding area appears to be developed with agricultural land.

Year	Subject Property	Notable Adjoining Property Observations	Notable Observations of the Surrounding Area
1985, 1990, and 1994	The subject property appears to be developed for agricultural purposes.	Northeast: Residential (across Millsweet Place) Southeast: Residential (across unpaved road) Southwest: Residential (across La Sierra Avenue) West: Residential (across La Sierra Avenue and Victoria Avenue) Northwest: Residential(across Victoria Avenue)	The surrounding area appears to be developed with residential structures and agricultural land.
2006, 2009, 2012, and 2016	The subject property appears to be developed for agricultural purposes. A portion of unpaved vacant land is visible on the southeastern portion. By 2009, a concrete-paved walk way was constructed and a trailer was stationed on the eastern portion.	Northeast: Residential (across Millsweet Place) Southeast: Residential (across unpaved road) Southwest: Residential (across La Sierra Avenue) West: Residential (across La Sierra Avenue and Victoria Avenue) Northwest: Residential(across Victoria Avenue)	The surrounding area appears to be developed with residential structures and agricultural land.

- Aerial photographs indicate that the subject property was utilized for agricultural land from at least 1931 to 2016. For further discussion on this former use, please refer to Section 4.5.1.

4.2 Building Department Records Review

The subject property APN: 136-220-016 was researched at the City of Riverside Building and Safety Division (RBSD). EFI Global also reviewed the Riverside County Information Technology (RCIT) online database for information pertaining to the subject property. Items considered in the course of the building permit review are previous site usage, previous ownership, and the construction or demolition of any structures that may have had a negative environmental impact on the property.

- According to the RBSD there are no building permits available for the subject property. A review of the RCIT online database indicated that there are no pertinent records available for the subject property. The remaining Historical Land Use data in our opinion is sufficient to accurately ascertain the historical site use.

4.3 City Directory Review

City directories have been published since the 1800's and provide detailed occupant information for the property and its surrounding area at five-year intervals. The purpose of the City Directory research is to attempt to determine the businesses that historically occupied the subject property. Historical City Directories provided by EDR and reviewed by EFI Global, Inc. are listed below.

- As the subject property has not been assigned a physical address, City Directory information was not available for review. The remaining Historical Land Use data in our opinion is sufficient to accurately ascertain the historical site use.

- Listings for adjoining and immediately surrounding properties reviewed during the course of researching the subject property did not reveal any uses of concern.

4.4 Sanborn Map Review

Originally compiled by the Sanborn Map Company of Pelham, New York for fire insurance companies to assess fire risks related to building materials and hazardous materials storage, today Sanborn Maps are an invaluable tool for Environmental Professionals in determining historical site use and the potential for environmental conditions. Sanborn Map Coverage is available from as early as 1867 in some cities. Although Sanborn maps were created for approximately twelve thousand cities and towns in the United States, Canada, and Mexico, Sanborn Map Coverage is not available in newer and more rural communities.

- Sanborn Map Coverage was not available for the subject property. The remaining Historical Land Use data in our opinion is sufficient to accurately ascertain the historical site use.

4.5 Historical Summary

4.5.1 Subject Property

According to EFI Global, Inc.'s interpretation of the historical research data, the subject property has been utilized for agricultural purposes since at least 1931. By at least 2009, a concrete-paved walk way was constructed and a trailer was stationed on the eastern portion. The subject property has remained in this configuration through the present. Additionally, since the subject property has never been developed with any structures, no physical address has been identified by EFI Global, Inc. during the course of this investigation. A physical address is often utilized

in the historical research process in order to identify any address-specific information, such as regulatory and enforcement actions. However, based on the reliability of other data sources, the lack of a physical address is not expected to significantly alter the findings of this investigation.

- The subject property has been utilized for agricultural purposes since at least 1931 through the present. There is a potential that agricultural chemicals, such as pesticides, herbicides, and fertilizers, were and are continued to be used on site. Agricultural chemicals tend to accumulate in the near surface soils. The types of pesticides and herbicides used prior to the present time are not known. As the subject property has never been developed, the potential for residual agricultural chemicals such as pesticides, herbicides, and fertilizers cannot be ruled out. Based on the forgoing and the proposed future residential development of the subject property, the historic and current agricultural use is considered to be a potential environmental concern for the subject property. Therefore, a limited soil investigation was performed as part of this assessment. The results of the investigation are provided in Section 7.0.

4.6 Historical Data Gaps

The earliest historical resource obtained during this investigation was an aerial photograph from 1931 which indicated development of the subject property for agricultural use. The lack of historical data sources for the subject property dating back to first developed uses represents historical data source failure. However, it is assumed that prior to 1931, the subject property would have been developed for agricultural use, if not undeveloped. Based on this notion, this limitation is not expected to significantly alter the findings of this investigation.

5.0 REGULATORY DATABASE REPORT

A radial database search was conducted in accordance with the specifications defined in ASTM E 1527-13 which sets the radial search distances for each regulatory database. The radial database search was conducted by EDR on December 2, 2019. A copy of the database report is presented in Appendix II of this report. The following table summarizes required databases reviewed, the approximate search distances, and indicates if the subject site, adjoining/immediately surrounding properties or surrounding sites are listed on the respective database.

Following the table are summaries of the information found in the relevant database listings and our opinion regarding the potential for the subject property to be impacted. Our opinion is based on the information found in the database listings, through other historical and regulatory resources, "Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" (ASTM E2600-15), and assumed groundwater flow direction. As discussed in Section 2.3, groundwater is estimated to be approximately 35 feet below ground surface in the area of the site and is assumed to flow towards the west.

DATABASE	Search Distance (Miles)	Subject Site (Yes/No)	Adjacent Site (Yes/No)	Total Listings (#)
Federal National Priorities List (NPL)	1.0	No	No	0
Federal De-listed NPL	1.0	No	No	0
Federal CERCLIS	0.5	No	No	0
Federal CERCLIS NFRAP	0.5	No	No	0
Federal RCRA CORRACTS	1.0	No	No	0
Federal RCRA non-CORRACTS TSD	0.5	No	No	0
Federal RCRA Generators	0.25	No	No	0
Federal Institutional/Engineering Controls	0.5	No	No	0
Federal ERNS	Property	No	No	0
State/Tribal Equivalent NPL	1.0	No	No	0
State/Tribal Equivalent CERCLIS	1.0	No	No	0
State/Tribal Landfill	0.5	No	No	0
State/Tribal Underground Storage Tank (UST)	0.25	No	No	1
State/Tribal Leaking Underground Storage Tank (LUST/ SLIC)	0.5	No	No	3
State/Tribal Institutional/Engineering Controls	0.5	No	No	0
State/Tribal Voluntary Clean-up Sites	0.5	No	No	0
State/Tribal Brownfield Sites	0.5	No	No	0

5.1 Subject Property

TTM 36713 (Intersection of La Sierra Avenue and Victoria Avenue) - The subject property is listed on the National Pollutant Discharge Elimination System (NPDES), California Integrated Water Quality System (CIWQS), and California Environmental Reporting System (CERS) databases. According to the NPDES and CIWQS listings, the subject property was permitted for the collection of storm water on site in 2017. No other information was provided. According to the CERS listing, the subject property was listed as having a compliance evaluation inspection completed in 2018; however, no construction

occurred on site at that time. No further information was provided. Local regulatory research was conducted with the appropriate regulatory agencies with regard to the aforementioned listings. The results of those inquiries are summarized in Section 6.0.

5.2 Adjoining and Immediately Surrounding Properties

No adjoining/immediately surrounding properties (within 100-feet) were listed on any of the regulatory databases researched.

5.3 Surrounding Area

In our opinion, none of the other sites listed on the regulatory database report pose a significant threat to the subject property as there is no indication of a release at the respective sites, a release has occurred but groundwater has not been impacted, a release has occurred but the case is closed, or the sites are located cross or down gradient of the subject property and in excess of 1/10 mile from the subject property.

5.4 Orphan Sites

Orphan sites are unmappable sites which appear in a list form in the Radius Map Report rather than on the standard Radius Map. Four orphan sites were identified in the Radius Map Report prepared for this site. The sites were manually mapped to determine the location of the site relative to the subject property and groundwater gradient. The following conclusions were made:

In our opinion, none of the orphan sites listed pose a significant threat to the subject property as there is no indication of a release at the respective sites, a release has occurred but groundwater has not been impacted, a release has occurred but the case is closed, or the sites are located cross or down gradient of the subject property and in excess of 1/10 mile from the subject property.

6.0 AGENCY FILE REVIEWS

6.1 State Agencies

The Santa Ana Regional Water Quality Control Board (SARWQCB), Department of Toxic Substances Control (DTSC), and South Coast Air Quality Management District (SCAQMD) were contacted regarding permits, air emissions, and site investigation files for the subject property. Additionally, the State Water Resources Control Board (SWRCB) GeoTracker and California Integrated Water Quality System (CIWQS) Storm Water Multiple Applications and Report Tracking System (SMARTS), DTSC's Hazardous Waste Tracking System (HWTS) and EnviroStor, and SCAQMD's Facility Information Detail (FIND) online databases were reviewed for information pertaining to the subject property.

- According to responses to our requests from the SARWQCB, DTSC, and SCAQMD, there are no files for the subject property APN 136-220-016. Furthermore, a review of the GeoTracker, EnviroStor, HWTS, and FIND online databases found no files for the subject property.

- According to the review of the CIWQS SMARTS database, the current property owner, La Sierra Victoria Development LLC, was issued a Notice of Intent (NOI) by the CIWQS for the general permit to discharge storm water since October 2018, for the future residential construction of the subject property. The subject property was listed under TTM 36713. The permit remained active until October 2019. The CIWQS records included Annual Reports from 2016 to 2019. No violations were identified for the subject property. Based on the nature of the listing, lack of documented discharges, and good housekeeping practices observed during the site reconnaissance, this listing is not expected to represent a significant environmental concern for the subject property at this time.

The Division of Oil, Gas, and Geothermal Resources (DOGGR) Online Mapping System was reviewed for information pertaining to oil and gas exploration on or nearby the subject property.

- No oil wells were identified within 500 feet of the subject property.

6.2 City/County Agencies

The Riverside City Clerk's Office (RCCO) and Riverside County Department of Environmental Health (RCDEH) were contacted regarding hazardous materials, underground storage tank, and industrial waste discharge records for the subject property. Furthermore, the Riverside County Information Technology (RCIT) online database was reviewed for information relating to potential environmental concerns associated with the subject property.

- According to responses to our requests from the RCCO and RCDEH, there are no files for the subject property APN 136-220-016. Furthermore, a review of the RCIT online database revealed no records for the subject property.

6.3 Agency File Review Limitations

No significant data gaps were encountered during our agency file reviews.

7.0 LIMITED SOIL INVESTIGATION

EFI Global conducted a limited soil investigation at the subject property to assess near-surface soils for the presence (or absence) of residual agricultural chemicals associated with the agricultural use onsite. The field activities are summarized below.

7.1 Field Activities

Field activities pertaining to this investigation were completed on December 5, 2019. Details regarding the work performed are presented below.

7.1.1 Soil Sampling Locations

A total of 18 shallow soil borings (identified as B1 through B18) were advanced to a maximum depth of 2 feet below ground surface (bgs). Soil borings were advanced to provide reasonable lateral coverage of the entire subject property footprint as depicted in Figure 3. Two discrete soil samples were collected from each location at depth intervals of 0 to 0.5 feet and 1.5 to 2 feet bgs.

7.1.1.1 Soil Sample Collection and Handling Procedures

An approximately 3.25-inch-diameter hand auger was used to advance the borings after a shovel was used to clear the surface of vegetation. Discrete soil samples were collected at designated sampling depths in each boring by retrieving a representative volume of soil from the auger bucket and transferring the soil into a leak-resistant, disposable plastic bag; the contents of the bag were then homogenized by hand. Each homogenized bag sample was then transferred into one 8-ounce pre-cleaned, laboratory-provided, glass jar equipped with Teflon® lids.

Each discrete sample was logged in accordance with the Unified Soil Classification System (USCS) and observed for color, moisture content, texture, discoloration, odor and physical evidence of contaminant impact or fill material.

All soil samples were labeled, recorded in a chain-of-custody form, and chilled pending transportation and submittal to Positive Lab Service (Positive) of Los Angeles, California, a State-certified analytical laboratory. Chain-of-custody documentation and protocol were maintained during sample collection through submittal to the analytical laboratory.

7.1.1.2 Encountered Soil Types

Soil types encountered during this investigation were generally classified as silty sand (USCS soil type symbol “SM”); brown and reddish brown; fine- to medium-grained sand; loose; moist. Groundwater was not encountered during sampling activities.

7.1.2 Borehole Abandonment

Following completion of soil sampling, the borings were backfilled with soil cuttings. No investigative derived waste was generated during this investigation.

7.2 Laboratory Analytical Program

7.2.1 Composite Soil Sample Preparation

Following the submittal of all the discrete soil samples to the laboratory, a total of 10 composite samples were prepared by the laboratory using a portion of three discrete samples of like depths. The following bulleted items summarize the composite sample preparation:

- The 0.5-foot samples from borings B1, B2, and B3 were used to prepare composite soil sample B1-S-0.5, B2-S-0.5 and B3-S-0.5;
- The 0.5-foot samples from borings B4, B5, B6, and B7 were used to prepare composite soil sample B4-S-0.5, B5-S-0.5 B6-S-0.5, and B7-S-0.5;
- The 0.5-foot samples from borings B8, B9, B10, and B11 were used to prepare composite soil sample B8-S-0.5, B9-S-0.5, B10-S-0.5, and B11-S-0.5;
- The 0.5-foot samples from borings B12, B13, and B14 were used to prepare composite soil sample B12-S-0.5, B13-S-0.5, and B14-S-0.5;
- The 0.5-foot samples from borings B15, B16, B17, and B18 were used to prepare composite soil sample B15-S-0.5, B16-S-0.5, B17-S-0.5, and B18-S-0.5;

7.2.2 Chemical Analysis

The following is a summary of the chemical analysis performed on the soil samples collected as part of this investigation. The laboratory reports are included in the Limited Soil Investigation Documentation appendix.

- A total of five discrete soil samples collected at 0.5-feet bgs were analyzed for arsenic by United States Environmental Protection Agency (EPA) Method 6010B. The following samples were analyzed: B1-S-0.5, B5-S-0.5, B10-S-0.5, B14-S-0.5, and B16-S-0.5. The remaining 0.5-foot and all 2-foot samples were archived by the laboratory pending future analysis.
- All five composite soil samples were analyzed for Organochlorine Pesticides (OCPs) by EPA Method 8081A.

7.2.3 Soil Analytical Results

Table 1 and 2, attached to this report, presents a summary of the soil analytical results. The following bulleted items summarize OCPs detections:

- alpha-Chlordane was detected in all the composite soil samples analyzed and at concentrations ranging from 18.8 micrograms per kilogram (µg/kg) (composite sample B15-S-0.5, B16-S-0.5, B17-S-0.5, B18-S-0.5) to 331 µg/kg (composite sample B1-S-0.5, B2-S-0.5, B3-S-0.5).
- 4,4´-DDD was detected in all the composite soil samples analyzed and at concentrations ranging from 6.2 µg/kg (composite sample B4-S-0.5, B5-S-0.5, B6-S-0.5, B7-S-0.5) to 11.4 µg/kg (composite sample B12-S-0.5, B13-S-0.5, B14-S-0.5).

- 4,4´-DDE was detected in all the composite soil samples and at concentrations ranging from 222 µg/kg (composite sample B15-S-0.5, B16-S-0.5, B17-S-0.5, B18-S-0.5) to 578 µg/kg (composite sample B1-S-0.5, B2-S-0.5, B3-S-0.5).

- 4,4´-DDT was detected in all the composite soil samples analyzed and at concentrations ranging from 88.1 µg/kg (composite sample B15-S-0.5, B16-S-0.5, B17-S-0.5, B18-S-0.5) to 396 µg/kg (composite sample B1-S-0.5, B2-S-0.5, B3-S-0.5).

- Dieldrin was detected in all of the composite soil samples analyzed and at concentrations ranging from 18.0 µg/kg (composite sample B8-S-0.5, B9-S-0.5, B10-S-0.5, B11-S-0.5 and B18-S-0.5) to 34.0 µg/kg (composite sample B12-S-0.5, B13-S-0.5, B14-S-0.5).

The following bulleted item summarizes the arsenic detected:

- Arsenic was detected in all five discrete soil samples analyzed and at concentrations ranging between 2.17 milligrams per kilogram (mg/kg, discrete sample B16-S-0.5) and 3.41 mg/kg (discrete sample B14-S-0.5).

7.3 Regulatory Screening Levels

In general, human receptors may be exposed to contaminants in soil through dermal contact, inhalation of particulate matter, and ingestion. To evaluate if the detected contaminants represent a significant risk to human receptors, the concentrations in soil were compared to regulatory screening levels that have been established for this purpose.

Regional Screening Levels (RSLs) have been developed by the EPA using default exposure and toxicity criteria to provide conservative screening levels, whereby concentrations of contaminants below such levels are not considered to represent a significant risk (including cancer and non-cancer risks) to human receptors. EPA publishes RSLs periodically. The most current release is dated November 2019. For the Site, the "Target Risk = 1E-06, Target Hazard Quotient = 1.0" RSL data set is appropriate to use.

DTSC recommends the use of alternative screening levels based on toxicity criteria reviewed by DTSC's Human and Ecological Risk Office (HERO). DTSC-modified Screening Levels (DTSC-SLs) are updated periodically and published in *Human Health Risk Assessment (HHRA) Note, HERO HHRA Note Number: 3, DTSC-modified Screening Levels (DTSC-SLs), Release Date: April 2019 Update* (Note 3). For compounds that have screening criteria listed in Note 3, the alternative screening levels are used instead of RSLs.

EPA RSLs and DTSC-SLs for residential soil have been established for chemicals of potential concern detected in the soil samples collected as part of this investigation, which includes arsenic (0.11 mg/kg), Chlordane (1,700 µg/kg), 4-4'-DDD (2,300 µg/kg), 4-4'-DDE (2,000 µg/kg), 4,4'-DDT (1,900 µg/kg), and Dieldrin (34 µg/kg). As shown in Table 1 and 2, none of the detected chemicals of potential concern exceeded their respective EPA RSLs or DTSC-SLs, except for arsenic which is further discussed below. Therefore, the detections are considered to be *de minimis* in nature and do not warrant further action.

Although the arsenic concentrations ranging between 2.17 and 3.41 mg/kg exceeded the DTSC-SL of 0.11 mg/kg, it is well documented that natural background concentrations of arsenic in California soils commonly exceed the screening criteria. In the document titled Determination of a Southern

California Regional Background arsenic Concentration in Soil (Chernoff, et al., 2008), which was prepared by DTSC staff, the authors concluded, "A Probability Plot and statistical analysis of a large data set from school sites in Los Angeles County gave an upper-bound arsenic concentration of 12 mg/kg. A Probability Plot for school sites from 5 counties in Southern California also gave an upper-bound background arsenic concentration of 12 mg/kg." They also stated, "This finding suggests that in Southern California, 12 mg/kg [may be] a useful screening number for evaluating arsenic as a chemical of potential concern." The maximum arsenic level detected in sample B14-S-0.5 is less than 12 mg/kg; therefore, is considered to be background and not of concern.

7.4 Findings

EFI Global has performed a Limited Soil Investigation at the subject property located at the southeast corner of La Sierra Avenue and Victoria Avenue, in Riverside County, and the City of Riverside, California. The purpose of this investigation was to evaluate near-surface soils for the presence (or absence) of potential chemicals of concern associated with the onsite agricultural use. EFI Global collected soil samples at 18 locations throughout the subject property and submitted them for laboratory analytical testing of OCPs and arsenic. All detected concentrations of OCPs were below their respective residential screening levels, while the detected arsenic concentrations appear to represent background or a trace concentration inherent to soil in the site vicinity. Therefore, it is EFI Global's opinion that the detected concentrations of OCPs and arsenic represent a *de minimis condition* and no additional environmental assessment is warranted at this time.

8.0 NON-SCOPE ENVIRONMENTAL RISKS

ASTM Standard E1527-13 identifies additional conditions which, should they exist at the subject property, may create a human health risk to the occupants of the site. These risks may also create additional costs to the property owner in the form of identification, operations & maintenance, and cleanup or remediation.

8.1 Asbestos Containing Building Materials

Asbestos is a group of naturally occurring minerals used in many products, including building materials vehicle brakes, insulation and other products that require resistance to heat and corrosion. Asbestos includes: chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these materials that have been chemically treated and/or altered.

The inhalation of asbestos fibers by workers can cause cancer and other serious diseases of the lungs and other organs that may not appear until years after the exposure has occurred. For instance, asbestosis can cause a buildup of scar-like tissue in the lungs and result in loss of lung function. Asbestos fibers associated with these health risks are too small to be seen with the naked eye, and smokers are at higher risk of developing some asbestos-related diseases.

Asbestos-containing materials (ACM) do not always pose a hazard to occupants and workers in buildings that contain these materials. Intact, undisturbed ACMs generally do not pose a health risk. ACMs may become hazardous and pose an inhalation risk when they are damaged, disturbed in some manner, or deteriorate over time and asbestos fibers are released into building air.

ACM can be found in a multitude of building products which include decorative and acoustical plaster texture, fire-proofing (Monokote), joint compound, attic and wall insulation, resilient floor covering, mastic, recessed lighting fixtures, wiring, elevator brakes, fire doors, pipe insulation, pipe gaskets, duct insulation, duct tape, siding and roofing materials (tar/shingles), textured paint, stucco, concrete, asphalt underlayment (Petromat) and plaster.

Local jurisdictions have specific laws and regulations regarding asbestos and actions including building renovations and building demolition.

- As there are no structures on the subject property, the potential for asbestos-containing building materials (ACMs) is considered to be low.

8.2 Lead-Based Paint

Although the use of lead-based paint in residential structures has been prohibited since 1978, it may still be used in commercial and industrial buildings. It is approximated that 80 percent of buildings built prior to 1978 contain lead paint. Even at low levels, lead poisoning can cause IQ deficiencies, reading and learning disabilities, impaired hearing, reduced attention spans, hyperactivity and other behavior problems with children under 6 years old being most at risk.

Lead is a highly toxic metal that was used for many years in products found in and around our homes and commercial buildings. Lead can be found in dust from friction surfaces of windows and doors that are painted with lead-based paint and from building components coated with lead-based paint that has begun peeling, flaking and chalking. There is also the potential for soil to have elevated lead levels due to leaching from lead based paint on nearby structures and deposition of airborne lead when leaded fuel was in use prior to the 1976 ban and phase out.

Since the 1980's, lead has been phased out in gasoline, reduced in drinking water, reduced in industrial air pollution, and banned or has been limited in use in consumer products.

Between the local, State and Federal agencies, including the Environmental Protection Agency (EPA), Department of Housing and Urban Development (HUD), Occupational Safety & Health Administration (OSHA) and the California Department of Public Health (CDPH), each state has various action limits that have been enacted with the intent to prevent human exposure and contamination of the surrounding environment.

- As there are no structures on the subject property, the potential for lead-based paint is considered to be low.

8.3 Radon

Radon is a radioactive gas that has been found in structures all over the United States. Radon is produced from the natural breakdown of uranium in soil, rock, and water. Radon typically moves up through the ground and into structures through cracks and other holes in the foundation. Movement of radon through the earth is strongly influenced by moisture content and permeability of soil, porosity, and degree of fracturing in rocks, as well as surface meteorological conditions. High levels of radon have been discovered in every state.

Radon cannot be seen, smelled, or tasted. Breathing air-containing radon may increase the risk of getting lung cancer. The Surgeon General of the United States has warned that radon is the second leading cause of lung cancer in the United States today after smoking.

Testing for the presence of radon is fairly inexpensive, simple and is the only way to be certain of the on-site concentrations. Various types of sampling methods exist to determine the concentration. On-site radon sampling was not performed during the completion of this assessment.

- Based on research by the United States Environmental Protection Agency (USEPA), the average radon concentrations for Riverside County are between 2.0 and 4.0 picocuries per liter (pCi/L), which is below the 4.0 pCi/L action level set by the USEPA; however, site-specific radon levels vary greatly within the USEPA radon zones and on-site radon measurements would need to be collected in order to determine the radon levels at the subject property.

8.4 Wetlands

According to the Clean Water Act, a wetland is “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetland areas have been identified as ecologically diverse and sensitive areas and are generally subject to more stringent development, re-development, and building regulations.

- The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory was reviewed to determine if the subject property is situated within an identified wetland. According to the USFWS, the subject property is not located within a wetland area.

8.5 Mold

Mold and mildew are simple, microscopic organisms in the Fungi kingdom that can grow virtually anywhere if they have adequate moisture, nutrients, air and appropriate temperatures. Depending on the particular mold or fungus, growing colonies can be almost any color. Most household molds and fungi (mildews) are white, black, grey, or brown colored. Spores of dozens of kinds of mold and fungus (mildew) are present at all times in indoor and outdoor air. These spores can settle, germinate and grow wherever good growth conditions are found. They can grow on soil, plants, dead plant materials, foods, fabrics, paper, wood and many other materials found within buildings. Many molds are not harmful and actually have a beneficial role in the environment and in living systems. In soil, molds play a crucial part in decomposition of organic matter and in making nutrients available to plants.

When mold and fungi (mildews) growth occurs in buildings, it can be very destructive to the materials on which they grow and cause high levels of airborne mold spores and volatile organic compounds associated with the characteristic musty / moldy odor. They cause staining, decomposition (rotting of materials) and objectionable, musty odors. Where colonies are extensive they can also produce enough spores, and by-products to be harmful to health. Many of the by-products of mold and fungus (mildew) are irritating to skin, eyes and respiratory tracts. Some molds produce true allergic sensitization and allergic reactions in susceptible people. Some molds produce toxic by-products that could be harmful to skin, and poisonous if ingested or inhaled in quantity. Persons with compromised immune systems may even experience systemic fungal infections of the respiratory tract.

- As there are no structures on the subject property, a mold inspection was not conducted as part of this assessment.

8.6 Methane Gas

In response to growing concern regarding methane intrusion into buildings and to the potential for methane build-up underneath buildings, certain municipalities have established methane requirements for structures based on the proximity to oil wells and landfills. If a subject property is located in the proximity of active or abandoned oil wells or landfills, methane mitigation devices installed prior to construction activities at a subject property may be necessary.

- Based on our research, the property is not known to be located in proximity (within 1,000 feet) to any active or abandoned oil wells or landfills. Therefore, the potential for methane risk at the subject property is considered low.

9.0 FINDINGS

EFI Global, Inc. has performed a Phase I Environmental Site Assessment (Phase I) and Limited Soil Investigation for Murow Development Consultants (Client) for a agricultural property located at the southeast corner of Victoria Avenue and La Sierra Avenue, in Riverside County, and the City of Riverside, California, Assessor's Parcel Number: 136-220-016. The research conducted for this study and the report prepared are in conformance with the United States Environmental Protection Agency (USEPA) All Appropriate Inquiry (AAI) standard and the American Society for Testing and Materials (ASTM) E 1527-13 scope of work.

9.1 CONCLUSIONS

EFI Global, Inc. has performed a Phase I Environmental Site Assessment and Limited Soil Investigation in conformance with the scope and limitations of ASTM Practice 1527-13, for a vacant property located at the southeast corner of Victoria Avenue and La Sierra Avenue, Riverside, California, the subject property. Any exceptions to or deletions from this practice are described in the individual sections of this report. This assessment has revealed no evidence of recognized environmental conditions or *de minimis* conditions in connection with the subject property, except for the following:

Recognized Environmental Condition (REC)

In our opinion, no RECs were identified during the course of this assessment.

Historical Recognized Environmental Condition (HREC)

In our opinion, no HRECs were identified during the course of this assessment.

Controlled Recognized Environmental Condition (CREC)

In our opinion, no CRECs were identified during the course of this assessment.

De Minimis Condition

The low levels of OCPs and arsenic detected in near-surface soils as part of our Limited Soil Investigation are considered to be a *de minimis condition* for the subject property. However, EFI Global notes that based on the subject property's historical agricultural use, it is possible that buried/concealed/hidden agricultural by-products, both above and below ground may have existed or exists on the subject property. Any buried trash/debris or other waste encountered during future subject property development should be evaluated by an experienced environmental consultant prior to removal. If stained or suspicious soil is encountered during future grading operations, the material should be evaluated and if deemed necessary, characterized for property disposal.

9.2 RECOMMENDATIONS

Based on the foregoing, no additional investigation is recommended at this time.

10.0 SIGNATURES

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

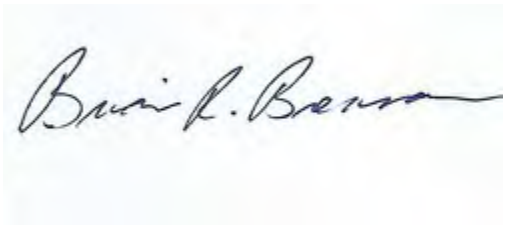
Prepared By: Date: December 19, 2019

Kevin Ballesteros
Project Manager

Raul Gaina
Project Manager

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Reviewed By: Date: December 19, 2019



Brian Brennan
Senior Project Manager

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South Coast Air Quality Management District Facility Information Detail System (FIND) - http://www3.aqmd.gov/webappl/fim/prog/search.aspx

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APPENDIX I

ILLUSTRATIONS