Appendix C

Laboratory Testing

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Appendix C
Laboratory Testing

Classification
Soils were visually and texturally classified in accordance with the Unified Soil Classification System. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

In-Place Moisture and Dry Density Tests
The moisture contents and dry densities of relatively undisturbed samples obtained from the exploratory boreholes were evaluated in general accordance with the latest version of ASTM D2937. The test results are presented on the logs of the exploratory borings.

Particle Size Analysis
An evaluation of the particle size analyses in selected soil samples was performed in general accordance with ASTM D422. The results of the analyses are presented in the back of this Appendix.

Atterberg Limits Tests
Liquid Limit, Plastic Limit, and Plasticity Index of selected and representative on-site materials were performed in general accordance with ASTM D4318. The results are presented in the table below.

Sample Location	Sample Depth (ft)	Soil Type USCS	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
B-1	22.5-22.7	CH	64	26	38
B-4	41.0	CH	80	29	51

Maximum density/optimum moisture content relationship tests were performed in general accordance with ASTM D1557. The results are presented in the table below.

Sample Location	Sample Depth (ft)	Soil Type USCS	Maximum Dry Density (pcf)	Optimum Moisture (%)
B-1	1-4	ML	111.0	24.5
B-2	13-16	ML	107.0	16.0

Expansion Index Tests
The expansion index of a selected sample was evaluated in general accordance with Uniform Building Code Standard No. 18-2. The result of this test is presented on the boring log in Appendix A and in the back of this Appendix.

Direct Shear

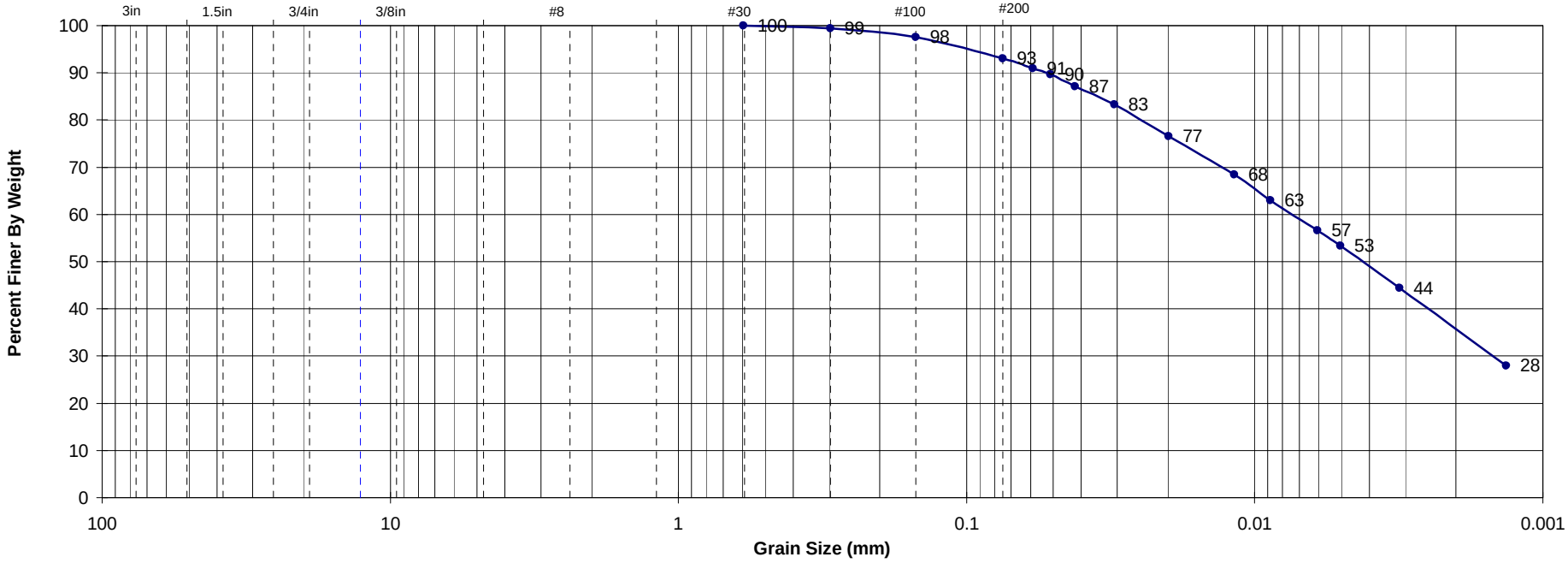
Direct shear tests were performed on selected relatively undisturbed and remolded soil samples in general accordance with the latest version of ASTM 3080. The test specimens, 2.4 inches in diameter and 1 inch in height, were subject to shear along a plane at mid-height.

The samples were tested under various normal loads. The samples were sheared at a constant rate of strain selected in general accordance with the consolidation characteristics of the soils (Section 7.3 of ASTM D3080). A strain rate of 0.002 inches per minute was used for the shear tests. Shearing of the specimens was continued until the shear stress became essentially constant or until a deformation of approximately 10 percent of the original diameter had been reached. In addition, several selected samples were remolded and subject to 5 re-shearing cycles to determine residual shear strength.

The results of the tests are presented in the back of this Appendix.

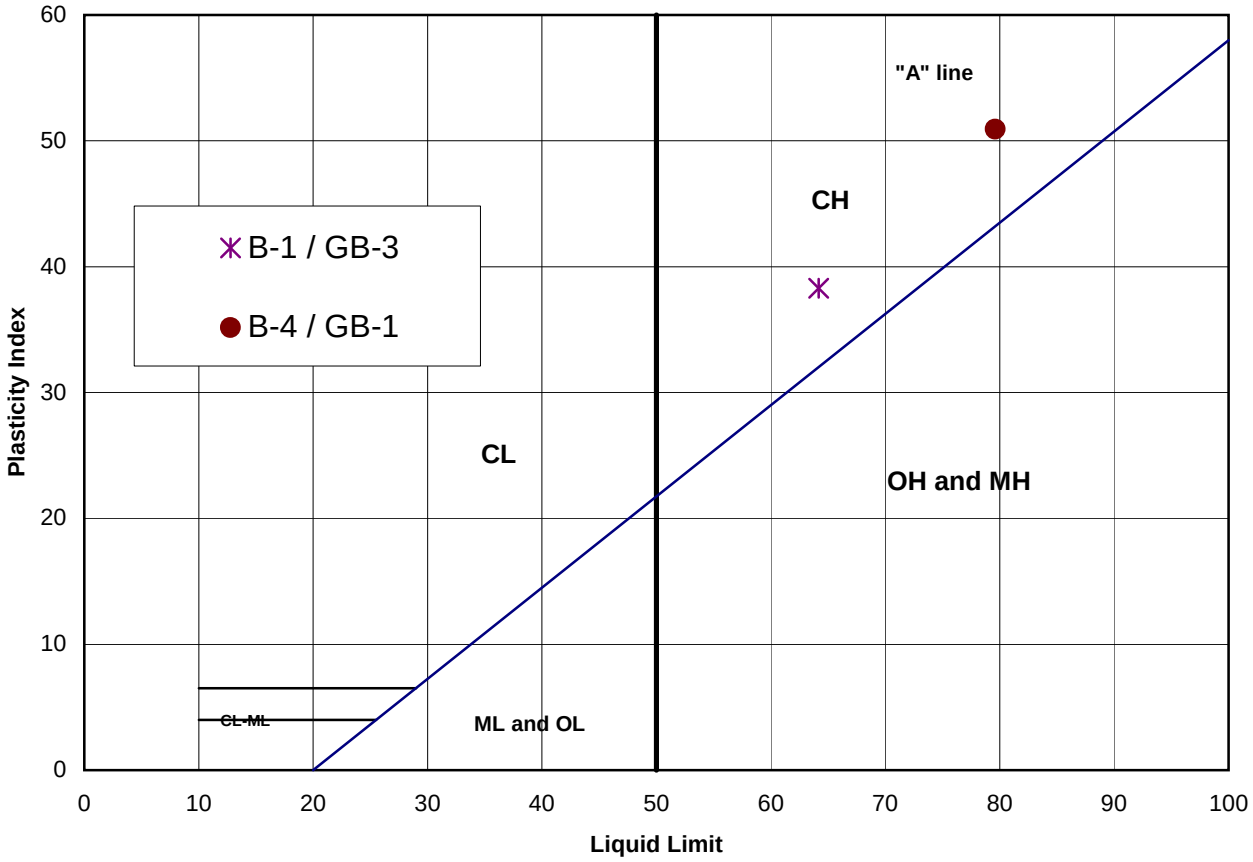
Water Soluble Sulfates

The sulfate contents of selected samples were evaluated in general accordance with the latest version of California Test Method 417. The results of the tests are presented in the section "Soil Corrosion" in the text of this report.



Boring / Sample No.	Initial Dry Density (pcf)	Initial Moist. (%)	Test Dry Density (pcf)	Test Moist. (%)	Permeability, K (cm/sec)	LL	PL	PI	Unified Soil Class.	Description
B-1 / GB-3									CH	

PLASTICITY INDEX _ ASTM D4318



Sample	Depth	LL	PL	PI	USCS	Material Description
B-1 / GB-3		64	26	38	CH	
B-4 / GB-1		80	29	51	CH	

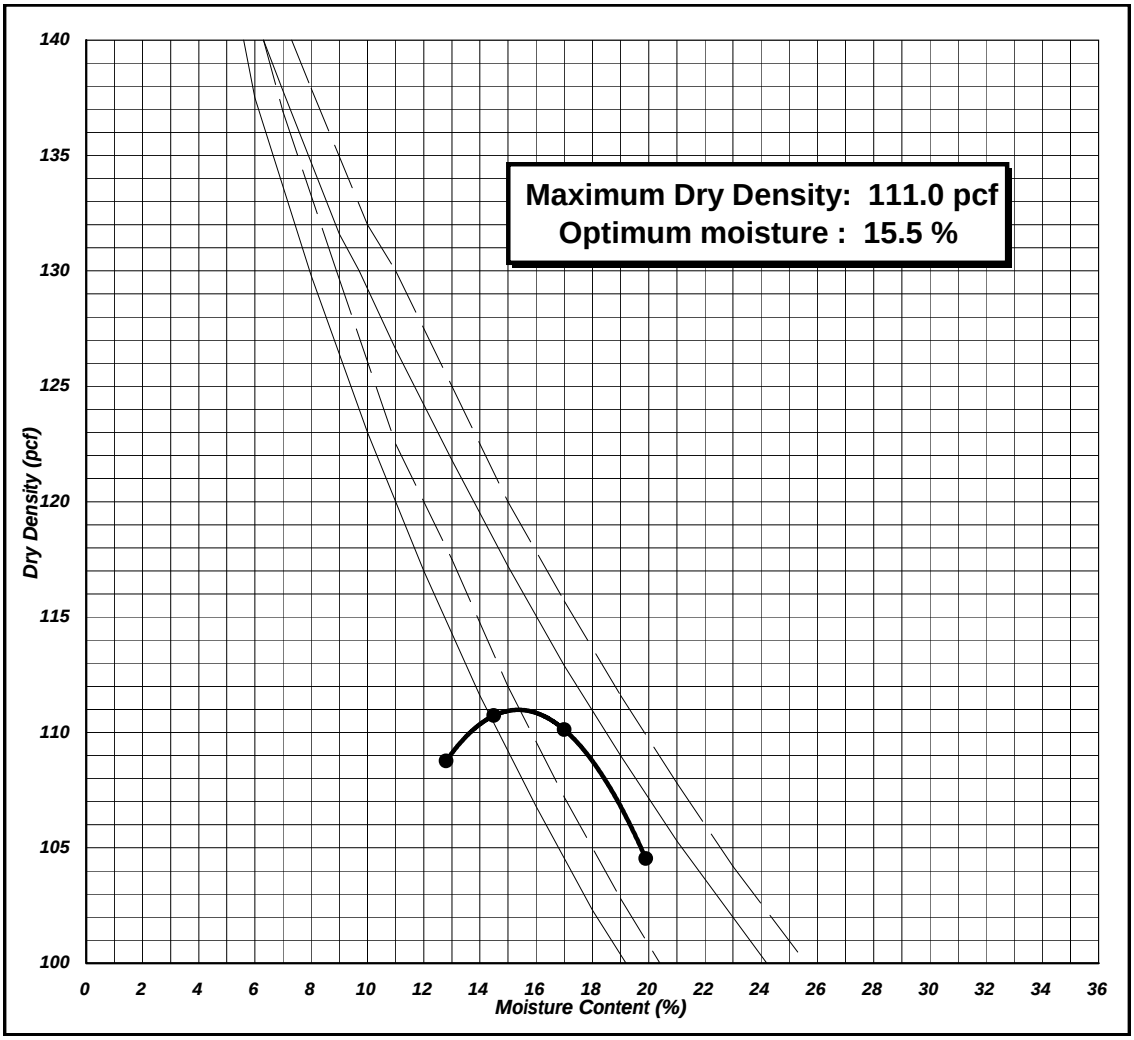
Job Name: KFM # TRG 07-02E Date: 10/31/07

Job No.: 2005-033

MAXIMUM DENSITY TEST ASTM D1557

Job Name	KFM # TRG 07-02E	**Date:**	10/23/2007
Job No.	2005-033	**By:**	WK
Boring/Sample No.	B-1 / SK-1		
Description:	Olive Brown, F. Sandy Silt w. Clay		

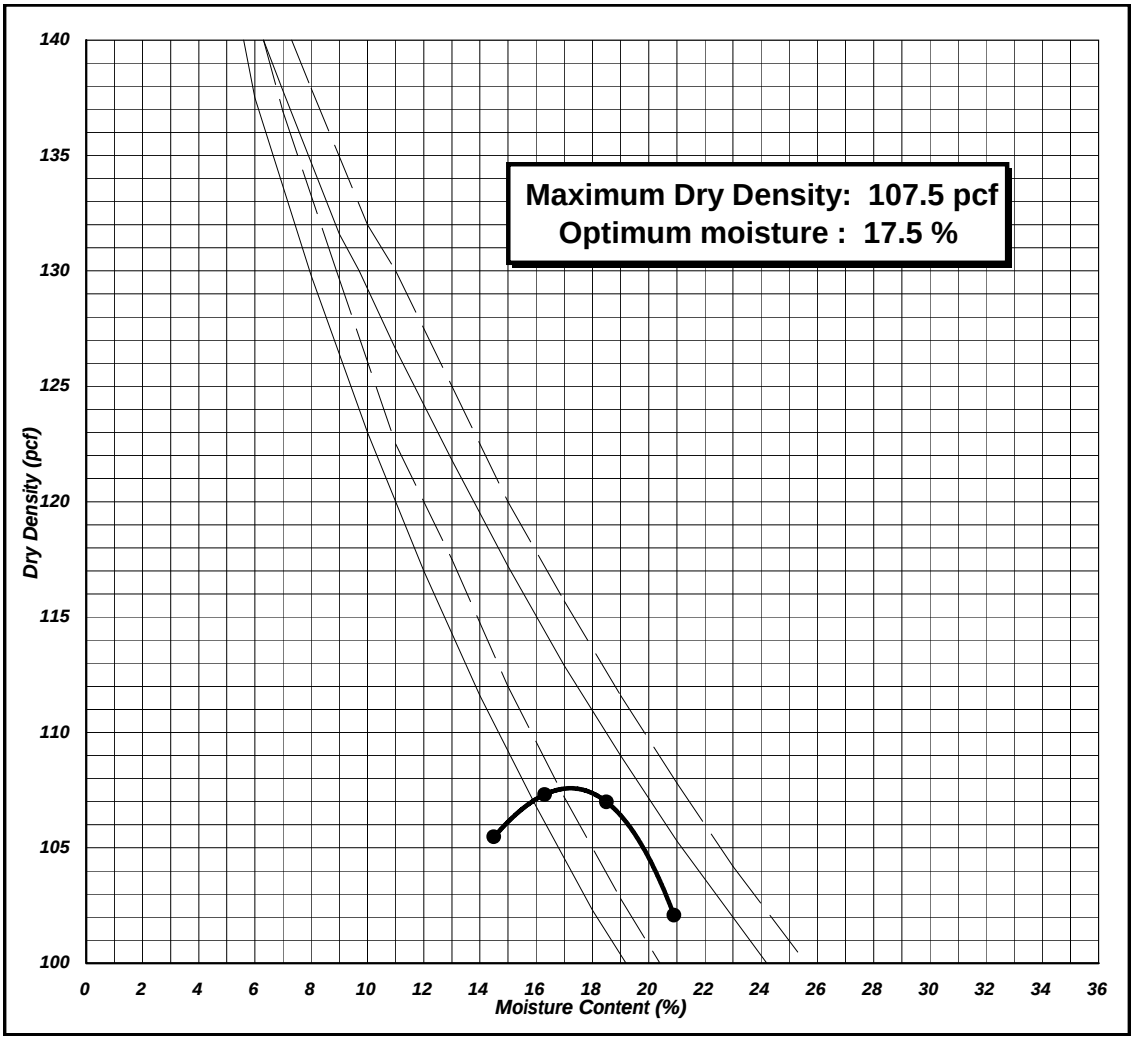
Method: **A**	Mold Volume (cf): **0.0333**	Blows: **25**		Layers: **5**	
Specimen	A	B	C	D	E
Total Wet Weight (lbs)	**3781**	**3728**	**3750**	**3688**	
Weight of Mold (lbs)	1833	1833	1833	1833	
Wet Weight of Soil (lbs)	1948	1895	1917	1855	
Wet Density (pcf)	128.8	125.3	126.8	122.7	
Moisture Can No.					
Dry Weight					
Moisture Content (%)	**17.0**	**19.9**	**14.5**	**12.8**	
Dry Density (pcf)	110.1	104.5	110.7	108.8	



MAXIMUM DENSITY TEST ASTM D1557

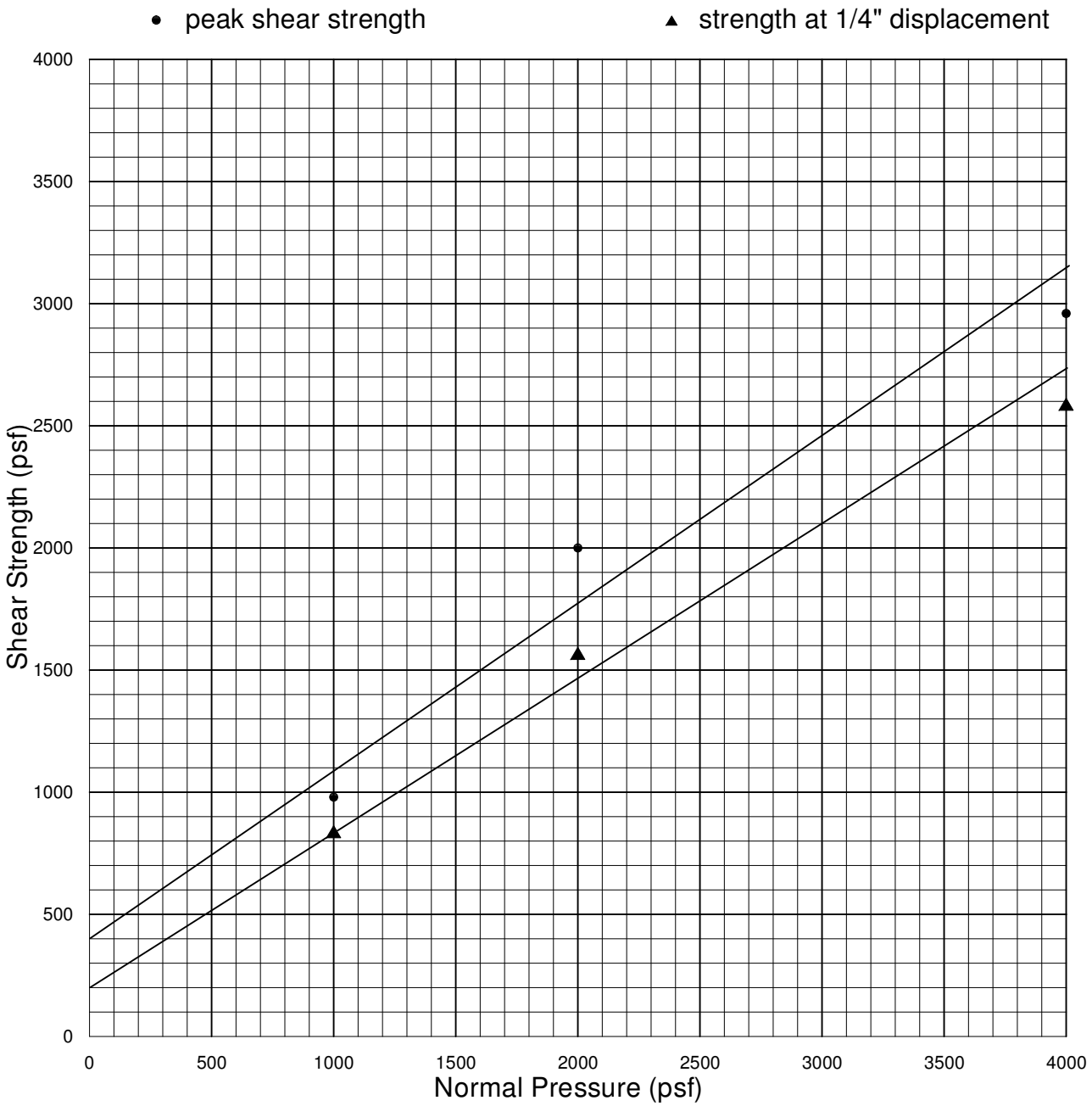
Job Name	KFM # TRG 07-02E	**Date:**	10/23/2007
Job No.	2005-033	**By:**	WK
Boring/Sample No.	B-2 / SK-2		
Description:	Olive Brown, F. Sandy Silt w. Clay		

Method: **A**	Mold Volume (cf): **0.0333**	Blows: **25**		Layers: **5**	
Specimen	A	B	C	D	E
Total Wet Weight (lbs)	**3699**	**3750**	**3720**	**3659**	
Weight of Mold (lbs)	1833	1833	1833	1833	
Wet Weight of Soil (lbs)	1866	1917	1887	1826	
Wet Density (pcf)	123.4	126.8	124.8	120.8	
Moisture Can No.					
Dry Weight					
Moisture Content (%)	**20.9**	**18.5**	**16.3**	**14.5**	
Dry Density (pcf)	102.1	107.0	107.3	105.5	



Geo**L**ogic **A**ssociates

DIRECT SHEAR TEST - ASTM D-3080

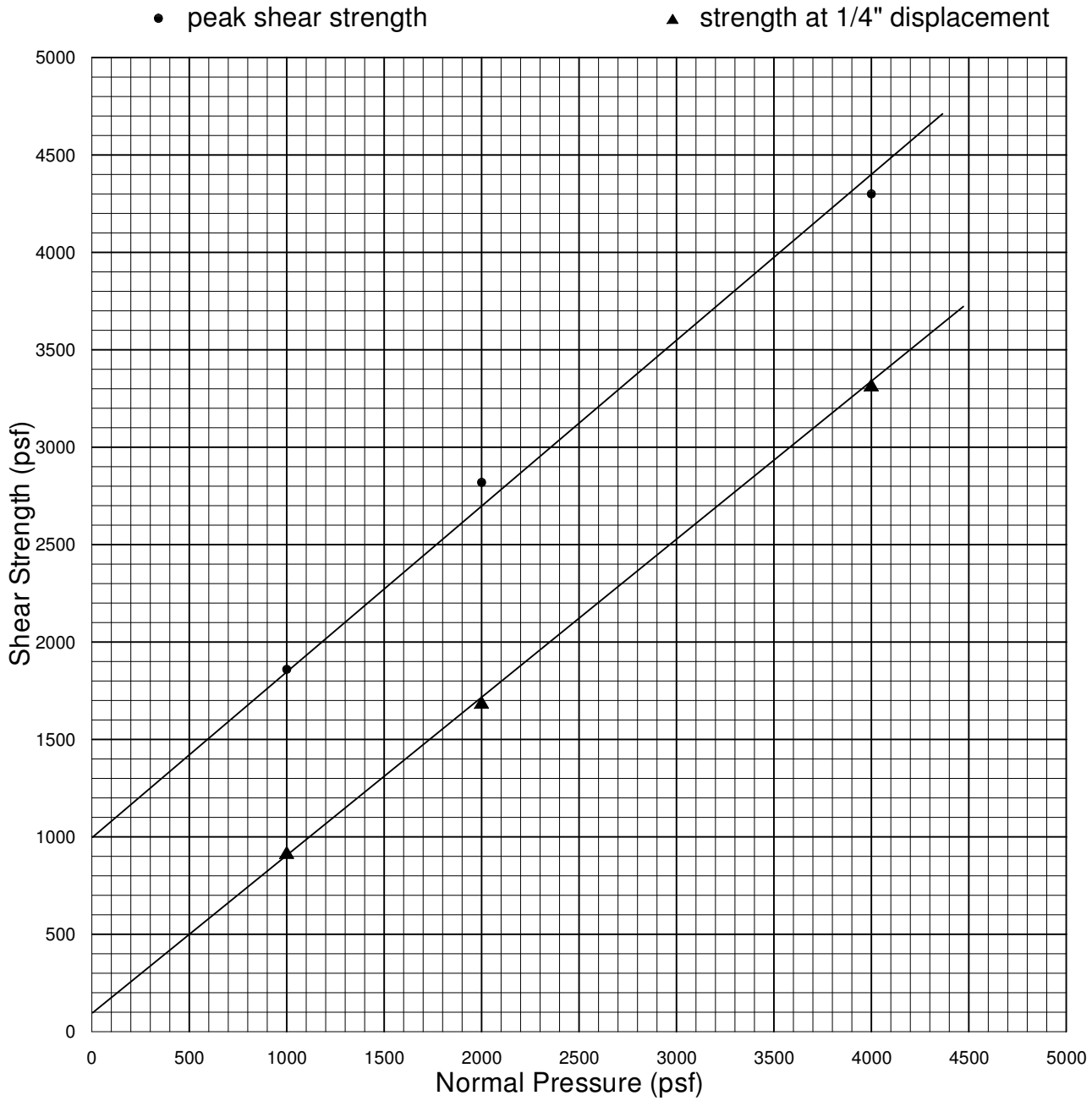


Strain Rate: 0.0042 in. / min.

Sample	Type	Description	Dry Density (pcf)	Initial Water Content (%)
B-1/R-5	Undisturbed & Saturated	Siltstone	101.6	18.2

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	980 @ 0.0250"	830
2000	2000 @ 0.0100"	1560
4000	2960 @ 0.0385"	2580
	C = 400 psf	C = 200 psf
	ϕ = 35 deg.	ϕ = 32 deg.

DIRECT SHEAR TEST - ASTM D-3080

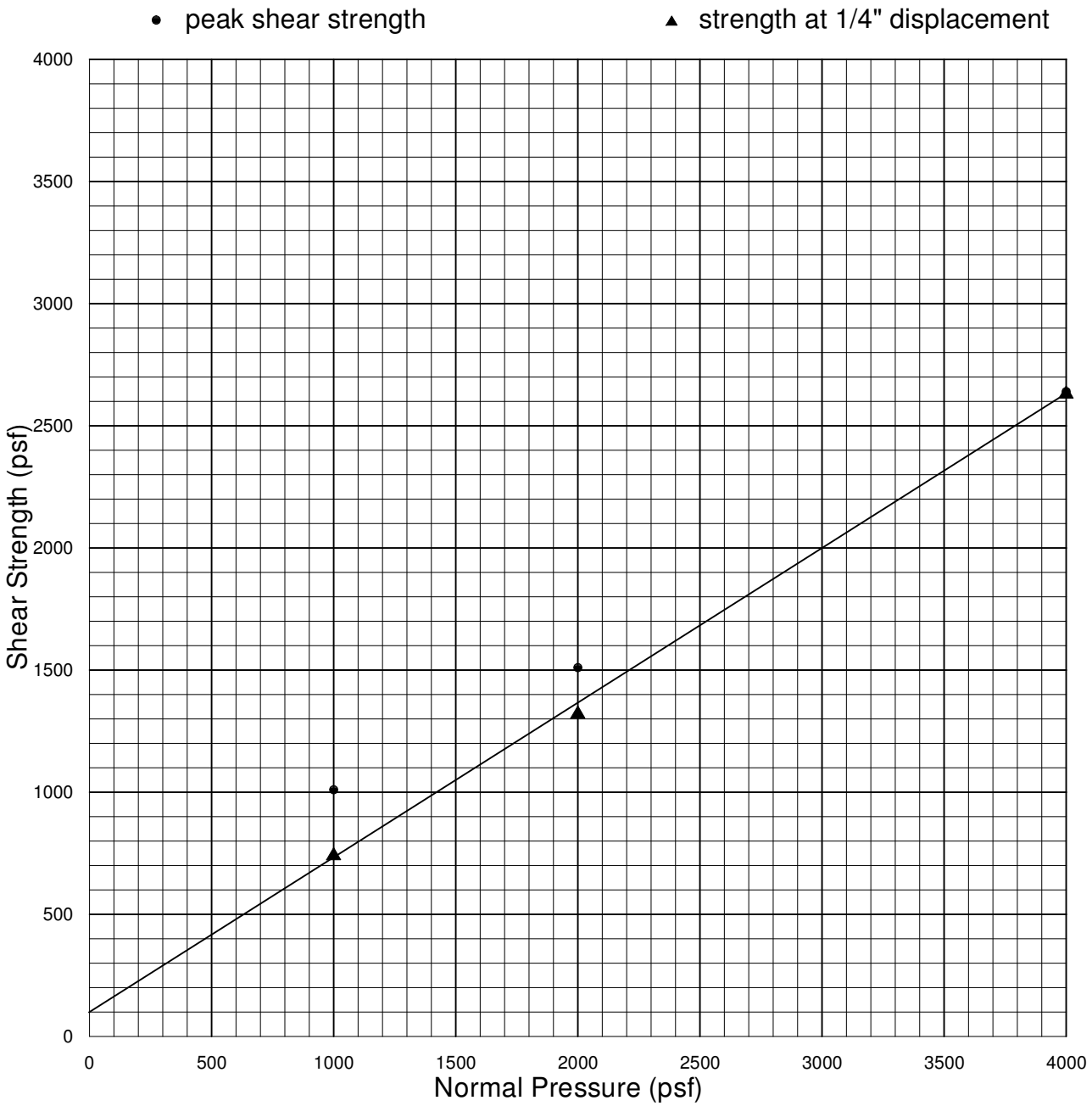


Strain Rate: 0.0042 in. / min.

Sample	Type	Description	Dry Density (pcf)	Initial Water Content (%)
B-4/R-1	Undisturbed & Saturated	Sandstone	113.5	5.9

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	1860 @ 0.0495"	910
2000	2820 @ 0.0700"	1680
4000	4300 @ 0.0700"	3310
	C = 1000 psf	C = 100 psf
	ϕ = 39 deg.	ϕ = 39 deg.

DIRECT SHEAR TEST - ASTM D-3080



Strain Rate: 0.0042 in. / min.

Sample	Type	Description	Dry Density (pcf)	Initial Water Content (%)
B-2/SK-2	Remolded & Saturated	F. Sandy Silt w. Clay	96.8	18.0

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	1010 @ 0.0350"	740
2000	1510 @ 0.0600"	1320
4000	2640 @ 0.2000"	2630
	C = 100 psf	C = 100 psf
	ϕ = 32 deg.	ϕ = 32 deg.

DIRECT SHEARS

GLA JOB NO. : 2005-033 **DATE: 11/1/2007**
CLIENT: KFM # TRG 07-02E
JOB NAME: Site D, Diamond Bar **BY: LD**

SAMPLE	DESCRIPTION	DRY DENSITY (PCF)	Initial w.c. (%)	Final w.c. (%)	SHEAR RATE (IN/MIN.)	NORMAL STRESS (PSF)	PEAK SHEAR STRESS (PSF)	SHEAR STRESS (PSF) @ 0.25 IN.	RESIDUAL SHEAR STRESS (PSF)
B-1 / GB-3	Clayey Silt	83.1	36.4	36.4	0.0021	1500	1270	890	600
						3000	1970	1500	770
B-4 / GB-1	Clayey Silt	83.3	37.8	37.8	0.0021	2500	1430	1250	950
						4500	1780	1690	1210

EXPANSION INDEX - UBC 18-2 & ASTM D 4829-88

PROJECT KFM # TRG 07-02E JOB NO. 2005-033

Sample	B-2 / SK-2		By WK		Sample			By	
Sta. No.					Sta. No.				
Soil Type	Olive Gray, F. Sandy Silt				Soil Type				
Date	Time	Dial Reading	Wet+Tare	577.6	Date	Time	Dial Reading	Wet+Tare	
11/1/2007	16:00	0.3441	Tare	220				Tare	
		H2O	Net Weight	357.6				Net Weight	
11/2/2007	12:30	0.3271	% Water	14				% Water	
			Dry Dens.	95.0				Dry Dens.	
			% Max					% Max	
			Wet+Tare	612.9				Wet+Tare	
			Tare	220				Tare	
			Net Weight	392.9				Net Weight	
INDEX	17	1.7%	% Water	25.3	**INDEX**			% Water	

Sample			By		Sample			By	
Sta. No.					Sta. No.				
Soil Type					Soil Type				
Date	Time	Dial Reading	Wet+Tare		Date	Time	Dial Reading	Wet+Tare	
			Tare					Tare	
			Net Weight					Net Weight	
			% Water					% Water	
			Dry Dens.					Dry Dens.	
			% Max					% Max	
			Wet+Tare					Wet+Tare	
			Tare					Tare	
			Net Weight					Net Weight	
INDEX			% Water		**INDEX**			% Water	

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Appendix D

Slope Stability Analyses

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Name: Tpl WEAK CLAY LAYERS
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #3: Upper - Existing - Shear
Description: Upper shear zone
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

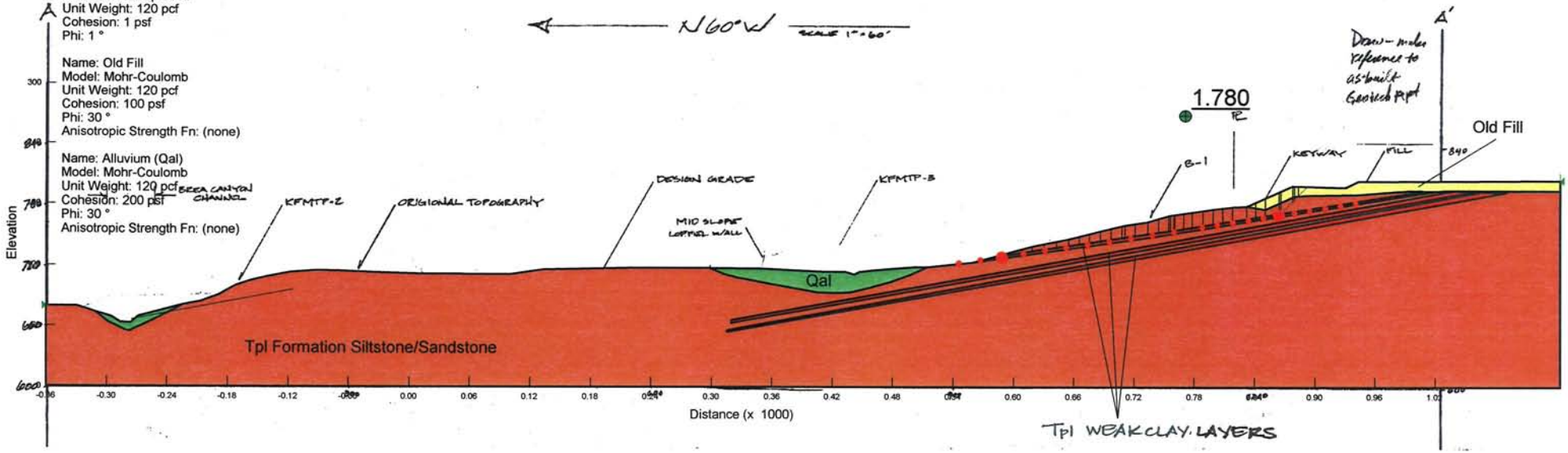


FIGURE D-1a

Name: Tpl WEAK CLAY LAYERS
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #3: Upper - Existing - Shear (eq)
Description: Upper shear zone
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

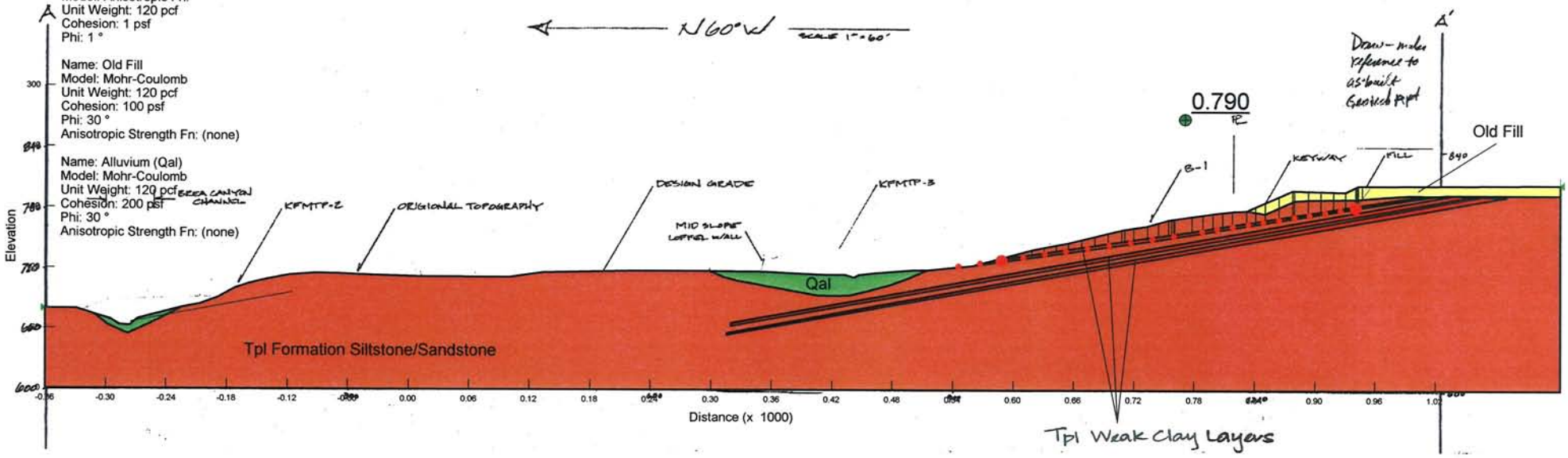


FIGURE D-16

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #1.1: Upper - Existing - Shear
Description: Lowest shear zone
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

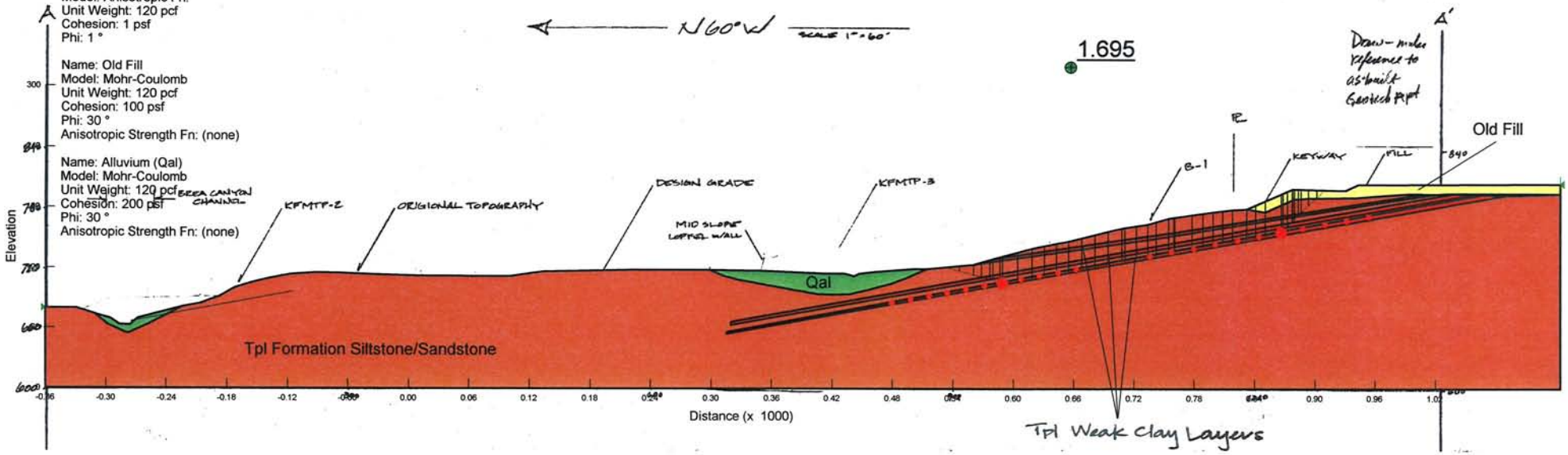


FIGURE D-2a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #1.1: Upper - Existing - Shear (eq)
Description: Lowest shear zone
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

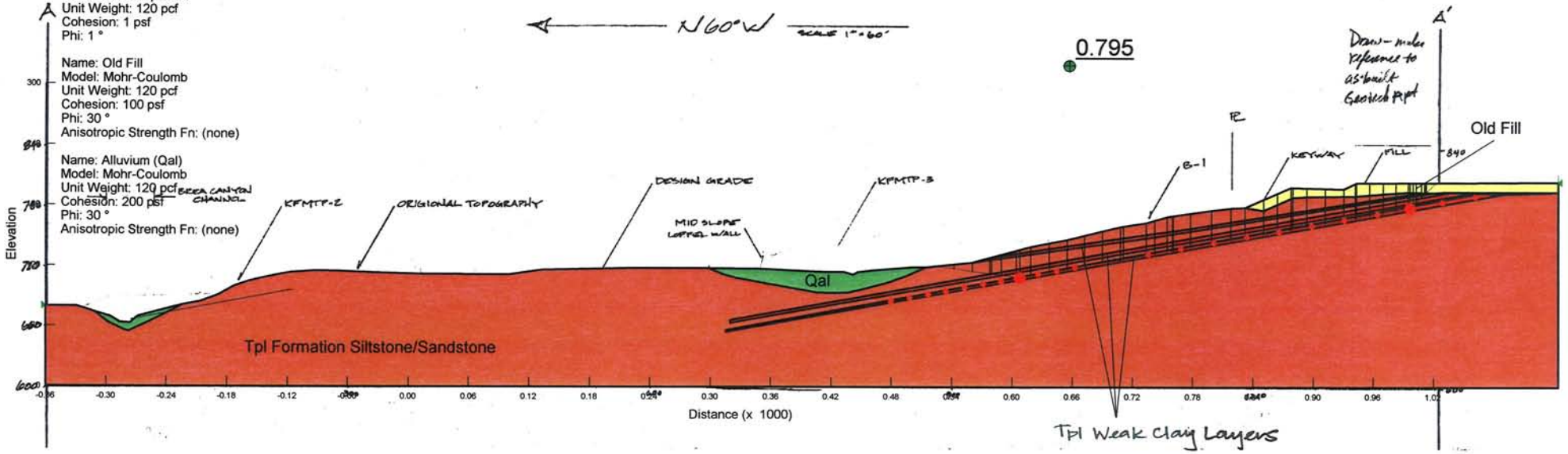


FIGURE D-26

Name: #1.2: Upper - Existing - Weak
Description:
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

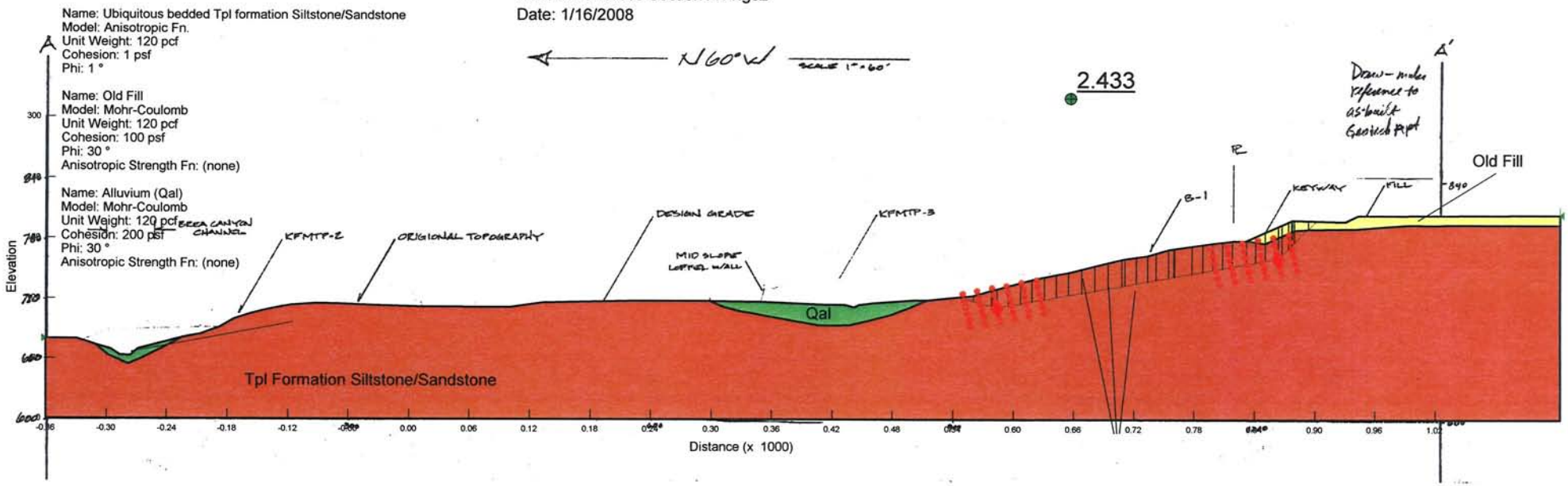


FIGURE D-3a

Name: #1.2: Upper - Existing - Weak (eq)
Description:
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

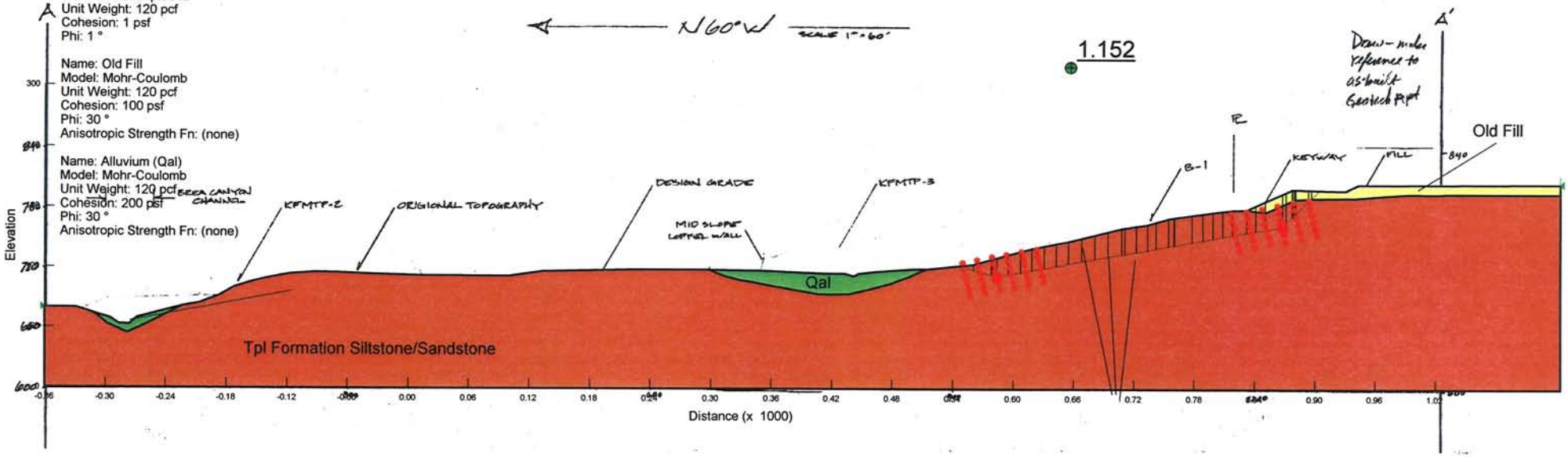


FIGURE D-3b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #6.1: Upper - Proposed - Shear
Description: Upper shear zone
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

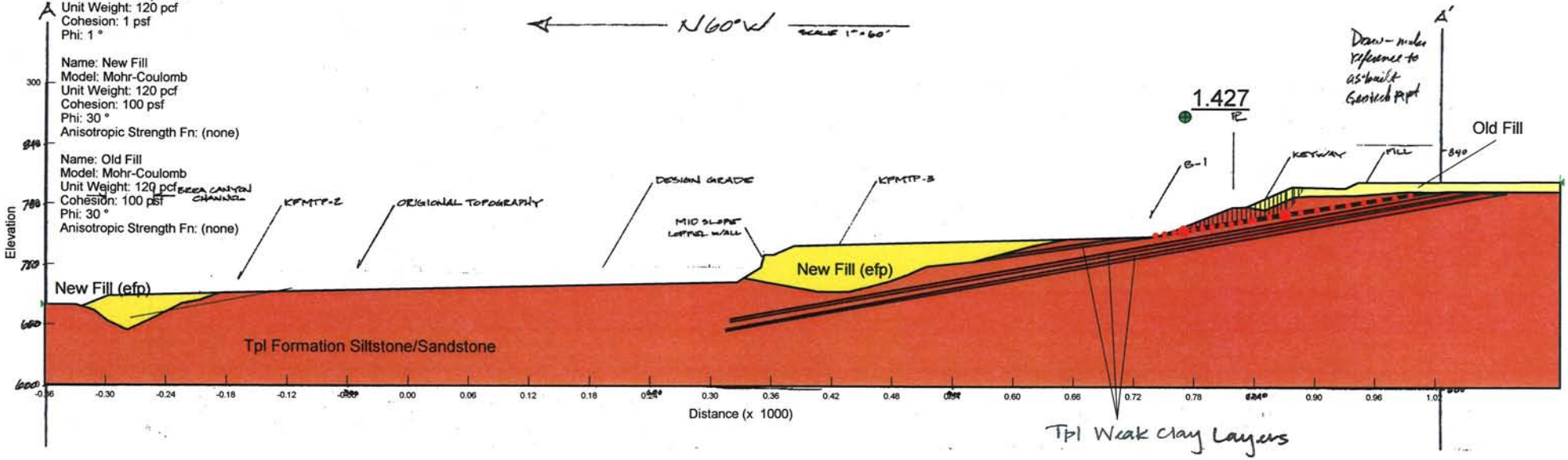


FIGURE D-4a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #6.2: Upper - Proposed - Shear (eq)
Description: Upper shear zone
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

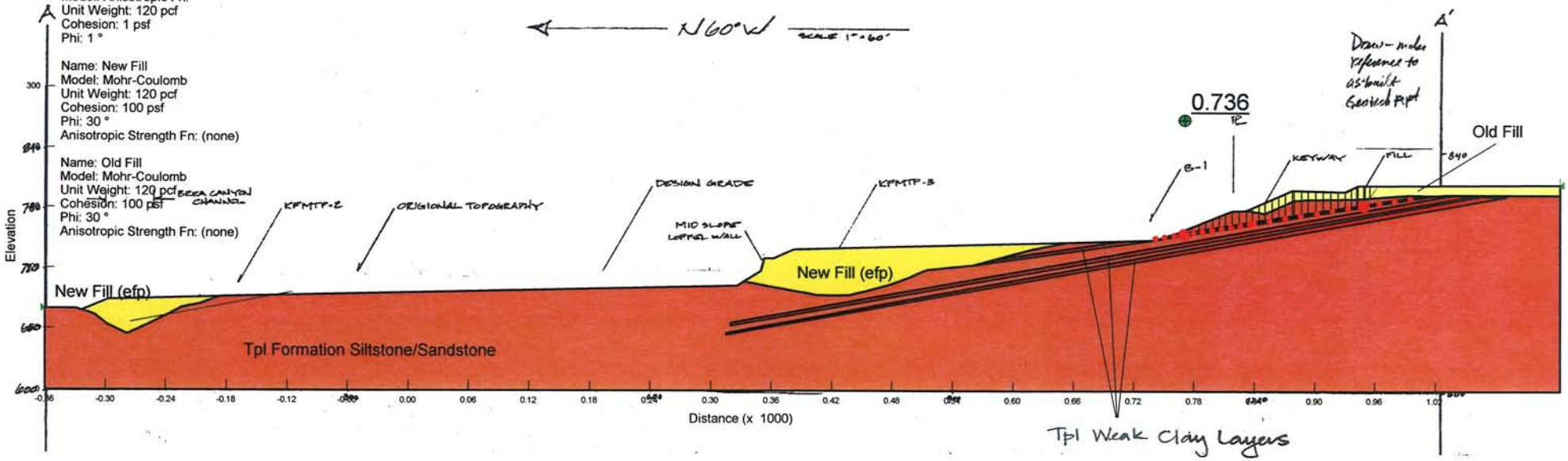


FIGURE D-4b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #4.1: Upper - Proposed - Shear
Description: Lowest shear zone
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

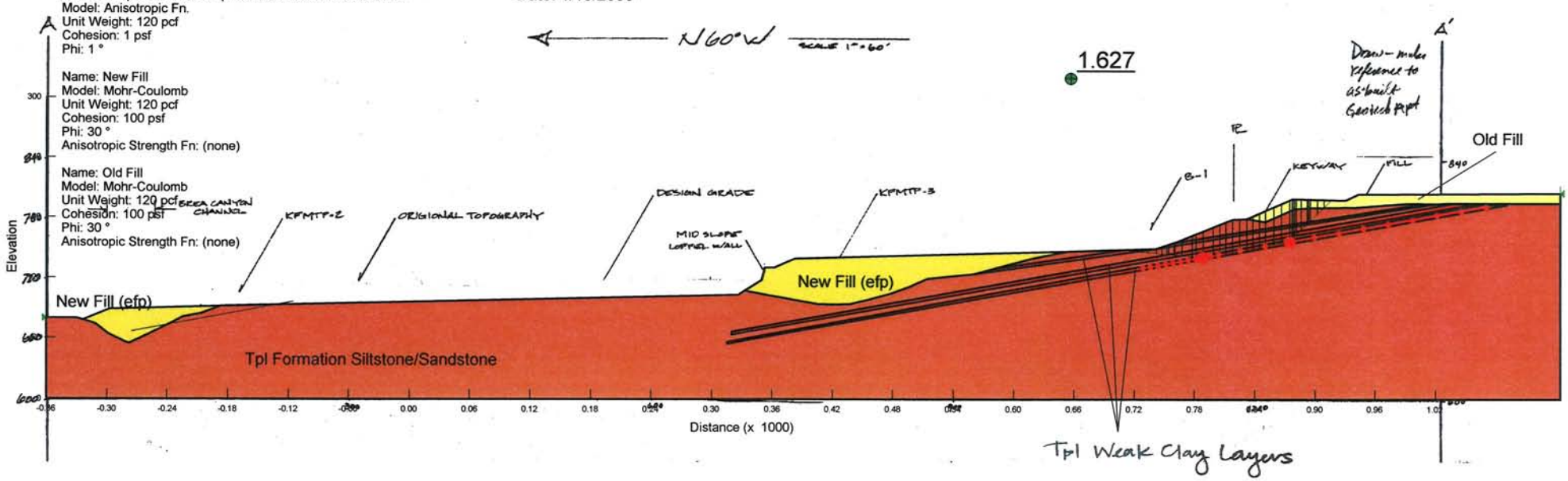


FIGURE D-5a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: #4.2: Upper - Proposed - Shear (eq)
Description: Lowest shear zone
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section A-A'.gsz
Date: 1/16/2008

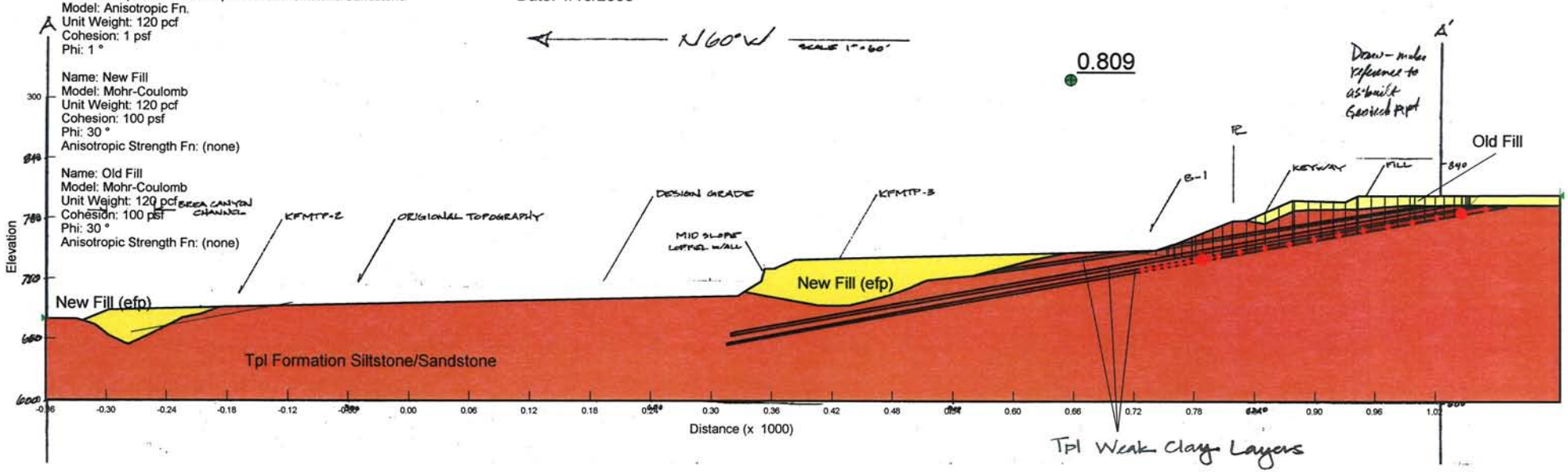


FIGURE D-5b

Name: #9.5: Upper - Proposed/Buttress - Shear
Description: Upper Shear Zone - Toe berm - Import material
Method: Spencer
Horz Seismic Load:0.000
File Name: Cross Section A-A' - Fix.gsz
Date: 1/16/2008

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

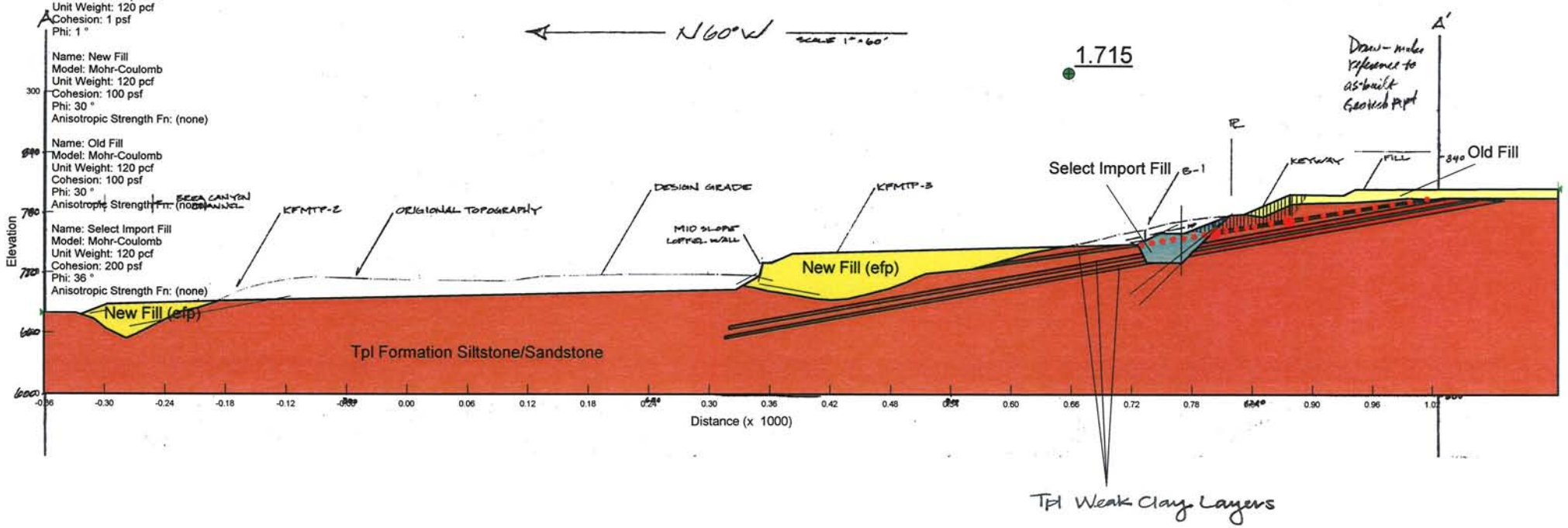


FIGURE D-60a

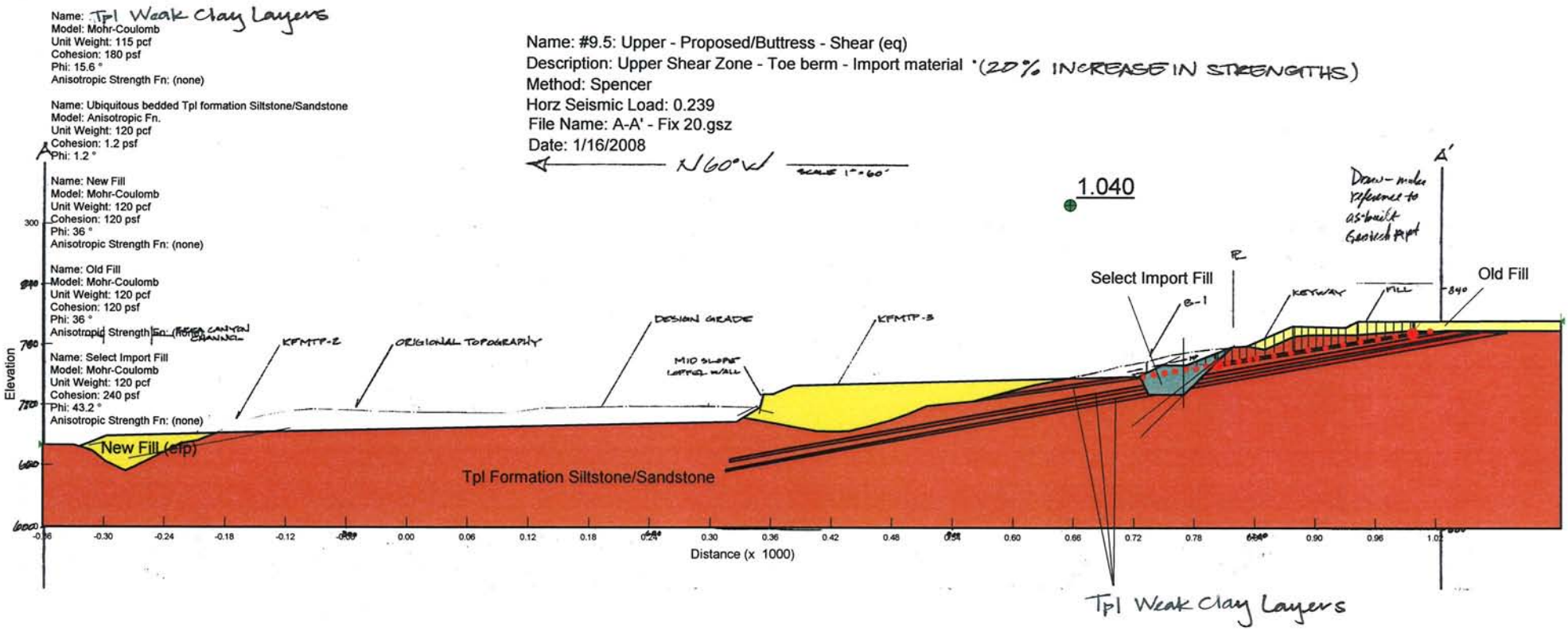

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 180 psf
Phi: 15.6 °
Anisotropic Strength Fn: (none)
Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1.2 psf
Phi: 1.2 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 120 psf
Phi: 36 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 120 psf
Phi: 36 °
Anisotropic Strength Fn: (none)
Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 240 psf
Phi: 43.2 °
Anisotropic Strength Fn: (none)
Name: #9.5: Upper - Proposed/Buttress - Shear (eq)
Description: Upper Shear Zone - Toe berm - Import material *(20% INCREASE IN STRENGTHS)
Method: Spencer
Horz Seismic Load: 0.239
File Name: A-A' - Fix 20.gsz
Date: 1/16/2008
N60°W
SCALE 1"=60'
1.040
A
A'
Draw - make reference to as-built Geotech Rpt
Select Import Fill
Old Fill
KEYWAY
FILL
DESIGN GRADE
ORIGINAL TOPOGRAPHY
KFMTP-2
KFMTP-3
MID SLOPE LOFFEL W/ALL
New Fill (elp)
Tpl Formation Siltstone/Sandstone
Tpl Weak Clay Layers
Elevation
Distance (x 1000)

FIGURE D-6b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

Name: #8.5: Upper - Proposed/Buttress - Shear
Description: Toe berm - Import material
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A' - Fix.gsz
Date: 1/12/2008

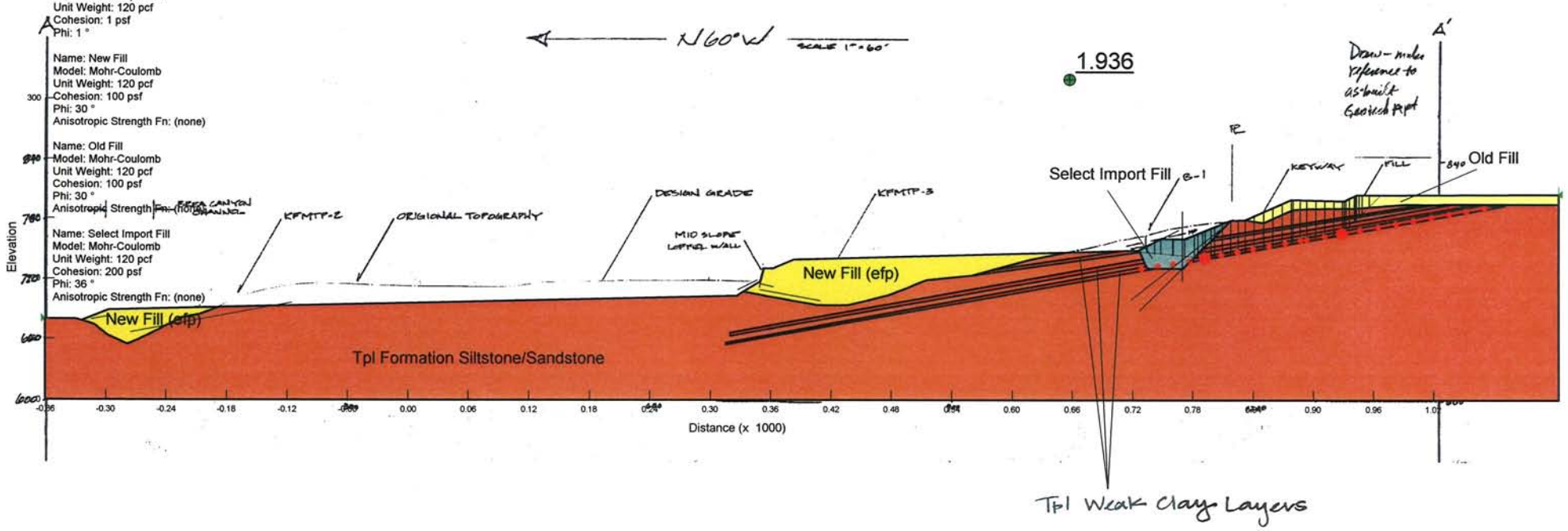


FIGURE D-7a

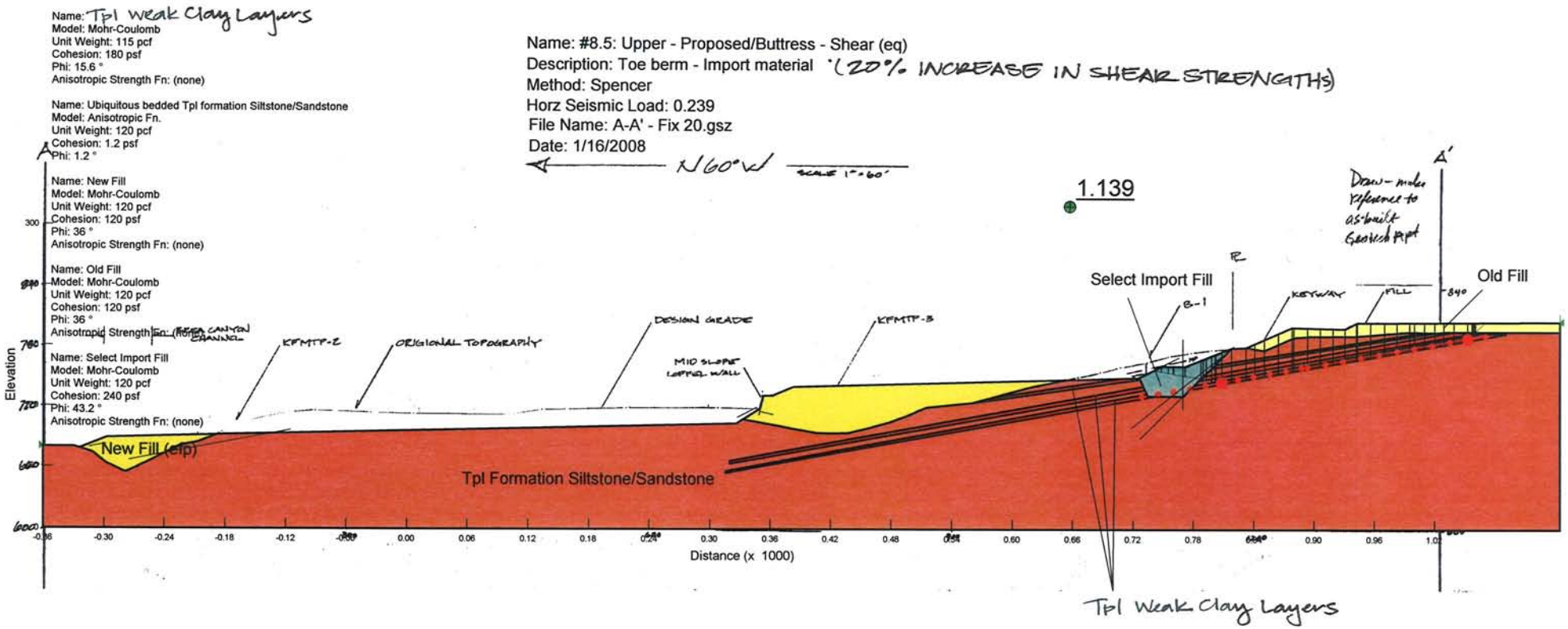

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 180 psf
Phi: 15.6 °
Anisotropic Strength Fn: (none)
Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1.2 psf
Phi: 1.2 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 120 psf
Phi: 36 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 120 psf
Phi: 36 °
Anisotropic Strength Fn: (none)
Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 240 psf
Phi: 43.2 °
Anisotropic Strength Fn: (none)
Name: #8.5: Upper - Proposed/Buttress - Shear (eq)
Description: Toe berm - Import material (20% INCREASE IN SHEAR STRENGTHS)
Method: Spencer
Horz Seismic Load: 0.239
File Name: A-A' - Fix 20.gsz
Date: 1/16/2008
N60°W
SCALE 1"=60'
1.139
A
A'
Draw - make reference to as-built Geotech Rpt
Select Import Fill
Old Fill
B-1
KEYWAY
FILL
840
DESIGN GRADE
KFMTP-3
KFMTP-2
ORIGIONAL TOPOGRAPHY
MID SLOPE LOADING WALL
New Fill (Qfp)
Tpl Formation Siltstone/Sandstone
Elevation
300
780
720
600
-0.36
-0.30
-0.24
-0.18
-0.12
0.00
0.06
0.12
0.18
0.24
0.30
0.36
0.42
0.48
0.54
0.60
0.66
0.72
0.78
0.84
0.90
0.96
Distance (x 1000)
Tpl Weak Clay Layers

FIGURE D-7b

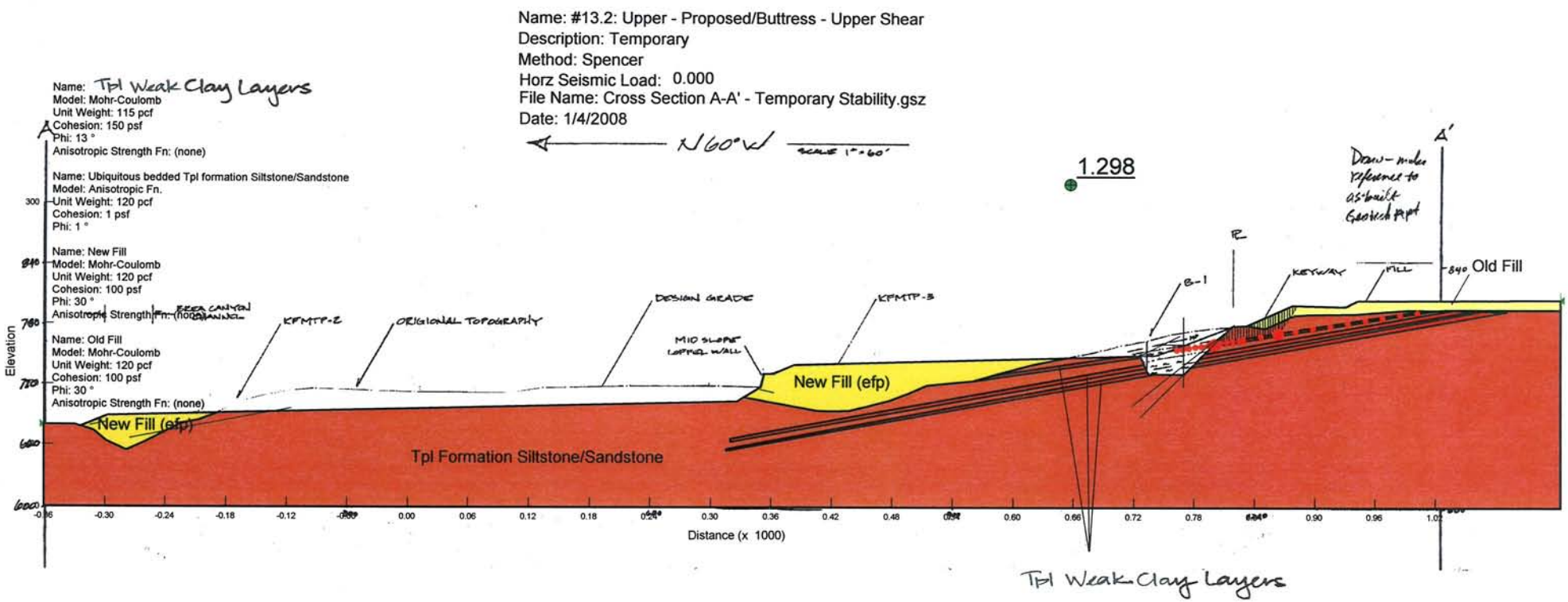

Name: #13.2: Upper - Proposed/Buttress - Upper Shear
Description: Temporary
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A' - Temporary Stability.gsz
Date: 1/4/2008
N60°W
SCALE 1"=60'
1.298
A
A'
Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)
Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Elevation
Distance (x 1000)
KFMTP-2
ORIGINAL TOPOGRAPHY
DESIGN GRADE
KFMTP-3
MID SLOPE KEYWAY WALL
B-1
KEYWAY
FILL
Old Fill
New Fill (efp)
New Fill (efp)
Tpl Formation Siltstone/Sandstone
Tpl Weak Clay Layers
Draw - make reference to as-built Geotech Rpt

FIGURE D-8

Name: #13.1: Upper - Proposed/Buttress - Lower Shear
Description: Temporary
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A' - Temporary Stability.gsz
Date: 1/4/2008

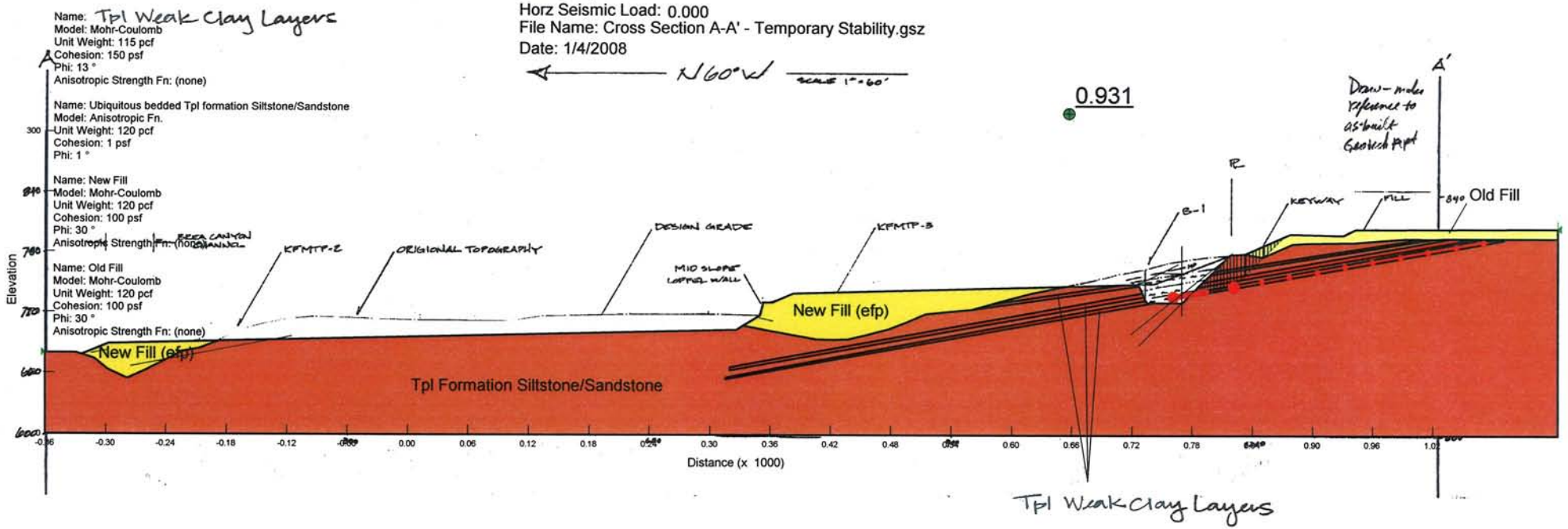


FIGURE D-9

Name: #10.1: Middle - Proposed - Fill
Description:
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section A-A' - Fix.gsz
Date: 1/16/2008

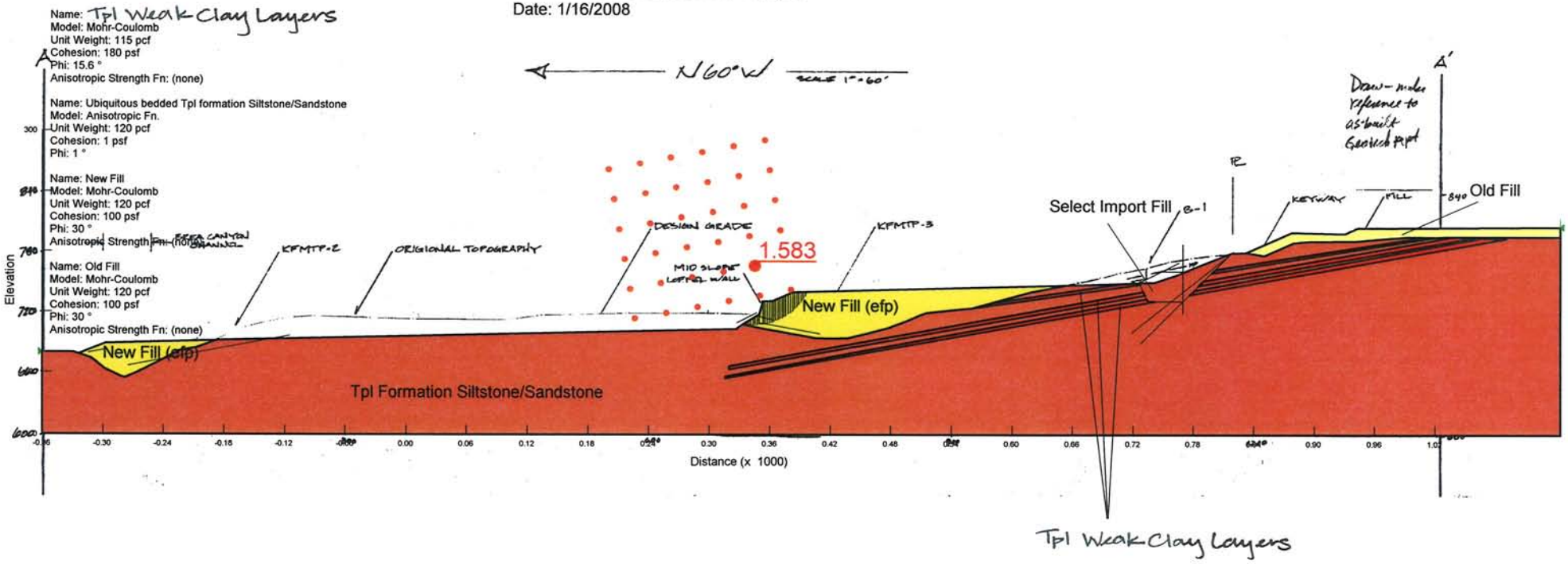


FIGURE D-10a

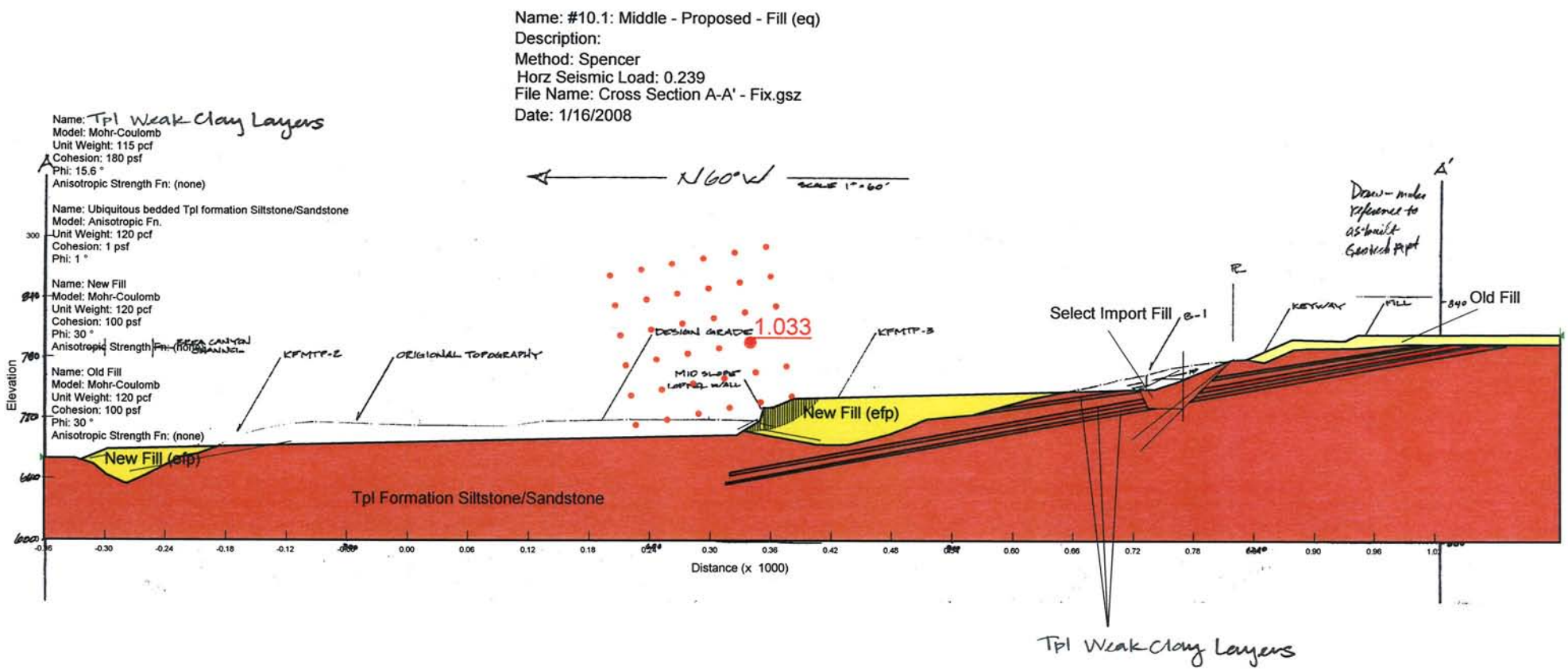

Name: #10.1: Middle - Proposed - Fill (eq)
Description:
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section A-A' - Fix.gsz
Date: 1/16/2008
Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 180 psf
Phi: 15.6 °
Anisotropic Strength Fn: (none)
Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
N60°W
SCALE 1"=60'
A
A'
DESIGN GRADE 1.033
KFMTF-2
ORIGINAL TOPOGRAPHY
KFMTF-3
MID SLOPE LAYERED WALL
New Fill (efp)
New Fill (efp)
Select Import Fill
B-1
KEYWAY
MH
840 Old Fill
Tpl Formation Siltstone/Sandstone
Elevation
Distance (x 1000)
Tpl Weak Clay Layers

FIGURE D-10b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °

Name: #01.0: Upper - Existing - Shear
Description:
Method: Spencer
Seismic coefficient: 0.000
File Name: B-B' Existing PS.gsz
Date: 01/02/08

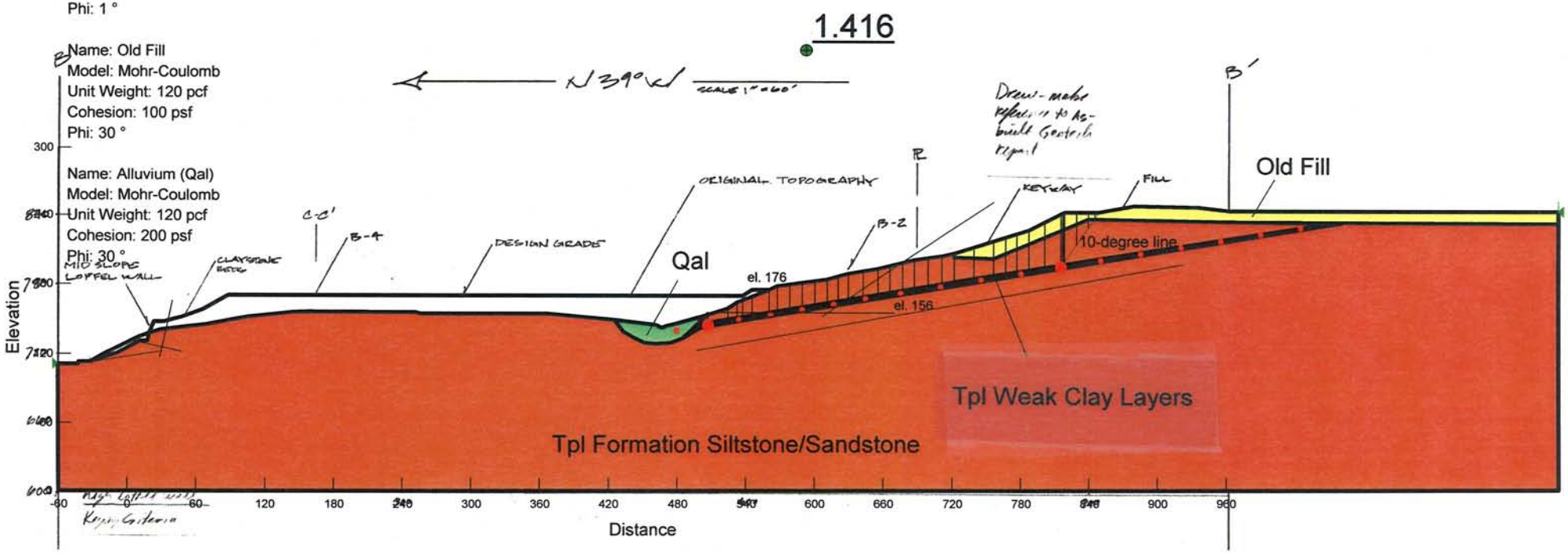


FIGURE D-11a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °

Name: #01.eq: Upper - Existing - Shear (k=0.239)
Description:
Method: Spencer
Seismic coefficient: 0.239
File Name: B-B' Existing PS.gsz
Date: 01/02/08

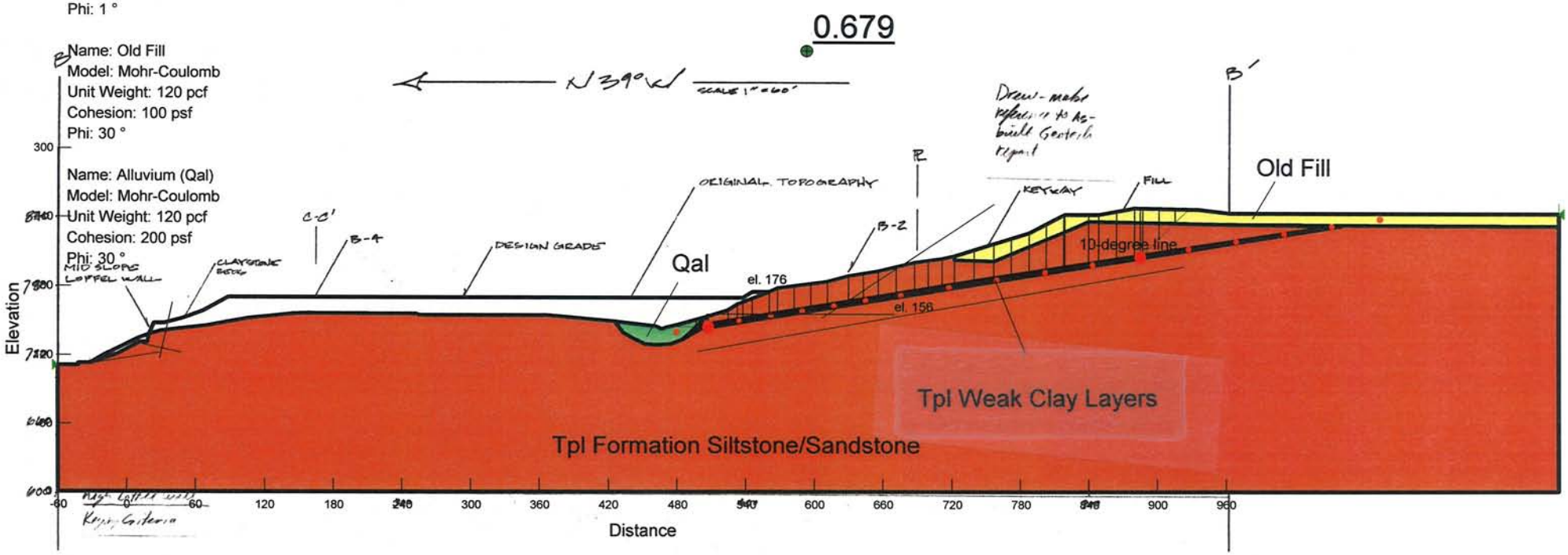


FIGURE D-11b

Name: #02.1: Upper - Existing - Weak
Description:
Method: Spencer
Seismic coefficient: 0.000
File Name: B-B' Existing PS.gsz
Date: 01/02/08

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °

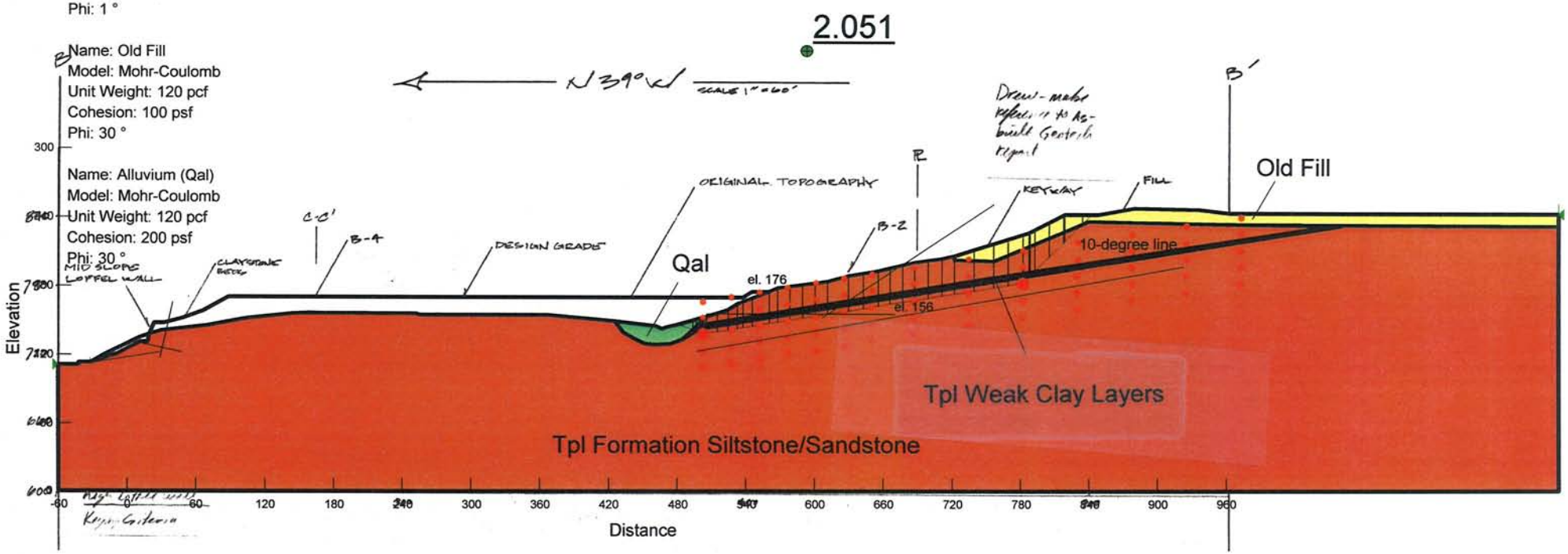


FIGURE D-12a

Name: #02.eq: Upper - Existing - Weak (k=0.239))
Description:
Method: Spencer
Seismic coefficient: 0.239
File Name: B-B' Existing PS.gsz
Date: 01/02/08

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °

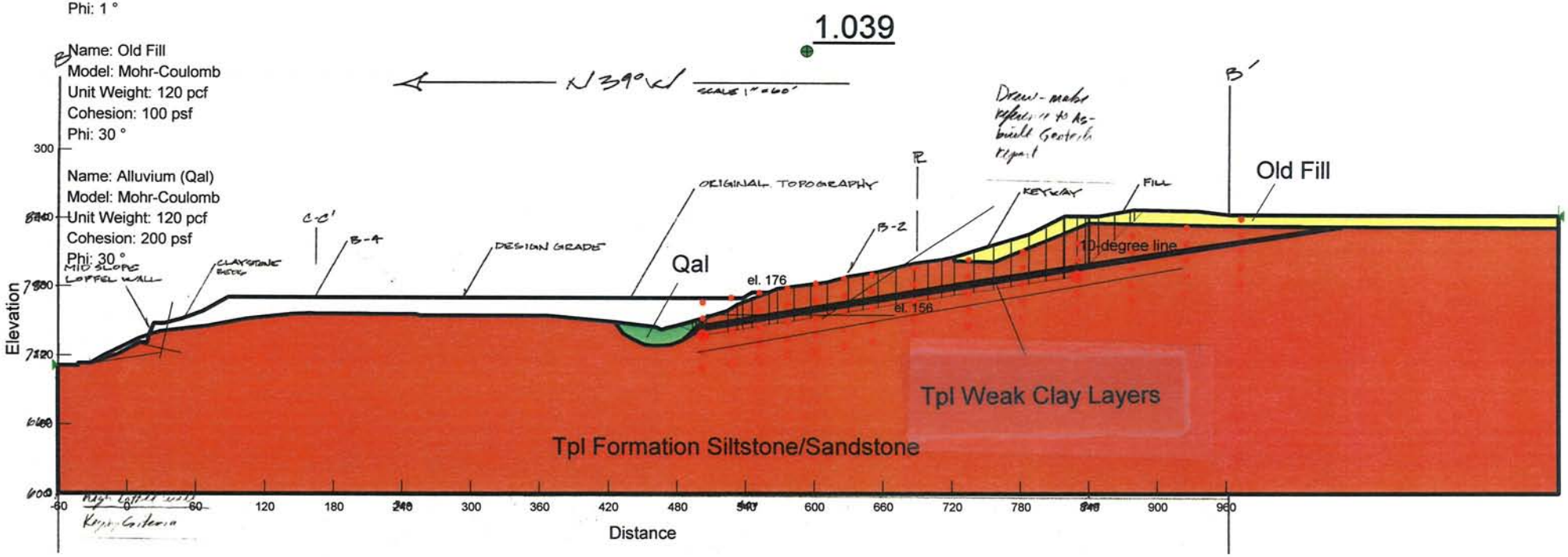


FIGURE D-12b

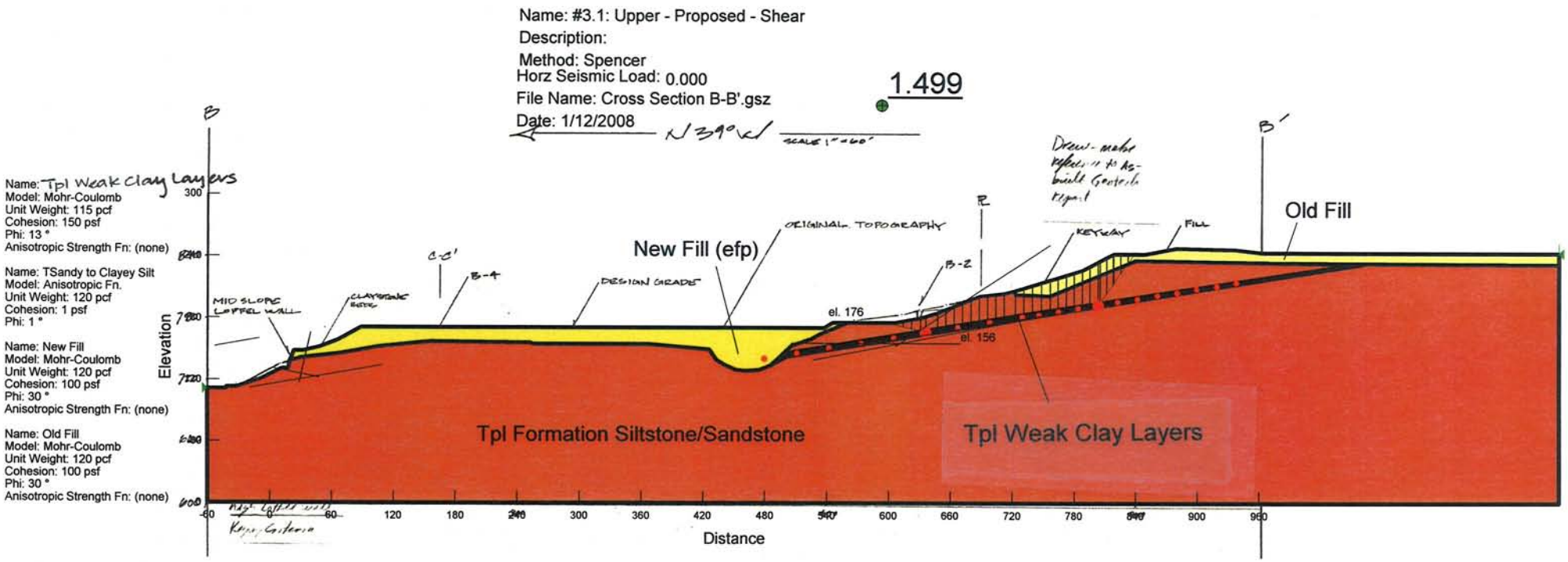

Name: #3.1: Upper - Proposed - Shear
Description:
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section B-B'.gsz
Date: 1/12/2008
1.499
Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)
Name: TSandy to Clayey Silt
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
B
B'
New Fill (efp)
ORIGINAL TOPOGRAPHY
DESIGN GRADE
Old Fill
KEYWAY
FILL
el. 176
el. 156
Tpl Formation Siltstone/Sandstone
Tpl Weak Clay Layers
Elevation
Distance
300
120
180
300
360
420
480
600
660
720
780
900
960

FIGURE D-13a

Name: #3.2: Upper - Proposed (eq) - Shear
Description:
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section B-B'.gsz
Date: 1/12/2008

0.771

N 39° W

SCALE 1" = 60'

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: TSandy to Clayey Silt
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

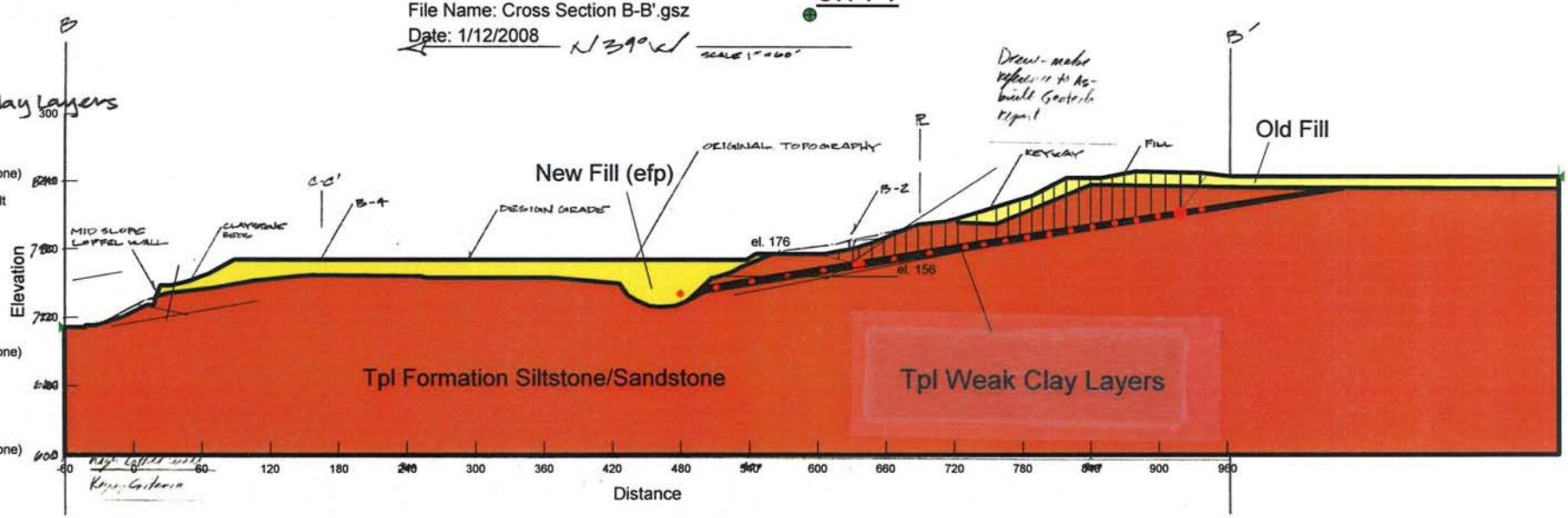


FIGURE D-136

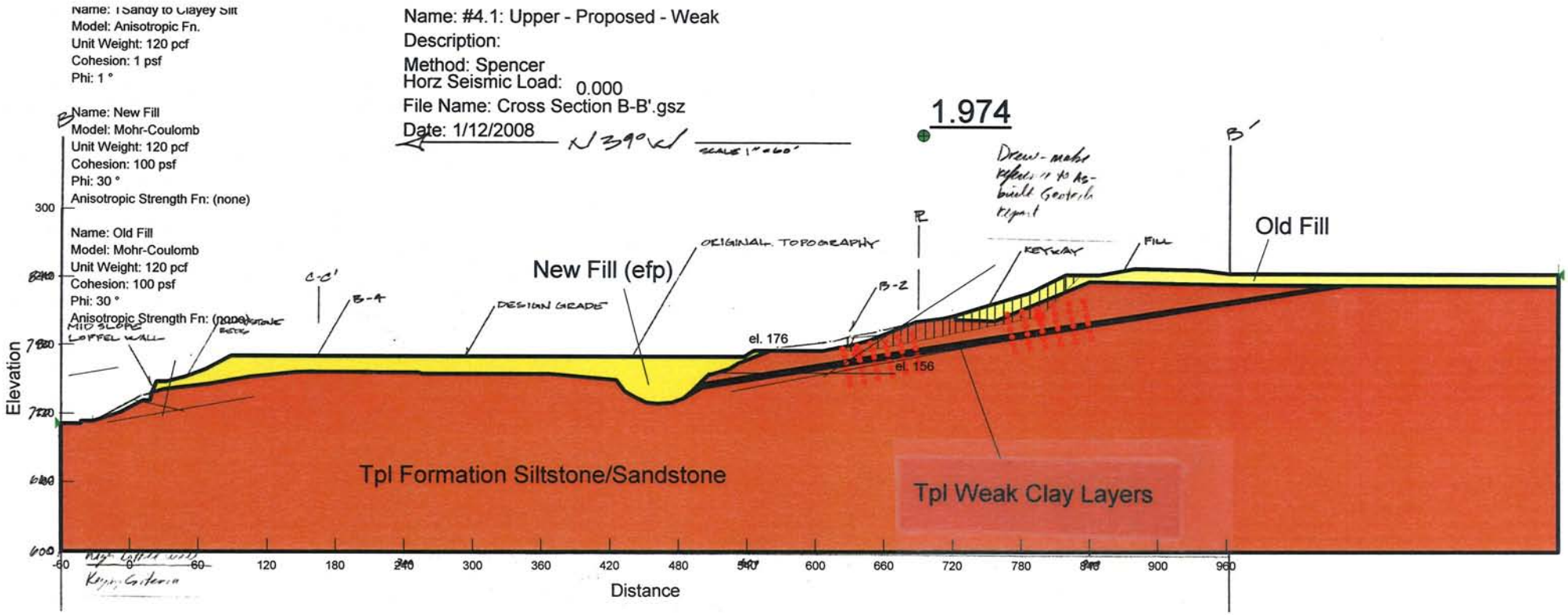

Name: Sandy to Clayey Silt
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: #4.1: Upper - Proposed - Weak
Description:
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section B-B'.gsz
Date: 1/12/2008
N 39° W
SCALE 1"=60'
1.974
B
B'
C-C'
B-4
B-2
DESIGN GRADE
ORIGINAL TOPOGRAPHY
New Fill (efp)
KEYWAY
FILL
Old Fill
el. 176
el. 156
Tpl Formation Siltstone/Sandstone
Tpl Weak Clay Layers
Elevation
Distance
300
-60
0
60
120
180
240
300
360
420
480
540
600
660
720
780
840
900
960

FIGURE D-4a

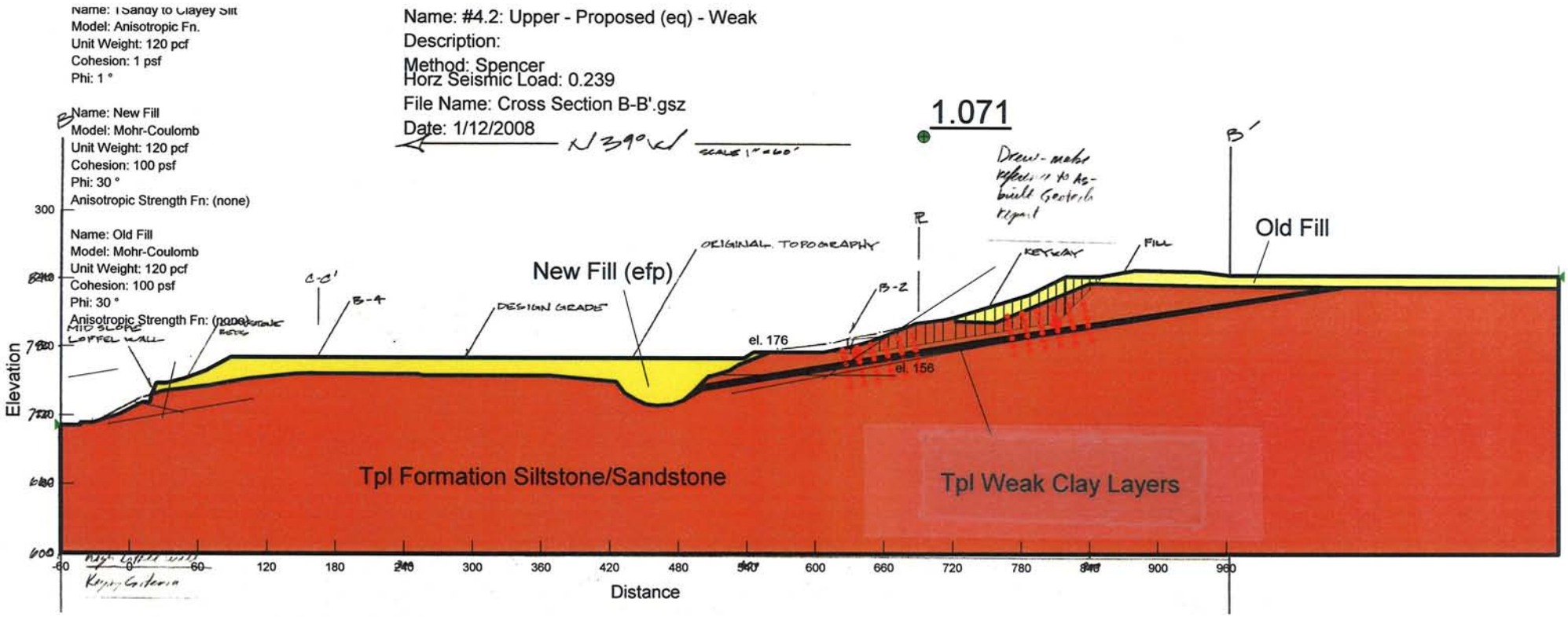

Name: Sandy to Clayey Silt
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °
Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: #4.2: Upper - Proposed (eq) - Weak
Description:
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section B-B'.gsz
Date: 1/12/2008
1.071
B
B'
C-C'
B-4
B-2
DESIGN GRADE
ORIGINAL TOPOGRAPHY
New Fill (efp)
KEYWAY
FILL
Old Fill
el. 176
el. 156
Tpl Formation Siltstone/Sandstone
Tpl Weak Clay Layers
Elevation
Distance
300
-60
0
60
120
180
300
360
420
480
600
660
720
780
900
960

FIGURE D-14b

Name: #6.4.: Upper - Proposed/Buttress - Shear
Description: toe butress
Method: Spencer
Horz Seismic Load: 0.000
File Name: B-B' Proposed PS tst.gsz
Date: 1/16/2008

1.847

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 750 psf
Phi: 26 °
Anisotropic Strength Fn: (none)

Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

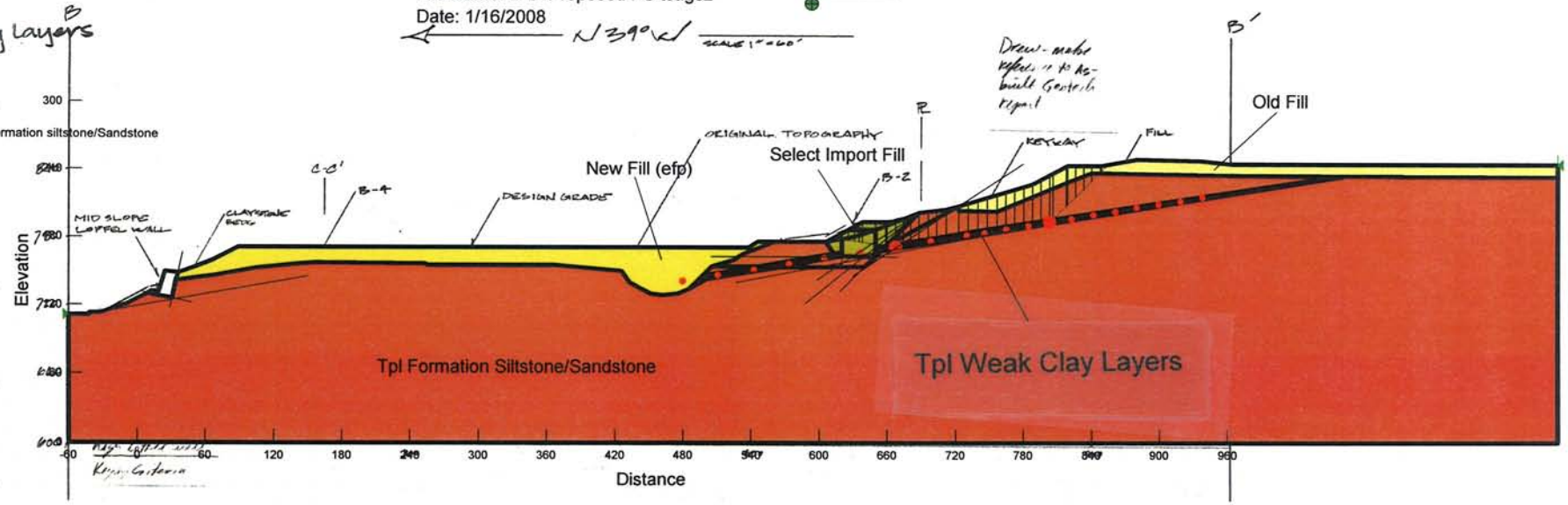


FIGURE D-15a

Name: #6.4.eq: Upper - Proposed/Buttress - Shear (k=0.239)
Description: toe butress (20% INCREASE IN SHEAR STRENGTHS)
Method: Spencer
Horz Seismic Load: 0.239
File Name: B-B' Proposed PS 3 20.gsz
Date: 1/15/2008

0.999

N 39° W

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 180 psf
Phi: 15.6 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1.2 psf
Phi: 1.2 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 120 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 900 psf
Phi: 31.2 °
Anisotropic Strength Fn: (none)

Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

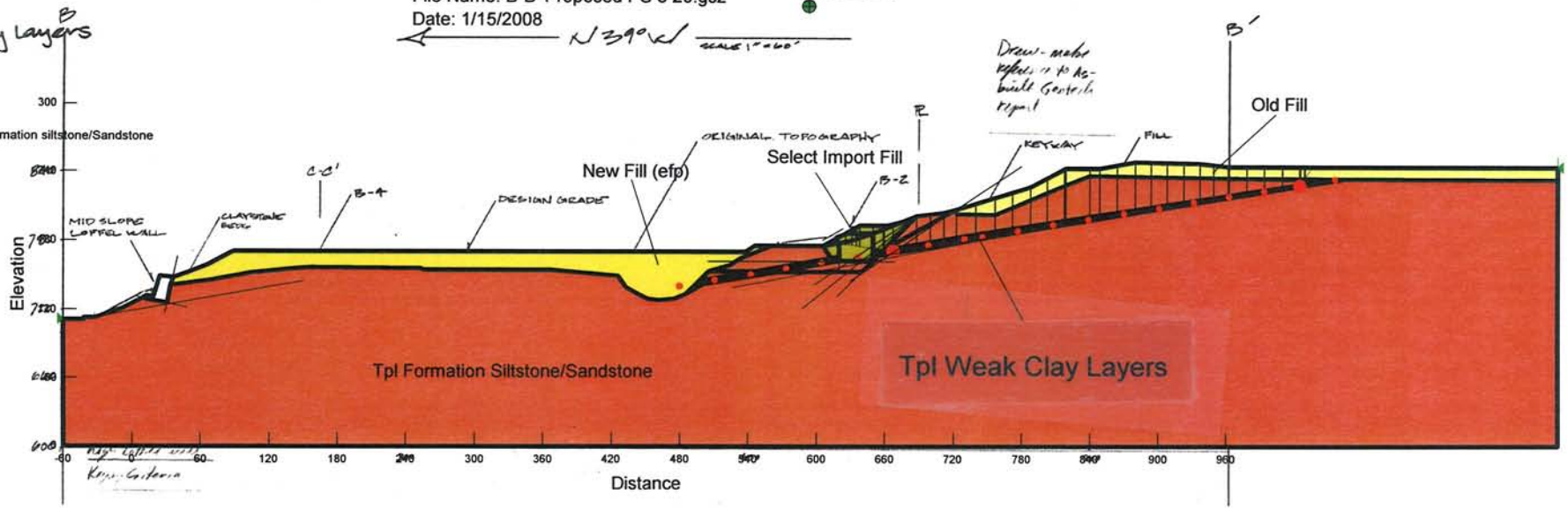


FIGURE D-15b

Name: #6.0.: Upper - Proposed/Buttress - Shear
Description: temporary
Method: Spencer
Horz Seismic Load: 0.000
File Name: B-B' Proposed PS.gsz
Date: 1/15/2008

1.184

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Select Import Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

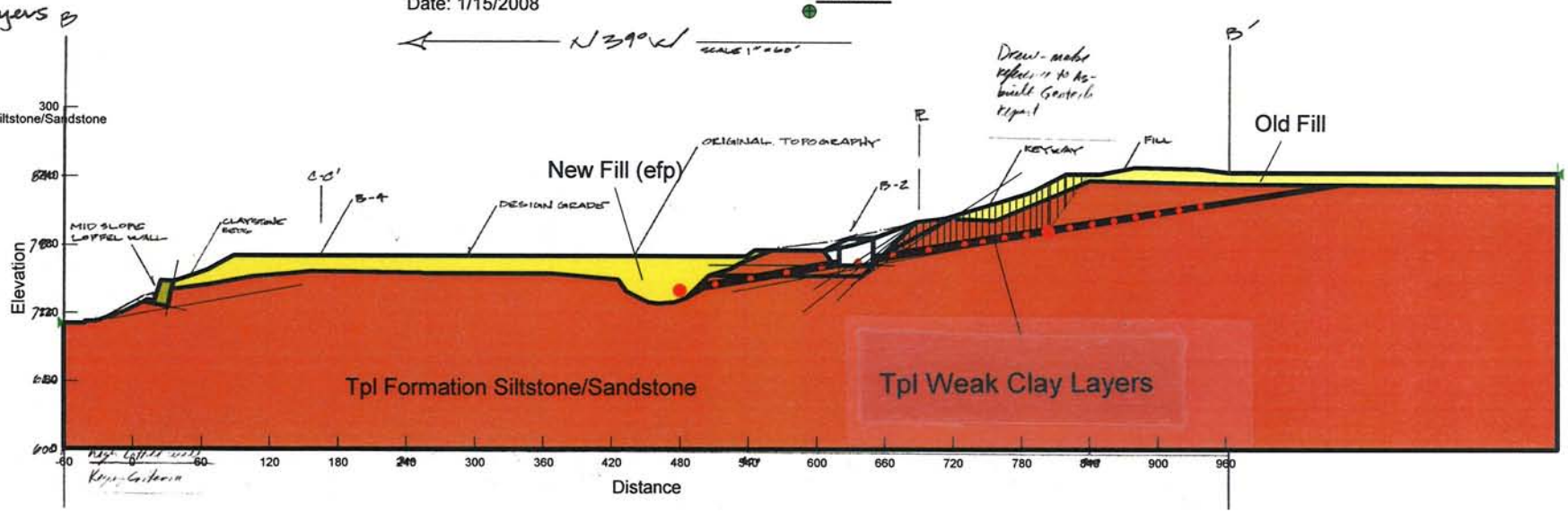


FIGURE D-16

Name: #03.0: Lower - Existing - Weak
Description:
Method: Spencer
Seismic coefficient: 0.000
File Name: B-B' lower w cly bds loffl wll fix 2.gsz
Date: 1/15/2008

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °

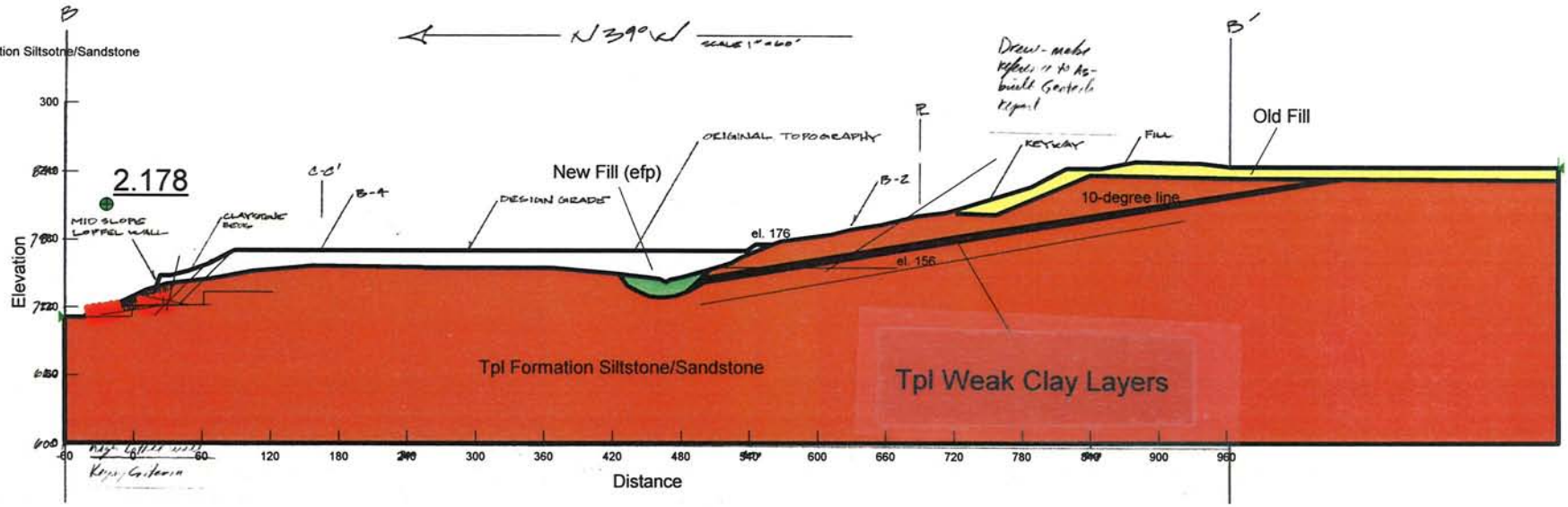


FIGURE D-17a

Name: #03.eq: Lower - Existing - Weak (k=0.239)
Description:
Method: Spencer
Seismic coefficient: 0.239
File Name: B-B' lower w cly bds loffl wll fix 2.gsz
Date: 1/15/2008

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Alluvium (Qal)
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 200 psf
Phi: 30 °

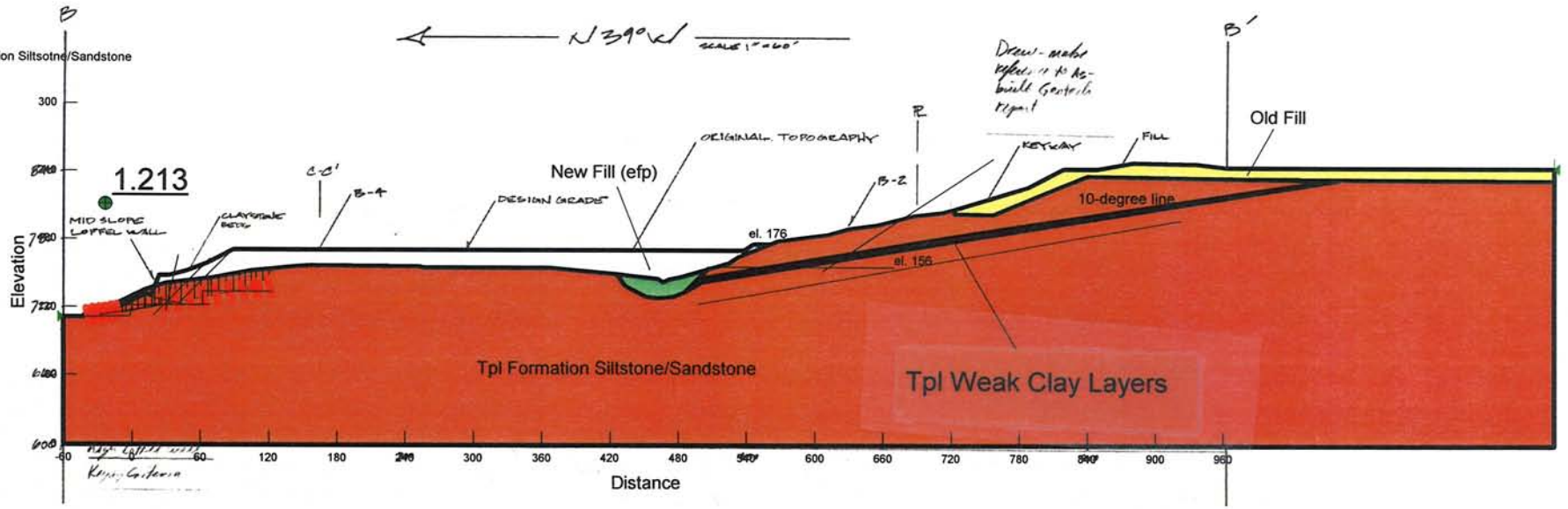


FIGURE D-17b

Name: C: Lower - Proposed - Shear - Clay Beds
Description:
Method: Spencer
Seismic coefficient: 0.000
File Name: B-B' lower w cly bds loffl wll fix 2.gsz
Date: 1/15/2008

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Backfill
Model: Mohr-Coulomb
Unit Weight: 130 pcf
Cohesion: 10000 psf
Phi: 0 °

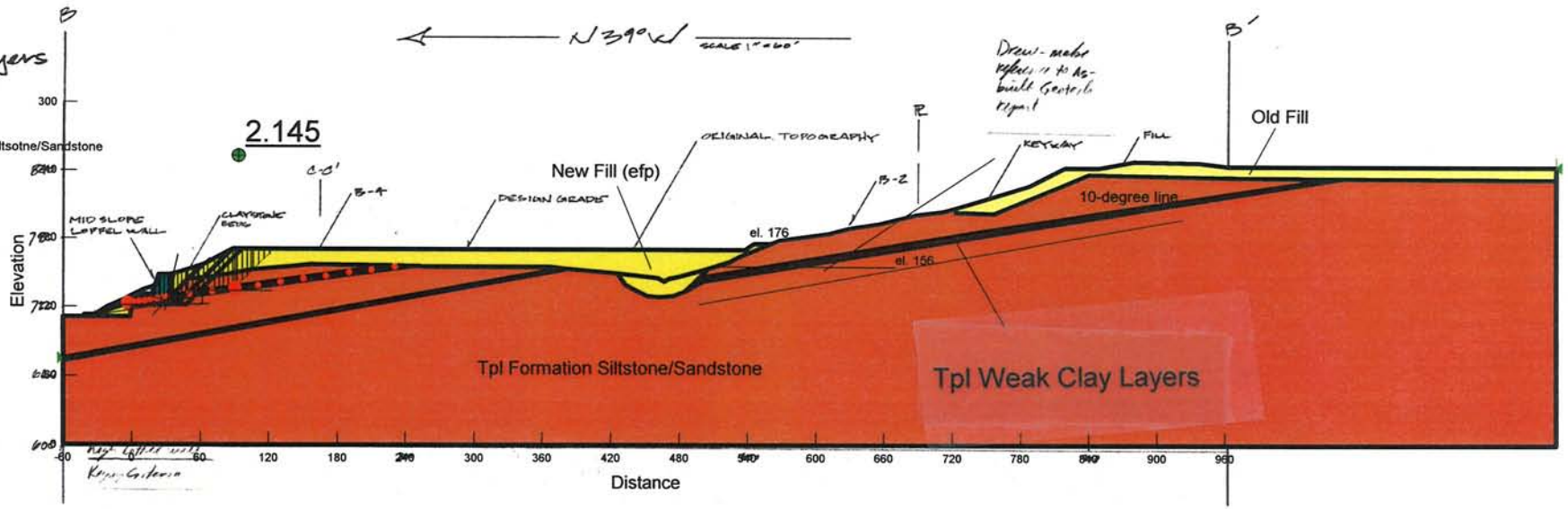


FIGURE D-18a

Name: C: Lower - Proposed - Shear - Clay Beds (k=0.239)
Description:
Method: Spencer
Seismic coefficient: 0.239
File Name: B-B' lower w cly bds loffl wll fix 2.gsz
Date: 1/15/2008

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °

Name: Backfill
Model: Mohr-Coulomb
Unit Weight: 130 pcf
Cohesion: 10000 psf
Phi: 0 °

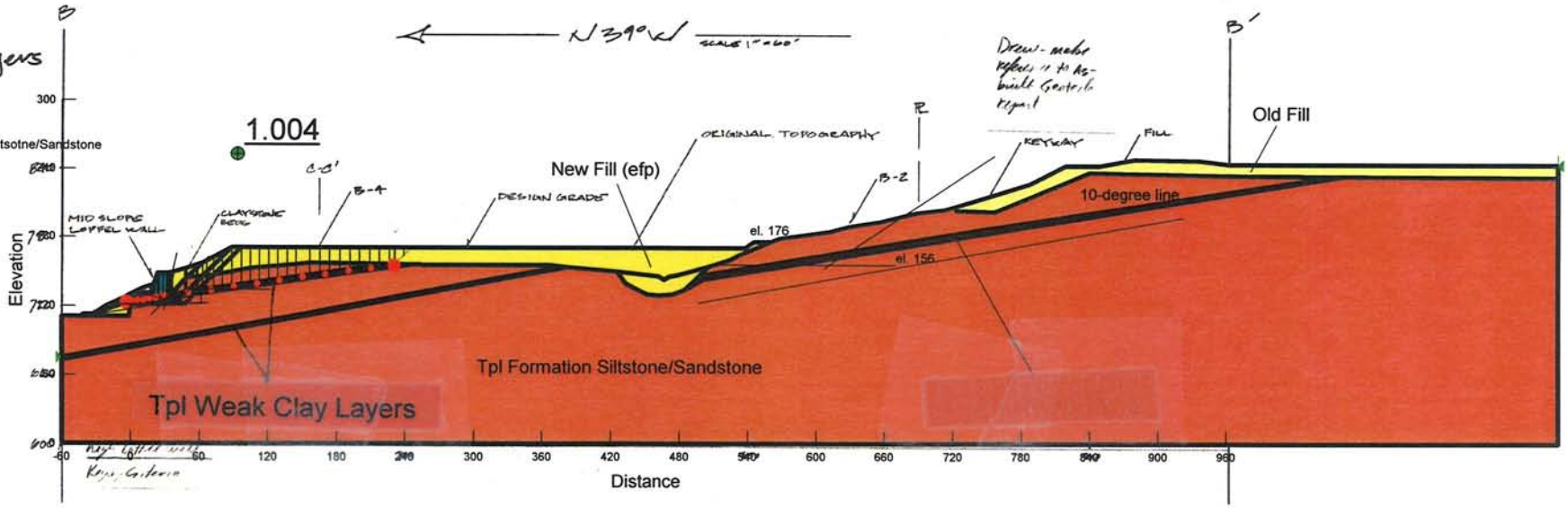
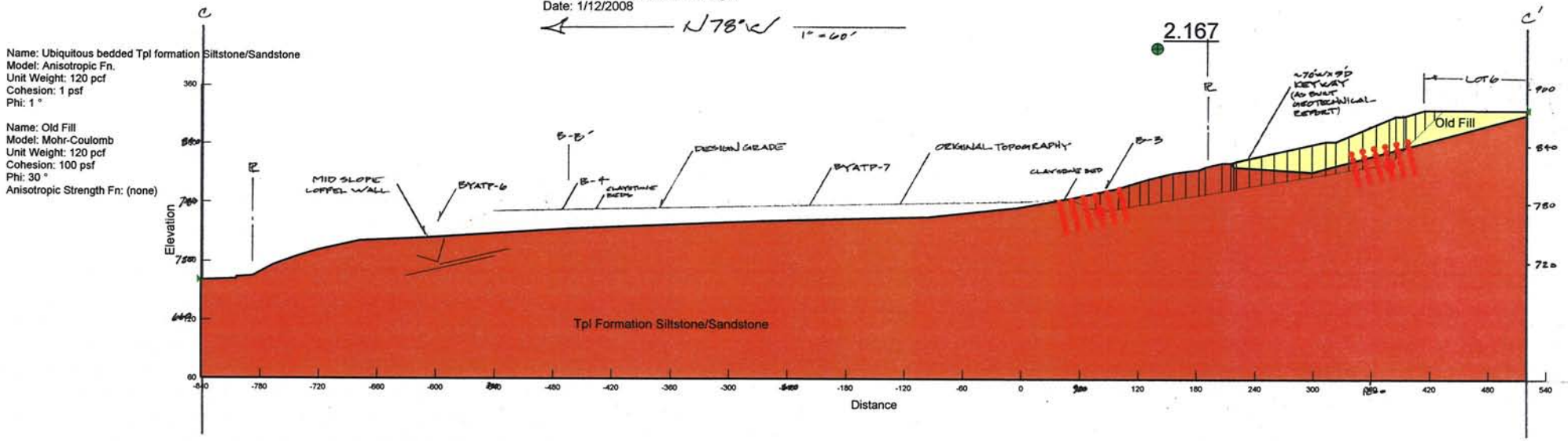


FIGURE D-18b

Name: #1.0: Upper - Existing
Method: Spencer
Horz Seismic Load: 0.000

File Name: Cross Section C-C'.gsz
Date: 1/12/2008



Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

FIGURE D-19a

Name: #1.0: Upper - Existing (eq)
Method: Spencer
Horz Seismic Load: 0.239

File Name: Cross Section C-C'.gsz
Date: 1/12/2008

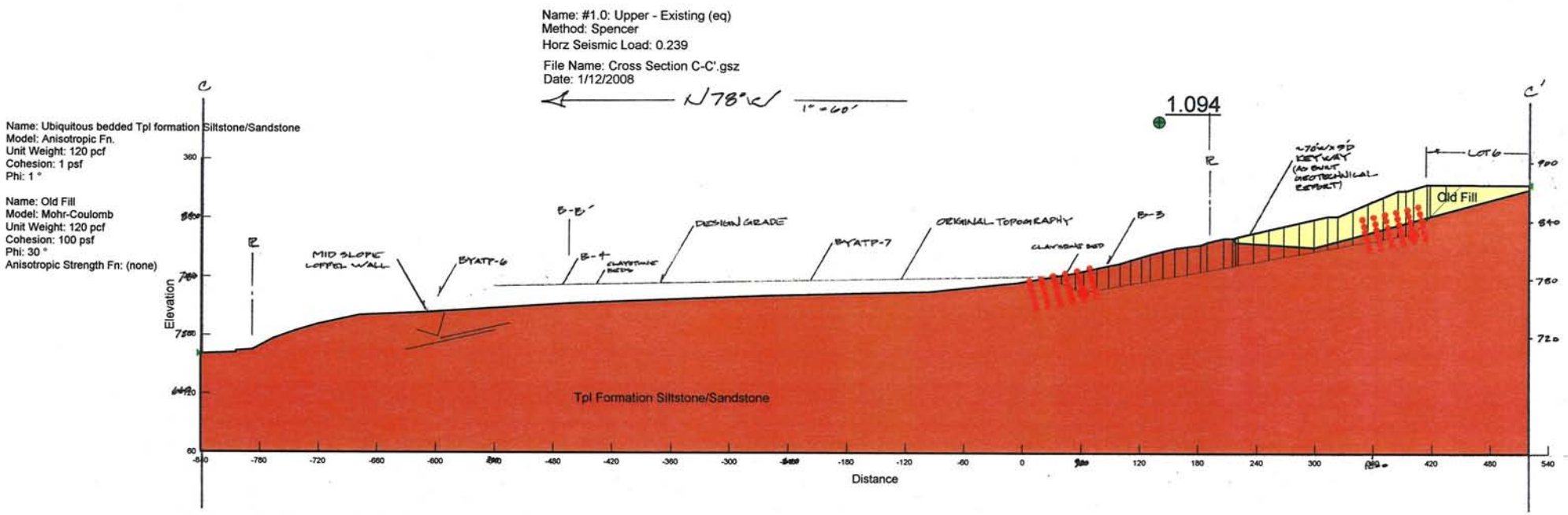


FIGURE D-19b

Name: #3.0: Upper - Proposed
Method: Spencer
Horz Seismic Load: 0.000

File Name: Cross Section C-C'.gsz
Date: 1/12/2008

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

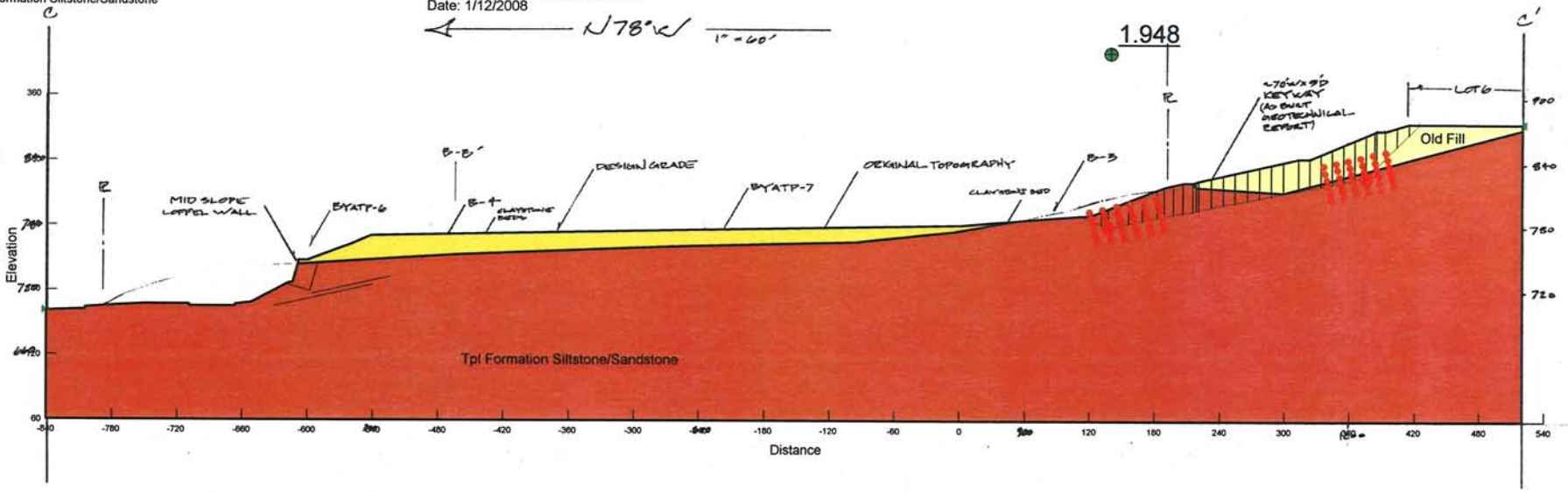


FIGURE D-20a

Name: #3.0: Upper - Proposed (eq)
Method: Spencer
Horz Seismic Load: 0.239

File Name: Cross Section C-C'.gsz
Date: 1/12/2008

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

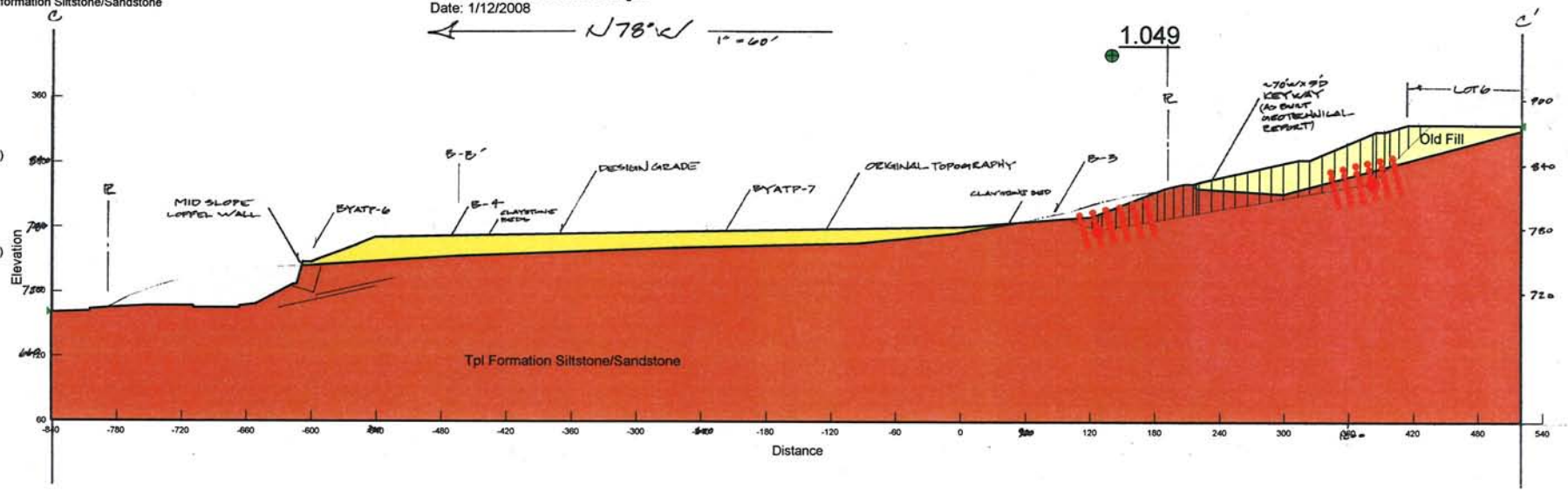


FIGURE D-206

Name: #6.0: Lower - Existing - Upper Shear - Clay Beds
Method: Spencer
Horz Seismic Load: 0.000
File Name: Cross Section C-C' cly bds loffl wll.gsz
Date: 1/11/2008

N78°W 1" = 60'

Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

Name: Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

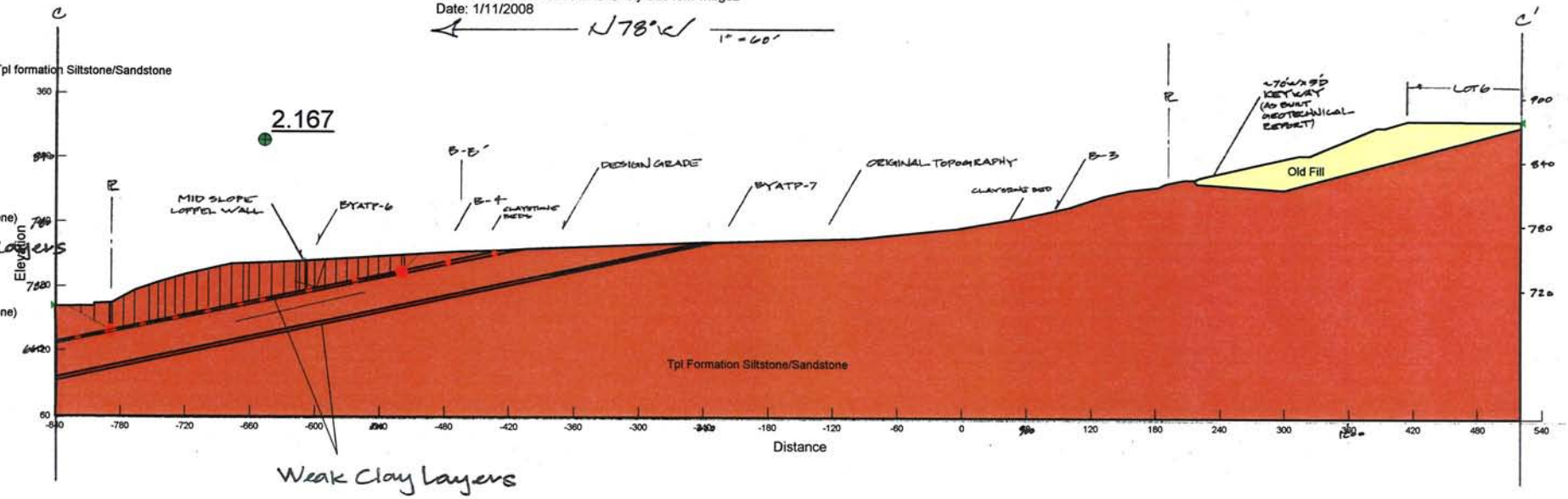


FIGURE D-21a

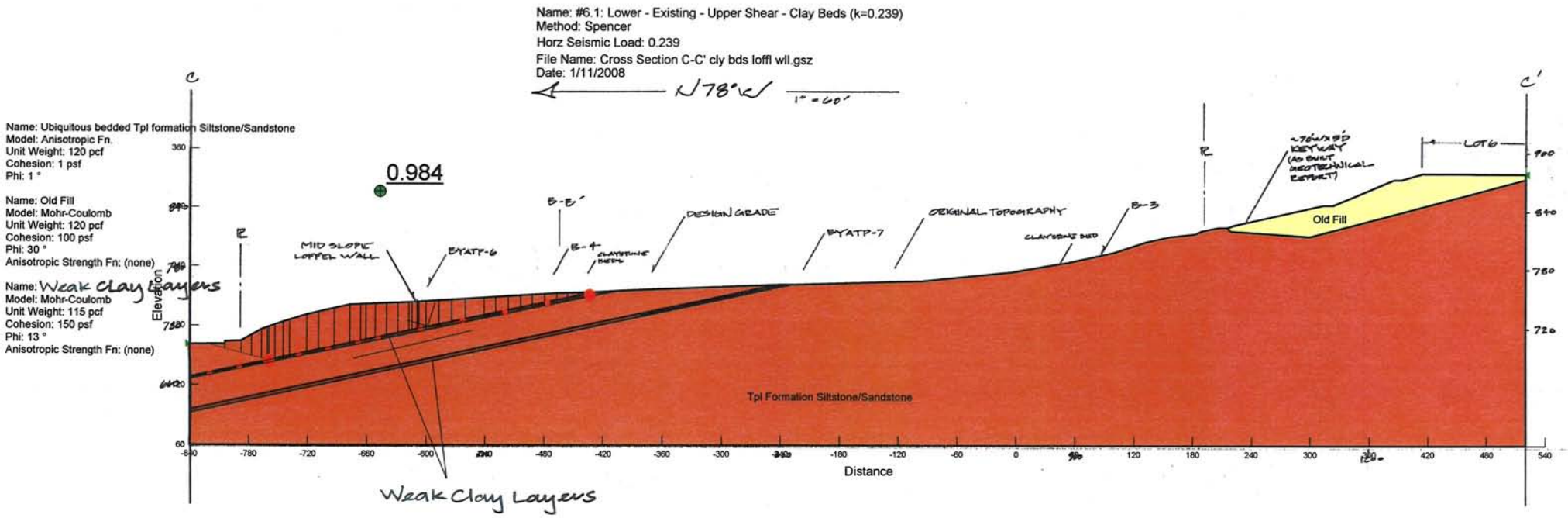

Name: #6.1: Lower - Existing - Upper Shear - Clay Beds (k=0.239)
Method: Spencer
Horz Seismic Load: 0.239
File Name: Cross Section C-C' cly bds loffl wll.gsz
Date: 1/11/2008
N78°W
1" = 60'
C
C'
Name: Ubiquitous bedded Tpl formation Siltstone/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °
Name: Old Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)
Name: Weak clay layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)
0.984
B-B'
B-4
B-3
MID SLOPE LOFFEL WALL
BYATP-6
BYATP-7
DESIGN GRADE
ORIGINAL TOPOGRAPHY
CLAYSTONE BED
CLAYSTONE BEDS
~76'W x 9'D KEYWAY (AS BUILT GEOTECHNICAL REPORT)
LOT 6
Old Fill
Tpl Formation Siltstone/Sandstone
Weak Clay Layers
Elevation
Distance
360
840
780
720
660
600
540
-840
-780
-720
-660
-600
-540
-480
-420
-360
-300
-240
-180
-120
-60
0
60
120
180
240
300
360
420
480
540
900
840
780
720

FIGURE D-21b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

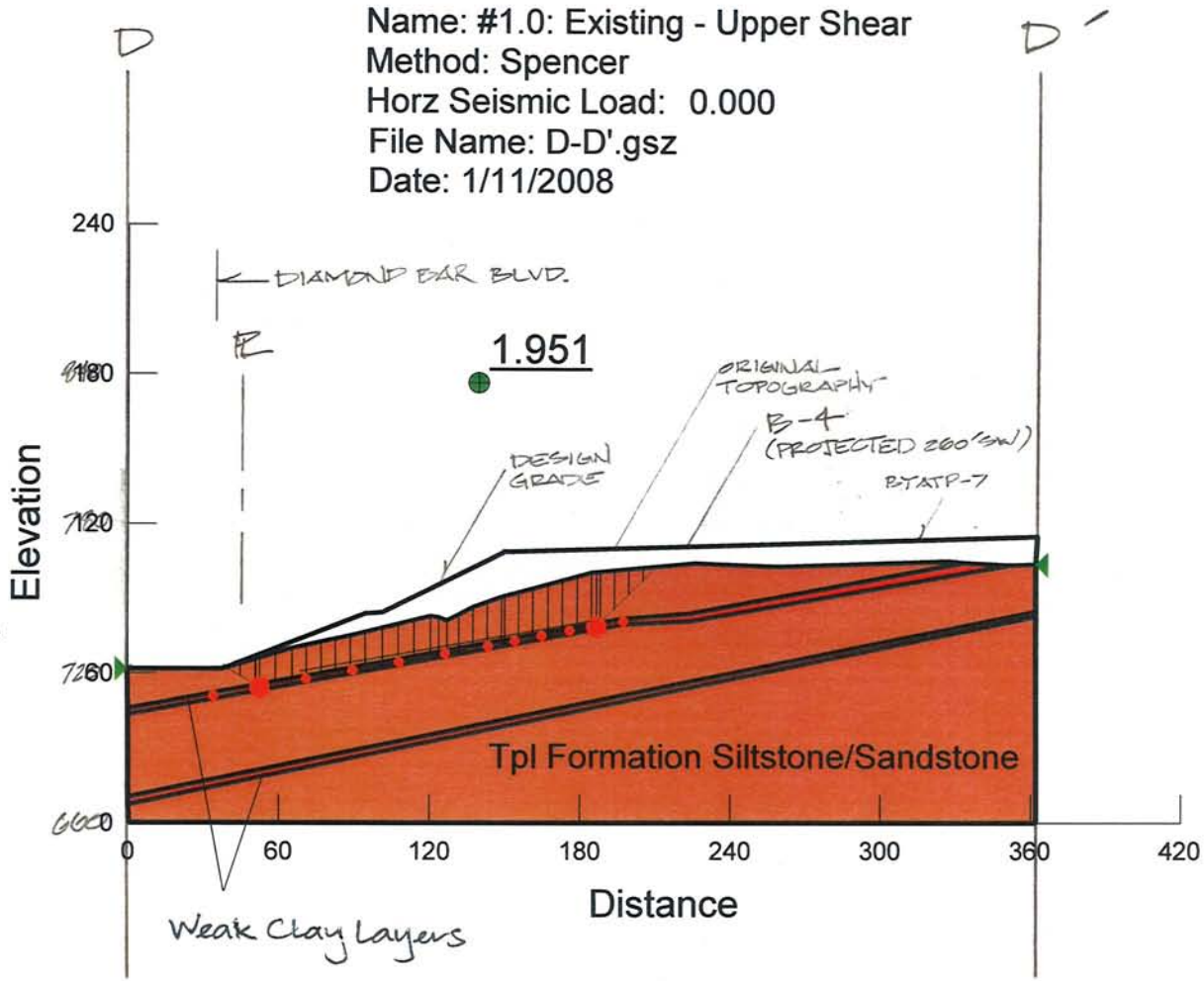


FIGURE D-22a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

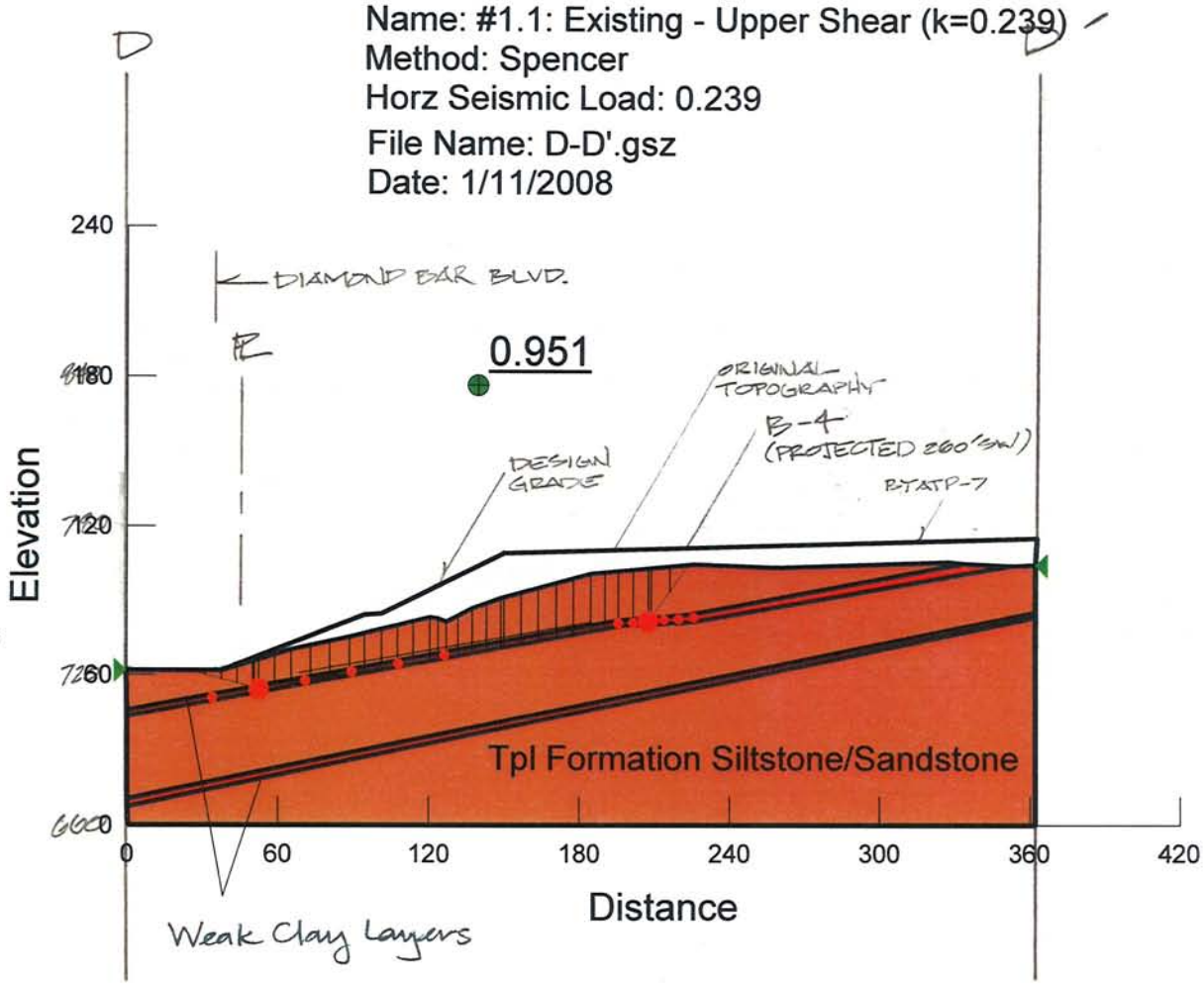


FIGURE D-22b

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

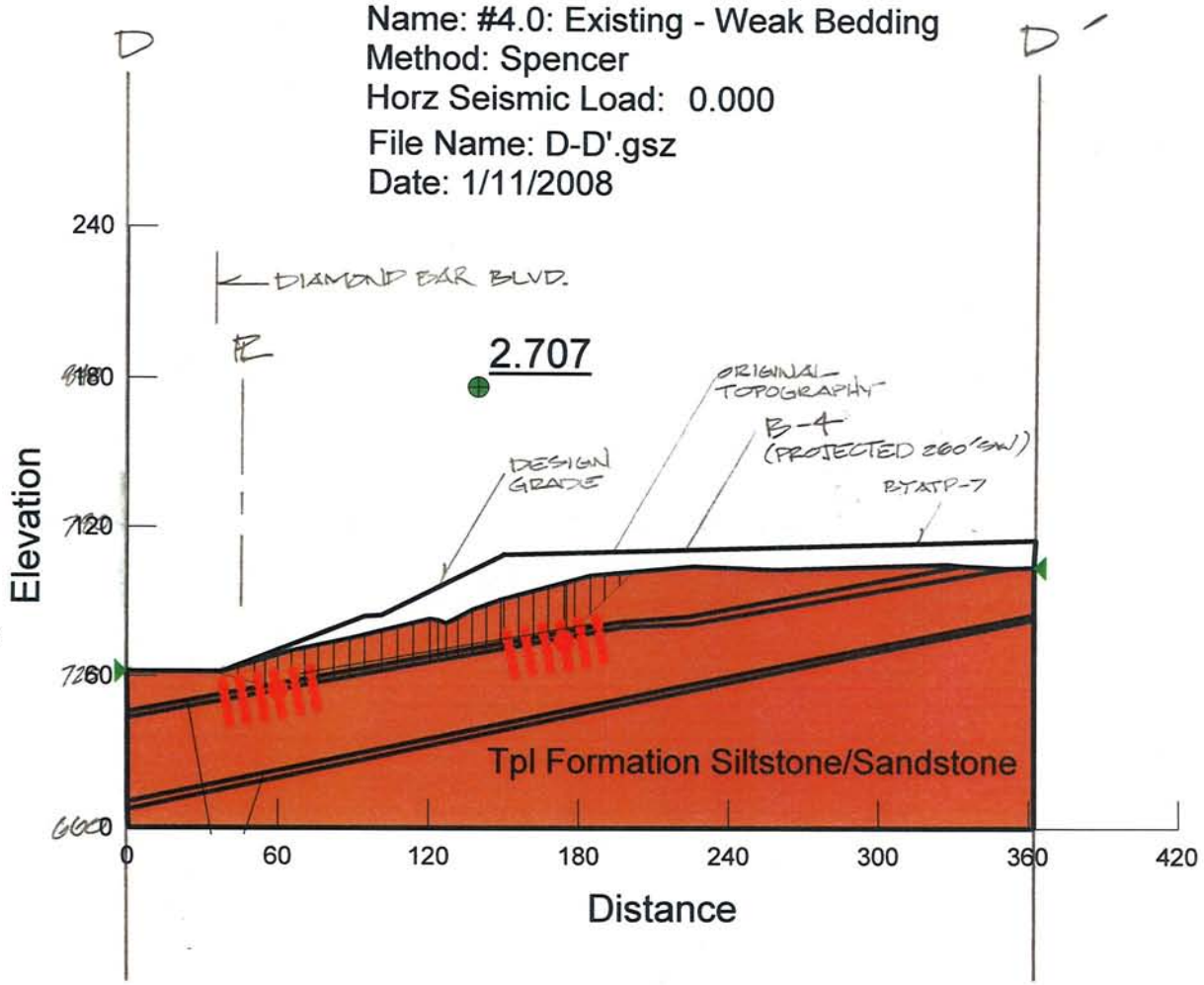


FIGURE D-23a

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

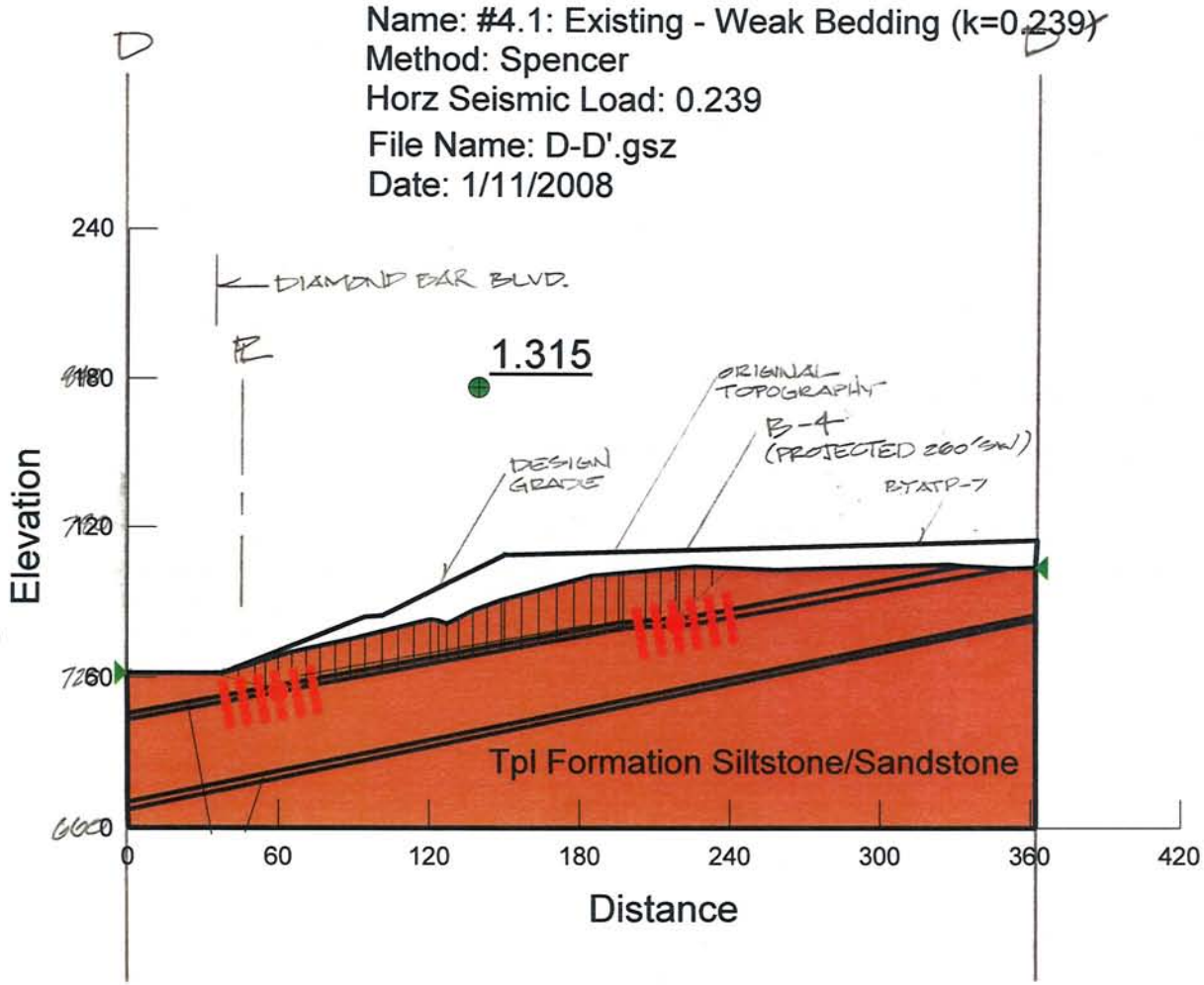


FIGURE D-23b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

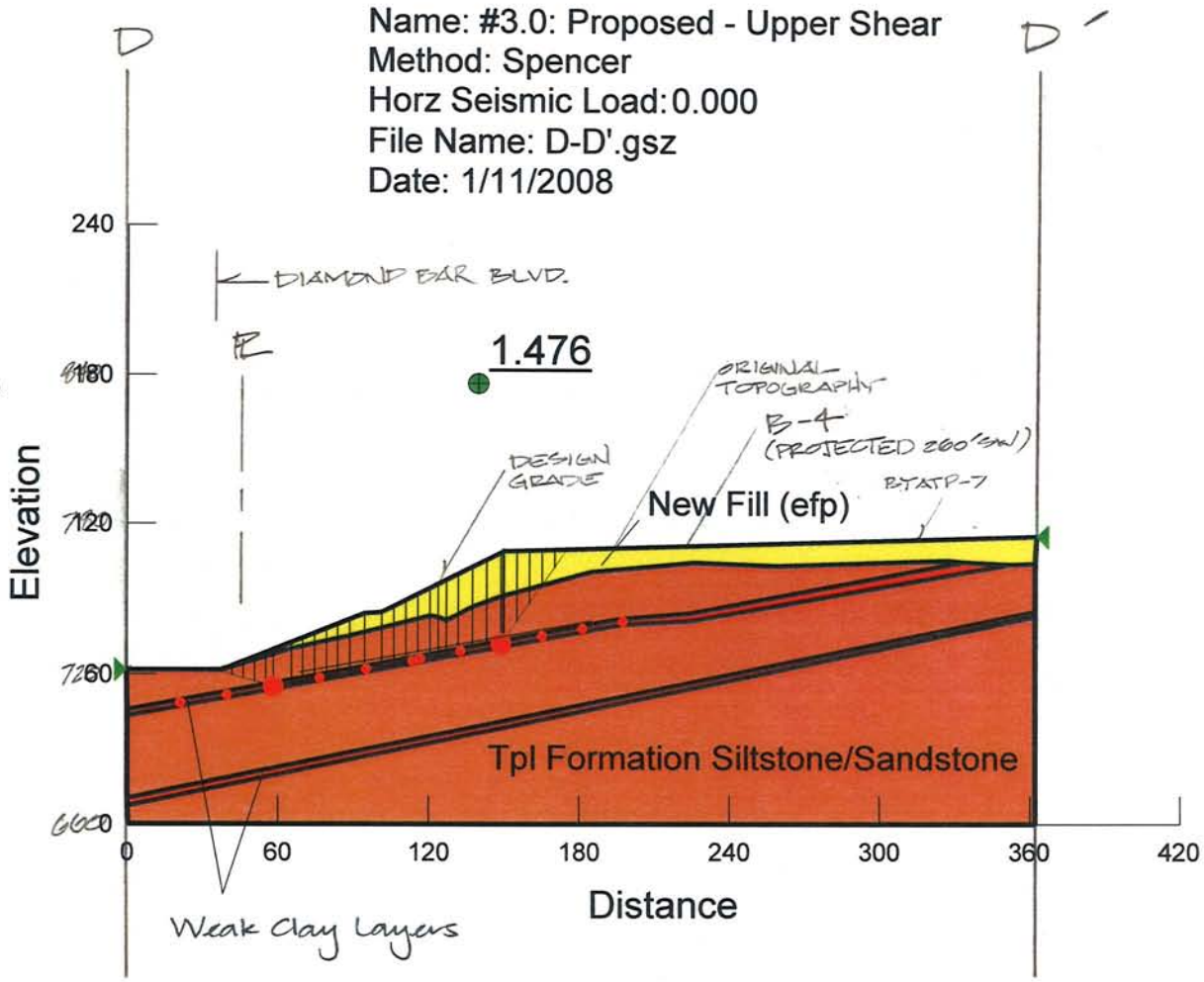


FIGURE D-24a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

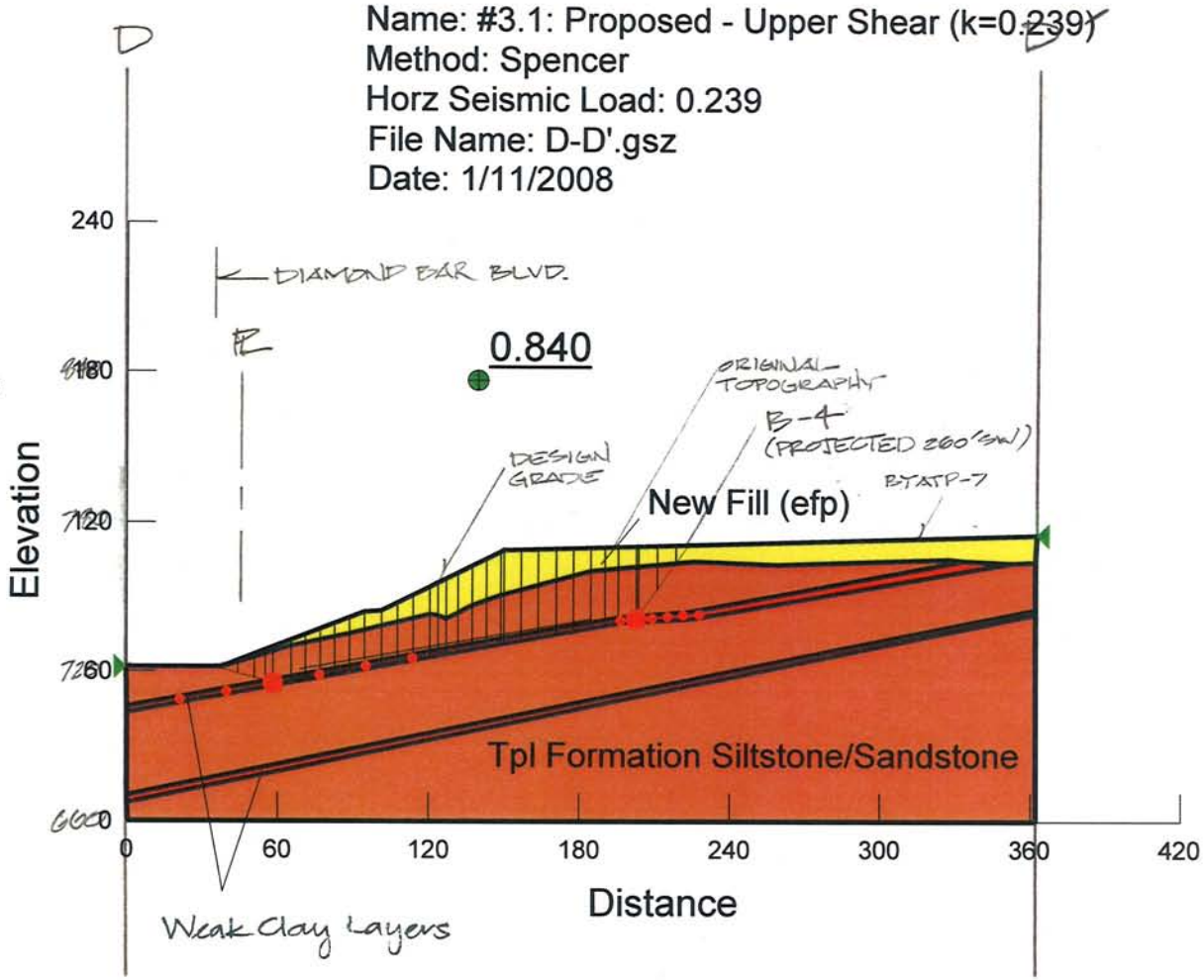


FIGURE D-24b

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 150 psf
Phi: 13 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1 psf
Phi: 1 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 100 psf
Phi: 30 °
Anisotropic Strength Fn: (none)

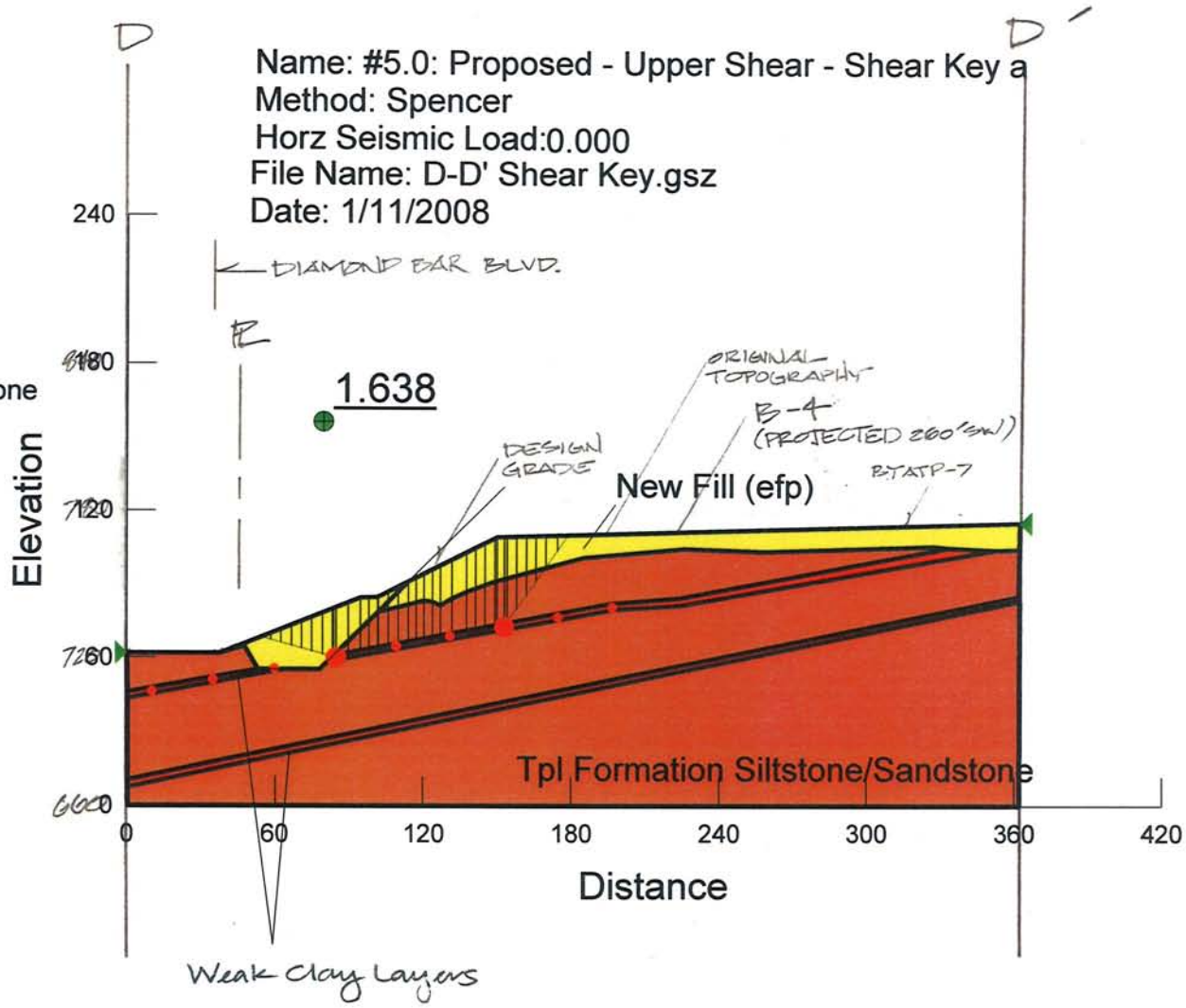


FIGURE D-25a

Name: Tpl Weak Clay Layers
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 180 psf
Phi: 15.6 °
Anisotropic Strength Fn: (none)

Name: Ubiquitous bedded Tpl formation Siltsotne/Sandstone
Model: Anisotropic Fn.
Unit Weight: 120 pcf
Cohesion: 1.2 psf
Phi: 1.2 °

Name: New Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion: 120 psf
Phi: 36 °
Anisotropic Strength Fn: (none)

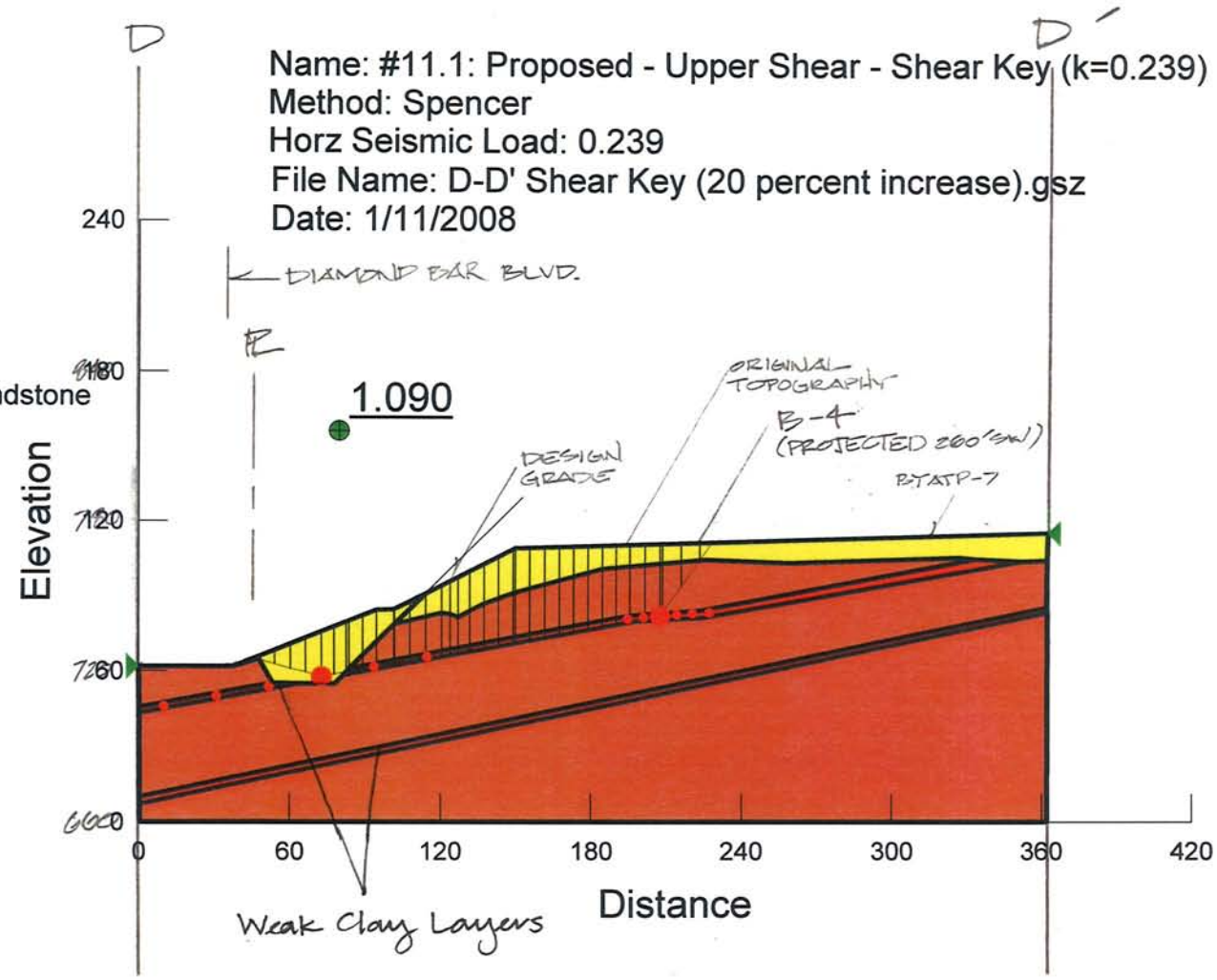


FIGURE D-25b

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Appendix D

Phase I Environmental Site Assessment

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PHASE I ENVIRONMENTAL SITE ASSESSMENT AND LIMITED SITE CHARACTERIZATION SITE D PROPERTY APN's 8714-002-900, -901, -902, AND -903 28 ± ACRES OF VACANT LAND CITY OF DIAMOND BAR LOS ANGELES COUNTY, CALIFORNIA

PROJECT NO. 11903.2
APRIL 30, 2004

Prepared For:

Lewis Investment Company, LLC
1156 N. Mountain Avenue
P.O. Box 670
Upland, California 91785-0670

Attention: Mr. Tom Ashcraft

6121 Quail Valley Court ▲ Riverside, CA 92507 ▲ (909) 653-1760 ▲ Fax (909) 653-1741

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LOR GEOTECHNICAL GROUP, INC.
Soil Engineering ▲ Geology ▲ Environmental

April 30, 2004

Lewis Investment Company, LLC
1156 N. Mountain Avenue
P.O. Box 670
Upland, California 91785-0670

Project No. 11903.2

Attention: Mr. Tom Ashcraft

Subject: Phase I Environmental Site Assessment and Limited Site Characterization, Site D Property, APN's 8714-002-900, -901, -902, and -903, 28 ± Acres of Vacant Land, City of Diamond Bar, Los Angeles County, California

Attached herewith is the Phase I Environmental Site Assessment (ESA) and Limited Site Characterization (LSC) conducted by this firm for the Site D Property, APN's 8714-002-900, -901, -902, and -903, 28 ± Acres of Vacant Land, City of Diamond Bar, Los Angeles County, California.

This Phase I ESA and LSC was planned and executed based upon a scope of services generally outlined in our Work Authorization Agreement dated April 2, 2004.

We appreciate the opportunity to provide this Phase I ESA and LSC for this property. If you have any questions or comments regarding this evaluation, please do not hesitate to contact this firm at your convenience.

LOR Geotechnical Group, Inc.

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EXECUTIVE SUMMARY

The site consists of the Site D Property, APN's 8714-002-900, -901, -902, and -903, approximately 28 acres of native vacant land located in Diamond Bar, Los Angeles County, California. The subject site had been primarily dry farm land with associated structures and some orchard trees from the late-1920's to the 1960's when it became vacant land.

No drums, barrels, or other containers were noted at the subject site. No distressed vegetation or stained soils were noted at the subject site. Some windblown and illegally dumped trash and debris were observed at the subject site.

There are no environmentally impaired properties within one mile of the subject site which would have an adverse environmental impact to the site.

Based on the past agricultural use of the site, a Limited Site Characterization for environmentally persistent pesticides was conducted. The results of our Limited Site Characterization indicated no reportable amounts of organochlorine pesticides, such as DDT, are present in the site soils and unrestricted use of the property appears to be warranted.

Based on the findings of the site investigation and with consideration given to the recommendations contained herein, (1) the subject property exhibits no evidence of recognized environmental conditions that would prohibit its intended use as a residential/mixed use development, except as expressly stated in this report, and (2) no further tests or investigations are recommended except as expressly stated in this report for such intended use.

INTRODUCTION

During April of 2004, a Phase I Environmental Site Assessment (ESA) was conducted by this firm for the Site D Property, Assessor's Parcel Numbers (APN's) 8714-002-900, -901, -902, and -903, approximately 28 acres of native vacant land, located in the City of Diamond Bar, Los Angeles County, California. This Phase I Environmental Site Assessment was conducted for Lewis Investment Company, LLC ("Lewis") and their designate(s) in general conformance with the standard practice for Environmental

Site Assessments (ASTM E 1527-00). The purpose of this Phase I ESA is to identify, to the extent feasible pursuant to the processes described within, recognized environmental conditions in connection with the property and its intended use by Lewis for residential/mixed-use development.

Concurrent with our Phase I ESA, a Limited Site Characterization (LSC) was conducted. The LSC was conducted to assess concentrations of organochlorine pesticides present in the site soils which may be present from past agricultural activities.

The location of the site, within its regional settings, is presented on the enclosed Index Map, Enclosure A-1, within Appendix A.

The scope of work included: 1) A reconnaissance of the site and surrounding properties; 2) collection of soil samples for organochlorine pesticide analysis; 3) review of the data available from various regulatory agencies; 4) interviews with public and regulatory agencies; and 5) preparation of this report.

The findings of our Phase I ESA and LSC, as well as our conclusions and recommendations, are presented in the following sections of this report.

NON-SCOPE CONSIDERATIONS

The following environmental issues are outside the scope of ASTM E 1527-00 and were not addressed in this report:

- Radon
- Lead in Drinking Water
- Lead-Based Paint
- Wetlands
- Cultural Land Historical Resources
- Industrial Hygiene
- Health and Safety
- Ecological Resources
- Endangered Species
- Indoor Air Quality
- Mold and Mildew
- Asbestos

METHODOLOGY AND PROCEDURES

During our research for this site assessment, various public agencies and individuals were contacted in order to provide insight into the previous and current uses of the site with respect to hazardous materials and/or toxic waste. Local agencies, such as the Los Angeles County Department of Environmental Health, Department of Public Works, and Fire Department were contacted for information about the site with respect to potential environmental concerns.

Concurrent with our public and governmental agency interviews and literature research, a site reconnaissance of the property was conducted. The site reconnaissance was conducted in order to determine current uses of the site and the potential for soil and/or possible groundwater contamination based on aboveground visual observation.

Federal, state, and county lists and databases were reviewed to ascertain the presence of known environmentally impaired sites within the area of the site and to determine their impact, if any, to the subject site.

Aerial photographs, on file at Continental Aerial Photo, Inc., were examined at various time intervals from 1953 through 1999 to investigate the past use of the site and the surrounding region. Environmental Data Resources, Inc. (EDR) provided aerial photographs from 1928 through 2002 for inclusion in this Phase I ESA Report, which were also examined.

GEOLOGIC AND HYDROLOGIC SETTING

The subject site is located along the northwestern foothills of the Chino Hills. The Chino and nearby Puente Hills make up the far northwestern end of the Peninsular Ranges Geomorphic Province of southern California. The Peninsular Ranges Geomorphic Provinces is characterized by a series of small, northwest trending, mountain ranges that begin down in the California Peninsula of Baja California and extends northward to San Diego County, Orange County, and up to the Los Angeles Basin. The bedrock underlying the site is composed of the Puente Formation named for a series of near shore marine sedimentary rocks of late Miocene age (about 5 million years) exposed across much of the Puente Hills, Chino Hills, and along the

northern end of the Santa Ana Mountains. These units are composed of a very thick sequence of alternating sandstones and siltstones with lessor amounts of conglomerates, and mudstones. Past authors have divided the Puente Formation into four members, from bottom to top, these are the La Vida, the Sycamore Canyon, the Yorba, and the Sycamore Canyon members.

Structurally, the site lies within the Northeastern Block of the Los Angeles Basin. This block has been uplifted along the Whittier fault zone, which lies along the southwestern margin of the block, and the Chino fault zone, which lies along the eastern margin of the block. This is a seismically active region of southern California.

Based on information available from the California State Geotracker Database for the ARCO gasoline station (#6212) located at the southwest corner of Diamond Bar Boulevard and Brea Canyon Road, shallow groundwater in the local area of the subject site flows southwesterly. The groundwater elevation beneath the ARCO gasoline station is estimated at 657 feet above mean sea level, which is approximately 20 feet below the ground surface. The groundwater beneath this gasoline station is contaminated with benzene, ethylbenzene, xylenes, methyl *tert*-butyl ether (M*t*BE), and *tert*-butyl alcohol (*t*BA). These fuel constituents are not anticipated to impact the site based on the position of the subject up- to cross-gradient of the gasoline station and higher topographic relief. Groundwater at the site will be variable depending on bedrock and drainage features present.

HISTORY OF SITE USAGE

To obtain a comprehensive history of previous site usage, a representative from this firm requested a search for aerial photographs of the area on file at Continental Aerial Photo, Inc. for review.

Aerial Photograph Review

A search was conducted by this firm for available stereo pairs of aerial photographs of the area on file in the Continental Aerial Photo, Inc. collection. The search provided aerial photographs taken of the subject site and surrounding area in 1953, 1960, 1975, 1976, 1978, 1979, 1981, 1983, 1987, 1988, 1990, 1993, 1995, 1997, and 1999, the latest photograph available. We also looked at the aerial photographs

provided by EDR from 1928, 1938, 1947, 1953, 1968, 1976, 1989, 1994, and 2002, which are provided in this Phase I ESA Report for historical reference; the subject site was essentially the same from the 1920's to the 1950's, including dry farm land with associated structures and some orchard trees and native land.

The Continental Aerial Photo, Inc. aerial photographs reviewed consisted of vertical aerial stereo graphic photographic pairs of varying scales. These photographs were viewed using stereoscopes with magnifications of 2X, and 4X for three-dimensional enhancement. Due to the relatively large photographic scales involved, the analysis and subsequent interpretation of detail from aerial photographs sometimes requires a degree of subjective judgement. The degree of certainty on the interpretation of details depends upon such factors as the scale and the quality for the photograph. However, an analysis of aerial photographs will reveal the general site history as to the relative us of the land, possible ground disturbance, activities, etc.

A summary of the site and surrounding conditions during the various times, as reflected in the photographs, is presented below.

1. **January 2, 1953, Photo Nos. AXJ-9K-108 and AXJ-9K-109, Scale 1" = 1,700'**

These early photographs reveal that the subject site lies in Brea Canyon, which is the transition from the Chino Hills to the east to the Puente Hills to the west. The site lies at the base of the Chino Hills on the west side. Slopes at the site appear to range from gentle to moderate. Drainage features are present at the site. The site appears to include dry farm land, some orchard trees, some native vacant land, and a few structures, possibly including a residence. Numerous trees are present at the site, some native and some were probably planted. A wide dirt road leads to the structures to the southeast from a dirt or paved road along the present day alignment for Diamond Bar Boulevard. The properties immediately surrounding the site are primarily either dry farm land or native vacant land; however, there are at least a few structures to the north beyond Diamond Bar Boulevard, which are amongst numerous trees. The structures appear to include a very large house, possibly a mansion, and a large storage structure. There also appears to be an empty or partially full pool or reservoir present just east of the house.

A two-lane roadway lies approximately 500 feet northwest of the subject site along the present day alignment of the 57 Freeway. Brea Canyon Cutoff, which may be paved, is present on the west side of the present day alignment for the 57 Freeway. The landscape in the photographs is dominated by orchards, dry farm land, and hills with native vegetation and associated drainage features. Minor structural development is evident in the photographs.

2. **March 29, 1960, Photo Nos. 311-2 FL.63-3 and -4, Scale 1" = 1,050'**

The subject site and surrounding region are essentially as previously described.

3. **January 13, 1975, Photo Nos. 157 7-5 and 7-6, Scale 1" = 2,000'**

The structures and orchard trees at the subject site are absent and farming is no longer present; there appears to be some concrete remaining in the area of the former structures. There are numerous dirt roads and trails at the site. There is a significant drainage channel in the southwest portion of the site. There appear to be concrete drainage swales present along the north side of the site where there are steep slopes present. The large storage structure at the property immediately north is gone. Significant development has occurred near the site and in the region. Residential tracts are now present to the southwest and northeast of the site. The site is presently bordered to the west by a concrete flood control channel. There has been some cutting down of the natural topography for the construction of Diamond Bar Boulevard, which is now a two-lane paved road that borders the site to the north. Other major paved roads include Brea Canyon Road and Brea Canyon Cutoff. Two commercial properties with structures are present at the northwest and southwest corners of Diamond Bar Boulevard and Brea Canyon Road, which are the locations of the present day Shell and ARCO gasoline stations; the configuration of the buildings at the northwest corner coincide with that of the present day Shell station, while those at the southwest corner do not coincide with the present day ARCO station.

The interchange for the 57 and 60 Freeways is present. The 60 Freeway leading from the west merges with the 57 Freeway heading northeast. These freeways have multiples lanes going east/west and south/north, on- and off-ramps, and overpasses and underpasses.

Significant commercial and residential development is evident in the photographs. Orchards are decreasing, and most of the agricultural land still present appears to be north of the 60 Freeway. There is a large round aboveground storage tank approximately 600 feet southeast of the site. This tank appears to coincide with the present day Walnut Valley Water District water tank reservoir.

4. **October 24, 1975, Photo Nos. 39 and 40, Scale 1" = 2,000'**

The subject site and surrounding region are essentially the same as shown in the previous photographs; however, there appears to be a very small structure in the northwest corner of the site along Diamond Bar Boulevard. This structure is too small to identify, and may be associated with a utility of some sort.

5. **December 28, 1976, Photo Nos. 181 7-5 and 7-6, Scale 1" = 2,000'**

The subject site and surrounding areas are essentially as previously described. There is some additional residential development evident in the photographs.

6. **December 10, 1978, Photo Nos. 203 7-6 and 7-7, Scale 1" = 2,000'**

The subject site appears to be currently used for access to a large residential tract under construction to the south, southeast, and east. As a result, areas of cleared vegetation are present. The tract under construction has enveloped the aboveground water reservoir tank. Concrete drainage swales are present as part of the residential tract construction, some of which appear to encroach on the site. The remaining structures to the north have been demolished with some debris evident. There is a new commercial building present north of the site beyond Diamond Bar Boulevard, situated between the concrete flood control channel and Brea Canyon Road.

Some additional residential and commercial development are evident in the photographs. Commercial development under construction is evident adjacent to the north of the present day Shell station.

7. May 12, 1979, Photo Nos. 7-61, 7-62, and 7-63, Scale 1" = 3,000'

The subject site is essentially as previously described. The property to the north is graded, probably for either residential or commercial development.

8. January 31, 1981, Photo Nos. 211 7-3 and 7-4, Scale 1" = 2,000'

The very small structure in the northwest corner of the site along Diamond Bar Boulevard appears to be absent. There appear to be several vehicles present at the site, possibly associated with the residential tract under construction to the south and east, which is approaching completion. A small tract of homes has been added north of the site.

Some additional residential and commercial development has occurred.

9. April 2, 1983, Photo Nos. 218 7-5 and 7-6, Scale 1" = 2,000'

Stereo coverage was not available for the subject site and surrounding properties. The subject site is essentially as previously described. There is a large structure now present north of the site.

Continued residential and commercial development is evident.

10. January 8, 1987, Photo Nos. F 167 and F 168, Scale 1" = 2,800'

The subject site and surrounding properties are essentially the same as shown in the previous photographs.

Additional residential and commercial development has occurred in the region.

11. July 7, 1988, Photo No. 19122, Scale 1" = 2,200'

Stereo coverage was not available for the subject site and surrounding properties. The subject site and surrounding properties are essentially as previously described; however, the residential tract to the east and south is complete.

Continued residential and commercial development is evident in the photograph.

12. June 12, 1990, Photo Nos. C83-12-35 and -36, Scale 1" = 2,900'

The subject site and surrounding properties are essentially as previously described.

13. May 19, 1993, Photo Nos. C92-18-126 and -127, Scale 1" = 2,000'

The subject site and surrounding properties are essentially as previously described.

14. July 11, 1995, Photo Nos. C114-30-63 and -64, Scale 1" = 2,000'

The subject site and surrounding properties are essentially as previously described; however, the configuration of structures at the location of the present day ARCO station have changed to match those currently present.

15. October 16, 1997, Photo Nos. C119-30-180 and -181, Scale 1" = 2,000'

The subject site and surrounding properties are essentially as previously described.

Some additional residential development has occurred.

16. February 23, 1999, Photo No. C133-30-27 and -28, Scale 1" = 2,000'

The subject site and surrounding properties are essentially as previously described.

Copies of electronic aerial photographs of the site taken in 1928, 1938, 1947, 1953, 1968, 1976, 1989, 1994, and 2002, provided by Environmental Data Resources, Inc. (EDR), are included within Appendix B.

SITE RECONNAISSANCE

A site reconnaissance was conducted on April 20, 2004 by Mr. Mathew L. Hunt of this firm. To orient our site reconnaissance, an Assessor's Parcel Map and Recent Site Aerial Photograph were provided by the client. A copy of the Assessor's Parcel Map

and Recent Site Aerial Photograph are presented as Enclosures A-2 and A-3, within Appendix A.

The subject site is irregular in shape, and is comprised of APN's 8714-002-900, -901, -902, and -903, approximately 28 acres of native vacant land located in Diamond Bar, California. The site is comprised of vacant land with moderate to dense, primarily native vegetation on lower hillsides and old terraces. Drainage from the site is generally to the northwest by sheet flow and drainages; sheet flow is captured by some concrete drainage swales. The site sits topographically higher than the property to the north and west with moderate to steep northwest slopes. Vehicular access to the site is obtained at the end of Pasado Drive through a locked gate that leads to a dirt road into the site. Pasado Drive borders the site to the south. There is a fence present at this entrance to the site from Pasado Drive, as well as two sections of fence with gates along the north side of the site, which appear to be former entrances to the site. Several dirt roads and motorcycle trails are present at the site, including soil motorcycle ramps and associated small excavations. A couple of small sections of remnant asphalt drives are present in the northeast portion of the site just south of Diamond Bar Boulevard.

Power poles and lines are present off-site along the southwest and northwest boundaries. Two small power poles are present along the north site border, which support tension cables for power poles and lines running along the north side of Diamond Bar Boulevard. There is a curb and gutter along Diamond Bar Boulevard, but no sidewalk, except for a small section associated with a bus stop. Various utilities are present along Diamond Bar Boulevard, including water, natural gas, storm drain, and sanitary sewer.

Significant windblown and illegally dumped trash and debris including plastic, metal, cardboard, paper, glass, wood, concrete, asphalt, a mattress, a sofa, and green waste are present predominantly in the central portion of the site.

No drums, barrels, or other containers were observed at the subject site that might adversely impact the site. No stained soils, unusual odors, or distressed vegetation were noted.

Adjacent Properties

The subject site is located in a residential/commercial area with single-family residences located southwest, south, southeast, east, northeast, and north of the site. A church property and other commercial properties which include a suite of offices, an ARCO gasoline station, and a Shell gasoline station are located north, northwest, and west of the site. The site is bordered to the north by Diamond Bar Boulevard, a four-lane paved roadway. There is a concrete-lined flood control channel (Brea Canyon Channel) that borders the site to the west. Brea Canyon Road, a four-lane paved roadway, is located just west of the flood control channel. The ARCO and Shell gasoline stations are located on the west side of Brea Canyon Road where it intersects with Diamond Bar Boulevard. Vacant land is present to the west, east, and south, most of which is hilly vacant land with native vegetation including trees and underbrush.

No drums, barrels, or other containers were noted on the immediately adjacent properties that might adversely impact the site.

Color photographs of the subject site and adjacent properties are presented with in Appendix A.

REGULATORY AGENCY RECORDS REVIEW

County and Local agencies were contacted and a records search was performed in an effort to identify any known environmentally impaired (hazardous waste/substance) sites or incidents of hazardous waste storage or disposal violations on the subject property.

For records relating to environmental compliance and hazardous materials/waste within the City of Diamond Bar, the County of Los Angeles Department of Health Services (DHS) is generally the lead agency. The DHS sent a fax on April 13, 2004, indicating that they need a specific address to search for records; therefore, no records are available from this agency.

The County of Los Angeles, Department of Public Works, Environmental Programs Division (EPD) was also contacted, and verbally informed us that they had no records on file for underground storage tanks (UST's) or industrial waste for the subject site.

The County of Los Angeles Fire Department, Forestry Division was contacted for any records they may have on the subject site. At the time of this report, they have not completed our request for records. Based on the site being vacant land throughout much of its researched history and lack of records found by either County of Los Angeles DHS or EPD, we do not anticipate any records will be found; however, if records are found, they will be forwarded under separate cover.

ENVIRONMENTAL DATABASE REVIEW

LOR Geotechnical Group, Inc., contracted with EDR to provide an environmental database search for the subject site. The database search provides information regarding landfills, underground storage tanks, hazardous waste generators, etc., on the site and surrounding properties in accordance with ASTM Standards. The search radius was expanded 1/8 mile due to the size of the site. Many mapped sites were found in EDR's search of available government records within the expanded ASTM search radius. A copy of the EDR report, which provides a complete list of the ASTM and non-ASTM databases searched, is provided within Appendix C. A summary of the ASTM databases are tabulated below:

FEDERAL DATABASES		
Database Abbreviation	**Search Distance (miles)**	**Results**
NPL	1.125	None
Proposed NPL	1.125	None
CERCLIS	0.625	None
NFRAP	0.375	None
CORRACTS	1.125	None
RCRIS - TSD	0.625	None
RCRIS - Lg. Quantity Generator	0.375	None

Database Abbreviation	Search Distance (miles)	Results
RCRIS - Sm. Quantity Generator	0.375	3 Sites, See Below
ERNS	0.125	None
STATE DATABASES		
AWP	1.125	None
Cal-sites	1.125	None
CHMIRS	0.125	None
Cortese	0.625	3 Sites, See Below
Notify 65	1.125	None
Toxic Pits	1.125	None
State Landfills	0.625	None
WMUDS/SWAT	0.625	None
LUST	0.625	3 Sites, See Below
CA Bond Exp. Plan	1.125	None
UST	0.375	1 Site, See Below
VCP	0.625	None
INDIAN LUST	0.5	None
INDIAN UST	0.375	None
CA FID UST	0.375	None
Hist. UST	0.375	2 Sites, See Below

RCRIS Small Quantity Generators

The Environmental Protection Agency (EPA) Resource Conservation and Recovery Information System (RCRIS) listed three small quantity hazardous waste generators within 0.5 miles of the subject site. No adverse environmental impact to the subject site is anticipated from these small quantity generators due to the lack of reported violations.

Cortese

The California EPA Office of Emergency Information annually publishes a list of potential and confirmed hazardous waste sites, solid waste landfills, leaking underground storage tanks, and public wells with detectable levels of contaminants throughout the State of California. The Cortese list was reviewed to identify sites within 1.125 miles of the subject site. There are three sites identified on this list within that radius. All three had leaking underground storage tanks. Two of the listed sites are within approximately 300 feet of the site. These are the ARCO of Diamond Bar and Shell #204-2173-0308 located at 3302 South Diamond Bar Boulevard and 3241 South Brea Canyon Road, respectively. The ARCO site has contaminated soil and shallow groundwater with gasoline compounds, and remedial action, including vapor extraction is underway. The Shell site had an environmental case involving gasoline contamination of soil and shallow groundwater, which was closed in 1996. The third site listed, Unocal Corporation SS 5683 at 2875 South Diamond Bar Boulevard, had a soil-only environmental case involving gasoline that was closed in 1996. No adverse environmental impact to the subject site is anticipated from these LUST sites based on one or more of the following: distance from the subject site, estimated local groundwater flow direction, environmental case closure, and higher topographic relief of the subject site.

LUST

The State Water Resource Control Board (SWRCB) maintains a list of all leaking underground storage tanks (LUST) within the state. According to the SWRCB LUST database, there are three sites with within 0.625 miles of the site. The sites listed are the ARCO of Diamond Bar, Shell #204-2173-0308, and Unocal Corporation SS 5683, which are all included in the discussion above in the Cortese section of this report.

UST

The Underground Storage Tank (UST) database is maintained by the SWRCB and lists all registered UST's. This database listed one site within 0.375 miles of the subject site. This site is the Diamond Bar Shell, which is included in the discussion above in the Cortese section of this report.

HIST UST

The SWRCB maintains the Historical UST List which contains active and inactive UST locations. This database listed two sites within 0.375 miles of the subject site. These sites are the ARCO #05914 and Tulsi - Savani, which have addresses that coincide with the ARCO and Shell sites included in the discussion above in the Cortese section of this report.

Division of Oil, Gas, and Geothermal Resources

The California Division of Oil, Gas, and Geothermal Resources maintains a list of all producing and abandoned oil and gas wells within the State of California. Maps of the area were reviewed, and several locations of drilled, plugged, and abandoned dry holes were found. The closest two locations are approximately 0.6 miles west of the subject site, which were performed by El Rancho Exploration Company in 1946 to 2,240 feet deep and by Fairco Drilling and Development Company in 1953 to 1,641 feet deep.

Geotracker

The California State Water Resources Control Board maintains an online database, Geotracker, for UST and LUST sites. The subject site did not appear in the database as either a UST or LUST site; however, the ARCO #6212 at 3302 Diamond Bar Boulevard just west of the site is listed as a LUST site. This ARCO site has contaminated soil and shallow groundwater with benzene, ethylbenzene, xylenes, M*t*BE, and *t*BA. This site is included in the RCRIS Small Quantity Generators, Cortese, LUST, HIST UST, and Orphan Summary sections of this report, and is not anticipated to have an adverse environmental impact to the site due to estimated local groundwater flow direction and higher topographic relief of the site. ARCO Products 05914 listed at 3302 South Diamond Bar Boulevard coincides with the location of the ARCO #6212, and is listed as an UST site. Diamond Bar Shell listed at 3241 South Brea Canyon Road is located just northwest of the site, and is included in the Cortese, LUST, UST, and Orphan Summary sections of this report. The Diamond Bar Shell is not anticipated to have an adverse environmental impact to the site due to estimated local groundwater flow direction and higher topographic relief of the site.

Orphan Summary

The orphan summary, which is a list of all sites whose location is not readily identified and may be near the site was reviewed. Our review of this list indicated there were no listed sites on or immediately adjacent to the subject site, and there should be no impact from these sites due to their distance from the subject site; however, the ARCO Products 05914 listed at 3302 South Diamond Bar Boulevard under the UST database is located within approximately 300 feet to the west of the site. This site is included in the discussions in the following sections of this report: RCRIS Small Quantity Generators, Cortese, LUST, and HIST UST.

Database Summary

Based on the information provided by the public, regulatory and governmental agencies, and information obtained during our records search, and database review, the subject site does not appear to be a hazardous waste property or border zone property as defined in Section 25221 of the State of California's Health and Safety Code.

LIMITED SITE CHARACTERIZATION

Our research indicates the site has had farming activities since at least the 1920's. Due to this extended agricultural history, we performed a Limited Site Characterization which involved sampling of the near surface soils for organochlorine pesticides. Organochlorine pesticides, such as dichlorodiphenyltrichloroethane (DDT), were historically used for pest control on agricultural properties. These types of pesticides can be highly persistent in the environment. The sampling was conducted randomly over the site using a hand trowel to obtain samples at depths of 6 to 12 inches deep. The locations of the samples taken are presented in the Enclosure D-1, Soil Sample Location Map, within Appendix D.

Soil Sampling Methodology and Procedure

The field sampling equipment consisted of a clean hand trowel and clean glass jars.

To minimize the chance of cross-contamination between samples, all sampling equipment was decontaminated prior to its use in the following manner:

- Wash with water and Alconox detergent solution
- Rinse twice with distilled water

A total of three soil samples were obtained from a depth of 6 to 12 inches deep by transferring soil from the trowel into a clean glass jar. The soil was examined for signs of staining, discoloration, or odors. The samples did not exhibit any noticeable staining, discoloration or odors. The glass jar was sealed with a Teflon lined cap and immediately placed in a cooler for transport to the laboratory. Chain-of-Custody (CoC) documentation was maintained and accompanied the samples to the laboratory.

All field work was documented in the following manner. The sample labels were filled out with the sample number, location, depth, and the date and time of sampling. Upon delivery of the samples to the laboratory for analysis, the CoC form was signed by authorized personnel and a copy was retained by LOR. The samples were analyzed by Centrum Analytical Laboratories, a state-certified hazardous waste testing laboratory.

The quality assurance/quality control (QA/QC) program in effect during the performance of all field activities included the following items:

- Complete documentation of all field activities.
- Use of appropriate CoC forms.
- Use of clean sampling equipment.
- Proper equipment decontamination according to accepted Environmental Protection Agency (EPA) Protocol.

Laboratory Test Results

Laboratory analysis was conducted on all 3 soil samples. The samples were analyzed for the presence of organochlorine pesticides such as DDT using EPA Method 8081A. The results are summarized in the following table:

Sample No.	Pesticide (mg/kg)
S-1	ND
S-2	ND
S-3	ND

mg/kg - milligrams per kilogram (parts per million)
ND - none detected

The results of this initial testing indicated no reportable concentrations of organochlorine pesticides were present in the near surface soils. These test results indicate no further testing for pesticides is deemed necessary and unrestricted use of the property appears to be warranted.

A copy of the Centrum Analytical laboratory results and Chain-of-Custody are presented within Appendix D.

CONCLUSIONS AND RECOMMENDATIONS

The subject site had been primarily dry farm land with associated structures and some orchard trees from the late-1920's to the 1960's when it became vacant land.

No drums, barrels, or other containers were noted at the subject site. No distressed vegetation or stained soils were noted at the subject site. Some windblown and illegally dumped trash and debris were observed at the subject site.

There are no environmentally impaired properties within one mile of the subject site which would have an adverse environmental impact to the site.

Based on the past agricultural use of the site, a Limited Site Characterization for environmentally persistent pesticides was conducted. The results of our Limited Site Characterization indicated no reportable amounts of organochlorine pesticides, such as DDT, are present in the site soils and unrestricted use of the property appears to be warranted.

We have performed this Phase I ESA in general conformance with the Scope of Work required by ASTM Standard E 1527-00 for Lewis Investment Company, LLC. Based on the findings of the site investigation and with consideration given to the recommendations contained herein, (1) the subject property exhibits no evidence of recognized environmental conditions that would prohibit its intended use as a residential/mixed-use development, except as expressly stated in this report, and (2) no further tests or investigations are recommended except as expressly stated in this report for such intended use.

STATEMENT OF QUALIFICATIONS

Mr. M. Kevin Osmun has over 18 years experience in the environmental field. Mr. Osmun directs LOR Geotechnical Group's environmental operations and has conducted over 300 Phase I Environmental Site Assessments for the private and public sectors. The properties have ranged from agricultural to commercial/industrial. In addition to his experience with environmental assessments for property transfers, he has managed projects that require mitigation prior to and during development. Mr. Osmun is well versed in hazardous waste sampling and characterization methodologies in soil and groundwater regimes and risk assessments. Projects have ranged from leaking UST's, solid waste landfills, TSD facility closures to single spill response. LOR Geotechnical Group, Inc. is one of three firms that provides report review for underground storage tank closure for the County of San Bernardino, Fire Department Hazardous Materials Division.

Mr. Osmun has a B.S. in geology from Wayne State University, Detroit, Michigan. He is a Registered Professional Civil Engineer and Environmental Assessor II in the State of California.

Mr. Mathew L. Hunt has over 4 years experience in the environmental field. Mr. Hunt works under LOR Geotechnical Group's environmental operations and has conducted over 45 Phase I Environmental Site Assessments for the private and public sectors. The properties have ranged from agricultural to residential to commercial/industrial. In addition to his experience with environmental assessments for property transfers, he has worked on projects that require mitigation prior to development. Mr. Hunt is well versed in hazardous waste sampling and characterization methodologies in soil and groundwater regimes for groundwater monitoring, site assessment, and site

remediation. Projects have ranged from leaking UST's at gasoline stations to commercial and government (including CERCLA sites) projects involving metals, perchlorate, and solvents.

Mr. Hunt has a B.S. in soil science from California Polytechnic State University, San Luis Obispo and a M.S. in soil and water science from the University of California, Riverside. He is a Registered Environmental Assessor I in the State of California.

LIMITATIONS

This report was prepared solely for the use and benefit of LOR's client, Lewis Investment Company, LLC ("Lewis") and their designates, they may release this information to third parties, who may use and rely upon this information at their discretion. However, any use of or reliance upon this information by a party other than Lewis Investment Company, LLC ("Lewis") and their designates, shall be solely at the risk of such third party and without legal recourse against LOR Geotechnical Group, Inc.; its subsidiaries and affiliates; or their respective employees, officers, or directors; regardless of whether the action in which recovery of damages is sought is based upon contract, statute, or otherwise. This information shall not be used or relied upon by a party which does not agree to be bound by the above statement.

The content and conclusions provided by LOR in this assessment are based on information collected during our investigation, which may include, but is not limited to, visual site inspections, interviews with the site owner, regulatory agencies and other pertinent individuals, a review of available public documents, subsurface exploration and laboratory testing of soil samples, and our professional judgement based on said information at the time of preparation of this document. Any subsurface samples results and observations presented herein are considered to be representative of the area of investigation; however, soil conditions may vary between sample locations and may not necessarily apply to the general site as a whole. If future subsurface or other conditions are revealed which may vary from these findings, the newly-revealed conditions must be evaluated and may invalidate the conclusions of this report.

This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. LOR Geotechnical Group, Inc. (LOR) is not

responsible for the accuracy of information provided by other individuals or entities which is used in this report. This report presents our professional judgement based upon data and findings identified in this report, and the interpretation of such data based upon our experience and background, and no warranty, either expressed or implied, is made. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

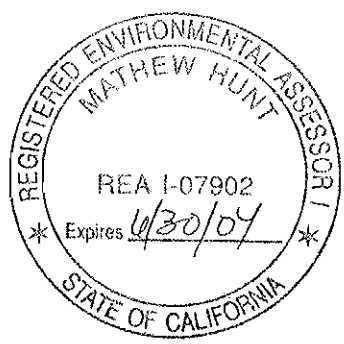
CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
LOR Geotechnical Group, Inc.

M. Kevin Osmun, CE 55116
Vice President

Mathew L. Hunt, REA I 7902
Environmental Scientist



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APPENDIX A

Index Map, Assessor's Parcel Map, Recent Site Aerial Photograph, and Color Photographs

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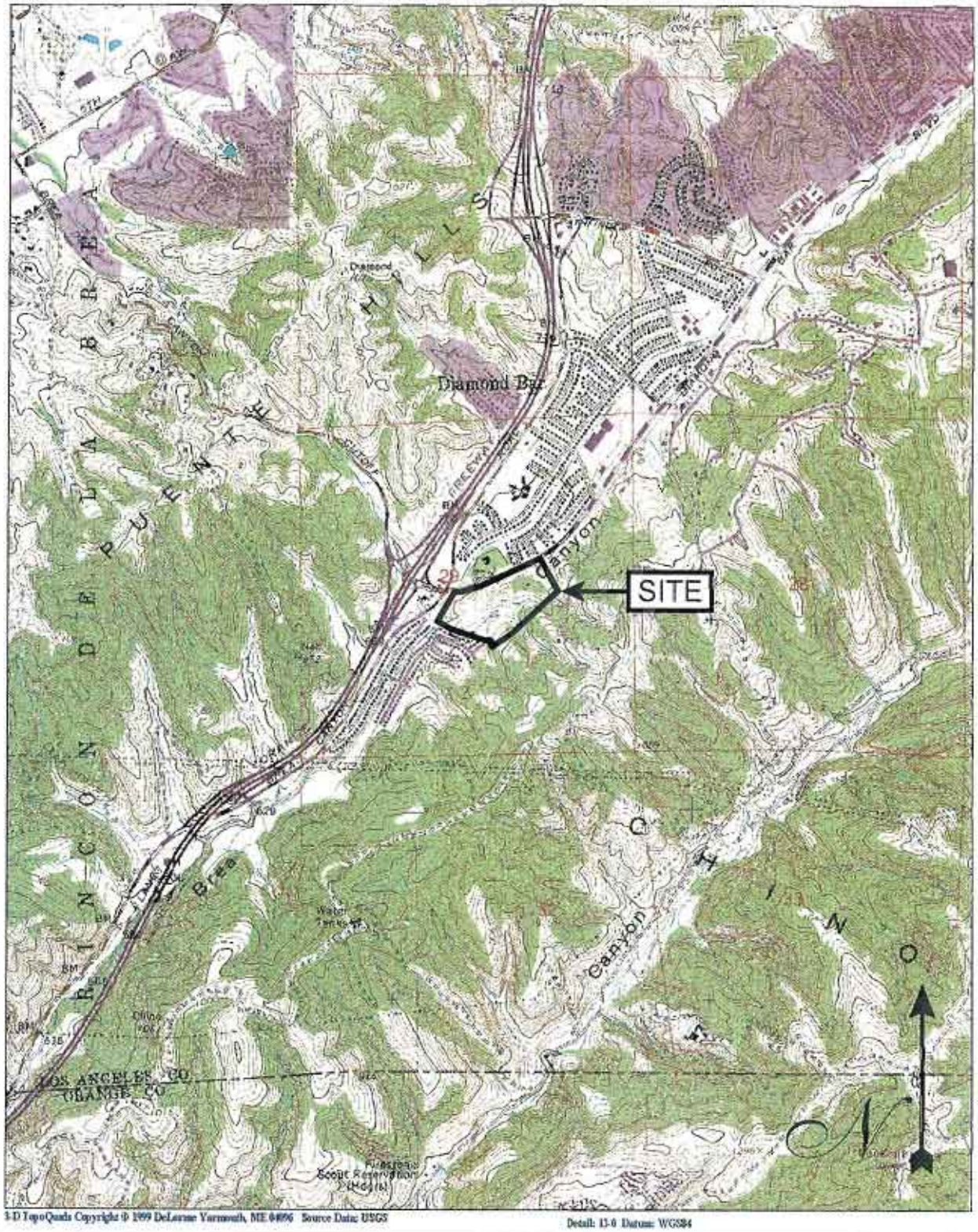
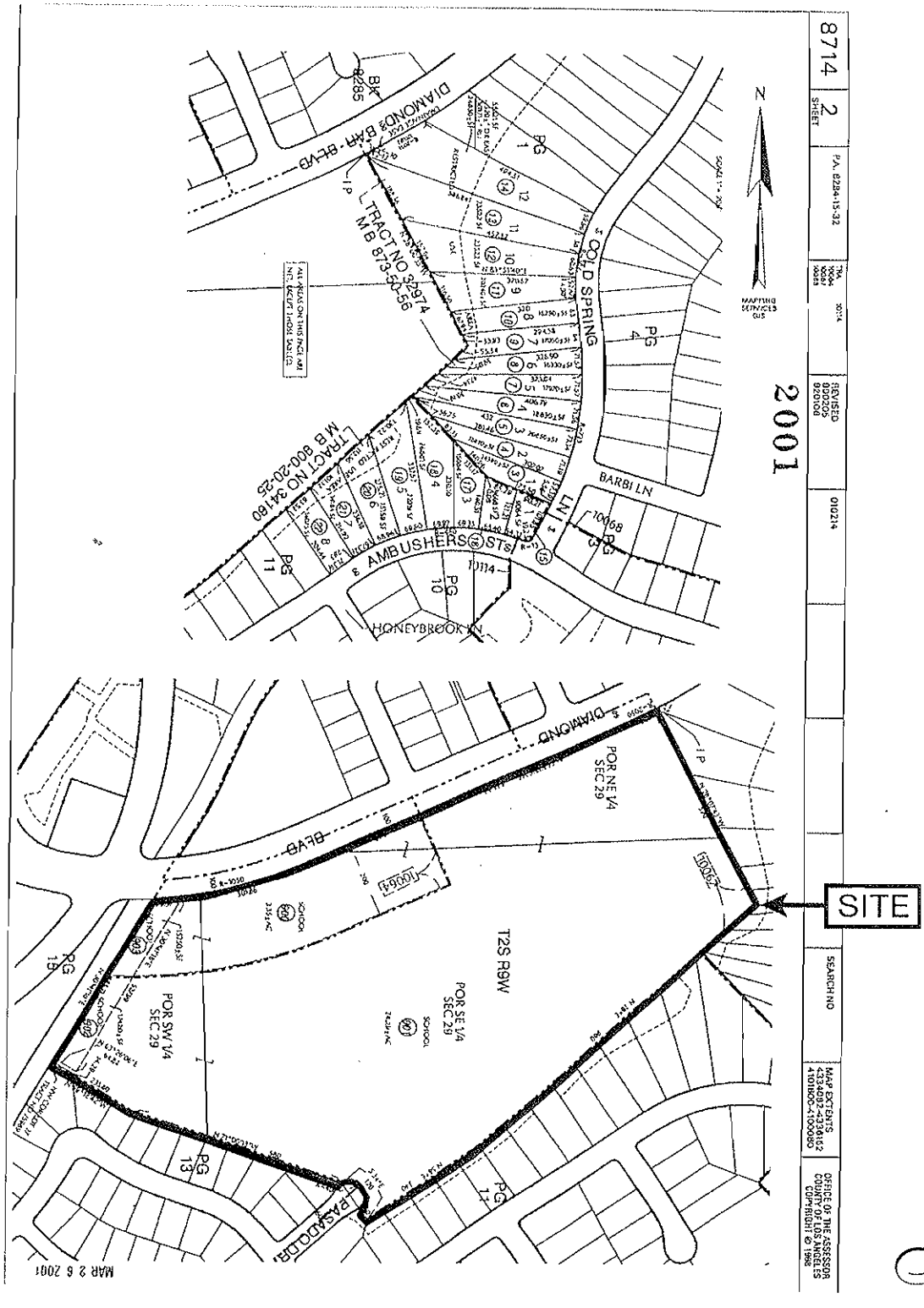


3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

Detail: 13-0 Datum: WGS84

INDEX MAP

PROJECT:	SITE D PROPERTY, DIAMOND BAR, LOS ANGELES COUNTY, CA	PROJECT NO.:	11903.2
LIENT:	LEWIS INVESTMENT COMPANY, LLC	ENCLOSURE:	A-1
LOR Geotechnical Group, Inc.		DATE:	APRIL 2004
		SCALE:	REDUCED



ASSESSOR'S PARCEL MAP

PROJECT:	SITE D PROPERTY, DIAMOND BAR, LOS ANGELES COUNTY, CA	PROJECT NO.:	11903.2
CLIENT:	LEWIS INVESTMENT COMPANY, LLC	ENCLOSURE:	A-2
LOR Geotechnical Group, Inc.		DATE:	APRIL 2004
		SCALE:	REDUCED

N

RECENT SITE AERIAL PHOTOGRAPH

PROJECT:	SITE D PROPERTY, DIAMOND BAR, LOS ANGELES COUNTY, CA	PROJECT NO.:	11903.2
CLIENT:	LEWIS INVESTMENT COMPANY, LLC	ENCLOSURE:	A-3
LOR Geotechnical Group, Inc.		DATE:	APRIL 2004
		SCALE:	REDUCED

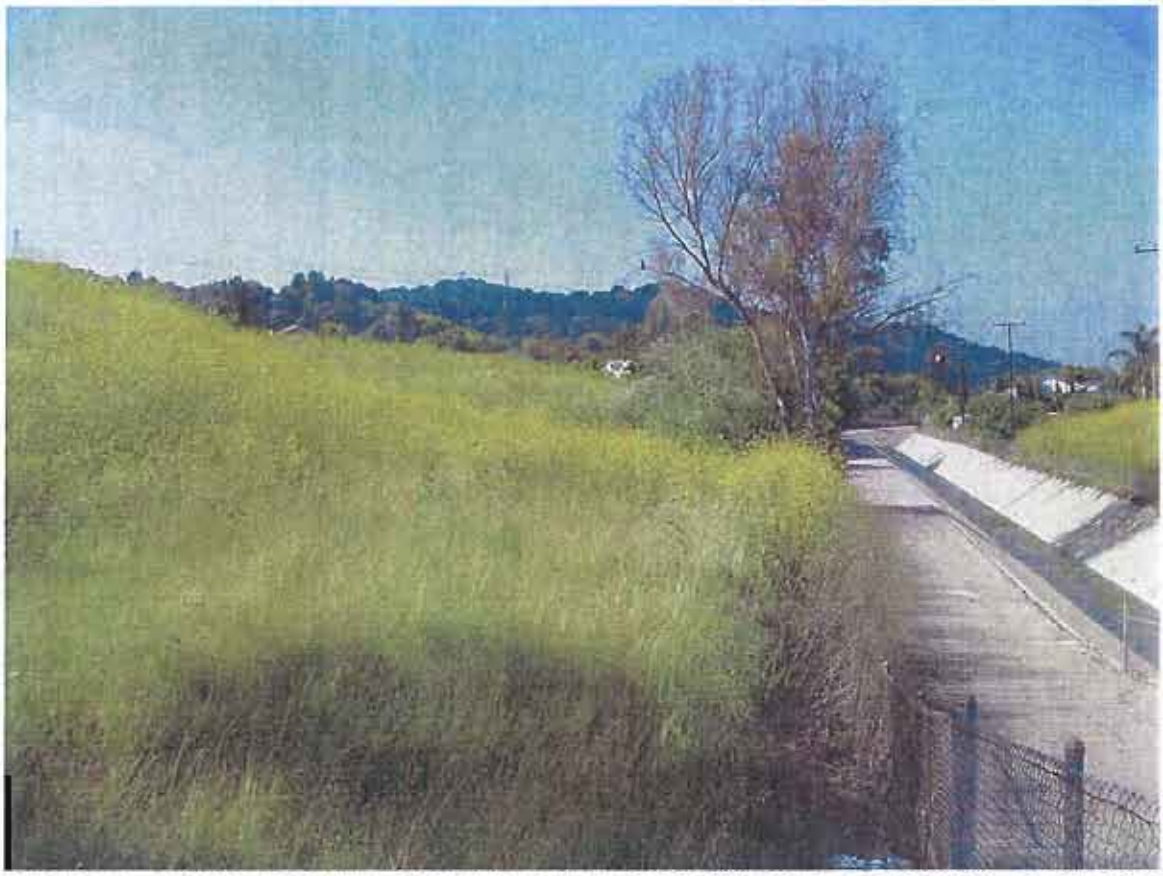


PHOTO 1 - VIEW LOOKING SOUTHWEST ALONG THE SITE BOUNDARY FROM THE NORTHWEST CORNER OF THE SITE. THE CONCRETE DRAINAGE CHANNEL SHOWN BORDERS THE SITE TO THE WEST.

PHOTO 2 - VIEW FACING EAST FROM THE NORTHWEST CORNER OF THE SITE. DIAMOND BAR BOULEVARD IS EVIDENT. THE SMALL UTILITY POLE IN THE BACKGROUND ALONG THE NORTH SITE BOUNDARY IS SUPPORTING TENSION CABLES.