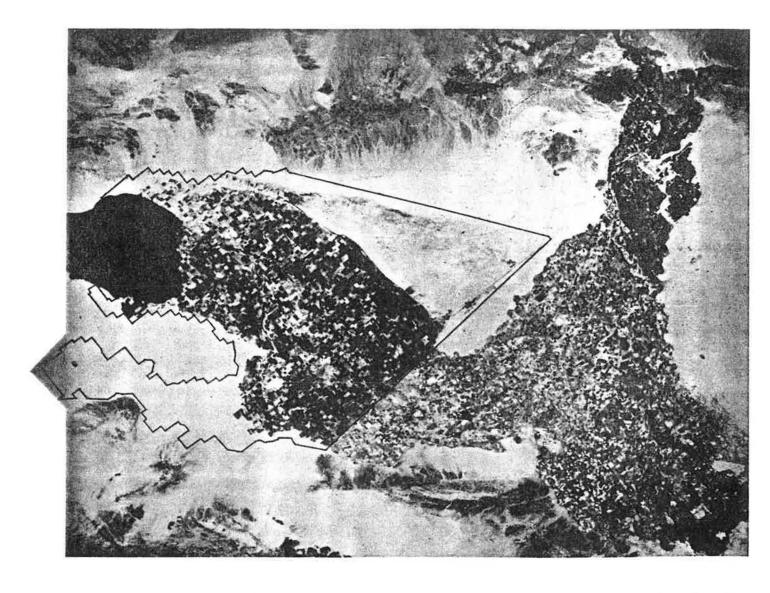
DOCKETED	
Docket Number:	23-AFC-02
Project Title:	Elmore North Geothermal Project (ENGP)
TN #:	252490-3
Document Title:	Elmore North Geothermal Project Data Request Response Set 1 Part 3
Description:	N/A
Filer:	Jerry Salamy
Organization:	Jacobs
Submitter Role:	Applicant Consultant
Submission Date:	10/2/2023 7:50:34 PM
Docketed Date:	10/3/2023

## **Soil Survey of**

## IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station

and

Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and	Depth	USDA texture	Classif	ication	Frag-	P	ercenta, sieve	ge pass number-	-	Liquid	Plas-
map symbol	l spon	002 00000	Unified	AASHTO	> 3  inches	4	10	40	200	limit	ticity index
	In			1	Pot		1			Pot	
100 Antho	0-13 13-60	Loamy fine sand Sandy loam, fine sandy loam.	SM SM	A-2, A-2, A-4	0	100 90-100	100 75 <b>-</b> 95	75-85 50-60			N P N P
101*: Antho		Loamy fine sand Sandy loam, fine sandy loam.		A-2 A-2, A-4			100 75 <b>-</b> 95			===	NP NP
Superstition		Fine sandLoamy fine sand, fine sand, sand.		A-2 A-2	0		95-100 95-100				N P N P
102*. Badland											
103 Carsitas	110-60	Gravelly sand Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1, A-2 A-1			50-85 50-85		0-10 0-10	===	NP NP
104* Fluvaquents								 	1		
105 Glenbar	13-60	Clay loam Clay loam, silty clay loam.		A-6 A-6	0	100 100		90-100 90-100	70-95 70-95	35-45 35-45	
106 Glenbar	13-60	Clay loam Clay loam, silty clay loam.	CL CL	A-6, A-7 A-6, A-7		100 100		90 <b>-</b> 100 90 <b>-</b> 100	70-95 70-95	35-45 35-45	15-25 15-25
107* Glenbar	0-13	Loam	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
		Clay loam, silty clay loam.		A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108 Holtville	14-22 22-60	Loam	CL, CH	A-4 A-7 A-4	0 0 0	100 100 100	100	85-100 95-100 95-100		25-35 40-65 25-35	NP-10 20-35 NP-10
	17-24	Clay, silty clay Silt loam, very fine sandy	CL, CH	A-7 A-7 A-4	0 0	100 100 100	100	95-100 95-100 95-100		40-65 40-65 25-35	20-35 20-35 NP-10
	35-60	loam. Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55		ΝP
110 Holtville	17-24 24-35	Silty clay Clay, silty clay Silt loam, very fine sandy	CH, CL	A-7 A-7 A-4	0 0	100 100 100	100	95-100 95-100 95-100	185-95	40-65 40-65 25-35	20-35 20-35 NP-10
		loam. Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55		NΡ

See footnote at end of table.

TABLE 11. -- ENGINEERING INDEX PROPERTIES -- Continued

Soil name and	  Depth	USDA texture	Classif	ication	Frag-	Pe	sieve i	ge pass: number-		Liquid	Plas-
map symbol			Unified		> 3 linches	4	10	40	200	limit	
	In				Pet					Pct	
111*: Holtville	110-22 22-60	Silty clay loam Clay, silty clay Silt loam, very fine sandy loam.	CL, CH	A-7 A-7 A-4	0 0 0	100 100 100	100	95-100 95-100 95-100	85-95	40-65 40-65 25-35	20-35 20-35 NP-10
Imperial	112-60	Silty clay loam Silty clay loam, silty clay, clay.	CH CH	A-7 A-7	0	100 100	100 100		85-95 85-95	40 <b>-</b> 50 50 <b>-</b> 70	10-20 25-45
112 Imperia <sup>1</sup>	12-60	Silty clay Silty clay loam, silty clay, clay.	CH CH	A-7 A-7	0 0	100 100	100 100		85 <b>-</b> 95 85 <b>-</b> 95	50-70 50-70	25-45 25-45
113 Imperial	12-60		CH CH	A-7 A-7	0	100	100 100		85 <b>-</b> 95 85 <b>-</b> 95	50-70 50-70	25-45 25-45
114 Imperial	12-60	Silty clay Silty clay loam, silty clay, clay.	СН	A-7 A-7	0	100 100	100 100		85 <b>-</b> 95 85 <b>-</b> 95	50-70 50-70	25-45 25-45
115*: Imperial	0-12 12-60	Silty clay loam Silty clay loam, silty clay, clay.	CL CH	A-7 A-7	0	100 100	100 100		85 <b>-</b> 95 85 <b>-</b> 95	40-50 50-70	10-20 25-45
Glenbar		Silty clay loam Clay loam, silty clay loam.		A-6, A-7 A-6, A-7		100 100		90 <b>~1</b> 00 90 <b>~1</b> 00		35-45 35-45	15-25 15-25
116*: Imperial	13-60	Silty clay loam Silty clay loam, silty clay, clay.		A-7 A-7	0	100 100	100 100		85 <b>-</b> 95 85 <b>-</b> 95	40-50 50-70	10-20 25-45
Glenbar	0-13 13-60	Silty clay loam Clay loam, silty clay loam.	CL CL	A-6, A-7 A-6	0	100 100		90-100 90-100			15-25 15-30
117, 118 Indio		LoamStratified loamy very fine sand to silt loam.		A – 4 A – 4		95-100 95-100				20-30 20-30	
119*: Indio		LoamStratified loamy very fine sand to silt loam.		A-4 A-4		95-100 95-100				20-30 20-30	NP-5 NP-5
Vint			SM SM	A-2 A-2		95-100 95-100				===	NP NP
120# Laveen		LoamLoam, very fine sandy loam.			0	100 95-100	95-100 85-95			20-30 15-25	NP-10 NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

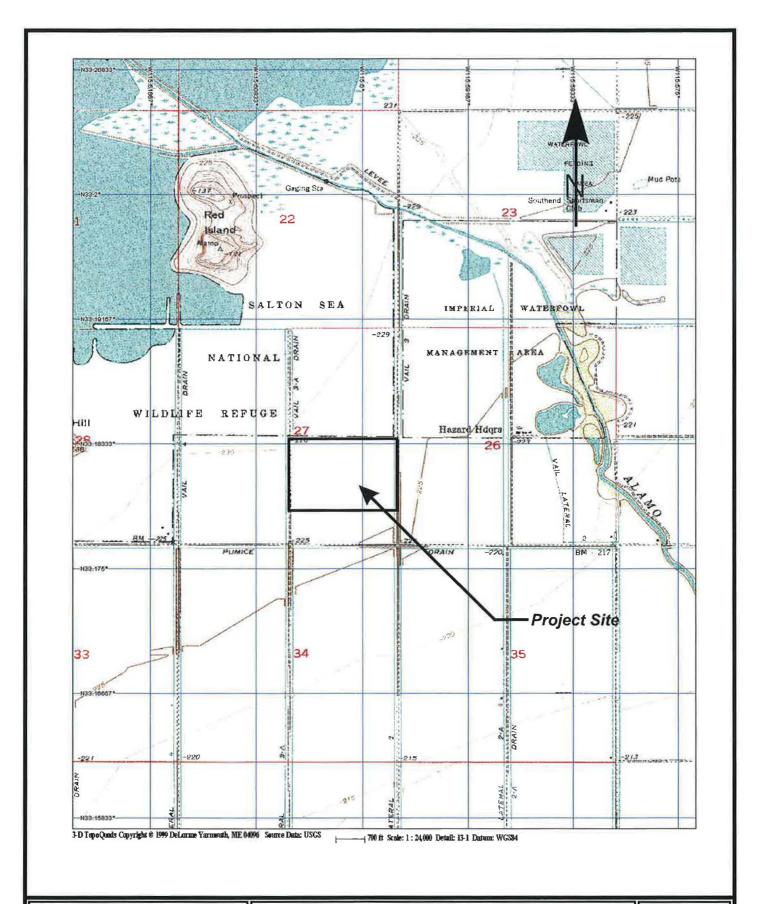
Soil name and	Depth	USDA texture	C]	lassif	catio	n	Frag-  ments	i Po		ge pass: number-	-	Liquid	Plas-
map symbol	Lopon		Uni	ified	AASH	OTF	l > 3	4	1 10	40	200	limit	ticity index
	In		1		-		inches   Pct	1	1	40	200	Pet	Index
121 Meloland		  Fine sand  Stratified loamy   fine sand to			A-2, A-4	A-3	0			75-100 90-100		25 <b>-</b> 35	NP NP-10
		silt loam. Clay, silty clay, silty clay loam.	CL,	СН	A-7		0	100	100	95-100	85-95	40-65	20-40
122			ML		A-4		0	95-100	95-100	95-100	55-85	25-35	NP-10
Meloland	112-26	loam.  Stratified loamy   fine sand to	ML		A-4		0	100	100	90-100	50-70	25-35	₩P-10
		silt loam. Clay, silty clay, silty clay loam.	CH,	CL	A-7		0	100	100	95-100	85-95	40-65	20-40
123*:	0.13		l I					OF 100	05 100	OF 100	FF 0F	25 25	NP-10
Meloland	112-26	Stratified loamy fine sand to			A-4 A-4		0			95-100 190-100		25-35 25-35	NP-10
		clay, silty	сн,	CL	A-7		0	100	100	95-100	85-95	40-65	20-40
		clay loam. Stratified silt loam to loamy fine sand.	SM,	ML	A-4		0	100	100	75-100	35-55	25 <b>-</b> 35	NP-10
Holtville	112-24	Clay, silty clay Silt loam, very fine sandy	CH,		A-4 A-7 A-4		0 0	100 100 100	100	85-100 95-100 95-100	85-95	25-35 40-65 25-35	NP-10 20-35 NP-10
	36-60	loam. Loamy very fine sand, loamy fine sand.	SM,	ML	A-2,	A-4	0	100	100	75-100	20-55		NР
124, 125 Niland	23 <b>-</b> 60				A-2, A-7	A-3				50-65 85-100		40 <b>-</b> 65	ΝР 20-40
126 Niland		Fine sand Silty clay			A-2, A-7	A-3	0			50 <b>-</b> 65 85 <b>-</b> 100		40-65	NP 20-40
127 Niland	0-23	Loamy fine sand Silty clay	SM CL,	СН	A-2 A-7					50-65 85-100		40-65	NP 20-40
128*:	0.00		CH	an av	1	4 2		00 100	70.05	50.65	5 25	1	NP
Niland			CL,		A-7	H-3	0	100		50 <b>–</b> 65  85 <b>–</b> 100		40-65	20-40
Imperial		Silty clay Silty clay loam, silty clay, clay.			A-7 A-7		0 0	100 100	100 100		<b>85-</b> 95 <b>85-</b> 95	50 <b>-</b> 70 50 <b>-</b> 70	25-45 25-45
129*: Pits			1		1							1 1 1 1 1	
130, 131 Rositas	0-27	Sand	SP-S	SM	A-1	,	0	100	80-100	40-70	5-15		NP
	27-60	Sand, fine sand, loamy sand.	SM,	SP-SM	A-2 A-3, A-2 A-1		0	100	80-100	40-85	5-30		NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and	Depth	USDA texture	Classif	ication	Frag-	P	ercenta; sieve	ge pass number-		Liquid	Plas-
map symbol			Unified	AASHTO	> 3  inches	4	10	40	200	limit	ticity index
	In				Pct					Pet	
132, 133, 134, 135-	0-9	Fine sand	SM	A-3,	0	100	80-100	50-80	10-25		NP
Rositas	9-60	Sand, fine sand, loamy sand.		A-2 A-3, A-2, A-1	0	100	80-100	40-85	5-30		NP
136 Rositas		Loamy fine sand  Sand, fine sand,   loamy sand.		A-1, A-2 A-3, A-2, A-1	0		80-100 80-100		10-35 5-30		NP NP
137 Rositas	112-60	Silt loam Sand, fine sand, loamy sand.	ISM, SP-SM	A-4 A-3, A-2, A-1	0 0		100 80-100			20-30	NP-5 NP
138 <b>*:</b> Rositas		Loamy fine sand Sand, fine sand, loamy sand.	ISM, SP-SM	A-1, A-2 A-3, A-2, A-1	0		80-100 80-100		10-35 5-30	=	N P N P
Superstition	0-6 6-60	Loamy fine sand Loamy fine sand, fine sand, sand.		A-2 A-2	0 0		95-100 95-100			===	NP NP
139 Superstition		Loamy fine sand Loamy fine sand, fine sand, sand.		A-2 A-2	0		95-100 95-100				NP NP
140*: Torriorthents											
Rock outerop	i	i !				1					
141*: Torriorthents			1 1 1 1 1							i i !	
Orthids											
142	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
Vint	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30		NP
143 Vint	1	Fine sandy loam	ML, CL-ML, SM,	A-4	0	100	100	75-85	45-55	15-25	NP-5
	12-60	Loamy sand, loamy fine sand.	SM-SC SM	A-2	0	95-100	95-100	70-80	20-30		NP
144*: Vint	0-10	Very fine sandy	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
		Loamy fine sand Silty clay	A CONTRACTOR OF THE PARTY OF TH	A-2 A-7	0	95 <b>-</b> 100 100		70 <b>-</b> 80 95 <b>-</b> 100		40-65	NP 20-35
Indio	0-12	Very fine sandy	ML	A-4	0	95 <b>-</b> 100	95-100	85-100	75 <b>-</b> 90	20-30	NP-5
	12-40	loam. Stratified loamy very fine sand	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	to silt loam.  Silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

<sup>\*</sup> See description of the map unit for composition and behavior characteristics of the map unit.

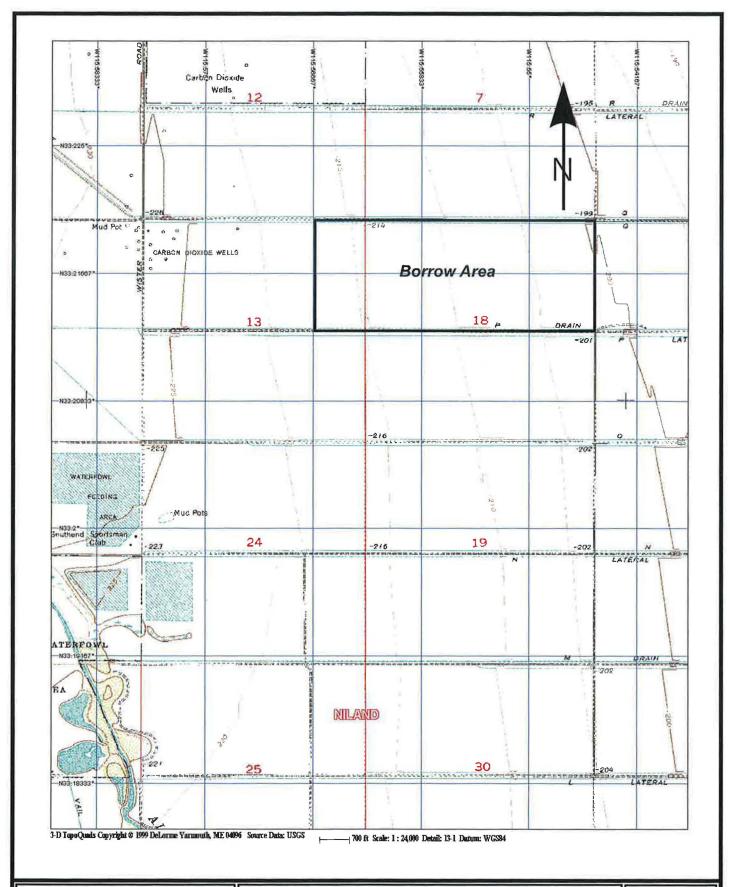


Geo-Engineers and Geologists

Project No.: LE11138

Black Rock 5-6 Topographic Map

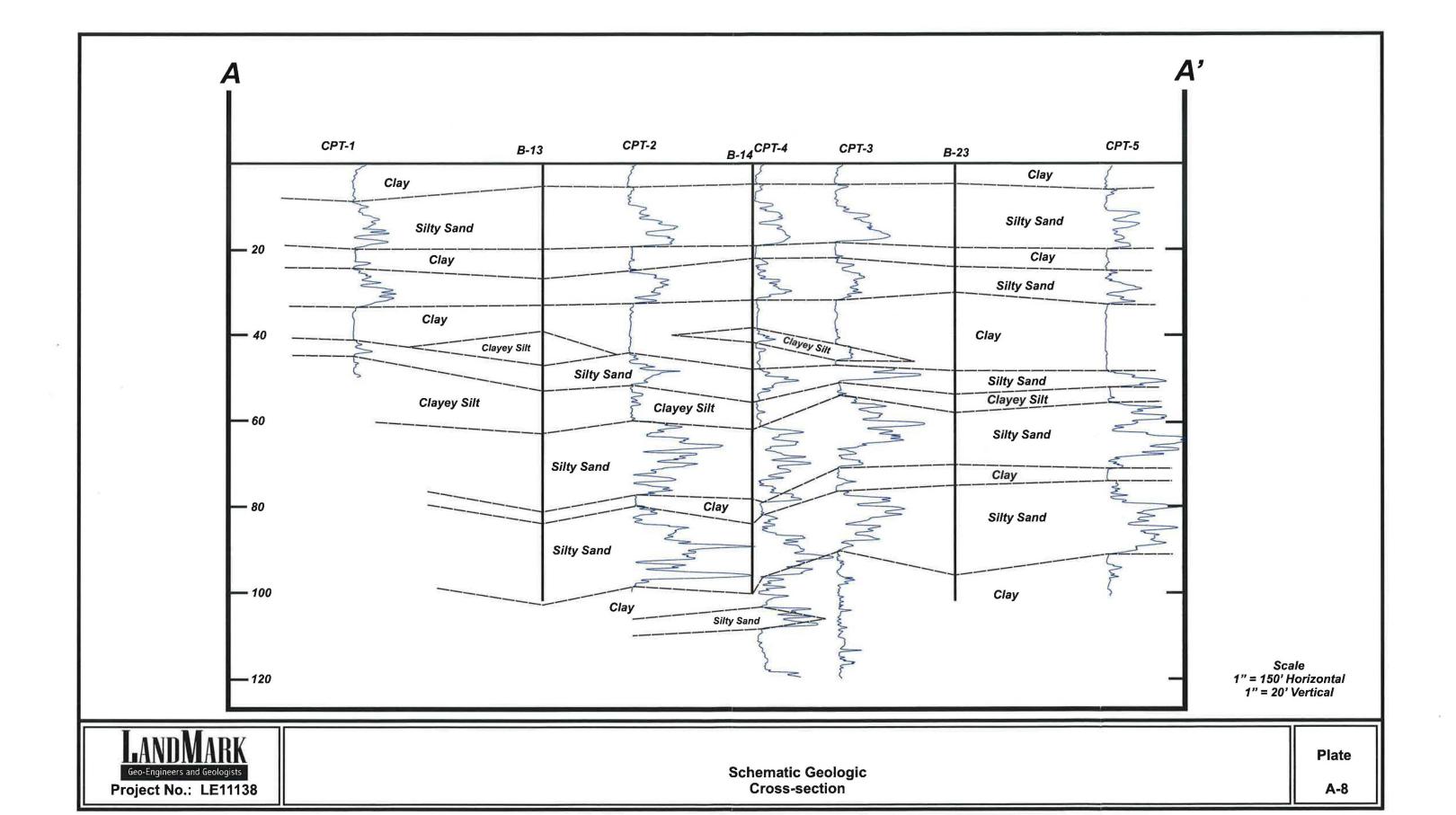
Plate A-6

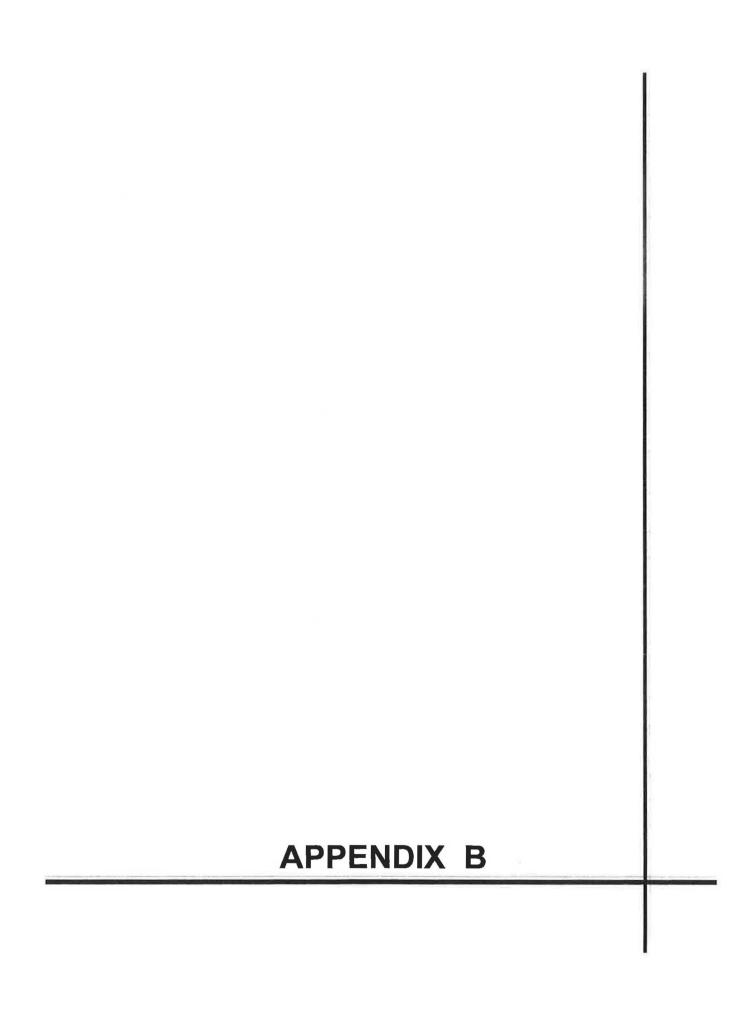


LANDMARK
Geo-Engineers and Geologists
Project No.: LE11138

**Borrow Area Topographic Map** 

Plate A-7





Ī	FIELD				LOG C	OF BORING	No. B-1		~	RATORY		
DEPTH	삘	S	\ <u>\</u>	(ET			SHEET 1 OF 1		_	URE Wt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESC	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TES	TS
-			7	0.5	SILTY CL	AY (CL): B	rown, moist to wet, r	oots, firm.				
5 —			13	0.0	SILT (ML	): Brown, sa	aturated, medium de	nse, some clay.				- 1
	ZI											
10 —			3	_			e grained sand. Lt. brown, saturated,	medium dense	-			
			13		very fine	to fine grain	ned.	mediam dense,				
15 —	7		12									
7	7		41		dense.							
20 —												
	3		21		medium o	lense.						- 1
25 —												- 1
1	7		10									
30 —			07									
-			27									
35 —												
40 —												
										1		
45 —												
50 -												
55 —												
33					Groundw		red at 4.0 feet after 2	24 hours				
-					Васкіше	d with excav	/ated soil					
60 -	DRII	LED:	7/1/1	1			TOTAL DEPTH:	31.5 Feet	DI	EPTH TO W	/ATER: 4	.0 ft.
LOGG				illiams			TYPE OF BIT:	Hollow Stem Auger		AMETER:	8 in.	
SURF	ACE	ELEVATI	ON:		Approximat	ely -224'	HAMMER WT.:	140 lbs.	DI	ROP:	30 in.	
F	PRO	JECT	NO. L	E111	138		LAND Geo-Engineers	MARK and Geologists		PL	ATE B-1	

DEPTH TPLE SS. SS. SS. MV DIBIA DISI										LABO	RATOR	/
王				I. 6		LOG (	OF BORING				KATOK	
H	PE	SS.	≥¤	A st	-		SHEET 1 OF		Ĕ	TUR W.E.		
-	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	ESTS
	0)			ш. п.						200		
					SILTY CI	LAY (CL): E	Brown, moist to very	moist.				
5 -	7		6									
	7		9		SILT (ML grades d	.): Brown, s ownward to	saturated, loose, sor silty sand,	me very fine sand, 🌉				
-			_7									
10 -			19		SILTY SA	AND (SM):	Lt. brown, saturated	I, medium dense to dense,				
					fine grain	ied.						
15 —	7		15		fine to m	edium grain	ned.					
10	7		33		dense, fi	ne grained.						
	Z		20									
20 -			22									
		(SERVINE)										
25 —												
-					1							
30 —												
-									1			
35 —												
40 —												
-												
I												
45 —												
-												
50 —												
30												
55 —					Total De	oth = 21.5'						
1					Groundw		ured at 5.5 feet after	24 hours				
					Dackille	u with exca	valed soil					
60 —												
DATE			7/1/1				TOTAL DEPTH:	21.5 Feet		PTH TO W		5.5 ft.
LOGG				illiams	Ann!	tale 004	TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.	
SURF	ACE E	ELEVATI	UN:		Approxima	lely -224	HAMMER WT.:	140 lbs.	DR	OP:	30 in.	
							LAND	MARK		20, 100		
F	PRO	JECT	NO. L	.E111	138		Geo-Enginee	rs and Geologists		PLA	ATE B-2	
							deo-Enginee	3 and acologists				

_	FIELD SS LITE (SE)						F BORING	No. B-3		LABOR	RATORY	′
DEPTH	Щ	4.5	<b>—</b>	ET tsf)			SHEET 1 OF 1	10. B 0	>	A P ()		
3	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESC	RIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	ESTS
-	4		15	1.0	SILTY CL	AY (CL): Bro	own, moist to very m	oist, stiff.				
5 —			5		SILT (ML):	Brown, sa	turated, loose.					
10 —			9									
-			10		SILTY SAI	ND (SM): Li	t. brown, saturated, r ed.	medium dense,				
15 —			18		•	_						
	1		20									
20 -			17 16		dark brow	n						
25 —		2										
-										)(		
30 -												
35 —				4								
40 —												
45 —												
Ī												
50 —												
55 —					Total Dep Boring ca	th = 21.5' ved at 1 ft. a with excava	after 3 days					
					Backfilled	with excava	ated soil					
60 -	DRIL	.ED:	7/1/1	1			TOTAL DEPTH:	21.5 Feet	DE	РТН ТО М	/ATER:	N/A
LOGG	SED B	Y: _	S. W	illiams			TYPE OF BIT:	Hollow Stem Auger	DIA	METER:	8 in.	
SURFACE ELEVATION: Approximately					Approximate	ely -224'	HAMMER WT.:	140 lbs.	DR	OP:	30 in.	
PROJECT NO. LE11138							Geo-Engineers	MARK and Geologists		PLA	ATE B-3	

I		FI	ELD			LOG (	OF BORING	B No. B-4				RATORY	
DEPTH	J.	. S	> =	(ET (tsf)			SHEET 1 OF			≽	URE ENT wt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION O	F MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	ESTS
-	•		13	2.0	SILTY CL	AY (CL): B	Brown, moist to ver	/ moist, stiff.					
5 —		<i>Y</i>	6		SILT (ML)	: Brown, s	aturated, loose, so						
			12		SILTY SA	ND (SM):	Brown, saturated.	loose to medium dens	se.				
10 -			6		very fine t	o fine grair	ned.						
-	7		24										
15 —			14		U								
					1								
20 —			19	1.5									
1			5	1.5	SILTY CL	AY (CL): D	ark brown, very m	oist, stiff					
25 —													
	7		13										
30 —					SILTY SA	ND (SM):	Dark brown, satura	ated, medium dense,					
-	7		15		very fine t	o fine grair	ned.		=				
35 —													
-													
40 —													
-													
45													
45 —													
=									- 1				
50 —													
-													
55 —					Total Dep		red at 4.0 feet afte	r 24 hours					
-					Backfilled	with excav	vated soil	1 24 Hours					
60 —													
DATE			6/30/	11 amachd			TOTAL DEPTH	31.5 Feet Hollow Stem A	uaer		PTH TO W METER:	ATER: 8 in.	4.0 ft
		T: ELEVATI			Approximate	ely -224'	TYPE OF BIT:  HAMMER WT.:	140 lbs.	- g-'		OP:	30 in.	
F	PRO	JECT	NO. I	_E111	138		Geo-Engine	DMARK ers and Geologists			PLA	ATE B-4	

I		FII	ELD		LOG OF BORING No. B-5		2	RATORY
DEPTH	Ш	, i	_ ⊢	ET (tst)	SHEET 1 OF 1	<b>-</b>	URE INT Mt.)	
10	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	•		12	1.5	SILTY CLAY (CL): Brown, moist to very moist, stiff to very stiff.			
5 —			8	1.5 3.0	grades into silt at 6.5 ft.			
+	7		5	5.0	SILT (ML): Brown, saturated, loose, some very fine grained sand.	90.6	32.4	% Passing #200 = 97%
10 -	N		7		SILTY SAND (SM): Brown, saturated, loose, very fine grained.		25.4	% Passing #200 = 21%
-	1		12					Sp. Gr. = 2,642
15 —	Z		7		siltier			
-	1		6		SANDY SILT (ML): Brown, saturated, loose, very fine grained sand.			
20 —	Z		28		SILTY SAND (SM): Brown, saturated, medium dense, very fine grained, fine laminations.			
25 —	1		24		SANDY SILT (ML): Brown, saturated, medium dense, very fine grained sand.			
30 —	Z		8		loose, fine laminations.			
35 —			16	1.0	CLAY (CH): Brown, wet, stiff.			
40 —	Z		3	0.25	soft		39.8	LL=58% Pl=34%
45 —	7		10	0.5	soft			
50 —	Z		5	1.5	stiff			
55 —					Total Depth = 51.5' Groundwater measured at 4.25 feet after 3 days. Backfilled with excavated soil			
60 — DATE	וואַס	ED.	7/1/1	1	TOTAL DEPTH: 51.5 Feet	DE	PTH TO W	/ATER: 4.25 ft.
LOGG				illiams	TYPE OF BIT: Hollow Stem Auger		METER:	8 in.
SURF	ACE E	ELEVATION	ON:		Approximately -224' HAMMER WT.: 140 lbs.	DR	OP:	30 in.
F	PRO	JECT	NO. L	.E111	38 LANDMARK Geo-Engineers and Geologists		PL/	ATE B-5

I	FIELD FIELD			LOG (	OF BORI	NG N	lo. B-6			RATORY		
DEPTH	凹	(i)	_ =	(tsf)			SHEET 1			≥	URE ENT wt.)	
۵	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION	N OF N	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
			5	2.0	SILTY CL	AY (CL): E	Brown, moist to	wet, roo	ots, stiff to very stiff.			
5 —	1		7						- T	96.0	27.7	
	Z		3		SANDY S	ILT (ML):	Brown, saturat	ted, loose	e, very fine sand.			
10 —	7		14		SILTY SA very fine t	ND (SM): o fine grair	Lt. brown, satu ned.	urated, m	nedium dense,			
15 —			9 36		dense.							
						AV (OL): D	- d- b		- L'EE L	-		
20 —	1		24	2.0	SILIYOD	AY (GL): D	ark brown, ve	ry moist,	stiff to very stiff.			
25 —	Z		4		SANDY S	ILT (ML): I	Dark brown, sa	aturated,	loose, very fine sand.			
30 —	7		25		SILTY SA fine graine	.ND (SM): ed.	Dark brown, s	aturated	medium dense,			
35 —												
40 —												
45 —												
50 —												
55 —							red at 3.75 fee vated soil	et after 2	4 hours			
60 —				-								
DATE			6/30/				TOTAL DE		31.5 Feet Hollow Stem Auger	-	PTH TO W	
LOGGED BY: S. Williams  SURFACE ELEVATION: Approximately -					Approximate	ely -224'	TYPE OF E		140 lbs.		AMETER: OP:	8 in. 30 in.
DROJECT NO LE11139 LANDMARK DIATE D.6								ATE D.C.				



Ī	DEPTH IPLE SS. SS. INT OTAL (tsf)			LOG (	OF BORING	G No. B-7				RATORY		
EPT	밀	S.	\ <u></u>	(ET (tsf)			SHEET 1 OF			≥	URE ENT wt.)	
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION C	F MATERIAL	-	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
1.1.1	• •		12	1.5	SILTY CL	.AY (CL): E	Brown, moist to ve	ry moist, stiff to ver	y stiff.			
5 —	V		9						Alber .			
	-		3		CLAYEY	SILT (ML):	Brown, wet, loose	e.		99.9	29.4	Sp. Gr. = 2,657
10 —	V		4							33.5	24.6	% Passing #200 = 87%
	1		5		SILTY SA	AND (SM): to fine grain	Brown, saturated,	loose,				
15 —			7		very mile	to into gran					26.6	% Passing #200 = 49%
			18		medium o	dense						
20 —	7		6									
1												
25 —	7		4	1.5	SILTY CL	AY (CL): E	Brown, wet, stiff.					
30 —	Z		3		SILTY SA	AND (SM): to fine grai	Brown, saturated, ned.	loose,			21.8	% Passing #200 = 24%
35 —	7		5	1.0	SILTY CL	.AY (CL): [	Dark brown, wet, s	tiff to very stiff.		88.5	32.3	c=0.89 tsf
40 —	Z		12	2.0								LL=46% PI=27%
45 —	7		5	1.0								
50 —	N		4		CLAYEY	SILT (ML):	Dark brown, satu	ırated, loose.				
55 —	Z		11	2.5	SILTY CL	.AY (CL): [	Dark brown, wet, v	ery stiff.				
60 —					SILTY SA	ND (SM):	Dark brown, satur	ated, fine grained.				
DATE	DRIL	LED:	6/30/	11			TOTAL DEPTH	l: 101.5 Fee	et	DE	РТН ТО И	/ATER: 3 <u>.75 ft.</u>
LOGG	ED B	Y:	E. Ca	amacho	)		TYPE OF BIT:	Hollow Stern	n Auger	DIA	METER:	8 in.
SURF	ACE I	ELEVATION	ON:		Approximat	tely -224'	HAMMER WT.	: 140 lbs.		DR	OP:	30 in.
							LAND	nMark				



PLATE B-7a

ī		FI	ELD			LOG OF BORING No. 7		No. 7			RATORY	
DEPTH	Щ	Ś	\ <u></u>	(ET (tsf)	(i		SHEET 2			≥	URE ENT wt.)	
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION	N OF N	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
- 3	Z		3		SILTY SA	ND (SM):	Dark brown, s	aturated	loose,			
65 —					nne gram	cu.						
05	Д		21									
70 -	N		20		SANDY S	SILT (ML): grained sa	Dark brown, sa	aturated,	medium dense,			
			29		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	9,00						
75 —	V		14									
										-		
80 -	Z		10		CLAYEY	SILT (ML):	Dark brown, s	saturated	, medium dense.			
										-		
85 —	Z		6		SILTY SA	ND (SM): ed.	Dark brown, s	aturated,	loose,			
-					_							
90 -	Z		38		dense							
95 —												
-	7		29		medium o	iense						
100 —					CILTY CI	AV (CL): F	Nark brown wa	st atiff		-		
	7		6	1.5	SILITOL	Af (CL): L	Dark brown, we	et, sum.		1		
105 —												
110 —												
115 -					Total Dep	th = 101.5						
-						ater meası I with exca	ured at 3.75 fee vated soil	et after 24	4 hours			
120 —										<u> </u>		
DATE			6/30/				TOTAL DE		101.5 Feet		PTH TO W	
LOGG		Y: ELEVATI		amacho	Approximat	ely -224'	TYPE OF I	-	Hollow Stem Auger		METER: OP:	8 in. 30 in.
							T A	MDI	Lanz			
F	PROJECT NO. LE11138  LANUWARK  Geo-Engineers and Geologists  PLATE B-7b											
							deo-Ei	-gineers ai				

I		FI	ELD		LOG OF BORING No. B-8			RATORY			
DEPTH	빌	છે	>=	(ET (tsf)	SHEET 1 OF 1	≽	URE ENT wt.)				
Δ	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS			
1					SILTY CLAY (CL): Brown, moist to very moist, very stiff.						
5 —			3	2.0	₹						
			13	2.5	CLAVEY CHT (MI) A Labour and the lab	100.0	27.7				
10 -			2		CLAYEY SILT (ML): Lt. brown, saturated, very loose.						
1	7		21		SILTY SAND (SM): Brown, saturated, loose to medium dense, fine grained.			% Passing #200 = 38%			
15 —	N		8				24.6	1			
13	1		17			98.7	24.2	Sp. Gr. = 2,617			
	Z		7				22.8	% Passing #200 = 31%			
20 -	7		13								
-							1				
25 —	Z -		7		CLAYEY SILT (ML): Brown, saturated, loose.						
30 -	1		5								
							1				
35 —	V		3	1.5	SILTY CLAY (CL): Grayish brown, wet, stiff,						
			J		, ( <u></u>						
40 -								(			
			6			l h					
45 -	H										
			6				29.3	LL=47% PI=29%			
50 -											
-	3		5		some sand	j j	1				
55 -											
	A		15		SILTY SAND (SM): Brown, saturated, medium dense, fine grained.						
00											
60 -	DRIL	LED:	7/1/1	1	TOTAL DEPTH: 101.5 Feet	DF	PTH TO W	/ATER: 4.0 ft.			
	GED B		1150	amacho			METER:	8 in.			
SUR	FACE I	ELEVATI	ON:		Approximately -224' HAMMER WT.: 140 lbs.	DR	OP:	30 in.			
	PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists  PLATE B-8a										

I	DEPTH IPLE OF THE OF TH				LOG OF BORING NO. 6						Υ		
EPT	Щ	S.	\	(ET			SHEET 2 OF			≽	URE ENT wt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION C	F MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	TESTS
	И		6	1.5	SILTY CL	AY (CL): Dar	k brown, very mois	t, very stiff.					
65 —	Z		12		CLAYEY	SILT (ML): E	3rown, saturated, m	edium dense.					
70 -	N		10		SANDY SI very fine g	LT (ML): Dark rained sand.	c brown, saturated, m	edium dense,					
75 —	Z		19		SILTY SAI fine graine	ND (SM): Dark d.	s brown, saturated, m	edium dense,					
80 -	Z		17		CLAYEY SI	LT (ML): Dark	brown, saturated, med	um dense to loose.					
85 —	Z		7										
90 —	Z		30		SILTY SA fine graine	ND (SM): Dai	rk brown, saturated,	dense,					
95 —	N		29										
100 —	Z		9	1.0	SILTY CLA	Y (CL): Greyisl	n brown, saturated, stiff						
105 —													
110 —													
115 —	Groundwater measured at 4.0 feet after 3 days Backfilled with excavated soil												
120 —	D2:::		7///								DTU TO V	MIED	
LOGG			7/1/1°	1 amachd			TYPE OF BIT:	f: 101.5 Feet Hollow Stem Au	aer		PTH TO W METER:	ATER: 8 in.	4.0
		i. Elevati			Approxima	tely -224'	HAMMER WT.		J		OP;	30 in.	
F	PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists  PLATE B-8b												

I		FI	ELD			LOG (	OF BOR	ING N	lo. B-9				RATOR'	Y
DEPTH	밀	. S	> =	(ET (tsf)			SHEET 1				≽	URE ENT wt.)		
Δ	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION	N OF M	MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	TESTS
-	N N		4	1.5	SILTY CL	AY (CL): B	Brown, moist to	very moi	ist, stiff,					
5 —	7		6		SILTY SA	ND (SM): to fine grair	Brown, satura ned.	ted, loose	to medium dense	е,				
10 —			5 13											
-	Z		8											
15 —	7		12											
20 —	Z		10	2.0	SILTY CL	AY (CL): C	ark brown, ve	ery moist,	stiff to hard.					1
-	1		19	4.5										
25 —														
-														
30 —														
35 —														
40 —														
45 —														
43														
50 —														
-														
55 —					20' piezo	oth = 21.5' meter insta	lled							
60 —						ater measu d with excar	red at 3.5 fee vated soil	t after 24	hours					
DATE	DRIL	LED:	6/30/	11			TOTAL DE	PTH:	21.5 Feet		DE	PTH TO W	/ATER:	3.5 ft
LOGG	ED B	Y:	S. W	illiams			TYPE OF	BIT:	Hollow Stem Au	iger		AMETER:	8 in.	
SURF	ACE I	ELEVATI	ON:		Approxima	tely -224'	HAMMER	WT.:	140 lbs.		DR	OP:	30 in.	
F	PRO	JECT	NO. L	E111	138		Geo-E	ND ngineers an	ARK ad Geologists			PL/	ATE B-9	)

Ī		FI	ELD		LOG OF BORING No. B-10							RATORY
DEPTH	Щ	κή	_ ⊨	(tsf)			SHEET 1			≥	URE ENT wt.)	
_ <u></u>	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	SCRIPTION	OF N	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	7		11	2.5	SILTY CI	LAY (CL):	Brown, moist to	very mo	pist, very stiff.			
5 -			4		CLAYEY	SILT (ML)	: Brown, wet, loo	ose.	*			
10 -			2							87.8	33.9	% Passing #200 = 99%
-	1		13 5		SILTY SA	AND (SM): to fine gra	: Brown, saturate ained.	ed, loos	e,	106.8	23.0	% Passing #200 = 37%
15 -			6								27.2	% Passing #200 = 28%
20 -	20 6 1.0 CLAY (CH): Brown, wet, stiff.									33.9	LL=54% PI=36%	
25 —	SANDY SILT (ML): Brown, saturated, loose, very fine to fine grained sand.											% Passing #200 = 81%
30 -			14	SILTY SAND (SM): Brown, saturated, medium dense, very fine to fine grained.								
35 —	1		12	2.0	SILTY CI	LAY (CL):	Brown, very moi	st, stiff.		83.6	35.2	c=0.81 tsf
40 —	Z		4	0.5	firm						30.4	LL=39% PI=24%
45 —	1		6	1.5	stiff							
50 —	Z		8			SILT (ML): ned sand.	: Dark brown, sa	turated	, loose,			
55 —	SILTY SAND (SM): Brown, saturated, medium dense, fine grain								lium dense, fine grained.			
60 -					SILTY C	LAY (CL):	Brown, very moi	ist, stiff.				
DATE	DRIL	ED;	6/29/	11			TOTAL DEP	TH:	101.5 Feet	DE	РТН ТО И	VATER: 4.25 ft.
LOGG	SED B	<b>Y</b> :	J. Av	alos			TYPE OF BI	IT:	Hollow Stem Auger	DIA	METER:	8 in.
SURF	ACE E	LEVATI	ON:		Approxima	tely -224'	HAMMER W	√T.:	140 lbs.	DR	OP:	30 in.
,		IECT	NO 1	<b>=</b> 144	120		I.AN	In	<b>MARK</b>		יים	ATE D 10a



PLATE B-10a

I	MPLE SS. SS. JNT					LOG	OF BORING	3 No. 10	<u> </u>		RATORY	
I E	凹	(ó	_ <u>_</u>	(tsf)			SHEET 2 OF		≥	URE ENT wt.)		
ă	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION O	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
	Z		9	1.0	SILTY CI	.AY (CL): E	Brown, very moist, s	tiff.				
65 —	Z		15		SANDY S very fine	SILT (ML): I grained sar	Dark browп, satura nd.	ed, medium dense,				
70 —	Z		23									
75 —	Z		8			SILT (ML): of sampler		ated, medium dense,				
80 —	Ŋ		12		SILT (ML some ver	): Brown, s y fine grain	aturated, medium c ed sand.	lense,				
85 —	Z		13		SILTY SA fine grain	ND (SM): ed.	Dark brown, satura	ted, medium dense to dense				
90 —	7		31		thin clay	layer at 91	ft.					
95 —	Ŋ		25									
100 —	Z		12	0.5	CLAYEY SILT/SILTY CLAY (ML/CL): Brown, very moist. medium dense/firm.							
105 —												
110 -												
Total Depth = 101.5' Groundwater measured at 4.25 feet after 24 hours Backfilled with excavated soil												
DATE	DRIL	LED:	6/29/	11			TOTAL DEPTH:	101.5 Feet	DE	PTH TO W	/ATER: 4.25 ft.	
LOGG			J. Av				TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.	
SURF	ACE I	ELEVATI	ON:	4	Approxima	tely -224'	HAMMER WT.:	140 lbs.	DR	OP:	30 in.	
F	PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists									PLATE B-10b		

I	PLE PTH SS. SS. NT				LOG OF BORING No. B-11	LABORATORY					
EPT	삗	S)	\ <u></u>	(ET (tsf)	SHEET 1 OF 2	≥	URE ENT wt.)				
□	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS			
	Z		11	1.0	SILTY CLAY (CL): Brown, moist, stiff			EI = 132			
5 —	1		13		SANDY SILT (ML): Light brown, saturated, medium dense to loose, very fine grained.						
10 —	N		6				25.8	% Passing #200 = 80%			
10 -			17		SILTY SAND (SM): Light brown, saturated, medium dense, very fine grained.	105.8	22.8	% Passing #200 = 37%			
15 —			10								
			27 14								
20 —	1		23	1.5	SILTY CLAY (CL): Brown, wet, stiff.						
25 —	Z		5			28.7	% Passing #200 = 45%				
30 -	7		21	3.5	CLAY (CH): Brown, wet, very stiff	89.9	30.5	c=1.06 tsf			
35 —	Z		4	0.25	soft		40.8	LL=52% PI=32%			
40 —	7		20	2.5	SILT (ML): Brown, saturated, medium dense,						
45 —					some fine grained sand						
-			7	1.0	CLAY (CH): Brown, wet, firm to hard.						
50 —	7		44	4.5							
55 —	7		8	SILTY SAND (SM): Brown, saturated, fine grained, loose.							
60 —											
DATE			6/30/		TOTAL DEPTH: 76.5 Feet  TYPE OF BIT: Hollow Stem Auger		PTH TO V				
LOGG		y: Elevatio		filliams	Approximately -224' HAMMER WT.: 140 lbs.		METER: OP:	8 in. 30 in.			
F	PROJECT NO. LE11138 LANDMARK PLATE B-11a										



I	SS. SS.					LOG	OF BORIN	G No. 11				RATORY	1
EPT	밀	છ	> 5	(ET (tsf)			SHEET 2 OF			≽	'URE ENT wt.)		
٥	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION O	F MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	ESTS
3	<u>Z</u>		22		SILTY SA very fine t	ND (SM): It is fine grain	Brown, saturated, m ed.	nedium dense,					
65 —	<u>Z</u>		12		SILT (ML) some ver	: Dark brow y fine graine	wn, saturated, medi ed sand, some fine	um dense, laminations.					
70 -	N		14	2.5	SILTY CL	AY (CL): G	rayish brown, very	moist, very stiff.	-				
75 —	Z		16		SILT (ML)	): Dark browy fine graine	wn, saturated, medi ed sand.	um dense,					
80 —													
85 —													
90 —													
95 —													
100 —													
105 —													
110 —													
Total Depth = 76.5' Boring caved at 3 feet after 24 hours Backfilled with excavated soil													
120 —													
DATE			6/30/				TOTAL DEPTH				PTH TO W		N/A_
LOGG		Y: ELEVATI		illiams	Approximat	tely -224'	TYPE OF BIT:  HAMMER WT.:	Hollow Stem A	uger		METER: OP:	8 in. 30 in.	
	PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists  PLATE B-11b												

I	FIELD				LOG OF BORING No. B-12			RATORY				
DEPTH	밀	S)	<b>,</b>	(tsf)	SHEET 1 OF 2	≽	URE ENT wt.)					
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS				
-	•				CLAY (CL): Brown, moist, stiff							
-			14	1.5								
5 -	Z		5		SANDY SILT (ML): Light brown, saturated, loose, very fine grain sand							
	1		12		SILTY SAND (SM): Light brown, saturated, medium dense,	106.4	26.1					
10 —	Z		4		very fine grained sand. loose		32.5	% Passing #200 = 48%				
			24									
15 —	Z		13				26.8	Sp., Gr. = 2,648				
-	7		10	2.5								
20 —			6			LL=64% PI=42%						
-												
25 —	7		16		SILT (ML): Lt. brown, saturated medium dense, sandy at tip.							
1				_								
30 —	V		6	1.5	SILTY CLAY (CL): Brown, wet, stiff							
1												
35 —					SILTY SAND (SM): Lt. brown, saturated, medium dense.							
-	7		12	0.25	SILTY CLAY (CL): Brown, wet, soft, very silty.							
40 —	N			0.05			20.0					
1			3	0.25			29.0					
45 —												
-	7		15	3.0	very stiff							
50 —												
-	7	$\prod$	9		CLAYEY SILT (ML): Dark brown, saturated, loose.							
55 —		1										
3	7		25		SILTY SAND (SM): Light brown, saturated, fine grain, medium dense.							
60												
60 -	DRII	LED.	6/30/	11	TOTAL DEPTH: 76.5 Feet	DF	PTH TO W	/ATER: 4.75 ft.				
LOGG				illiams	TYPE OF BIT: Hollow Stem Auger		METER:	8 in.				
	SURFACE ELEVATION: Approximately -224' HAMMER WT.: 140 lbs. DROP: 30 in.											
					LANDMADIZ	T						

LANDMARK
Geo-Engineers and Geologists

ī		FI	ELD			LOG	OF BORING	6 No. 12			RATORY
DEPTH	무	. v.	> =	(ET (tsf)			SHEET 2 OF 2		<u>≥</u>	rure Ent wt.)	
٥	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
			25		SILTY SA	.ND (SM): Li	ight brown, saturated	, fine grain, medium dense.			
65 —	Z		9		SILT (ML fine grain	): Grayish bi ed, grades f	rown, saturated, loos from sandy silt down	e to medium dense, ward to clayey silt.			
70 —	Z		17		interbedd	ed with clay					
75 —	N		12								
80 —											
85 —											
90 —											
95 —											
100 —											
105 —											
110 —											
115 —					Groundw	oth = 76.5' rater measu d with excav	red at 4.75 feet afte vated soil	r 24 hours			
120 —											
	DRILL		6/30/				TOTAL DEPTH:	76.5 Feet		ртн то м	-
	SED B	Y: ELEVATI		illiams	Approximat	elv -224'	TYPE OF BIT: HAMMER WT.:	Hollow Stem Auger 140 lbs.		METER: OP:	8 in. 30 in.
	PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists  PLATE B-12b										

т	FIELD				LOG OF BORING No. B-13					LABOI	RATORY	
DEPTH	Ш			ET tsf)			SHEET 1 OF			<b>&gt;</b>	JRE NT vt.)	
ä	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESC	CRIPTION O	F MATERIAL	DRY	DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5 —	7		10	1.0	SILTY CLA	Y (CL): B	rown, moist to very	y moist, stiff.				
-			6		CLAYEY SI	ILT (ML):	Brown, wet, loose					
10 —	7		1		SANDY SIL		Brown, wet, loose,	very fine to	10	02.0	29.8 35.7	% Passing #200 = 78%
15 —			12 8		SILTY SAN very fine to	ID (SM): I fine grain	Brown, saturated, led.					
20 —	CLAYEY SILT (ML): Brown, saturated, very loose.											
-	2 CLAYEY SILI (ML): Brown, saturated, very loose.  0.5 SILTY CLAY (CH): Brown, wet, firm.											
25 —	SIETT ODAT (OTI). BIOWIT, WEL, IIITI.											
30 —	Z		5		SILTY SAN very fine to	ID (SM): I fine grain	Brown, saturated, i ed.			28.6	% Passing #200 = 24%	
35 —	7		8	1.0	CLAY (CH)	: Brown,	very moist, stiff.					
40 —	N		6		CLAYEY SILT (ML): Brown, saturated, loose.							
45 —	<u> </u>		9		some very fine grained sand.							
50 —	Z		2		SANDY SILT/SILTY SAND (ML/SM): Dark brown, saturated, very loose, very fine grained sand.							
55 —	Z		7		CLAYEY SILT (ML): Brown, saturated, loose.							
60 —		шшц			U.							
DATE			7/1/1				TOTAL DEPTH:			-	PTH TO W	7
LOGG			J. Av		A		TYPE OF BIT:	Hollow Stem Au	ger		METER:	8 in.
SURF	AUE	ELEVATI	UN:		Approximatel	y -224	HAMMER WT.:	140 lbs.		T	OP:	30 in.
_		1505	No :	-44			LANT	MARK				

Geo-Engineers and Geologists

		FI	ELD			LOG OF BORING No. 13		No. 13		LABOI	RATORY
DEPTH	Щ	(i)		ET (tsf)			SHEET 2 OF			URE Mt.)	
ă	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESC	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	Z		10		CLAYEY S	SILT (ML): ed clay laye	Brown, saturated, r rs.	nedium dense,			
65 —	Z		7		SILTY SAN very fine g	ND (SM): E	Oark brown, saturat d.	ed, loose to dense,			
70 -	Z		32								
75 —	Z		12		SANDY SI fine graine		Brown, saturated, m	edium dense,			
80 -	Z		7		fine graine	d.		ed, medium dense to dense			
-				1.0	CLAY (CH	): Grayish	brown, very moist,	stiff.	-		
85 —	Z		11		SILT (ML): some clay		aturated, medium d	ense,			
90 -	Z		4		SANDY SI some very	LT (ML): B	Brown, saturated, lo grained sand.				
95 —	Z		30		SILTY SAI		Brown, saturated, n	nedium dense to dense,			
100 -	Z		10								
105 —											
110											
115 —							red at 3.75 feet afte ated soil	r 3 days			
120 —	DRILI	ED:	7/1/1	1			TOTAL DEPTH:	101.5 Feet	DE	PTH TO W	/ATER: 3.75 ft.
LOGG			J. Av				TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.
SURF	ACE E	LEVATI	ION:	-	Approximate	ely -224'	HAMMER WT.:	140 lbs.	DR	OP:	30 in.
F	PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists  PLATE B-13b										

T		FII	ELD		LOG OF BORING No. B-14	LABORATORY				
DEPTH	PLE	SS.	≥¤	KET (tsf)	SHEET 1 OF 2	Ĕ	MOISTURE CONTENT (% dry wt.)			
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOIS CON (% dr)	OTHER TESTS		
	7		11	2.5	SILTY CLAY (CL): Brown, moist, stiff to very stiff		16.7	LL=39% PI=23%		
5	Z		7		SANDY SILT (ML): Light brown, saturated, loose, fine grained sand.					
10	7		5			105.7	31.2	% Passing #200 = 92%		
10		REFERSE	5					% Passing #200 = 68%		
15			24		SILTY SAND (SM): Light brown, saturated, medium dense,					
	7		12		fine grained sand.		23.6	% Passing #200 = 15%		
20			12 4	0.25 1.5	SILTY CLAY (CL): Grayish brown, wet, stiff					
25	1		13		SANDY SILT/SILTY SAND (ML/SM): Lt. brown, saturated, medium dense, very fine grained sand.					
30	Z		10		SILTY SAND (SM): Lt. brown, saturated, medium dense, very fine grained sand.			% Passing #200 = 28%		
35	1		15	0.5	SILTY CLAY (CL): Grayish brown, very moist, firm	80.3	38.3	c=0.47 tsf		
40	7		9		SANDY SILT (ML): Grayish brown, saturated, loose, very fine grained sand.					
45	1		26	3.5	CLAY (CH): Reddish brown, very moist, very stiff					
50	Z		12		SILTY SAND (SM): Light brown, saturated, medium dense, very fine to fine grained.					
55	1		10							
60					CLAYEY SILT (ML): Brown, wet, medium dense, fine laminations.					
DATE I	DRILL	.ED:	6/28/	11	TOTAL DEPTH: 101.5 Feet	DE	ртн то м	ATER: N/A		
LOGGE				illiams	TYPE OF BIT: Hollow Stem Auger	DIAMETER: 8 in.				
SURFA	ACE E	LEVATION	ON:	_	Approximately -224' HAMMER WT,: 140 lbs.	DR	OP:	30 in.		

LANDWARK
Geo-Engineers and Geologists

I	_ FIELD					LOG OF BORING No. 14						LABORATORY				
DEPTH	Щ	(i)	_ ⊢	ET (tsf)			SHEET 2 OF			∠	URE Mt.)					
ă	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION C	OF MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS				
			9		CLAYEY	SILT (ML): E	Brown, wet, mediu	m dense, fine laminatio	ns.							
65 —	1		11		SANDY S	ILT (ML): B grained sand	rown, saturated, m	nedium dense,								
70 —	Z		10		SILTY SA fine to me	ND (SM): Bedium graine	rown, saturated, n d sand.									
75 —	Z		9		SANDY S very fine	SILT (ML): B grained sand	rown, saturated, lo i.									
80 -	N		15	3.5	CLAY (CI	H): Greyish	brown, very stiff,	very moist.								
85 —	Z		5		SILT (ML)	): Grayish bi	rown, loose, satur ding).									
90 —	A		16													
95 —			38		SILTY SA	AND (SM): E	3rown, saturated,	dense, fine grained								
100 -	N		16		medium	dense										
105 —					U											
110 —																
115 —					Boring ca	oth = 101.5' aved at 3.5 of d with excav	feet after 24 hour	s								
120 —																
DATE			6/28/				TOTAL DEPTI				PTH TO W		N/A			
LOGGED BY: S. Williams							TYPE OF BIT:		uger		METER: OP:	8 in. 30 in.				
	PROJECT NO. LE11138  Approximately -224' HAMMER WT.: 140 lbs.  LANDMARK  Geo-Engineers and Geologists										PLATE B-14b					

F		FI	ELD		LOG OF BORING No. B-15	LABORATORY				
DEPTH	片	SS.	> =	(tsf)	SHEET 1 OF 2	≧	TURE ENT wt.)			
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS		
-	7		11	1.5	SILTY CLAY (CL): Brown, very moist, stiff					
5 -	Z		5							
-			4		SANDY SILT (ML): Brown, saturated, loose, very fine grained	94.6	36.0	% Passing #200 = 99%		
10 -	Z		5					% Passing #200 = 58%		
-	7		26		SILTY SAND (SM): Lt. brown, saturated, loose to medium dense, very fine grained.					
15 —	Z		5		very line granted.		24.6	% Passing #200 = 20%		
	1		28							
20 -	Z		6	1.0	CLAY (CH): Brown, moist, stiff.		33.0	LL=61% PI=42%		
25 —	7		9		SILT (ML): Brown, saturated, loose, some very fine grained sand.					
-										
30 -	Z		12		SANDY SILT (ML): Brown, saturated, medium dense, very fine grained sand.					
35 —										
	3		11	1.0	CLAY (CH): Grayish brown, stiff to firm, wet	82.3	35.7			
40 -								11 000/ BL 400/		
	2		3	0.25			38.8	LL=63% PI=43%		
45 —					hard					
			11	4.5	nara -					
50 -			13		SILTY SAND (SM): Lt. brown, saturated, medium dense,					
-					fine grained sand.					
55 -	1		9		SILT (ML): Brown, saturated, loose, some sand and clay					
-					SILTY CLAY (CL): Brown, wet, stiff					
60 -										
	DRILI		6/29/		TOTAL DEPTH: 101.5 Feet		PTH TO W			
	SED B	Y: ELEVATI		illiams	TYPE OF BIT: Hollow Stem Auger  Approximately -224' HAMMER WT.: 140 lbs.	METER: OP:	8 in. 30 in.			
- 5510		٧/١١			PADITONIMATERY -2224 PAINTINGER WIT. 140 lbs.	T		OV III		



PLATE B-15a

Ī	. FIELD					LOG	OF BORIN	NG No. 15		LABORATORY			
DEPTH	Ш	, i	_ ⊢	ET (tsf)			SHEET 20			≥	Mr.)		
Ğ	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION (	OF MATERIA	L	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
	Z		6	1.5	SILTY CI	AY (CL): E	Brown, wet, stiff.						
65 —	Z		7		SILTY SA	ND (SM):	Lt. brown, satura	ted, loose to mediu	m dense,				
70 —	Z		21									% Passing #200	= 30%
75 —	Z		12		SILT (ML some sar	): Grayish nd and clay	brown, saturated						
80 —	Z		10	3.0			Grayish brown, w	ty.					
85 —	N		9										
90 —	Z		29		SILTY SA fine grain		Grayish brown, ย	saturated, medium o	lense,				
95 —	Z		21										
100 —	Z		9	1.5	SILTY CL	AY (CL): 0	Grayish brown, w	et, stiff, some micac	eous sand.				
105 —													
110 —													
115 —					Groundw	oth = 101.5' rater measu d with exca	red at 4.25 feet	after 24 hours		U.			
120 -	יופח	I ED	6/29/	11			TOTAL DEPT	H: 101.5 Fe	et	DE	PTH TO V	/ATER·	4.25 ft.
LOGO				filliams			TYPE OF BIT				METER:	8 in.	1.20 IL
SURFACE ELEVATION: Approximately -224' HAMMER WT.: 140 lbs. DROP:										30 in.			
F	PROJECT NO. LE11138    Approximately -224'   HAMMER WT.: 140 lbs.										PLATE B-15b		

ı		. FII	ELD			LOG C	OF BOF	RING N	lo. B-16		LABORATORY			
DEPTH	Щ	(6)	_ ⊢	ET (tsf)			SHEET				<b>&gt;</b>	URE :NT wt.)		
ä	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTIC	ON OF I	MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
5 -	Z		7	0.5	SILTY CL	.AY (CL): E	Brown, very i	moist, firm.		¥		11.2	LL=45% PI=29%	
40	Z		14 4		SANDY S to loose,	SILT (ML): very fine gi	Light brown, rained sand.	saturated,	medium dense				% Passing #200 = 96%	
10 -	7		21 13		SILTY SA very fine (		Light brown,				% Passing #200 = 29%			
15 —			18		lagge									
20 -			18	4.0	CLAY (CH	ł): Brown, l	hard, very mo		90.6	27.3	% Passing #200 = 28%			
25 —			6		SILT (ML	.): Brown,	saturated, lo			27.9	% Passing #200 = 95%			
30 —	7		28		SILTY SA	ND (SM): edium grair	Light brown							
35 —	Z		4	0.25	CLAY (CI	CLAY (CH): Gray/brown, soft, wet, high plasticity.								
40 -	N		16	3.0	SANDY S	SILT CLAY	(CL): Brown	ı, wet, very	stiff.		89.2	29.3		
45 —	N		16	1.5	SILTY CL	.AY (CL): E	Brown, very	moist, stiff						
50 —	4		14			AND (SM): edium grair		, saturated,	medium dense,					
55 —	Z		11	2.0	interbedd	ed.			nedium dense,					
60 -					CLAY/SIL interbedd		saturated, sti	ff/medium d						
DATE	DRIL	LED:	6/29/	11			TOTAL	DEPTH:	101.5 Feet		DEI	PTH TO W	/ATER: 4.25 ft.	
LOGG	ED B	Y:	S. W	filliams			TYPE C		Hollow Stem Aug	ger	DIA	METER:	8 in.	
SURF	ACE I	ELEVATI	ON:		Approximat	tely -224'	HAMME	ER WT.:	140 lbs.		DR	OP:	30 in.	
		JECT	NO I	E114	138		I.	ANN	<b>JARK</b>			ם ום	ATE B 160	

ANDMARK
Geo-Engineers and Geologists

_	FIELD					LOG	OF BORING	3 No. 16		LABORATORY				
DEPTH	Ш	, vo		ET (tsf)			SHEET 2 OF		>	M. J.				
ă	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS			
-	A		12	1.0	SILTY CL stiff/media	AY/CLAYEY um dense, ir	/ SILT (CL/ML): Brov nterbedded.	n, saturated,						
65 —	Z		8		SILT (ML	): Brown, sa	aturated, loose, some	sandy zones.		29.0	% Passing #200 = 98%			
70 -			36											
75 —	Z		20											
80 -	Z		9	0.5 2.0	SILTY CI	_AY (CL): (	Grayish brown, wet,	firm to stiff.						
85 —	Z		12		SILT (ML some ver	): Grayish b y fine graine	orown, saturated, med ed sand.	lium dense,						
90 —	Z		16											
95 —	Z		31		SILTY SA fine grain	ND (SM): 0 ed.	Grayish brown, satura	ted, dense,						
100 —	Z		8	0.25	SILTY CI	AY (CL): 0	Grayish brown, wet,	soft to firm.						
105 —														
110 —														
115 —					Groundw	oth = 101.5' vater measu d with exca	ired at 4.25 feet after	r 24 hours						
120 —	DRIII	FD.	6/20/	11			TOTAL DEPTH:	151.5 Feet	DE	PTH TO W	/ATER: 4.25 ft.			
DATE DRILLED: 6/29/11  LOGGED BY: S. Williams							TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.			
SURF	ACE E	ELEVAT	ION:		Approxima	tely -224'	HAMMER WT.:	140 lbs.	DR	OP:	30 in.			
F	PRO	JECT	NO. L	.E111	38		Geo-Engineers and Geologists				PLATE B-16b			

_	FIELD					LOG OF BORING No. B-17						LABORATORY			
DEPTH	Щ	,	<u>_</u> =	ET (tsf)			SHEET			2	-	URE ENT wt.)			
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTIO	N OF I	MATERIAL	DRY	(pct)	MOISTURE CONTENT (% dry wt.)	OTHER TEST	·s	
					SILTY CI	AY (CL): I	Dark brown in	maist to ve	ery moist, stiff.						
5 -			5	1.5	OILT TOE	3 (1 (OZ). E	oun brown, r	1101011011	Ty moiot, only	,					
			7	1.5	CLAYEY	SILT (ML):	Brown, wet,	loose, so	me very fine sand.	95	.4	27.2	c=0.23 tsf	-	
10 -	7		3	_	SUTYSA	ND (SM):	Brown, satur	rated med	lium dense	$\dashv$		30.6	% Passing #200 = 8	98%	
-	7		13		very fine	to fine grain	ned.	ateu, met	Julii delise,						
15 -			14	t .											
-			19											-	
20 -			5							$\dashv$		26.7	% Passing #200 = 3	30%	
20	Z		23	2.5	CLAY (CH	H): Brown,	very moist, v	very stiff, h	nigh plasticity.	99	).7	24.6	c=1.79 tsf		
25 —					CLAYEY	SANDY SI	IT (MI). Bro	wn satur	ated, very loose,						
	<u>N</u>		1		very fine		ET (WIL). DIO	, Jacan	atou, very toose,					-	
30 -														- 1	
30	7		9	1.0	01.07.701	D. O				$\dashv$					
0.5					CLAY (CH	1): Grayisr	n brown, very	moist, sti	π.						
35 —	Z		4	1.0										- 1	
-															
40 -	Z		6							85	.6	38.3			
45					CLAYEY	SILT/SILT	CLAY (ML/0	CL): Brow	/n, saturated,						
45 —	Z		21	0.5	loose/firm			,	,						
50															
50 —	Z		13	1.0	CLAY (CI	H): Brown,	very moist,	stiff, high p	plasticity.						
55 -									vn, saturated,						
35 -			10		medium (	dense, fine	grained san	d.							
00															
60 -	DRII	LED:	6/28/	11			TOTAL D	EPTH:	121.5 Feet		DEI	PTH TO W	/ATER: 4.9	→ ft.	
LOGGED BY: J. Avalos TYPE OF BIT: Hollow Stem Auger									r	-	METER:	8 in.	=="1"		
SURF	ACE I	ELEVATION	ON:		Approximat	lely -224'	HAMMER	R WT.:	140 lbs.		DR	OP:	30 in.	_	
F	PROJECT NO. LE11138  PROJECT NO. LE11138  Approximately -224' HAMMER WT.: 140 lbs.  Geo-Engineers and Geologists											PLATE B-17a			

_		FII	ELD		LOG OF	BORING	No. 17		LABO	RATORY
DEPTH	Ш			ET tsf)		HEET 2 OF 3		>	JRE INT Mt.)	
Di	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCR	IPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	Z		6		SANDY SILT/SILTY SAN loose, fine grained sand	ND (ML/SM): Brow	vn, saturated,		24.8	% Passing #200 = 46%
-					loose, into grained said					
65 —	Z		8							
-					CLAY (CH): Brown, very	moist, very stiff.				
70 —	N					, ,				
			13	2.0						
75 —					SANDY SILT/SILTY SAN	ID (ML/SM): Brov	vn, saturated,			
-	7		11		medium dense to dense	, fine grained sand	I.			
-										
80 —	Z		32							
85 —	V		24							
90 -					CLAY (CH): Grayish bro	wn very moist st	iff to very stiff			
] 3	7		8	1.0	OLAT (OH). Grayish bro	wii, very moist, st	iii to very still.			
95 —										
95	7		13	3.5						
-										
100 —	Z		13	3.0						
-										
105 —			1		SILTY SAND (SM): Brov	wn. saturated. ver	v loose.			
					fine grained.	,,	,,			
110 —										
-	7		32		dense					
-										
115 —	Z		48							
120 —										
DATE			6/28/			TOTAL DEPTH:	121.5 Feet		PTH TO W	/ATER: 4.9 ft.
LOGG			J. Av			TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.
SURF	AUE E	LEVATION	JN:		oproximately -224'	HAMMER WT.:	140 lbs.	DRO	JP.	30 in.
F	PRO	JECT	NO. L	.E111	38	LAND	MARK		PLA	ATE B-17b

PROJECT NO. LE11138



FIELD						LOG	OF BORING	No. 17		LABOI	RATORY
l E	APLE SS. SS. JNT CKET						SHEET 3 OF 3	110. 17	>	照 본 한	
H	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
-	V	1110	15	4.0	CLAY (C	H): Grayish	brown, very moist, ha	ard.			
									1		
125 —											
-									ì		
-											
130 —					ri.						
135 —											
135 —											
140 —											
145 —											
145 -	-										
150 —											
-											
-					111						
155 —											
-											
160 —											
_											1
165 —											
170 —											
-											
175 —					Total De	oth = 121.5'					
-						ater measu d with excav	ired at 4.9 feet after 24 vated soil	4 hours			
180 —											
DATE	DDII	I ED:	6/28/	11			TOTAL DEPTH:	121.5 Feet	DE	PTH TO W	/ATER: 4.9 ft.
LOGG			J. Av				TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.
SURFACE ELEVATION: Approximat					Approxima	tely -224'	HAMMER WT.:	140 lbs.		OP:	30 in.
							LAND	Lanz			
PROJECT NO. LE11138  LANDMARK  Geo-Engineers and Geologists  PLATE B-17c										TE B-17c	

_	PLE SS. SS. SS. SS. SS. SS. SS. SS. SS. SS					LOG OF BORING No. B-18							RATORY
THE	LE	ιń	/ IT	ET (tsf)				1 OF 2			۲	URE ENT wt.)	
ă	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTI	ON OF I	MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	•				SII TV CI	AV (C1 \-	Dork brown	moist to va	ery moist, stiff.				
5			6	2.0	SILITOL	Ai (CL).	Dark blown	i, moist to ve	Ty moist, still.			23.4	LL=48% PI=31%
$\mid                   $	7		16	2.0					*				
. 1	Z	11111111	_3			1			me very fine sand.	_		30.7	% Passing #200 = 94%
10	Z		25		SILTY SA very fine	ND (SM): to fine gra	Brown, sa ined.	turated, loos	e to medium dense	,			
	Z		7										% Passing #200 = 25%
15	1		16		l .								
			5							_		25.5	% Passing #200 = 33%
20	7		8	1.0	CLAY (CI	H): Brown	, very mois	t, stiff, high p	lasticity.				
25	Z		1		SANDY S very fine	SILT (ML): sand.	Brown, sa	turated, very	loose,				% Passing #200 = 85%
						very fille Salid.							
30			8		SILTY SA	SILTY SAND (SM): Brown, saturated, loose, fine grained sand.							
35			5	1.0									
			J	1.0	CLAY (CI	(CH): Grayish brown, very moist, stiff, some silty clay zones.							
40													
			11	2.0									
45													
-	7		6	0.5									
50													
	7		17	3.0									
							: Brown, sa	aturated, me	dium dense,				
55	$\overline{Z}$		16			ned sand.							
60 -	DDILL	ED:	6/20/	11			TOTAL	DEDTU	404 F Fact	-	DE	PTH TO W	INTER: 504
LOGG			6/28/ J. Av					DEPTH: OF BIT:	101.5 Feet Hollow Stem Aug	ger		METER:	/ATER: <u>5.0 ft</u> . 8 in.
		LEVATI			Approxima	tely -224'		IER WT.:	140 lbs.		DR	OP:	30 in.
							I	AND	ADV				
P	PRO	JECT	NO. L	-E111	138		G	eo-Engineers a	and Geologists			PL/	ATE B-18a

_	DEPTH MPLE SS. SS. UNT CKET					LOG	OF BOF	RING I	Vo. 18			LABO	RATOR	Υ
<u>E</u>	Щ	(6	_ F	ET tsf)			SHEET 2		10. 10	<b>→</b>		A, N. C. (.)		
DE DE	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTIO	N OF N	MATERIAL	DRY DENSITY	(pct)	MOISTURE CONTENT (% dry wt.)	OTHER T	TESTS
22	Z		13		SANDY S	SILT (ML): ned sand.	Brown, satura	ated, med	ium dense,			26.5	% Passing #2	200 = 53%
65 —	Z		55		SILTY SA fine grain	AND (SM): ned sand.	Brown, satura	ated, very	dense,					
70 —	Z		4	2.0	CLAY (CI	H): Grayisl	h brown, very	moist, stif	f to very stiff.					
75 —	Z		8		CLAYEY medium	SILT (ML): dense, low	Grayish brov plasticity.	vn, satura	ted, loose to					
80 —	Ŋ		18		SANDY S	SILT/SILTY dense to de	SAND (ML/S ense, fine grai	M): Brow ined sand	n, saturated,					
85 —	Z		28											
90 —	Z		5		loose									
95 —			18	1.5	CLAY (C	H): Grayis	h brown, very	moist, sti	ff.					
100 —	Z		11	1.0						_				
105 —														
110 —														
115 -	Groun Backfi						ured at 5.0 fee vated soil	et after 24	hours			=		
DATE	DRIL	LED:	6/28/	11			TOTAL DE	EPTH:	101.5 Feet	-	DEF	PTH TO W	ATER:	5.0 ft.
	LOGGED BY: J. Avalos						TYPE OF		Hollow Stem Auger			METER:	8 in.	2.0 10
SURFACE ELEVATION: Approximately					Approxima	tely -224'	HAMMER	-	140 lbs.		ORG	OP:	30 in.	
PROJECT NO. LE11138 LANDMARK										PL/	ATE B-1	8b		

Geo-Engineers and Geologists

Ī	FIELD				LOG OF BORING No. B-19			RATORY
DEPTH	빌	v	>=	(ET (tsf)	SHEET 1 OF 2	≽	URE ENT wt.)	
٥	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5 -	1		13	2.0	SILTY CLAY (CL): Brown, moist to very moist, stiff to very stiff.	101.2	24.3	
10 -			8 8		SANDY SILT (ML): Brown, wet, loose, some clayey zones.	104.0	27.8	% Passing #200 = 53%
15 -			12		SILTY SAND (SM): Brown, saturated, medium dense, very fine to fine grained.			
20 -			19 13				24.0	% Passing #200 = 22%
25 -	1		13					
30 -	Z		6		SANDY SILT (ML): Brown, saturated, loose, very fine to fine grained sand.			
35 -	3		14	4.0	SILTY CLAY (CL): Dark brown, wet, stiff to hard.			
40 -	Z		7	2.0				
45 —	3		9	0.75	firm			
50 -	Z		10	4.0			28.9	
55 -	Z		8		SILTY SAND (SM): Brown, saturated, loose, fine grained.			
60 -			2/			-	DTI./ TO ::	WATER
1	DRILL SED B		6/29/ J. Av		TOTAL DEPTH: 101.5 Feet  TYPE OF BIT: Hollow Stem Auger		PTH TO W METER:	/ATER: 6.0 ft. 8 in.
		LEVATI			Approximately -224' HAMMER WT.: 140 lbs.	DR		30 in.
F	PRO	JECT	NO. L	.E111	38 LANDMARK Geo-Engineers and Geologists		PLA	\TE B-19a

Ī	DEPTH SS. SS. SS. JAN					LOG	OF BORIN	G No. 19				RATOR	Y
I F	Ш	(6)	. ⊢	ET (tsf)			SHEET 2 OF			>	JRE NT Mt.)		
DE	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION C	OF MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER	rests
	Z		18		SILTY SA	AND (SM):	Dark brown, satu	rated, loose,					
					fine grain	iea.							
65 -	Z		21										
					SILTY CL	AY (CL): [	Dark brown, wet, s	tiff to very stiff.					
70 -				2.0									
			10		SANDY S very fine	SILT (ML): grained sai	Brown, saturated, nd.	medium dense,					
75 —					011 = 4141				-				
	A		11		SILI (ML	): Dark bro	own, saturated, me	dium dense.					
80 -	Z		16		SANDY S	SILT (ML): led sand.	Brown, saturated,	medium dense,	- 1				
85 —	Z		10						- 1				
90 -	KI.				arades to	clayey silt							
			4		grades to	olayey siit							
95 -									=				
	7		6	1.5	SILTY CL	.AY (CL): (	Grayish brown, we	t, stiff.					
400													
100 -	N		12	1.5					_				
105 —													
									- 1				
110 -													
									- 1				
115 -													
113					20 ft. pie:	oth = 101.5 zometer ins	stalled					1	
					Groundw Backfilled	ater measu with exca	ured at 6.0 feet aft vated soil	er 24 hours					
120 —													
	DRIL GED B		6/29/ J. Av				TOTAL DEPTH TYPE OF BIT:	d: 101.5 Feet  Hollow Stem Aug	ner		PTH TO W METER:	ATER: 8 in.	6.0 ft.
		i. Elevati			Approximat	ely -224'	HAMMER WT.				OP:	30 in.	
						7	T	Mare		T			
	PRO	JECT	NO. L	.E111	138		LAN	UMAKK			PL/	ATE B-1	9b
							Geo-Engin	eers and Geologists					

$\lceil \cdot \rceil$	DEPTH IPLE SS. SS. SS. WY INT (tsf)					LOG C	F BOR	ING N	lo. B-20			LABOI	RATORY
E	Ш	()	Ţ	ET (tsf)			SHEET		5 20			URE INT Mt.)	
Ö	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTIO	N OF	MATERIAL	DRY DENSITY	(pct)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
													EI = 115
			5	1.5	CLAY (CI	H): Dark bi	rown, moist, s	stiff.					
5 —	7		17		SANDY S to very lo		Brown, satur	ated, med	lium dense				
	N		3									34.2	% Passing #200 = 98%
10 -	7		8		SILTY SA	AND (SM):	Dark brown, s	saturated,	loose, fine grained.	94.6		28.8	
	Z		7										
15 —	7		35		dense								
:	$\square$		1		SANDY S	SILT (ML):	Brown, satur	ated, very	loose.			33.5	% Passing #200 = 90%
20 -	I		9	1.0	SILTY CI	LAY (CL): F	Brown, very n	noist, stiff					
25 —	7		1			AND (SM): to fine gra		ı, saturate	ed, very loose,				
30 -	7		8		SANDY (	CLAY (CL):	Brown, wet	t, stiff, fine	e grained sand.				
35 —	7		5	1.5	CLAY (C	H): Brown	, very moist,	stiff.					
40 -	1		3	1.5									
45 —	N		24	1.0	SANDY	CLAY (CL)	: Brown, we	t, stiff, fin	e grained sand.				
50 —	50 10 SILTY S					AND (SM): to fine gra	Dark brown ined.	ı, saturate	ed, very loose,				
55 —	Z		8		SANDY S	SILT (ML):	Brown, very	moist, stif	f.				
60 -					SILTY So	AND (SM): to fine gra	Dark brown ined.	n, saturate	ed, very loose,				
	DRIL	LED:	7/5/1	1			TOTAL D	EPTH.	101.5 Feet		DEP	TH TO W	/ATER: 4.0 ft.
	SED B			illiams			TYPE OF		Hollow Stem Auge			METER:	8 in.
SURF	ACE I	ELEVATI	ON:		Approximat	tely -224'	HAMMER	R WT.:	140 lbs.		ORC	)P:	30 in.
F	PRO	JECT	NO. L	.E111	38		Geo-	LEngineers a	MARK and Geologists			PLA	ATE B-20a

T	DEPTH PLE SS. SS. NV INT INT INT					LOG	OF BORIN	IG No. 20			LABOI	RATORY	
I G	Ш	, i	. ⊢	ET tsf)			SHEET 20			>	JRE NT Mt.)		
]   	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION	OF MATERIA	L	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TEST	s
	Z		24		SILTY SA	AND (SM): to fine grai	Dark brown, sat	turated, very loose	1				
-					very line	to line grai	incu.						-
65 —	7		12										-
1					*								-
70 -					CILTY O	A)/ (OL): 1	Davida bassuma susat						-
			7	3.0	SILIYC	LAY (CL):	Dark brown, wet	very stiff.					-
													-
75 —	Z		20	2.5									-
-													
80 -					SILTYS	AND (SM)	Dark brown sa	turated, very loose					
- 2	Ы		15		very fine	to fine grai	ined.	turated, very 100se	,				-
85 -													- 1
65 -	Z		20		grayish b	rown							
-													
90 -	N		40	20									1
			12	2.0	SILTY C	LAY (CL):	Dark brown, wet	, very stiff.					
95 —													
95 -	7		10	2.0	SILTY C	LAY (CL):	Dark brown, we	t, very stiff.					
100 —			8										
1										1			-1
105 —													
100													-
1.8													-
110 —													
													- 1
115 -													
113					Total Dep Groundw	oth = 101.5' rater measu	ured at 4.0 feet af	ter 24 hours					
						d with excar							
120 —													
DATE	DRIL	LED:	7/5/1	1			TOTAL DEPT	H: 101.5 Fe	eet	DE	PTH TO W	/ATER: 4.0 ft	_
LOGG	SED B	<b>Y</b> :	E. Ca	amacho	)		TYPE OF BIT	Hollow Ste	m Auger	DIA	METER:	8 in.	-
SURF	ACE I	ELEVATI	ON:		Approxima	tely -224'	HAMMER WI	T.: 140 lbs.		DR	OP:	30 in.	
F	PRO	JECT	NO. I	.E111	138		LAN	<u>DMark</u>			PL/	ATE B-20b	
							Geo-Engii	neers and Geologists					

Ī	DEPTH PLE SS. SS. SS. SS. I (tsf)				LOG OF BORING No. B-21		LABO	RATORY
H H	Щ	S.	<b>&gt;</b> =	(ET	SHEET 1 OF 3	≽	URE ENT wt.)	
□	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
-					CLAY (CL-CH): Brown, soft, very moist.		33.2	LL=50% PI=32%
5 —			8	0.5	*		00.2	LL-30 /0 F I-32 /0
			10		SANDY SILT (ML): Light brown, saturated, medium dense to very loose, very fine grained sand.	100.0	30.1	% Passing #200 = 69%
10 —	7		2					% Passing #200 = 98%
-			30		SILTY SAND (SM): Light brown, saturated, medium dense to dense, fine grained.			
15 —			16					% Passing #200 = 46%
-			44					
20	Z		7		loose			% Passing #200 = 19%
20 —			16					
_					SILTY CLAY (CL): Brown, very moist.			
25 —	Z		6		CLAYEY SILT (ML): Brown, saturated, loose, some very fine grained sand.		28.4	% Passing #200 = 96%
30 -	7		16		SILTY SAND (SM): Light brown, saturated, medium dense to dense, fine grained.			
35 —	7		7	1.5	CLAY (CH): Grayish brown, very moist, stiff to firm.			
-								
40 —				0.25				
1			9	0.25				
45 —								
-	7		2		sandy			
50 —			44					
	7		14		CLAYEY SILTY (ML): Brown, saturated, medium dense, some very fine sand.			
55 —								
55	Z		8	0.5	SILTY CLAY (CL): Brown, very moist, soft to firm			
-					SILTY SAND (SM): Light brown, saturated, medium dense, fine grained.			
60 —	ייים	ED.	6/28/	11		DE	PTH TO W	/ΔTER: 46 A
LOGG				illiams	TOTAL DEPTH: 121.5 Feet  TYPE OF BIT: Hollow Stem Auger		METER:	/ATER: 4 <u>.6 ft.</u> 8 in.
3 33 5		ELEVATION			Approximately -224' HAMMER WT.: 140 lbs.		OP:	30 in.
F	PRO	JECT	NO. L	E111	38 LANDMARK Geo-Engineers and Geologists		PLA	ATE B-21a

T	PEPTH SS. SS. SS. NAT WAY SET WAT SET WAY SET WAT SET WAY SET WAT SET WAY SET WAY SET WAY SET WAT SET				LOG OF BORIN	G No. 21		LABOI	RATORY
EPTI	Щ	ς,	_=	(tsf)	SHEET 2 OF		≥	URE ENT wt.)	
ă	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION C	F MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
1.0	1		15		SILTY SAND (SM): Light brown, satura	ted, medium dense,			
-					<b>3</b>				
65 —	Z		16						
									1
70 —			46						
-									
75 —			9		SILT (ML): Grayish brown, saturated, grades from silty sand to silt	loose, some very fine sand.			
-									
80 —	Z		9	3.0	SILTY CLAY (CL): Grayish brown, ver	y moist, very stiff.			
					OUT (MI). On ink house and sadd				
85 —	Z		3		SILT (ML): Grayish brown, saturated,	loose.			
90 —	V		12		SILTY SAND (SM): Grayish brown, sat	urated, medium dense,			
1					îne grained.				
95 —			23						
-			20						
100 —									
-	7		13		SILT (ML): Grayish brown, saturated, fine laminations, some very fine sand.	medium dense to loose,			
105 —									
-	7		6						
110 —			10	3.5	SILTY CLAY (CL): Grayish brown, ve	ry moist very stiff			
110	4		10	3.5	0.2. F 0.2 tr (0.2). Gray on 2.0 tri, F0	y moist, very same			
-									
115 —	Z		8	3.0					
					SILTY SAND/SANDY SILT (SM/ML): very soft, fine grained sand.	Grayish brown, saturated,			
120 —					very soit, fine grained saild.				
DATE			6/28/	11 Illiams	TOTAL DEPTH	t: 121.5 Feet Hollow Stem Auger		PTH TO W METER:	/ATER: 4 <u>.6 ft.</u> 8 in.
LOGG		r: Elevati			TYPE OF BIT: pproximately -224' HAMMER WT.			OP;	30 in.
				Tree .	LAND	nMany			
F	PRO	JECT	NO. L	E111		<u>UMAKK</u>		PLA	ATE B-21b
					Geo-Engin	eers and Geologists			

EPTH S. S. S. V. V. V. V. C.					LOG	OF BORING	No. 21		LABOI	RATORY		
I di	MPLE SS						SHEET 3 OF 3	110. 21	>	A 는 는		
<u>B</u>	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESC	CRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TE	STS
-	Z		1		SILTY Soft	AND/SANDY fine grained	/ SILT (SM/ML): Gra	yish brown, saturated,				
125 —					Toly out	, mio gramo	o dana,					
-										)		
130 —												
135 —												
140 —												
145 —												
150 —												
155 —												
160 —												
1 7 1 8												
165 —												
170 —												
175 —					Groundw	oth = 121,5' vater measu d with excav	red at 4.6 feet after 2 ated soil	4 hours				
180 —												
DATE	DRILI	ED:	6/28/	11			TOTAL DEPTH:	121.5 Feet	DE	PTH TO W	ATER: 4.6	ift.
LOGGED BY: S. Williams				TYPE OF BIT:	Hollow Stem Auger		METER:	8 in.				
SURFACE ELEVATION: Approximate				Approxima	tely -224'	HAMMER WT.:	140 lbs.	DR	OP;	30 in.		
PROJECT NO. LE11138						W =	LAND Geo-Engineers	MARK		PLAT	E B-21c	

I	PLE SS. SS. SN. SN. SN. SN. SN. SN. SN. SN.				LOG OF BORING No. B-22		LABO	RATORY		
EPT	빌	, S	<u> </u>	(tsf)	SHEET 1 OF 2	≽	URE ENT wt.)			
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS		
	o)		шО	4.4		000	200			
-	1		40		SILTY CLAY (CL): Brown, moist, hard to stiff.					
5 —			18	4.5 1.5	<u> </u>					
			5	1.5	SILTY SAND (SM): Light brown, saturated, loose, very fine grained.					
10 -			5		SANDY SILT (ML): Light brown, saturated, loose, very fine grained sand.					
-	7		4				27.1	% Passing #200 = 30%		
=			28		SILTY SAND (SM): Light brown, saturated, medium dense, very fine to fine grained.	103.7	24.4			
15 —	Z		11							
	7		32		dense					
20 -			12							
			12							
25 —					SILT (ML): Brown, saturated, loose, some very fine grained sand					
-	7		7							
-										
30 —	Z		12							
-										
35 —			5	1.0	CLAY (CH): Gray/brown, stiff, wet.					
-			5	1.0						
40 —										
-	7		4	1.0						
45 —	7		7	1.0	SILTY CLAY (CL): Brown, stiff, wet.					
50 —			5	3.0	reddish brown, wet, very stiff, thin sandy layers (1/2").					
-			J	5.0						
55 —					SILTY SAND (SM): Brown, saturated, loose, fine grained.					
=	7		9		OLL 1 OCHED (OW). BIOWIT, Saturated, 10056, ITTHE Grained.					
60										
DATE	חפוו	ED:	7/6/1	1	TOTAL DEPTH: 101.5 Feet	DE	PTH TO W	/ATER: 5.0 ft.		
LOGG				illiams	TYPE OF BIT: Hollow Stem Auger		METER:	8 in.		
		ELEVATION			Approximately -224' HAMMER WT.: 140 lbs.		OP:	30 in.		
		IECT	NO 1	E111	I.ANDMARK		DI /	ATE D 22a		
	PROJECT NO. LE11138  Geo-Engineers and Geologists  PLATE B-22a									

Ī		FI	ELD			LOG	OF BOR	ING N	lo. 22		LABO	RATORY	
DEPTH	밀	S.	\ <u></u>	(ET			SHEET 2			≥	URE ENT wt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION	OF M	IATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TES	STS
	7		11		SILTY SA	ND (SM): E	Brown, saturated	d, loose, fi	ine grained.				
65 —		19 49 4 4 4 4			SILT (ML	): Brown, sa	aturated, mediu	m dense.					
70 —			30		SILTY SA very fine	.ND (SM); E to fine grain	Brown, saturated ed.	d, medium	dense,				
75 —	Z	8888888	15		SANDY S	SILT (ML): B grained sand	rown, saturated	d, medium	dense,				
80 —	Z		5	3.0	SILTY CI	.AY (CL): G	iray brown, we	t, stiff					
85 —	Z		4	0.5	CLAYEY loose/firr	SILT/SILTY n.	CLAY (ML/CL	₋): Grayis	sh brown, wet,				
90 —	Z		39							_			
95 —	Z		26		SILTY SA dense to	ND (SM): ( medium der	Grayish brown, s	saturated, d.					
100 —	Z		15										
105 —													
110 —													
115 —					Groundw	oth = 101.5' rater measu d with excar	red at 5.0 feet	after 24 h	nours				
120 —													
LOGG			7/6/1	illiams			TOTAL DEF		101.5 Feet Hollow Stem Auger		EPTH TO W AMETER:	/ATER: <u>5.</u> 8 in.	.0 ft.
7,000,000,000,00		LEVATI			Approxima	tely -224'	TYPE OF E		140 lbs.		ROP:	30 in.	
F	PRO	JECT	NO. L	.E111	38		Geo-En	ND V	ARK d Geologists		PLA	NTE B-22b	<b>-</b>

_		FI	ELD			OG C	F BOF	RING N	lo. B-23			LABO	RATOF	RY		
DEPTH	Щ		. L	ET tsf)	_		SHEET		.0. 5 20		>	NT (.)				
<u> </u>	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTIC	ON OF I	MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER	TESTS		
	• V		4	1.0	SILTY CLA	Y (CL): B	rown, moist	t, stiff								
5 —	7		26		SILTY SAI	ND (SM): ed.	Light brown	n, saturate	d, medium dense,	*	105.0	23.2				
	Z		2		SANDY SI fine graine	ILT (ML): ed sand.	Light brow	n, saturate	d, very loose,							
10 -	1		19		SILTY SAI	ND (SM):	Light brown	n, saturate	d, medium dense,		103.5	22.4	% Passing	#200 = 24%		
45	Z		12		fine graine	ed.										
15 —	7		34													
20 -			4													
20	7		7	0.5	CLAY (CH)	): Brown,	wet, firm.									
25 —	Z		4		SILTY SAN	ND (SM):	Light brown	n, saturate	d, loose to							
-					medium de	ense, nne	grained.									
30 -	N		12	1.5												
35 —					CLAY (CH	): Grayisl	h brown, we	t, soft to st	iff.							
55	И		5	0.5 2.0												
40 -	7		6	0.25												
45	H															
45 —	Z		2	0.25	SANDY S	ILTY CLA	Y (CL): Brov	wn, wet, so	ft, fine grained san	d						
50 —	N		50/6"		SILTY SAI	ND (SM): o fine gra	Light brow ined.	n, saturate	d, very dense,							
55 -	1 0.25				SILTY CLA	Y/CLAYE	Y SILT (CL/N	/IL): Light b	rown, wet, soft/very	loose.						
60 —						ND (SM): o fine gra	Light brown ined.	n, saturated	d, medium dense,							
DATE	DRIL	LED:	7/6/1	1			TOTAL	DEPTH:	101.5 Feet		DE	ртн то м	ATER:	5.0 ft.		
LOGG	SED B	<b>Y</b> :	S. W	illiams			TYPE C	F BIT:	Hollow Stem Au	ger	DIA	METER:	8 in.			
SURF	ACE I	ELEVATI	ON:	-	Approximate	ly -224'	HAMME	R WT.:	140 lbs.		DR	OP;	30 in.			
F	PRO	JECT	NO. L	E111	38		L	PROJECT NO. LE11138  LANDMARK								

Geo-Engineers and Geologists

T <sub>T</sub>		FI	ELD		77	LOG	OF BORING	G No. 23			RATOR	Y
DEPTH	Ш	(6)		ET (tsf)			SHEET 2 OF			URE Mt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION O	F MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	ESTS
	7		18			AND (SM): to fine grai		ated, medium dense,			f:	
65 -	Z		11		SANDY S very fine	SILT (ML): grained sa	Light brown, saturand.	ated, medium dense,	]			
70 -	N				SILTY S/ very fine	AND (SM): grained.	Grayish brown, sa	iturated, loose,				
75 -			9	2.5	SILTY CI	LAY (CL): (	Grayish brown, we	t, very stiff.				
/5 -	Z		5		SILT (ML	.): Grayish	brown, saturated,	loose.				
80 -	Z		13		SILTY SA very fine	AND (SM): to fine grai	Light brown, satura ined.	ated, medium dense,				
85 –			39		SANDY :	SILT (ML): to fine grai	Light brown, satur ined sand.	ated, dense,				
90 -	A		3		very loos	se	-					
95 -	N		5		SILTY S. very fine	AND (SM): to fine gra	Brown, saturated, ined, clay at tip of s	loose, sampler.				
100 -	Z		7	1.0	SILTY C	LAY (CL): I	Brown, wet, stiff.					
105 -												
110 -												
115 -					Groundw	oth = 101.5' vater measu d with excar	ired at 5.0 feet after	24 hours				
120 -									<u> </u>			
	DRIL		7/6/1				TOTAL DEPTH:			PTH TO W		5.0 ft.
	GED B FACE I	Y: Elevati		illiams	Approxima	tely -224'	TYPE OF BIT: HAMMER WT.:	Hollow Stem Auger 140 lbs.		AMETER: ROP:	8 in. 30 in.	
			NO. L				LANI	MARK ors and Geologists			ATE B-2	3b

Ī		FI	ELD		LOG OF BORING No. B-24			RATORY
DEPTH	삘	S.	\ <u>\</u>	(ET	SHEET 1 OF 3	М	URE ENT wt.)	
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5 —	<b>7</b>		15 8	2.0	SILTY CLAY (CL): Dark brown, moist, stiff to very stiff.			
10 -			5 4		SANDY SILT (ML): Dark brown, saturated, loose, very fine to fine grained sand.	98.9	32.3 14.6	% Passing #200 = 70%
15 —			10 9 14		SILTY SAND (SM): Dark brown, saturated, loose to medium dense, very fine to fine grained.			
20 -	Z		4	1.5	SILTY CLAY (CL): Dark brown, wet, stiff.			
25 -	7		8		SANDY SILT (ML): Dark brown, saturated, loose, very fine to fine grained sand.		29.8	% Passing #200 = 71%
30 -	SILTY SAND (SM): Dod, brown acturated loose to						0	j
35 —	3		14					
40 -	Z		4	2.0	CLAY (CH): Dark brown, wet, stiff to very stiff.			
45 -	N		13	2.0				
50 -	Z		5		SILTY SAND (SM): Brown, saturated, loose, fine grained.			
55 -	7		7	1.0	SILTY CLAY (CL): Dark brown, very moist, stiff.			
60 -					SILTY SAND (SM): Lt. brown, saturated, medium dense to dense, fine grained.			
DATE	DRILL	.ED:	7/6/1	1	TOTAL DEPTH: 121.5 Feet	DE	PTH TO W	/ATER: N/A
	GED B			amacho	TYPE OF BIT: Hollow Stem Auger		METER:	8 in.
SURF	ACE E	LEVATI	ON:		Approximately -224' HAMMER WT.: 140 lbs.	DR	OP:	30 in.
F	PRO.	JECT	NO. L	E111	LANDMARK		PLA	ATE B-24a



I		FI	ELD			LOG	OF B	ORING	NO. 24				RATOR	Υ
DEPTH	밀	ů,	<u>_</u> =	(tsf)				T 2 OF 3			Т	URE ENT wt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPT	ION OF	MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER T	TESTS
-	7		21		SILTY SA fine grain		Lt. brown,	saturated, m	nedium dense to d	ense,				
65 —														
			34											
70 -			6	1.0	SILTY CL	AY (CL): I	Brown, wel	t, stiff.						
75 —	Z		8		SANDY S	SILT (ML): ed sand.	Dark brow	n, saturated,	loose to medium	dense,				
80 —	Ŋ		19											
85 —	Z		19		SILTY SA	ND (SM): ed.	Dark brow	/n, saturated	, medium dense to	dense,				
90 —	Z		35											
95 —	Z		5		CLAYEY	SILT (ML):	Dark brov	wn, saturated	I, loose.					
100 —	Z		14	4.0	SILTY CL	.AY (CL):	Dark brow	n, very mois	it, very stiff to stiff					
105 —	Ŋ		9	3.5										
110 —	Z		9	1.5										
115 —	Z		7	3.5										
120 —														
DATE	ATE DRILLED: 7/6/11  OGGED BY: E. Camacho						TOTA	AL DEPTH:	121.5 Feet		DE	PTH TO W	ATER:	N/A
		Y: ELEVATI			o Approxima	telv -224'		OF BIT:	Hollow Stem A	Auger		METER: OP:	8 in. 30 in.	
			NO. L					LAND	WARK and Geologists				ATE B-2	.4b

т		FII	ELD			LOG	OF BORING	No. 24			RATOR	Y
DEPTH	щ		_	ET (PSI)			SHEET 3 OF 3		>	E F		
	SAMPLE	SS	BLOW	POCKET PEN. (tsf)					DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER 1	TECTO
	SA	USCS CLASS.	BL( CO	S H		DES	CRIPTION OF	MATERIAL	Per	Ø0% 00%	OTTER	IESIS
	Z.		8	3.5	SILTY CL	AY (CL): I	Dark brown, very mois	t, very stiff.				
-					10							
125 —												
-												
-					V							
130 —												
-												
135 —												
133												
140 —	#											
-												
-												
145 —												
1												
150 —												
-												
-												
155 —												
1												
160	0 —											
160 —	60											
-												
165 —												
_												
-												
170 —												
175 —												
175					Total Dep Groundw	oth = 121.5 ater not me	; <sup>,</sup> easured after 24 hours	s due to caving				
-					Backfilled	d with exca	vated soil	•				
180												
DATE	DRILL	ED:	7/6/1	l			TOTAL DEPTH:	121.5 Feet	DE	тн то м	ATER:	N/A
LOGGED BY: E. Camacho							TYPE OF BIT:	Hollow Stem Auger	DIA	METER:	8 in.	
SURFACE ELEVATION: Approx						tely -224'	HAMMER WT.:	140 lbs.	DR	OP:	30 in.	
Р	RO	JECT	NO. L	.E111	38		Geo-Engineers	MARK and Geologists		PLAT	TE B-24	С

Ī		FI	ELD			LOG C	F BORII	NG N	o. B-25			RATORY
DEPTH	빌	S.	> =	(ET			SHEET 1			_	Wt.)	
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION	N OF N	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	7		12	3.5	SILTY CL	.AY (CL): E	Brown, moist, s	stiff to ver	y stiff			
5 -	Z		6		SILT (ML)	): Brown, sa	aturated, loose	, sandy a	t 6.8 ft.			
	7		2									
10 -	Z		8				_ight brown, sa		oose	97.6	22.4	% Passing #200 = 99%
15 -	I		21		to mediur	n dense, ve	ry fine to fine g	grained.				
15			28									
20 -	1		14	0.5						-		
	7		3	2.0	CLAY (CI	H): Brown,	very moist, fire	m to stiff			27.3	LL=59% PI=40%
25 —	N		23		SILTY CL grades do	AY/SILTY S	SAND(CL/SM) ay to silty sand	: Brown, d.	very moist/saturated,			
30 -	Z		4		SILTY SA	AND (SM): Ito fine grain	Light brown, sa led.	aturated, v	very loose,		24.6	% Passing #200 = 32%
35 —	Z		13	1.5	CLAY (CI	H): Dark br	own, wet, stiff,	, very pla	stic.			
40 -	Z		2	0.25	firm, som	ne very thin	sand layers.					
45 -	7		11		SILT (ML	₋): Brown, s	aturated, med	ium dens	e.			
50 -	N		15			ND (SM): I to fine grain		iturated, r	medium dense,			
55 —	21 very fine						rown, saturated	d, mediun	n dense,			
60 -							SAND (ML/SM fine to fine gra					
DATE	DRIL	LED:	7/5/1	1			TOTAL DE	PTH:	101.5 Feet	DE	PTH TO V	VATER: 5.25 ft.
	GED B			illiams	A = = = = = = = = = = = = = = = = = = =	tah. 004	TYPE OF I	-	Hollow Stem Auger		METER:	8 in.
SURF	ACE I	ELEVATI	ON:		Approximat	tely -224	HAMMER		140 lbs.	UR I	OP:	30 in.
	PR∩	JECT	NO I	F111	38		I.A	NNA	<b>AARK</b>		DI A	ATE B_25a

PROJECT NO. LE11138



PLATE B-25a

_		FI	ELD			LOG	OF BORIN	IG No. 25			LABO	RATOR	Υ
DEPTH	巴	(6		ET tsf)			SHEET 2 O			>	JRE :NT Mt.)		
Di Di	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION (	OF MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER	TESTS
	И		15		SANDY S medium	SILT/SILTY : dense, very	SAND (ML/SM): I fine to fine graine	Brown, saturated, d sand.					
65 —	Z		11		SILTY SA fine grains		Brown, saturated,	medium dense,					
70 -	Z		12			): Dark brove grained sa	wn, saturated, me ind.	dium dense,					
75 —	Z		4		CLAYEY	SILT (ML):	Dark brown, satu	rated, loose.					
80 -	7		18		SILTY SA to dense,	.ND (SM): E very fine to	Brown, saturated, fine grained.	medium dense					
85 —	Z		38										
90 -	7		42										
95 —	Z		13										
		,,,,,,,			SILT (ML	): Brown, sa	aturated, medium	dense.					
100 -	Z		11	1.5	SILTY CL	AY (CL): B	rown, wet, stiff.						
105 —													
110 -													
115 -					Groundw	oth = 101.5' vater measu d with exca	red at 5.25 feet a	after 24 hours					
120 -	DRIL	FD.	7/5/1	1			TOTAL DEPT	H: 101.5 Fee	at .	DF	РТН ТО М	/ATER·	5.25 ft.
	SED B			illiams			TYPE OF BIT				METER:	8 in.	J.EU IL.
SURF	ACE E	LEVAT	ION:		Approxima	tely -224'	HAMMER WI	: 140 lbs.		DR	OP:	30 in.	
F	PRO	JECT	ΓNO. L	.E11′	138		Geo-Engir	DMARK Deers and Geologists			PLA	ATE B-2	25b

I		FII	ELD			LOG OF	BORING	No. B-26			RATORY	
DEPTH	Щ	, i	\E	(ET			SHEET 1 OF 1		≽	URE ENT wt.)		
□	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESC	RIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TEST	·s
-	9		8	1.5	SILTY CL	AY (CL): Bro	wn, moist to very n	noist, stiff.				
5 —			4		SILT (ML)	: Brown, sat y fine grained	urated, loose, sand.					
10 -	7		7									
15 —	1		18		SILTY SA very fine	ND (SM): Br to fine graine	rown, saturated, me d.	edium dense to loose,				
	1		6 5									
20 —	Z		_7_	1.5	SILTY CI	AY (CL): Da	rk brown, very mois	at stiff				
-				1.0	0.2., 0.2	(0.2).		.,				
25 —												
30 —												
35 —												
40 —												
45 —												
50 —												
55 —					Groundw	oth = 21.5' rater measure d with excava	ed at 3.25 feet after ted soil	24 hours				
60 -												
DATE			6/30/				TOTAL DEPTH:	21.5 Feet		PTH TO W		ft.
LOGO		Y: ELEVATI		filliams	Approxima	tely -224'	TYPE OF BIT: HAMMER WT.:	Hollow Stem Auger 140 lbs.		METER: OP:	8 in. 30 in.	-
			NO. I				LAND	MARK and Geologists		PL/	ATE B-26	

Г		FII	ELD			LOGO	F BORING	No B-27			LABO	RATORY	′
DEPTH	Щ	(i)		ET (tsf)			SHEET 1 OF			≥	URE INT Mt.)		
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION O	F MATERIAL		DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TE	ESTS
	7		12	1.0	SILTY CL	AY (CL): B	rown, moist to very	moist, stiff.					
5 -			7		SILT (ML	): Brown, s	aturated, loose.						
10 -		ШШ	10										
			6 16		SANDY S	SILT (ML): grained sar	Lt. brown, saturate nd.	d, loose,					
15 —	Z		11		SILTY SA	ND (SM)	Brown saturated i	medium dense to loose					
20 -	1		29		very fine	to fine grair	ned.	nedium dense to loose	,				
-	7	8888888	25						$\dashv$				
25 -													
30 -													
35 —													
40 -													
, in													
45 -													
50 -													
55 -					Total Dep	oth = 21.5'	easured after 24 ho	urs due to caving					
					Backfille	d with excav	vated soil	aro dao to caving					
60 -				44							DTU TO ::	WATES	N/C
	DRILI		6/30/	11 filliams			TOTAL DEPTH: TYPE OF BIT:	21.5 Feet Hollow Stem Au	аег		PTH TO W METER:	ATER: 8 in.	N/A
		t. ELEVATION			Approxima	tely -224'	HAMMER WT.:	140 lbs.	J		OP:	30 in.	
F	PRO	JECT	NO. L	_E111	38		Geo-Engine	MARK ers and Geologists			PLA	ATE B-27	7

ī		FI	ELD			LOG C	F BORING	3 No. B-2	8		LABO	RATORY	
DEPTH	빌	. s	>=	(ET (tsf)			SHEET 10			≽	URE ENT wt.)		
Ω	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DES	CRIPTION (	OF MATER	IAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TE	STS
=	• N		8	1.0	SILTY CL	.AY (CL): E	Brown, moist to ve	ry moist, stiff.					
5 -	1		9		SILT (ML	): Brown, s y fine grain	saturated, loose to	medium dense	, ¥				
	Z		4		SILTY SA		Brown, saturated	, loose to mediu	m dense,				
10 -	1		12		thin clay	ayer with g	ypsum crystals a	11 ft.					
	Z		7		SANDY S	SILT (ML): grained sai	Brown, saturated nd.	loose,					
15 —	7		16		SILTY SA		Brown, saturated	, medium dense	,				
	Z		16										
20 -	1		41		dense								
25 —													
-													
30 —													
-													
35 —													
-													
40 —													
-													
45 —													
50 —													
55 —													
-					Groundw	oth = 21.5' ater measu d with exca	ured at 5.25 feet a	fter 24 hours					
60 -					Dackinie	WILLI EXCA	vated Soli						
DATE	DRILI	LED:	7/1/1	1			TOTAL DEPT	H: 21.5 F	eet	DEI	PTH TO W	ATER: 5.2	25 ft.
LOGG	SED B	Y:	S. W	illiams			TYPE OF BIT	Hollow S	Stem Auger	DIA	METER:	8 in.	
SURF	ACE E	LEVATI	ON:		Approximat	tely -224'	HAMMER WI	.: 140 lb	S.	DR	OP:	30 in.	
F	PRO	JECT	NO. L	E111	38		LAN Geo-Engir	DMARI eers and Geologists	<u>(</u>		PLA	ATE B-28	

т		FIE	ELD			LOG OF TEST	PIT N	n T-1			RATORY
DEPTH	Щ		-	ET tsf)		SHEET 1		J. 1 1	>	JRE NT.	
DE	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESCRIPTION	OF MA	ATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
1 1 1 1	•				SILTY CI	.AY (CL): Brown, moist, s	itiff to very s	stiff.		12.3	LL=45% PI=27% Passing #200 = 99%
5 —											
10 —											
15 —					No free o	oth = 6.0 ft. groundwater at time of exc d with excavated soil	cavation				
20 —		,									
25 —											
30											
LOGG	ED B	vated: Y: Elevatio		11 amacho -20		TOTAL DE TYPE OF E HAMMER	3IT:	6.0 Feet Backhoe N/A		PTH TO W METER: OP:	ATER: <u>N/A</u> N/AN/A
P	PRO.	JECT	NO. L	.E111	38	Geo-Er	NDM ngineers and	ARK Geologists		PLA	TE B-29

FIELD		LOG OF TEST PIT No. T-2			LABORATORY						
DEPTH	Щ	0.0		L (Js		SHEET 1 OF 1	110. 1 2	<u> </u>	E C		
B	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESCRIPTION OF I	MATERIAI	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
	S	30 ////////////////////////////////////	<u>m</u> O	ם ם		DECOMM MOREON	VI CI CI CI CI	008	≥೮೮		
	•				CLAY (CI	L-CH): Brown, moist, stiff to very	stiff.		19.1	LL=50% PI=30% Passing #200 = 99%	
5 —											
-											
10 —											
15 —											
20 —					No free o	oth = 10.0 ft. groundwater noted at time of exca d with excavated soil	vation				
25 —											
-											
30 —	EVA	\/ATCD	6/00/	11		TOTAL DEDTIL	40.0 ===	DE		ATED: NA	
LOGG		WATED; Y:		macho		TOTAL DEPTH:  TYPE OF BIT:	10.0 Feet Backhoe		PTH TO W METER:	ATER: N/A N/A	
		LEVATION			03 ft.	HAMMER WT.:	N/A		OP:		
F	PRO	JECT	NO. L	.E111	38	IAND	MARK nd Geologists		PLA	TE B-30	

т	FIELD					LOG OF TEST PIT No. T-3			LABORATORY		
DEPTH	Щ	7.		Sf)		SHEET 1 OF 1	110. 1 0	>	유수(		
DE	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESCRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
	•				CLAY (CI	H): Brown, moist, stiff to very stiff	i.		14.8	LL=51% PI=31% Passing #200 = 99%	
5 —											
10 —											
15 —					No free g	oth = 7.0 ft. groundwater noted at time of exca	ıvation				
20 —					Backfilled	d with excavated soil					
25 —											
30											
		VATED:	6/28/			TOTAL DEPTH:	7.0 Feet	DE	PTH TO W	ATER: N/A	
LOGG		Y: :LEVATIO		macho		TYPE OF BIT: HAMMER WT.:	Backhoe N/A	DIA DR	METER:	N/A N/A	
			NO. L		38	Geo-Engineers	Mark			TE B-31	

т	FIELD				LOG OF TEST PIT No. T-4				LABORATORY			
DEPTH	щ		<b>—</b>	ET (Js		SHEET 1 OF 1		>	A P ( )			
DE	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DESCRIPTION OF	MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS		
	•					LAY (CL): Brown, moist, stiff to v	very stiff.		15.1	LL=46% PI=28% Passing #200 = 99%		
5 —												
10 —												
15 —					No free o	pth = 8.0 ft. groundwater noted at time of exc d with excavated soil	cavation					
20 —												
25 —												
30 —												
LOGG	ED B	VATED; Y: ELEVATIO	E. Ca	amacho	07 ft.	TOTAL DEPTH: TYPE OF BIT: HAMMER WT.:	8.0 Feet  Backhoe  N/A	DIA	PTH TO W METER: OP:	VATER: N/A N/A N/A		
F	RO	JECT	NO. L	.E111	38	LAND Geo-Engineers	MARK s and Geologists		PLA	TE B-32		

т	LOO OI ILOI I I I I I I I I I I I I I I		LABOI	RATORY						
DEPTH	щ		ь	ET (st)		SHEET 1 OF		>	JRE NT vt.)	
DE	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)	D	ESCRIPTION C	F MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5	•				SILTY CLAY (C	CL): Brown, moist, stiff t	o very stiff.		17.3	LL=44% PI=25% Passing #200 = 96%
10 —										
15 —					Total Depth = 5 No free ground Backfilled with	5.0 ft. Iwater noted at time of e excavated soil	excavation			
20 —										
25 —										
20										
30 —	EVCA	VATED:	6/20/	1		TOTAL DEDT	b 505-4	, DE		ATED: N/A
LOGG	ED B	ivated; Y: Elevation		macho	09 ft.	TOTAL DEPTH TYPE OF BIT: HAMMER WT.	Backhoe	DIA	PTH TO W METER: OP:	ATER: <u>N/A</u> N/A  N/A
P	PRO	JECT	NO. L	.E111	38	IAN Geo-Engine	DMARK Ders and Geologists		PLA	TE B-33

FIELD			LOG OF TEST PIT No. T-6			LABORATORY						
DEPTH	E		<b>F</b>	ET ET			SHEET 10			>	JRE NT vt.)	
	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)		DEGG	DIDTION	)	EDIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	SA	공리	필요	2 2		DESC	RIPTION	JF MAI	ERIAL	R R 9	₹0%	
1	•				SILTY CL	.AY (CL): Bro	own, moist, stiff	to very stiff			17.5	LL=47% PI=28% Passing #200 = 98%
5 —												
3												
10 -										y		
15 —			i.		Total Dep No free g Backfilled	oth = 6.0 ft. groundwater r d with excava	noted at time of ated soil	excavation				
20 —												
25 —												
2-												
30 —												
		VATED:	6/28/				TOTAL DEPT		.0 Feet		PTH TO W	
LOGG		r: :Levatio		macho -2	12 ft.		TYPE OF BITS HAMMER WT	-	Backhoe N/A	DR	METER: OP:	N/A N/A
			NO. L				LAN	DMA eers and Geo	<u>RK</u>			TE B-34

т	FIELD		LOG OF TEST PIT No. T-7			LABORATORY				
DEPTH	Щ	ц		ET Sf)	SHEET 1 OF 1		110. 1 1	>	HE (F	
B	SAMPLE	USCS CLASS.	BLOW	POCKET PEN. (tsf)				DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
	SAI	CLZ	SPC	임핍		DESCRIPTION OF	MATERIAL	Peg	00 00 00 00 00 00 00 00 00 00 00 00 00	OTHER TESTS
7 3 6 K	•				SILTY CL	AY (CL): Brown, moist, stiff to ve	ery stiff.		20.8	LL=46% PI=27% Passing #200 = 98%
5 —										
10 —										
15 —		-			No free q	oth = 9.0 ft. roundwater noted at time of exca d with excavated soil	vation			
20 —										
25 —										
30 —										
	EXCA	VATED:	6/28/	11		TOTAL DEPTH:	9.0 Feet	DFI	PTH TO W	ATER: N/A
LOGG				amacho		TYPE OF BIT:	Backhoe		METER:	N/A
		LEVATION			15 ft.	HAMMER WT.:	N/A	DR		N/A
F	PRO	JECT	NO. L	.E111	38	Geo-Engineers	MARK and Geologists		PLA	TE B-35

CLIENT: Cal Energy
PROJECT: Black Rock 5-6 Geothermal Plant -- Calipatria, CA

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric

Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 6/28/2011

## **CONE SOUNDING DATA CPT-1**

INTERPRETED SOIL PROFILE From Robertson and Campanella (1989	Tip Resistance (tsf)	Sleeve Friction (tsf)	Friction Ratio
Clay CUCH hard	100 200 300	4000 2 4 8 8 1	00 2 4 6 8
Clay Sliff Clay Sliff Clay Sliff	\$	5	
Clay : : firm			, <del>, , , , , , , , , , , , , , , , , , </del>
Sitty Clay to Clay CL firm Sitty Clay to Clay firm Sitty Clay to Clay firm			2
Silty Sand to Sandy Silt SM/ML medium dense Sandy Silt to Clayey Silt ML medium dense	7		\$
Sitty Sand to Sandy Sitt SMML medium dense Sitty Sand to Sandy Sitt dense Sitty Sand to Sandy Sitt dense	>	3 111111	3
Sitty Sand to Sandy Silt medium dense Sitty Sand to Sandy Silt medium dense	2_		<b>₩</b>
Sandy Sitt to Clayer Sit Mt. medium dense			
Sitty Sand to Sandy Sitt SM/ML dense Clayey Sitt to Sitty Clay ML/Ct. very stiff Clay Clay CDCH stiff	F		3
Clay stiff			2
Sitty Sand to Sandy Bitt SM/ML medium dense Sitty Clay to Glay Cl. stiff Sandy Sitt to Clayey Sitt ML loose	2		33
Silty Sand to Sandy Silt SM/ML medium dense	2	3	N. Company
Sandy Silt to Clayer Silt Mt. medium dense Silty Sand to Sandy Silt SM/ML dense Sand to Silty Sand SP/SM dense		\$	3
Sand to Sitty Sand dense Sitty Sand to Sandy Sitt SM/ML medium dense		<b>S</b>	- <b>Ş</b>
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Clavey Sift to Sifty Clay ML/CL stiff Sandy Sift to Clayey Sift ML loose	>		2
Salty Sand to Sandy Salt SM/ML loose Sandy Salt to Clayer Salt ML loose			
Clayey Silt to Silty Clay ML/CL firm Ctayey Silt to Silty Clay atiff Silty Clay to Clay CL stiff	}		
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END OF SOUNDING AT 50 ft			

Project No. LE111138

