

DOCKETED	
Docket Number:	24-OPT-02
Project Title:	Compass Energy Storage Project
TN #:	264558
Document Title:	Geotechnical Evaluation Report (TN #255561-6) References Part 2_7 of 9
Description:	N/A
Filer:	Erin Phillips
Organization:	Dudek
Submitter Role:	Applicant Consultant
Submission Date:	7/2/2025 6:58:42 PM
Docketed Date:	7/2/2025

SURFACE ELEVATION ± 295

CONTINUED:

					20				TC.	BEDROCK(TC): CONT CLAYEY SILTSTONE - HARD, GREY TO BROWN, MOIST, MASSIVE, MOD. FRAE. & WEATH. BEDDING: N45W, 40S JOINT: N35W 67S	
					21						
					22						
					23						
					24						
					25						
					26				ML		
					27						
					28						
					29						
					30						
					31						
					32						
					33						
					34						
					35						
					36						
					37						
					38					TOTAL DEPTH 37' NO GROUNDWATER NO CAVING BORING BACK-FILLED	
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: R. MERKER			
								Exploratory Boring/Pit Number: EB-1			
								Job No: 82-100	Date: 6/4/82		

SURFACE ELEVATION 408

CONTINUED:

					20	ML	BEDROCK (TC): SANDY SILTSTONE - MOD. HARD, GREY, SLIGHTLY MOIST, MASSIVE, MOD. WEATH., MOD. FRAC.; V.F. GR. SAND.		
					21				
					22				
					23				
					24	ML	CLAYEY SILTSTONE - MOD. HARD, GREY TO BROWN- ISH GREY, MOIST MOD. WEATH., MOD. FRAC., MASSIVE,  ← SILICEOUS SILTSTONE LAYER		
					25				
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					37				
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RELATIVE % COMPACTION	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: R. MEKER	
								Exploratory Boring/Pit Number: EB-2	
								Job No: BZ-100	Date: 6/4/82

Continued:

[illegible]

SURFACE ELEVATION ± 408

CONTINUED:

					58			ML	BEDROCK (Tc): SILTSTONE - (CONT) HARD, GREENISH GREY, VERY MOIST MASSIVE, SLIGHTLY WEATH., MOD. FRAC, CaSO ₄ FeO ₂ , MICACEOUS, SLIGHTLY FOLIATED, SANDY.
					59				
					60				
					61				
					62				
					63				
					64				
					65				
					66				
					67				
					68				
					69				
					70				VERY HARD, VERY DARK GREENISH GREY.
					71				
					72				
					73				
					74				
					75				
					76				
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: R. MERKER	
								Exploratory Boring/Pit Number ER-2	
								Job No: 82-100	Date: 6/4/82

CONTINUED:

[illegible]

RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	
					1		ML	<u>TOPSOIL:</u> CLAYEY SILT - V. FIRM TO STIFF, DK. BRN, MOIST POROUS, 10-15% GRASS ROOTS, DES- SICATION CRACKS
					2			
					3			
					4		ML	<u>SLOPEWASH (Qsw):</u> CLAYEY SILT - FIRM TO V. FIRM, BRN TO LT. BRN, MOIST, SLIGHTLY POROUS, SOME GRASS ROOTS & V.F. GR. SAND.
					5			
					6			
					7		SM	SANDY SILT - FIRM, MOTTLED LT. BRN, BRN & DK. BRN, MOIST, SLIGHTLY POROUS, MIXED SILTY SAND, SANDY SILT & V.F. GR. SAND, SOME DECOMPOSING PLANT DEBRIS (BARK).
					8			
					9			
					10			
					11			
					12			
					13			
					14			
					15			
					16			
					17		SM	SILTY SAND - LOOSE TO MED. DENSE, BRN TO DK. BRN, MOIST, POROUS, SOME PLANT DEBRIS, 20±% CLAY BINDING. PROBABLY PALEOSOL.
					18			
					19		ML	SANDY SILT - FIRM TO V. FIRM, MOTTLED, LT. BRN,
								Logged by: Exploratory Boring/Pit Number: <u>EB-3</u> Job No: <u>82-100</u> Date: <u>6/5/92</u>

SURFACE ELEVATION ± 430

CONTINUED:

CORRELATION OBSERVATION 1-450									
					58		<u>BEDROCK (T_c); (CONT)</u> SANDY SILTSTONE - SOFT TO MOD. HARD, GREY TO DK GREY, WET TO MOIST, LAM- INATED TO MASSIVE, MOD. WEATH., VERY FRAC. w/ MANY NEAR VERT. CaSO₄ FILLED FRACTURES SAND LENSE BEDDING: N30W 5SW SEEPAGE - LESS THAN 10ppm.		
					59				
					60				
					61	ML			
					62		CLAYEY SILTSTONE - MOD. HARD, GREY, MOIST TO WET, MASSIVE, MOD. WEATH., VERY FRAC., SOME CaSO₄, FeO₂. SILICIFIED SILTSTONE LAYER HEAVY SEEPAGE FROM VOID SPACES BONE FRAGMENT INCLUSIONS OF REDDISH BROWN AND OLIVE GREEN TO BLACK SILTSTONE		
					63				
					64				
					65				
					66				
					67				
					68	ML			
					69				
					70				
					71				
					73				
					74				
					75				
					76				
					77				
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: <i>J. Row</i>	
								Exploratory Boring/Pit Number: <u>EB-3</u>	
								Job No: <u>82-100</u>	Date: <u>6/5/82</u>

Continued:

RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
					39	ML	ML	SLOPEWASH (GSW) CONT. SANDY SILT - (CONT)
					40	SM	SM	SILTY SAND - MED. DENSE, YELL. BRN, MOIST LAMINATED V.F. GRAINED SAND AND SILT V.F. GR. SAND 50±%, FeO ₂ STAINING
					41	ALs	ALs	LANDSLIDE MATERIAL (Q1s): CLAYEY SILTSTONE - SOFT TO MOD. HARD, GREY TO DARK GREY, MASSIVE VERY WEATHERED & FRACTURED, APPROXIMATE CLAY-15-20±%.
					42	ML	ML	CONTACT IS VERY FRACTURED AND IRREGULAR OVER 8" SEC- ONDARY CaSO ₄ FILLING IN VERTICAL FRACTURES, AP- PEARS TO BE UNCONFORMABLE SURFACE, SANDIER, MODERATELY WEATHERED & FRACTURED
					43			
					44			
					45			
					46			
					47			
					48			
					49			MORE CLAY CaSO ₄ IN FRACTURES, SOME FeO ₂
					50			CONTACT: N40E, 5 SE
					51			BEDROCK (Tc): SANDY SILTSTONE - SOFT TO MOD. HARD GREY TO DK. GREY LAMINATED V.F. GR. SAND AND SILT TO MASSIVE, MODERATELY WEATHERED, VERY FRA- CTURED, SEEPAGE - GREATER THAN 1 gpm.
					52			
					53	Tc	Tc	
					54	ML	ML	SOME DISCONTINUOUS SLICKENSIDES IN POS- SIBLE SLIDE SHEAR ZONE, BEDDING: N30W/DNW SILICIFIED SILTSTONE LAYER
					55			
					56			
					57			
								Logged by: <i>L. P. ...</i>
								Exploratory Boring/Pit Number: <i>EB-3</i>
								Job No: <i>82-100</i> Date: <i>6/5/72</i>

Continued:

RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	
					77			BEDROCK (Tc): SILTSTONE - HARD TO VERY HARD, DARK OLIVE GREEN TO BLACK, MOIST, MASSIVE, MICACEOUS, SLIGHTLY FOLIATED, RARE DISC SHAPED PELECYPODS, FORAMINIFERIA.
					78			SILICIFIED SILTSTONE LAYER
					79			SAND LENSE OFFSET 2' BY FAULT. BEDDING : N30W, 35SW CONSISTANT ACROSS FAULT FAULT : NDE 55NW
					80			
					81			
					82			
					83			
					84			
					85			SAND LENSE
					86			
					87			
					88			
					89			
					90			SILICIFIED SILTSTONE LAYER
					91			TOTAL DEPTH 90' GROUNDWATER @ 53' & BELOW CAVING @ 53' & BELOW BORING BACKFILLED
					92			
					93			
					94			
					95			
								Logged by: J. P. [Signature]
								Exploratory Boring/Pit Number: EB-3
								Job No: 82-100 Date: 1/15/82

RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
					1	ML	ML	TOP SOIL: CLAYEY SILT - V. FIRM TO STIFF, BRN TO DK BRN, MOIST, POROUS, 10-15% ROOTS, SOME V.F. GR. SAND, DESSICATION CRACKS
					2			
					3	QSN	QSN	SLOPEWASH (QSN): SANDY SILT - V. FIRM, GREY TO BRN, MOIST, SLIGHTLY POROUS, V.F. GR. SAND
					4			
					5			
					6			
					7	ML	ML	
					8			
					9			
					10			
					11			
					12			SILICEOUS SILTSTONE COBBLES CONCENTRATED @ CONTACT
					13	QLS	QLS	LANDSLIDE MATERIAL (QLS): CLAYEY SILTSTONE - SOFT TO MOD. HARD, GREY TO DARK GREY, MOIST, MASSIVE W/ SAND LENSES, MOD. WEATH, VERY FRACTURED, $CaSO_4$ & FeO_2 . JOINTS: N-S 50E N30W, 90
					14			
					15	ML	ML	
					16			
					17			SANDSTONE LENSE BEDDING: N40W, 5SW
					18			
					19			JOINTS w/ $CaSO_4$: N30W, 40SW N-S, 80NE N60W, 25SW
								Logged by: J. Rossi
								Exploratory Boring/Pit Number: EB-4
								Job No: 82-100 Date: 6/8/82

CONTINUED:

RELATIVE % COMPACTION	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	LANDSLIDE MATERIAL (Q15): CLAYEY SILTSTONE - (CONT.) SOFT TO MOD. HARD, GREY, MOIST MASSIVE w/ SANDSTONE LENSES MOD. WEATH., MOD. FRAC., CaSO ₄ & FeO ₂ , SOME V.F. GR. SAND.	
					20				
					21				
					22				
					23				
					24			← SANDSTONE LENSE BEDDING: N 30 W, 20 SW	
					25				
					26				
					27				
					28			← SANDSTONE LENSE BEDDING: N 20 W, 25 SW	
					29				
					30				
					31				
					32				
					33			← SANDSTONE LENSE BEDDING: N 10 W, 15 SW	
					34				
					35				
					36				
					37				
					38				
								Logged by: <i>J. Roush</i>	
								Exploratory Boring/Pit Number: <i>EB-4</i>	
								Job No: <i>82-100</i>	Date: <i>6/5/82</i>

SURFACE ELEVATION ± 415

Continued:

					39			<u>LANDSLIDE MATERIAL (Q15):</u> CLAYEY SILTSTONE - (CONT) SOFT TO MOD. HARD, GREY, MOIST MASSIVE W/SAND- STONE LENSES, MOD. WEATH, MOD. FRAC., FeO₂ STAINING, CaSO₄ FRAC. FILLING,
					40			
					41			
					42			
					43			
					44			
					45			
					46			
								← SILICEOUS SILTSTONE LAYER - DRILLING REFUSAL
					47			TOTAL DEPTH 46 1/2 FT. NO CAVING NO GROUNDWATER BORING BACKFILLED
					48			
					49			
					50			
					51			
					52			
					53			
					54			
					55			
					56			
					57			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: <i>J. Rossi</i> Exploratory Boring/Pit Number: <u>EB-4</u> Job No: <u>82-100</u> Date: <u>6/3/82</u>

SURFACE ELEVATION ± 415

CONTINUED:

					20	GSW	SLOPEWASH (GSW): (CONT)
					21	SM	SAND - T - SOFT, LIGHT GREY, SLIGHTLY MEDIUM GRAINED, MOIST, WITH GREY SILTY INTERBEDS.
					22	QLS	LANDSLIDE MATERIAL (QLS)!
					23	ML	CLAYEY SILTSTONE - SOFT GREY WITH ORANGE MOTTLEING, MOIST, MAS- SIVE, MOD. WEATH & FRAC.
					24		← GYPSUM FILLED FRAC. ATTITUDE: N40W, 75E
					25		SANDY SILTSTONE -
					26		MOD. HARD, GREY TO LT, GREY, MOIST, MASSIVE, MOD. WEATH & FRAC.
					27		CaSO ₄ & FeO ₂ .
					28		
					29	ML	
					30		
					31		← SANDSTONE LENSE BEDDING: N10E, 10E
					32		
					33		
					34		
					35		CLAYEY SILTSTONE -
					36	ML	MOD. HARD, GREY, MOIST, MASSIVE, MOD. WEATH. & FRAC., CaSO ₄ FILINGS, FeO ₂ STAINING.
					37		
					38		← JOINT: N-S. 80E N-S 90
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION
							Logged by: C.P. BUCKLEY
							Exploratory Boring/Pit Number: EB-5
							Job No: 415-82 Date: 6/7/82

Continued:

RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
					39			LANDSLIDE MATERIAL (Q1s) CLAYEY SILTSTONE - MOD HARD, GREY, MOIST, MASSIVE, MOD. FRAE & WEATH. CaSO₄ FILLING, FeO₂ STAINING.
					40			
					41			
					42			
					43	ML		
					44			
					45			
					46			
					47			
					48			
					49			MOTTLED LT. GREY TO BROWN.
					50			
					51			
					52	ML		
					53			
					54			
					55			
					56			← SILICIFIED SILTSTONE LAYER
					57			TOTAL DEPTH 57' - REFUSAL
								Logged by: C.P. BUCKLEY
								Exploratory Boring/Pit Number: EB-5
								Job No: 415-82 Date: 6/7/82

SURFACE ELEVATION ± 248

CONTINUED: B-6

					20				ML	CLAYEY SILT - Continued
					21				ML	SANDY SILT - FIRM TO V. FIRM, DK. BROWN w/ YELLOW, GREY, & BROWN MOTTLING, CLAYEY SILTSTONE LAYERS WITHIN UNIT, FEW ORGANIC, BURIED SOIL.
					22					
					23					CLAYEY SILT - FIRM TO V. FIRM, GREY GREEN, TO YELLOW BROWN MOTTLED, MOIST, SOME SILICEOUS SILTSTONE NOD- ULAR CLASTS, GREY GREEN CLAY LAYERS WITHIN UNIT.
					24				ML	
					25					
					26					
					27					
					28					WATER WORN MAMMEL BONE FRAGMENT CLAST
					29					SLIDE MATERIAL (OLDER) Also: CLAYEY SILTSTONE - MOD. HARD, GREY TO LT. BROWN w/ ORANGE MOTT- LING, MOIST, FINELY LAMINATED V. FINE GLAUCED SAND, MODERATELY WEATHERED & FRACTURED, WHITE MINERAL FRAC- TURE FILLING.
					30				ML	
					31					
					32					
					33					
					34					
					35					
					36					
					37					
					38					
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: <i>Chris Buckley</i>		
								Exploratory Boring/Pit Number: <i>EB-6</i>		
								Job No: <i>82-100</i>	Date: <i>6/8/82</i>	

Continued: FB-6

RELATIVE % COMPACTION	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
					39			SLIDE MATERIAL (OLDER) Q150: CLAYEY SILTSTONE (continued) BROWN TO GREY BROWN MOTTLED, MOIST TO WET, GYPSUM FILLED FRACTURES. SEEPAGE
					40	ML		
					41			
					42			
					43			SANDY SILTSTONE - MODERATELY HARD, MOTTLED GREY, BROWN AND ORANGE BROWN, MOIST, MODERATELY FRACTURED, AND WEATHERED.
					44	ML		
					45			
					46			
					47			SILTSTONE - HARD TO VERY HARD, DARK OLIVE GREEN TO BLACK, MOIST, MICACEOUS, SLIGHTLY WEATHERED TO FRACTURED, w/ REDDISH BROWN IRON OXIDE.
					48			
					49			
					50	ML		
					51			
					52			
					53			
					54			
					55			
					56			
					57			
								Logged by: Chris Buckley
								Exploratory Boring/Pit Number: EB-6
								Job No: 82-100 Date: 6/8/82

SURFACE ELEVATION ± 248

Continued

					58			ML	SLIDE MATERIAL (OLDER) Q150: SILTSTONE - (CONTINUED) ← CLAY PODS < 1"; SEEPAGE
					59			ML	SLIDE PLANE:
					60				CLAYEY SILT -
					61				VERY FIRM, MOTTLED BROWN
					62				TO GREY & REDDISH BRN, MOIST,
					63				ROCK FRAGMENTS & SILICEDUS
					64				NODULES, ORGANIC MATERIAL,
					65				FOROUS; SLIDE INDUCED
					66				SOIL.
					67			ML	BEDROCK (Tc):
					68				CLAYEY SILTSTONE -
					69				MODERATELY HARD, LT.
					70				GREY, MOIST TO VERY MOIST,
					71				SANDY IN PARTS, FILLED
					72				WORM BURROWS, SOME
					73				DARKER GREY SILTSTONE
					74				INCLUSIONS.
					75				SANDSTONE LENSE &
					76				SEEPAGE
					77			ML	SILTSTONE -
					78				HARD, DARK OLIVE GREEN
					79				TO BLACK, MOIST, MICAC-
					80				EOUS, SLIGHTLY WEATHER-
					81				ED & FRACTURED, DISC
					82				PELECYPODS.
					83				SANDSTONE LENSE &
					84				SEEPAGE.
					85				TOTAL DEPTH 68 1/2'
					86				GROUNDWATER @ 19'
					87				CAVING @ 21'
					88				BORING BACK FILLED
					89				
					90				
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					298				

SURFACE ELEVATION $\pm$ 270

					1			CLAY, DK. BRN. TO BLACK, MOIST & FIRM, PIECES OF A.C. & COBBLES
					2			
					3		CL	
					4			
					5			
					6			
					7			
					8		CL	SILTY CLAY, MED. BRN., MOIST & FIRM
					9			SILTY CLAY, BLACK, MOIST & FIRM
	111.0	99	20.0		10			
					11			
					12		CL	
					13			
					14			
					15			
					16			
	115.0		9.5		17			SILTY CLAY, LT. TAN, WITH ORANGE STREAKS, MOIST & VERY DENSE
					18		CL	
					19			(CONTINUED)
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.
								Exploratory Boring/Pit Number: EDH-2
								Job No: 82-100-1 Date: 4-13-82

SURFACE ELEVATION ± 270

CONTINUED:

					20		CL	SILTY CLAY, LT. TAN, WITH ORANGE STREAKS, MOIST & VERY DENSE
					21			
					22			
					23			
					24			
					25			
					26			E.O.B., NO G.W., NO CAVING
					27			
					28			
					29			
					30			
					31			
					32			
					33			
					34			
					35			
					36			
					37			
					38			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W. Exploratory Boring/Pit Number: <u>EDH-2</u> Job No: <u>82-100-1</u> Date: <u>4-13-82</u>

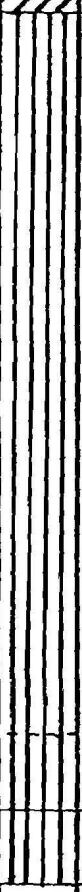
SURFACE ELEVATION ± 250

					Ring 1		CLAY, BLACK, WET & SOFT
					2		
					3		----- BECOMING DRIER & FIRMER
					4		
					5	CL	
					6		
					7		
					8		
					9		
					10		
					11		
					12		SILTY CLAY, LT. TAN, SL. MOIST & HARD
					13	CL	
					14		
					15		E.O.B., NO G.W., NO CAVING
					16		
					17		
					18		
					19		
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION
							Logged by: B.W.
							Exploratory Boring/Pit Number: <u>EDH-3</u>
							Job No: <u>82-100-1</u> Date: <u>4-13-82</u>

SURFACE ELEVATION ± 250

						1		CL	CLAY, BLACK, MOIST & SOFT
						2			
						3			----- BECOMING DRIER & FIRMER
						4			
						5			
						6			
						7			
						8			----- MATERIAL SL. CHANGING TO A DARK BRN., VERY FIRM
						9			
						10			
						11			
						12			
						13			
						14		CL	SILTY CLAY, LT. TAN., SL. MOIST & HARD
						15			
						16			E.O.B., NO G.W., NO CAVING
						17			
						18			
						19			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.	
								Exploratory Boring/Pit Number: EDH-4	
								Job No: 82-100-1	Date: 4-13-82

SURFACE ELEVATION ± 250

					1		CL	CLAY, BLACK, MOIST & SOFT
					2			
					3			
	115.0	115.0	14.1		4		ML	FINE SANDY CLAYEY SILT, DK. BRN., SL. MOIST & FIRM
					5			
					6			
					7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			----- SAME MATERIAL BUT WITH ORANGE MOTTLING
					15		ML	SILT, GREY, SL. MOIST & VERY DENSE
					16			E.O.B. NO. G.W., NO CAVING
					17			
					18			
					19			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W. Exploratory Boring/Pit Number: <u>EDH-5</u> Job No: <u>82-100-1</u> Date: <u>4-14-82</u>

SURFACE ELEVATION $\pm$ 280

	118.5	95	18.5		1 Ring			CLAY, BLACK, MOIST TO WET & SOFT
					2		CL	
					3 Ring			
					4			
					5			
	119.0	106	13.6		6 Ring			CLAY, DK. BRN, MOIST & FIRM
					7			
					8		CL	
					9			
					10			
					11			
	115.0	104	20.2		12			SILTY CLAY, TAN, MOIST & FIRM
					13 Ring		CL	
					14			
					15			E.O.B., NO G.W., NO CAVING
					16			
					17			
					18			
					19			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.
								Exploratory Boring/Pit Number: <u>EDH-6</u>
								Job No: <u>82-100-1</u> Date: <u>4-14-82</u>

					1		CLAY, BLACK, MOIST TO WET & SOFT
					2		
					3	CL	
					4		
					5		
					6		
					7	CL	CLAY, DK BRN., MOIST & FIRM
					8		SILTY CLAY, TAN, MOIST & VERY FIRM, SOME WHITE MOTTLING
					9		
					10	CL	
					11		
					12		
					13		SILTY CLAY, GREENISH GREY, MOIST & VERY DENSE
					14		
					15		
					16	CL	
					17		
					18		
					19		(CONTINUED)
MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.		
					Exploratory Boring/Pit Number: EDH-7		
					Job No: 82-100-1	Date: 4-14-82	

					SILTY CLAY, GREENISH GREY, MOIST & VERY DENSE
		20		CL	
		21			
		22			
		23			
		24			
		25			
		26			E.O.B., NO G.W., NO CAVING
		27			
		28			
		29			
		30			
		31			
		32			
		33			
		34			
		35			
		36			
		37			
		38			
MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W. Exploratory Boring/Pit Number: <u>EDN-7</u> Job No: <u>82-100-1</u>
					Date: <u>4-14-82</u>

SURFACE ELEVATION ± 290

					1			CLAY, BLACK, MOIST TO WET & SOFT	
	111.0	90	22		2			CL	
					3				
					4				
					5				
	111.0	92	21		6				----- ORANGE MOTTLING BETWEEN 5 & 7 FT.
					7			CL	
					8				
					9				CLAY, GREY BRN., MOIST & HARD
					10			CL	
					11				
					12				
					13				
					14				
					15				
					16				
					17				
					18				----- BECOMING VERY DENSE
					19				E.O.B., NO G.W., NO CAVING.
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.	
							Exploratory Boring/Pit Number: <u>EDH-8</u>		
							Job No: 82-100-1	Date: 4-14-82	

SURFACE ELEVATION ± 300

					1			CLAY, BLACK, MOIST TO WET & SOFT
					2		CL	
					3			
					4			
					5			
					6		CL	CLAY, DK. BRN, MOIST & HARD
					7			
					8		ML	CLAYEY SILT, GREY, MOIST & HARD
					9			----- ORANGE MOTTLING
					10			
					11		ML	SILT, ORANGE, GREY, MOIST & VERY DENSE
					12			
					13			E.O.B., NO G.W., NO CAVING
					14			
					15			
					16			
					17			
					18			
					19			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.
								Exploratory Boring/Pit Number: EDH-9
								Job No: 82-100-1 Date: 4-14-82

					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	CL CL ML	CLAY, BLACK, WET & SOFT SILTY CLAY, DK. BRN., MOIST & HARD CLAYEY SILT, LT. BRN., SL. MOIST & VERY DENSE REFUSAL, NO G.W., NO CAVING
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION
116.0	116.5	109	15.7 16.0 14.0				Logged by: B.W. Exploratory Boring/Pit Number: EPH-10 Job No: 82-100-1 Date: 4-15-82

					1	CL	CLAY, BLACK, MOIST TO WET & SOFT
					2		
					3	CL	SILTY CLAY, DK. BRN., MOIST & FIRM
					4		
					5	ML	CLAYEY SILT, LT. BRN., SL. MOIST & VERY DENSE
					6		----- ORANGE MOTTLING & PIECES OF CALICHE
					7		
					8		
					9		
					10		
					11		
					12		
					13		E.O.B., REFUSAL, NO G.W., NO CAVING
					14		
					15		
					16		
					17		
					18		
					19		
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION
Logged by: B.W.							
Exploratory Boring/Pit Number: EDH-11							
Job No: 82-100-1						Date: 4-15-82	

SURFACE ELEVATION ± 415

					1			CLAY, BLACK, WET & SOFT
					2			
					3		CL	
					4			
					5			
	116.5	107	15		6		CL	SILTY CLAY, DK. BRN., MOIST & HARD
					7			
					8			CLAYEY SILT, LT. BRN., SL. MOIST & VERY DENSE
	118.5	108	12		9		ML	
					10			
					11			
					12			E.O.B., REFUSAL, NO G.W. NO CAVING
					13			
					14			
					15			
					16			
					17			
					18			
					19			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.
								Exploratory Boring/Pit Number: EDH-12
								Job No: 82-100-1 Date: 4-15-82

SURFACE ELEVATION ± 435

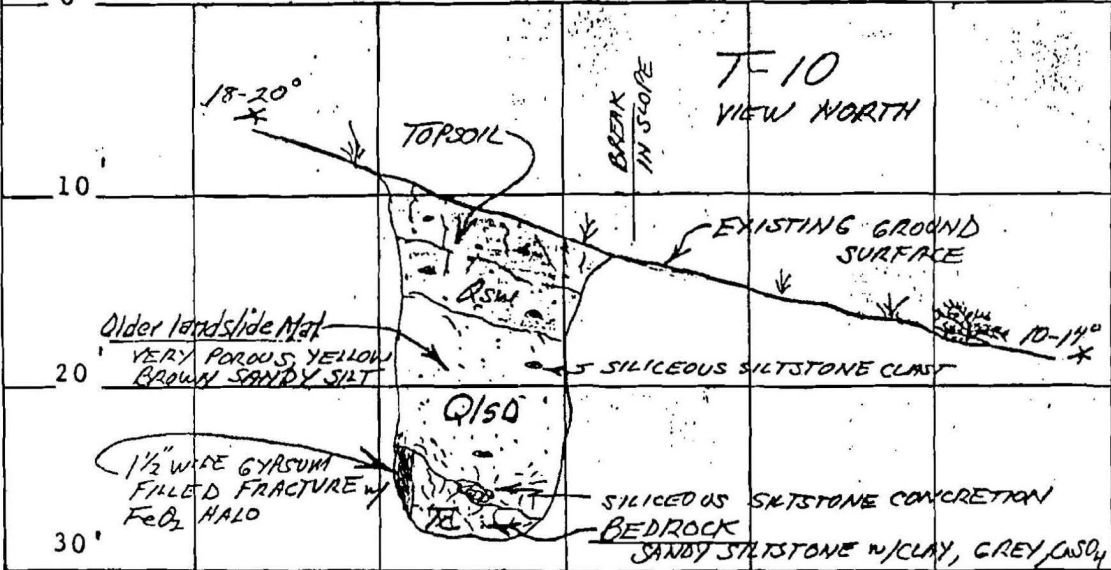
					1			CLAY, BLACK, WET & SOFT
					2		CL	
					3			
					4		CL	SILTY CLAY, DK. BRN., SL. MOIST & HARD
					5			
					6		ML	CLAYEY SILT, LT. BRN. SL. MOIST & VERY DENSE
					7			
					8		ML	CLAYEY SILT, LT. TAN, SL. MOIST & VERY DENSE
					9			
					10			
					11			E.O.B. NO G.W., NO CAVING (NEAR REFUSAL)
					12			
					13			
					14			
					15			
					16			
					17			
					18			
					19			
RELATIVE COMPACTION %	MAX. DENSITY (pcf)	DRY DENSITY (pcf)	MOISTURE (%)	PENETRATION (N)	DEPTH (ft.)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Logged by: B.W.
								Exploratory Boring/Pit Number: EDH-14
								Job No: 82-100-1 Date: 4-16-82

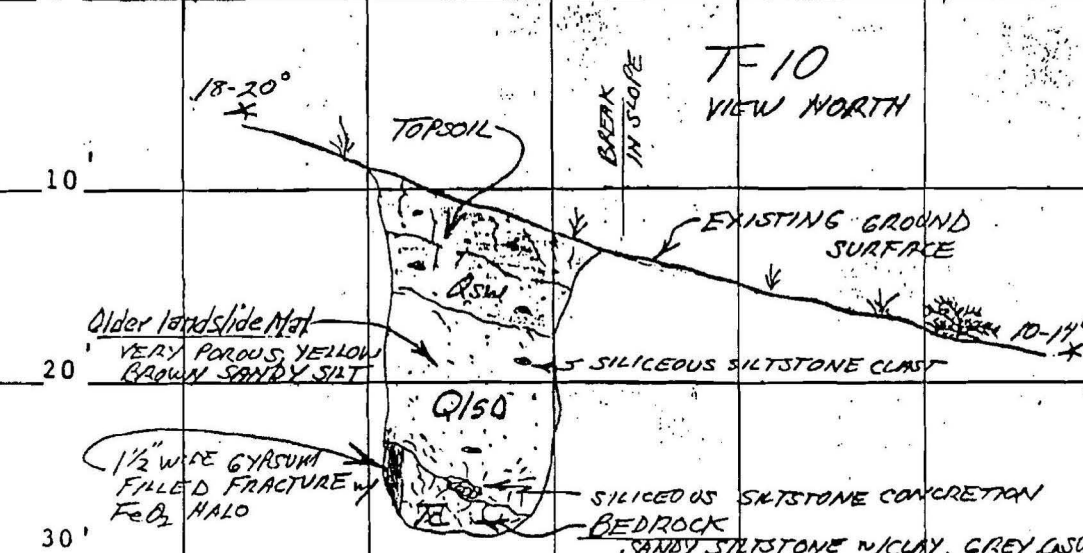
SOIL TYPE <i>CLAYEY SILT</i>	LOGGED BY <i>J. Porri</i>	PIT # <i>6</i>	
NATURAL SLOPE <i>33 ± °</i>	NOTES BY <i>J. Porri</i>	PROJECT # <i>82-100</i>	
LITHOLOGY (Slide debris and plastic clays in green)	FAULTING (in red)	JOINTS	BEDDING
<i>0-1' TOPSOIL:</i> <i>CLAYEY SILT -</i> <i>V. FIRM, DK BRN TO BROWN, MOIST, POROUS, SOME FINE GR. SAND, 10% GRASS ROOTS</i> <i>1-7' SLOPE WASH (QSW):</i> <i>CLAYEY SILT -</i> <i>FIRM TO V. FIRM, DK. BRN. TO YELL BROWN, MOIST, POROUS, SOME FINE GR. SAND & ROOT HAIRS, SOME GRAVEL.</i> <i>7-10' BEDROCK (Tc):</i> <i>CLAYEY SILTSTONE -</i> <i>SCALE 1" = 5' SOFT TO MOD. HARD, PIT TREND GREY, MOIST, MOD. WEATH & FRAC, FeO₂ + CaCO₃</i>	<i>NONE</i>	<i>NONE</i>	<i>NONE</i>
		DATE	<i>5/8/82</i>
<i>T-6</i> <i>VIEW NORTH</i> <i>SLOPE WASH</i> <i>DARK BROWN</i> <i>CLAYEY SILT</i> <i>TOPSOIL</i> <i>EXISTING ROAD</i> <i>VERY WEATHERED BEDROCK</i> <i>BEDROCK</i> <i>GREY CLAYEY SILTSTONE</i> <i>QSW</i> <i>Tc</i>			

SOIL TYPE <u>CLAYEY SILT</u>	LOGGED BY <u>J. Rossi</u>	PIT # <u>6</u>	
NATURAL SLOPE <u>33 ± °</u>	NOTES BY <u>J. Rossi</u>	PROJECT # <u>82-100</u>	
LITHOLOGY (Slide debris and plastic clays in green)	FAULTING (in red)	JOINTS	BEDDING
<u>0-1' TOPSOIL:</u> CLAYEY SILT - V. FIRM, DK BRN TO BROWN, MOIST, POROUS, SOME FINE GR. SAND, 10% GRASS ROOTS <u>1-7' SLOPE WASH (QSW):</u> CLAYEY SILT - FIRM TO V. FIRM, DK. BRN. TO YELL BROWN, MOIST, POROUS, SOME FINE GR SAND & ROOT HAIRS, SOME GRAVEL. <u>7-10' BEDROCK (Tc):</u> CLAYEY SILTSTONE - SOFT TO MOD. HARD, PIT TREND GREY, MOIST, MOD. WEATH. FRAC, $FeO_2 + CaSO_3$	NONE	NONE	NONE
SCALE 1" = 5' DATE <u>5/8/82</u>			

SOIL TYPE <i>CLAYEY SILT</i>	LOGGED BY <i>J. Romi</i>	PIT # <i>9</i>
NATURAL SLOPE <i>14°</i>	NOTES BY <i>J. Romi</i>	PROJECT # <i>82-100</i>
LITHOLOGY (Slide debris and plastic clays in green)	FAULTING (in red)	JOINTS
0-3' <u>TOPSOIL:</u> CLAYEY SILT - V. FIRM TO STIFF, DK BRN, MOIST POROUS, SOME DESICCATION CRACKS, 10% GRASS ROOTS 3-4' <u>SLOPEWASH (Qsw):</u> SANDY SILT - V. FIRM, YELLOW BROWN TO GREY, SLIGH. POROUS, SOME CLAY AND PDS OR CONCENTRATIONS OF SILICIFIED SILTSTONE GRAVEL. 11- <u>Older landslide material (Qiso)</u> SANDY SILTSTONE - MOD HARD, GREY TO LT. GREY, MOST MASSIVE w/ SAND LENSES, SLIGH. PIT TREND TO MOD. WEATH & FRACTURED, SOME CaCO₃, TRACE FeO₂ IN SAND	NONE	NO WELL DEV ELOPED JOINTING
SCALE 1" = 5' DATE		BEDDING Tc N 30 W 40° S GOOD, SAND LENSE N 40 W 35 S GOOD SAND LENSE NOTE: NOT VERY POROUS, NO GRAV., OR PLANT DEB. TIGHT W/ SAND LENSES.
5/14/82		
T-9 VIEW NORTH		

SOIL TYPE <i>CLAYEY SILT</i>	LOGGED BY <i>J. Romi</i>	PIT # <i>9</i>
NATURAL SLOPE <i>14°</i>	NOTES BY <i>J. Romi</i>	PROJECT # <i>82-100</i>
LITHOLOGY (Slide debris and plastic clays in green)	FAULTING (in red)	JOINTS
<i>0-3' TOPSOIL:</i> <i>CLAYEY SILT-</i> <i>V. FIRM TO STIFF, DK BRN, MOIST POROUS,</i> <i>SOME DESICCATION CRACKS, 10% GRASS ROOTS</i> <i>3-4' SLOPEWASH (Qsw):</i> <i>SANDY SILT-</i> <i>V. FIRM, YELLOW BROWN TO GREY, SLIGH. POROUS,</i> <i>SOME CLAY AND PDS OR CONCENTRATIONS OF</i> <i>SILICIFIED SILTSTONE GRAVEL:</i> <i>1/- Older landslide material (Q150)</i> <i>SANDY SILTSTONE-</i> <i>MOD HARD, GREY TO LT. GREY, MOST MASSIVE w/</i> <i>SAND LENSES, SLIGH. PIT TREND TO MOD. WEATH. & FRACTURED,</i> <i>SOME CaCO₃ TRACE FeO₂ IN SAND</i> SCALE <i>1" = 5'</i>	NONE	NO WELL DEVELOPED JOINTING DATE
BEDDING	TC <i>N 30 W 40° S</i> <i>GOOD, SAND LENSE</i> <i>N 40 W 35° S</i> <i>GOOD SAND LENSE</i> NOTE: NOT VERY POROUS, NO GRAV., OR PLANT DEB., TIGHT w/ SAND LENSES.	
<i>5/14/82</i>		

SOIL TYPE <i>CLAYEY SILT</i>		LOGGED BY <i>J. Boni</i>	PIT # <i>10</i>	
NATURAL SLOPE <i>18-20° / 10-14°</i>		NOTES BY <i>J. Boni & R. MEYER</i>	PROJECT # <i>82-100</i>	
LITHOLOGY (Slide debris and plastic clays in green)		FAULTING (in red)	JOINTS	BEDDING
<i>0-3' TOPSOIL:</i> <i>CLAYEY SILT -</i> <i>V. FIRM TO STIFF, DARK BROWN TO BROWN, SLIGHTLY MOIST TO MOIST, POROUS, 10% GRASS ROOTS, A FEW SILICEOUS SILTSTONE COBBLES</i>		<i>FRACTURE:</i> <i>NEAR VERTICAL, FRACTURE FILLED WITH GYPSUM, 1 1/2"-2" IN WIDTH, IRON OXIDES IN SURROUNDING FEATURE CUT OFF BY QT.</i> <i>N-S, 90°</i>	<i>QT:</i> <i>NO NOTICABLE JOINTING</i>	<i>NONE</i>
<i>3'-6' SLOPE WASH (Qsw):</i> <i>CLAYEY SILT -</i> <i>V. FIRM, DARK BROWN TO BROWN, MOIST, POROUS, BLOCKY APPEARANCE, SOME SILICEOUS SILTSTONE COBBLES, CaCO₃ w/ DESICCATION CRACKS</i>				
<i>6-13 1/2' TERRACE (QT)?:</i> <i>SANDY SILT -</i>				
SCALE 1" = 10'		PIT TREND ← E-W		DATE <i>5/14/82</i>
		LITHOLOGY & DESCRIPTION (CONT)		
<i>6-13 1/2' Older landslide material (Q/50)</i> <i>SANDY SILT -</i> <i>V. FIRM, YELLOW BRN TO MOTTLED BROWN, YEL. BRN REDDISH BRN & GREY, MOIST, V. POROUS, SOME PLANT DEBRIS (ROOT WHIPS), SCATTERED SILICEOUS SILTSTONE GRAVEL & COBBLES, SOME CaSO₄ & WORM TUBES</i>		<i>13 1/2'-17' BEDROCK (TC):</i> <i>SANDY SILTSTONE -</i> <i>MOD. HARD, GREY, MOIST, MASSIVE, SLIGHTLY POROUS, 10% V.F. GR SAND, SOME CLAY & SILICEOUS SILTSTONE CONCRETIONS, VERY FRACTURED & WEATH. SOME CLAY CONTACT IRREGULAR, GRADATIONAL OVER 3" NEAR VERT. FRAC w/ GYPSUM STOPS @ CONTACT</i>		

SOIL TYPE <i>CLAYEY SILT</i>		LOGGED BY <i>J. Perri</i>	PIT # <i>10</i>
NATURAL SLOPE <i>18-20° / 10-14°</i>		NOTES BY <i>J. Perri & R. MEYER</i>	PROJECT # <i>82-100</i>
LITHOLOGY (Slide debris and plastic clays in green)		FAULTING (in red)	JOINTS
BEDDING			
<i>0-3' TOPSOIL:</i> <i>CLAYEY SILT -</i> <i>V. FIRM TO STIFF, DARK BROWN TO BROWN, SLIGHTLY MOIST TO MOIST, POROUS, 10% GRASS ROOTS, A FEW SILICEOUS SILTSTONE COBBLES</i>		<i>FRACTURE:</i> <i>NEAR VERTICAL, FRACTURE FILLED WITH GYPSUM 1 1/2"-2" IN WIDTH, IRON OXIDES SURROUNDING FEATURE CUT OFF BY QT.</i> <i>N-S, 90°</i>	<i>QT:</i> <i>NO NOTICABLE JOINTING</i>
<i>3'-6' SLOPEWASH (Qsw):</i> <i>CLAYEY SILT -</i> <i>V. FIRM, DARK BROWN TO BROWN, MOIST, POROUS, BLOCKY APPEARANCE, SOME SILICEOUS SILTSTONE COBBLES (CaCO₃ w/ DESICCATION CRACKS)</i>			
<i>6-13 1/2' TERRACE (QT)?</i> <i>SANDY SILT -</i>			
SCALE 1" = 10'		DATE <i>5/14/82</i>	
PIT TREND ← E-W			
		LITHOLOGY & DESCRIPTION (CONT)	
<i>0'</i>		<i>6-13 1/2' Older landslide material (Q/so)</i> <i>SANDY SILT</i> <i>V. FIRM, YELLOW BROWN TO MOTTLED BROWN, ELL. BROWN REDDISH BROWN & GREY, MOIST, V. POROUS, SOME PLANT DEBRIS (ROOT WHIRLS), SCATTERED SILICEOUS SILTSTONE GRAVEL & COBBLES, SOME CaSO₄ & WORM TUBES</i>	
<i>10'</i>		<i>13 1/2'-17' BEDROCK (TE):</i> <i>SANDY SILTSTONE -</i> <i>MOD. HARD, GREY, MOIST, MASSIVE, SLIGHTLY POROUS, 10% V.F. GR SAND, SOME CLAY & SILICEOUS SILTSTONE CONCRETIONS, VERY FRACTURED & WEATH., SOME CLAY CONTACT IRREGULAR, GRADATIONAL OVER 3" NEAR VERT. FRACK/ GYPSUM STOPS @ CONTACT</i>	
<i>20'</i>			
<i>30'</i>			

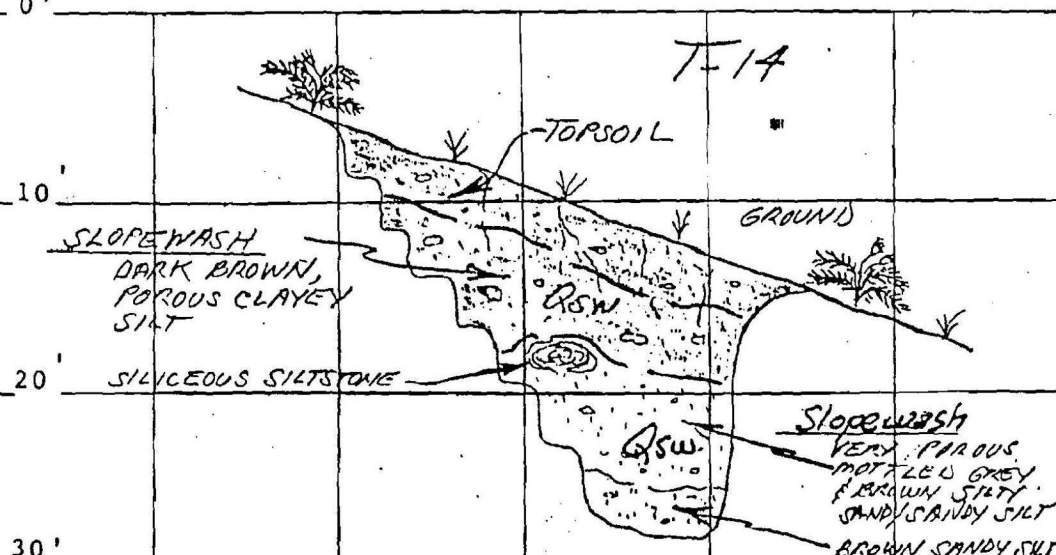
SOIL TYPE <u>CLAYEY SILT</u>		LOGGED BY <u>J.R.</u>		PIT # <u>11</u>	
NATURAL SLOPE <u>38°</u>		NOTES BY <u>J.R.</u>		PROJECT # <u>82-100</u>	
LITHOLOGY (Slide debris and plastic clays in green)			FAULTING (in red)	JOINTS	BEDDING
0-2' <u>TOPSOIL</u> : CLAYEY SILT - V. FIRM TO STIFF, DK BRN TO BRN, MOIST, POROUS, SOME V.F. GR. SAND & GRAVEL, DESICCATION CRACKS w/ $CaSO_4$ or $CaCO_3$, 10% PLANT ROOTS.			NONE	NONE	NONE
2-4' <u>SLOPEWASH (Qsw)</u> : CLAYEY SILT V. FIRM, BRN TO YELL, BRN, MOIST, POROUS, SOME V.F. GR. SAND, GRAVEL, & ROOT HAIRS					
4-7' <u>TERRACE (Qt?)</u> : SANDY SILT - FIRM, BRN TO YELL BRN MOTTLED, MOIST, V. POROUS, SOME COARSE SAND,					
SCALE 1" = 5' 10' PIT TREND <u>N80W</u>			DATE <u>5/14/82</u>		
			LITHOLOGY & DESCRIPTION (CONT.) 7-11' BEDROCK (Tc): SANDY SILTSTONE - MOD. HARD, GREY, MOIST MAS- SIVE, MOD. WEATH, SLIGHTLY FRAC., V.F. GRAINED SAND 15-20%, VERY LITTLE POROSITY IF ANY, PODS + STRINGERS OF $CaSO_4$ & AS FRAC. FILLING.		

SOIL TYPE <u>CLAYEY SILT</u>	LOGGED BY <u>JK</u>	PIT # <u>12</u>
NATURAL SLOPE <u>40°</u>	NOTES BY <u>JK</u>	PROJECT # <u>82-100</u>

LITHOLOGY (Slide debris and plastic clays in green)	FAULTING (in red)	JOINTS	BEDDING
<u>0-2 1/2' TOPSOIL:</u> CLAYEY SILT - V. FIRM TO STIFF, DK BRN TO BRN, SLIGH. MOIST TO MOIST, POROUS, DESICCATION CRACKS, 10% PLANT ROOTS, SOME SLICEOUS SILTSTONE COBBLES. <u>2 1/2'-6' SLOPEWASH (Qsw):</u> CLAYEY SILT - FIRM TO V. FIRM, DK BRN TO BRN GRADING TO YELL BRN WITH DEPTH MOIST, POROUS, CASO ₄ or CaCO ₃ , SOME FINE SAND & SLICEOUS SILTSTONE GRAVEL	NONE	NONE	NONE PALEOSOIL: N-S, 35-40°E
SCALE 1" = 10' 1" = 5'	PIT TREND N80W	DATE	4/14/82

LITHOLOGY & DESCRIPTION (CONT)	
T-12 VIEW NORTH EXISTING ROAD 6" MAIN SLOPEWASH SANDY SILT, MOTTLED BRN, YELL BRN + GREY w/ OXIDE SILICEOUS SILTSTONE CRUST Qsw Qsw PALEOSOL SILTY SAND w/ CLAY	6-12' Slopewash Qsw SANDY SILT - FIRM TO V. FIRM, MOTTLED BRN, DK BRN, YELL BRN & GREY w/ REDDISH BRN OXIDES, MOIST, V. POROUS, SOME ROOT HANS, SILICEOUS SILTSTONE GRAVEL & COBBLES, V.F. TO F. BR SANDS ± 3%. 12-14' PALEOSOL: SILTY SAND - MED. DENSE BRN, MOIST V.F. TO F. GR, SLIGH. POROUS w/ FeO₂ & CASO₄, CONTACT PARALLELS HILL SIDE

SOIL TYPE <i>SANDY SILT</i>		LOGGED BY <i>J. Rossi</i>		PIT # <i>13</i>	
NATURAL SLOPE <i>15-18°</i>		NOTES BY <i>J. Rossi</i>		PROJECT # <i>82-100</i>	
LITHOLOGY (Slide debris and plastic clays in green)			FAULTING (in red)	JOINTS	BEDDING
<i>0-4' TOPSOIL:</i> <i>SANDY SILT -</i> <i>'STIFF BROWN, SLIGHTLY MOIST, VERY POROUS (30%),</i> <i>V. FINE TO FINE GR. SAND 30%, SOME CLAY,</i> <i>1.5" GRASS ROOTS, SCATTERED SILT. SLTST COBBLES.</i>			<i>NONE</i>	<i>N 80 W, 65 S</i> <i>N 85 W, 45 S</i> <i>N 70 W, 60 S</i>	<i>NONE</i>
<i>4-5 1/2' - Landslide Qls</i> <i>SANDY SILT -</i> <i>FIRM TO VERY FIRM, BROWN, POROUS (15%),</i> <i>V. FINE TO FINE GR SAND 20%, SOME CLAY,</i> <i>LT. BROWN TO BROWN, CaSO₄ & CaCO₃ IN FRACS.</i> <i>BLOCKY MOTTLED APPEARANCE w/ TC CLASTS</i>					
SCALE 1" = 10' PIT TREND <i>N 35 W</i>				DATE	<i>5/15/82</i>
			LITHOLOGY & DESCRIPTION. (CONT) <i>Landslide (Qls)</i> <i>7-13 1/2' SANDY SILT -</i> <i>FIRM TO V. FIRM, MOTTLED BRN,</i> <i>LT. BRN, GREY & YELLOW BRN,</i> <i>MOIST, POROUS, FeO₂ & CaSO₄.</i>		
			<i>13 1/2-18' BEDROCK (TC):</i> <i>SANDY SILTSTONE -</i> <i>SOFT TO MOD HARD, GREY</i> <i>TO BROWNISH GREY, MOIST,</i> <i>MASSIVE MOD. FRACTURED, w/</i> <i>FeO₂ & CaSO₄, MOD. WEATH.</i> <i>POORLY DEVELOPED JOINTING.</i>		

SOIL TYPE <u>CLAYEY SILT</u>	LOGGED BY <u>J. Romi</u>	PIT # <u>14</u>	
NATURAL SLOPE <u>15-18°</u>	NOTES BY <u>J. Romi</u>	PROJECT # <u>82-100</u>	
LITHOLOGY (Slide debris and plastic clays in green)	FAULTING (in red)	JOINTS	BEDDING
<u>0-2 1/2' TOPSOIL:</u> CLAYEY SILT - V. FIRM TO STIFF, DK. BROWN TO BROWN, SLIGH. MOIST TO MOIST, POROUS, 10% GRASS ROOTS, SCATTERED SILICEOUS SILTSTONE GRAVEL & COBBLES, SOME V.F. GR. SAND <u>2 1/2 - 7' SLOPEWASH (Qsw)</u> CLAYEY SILT - V. FIRM TO STIFF, DK BRN TO BROWN, MOIST, POROUS, SOME ROOT HAIRS & V.F. GR SAND, SCATTERED SILICEOUS SILTSTONE COBBLES, IIR, GRADATIONAL CONTACT W/ TERRACE BELOW SCALE 1" = 10' PIT TREND	NONE	NONE	NONE CONTACT BETWEEN MOTTLED GREY & BROWN TERRACE, AND BROWN TERRACE, BELOW NEAR HORIZ.
0' 		DATE	<u>5/15/82</u>
		LITHOLOGY & DESCRIPTION (CONT) <u>7-18' Slope wash (Qsw)</u> SILTY SAND - MED DENSE, MOTTLED GREY & BRN, MOIST, V.F. GR., INTER-MIXED WITH SANDY SILT, OBSCURE BEDDING, BLOCK TEXTURE IN SOME PARTS, FeO ₂ STAINING & CaSO ₄ IN FRACS. SANDY SILT - V. FIRM, MOTTLED GREY, & BRN, BROWN BELOW 14', MOIST POROUS, COARSE SAND TO COBBLE CLUSTS OF LAPISTRAND.	
10' 20' 30'			

APPENDIX C

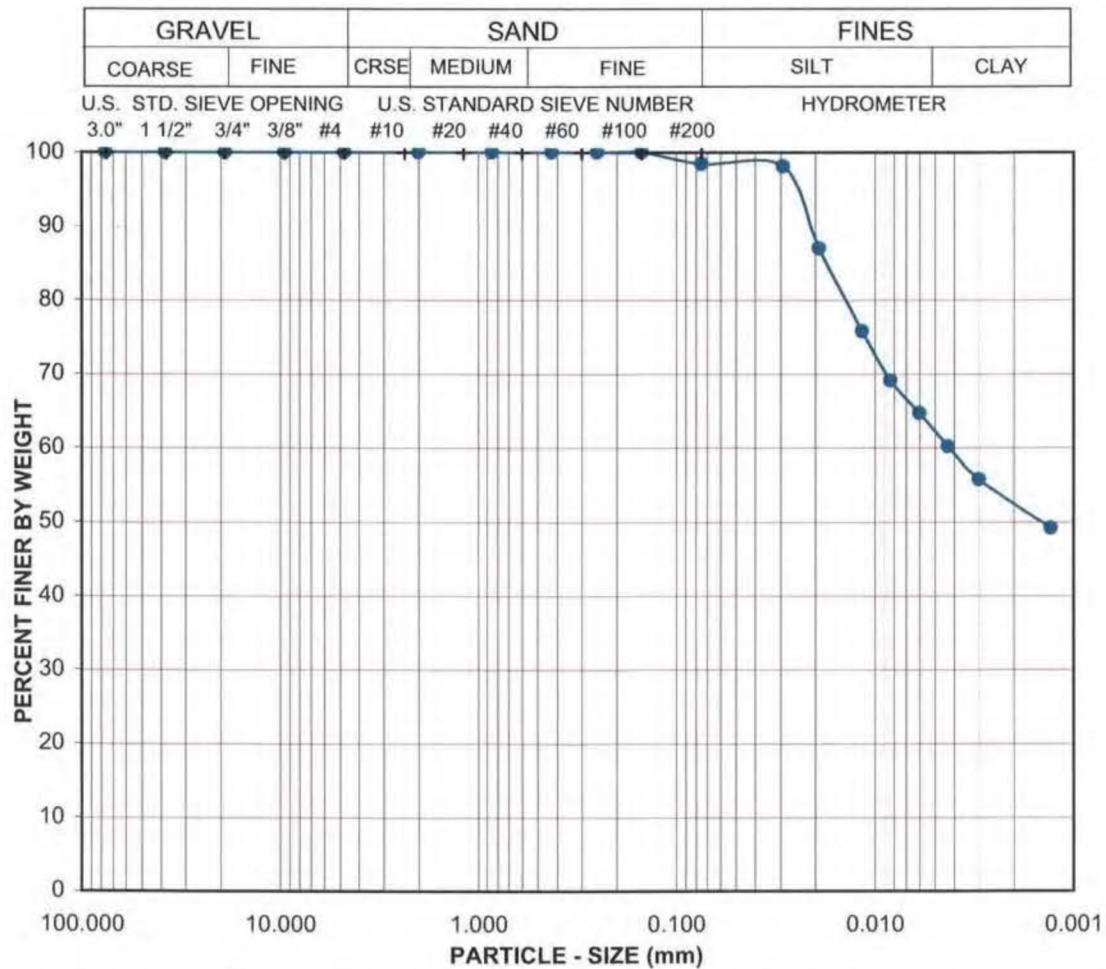
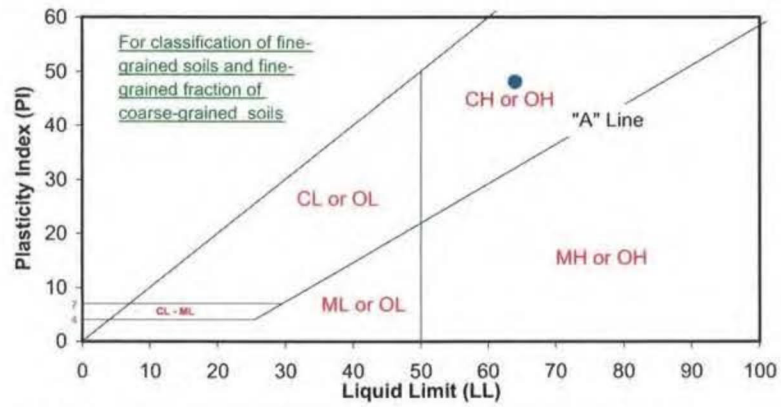
APPENDIX C

Laboratory Testing Procedures and Test Results

Classification or Grain Size Tests: Typical materials were subjected to mechanical grain-size analysis by sieving from U.S. Standard brass screens (ASTM Test Methods C136 or D422). Hydrometer analyses were performed on selected samples. The data was evaluated in determining the classification of the materials. Grain size distribution curves are attached.

Particle size analysis: Particle size analysis was performed by mechanical sieving and hydrometer methods according to ASTM D422 and D4318. the percent fines particle from these grading is summarized below.

Sample Location	USCS Soil Classification
LB-2 @ 58.5 feet	CH
LB-2 @ 58.5 feet	CH



Boring No.	Sample No.	Depth (m)	Soil Type	GR:SA:FI (%)	LL,PL,PI
LB-2	B8-A	58.5	CH	0,0,2	64,16,48

Sample Description:
CH: BLACK FAT CLAY



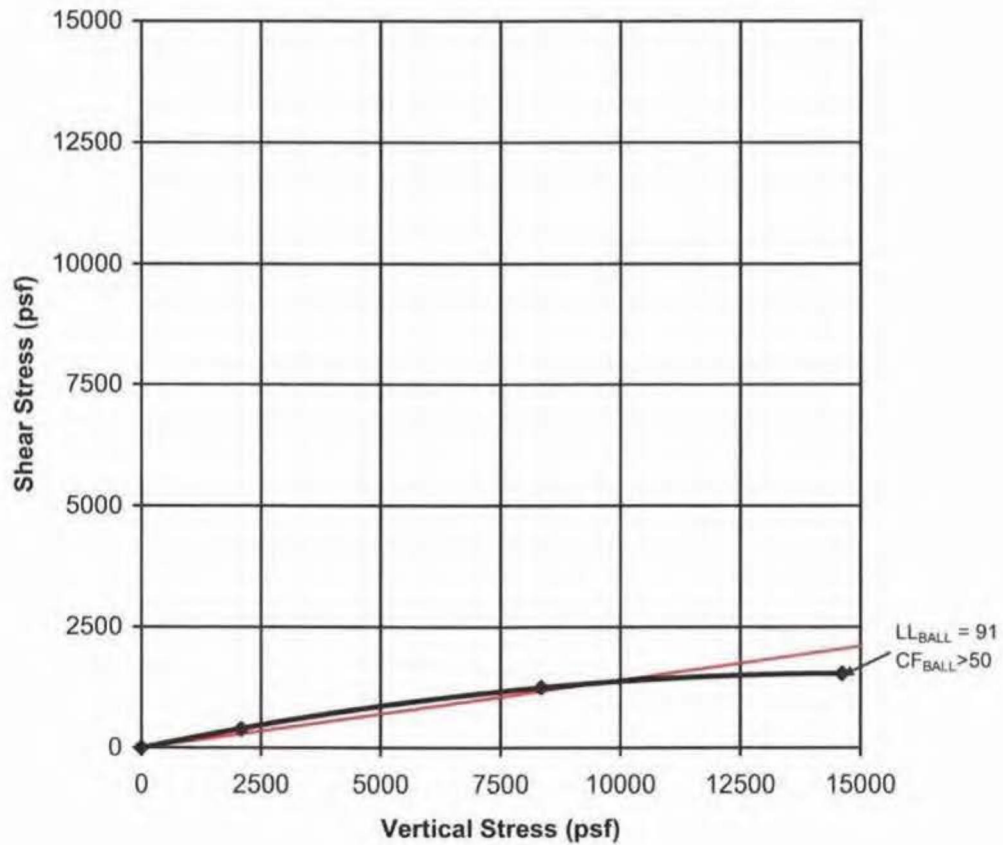
Leighton

Project No.: 012383-001

CONT. LIFE / ORCHARD

ATTERBERG LIMITS, PARTICLE - SIZE CURVE
ASTM D 4318, D 422

Rev. 08-08



Boring Location LB-2

Sample Depth (feet) 58.5

Linear Strength Envelope

Friction Angle, ϕ'_{res} (deg) 8

Cohesion, c'_{res} (psf) 0

Legend

○ Shear Test Result ◆ Envelope by Correlation (Stark, Choi, McCone, 2005) / Linear Envelope

RESIDUAL STRENGTH
BY CORRELATION

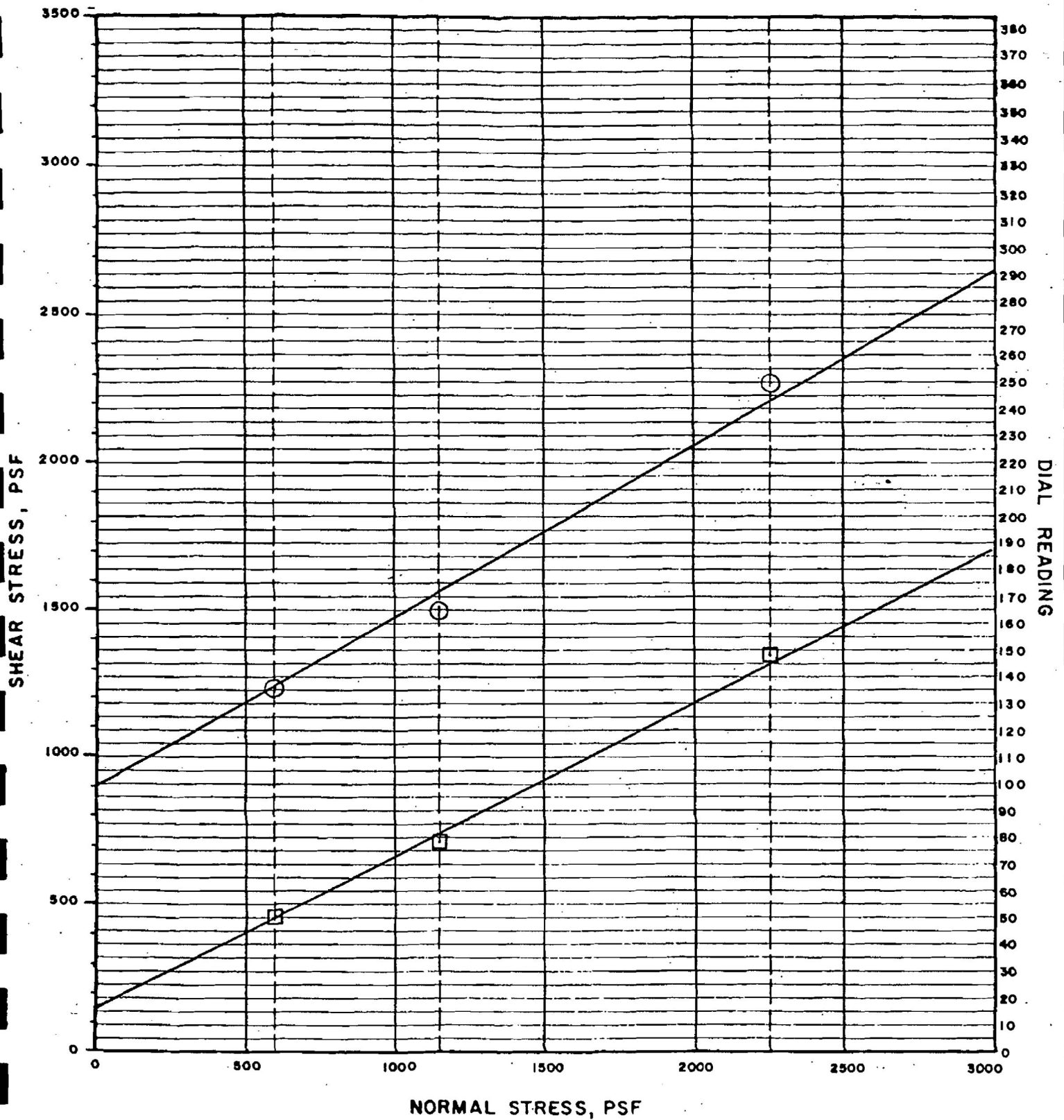
Project No. 012383-001
 Project Name Continuing Life



Leighton

**Previous
Leighton Lab**

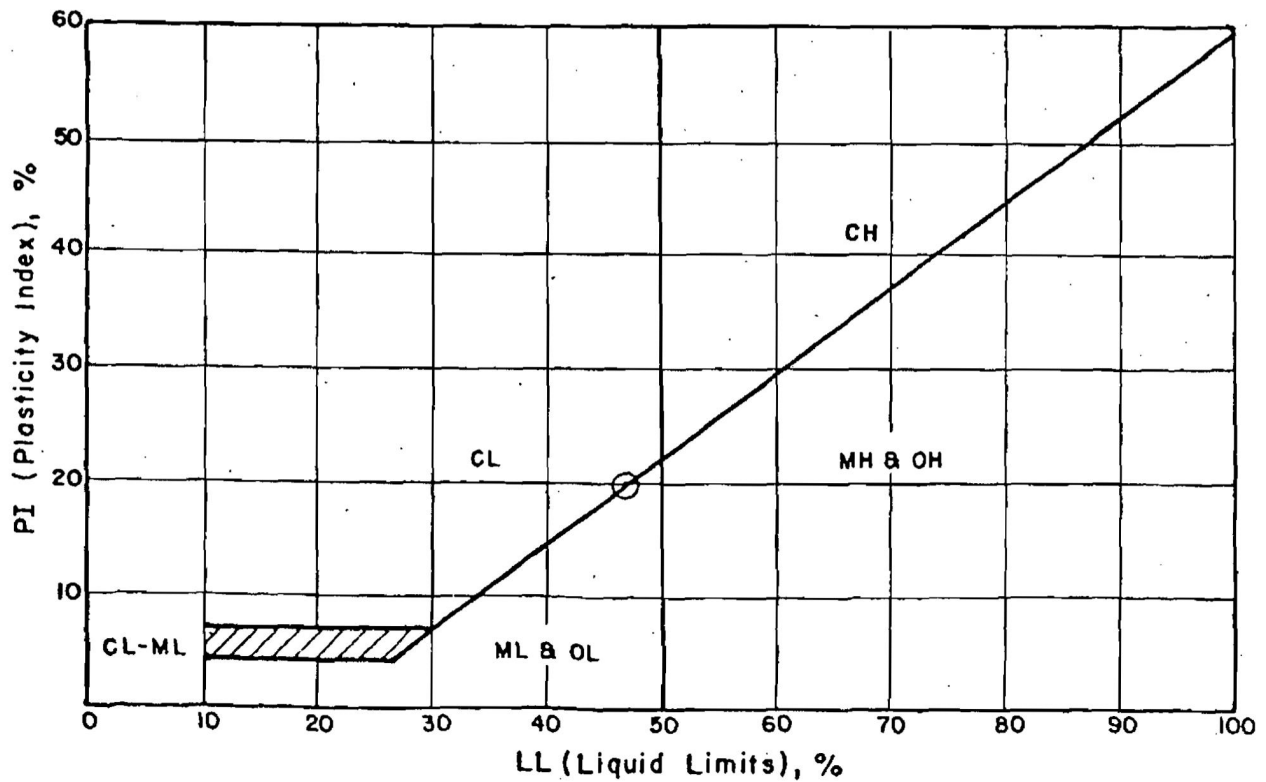
DIRECT SHEAR SUMMARY



Boring	Depth	Symbol	Friction Angle	Cohesion	Remarks
B-3	95'-96'	○	30°	900 PSF	Undisturbed Slit
B-3	95'-96'	□	27°	150 PSF	Residual

ATTERBERG LIMITS TEST RESULTS

SYMBOL	HOLE NO.	DEPTH	FIELD MOISTURE (%)	LL (%)	PL (%)	PI (%)	U. S. C. S.
O	B-3	96'	-	47	27	20	CL/ML



MAXIMUM DENSITY TEST RESULTS

Project: Currie-Samuelson No: 180165-02 Date: 12-1-80

Boring No: B-3 Sample No: 2 Depth: 17-19'

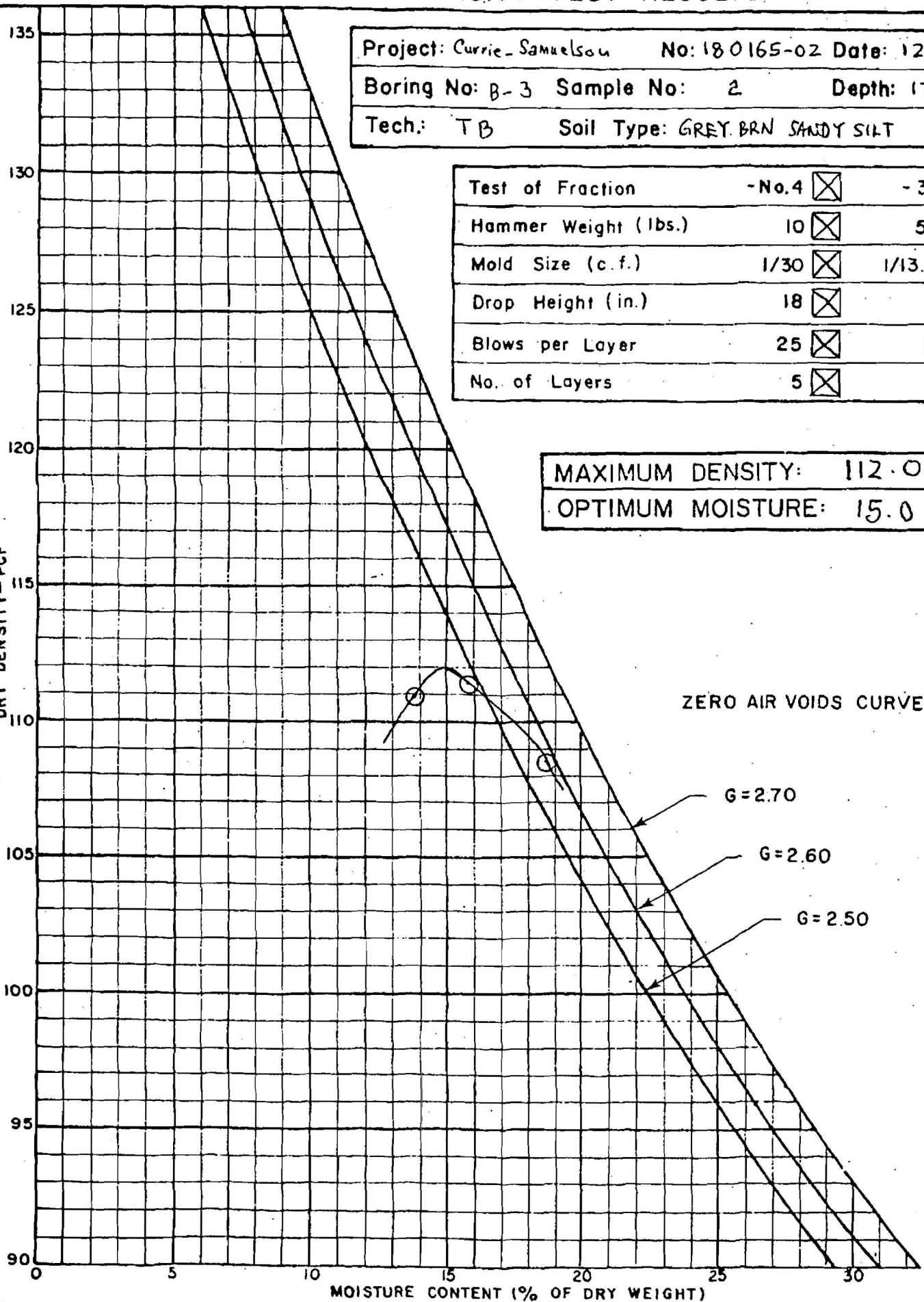
Tech: TB Soil Type: GREY BRN SANDY SILT

Test of Fraction	- No. 4 ☒	- 3/4 ☐
Hammer Weight (lbs.)	10 ☒	5.5 ☐
Mold Size (c.f.)	1/30 ☒	1/13.33 ☐
Drop Height (in.)	18 ☒	12 ☐
Blows per Layer	25 ☒	56 ☐
No. of Layers	5 ☒	3 ☐

MAXIMUM DENSITY: 112.0

OPTIMUM MOISTURE: 15.0

DRY DENSITY - PCF



ZERO AIR VOIDS CURVES

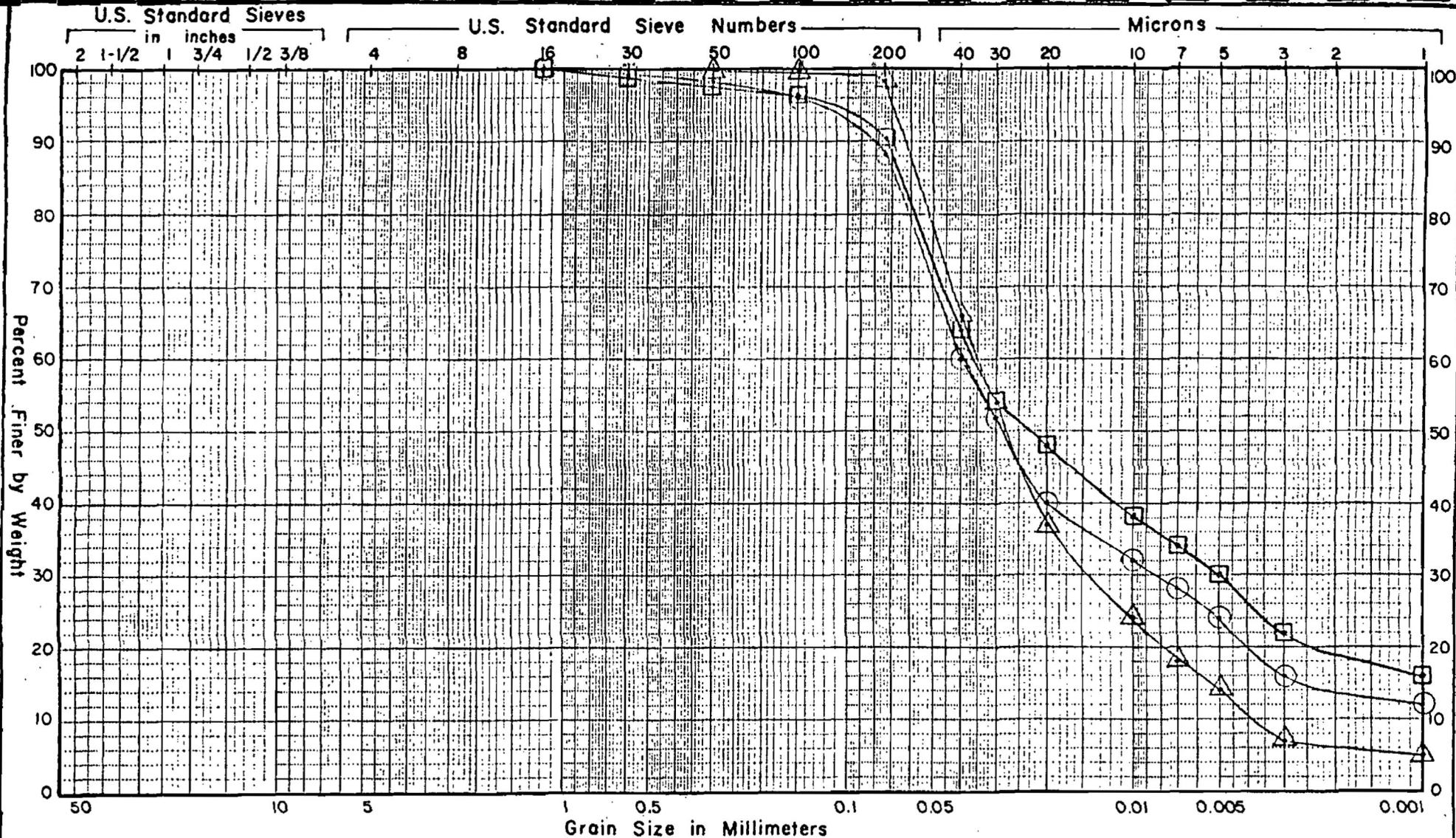
G=2.70

G=2.60

G=2.50

MOISTURE CONTENT (% OF DRY WEIGHT)

Project No.: 180165-01



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

Symbol	Hole No.	Sample No.	Depth or Elev.	Field Moisture (%)	LL (%)	PI (%)	Activity PI/-2u	Cu D_{60}/D_{10}	Cc $\frac{(D_{30})^2}{D_{10} \times D_{60}}$	Percent Passing No. 200	Percent Passing 2u	U.S.C.S.
○	2	7	35'									
△	2	18	90'									
□	2	4	20'									

GRADATION
TEST
RESULTS

Plate No.: B-4

Lowney Lab

APPENDIX B

GEOTECHNICAL LABORATORY TESTING

The geotechnical laboratory testing program was directed toward a quantitative and qualitative evaluation of the physical and mechanical properties of the soils underlying the site and to aid in verifying soil classification.

In-Situ Moisture and Density: The natural water content was determined (ASTM D 2216-98) on samples of the materials recovered from the subsurface exploration. Also, in place dry density determinations (ASTM D 2937-94) were performed on relatively undisturbed samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the logs at the appropriate sample depths, in Appendix A.

Compaction: Laboratory compaction tests (ASTM D 1557-91) were performed on representative bulk soil samples of the surface soil to determine the maximum dry density and optimum moisture content. Results of the tests are presented on the following "Moisture-Density Relationship" figures.

Direct Shear: Direct shear tests (ASTM D 3080-98) were performed on undisturbed samples to evaluate the strength characteristics of the subsurface earth materials. The tests were performed at a constant rate of strain on soaked samples. Peak shear strengths are plotted. Ultimate shear strengths (at ¼-inch deflection) are also plotted for each sample, with a "U-" prefix before the boring number. Both sets of results are presented graphically on the "Direct Shear Test" figures.

Consolidation: Consolidation tests (ASTM D 2435-96) were performed on undisturbed samples of the subsurface earth materials to assist in evaluating the compressibility properties. Results of the consolidation tests are presented graphically on the attached "Consolidation Test" figures.

Expansion Index: Expansion Index (EI) tests were performed on bulk samples of the site clays, in general accordance with the ASTM D 4829-95 Standard Test Method. Results are tabulated in Table B-1, below:

Table B-1. Results of Expansion Index Tests

Boring Number	Sample Depth (feet)	Description of Material	Expansion Index (EI) value
LF-4	0-5	CLAY (CH), dark gray to black	110
LH-10	0-5	CLAY (CL), dark gray to black	87

R-Value: An R-value resistance test (California Test Method No. 301) was performed on a representative sample of the surface soils at the site to provide data for the pavement design. The test indicated an R-value of 7 at an exudation pressure of 300 pounds per square inch. The results of the test are presented on Table B-2.

Table B-2. Results of R-Value Tests

Boring Number	Sample Depth (feet)	Description of Material	Water Content (percent)	Dry Density (pcf)	Exudation Pressure (psi)	"R" value
LF-6	0-5	CLAY (CH)	20	105	448	15
			23	100	313	8
			26	92	209	4

Corrosivity Tests: To evaluate the corrosion potential of the subsurface soils at the site we submitted samples collected during our subsurface investigation to the M. J. Schiff & Associates laboratory for pH, resistivity and soluble sulfate and chloride content testing. Results of these tests are enclosed in this appendix.

* * * * *

Job No. 1651-4
Project JUNIPERO SERRA HIGH SCHOOL
SAN JUAN CAPISTRANO, CALIFORNIA

Reference Curve # LB-02 3.0
Description of Material SILTY CLAY (CL), dark brown
Test Method ASTM D1557 Method A

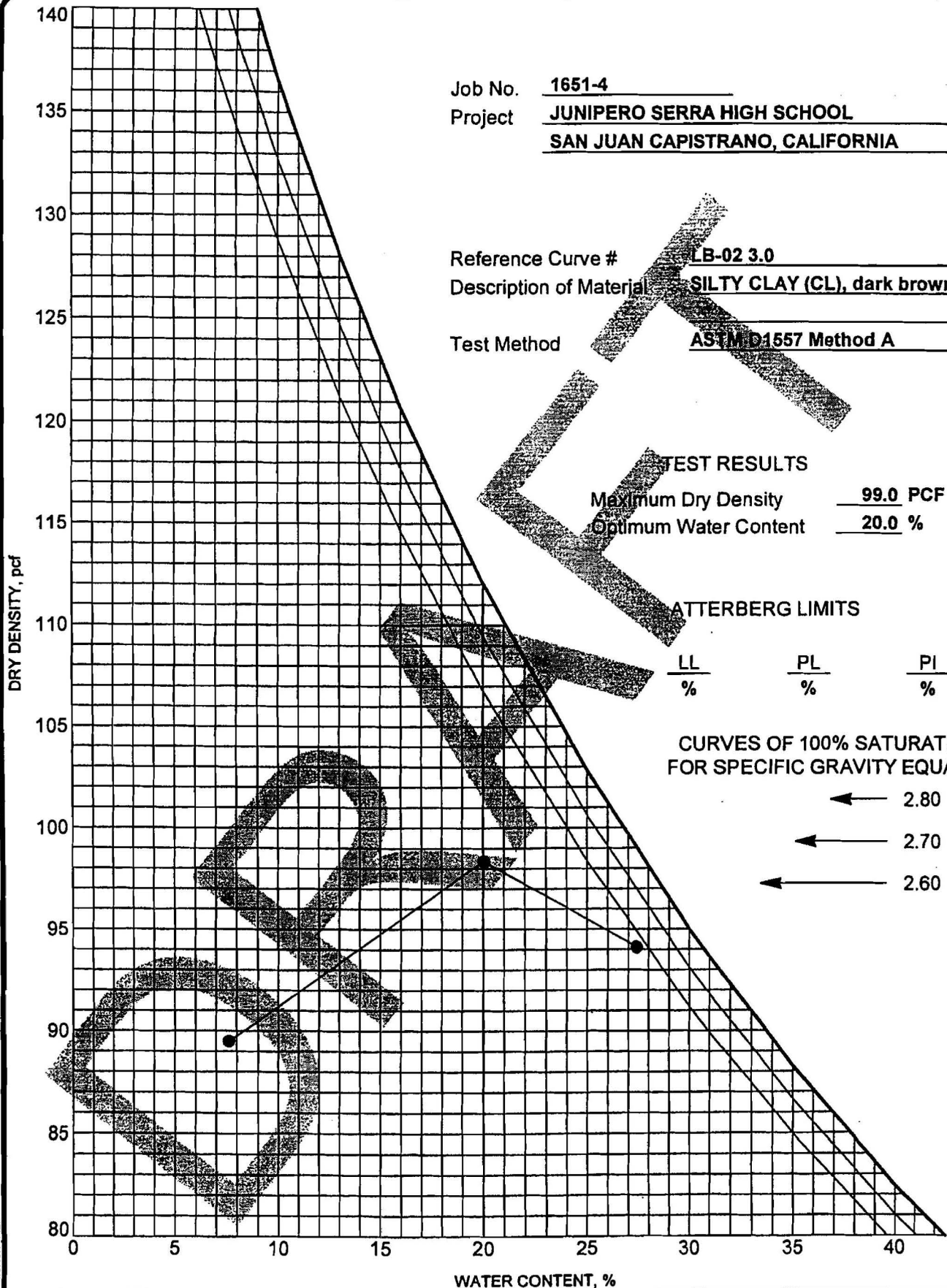
TEST RESULTS
Maximum Dry Density 99.0 PCF
Optimum Water Content 20.0 %

ATTERBERG LIMITS

LL	PL	PI
%	%	%

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

← 2.80
← 2.70
← 2.60



WATER CONTENT, %

MOISTURE-DENSITY RELATIONSHIP

Project: JUNIPERO SERRA HIGH SCHOOL
Location: SAN JUAN CAPISTRANO, CALIFORNIA
Project No.: 1651-4

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

Job No. 1651-4
Project JUNIPERO SERRA HIGH SCHOOL
SAN JUAN CAPISTRANO, CALIFORNIA

Reference Curve # LF-18 4.0
Description of Material SILTY CLAY (CL), with sand
Test Method ASTM D1557 Method A

TEST RESULTS

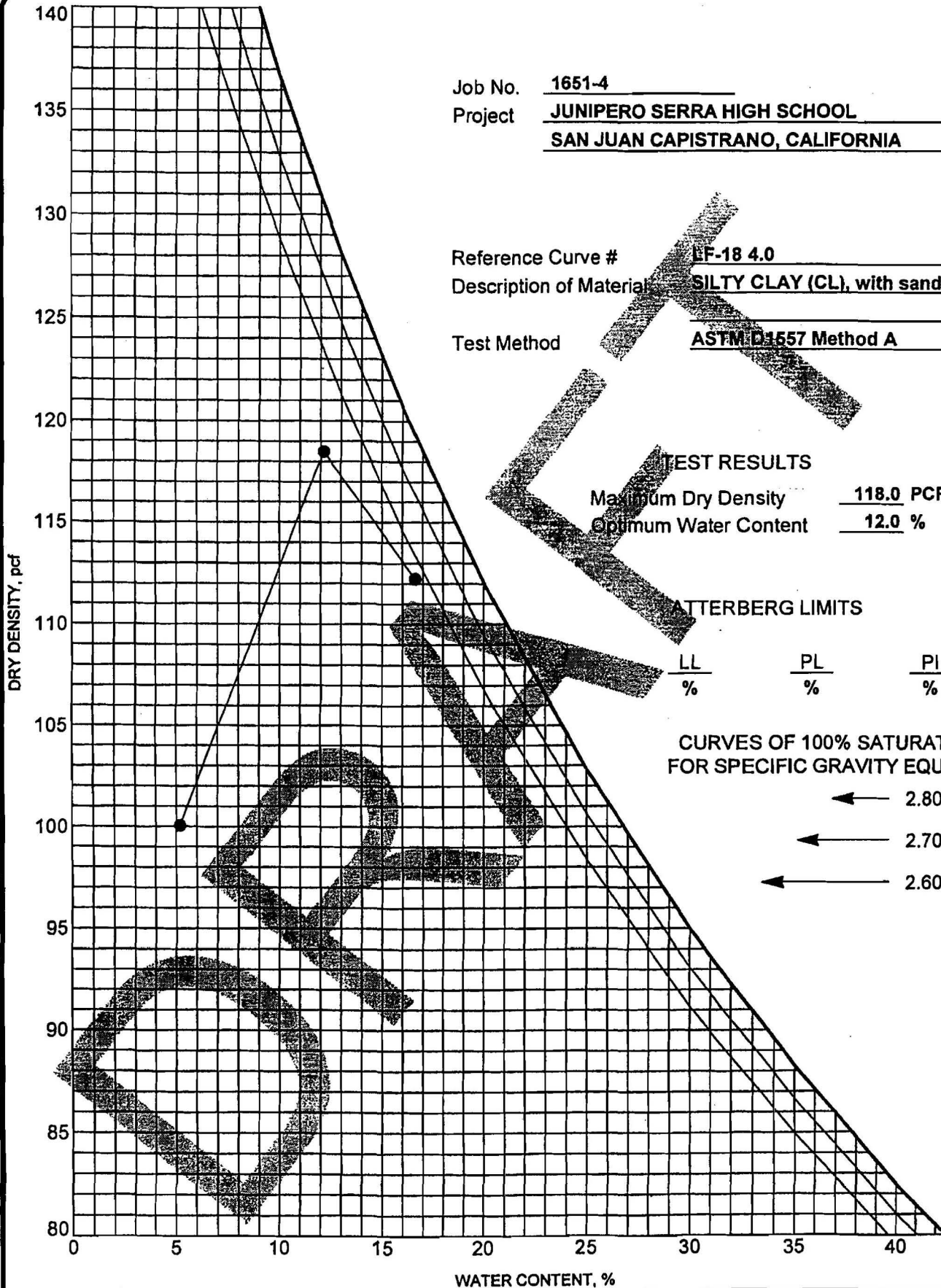
Maximum Dry Density 118.0 PCF
Optimum Water Content 12.0 %

ATTERBERG LIMITS

LL	PL	PI
%	%	%

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

← 2.80
← 2.70
← 2.60



WATER CONTENT, %

MOISTURE-DENSITY RELATIONSHIP

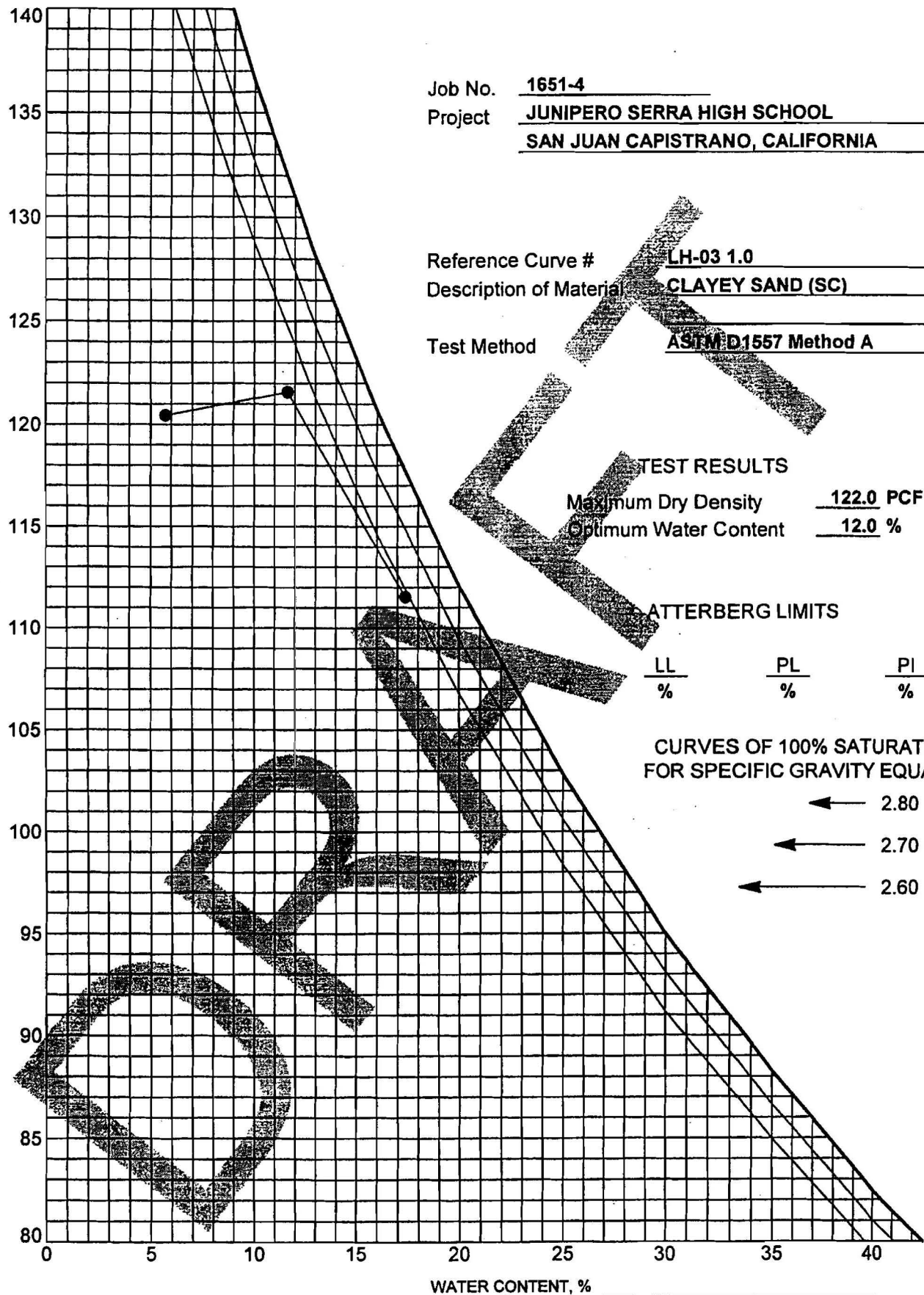
Project: JUNIPERO SERRA HIGH SCHOOL

Location: SAN JUAN CAPISTRANO, CALIFORNIA

Project No.: 1651-4

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

DRY DENSITY, pcf



Job No. 1651-4
Project JUNIPERO SERRA HIGH SCHOOL
SAN JUAN CAPISTRANO, CALIFORNIA

Reference Curve # LH-03 1.0
Description of Material CLAYEY SAND (SC)
Test Method ASTM D1557 Method A

TEST RESULTS
Maximum Dry Density 122.0 PCF
Optimum Water Content 12.0 %

ATTERBERG LIMITS

LL	PL	PI
%	%	%

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:
← 2.80
← 2.70
← 2.60

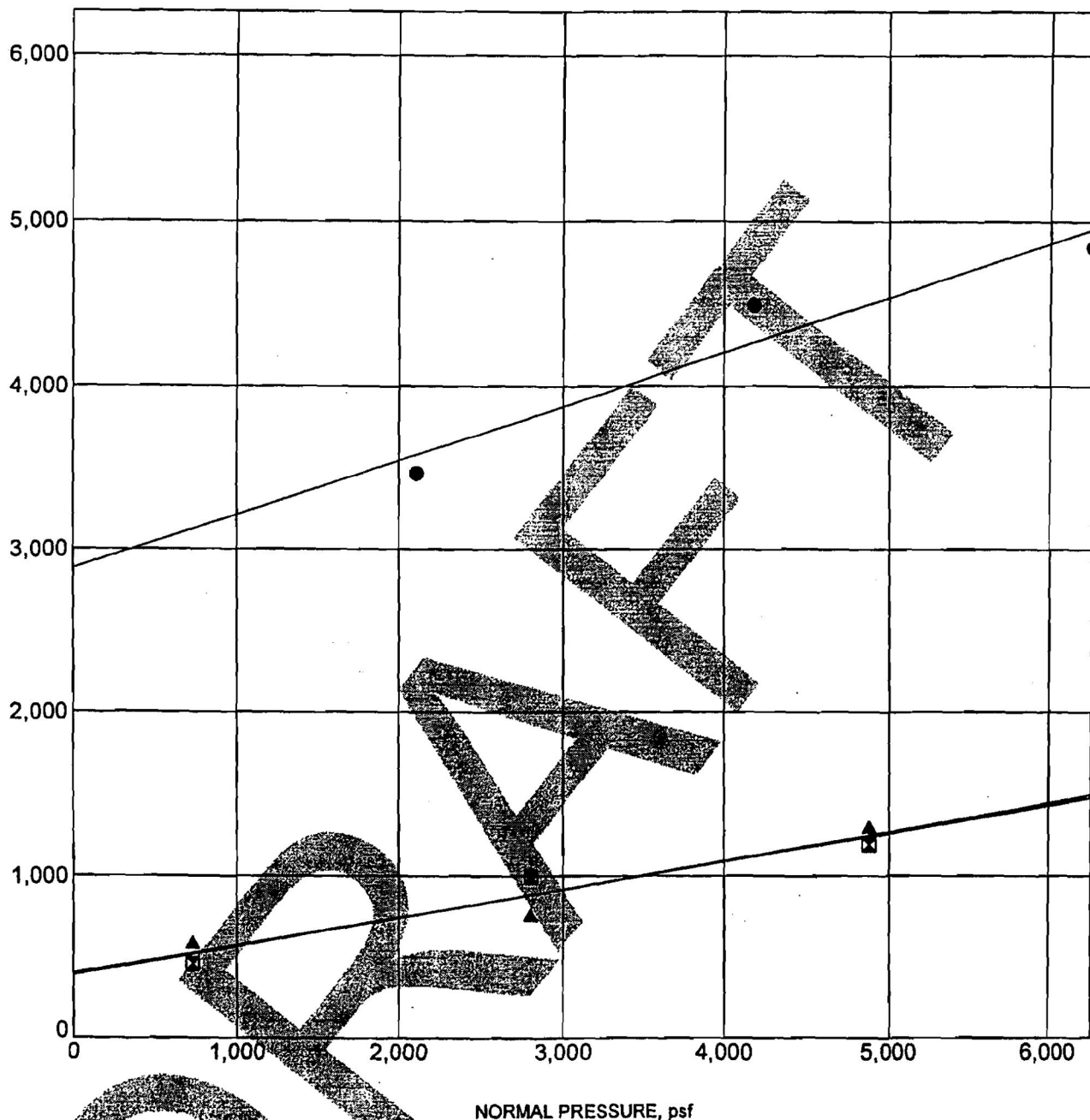
LA CORP. GDT 7/31/01 Fullerton ALM

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

MOISTURE-DENSITY RELATIONSHIP

Project: JUNIPERO SERRA HIGH SCHOOL
Location: SAN JUAN CAPISTRANO, CALIFORNIA
Project No.: 1651-4

SHEAR STRENGTH, psf



Exploration	Depth (feet)	Classification	γ_d	MOIST. (%)	c	ϕ
● LB-05	45.0	SILTSTONE (Tcs), very dark gray	90	33	2883	18
▣ LB-09	19.0	REMOLD: CLAY (CL), dark gray-brown	90	35	384	10
▲ LB-09	34.0	REMOLD: CLAY (CL), dark gray-brown	99	30	399	10

DIRECT SHEAR TEST

Project: JUNIPERO SERRA HIGH SCHOOL

Location: SAN JUAN CAPISTRANO, CALIFORNIA

Project No.: 1651-4

LOWNEY ASSOCIATES
Environmental/Geotechnical/Engineering Services

Table 1 - Laboratory Tests on Soil Samples

JSHS - San Juan Capistrano

Your #1651-4, MJS&A #01-0266LAB

29-Mar-01

Sample ID	LF-1 @ 0-5' Clay	LF-10 @ 0-5' Clay
-----------	------------------------	-------------------------

Resistivity	Units		
as-received	ohm-cm	6,700	70,000
saturated	ohm-cm	570	1,200

pH	7.2	7.0
----	-----	-----

Electrical

Conductivity	mS/cm	0.90	0.23
--------------	-------	------	------

Chemical Analyses

Cations

calcium	Ca ²⁺	mg/kg	353	60
magnesium	Mg ²⁺	mg/kg	139	36
sodium	Na ¹⁺	mg/kg	405	82

Anions

carbonate	CO ₃ ²⁻	mg/kg	ND	ND
bicarbonate	HCO ₃ ¹⁻	mg/kg	207	293
chloride	Cl ¹⁻	mg/kg	248	ND
sulfate	SO ₄ ²⁻	mg/kg	1,739	228

Other Tests

ammonium	NH ₄ ¹⁺	mg/kg	na	na
nitrate	NO ₃ ¹⁻	mg/kg	na	na
sulfide	S ²⁻	qual	na	na
Redox	mv		na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

**Medall
Lab**

July 6, 1984

APPENDIX B

LABORATORY TESTING

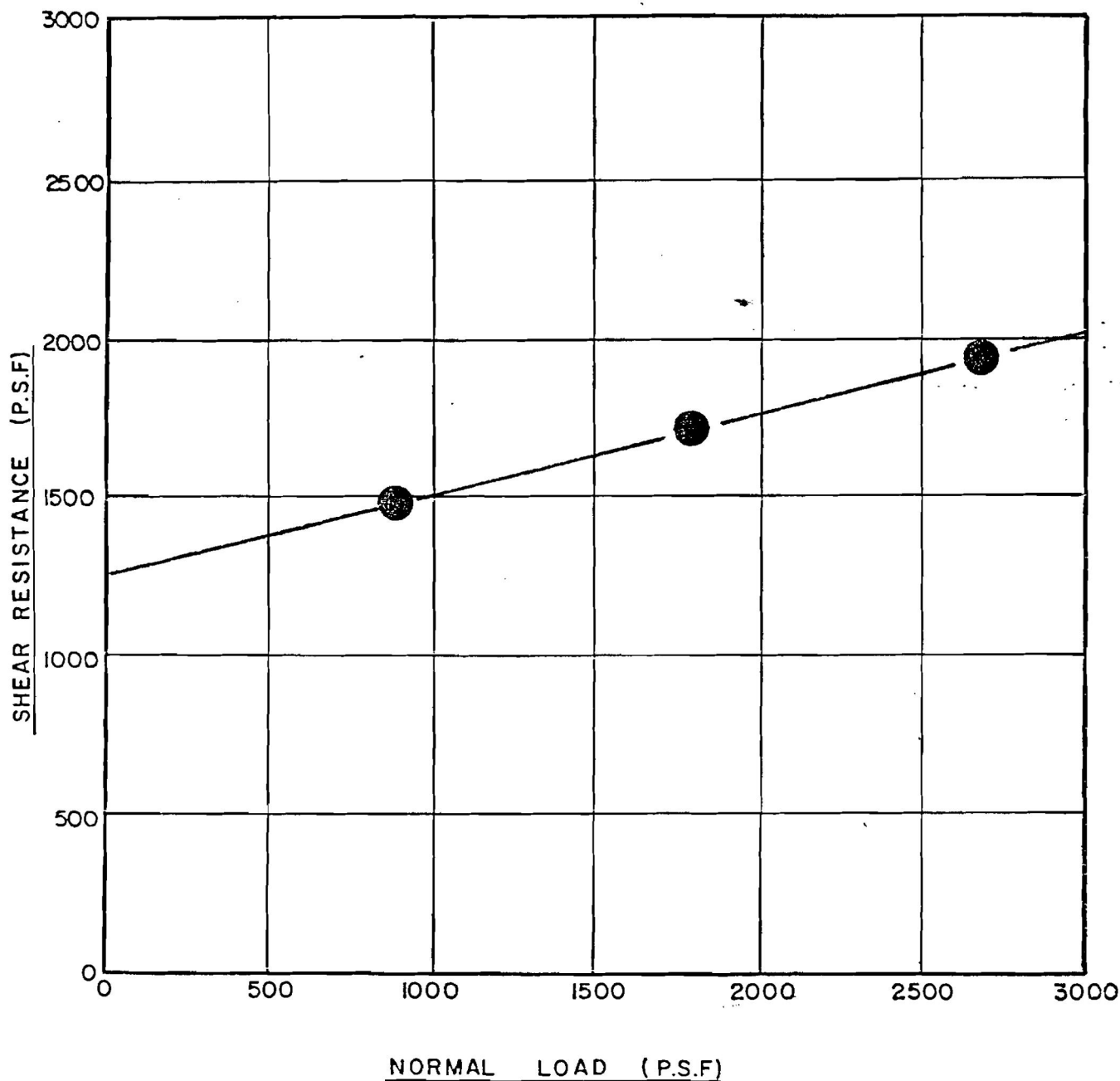
The soil samples obtained from the borings were visually classified and selected samples were tested in our laboratory to evaluate their engineering properties. The laboratory tests performed are summarized in the subsections below.

Moisture Density

The natural moisture content and dry density were determined for undisturbed soil samples as an aid to classification and to permit recognition of variations in material consistency. The results of the field moisture content/dry density tests are presented on the Logs of Borings for convenient correlation.

Direct Shear Tests

Direct shear tests were performed on representative undisturbed samples. The shear box was designed to accommodate a sample having a diameter of 2.375 inches and a height of one inch. Samples were tested at various normal loads at field moisture contents. The shear stress was applied at a constant rate of strain of approximately 0.05 inches per minute. The results of these tests are plotted in Figures B-1 through B-3.



LOCATION: B-4

ANGLE OF INTERNAL FRICTION(ϕ)= 15°

DEPTH: 30'

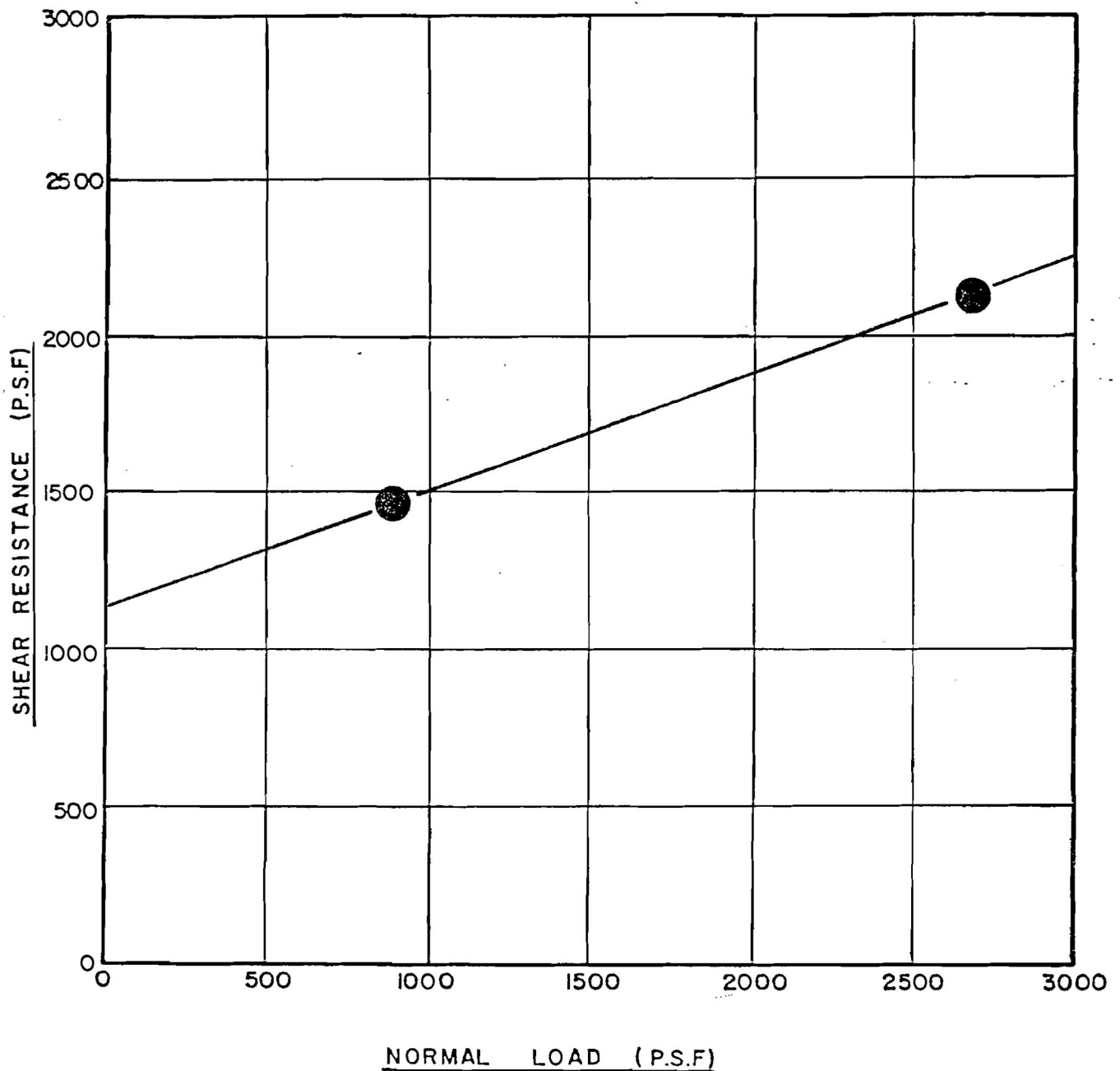
COHESION (P.S.F.)= 1240

CLASSIFICATION: Brn. Clayey Silt
(Fractured Siltstone), (ML)

EXPLANATION

- TEST AT FIELD MOISTURE CONTENT
- TEST AT INCREASED MOISTURE CONTENT
- └ REMOLDED SOILS
- └ NATURAL SOILS

DIRECT SHEAR TEST DATA



LOCATION: B-4

ANGLE OF INTERNAL
FRICTION(ϕ)= 20°

DEPTH: 50'

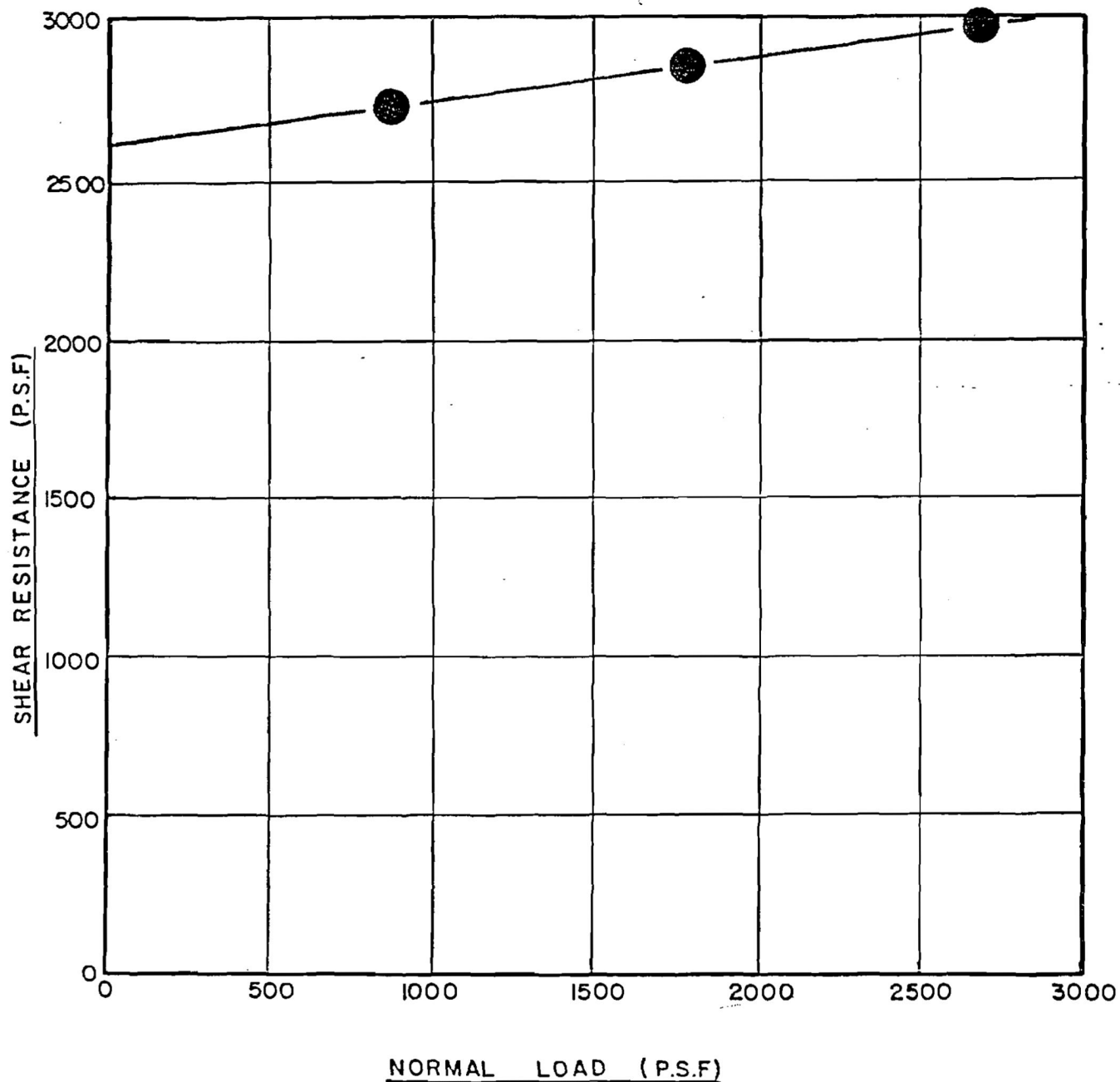
COHESION (P.S.F.)= 1130

CLASSIFICATION: Brn. Sandy Silt
w/ Siltstone, (ML)

EXPLANATION

- △ TEST AT FIELD MOISTURE CONTENT
- ▲ TEST AT INCREASED MOISTURE CONTENT
- └ REMOLDED SOILS
- └ NATURAL SOILS

DIRECT SHEAR TEST DATA



LOCATION: B-4

ANGLE OF INTERNAL
FRICTION (ϕ) = 9°

DEPTH: 75'

COHESION (P.S.F.) = 2600

CLASSIFICATION: Dk. Brn. Silty Clay, (CH)

EXPLANATION

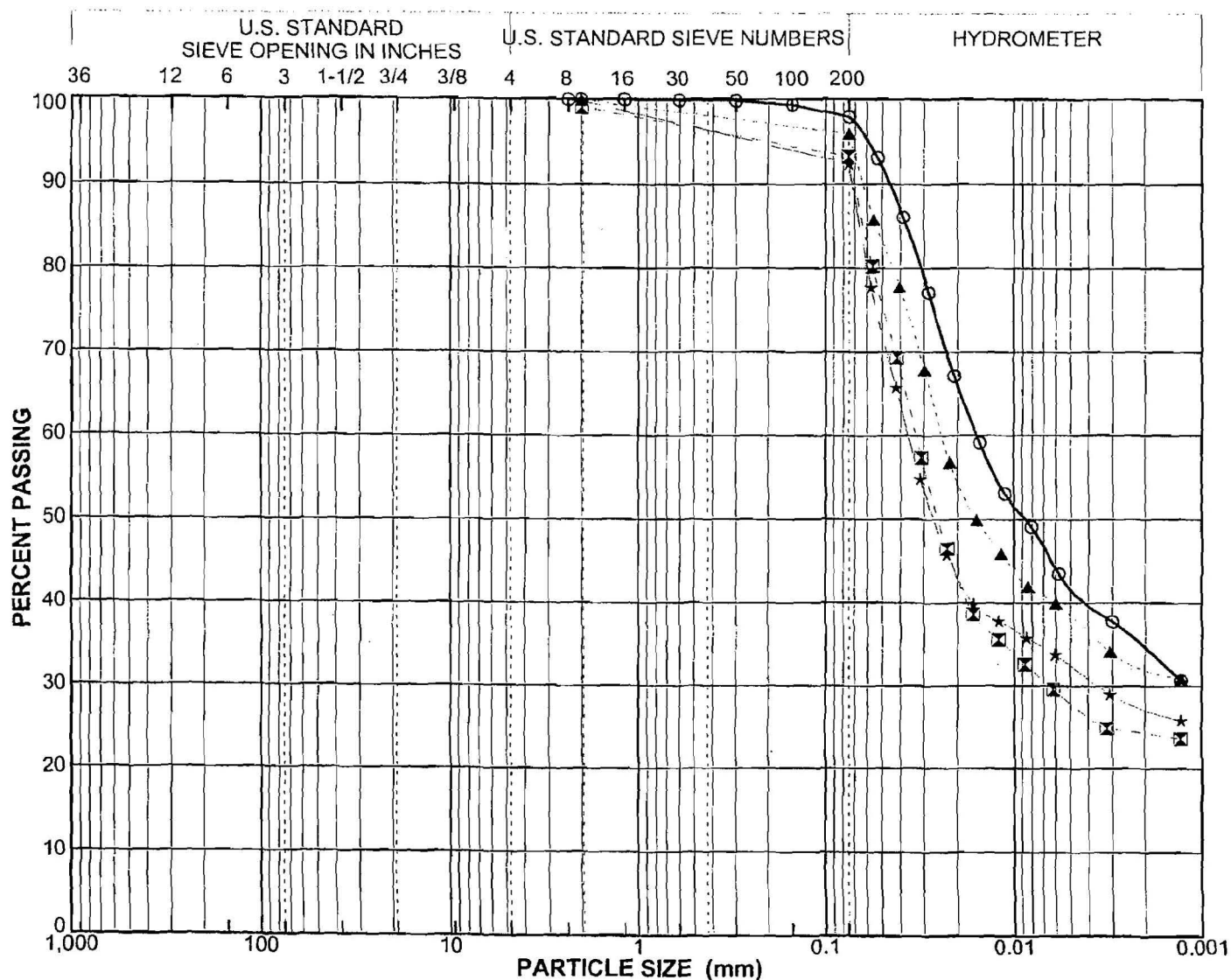
- TEST AT FIELD MOISTURE CONTENT
- TEST AT INCREASED MOISTURE CONTENT
- └ REMOLDED SOILS
- └ NATURAL SOILS

DIRECT SHEAR TEST DATA

**NMG
Lab**

APPENDIX C

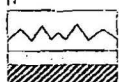
BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2 μ	C _u	C _c	Passing No. 200 Sieve (%)	Passing 2 μ (%)	USCS
○	B-3	SB-3	71.5		56	30				98	34	CL
⊠	H-1	D-9	45.0	29	44	24				93	24	CL
▲	H-1	D-10	50.0	30	50	29				96	32	CH
★	H-1	D-12	60.0	31	48	26				92	27	CL

PARTICLE SIZE DISTRIBUTION

CUSD/Rancho Capistrano
San Juan Capistrano
PROJECT NO. 01012-02



NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	

