APPENDIX G

PHOTOGRAPHS

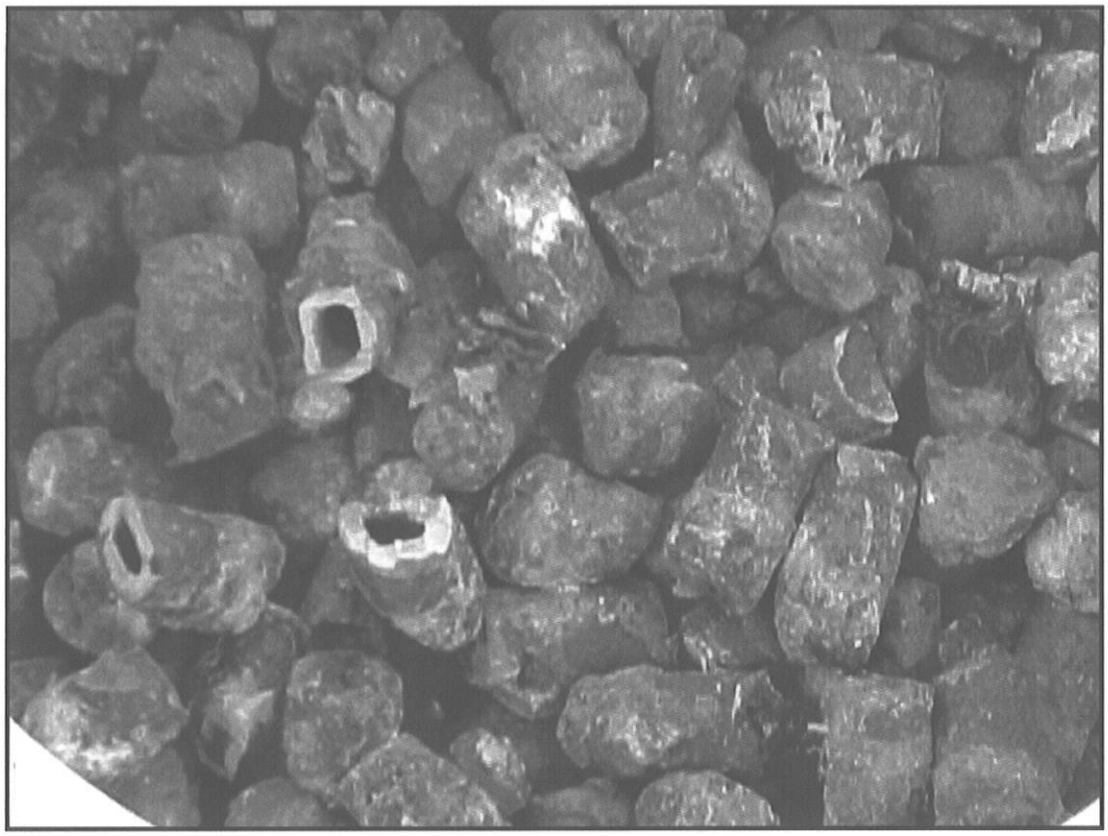


Photo 1 – Demilitarized 20-mm Rounds

Photo 2 – Recovered Inert Land Mine Trainer

Photo 3 – Excavated Test Pit, TP-2-4

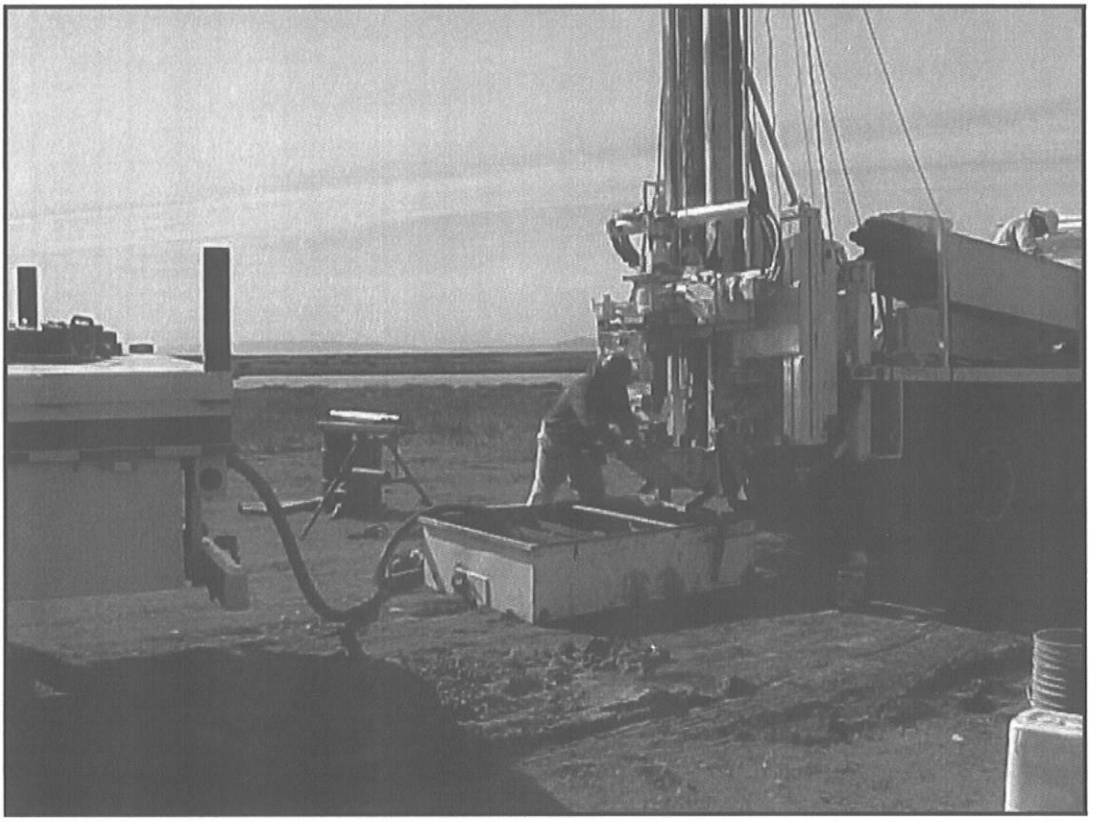


Photo 4 – Soil Borings at B-2-8

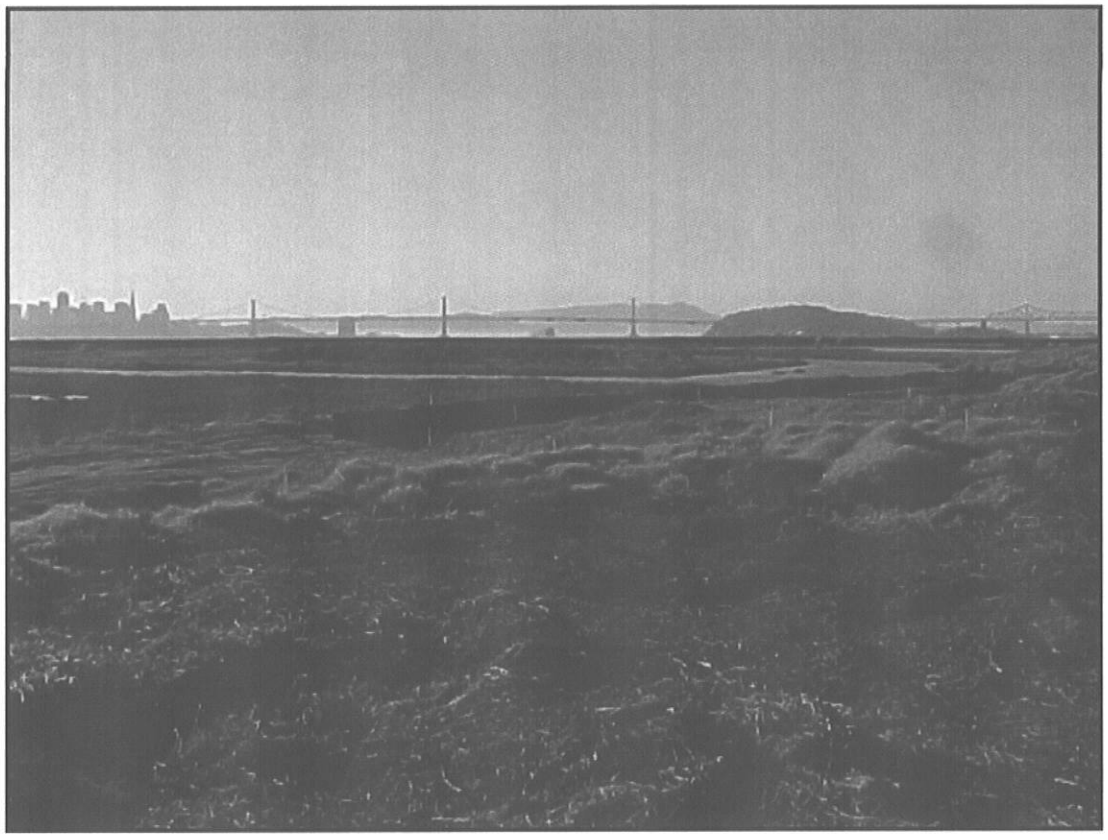


Photo 5 – Wetland at IR Site 2

Photo 6 – Survey and Staking of Delineated Wetland

Photo 7 – Biologist Inspection Prior to Vegetation Removal

Photo 8 – Vegetation Removal

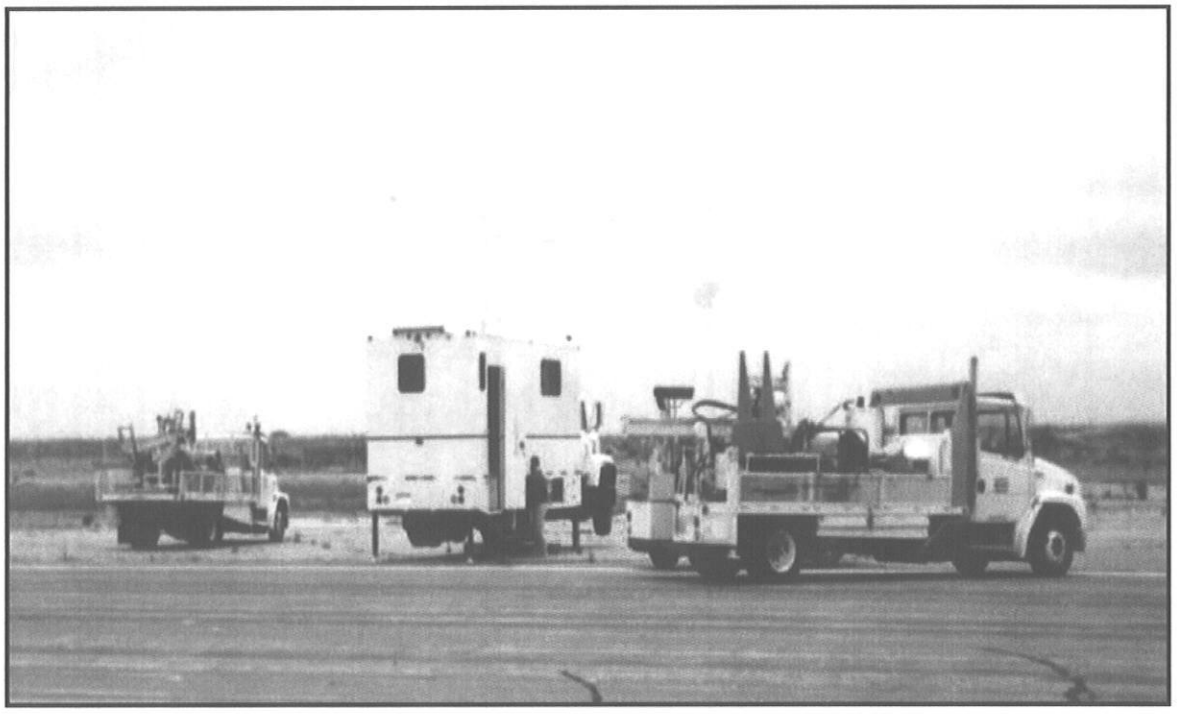


Photo 9 – CPT Activities in Area Between IR Sites 1 and 2

Photo 10 – Conducting Shear Wave Velocity Test in Area Between IR Sites 1 and 2

Photo 11 – Excavation of Soil for Ordnance and Explosives

Photo 12 – Mechanical Trommel (Powerscreen 725)

Photo 13 – Soil Screening Activities Utilizing Mechanical Trommel

Photo 14 – Excavated Debris Stockpiled for Disposal

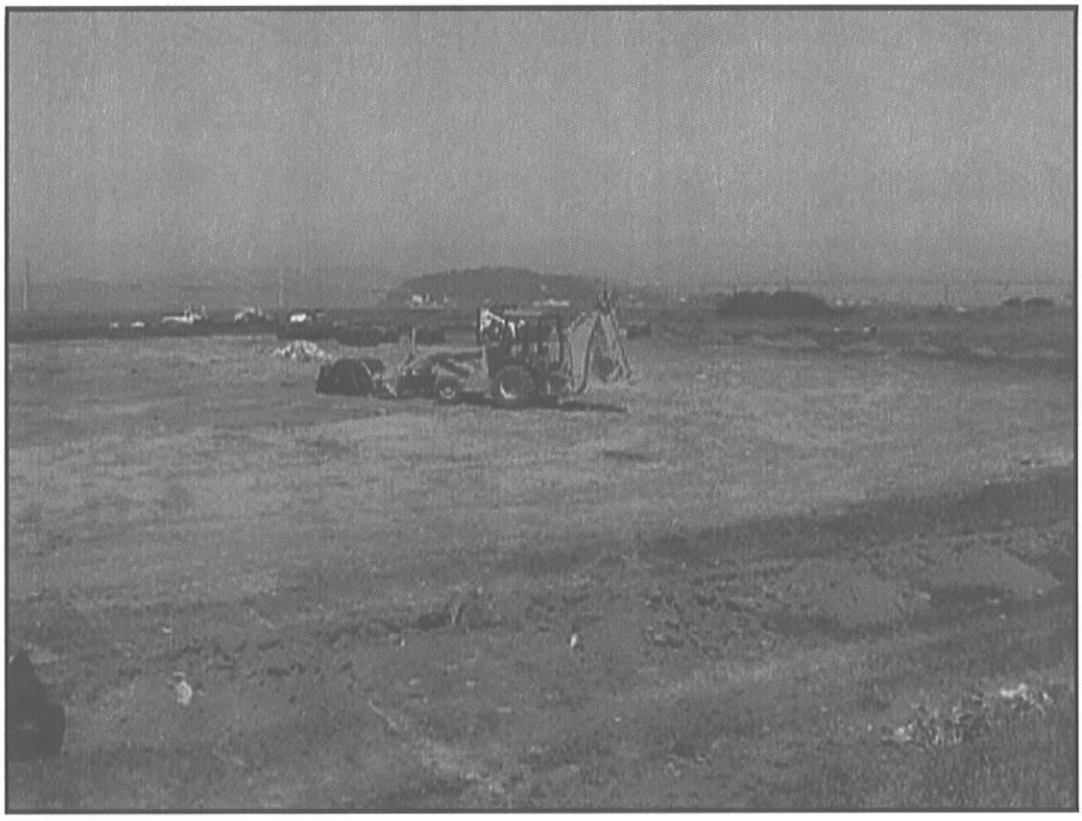


Photo 15 – Preparation of Excavated Area for Liner Installation

Photo 16 – Liner Installation Over Area of Excavation

APPENDIX H

DESCRIPTION OF TEST METHODS, SUMMARY OF TEST RESULTS, TERATEST LABORATORY REPORT, AND CHAIN-OF-CUSTODY (COC) RECORDS

DESCRIPTION OF GEOTECHNICAL LABORATORY TEST DATA

A description of the geotechnical soil parameters obtained from each laboratory test performed is presented below.

Atterberg Limits (ASTM D-4318). This test was performed on the fine-grained factions of soils to determine its liquid limit, plastic limit, and plasticity index. These water content limits were primarily used to classify the soil by distinguishing between clay and silt and whether it has high or low plasticity. The Atterberg Limits can also be used with other soil properties in correlating certain engineering properties such as compressibility, permeability, compactibility, shrink-swell potential, and shear strength.

Moisture/Density Analyses (ASTM D-2216/2937). The wet unit weight of the soil can be determined by performing a moisture/density test. In addition, the dry unit weight of the soil can be obtained by using the wet unit weight together with the water content.

Sieve & Hydrometer-Particle Size Analyses (ASTM D-422). Grain size analysis using a mechanical sieve for coarse soils and a hydrometer test for fine-grained soils are performed to obtain a gradation curve. This curve is used for soil classification purposes. If the fine-grained fraction of the soil is significant, an Atterberg Limits test is needed to complete the classification.

Unconsolidated-Undrained (UU) Triaxial Shear (ASTM D-2850). This test was performed to obtain shear strength parameters of soils. No confining pressure was used (unconsolidated) and pore pressure was not allowed to dissipate (undrained). For fine-grained soils tested, both friction angle and cohesion values were obtained to represent the shear strength of the soils. For cohesionless soils, only the friction angle is obtained.

Consolidated-Undrained (CU) Triaxial Shear (ASTM D-4767). This test was performed to obtain shear strength parameters of soils. A confining pressure was applied to the sample (consolidated) and pore pressure was not allowed to dissipate (undrained). For fine-grained soils tested, both friction angle and cohesion values were obtained to represent the shear strength of the soils. For cohesionless soils, only the friction angle is obtained. Confining pressures used for testing were specified by Hushmand Associates, Inc. (HAI) and chosen to represent actual field conditions (overburden/surrounding pressures).

Water Content (ASTM D-2216). This test determines the moisture content of soils as defined by the weight ratio of water to solid in a soil mass.

Percent Passing No. 200 (ASTM D-1140). Grain-size analysis using a mechanical sieve (No. 200 sieve) to determine the percent of fine-grained soils present.

Direct Shear (ASTM D-3080). This test was performed to obtain shear strength parameters of soils (cohesion and friction angle). A normal confining force is applied on the sample with the failure surface orientation predetermined.

Specific Gravity (ASTM D-854). This test is used to obtain the ratio of the unit weight of the soil to the unit weight of water.

Particle Size (Sieve only to No. 200-ASTM D-422). Grain-size analysis using a mechanical sieve for coarse soils. This test has been described above, but does not include a hydrometer analyses.

Consolidation (ASTM D-2435). Consolidation is the process of water being removed from the soil mass. This test was performed to obtain consolidation characteristics of soils. Results from the test can be used to estimate void changes (settlement) due to consolidation and time rate of settlement.

Vane Shear (ASTM D4648-94). This test is used to measure the undrained shear strength of very soft, saturated, fine grained sea-bed sediments and was selected because it allows measurement of shear strength without having to extrude the soils from the shelby tubes or sample sleeve. Very soft seabed sediments (with shear strength ranging from 200 to 500 psf) can not be extruded from the shelby tubes or rings because of their consistency, and the miniature vane shear testing is the preferred way to obtain reliable shear strength measurements.

HUSHMAND ASSOCIATES INC.
Geotechnical and Earthquake Engineers

TABLE D1

SUMMARY OF LABORATORY TEST RESULTS

Project Name: ALAMEDA NAS (SITE II and between Site I and II) *Project Number: 01-0810*

Borehole No.	Elev. (ft)	Depth (ft)	Sample No.	In situ Moisture Content (%)	In situ Dry Density (pcf)	Percent Passing # 200	Gs	Atterberg Limits			USCS	Sieve Analysis (Percent Passing)										Direct Shear				Vane Shear (ksf)
																						Peak		Ultimate		
								LL	PL	PI		3/4"	3/8"	# 4	# 10	# 16	# 30	# 50	# 100	# 200	2 μ	c (ksf)	ϕ (deg)	c (ksf)	ϕ (deg)	
B-2-1	-17.4																									
	-22.4	5.0	095-2-001	21.8	103.7			NP	NP	NP	SP-SM					100.0	99.9	94.7	35.4	8.0	5.6					0.498
	-27.4	10.0	095-2-002			23.0					SM															
	-32.4	15.0	095-2-003			34.0					SM											0.3	35.8	0.1	31.4	
	-42.9	25.5	095-2-005	19.1	110.3	17.5					SM															
	-57.4	40.0	095-2-008			21.4					SM															
	-62.4	45.0	095-2-009	19.5	111.3	18.4					SM															
B-2-2	-20.3																									
	-25.3	5.0	095-2-041	26.9	93.2						SM				100.0	99.8	98.6	95.4	38.2	27.2	10.9					
	-30.3	10.0	095-2-042			18.4					SM											0.1	28.1	0.0	24.2	
	-35.3	15.0	095-2-043			34.5					SM											0.3	39.5	0.1	34.0	
	-40.3	20.0	095-2-044			15.5					SM															
	-45.3	25.0	095-2-045			22.4					SM															
	-55.3	35.0	095-2-046			20.8					SM															
	-70.3	50.0	095-2-048			11.1					SP-SM															
	-80.3	60.0	095-2-049			8.2					SP-SM															
B-2-3	-35.3																									
	-40.3	5.0	095-2-034			12.7					SM											0.1	29.3	0.0	22.4	
	-45.3	10.0	095-2-035	19.1	112.1	37.2					SM															
	-50.3	15.0	095-2-036	17.1		29.9					SC															
	-60.3	25.0	095-2-037			18.9					SM															
	-70.3	35.0	095-2-038			11.8					SP-SM															
	-80.3	45.0	095-2-039			15.1					SM															
	-90.3	55.0	095-2-040			8.7					SP-SM															
B-2-4	-17.5																									
	-22.5	5.0	095-2-011	43.1	74.6			NP	NP	NP	ML					100.0	99.9	99.8	98.3	77.9	16.2					0.161
	-32.5	15.0	095-2-012	60.5	64.7			47	22	25	CL						100.0	99.9	99.0	96.3	33.8					0.538
	-42.5	25.0	095-2-013	53.5	66.1			44	21	23	CL						100.0	99.7	98.7	97.8	32.1					0.295
	-48.5	31.0	095-2-014	32.9	86.4	43.1					SC															
	-52.5	35.0	095-2-015			12.5					SM															
	-62.5	45.0	095-2-016			17.1					SM															
	-77.5	60.0	095-2-018			17.0					SM															

HUSHMAND ASSOCIATES INC.
Geotechnical and Earthquake Engineers

TABLE D1

SUMMARY OF LABORATORY TEST RESULTS

Project Name: ALAMEDA NAS (SITE II and between Site I and II) *Project Number: 01-0810*

Borehole No.	Elev. (ft)	Depth (ft)	Sample No.	In situ Moisture Content (%)	In situ Dry Density (pcf)	Percent Passing # 200	Gs	Atterberg Limits			USCS	Sieve Analysis (Percent Passing)										Direct Shear				Vane Shear (ksf)
																						Peak		Ultimate		
								LL	PL	PI		3/4"	3/8"	# 4	# 10	# 16	# 30	# 50	# 100	# 200	2 μ	c (ksf)	ϕ (deg)	c (ksf)	ϕ (deg)	
B-2-5	-9.5																									
	-14.5	5.0	095-2-019	31.5	86.5			NP	NP	NP	SM						100.0	99.8	83.1	48.6	12.2					0.525
	-24.5	15.0	095-2-020	20.6	107.2			NP	NP	NP	SM				100.0	99.9	98.9	94.0	42.7	17.9	7.2					0.460
	-29.5	20.0	095-2-021	47.9	70.0			25	20	5	CL-ML				100.0	98.6	97.6	93.6	68.0	52.1	13.2					0.558
	-39.5	30.0	095-2-022	45.9	68.4			38	19	19	CL					100.0	99.9	99.8	98.7	90.1	28.6					0.255
	-59.5	50.0	095-2-023	45.3	72.9			45	25	20	CL					100.0	99.9	99.9	99.5	96.0	34.9					0.456
	-79.5	70.0	095-2-024	48.7	71.1			53	26	27	CH					100.0	99.9	99.9	99.5	97.2	39.3					0.371
B-2-6	-13.2																									
	-20.2	7.0	095-2-027	44.2	75.7			25	14	11	SC				100.0	99.0	97.9	93.6	51.6	39.5	19.4					0.302
	-28.2	15.0	095-2-028	39.5	80.6			31	17	14	CL					100.0	99.9	99.8	97.8	59.9	21.8					0.210
	-54.2	41.0	095-2-029	25.0	96.9			25	15	10	SC					100.0	99.0	96.0	63.0	46.0	31.0					0.239
	-63.2	50.0	095-2-030			14.9					SM											0.2	33.3	0.2	30.1	
	-68.2	55.0	095-2-031			12.0					SP-SM															
	-73.2	60.0	095-2-032			9.3					SP-SM															
	-78.2	65.0	095-2-033			10.9					SP-SM															
B-2-7	16.9																									
	11.9	5.0	095-2-062	22.8	100.8																					
	1.9	15.0	095-2-064	25.8	102.5																					
B-2-7A	8.5																									
	-16.5	25.0	095-2-131	24.0	100.0			NP	NP	NP	SP-SM	100.0	99.2	97.1	96.6	96.3	95.5	78.8	20.7	11.0	3.9					0.478
	-21.5	30.0	095-2-132	36.5	90.1			24	16	8	SC				100.0	99.9	99.7	95.8	64.1	47.0	13.7					
	-26.5	35.0	095-2-133	23.5	102.0			NP	NP	NP	SP-SM					100.0	99.4	77.0	40.6	11.7	5.9					0.627
	-31.5	40.0	095-2-134			31.4					SM											0.4	30.8	0.2	28.2	
	-41.5	50.0	095-2-136			15.2					SM															
B-2-8	16.8																									
	11.8	5.0	095-2-069	31.7	94.8	27.8					SC															
	6.8	10.0	095-2-070	18.7	101.5	43.0					SC															
	1.8	15.0	095-2-071	19.3	107.0	8.9					SP-SM															
	-3.2	20.0	095-2-072	21.8	100.6	4.4					SP															
	-13.2	30.0	095-2-074	22.7		5.9					SP-SM															
	-18.2	35.0	095-2-075	48.1	74.9			42	23	19	CL							100.0	96.2	67.8	22.5					0.551
	-28.2	45.0	095-2-076			11.1					SP-SM															
	-33.2	50.0	095-2-077			22.1					SC															
	-43.2	60.0	095-2-079	20.4	113.9	6.7					SP-SM															
	-53.2	70.0	095-2-081	21.7	109.5	14.1					SC/SM															

HUSHMAND ASSOCIATES INC.
Geotechnical and Earthquake Engineers

TABLE D1

SUMMARY OF LABORATORY TEST RESULTS

Project Name: ALAMEDA NAS (SITE II and between Site I and II) *Project Number: 01-0810*

Borehole No.	Elev. (ft)	Depth (ft)	Sample No.	In situ Moisture Content (%)	In situ Dry Density (pcf)	Percent Passing # 200	Gs	Atterberg Limits			USCS	Sieve Analysis (Percent Passing)										Direct Shear				Vane Shear (ksf)
																						Peak		Ultimate		
								LL	PL	PI		3/4"	3/8"	# 4	# 10	# 16	# 30	# 50	# 100	# 200	2 μ	c (ksf)	ϕ (deg)	c (ksf)	ϕ (deg)	
B-2-9	16.2																									
	11.2	5.0	095-2-082	30.2	94.2	26.0					SC															
	6.2	10.0	095-2-083	14.2	115.5	43.6					SC															
	1.2	15.0	095-2-084	21.8	108.3	9.1					SP-SM											0.0	40.4	0.1	30.3	
	-3.8	20.0	095-2-085	20.6	104.0	2.3					SP															
	-8.8	25.0	095-2-086	20.8	104.6	5.5					SP-SM															
	-18.8	35.0	095-2-088	21.8	109.8	3.8					SP															
	-28.8	45.0	095-2-090	27.8	99.0	30.4					SC/SM															
	-38.8	55.0	095-2-092			23.6					SC															
	-48.8	65.0	095-2-094			17.2					SC															
B-2-10	16.8																									
	1.8	15.0	095-2-098	73.2	55.6			96	34	62	CH						100.0	99.9	99.6	98.9	44.6					0.536
	-3.2	20.0	095-2-099	18.7	111.0	7.1					SP-SM															
	-8.2	25.0	095-2-100			28.4					SC/SM											0.1	26.2	0.0	27.1	
	-13.2	30.0	095-2-101	22.3	107.5	6.5					SP-SM															
	-23.2	40.0	095-2-103	20.6	99.0	4.2					SP															
	-33.2	50.0	095-2-105	44.8	77.6			43	22	21	CL				100.0	99.6	99.2	98.2	91.9	88.4	25.5					0.634
	-43.2	60.0	095-2-107			9.3					SP-SM															
	-58.2	75.0	095-2-109			13.4					SM															
B-2-11	7.7																									
	2.7	5.0	095-2-110			36.4					SC											0.3	37.4	0.0	41.3	
	-7.3	15.0	095-2-112	23.5	104.8	7.5					SP-SM															
	-17.3	25.0	095-2-114	26.2	101.8	28.3					SM															
	-27.3	35.0	095-2-116	32.8	92.6			36	18	18	CL				100.0	99.9	99.9	99.8	92.6	49.6	14.5					0.894
	-37.3	45.0	095-2-118	47.4	70.7			57	32	25	MH						100.0	99.9	99.5	95.0	27.4					0.499
	-47.3	55.0	095-2-119	29.3	91.3			NP	NP	NP	SM						100.0	93.3	33.5	21.2	10.5					0.368
	-62.3	70.0	095-2-120	18.3	107.7			NP	NP	NP	SM					100.0	99.9	89.4	41.3	23.7	4.8					0.426
	-72.3	80.0	095-2-122			16.1					SC															
	-102.3	110.0	095-2-125	42.8	77.2			69	29	40	CH							100.0	99.7	94.0	49.7					0.299
	-112.3	120.0	095-2-126	44.5	75.4			60	31	29	CH						100.0	99.8	87.6	68.7	35.1					3.088

HUSHMAND ASSOCIATES INC.
Geotechnical and Earthquake Engineers

TABLE D1

SUMMARY OF LABORATORY TEST RESULTS

Project Name: ALAMEDA NAS (SITE II and between Site I and II) *Project Number: 01-0810*

Borehole No.	Elev. (ft)	Depth (ft)	Sample No.	In situ Moisture Content (%)	In situ Dry Density (pcf)	Percent Passing # 200	Gs	Atterberg Limits			USCS	Sieve Analysis (Percent Passing)										Direct Shear				Vane Shear (ksf)
																						Peak		Ultimate		
								LL	PL	PI		3/4"	3/8"	# 4	# 10	# 16	# 30	# 50	# 100	# 200	2 μ	c (ksf)	ϕ (deg)	c (ksf)	ϕ (deg)	
B-2-12	4.6																									
	-25.4	30.0	095-2-059	64.8				54	31	23	MH					100.0	99.9	98.0	84.0	79.8	36.4					
	-40.4	45.0	095-2-061	50.1	71.7			62	29	33	CH					100.0	99.9	99.6	98.5	90.5	34.8					0.433
	-50.4	55.0	095-2-066	52.8	69.7			62	27	35	CH					100.0	99.9	99.8	99.4	98.4	36.9					0.420
	-67.4	72.0	095-2-067	44.3	74.5			52	29	23	MH/CH						100.0	99.8	99.4	98.3	30.6					
B-2-13 (756)	8.0																									
	-17.5	25.5	095-2-166	41.0	88.3			35	23	12	CL				100	99.8	99.6	98.3	94.2	88.1	20.0					0.224
	-33.0	41.0	095-2-167	47.1	73.8		2.66	48	22	26	CL	100	98.6	96.5	89	82.9	76.5	72.1	68.8	64.6	32.0					1.491
	-62.5	70.5	095-2-168	15.8	111.8	16.6					SM															
	-73.0	81.0	095-2-169			8.6					SP-SM															
	-83.0	91.0	095-2-170	62.2	61.4			82	41	41	MH															2.343
	-93.0	101.0	095-2-171	33.5							CL															
B-2-14 (754)	8.0																									
	-17.0	25.0	095-2-152			2.9					SP															
	-17.0	25.0	095-2-155			8.4					SP-SM															
	-23.0	31.0	095-2-156	33.6	89.5		2.67	40	22	18	CL	100	99.3	98.6	97.1	96.8	94.6	93.4	87.4	81.4	33.0					1.363
	-32.0	40.0	095-2-157			76.5					CLs															0.774
	-42.0	50.0	095-2-158			5.7					SP-SM															
	-63.0	71.0	095-2-160			10.4					SP-SM															
	-72.5	80.5	095-2-161			8.3					SP-SM															
	-83.0	91.0	095-2-162	66.6	59.0			108	52	56	MH				100	99.8	99.4	98.2	96	93.9	61.0					
	-93.0	101.0	095-2-163	37.1	83.1						CL/CH															
B-2-15 (755)	8.0																									
	-3.0	11.0	095-2-138			12.5					SM															
	-12.5	20.5	095-2-140			38.2					SM															
	-23.0	31.0	095-2-141	29.4	91.3		2.66	31	17	14	CL	100	98.4	96.3	91.6	86.7	81.4	78	75.4	72	32.0					0.033
	-32.0	40.0	095-2-142								CH															0.696
	-52.0	60.0	095-2-144			10.9					SP-SM															
	-81.0	89.0	095-2-147	43.7	74.0			48	26	22	CL															
	-104.0	112.0	095-2-148	45.0	76.9						CL															

TERATEST LABS INC.

Materials Testing
Special Inspection Services
Geotechnical Testing

July 5, 2002

Foster Wheeler Environmental Corporation
1940 East Deere Avenue, Suite 200
Santa Ana, CA 92705

Attention: Mr. Vince Richards

Subject: **Report / Laboratory Testing Results / Certificate of Compliance**
Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA
Project No.: 2384095-B-07060
Purchase Order No.: 38887
TERATEST No.: 015139
Cover Sheet for Submittal of Signed Copies of the Chain of Custody (COC) Forms / After Completion of Project

Dear Mr. Richards:

Enclosed please find laboratory testing results for the soil samples from the above referenced project. The requested tests were conducted in essential accordance with the standard test methods listed below.

TYPE OF TEST	TEST METHOD
Liquid Limit, Plastic Limit and Plasticity Index of Soils	ASTM D 4318
Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	ASTM D 2216
Density of Soil in Place by the Drive-Cylinder Method	ASTM D 2937
Particle-Size Analysis of Soils	ASTM D 422
Amount of Material in Soils Finer Than the No. 200 Sieve	ASTM D 1140
Direct Shear Test of Soils Under Consolidated Undrained Conditions	ASTM D 3080 (modified)
Laboratory Miniature Shear Test for Saturated Fine-Grained Clayey Soil	ASTM D 4648

Test results are presented in Table 1 and the attached Data Sheets.

17781 Cowan Ave., Ste.150
Irvine, CA 92614
949 . 253 . 5922
dispatch 949 . 222 . 5321
fax 949 . 263 . 8843

ASTM: American Society for Testing and Materials, Annual Book of ASTM Standards, Section 4 Construction, Volume 04.08 Soil and Rock (I), 2000.

Thank you for selecting Teratest Labs, Inc. to provide laboratory testing services to Foster Wheeler Environmental Corporation. Please feel free to contact us if you should have any questions concerning these results.

Very truly yours,

TERATEST LABS, INC.
Laboratory Testing Services

Lester Fruth

Lester Fruth, Ph.D.
Soils Laboratory Supervisor

Enclosures

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Stre San Diego, CA 92101 (619) 234-8696

NUMBER 03518

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: DI SITE- 1-12
PURCHASE ORDER NO.: 038887
PROJECT LOCATION: Ramsgate, Marina CA
PROJECT NO.: DO 95
SAMPLER NAME: Dave Secrest
SAMPLER SIGNATURE: [illegible] for D Secrest
PROJECT CONTACT: V. Richards
PHONE NUMBER: 949-283-0589

ANALYSES REQUIRED: MOISTURE DENSITY; HYDROMETER; #200; ATTERBERG; DIRECT SHEAR; MIN VANE SHEAR

LABORATORY NAME: TERRATEST 949-253-5922
LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN VANE SHEAR	COMMENTS	LOCATION	DEPTH START	DEPTH END	*
095-2-001	12-17-01	1250	1					/	/		/		/	2"x 30" TUBE	SITE 2-B-1	5		
095-2-002		1305	1							/				BAG	SITE 2-B-1	10		
095-2-003		1340	1							/		/		2"x 6" SLEEVE	SITE 2 B-1	15		
095-2-004		1400	1											BAG	SITE 2 B-1	20		
095-2-005		1405	1					/		/				2"x 6" SLEEVE	SITE 2 B-1	25.5		
095-2-006		1420	1												SITE 2 B-1	30		
095-2-007		1440												NO SAMPLE	SITE 2 B-1			
095-2-008		1450	1							/				BAG	SITE 2 B-1	40		
095-2-009		1505	1					/		/				2"x 6"	SITE 2 B-1	45		
095-2-010		1525	1			S								BAG	~~SITE 2 B-1~~ SITE 2 B-1	50		

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	LABORATORY INSTRUCTIONS/COMMENTS	SAMPLING COMMENT:
[illegible]	1/15/02	Julio E. Bodil	C-/C 03518 Rec'd 5-8-02 13:15	
COMPANY	TIME	COMPANY HAI		
RELINQUISHED BY (Signature) Julio E. Bodil	DATE 05/08/02	RECEIVED BY (Signature) Lee Frantz	COMPOSITE DESCRIPTION	
COMPANY HAI	TIME 10:45	COMPANY TLI 13:15		
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)	
COMPANY	TIME	COMPANY	TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN; COOLER SEALS: ☐ INTACT ☐ BROKEN	

White - Laboratory; Pink - Laboratory; Gr[illegible] - Project File; Yellow - Project

FOSTER W[illegible]ER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03521

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IN SITE 1+2	PURCHASE ORDER NO.: 038887
PROJECT LOCATION: ALAMEDA PT, ALAMEDA, CA	PROJECT NO.: D095
SAMPLER NAME: ~~V. Richards~~ D. Sawr	SAMPLER SIGNATURE: V. [illegible] D. Sawr
PROJECT CONTACT: V. Richards	~~AREA~~ NUMBER: 949-283-0589

LABORATORY NAME: TERRATEST 949-253-5922

LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	DIRECT SHEAR	MIN VANE SHEAR	ATTERBERG					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-011	12-19-01	0710	1			S		/	/			/	/					3"x30" TUBE	IR2-B-4	5		
095-2-012	12-19-01	0720						/	/			/	/					3"x30" ↓	B-4	15		
095-2-013		0740						/	/			/	/					2"x6" SLEEVE	B-4	25		
095-2-014		0750						/		/								2"x6" ↓	B-4	31		
095-2-015		0805								/								BAG	B-4	35		
095-2-016		0835								/								BAG	B-4	45		
095-2-017		0850																BAG	B-4	50		
095-2-018		0910								/								BAG	B-4	60		
095-2-019		1020						/	/			/	/					3"x30" TUBE	B-5	5	7'	
095-2-020		1035						/	/			/	/					3"x30" ↓	B-5	15	17	
095-2-021		1040						/	/			/	/					2"x6" SLEEVE		20.5	21	

SITE 2 OFF SHORE

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	1/15/02	Wio G. Bodel
COMPANY	TIME	COMPANY HAI
Wio G. Bodel	5/3/02	[signature]
COMPANY HAI	TIME 3:30	COMPANY TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Gr[illegible]

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, San Diego, CA 92101 (619) 234-8696

NUMBER 03522

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: In Site 1+2	PURCHASE ORDER NO.: 038887
PROJECT LOCATION: Alameda, CA - Alameda PT	PROJECT NO.: D095
SAMPLER NAME: D Seaver	SAMPLER SIGNATURE: V. [signature] for D Seaver
PROJECT CONTACT: V. Richel	~~AIRBILL~~ NUMBER: 949-283-0589

LABORATORY NAME: TRAFFIC 949-253-5922

LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED: MOISTURE DENSITY / HYDROMETER / #200 / ATTERBERG / DIRECT SHEAR / VIN VANE SHEAR

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	VIN VANE SHEAR	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-022	12-19-01	1100	1			S		/	/		/		/	2"x6" SLEEVE	In2 B-5	30	31.5	
095-2-023	↓	1110	1			S		/	/		/		/	2"x6" ↓	B-5	50	57.5	
095-2-024		1130	1			S		/	/		/		/	2"x6"	B-5	70	71.5	
095-2-025		1200	1			S								2"x6"	B-5	75	76.5	
095-2-026		1220	1			S								BAG	B-5	80	84.5	
095-2-027	12-19-01	1420	1			S		/	/		/		/	3"x30" TUBE	In2 B-6	7	9	
095-2-028	12-19-01	1430	1			S		/	/		/		/	3"x30" TUBE	In2 B-6	15	17	
095-2-029	↓	1450	1			S		/	/		/		/	2"x6" SLEEVE	In2 B-6	41	42.5	
095-2-030		1510	1			S				/		/		2"x6" ↓	In2 B-6	50	51.5	
095-2-031		1520	1			S				/				2"x6"	In2 B-6	55	56.5	
095-2-032		1540	1			S				/				BAG	In2 B-6	60	61.5	
095-2-033		1600				S				/				BAG	In2 B-6	65	66.5	

SITE 2 OFFSHORE

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	1/15/02	J Wico E. Badel
COMPANY	TIME	COMPANY: HAI
J Wico E. Badel	5/3/07	Les Franklin
COMPANY: HAI	TIME: 3:30	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
	3:30	
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOPER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

FOSTER W[illegible]ER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03105

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: In-Site 1+2	PURCHASE ORDER NO.: 038887
PROJECT LOCATION: ALAMEDA PT, ALAMEDA CA	PROJECT NO.: D095
SAMPLER NAME: D Seaver	SAMPLER SIGNATURE: [illegible]
PROJECT CONTACT: V. Rich[illegible]	[illegible] NUMBER: 949-283-0589

LABORATORY NAME: TRATEST 949-[illegible]253-5922

LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED: MOISTURE/DENSITY; HYDROMETER; #200; DIRECT SHEAR; MIN VANE SHEAR

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	DIRECT SHEAR	MIN VANE SHEAR	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-045	12-21-01	1710	1			S				/			BAG	In-2 B-2	25	26.5	
095-2-046	↓	1725	↓			↓				/			BAG	In-2 B-2	35	36.5	
095-2 047		1745								/			BAG	In-2 B-2	40	41.5	
095-2-048		1755								/			BAG	In-2 B-2	50	51.5	
095-2-049		1815								/			BAG	In-2 B-2	60	61.5	

RELINQUISHED BY (Signature): V. Rich[illegible]	DATE: 1/15/02	RECEIVED BY (Signature): [illegible] G. Bodd	LABORATORY INSTRUCTIONS/COMMENTS
COMPANY: [illegible] G Bodd	TIME:	COMPANY: HAI	
RELINQUISHED BY (Signature): [illegible] G Bodd	DATE: 1/3/02	RECEIVED BY (Signature): [illegible]	COMPOSITE DESCRIPTION
COMPANY: HAI	TIME: 3:30	COMPANY: TTL	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
COMPANY	TIME	COMPANY	TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN; COOLER SEAL: [illegible] ☐ BROKEN

SAMPLING COMMENT:

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

Project No.: 2384095-B-07060

Client: Foster Wheeler Environmental Corporation

Teratest No. 015139

Tabulated By: LF

Date: 07/05/02

TABLE 1

SUMMARY of LABORATORY TEST RESULTS

Sample ID	Location	Depth (ft.)	Sample Type	Moisture Content ASTM D 2216 (%)	Dry Density ASTM D 2937 (pcf)	Atterberg Limits ASTM D 4318 LL,PL,PI[1]	Particle - Size Distribution ASTM D 422 GR:SA:FI[2] (%)	Percent Passing No. 200 Sieve ASTM D 1140 (%)	Laboratory Miniature Vane Shear Shear Strength ASTM D 4648 (psf) average	Soil Classification / Identification* ASTM D 2487 / D 2488* (group symbol)
095-2-001	B-1	5	3"x30" Tube	21.8	103.7	Nonplastic	0:92:8		498	SP-SM
095-2-002	B-1	10	Bag					23.0		SM
095-2-003	B-1	15	2"x6" Sleeve	19.3	111.3[3]			34.0		SM
095-2-005	B-1	25.5	2"x6" Sleeve	19.1	110.3			17.5		SM
095-2-008	B-1	40	Bag					21.4		SM
095-2-009	B-1	45	2"x6" Sleeve	19.5	111.3			18.4		SM
095-2-011	B-4	5	3"x30" Tube	43.1	74.6	Nonplastic	0:22:78		161	(ML)s
095-2-012	B-4	15	3"x30" Tube	60.5	64.7	47,22,25	0:4:96		538	CL
095-2-013	B-4	25	2"x6" Sleeve	53.5	66.1	44,21,23	0:2:98		295	CL
095-2-014	B-4	31	2"x6" Sleeve	32.9	86.4			43.1		SC
095-2-015	B-4	35	Bag					12.5		SM
095-2-016	B-4	45	Bag					17.1		SM
095-2-018	B-4	60	Bag					17.0		SM
095-2-019	B-5	5-7	3"x30" Tube	31.5	86.5	Nonplastic	0:51:49		525	SM
095-2-020	B-5	15-17	3"x30" Tube	20.6	107.2	Nonplastic	0:82:18		460	SM
095-2-021	B-5	20.5-21	2"x6" Sleeve	47.9	70.0	25,20,5	0:48:52		558	s(CL-ML)
095-2-022	B-5	30-31.5	2"x6" Sleeve	45.9	68.4	38,19,19	0:10:90		255	CL
095-2-023	B-5	50-51.5	2"x6" Sleeve	45.3	72.9	45,25,20	0:4:96		456	CL
095-2-024	B-5	70-71.5	2"x6" Sleeve	48.7	71.1	53,26,27	0:3:97		371	CH
095-2-027	B-6	7-9	3"x30" Tube	44.2	75.7	25,14,11	0:60:40		302	SC
095-2-028	B-6	15-17	3"x30" Tube	39.5	80.6	31,17,14	0:40:60		210	s(CL)

[1] LL,PL,PI = Liquid Limit, Plastic Limit, Plasticity Index

[2] GR:SA:FI = Gravel: Sand: Fines (Percent Passing #200 Sieve)

[3] Average values from Direct Shear Test Specimens

TABLE 1 cont'd

SUMMARY of LABORATORY TEST RESULTS

Sample ID	Location	Depth (ft.)	Sample Type	Moisture Content ASTM D 2216 (%)	Dry Density ASTM D 2937 (pcf)	Atterberg Limits ASTM D 4318 LL,PL,PI[1]	Particle - Size Distribution ASTM D 422 GR:SA:FI[2] (%)	Percent Passing No. 200 Sieve ASTM D 1140 (%)	Laboratory Miniature Vane Shear Shear Strength ASTM D 4648 (psf) average	Soil Classification / Identification* ASTM D 2487 / D 2488* (group symbol)
095-2-029	B-6	41-42.5	2"x6" Sleeve	25.0	96.9	25,15,10	0:54:46		239	SC
095-2-030	B-6	50-51.5	2"x6" Sleeve	9.4	116.3[3]			14.9		SM
095-2-031	B-6	55-56.5	2"x6" Sleeve					12.0		SP-SM
095-2-032	B-6	60-61.5	Bag					9.3		SP-SM
095-2-033	B-6	65-66.5	Bag					10.9		SP-SM
095-2-034	B-3	5-6.5	2"x6" Sleeve	20.9	109.5[3]			12.7		SM
095-2-035	B-3	10-11.5	2"x6" Sleeve	19.1	112.1			37.2		SM
095-2-036	B-3	15-16.5	Bag	17.1				29.9		SC
095-2-037	B-3	25-26.5	Bag					18.9		SM
095-2-038	B-3	35-36.5	Bag					11.8		SP-SM
095-2-039	B-3	45-45.5	Bag					15.1		SM
095-2-040	B-3	55-56.5	Bag					8.7		SP-SM
095-2-041	B-2	5-7	3"x30" Tube	26.9	93.2		0:73:27			SM
095-2-042	B-2	10-11.5	2"x6" Sleeve	22.7	105.1[3]			18.4		SM
095-2-043	B-2	15-16.5	2"x6" Sleeve	21.0	109.7[3]			34.5		SM
095-2-044	B-2	20-21.5	Bag					15.5		SM
095-2-045	B-2	25-26.5	Bag					22.4		SM
095-2-046	B-2	35-36.5	Bag					20.8		SM
095-2-048	B-2	50-51.5	Bag					11.1		SP-SM
095-2-049	B-2	60-61.5	Bag					8.2		SP-SM

[1] LL,PL,PI = Liquid Limit, Plastic Limit, Plasticity Index

[2] GR[illegible] Gravel: Sand: Fines (Percent Passing #200 Sieve)

[3] Average values from Direct Shear Test Specimens

LOCATION	B-1	B-1	B-1	B-4	B-4	B-4	B-4	B-5
SAMPLE ID	095-2-001	095-2-005	095-2-009	095-2-011	095-2-012	095-2-013	095-2-014	095-2-019
Depth (ft.)	5.0	25.5	45.0	5.0	15.0	25.0	31.0	5.0-7.0
Sample Type	Shelby Tube	2" X 6" Sleeve	2" X 6" Sleeve	Shelby Tube	Shelby Tube	2" X 6" Sleeve	2" X 6" Sleeve	Sheby Tube
Visual Soil Identification	Olive, poorly graded sand with silt (SP-SM), dense	Olive brown, silty sand (SM) dense	Olive, silty sand, dense (SM)	Olive, silt with sand, dense (ML)s	Olive, lean clay (CL) very soft	Olive, lean clay (CL) very soft	Olive, clayey sand (SC) medium dense	Very dark gray, silty sand (SM)
Pocket Penetrometer	1.75	2.75/1.25	2.25/3.75	1.0	<0.25	0.25/<0.25	0.25/0.75	<0.75
Weight Soil + Rings / Tube (gm.	1726.80	745.06	754.18	1555.65	1496.20	594.16	682.21	1624.60
Weight of Rings / Tube (gm.	445.85	149.45	148.91	468.71	447.61	149.08	148.48	462.08
Average Length (in.)	5.958	5.860	5.858	5.972	5.938	5.658	5.986	6.002
Average Diameter (in.)	2.873	1.938	1.941	2.875	2.872	1.940	1.941	2.874
Wet. Wt. of Soil + Cont. (gm.	679.08	153.08	155.56	753.64	410.25	113.18	161.38	602.66
Dry Wt. of Soil + Cont. (gm.)	571.36	134.86	136.01	549.29	284.80	87.57	130.91	476.41
Weight of Container (gm)	77.19	39.22	35.91	75.39	77.59	39.66	38.36	75.43
Container No.:								
Wet Density	126.3	131.3	133.0	106.8	103.8	101.4	114.8	113.7
Moisture Content (%)	**21.8**	**19.1**	**19.5**	**43.1**	**60.5**	**53.5**	**32.9**	**31.5**
Dry Density (pcf)	**103.7**	**110.3**	**111.3**	**74.6**	**64.7**	**66.1**	**86.4**	**86.5**
Degree of Saturation (%)	94.2	97.3	102.5	92.5	101.8	93.0	93.4	89.6

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 05/16/02

LOCATION	B-5	B-5	B-5	B-5	B-5	B-6	B-6	B-6
SAMPLE ID	095-2-020	095-2-021	095-2-022	095-2-023	095-2-024	095-2-027	095-2-028	095-2-029
Depth (ft.)	15.0-17.0	20.5-21.0	30.0-31.5	50.0-51.5	70.0-71.5	7.0-9.0	15.0-17.0	41.0-42.5
Sample Type	Shelby Tube	2" X 6" Sleeve	2" X 6" Sleeve	2" X 6" Sleeve	2" X 6" Sleeve	Shelby Tube	Shelby Tube	2" X 6" Sleeve
Visual Soil Identification	Olive, silty sand, dense (SM)	Olive, sandy silty clay s(CL-ML) very soft	Olive, lean clay (CL) very soft	Olive, lean clay (CL) very soft	Olive, fat clay (CH) soft	Olive, clayey sand (SC) med. Dense	Olive sandy lean clay s(CL)	Olive clayey sand (SC) LOOSE
Pocket Penetrometer	1.0	0.25/0.75	<0.25/0.25	<0.25/0.25	<0.25/0.25	1.0-1.25	0.5/<0.25	0.25 / 0.5
Weight Soil + Rings / Tube (gm.	1775.90	618.68	568.05	625.52	591.69	1560.85	1597.98	645.62
Weight of Rings / Tube (gm.	461.99	149.08	149.08	149.08	149.08	447.43	457.98	149.08
Average Length (in.)	5.964	5.854	5.406	5.784	5.401	5.995	5.954	5.278
Average Diameter (in.)	2.875	1.939	1.941	1.942	1.939	2.873	2.874	1.941
Wet. Wt. of Soil + Cont. (gm.	691.94	170.15	181.93	154.76	159.08	1130.28	399.32	187.89
Dry Wt. of Soil + Cont. (gm.)	586.61	134.10	146.12	118.22	119.58	806.90	307.38	158.34
Weight of Container (gm)	74.74	58.80	68.17	37.55	38.39	75.80	74.36	40.23
Container No.:								
Wet Density	129.3	103.5	99.8	105.9	105.7	109.1	112.4	121.1
Moisture Content (%)	**20.6**	**47.9**	**45.9**	**45.3**	**48.7**	**44.2**	**39.5**	**25.0**
Dry Density (pcf)	**107.2**	**70.0**	**68.4**	**72.9**	**71.1**	**75.7**	**80.6**	**96.9**
Degree of Saturation (%)	97.1	91.8	84.6	93.2	95.9	97.3	97.7	91.3

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 05/16/02

LOCATION	B-3	B-3	B-2					
SAMPLE ID	095-2-035	095-2-036	095-2-041					
Depth (ft.)	10.0-11.5	15.0-16.5	5.0-7.0					
Sample Type	2" X 6" Sleeve	Bag	Shelby Tube					
Visual Soil Identification	Olive brown. Silty sand (SM) dense	Olive yellow clayey sand (SC)	Olive ,Silty sand (SM) loose / v. dense					
Pocket Penetrometer	1.25/1.75		.25/3.75					
Weight Soil + Rings / Tube (gm.	737.88		1690.02					
Weight of Rings / Tube (gm.	149.51		457.15					
Average Length (in.)	5.663		6.122					
Average Diameter (in.)	1.943		2.874					
Wet. Wt. of Soil + Cont. (gm.	230.14	180.60	234.42					
Dry Wt. of Soil + Cont. (gm.)	202.35	162.11	198.59					
Weight of Container (gm)	56.81	54.19	65.37					
Container No.:								
Wet Density	133.5		118.3					
Moisture Content (%)	**19.1**	**17.1**	**26.9**					
Dry Density (pcf)	**112.1**		**93.2**					
Degree of Saturation (%)	102.3		89.8					

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 05/16/02

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/17/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	05/30/02
Location:	B-1	Checked By:	LF		
Sample ID:	095-02-001	Depth (ft.)	5.0		

Visual Sample Description: Olive, poorly graded sand with silt (SP-SM)

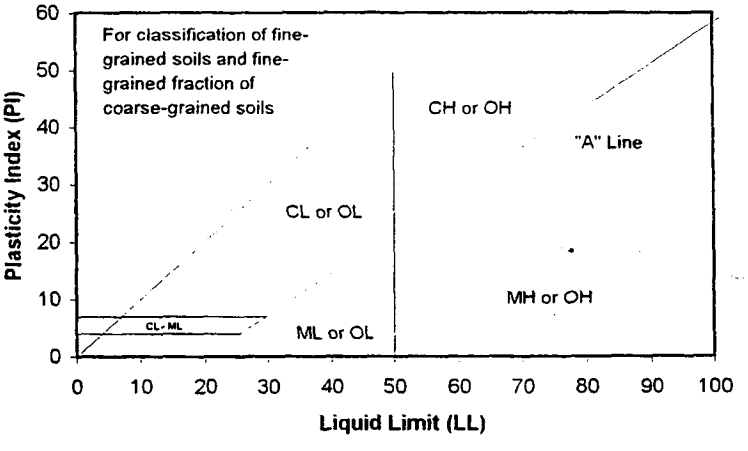
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			33	23	17	
Wet Wt. of Soil + Cont. (gm)						
Dry Wt. of Soil + Cont. (gm)		NONPLASTIC				
Wt. of Container (gm)						
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

Liquid Limit	
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**SP-SM**

PI at "A" - Line = 0.73(LL-20) = -14.6

One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-4	Checked By:	LF		
Sample ID:	095-02-011	Depth (ft.)	5.0		

Visual Sample Description: Olive, silt with sand (ML)s

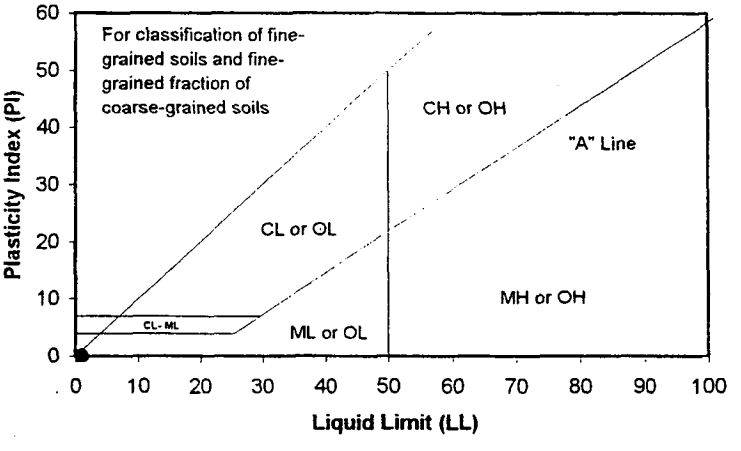
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]					12	
Wet Wt. of Soil + Cont. (gm)					18.45	
Dry Wt. of Soil + Cont. (gm)		NONPLASTIC			14.62	
Wt. of Container (gm)					1.07	
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	28.27	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

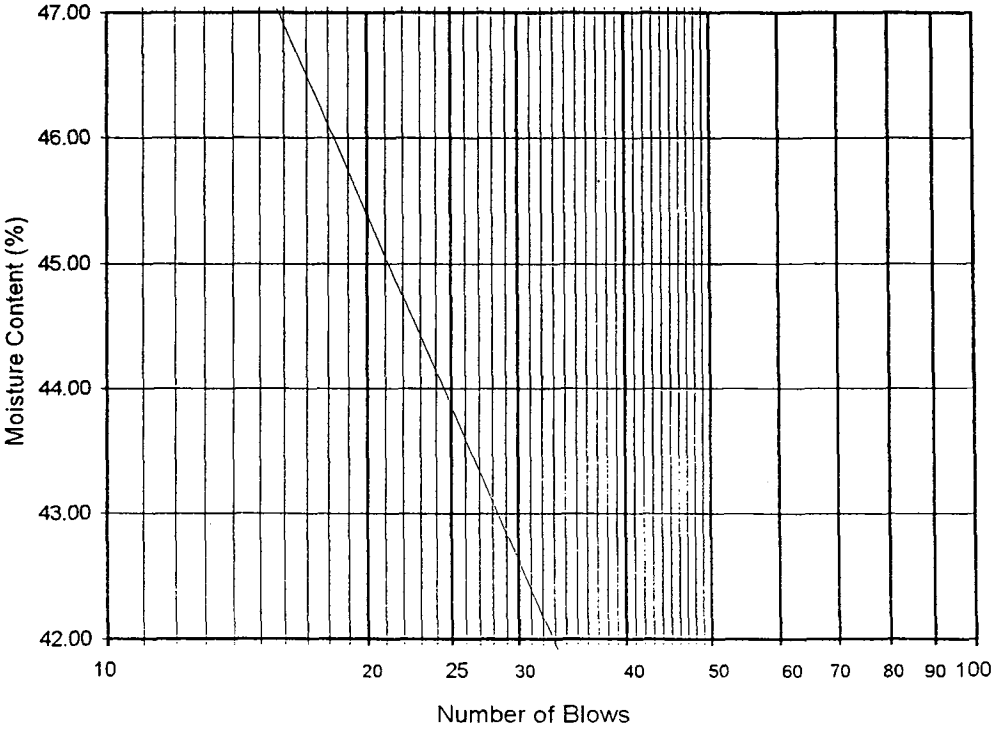
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-4	Checked By:	LF		
Sample ID:	095-02-012	Depth (ft.)	15.0		

Visual Sample Description: Olive, lean clay (CL)

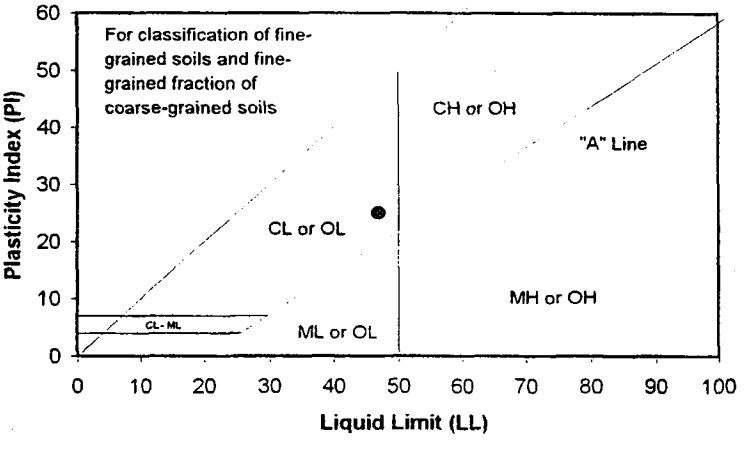
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			29	23	16	
Wet Wt. of Soil + Cont. (gm)	14.70	16.87	16.05	14.74	17.48	
Dry Wt. of Soil + Cont. (gm)	12.25	14.01	11.33	10.35	12.16	
Wt. of Container (gm)	1.10	1.00	1.11	1.02	1.05	
Moisture Content (%) [Wn]	21.97	21.98	46.18	47.05	47.88	

Liquid Limit	**47**
Plastic Limit	**22**
Plasticity Index	**25**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 19.71

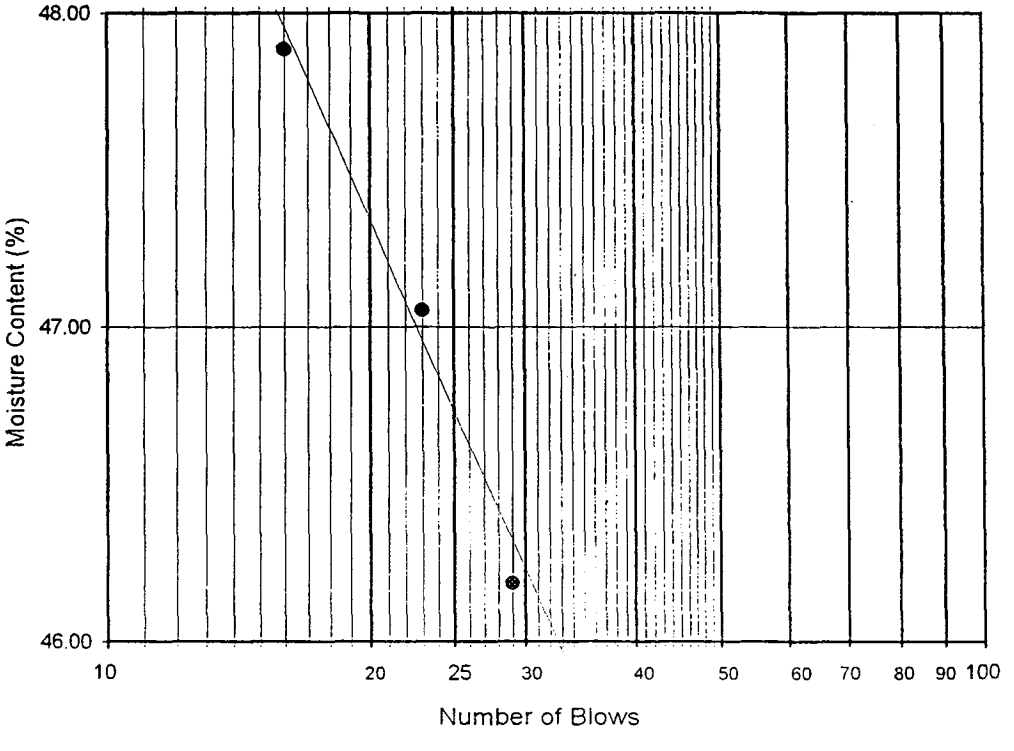
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/17/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	05/30/02
Location:	B-4	Checked By:	LF		
Sample ID:	095-02-013	Depth (ft.)	25.0		

Visual Sample Description: Olive, lean clay (CL)

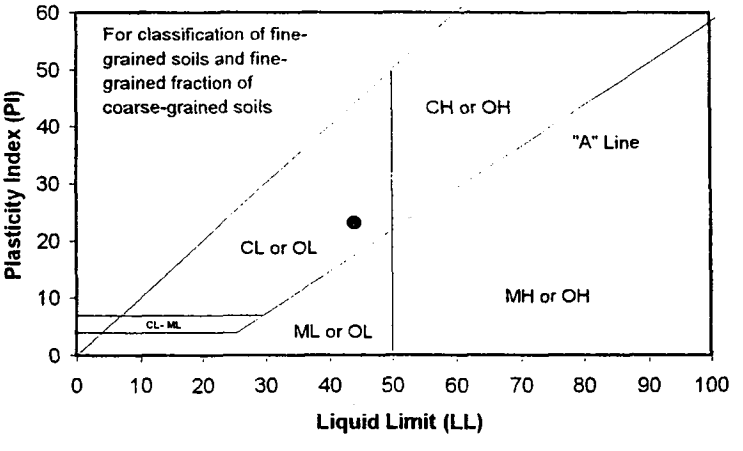
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			32	27	20	
Wet Wt. of Soil + Cont. (gm)	15.66	15.40	19.13	15.10	17.73	
Dry Wt. of Soil + Cont. (gm)	13.14	12.93	13.76	10.85	12.50	
Wt. of Container (gm)	1.07	1.08	1.01	0.98	1.02	
Moisture Content (%) [Wn]	20.88	20.84	42.12	43.06	45.56	

Liquid Limit	**44**
Plastic Limit	**21**
Plasticity Index	**23**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 17.52

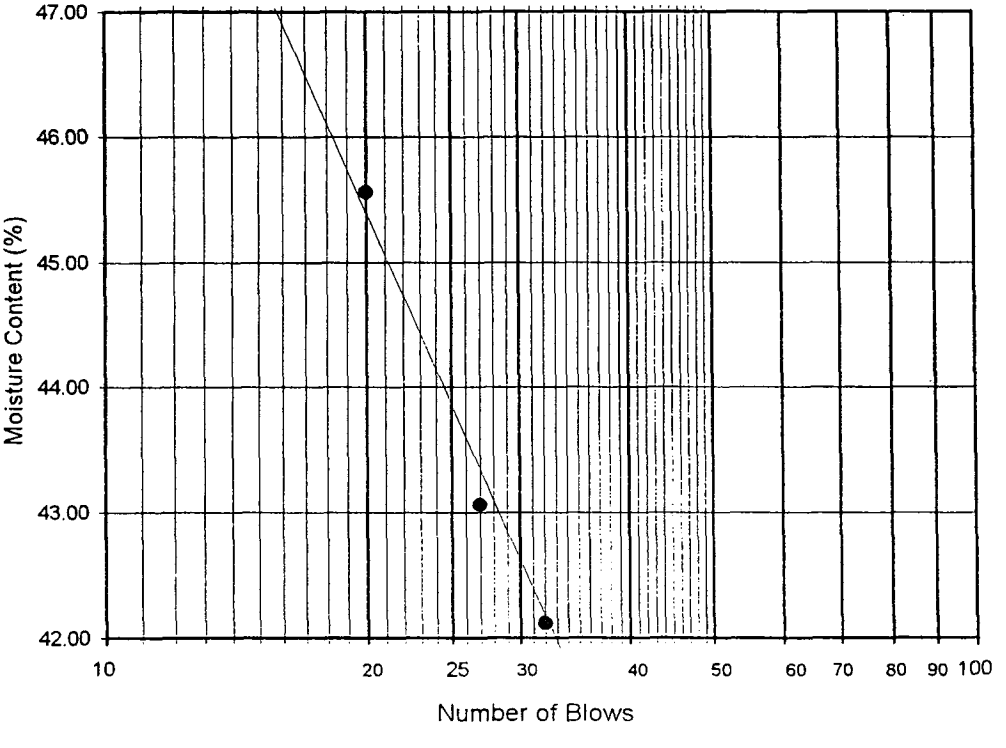
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID:	095-02-019	Depth (ft.)	5.0-7.0		

Visual Sample Description: Very dark gray, silty sand (SM)

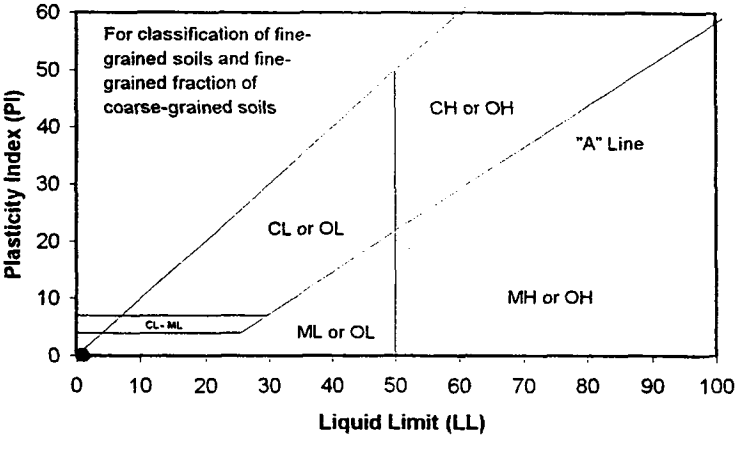
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]					9	
Wet Wt. of Soil + Cont. (gm)					20.91	
Dry Wt. of Soil + Cont. (gm)		NONPLASTIC			16.70	
Wt. of Container (gm)					1.10	
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	26.99	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

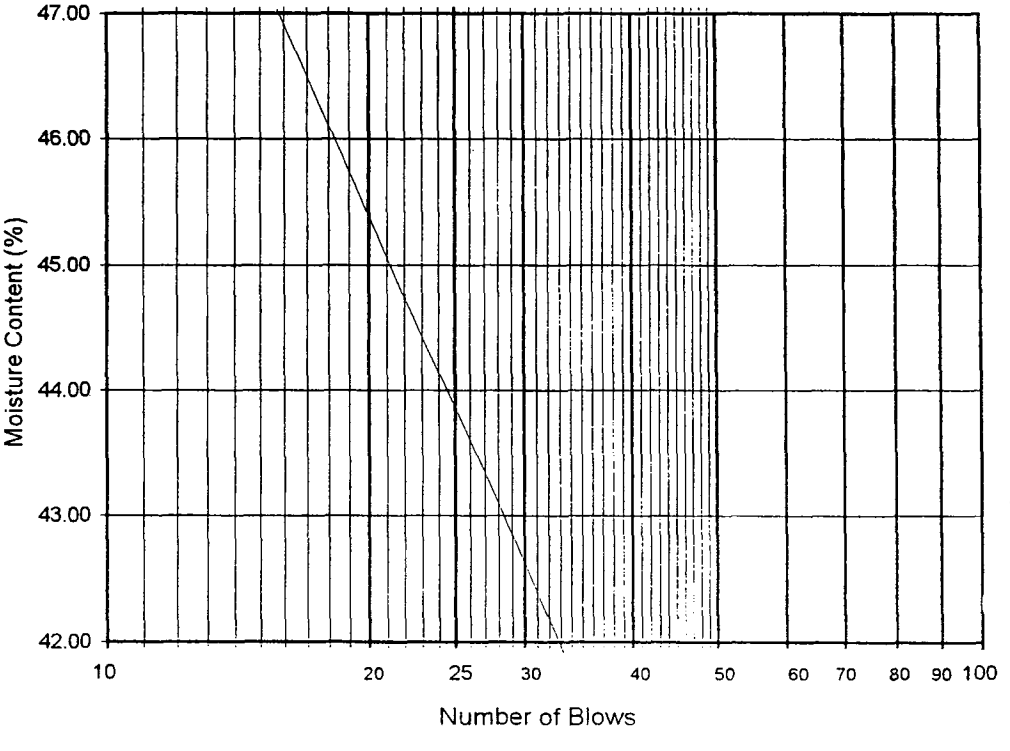
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  - Multipoint - Wet
- [X] Dry Preparation
  - Multipoint - Dry
- [X] Procedure A
  - Multipoint Test
- [ ] Procedure B
  - One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID:	095-02-020	Depth (ft.)	15.0-17.0		

Visual Sample Description: Olive, silty sand (SM)

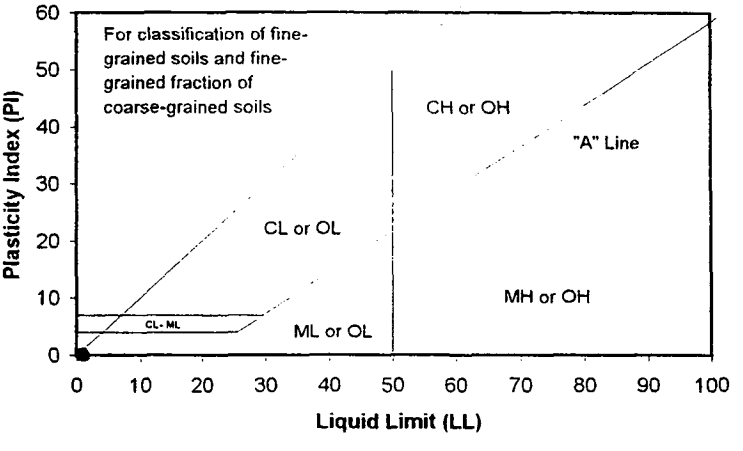
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]					7	
Wet Wt. of Soil + Cont. (gm)					19.60	
Dry Wt. of Soil + Cont. (gm)		NONPLASTIC			16.92	
Wt. of Container (gm)					1.03	
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	16.87	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

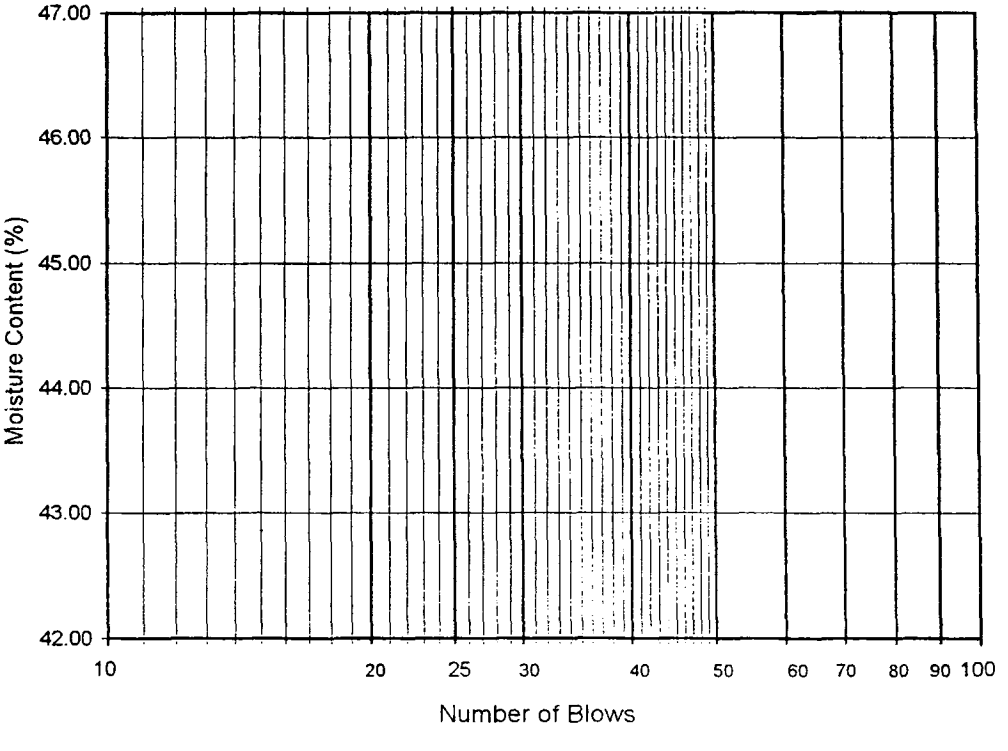
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID:	095-02-021	Depth (ft.)	20.5-21.0		

Visual Sample Description: Olive, sandy silty clay s(CL-ML)

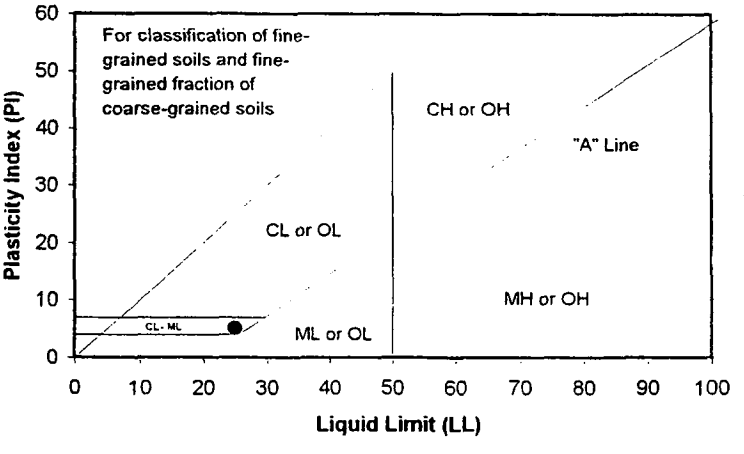
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			31	24	18	
Wet Wt. of Soil + Cont. (gm)	13.50	13.72	16.76	16.03	17.02	
Dry Wt. of Soil + Cont. (gm)	11.43	11.62	13.70	13.05	13.77	
Wt. of Container (gm)	1.07	1.02	1.06	1.07	1.11	
Moisture Content (%) [Wn]	19.98	19.81	24.21	24.87	25.67	

Liquid Limit	**25**
Plastic Limit	**20**
Plasticity Index	**5**
USCS Classification	**CL-ML**

PI at "A" - Line = 0.73(LL-20) = 3.65

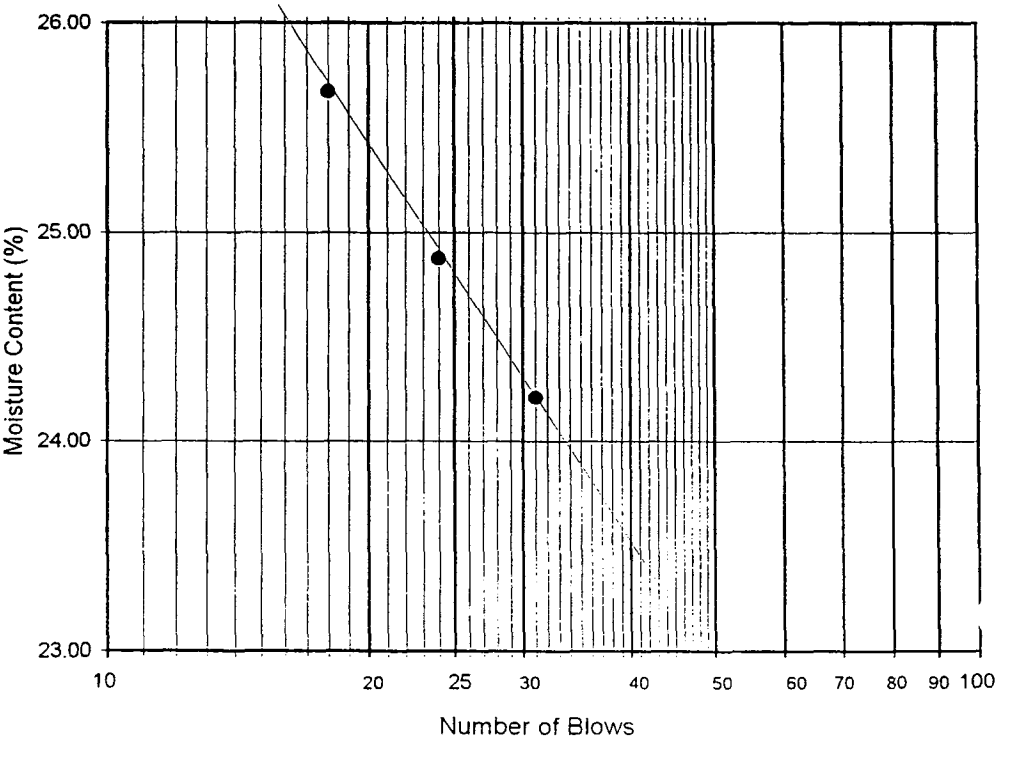
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/17/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	05/30/02
Location:	B-5	Checked By:	LF		
Sample ID:	095-02-022	Depth (ft.)	30.0-31.5		

Visual Sample Description: Olive, lean clay (CL)

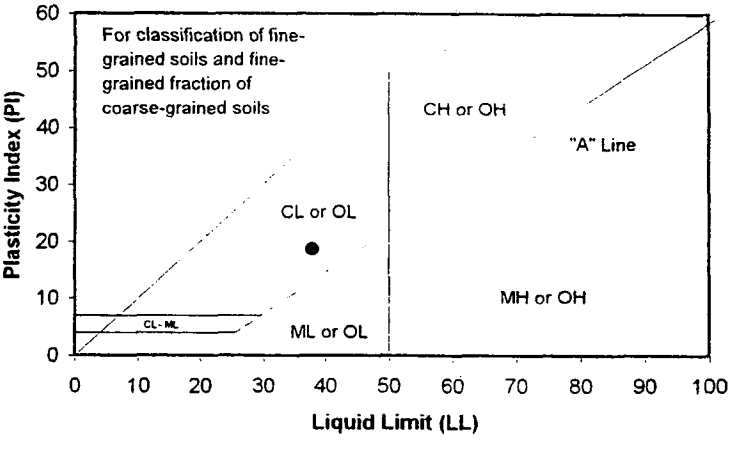
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			33	23	17	
Wet Wt. of Soil + Cont. (gm)	16.94	17.03	17.74	19.53	18.63	
Dry Wt. of Soil + Cont. (gm)	14.35	14.43	13.21	14.40	13.64	
Wt. of Container (gm)	1.01	1.00	1.05	1.03	1.03	
Moisture Content (%) [Wn]	19.42	19.36	37.25	38.37	39.57	

Liquid Limit	**38**
Plastic Limit	**19**
Plasticity Index	**19**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 13.14

One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	ACS	Date:	05/28/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID:	095-02-023	Depth (ft.)	50.0-51.5		

Visual Sample Description: Olive, lean clay (CL)

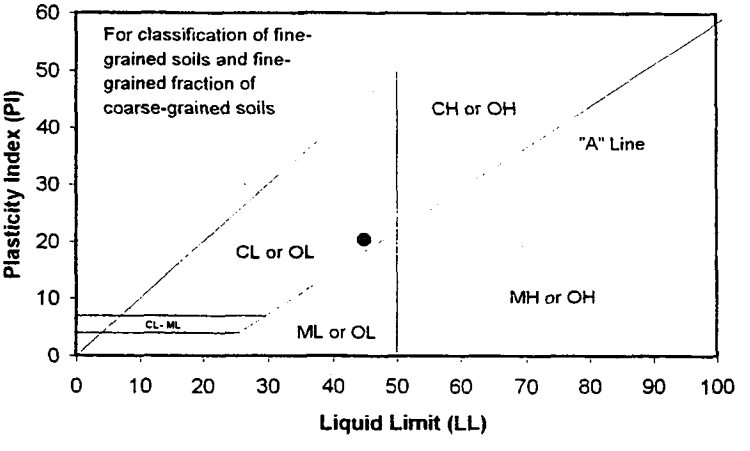
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			31	21	15	
Wet Wt. of Soil + Cont. (gm)	8.80	8.57	19.41	19.32	18.82	
Dry Wt. of Soil + Cont. (gm)	7.25	7.08	13.78	13.61	13.15	
Wt. of Container (gm)	0.99	1.06	1.09	1.07	1.03	
Moisture Content (%) [Wn]	24.76	24.75	44.37	45.53	46.78	

Liquid Limit	**45**
Plastic Limit	**25**
Plasticity Index	**20**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 18.25

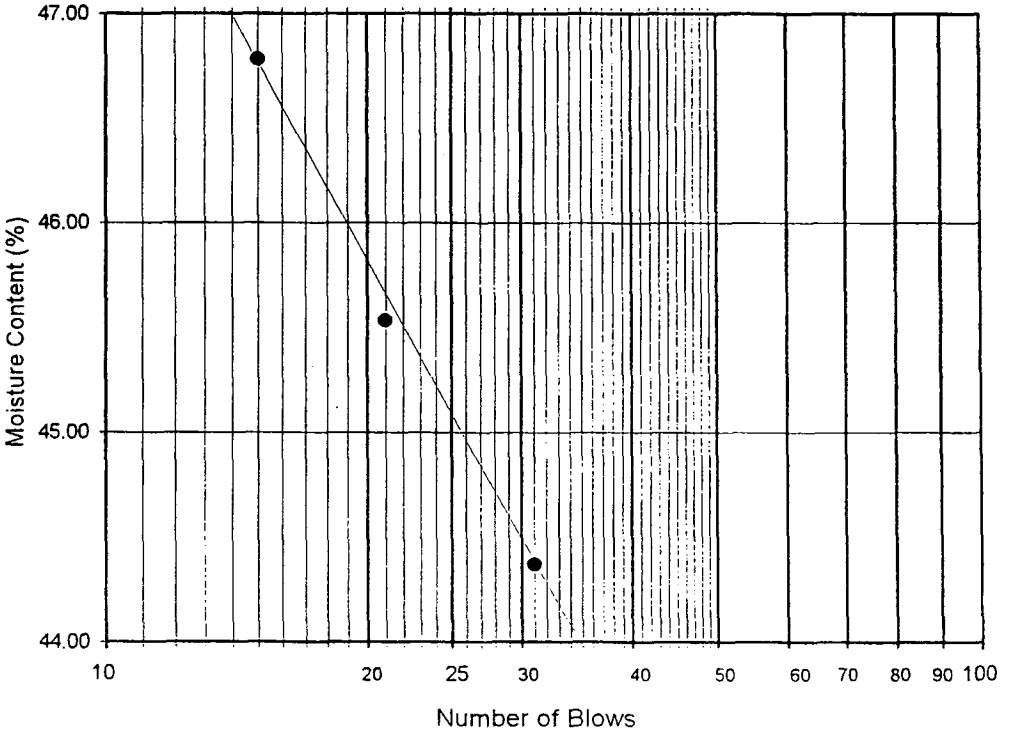
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/30/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID:	095-02-024	Depth (ft.)	70.0-71.5		

Visual Sample Description: Olive, fat clay (CH)

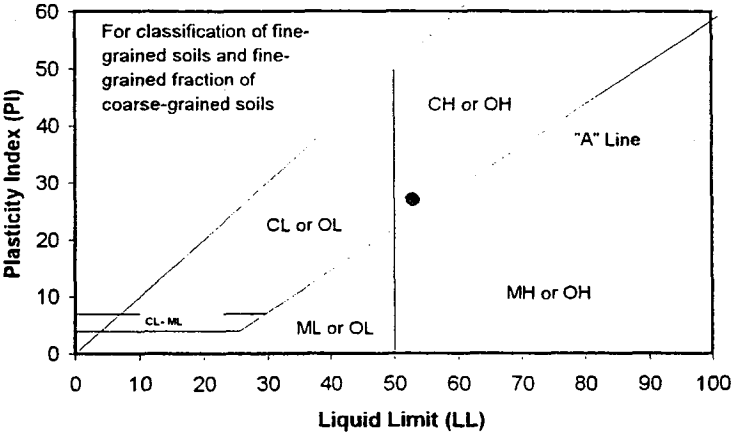
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			35	28	18	
Wet Wt. of Soil + Cont. (gm)	16.38	15.62	17.50	16.71	17.59	
Dry Wt. of Soil + Cont. (gm)	13.18	12.57	11.98	11.32	11.77	
Wt. of Container (gm)	1.02	1.02	1.10	1.00	1.09	
Moisture Content (%) [Wn]	26.32	26.41	50.74	52.23	54.49	

Liquid Limit	**53**
Plastic Limit	**26**
Plasticity Index	**27**
USCS Classification	**CH**

PI at "A" - Line = 0.73(LL-20) = 24.09

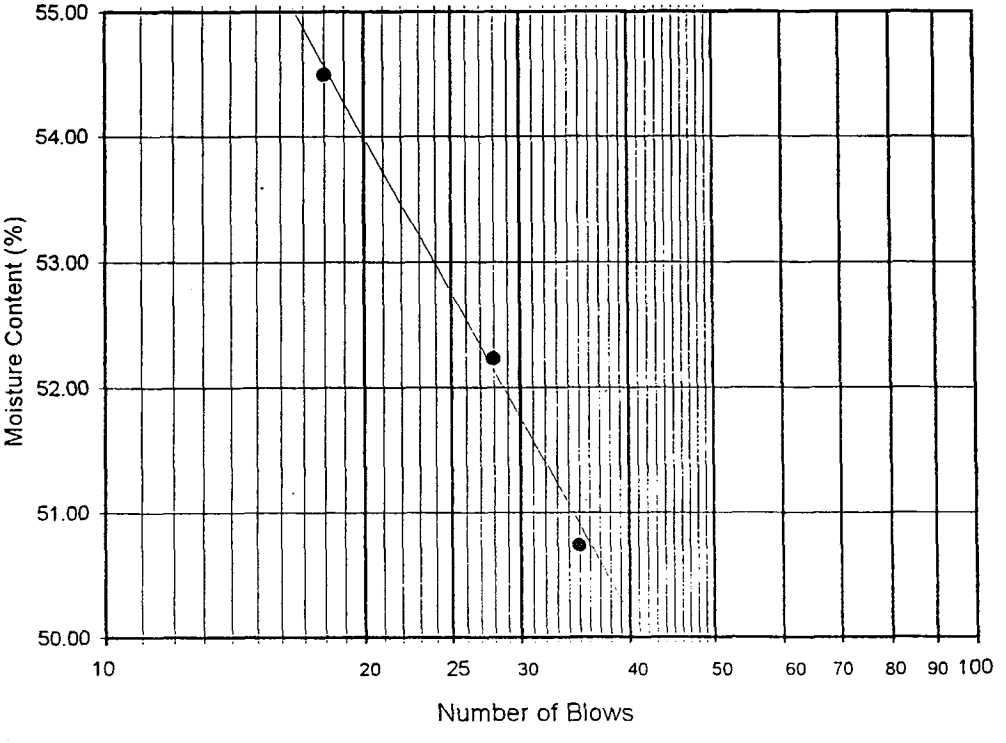
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-6	Checked By:	LF		
Sample ID:	095-02-027	Depth (ft.)	7.0-9.0		

Visual Sample Description: Olive, clayey sand (SC)

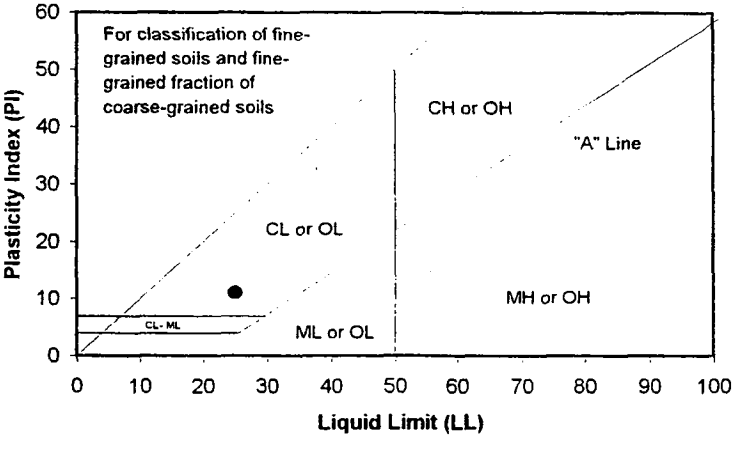
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			31	24	17	
Wet Wt. of Soil + Cont. (gm)	15.18	14.90	19.38	18.55	17.92	
Dry Wt. of Soil + Cont. (gm)	13.47	13.19	15.81	15.04	14.42	
Wt. of Container (gm)	1.12	1.00	1.01	0.99	1.10	
Moisture Content (%) [Wn]	13.85	14.03	24.12	24.98	26.28	

Liquid Limit	**25**
Plastic Limit	**14**
Plasticity Index	**11**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 3.65

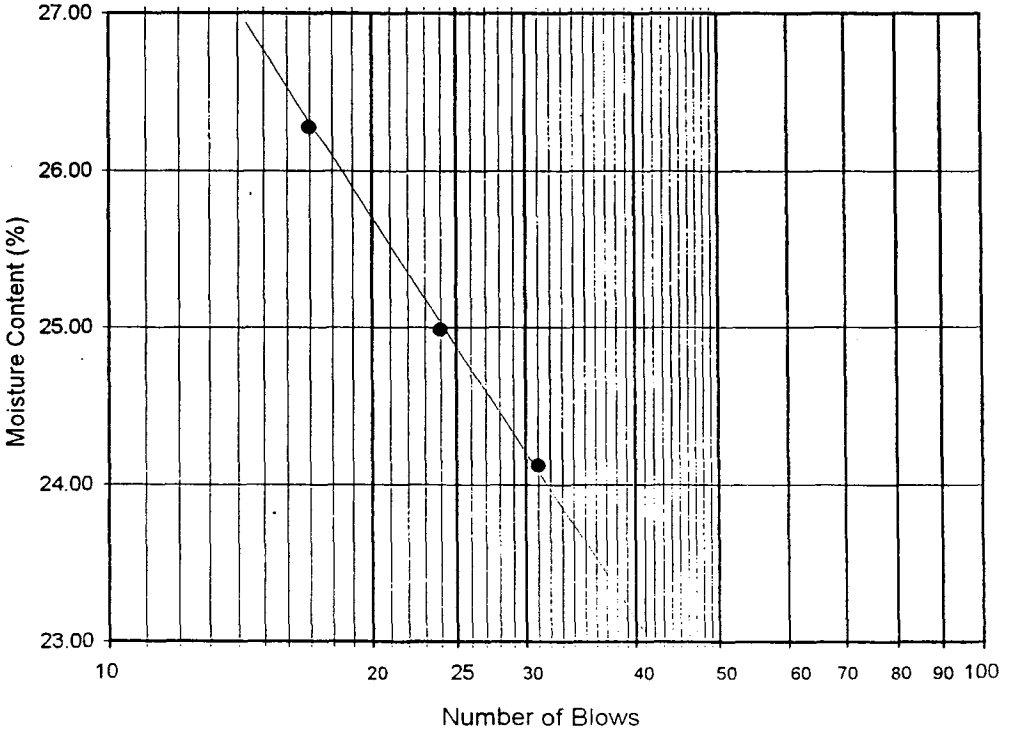
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/03/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-6	Checked By:	ZF		
Sample ID:	095-02-028	Depth (ft.)	15.0-17.0		

Visual Sample Description: Olive, sandy lean clay s(CL)

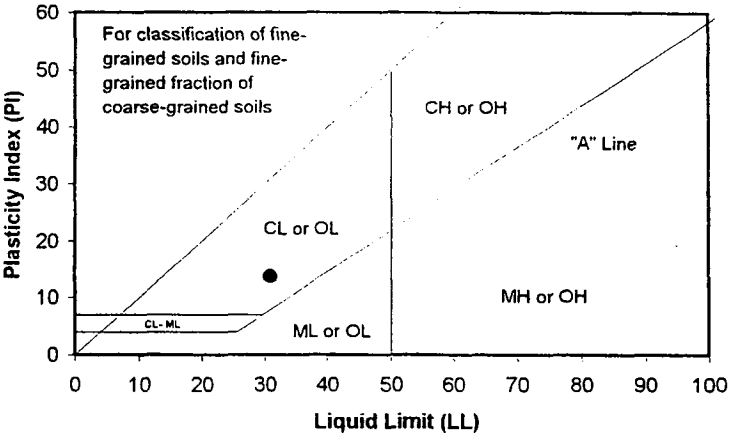
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			32	27	18	
Wet Wt. of Soil + Cont. (gm)	15.85	15.64	17.16	18.04	18.66	
Dry Wt. of Soil + Cont. (gm)	13.67	13.49	13.48	14.06	14.41	
Wt. of Container (gm)	1.10	1.00	1.11	1.06	1.09	
Moisture Content (%) [Wn]	17.34	17.21	29.75	30.62	31.91	

Liquid Limit	**31**
Plastic Limit	**17**
Plasticity Index	**14**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 8.03

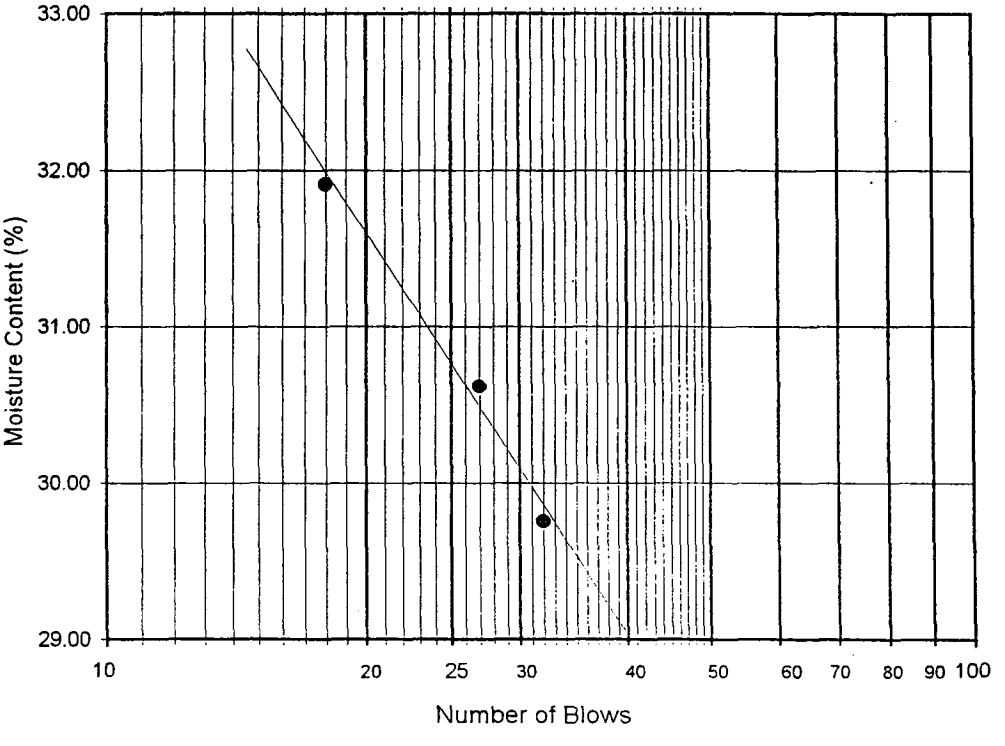
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By:	RA	Date:	05/31/02
Project No. :	2384095-D-07060	Input By:	RA	Date:	06/05/02
Location:	B-6	Checked By:	LF		
Sample ID:	095-02-029	Depth (ft.)	41.0-42.5		

Visual Sample Description: Olive, clayey sand (SC)

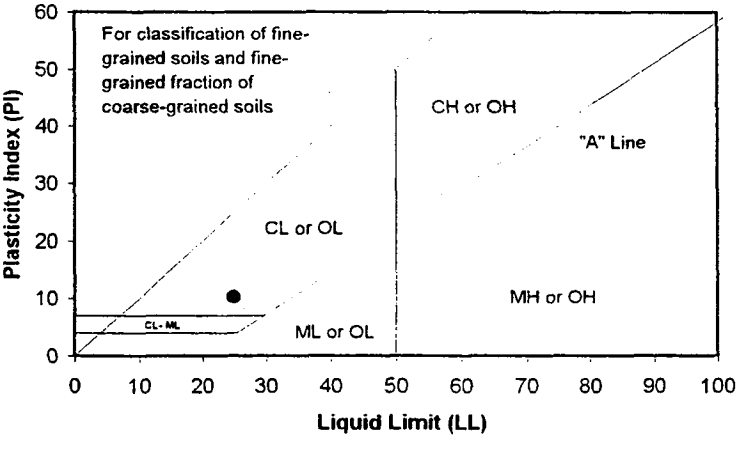
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			32	26	19	
Wet Wt. of Soil + Cont. (gm)	16.15	16.84	16.84	18.77	21.40	
Dry Wt. of Soil + Cont. (gm)	14.22	14.81	13.72	15.23	17.19	
Wt. of Container (gm)	1.06	1.02	1.06	1.09	0.97	
Moisture Content (%) [Wn]	14.67	14.72	24.64	25.04	25.96	

Liquid Limit	**25**
Plastic Limit	**15**
Plasticity Index	**10**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 3.65

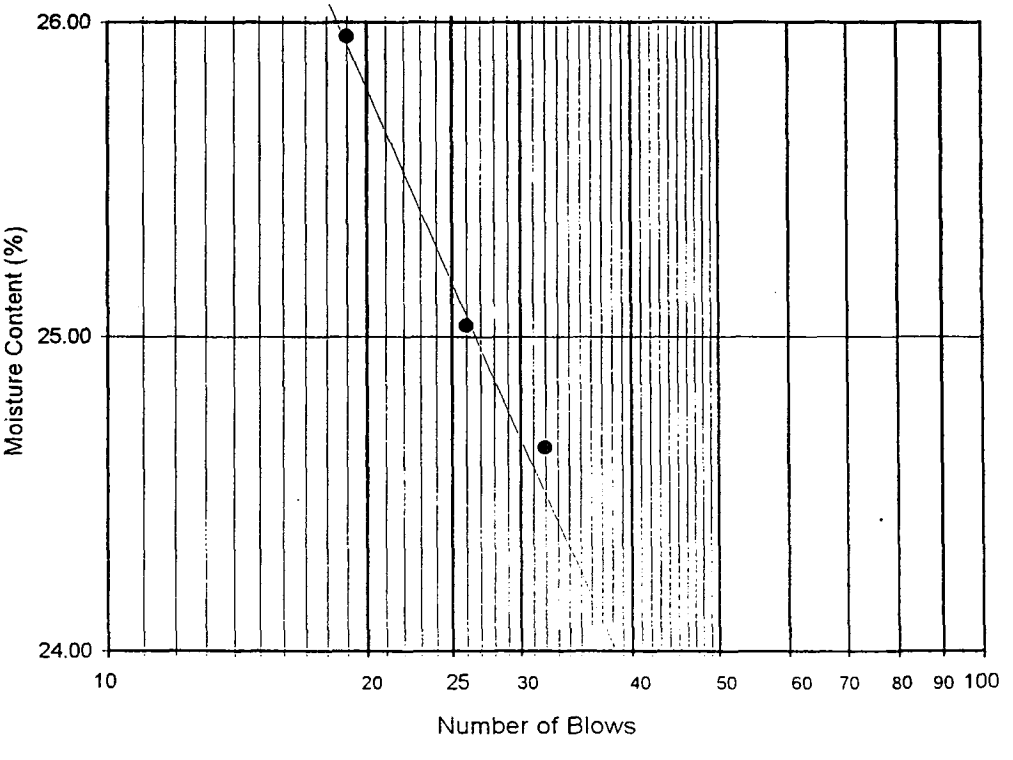
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	05/30/02
Location:	B-1	Checked By:	LF		
Sample ID.:	095-02-001	Depth (ft.) :	5.0		

Visual Sample Description: Olive, poorly graded sand with silt (SP-SM)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	NONPLASTIC			
Plastic Limit:	NP	GR:SA:FI:	0:92:8			
Plasticity Index:	NP	Grp. Symbol:	SP-SM			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	169.13
Wt.of Air-Dry Soil + Cont. (gm.)	100.08	Wt. of Container No.___ (gm.)		1.00	1.00	76.98
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	100.08	Wt. of Dry Soil (gm.)				92.15

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

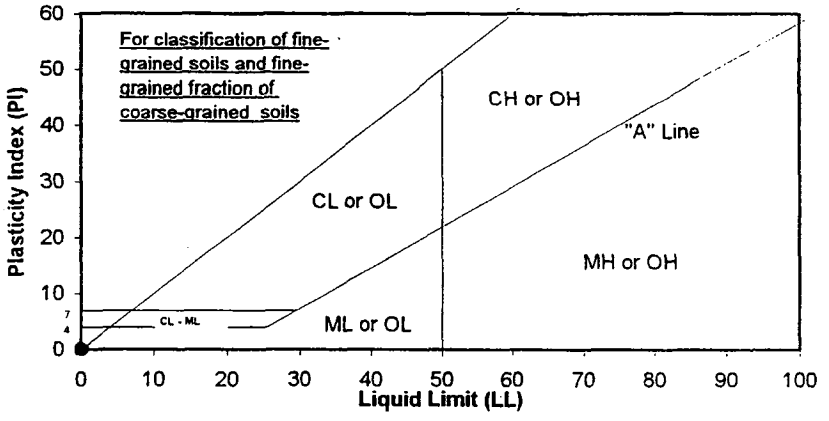
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.03	100.0	100.0
No. 30	0.07	99.9	99.9
No. 50	5.27	94.7	94.7
No. 100	64.61	35.4	35.4
No. 200	92.11	8.0	8.0
Pan			

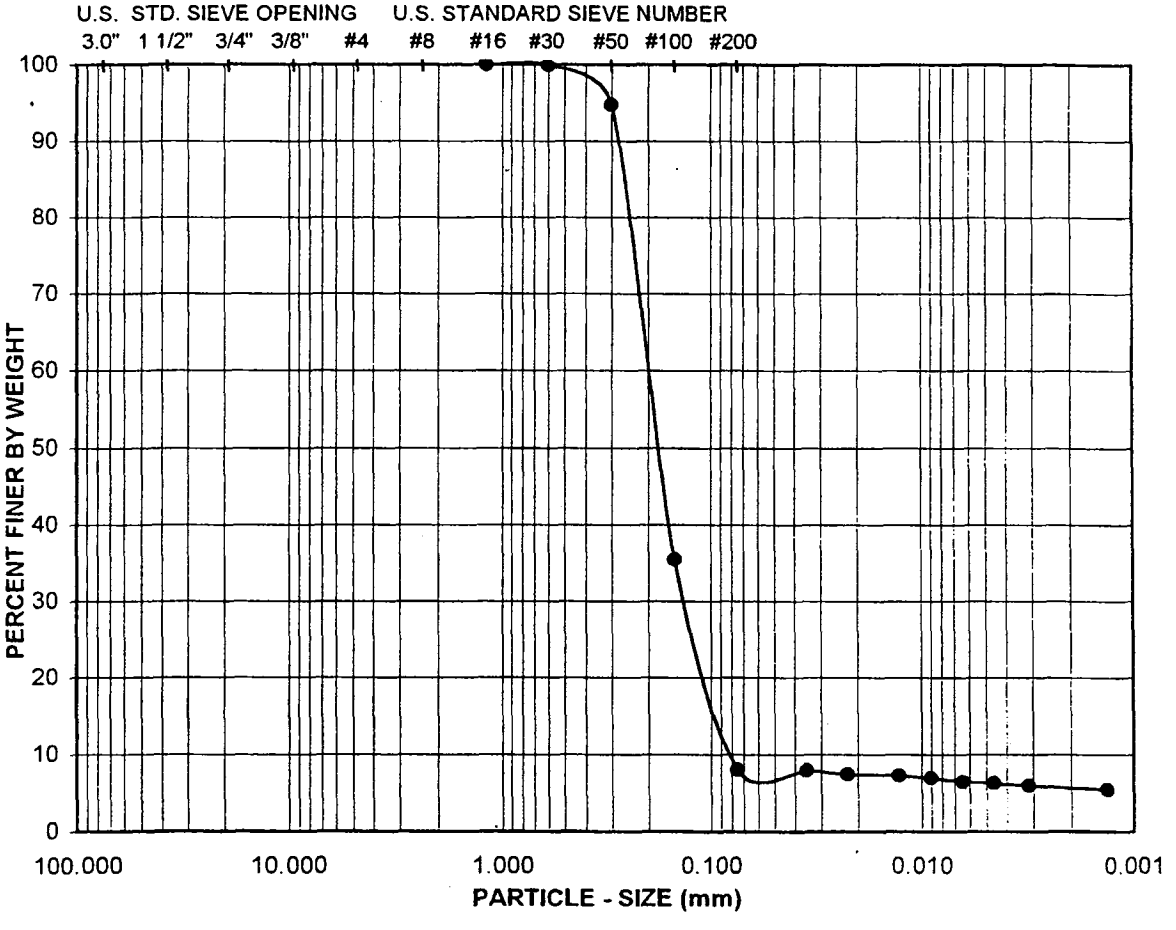
Hydrometer Wt. of Air-Dry Soil (gm) 100.08 Wt. of Dry Soil (gm) 100.08

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	10:06	0	22.9	4.0			
	10:08	2	22.9	4.0	12.0	7.9	0.0351
	10:11	5	22.9	4.0	11.5	7.4	0.0223
	10:21	15	23.0	4.0	11.3	7.2	0.0128
	10:36	30	23.0	4.0	11.0	6.9	0.0090
	11:06	60	23.0	4.0	10.5	6.4	0.0064
	12:06	120	22.8	4.0	10.3	6.2	0.0046
	14:16	250	23.3	4.0	10.0	5.9	0.0031
05/21/02	10:06	1440	21.8	4.0	9.5	5.4	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-1	095-02-001	5.0	SP-SM	0:92:8	NONPLASTIC

Sample Description:

Olive, poorly graded sand with silt (SP-SM)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point,

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/18/02
Location:	B-2	Checked By:			
Sample ID.:	095-02-041	Depth (ft.) :	5.0-7.0		

Visual Sample Description: Olive, silty sand (SM)

Liquid Limit:		LL,PL,PI:	N/A	Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Plastic Limit:		GR:SA:FI:	0:73:27			
Plasticity Index:		Grp. Symbol:	SM			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	150.05
Wt.of Air-Dry Soil + Cont. (gm.)	100.42	Wt. of Container No.___ (gm.)		1.00	1.00	76.86
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	100.42	Wt. of Dry Soil (gm.)				73.19

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

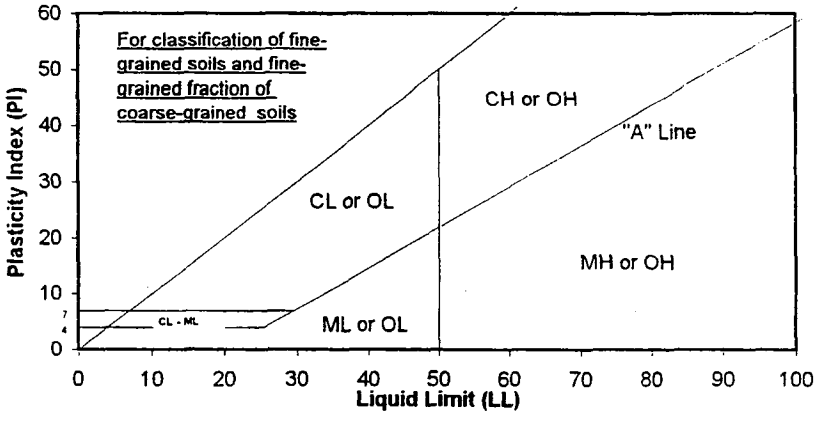
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.20	99.8	99.8
No. 30	0.39	99.6	99.6
No. 50	4.57	95.4	95.4
No. 100	62.07	38.2	38.2
No. 200	73.15	27.2	27.2
Pan			

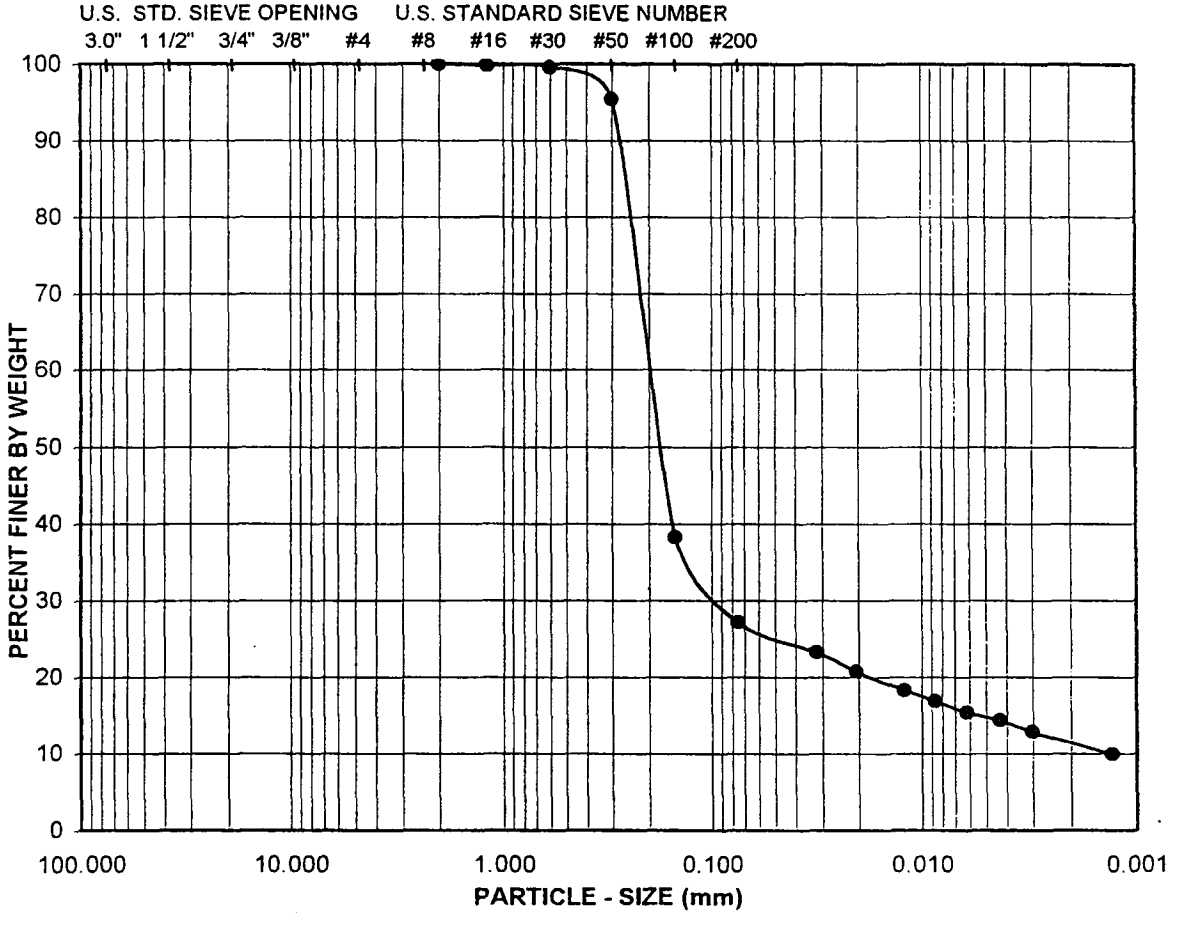
Hydrometer Wt. of Air-Dry Soil (gm) 100.42 Wt. of Dry Soil (gm) 100.42

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	9:20	0	22.3	3.5			
	9:22	2	22.6	3.5	27.0	23.2	0.0320
	9:25	5	22.6	3.5	24.5	20.7	0.0206
	9:35	15	22.6	3.5	22.0	18.3	0.0121
	9:50	30	22.6	3.5	20.5	16.8	0.0086
	10:20	60	22.7	3.5	19.0	15.3	0.0062
	11:20	120	23.2	3.5	18.0	14.3	0.0043
	13:30	250	23.4	3.5	16.5	12.8	0.0030
05/23/02	9:20	1440	22.2	3.5	13.5	9.9	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-2	095-02-041	5.0-7.0	SM	0:73:27	N/A

Sample Description:

Olive, silty sand (SM)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-4	Checked By:	LF		
Sample ID.:	095-02-011	Depth (ft.) :	5.0		
Visual Sample Description:	Olive, silt with sand (ML)s				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	**Nonplastic**			
Plastic Limit:	NP	GR:SA:FI:	**0:22:78**			
Plasticity Index:	NP	Grp. Symbol:	**(ML)s**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	104.76
Wt.of Air-Dry Soil + Cont. (gm.)	101.13	Wt. of Container No.___ (gm.)		1.00	1.00	82.35
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	101.13	Wt. of Dry Soil (gm.)				22.41

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

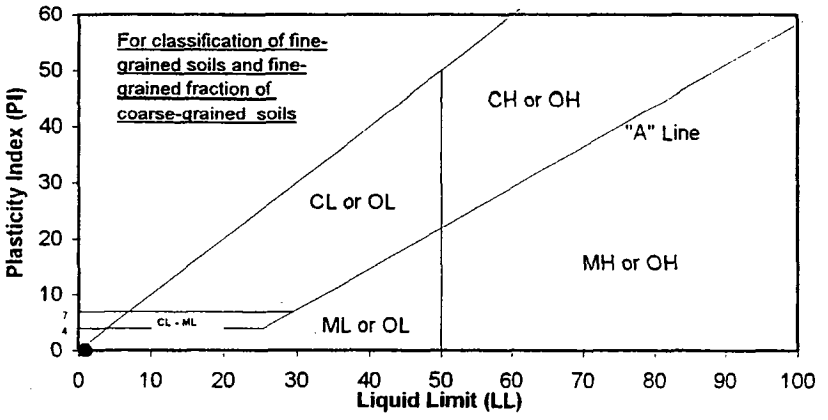
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.05	100.0	100.0
No. 30	0.08	99.9	99.9
No. 50	0.23	99.8	99.8
No. 100	1.74	98.3	98.3
No. 200	22.38	77.9	77.9
Pan			

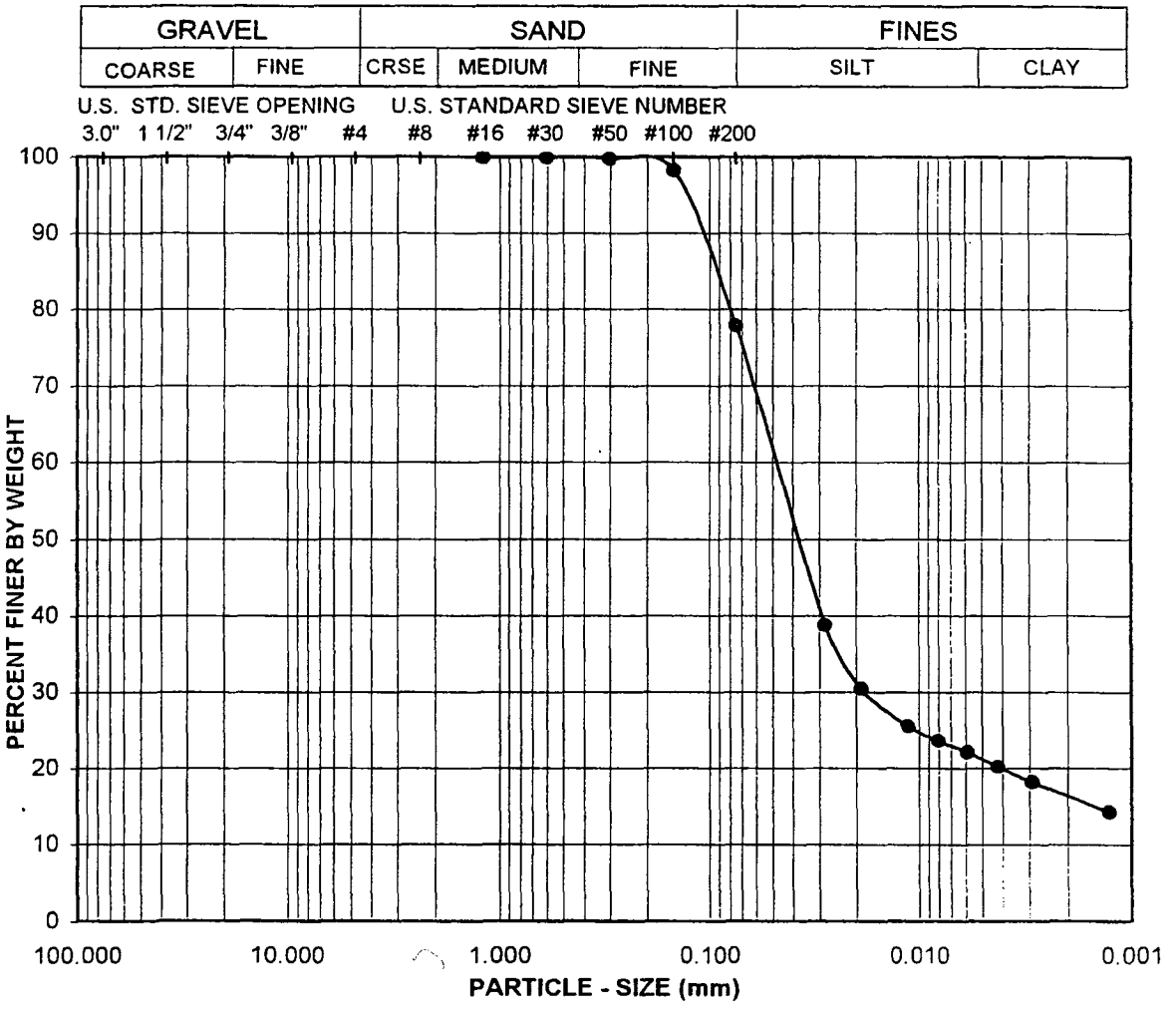
Hydrometer

Wt. of Air-Dry Soil (gm) 101.13 Wt. of Dry Soil (gm) 101.13

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	10:10	0	22.9	4.0			
	10:12	2	22.9	4.0	43.5	38.7	0.0281
	10:15	5	23.0	4.0	35.0	30.4	0.0189
	10:25	15	23.0	4.0	30.0	25.5	0.0113
	10:40	30	23.0	4.0	28.0	23.5	0.0081
	11:10	60	22.9	4.0	26.5	22.1	0.0059
	12:10	120	22.8	4.0	24.5	20.1	0.0042
	14:20	250	23.3	4.0	22.5	18.1	0.0029
05/23/02	10:10	1440	21.8	4.0	18.5	14.2	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-4	095-02-011	5.0	(ML)s	0:22:78	Nonplastic

Sample Description:

Olive, silt with sand (ML)s

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-4	Checked By:	LF		
Sample ID.:	095-02-012	Depth (ft.) :	15.0		

Visual Sample Description: Olive, lean clay (CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	47	LL,PL,PI:	47,22,25			
Plastic Limit:	22	GR:SA:FI:	0:4:96			
Plasticity Index:	25	Grp. Symbol:	CL			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	76.18
Wt.of Air-Dry Soil + Cont. (gm.)	50.68	Wt. of Container No.___ (gm.)		1.00	1.00	74.20
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.68	Wt. of Dry Soil (gm.)				1.98

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

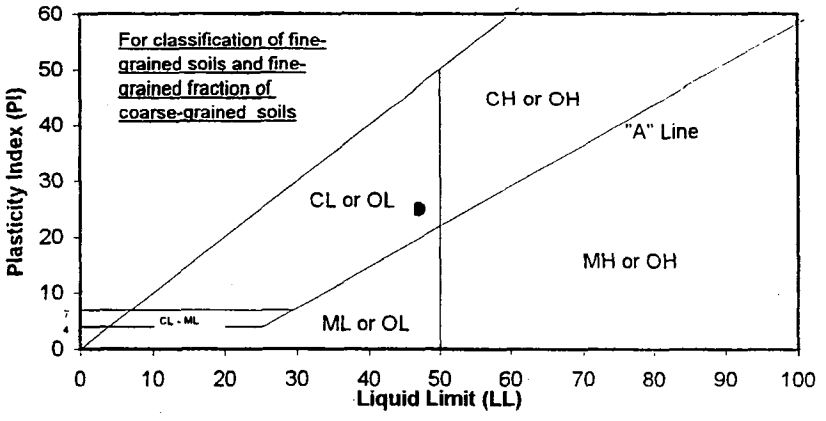
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.02	100.0	100.0
No. 50	0.07	99.9	99.9
No. 100	0.52	99.0	99.0
No. 200	1.85	96.3	96.3
Pan			

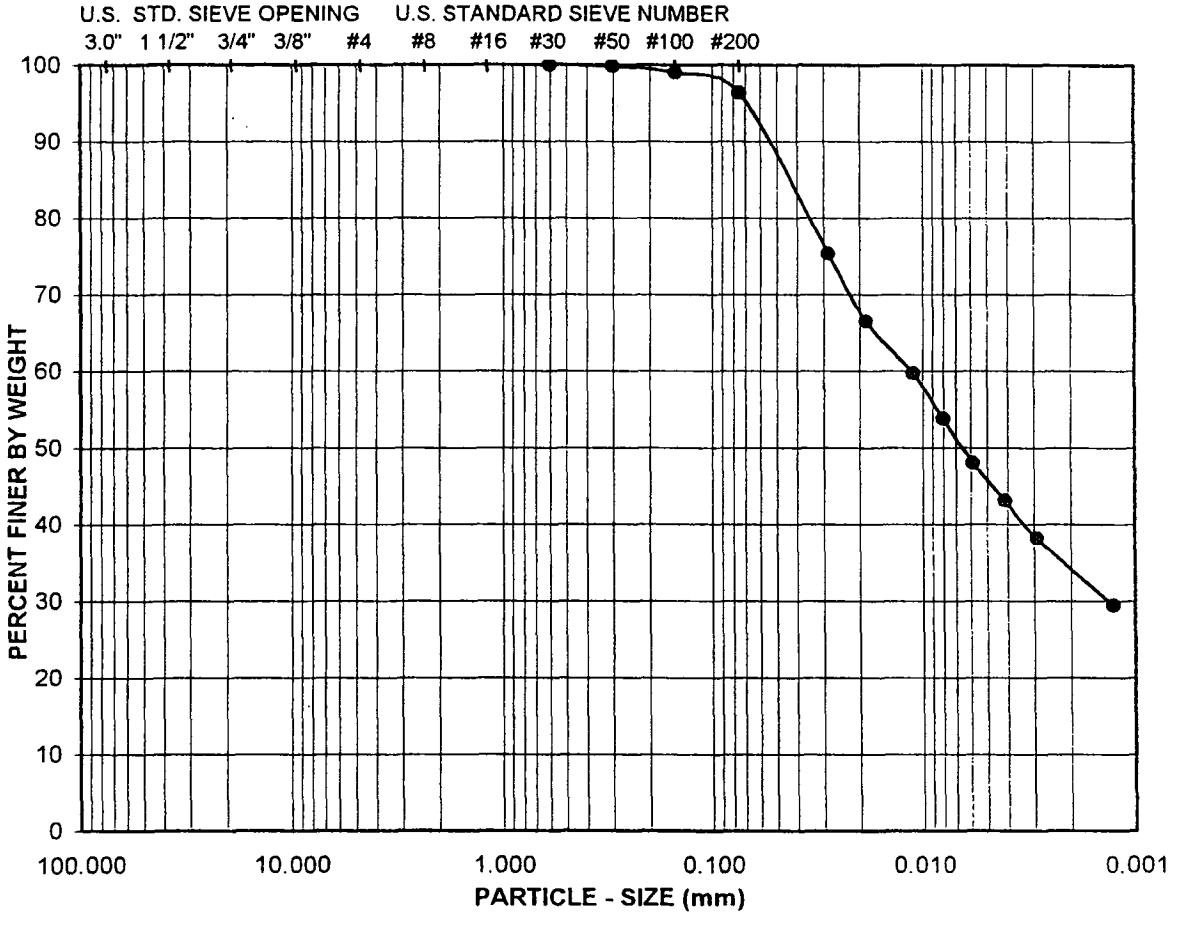
Hydrometer Wt. of Air-Dry Soil (gm) 50.68 Wt. of Dry Soil (gm) 50.68

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	9:00	0	22.3	3.5			
	9:02	2	22.5	3.5	42.0	75.4	0.0284
	9:05	5	22.5	3.5	37.5	66.6	0.0187
	9:15	15	22.6	3.5	34.0	59.7	0.0111
	9:30	30	22.6	3.5	31.0	53.8	0.0080
	10:00	60	22.6	3.5	28.0	48.0	0.0058
	11:00	120	23.1	3.5	25.5	43.1	0.0041
	13:10	250	23.4	3.5	23.0	38.2	0.0029
05/23/02	9:00	1440	22.2	3.5	18.5	29.4	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-4	095-02-012	15.0	CL	0:4:96	47,22,25

Sample Description:

Olive, lean clay (CL)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	05/30/02
Location:	B-4	Checked By:	LF		
Sample ID.:	095-02-013	Depth (ft.) :	25.0		

Visual Sample Description: Olive, lean clay (CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**44**	LL,PL,PI:	**44,21,23**			
Plastic Limit:	**21**	GR:SA:FI:	**0:2:98**			
Plasticity Index:	**23**	Grp. Symbol:	**CL**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	76.41
Wt.of Air-Dry Soil + Cont. (gm.)	50.19	Wt. of Container No.___ (gm.)		1.00	1.00	75.30
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.19	Wt. of Dry Soil (gm.)				1.11

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

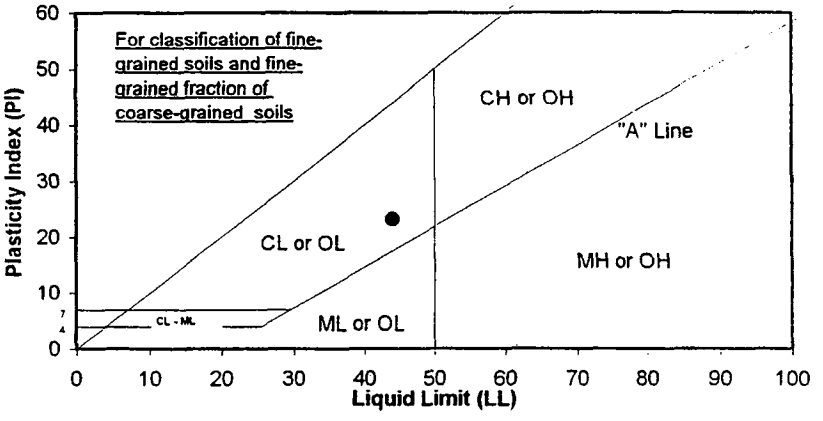
Sieve after Hydrometer & Wet Sieve

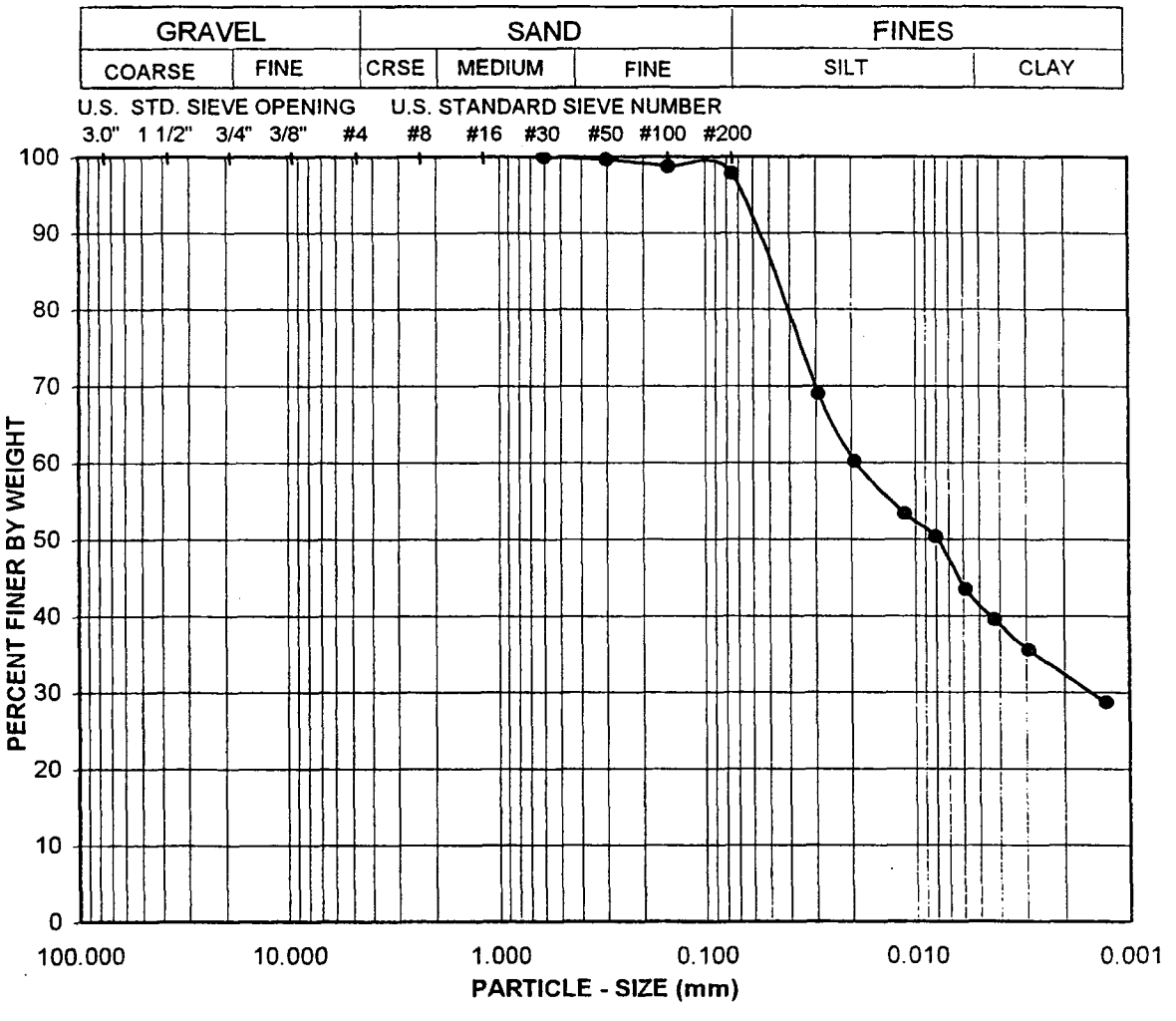
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.02	100.0	100.0
No. 50	0.16	99.7	99.7
No. 100	0.63	98.7	98.7
No. 200	1.10	97.8	97.8
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 50.19 Wt. of Dry Soil (gm) 50.19

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	9:58	0	22.9	4.0			
	10:00	2	23.0	4.0	39.0	69.0	0.0289
	10:03	5	22.9	4.0	34.5	60.2	0.0192
	10:13	15	23.0	4.0	31.0	53.3	0.0112
	10:28	30	23.0	4.0	29.5	50.3	0.0080
	10:58	60	23.0	4.0	26.0	43.4	0.0058
	11:58	120	22.8	4.0	24.0	39.5	0.0042
	14:08	250	23.3	4.0	22.0	35.5	0.0029
05/21/02	9:58	1440	21.8	4.0	18.5	28.6	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-4	095-02-013	25.0	CL	0:2:98	44,21,23

Sample Description:

Olive, lean clay (CL)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point,

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

01-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID.:	095-02-019	Depth (ft.) :	5.0-7.0		

Visual Sample Description: Very dark gray, silty sand (SM)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	**Nonplastic**			
Plastic Limit:	NP	GR:SA:FI:	**0:51:49**			
Plasticity Index:	NP	Grp. Symbol:	**SM**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	128.17
Wt.of Air-Dry Soil + Cont. (gm.)	100.47	Wt. of Container No.___ (gm.)		1.00	1.00	75.51
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	100.47	Wt. of Dry Soil (gm.)				52.66

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

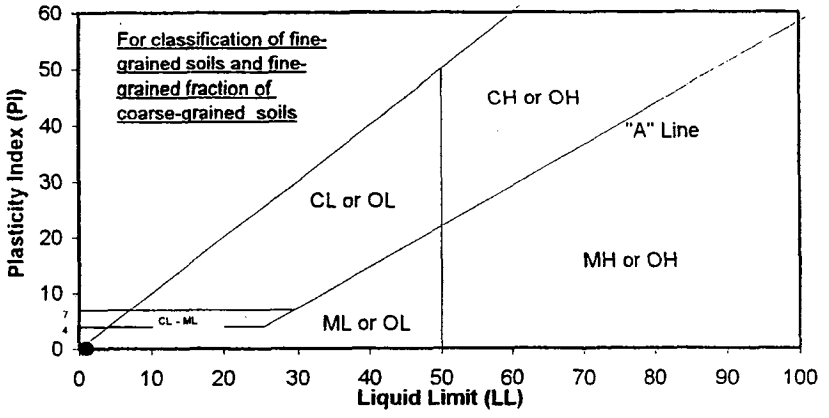
Sieve after Hydrometer & Wet Sieve

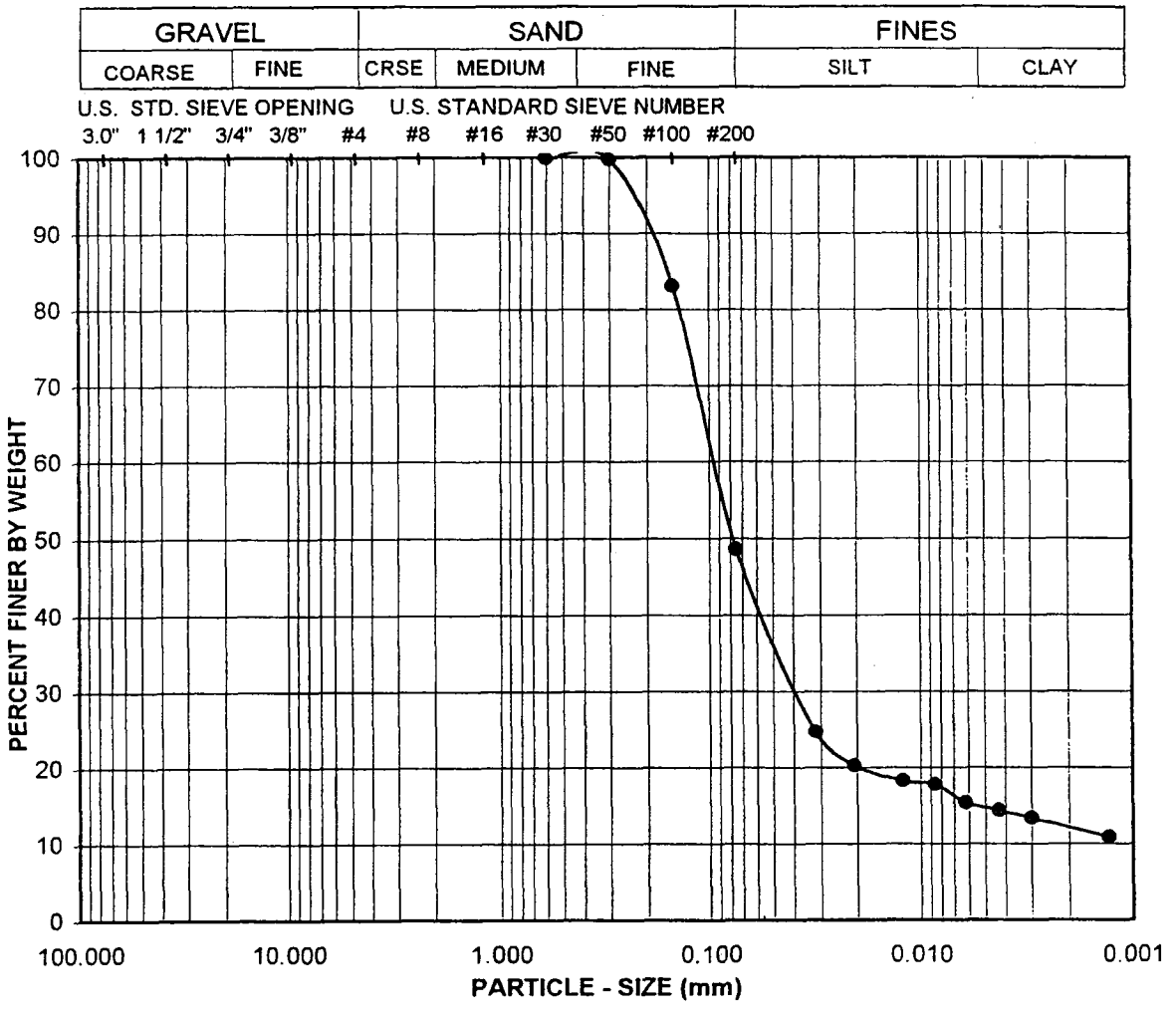
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.05	100.0	100.0
No. 50	0.22	99.8	99.8
No. 100	16.99	83.1	83.1
No. 200	51.68	48.6	48.6
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 100.47 Wt. of Dry Soil (gm) 100.47

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	9:04	0	22.3	3.5			
	9:06	2	22.5	3.5	28.5	24.7	0.0316
	9:09	5	22.5	3.5	24.0	20.2	0.0207
	9:19	15	22.6	3.5	22.0	18.3	0.0121
	9:34	30	22.6	3.5	21.5	17.8	0.0086
	10:04	60	22.6	3.5	19.0	15.3	0.0062
	11:04	120	23.4	3.5	18.0	14.3	0.0043
	13:14	250	23.4	3.5	17.0	13.3	0.0030
05/21/02	9:04	1440	22.2	3.5	14.5	10.9	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-5	095-02-019	5.0-7.0	SM	0:51:49	Nonplastic

Sample Description:

Very dark gray, silty sand (SM)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID.:	095-02-020	Depth (ft.) :	15.0-17.0		

Visual Sample Description: Olive, silty sand (SM)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	**Nonplastic**			
Plastic Limit:	NP	GR:SA:FI:	**0:82:18**			
Plasticity Index:	NP	Grp. Symbol:	**SM**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	158.03
Wt.of Air-Dry Soil + Cont. (gm.)	100.97	Wt. of Container No.___ (gm.)		1.00	1.00	74.80
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	100.97	Wt. of Dry Soil (gm.)				83.23

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

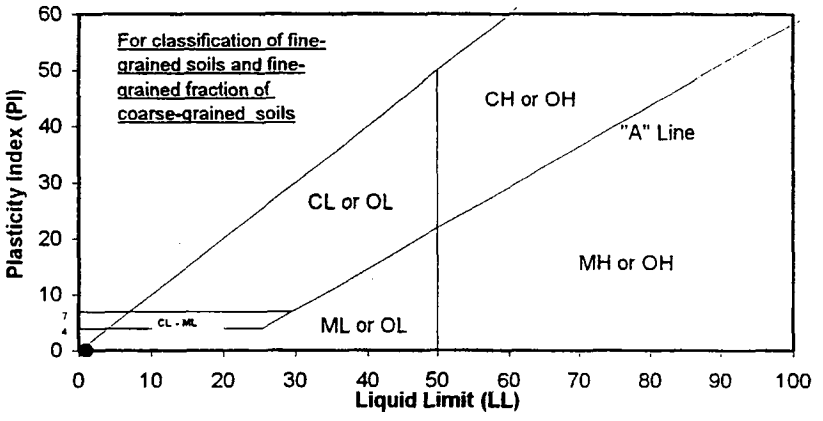
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.07	99.9	99.9
No. 30	0.14	99.9	99.9
No. 50	6.06	94.0	94.0
No. 100	57.86	42.7	42.7
No. 200	82.85	17.9	17.9
Pan			

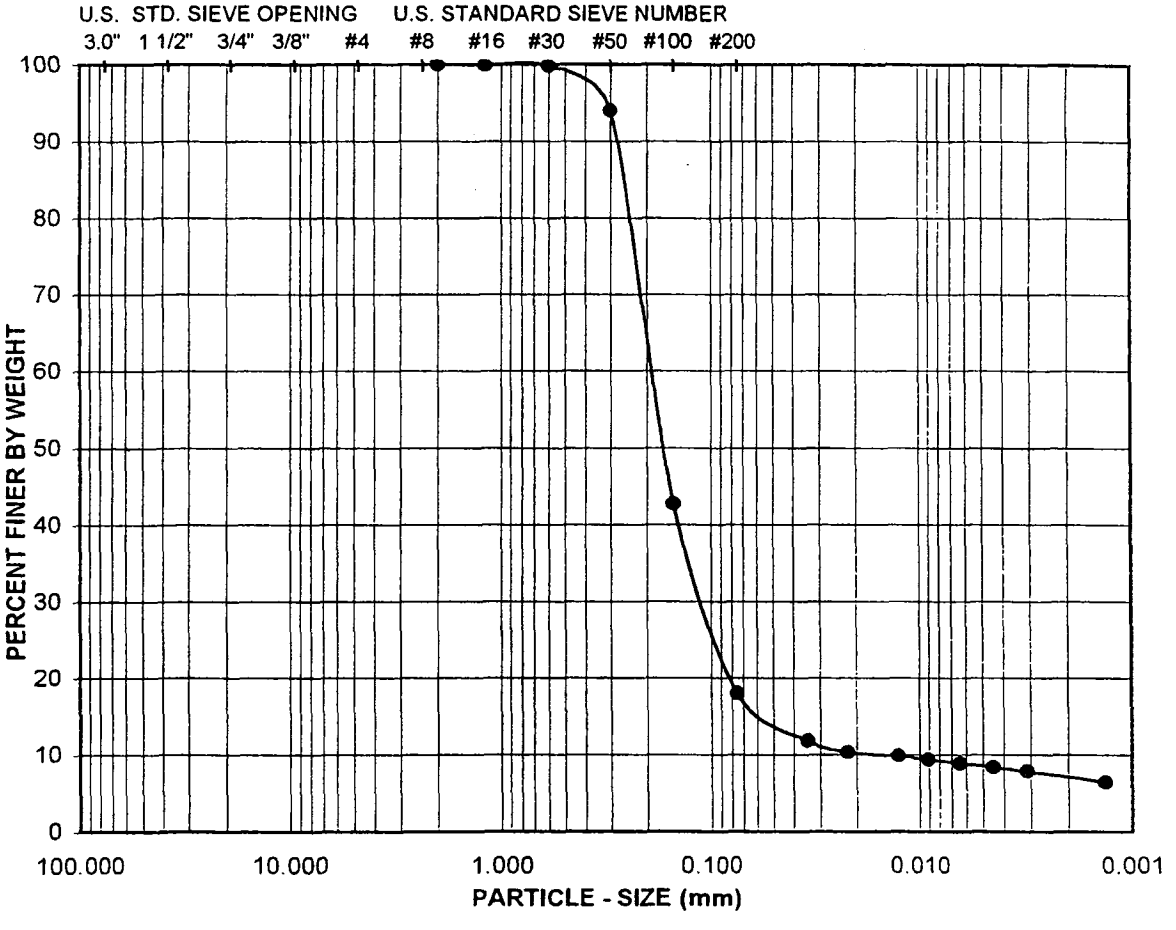
Hydrometer Wt. of Air-Dry Soil (gm) 100.97 Wt. of Dry Soil (gm) 100.97

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	9:08	0	22.3	3.5			
	9:10	2	22.5	3.5	15.5	11.8	0.0344
	9:13	5	22.5	3.5	14.0	10.3	0.0220
	9:23	15	22.6	3.5	13.5	9.8	0.0127
	9:38	30	22.6	3.5	13.0	9.3	0.0090
	10:08	60	22.6	3.5	12.5	8.8	0.0064
	11:08	120	23.1	3.5	12.0	8.4	0.0045
	13:18	250	23.4	3.5	11.5	7.9	0.0031
05/21/02	9:08	1440	22.2	3.5	10.0	6.4	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-5	095-02-020	15.0-17.0	SM	0:82:18	Nonplastic

Sample Description:

Olive, silty sand (SM)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LF		
Sample ID.:	095-02-021	Depth (ft.) :	20.5-21.0		

Visual Sample Description: Olive, sandy silty clay s(CL-ML)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**25**	LL,PL,PI:	**25,20,5**			
Plastic Limit:	**20**	GR:SA:FI:	**0:48:52**			
Plasticity Index:	**5**	Grp. Symbol:	**s(CL-ML)**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	124.09
Wt.of Air-Dry Soil + Cont. (gm.)	100.01	Wt. of Container No.___ (gm.)		1.00	1.00	75.63
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	100.01	Wt. of Dry Soil (gm.)				48.46

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

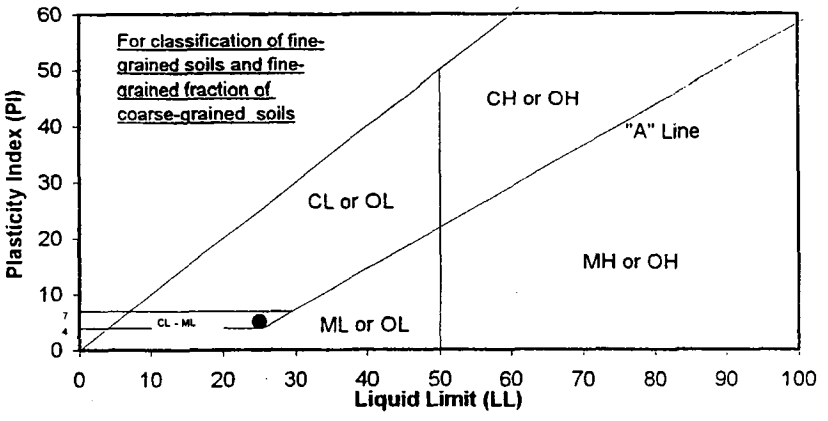
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	1.36	98.6	98.6
No. 30	2.36	97.6	97.6
No. 50	6.45	93.6	93.6
No. 100	32.01	68.0	68.0
No. 200	47.95	52.1	52.1
Pan			

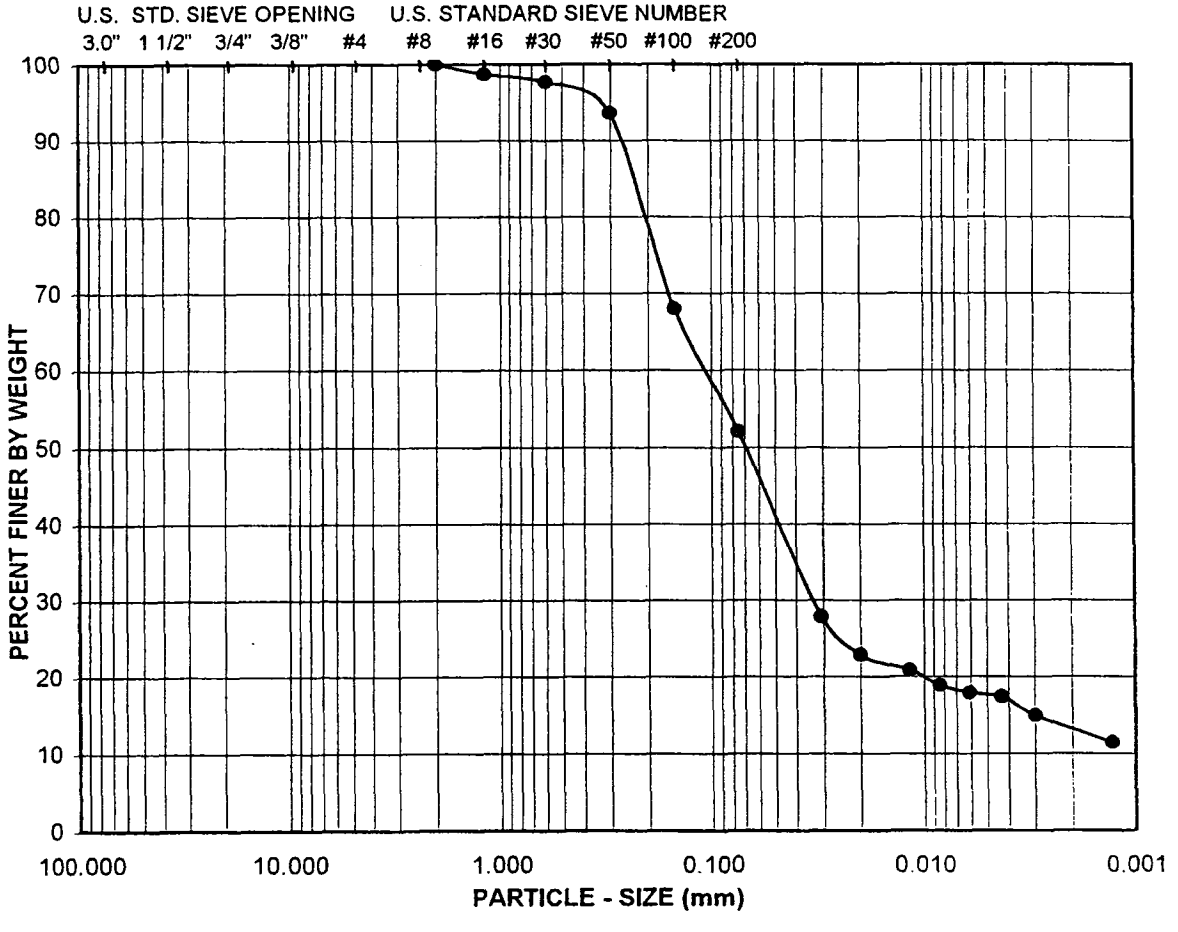
Hydrometer Wt. of Air-Dry Soil (gm) 100.01 Wt. of Dry Soil (gm) 100.01

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	10:18	0	22.9	4.0			
	10:20	2	23.0	4.0	32.0	27.8	0.0306
	10:23	5	23.0	4.0	27.0	22.8	0.0200
	10:33	15	23.0	4.0	25.0	20.8	0.0117
	10:48	30	23.0	4.0	23.0	18.8	0.0084
	11:18	60	22.9	4.0	22.0	17.9	0.0060
	12:18	120	22.9	4.0	21.5	17.4	0.0043
	14:28	250	23.3	4.0	19.0	14.9	0.0030
05/21/02	10:18	1440	21.9	4.0	15.5	11.4	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-5	095-02-021	20.5-21.0	s(CL-ML)	0:48:52	25,20,5

Sample Description:

Olive, sandy silty clay s(CL-ML)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	05/30/02
Location:	B-5	Checked By:	LF		
Sample ID.:	095-02-022	Depth (ft.) :	30.0-31.5		

Visual Sample Description: Olive, lean clay (CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**38**	LL,PL,PI:	**38,19,19**			
Plastic Limit:	**19**	GR:SA:FI:	**0:10:90**			
Plasticity Index:	**19**	Grp. Symbol:	**CL**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	80.12
Wt.of Air-Dry Soil + Cont. (gm.)	50.18	Wt. of Container No.___ (gm.)		1.00	1.00	74.54
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.18	Wt. of Dry Soil (gm.)				5.58

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

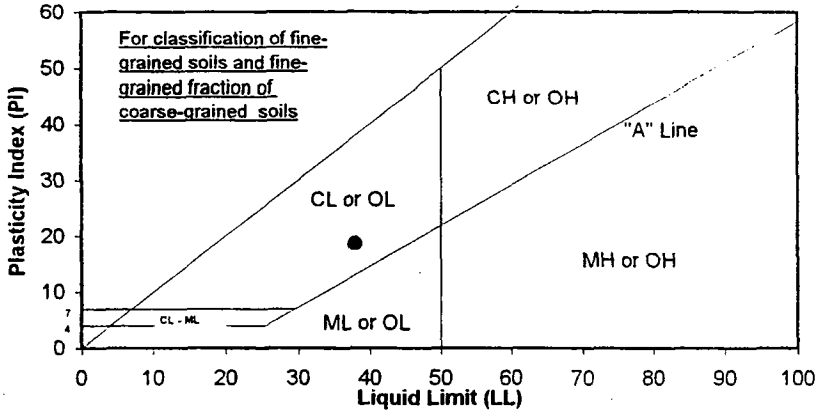
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.03	99.9	99.9
No. 50	0.12	99.8	99.8
No. 100	0.65	98.7	98.7
No. 200	4.99	90.1	90.1
Pan			

Hydrometer

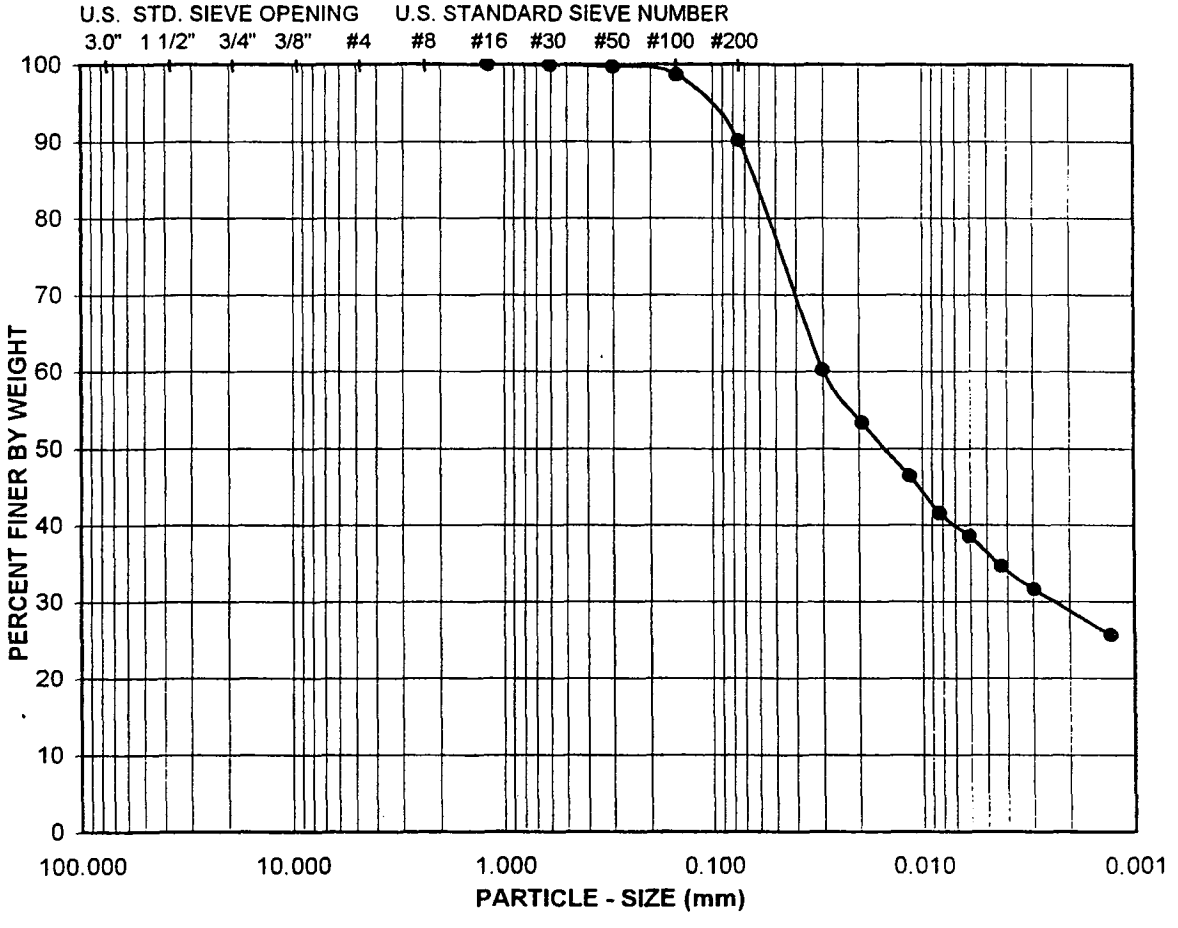
Wt. of Air-Dry Soil (gm) 50.18 Wt. of Dry Soil (gm) 50.18

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	10:14	0	22.9	4.0			
	10:16	2	23.0	4.0	34.5	60.2	0.0299
	10:19	5	23.0	4.0	31.0	53.3	0.0194
	10:29	15	23.0	4.0	27.5	46.4	0.0115
	10:44	30	23.0	4.0	25.0	41.4	0.0083
	11:14	60	22.9	4.0	23.5	38.5	0.0060
	12:14	120	22.9	4.0	21.5	34.5	0.0043
	14:24	250	23.3	4.0	20.0	31.6	0.0030
05/21/02	10:14	1440	21.9	4.0	17.0	25.6	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-5	095-02-022	30.0-31.5	CL	0:10:90	38,19,19

Sample Description:

Olive, lean clay (CL)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point,

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	ZF		
Sample ID.:	095-02-023	Depth (ft.) :	50.0-51.5		
Visual Sample Description:	Olive, lean clay (CL)				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**45**	LL,PL,PI:	**45,25,20**			
Plastic Limit:	**25**	GR:SA:FI:	**0:4:96**			
Plasticity Index:	**20**	Grp. Symbol:	**CL**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	78.52
Wt.of Air-Dry Soil + Cont. (gm.)	50.54	Wt. of Container No.___ (gm.)		1.00	1.00	76.42
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.54	Wt. of Dry Soil (gm.)				2.10

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

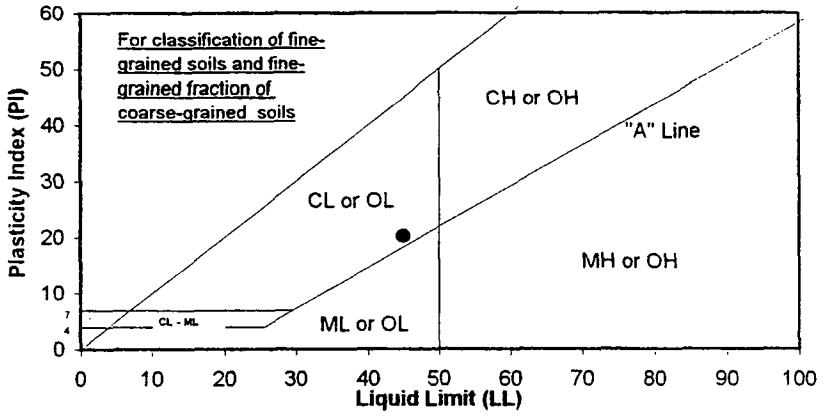
Sieve after Hydrometer & Wet Sieve

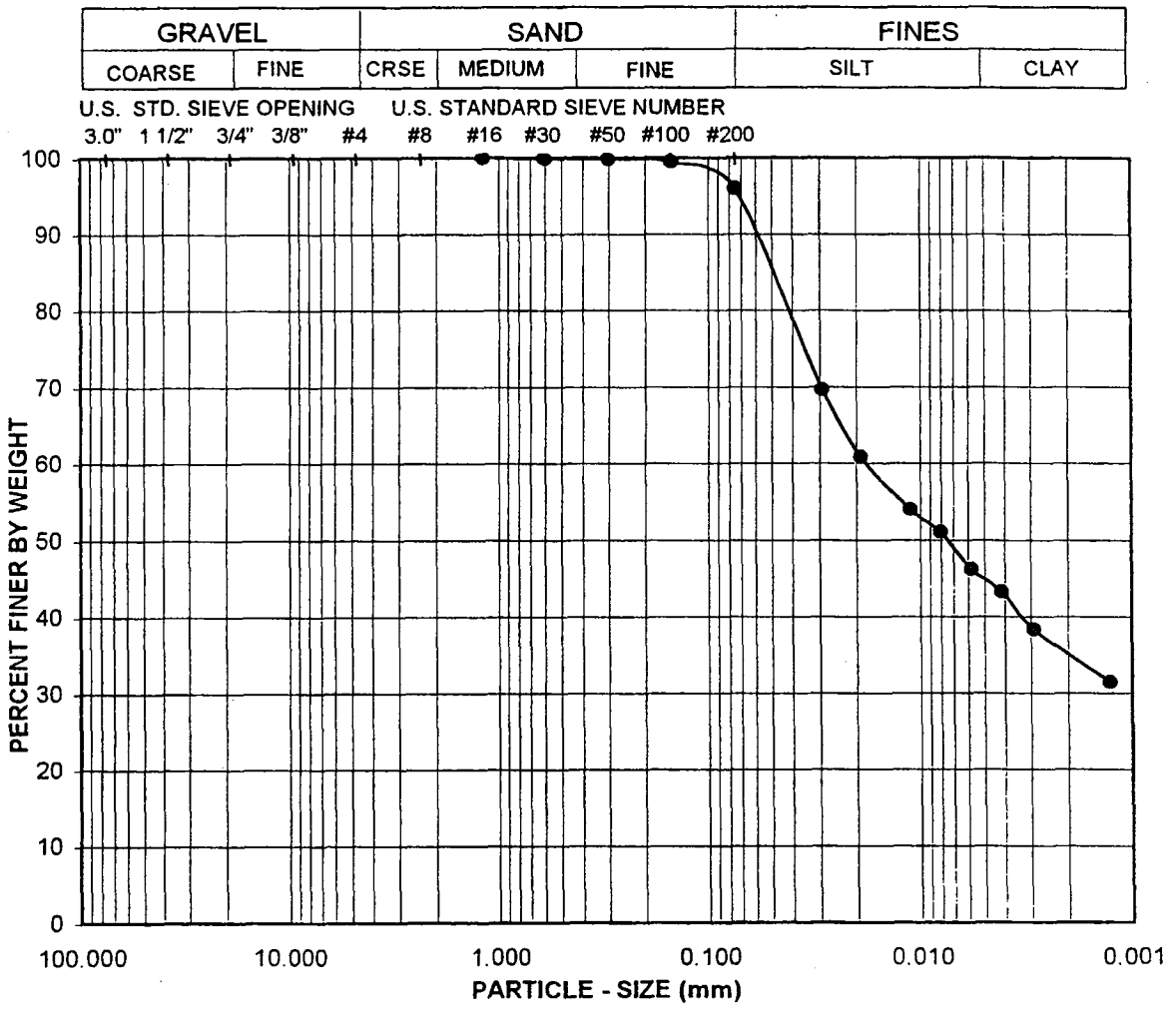
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.03	99.9	99.9
No. 50	0.07	99.9	99.9
No. 100	0.25	99.5	99.5
No. 200	2.04	96.0	96.0
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 50.54 Wt. of Dry Soil (gm) 50.54

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	10:02	0	22.9	4.0			
	10:04	2	22.9	4.0	39.5	69.7	0.0290
	10:07	5	22.9	4.0	35.0	60.8	0.0191
	10:17	15	23.0	4.0	31.5	54.0	0.0112
	10:32	30	23.0	4.0	30.0	51.0	0.0080
	11:02	60	23.0	4.0	27.5	46.1	0.0058
	12:02	120	22.8	4.0	26.0	43.2	0.0041
	14:12	250	23.3	4.0	23.5	38.3	0.0029
05/23/02	10:02	1440	21.8	4.0	20.0	31.4	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-5	095-02-023	50.0-51.5	CL	0:4:96	45,25,20

Sample Description:

Olive, lean clay (CL)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-5	Checked By:	LP		
Sample ID.:	095-02-024	Depth (ft.) :	70.0-71.5		
Visual Sample Description:	Olive, fat clay (CH)				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	53	LL,PL,PI:	53,26,27			
Plastic Limit:	26	GR:SA:FI:	0:3:97			
Plasticity Index:	27	Grp. Symbol:	CH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	76.95
Wt.of Air-Dry Soil + Cont. (gm.)	50.48	Wt. of Container No.___ (gm.)		1.00	1.00	75.03
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.48	Wt. of Dry Soil (gm.)				1.92

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

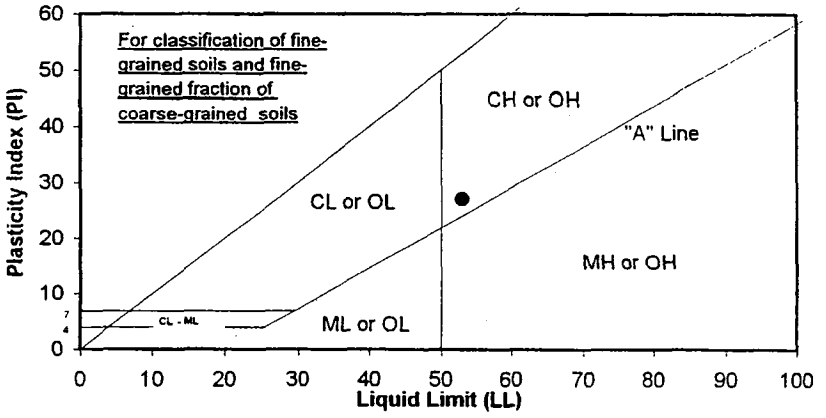
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.02	100.0	100.0
No. 30	0.04	99.9	99.9
No. 50	0.07	99.9	99.9
No. 100	0.25	99.5	99.5
No. 200	1.41	97.2	97.2
Pan			

Hydrometer

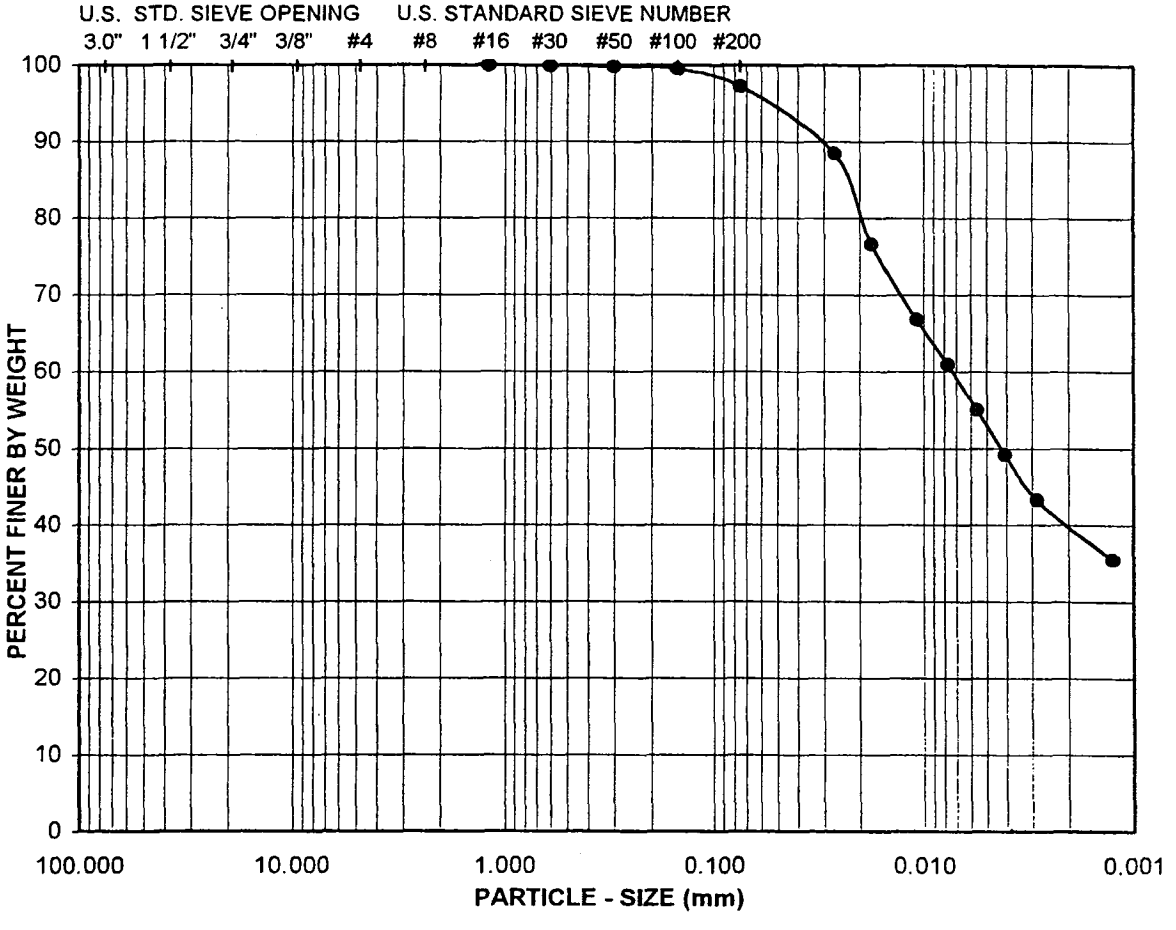
Wt. of Air-Dry Soil (gm) 50.48 Wt. of Dry Soil (gm) 50.48

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/20/02	9:50	0	22.9	4.0			
	9:52	2	23.0	4.0	49.0	88.4	0.0264
	9:55	5	23.0	4.0	43.0	76.6	0.0176
	10:05	15	22.9	4.0	38.0	66.8	0.0108
	10:20	30	23.0	4.0	35.0	60.9	0.0077
	10:50	60	23.0	4.0	32.0	55.0	0.0056
	11:50	120	22.8	4.0	29.0	49.1	0.0041
	14:00	250	23.3	4.0	26.0	43.2	0.0028
05/21/02	9:50	1440	21.8	4.0	22.0	35.4	0.0012



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-5	095-02-024	70.0-71.5	CH	0:3:97	53,26,27

Sample Description:

Olive, fat clay (CH)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-6	Checked By:	LF		
Sample ID.:	095-02-027	Depth (ft.) :	7.0-9.0		
Visual Sample Description:	Olive, clayey sand (SC)				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**25**	LL,PL,PI:	**25,14,11**			
Plastic Limit:	**14**	GR:SA:FI:	**0:60:40**			
Plasticity Index:	**11**	Grp. Symbol:	**(SC)**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	137.83
Wt.of Air-Dry Soil + Cont. (gm.)	100.87	Wt. of Container No.___ (gm.)		1.00	1.00	76.75
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	100.87	Wt. of Dry Soil (gm.)				61.08

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

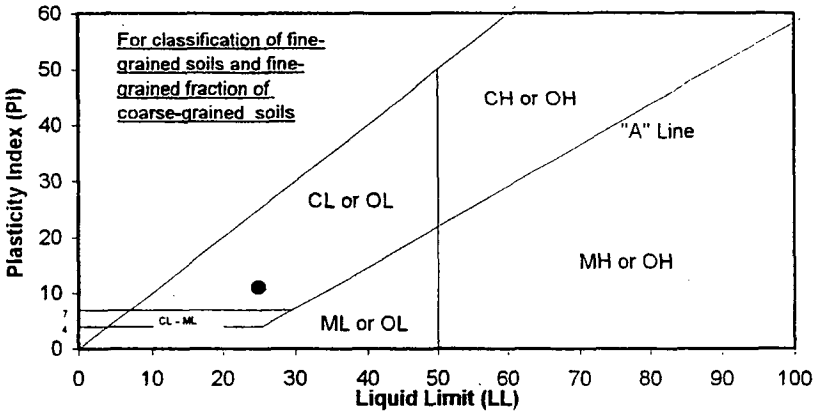
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	1.02	99.0	99.0
No. 30	2.07	97.9	97.9
No. 50	6.41	93.6	93.6
No. 100	48.81	51.6	51.6
No. 200	61.05	39.5	39.5
Pan			

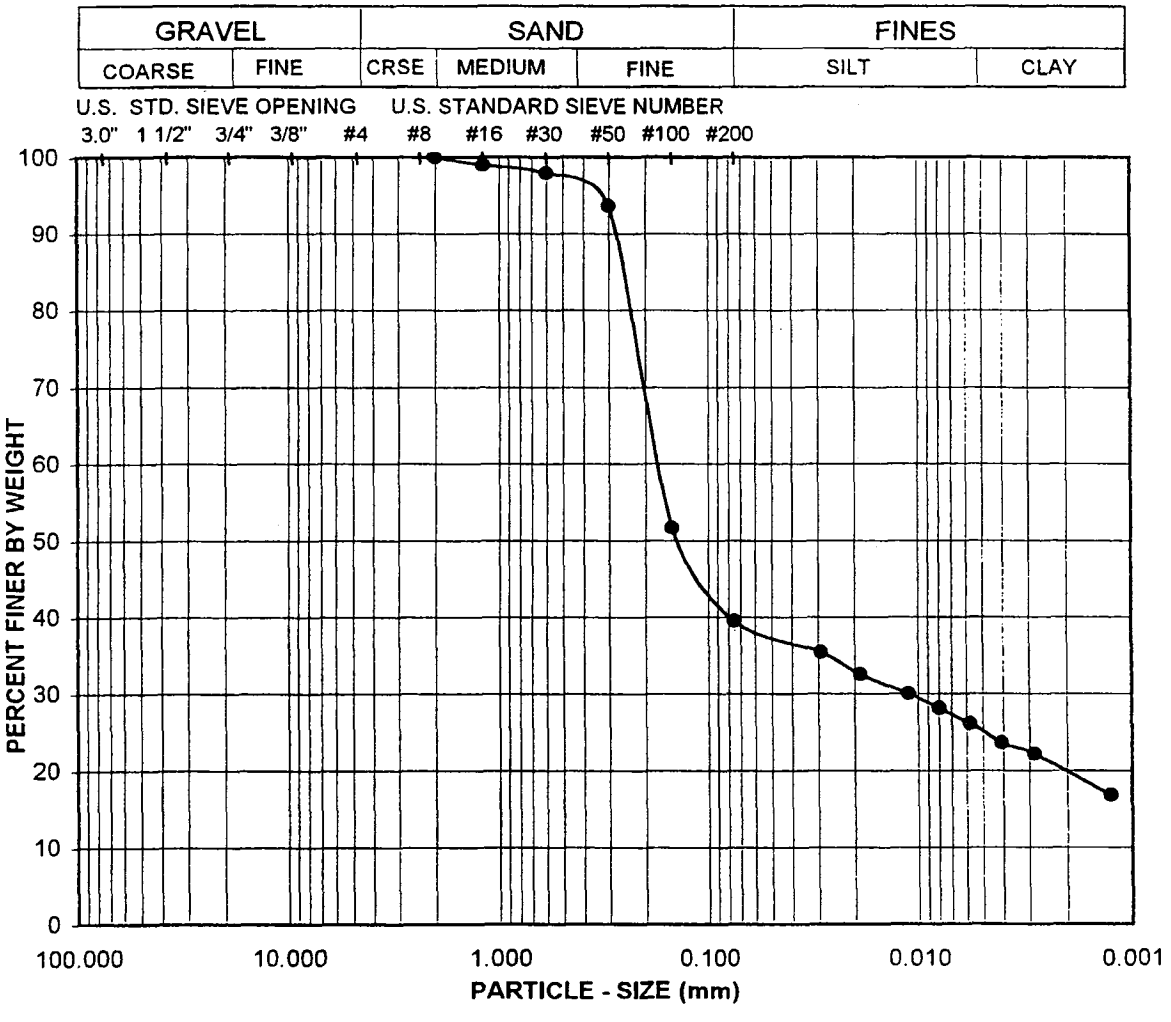
Hydrometer

Wt. of Air-Dry Soil (gm) 100.87 Wt. of Dry Soil (gm) 100.87

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	9:12	0	22.3	3.5			
	9:14	2	22.5	3.5	39.5	35.4	0.0290
	9:17	5	22.5	3.5	36.5	32.5	0.0188
	9:27	15	22.6	3.5	34.0	30.0	0.0111
	9:42	30	22.6	3.5	32.0	28.0	0.0080
	10:12	60	22.7	3.5	30.0	26.1	0.0057
	11:12	120	23.2	3.5	27.5	23.6	0.0041
	13:22	250	23.4	3.5	26.0	22.1	0.0028
05/23/02	9:12	1440	22.2	3.5	20.5	16.7	0.0012





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-6	095-02-027	7.0-9.0	(SC)	0:60:40	25,14,11

Sample Description:

Olive, clayey sand (SC)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-6	Checked By:	LF		
Sample ID.:	095-02-028	Depth (ft.) :	15.0-17.0		

Visual Sample Description: Olive, sandy lean clay s(CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	31	LL,PL,PI:	31,17,14			
Plastic Limit:	17	GR:SA:FI:	0:40:60			
Plasticity Index:	14	Grp. Symbol:	s(CL)			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	96.35
Wt.of Air-Dry Soil + Cont. (gm.)	50.18	Wt. of Container No.___ (gm.)		1.00	1.00	75.84
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.18	Wt. of Dry Soil (gm.)				20.51

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

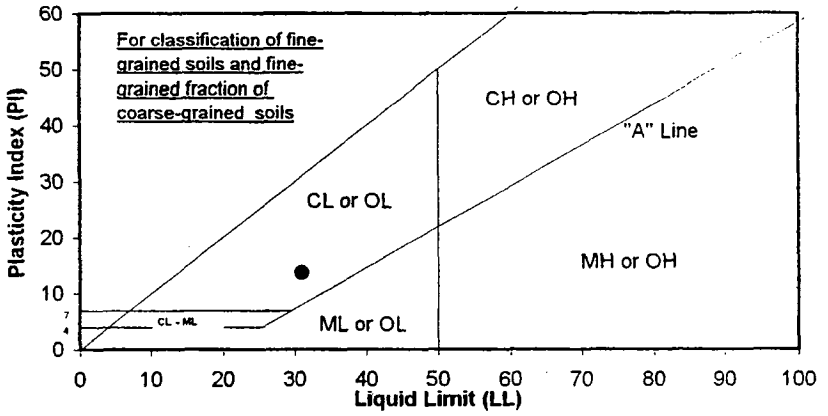
Sieve after Hydrometer & Wet Sieve

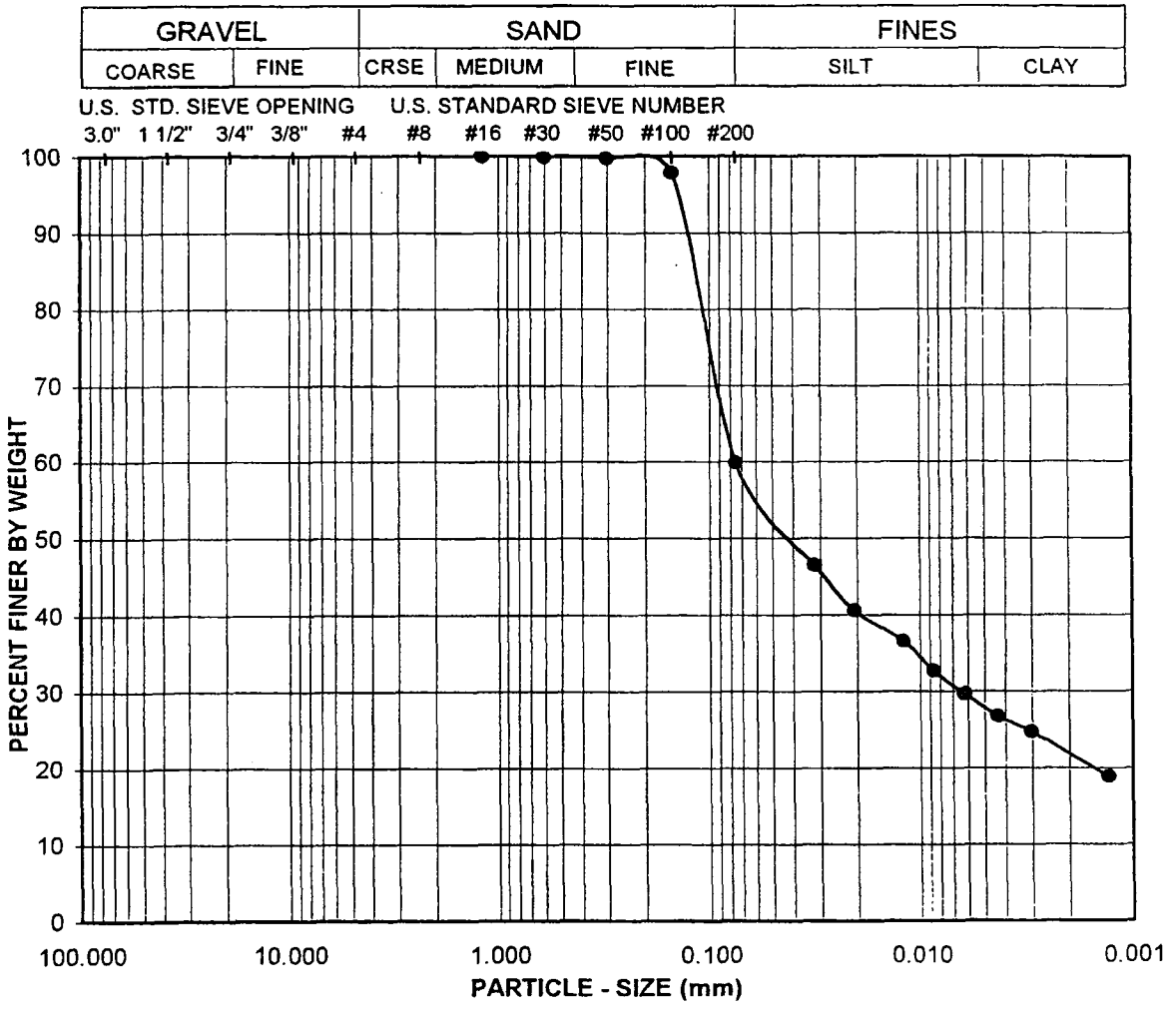
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.03	99.9	99.9
No. 50	0.12	99.8	99.8
No. 100	1.09	97.8	97.8
No. 200	20.12	59.9	59.9
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 50.18 Wt. of Dry Soil (gm) 50.18

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	9:16	0	22.3	3.5			
	9:18	2	22.6	3.5	27.0	46.5	0.0320
	9:21	5	22.6	3.5	24.0	40.5	0.0207
	9:31	15	22.6	3.5	22.0	36.6	0.0121
	9:46	30	22.6	3.5	20.0	32.6	0.0086
	10:16	60	22.7	3.5	18.5	29.7	0.0062
	11:16	120	23.2	3.5	17.0	26.7	0.0044
	13:26	250	23.4	3.5	16.0	24.7	0.0030
05/23/02	9:16	1440	22.2	3.5	13.0	18.8	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-6	095-02-028	15.0-17.0	s(CL)	0:40:60	31,17,14

Sample Description:

Olive, sandy lean clay s(CL)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	05/17/02
Project No. :	2384095-D-07060	Data Input By:	RA	Date:	06/05/02
Location:	B-6	Checked By:	LF		
Sample ID.:	095-02-029	Depth (ft.) :	41.0-42.5		
Visual Sample Description:	Olive, clayey sand (SC)				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**25**	LL,PL,PI:	**25,15,10**			
Plastic Limit:	**15**	GR:SA:FI:	**0:54:46**			
Plasticity Index:	**10**	Grp. Symbol:	**SC**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	106.80
Wt.of Air-Dry Soil + Cont. (gm.)	53.66	Wt. of Container No.___ (gm.)		1.00	1.00	77.55
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	53.66	Wt. of Dry Soil (gm.)				29.25

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

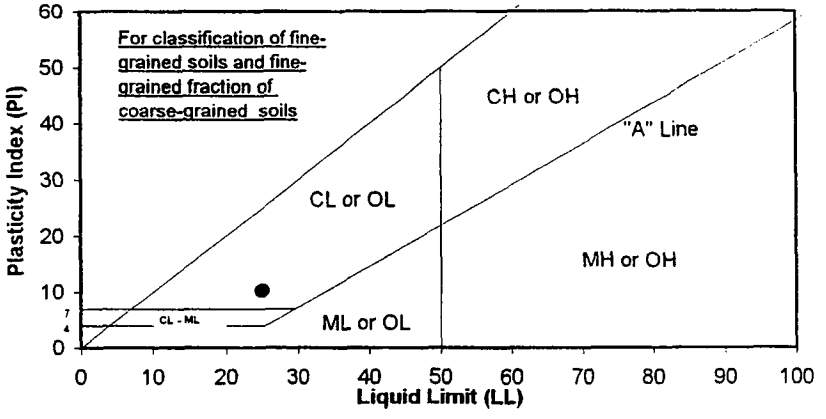
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.03	99.9	99.9
No. 30	0.10	99.8	99.8
No. 50	2.07	96.1	96.1
No. 100	19.46	63.7	63.7
No. 200	29.22	45.5	45.5
Pan			

Hydrometer

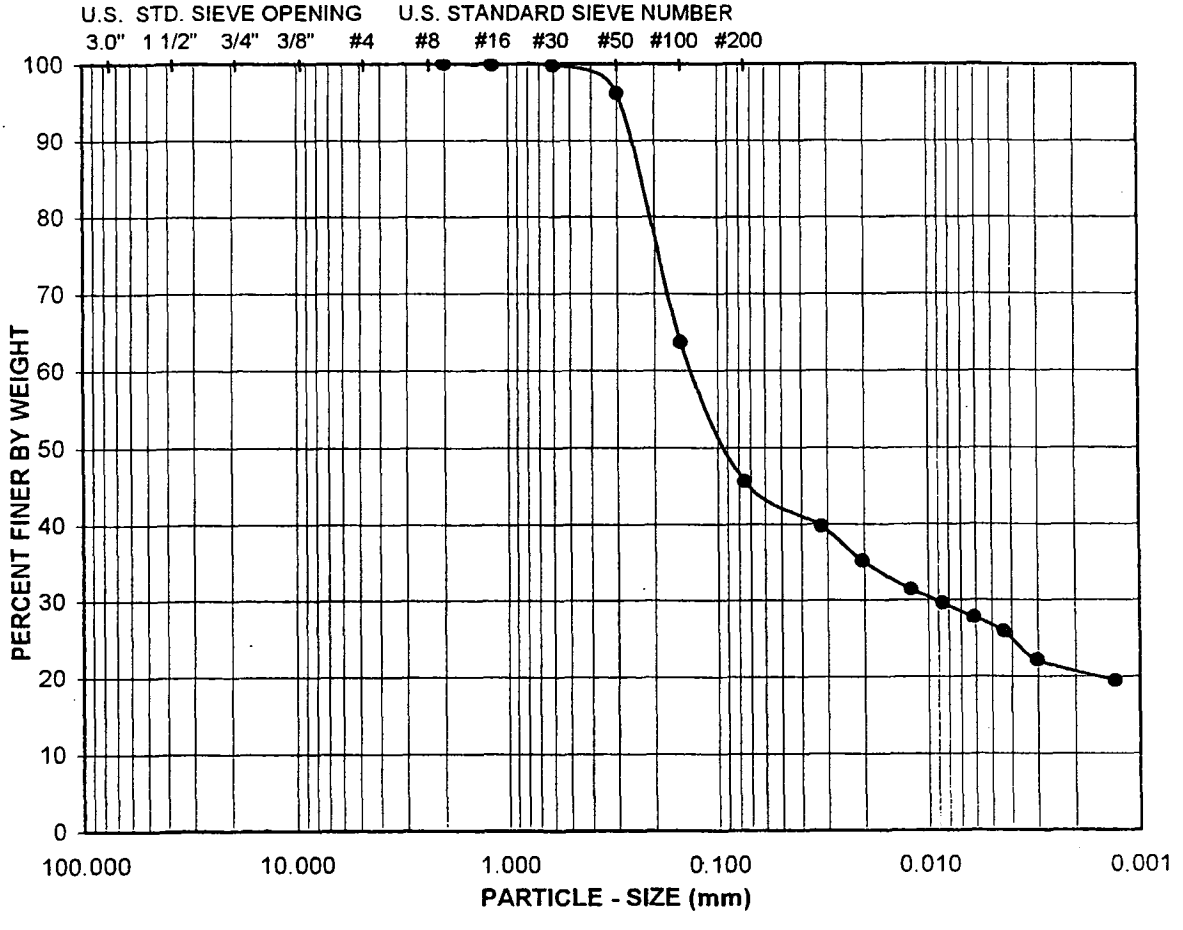
Wt. of Air-Dry Soil (gm) 53.66 Wt. of Dry Soil (gm) 53.66

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
05/22/02	9:54	0	22.9	4.0			
	9:56	2	23.0	4.0	25.5	39.7	0.0319
	9:59	5	23.0	4.0	23.0	35.1	0.0205
	10:09	15	23.0	4.0	21.0	31.4	0.0120
	10:24	30	23.0	4.0	20.0	29.6	0.0085
	10:54	60	23.0	4.0	19.0	27.7	0.0061
	11:54	120	22.8	4.0	18.0	25.9	0.0044
	14:04	250	23.3	4.0	16.0	22.2	0.0030
05/23/02	9:54	1440	21.8	4.0	14.5	19.4	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-6	095-02-029	41.0-42.5	SC	0:54:46	25,15,10

Sample Description:

Olive, clayey sand (SC)

TERATEST LABS

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

LOCATION	B-1	B-1	B-1	B-1	B-1	B-4	B-4	B-4
SAMPLE ID	095-2-002	095-2-003	095-2-005	095-2-008	095-2-009	095-2-014	095-2-015	095-2-016
Depth (ft.)	10.0	15.0	25.5	40.0	45.0	31.0	35.0	45.0
Sample Type	Bag	Sleeve	Sleeve	Bag	Sleeve	Sleeve	Bag	Bag
Visual Soil Classification	Olive yellow, silty sand (SM)	Olive yellow, silty sand (SM)	Olive brown, silty sand (SM)	Olive brown, silty sand (SM)	Olive brown, silty sand (SM)	Olive ,clayey sand (SC)	Olive ,silty sand (SM)	Olive ,silty sand (SM)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	161.36	182.39	163.76	151.26	177.29	189.17	177.33	191.20
Dry Weight of Soil + Container (gm.)	145.62	164.87	146.72	136.97	158.82	155.47	155.29	169.18
Weight of Container (gm)	57.33	71.86	55.29	60.53	66.09	63.51	57.11	74.46
Moisture Content (%)	17.83	18.84	18.64	18.69	19.92	36.65	22.45	23.25
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	295.58	355.19	325.45	260.21	328.21	291.43	335.83	299.17
Weight of Container (gm.)	77.03	74.76	76.08	75.05	79.18	76.44	82.22	78.23
Weight of Dry Sample (gm.)	185.48	235.98	210.20	156.00	207.67	157.33	207.12	179.27
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	219.88	230.62	249.48	197.71	248.62	166.01	263.53	226.88
Weight of Container (gm)	77.03	74.76	76.08	75.05	79.18	76.44	82.22	78.23
Dry Weight of Sample (gm)	142.85	155.86	173.40	122.66	169.44	89.57	181.31	148.65
% Passing No. 200 Sieve	**23.0**	**34.0**	**17.5**	**21.4**	**18.4**	**43.1**	**12.5**	**17.1**
% Retained No. 200 Sieve	77.0	66.0	82.5	78.6	81.6	56.9	87.5	82.9

TERATEST LABS

PERCENT PASSING No. 200 SIEVE
ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda CA
Project No.: 2384095-D-07060
Client Name: Foster Wheeler Environmental Corp.
Tested By: VJ Date: 05/15/02

LOCATION	B-4	B-6	B-6	B-6	B-6	B-3	B-3	B-3
SAMPLE ID	095-2-018	095-2-030	095-2-031	095-2-032	095-2-033	095-2-034	095-2-035	095-2-036
Depth (ft.)	60.0	50.0-51.5	55.0-56.5	60.0-61.5	65.0-66.5	5.0-6.5	10.0-11.5	15.0-16.5
Sample Type	Bag	Sleeve	Sleeve	Bag	Bag	Sleeve	Sleeve	Bag
Visual Soil Classification	Olive, silty sand (SM)	Olive, silty sand (SM)	Olive, poorly graded sand with silt (SP-SM)	Olive, poorly graded sand with silt (SP-SM)	Olive, poorly graded sand with silt (SP-SM)	Olive, silty sand (SM)	Olive brown, silty sand (SM)	Olive yellow, clayey sand (SC)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	147.58	151.86	163.87	183.87	159.01	195.82	155.43	180.60
Dry Weight of Soil + Container (gm.)	126.26	125.93	145.78	164.28	143.53	170.70	137.88	162.11
Weight of Container (gm)	39.64	32.73	52.35	72.94	65.34	65.67	52.74	54.19
Moisture Content (%)	24.61	27.82	19.36	21.45	19.80	23.92	20.61	17.13
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	298.50	332.42	321.41	313.29	388.61	315.19	347.28	336.15
Weight of Container (gm.)	75.38	77.60	75.63	82.51	75.39	75.85	77.04	74.01
Weight of Dry Sample (gm.)	179.05	199.36	205.91	190.02	261.46	193.15	224.06	223.80
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	224.03	247.29	256.74	254.87	308.26	244.44	217.65	230.99
Weight of Container (gm)	75.38	77.60	75.63	82.51	75.39	75.85	77.04	74.01
Dry Weight of Sample (gm)	148.65	169.69	181.11	172.36	232.87	168.59	140.61	156.98
% Passing No. 200 Sieve	**17.0**	**14.9**	**12.0**	**9.3**	**10.9**	**12.7**	**37.2**	**29.9**
% Retained No. 200 Sieve	83.0	85.1	88.0	90.7	89.1	87.3	62.8	70.1

TERATEST LABS

PERCENT PASSING No. 200 SIEVE
ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda CA
Project No.: 2384095-D-07060
Client Name: Foster Wheeler Environmental Corp.
Tested By: VJ Date: 05/15/02

-200.xls

LOCATION	B-3	B-3	B-3	B-3	B-2	B-2	B-2	B-2
SAMPLE ID	095-2-037	095-2-038	095-2-039	095-2-040	095-2-042	095-2-043	095-2-044	095-2-045
Depth (ft.)	25.0-26.5	35.0-36.5	45.0-46.5	55.0-56.5	10.0-11.5	15.0-16.5	20.0-21.5	25.0-26.5
Sample Type	Bag	Bag	Bag	Bag	Sleeve	Sleeve	Bag	Bag
Visual Soil Classification	Olive, silty sand (SM)	Olive, poorly graded sand with silt (SP-SM)	Olive, silty sand (SM)	Olive, poorly graded sand with silt (SP-SM)	Olive, silty sand (SM)	Yellowish brown, silty sand (SM)	Yellowish brown, silty sand (SM)	Olive brown, silty sand (SM)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	145.92	203.49	197.98	193.13	180.51	218.38	184.60	158.99
Dry Weight of Soil + Container (gm.)	130.82	181.35	174.25	171.10	152.17	192.95	160.79	142.32
Weight of Container (gm)	57.04	74.74	57.45	61.93	39.75	68.29	55.65	58.11
Moisture Content (%)	20.47	20.77	20.32	20.18	25.21	20.40	22.65	19.80
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	327.46	328.83	329.26	327.18	336.49	332.98	285.09	333.54
Weight of Container (gm.)	75.63	72.12	76.97	82.31	75.33	74.55	76.47	74.38
Weight of Dry Sample (gm.)	209.05	212.57	209.69	203.75	208.58	214.64	170.10	216.33
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	245.15	259.68	255.01	268.34	245.56	215.24	220.12	242.22
Weight of Container (gm)	75.63	72.12	76.97	82.31	75.33	74.55	76.47	74.38
Dry Weight of Sample (gm)	169.52	187.56	178.04	186.03	170.23	140.69	143.65	167.84
% Passing No. 200 Sieve	**18.9**	**11.8**	**15.1**	**8.7**	**18.4**	**34.5**	**15.5**	**22.4**
% Retained No. 200 Sieve	81.1	88.2	84.9	91.3	81.6	65.5	84.5	77.6

TERATEST LABS

PERCENT PASSING No. 200 SIEVE
ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda CA
Project No.: 2384095-D-07060
Client Name: Foster Wheeler Environmental Corp.
Tested By: VJ Date: 05/15/02

-200.xls

LOCATION	B-2	B-2	B-2					
SAMPLE ID	095-2-046	095-2-048	095-2-049					
Depth (ft.)	35.0-36.5	50.0-51.5	60.0-61.5					
Sample Type	Bag	Bag	Bag					
Visual Soil Classification	Olive brown, silty sand (SM)	Olive brown, poorly graded sand with silt (SP-SM)	Olive, poorly graded sand with silt (SP-SM)					
Moisture Correction								
Wet Weight of Soil + Container (gm.)	213.18	172.48	184.98					
Dry Weight of Soil + Container (gm.)	191.02	153.61	167.74					
Weight of Container (gm)	74.37	65.90	70.07					
Moisture Content (%)	19.00	21.51	17.65					
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	335.16	331.14	339.35					
Weight of Container (gm.)	75.81	76.53	82.39					
Weight of Dry Sample (gm.)	217.95	209.53	218.41					
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	248.37	262.77	282.88					
Weight of Container (gm)	75.81	76.53	82.39					
Dry Weight of Sample (gm)	172.56	186.24	200.49					
% Passing No. 200 Sieve	**20.8**	**11.1**	**8.2**					
% Retained No. 200 Sieve	79.2	88.9	91.8					

TERATEST LABS

PERCENT PASSING No. 200 SIEVE

ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda CA

Project No.: 2384095-D-07060

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 05/15/02

200.xls

Project name: ALAMEDA NAS
Project number: 01-0810

NORMAL LOAD FOR CONSOLIDATED UNDRAINED (QUICK) DIRECT SHEAR TESTS (ASTM D 3080)

Sample Identification Number	Normal Load (ksf)		
095-2-003	0.5	1.0	2.0
095-2-030	1.0	2.0	4.0
095-2-034	0.5	1.0	2.0
095-2-042	0.5	1.0	2.0
095-2-043	0.5	1.0	2.0
095-2-084	1.0	2.0	4.0
095-2-100	1.0	2.0	4.0
095-2-110	0.5	1.0	2.0
095-2-134	1.0	2.0	4.0

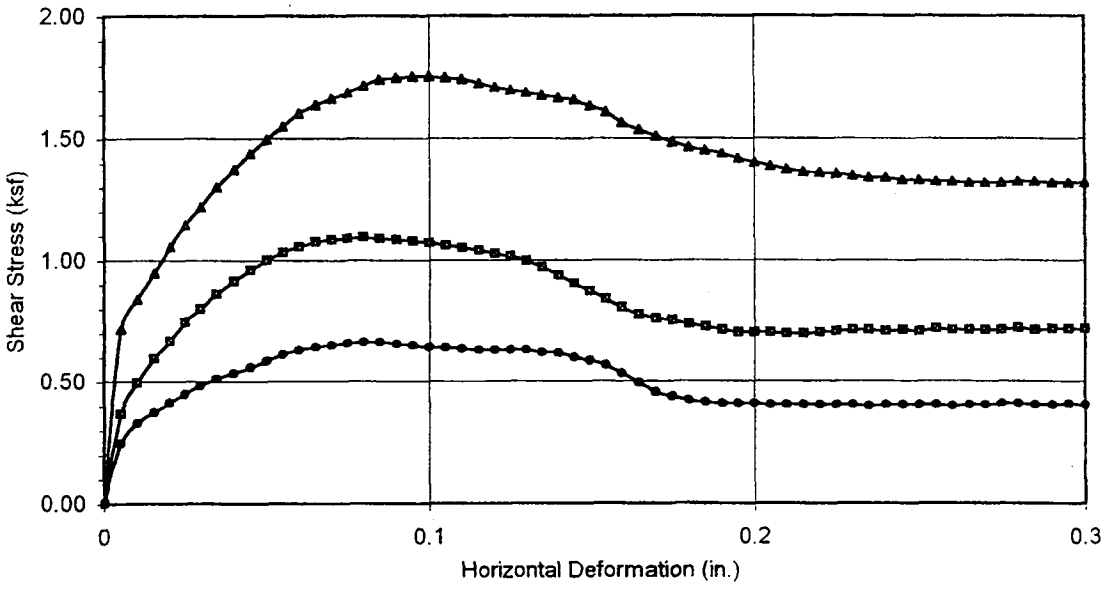
DIRECT SHEAR TEST

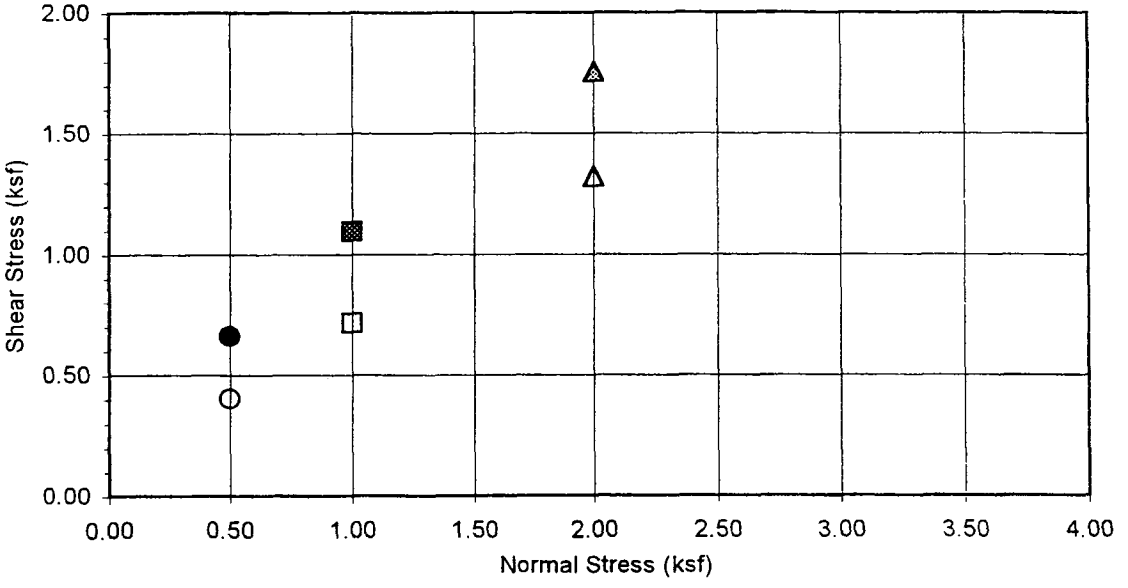
ASTM D3080

Project Name:	Geotechnical Evaluation, Site 2	Tested By:	RA	Date:	05/21/02
Project No.:	2384095-D-07060	Checked By:	LF		
Location:	B-1	Sample Type:	2"x 6" Sleeve		
Sample ID:	095-2-003	Depth (ft.):	15.0		

Sample Description: Olive brown, silty sand (SM)

Sample Diameter(in):	1.927	1.927	1.927
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	129.04	130.71	130.37
Weight of Ring(gm):	28.17	28.36	28.87
Before Shearing			
Weight of Wet Sample+Cont.(gm):	161.87	161.87	161.87
Weight of Dry Sample+Cont.(gm):	146.20	146.20	146.20
Weight of Container(gm):	64.90	64.90	64.90
Vertical Rdg.(in): Initial	0.2459	0.2207	0.1768
Vertical Rdg.(in): Final	0.2515	0.2416	0.2155
After Shearing			
Weight of Wet Sample+Cont.(gm):	134.83	137.38	167.95
Weight of Dry Sample+Cont.(gm):	119.32	122.08	152.93
Weight of Container(gm):	35.95	38.39	70.13
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.662	▩ 1.093	◬ 1.754
Shear Stress @ End of Test (ksf)	○ 0.402	□ 0.715	△ 1.319
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	1.927	1.927	1.927
Initial Moisture Content (%)	19.27	19.27	19.27
Dry Density (pcf)	110.5	112.1	111.2
Saturation (%)	99.0	103.3	100.8
Soil Height Before Shearing (in.)	0.9944	0.9791	0.9613
Final Moisture Content (%)	18.6	18.3	18.1

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-1
Sample ID: 095-2-003
Depth (ft) 15.0
Sample Type: 2"x 6" Sleeve
Soil Description: Olive brown, silty sand (SM)

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda,CA

05-02

DS B1@15.xls

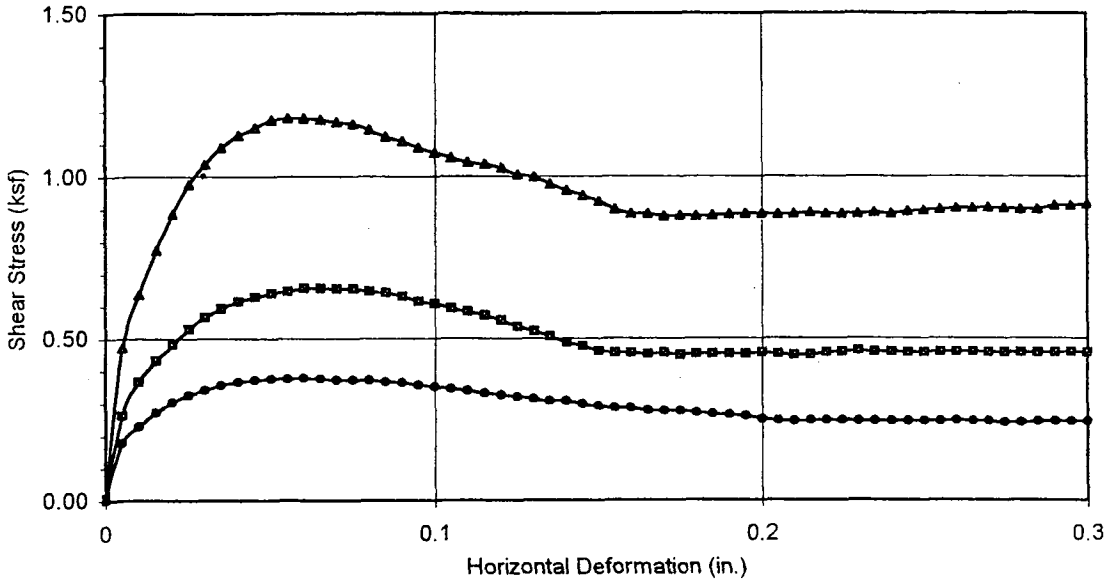
DIRECT SHEAR TEST

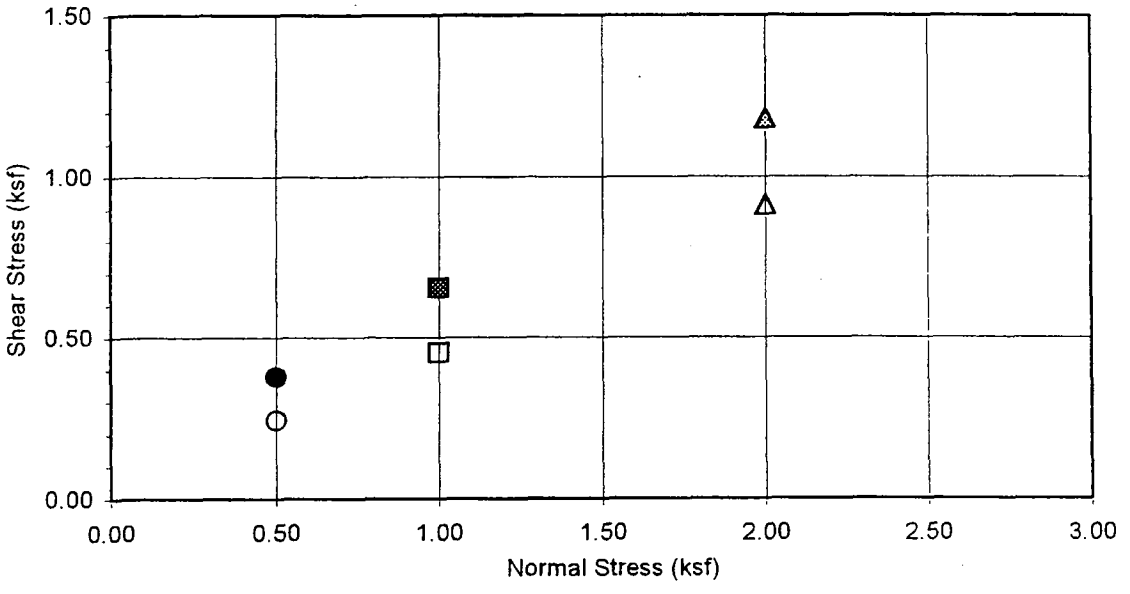
ASTM D3080

Project Name:	Geotechnical Evaluation, IR Site 2	Tested By:	FT	Date:	05/26/02
Project No.:	2384095-D-07060	Checked By:	LF		
Location:	B-2	Sample Type:	2"x 6" Sleeve		
Sample ID:	095-2-042	Depth (ft.):	10-11.5		

Sample Description: Olive, silty sand (SM)

Sample Diameter(in):	1.927	1.927	1.927
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	126.08	127.35	128.48
Weight of Ring(gm):	28.17	28.70	28.72
Before Shearing			
Weight of Wet Sample+Cont.(gm):	194.75	194.75	194.75
Weight of Dry Sample+Cont.(gm):	171.17	171.17	171.17
Weight of Container(gm):	67.22	67.22	67.22
Vertical Rdg.(in): Initial	0.0000	0.2561	0.2653
Vertical Rdg.(in): Final	-0.0016	0.2599	0.2726
After Shearing			
Weight of Wet Sample+Cont.(gm):	144.87	145.43	151.10
Weight of Dry Sample+Cont.(gm):	128.14	128.19	133.42
Weight of Container(gm):	50.79	50.11	54.37
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.377	■ 0.655	▲ 1.179
Shear Stress @ End of Test (ksf)	○ 0.243	□ 0.452	△ 0.914
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	1.927	1.927	1.927
Initial Moisture Content (%)	22.68	22.68	22.68
Dry Density (pcf)	104.2	105.0	106.2
Saturation (%)	99.3	101.3	104.3
Soil Height Before Shearing (in.)	0.9984	0.9962	0.9927
Final Moisture Content (%)	21.6	22.1	22.4

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-2
Sample ID: 095-2-042
Depth (ft) 10-11.5
Sample Type: 2"x 6" Sleeve
Soil Description: Olive, silty sand (SM)

Project No.: 2384095-D-07060
Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda,CA

06-02

DS 095-2-042 B-2 @ 10-11.5.xls

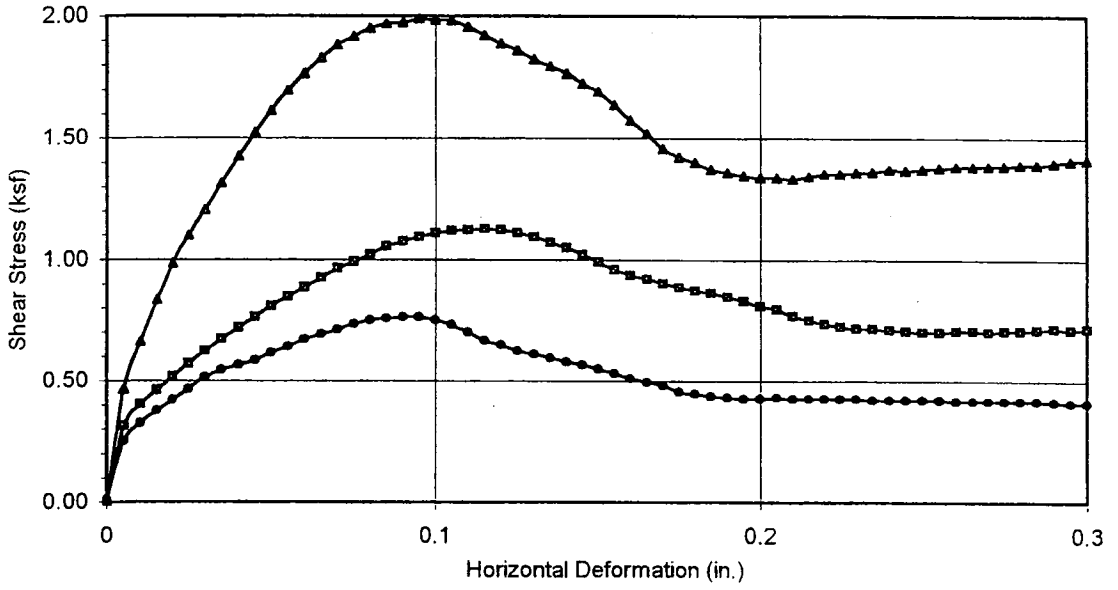
DIRECT SHEAR TEST

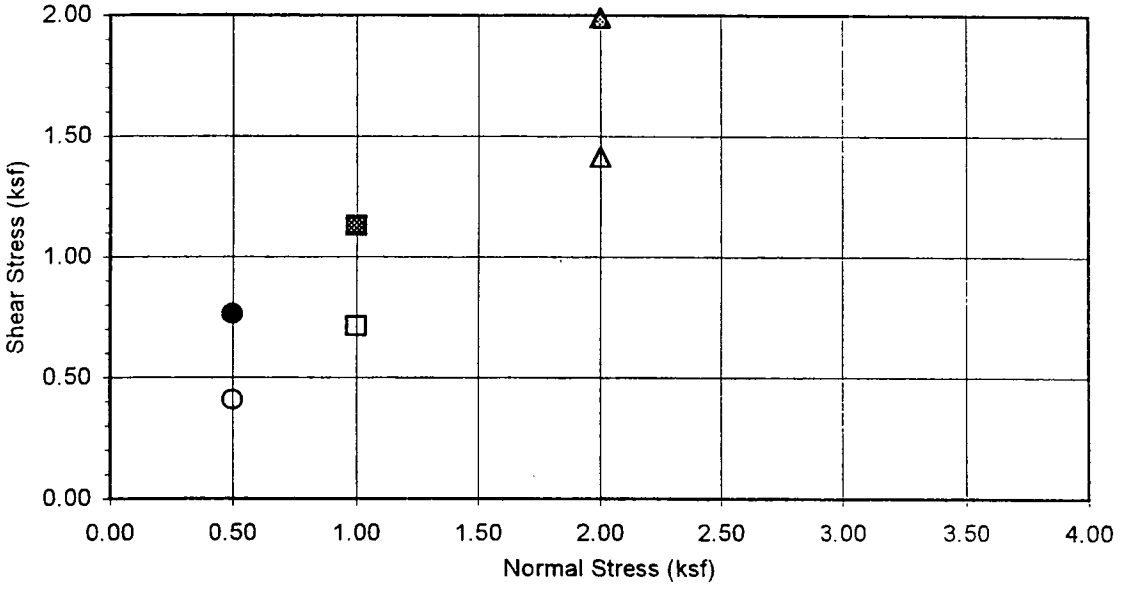
ASTM D3080

Project Name:	Geotechnical Evaluation, Site 2	Tested By:	RA	Date:	05/20/02
Project No.:	2384095-D-07060	Checked By:	LF		
Location:	B-2	Sample Type:	2"x 6" Sleeve		
Sample ID:	095-2-043	Depth (ft.):	15.0-16.5		

Sample Description: Olive, silty sand (SM)

Sample Diameter(in):	1.927	1.927	1.927
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	129.40	129.56	131.02
Weight of Ring(gm):	28.17	28.36	28.70
Before Shearing			
Weight of Wet Sample+Cont.(gm):	163.69	163.69	163.69
Weight of Dry Sample+Cont.(gm):	144.46	144.46	144.46
Weight of Container(gm):	52.71	52.71	52.71
Vertical Rdg.(in): Initial	0.1891	0.2316	0.2527
Vertical Rdg.(in): Final	0.1921	0.2502	0.2727
After Shearing			
Weight of Wet Sample+Cont.(gm):	161.09	157.92	176.48
Weight of Dry Sample+Cont.(gm):	145.05	141.85	161.55
Weight of Container(gm):	61.96	59.92	76.91
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.764	▩ 1.127	◬ 1.990
Shear Stress @ End of Test (ksf)	○ 0.407	□ 0.715	△ 1.412
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	1.927	1.927	1.927
Initial Moisture Content (%)	20.96	20.96	20.96
Dry Density (pcf)	109.3	109.3	110.5
Saturation (%)	104.4	104.3	107.7
Soil Height Before Shearing (in.)	0.9970	0.9814	0.9800
Final Moisture Content (%)	19.3	19.6	17.6

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-2
Sample ID: 095-2-043
Depth (ft) 15.0-16.5
Sample Type: 2"x 6" Sleeve
Soil Description: Olive, silty sand (SM)

Project No.: 2384095-D-07060
Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda,CA

05-02

DS B2@15.xls

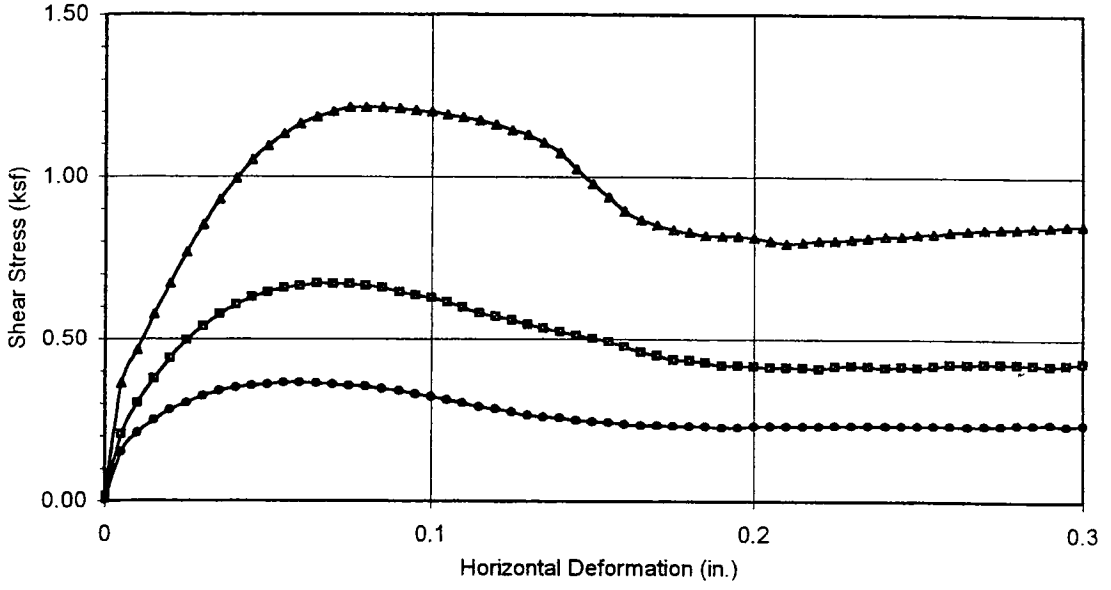
DIRECT SHEAR TEST

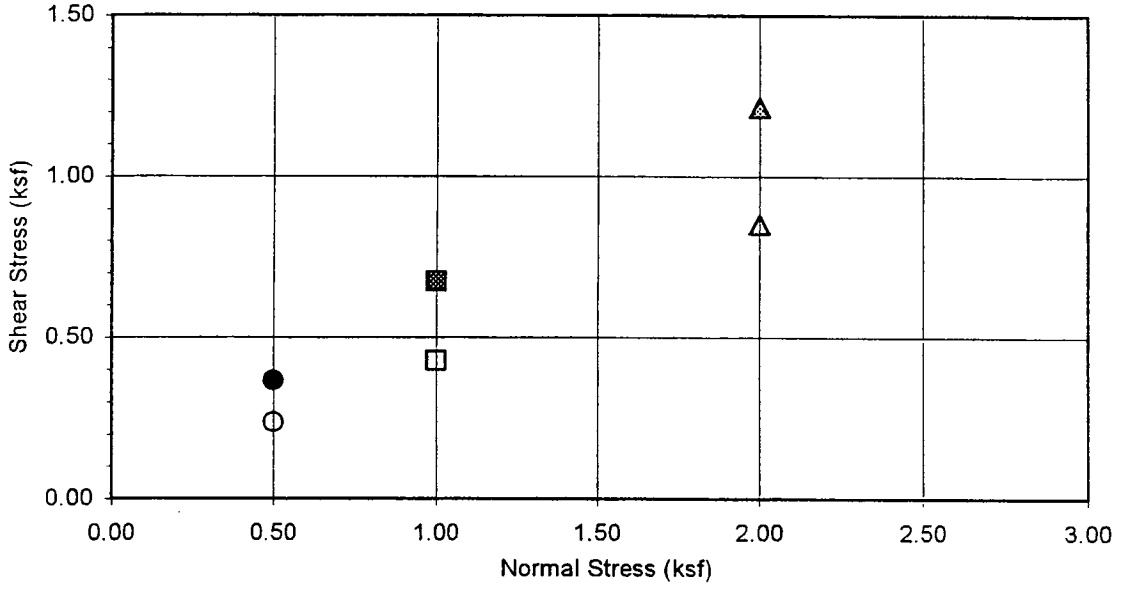
ASTM D3080

Project Name:	Geotechnical Evaluation, IR Site 2	Tested By:	RA	Date:	05/23/02
Project No.:	2384095-D-07060	Checked By:	LF		
Location:	B-3	Sample Type:	2"x 6" Sleeve		
Sample ID:	095-2-034	Depth (ft.):	5-6.5		

Sample Description: Olive, silty sand (SM)

Sample Diameter(in):	1.927	1.927	1.927
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	129.31	129.20	130.86
Weight of Ring(gm):	28.28	28.17	28.70
Before Shearing			
Weight of Wet Sample+Cont.(gm):	189.33	189.33	189.33
Weight of Dry Sample+Cont.(gm):	166.40	166.40	166.40
Weight of Container(gm):	56.80	56.80	56.80
Vertical Rdg.(in): Initial	0.2606	0.2700	0.0000
Vertical Rdg.(in): Final	0.2628	0.2754	-0.0092
After Shearing			
Weight of Wet Sample+Cont.(gm):	146.69	151.26	152.85
Weight of Dry Sample+Cont.(gm):	129.65	134.44	136.41
Weight of Container(gm):	48.54	52.60	53.26
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.365	▩ 0.673	◬ 1.213
Shear Stress @ End of Test (ksf)	○ 0.237	□ 0.427	△ 0.851
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	1.927	1.927	1.927
Initial Moisture Content (%)	20.92	20.92	20.92
Dry Density (pcf)	109.1	109.1	110.4
Saturation (%)	103.7	103.7	107.1
Soil Height Before Shearing (in.)	0.9979	0.9947	0.9908
Final Moisture Content (%)	21.0	20.6	19.8

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-3
Sample ID: 095-2-034
Depth (ft) 5-6.5
Sample Type: 2"x 6" Sleeve
Soil Description: Olive, silty sand (SM)

Project No.: 2384095-D-07060
Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda,CA

06-02

DS 095-2-034 B-3 @ 5-6.5.xls

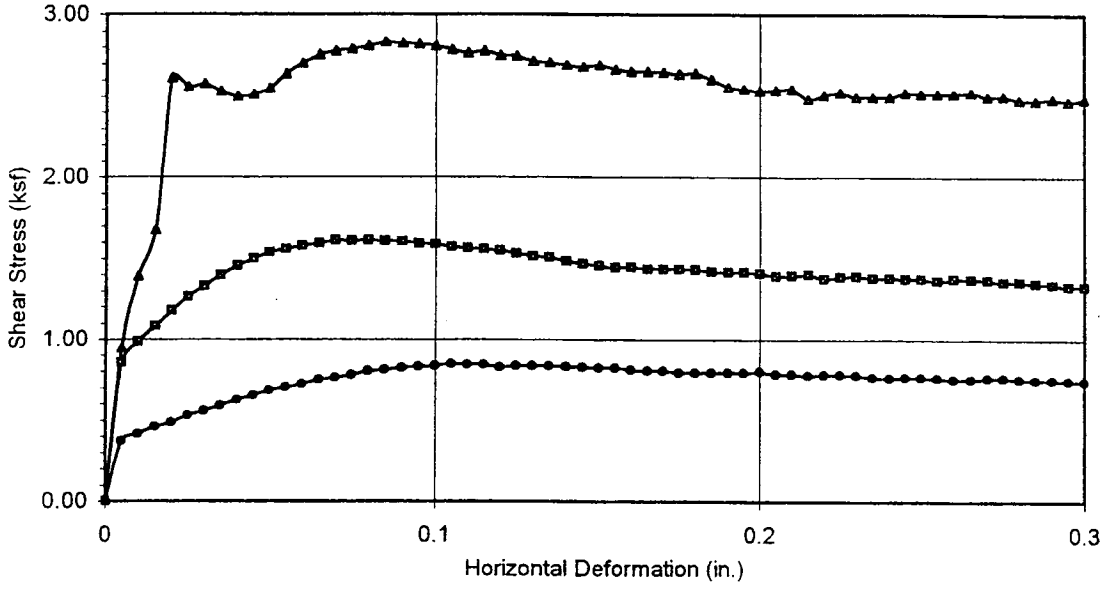
DIRECT SHEAR TEST

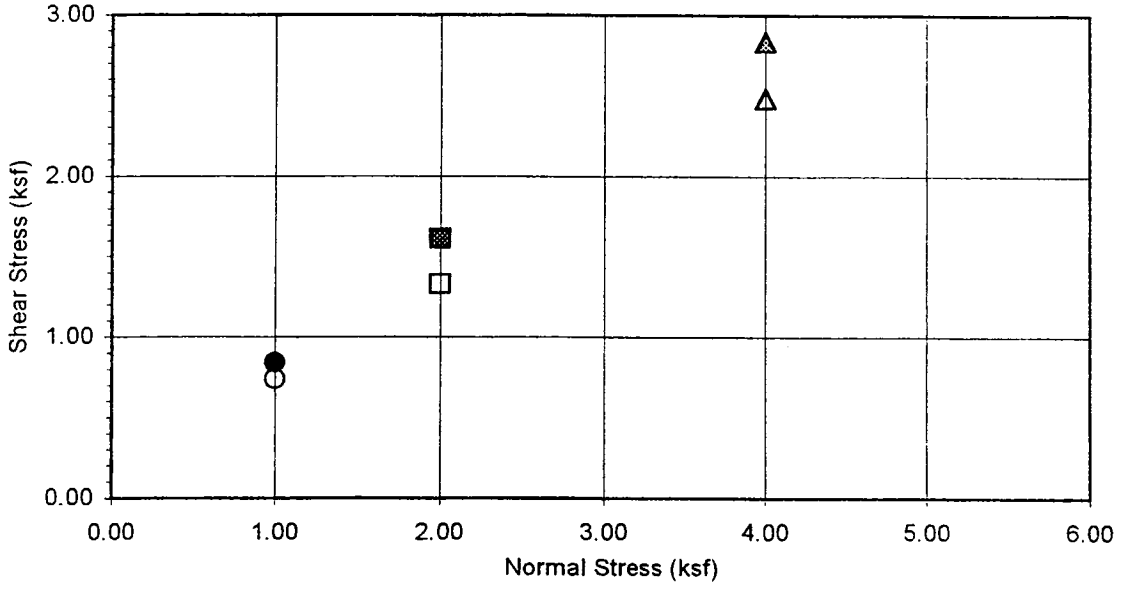
ASTM D3080

Project Name:	Geotechnical Evaluation, Site 1	Tested By:	ACS	Date:	05/20/02
Project No.:	2384095-D-07060	Checked By:	LF		
Location:	B-6	Sample Type:	2"x 6" Sleeve		
Sample ID:	095-2-030	Depth (ft.):	50.0-51.5		

Sample Description: Dark gray, silty sand (SM)

Sample Diameter(in):	1.927	1.927	1.927
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	123.11	126.51	127.08
Weight of Ring(gm):	28.17	28.11	28.36
Before Shearing			
Weight of Wet Sample+Cont.(gm):	180.54	180.54	180.54
Weight of Dry Sample+Cont.(gm):	170.70	170.70	170.70
Weight of Container(gm):	65.83	65.83	65.83
Vertical Rdg.(in): Initial	0.0000	0.2706	0.2546
Vertical Rdg.(in): Final	-0.0108	0.2896	0.2844
After Shearing			
Weight of Wet Sample+Cont.(gm):	160.23	152.72	154.04
Weight of Dry Sample+Cont.(gm):	142.78	135.43	137.41
Weight of Container(gm):	68.77	57.04	57.67
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 0.843	■ 1.613	▲ 2.833
Shear Stress @ End of Test (ksf)	○ 0.740	□ 1.328	△ 2.481
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	1.927	1.927	1.927
Initial Moisture Content (%)	9.38	9.38	9.38
Dry Density (pcf)	113.4	117.5	117.9
Saturation (%)	52.0	58.3	58.9
Soil Height Before Shearing (in.)	0.9892	0.9810	0.9702
Final Moisture Content (%)	23.6	22.1	20.9

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location:	B-6
Sample ID:	095-2-030
Depth (ft)	50.0-51.5
Sample Type:	2"x 6" Sleeve
Soil Description:	Dark gray, silty sand (SM)

Project No.: 2384095-D-07060

Geotechnical Evaluation, IR Site 2, Offshore, Alameda Point, Alameda,CA

05-02

DS B6@50.xls

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-022	top	30.0	CL	1	7	75	68	304	255
	bottom		CL	1	8	54	46	205	
095-2-023	top	50.0	CL	1	8	142	134	598	456
	bottom		CL	1	8	78	70	313	
095-2-021	top	20.5	CL	1	9	147	138	616	558
	bottom		CL	1	10	122	112	500	
095-2-013	top	25.0	CL	1	10	74	64	286	295
	bottom		CL	1	10	78	68	304	
095-2-024	top	70.0	CL	1	9	84	75	335	371
	bottom		CL	1	10	101	91	406	
095-2-029	top	41.0	SC	1	9	56	47	210	239
	bottom		SC	1	11	71	60	268	
095-2-001	top	5.0	CL	1	10	142	132	590	498
	bottom		CL	1	10	101	91	406	
095-2-011	top	5.0	CL	1	10	42	32	143	161
	bottom		CL	1	10	50	40	179	
095-2-012	top	15.0	CH	1	10	121	111	496	538
	bottom		CH	1	10	140	130	581	

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-019	top	5.0	SC/CL	1	10	167	157	701	525
	bottom		SC	1	10	88	78	348	
095-2-020	top	15.0	SC	1	10	63	53	237	460
	bottom		SC-SM	1	10	163	153	683	
095-2-027	top	7.0	CL-ML	1	87	165	78	348	302
	bottom		CL	2	10	38	28	256	
095-2-028	top	15.0	CL	1	9	58	49	219	210
	bottom		CL	1	8	53	45	201	
095-2-059	top		Not Tested						
	bottom		Not Tested						
095-2-061	top	45.0	CH	1	10	107	97	433	433
	bottom								
095-2-066	top	55.0							
	bottom		CH	1	10	123	113	505	
095-2-067	top	72.0	CH	1	10	34	24	107	420
	bottom		CH	3	1	43	42	732	
095-2-075	top	35.0	SC	1	10	97	87	389	551
	bottom		CH	2	87	165	78	714	

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No. _____

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer: _____

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-098	top	15.0	CH	1	11	92	81	362	536
	bottom		CH	1	10	169	159	710	
095-2-105	top	50.0	CL	1	9	130	121	540	634
	bottom		CL	1	9	172	163	728	
095-2-116	top	35.0	CH	1	10	89	79	353	694
	bottom		CH	2	87	200	113	1034	
095-2-118	top	45.0	CL	1	11	63	52	232	499
	bottom		CH	3	2	46	44	767	
095-2-119	top	55.0	CH	1	11	58	47	210	368
	bottom		SM	1	11	129	118	527	
095-2-120	top	70.0	CH	1	10	47	37	165	426
	bottom		SC-SM	2	87	162	75	687	
095-2-125	top	110.0	CH	4	41	56	15	67	299
	bottom		CH	4	41	160	119	531	
095-2-126	top	120.0	CH	3	93	260	167	2910	3088
	bottom		CH	4	41	156	115	3266	
095-2-131	top	25.0	CH	1	10	117	107	478	478
	bottom		SM	1	10	seashells	NA	NA	

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-132	top		Not Tested						
	bottom		Not Tested						
095-2-133	top	35.0	CH	1	10	128	118	527	627
	bottom		SC	1	12	175	163	728	

TERATEST LABS INC.

Materials Testing
Special Inspection Services
Geotechnical Testing

July 8, 2002

Foster Wheeler Environmental Corporation
1940 East Deere Avenue, Suite 200
Santa Ana, CA 92705

Attention: Mr. Vince Richards

Subject: **Report / Laboratory Testing Results / Certificate of Compliance**
Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA
Project No.: 2384095-B-07060-1000
Purchase Order No.: 040413 (with Mod. 001)
TERATEST No.: 015190
Cover Sheet for Submittal of Signed Copies of the Chain of Custody (COC) Forms / After Completion of Project

Dear Mr. Richards:

Enclosed please find laboratory testing results for the soil samples from the above referenced project. The requested tests were conducted in essential accordance with the standard test methods listed below.

TYPE OF TEST	TEST METHOD
Liquid Limit, Plastic Limit and Plasticity Index of Soils	ASTM D 4318
Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	ASTM D 2216
Density of Soil in Place by the Drive-Cylinder Method	ASTM D 2937
Particle-Size Analysis of Soils	ASTM D 422
Amount of Material in Soils Finer Than the No. 200 Sieve	ASTM D 1140
Direct Shear Test of Soils Under Consolidated Undrained Conditions	ASTM D 3080 (modified)
Laboratory Miniature Shear Test for Saturated Fine-Grained Clayey Soil	ASTM D 4648

Test results are presented in Table 1 and the attached Data Sheets.

17781 Cowan Ave., S[illegible]
Irvine, CA 92614
949 . 253 . 5922
dispatch 949 . 222 . 5321
fax 949 . 263 . 8843

ASTM: American Society for Testing and Materials, Annual Book of ASTM Standards, Section 4 Construction, Volume 04.08 Soil and Rock (I), 2000.

Thank you for selecting Teratest Labs, Inc. to provide laboratory testing services to Foster Wheeler Environmental Corporation. Please feel free to contact us if you should have any questions concerning these results.

Very truly yours,

TERATEST LABS, INC.
Laboratory Testing Services

Lester Fruth

Lester Fruth, Ph.D.
Soils Laboratory Supervisor

Enclosures

TERATEST LABS

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03637

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA POINT, ALAMEDA, CA	PROJECT NO.: DO 095
SAMPLER NAME: VINCE RICHARDS/TIM LAI	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: VINCE RICHARDS	~~AIRBILL~~ NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

LABORATORY USE (FOR LABORATORY)

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-050	2-8-02	1159	1			S												20# BAG	TP-2	3"	1.5'	
095-2-051	2-8-02	1315	1			S												20# BAG	TP-1	3"	1.0'	
095-2-052	2-8-02	1352	1			S												20# BAG	TP-3	3"	1.0'	
095-2-053	2-8-02	1426	2			S												20# BAG	TP-4	0.5'	2.0'	
095-2-054	2-11-02	1455	1			S												20# BAG	TP-10	3"	1.0'	
095-2-055	2-11-02	1534	1			S												20# BAG	TP-8	3"	1.5'	
095-2-056	2-11-02	1602	1			S												20# BAG	TP-7	3"	2.0'	
095-2-057	3-8-02	1200	1			S												3"x30" TUBE	B-12	15.0'	17.0'	
095-2-058	3-8-02	1300	1			S												3"x30" TUBE	B-12	25.0'	27.0'	
095-2-059	3-8-02	1450	1			S		/	/		/		/					2"x6" SLEEVE	B-12	30.0'	31.5'	
095-2-060	3-8-02	1550	1			S												3"x30" TUBE	B-12	40.0'	42.0'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	3/18/02	Les Frank
COMPANY: FWENC	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): Julio G. Badel	DATE: 05/03/02	RECEIVED BY (Signature): Les Frank
COMPANY: HAI	TIME: 3:30	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEALS: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

FOST LER ENVIRONMENTAL CORPORATION
1230 Columbia Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03638

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT., ALAMEDA CA.	PROJECT NO.: DO 095
SAMPLER NAME: VINCE RICHARDS / TIM LAI	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: VINCE RICHARDS	AIRBILL NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

LABORATORY ID (FOR LABORATORY)

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE / DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-061	3-8-02	1615	1			S		/	/		/		/					2"x6" SLEEVE	B-12	45.0'	46.5'	
095-2-062	3-9-02	0832	1			S		/										2"x6" SLEEVE	B-7	5.0'	6.5'	
095-2-063	3-9-02	0847	1			S												2"x6" SLEEVE	B-7	10.0'	11.5'	
095-2-064	3-9-02	1027	1			S		/										2"x6" SLEEVE	B-7	15.0'	16.5'	
095-2-065	3-11-02	0755	1			S												3"x30" TUBE	B-12	50.0'	52.0'	
095-2-066	3-11-02	0900	1			S		/	/		/		/					2"x6" SLEEVE	B-12	55.0'	56.5'	
095-2-067	3-11-02	1105	1			S		/	/		/		/					3"x30" TUBE	B-12	72.0'	74.0'	
095-2-068	3-11-02	1140	1			S												2"x6" SLEEVE	B-12	75.0'	76.5'	
095-2-069	3-11-02	1640	1			S		/		/								2"x6" SLEEVE	B-8	5.0'	6.5'	
095-2-070	3-11-02	1655	1			S		/		/								2"x6" SLEEVE	B-8	10.0'	11.5'	
095-2-071	3-11-02	1715	1			S		/		/								2"x6" SLEEVE	B-8	15.0'	16.5'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	3/11/02	Les Fruth
COMPANY: [signature]	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): Wm G Bodd	DATE: 05/03/02	RECEIVED BY (Signature): Les Fruth
COMPANY: HAI	TIME: 3:35	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03639

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT., ALAMEDA, CA.	PROJECT NO.: DO 095
SAMPLER NAME: TIM LAI	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: VINCE RICHARDS	AIRBILL NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

LABORATORY ID (CORPORATION ONLY)

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-072	3-11-02	1725	1			S		/		/								2"x6" SLEEVE	B-8	20.0'	21.5'	
095-2-073	3-11-02	1735	1			S												2"x6" SLEEVE	B-8	25.0'	26.5'	
095-2-074	3-12-02	0745	1			S		/		/								2"x6" SLEEVE	B-8	30.0'	31.5'	
095-2-075	3-12-02	0805	1			S		/	/		/		/					3"x30" TUBE	B-8	35.0'	37.0'	
095-2-076	3-12-02	0835	1			S				/								BAG	B-8	45.0'	46.5'	
095-2-077	3-12-02	0850	1			S				/								BAG	B-8	50.0'	51.5'	
095-2-078	3-12-02	0912	1			S												BAG	B-8	55.0'	56.5'	
095-2-079	3-12-02	0920	1			S		/		/								2"x6" SLEEVE	B-8	60.0'	61.5'	
095-2-080	3-12-02	0945	1			S												2"x6" SLEEVE	B-8	65.0'	66.5'	
095-2-081	3-12-02	1003	1			S		/		/								2"x6" SLEEVE	B-8	70.0'	71.5'	
095-2-082	3-12-02	1345	1			S		/		/								3"x30" TUBE	B-9	5.0'	7.0'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	3/18/02	Les Fruth
COMPANY: FWENC	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): Wm G. Bodel	DATE: 05/03/02	RECEIVED BY (Signature): Les Fruth
COMPANY: HAI	TIME:	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT FOR LABORATORY
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ BROKEN

SAMPLING COMMENT:

FOSTER ENVIRONMENTAL CORPORATION
1230 Columbia St. Suite 1100 San Diego, CA 92101 (619) 234-8696

NUMBER 03640

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT., ALAMEDA CA.	PROJECT NO.: DO 095
SAMPLER NAME: TIM LAI	SAMPLER SIGNATURE: Tim Lai
PROJECT CONTACT: VINCE RICHARDS	AIRBILL NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED: MOISTURE/DENSITY; HYDROMETER; #200; ATTERBERG; DIRECT SHEAR; UNC. VANE SHEAR

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	UNC. VANE SHEAR	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-083	3-12-02	1355	1			S		/		/				2"x6" SLEEVE	B-9	10.0'	11.5'	
095-2-084	3-12-02	1403	1			S		/		/		/		2"x6" SLEEVE	B-9	15.0'	16.5'	
095-2-085	3-12-02	1411	1			S		/		/				3"x30" TUBE	B-9	20.0'	22.0'	
095-2-086	3-12-02	1422	1			S		/		/				3"x30" TUBE	B-9	25.0'	27.0'	
095-2-087	3-12-02	1435	1			S								3"x30" TUBE	B-9	30.0'	32.0'	
095-2-088	3-12-02	1448	1			S		/		/				2"x6" SLEEVE	B-9	35.0'	36.5'	
095-2-089	3-12-02	1500	1			S								3"x30" TUBE	B-9	40.0'	42.0'	
095-2-090	3-12-02	1515	1			S		/		/				2"x6" SLEEVE	B-9	45.0'	46.5'	
095-2-091	3-12-02	1526	1			S								2"x6" SLEEVE	B-9	50.0'	51.5'	
095-2-092	3-12-02	1543	1			S				/				BAG	B-9	55.0'	56.5'	
095-2-093	3-12-02	1554	1			S								BAG	B-9	60.0'	61.5'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	3/18/02	Lee Frantz
COMPANY: FWENC	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): John G. Bodel	DATE: 03/03/02	RECEIVED BY (Signature): Lee Frantz
COMPANY: HAI	TIME: 3:35	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT BY LABORATORY:
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEALS: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03641

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT., ALAMEDA, CA.	PROJECT NO.: DO 095
SAMPLER NAME: TIM LAI	SAMPLER SIGNATURE: Tim Lai
PROJECT CONTACT: VINCE RICHARDS	AIRBILL NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

Project Information Section Do not submit to Laboratory

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN. VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-094	3-12-02	1612	1			S				/								BAG	B-9	65.0'	66.5	
095-2-095	3-12-02	1628	1			S												BAG	B-9	70.0'	71.5'	
095-2-096	3-13-02	1223	1			S												2"x6" SLEEVE	B-10	5.0'	6.5'	
095-2-097	3-13-02	1238	1			S												2"x6" SLEEVE	B-10	10.0'	11.5'	
095-2-098	3-13-02	1258	1			S		/	/		/		/					3"x30" TUBE	B-10	15.0'	17.0 17.5	
095-2-099	3-13-02	1325	1			S		/		/								2"x6" SLEEVE	B-10	20.0'	21.5	
095-2-100	3-13-02	1342	1			S				/		/						2"x6" SLEEVE	B-10	25.0'	26.5'	
095-2-101	3-13-02	1400	1			S		/		/								2"x6" SLEEVE	B-10	30.0'	31.5'	
095-2-102	3-13-02	1411	1			S					/							3"x30" TUBE	B-10	35.0'	37.0'	
095-2-103	3-13-02	1440	1			S		/		/								3"x30" TUBE	B-10	40.0'	42.0'	
095-2-104	3-13-02	1500	1			S												3"x30" TUBE	B-10	45.0'	47.0'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[illegible]	3/18/02	Les Frantt
COMPANY: FWENC	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): Willo E Badel	DATE: 03/03/02	RECEIVED BY (Signature): Les Frantt
COMPANY: HAI	TIME: 3:35	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT FOR LABORATORY
TEMPERATURE: SAMPLE CONDITION: INTACT BROKEN
COOLER NO.: CL: BROKEN

SAMPLING COMMENT:

FOSTER ENVIRONMENTAL CORPORATION
1230 Columbia S. Suite 040 San Diego, CA 92101 (619) 234-8696

NUMBER 03644

CHAIN-OF-CUSTODY RECORD

PROJECT NAME	PURCHASE ORDER NO.	LABORATORY NAME
IR SITE 2	40413	TERATEST LABS 949-253-5922
PROJECT LOCATION: ALAMEDA PT., ALAMEDA, CA.	PROJECT NO.: DO 095	[redacted]
SAMPLER NAME: TIM LAI	SAMPLER SIGNATURE: Tim Lai	
PROJECT CONTACT: VINCE RICHARDS	PHONE NUMBER: 949-283-0589	

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN. VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-105	3-13-02	1517	1			S		/	/		/		/					2"x6" SLEEVE	B-10	50.0'	51.5'	
095-2-106	3-13-02	1540	1			S												3"x30" TUBE	B-10	55.0'	57.0'	
095-2-107	3-13-02	1602	1			S				/								BAG	B-10	60.0'	61.5'	
095-2-108	3-13-02	1618	1			S												BAG	B-10	65.0'	66.5'	
095-2-109	3-13-02	1658	1			S				/								2"x6" SLEEVE	B-10	75.0'	76.5'	
095-2-110	3-14-02	0753	1			S				/		/						2"x6" SLEEVE	B-11	5.0'	6.5'	
095-2-111	3-14-02	0808	1			S												3"x30" TUBE	B-11	10.0'	12.0'	
095-2-112	3-14-02	0819	1			S		/		/								2"x6" SLEEVE	B-11	15.0'	16.5'	
095-2-113	3-14-02	0831	1			S												BAG	B-11	20.0'	21.5'	
095-2-114	3-14-02	0840	1			S		/		/								2"x6" SLEEVE	B-11	25.0'	26.5'	
095-2-115	3-14-02	0857	1			S												3"x30" TUBE	B-11	30.0'	32.0'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[illegible]	03/14/02	Lee Frutt
COMPANY: FWENC	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): [illegible]	DATE: 06/03/02	RECEIVED BY (Signature): Lee Frutt
COMPANY: HAI	TIME: 3:35	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT FOR LABORATORY USE ONLY
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

Project Information Section
Do not submit to Laboratory

SAMPLING COMMENT:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03645

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT., ALAMEDA, CA.	PROJECT NO.: DO 095
SAMPLER NAME: TIM LAI	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: VINCE RICHARDS	~~AIRBILL~~ NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

LABORATORY ID (FOR LABORATORY)

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIDECT SHEAR	MIN VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-116	3-14-02	0912	1			S		/	/		/		/					3"X30" TUBE	B-11	35.0'	37.0'	
095-2-117	3-14-02	0923	1			S												3"X30" TUBE	B-11	40.0'	42.0'	
095-2-118	3-14-02	0940	1			S		/	/		/		/					3"X30" TUBE	B-11	45.0'	47.0'	
095-2-119	3-14-02	1005	1			S		/	/		/		/					3"X30" TUBE	B-11	55.0'	57.0'	
095-2-120	3-14-02	1057	1			S		/	/		/		/					3"X30" TUBE	B-11	70.0'	72.0'	
095-2-121	3-14-02	1122	1			S												BAG	B-11	75.0'	76.5'	
095-2-122	3-14-02	1148	1			S				/								BAG	B-11	80.0'	81.5'	
095-2-123	3-14-02	1230	1			S												2"X6" SLEEVE	B-11	90.0'	91.5'	
095-2-124	3-14-02	1328	1			S												BAG	B-11	105.0'	106.5'	
095-2-125	3-14-02	1355	1			S		/	/		/		/					3"X30" TUBE	B-11	110.0'	112.0'	
095-2-126	3-14-02	1414	1			S		/	/		/		/					3"X30" TUBE	B-11	120.0'	122.0'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	03/18/02	Les Fruth
COMPANY: FWENC	TIME: 0802	COMPANY: Teratest
RELINQUISHED BY (Signature): [signature]	DATE: 05/03/02	RECEIVED BY (Signature): Les Fruth
COMPANY: HAI	TIME: 3:35	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File

FOSTER ... R ENVIRONMENTAL CORPORATION
1230 Columbia ... ite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03646

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: IR SITE 2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT., ALAMEDA, CA.	PROJECT NO.: DO 095
SAMPLER NAME: TIM LAI	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: VINCE RICHARDS	AIRBILL NUMBER: 949-283-0589

LABORATORY NAME: TERATEST LABS 949-253-5922

LABORATORY ID (FOR LABORATORY)

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	MOISTURE/DENSITY	HYDROMETER	#200	ATTERBERG	DIRECT SHEAR	MIN VANE SHEAR					COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-127	3-14-02	1520	1			S												BAG	B-11	130.0'	132.0'	
095-2-128	3-15-02	0738	1			S												BAG	B-7A	5.0'	6.5'	
095-2-129	3-15-02	0745	1			S												BAG	B-7A	10.0'	11.5'	
095-2-130	3-15-02	0802	1			S												BAG	B-7A	15.0'	16.5'	
095-2-131	3-15-02	0855	1			S		/	/		/		/					3"X30" TUBE	B-7A	25.0'	27.0'	
095-2-132	3-15-02	0915	1			S		/	/		/		/					2"X6" SLEEVE	B-7A	30.0'	31.5'	
095-2-133	3-15-02	0928	1			S		/	/		/		/					3"X30" TUBE	B-7A	35.0'	37.0'	
095-2-134	3-15-02	0945	1			S				/		/						2"X6" SLEEVE	B-7A	40.0'	41.5'	
095-2-135	3-15-02	1000	1			S												BAG	B-7A	45.0'	46.5'	
095-2-136	3-15-02	1012	1			S				/								BAG	B-7A	50.0'	51.5'	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	3/1/02	Les Fruth
COMPANY: TWENC	TIME: 0800	COMPANY: Teratest
RELINQUISHED BY (Signature): [signature]	DATE: 05/03/02	RECEIVED BY (Signature): Les Fruth
COMPANY: HAI	TIME: 3:35	COMPANY: TTL
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS

COMPOSITE DESCRIPTION

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

GEOTECHNICAL EVALUATION

CLIENT AND SITE LOCATION
FOSTER WHEELER ENVIRONMENTAL CORP.
IR SITE 2, ALAMEDA PT., ALAMEDA, CA

SAMPLERS (SIGNATURE)

CALL & SEND RESULTS TO:
~~LEIGHTON & ASSOCIATES, INC.~~
TERATEST LABS, INC.*
FAX: (949)263-8843
ATTENTION: LES FRUTH
PHONE NO.: (949) 253-5922

SAMPLE NUMBER	DATE	TIME	DEPTH BELOW GRADE (FT)	SAMPLE TYPE	NO. OF CONTAINERS	TYPE OF CONTAINER	CONTAINER VOLUME (LIQUID ONLY)	TYPE OF PRESERVATION (IF NECESSARY)	SEDIMENT VOLUME IN LIQUID SAMPLE	EPA TEST METHOD NO.	VANE SHEAR (ASTM D 4648-94 OR EQUIVALENT)	REMARKS
095-2-001	12-17-01	1250	5	3"x30" TUBE	1	SHELBY	BOX				X	PLEASE INVOICE
095-2-011	12-19-01	0710	5	3"x30" TUBE		"			"		X	USING JOB NUMBER
095-2-012	12-19-01	0720	15	3"x30" TUBE		"			"		X	015190-C01
095-2-013	12-19-01	0740	25	2"x6" SLEEVE	1	METAL	BOX				X	
095-2-019	12-19-01	1020	5	3"x30" TUBE		SHELBY	BOX				X	
095-2-020	12-19-01	1035	15	3"x30" TUBE		"			"		X	TOTAL OF TWO
095-2-021	12-19-01	1040	20.5	2"x6" SLEEVE		METAL	BOX				X	CONTAINERS: ONE
095-2-022	12-19-01	1100	30	2"x6" SLEEVE		"			"		X	SHELBY TUBE BOX
095-2-023	12-19-01	1110	50	2"x6" SLEEVE		"			"		X	AND ONE SMALL
095-2-024	12-19-01	1130	70	2"x6" SLEEVE		"			"		X	METAL BOX
095-2-027	12-19-01	1420	7	3"x30" TUBE		SHELBY	BOX				X	
095-2-028	12-19-01	1430	15	3"x30" TUBE		"			"		X	
095-2-029	12-19-01	1450	41	2"x6" SLEEVE		METAL	BOX				X	

SAMPLES INTACT: YES _____ NO _____
SAMPLES PROPERLY COOLED: YES _____ NO _____
SAMPLES ACCEPTED: YES _____ NO _____
IF NOT, WHY: _____

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
James H Ward	5/31/02 3:15 PM	Tom O'Meara TOM O'MEARA
Tom O'Meara	6/11/02 1605	James H Ward

SAMPLES PLACED IN LAB REFRIGERATOR
DATE _____ TIME _____ LAB REP. INITIALS _____

RECEIVED FOR LAB BY:

LABORATORY NAME:

CERTIFICATION NO:

CHAIN-OF-CUSTODY RECORD

*TERATEST LABS, INC.
1778 SOWAN AVE., STE. 150
IRVINE CA 92614

Project No. 015190-C01
Project Name FOSTER WHEELER IR SITE 2
Date 05/31/02

10 390

WHITE - FILE COPY YELLOW - LAB COPY PINK - PROJECT MANAGER COPY

CLIENT AND LOCATION
FOSTER WHEELER ENVIRONMENTAL CORP.
IR SITE 2, ALAMEDA PT., ALAMEDA, CA

SAMPLERS (SIGNATURE)

CALL & SEND RESULTS TO:
~~LEIGHTON & ASSOCIATES, INC.~~
TERATEST LABS, INC.*
FAX: (949) 263-8843
ATTENTION: LES FRUTH
PHONE NO.: (949) 253-5922

SAMPLE NUMBER	DATE	TIME	DEPTH BELOW GRADE (FT)	SAMPLE TYPE	NO. OF CONTAINERS	TYPE OF CONTAINER	CONTAINER VOLUME (LIQUID ONLY)	TYPE OF PRESERVATION (IF NECESSARY)	SEDIMENT VOLUME IN LIQUID SAMPLE	EPA TEST METHOD NO.	VANE SHEAR (ASTM D 4648-94 OR EQUIVALENT)	REMARKS
095-2-059	3-8-02	14:50	30	2"x6" SLEEVE	1	METAL BOX					NOT AVAILABLE	PLEASE INVOICE USING
095-2-061	3-8-02	16:15	45	2"x6" SLEEVE		"			"			JOB NUMBER
095-2-066	3-11-02	09:00	55	2"x6" SLEEVE		"			"			015190-C01
095-2-067	3-11-02	11:05	72	3"x30" TUBE	2	SHELBY						
095-2-075	3-12-02	08:05	35	3"x30" TUBE		BOXES						TOTAL OF THREE
095-2-098	3-13-02	12:58	15	3"x30" TUBE								CONTAINERS:
095-2-105	3-13-02	15:17	50	2"x6" SLEEVE		METAL BOX						ONE SMALL METAL
095-2-116	3-14-02	09:12	35	3"x30" TUBE		SHELBY						BOX AND TWO
095-2-118	3-14-02	~~10:05~~ 09:55	45	3"x30" TUBE		BOXES						SHELBY TUBE
095-2-119	3-14-02	10:05	55	3"x30" TUBE								BOXES
095-2-120	3-14-02	10:57	70	3"x30" TUBE								
095-2-125	3-14-02	13:55	110	3"x30" TUBE								
095-2-126	3-14-02	14:14	120	3"x30" TUBE								
095-2-131	3-15-02	08:55	25	3"x30" TUBE								
095-2-132	3-15-02	09:15	30	2"x6" SLEEVE		METAL BOX					NOT TESTED	

SAMPLES INTACT: YES _____ NO _____
SAMPLES PROPERLY COOLED: YES _____ NO _____
SAMPLES ACCEPTED: YES _____ NO _____
IF NOT, WHY: _____

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
James H Ward (James Ward)	6/11/02 16:05	Tom O'Meara
Tom O'Meara	6/12/02 1608	James Ward

SAMPLES PLACED IN LAB REFRIGERATOR
DATE _____ TIME _____ LAB REP. INITIALS _____

RECEIVED FOR LAB BY:

LABORATORY NAME:

CERTIFICATION NO:

CHAIN-OF-CUSTODY RECORD

*TERATEST LABS, INC.
17781 COWAN AVE., STE. 150
IRVINE, CA 92614

Project No. 2384095-D-07060-1000
Project Name GEOTECHNICAL EVALUATION, IR SITE 2, ALAMEDA PT., ALAMEDA, CA
Date _____

4010 390

WHITE - FILE COPY YELLOW - LAB COPY PINK - PROJECT MANAGER COPY

CLIENT AND SITE LOCATION
FOSTER WHEELER ENVIRONMENTAL CORP.
IR SITE 2, ALAMEDA PT., ALAMEDA, CA

SAMPLERS (SIGNATURE)

CALL & SEND RESULTS TO:
~~LEIGHTON & ASSOCIATES, INC.~~
TERATEST LABS, INC.*
FAX: (949) 263-8843
ATTENTION: LES FRUTH
PHONE NO.: (949) 253-5922

SAMPLE NUMBER	DATE	TIME	DEPTH BELOW GRADE (FT)	SAMPLE TYPE	NO. OF CONTAINERS	TYPE OF CONTAINER	CONTAINER VOLUME (LIQUID ONLY)	TYPE OF PRESERVATION (IF NECESSARY)	SEDIMENT VOLUME IN LIQUID SAMPLE	EPA TEST METHOD NO.	VANE SHEAR (ASTM D 4648-94 OR EQUIVALENT)	REMARKS
095-2-133	3-15-02	09:28	35	3"x3" TUBE		SHELBY	BOX				X	PLEASE INVOICE USING JOB NUMBER 015190-C01

SAMPLES INTACT: YES ____ NO ____	RELINQUISHED BY: James H Ward (James Ward)	DATE/TIME 6/14/02 16:05	RECEIVED BY: Tom O'Meara
SAMPLES PROPERLY COOLED: YES ____ NO ____			
SAMPLES ACCEPTED: YES ____ NO ____	RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
IF NOT, WHY: ____			
SAMPLES PLACED IN LAB REFRIGERATOR DATE ____ TIME ____ LAB REP. INITIALS ____	RELINQUISHED BY:	DATE/TIME	RECEIVED FOR LAB BY:
LABORATORY NAME:	CERTIFICATION NO:		

CHAIN-OF-CUSTODY RECORD

*TERATEST LABS, INC.
17781 OWAN AVE., STE. 150
IRVIN CA 92614

Project No. 2384095-D-07060-1000
Project Name GEOTECHNICAL EVALUATION, IR SITE 2, ALAMEDA PT., ALAMEDA, CA
Date ____

390

WHITE - FIL YELLOW - COPY PINK - PROJECT MANAGER COPY

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

Project No.: 2384095-B-07060-1000

Client: Foster Wheeler Environmental Corporation

Teratest No. 015190

Tabulated By: LF

Date: 07/08/02

TABLE 1

SUMMARY of LABORATORY TEST RESULTS

Sample ID	Location	Depth (ft.)	Sample Type	Moisture Content ASTM D 2216 (%)	Dry Density ASTM D 2937 (pcf)	Atterberg Limits ASTM D 4318 LL,PL,PI[1]	Particle - Size Distribution ASTM D 422 GR:SA:FI[2] (%)	Percent Passing No. 200 Sieve ASTM D 1140 (%)	Laboratory Miniature Vane Shear Shear Strength ASTM D 4648 (psf) average	Soil Classification / Identification* ASTM D 2487 / D 2488* (group symbol)
095-2-059	B-12	30.0-31.5	2.5"x6" Sleeve	64.8	Bad Sample	54,31,23	0:20:80		Not Tested	(MH)s
095-2-061	B-12	45.0-46.5	2.5"x6" Sleeve	50.1	71.7	62,29,33	0:9:91		433	CH
095-2-062	B-7	5.0-6.5	2.5"x6" Sleeve	22.8	100.8					CL*
095-2-064	B-7	15.0-16.5	2.5"x6" Sleeve	25.8	102.5					SM*
095-2-066	B-12	55.0-56.5	2.5"x6" Sleeve	52.8	69.7	62,27,35	0:2:98		505	CH
095-2-067	B-12	72.0-74.0	3"x30" Tube	44.3	74.5	52,29,23	0:2:98		420	MH/CH
095-2-069	B-8	5.0-6.5	2.5"x6" Sleeve	31.7	94.8			27.8		SC
095-2-070	B-8	10.0-11.5	2.5"x6" Sleeve	18.7	101.5			43.0		SC
095-2-071	B-8	15.0-16.5	2.5"x6" Sleeve	19.3	107.0			8.9		SP-SM
095-2-072	B-8	20.0-21.5	2.5"x6" Sleeve	21.8	100.6			4.4		SP
095-2-074	B-8	30.0-31.5	2.5"x6" Sleeve	22.7	Bad Sample			5.9		SP-SM
095-2-075	B-8	35.0-37.0	3"x30" Tube	48.1	74.9	42,23,19	0:32:68		551	s(CL)
095-2-076	B-8	45.0-46.5	Bag					11.1		SP-SM
095-2-077	B-8	50.0-51.5	Bag					22.1		SC
095-2-079	B-8	60.0-61.5	2.5"x6" Sleeve	20.4	113.9			6.7		SP-SM
095-2-081	B-8	70.0-71.5	2.5"x6" Sleeve	21.7	109.5			14.1		SC/SM
095-2-082	B-9	5.0-7.0	3"x30" Tube	30.2	94.2			26.0		SC
095-2-083	B-9	10.0-11.5	2.5"x6" Sleeve	14.2	115.5			43.6		SC
095-2-084	B-9	15.0-16.5	2.5"x6" Sleeve	21.8	108.3			9.1		SP-SM
095-2-085	B-9	20.0-22.0	3"x30" Tube	20.6	104.0			2.3		SP
095-2-086	B-9	25.0-27.0	3"x30" Tube	20.8	104.6			5.5		SP-SM

[1] LL,PL,PI = Liquid Limit, Plastic Limit, Plasticity Index

[2] GR:SA:FI = Gravel: Sand: Fines (Percent Passing #200 Sieve)

[3] Average values from Direct Shear Test Specimens

TABLE 1 cont'd

SUMMARY of LABORATORY TEST RESULTS

Sample ID	Location	Depth (ft.)	Sample Type	Moisture Content ASTM D 2216 (%)	Dry Density ASTM D 2937 (pcf)	Atterberg Limits ASTM D 4318 LL,PL,PI[1]	Particle - Size Distribution ASTM D 422 GR:SA:FI[2] (%)	Percent Passing No. 200 Sieve ASTM D 1140 (%)	Laboratory Miniature Vane Shear Shear Strength ASTM D 4648 (psf) average	Soil Classification / Identification* ASTM D 2487 / D 2488* (group symbol)
095-2-088	B-9	35.0-36.5	2.5"x6" Sleeve	21.8	109.8			3.8		SP
095-2-090	B-9	45.0-46.5	2.5"x6" Sleeve	27.8	99.0			30.4		SC/SM
095-2-092	B-9	55.0-56.5	Bag					23.6		SC
095-2-094	B-9	65.0-66.5	Bag					17.2		SC
095-2-098	B-10	15.0-17.0	3"x30" Tube	73.2	55.6	96,34,62	0:1:99		536	CH
095-2-099	B-10	20.0-21.5	2.5"x6" Sleeve	18.7	111.0			7.1		SP-SM
095-2-100	B-10	25.0-26.5	2.5"x6" Sleeve	33.2	89.7[3]			28.4		SC/SM
095-2-101	B-10	30.0-31.5	2.5"x6" Sleeve	22.3	107.5			6.5		SP-SM
095-2-103	B-10	40.0-42.0	3"x30" Tube	20.6	99.0			4.2		SP
095-2-105	B-10	50.0-51.5	2.5"x6" Sleeve	44.8	77.6	43,22,21	0:12:88		634	CL
095-2-107	B-10	60.0-61.5	Bag					9.3		SP-SM
095-2-109	B-10	75.0-76.5	2.5"x6" Sleeve					13.4		SM
095-2-110	B-11	5.0-6.5	2.5"x6" Sleeve	22.4	92.7[3]			36.4		SC
095-2-112	B-11	15.0-16.5	2.5"x6" Sleeve	23.5	104.8			7.5		SP-SM
095-2-114	B-11	25.0-26.5	2.5"x6" Sleeve	26.2	101.8			28.3		SM
095-2-116	B-11	35.0-37.0	3"x30" Tube	32.8	92.6	36,18,18	0:50:50		694	s(CL)
095-2-118	B-11	45.0-47.0	3"x30" Tube	47.4	70.7	57,32,25	0:5:95		499	MH
095-2-119	B-11	55.0-57.0	3"x30" Tube	29.3	91.3	Nonplastic	0:79:21		368	SM
095-2-120	B-11	70.0-72.0	3"x30" Tube	18.3	107.7	Nonplastic	0:76:24		426	SM
095-2-122	B-11	80.0-81.5	Bag					16.1		SC
095-2-125	B-11	110.0-112.0	3"x30" Tube	42.8	77.2	69,29,40	0:6:94		299	CH
095-2-126	B-11	120.0-122.0	3"x30" Tube	44.5	75.4	60,31,29	0:31:69		3088	s(CH)
095-2-131	B-7A	25.0-27.0	3"x30" Tube	24.0	100.0	Nonplastic	3:86:11		478	SP-SM
095-2-132	B-7A	30.0-31.5	2.5"x6" Sleeve	36.5	90.1	24,16,8	0:53:47		Not Tested	SC
095-2-133	B-7A	35.0-37.0	3"x30" Tube	23.5	102.0	Nonplastic	0:88:12		627	SP-SM
095-2-134	B-7A	40.0-41.5	2.5"x6" Sleeve	21.6	106.5[3]			31.4		SM
[illegible]	[illegible]36	B-7A	50.0-51.5	Bag	[illegible]			15.2		[illegible]

[1] LL, [illegible] Liquid Limit, Plastic Limit, Plasticity Index

[2] GR:[illegible] = Gravel: Sand: Fines (Percent Passing #200 Sieve)

[3] Aver[illegible]es from Direct Shear Test Specimens

LOCATION	B-12	B-12	B-7	B-7	B-12	B-12	B-8	B-8
SAMPLE ID	095-2-059	095-2-061	095-2-062	095-2-064	095-2-066	095-2-067	095-2-069	095-2-070
Depth (ft.)	30.0-31.5	45.0-46.5	5.0-6.5	15.0-16.5	55.0-56.5	72.0-74.0	5.0-6.5	10-11.5
Sample Type	Sleeve	Sleeve	Sleeve	Sleeve	Sleeve	Tube	Sleeve	Sleeve
Visual Soil Identification	Olive elastic silt with sand (MH)s	Dark gray fat clay (CH)	Olive brown lean clay (CL) with layers of sand	Dark gray silty sand (SM)	Dark gray fat clay (CH)	Dark gray elastic silt / fat clay (MH/CH)	Olive brown clayey sand (SC)	Olive brown, Top: clayey sand (SC), Bot.: Loose poorly graded sand (SP)
Pocket Penetrometer	N/A	0.25	2.25	0.25	0.5	0.75	>4.5 / 1.25	2.5 / 0.5
Weight Soil + Rings / Tube (gm.	Bad Sample:	980.16	1006.20	901.84	972.66	1543.25	1078.48	1064.34
Weight of Rings / Tube (gm.	Dia. Only = 1/4	204.17	204.17	204.17	204.17	453.55	204.17	204.17
Average Length (in.)	Circle	6.000	5.390	4.500	6.000	5.946	5.710	5.820
Average Diameter (in.)	N/A	2.415	2.415	2.415	2.415	2.875	2.439	2.439
Wet. Wt. of Soil + Cont. (gm.	329.00	185.17	253.93	176.18	187.59	198.88	240.44	174.38
Dry Wt. of Soil + Cont. (gm.)	232.10	136.47	220.66	150.58	143.29	154.80	197.68	157.22
Weight of Container (gm)	82.46	39.27	74.75	51.37	59.34	55.37	62.60	65.59
Container No.:								
Wet Density		107.6	123.8	128.9	106.5	107.5	124.8	120.5
Moisture Content (%)	**64.8**	**50.1**	**22.8**	**25.8**	**52.8**	**44.3**	**31.7**	**18.7**
Dry Density (pcf)		**71.7**	**100.8**	**102.5**	**69.7**	**74.5**	**94.8**	**101.5**
Degree of Saturation (%)		100.0	91.5	108.1	100.5	94.8	109.9	76.5

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: RA Date: 06/12/02

LOCATION	B-8	B-8	B-8	B-8	B-8	B-8	B-9	B-9
SAMPLE ID	095-2-071	095-2-072	095-2-074	095-2-075	095-2-079	095-2-081	095-2-082	095-2-083
Depth (ft.)	15.0-16.5	20.0-21.5	30.0-31.5	35.0-37.0	60.0-61.5	70.0-71.5	5.0-7.0	10.0-11.5
Sample Type	Sleeve	Sleeve	Sleeve	Tube	Sleeve	Sleeve	Tube	Sleeve
Visual Soil Identification	Olive poorly graded sand with silt (SP-SM) LOOSE	Olive brown poorly graded sand (SP) LOOSE	Olive poorly graded sand with silt (SP-SM)	Olive brown sandy lean clay s(CL)	Olive brown poorly graded sand with silt (SP-SM)	Light brown clayey / silty sand (SC/SM)	Olive brown clayey sand (SC)	Olive clayey sand (SC)
Pocket Penetrometer	0.75	1.5	N/A	0.5	2.5	1.75	2.25-3.0	2.0
Weight Soil + Rings / Tube (gm.	1069.42	1043.58	Bad Sample:	1572.25	1176.94	1161.86	1766.15	1072.16
Weight of Rings / Tube (gm.	204.17	204.17	Dia. Only = 1/2	452.33	204.17	204.17	481.57	204.17
Average Length (in.)	5.640	5.700	Circle	5.930	5.900	5.980	6.144	5.470
Average Diameter (in.)	2.415	2.415	2.415	2.875	2.415	2.415	2.875	2.415
Wet. Wt. of Soil + Cont. (gm.	455.01	486.40	415.67	223.44	389.22	420.19	230.56	309.73
Dry Wt. of Soil + Cont. (gm.)	393.61	413.24	353.10	171.56	337.31	358.93	192.10	280.63
Weight of Container (gm)	74.76	76.97	77.02	63.60	82.28	76.05	64.73	75.91
Container No.:								
Wet Density	127.6	122.5		110.8	137.1	133.2	122.7	132.0
Moisture Content (%)	**19.3**	**21.8**	**22.7**	**48.1**	**20.4**	**21.7**	**30.2**	**14.2**
Dry Density (pcf)	**107.0**	**100.6**		**74.9**	**113.9**	**109.5**	**94.2**	**115.5**
Degree of Saturation (%)	90.3	86.9		103.6	114.6	108.4	103.4	83.6

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: RA Date: 06/12/02

LOCATION	B-9	B-9	B-9	B-9	B-9	B-10	B-10	B-10
SAMPLE ID	095-2-084	095-2-085	095-2-086	095-2-088	095-2-090	095-2-098	095-2-099	095-2-101
Depth (ft.)	15.0-16.5	20.0-22.0	25.0-27.0	35.0-36.5	45.0-46.5	15.0-17.0	20.0-21.5	30.0-31.5
Sample Type	Sleeve	Tube	Tube	Sleeve	Sleeve	Tube	Sleeve	Sleeve
Visual Soil Identification	Olive brown poorly graded sand with silt (SP-SM)	Olive poorly graded sand (SP)	Olive poorly graded sand with silt (SP-SM)	Olive poorly graded sand (SP)	Dark gray clayey / silty sand (SC/SM)	Dark olive fat clay (CH)	Olive poorly graded sand with silt (SP-SM)	Olive poorly graded sand with silt (SP-SM)
Pocket Penetrometer	1.0	1.75	0.5 / 2.75	1.0	0.5	1.25	0.75	0.5
Weight Soil + Rings / Tube (gm.	598.32	1799.95	1789.60	1008.24	1063.64	1441.55	1039.62	1105.82
Weight of Rings / Tube (gm.	122.44	479.65	468.97	204.17	204.17	457.67	204.17	204.17
Average Length (in.)	3.000	6.181	6.138	5.000	5.650	6.000	5.275	5.700
Average Diameter (in.)	2.415	2.875	2.875	2.415	2.415	2.875	2.415	2.415
Wet. Wt. of Soil + Cont. (gm.	211.45	274.31	201.08	273.40	316.25	183.35	259.68	261.42
Dry Wt. of Soil + Cont. (gm.)	186.89	237.30	172.89	234.72	259.40	131.54	228.98	220.96
Weight of Container (gm)	74.44	57.36	37.07	57.38	55.27	60.78	64.62	39.82
Container No.:								
Wet Density	131.9	125.3	126.3	133.7	126.5	96.2	131.7	131.6
Moisture Content (%)	**21.8**	**20.6**	**20.8**	**21.8**	**27.8**	**73.2**	**18.7**	**22.3**
Dry Density (pcf)	**108.3**	**104.0**	**104.6**	**109.8**	**99.0**	**55.6**	**111.0**	**107.5**
Degree of Saturation (%)	105.9	89.4	91.5	110.0	106.9	97.2	97.2	106.3

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: RA Date: 06/12/02

LOCATION	B-10	B-10	B-11	B-11	B-11	B-11	B-11	B-11
SAMPLE ID	095-2-103	095-2-105	095-2-112	095-2-114	095-2-116	095-2-118	095-2-119	095-2-120
Depth (ft.)	40.0-42.0	50.0-51.5	15.0-16.5	25.0-26.5	35.0-37.0	45.0-47.0	55.0-57.0	70.0-72.0
Sample Type	Tube	Sleeve	Sleeve	Sleeve	Tube	Tube	Tube	Tube
Visual Soil Identification	Dark olive poorly graded sand (SP)	Dark gray lean clay (CL)	Olive poorly graded sand with silt (SP-SM)	Olive brown silty sand (SM)	Dark gray sandy lean clay s(CL)	Dark gray elastic silt (MH)	Olive gray silty sand (SM)	Dark gray silty sand (SM)
Pocket Penetrometer	0.5 / 1.0	0.5	2.0	1.25	1.25	1.0	0.25	0.75
Weight Soil + Rings / Tube (gm.	1848.60	832.44	1087.90	1076.70	1590.25	1567.70	1671.30	1796.10
Weight of Rings / Tube (gm.	535.01	204.17	204.17	204.17	424.49	471.02	459.58	467.21
Average Length (in.)	6.454	4.650	5.675	5.650	5.565	6.175	6.025	6.125
Average Diameter (in.)	2.875	2.415	2.415	2.415	2.875	2.875	2.875	2.875
Wet. Wt. of Soil + Cont. (gm.	214.66	254.03	207.13	277.64	243.91	200.65	353.14	242.91
Dry Wt. of Soil + Cont. (gm.)	184.70	197.68	178.59	239.99	200.63	159.61	285.38	211.55
Weight of Container (gm)	39.30	71.88	57.25	96.02	68.48	73.04	54.02	39.76
Container No.:								
Wet Density	119.4	112.4	129.5	128.4	122.9	104.2	118.0	127.3
Moisture Content (%)	**20.6**	**44.8**	**23.5**	**26.2**	**32.8**	**47.4**	**29.3**	**18.3**
Dry Density (pcf)	**99.0**	**77.6**	**104.8**	**101.8**	**92.6**	**70.7**	**91.3**	**107.7**
Degree of Saturation (%)	79.2	103.2	104.5	107.7	107.8	92.5	93.4	87.1

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: RA Date: 06/12/02

LOCATION	B-11	B-11	B-7A	B-7A	B-7A			
SAMPLE ID	095-2-125	095-2-126	095-2-131	095-2-132	095-2-133			
Depth (ft.)	110.0-112.0	120.0-122.0	25.0-27.0	30.0-31.5	35.0-37.0			
Sample Type	Tube	Tube	Tube	Sleeve	Tube			
Visual Soil Identification	Olive gray fat clay (CH)	Dark gray sandy fat clay s(CH)	Dark gray poorly graded sand with silt (SP-SM) and shell fragments	Dark gray clayey sand (SC)	Dark gray poorly graded sand with silt (SP-SM)			
Pocket Penetrometer	2.5	1.75	1.0	0	1.0			
Weight Soil + Rings / Tube (gm.	1631.80	1601.85	1748.15	1076.30	1826.20			
Weight of Rings / Tube (gm.	471.02	466.45	463.39	204.17	479.03			
Average Length (in.)	6.175	6.115	6.075	5.900	6.280			
Average Diameter (in.)	2.875	2.875	2.875	2.415	2.875			
Wet. Wt. of Soil + Cont. (gm.	196.41	248.78	333.40	254.16	327.20			
Dry Wt. of Soil + Cont. (gm.)	149.17	189.73	280.04	194.97	277.58			
Weight of Container (gm)	38.85	56.98	58.11	32.84	66.06			
Container No.:								
Wet Density	110.3	109.0	124.1	122.9	125.9			
Moisture Content (%)	**42.8**	**44.5**	**24.0**	**36.5**	**23.5**			
Dry Density (pcf)	**77.2**	**75.4**	**100.0**	**90.1**	**102.0**			
Degree of Saturation (%)	97.8	97.2	94.8	113.1	97.0			

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: RA Date: 06/12/02

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/05/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-7A	Checked By:	LF		
Sample ID:	095-2-131	Depth (ft.)	25.0-27.0		

Visual Sample Description: Dark gray poorly graded sand with silt (SP-SM) and shell fragments

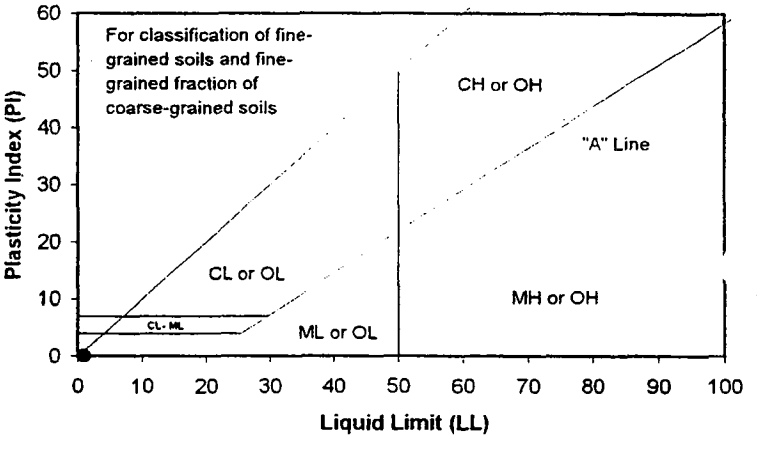
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]						
Wet Wt. of Soil + Cont. (gm)	Cannot be rolled					
Dry Wt. of Soil + Cont. (gm)	NONPLASTIC					
Wt. of Container (gm)						
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

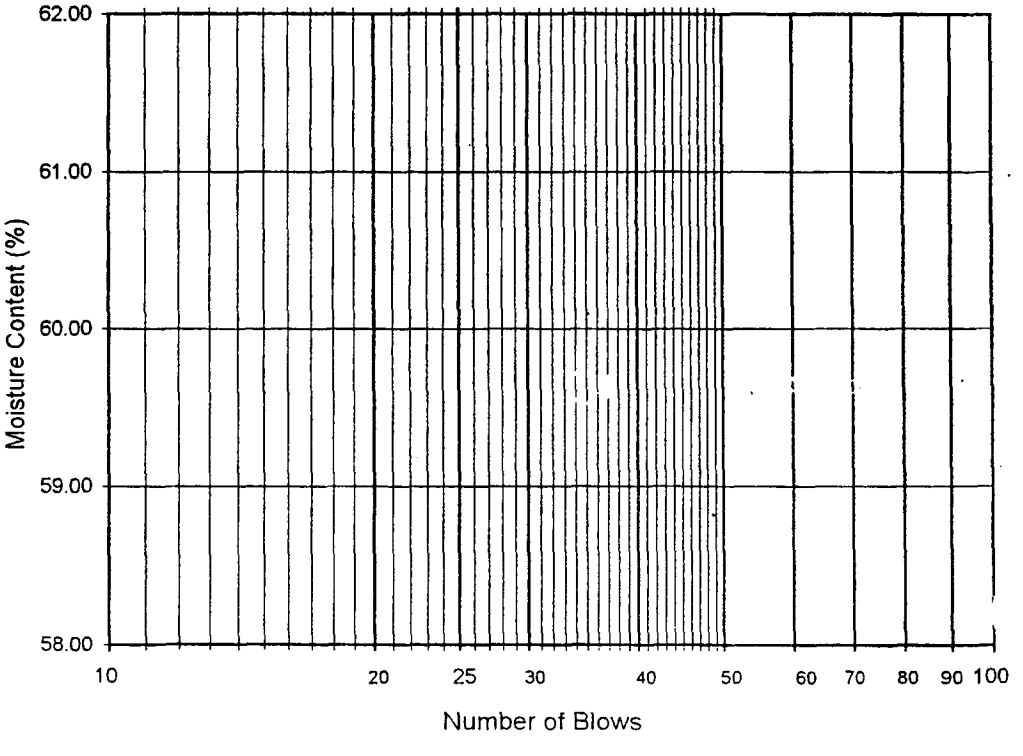
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-7A	Checked By:	LF		
Sample ID:	095-2-132	Depth (ft.)	30.0-31.5		

Visual Sample Description: Dark gray clayey sand (SC)

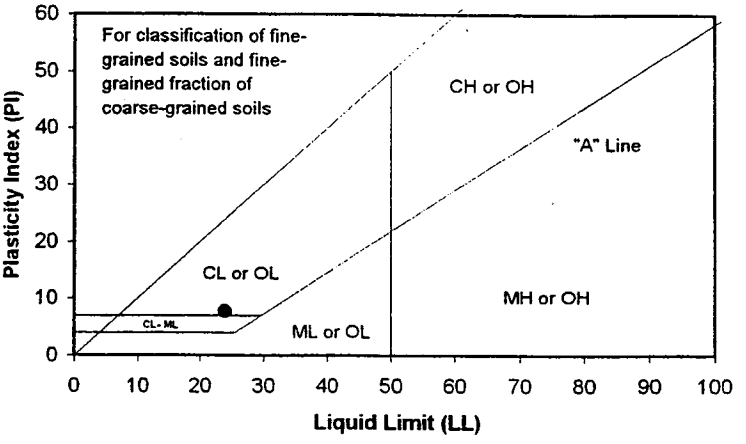
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			28	20	15	
Wet Wt. of Soil + Cont. (gm)	12.39	13.18	16.50	14.58	15.97	
Dry Wt. of Soil + Cont. (gm)	10.80	11.48	13.52	11.90	12.90	
Wt. of Container (gm)	1.08	1.03	0.99	1.06	1.01	
Moisture Content (%) [Wn]	16.36	16.27	23.78	24.72	25.82	

Liquid Limit	**24**
Plastic Limit	**16**
Plasticity Index	**8**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 2.92

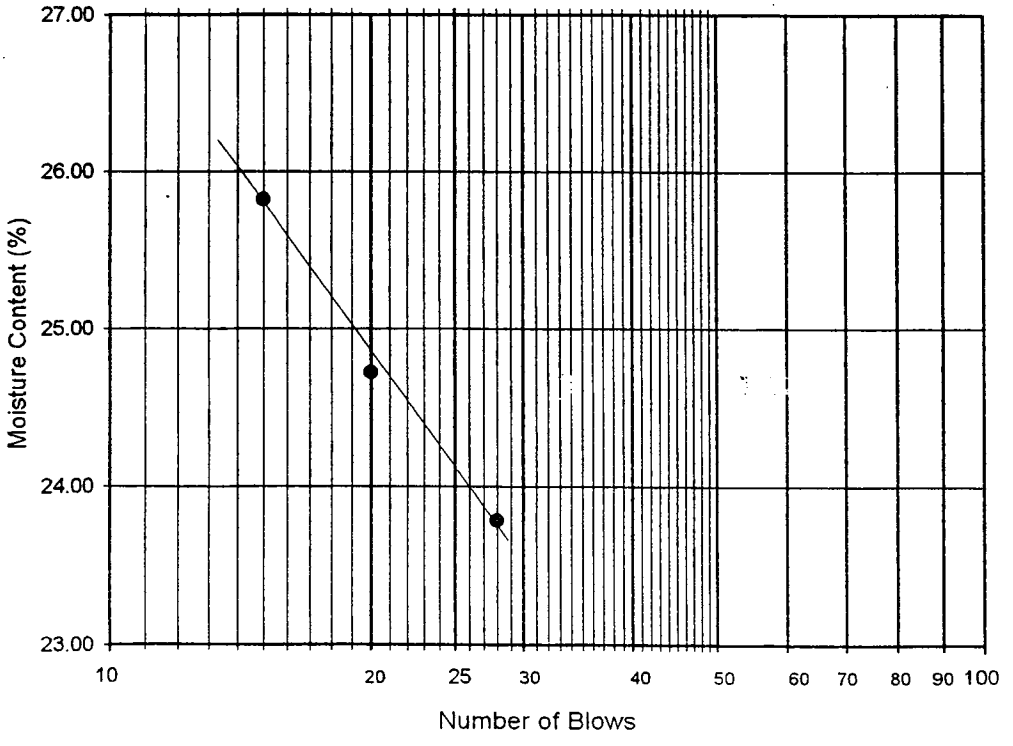
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/05/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-7A	Checked By:	LF		
Sample ID:	095-2-133	Depth (ft.)	35.0-37.0		

Visual Sample Description: Dark gray poorly graded sand with silt (SP-SM)

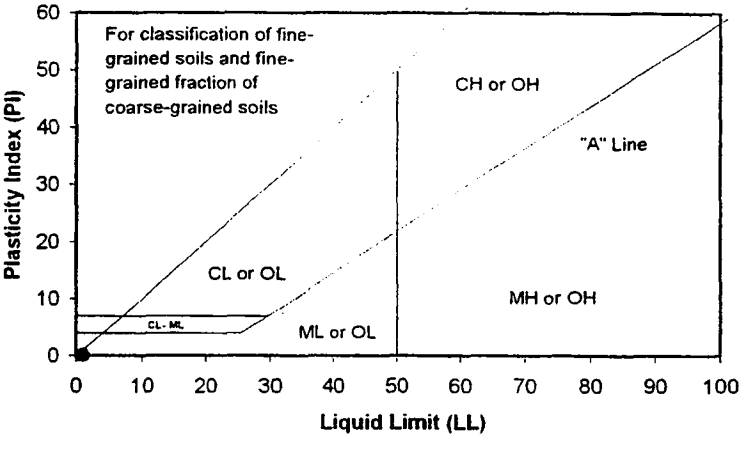
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]						
Wet Wt. of Soil + Cont. (gm)	Cannot be rolled					
Dry Wt. of Soil + Cont. (gm)	NONPLASTIC					
Wt. of Container (gm)						
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/10/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-8	Checked By:	LF		
Sample ID:	095-2-075	Depth (ft.)	35.0-37.0		

Visual Sample Description: Olive brown sandy lean clay s(CL)

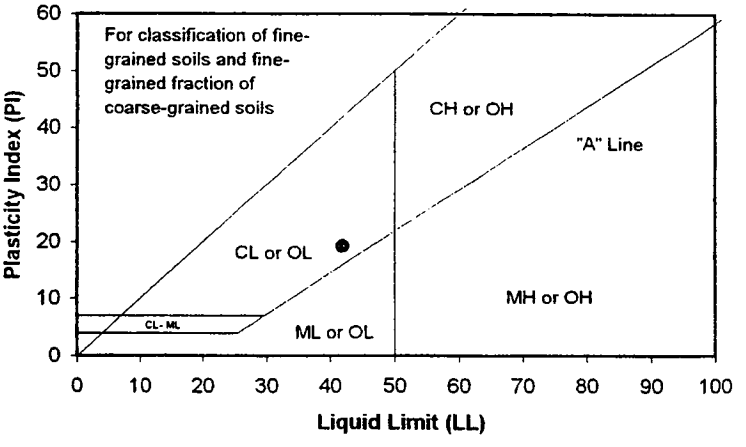
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			31	21	17	
Wet Wt. of Soil + Cont. (gm)	16.92	15.73	17.16	16.28	19.02	
Dry Wt. of Soil + Cont. (gm)	13.98	13.01	12.44	11.74	13.52	
Wt. of Container (gm)	1.08	1.07	1.02	1.08	1.08	
Moisture Content (%) [Wn]	22.79	22.78	41.33	42.59	44.21	

Liquid Limit	**42**
Plastic Limit	**23**
Plasticity Index	**19**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 16.06

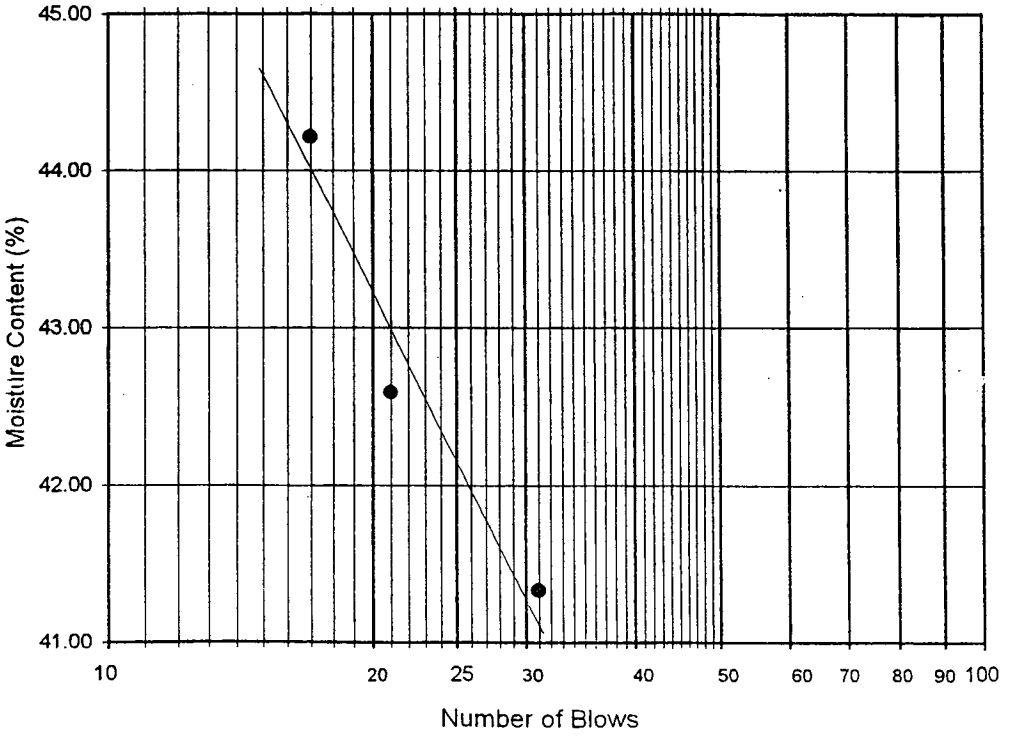
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/07/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-10	Checked By:	LF		
Sample ID:	095-2-098	Depth (ft.)	15.0-17.0		

Visual Sample Description: Dark olive gray fat clay (CH)

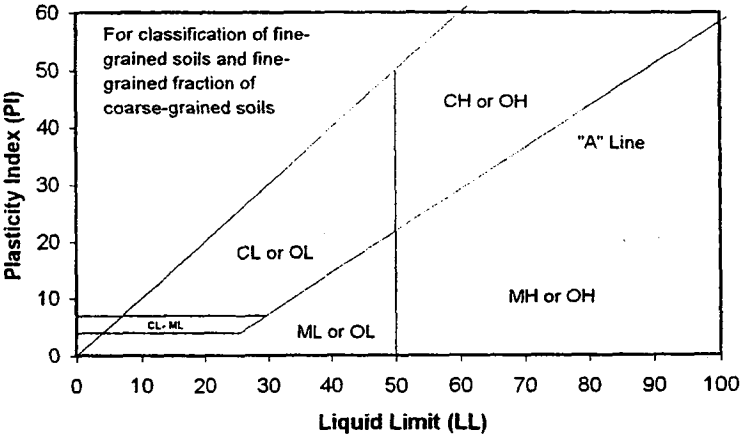
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			31	26	20	
Wet Wt. of Soil + Cont. (gm)	13.48	11.89	13.48	12.82	14.50	
Dry Wt. of Soil + Cont. (gm)	10.29	9.15	7.48	7.02	7.91	
Wt. of Container (gm)	1.02	1.13	1.11	1.00	1.14	
Moisture Content (%) [Wn]	34.41	34.16	94.19	96.35	97.34	

Liquid Limit	**96**
Plastic Limit	**34**
Plasticity Index	**62**
USCS Classification	**CH**
Plots off the Chart	

PI at "A" - Line = 0.73(LL-20) = 55.48

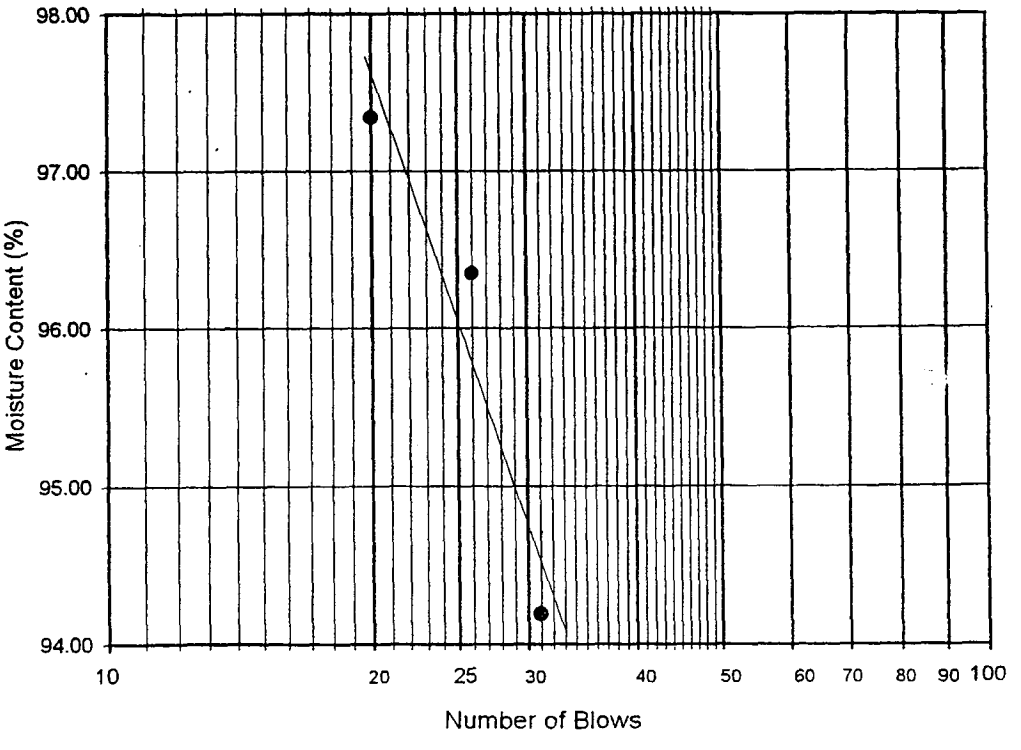
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	ACS	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-10	Checked By:	LF		
Sample ID:	095-2-105	Depth (ft.)	50.0-51.5		

Visual Sample Description: Dark gray lean clay (CL)

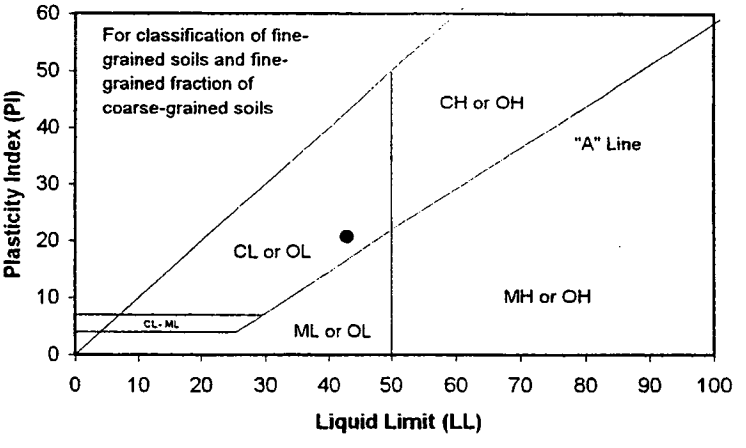
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			29	20	16	
Wet Wt. of Soil + Cont. (gm)	8.33	8.00	16.11	16.17	17.31	
Dry Wt. of Soil + Cont. (gm)	7.01	6.73	11.59	11.51	12.20	
Wt. of Container (gm)	1.09	1.05	1.01	1.07	1.06	
Moisture Content (%) [Wn]	22.30	22.36	42.72	44.64	45.87	

Liquid Limit	**43**
Plastic Limit	**22**
Plasticity Index	**21**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 16.79

One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/10/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID:	095-2-116	Depth (ft.)	35.0-37.0		

Visual Sample Description: Dark gray sandy lean clay s(CL)

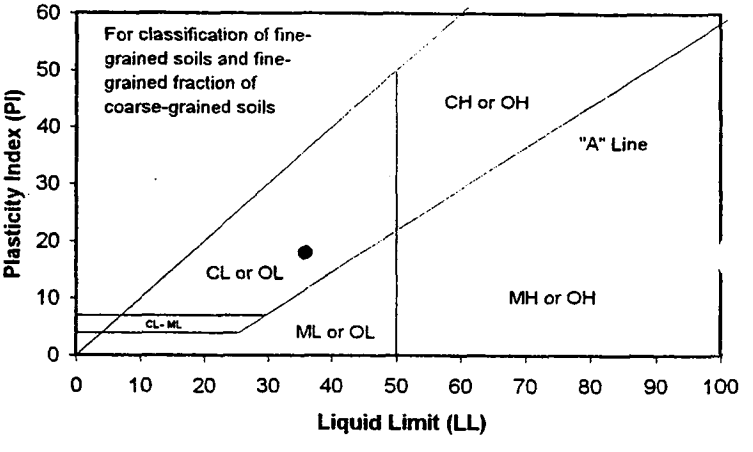
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			30	22	16	
Wet Wt. of Soil + Cont. (gm)	14.84	13.64	14.68	21.20	18.69	
Dry Wt. of Soil + Cont. (gm)	12.72	11.72	11.09	15.80	13.79	
Wt. of Container (gm)	1.00	1.05	1.05	1.06	1.11	
Moisture Content (%) [Wn]	18.09	17.99	35.76	36.64	38.64	

Liquid Limit	**36**
Plastic Limit	**18**
Plasticity Index	**18**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 11.68

One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	ZF		
Sample ID:	095-2-118	Depth (ft.)	45.0-47.0		

Visual Sample Description: Dark gray elastic silt (MH)

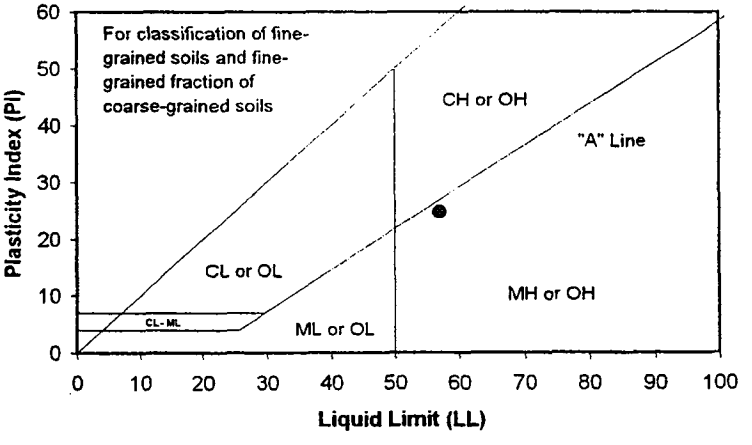
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			33	24	17	
Wet Wt. of Soil + Cont. (gm)	8.26	9.94	13.44	13.19	13.79	
Dry Wt. of Soil + Cont. (gm)	6.49	7.77	9.02	8.74	9.07	
Wt. of Container (gm)	1.01	1.05	1.07	1.02	1.11	
Moisture Content (%) [Wn]	32.30	32.29	55.60	57.64	59.30	

Liquid Limit	**57**
Plastic Limit	**32**
Plasticity Index	**25**
USCS Classification	**MH**

PI at "A" - Line = 0.73(LL-20) = 27.01

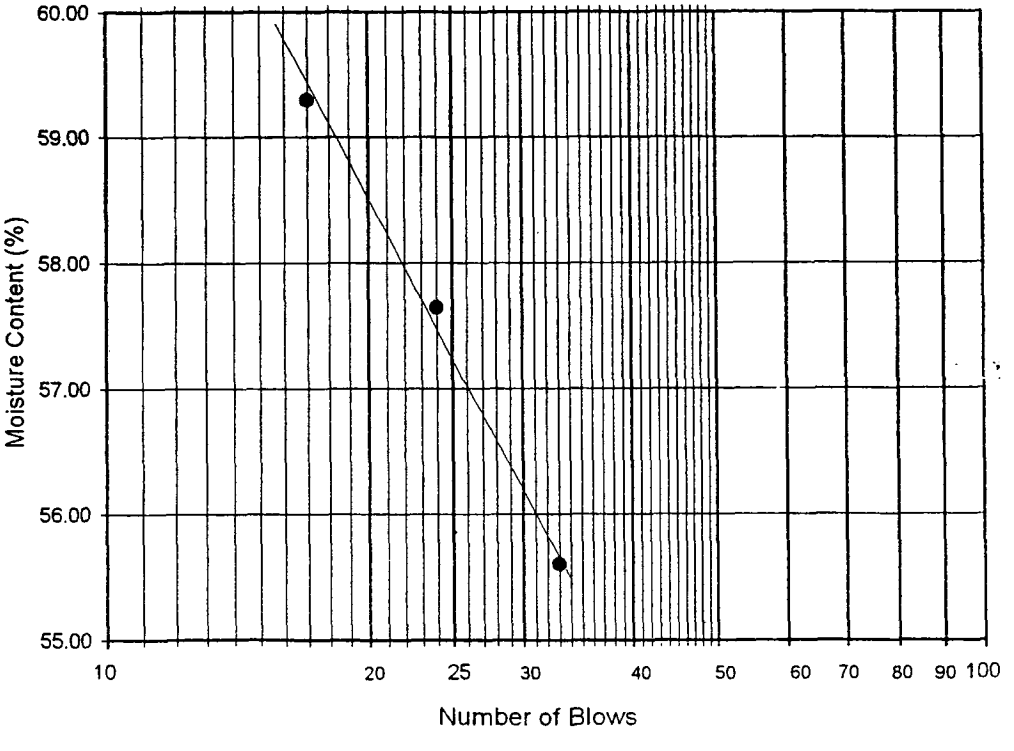
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID:	095-2-119	Depth (ft.)	55.0-57.0		

Visual Sample Description: Dark olive silty sand (SM)

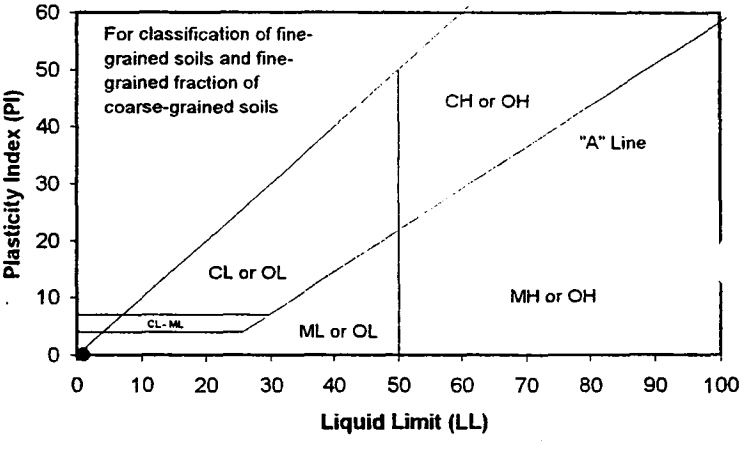
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			5			
Wet Wt. of Soil + Cont. (gm)	Cannot be rolled		17.80	Cannot get > 5 blows		
Dry Wt. of Soil + Cont. (gm)	NONPLASTIC		15.24	NONPLASTIC		
Wt. of Container (gm)			1.02			
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	18.00	#DIV/0!	#DIV/0!	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

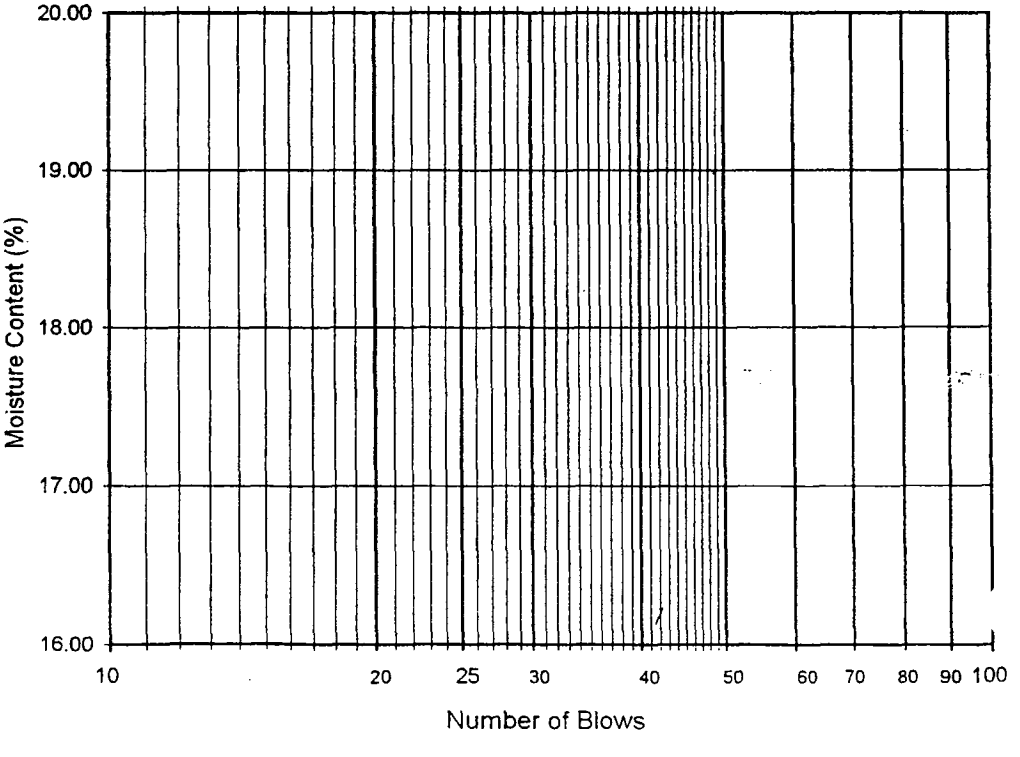
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	06/04/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID:	095-2-120	Depth (ft.)	70.0-72.0		

Visual Sample Description: Dark gray silty sand (SM)

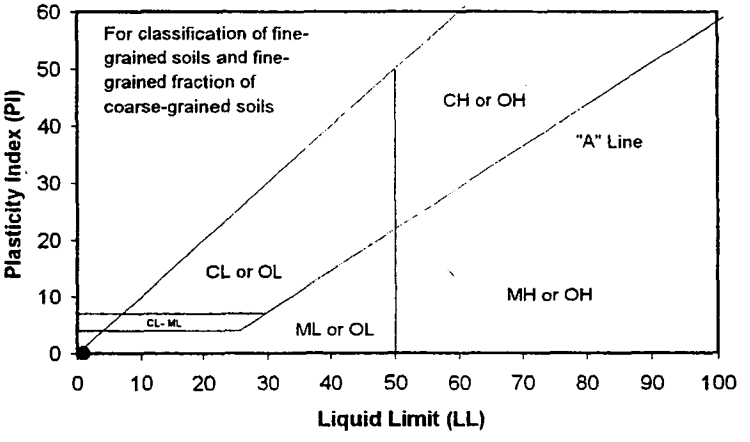
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]						
Wet Wt. of Soil + Cont. (gm)	Cannot be rolled					
Dry Wt. of Soil + Cont. (gm)	NONPLASTIC					
Wt. of Container (gm)						
Moisture Content (%) [Wn]	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

Liquid Limit	**NP**
Plastic Limit	**#DIV/0!**
Plasticity Index	**#DIV/0!**
USCS Classification	**NP**

PI at "A" - Line = 0.73(LL-20) = -14.6

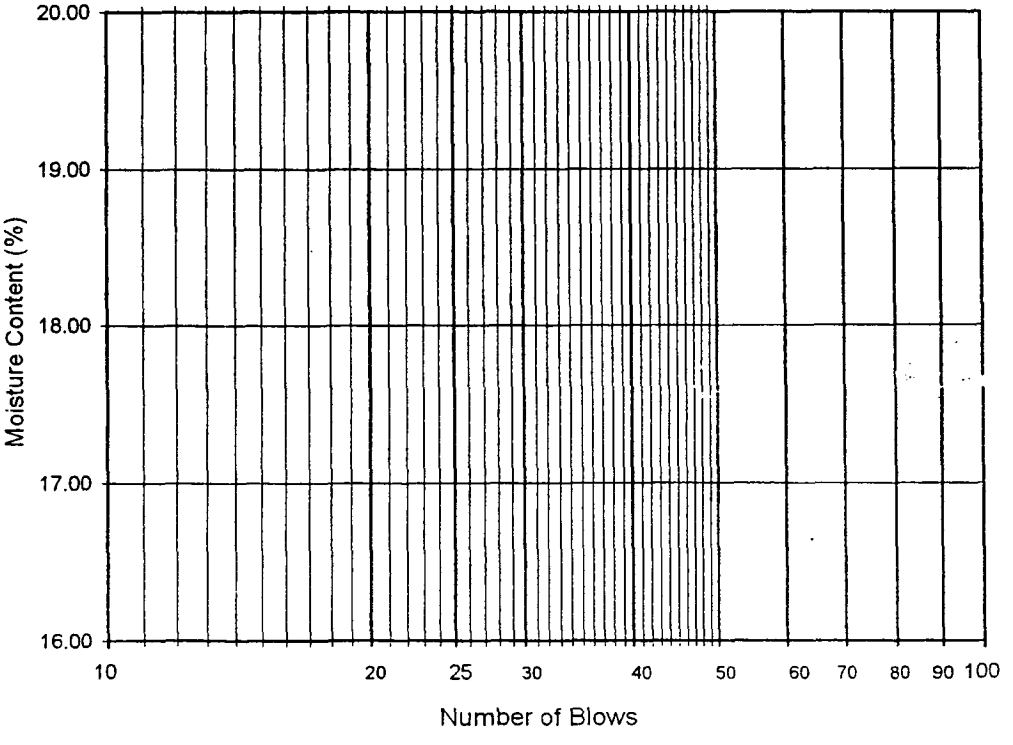
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	ACS	Date:	06/05/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID:	095-2-125	Depth (ft.)	110.0-112.0		

Visual Sample Description: Olive gray fat clay (CH)

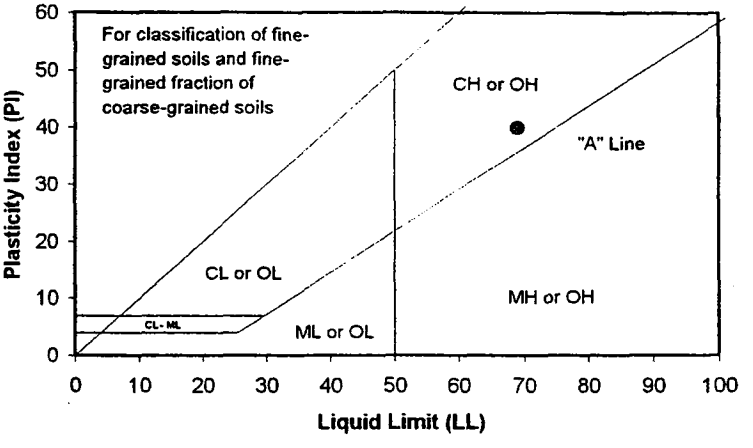
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			36	23	14	
Wet Wt. of Soil + Cont. (gm)	8.86	8.91	16.83	16.98	17.54	
Dry Wt. of Soil + Cont. (gm)	7.10	7.15	10.54	10.41	10.55	
Wt. of Container (gm)	1.02	1.11	1.10	1.03	1.05	
Moisture Content (%) [Wn]	28.95	29.14	66.63	70.04	73.58	

Liquid Limit	**69**
Plastic Limit	**29**
Plasticity Index	**40**
USCS Classification	**CH**

PI at "A" - Line = 0.73(LL-20) = 35.77

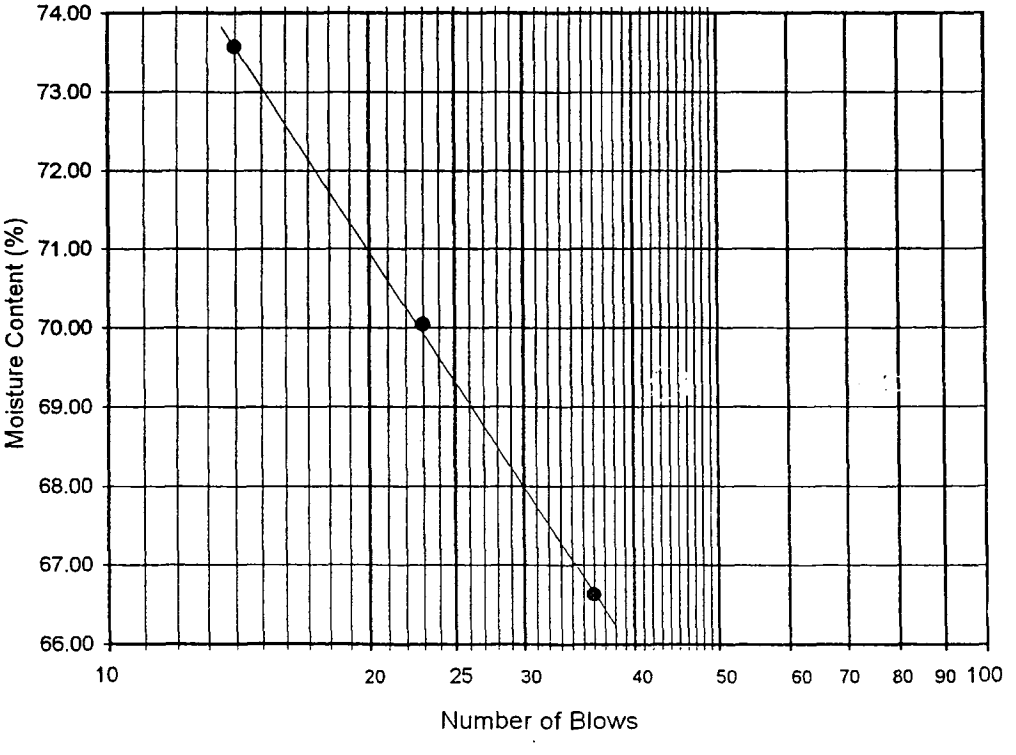
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID:	095-2-126	Depth (ft.)	120.0-122.0		

Visual Sample Description: Dark gray sandy fat clay s(CH)

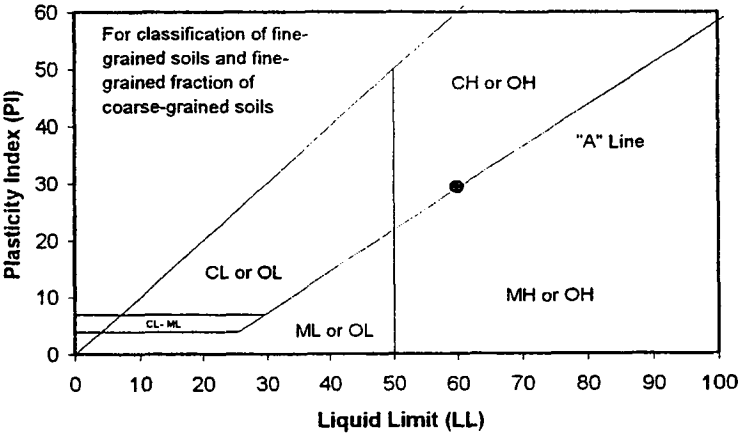
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			34	27	19	
Wet Wt. of Soil + Cont. (gm)	10.08	10.49	14.30	16.47	14.37	
Dry Wt. of Soil + Cont. (gm)	7.96	8.27	9.45	10.73	9.32	
Wt. of Container (gm)	1.00	1.07	1.10	0.98	1.04	
Moisture Content (%) [Wn]	30.46	30.83	58.08	58.87	60.99	

Liquid Limit	**60**
Plastic Limit	**31**
Plasticity Index	**29**
USCS Classification	**CH**

PI at "A" - Line = 0.73(LL-20) = 29.2

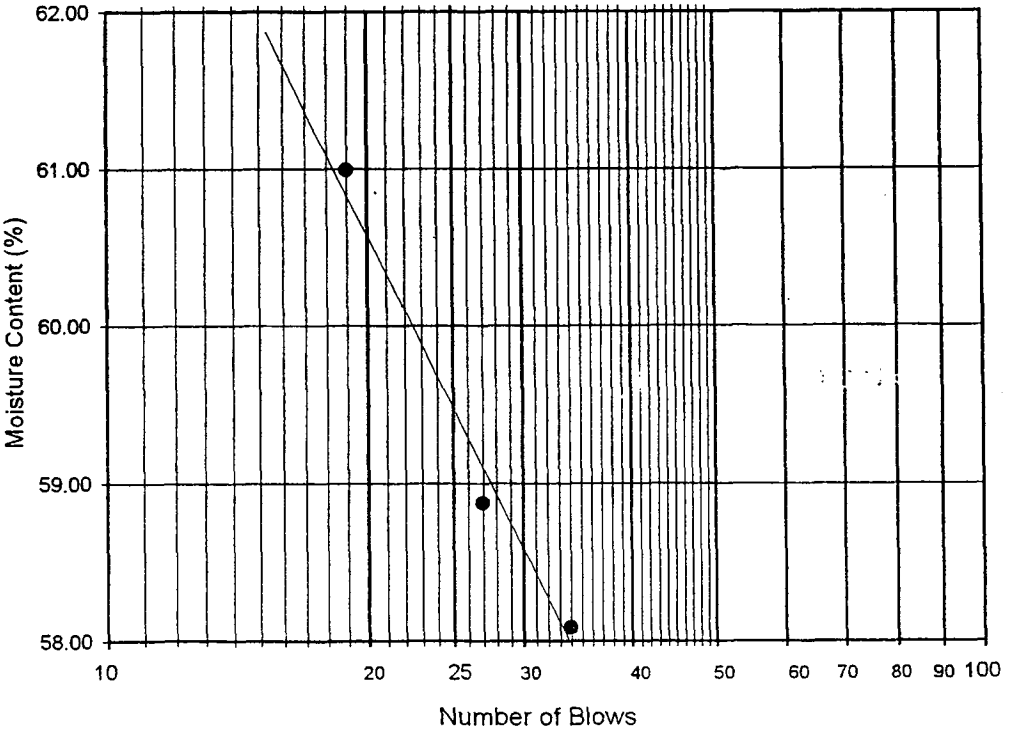
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	ACS	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	RA	Date:	06/18/02
Location:	B-12	Checked By:	LF		
Sample ID:	095-2-059	Depth (ft.)	30.0-31.5		

Visual Sample Description: Olive, elastic silt with sand (MH)s

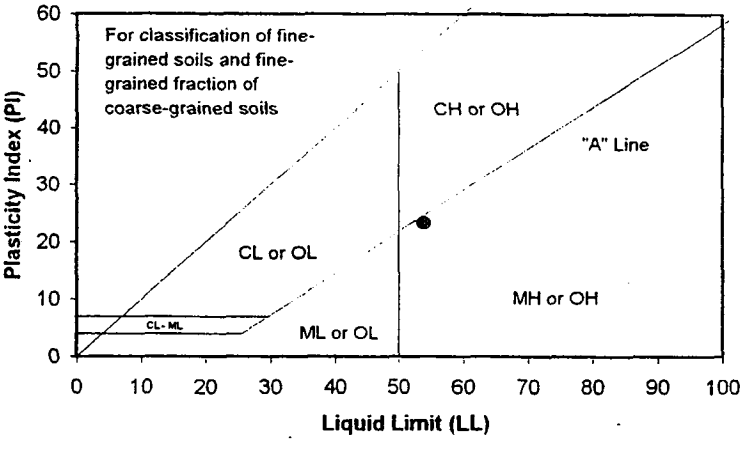
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			33	26	19	
Wet Wt. of Soil + Cont. (gm)	11.50	11.73	16.46	17.04	18.08	
Dry Wt. of Soil + Cont. (gm)	9.05	9.22	11.17	11.44	12.00	
Wt. of Container (gm)	1.08	1.02	1.04	1.02	1.01	
Moisture Content (%) [Wn]	30.74	30.61	52.22	53.74	55.32	

Liquid Limit	**54**
Plastic Limit	**31**
Plasticity Index	**23**
USCS Classification	**MH**

PI at "A" - Line = 0.73(LL-20) = 24.82

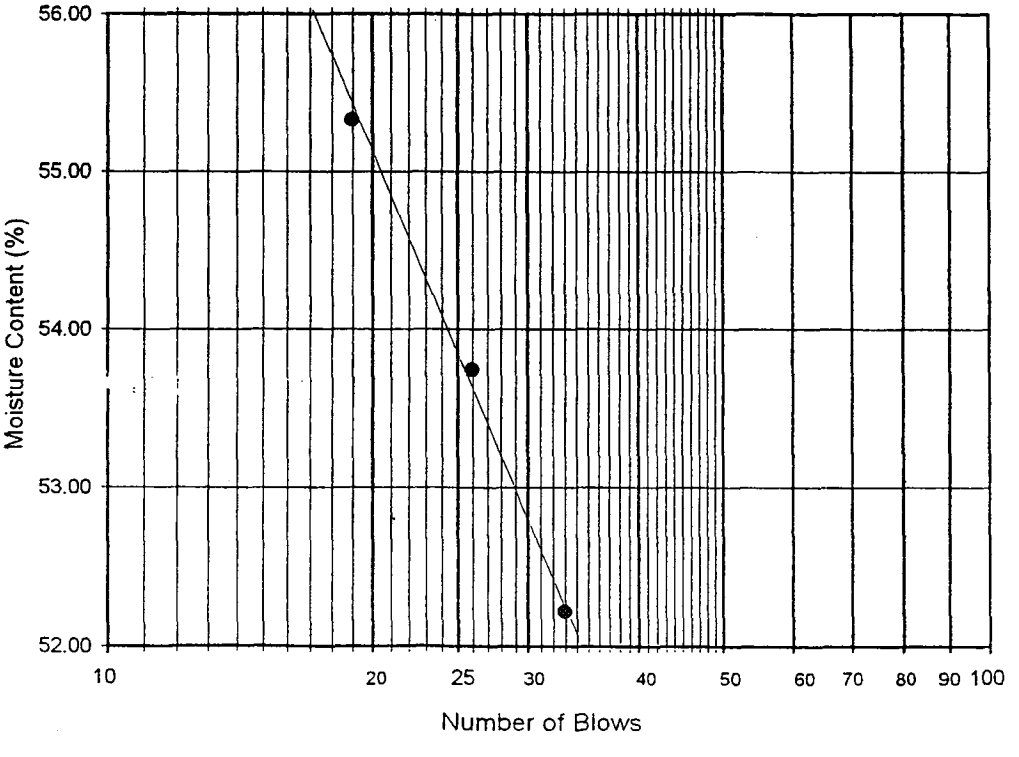
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	ACS	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	RA	Date:	06/18/02
Location:	B-12	Checked By:	LF		
Sample ID:	095-2-061	Depth (ft.)	45.0-46.5		

Visual Sample Description: Dark gray fat clay (CH)

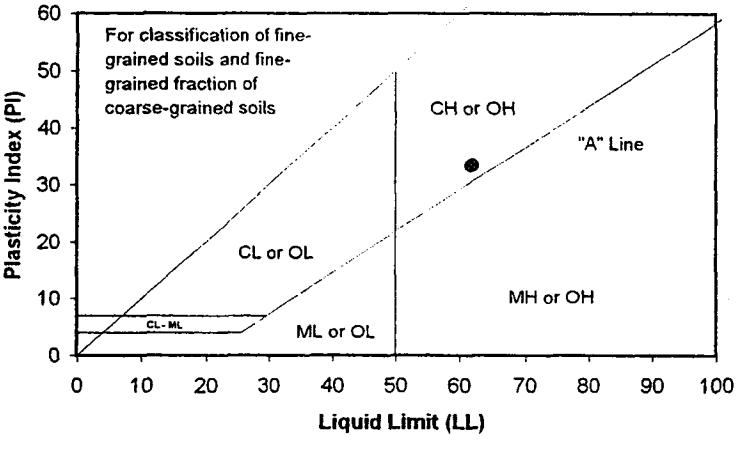
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			27	22	17	
Wet Wt. of Soil + Cont. (gm)	9.64	9.11	18.38	18.40	17.31	
Dry Wt. of Soil + Cont. (gm)	7.74	7.30	11.78	11.76	10.96	
Wt. of Container (gm)	1.03	1.08	1.01	1.14	1.06	
Moisture Content (%) [Wn]	28.32	29.10	61.28	62.52	64.14	

Liquid Limit	**62**
Plastic Limit	**29**
Plasticity Index	**33**
USCS Classification	**CH**

PI at "A" - Line = 0.73(LL-20) = 30.66

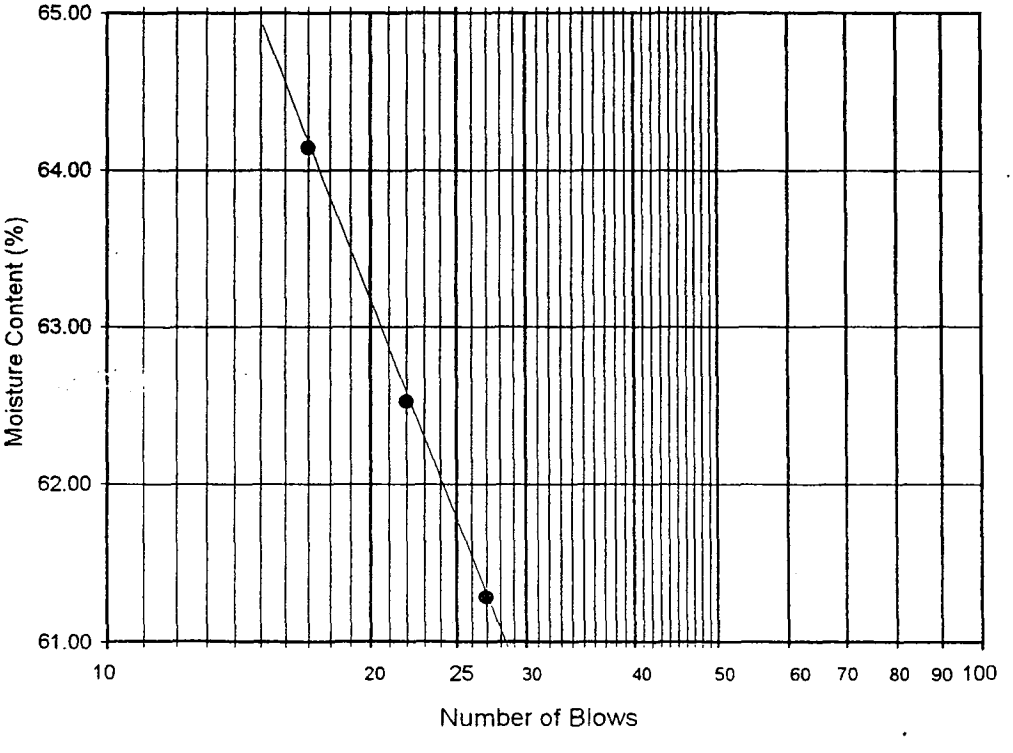
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	ACS	Date:	06/05/02
Project No. :	2384095-D-07060-1000	Input By:	RA	Date:	06/18/02
Location:	B-12	Checked By:	LF		
Sample ID:	095-2-066	Depth (ft.)	55.0-56.5		

Visual Sample Description: Dark gray fat clay (CH)

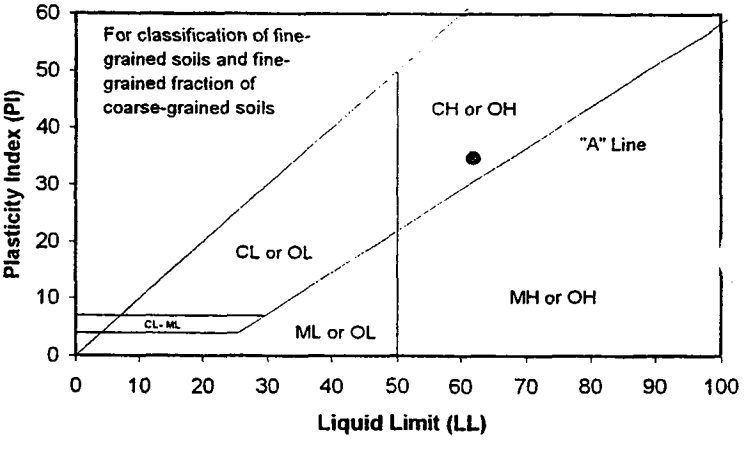
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			33	24	17	
Wet Wt. of Soil + Cont. (gm)	16.07	16.09	15.99	16.38	14.65	
Dry Wt. of Soil + Cont. (gm)	12.85	12.87	10.37	10.53	9.39	
Wt. of Container (gm)	1.07	1.10	1.03	1.11	1.08	
Moisture Content (%) [Wn]	27.33	27.36	60.17	62.10	63.30	

Liquid Limit	**62**
Plastic Limit	**27**
Plasticity Index	**35**
USCS Classification	**CH**

PI at "A" - Line = 0.73(LL-20) = 30.66

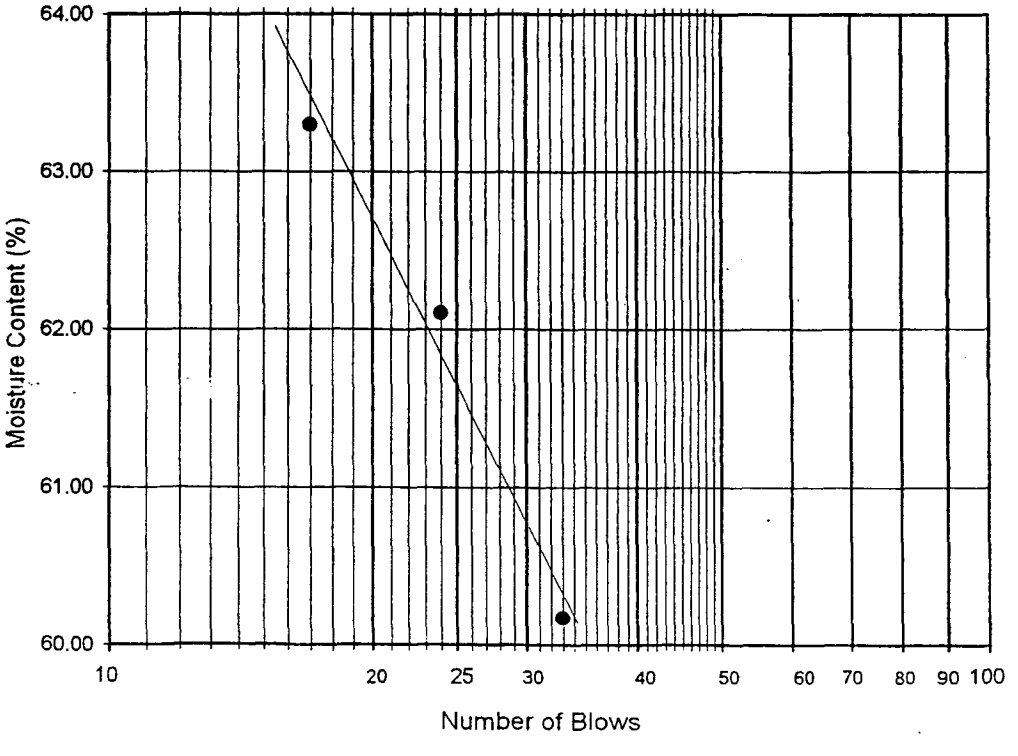
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	06/15/02
Project No. :	2384095-D-07060-1000	Input By:	LF	Date:	06/19/02
Location:	B-12	Checked By:	LF		
Sample ID:	095-2-067	Depth (ft.)	72.0-74.0		

Visual Sample Description: Dark gray elastic / fat clay (MH/CH)

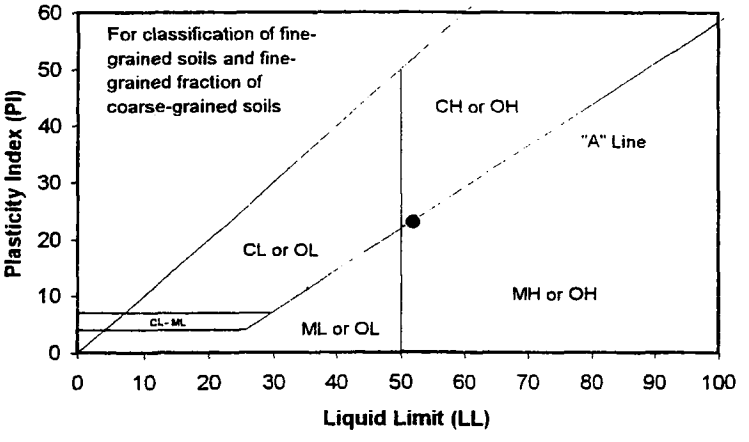
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			22	18	28	
Wet Wt. of Soil + Cont. (gm)	9.09	10.70	11.72	12.60	11.67	
Dry Wt. of Soil + Cont. (gm)	7.30	8.52	8.05	8.60	8.08	
Wt. of Container (gm)	1.08	1.09	1.01	1.08	1.12	
Moisture Content (%) [Wn]	28.78	29.34	52.13	53.19	51.58	

Liquid Limit	**52**
Plastic Limit	**29**
Plasticity Index	**23**
USCS Classification	**MH/CH**

PI at "A" - Line = 0.73(LL-20) = 23.36

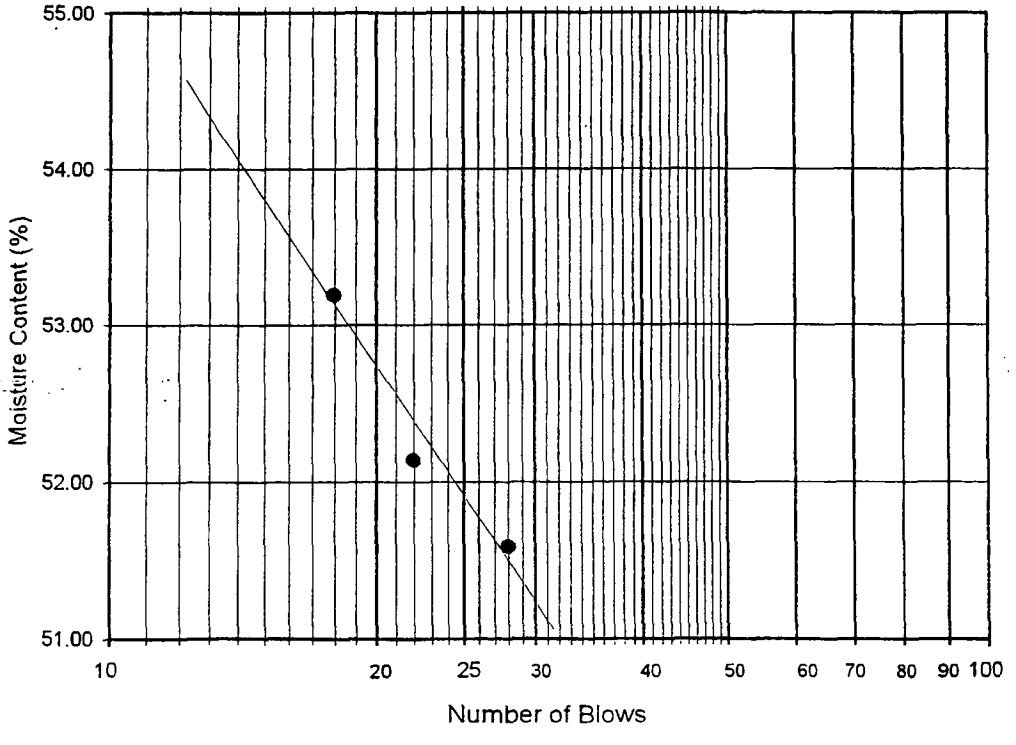
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-7A	Checked By:	LF		
Sample ID.:	095-2-131	Depth (ft.) :	25.0-27.0		

Visual Sample Description: Dark gray poorly graded sand with silt (SP-SM) and shell fragments

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	NONPLASTIC			
Plastic Limit:	NP	GR:SA:FI:	3:86:11			
Plasticity Index:	NP	Grp. Symbol:	SP-SM			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	178.22
Wt.of Air-Dry Soil + Cont. (gm.)	392.04	Wt. of Container No.___ (gm.)		1.00	1.00	82.32
Wt. of Container	82.50	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	309.54	Wt. of Dry Soil (gm.)				95.90

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	2.47	99.2
No. 4	9.10	97.1
No. 10	10.48	96.6
Pan		

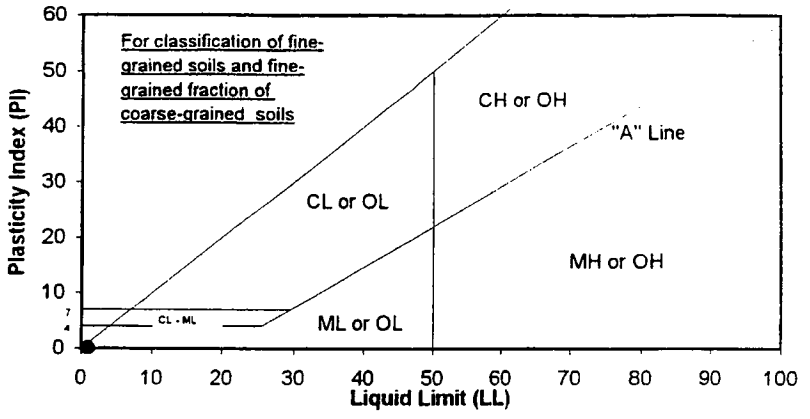
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	96.6
No. 16	0.32	99.7	96.3
No. 30	1.24	98.9	95.5
No. 50	20.01	81.5	78.8
No. 100	85.02	21.5	20.7
No. 200	95.95	11.4	11.0
Pan			

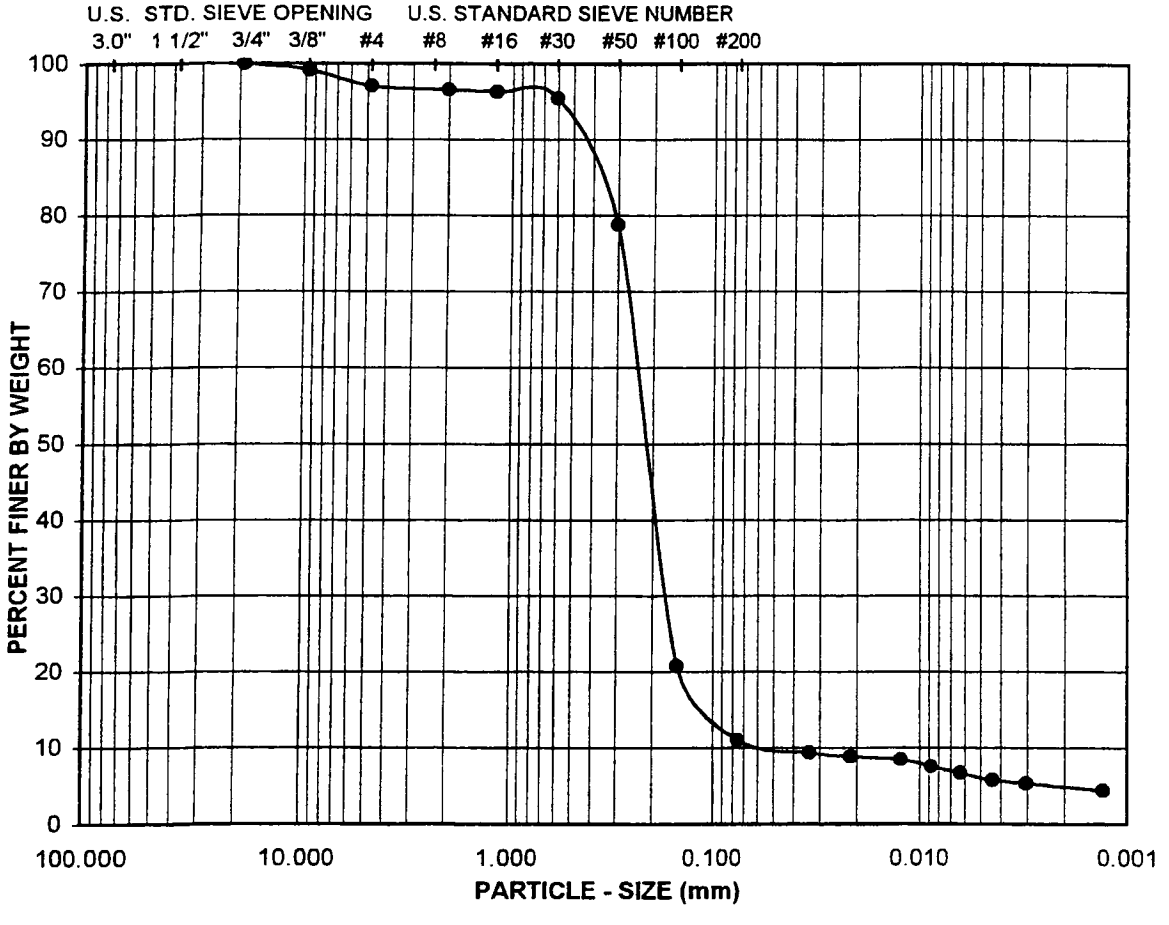
Hydrometer Wt. of Air-Dry Soil (gm) 108.25 Wt. of Dry Soil (gm) 108.25

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:45	0		5.5			
	9:47	2	24.3	5.5	16.0	9.3	0.0335
	9:50	5	24.3	5.5	15.5	8.9	0.0213
	10:00	15	24.4	5.5	15.0	8.4	0.0123
	10:15	30	24.5	5.5	14.0	7.5	0.0088
	10:45	60	24.6	5.5	13.0	6.6	0.0062
	11:45	120	25.0	5.5	12.0	5.8	0.0044
	13:55	250	25.3	5.5	11.5	5.3	0.0030
06/07/02	9:45	1440	23.6	5.5	10.5	4.4	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-7A	095-2-131	25.0-27.0	SP-SM	3:86:11	NONPLASTIC

Sample Description:

Dark gray poorly graded sand with silt (SP-SM) and shell fragments

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-7A	Checked By:	LF		
Sample ID.:	095-2-132	Depth (ft.) :	30.0-31.5		

Visual Sample Description: Dark gray clayey sand (SC)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	24	LL,PL,PI:	24,16,8			
Plastic Limit:	16	GR:SA:FI:	0:53:47			
Plasticity Index:	8	Grp. Symbol:	SC			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	106.90
Wt.of Air-Dry Soil + Cont. (gm.)	55.99	Wt. of Container No.___ (gm.)		1.00	1.00	77.04
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	55.99	Wt. of Dry Soil (gm.)				29.86

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

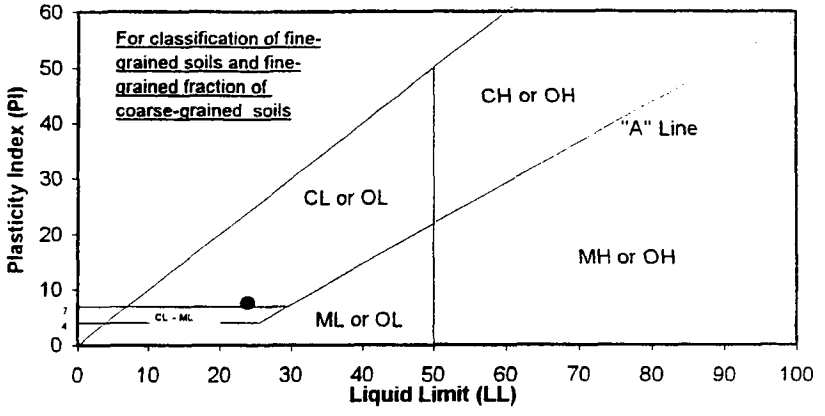
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.08	99.9	99.9
No. 30	0.19	99.7	99.7
No. 50	2.34	95.8	95.8
No. 100	20.09	64.1	64.1
No. 200	29.67	47.0	47.0
Pan			

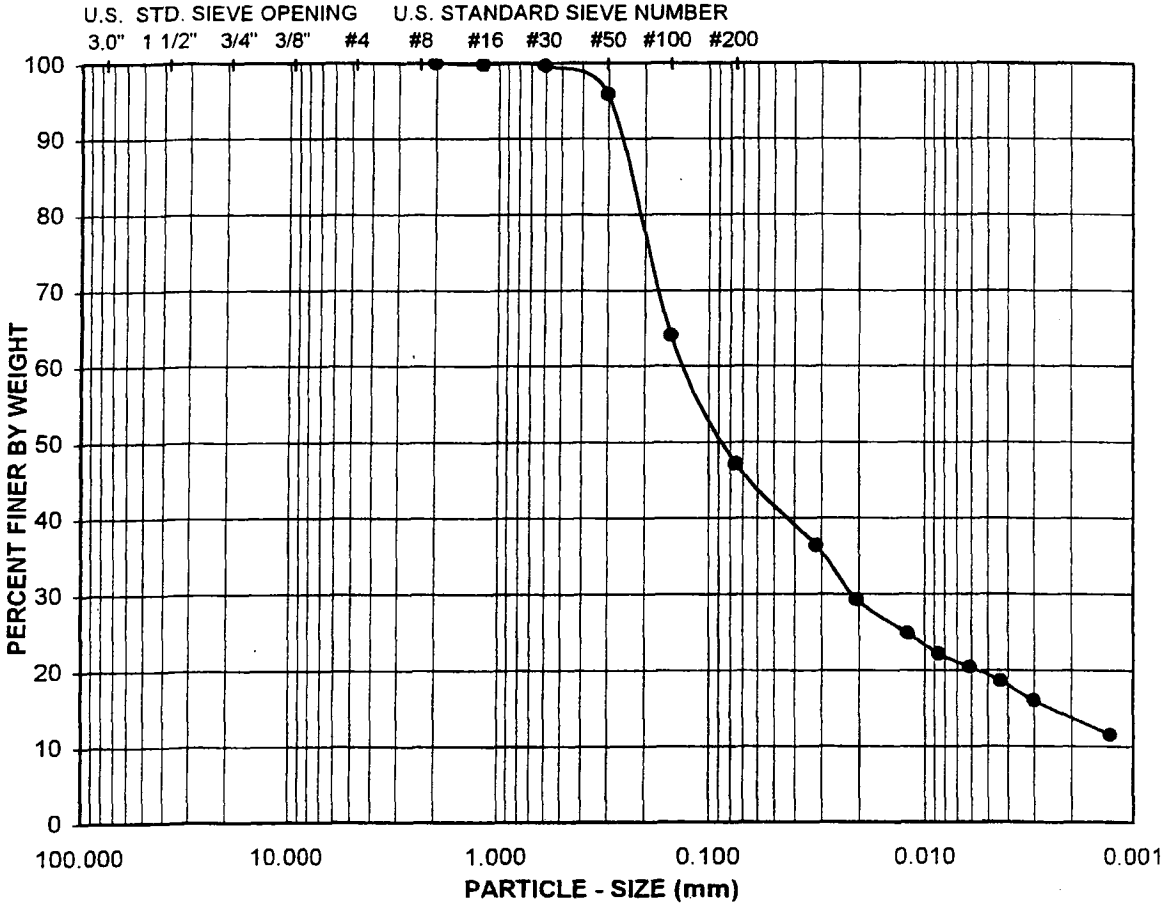
Hydrometer Wt. of Air-Dry Soil (gm) 55.99 Wt. of Dry Soil (gm) 55.99

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:05	0		5.5			
	9:07	2	24.2	5.5	26.0	36.3	0.0314
	9:10	5	24.2	5.5	22.0	29.2	0.0204
	9:20	15	24.2	5.5	19.5	24.8	0.0120
	9:35	30	24.2	5.5	18.0	22.1	0.0085
	10:05	60	24.4	5.5	17.0	20.4	0.0061
	11:05	120	24.8	5.5	16.0	18.6	0.0043
	13:15	250	25.2	5.5	14.5	15.9	0.0030
06/07/02	9:05	1440	23.6	5.5	12.0	11.5	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-7A	095-2-132	30.0-31.5	SC	0:53:47	24,16,8

Sample Description:

Dark gray clayey sand (SC)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-7A	Checked By:	ZF		
Sample ID.:	095-2-133	Depth (ft.) :	35.0-37.0		

Visual Sample Description: Dark gray poorly graded sand with silt (SP-SM)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	NONPLASTIC			
Plastic Limit:	NP	GR:SA:FI:	0:88:12			
Plasticity Index:	NP	Grp. Symbol:	SP-SM			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	236.70	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	223.02	164.77
Wt.of Air-Dry Soil + Cont. (gm.)	109.95	Wt. of Container No.___ (gm.)		1.00	72.14	75.67
Wt. of Container	0.00	Moisture Content (%)		0.00	9.07	
Dry Wt. of Soil (gm.)	109.95	Wt. of Dry Soil (gm.)				89.10

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

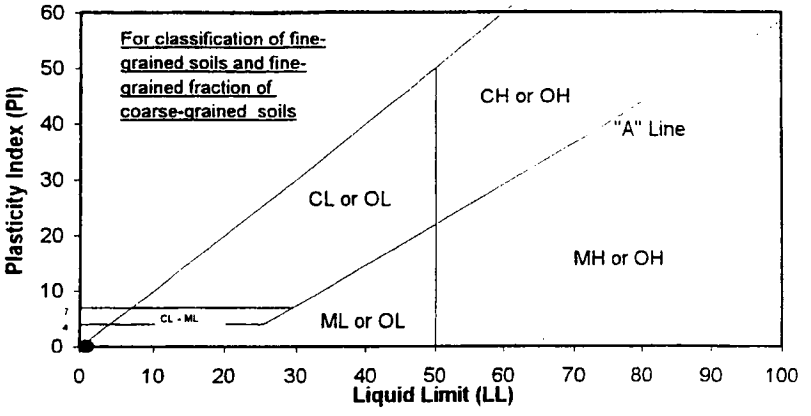
Sieve after Hydrometer & Wet Sieve

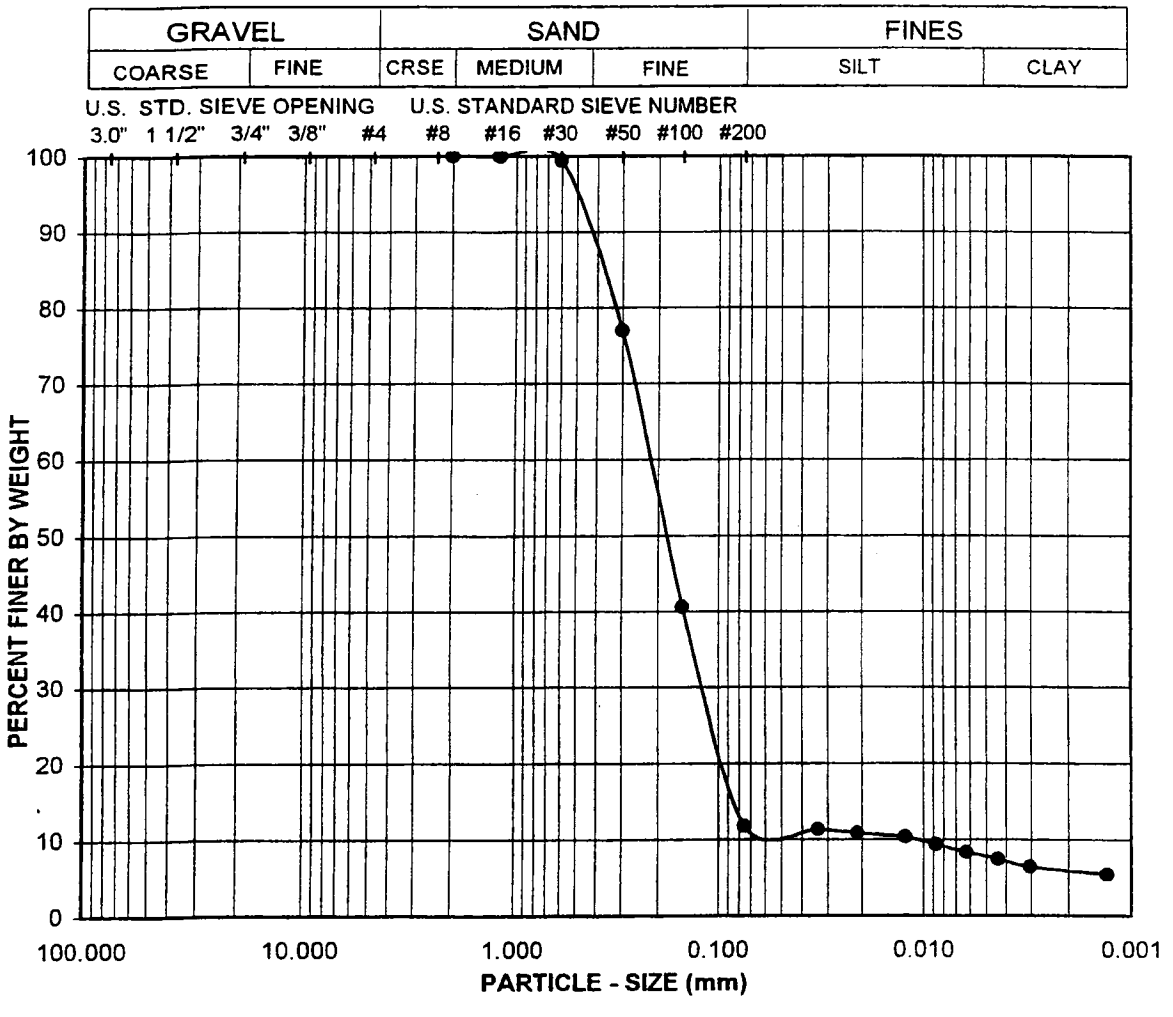
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.02	100.0	100.0
No. 30	0.57	99.4	99.4
No. 50	23.23	77.0	77.0
No. 100	59.93	40.6	40.6
No. 200	89.01	11.7	11.7
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 109.95 Wt. of Dry Soil (gm) 100.81

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:57	0		5.5			
	9:59	2	24.4	5.5	17.0	11.3	0.0333
	10:02	5	24.4	5.5	16.5	10.8	0.0211
	10:12	15	24.5	5.5	16.0	10.3	0.0122
	10:27	30	24.6	5.5	15.0	9.3	0.0087
	10:57	60	24.7	5.5	14.0	8.4	0.0062
	11:57	120	25.1	5.5	13.0	7.4	0.0044
	14:07	250	25.2	5.5	12.0	6.4	0.0030
06/07/02	9:57	1440	23.7	5.5	11.0	5.4	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-7A	095-2-133	35.0-37.0	SP-SM	0:88:12	NONPLASTIC

Sample Description:

Dark gray poorly graded sand with silt (SP-SM)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-8	Checked By:	LF		
Sample ID.:	095-2-075	Depth (ft.) :	35.0-37.0		

Visual Sample Description: Olive brown sandy lean clay s(CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	42	LL,PL,PI:	42,23,19			
Plastic Limit:	23	GR:SA:FI:	0:32:68			
Plasticity Index:	19	Grp. Symbol:	s(CL)			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	94.94
Wt.of Air-Dry Soil + Cont. (gm.)	55.25	Wt. of Container No.___ (gm.)		1.00	1.00	76.70
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	55.25	Wt. of Dry Soil (gm.)				18.24

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

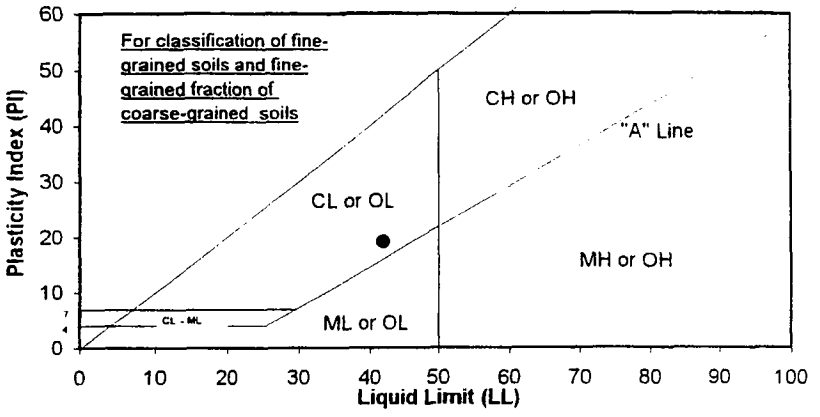
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.01	100.0	100.0
No. 50	0.02	100.0	100.0
No. 100	2.12	96.2	96.2
No. 200	17.81	67.8	67.8
Pan			

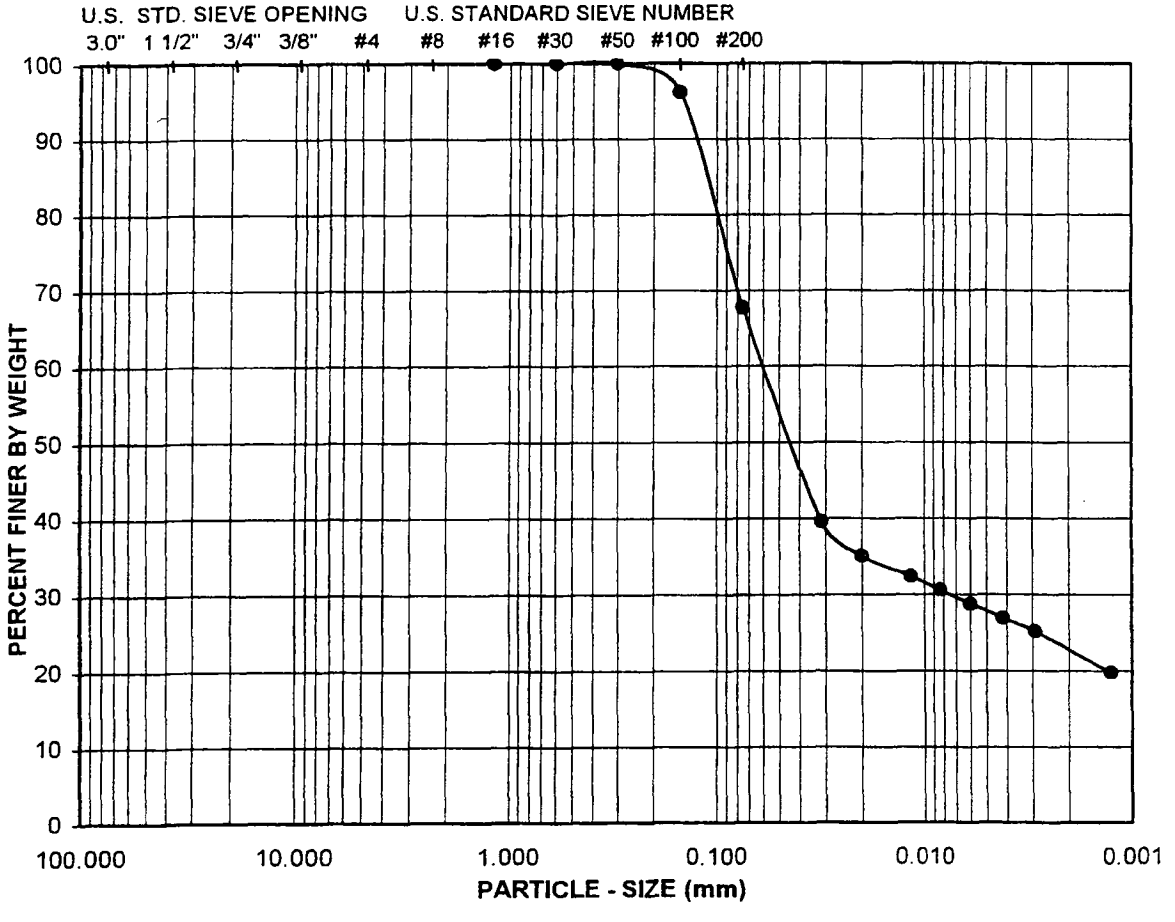
Hydrometer Wt. of Air-Dry Soil (gm) 55.25 Wt. of Dry Soil (gm) 55.25

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:41	0		5.5			
	9:43	2	24.2	5.5	27.5	39.5	0.0311
	9:46	5	24.3	5.5	25.0	35.0	0.0200
	9:56	15	24.4	5.5	23.5	32.3	0.0117
	10:11	30	24.5	5.5	22.5	30.5	0.0083
	10:41	60	24.6	5.5	21.5	28.7	0.0059
	11:41	120	25.0	5.5	20.5	26.9	0.0042
	13:51	250	25.3	5.5	19.5	25.1	0.0029
06/07/02	9:41	1440	23.6	5.5	16.5	19.8	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-8	095-2-075	35.0-37.0	s(CL)	0:32:68	42,23,19

Sample Description:

Olive brown sandy lean clay s(CL)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-10	Checked By:	LF		
Sample ID.:	095-2-098	Depth (ft.) :	15.0-17.0		

Visual Sample Description: Dark olive gray fat clay (CH)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	96	LL,PL,PI:	96,34,62			
Plastic Limit:	34	GR:SA:FI:	0:1:99			
Plasticity Index:	62	Grp. Symbol:	CH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	75.77
Wt.of Air-Dry Soil + Cont. (gm.)	56.16	Wt. of Container No.___ (gm.)		1.00	1.00	75.13
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	56.16	Wt. of Dry Soil (gm.)				0.64

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

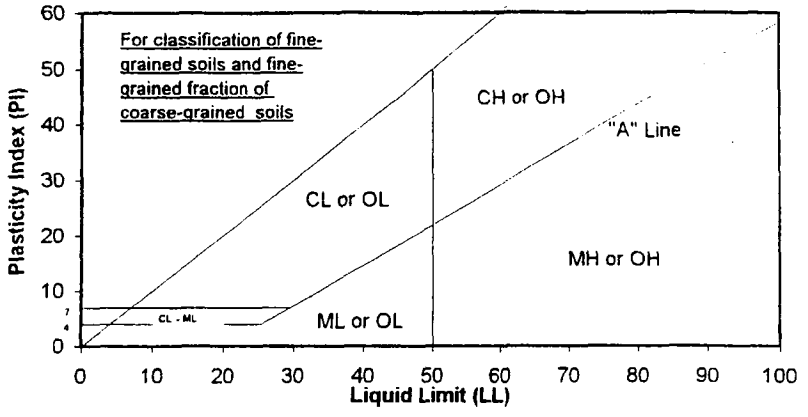
Sieve after Hydrometer & Wet Sieve

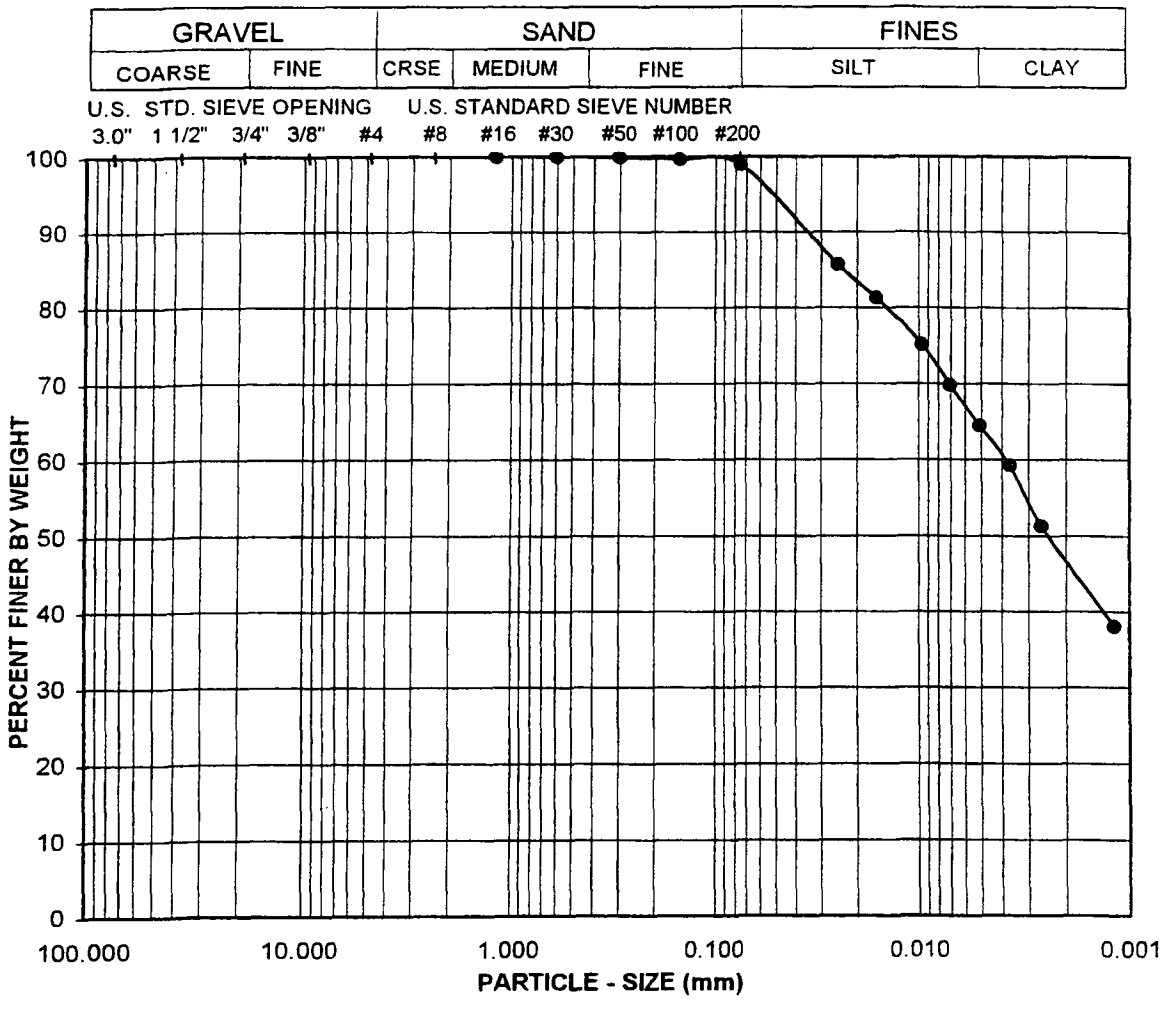
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.01	100.0	100.0
No. 50	0.06	99.9	99.9
No. 100	0.20	99.6	99.6
No. 200	0.62	98.9	98.9
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 56.16 Wt. of Dry Soil (gm) 56.16

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:37	0		5.5			
	9:39	2	24.2	5.5	54.0	85.7	0.0247
	9:42	5	24.2	5.5	51.5	81.3	0.0161
	9:52	15	24.3	5.5	48.0	75.1	0.0096
	10:07	30	24.4	5.5	45.0	69.8	0.0070
	10:37	60	24.6	5.5	42.0	64.5	0.0051
	11:37	120	25.0	5.5	39.0	59.2	0.0036
	13:47	250	25.4	5.5	34.5	51.2	0.0026
06/07/02	9:37	1440	23.6	5.5	27.0	38.0	0.0012





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-10	095-2-098	15.0-17.0	CH	0:1:99	96,34,62

Plots off the Chart

Sample Description:

Dark olive gray fat clay (CH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-10	Checked By:	LF		
Sample ID.:	095-2-105	Depth (ft.) :	50.0-51.5		

Visual Sample Description: Dark gray lean clay (CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	43	LL,PL,PI:	43,22,21			
Plastic Limit:	22	GR:SA:FI:	0:12:88			
Plasticity Index:	21	Grp. Symbol:	CL			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	83.71
Wt.of Air-Dry Soil + Cont. (gm.)	56.41	Wt. of Container No.___ (gm.)		1.00	1.00	76.99
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	56.41	Wt. of Dry Soil (gm.)				6.72

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

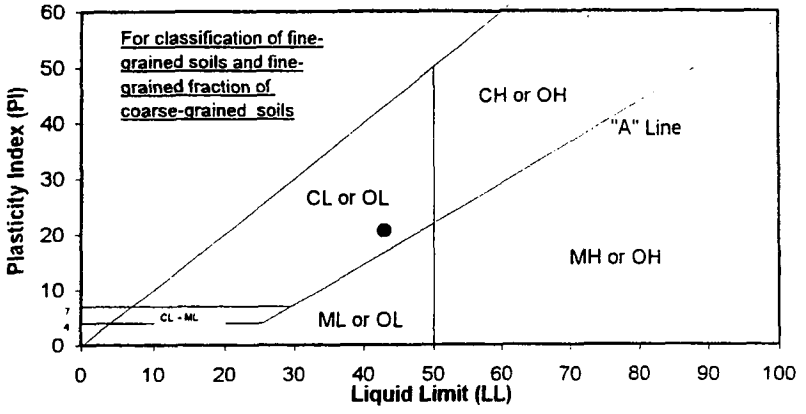
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.22	99.6	99.6
No. 30	0.44	99.2	99.2
No. 50	1.01	98.2	98.2
No. 100	4.58	91.9	91.9
No. 200	6.52	88.4	88.4
Pan			

Hydrometer

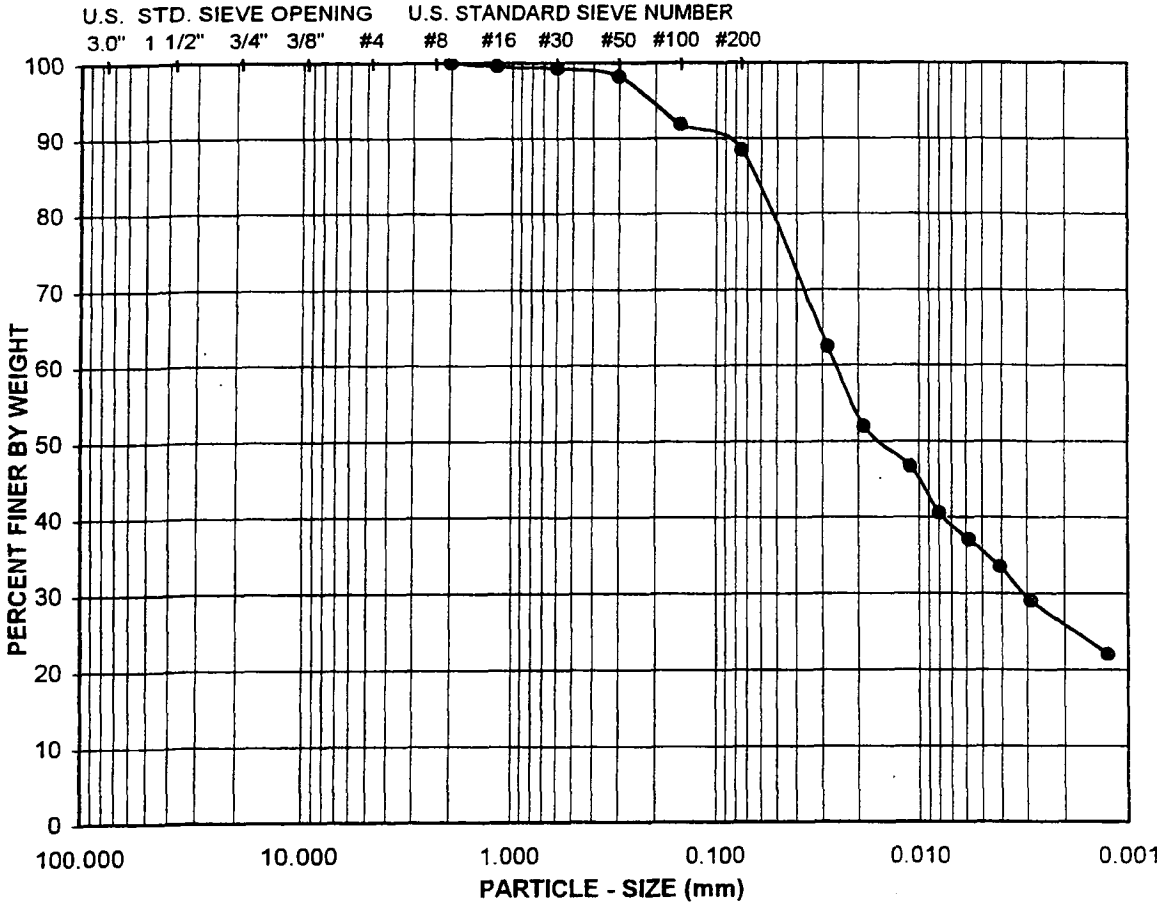
Wt. of Air-Dry Soil (gm) 56.41 Wt. of Dry Soil (gm) 56.41

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:53	0		5.5			
	9:55	2	24.4	5.5	41.0	62.4	0.0281
	9:58	5	24.4	5.5	35.0	51.9	0.0187
	10:08	15	24.4	5.5	32.0	46.6	0.0110
	10:23	30	24.6	5.5	28.5	40.4	0.0080
	10:53	60	24.6	5.5	26.5	36.9	0.0057
	11:53	120	25.0	5.5	24.5	33.4	0.0041
	14:03	250	25.2	5.5	22.0	29.0	0.0029
06/07/02	9:53	1440	23.7	5.5	18.0	22.0	0.0012



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-10	095-2-105	50.0-51.5	CL	0:12:88	43,22,21

Sample Description:

Dark gray lean clay (CL)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID.:	095-2-116	Depth (ft.) :	35.0-37.0		

Visual Sample Description: Dark gray sandy lean clay s(CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	36	LL,PL,PI:	36,18,18			
Plastic Limit:	18	GR:SA:FI:	0:50:50			
Plasticity Index:	18	Grp. Symbol:	s(CL)			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	105.46
Wt.of Air-Dry Soil + Cont. (gm.)	58.13	Wt. of Container No.___ (gm.)		1.00	1.00	75.07
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	58.13	Wt. of Dry Soil (gm.)				30.39

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

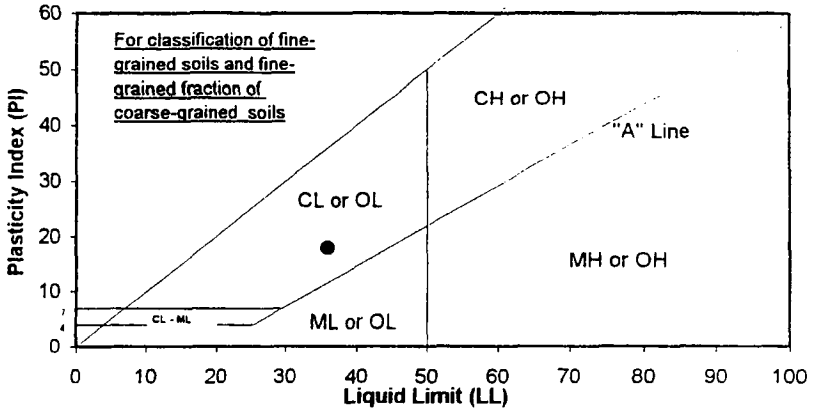
Sieve after Hydrometer & Wet Sieve

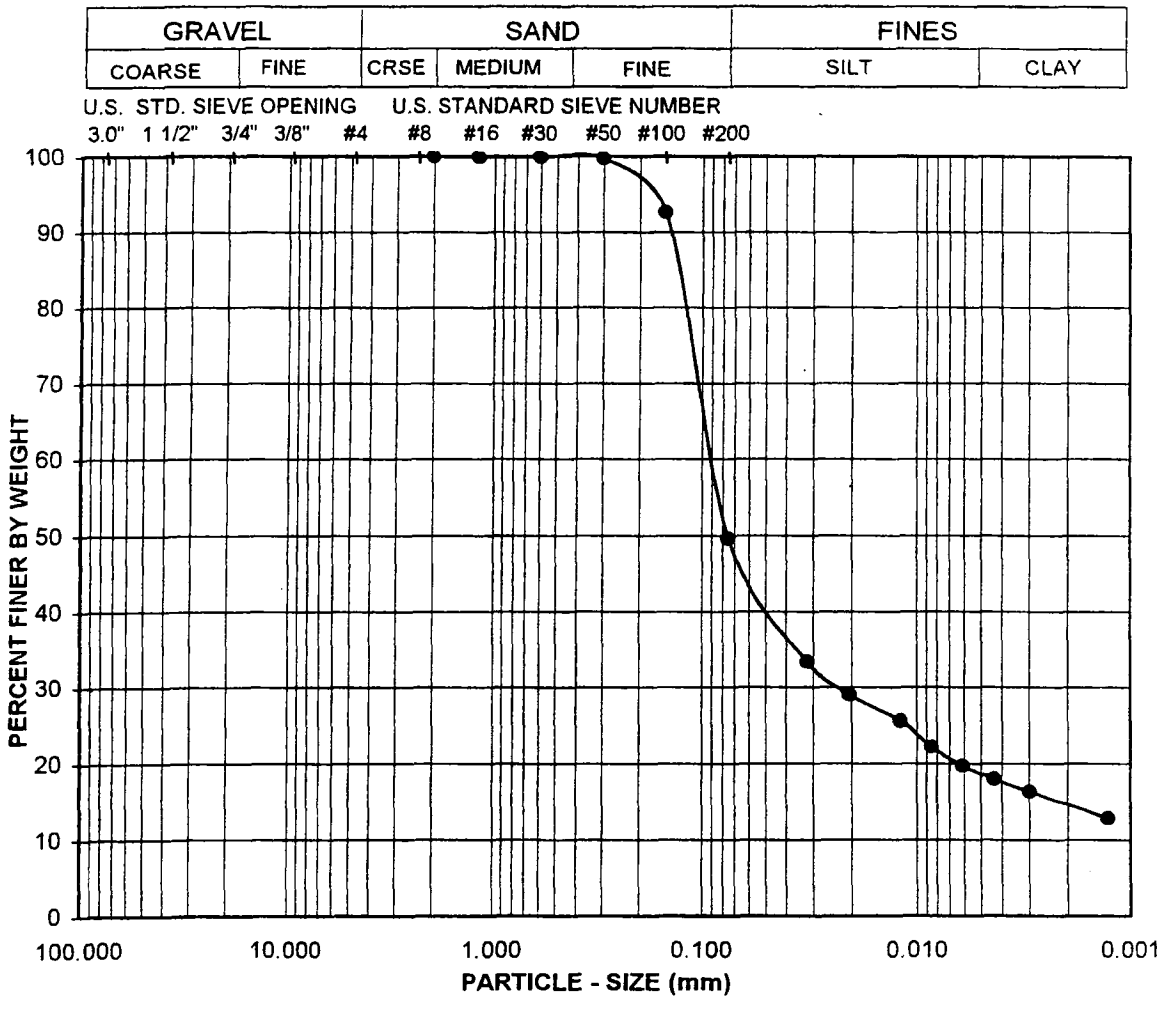
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.03	99.9	99.9
No. 30	0.04	99.9	99.9
No. 50	0.13	99.8	99.8
No. 100	4.30	92.6	92.6
No. 200	29.31	49.6	49.6
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 58.13 Wt. of Dry Soil (gm) 58.13

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:33	0		5.5			
	9:35	2	24.2	5.5	25.0	33.3	0.0317
	9:38	5	24.2	5.5	22.5	29.0	0.0203
	9:48	15	24.3	5.5	20.5	25.6	0.0119
	10:03	30	24.4	5.5	18.5	22.2	0.0085
	10:33	60	24.6	5.5	17.0	19.6	0.0061
	11:33	120	24.9	5.5	16.0	17.9	0.0043
	13:43	250	25.3	5.5	15.0	16.2	0.0030
06/07/02	9:33	1440	23.6	5.5	13.0	12.8	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-11	095-2-116	35.0-37.0	s(CL)	0:50:50	36,18,18

Sample Description:

Dark gray sandy lean clay s(CL)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID.:	095-2-118	Depth (ft.) :	45.0-47.0		

Visual Sample Description: Dark gray elastic silt (MH)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	57	LL,PL,PI:	57,32,25			
Plastic Limit:	32	GR:SA:FI:	0:5:95			
Plasticity Index:	25	Grp. Symbol:	MH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	75.99
Wt.of Air-Dry Soil + Cont. (gm.)	54.36	Wt. of Container No.___ (gm.)		1.00	1.00	73.16
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	54.36	Wt. of Dry Soil (gm.)				2.83

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

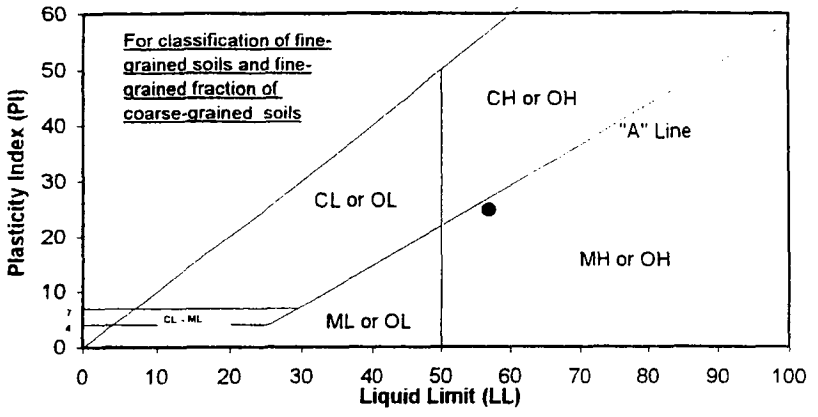
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.01	100.0	100.0
No. 50	0.04	99.9	99.9
No. 100	0.27	99.5	99.5
No. 200	2.71	95.0	95.0
Pan			

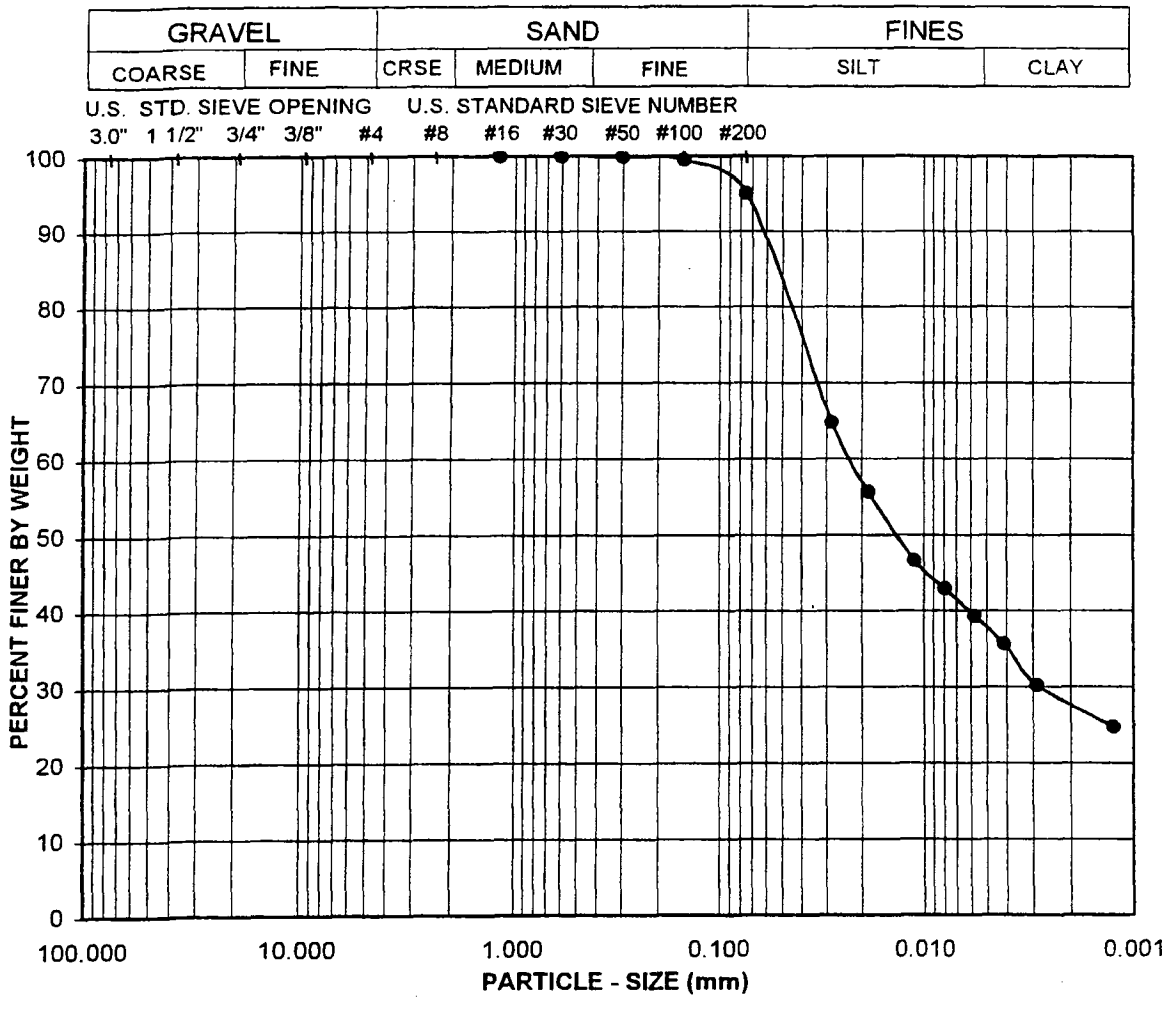
Hydrometer

Wt. of Air-Dry Soil (gm): 54.36 Wt. of Dry Soil (gm): 54.36

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:17	0		5.5			
	9:19	2	24.2	5.5	41.0	64.8	0.0281
	9:22	5	24.2	5.5	36.0	55.7	0.0185
	9:32	15	24.2	5.5	31.0	46.5	0.0111
	9:47	30	24.3	5.5	29.0	42.9	0.0079
	10:17	60	24.5	5.5	27.0	39.2	0.0057
	11:17	120	24.8	5.5	25.0	35.6	0.0041
	13:27	250	25.2	5.5	22.0	30.1	0.0029
06/07/02	9:17	1440	23.6	5.5	19.0	24.6	0.0012





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-11	095-2-118	45.0-47.0	MH	0:5:95	57,32,25

Sample Description:

Dark gray elastic silt (MH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID.:	095-2-119	Depth (ft.) :	55.0-57.0		
Visual Sample Description:	Dark olive silty sand (SM)				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	NONPLASTIC			
Plastic Limit:	NP	GR:SA:FI:	0:79:21			
Plasticity Index:	NP	Grp. Symbol:	SM			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	124.92
Wt.of Air-Dry Soil + Cont. (gm.)	56.62	Wt. of Container No.___ (gm.)		1.00	1.00	79.72
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	56.62	Wt. of Dry Soil (gm.)				45.20

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

Sieve after Hydrometer & Wet Sieve

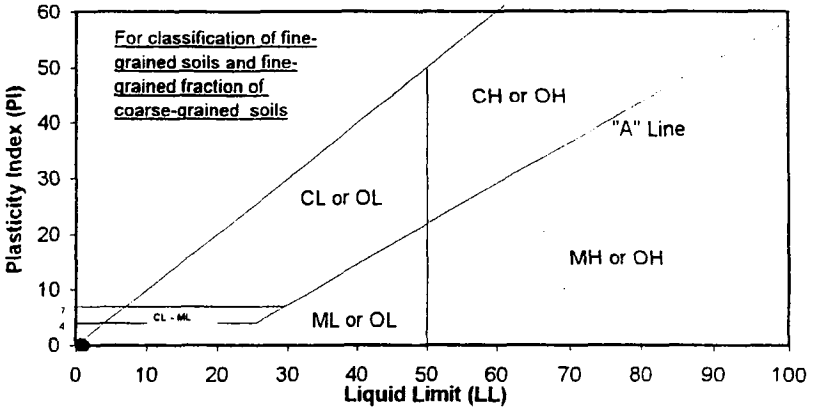
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.02	100.0	100.0
No. 50	3.80	93.3	93.3
No. 100	37.65	33.5	33.5
No. 200	44.64	21.2	21.2
Pan			

Hydrometer

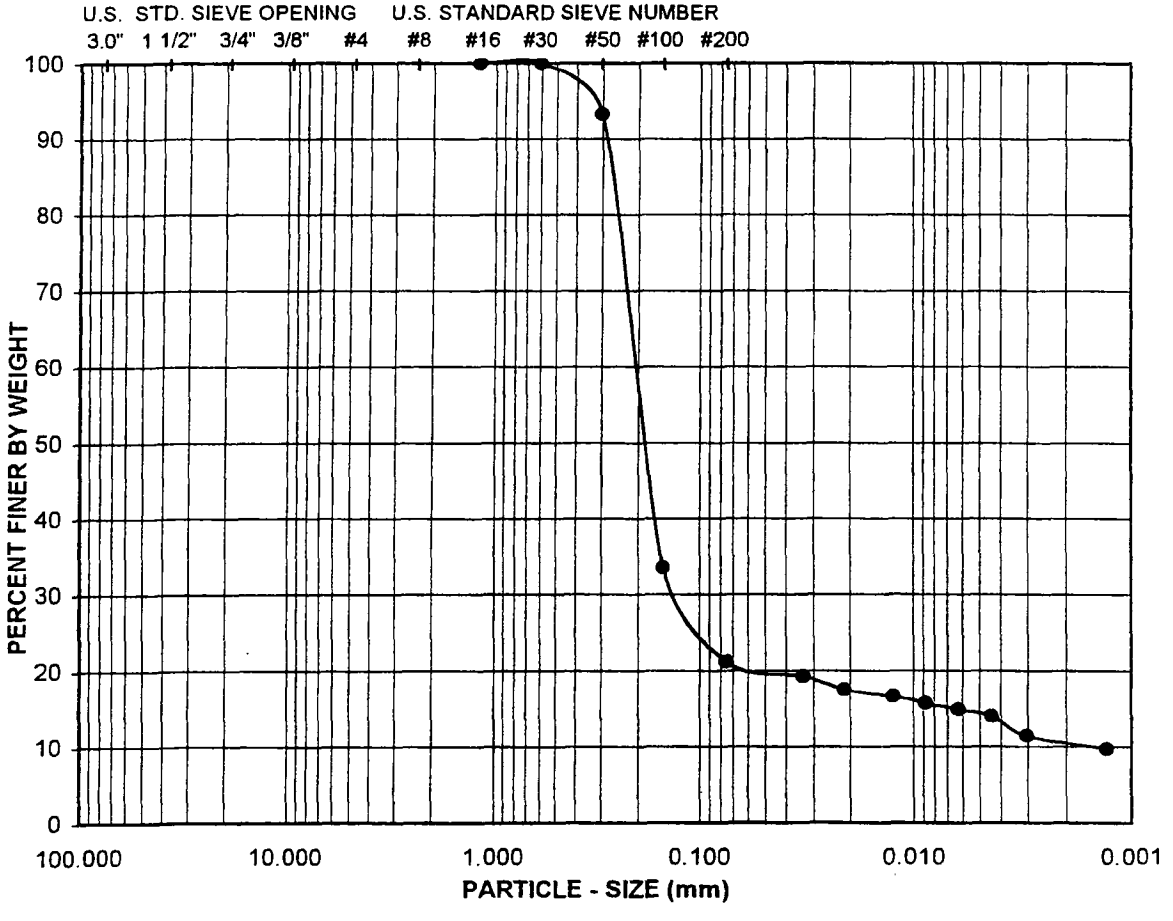
Wt. of Air-Dry Soil (gm) 56.62 Wt. of Dry Soil (gm) 56.62

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:29	0		5.5			
	9:31	2	24.2	5.5	16.5	19.3	0.0334
	9:34	5	24.2	5.5	15.5	17.5	0.0213
	9:44	15	24.3	5.5	15.0	16.6	0.0123
	9:59	30	24.4	5.5	14.5	15.8	0.0087
	10:29	60	24.6	5.5	14.0	14.9	0.0062
	11:29	120	24.9	5.5	13.5	14.0	0.0044
	13:39	250	25.3	5.5	12.0	11.4	0.0030
06/07/02	9:29	1440	23.6	5.5	11.0	9.6	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-11	095-2-119	55.0-57.0	SM	0:79:21	NONPLASTIC

Sample Description:

Dark olive silty sand (SM)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID.:	095-2-120	Depth (ft.) :	70.0-72.0		
Visual Sample Description:	Dark gray silty sand (SM)				

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	NP	LL,PL,PI:	NONPLASTIC			
Plastic Limit:	NP	GR:SA:FI:	0:76:24			
Plasticity Index:	NP	Grp. Symbol:	SM			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	120.92
Wt.of Air-Dry Soil + Cont. (gm.)	57.23	Wt. of Container No.___ (gm.)		1.00	1.00	76.80
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	57.23	Wt. of Dry Soil (gm.)				44.12

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

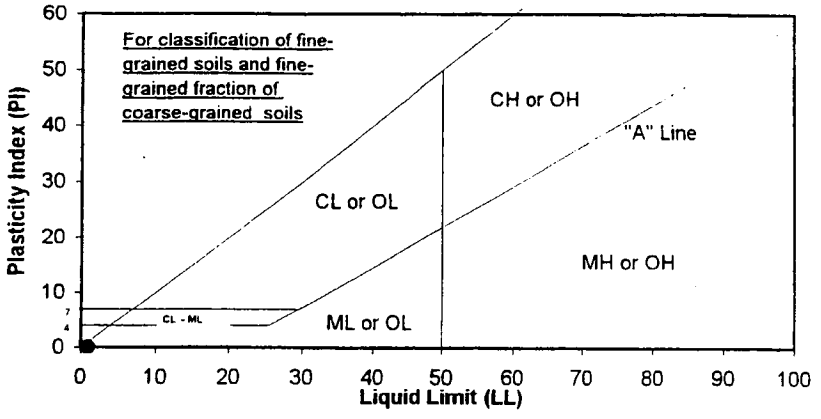
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.03	99.9	99.9
No. 50	6.09	89.4	89.4
No. 100	33.58	41.3	41.3
No. 200	43.69	23.7	23.7
Pan			

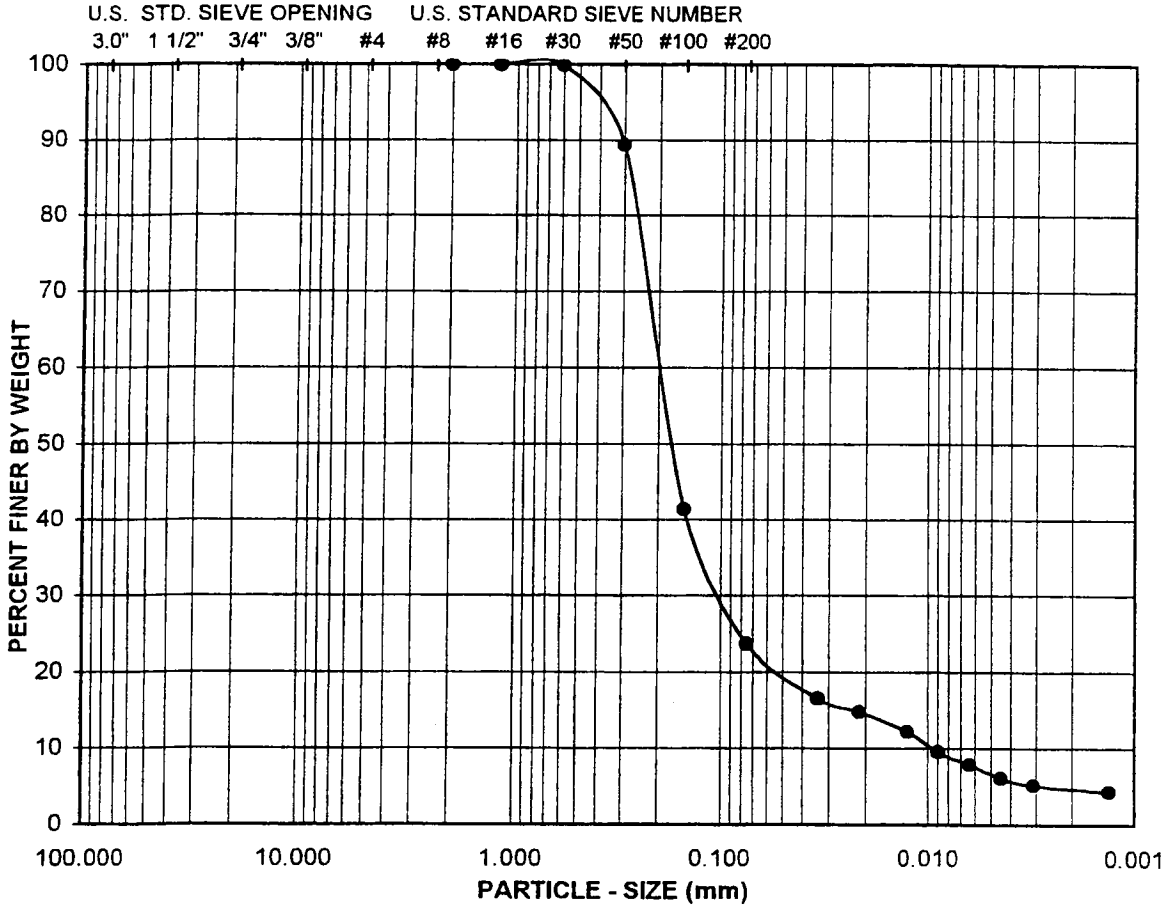
Hydrometer Wt. of Air-Dry Soil (gm) 57.23 Wt. of Dry Soil (gm) 57.23

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	10:05	0		5.5			
	10:07	2	24.4	5.5	15.0	16.5	0.0337
	10:10	5	24.5	5.5	14.0	14.7	0.0214
	10:20	15	24.5	5.5	12.5	12.1	0.0125
	10:35	30	24.6	5.5	11.0	9.5	0.0089
	11:05	60	24.8	5.5	10.0	7.8	0.0063
	12:05	120	25.1	5.5	9.0	6.1	0.0044
	14:15	250	25.4	5.5	8.5	5.2	0.0031
06/07/02	10:05	1440	23.7	5.5	8.0	4.3	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-11	095-2-120	70.0-72.0	SM	0:76:24	NONPLASTIC

Sample Description:

Dark gray silty sand (SM)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	LF		
Sample ID.:	095-2-125	Depth (ft.) :	110.0-112.0		

Visual Sample Description: Olive gray fat clay (CH)

Liquid Limit:	69	LL,PL,PI:	69,29,40	Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Plastic Limit:	29	GR:SA:FI:	0:6:94			
Plasticity Index:	40	Grp. Symbol:	CH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	127.86	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	118.73	78.21
Wt.of Air-Dry Soil + Cont. (gm.)	54.33	Wt. of Container No.___ (gm.)		1.00	60.69	75.31
Wt. of Container	0.00	Moisture Content (%)		0.00	15.73	
Dry Wt. of Soil (gm.)	54.33	Wt. of Dry Soil (gm.)				2.90

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

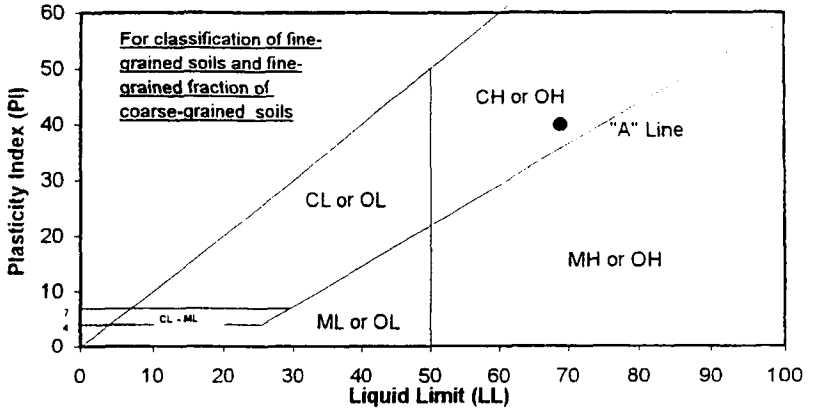
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.00	100.0	100.0
No. 50	0.01	100.0	100.0
No. 100	0.15	99.7	99.7
No. 200	2.84	94.0	94.0
Pan			

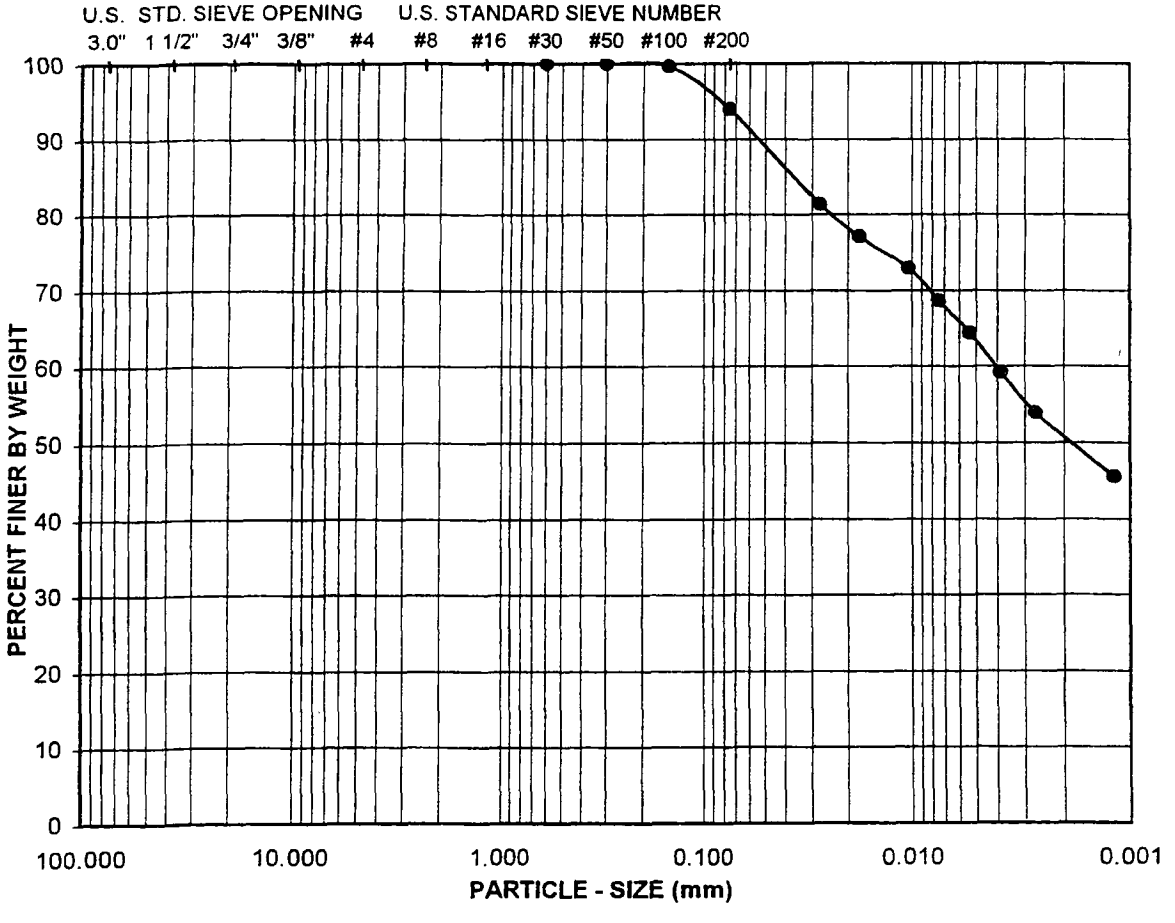
Hydrometer Wt. of Air-Dry Soil (gm) 54.33 Wt. of Dry Soil (gm) 46.95

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:13	0		5.5			
	9:15	2	24.2	5.5	44.0	81.4	0.0273
	9:18	5	24.2	5.5	42.0	77.1	0.0176
	9:28	15	24.2	5.5	40.0	72.9	0.0103
	9:43	30	24.3	5.5	38.0	68.7	0.0074
	10:13	60	24.5	5.5	36.0	64.4	0.0053
	11:13	120	24.9	5.5	33.5	59.2	0.0038
	13:23	250	25.2	5.5	31.0	53.9	0.0027
06/07/02	9:13	1440	23.6	5.5	27.0	45.4	0.0012



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-11	095-2-125	110.0-112.0	CH	0:6:94	69,29,40

Sample Description:

Olive gray fat clay (CH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	RA/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-11	Checked By:	ZF		
Sample ID.:	095-2-126	Depth (ft.) :	120.0-122.0		

Visual Sample Description: Dark gray sandy fat clay s(CH)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	60	LL,PL,PI:	60,31,29			
Plastic Limit:	31	GR:SA:FI:	0:31:69			
Plasticity Index:	29	Grp. Symbol:	s(CH)			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	141.75	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	129.12	92.41
Wt.of Air-Dry Soil + Cont. (gm.)	54.65	Wt. of Container No.___ (gm.)		1.00	55.74	77.78
Wt. of Container	0.00	Moisture Content (%)		0.00	17.21	
Dry Wt. of Soil (gm.)	54.65	Wt. of Dry Soil (gm.)				14.63

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

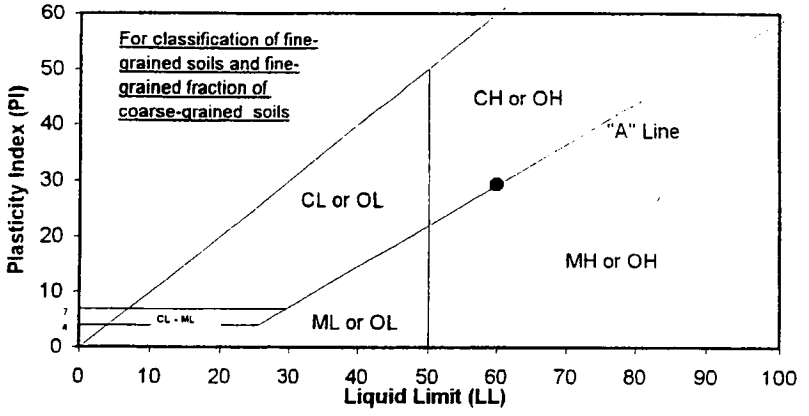
Sieve after Hydrometer & Wet Sieve

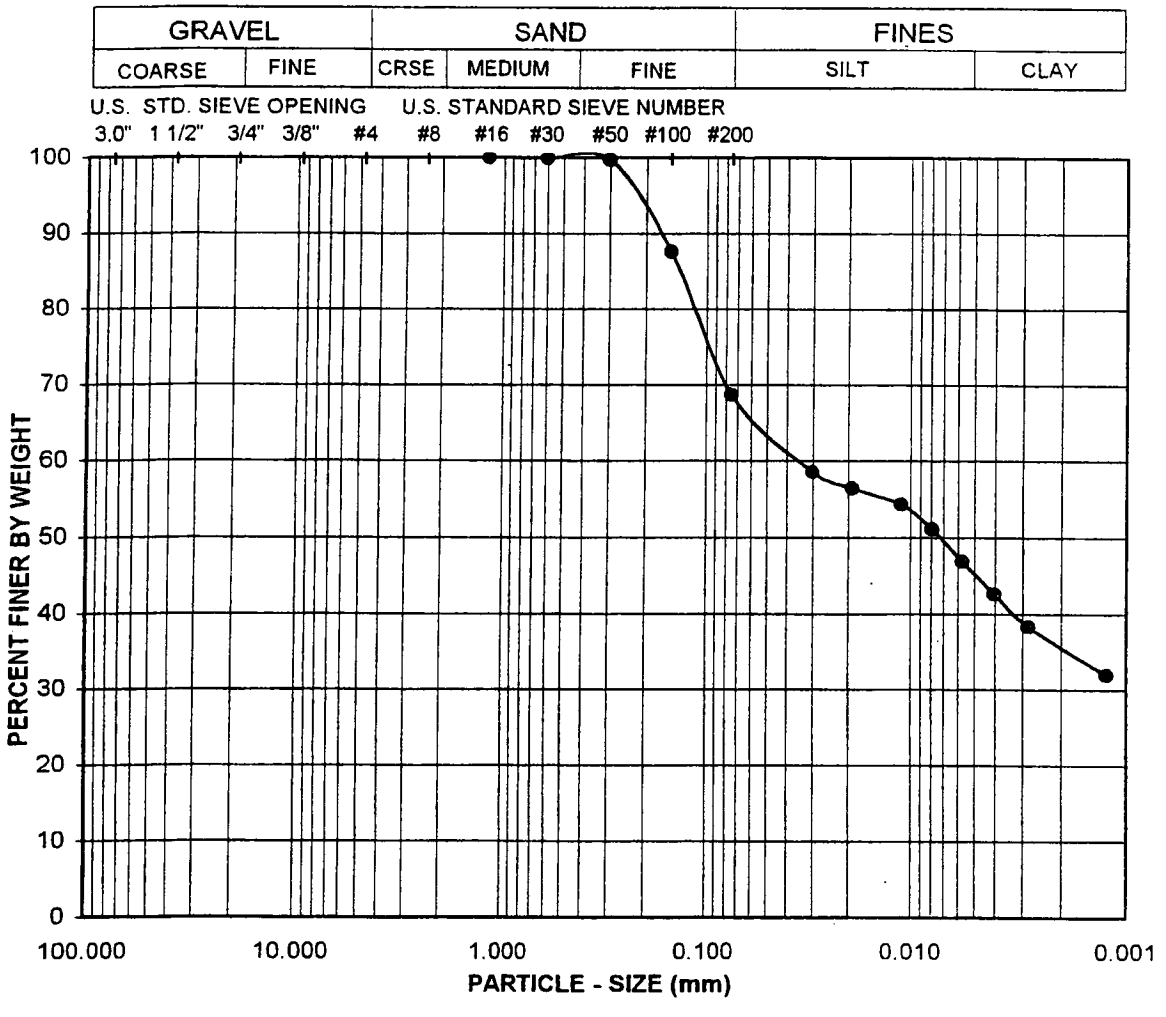
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.02	100.0	100.0
No. 50	0.10	99.8	99.8
No. 100	5.79	87.6	87.6
No. 200	14.60	68.7	68.7
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 54.65 Wt. of Dry Soil (gm) 46.63

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:49	0		5.5			
	9:51	2	24.3	5.5	33.0	58.5	0.0299
	9:54	5	24.4	5.5	32.0	56.4	0.0191
	10:04	15	24.4	5.5	31.0	54.3	0.0111
	10:19	30	24.5	5.5	29.5	51.1	0.0079
	10:49	60	24.6	5.5	27.5	46.8	0.0057
	11:49	120	25.0	5.5	25.5	42.6	0.0040
	13:59	250	25.3	5.5	23.5	38.3	0.0028
06/07/02	9:49	1440	23.6	5.5	20.5	31.9	0.0012





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-11	095-2-126	120.0-122.0	s(CH)	0:31:69	60,31,29

Sample Description:

Dark gray sandy fat clay s(CH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	ACS/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/18/02
Location:	B-12	Checked By:	LF		
Sample ID.:	095-2-059	Depth (ft.) :	30.0-31.5		

Visual Sample Description: Olive, elastic silt with sand (MH)s

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**54**	LL,PL,PI:	**54,31,23**			
Plastic Limit:	**31**	GR:SA:FI:	**0:20:80**			
Plasticity Index:	**23**	Grp. Symbol:	**(MH)s**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	86.54
Wt.of Air-Dry Soil + Cont. (gm.)	53.82	Wt. of Container No.___ (gm.)		1.00	1.00	75.65
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	53.82	Wt. of Dry Soil (gm.)				10.89

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

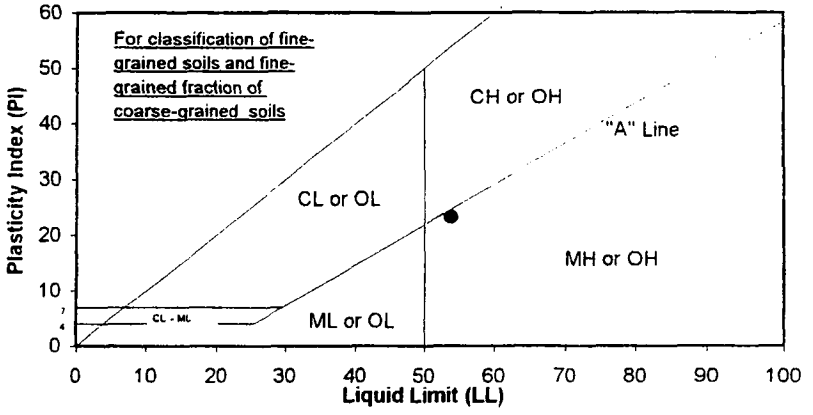
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.01	100.0	100.0
No. 30	0.04	99.9	99.9
No. 50	1.09	98.0	98.0
No. 100	8.59	84.0	84.0
No. 200	10.87	79.8	79.8
Pan			

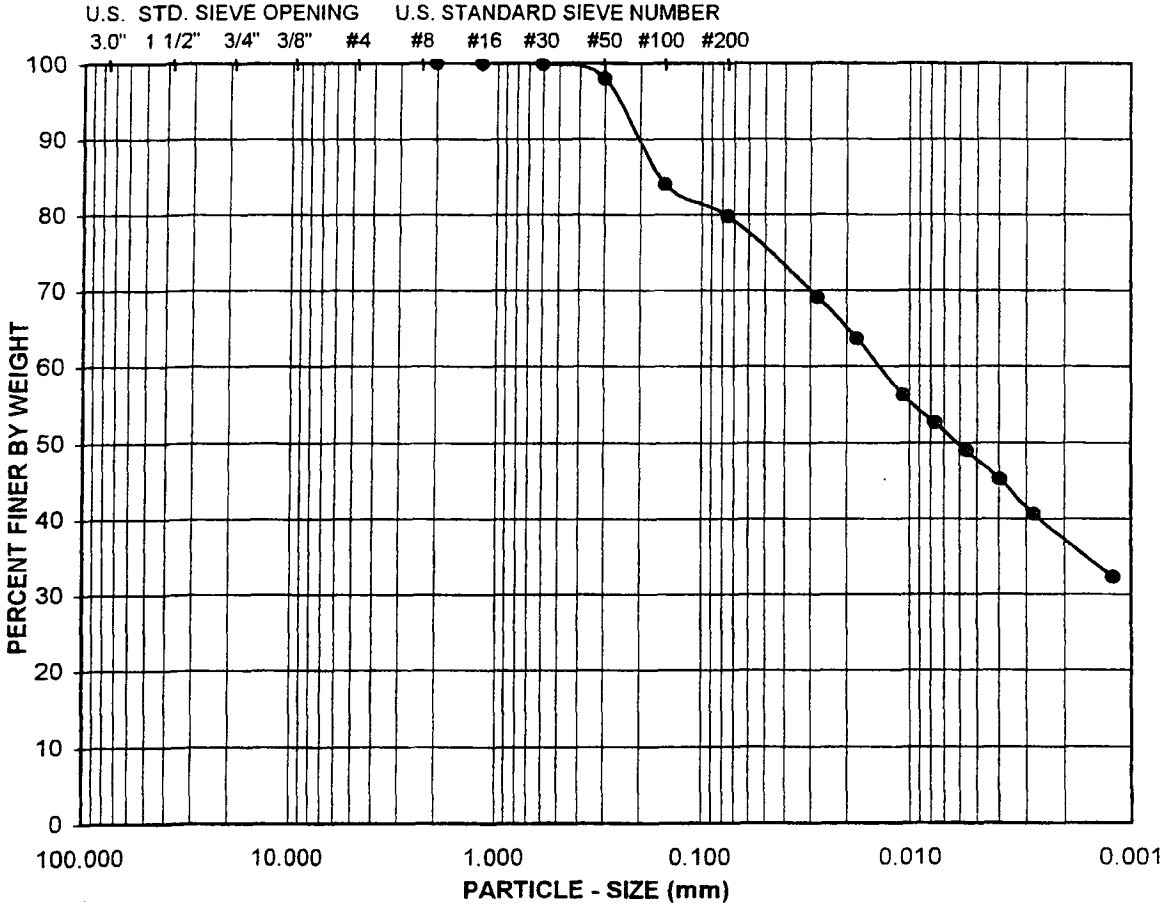
Hydrometer Wt. of Air-Dry Soil (gm) 53.82 Wt. of Dry Soil (gm) 53.82

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:25	0		5.5			
	9:27	2	24.2	5.5	43.0	69.1	0.0275
	9:30	5	24.2	5.5	40.0	63.6	0.0179
	9:40	15	24.2	5.5	36.0	56.2	0.0107
	9:55	30	24.4	5.5	34.0	52.5	0.0077
	10:25	60	24.5	5.5	32.0	48.8	0.0055
	11:25	120	24.9	5.5	30.0	45.2	0.0040
	13:35	250	25.2	5.5	27.5	40.5	0.0028
06/07/02	9:25	1440	23.6	5.5	23.0	32.3	0.0012



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-12	095-2-059	30.0-31.5	(MH)s	0:20:80	54,31,23

Sample Description:

Olive, elastic silt with sand (MH)s

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	ACS/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/18/02
Location:	B-12	Checked By:	LF		
Sample ID.:	095-2-061	Depth (ft.) :	45.0-46.5		

Visual Sample Description: Dark gray fat clay (CH)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	62	LL,PL,PI:	62,29,33			
Plastic Limit:	29	GR:SA:FI:	0:9:91			
Plasticity Index:	33	Grp. Symbol:	CH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	124.67	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	118.87	80.11
Wt.of Air-Dry Soil + Cont. (gm.)	58.57	Wt. of Container No.___ (gm.)		1.00	71.96	74.98
Wt. of Container	0.00	Moisture Content (%)		0.00	12.36	
Dry Wt. of Soil (gm.)	58.57	Wt. of Dry Soil (gm.)				5.13

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

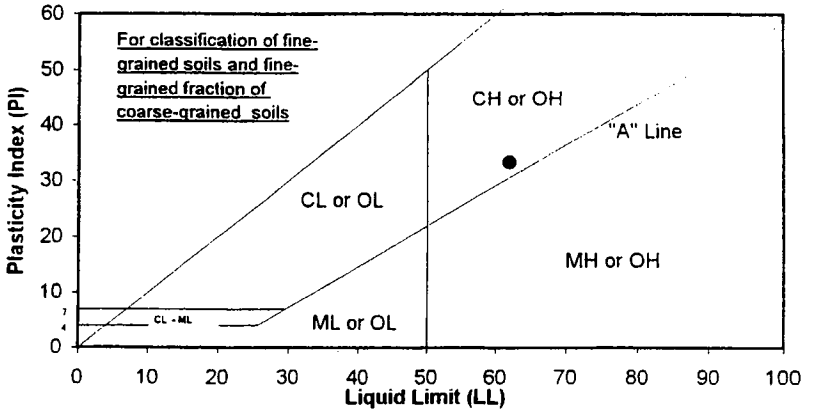
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.02	100.0	100.0
No. 30	0.05	99.9	99.9
No. 50	0.19	99.6	99.6
No. 100	0.78	98.5	98.5
No. 200	4.93	90.5	90.5
Pan			

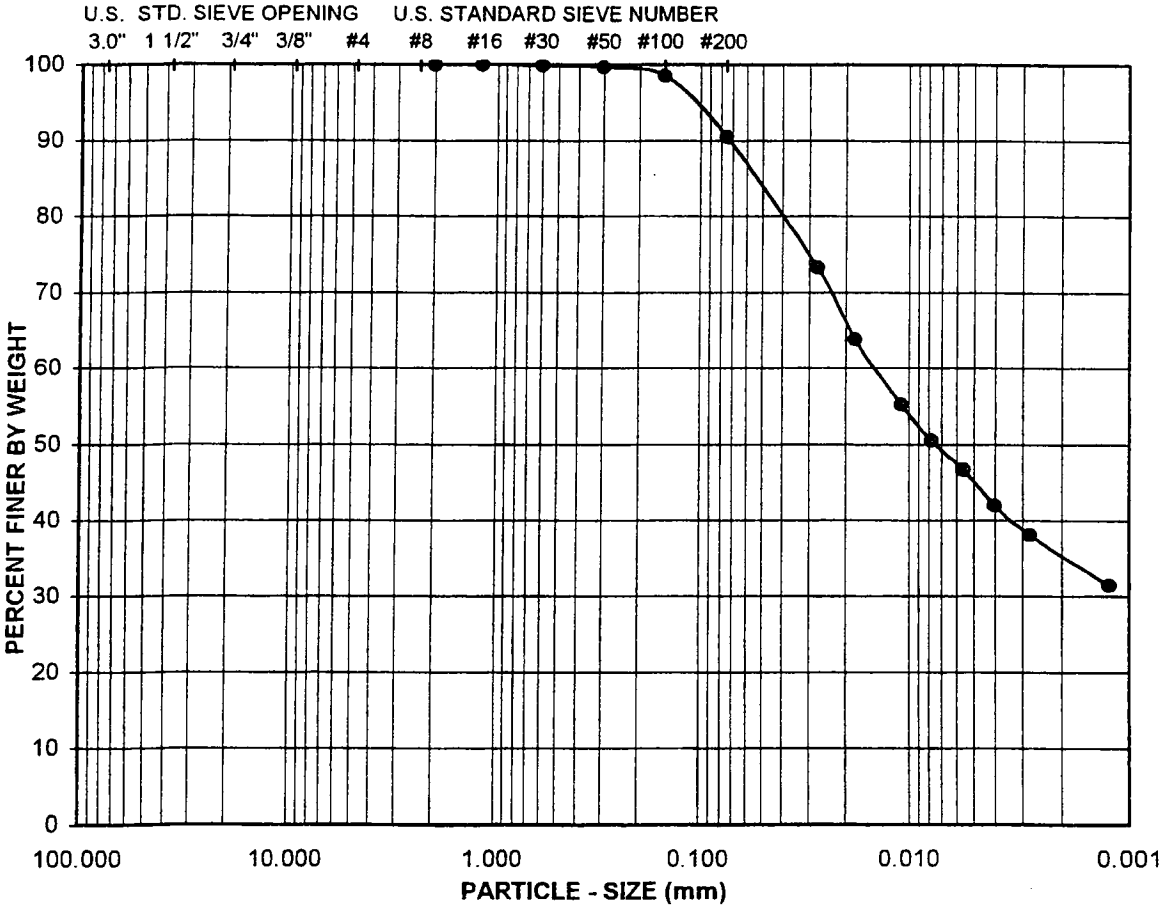
Hydrometer Wt. of Air-Dry Soil (gm) 58.57 Wt. of Dry Soil (gm) 52.13

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:09	0		5.5			
	9:11	2	24.2	5.5	44.0	73.3	0.0273
	9:14	5	24.2	5.5	39.0	63.8	0.0180
	9:24	15	24.2	5.5	34.5	55.2	0.0108
	9:39	30	24.2	5.5	32.0	50.4	0.0078
	10:09	60	24.4	5.5	30.0	46.6	0.0056
	11:09	120	24.8	5.5	27.5	41.9	0.0040
	13:19	250	25.2	5.5	25.5	38.1	0.0028
06/07/02	9:09	1440	23.6	5.5	22.0	31.4	0.0012



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-12	095-2-061	45.0-46.5	CH	0:9:91	62,29,33

Sample Description:

Dark gray fat clay (CH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	ACS/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/18/02
Location:	B-12	Checked By:	LF		
Sample ID.:	095-2-066	Depth (ft.) :	55.0-56.5		

Visual Sample Description: Dark gray fat clay (CH)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	62	LL,PL,PI:	62,27,35			
Plastic Limit:	27	GR:SA:FI:	0:2:98			
Plasticity Index:	35	Grp. Symbol:	CH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	102.64	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	97.94	76.16
Wt.of Air-Dry Soil + Cont. (gm.)	56.27	Wt. of Container No.___ (gm.)		1.00	65.60	75.36
Wt. of Container	0.00	Moisture Content (%)		0.00	14.53	
Dry Wt. of Soil (gm.)	56.27	Wt. of Dry Soil (gm.)				0.80

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

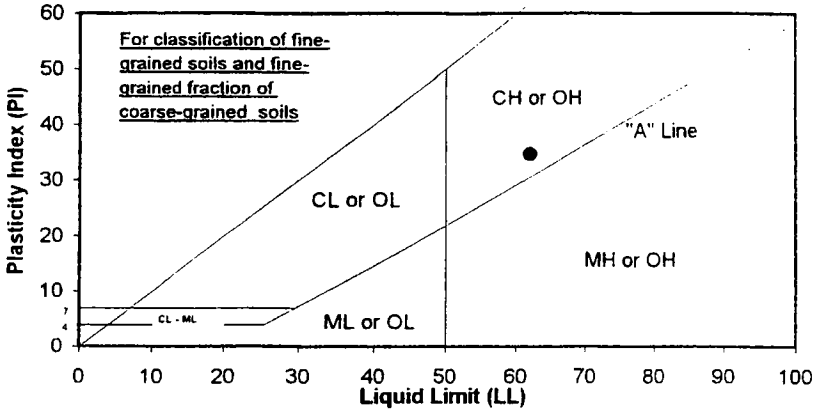
Sieve after Hydrometer & Wet Sieve

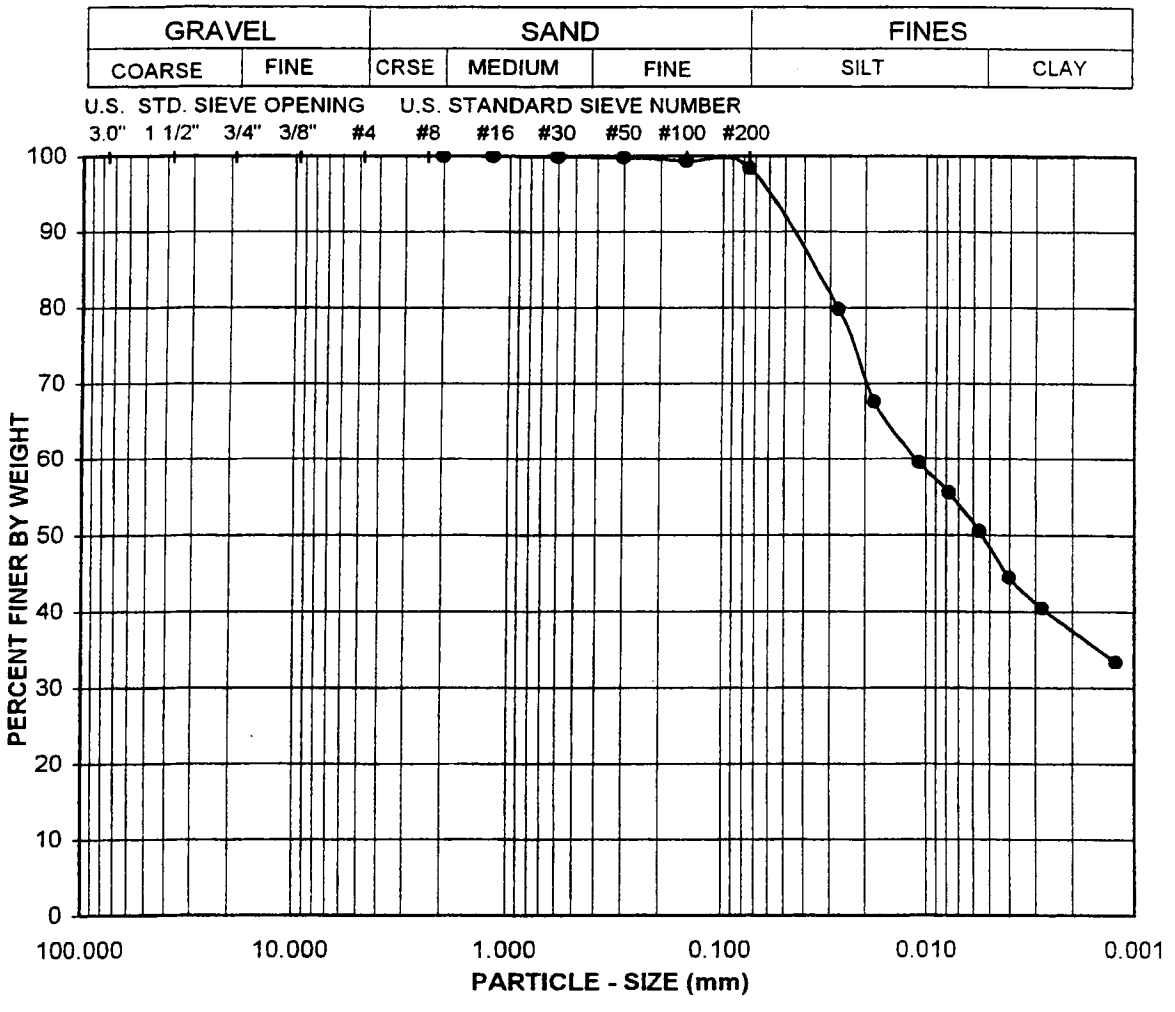
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.02	100.0	100.0
No. 30	0.03	99.9	99.9
No. 50	0.09	99.8	99.8
No. 100	0.31	99.4	99.4
No. 200	0.79	98.4	98.4
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 56.27 Wt. of Dry Soil (gm) 49.13

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	9:21	0		5.5			
	9:23	2	24.2	5.5	45.0	79.8	0.0270
	9:26	5	24.2	5.5	39.0	67.6	0.0180
	9:36	15	24.2	5.5	35.0	59.6	0.0108
	9:51	30	24.3	5.5	33.0	55.5	0.0077
	10:21	60	24.5	5.5	30.5	50.5	0.0056
	11:21	120	24.9	5.5	27.5	44.4	0.0040
	13:31	250	25.2	5.5	25.5	40.4	0.0028
06/07/02	9:21	1440	23.6	5.5	22.0	33.3	0.0012





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-12	095-2-C56	55.0-56.5	CH	0:2:98	62,27,35

Sample Description:

Dark gray fat clay (CH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

05-02

TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA	Tested By :	ACS/VJ	Date:	06/06/02
Project No. :	2384095-D-07060-1000	Data Input By:	LF	Date:	06/19/02
Location:	B-12	Checked By:	ZF		
Sample ID.:	095-2-067	Depth (ft.) :	72.0-74.0		

Visual Sample Description: Dark gray elastic / fat clay (MH/CH)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	52	LL,PL,PI:	52,29,23			
Plastic Limit:	29	GR:SA:FI:	0:2:98			
Plasticity Index:	23	Grp. Symbol:	MH/CH			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	76.38
Wt.of Air-Dry Soil + Cont. (gm.)	56.69	Wt. of Container No.___ (gm.)		1.00	1.00	75.34
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	56.69	Wt. of Dry Soil (gm.)				1.04

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

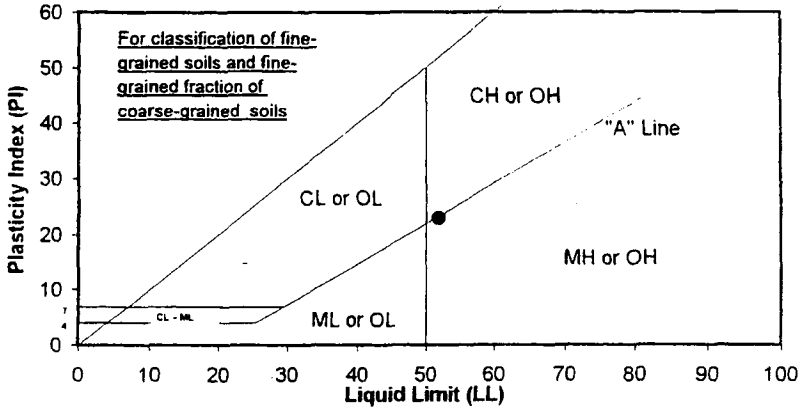
Sieve after Hydrometer & Wet Sieve

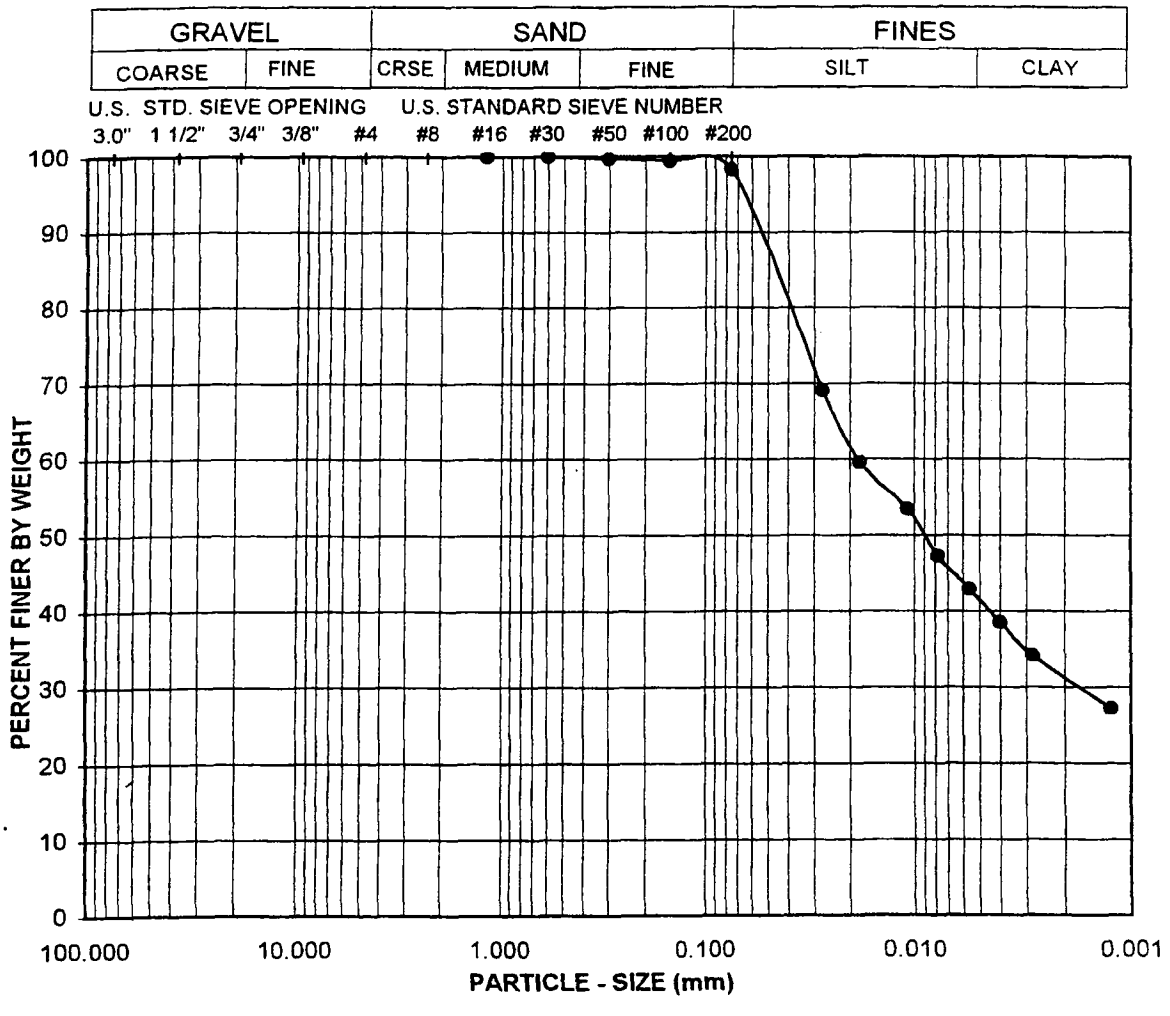
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.00	100.0	100.0
No. 30	0.02	100.0	100.0
No. 50	0.13	99.8	99.8
No. 100	0.32	99.4	99.4
No. 200	0.99	98.3	98.3
Pan			

Hydrometer Wt. of Air-Dry Soil (gm) 56.69 Wt. of Dry Soil (gm) 56.69

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
06/06/02	10:01	0		5.5			
	10:03	2	24.4	5.5	45.0	69.1	0.0270
	10:06	5	24.4	5.5	39.5	59.5	0.0179
	10:16	15	24.5	5.5	36.0	53.4	0.0107
	10:31	30	24.6	5.5	32.5	47.2	0.0078
	11:01	60	24.8	5.5	30.0	42.9	0.0056
	12:01	120	25.1	5.5	27.5	38.5	0.0040
	14:11	250	25.4	5.5	25.0	34.1	0.0028
06/07/02	10:01	1440	23.7	5.5	21.0	27.1	0.0012





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-12	095-2-067	72.0-74.0	MH/CH	0:2:98	52,29,23

Sample Description:

Dark gray elastic / fat clay (MH/CH)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

06-02

LOCATION	B-8	B-8	B-8	B-8	B-8	B-8	B-8	B-8
SAMPLE ID	095-2-069	095-2-070	095-2-071	095-2-072	095-2-074	095-2-076	095-2-077	095-2-079
Depth (ft.)	5.0-6.5	10.0-11.5	15.0-16.5	20.0-21.5	30.0-31.5	45.0-46.5	50.0-51.5	60.0-61.5
Sample Type	Sleeve	Bag	Bag	Bag	Bag	Bag	Bag	Bag
Visual Soil Classification	Olive brown clayey sand (SC)	Olive brown clayey sand (SC)	Olive, poorly graded sand with silt (SP-SM)	Olive brown, poorly graded sand (SP)	Olive, poorly graded sand with silt (SP SM)	Olive brown, poorly graded sand with silt (SP-SM)	Yellowish olive brown clayey sand (SC)	Olive brown, poorly graded sand with silt (SP-SM)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	240.44	118.67	182.39	152.50	143.57	150.23	155.87	151.61
Dry Weight of Soil + Container (gm.)	197.68	109.90	156.26	135.76	130.88	135.95	140.78	138.23
Weight of Container (gm)	62.60	65.69	55.13	57.09	76.39	68.13	63.25	67.58
Moisture Content (%)	31.66	19.84	25.84	21.28	23.29	21.06	19.46	18.94
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	550.93	250.45	279.51	300.12	240.80	244.00	256.04	252.51
Weight of Container (gm.)	82.26	82.35	75.35	77.38	76.98	75.05	76.41	76.73
Weight of Dry Sample (gm.)	355.98	140.27	162.24	183.66	132.88	139.56	150.36	147.79
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	339.18	162.37	223.15	252.97	202.03	199.10	193.50	214.67
Weight of Container (gm)	82.26	82.35	75.35	77.38	76.98	75.05	76.41	76.73
Dry Weight of Sample (gm)	256.92	80.02	147.80	175.59	125.05	124.05	117.09	137.94
% Passing No. 200 Sieve	**27.8**	**43.0**	**8.9**	**4.4**	**5.9**	**11.1**	**22.1**	**6.7**
% Retained No. 200 Sieve	72.2	57.0	91.1	95.6	94.1	88.9	77.9	93.3

TERATEST LABS

PERCENT PASSING No. 200 SIEVE

ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 06/03/02

-200.xls

LOCATION	B-8	B-9	B-9	B-9	B-9	B-9	B-9	B-9
SAMPLE ID	095-2-081	095-2-082	095-2-083	095-2-084	095-2-085	095-2-086	095-2-088	095-2-090
Depth (ft.)	70.0-71.5	5.0-7.0	10.0-11.5	15.0-16.5	20.0-22.0	25.0-27.0	35.0-36.5	45.0-46.5
Sample Type	Bag	Tube	Bag	Bag	Tube	Tube	Bag	Bag
Visual Soil Classification	Olive clayey / silty sand (SC/SM)	Olive clayey sand (SC)	Olive clayey sand (SC)	Olive brown, poorly graded sand with silt (SP-SM)	Olive poorly graded sand (SP)	Olive , poorly graded sand with silt (SP-SM)	Olive poorly graded sand (SP)	Dark gray clayey / silty sand (SC/SM)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	161.42	230.56	128.18	143.77	274.31	201.08	189.15	171.69
Dry Weight of Soil + Container (gm.)	144.64	192.10	110.48	130.63	237.30	172.89	168.46	148.14
Weight of Container (gm)	58.79	64.73	38.38	37.50	57.36	37.07	74.08	69.44
Moisture Content (%)	19.55	30.20	24.55	14.11	20.57	20.76	21.92	29.92
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	252.32	332.75	223.05	282.34	367.81	416.35	295.30	231.29
Weight of Container (gm.)	77.58	75.38	74.40	75.17	75.66	77.04	76.81	78.79
Weight of Dry Sample (gm.)	146.17	197.68	119.35	181.55	242.31	280.99	179.20	117.38
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	203.14	221.63	141.66	240.22	312.29	342.61	249.18	160.54
Weight of Container (gm)	77.58	75.38	74.40	75.17	75.66	77.04	76.81	78.79
Dry Weight of Sample (gm)	125.56	146.25	67.26	165.05	236.63	265.57	172.37	81.75
% Passing No. 200 Sieve	**14.1**	**26.0**	**43.6**	**9.1**	**2.3**	**5.5**	**3.8**	**30.4**
% Retained No. 200 Sieve	85.9	74.0	56.4	90.9	97.7	94.5	96.2	69.6

TERATEST LABS

PERCENT PASSING No. 200 SIEVE

ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 06/03/02

LOCATION	B-9	B-9	B-10	B-10	B-10	B-10	B-10	B-10
SAMPLE ID	095-2-092	095-2-094	095-2-099	095-2-100	095-2-101	095-2-103	095-2-107	095-2-109
Depth (ft.)	55.0-56.5	65.0-66.5	20.0-21.5	25.0-26.5	30.0-31.5	40.0-42.0	60.0-61.5	75.0-76.5
Sample Type	Bag	Bag	Bag	Bag	Bag	Tube	Bag	Bag
Visual Soil Classification	Olive brown clayey sand (SC)	Yellowish brown clayey sand (SC)	Olive, poorly graded sand with silt (SP-SM)	Olive clayey / silty sand (SC/SM)	Olive, poorly graded sand with silt (SP-SM)	Dark olive poorly graded sand (SP)	Olive, poorly graded sand with silt (SP-SM)	Olive silty sand (SM)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	127.51	160.28	178.14	0.00	165.71	214.66	136.99	119.21
Dry Weight of Soil + Container (gm.)	112.55	143.71	156.18	0.00	146.43	184.70	122.40	103.88
Weight of Container (gm)	40.24	57.63	53.86	1.00	58.06	39.30	56.32	37.51
Moisture Content (%)	20.69	19.25	21.46	0.00	21.82	20.61	22.08	23.10
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	260.64	257.72	284.98	260.15	280.15	404.80	223.26	289.09
Weight of Container (gm.)	79.84	75.53	76.82	82.31	75.21	74.85	76.84	73.31
Weight of Dry Sample (gm.)	149.81	152.78	171.38	177.84	168.24	273.58	119.94	175.29
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	194.24	202.02	236.09	209.62	232.51	336.82	185.61	225.05
Weight of Container (gm)	79.84	75.53	76.82	82.31	75.21	74.85	76.84	73.31
Dry Weight of Sample (gm)	114.40	126.49	159.27	127.31	157.30	261.97	108.77	151.74
% Passing No. 200 Sieve	**23.6**	**17.2**	**7.1**	**28.4**	**6.5**	**4.2**	**9.3**	**13.4**
% Retained No. 200 Sieve	76.4	82.8	92.9	71.6	93.5	95.8	90.7	86.6

TERATEST LABS

PERCENT PASSING No. 200 SIEVE

ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 06/03/02

-200 xls

LOCATION	B-11	B-11	B-11	B-11	B-7A	B-7A		
SAMPLE ID	095-2-110	095-2-112	095-2-114	095-2-122	095-2-134	095-2-136		
Depth (ft.)	5.0-6.5	15.0-16.5	25.0-26.5	80.0-81.5	40.0-41.5	50.0-51.5		
Sample Type	Bag	Bag	Bag	Bag	Bag	Bag		
Visual Soil Classification	Olive clayey sand (SC)	Olive brown, poorly graded sand with silt (SP-SM) & gravel	Olive silty sand (SM)	Olive clayey sand (SC)	Dark gray silty sand (SM)	Yellowish brown silty sand (SM)		
Moisture Correction								
Wet Weight of Soil + Container (gm.)	145.81	0.00	174.90	163.94	148.53	164.44		
Dry Weight of Soil + Container (gm.)	126.90	0.00	152.19	151.51	131.32	146.37		
Weight of Container (gm)	66.44	1.00	62.94	66.89	64.05	63.72		
Moisture Content (%)	31.28	0.00	25.45	14.69	25.58	21.86		
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	272.21	343.94	254.34	285.69	388.53	308.68		
Weight of Container (gm.)	78.01	73.99	82.34	75.61	75.30	75.30		
Weight of Dry Sample (gm.)	147.93	269.95	137.11	183.17	249.42	191.51		
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	172.15	323.73	180.62	229.32	246.36	237.69		
Weight of Container (gm)	78.01	73.99	82.34	75.61	75.30	75.30		
Dry Weight of Sample (gm)	94.14	249.74	98.28	153.71	171.06	162.39		
% Passing No. 200 Sieve	**36.4**	**7.5**	**28.3**	**16.1**	**31.4**	**15.2**		
% Retained No. 200 Sieve	63.6	92.5	71.7	83.9	68.6	84.8		

TERATEST LABS

PERCENT PASSING No. 200 SIEVE
ASTM D 1140

Project Name: Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda CA
Project No.: 2384095-D-07060-1000
Client Name: Foster Wheeler Environmental Corp.
Tested By: VJ Date: 06/03/02

Project name: ALAMEDA NAS
Project number: 01-0810

NORMAL LOAD FOR CONSOLIDATED UNDRAINED (QUICK) DIRECT SHEAR TESTS (ASTM D 3080)

Sample Identification Number	Normal Load (ksf)		
095-2-003	0.5	1.0	2.0
095-2-030	1.0	2.0	4.0
095-2-034	0.5	1.0	2.0
095-2-042	0.5	1.0	2.0
095-2-043	0.5	1.0	2.0
095-2-084 ✓	1.0	2.0	4.0
095-2-100 ✓	1.0	2.0	4.0
095-2-110 ✓	0.5	1.0	2.0
095-2-134 ✓	1.0	2.0	4.0

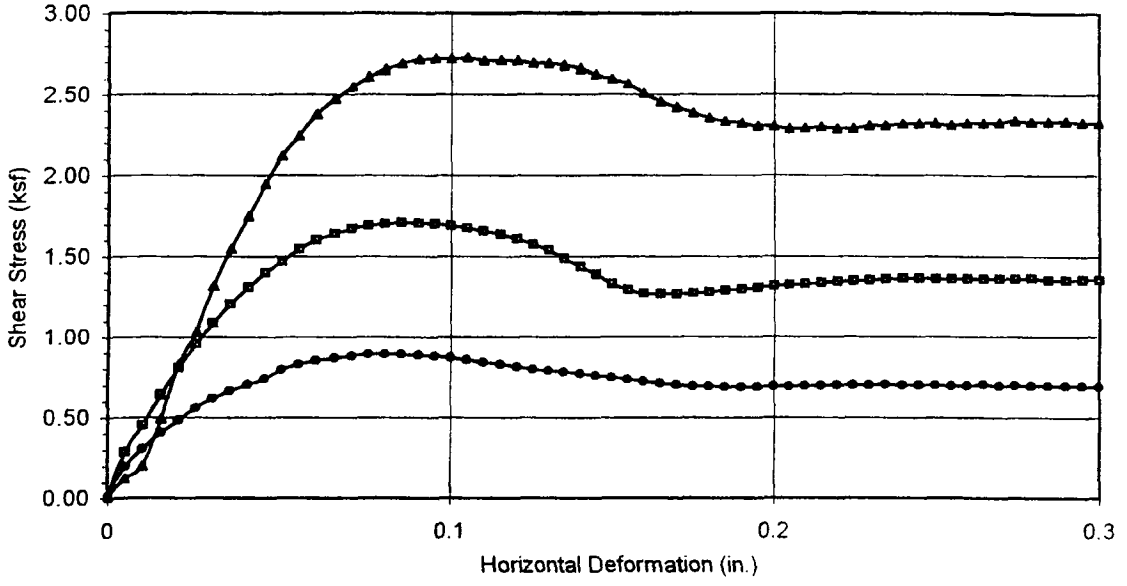
DIRECT SHEAR TEST

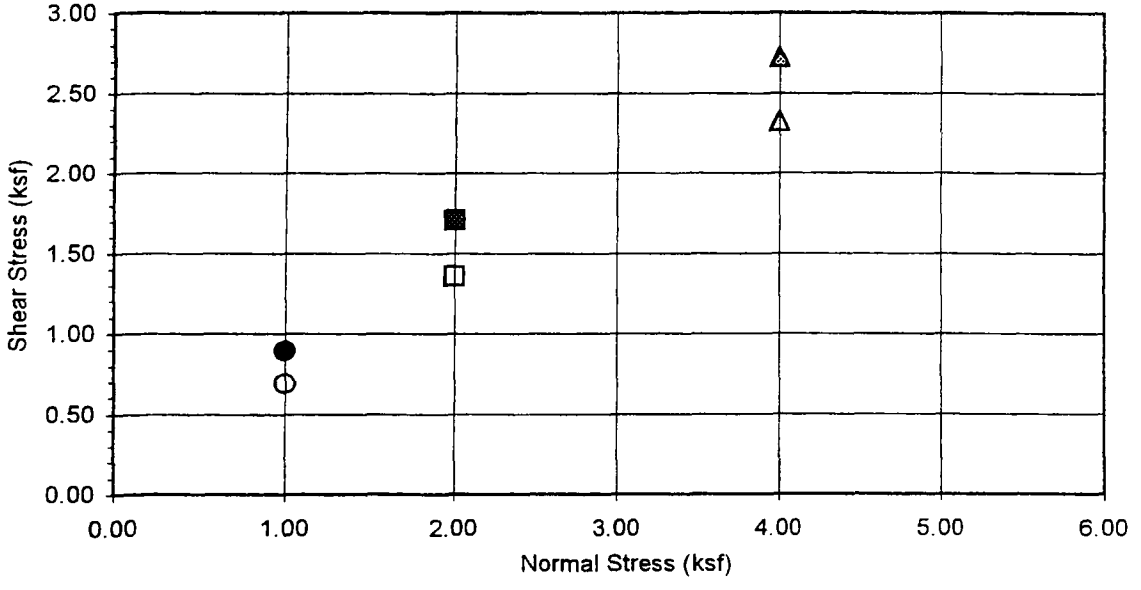
ASTM D3080

Project Name:	Geotechnical Evaluation, IR Site 2	Tested By:	RA	Date:	05/29/02
Project No.:	2384095-D-07060-1000	Checked By:	LF		
Location:	B-7A	Sample Type:	2.5"x 6" Sleeve		
Sample ID:	095-2-134	Depth (ft.):	40.0-41.5		

Sample Description: Dark gray silty sand (SM)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	201.82	202.90	202.46
Weight of Ring(gm):	46.59	46.68	46.50
Before Shearing			
Weight of Wet Sample+Cont.(gm):	208.48	208.48	208.48
Weight of Dry Sample+Cont.(gm):	181.98	181.98	181.98
Weight of Container(gm):	59.59	59.59	59.59
Vertical Rdg.(in): Initial	0.2639	0.2391	0.0000
Vertical Rdg.(in): Final	0.2756	0.2556	-0.0296
After Shearing			
Weight of Wet Sample+Cont.(gm):	227.31	217.56	188.77
Weight of Dry Sample+Cont.(gm):	199.13	191.49	162.28
Weight of Container(gm):	75.60	66.07	38.86
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 0.892	■ 1.709	▲ 2.725
Shear Stress @ End of Test (ksf)	○ 0.689	□ 1.356	△ 2.323
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	21.65	21.65	21.65
Dry Density (pcf)	106.1	106.8	106.6
Saturation (%)	99.4	101.1	100.6
Soil Height Before Shearing (in.)	0.9883	0.9835	0.9704
Final Moisture Content (%)	22.8	20.8	21.5

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-7A
Sample ID: 095-2-134
Depth (ft) 40.0-41.5
Sample Type: 2.5"x 6" Sleeve
Soil Description: Dark gray silty sand (SM)

Project No.: 2384095-D-07060-1000
Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda,CA

06-02

DS 095-2-134 B-7A @ 40-41.5.xls

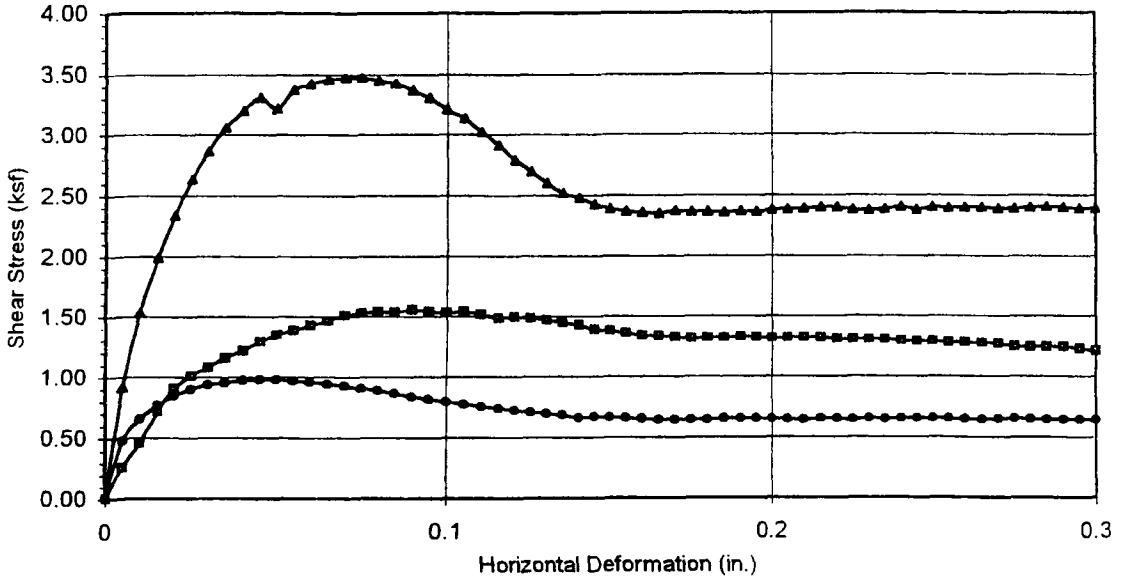
DIRECT SHEAR TEST

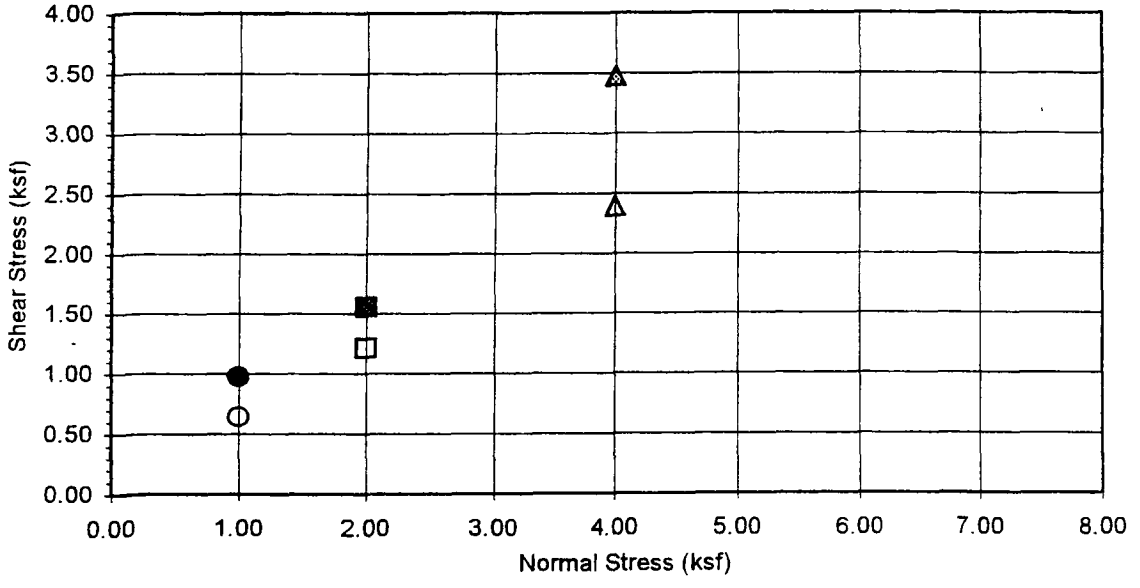
ASTM D3080

Project Name:	Geotechnical Evaluation, IR Site 2	Tested By:	RA	Date:	05/28/02
Project No.:	2384095-D-07060-1000	Checked By:	LF		
Location:	B-9	Sample Type:	2.5"x 6" Sleeve		
Sample ID:	095-2-084	Depth (ft.):	15.0-16.5		

Sample Description: Olive brown, poorly graded sand with silt (SP-SM)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	200.12	203.41	194.79
Weight of Ring(gm):	39.23	43.98	39.23
Before Shearing			
Weight of Wet Sample+Cont.(gm):	211.45	211.45	211.45
Weight of Dry Sample+Cont.(gm):	186.89	186.89	186.89
Weight of Container(gm):	74.44	74.44	74.44
Vertical Rdg.(in): Initial	0.2515	0.2333	0.2476
Vertical Rdg.(in): Final	0.2603	0.2453	0.2586
After Shearing			
Weight of Wet Sample+Cont.(gm):	231.50	228.76	208.85
Weight of Dry Sample+Cont.(gm):	204.62	200.02	183.22
Weight of Container(gm):	75.92	74.63	57.01
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 0.976	■ 1.556	▲ 3.473
Shear Stress @ End of Test (ksf)	○ 0.642	□ 1.210	△ 2.391
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	21.84	21.84	21.84
Dry Density (pcf)	109.8	108.8	106.2
Saturation (%)	110.2	107.4	100.4
Soil Height Before Shearing (in.)	0.9912	0.9880	0.9890
Final Moisture Content (%)	20.9	22.9	20.3

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-9
Sample ID: 095-2-084
Depth (ft) 15.0-16.5
Sample Type: 2.5"x 6" Sleeve
Soil Description: Olive brown, poorly graded sand with silt (SP-SM)

Project No.: 2384095-D-07060-1000
Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda,CA

06-02

DS 095-2-084 B-9 @ 15-16.5.xls

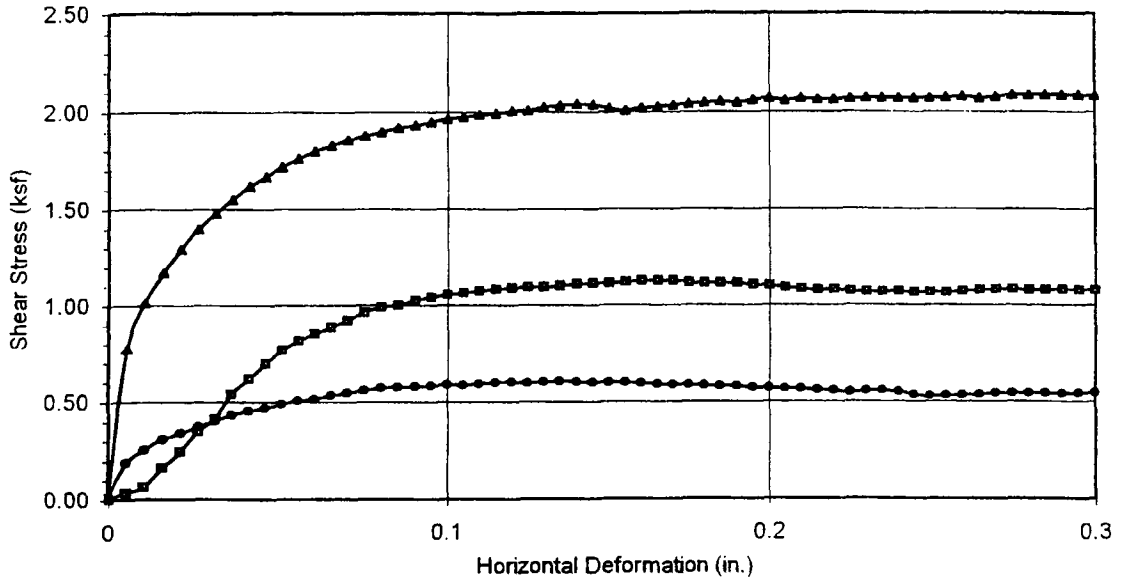
DIRECT SHEAR TEST

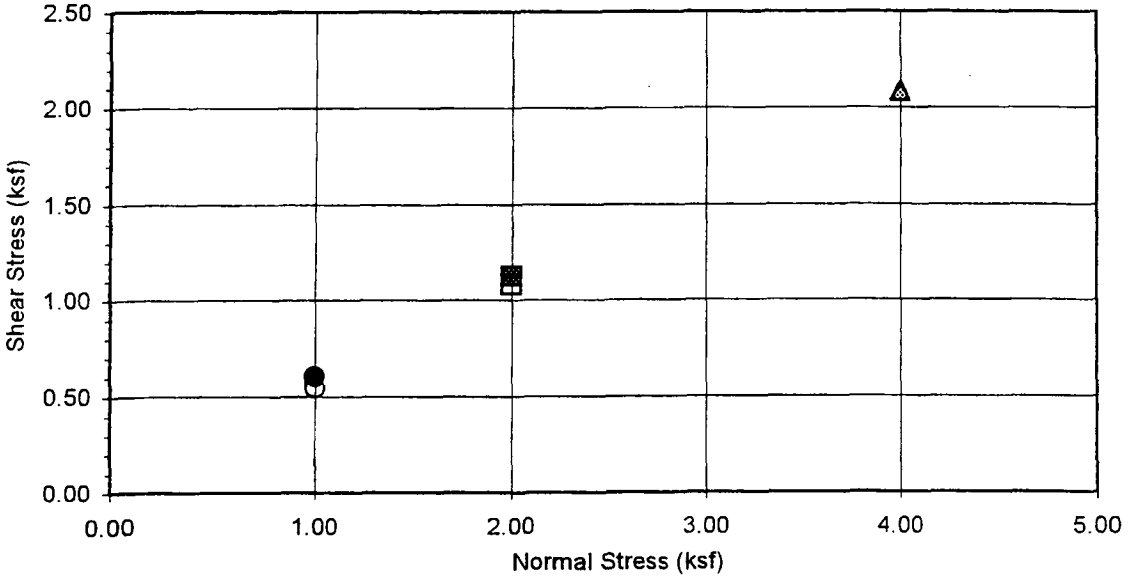
ASTM D3080

Project Name:	Geotechnical Evaluation, IR Site 2	Tested By:	RA	Date:	05/28/02
Project No.:	2384095-D-07060-1000	Checked By:	ZF		
Location:	B-10	Sample Type:	2.5"x 6" Sleeve		
Sample ID:	095-2-100	Depth (ft.):	25.0-26.5		

Sample Description: Very dark gray clayey / silty sand (SC/SM)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	185.47	190.43	190.87
Weight of Ring(gm):	42.59	46.50	46.68
Before Shearing			
Weight of Wet Sample+Cont.(gm):	168.04	168.04	168.04
Weight of Dry Sample+Cont.(gm):	139.19	139.19	139.19
Weight of Container(gm):	52.38	52.38	52.38
Vertical Rdg.(in): Initial	0.0000	0.2538	0.2546
Vertical Rdg.(in): Final	-0.0442	0.3211	0.3520
After Shearing			
Weight of Wet Sample+Cont.(gm):	193.62	189.65	186.25
Weight of Dry Sample+Cont.(gm):	162.27	160.54	158.48
Weight of Container(gm):	58.40	56.85	52.75
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 0.605	■ 1.126	▲ 2.086
Shear Stress @ End of Test (ksf)	○ 0.546	□ 1.079	△ 2.083
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	33.23	33.23	33.23
Dry Density (pcf)	89.2	89.8	90.0
Saturation (%)	100.8	102.4	102.8
Soil Height Before Shearing (in.)	0.9558	0.9327	0.9026
Final Moisture Content (%)	30.2	28.1	26.3

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-10
Sample ID: 095-2-100
Depth (ft) 25.0-26.5
Sample Type: 2.5"x 6" Sleeve
Soil Description: Very dark gray clayey / silty sand (SC/SM)

Project No.: 2384095-D-07060-1000
Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda,CA

06-02

DS 095-2-100 B-10 @ 25-26.5.xls

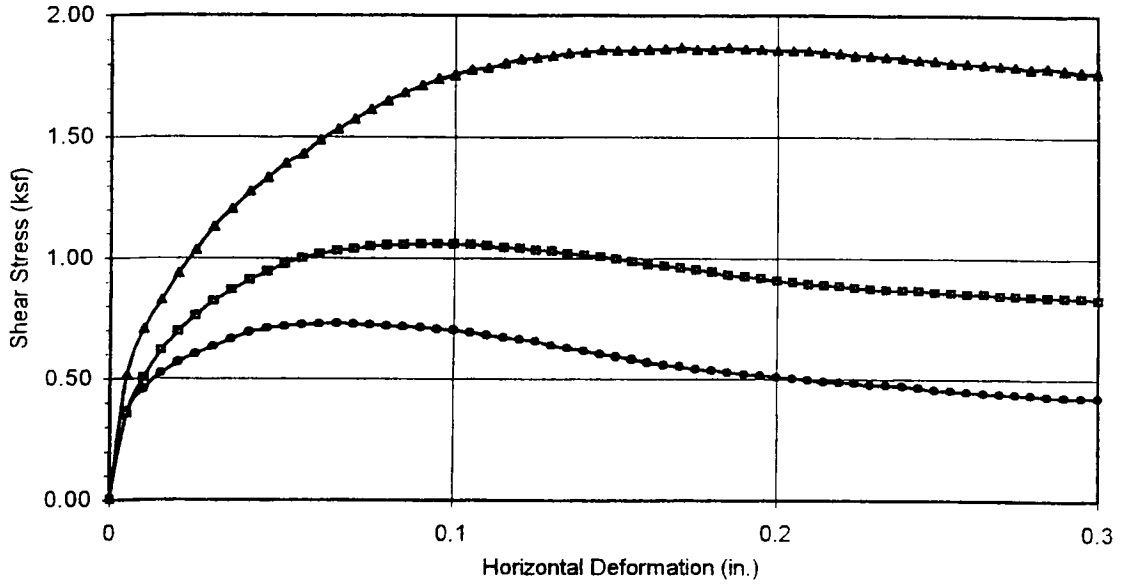
DIRECT SHEAR TEST

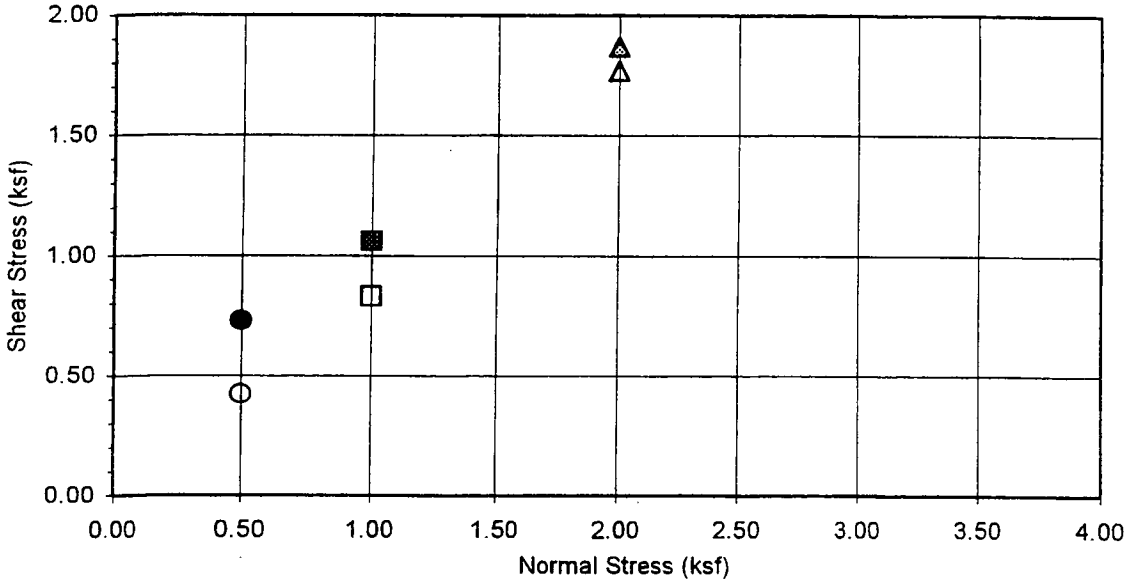
ASTM D3080

Project Name:	Geotechnical Evaluation, IR Site 2	Tested By:	RA	Date:	05/28/02
Project No.:	2384095-D-07060-1000	Checked By:	LF		
Location:	B-11	Sample Type:	2.5"x 6" Sleeve		
Sample ID:	095-2-110	Depth (ft.):	5.0-6.5		

Sample Description: Dark olive gray clayey sand (SC) with some gravel

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	179.89	180.16	188.31
Weight of Ring(gm):	46.59	46.68	45.60
Before Shearing			
Weight of Wet Sample+Cont.(gm):	143.98	143.98	143.98
Weight of Dry Sample+Cont.(gm):	128.43	128.43	128.43
Weight of Container(gm):	59.17	59.17	59.17
Vertical Rdg.(in): Initial	0.0000	0.2438	0.2511
Vertical Rdg.(in): Final	-0.0051	0.2536	0.2884
After Shearing			
Weight of Wet Sample+Cont.(gm):	186.51	190.24	195.08
Weight of Dry Sample+Cont.(gm):	144.56	150.78	160.76
Weight of Container(gm):	52.81	57.32	54.50
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.730	■ 1.060	▲ 1.868
Shear Stress @ End of Test (ksf)	○ 0.424	□ 0.829	△ 1.768
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	22.45	22.45	22.45
Dry Density (pcf)	90.5	90.7	96.9
Saturation (%)	70.3	70.5	82.0
Soil Height Before Shearing (in.)	0.9949	0.9902	0.9627
Final Moisture Content (%)	45.7	42.2	32.3

TERATEST LABS

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Location: B-11
Sample ID: 095-2-110
Depth (ft) 5.0-6.5
Sample Type: 2.5"x 6" Sleeve
Soil Description: Dark olive gray clayey sand (SC) with some gravel

Project No.: 2384095-D-07060-1000
Geotechnical Evaluation, IR Site 2, Alameda Point, Alameda,CA

06-02

DS 095-2-110 B-11 @ 5-6.5.xls

URS

June 17, 2002

Mr. Les Fruth
TERATEST LABS, Inc.
17781 Cowan Ave., Suite 150
Irvine, CA 92614

Subject: **Laboratory Miniature Vane Shear Testing**
Geotechnical Evaluation IR Site 2,
Alameda Point, Alameda, California
2384095-D-07060-1000

Dear Mr. Fruth:

Laboratory tests have been completed on 27 soil samples you provided for the referenced project. The purpose of these tests was to determine the undrained shear strength using a miniature vane shear apparatus.
The miniature vane shear device, manufactured by Wykeham Farrance Engineering, conforms to ASTM D4648 standard. Measurements were obtained by using a four-blade vane of equal height to diameter ratio and four springs; the vane blade diameter and rectangular blade height was 0.5 inch and each of the four torque springs used had different resistance. A calibration curve, of each spring, was used to derive a spring constant and are attached for your reference. The spring constants were calculated using equations published in the ASTM standard. Using these spring constants times the difference in rotation yielded the undrained shear strength. A rotational shearing rate was set at approximately 60 to 90 degrees per minute. Time to failure of each specimen was not noted but was observed to range from 30 seconds to about 2 minutes. Results of the laboratory tests are listed on the attached table.

Thank you for the opportunity to allow URS Corporation to help with laboratory testing. We hope that the work performed meets your expectations. If you have any questions, please feel free to contact us at your convenience.

Sincerely,

URS Corporation

Thomas J. O'Meara

Thomas J. O'Meara
Geotechnical Laboratory Manger

URS Corporation
2110 E. First Plaza, Suite 116
Santa Ana, California 92705
Tel: 714.648.2861
Fax: 714.973.4834
www.urscorp.com

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-022	top	30.0	CL	1	7	75	68	304	255
	bottom		CL	1	8	54	46	205	
095-2-023	top	50.0	CL	1	8	142	134	598	456
	bottom		CL	1	8	78	70	313	
095-2-021	top	20.5	CL	1	9	147	138	616	558
	bottom		CL	1	10	122	112	500	
095-2-013	top	25.0	CL	1	10	74	64	286	295
	bottom		CL	1	10	78	68	304	
095-2-024	top	70.0	CL	1	9	84	75	335	371
	bottom		CL	1	10	101	91	406	
095-2-029	top	41.0	SC	1	9	56	47	210	239
	bottom		SC	1	11	71	60	268	
095-2-001	top	5.0	CL	1	10	142	132	590	498
	bottom		CL	1	10	101	91	406	
095-2-011	top	5.0	CL	1	10	42	32	143	161
	bottom		CL	1	10	50	40	179	

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-012	top	15.0	CH	1	10	121	111	496	538
	bottom		CH	1	10	140	130	581	
095-2-019	top	5.0	SC/CL	1	10	167	157	701	525
	bottom		SC	1	10	88	78	348	
095-2-020	top	15.0	SC	1	10	63	53	237	460
	bottom		SC-SM	1	10	163	153	683	
095-2-027	top	7.0	CL-ML	1	87	165	78	348	302
	bottom		CL	2	10	38	28	256	
095-2-028	top	15.0	CL	1	9	58	49	219	210
	bottom		CL	1	8	53	45	201	
095-2-059	top		Not Tested						
	bottom		Not Tested						
095-2-061	top	45.0	CH	1	10	107	97	433	433
	bottom								
095-2-066	top	55.0							
	bottom		CH	1	10	123	113	505	

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-067	top	72.0	CH	1	10	34	24	107	420
	bottom		CH	3	1	43	42	732	
095-2-075	top	35.0	SC	1	10	97	87	389	551
	bottom		CH	2	87	165	78	714	
095-2-098	top	15.0	CH	1	11	92	81	362	536
	bottom		CH	1	10	169	159	710	
095-2-105	top	50.0	CL	1	9	130	121	540	634
	bottom		CL	1	9	172	163	728	
095-2-116	top	35.0	CH	1	10	89	79	353	694
	bottom		CH	2	87	200	113	1034	
095-2-118	top	45.0	CL	1	11	63	52	232	499
	bottom		CH	3	2	46	44	767	
095-2-119	top	55.0	CH	1	11	58	47	210	368
	bottom		SM	1	11	129	118	527	
095-2-120	top	70.0	CH	1	10	47	37	165	426
	bottom		SC-SM	2	87	162	75	687	

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

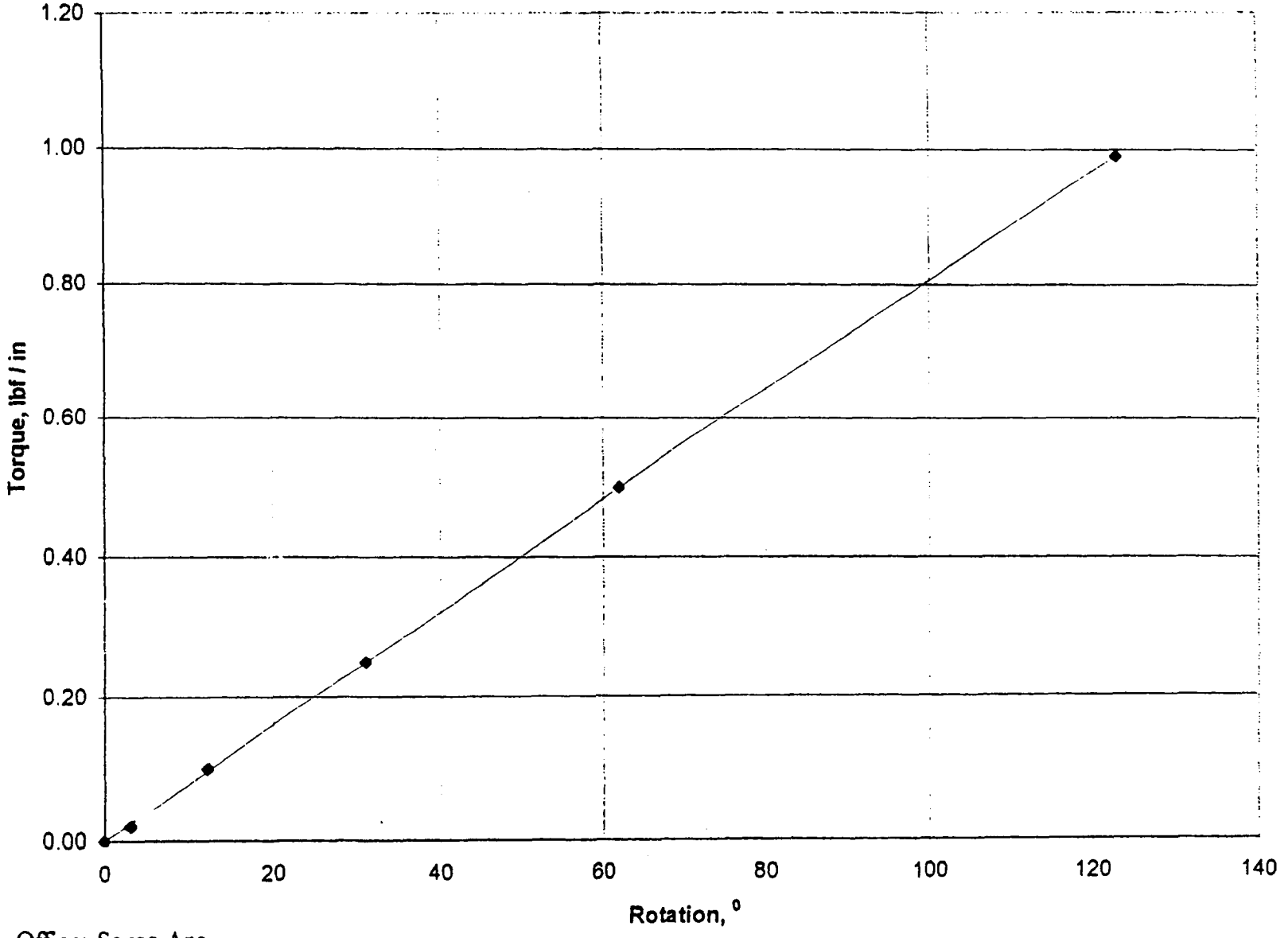
Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-125	top	110.0	CH	4	41	56	15	67	299
	bottom		CH	4	41	160	119	531	
095-2-126	top	120.0	CH	3	93	260	167	2910	3088
	bottom		CH	4	41	156	115	3266	
095-2-131	top	25.0	CH	1	10	117	107	478	478
	bottom		SM	1	10	seashells	NA	NA	
095-2-132	top		Not Tested						
	bottom		Not Tested						
095-2-133	top	35.0	CH	1	10	128	118	527	627
	bottom		SC	1	12	175	163	728	

URS

Vane Shear Spring Calibration



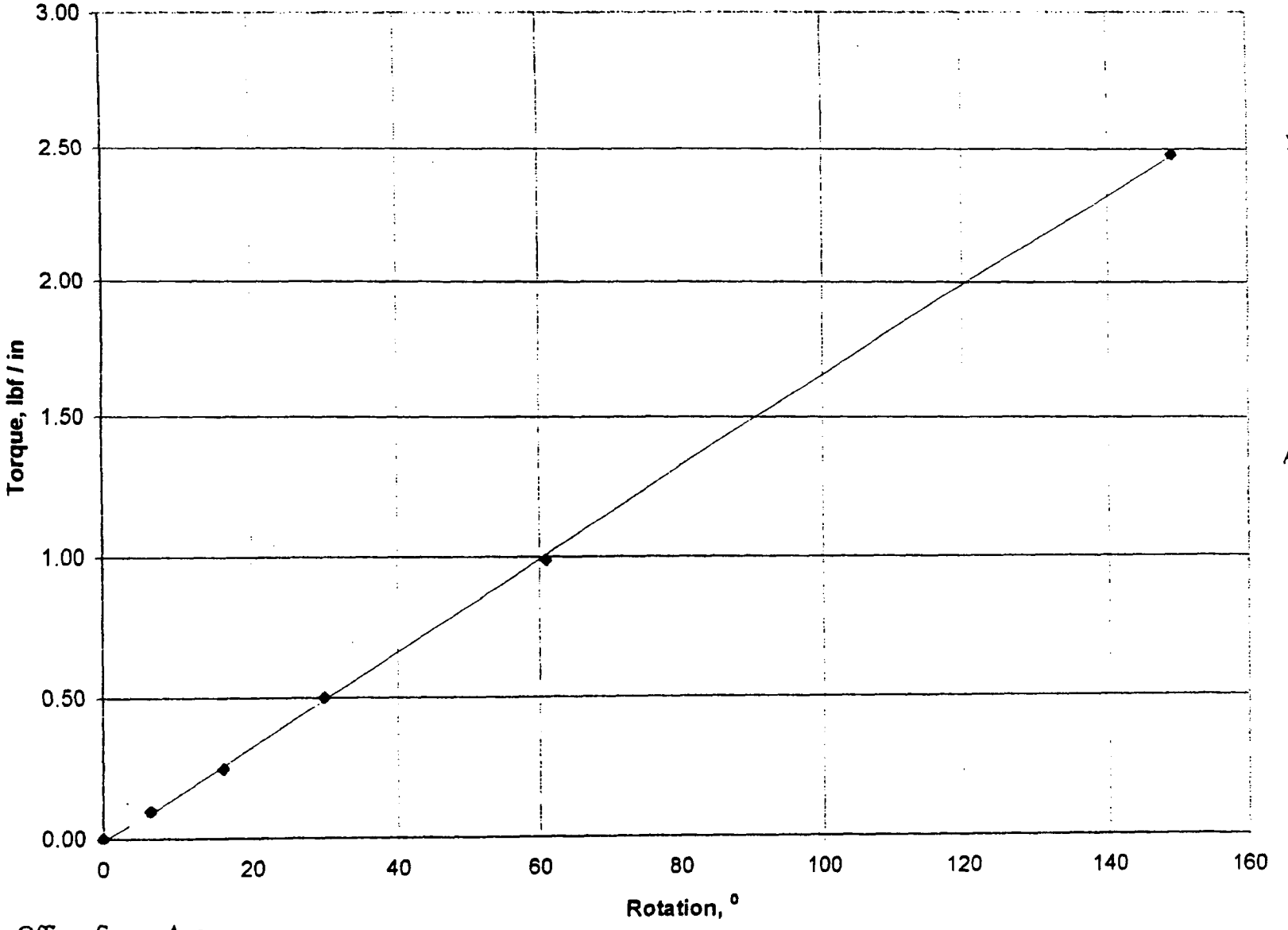
y = 0.0081x - 0.0001

Spring No. 1
Asset No.: 214

Office: Santa Ana
Date Calibrated: 3-16-02

URS

Vane Shear Spring Calibration



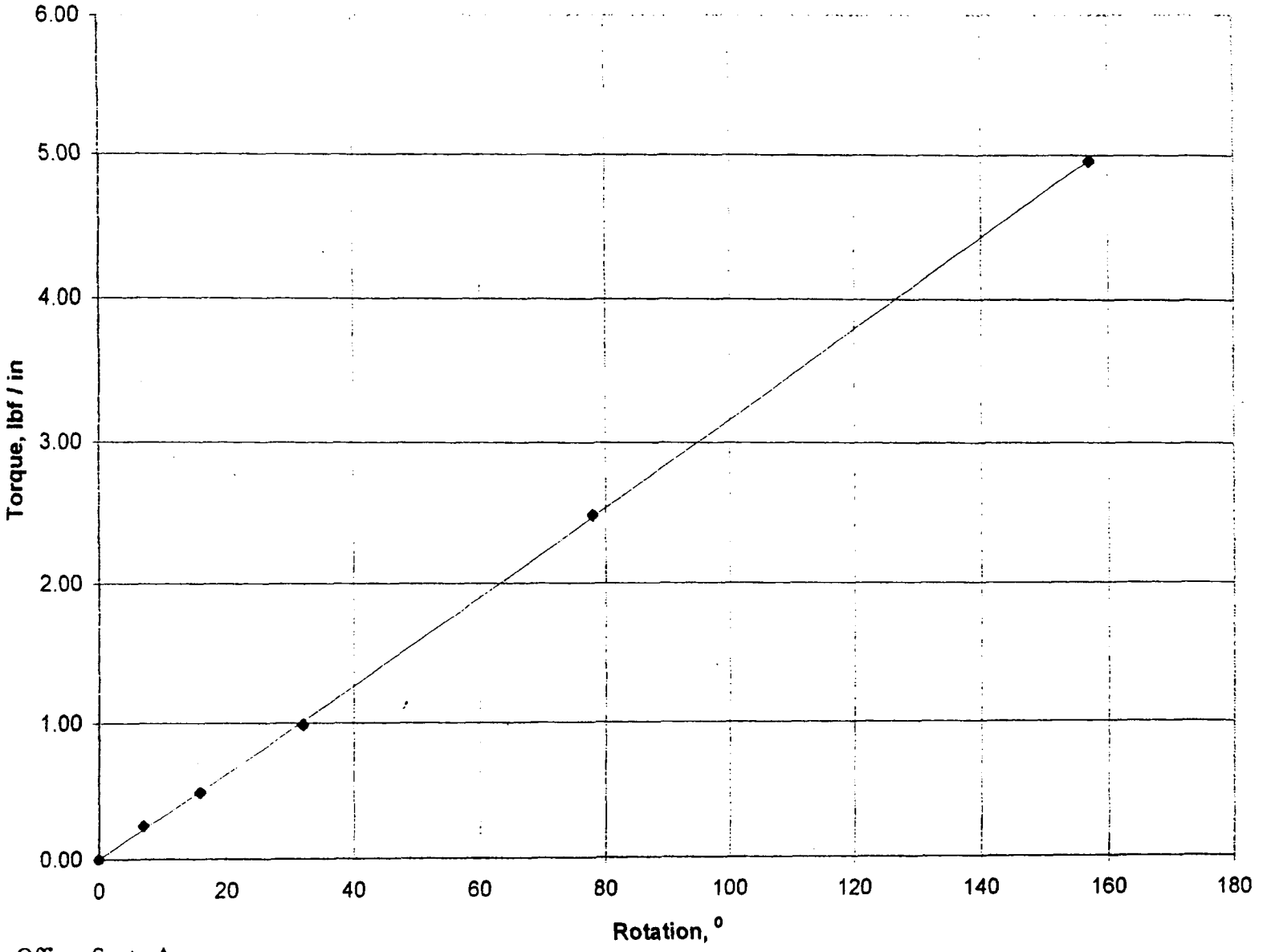
y = 0.0166x - 0.0068

Spring No. 2
Asset No.: 214

Office: Santa Ana
Date Calibrated: 3-16-02

URS

Vane Shear Spring Calibration



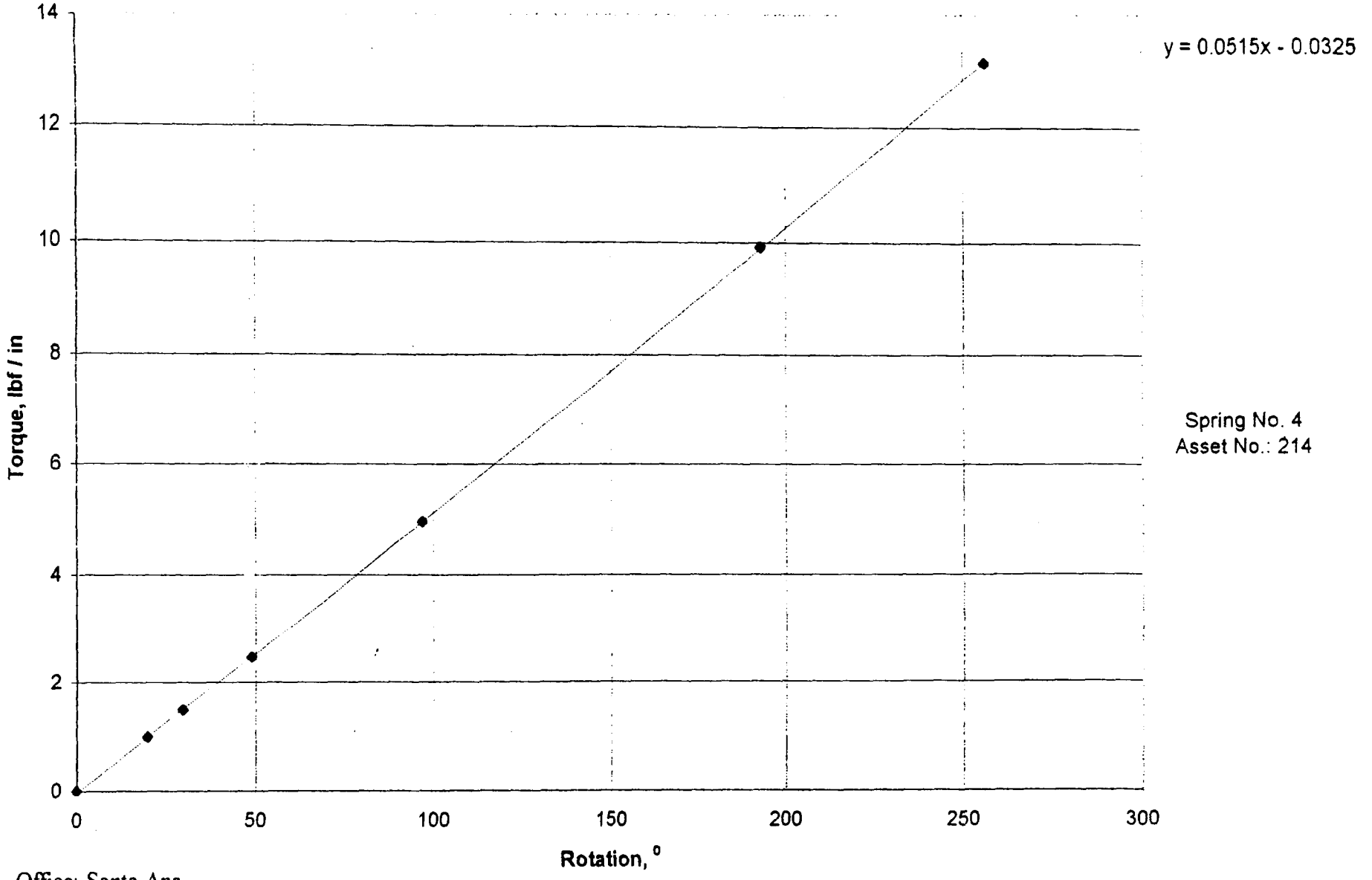
y = 0.0316x + 0.0036

Spring No. 3
Asset No.: 214

Office: Santa Ana
Date Calibrated: 3-16-02

URS

Vane Shear Spring Calibration



Office: Santa Ana
Date Calibrated: 3-16-02

TERATEST LABS INC.

Materials Testing
Special Inspection Services
Geotechnical Testing

August 12, 2002

Foster Wheeler Environmental Corporation
1940 East Deere Avenue, Suite 200
Santa Ana, CA 92705

Attention: Mr. Vince Richards

Subject: **Report / Laboratory Testing Results / Certificate of Compliance**
Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA
Project No.: 2384095-D-07060-1000
Purchase Order No.: 040413 Mod-002
TERATEST No.: 015190 CO2

Dear Mr. Richards:

Enclosed please find laboratory testing results for the soil samples from the above referenced project. The requested tests were conducted in essential accordance with the standard test methods listed below.

TYPE OF TEST	TEST METHOD
Liquid Limit, Plastic Limit and Plasticity Index of Soils	ASTM D 4318
Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	ASTM D 2216
Density of Soil in Place by the Drive-Cylinder Method	ASTM D 2937
Particle-Size Analysis of Soils	ASTM D 422
Amount of Material in Soils Finer Than the No. 200 Sieve	ASTM D 1140
Specific Gravity of Soils	ASTM D 854
Consolidated Undrained Triaxial Compression Test for Cohesive Soils	ASTM D 4767
Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils	ASTM D 2850
Laboratory Miniature Vane Shear Test for Saturated Fine-Grained Clayey Soil	ASTM D 4648
One-Dimensional Consolidation Properties of Soils	ASTM D 2435

Test results are presented in Table 1 and the attached Data Sheets.

17781 Cowan Ave., Ste.150
Irvine, CA 92614
949 . 253 . 5922
dispatch 949 . 222 . 5321
fax 949 . 263 . 8843

ASTM: American Society for Testing and Materials, Annual Book of ASTM Standards, Section 4 Construction, Volume 04.08 Soil and Rock (I), 2000.

Thank you for selecting Teratest Labs, Inc. to provide laboratory testing services to Foster Wheeler Environmental Corporation. Please feel free to contact us if you should have any questions concerning these results.

Very truly yours,

TERATEST LABS, INC.
Laboratory Testing Services

REGISTERED PROFESSIONAL ENGINEER
IRAJ
POORMAND
No. 693
Exp. 9/30/05
GEOTECHNICAL
STATE OF CALIFORNIA

Lester Fruth

Lester Fruth, Ph.D.
Soils Laboratory Supervisor

Iraj Poormand, GE
Geotechnical Engineer

Enclosures

TERATEST LABS

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03744

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: D095D/Between IR 1+2
PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT, ALAMEDA CA
PROJECT NO.: D095D
SAMPLER NAME: V. Richards
SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: ~~G. Farr~~ V. Richards/Tim Lai
AIRBILL NUMBER:
LABORATORY NAME: TERATEST 949-253-5922 [redacted]

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED: Atterberg Limits; Min Vane Shear; Water Content; Moisture/Dry Density; Hydrometer; Direct Shear; Consolidation; TX-ICU w/ PP Measure; TX-UU (one point); Specific Gravity

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Atterberg Limits	Min Vane Shear	Water Content	Moisture/Dry Density	Hydrometer	Direct Shear	Consolidation	TX-ICU w/ PP Measure	TX-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-137	6-25-02	0924	1			S												mc 2"x6"	B-755	5.5	6	
095-2-138	6-25-02	0951					-200											SPT BAG		10	11.5	
095-2-139	6-25-02	1029																ST 30"x3"		15	17	
095-2-140	6-25-02	1107					-200											mc 2"x6"		20.5	21	
095-2-141	6-25-02	1146						Ø	Ø	Ø	Ø			Ø	Ø		Ø	ST 30"x3"		30	32.5	
095-2-142	6-25-02	1226							Ø		Ø	Ø			/			ST 30"x3"		40	42.5	
095-2-143	6-25-02	1346																mc 2"x6"		50	50.5	
095-2-144	6-25-02	1610					-200											SPT BAG		60	60.5	
095-2-145	6-25-02	1706																SPT BAG		70	71.5	
095-2-146	6-25-02	1750																SPT BAG		80	81.5	
095-2-147	6-25-02	1923						Ø			Ø			Ø		Ø		30"x3"		88	90.5	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	07/09/02	[signature]
COMPANY: PWENC	TIME: 4:30	COMPANY: HAI
RELINQUISHED BY (Signature): [signature]	DATE: 07/09/02	RECEIVED BY (Signature): Les Fruth
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Hydrometer = Sieve + Hydro

COMPOSITE DESCRIPTION: Final testing assigned by Jules 7-11-02

[redacted]

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

FOSTER ER ENVIRONMENTAL CORPORATION
1230 Columbia Street, 40 San Diego, CA 92101 (619) 234-8696

NUMBER 03745

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: DO 95D/Between IR 1+2
PURCHASE ORDER NO.: 40413
PROJECT LOCATION: Alameda Pt., Alameda Ca.
PROJECT NO.: DO 95D
SAMPLER NAME: V. Richards
SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: V. Richards / T. Lai
AIRBILL NUMBER:

LABORATORY NAME: Tera Test 949-253-5922

ANALYSES REQUIRED

Project Information Section Do not submit to Laboratory

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	ATterberg Limits	Min Vane Shear	Water Content	Moisture Day Dens	HYDROMETER	DIRECT SHEAR	CONSOLIDATION	Tx-CU	Tx-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-148	6-26-02	1046	1			S					∅							ST 30"x3"	B-755	111	113.5	
095-2-149	6-26-02	1341						See attached Test Sheet								∅		ST 30"x3"		161	163	
095-2-150	6-26-02	1601																SPT BAG		180	181.5	
095-2-151	6-26-02	1746																SPT BAG		191	192.5	
095-2-152	6-26-02	1123					-200											mc 2"x6"	B-754	5.5	6	
095-2-153	6-27-02	1148					-200	SAMPLE MISSING										SPT BAG		10	11.5	
095-2-154	6-27-02	1218																ST 30"x3"		15	17.5	
095-2-155	6-27-02	1241					-200			OK								mc 2"x6"		19	19.5	
095-2-156	6-27-02	1342						∅	∅		∅	∅		∅	∅		∅	ST 30"x3"		30	32.5	
095-2-157	6-27-02	1440					-200		∅		∅				/			ST 30"x3"		40	42.5	
095-2-158	6-27-02	1521					-200											mc 2"x6"		50		

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	7/9/02	[signature]
COMPANY: RWQCB	TIME: 4:30	COMPANY: HAI
RELINQUISHED BY (Signature): [signature]	DATE: 7/9/02	RECEIVED BY (Signature): Lee Frith
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Vane Shear -156 not cancelled; Hydrometer = Sieve + hydro

COMPOSITE DESCRIPTION: Final testing assigned by Julie 7-11-02

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03742

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: DO 95D/Between IR 1+2
PURCHASE ORDER NO.: 40413
PROJECT LOCATION: Alameda Pt., Alameda CA
PROJECT NO.: DO 95D
SAMPLER NAME: V. Richards
SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: V. Richards/T. Lai
AIRBILL NUMBER:

LABORATORY NAME: Tera Test 949-253-5922

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Atterberg Limits	Min Vane Shear	Water Content	Moisture/Dry Density	Hydrometer	Direct Shear	Consolidation	Tx-ICU w/PP Measure	Tx-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-159	6-27-02	1545	1			S												SPT BAG	B-754	60	61.5	
095-2-160	6-27-02	1630					-200											SPT BAG		70	71.5	
095-2-161	6-27-02	1758					-200											SPT BAG		80	80.8	
095-2-162	6-27-02	1901						Ø			Ø	Ø				Ø		ST 30"x3"		90	92.5	
095-2-163	6-27-02	1957									Ø							ST 30"x3"		100	102.5	
095-2-164	6-28-02	0827														Ø		ST 30"x3"		120	122.5	
095-2-165	6-28-02	1021														Ø		ST 30"x3"		150	152.5	
095-2-1616	6-28-02	1620						Ø	Ø		Ø	Ø						mc 2"x6"	B-756	25.5	26	
095-2-167	6-28-02	1728						Ø	[illegible]		Ø	Ø		Ø	Ø		Ø	ST 30"x3"		40	42.5	
095-2-168	6-28-02	1003					-200		[illegible]		Ø		[illegible]					mc 2"x6"		70.5	71	
095-2-169	6-28-02	1050					-200											SPT BAG		80	81.5	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	07/09/02	[signature]
COMPANY: FWENC	TIME: 8:30	COMPANY: HAI
RELINQUISHED BY (Signature): [signature]	DATE: 07/9/02	RECEIVED BY (Signature): Les Frank
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Vane Shear - 167 not cancelled
Hydrometer = Sieve + hydro.

COMPOSITE DESCRIPTION: Final testing assigned by Julia 7-11-02

SAMPLING COMMENT:

White - Laboratory: Pink - Laboratory: Canary - Project File: Manila - Data Management

FOSTER ER ENVIRONMENTAL CORPORATION
1230 Columbia Street 40 San Diego, CA 92101 (619) 234-8696

NUMBER 04006

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: D095D/Between IR 1+2
PURCHASE ORDER NO.: 40413
PROJECT LOCATION: Alameda Pt.; Alameda CA
PROJECT NO.: D095D
SAMPLER NAME: V. Richards
SAMPLER SIGNATURE:
PROJECT CONTACT: V. Richards/T. Lai
AIRBILL NUMBER:

ANALYSES REQUIRED

LABORATORY NAME: TeraTest 949-253-5922

Project Information Section Do not submit to Laboratory

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Atterberg Limits	Min Vane Shear	Water Content	Moisture/Dry Density	HYDROMETER	DIRECT SHEAR	CONSOLIDATION	TX-ICU W/PP MEASURE	TX-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-170	6-29-02	1237	1			S		∅	∅		∅					∅		JT 30"x3"	B-756	90	92.5	
095-2-171	6-29-02	1511	1			S				∅								JT 30"x3"	B-756	100	102.5	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	07/09/02	[signature]
COMPANY: FWENC	TIME: 4:30	COMPANY: HAI
RELINQUISHED BY (Signature): [signature]	DATE: 07/09/02	RECEIVED BY (Signature): Les Pruitt
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Hydrometer = Sieve + Hydro

COMPOSITE DESCRIPTION: Final testing assigned by Julia 7-11-02

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client: Foster Wheeler Environmental Corporation

Test No.: 015190

Tabulated By: LF

Date: 08/09/02

TABLE 1

SUMMARY of LABORATORY TEST RESULTS

Sample ID	Location	Depth (ft.)	Sample Type	Moisture Content ASTM D 2216 (%)	Dry Density ASTM D 2937 (pcf)	Atterberg Limits ASTM D 4318 LL,PL,PI[1]	Particle - Size Distribution ASTM D 422 GR:SA:FI[2] (%)	Percent Passing No. 200 Sieve ASTM D 1140 (%)	Specific Gravity of Soils ASTM D 854	Laboratory Miniature Vane Shear Shear Strength ASTM D 4648 (psf) average	Unconsolidated-Undrained Triaxial Compressive Strength ASTM D 2850 (psi @ conf. psi)	Soil Classification / Identification* ASTM D 2487 ASTM D (group symbol)
095-2-138	B-755	10.0-11.5	SPT / Bag					12.5				SM
095-2-140	B-755	20.5-21.0	MC / 2"X6"					38.2				SM
095-2-141	B-755	30.0-32.5	ST / 30"X3"	29.4	91.3	31,17,14			2.66	33		(CL)s
095-2-142	B-755	40.0-42.5	ST / 30"X3"	51.2	69.9		4:24:72			696		(CL)s
095-2-144	B-755	60.0-60.5	SPT / Bag					10.9				SP-SM
095-2-147	B-755	88.0-90.5	ST / 30"X3"	43.7	74.0	48,26,22					26.6 @ 26.4	s(CL)
095-2-148	B-755	111.0-113.5	ST / 30"X3"	45.0	76.9							CL*
095-2-149	B-755	161.0-163.0	ST / 30"X3"	43.8	77.1						23.9 @ 46.5	CL/CH*
095-2-152	B-754	5.5-6.0	MC / 2"X6"					2.9				SP
095-2-153	B-754	10.0-11.5	SPT / Bag				SAMPLE MISSING					
095-2-155	B-754	19.0-19.5	MC / 2"X6"					8.4				SP-SM
095-2-156	B-754	30.0-32.5	ST / 30"X3"	33.6 / 37.8	89.5 / 83.1	40,22,18	1:18:81		2.67	1363		(CL)s
095-2-157	B-754	40.0-42.5	ST / 30"X3"	52.0	71.1			76.5		774		(CL)s
095-2-158	B-754	50.0	MC / 2"X6"					5.7				SP-SM
095-2-160	B-754	70.0-71.5	SPT / Bag					10.4				SP-SM
095-2-161	B-754	80.0-80.8	SPT / Bag					8.3				SP-SM
095-2-162	B-754	90.0-92.5	ST / 30"X3"	66.6	59.0	108,52,56	0:6:94				27.4 @ 26.4	MH
095-2-163	B-754	100.0-102.5	ST / 30"X3"	37.1	83.1							CL/CH*
095-2-164	B-754	120.0-122.5	ST / 30"X3"	38.9	80.9						44.1 @ 34.7	CL/CH*
095-2-165	B-754	150.0-152.5	ST / 30"X3"	36.9	84.9						47.0 @ 43.8	CL*

[1] LL,PL,PI = Liquid Limit, Plastic Limit, Plasticity Index

[2] GR:SA:FI = Gravel: Sand: Fines (Percent Passing #200 Sieve)

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client: Foster Wheeler Environmental Corporation

Teratest No.: 015190

Tabulated By: LF

Date: 08/09/02

TABLE 1 continued

SUMMARY of LABORATORY TEST RESULTS

Page 2

Sample ID	Location	Depth (ft.)	Sample Type	Moisture Content ASTM D 2216 (%)	Dry Density ASTM D 2937 (pcf)	Atterberg Limits ASTM D 4318 LL,PL,PI[1]	Particle - Size Distribution ASTM D 422 GR:SA:FI[2] (%)	Percent Passing No. 200 Sieve ASTM D 1140 (%)	Specific Gravity of Soils ASTM D 854	Laboratory Miniature Vane Shear Shear Strength ASTM D 4648 (psf) average	Unconsolidated-Undrained Triaxial Compressive Strength ASTM D 2850 (psi @ conf. psi)	Soil Classification / Identification* ASTM D 2487 ASTM D (group symbol)
095-2-166	B-756	25.5-26.0	MC / 2"X6"	41.0	88.3	35,23,12	0:12:88			224		CL
095-2-167	B-756	40.0-42.5	ST / 30"X3"	47.1	73.8	48,22,26	3:32:65		2.66	1491		s(CL)
095-2-168	B-756	70.5-71.0	MC / 2"X6"	15.8	111.8			16.6				SM
095-2-169	B-756	80.0-81.5	SPT / Bag					8.6				SP-SM
095-2-170	B-756	90.0-92.5	ST / 30"X3"	62.2	61.4	82,41,41				2343	26.4 @ 26.4	MH
095-2-171	B-756	100.0-102.5	ST / 30"X3"	33.5								CL*

[1] LL,PL,PI = Liquid Limit, Plastic Limit, Plasticity Index

[2] GR:SA:FI = Gravel: Sand: Fines (Percent Passing #200 Sieve)

LOCATION	B-755	B-755	B-755	B-755	B-754	B-754	B-754	B-754
SAMPLE ID	095-2-141	095-2-142	095-2-147	095-2-148	095-2-156	095-2-157	095-2-162	095-2-163
Depth (ft.)	30.0-32.5	40.0-42.5	88.0-90.5	111.0-113.5	30.0-32.5	40.0-42.5	90.0-92.5	100.0-102.5
Sample Type	ST / 30"X3"	ST / 30"X3"	ST / 30"X3"	ST / 30"X3"	ST / 30"X3"	ST / 30"X3"	ST / 30"X3"	ST / 30"X3"
Visual Soil Identification	Very dark gray lean clay with sand (CL)s	Very dark gray lean clay with sand (CL)s	Very dark gray sandy lean clay s(CL)	Olive lean clay (CL)	Very dark gray lean clay with sand (CL)s and shells	Very dark gray lean clay with sand (CL)s	Olive elastic silt (MH) with organics	Olive lean / fat clay (CL/CH
Pocket Penetrometer	N/A	0.75 / .075	N/A	2.25	N/A	0.75 / 0.5	N/A	>2.25
Weight Soil + Rings / Tube (gm.	1195.32	1634.90	1082.00	1567.45	1216.75	1555.30	992.08	1614.60
Weight of Rings / Tube (gm.	0.00	462.37	0.00	426.41	0.00	432.87	0.00	432.46
Average Length (in.)	5.927	6.504	5.981	5.998	5.966	6.089	5.998	6.083
Average Diameter (in.)	2.877	2.876	2.873	2.876	2.876	2.876	2.857	2.876
Wet. Wt. of Soil + Cont. (gm.	112.19	232.33	1172.70	237.40	201.24	253.46	1098.24	188.71
Dry Wt. of Soil + Cont. (gm.)	95.22	173.40	849.04	181.91	166.07	186.38	702.32	152.93
Weight of Container (gm)	37.54	58.41	109.19	58.68	61.37	57.28	107.95	56.41
Container No.:								
Wet Density	118.2	105.7	106.3	111.6	119.6	108.1	98.3	114.0
Moisture Content (%)	**29.4**	**51.2**	**43.7**	**45.0**	**33.6**	**52.0**	**66.6**	**37.1**
Dry Density (pcf)	**91.3**	**69.9**	**74.0**	**76.9**	**89.5**	**71.1**	**59.0**	**83.1**
Degree of Saturation (%)	95.6	98.0	92.3	102.0	104.1	102.4	96.8	97.4

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 08/02/02

LOCATION	B-756	B-756	B-756	B-756	B-756		B-754	
SAMPLE ID	095-2-166	095-2-167	095-2-168	095-2-170	095-2-171		095-2-156 #2	
Depth (ft.)	25.5-26.0	40.0-42.5	70.5-71.0	90.0-92.5	100.0-102.5		30.0-32.5	
Sample Type	MC / 2"X6"	ST / 30"X3"	MC / 2"X6"	ST / 30"X3"	ST / 30"X3"		ST / 30"X3"	
Visual Soil Identification	Olive lean clay (CL) soft & wet	Olive sandy lean clay s(CL) with shells	Olive silty sand (SM)	Olive elastic silt (MH)	Gray lean clay (CL)		Very dark gray lean clay with sand (CL)s and shells	
Pocket Penetrometer	>0.25 / >0.25	N/A	<1.25 / 0.75	N/A			N/A	
Weight Soil + Rings / Tube (gm.	677.50	1108.62	784.94	1018.34			1164.52	
Weight of Rings / Tube (gm.	190.20	0.00	189.42	0.00			0.00	
Average Length (in.)	5.876	5.987	6.002	5.995			5.959	
Average Diameter (in.)	1.797	2.877	1.928	2.877			2.877	
Wet. Wt. of Soil + Cont. (gm.	133.88	157.44	210.50	1126.52	180.21		245.41	
Dry Wt. of Soil + Cont. (gm.)	110.71	119.84	188.80	736.48	149.25		195.05	
Weight of Container (gm)	54.26	40.05	51.18	109.53	56.95		61.87	
Container No.:								
Wet Density	124.6	108.5	129.5	99.5			114.5	
Moisture Content (%)	**41.0**	**47.1**	**15.8**	**62.2**	**33.5**		**37.8**	
Dry Density (pcf)	**88.3**	**73.8**	**111.8**	**61.4**			**83.1**	
Degree of Saturation (%)	122.0	100.2	83.9	96.2			100.4	

TERATEST LABS

MOISTURE & DENSITY of SOILS

ASTM D 2937

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 08/02/02

TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	08/04/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/05/02
LOCATION:	B-754	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-156	Depth (ft.)	32.0-32.5		

Visual Sample Description: Very dark gray lean clay with sand (CL)s and shells

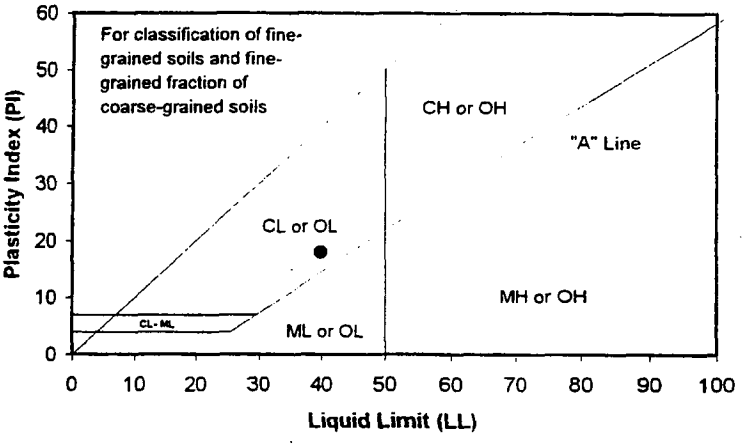
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			30	22	17	
Wet Wt. of Soil + Cont. (gm)	10.13	9.52	12.11	12.61	13.68	
Dry Wt. of Soil + Cont. (gm)	8.52	7.99	9.02	9.31	9.98	
Wt. of Container (gm)	1.03	1.08	1.08	1.07	1.09	
Moisture Content (%) [Wn]	21.50	22.14	38.92	40.05	41.62	

Liquid Limit	**40**
Plastic Limit	**22**
Plasticity Index	**18**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 14.6

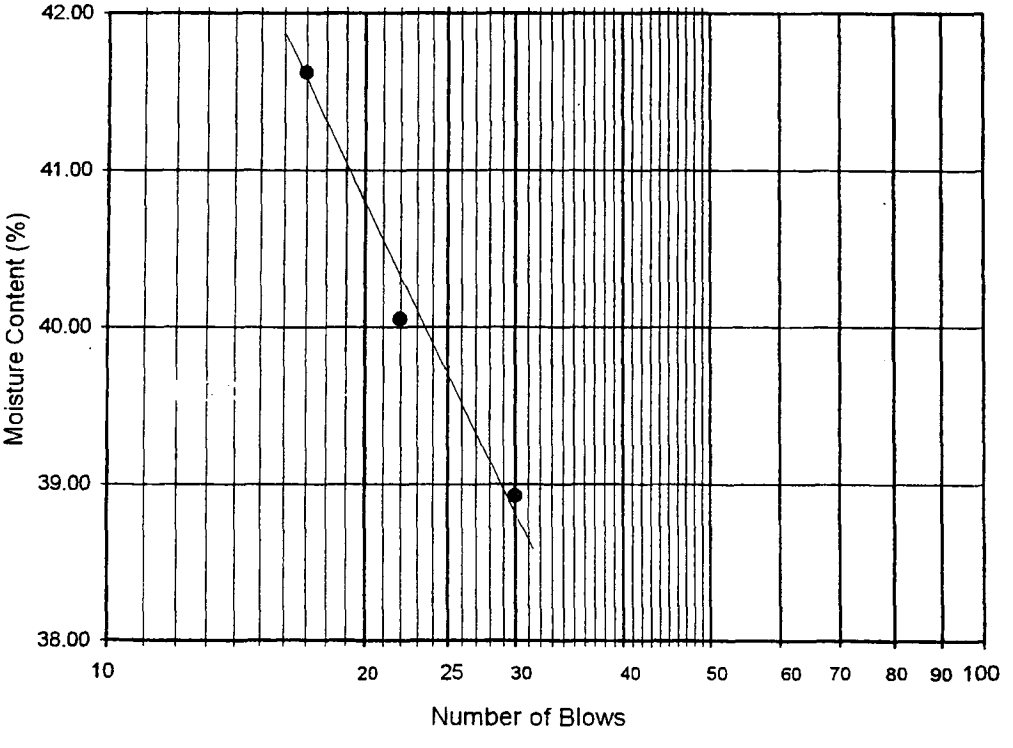
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	08/01/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/02/02
LOCATION:	B-754	Checked By:	LF	Date:	08/02/02
SAMPLE ID:	095-2-162	Depth (ft.)	90-92.5		

Visual Sample Description: Olive elastic silt (MH)

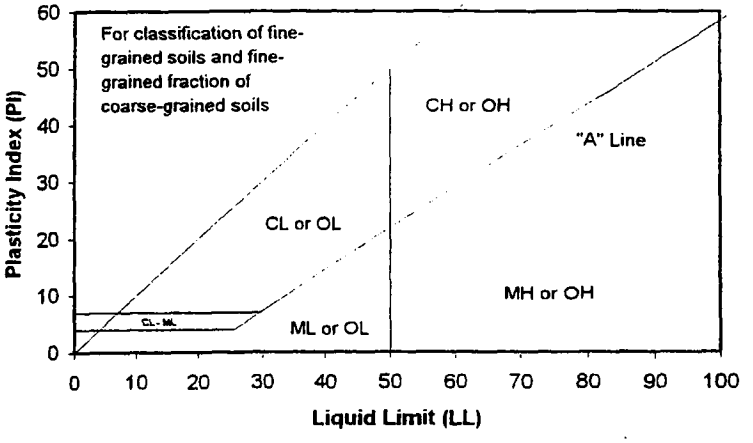
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			30	26	18	
Wet Wt. of Soil + Cont. (gm)	10.14	9.76	12.15	13.21	13.03	
Dry Wt. of Soil + Cont. (gm)	7.05	6.76	6.41	6.90	6.70	
Wt. of Container (gm)	1.07	1.01	1.01	1.04	1.07	
Moisture Content (%) [Wn]	51.67	52.17	106.30	107.68	112.43	

Liquid Limit	**108**
Plastic Limit	**52**
Plasticity Index	**56**
Classification	**MH**

PI at "A" - Line = 0.73(LL-20) = 64.24

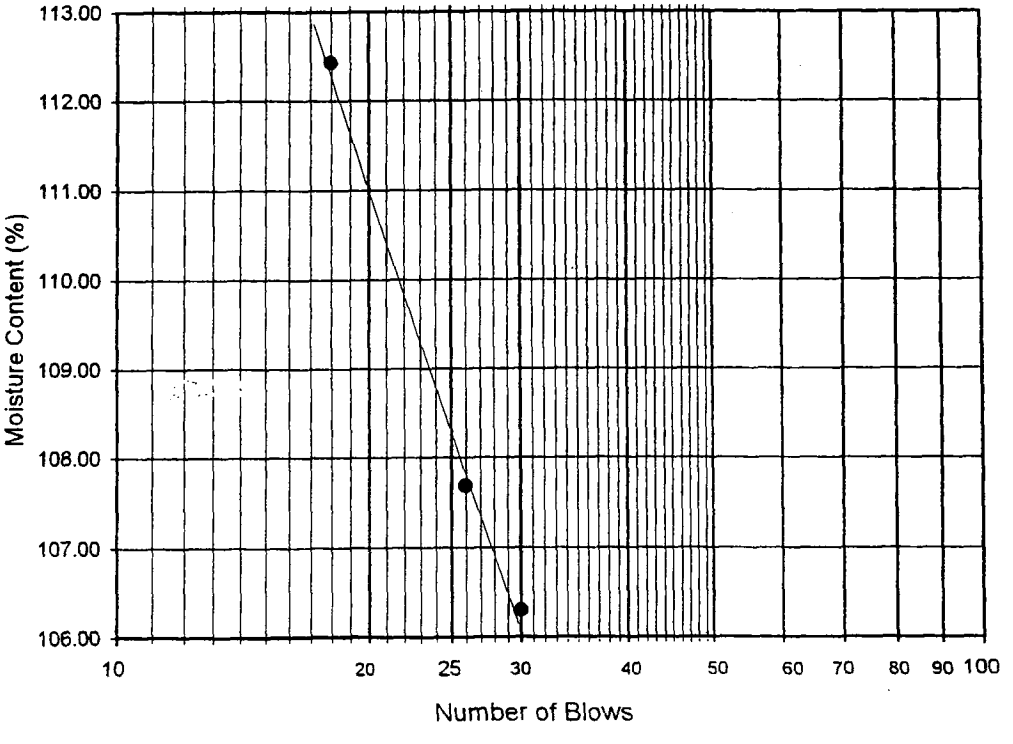
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	08/01/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/09/02
LOCATION:	B-755	Checked By:	LF	Date:	08/09/02
SAMPLE ID:	095-2-141	Depth (ft.)	30-32.5		

Visual Sample Description: Very dark gray lean clay with sand (CL)s

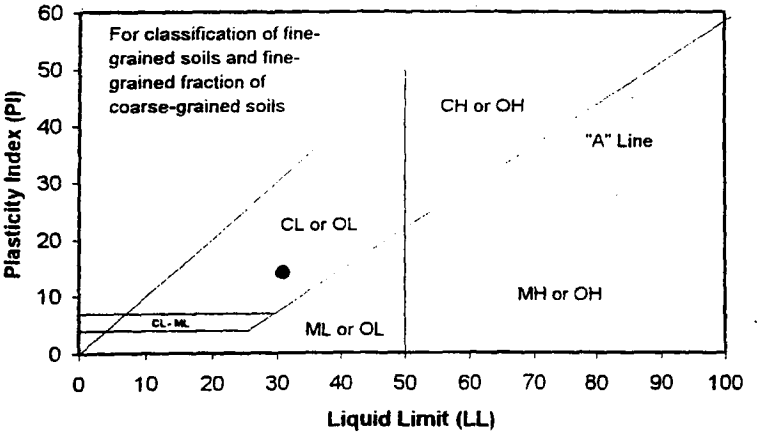
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			34	27	18	
Wet Wt. of Soil + Cont. (gm)	16.69	14.99	16.05	16.77	16.17	
Dry Wt. of Soil + Cont. (gm)	14.40	12.99	12.63	13.05	12.48	
Wt. of Container (gm)	1.04	1.00	0.96	1.13	1.16	
Moisture Content (%) [Wn]	17.14	16.68	29.31	31.21	32.60	

Liquid Limit	**31**
Plastic Limit	**17**
Plasticity Index	**14**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 8.03

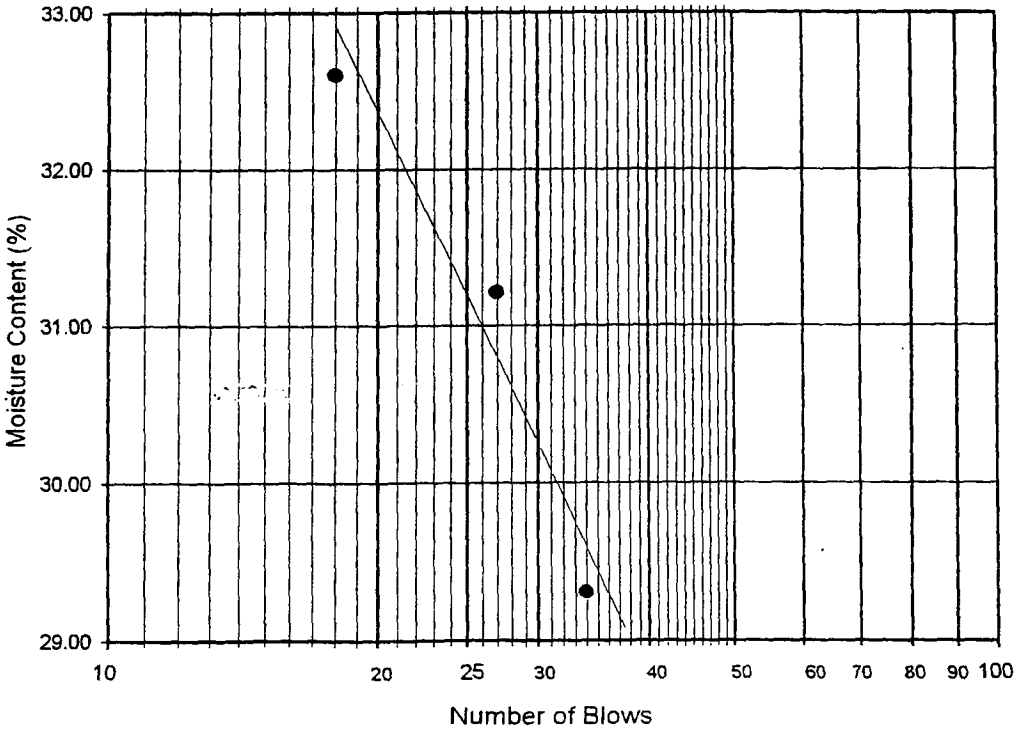
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	08/03/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/05/02
LOCATION:	B-755	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-147	Depth (ft.)	88.0-90.5		

Visual Sample Description: Very dark gray sandy lean clay s(CL)

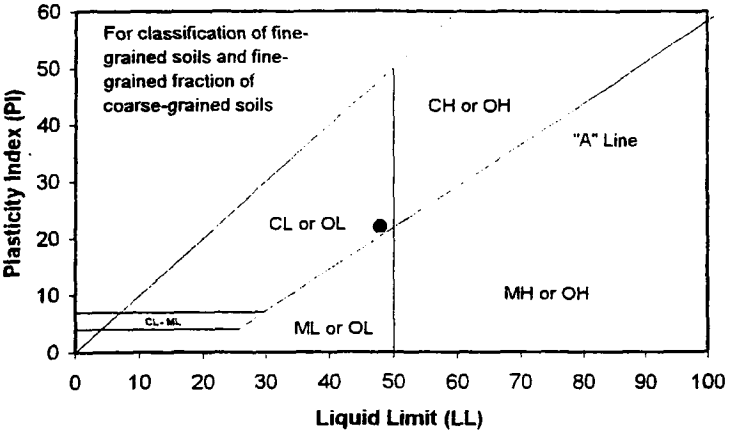
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			28	18	14	
Wet Wt. of Soil + Cont. (gm)	9.22	10.12	11.89	13.80	13.29	
Dry Wt. of Soil + Cont. (gm)	7.50	8.23	8.41	9.64	9.25	
Wt. of Container (gm)	1.03	1.01	1.07	1.04	1.01	
Moisture Content (%) [Wn]	26.58	26.18	47.41	48.37	49.03	

Liquid Limit	**48**
Plastic Limit	**26**
Plasticity Index	**22**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 20.44

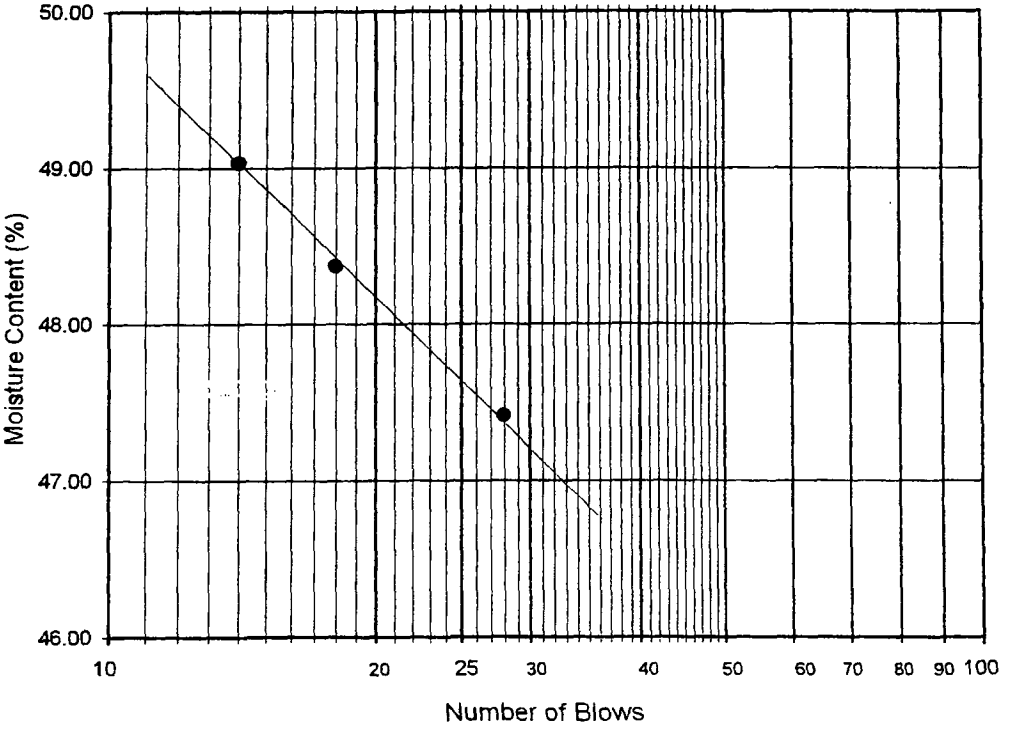
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	08/03/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/05/02
LOCATION:	B-756	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-166	Depth (ft.)	25.5-26.0		

Visual Sample Description: Olive lean clay (CL)

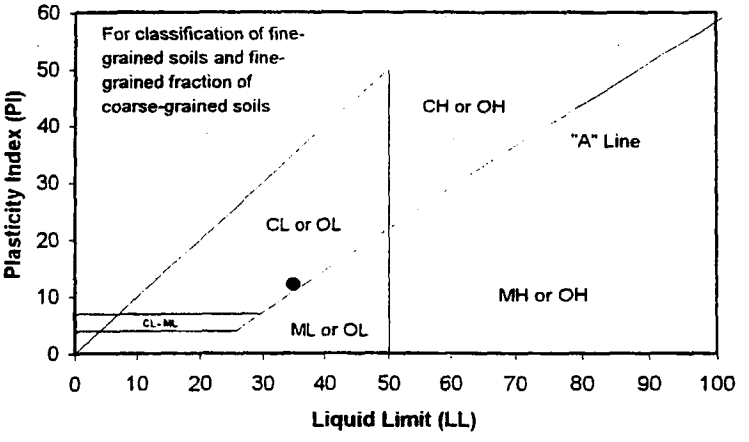
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			29	23	16	
Wet Wt. of Soil + Cont. (gm)	10.98	10.40	14.18	13.44	15.58	
Dry Wt. of Soil + Cont. (gm)	9.10	8.63	10.80	10.16	11.64	
Wt. of Container (gm)	1.01	1.04	1.03	1.04	1.03	
Moisture Content (%) [Wn]	23.24	23.32	34.60	35.96	37.13	

Liquid Limit	**35**
Plastic Limit	**23**
Plasticity Index	**12**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 10.95

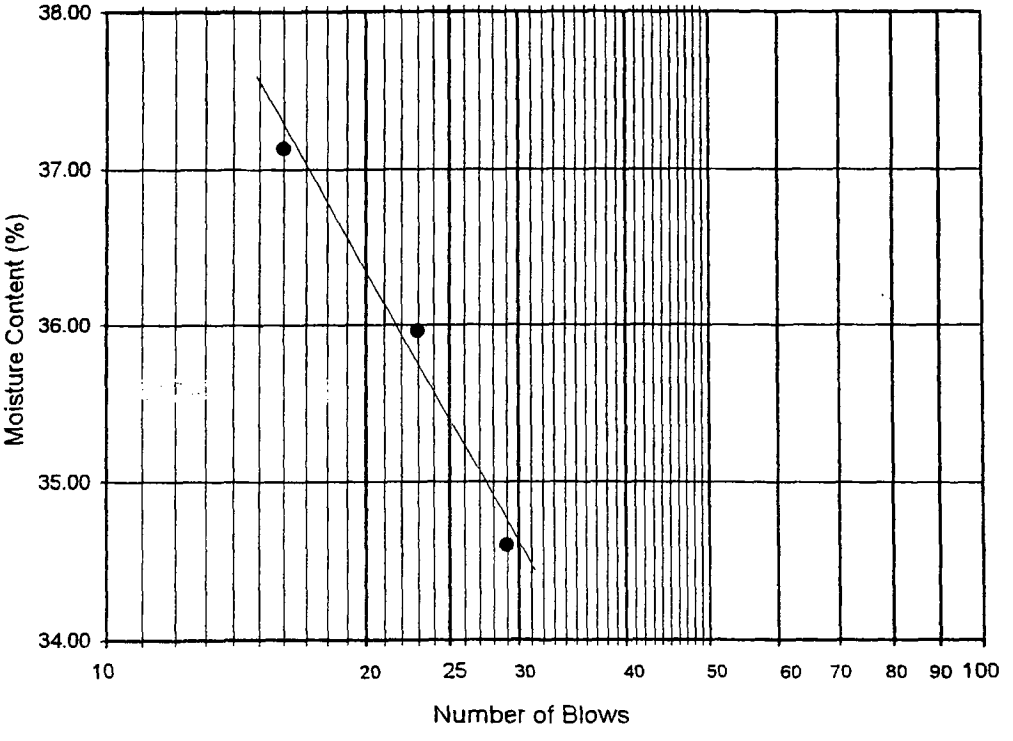
One - Point Liquid Limit Calculation

LL =Wn(N/25) $^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	08/01/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/05/02
LOCATION:	B-756	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-167	Depth (ft.)	40-42.5		

Visual Sample Description: Olive sandy lean clay s(CL) with shells

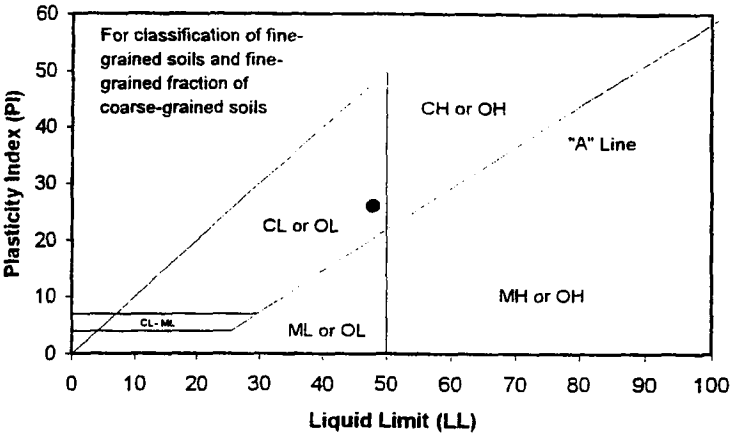
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			33	23	18	
Wet Wt. of Soil + Cont. (gm)	15.30	14.68	16.66	16.93	16.20	
Dry Wt. of Soil + Cont. (gm)	12.71	12.20	11.70	11.78	11.20	
Wt. of Container (gm)	1.05	1.03	0.99	1.03	0.98	
Moisture Content (%) [Wn]	22.21	22.20	46.31	47.91	48.92	

Liquid Limit	**48**
Plastic Limit	**22**
Plasticity Index	**26**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 20.44

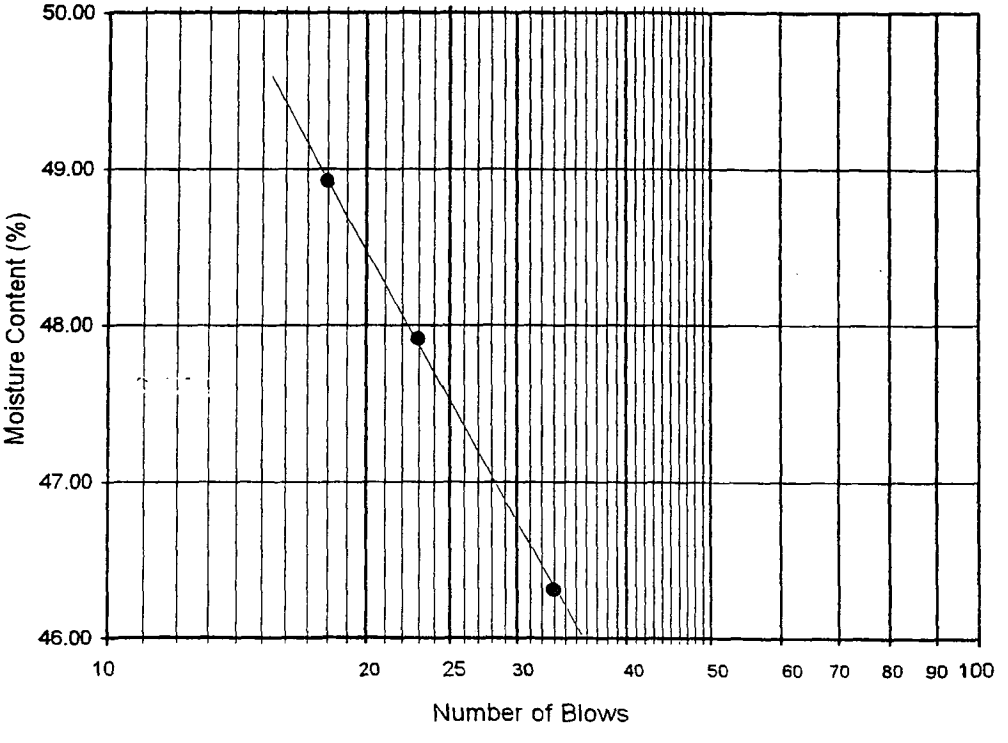
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Geotechnical Evaluations, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	VJ	Date:	08/04/02
Project No. :	2384095-B-07060-1000	Input By:	LF	Date:	08/05/02
LOCATION:	B-756	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-170	Depth (ft.)	90.0-92.5		

Visual Sample Description: Olive elastic silt (MH)

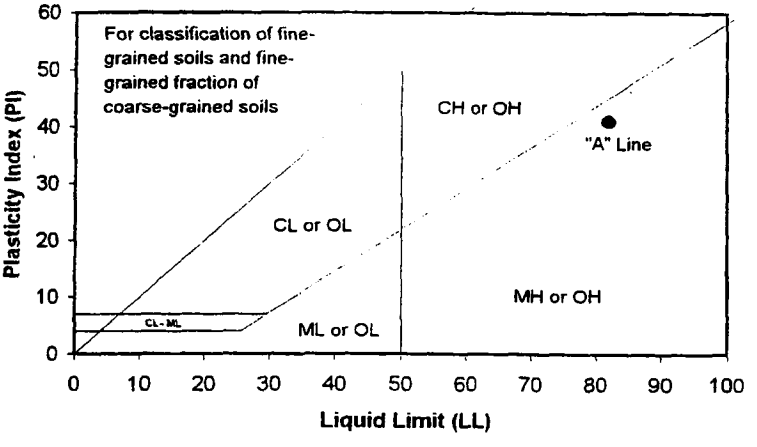
	PLASTIC LIMIT		LIQUID LIMIT			
TEST NO.	1	2	1	2	3	
Number of Blows [N]			35	28	21	
Wet Wt. of Soil + Cont. (gm)	10.29	9.82	11.28	11.44	11.77	
Dry Wt. of Soil + Cont. (gm)	7.64	7.28	6.73	6.76	6.94	
Wt. of Container (gm)	1.10	1.01	1.03	1.03	1.12	
Moisture Content (%) [Wn]	40.52	40.51	79.82	81.68	82.99	

Liquid Limit	**82**
Plastic Limit	**41**
Plasticity Index	**41**
Classification	**MH**

PI at "A" - Line = 0.73(LL-20) = 45.26

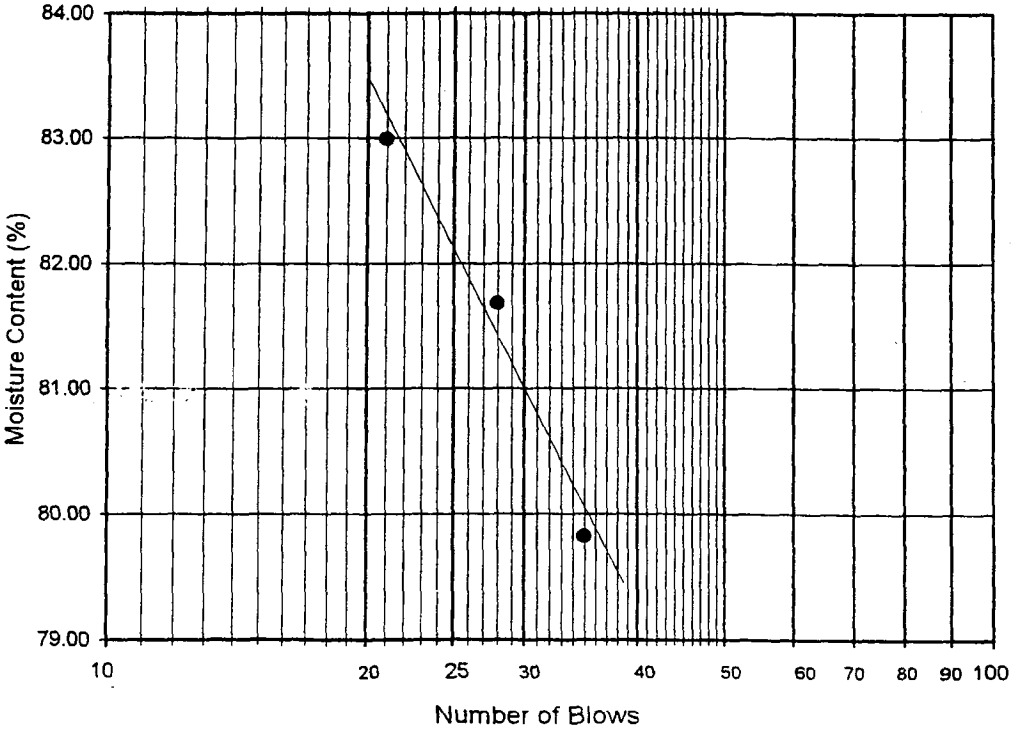
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



TERATEST LABS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	07/31/02
Project No. :	2384095-B-07060-1000	Data Input By:	LF	Date:	08/05/02
LOCATION:	B-754	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-156	Depth (ft.) :	30.0-32.5		

Visual Sample Description: Very dark gray lean clay with sand (CL)s and shells

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	40	LL,PL,PI:	40,22,18			
Plastic Limit:	22	GR:SA:FI:	1:18:81			
Plasticity Index:	18	Grp. Symbol:	(CL)s			
Specific Gravity	2.67	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	1.00	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	82.99
Wt.of Air-Dry Soil + Cont. (gm.)	559.46	Wt. of Container No.___ (gm.)		1.00	1.00	74.18
Wt. of Container	109.61	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	449.85	Wt. of Dry Soil (gm.)				8.81

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	3.03	99.3
No. 4	6.48	98.6
No. 10	13.11	97.1
Pan		

Sieve after Hydrometer & Wet Sieve

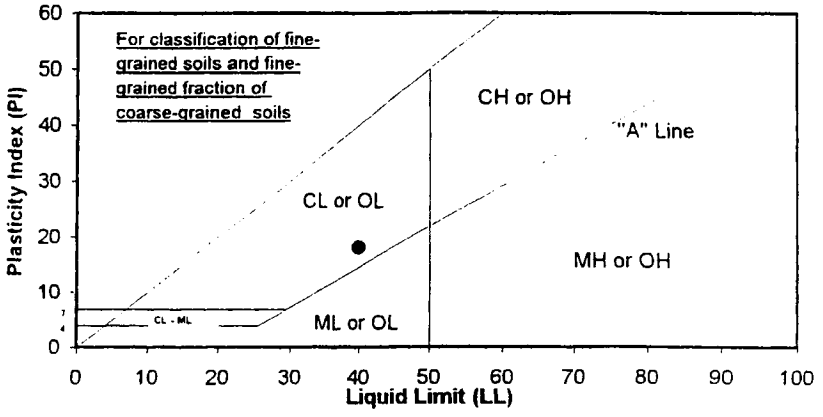
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	97.1
No. 16	0.67	98.7	95.8
No. 30	1.38	97.4	94.6
No. 50	2.04	96.2	93.4
No. 100	5.33	90.0	87.4
No. 200	8.62	83.8	81.4
Pan			

Hydrometer

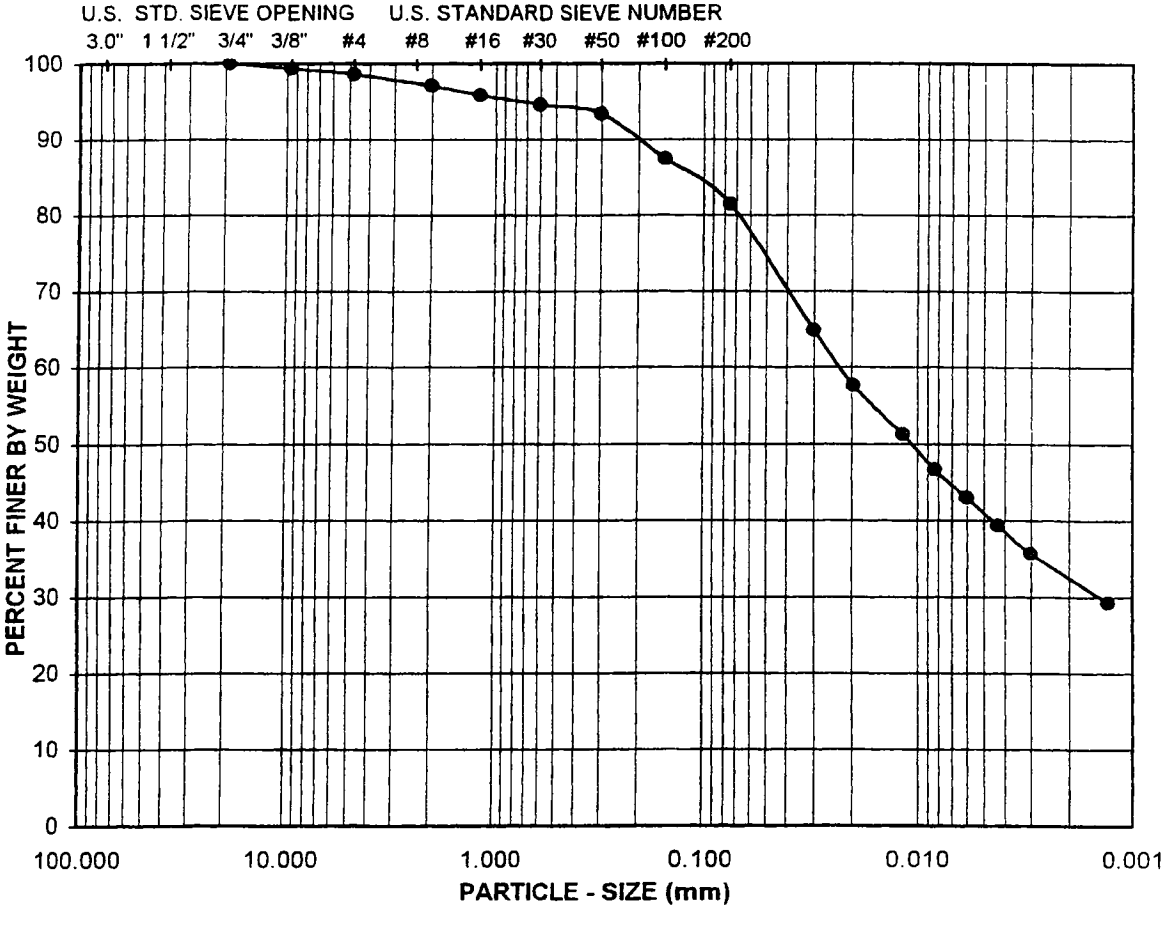
Wt. of Air-Dry Soil (gm) 53.12 Wt. of Dry Soil (gm) 53.12

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
02-Aug-02	8:33	0		3.0			
	8:35	2	21.5	3.0	38.5	64.9	0.0300
	8:38	5	21.5	3.0	34.5	57.6	0.0196
	8:48	15	21.4	3.0	31.0	51.2	0.0116
	9:03	30	21.5	3.0	28.5	46.6	0.0083
	9:33	60	21.6	3.0	26.5	43.0	0.0060
	10:33	120	21.7	3.0	24.5	39.3	0.0043
	12:43	250	22.0	3.0	22.5	35.6	0.0030
03-Aug-02	8:33	1440	20.9	3.0	19.0	29.2	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-754	095-2-156	30.0-32.5	(CL)s	1:18:81	40,22,18

Sample Description:

Very dark gray lean clay with sand (CL)s and shells

TERATEST LABS

Project No.: 2384095-B-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

08-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	08/01/02
Project No. :	2384095-B-07060-1000	Data Input By:	LF	Date:	08/05/02
LOCATION:	B-754	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-162	Depth (ft.) :	90.0-92.5		

Visual Sample Description: Olive elastic silt (MH) with organics

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	**108**	LL,PL,PI:	**108,52,56**			
Plastic Limit:	**52**	GR:SA:FI:	**0:6:94**			
Plasticity Index:	**56**	Grp. Symbol:	**MH**			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	77.88
Wt.of Air-Dry Soil + Cont. (gm.)	50.76	Wt. of Container No.___ (gm.)		1.00	1.00	74.73
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	50.76	Wt. of Dry Soil (gm.)				3.15

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

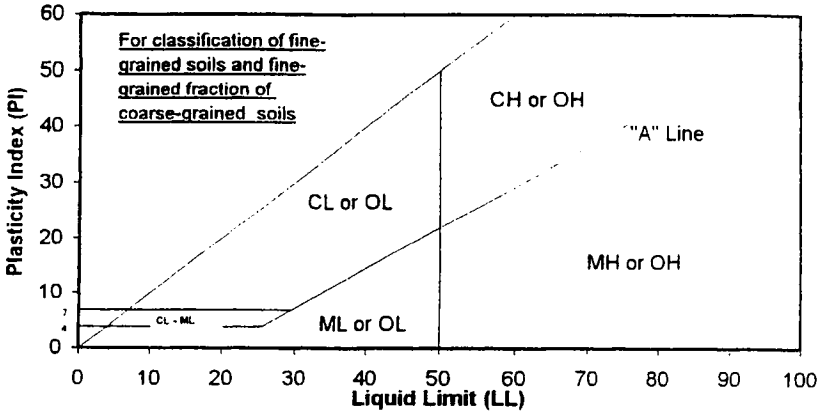
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.08	99.8	99.8
No. 30	0.28	99.4	99.4
No. 50	0.90	98.2	98.2
No. 100	2.02	96.0	96.0
No. 200	3.10	93.9	93.9
Pan			

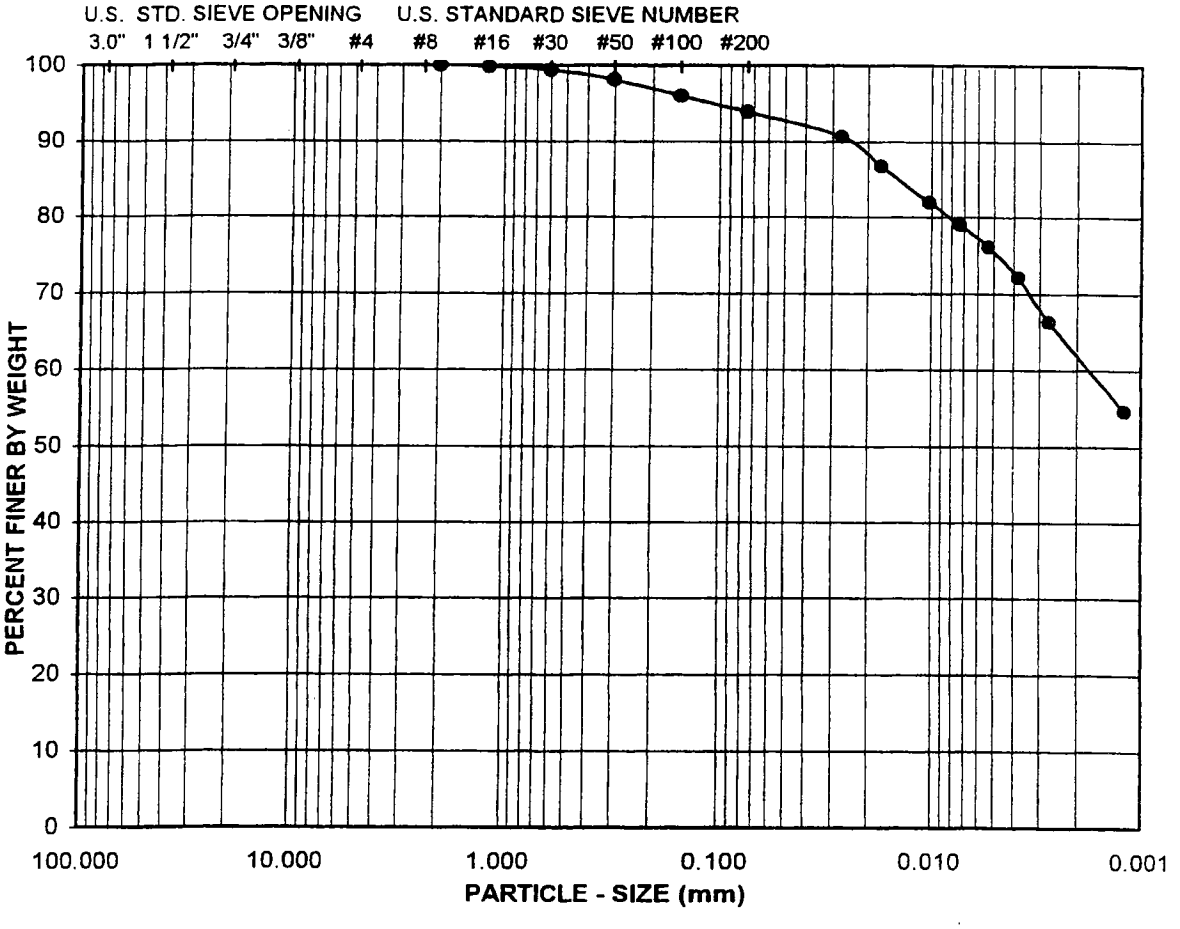
Hydrometer Wt. of Air-Dry Soil (gm) 50.76 Wt. of Dry Soil (gm) 50.76

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
02-Aug-02	8:37	0		3.0			
	8:39	2	21.5	3.0	49.5	90.7	0.0269
	8:42	5	21.4	3.0	47.5	86.8	0.0173
	8:52	15	21.5	3.0	45.0	81.9	0.0102
	9:07	30	21.5	3.0	43.5	79.0	0.0073
	9:37	60	21.6	3.0	42.0	76.1	0.0053
	10:37	120	21.7	3.0	40.0	72.2	0.0038
	12:47	250	22.0	3.0	37.0	66.3	0.0027
03-Aug-02	8:37	1440	20.9	3.0	31.0	54.6	0.0012



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-754	095-2-162	90.0-92.5	MH	0:6:94	108,52,56

Sample Description:

Olive elastic silt (MH) with organics

TERATEST LABS

Project No.: 2384095-B-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

08-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	07/31/02
Project No. :	2384095-B-07060-1000	Data Input By:	LF	Date:	08/05/02
LOCATION:	B-755	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-142	Depth (ft.) :	40.0-42.5		

Visual Sample Description: Very dark gray lean clay with sand (CL)s and shells

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:		LL,PL,PI:	N/A			
Plastic Limit:		GR:SA:FI:	4:24:72			
Plasticity Index:		Grp. Symbol:	(CL)s			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	89.25
Wt.of Air-Dry Soil + Cont. (gm.)	780.28	Wt. of Container No.___ (gm.)		1.00	1.00	77.58
Wt. of Container	108.61	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	671.67	Wt. of Dry Soil (gm.)				11.67

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	11.08	98.4
No. 4	24.85	96.3
No. 10	56.68	91.6
Pan		

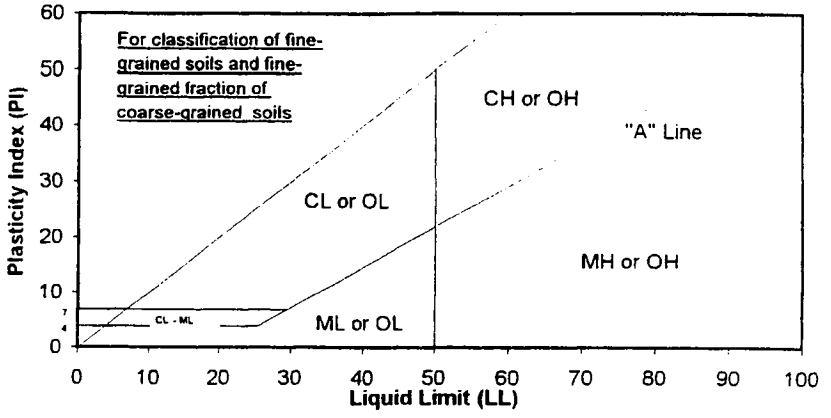
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	91.6
No. 16	2.85	94.7	86.7
No. 30	5.89	88.9	81.4
No. 50	7.95	85.1	78.0
No. 100	9.43	82.3	75.4
No. 200	11.38	78.6	72.0
Pan			

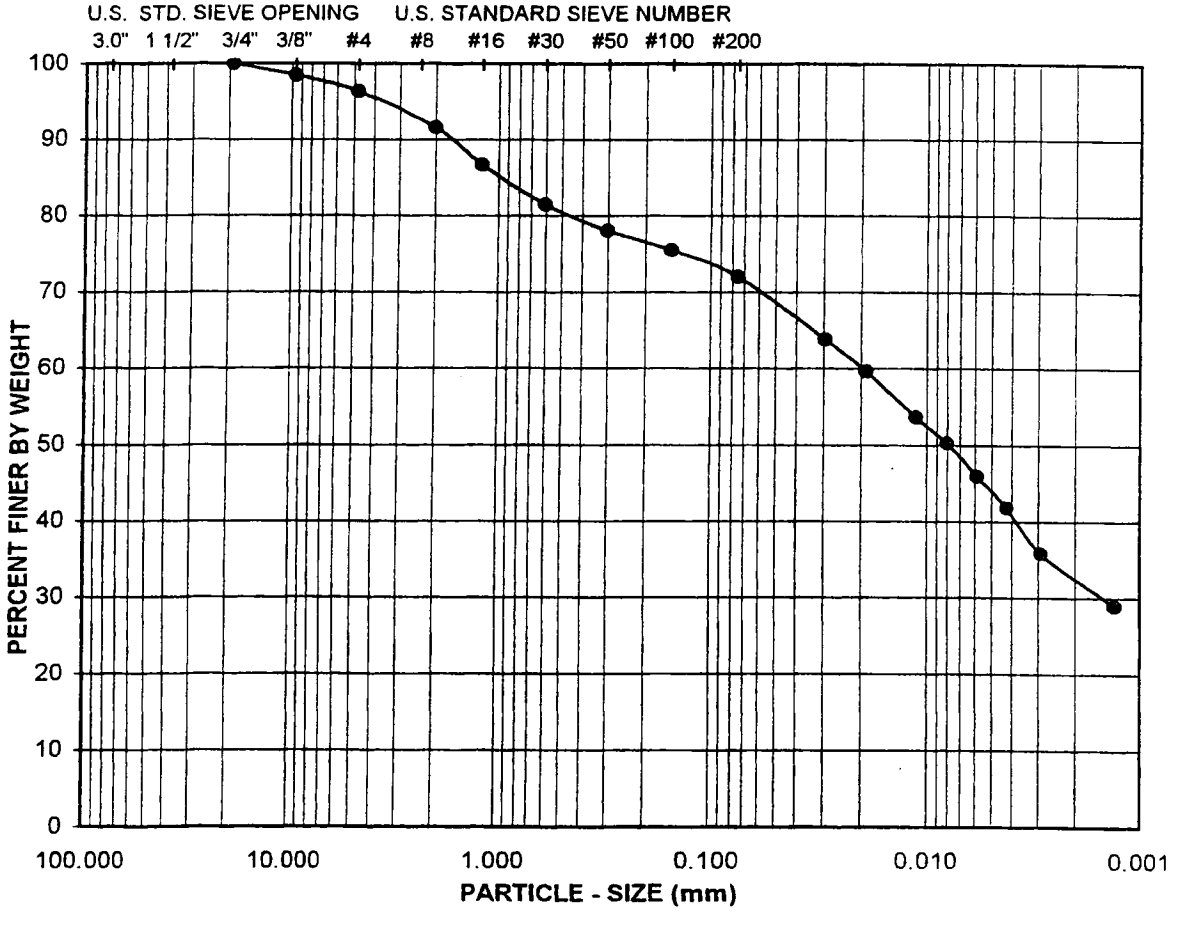
Hydrometer Wt. of Air-Dry Soil (gm) 53.29 Wt. of Dry Soil (gm) 53.29

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
02-Aug-02	8:25	0		3.0			
	8:27	2	21.3	3.0	40.5	63.8	0.0292
	8:30	5	21.4	3.0	38.0	59.6	0.0189
	8:40	15	21.5	3.0	34.5	53.6	0.0112
	8:55	30	21.5	3.0	32.5	50.2	0.0080
	9:25	60	21.6	3.0	30.0	45.9	0.0058
	10:25	120	21.7	3.0	27.5	41.7	0.0042
	12:35	250	22.0	3.0	24.0	35.7	0.0029
03-Aug-02	8:25	1440	20.9	3.0	20.0	28.9	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-755	095-2-142	40.0-42.5	(CL)s	4:24:72	N/A

Sample Description:

Very dark gray lean clay with sand (CL)s

TERATEST LABS

Project No.: 2384095-B-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

08-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	08/02/02
Project No. :	2384095-B-07060-1000	Data Input By:	LF	Date:	08/05/02
LOCATION:	B-756	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-166	Depth (ft.) :	25.5-26.0		

Visual Sample Description: Olive lean clay (CL)

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	35	LL,PL,PI:	35,23,12			
Plastic Limit:	23	GR:SA:FI:	0:12:88			
Plasticity Index:	12	Grp. Symbol:	CL			
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	81.08
Wt.of Air-Dry Soil + Cont. (gm.)	53.06	Wt. of Container No.___ (gm.)		1.00	1.00	74.72
Wt. of Container	0.00	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	53.06	Wt. of Dry Soil (gm.)				6.36

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

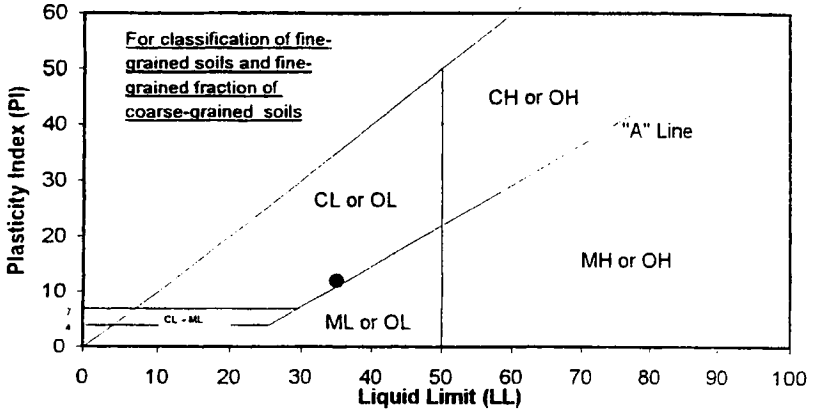
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.12	99.8	99.8
No. 30	0.20	99.6	99.6
No. 50	0.90	98.3	98.3
No. 100	3.06	94.2	94.2
No. 200	6.34	88.1	88.1
Pan			

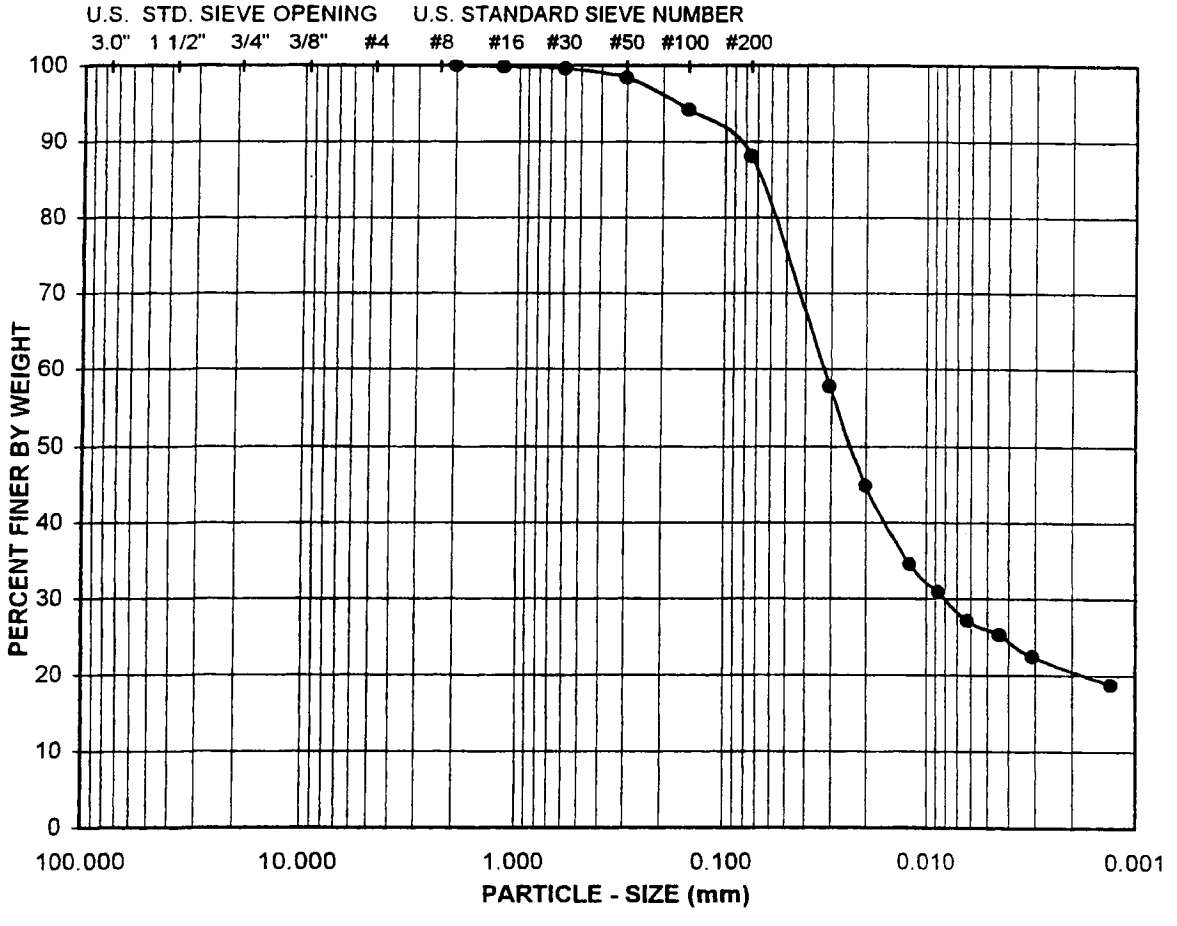
Hydrometer Wt. of Air-Dry Soil (gm) 53.06 Wt. of Dry Soil (gm) 53.06

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
03-Aug-02	7:13	0		5.0			
	7:15	2	21.1	5.0	36.0	57.8	0.0303
	7:18	5	21.1	5.0	29.0	44.8	0.0201
	7:28	15	21.1	5.0	23.5	34.5	0.0121
	7:43	30	21.3	5.0	21.5	30.8	0.0087
	8:13	60	21.3	5.0	19.5	27.1	0.0062
	9:13	120	21.4	5.0	18.5	25.2	0.0044
	11:23	250	21.5	5.0	17.0	22.4	0.0031
04-Aug-02	7:13	1440	20.9	5.0	15.0	18.7	0.0013



GRAVEL		SAND			FINES	
COARSE	FINE	CRSE	MEDIUM	FINE	SILT	CLAY



LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-756	095-2-166	25.5-26.0	CL	0:12:88	35,23,12

Sample Description:

Olive lean clay (CL)

TERATEST LABS

Project No.: 2384095-B-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

08-02

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 422

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By :	VJ	Date:	07/31/02
Project No. :	2384095-B-07060-1000	Data Input By:	LF	Date:	08/05/02
LOCATION:	B-756	Checked By:	LF	Date:	08/05/02
SAMPLE ID:	095-2-167	Depth (ft.) :	40.0-42.5		

Visual Sample Description: Olive sandy lean clay s(CL) with shells

				Moisture Content of Total Air-Dry Soils	Moisture Content of Air-Dry Soils Passing # 10	After Hydrometer & wet sieve ret. on #200 sieve
Liquid Limit:	48	LL,PL,PI:	48,22,26			
Plastic Limit:	22	GR:SA:FI:	3:32:65			
Plasticity Index:	26	Grp. Symbol:	s(CL)			
Specific Gravity	2.66	Wt.of Air-Dry Soil + Cont.(gm.)		0.00	0.00	
Correction for Specific Gravity	1.00	Dry Wt. of Soil + Cont. (gm.)		0.00	0.00	90.80
Wt.of Air-Dry Soil + Cont. (gm.)	675.24	Wt. of Container No.___ (gm.)		1.00	1.00	76.03
Wt. of Container	108.29	Moisture Content (%)		0.00	0.00	
Dry Wt. of Soil (gm.)	566.95	Wt. of Dry Soil (gm.)				14.77

Coarse Sieve

U.S. Sieve Size	Cumulative Wt.of Dry Soil Retained(gm)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	8.19	98.6
No. 4	19.68	96.5
No. 10	62.60	89.0
Pan		

Sieve after Hydrometer & Wet Sieve

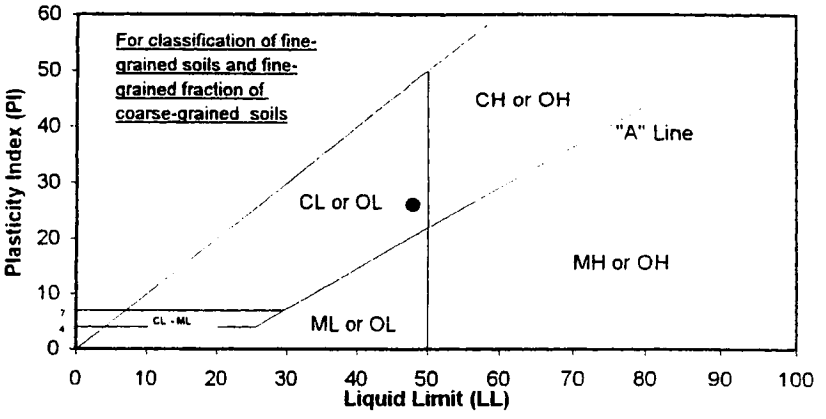
U.S. Sieve Size	Cumulative Wt. of Dry Soil Retained (gm)	% Passing	% Total Sample
No. 10	0.00	100.0	89.0
No. 16	3.67	93.1	82.9
No. 30	7.48	85.9	76.5
No. 50	10.08	81.0	72.1
No. 100	12.05	77.3	68.8
No. 200	14.56	72.6	64.6
Pan			

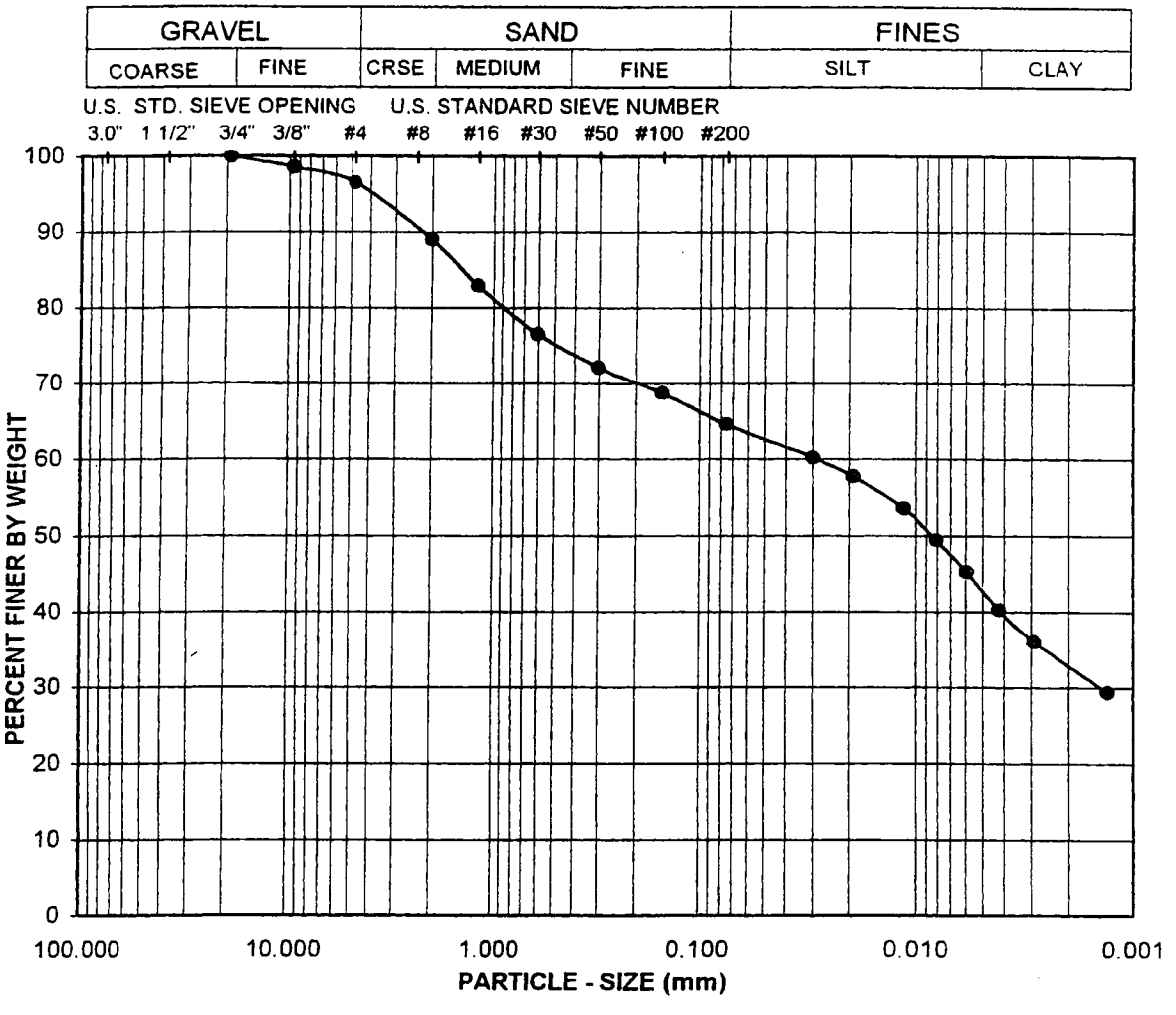
Hydrometer

Wt. of Air-Dry Soil (gm) 53.19 Wt. of Dry Soil (gm) 53.19

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature °C	Composite Correction 152 H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
02-Aug-02	8:29	0		3.0			
	8:31	2	21.4	3.0	39.0	60.2	0.0299
	8:34	5	21.5	3.0	37.5	57.7	0.0191
	8:44	15	21.4	3.0	35.0	53.5	0.0113
	8:59	30	21.5	3.0	32.5	49.4	0.0081
	9:29	60	21.5	3.0	30.0	45.2	0.0059
	10:29	120	21.7	3.0	27.0	40.2	0.0042
	12:39	250	22.0	3.0	24.5	36.0	0.0029
03-Aug-02	8:29	1440	20.9	3.0	20.5	29.3	0.0013





LOCATION	SAMPLE ID	Depth (ft.)	Soil Type	GR:SA:FI (%)	LL,PL,PI
B-756	095-2-167	40.0-42.5	s(CL)	3:32:65	48,22,26

Sample Description:

Olive sandy lean clay s(CL) with shells

TERATEST LABS

Project No.: 2384095-B-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ATTERBERG LIMITS, PARTICLE - SIZE CURVE

ASTM D 4318, D 422

08-02

LOCATION	B-755	B-755	B-755	B-754	B-754	B-754	B-754	B-754
SAMPLE ID	095-2-138	095-2-140	095-2-144	095-2-152	095-2-153	095-2-155	095-2-157	095-2-158
Depth (ft.)	10.0-11.5	20.5-21.0	60.0-60.5	5.5-6.0	10.0-11.5	19.0-19.5	40.0-42.5	50.0
Sample Type	SPT / BAG	MC / 2"X6"	SPT / BAG	MC / 2"X6"	SPT / BAG	MC / 2"X6"	ST / 30"X3"	MC / 2"X6"
Visual Soil Classification	Pale olive silty sand (SM)	Olive silty sand (SM)	Olive poorly graded sand with silt (SP-SM)	Olive brown poorly graded sand (SP)	SAMPLE MISSING	Very dark gray poorly graded sand with silt (SP-SM)	Very dark gray lean clay with sand (CL)s	Dark olive poorly graded sand with silt (SP-SM)
Moisture Correction								
Wet Weight of Soil + Container (gm.)	153.76	186.78	0.00	246.28		233.57	199.95	211.42
Dry Weight of Soil + Container (gm.)	131.02	161.33	0.00	215.02		204.98	184.62	185.77
Weight of Container (gm)	36.72	58.78	1.00	56.41		72.26	65.69	51.92
Moisture Content (%)	24.11	24.82	0.00	19.71		21.54	12.89	19.16
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	306.67	460.20	334.53	432.73		356.12	365.28	345.25
Weight of Container (gm.)	76.39	76.79	75.41	75.62		75.86	75.89	79.70
Weight of Dry Sample (gm.)	185.54	307.18	259.12	298.32		230.59	256.35	222.85
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	238.67	266.63	306.35	365.43		287.02	136.03	289.93
Weight of Container (gm)	76.39	76.79	75.41	75.62		75.86	75.89	79.70
Dry Weight of Sample (gm)	162.28	189.84	230.94	289.81		211.16	60.14	210.23
% Passing No. 200 Sieve	**12.5**	**38.2**	**10.9**	**2.9**		**8.4**	**76.5**	**5.7**
% Retained No. 200 Sieve	87.5	61.8	89.1	97.1		91.6	23.5	94.3

TERATEST LABS

PERCENT PASSING No. 200 SIEVE

ASTM D 1140

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda CA

Project No.: 2384095-D-07060-1000

Client Name: Foster Wheeler Environmental Corp.

Tested By: VJ Date: 08/02/02

LOCATION	B-754	B-754	B-756	B-756				
SAMPLE ID	095-2-160	095-2-161	095-2-168	095-2-169				
Depth (ft.)	70.0-71.5	80.0-80.8	70.5-71.0	80.0-81.5				
Sample Type	SPT / BAG	SPT / BAG	MC / 2"X6"	SPT / BAG				
Visual Soil Classification	Olive poorly graded sand with silt (SP-SM)	Olive poorly graded sand with silt (SP-SM)	Olive silty sand (SM)	Olive poorly graded sand with silt (SP-SM)				
Moisture Correction								
Wet Weight of Soil + Container (gm.)	208.13	193.53	210.50	153.62				
Dry Weight of Soil + Container (gm.)	181.70	171.89	188.80	130.80				
Weight of Container (gm)	67.33	69.41	51.18	57.31				
Moisture Content (%)	23.11	21.12	15.77	31.05				
Container No.:								
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	357.31	349.10	507.03	336.75				
Weight of Container (gm.)	75.68	77.07	74.81	75.20				
Weight of Dry Sample (gm.)	228.76	224.60	373.35	199.58				
Container No.:								
After Wash								
Dry Weight of Sample + Container (gm)	280.56	282.94	386.32	257.64				
Weight of Container (gm)	75.68	77.07	74.81	75.20				
Dry Weight of Sample (gm)	204.88	205.87	311.51	182.44				
% Passing No. 200 Sieve	**10.4**	**8.3**	**16.6**	**8.6**				
% Retained No. 200 Sieve	89.6	91.7	83.4	91.4				

TERATEST LABS

PERCENT PASSING No. 200 SIEVE
ASTM D 1140

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda CA
Project No.: 2384095-D-07060-1000
Client Name: Foster Wheeler Environmental Corp.
Tested By: VJ Date: 08/02/02

.xls

TERATEST LABS

SPECIFIC GRAVITY of SOILS

ASTM D 854

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA — Tested By: VJ — Date: 08/01/02

Project No. : 2384095-D-7060-1000 — Input By: LF — Date: 08/05/02

LOCATION	B-755	B-754	B-756		
SAMPLE ID	095-2-141	095-2-156	095-2-167		
Depth (ft)	30.0-32.5	30.0-32.5	40.0-42.5		
Sample Description	Very dark gray lean clay with sand (CL)s	Very dark gray lean clay with sand (CL)s and shells	Olive sandy lean clay s(CL) with shells		
Container No.	915	100	4-C		
Flask No.	2	4	16		
Weight of Flask + Water + Soil (gm)	394.84	391.88	387.35		
Temperature °C	21	21	21		
Correction Factor	0.9998	0.9998	0.9998		
Weight of Dry Soil (gm)	50.85	50.61	50.53		
Weight of Flask + Water (gm)	363.4	360.49	356.03		
Container No.	P-44	543	752		
Weight of Dry Soil+Cont. after Test	123.91	132.03	125.25		
Weight of Container	73.98	82.2	75.36		
Weight of Dry Back Soil	49.93	49.83	49.89		
Specific Gravity (average)	**2.66**	**2.67**	**2.66**		

Temperature °C	Correction Factor
17	1.0006
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9983

Laboratory Miniature Vane Shear Test

ASTM D 4648

Project Number: 2384095-D-07060-1000 Task No. _____

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer: _____

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg)			Shear Strength (psf)	
					Initial	Final	Difference	point	average
095-2-141	top	30.0	CL	1	21	30	9	40	33
	bottom		CL	1	15	21	6	27	
095-2-142	top	40.0	CH	4	42	66	24	682	696
	bottom		CH	4	42	67	25	710	
095-2-156	top	30.0	CH	not tested	NA	NA	NA	NA	1363
	bottom		CL	4	42	90	48	1363	
095-2-157	top	40.0	CH	2	87	147	60	549	774
	bottom		CH	2	91	200	109	998	
095-2-166	top	25.5	CL	2	87	115	28	256	224
	bottom		CL	2	89	110	21	192	
095-2-167	top	40.0	CH	4	43	113	70	1988	1491
	bottom		CH	4	43	78	35	994	
095-2-170	top	90.0	CH	4	43	120	77	2187	2343
	bottom		CH	4	43	131	88	2499	

HUSHMAND ASSOCIATES, INCORPORATED
Geotechnical, Earthquake and Environmental Engineers

Subject: GeoTechnical Testing Project Name: ALAMEDA NAS BETWEEN 1 & 2

By: J.B/EV Date: 8/10/02 Project No:

Checked By: Date: Sheet: 1 of 4

Ernesto 714-731-1049 Rec'd 7-11-02

GEOTECHNICAL TESTING PROGRAM

ALAMEDA BETWEEN SITES 1 AND 2

1) CONSOLIDATION:

SAMPLES IN SHELBY TUBES

BORING	ID	DEPTH
B-756	095-2-167	40-42.5'
B-754	095-2-156	30-32.5
B-755	095-2-141	30-32.5
B-755	095-2-129	88-90.6

INUNDATION AT THE START

LOADING σ_{vo}: 0.25, 0.50, 1.0, 2.0, 4.0, 8, 16, 32, 64 K.S.F

MEASURE SETTLEMENT DATES @ 2 and 4 K.S.F

UNLOADING: σ_{vo}: 16, 4, 1.0, 0.5 K.S.F

RELOADING TO σ_{vo}: 1.0, 4.0, 16, 64 K.S.F

2) SPECIFIC GRAVITY (Some specimens)

3) ISOTROPICALLY CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST (Tx-ICU) SATURATED AND WITH PORE WATER PRESSURE MEASUREMENTS

d:\officeforms\calcsheets.wpd

HUSHMAND ASSOCIATES, INCORPORATED
Geotechnical, Earthquake and Environmental Engineers

Subject: GEOTECH. TESTING Project Name: ALAMEDA NAS BETWEEN 1 & 2

By: JB/E.V. Date: Project No:

Checked By: Date: Sheet: 2 of 4

4 points from 5 shelbys

Use SHANSEP Approach. Test 4 specimens from the following similar clayey materials left in Shelby tube specimens only.

a) B756 at 40 – 42.5' (095-2-167).
b) B754 at 30'–32.5' and 40'–42.5' (095-2-156 & 157
c) B755 at 30'–32.5' and 40'–42.5 (095-2-141 & 142

All 4 similar clayey soil specimens should be isotropically consolidated in the lab to $\sigma'_{3c} \approx$ ~~20~~ 11.5 ksf. Once all excess pore water pressures are dissipated, then:

~~EE~~ V
07/10/02

Test ① at $\sigma'_{3c} =$ ~~20.0~~ 11.5 ksf with measurement of excess pore-water pressures

Unload:

② to $\sigma'_{3c} \approx$ ~~10~~ ksf 5.75
③ to $\sigma'_{3c} \approx$ 5 ksf 2.875
④ to $\sigma'_{3c} \approx$ 2 ksf 1.158

and wait until pore water pressure stabilizes at the new σ'_{3c} value

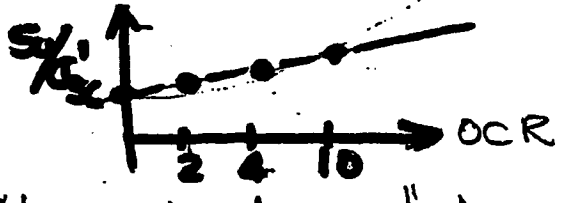
HUSHMAND ASSOCIATES, INCORPORATED
Geotechnical, Earthquake and Environmental Engineers

Subject: GEOTECH. TESTING Project Name: ALAMEDA NAS BETWEEN 1 & 2
By: J.B/EY Date: Project No:
Checked By: Date: Sheet: 3 of 4

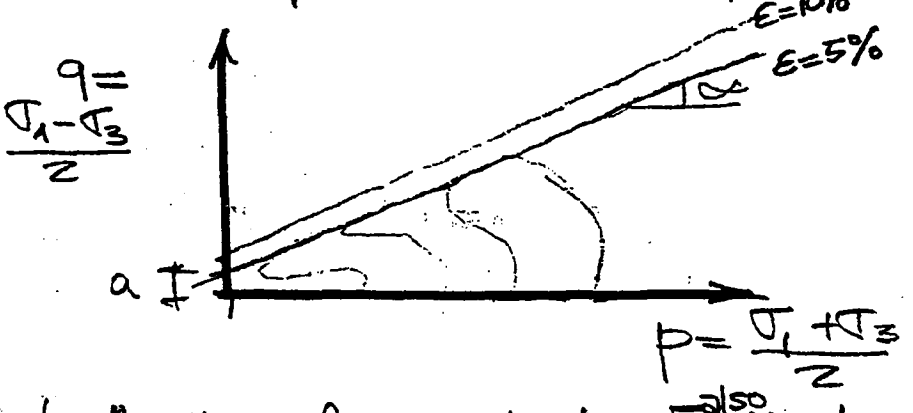
The result of this loading (and unloading) produces the following laboratory-induced values of over consolidation ratio (OCR):

① OCR = 20/20 = 1
② = 20/10 = 2
③ = 20/5 = 4
④ = 20/2 = 10

These 4 specimens will the be sheared at varios lab-induced values of OCR, which will allow plotting of normalized (SHANSEP) undrained shear strength (S_u/σ'_{3c}) versus OCR in a log/log scale:



Also produce a "stress-path" plot



that will allow for estimating also effective shear strength parameters (ϕ' and c').

HUSHMAND ASSOCIATES, INCORPORATED
Geotechnical, Earthquake and Environmental Engineers

Subject: GEOTECH. TESTING Project Name: ALAMEDA NAS BETWEEN 1 & 2

By: JB/EV Date: Project No:

Checked By: Date: Sheet: 4 of 4

4) UNCONSOLIDATED - UNDRAINED TRIAXIAL COMPRESSION TESTS (TX UU).

- B756 at 90' - 92.5' $\sigma_{3c} \approx 3.8$ ksf (095-2-170)
- ~~" " 101' 103.5' $\sigma_{3c} \approx 4.2$ ksf~~
- B754 " 90' - 92.5' $\sigma_{3c} \approx 3.8$ ksf (095-2-162)
  " 120' - 122.5' $\sigma_{3c} \approx 5.0$ ksf (095-2-164)
  " 150 - 152.5' $\sigma_{3c} \approx 6.3$ ksf (095-2-165)
- B755 " 88 - 90.5' $\sigma_{3c} \approx 3.8$ ksf (095-2-147)
  " 161 - 163.5 $\sigma_{3c} \approx 6.7$ ksf (095-2-144)

This sample was not marked on the C of C for this test. We ran it anyway.

TERATEST LABS

Summary of Triaxial Test Results[1]

Project Name : Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Project No.: 2384095-D-07060-1000

SAMPLE ID	LOCATION	Depth (ft)	Type of Triaxial Test[2]	Effective Consol. Stress (psi)	AT Failure			
					Deviator Stress (psi)	Eff. Minor Princ. Stress (psi)	Eff. Major Princ. Stress (psi)	Axial Strain (%)
095-2-147	B-755	88.0-90.5	UU	26.40	26.6	26.4	53.0	6.2
095-2-149	B-755	161.0-163.0	UU	46.50	23.9	46.5	70.4	8.0
095-2-162	B-754	90.0-92.5	UU	26.40	27.4	26.4	53.8	3.3
095-2-164	B-754	120.0-122.5	UU	34.70	44.1	34.7	78.8	2.7
095-2-165	B-754	150.0-152.5	UU	43.75	47.0	43.8	90.7	4.4
095-2-170	B-756	90.0-92.5	UU	26.40	26.4	26.4	52.8	1.8
095-2-167	B-756	40.0-42.5	CU	8.00	34.2	11.2	45.4	7.0
095-2-156	B-754	30.0-32.5	CU	20.00	44.6	18.1	62.7	7.6
095-2-156	B-754	30.0-32.5	CU	40.00	55.3	22.5	77.8	10.7
095-2-141	B-755	30.0-32.5	CU	80.00	54.9	22.6	77.4	10.8

[1] Please refer to the Individual Test Data Sheets for complete data and Plots
[2] UU = Unconsolidated Undrained / ASTM D 2850
[2] CU = Consolidated Undrained / ASTM D 4767

TERATEST LABS

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 2850

Project Name:	Geotechnical Evaluation, Betw. IR Sites	Tested by:	RA	Date:	08/05/02
	1 & 2, Alameda Point, Alameda, CA	Checked by:	LF	Date:	08/07/02
Project No:	2384095-D-07060-1000	Sample Type:	Shelby Tube		
Location:	B-754	Sample Description:	Olive elastic silt (MH)		
Sample ID.:	095-2-162				
Depth(ft):	90.0-92.5				

Diameter (in)	2.857	2.858	2.856	Avg. =	2.857
Height (in)	5.998	5.996	6.000	Avg. =	5.998

SKETCH/PHOTO AFTER TEST

Area (in²)	6.411
Moisture Content (%)	66.61
Wt. Wet Sample + Container (gms)	1098.24
Wt. Dry Sample + Container (gms)	702.32
Wt. Container (gms)	107.95
Density and Saturation	
Wt. Wet Sample + Container (gms)	992.08
Wt. Container (gms)	0.00
Wet Density (pcf)	98.3
Dry Density (pcf)	59.0
Void Ratio	1.855
% Saturation	97.0

Assumed Gs = 2.70

Back Pressure Saturation

B Value (%) = N/A Change in Ht. of the Specimen (in)= N/A

Effective Stress

Cell Pressure (psi) =	26.40
Back Pressure(psi) =	0.00
Eff. Consol. Stress (psi) =	26.40

Shear

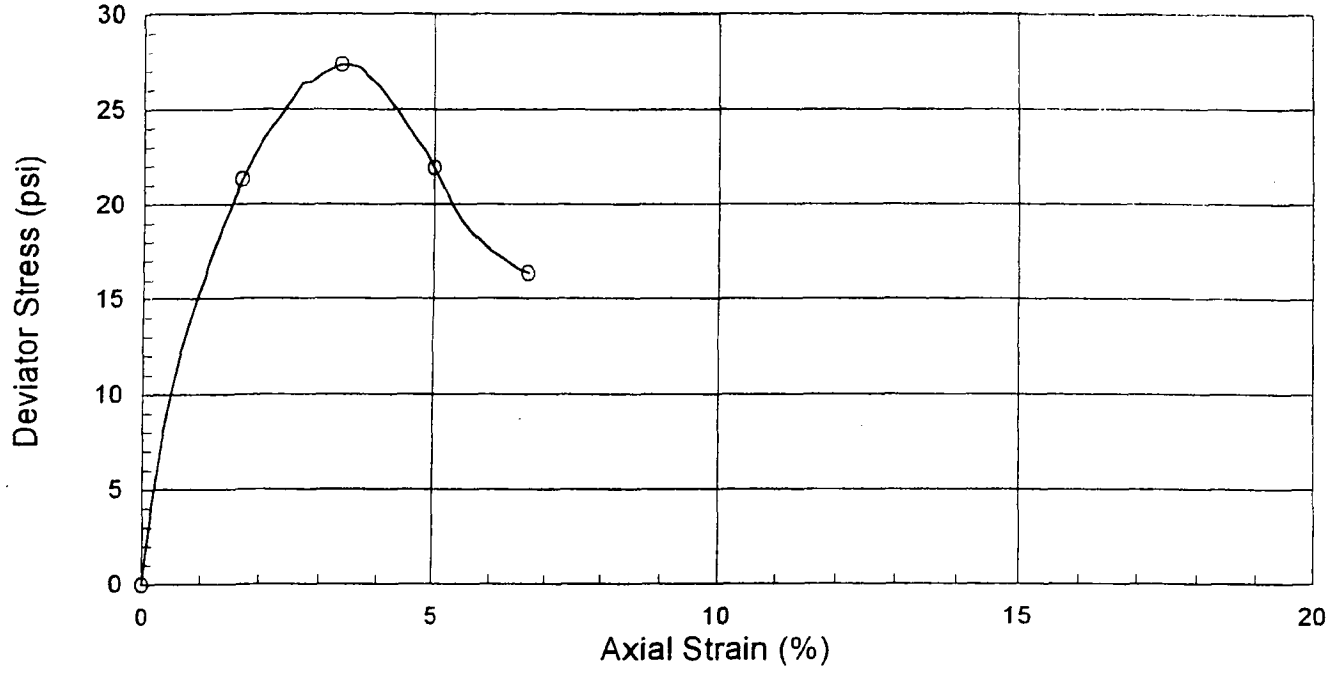
Rate of Deformation (in/min)= 0.0600

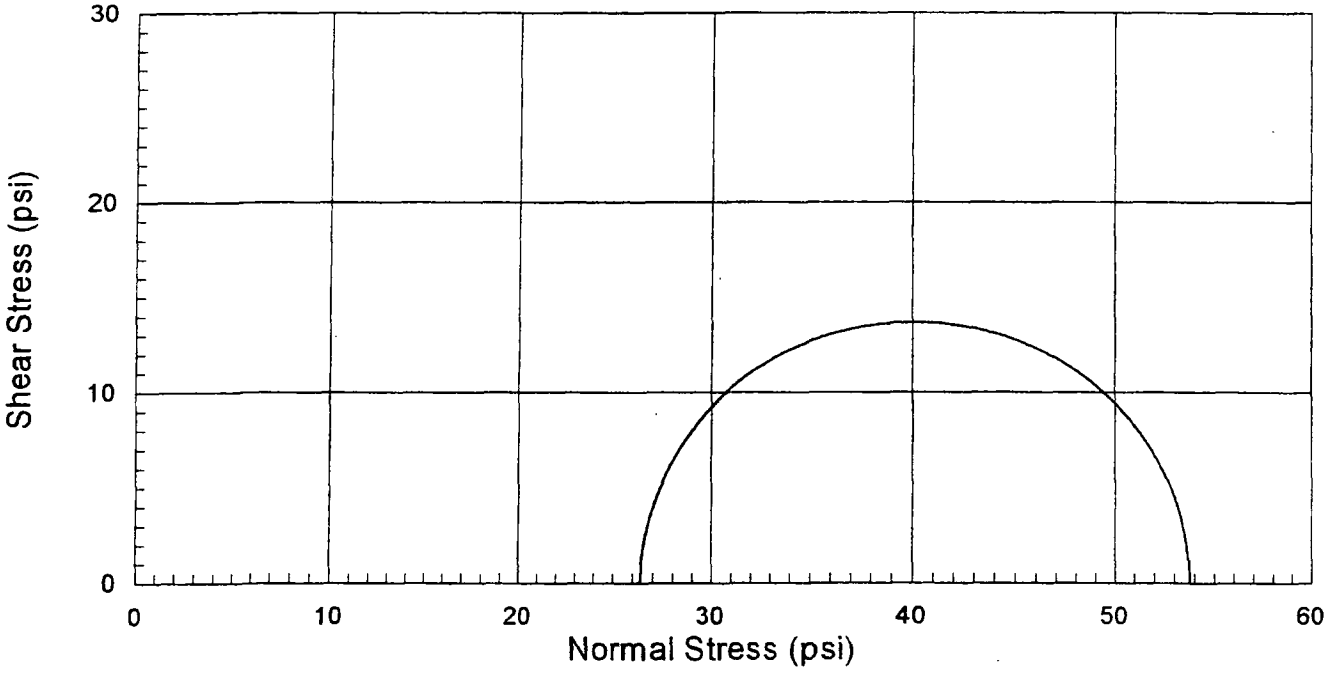
Failure Criterian:

Condition at which maximum deviator stress occurs

At Failure

Deviator Stress (psi) =	27.37
Eff. Minor Principal stress (psi) =	26.40
Eff. Major Principal stress (psi) =	53.77
Axial Strain (%) =	3.33





Location	Sample ID	Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○ B-754	095-2-162	90.0-92.5	26.4	27.37

_____ Mohr Circle based on Total Stress

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST ASTM D 2850

08-02

TERATEST LABS

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 2850

Project Name:	Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested by:	RA	Date:	08/06/02
		Checked by:	LF	Date:	08/07/02
Project No:	2384095-D-07060-1000	Sample Type:	Shelby Tube		
Location:	B-754	Sample Description:	Dark olive gray lean / fat clay (CL/CH)		
Sample ID.:	095-2-164				
Depth(ft):	120.0-122.5				

Diameter (in)	2.875	2.877	2.876	Avg. =	2.876
Height (in)	5.979	5.983	5.975	Avg. =	5.979

SKETCH/PHOTO AFTER TEST

Area (in²)	6.496
Moisture Content (%)	38.89
Wt. Wet Sample + Container (gms)	1248.65
Wt. Dry Sample + Container (gms)	928.98
Wt. Container (gms)	106.91
Density and Saturation	
Wt. Wet Sample + Container (gms)	1145.75
Wt. Container (gms)	0.00
Wet Density (pcf)	112.3
Dry Density (pcf)	80.9
Void Ratio	1.084
% Saturation	96.9

Assumed Gs = 2.70

Back Pressure Saturation

B Value (%) = N/A

Change in Ht. of the Specimen (in)= N/A

Effective Stress

Cell Pressure (psi) =	34.70
Back Pressure(psi) =	0.00
Eff. Consol. Stress (psi) =	34.70

Shear

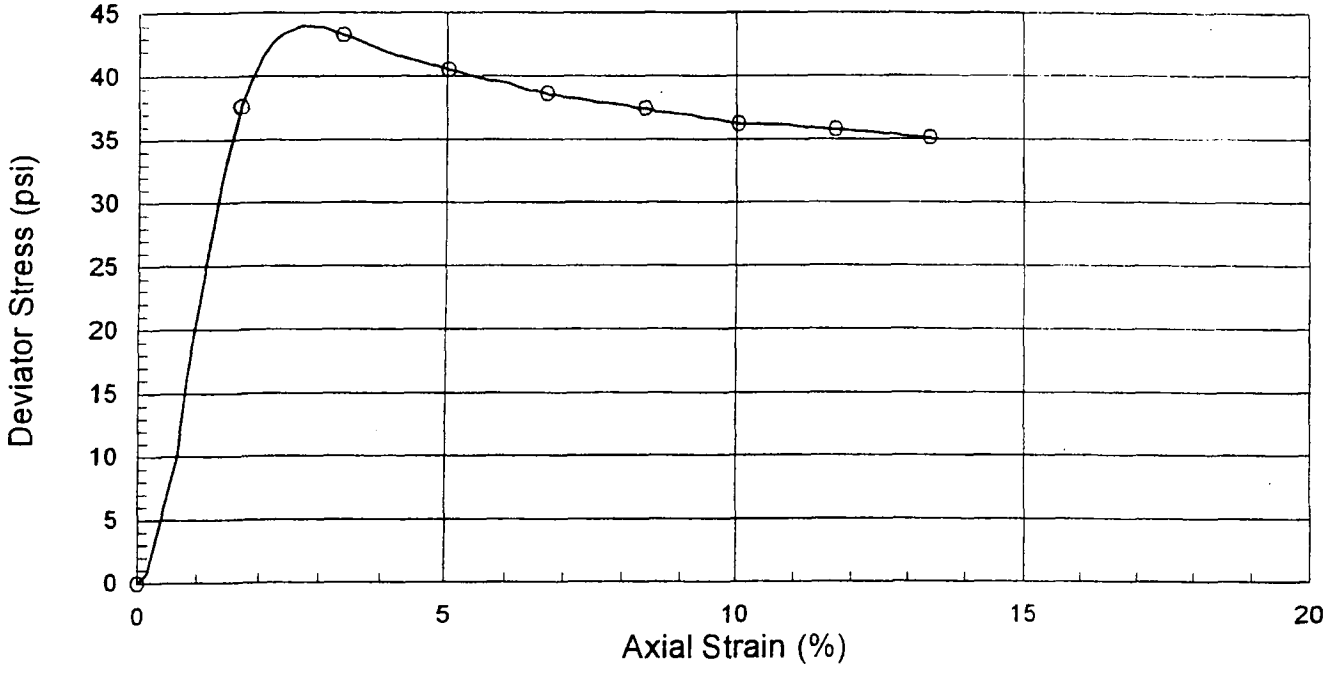
Rate of Deformation (in/min)= 0.0600

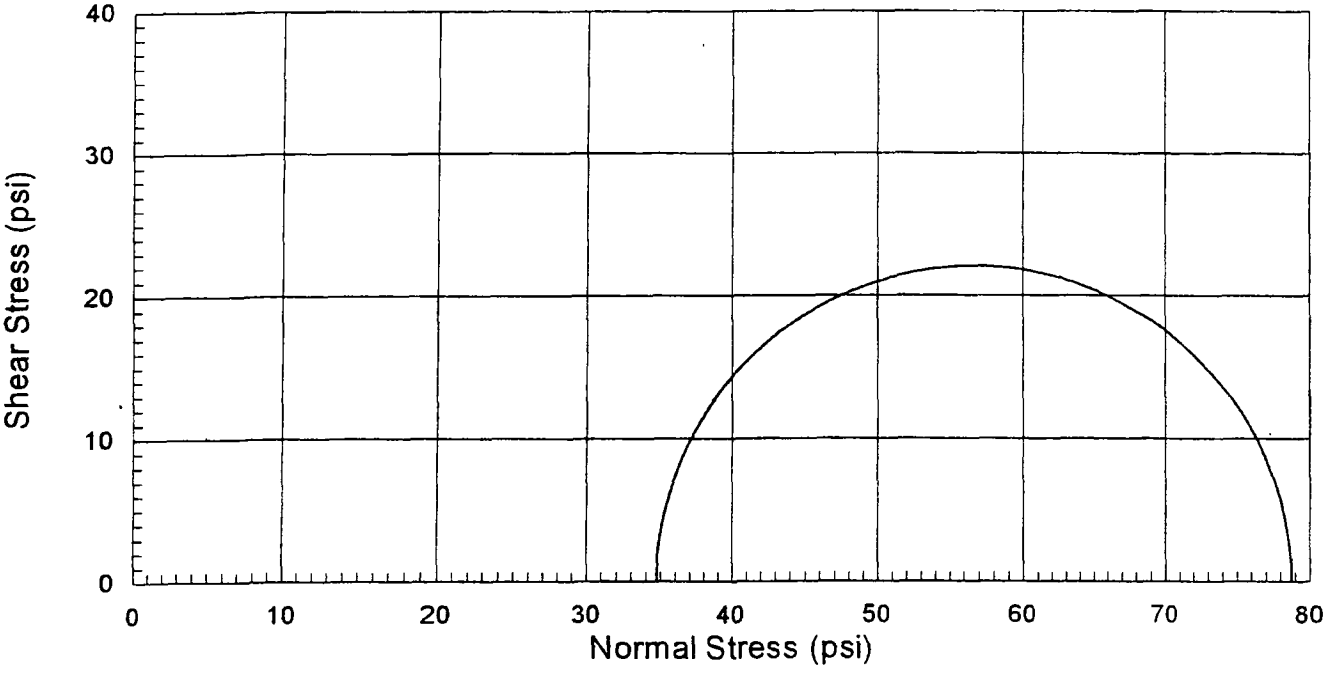
Failure Criterian:

Condition at which maximum deviator stress occurs

At Failure

Deviator Stress (psi) =	44.08
Eff. Minor Principal stress (psi) =	34.70
Eff. Major Principal stress (psi) =	78.78
Axial Strain (%) =	2.68





Location	Sample ID	Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○ B-754	095-2-164	120.0-122.5	34.7	44.08

_____ Mohr Circle based on Total Stress

TERRATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST ASTM D 2850

08-02

TERATEST LABS

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 2850

Project Name:	Geotechnical Evaluation, Betw. IR Sites	Tested by:	RA	Date:	08/05/02
	1 & 2, Alameda Point, Alameda, CA	Checked by:	LF	Date:	08/07/02
Project No:	2384095-D-07060-1000	Sample Type:	Shelby Tube		
Location:	B-754	Sample Description:	Dark gray lean clay (CL)		
Sample ID.:	095-2-165				
Depth(ft):	150.0-152.5				

Diameter (in)	2.875	2.877	2.874	Avg. =	2.875
Height (in)	5.970	5.975	5.973	Avg. =	5.973

SKETCH/PHOTO AFTER TEST

Area (in²)	6.493
Moisture Content (%)	36.90
Wt. Wet Sample + Container (gms)	1288.10
Wt. Dry Sample + Container (gms)	970.52
Wt. Container (gms)	109.83
Density and Saturation	
Wt. Wet Sample + Container (gms)	1183.28
Wt. Container (gms)	0.00
Wet Density (pcf)	116.2
Dry Density (pcf)	84.9
Void Ratio	0.985
% Saturation	101.1

Assumed Gs = 2.70

Back Pressure Saturation

B Value (%) = N/A

Change in Ht. of the Specimen (in)= N/A

Effective Stress

Cell Pressure (psi) =	43.75
Back Pressure(psi) =	0.00
Eff. Consol. Stress (psi) =	43.75

Shear

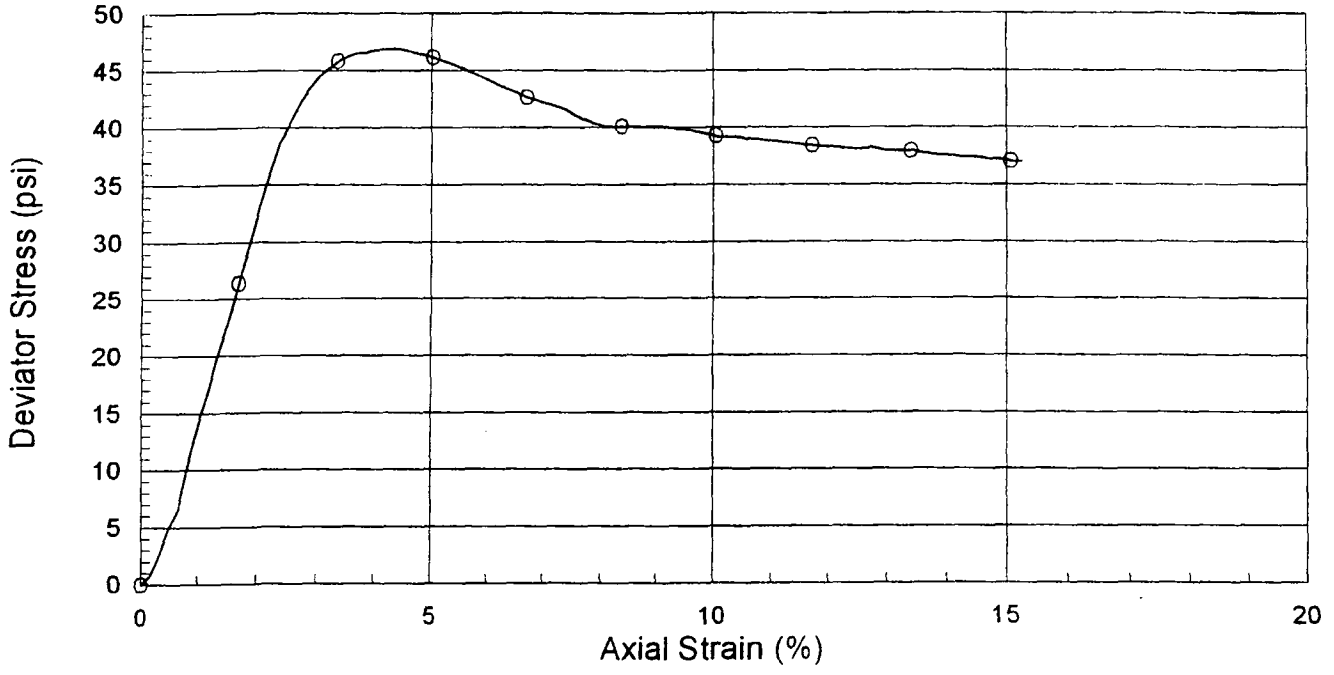
Rate of Deformation (in/min)= 0.0600

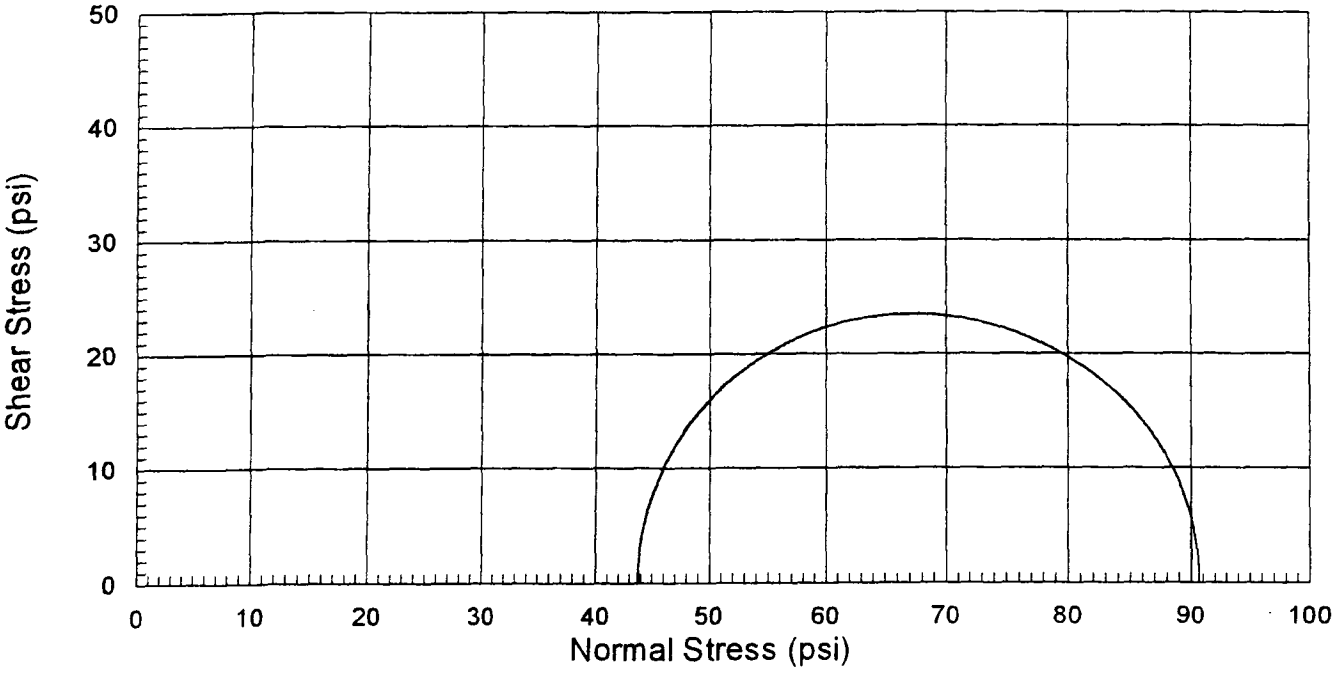
Failure Criterian:

Condition at which maximum deviator stress occurs

At Failure

Deviator Stress (psi) =	46.95
Eff. Minor Principal stress (psi) =	43.75
Eff. Major Principal stress (psi) =	90.70
Axial Strain (%) =	4.35





Location	Sample ID	Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○ B-754	095-2-165	150.0-152.5	43.75	46.95

_____ Mohr Circle based on Total Stress

TERRATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST
ASTM D 2850

08-02

TERATEST LABS

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 2850

Project Name:	Geotechnical Evaluation, Betw. IR Sites	Tested by:	RA	Date:	08/06/02
	1 & 2, Alameda Point, Alameda, CA	Checked by:	LF	Date:	08/07/02
Project No:	2384095-D-07060-1000	Sample Type:	Shelby Tube		
Location:	B-755	Sample Description:	Very dark gray sandy lean clay s(CL)		
Sample ID.:	095-2-147				
Depth(ft):	88.0-90.5				

Diameter (in)	2.873	2.874	2.872	Avg. =	2.873
Height (in)	5.985	5.978	5.980	Avg. =	5.981

SKETCH/PHOTO AFTER TEST

Area (in²)	6.483
Moisture Content (%)	43.75
Wt. Wet Sample + Container (gms)	1172.70
Wt. Dry Sample + Container (gms)	849.04
Wt. Container (gms)	109.19
Density and Saturation	
Wt. Wet Sample + Container (gms)	1082.00
Wt. Container (gms)	0.00
Wet Density (pcf)	106.4
Dry Density (pcf)	74.0
Void Ratio	1.277
% Saturation	92.5

Assumed Gs = 2.70

Back Pressure Saturation

B Value (%) = N/A Change in Ht. of the Specimen (in)= N/A

Effective Stress

Cell Pressure (psi) =	26.40
Back Pressure(psi) =	0.00
Eff. Consol. Stress (psi) =	26.40

Shear

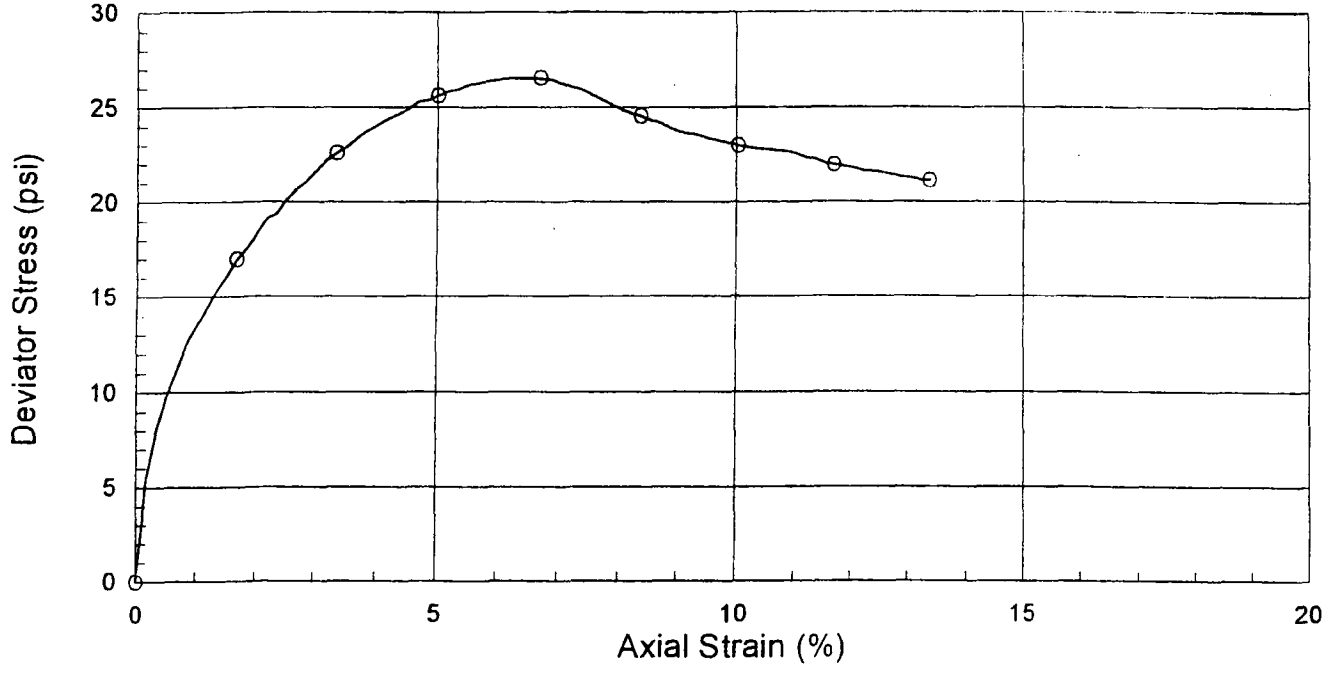
Rate of Deformation (in/min)= 0.0600

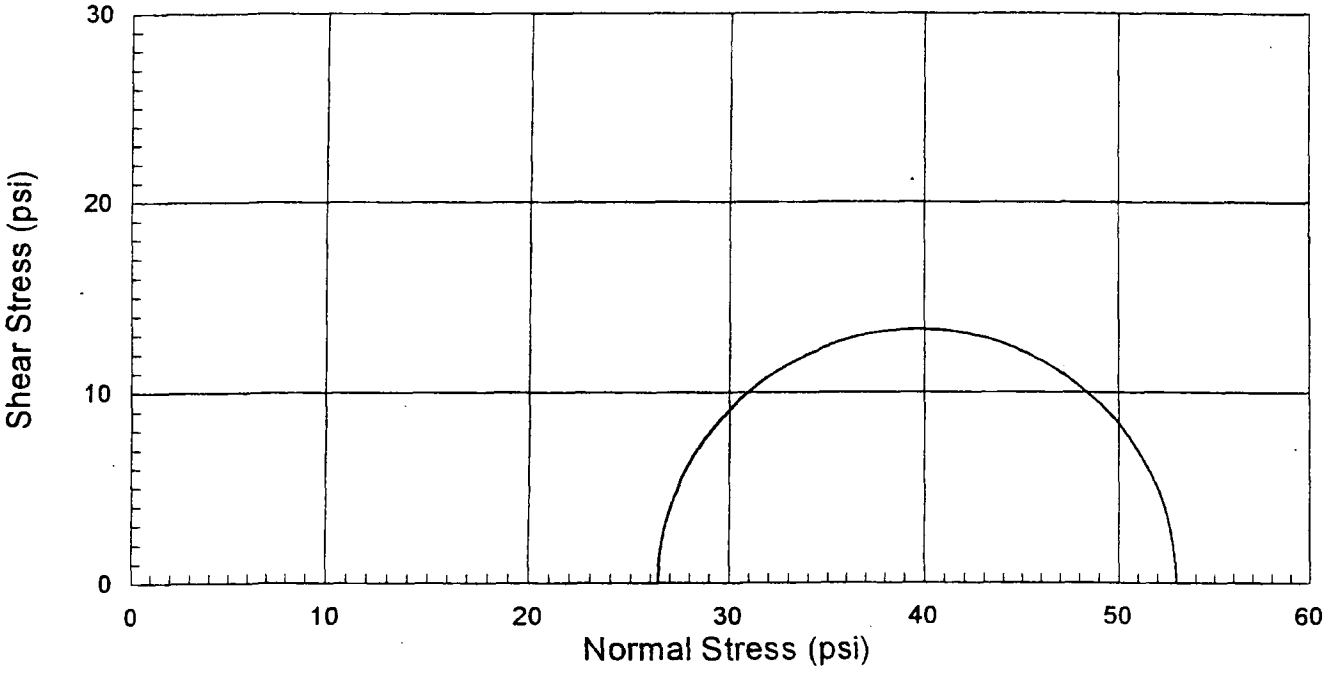
Failure Criterian:

Condition at which maximum deviator stress occurs

At Failure

Deviator Stress (psi) =	26.57
Eff. Minor Principal stress (psi) =	26.40
Eff. Major Principal stress (psi) =	52.97
Axial Strain (%) =	6.19





Location	Sample ID	Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○ B-755	095-2-147	88.0-90.5	26.4	26.57

_____ Mohr Circle based on Total Stress

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST ASTM D 2850

08-02

TERATEST LABS

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 2850

Project Name:	Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested by:	RA	Date:	08/05/02
		Checked by:	LF	Date:	08/06/02
Project No:	2384095-D-07060-1000	Sample Type:	Shelby Tube		
Location:	B-755	Sample Description:	Dark gray lean / fat clay (CL/CH)		
Sample ID.:	095-2-149				
Depth(ft):	161.0-163.0				

Diameter (in)	2.875	2.877	2.876	Avg. =	2.876
Height (in)	5.995	5.990	5.992	Avg. =	5.992

SKETCH/PHOTO AFTER TEST

Area (in²)	6.496
Moisture Content (%)	43.84
Wt. Wet Sample + Container (gms)	1239.75
Wt. Dry Sample + Container (gms)	895.44
Wt. Container (gms)	110.12
Density and Saturation	
Wt. Wet Sample + Container (gms)	1133.08
Wt. Container (gms)	0.00
Wet Density (pcf)	110.9
Dry Density (pcf)	77.1
Void Ratio	1.185
% Saturation	99.9

Assumed Gs = 2.70

Back Pressure Saturation

B Value (%) = N/A Change in Ht. of the Specimen (in)= N/A

Effective Stress

Cell Pressure (psi) =	46.50
Back Pressure(psi) =	0.00
Eff. Consol. Stress (psi) =	46.50

Shear

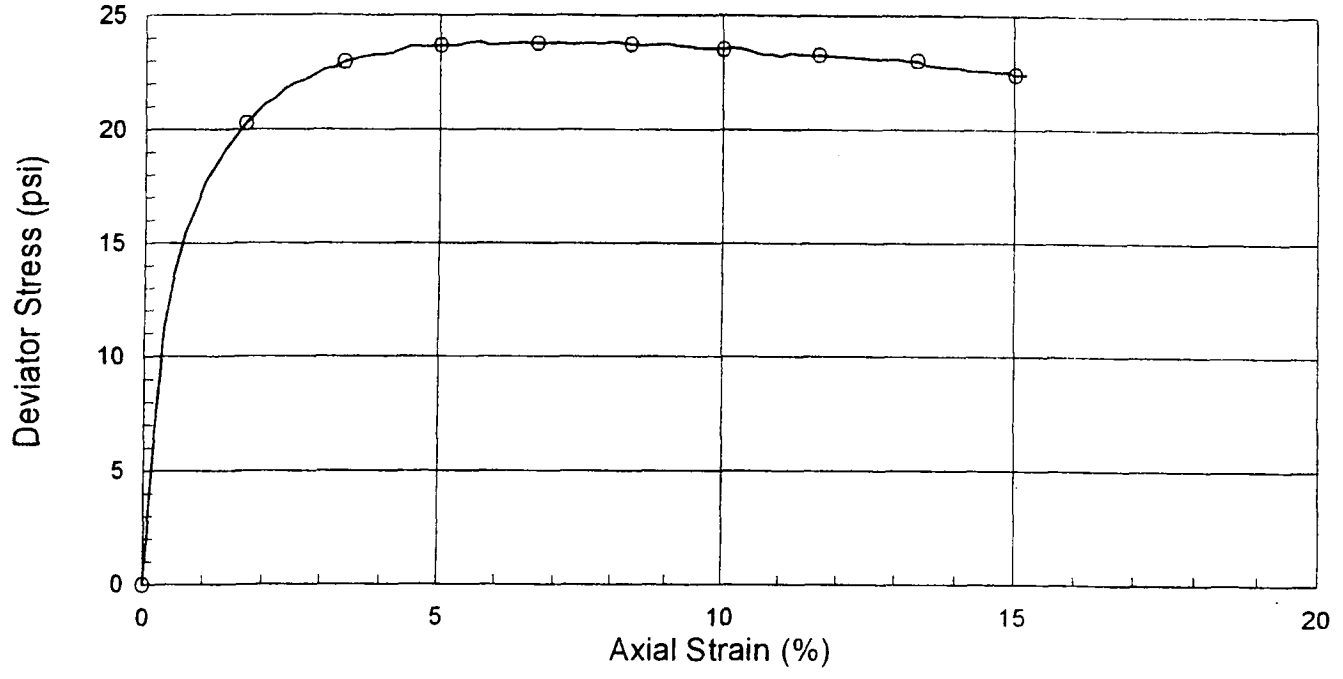
Rate of Deformation (in/min)= 0.0600

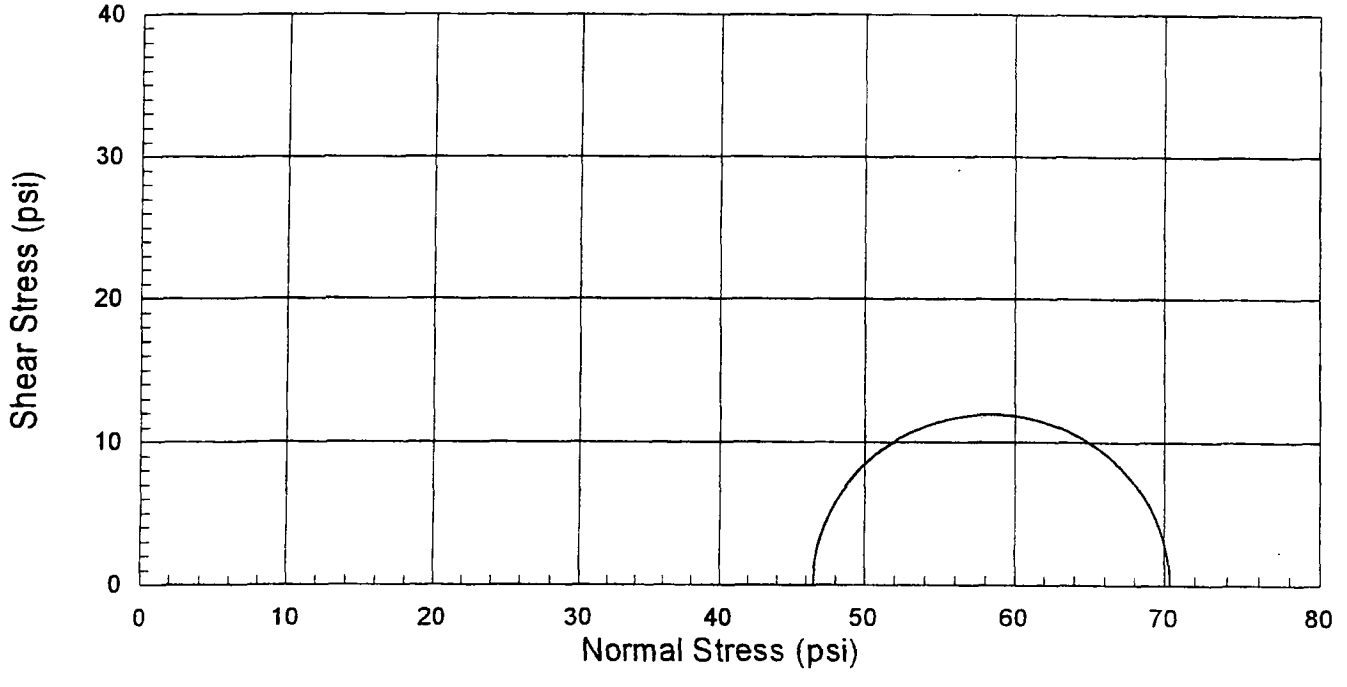
Failure Criterian:

Condition at which maximum deviator stress occurs

At Failure

Deviator Stress (psi) =	23.86
Eff. Minor Principal stress (psi) =	46.50
Eff. Major Principal stress (psi) =	70.36
Axial Strain (%) =	8.01





Location	Sample ID	Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○B-755	095-2-149	161.0-163.0	46.5	23.86

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST ASTM D 2850

_____ Mohr Circle based on Total Stress

08-02

TERATEST LABS

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 2850

Project Name:	Geotechnical Evaluation, Betw. IR Sites	Tested by:	RA	Date:	08/06/02
	1 & 2, Alameda Point, Alameda, CA	Checked by:	LF	Date:	08/07/02
Project No:	2384095-D-07060-1000	Sample Type:	Shelby Tube		-
Location:	B-756	Sample Description:	Olive elastic silt (MH)		
Sample ID.:	095-2-170				
Depth(ft):	90.0-92.5				

Diameter (in)	2.875	2.878	2.877	Avg. =	2.877
Height (in)	5.993	5.997	5.995	Avg. =	5.995

SKETCH/PHOTO AFTER TEST

Area (in²)	6.499
Moisture Content (%)	62.21
Wt. Wet Sample + Container (gms)	1126.52
Wt. Dry Sample + Container (gms)	736.48
Wt. Container (gms)	109.53
Density and Saturation	
Wt. Wet Sample + Container (gms)	1018.34
Wt. Container (gms)	0.00
Wet Density (pcf)	99.5
Dry Density (pcf)	61.4
Void Ratio	1.746
% Saturation	96.2

Assumed Gs = 2.70

Back Pressure Saturation

B Value (%) = N/A Change in Ht. of the Specimen (in)= N/A

Effective Stress

Cell Pressure (psi) =	26.40
Back Pressure(psi) =	0.00
Eff. Consol. Stress (psi) =	26.40

Shear

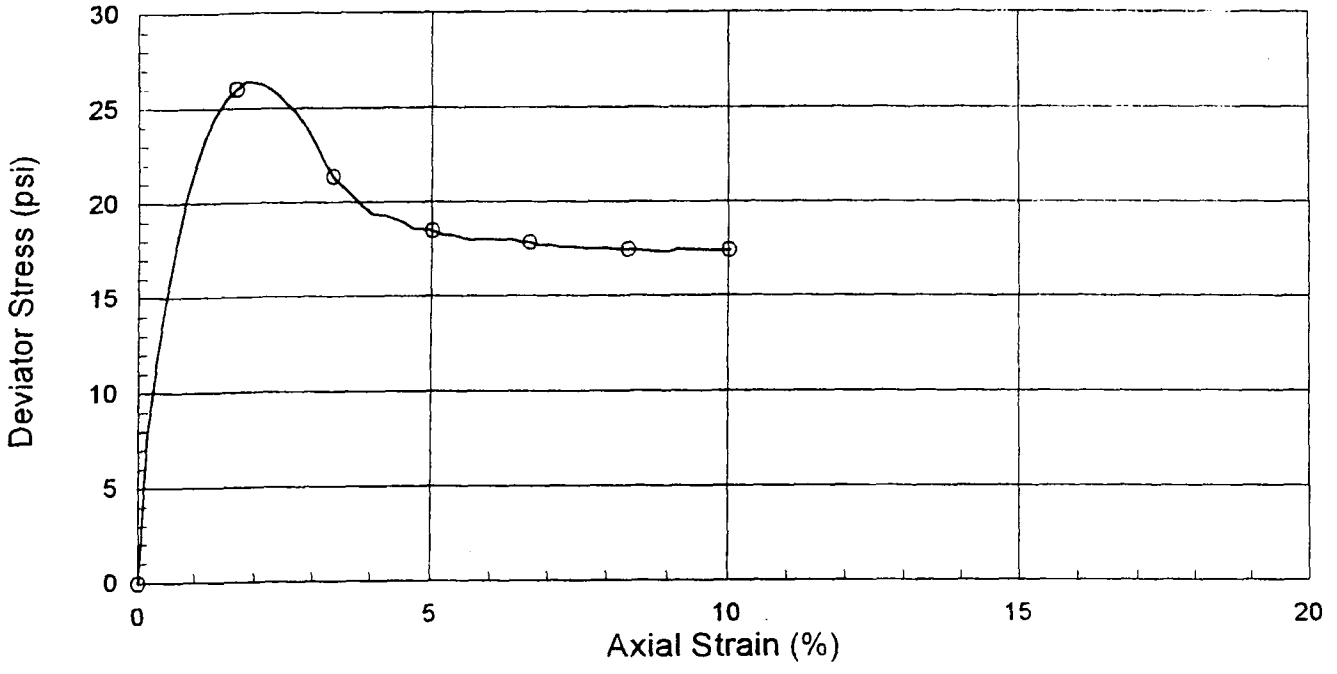
Rate of Deformation (in/min)= 0.0600

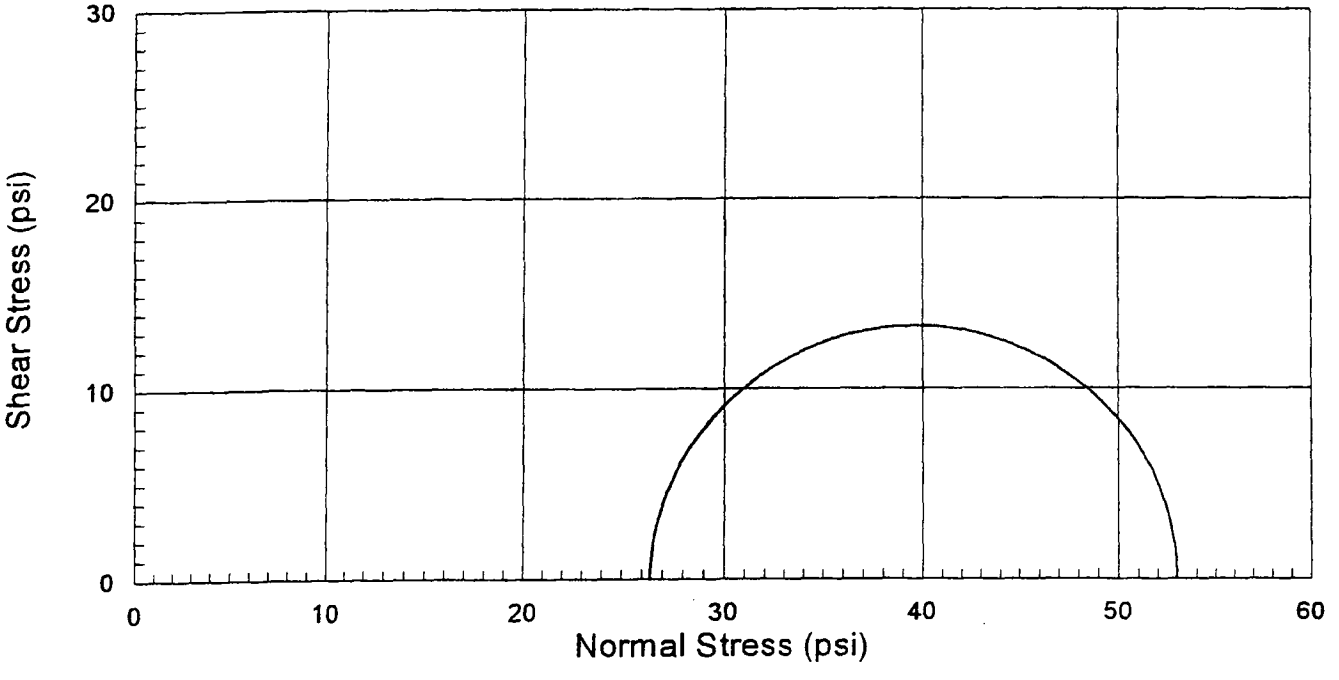
Failure Criterian:

Condition at which maximum deviator stress occurs

At Failure

Deviator Stress (psi) =	26.43
Eff. Minor Principal stress (psi) =	26.40
Eff. Major Principal stress (psi) =	52.83
Axial Strain (%) =	1.83





Location	Sample ID	Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○ B-756	095-2-170	90.0-92.5	26.4	26.43

_____ Mohr Circle based on Total Stress

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Betw. IR Sites 1 & 2, Alameda Point, Alameda, CA

UNCONSOLIDATED-UNDRAINED TRIAXIAL TEST
ASTM D 2850

08-02

TERATEST LABS

CONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 4767

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	07/23/02
Project No:	2384095-D-07060-1000	Checked By:	LF	Date:	08/05/02
LOCATION:	B-754	Sample Description:	Dark olive gray lean clay with sand (CL)s		
SAMPLE ID:	095-2-156				
Sample Depth (ft.):	30.0-32.5				
Sample Type:	Shelby Tube				

Diameter (in)	2.875	2.877	2.878	Avg. =	2.877
Height (in)	5.953	5.959	5.965	Avg. =	5.959

	Before Saturation	Pre-Consol.	Post Consol.	Post Test
Area (in²)	6.499	6.463	5.798	
Moisture Content (%)	37.81			29.42
Wt. Wet Sample + Container (gms)	245.41			1183.38
Wt. Dry Sample + Container (gms)	195.05			938.75
Wt. Container (gms)	61.87			107.15
Density and Saturation				
Wt. Wet Sample + Container (gms)	1164.52			1183.38
Wt. Container (gms)	0.00			107.15
Wet Density (pcf)	114.5			124.3
Dry Density (pcf)	83.1			96.0
Void Ratio	1.005			0.735
% Saturation	100.0			100.0

Specific Gravity = 2.67

Back Pressure Saturation		Burette Area (sq. in.)=	0.390
		Initial Burette Ht.(cm)=	26.0
		Final Burette Ht.(cm)=	25.6
		Volume of water during saturation (cc):	1.0
B Value (%) =	95	Change in Ht. of the Specimen (in)=	0.0167

Consolidation	NOTE: Consolidated to 80.0 psi eff. then backed off to 20 psi eff.			
	Cell Pressure (psi) =	72.60	Burette Area (sq. in.)=	0.3900
	Back Pressure(psi) =	52.60	Initial Burette Ht.(cm)=	3.5
	Eff. Consol. Stress (psi) =	20.00	Final Burette Ht.(cm)=	38.8
	Change in Ht. of Specimen (in) =	0.2534	Final Height (in)=	5.689

Shear		At Failure	
Rate of Deformation (in/min)=	0.0024	Deviator Stress (psi) =	44.6
Time to 50% primary Consolidation =		Eff. Minor Principal stress (psi) =	18.1
Failure Criterian:		Eff. Major Principal stress (psi) =	62.7
Condition at which maximum deviator stress occurs		Axial Strain (%) =	7.6

CONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 4767

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	07/23/02
Project No:	2384095-D-07060-1000	Checked By:	LF	Date:	08/05/02
LOCATION:	B-754	Sample Description:	Dark gray lean clay with sand (CL)s		
SAMPLE ID:	095-2-156				
Sample Depth (ft.):	30.0-32.5				
Sample Type:	Shelby Tube				

Diameter (in)	2.875	2.877	2.876	Avg. =	2.876
Height (in)	5.966	5.972	5.959	Avg. =	5.966

	Before Saturation	Pre-Consol.	Post Consol.	Post Test
Area (in²)	6.496	6.486	5.853	
Moisture Content (%)	33.59			24.40
Wt. Wet Sample + Container (gms)	201.24			1244.90
Wt. Dry Sample + Container (gms)	166.07			1021.80
Wt. Container (gms)	61.37			107.43
Density and Saturation				
Wt. Wet Sample + Container (gms)	1216.75			1244.90
Wt. Container (gms)	0.00			107.43
Wet Density (pcf)	119.6			127.2
Dry Density (pcf)	89.5			102.3
Void Ratio	0.861			0.629
% Saturation	100.0			100.0

Specific Gravity = 2.67

Back Pressure Saturation		Burette Area (sq. in.)=	0.399
		Initial Burette Ht.(cm)=	25.0
		Final Burette Ht.(cm)=	22.8
		Volume of water during saturation (cc):	5.7
B Value (%) =	95	Change in Ht. of the Specimen (in)=	0.0047

Consolidation	NOTE: Consolidated to 80.0 psi eff. then backed off to 40 psi eff.			
	Cell Pressure (psi) =	91.03	Burette Area (sq. in.)=	0.3990
	Back Pressure(psi) =	51.03	Initial Burette Ht.(cm)=	2.5
	Eff. Consol. Stress (psi) =	40.00	Final Burette Ht.(cm)=	31.9
	Change in Ht. of Specimen (in) =	0.1426	Final Height (in)=	5.818

Shear		At Failure	
Rate of Deformation (in/min)=	0.0024	Deviator Stress (psi) =	55.3
Time to 50% primary Consolidation =		Eff. Minor Principal stress (psi) =	22.5
Failure Criterian:		Eff. Major Principal stress (psi) =	77.8
Condition at which maximum deviator stress occurs		Axial Strain (%) =	10.7

TERATEST LABS

CONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 4767

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	07/23/02
Project No:	2384095-D-07060-1000	Checked By:	LF	Date:	08/05/02
LOCATION:	B-755	Sample Description:	Very dark gray lean clay with sand (CL)s		
SAMPLE ID:	095-2-141				
Sample Depth (ft.):	30.0-32.5				
Sample Type:	Shelby Tube				

Diameter (in)	2.875	2.878	2.877	Avg. =	2.877
Height (in)	5.922	5.932	5.927	Avg. =	5.927

	Before Saturation	Pre-Consol.	Post Consol.	Post Test
Area (in²)	6.499	6.422	5.818	
Moisture Content (%)	29.42			24.79
Wt. Wet Sample + Container (gms)	112.19			1218.05
Wt. Dry Sample + Container (gms)	95.22			997.18
Wt. Container (gms)	37.54			106.07
Density and Saturation				
Wt. Wet Sample + Container (gms)	1195.32			1218.05
Wt. Container (gms)	0.00			106.07
Wet Density (pcf)	118.2			126.3
Dry Density (pcf)	91.3			101.2
Void Ratio	0.817			0.639
% Saturation	95.8			100.0

Specific Gravity = 2.66

Back Pressure Saturation		Burette Area (sq. in.)=	0.386
		Initial Burette Ht.(cm)=	25.0
		Final Burette Ht.(cm)=	22.0
		Volume of water during saturation (cc):	7.5
B Value (%) =	98	Change in Ht. of the Specimen (in)=	0.035

Consolidation			
	Cell Pressure (psi) =	131.45	Burette Area (sq. in.)= 0.3860
	Back Pressure(psi) =	51.45	Initial Burette Ht.(cm)= 3.5
	Eff. Consol. Stress (psi) =	80.00	Final Burette Ht.(cm)= 31.9
	Change in Ht. of Specimen (in) =	0.1292	Final Height (in)= 5.763

Shear		At Failure	
Rate of Deformation (in/min)=	0.0024	Deviator Stress (psi) =	54.9
Time to 50% primary Consolidation =		Eff. Minor Principal stress (psi) =	22.6
Failure Criterian:		Eff. Major Principal stress (psi) =	77.4
Condition at which maximum deviator stress occurs		Axial Strain (%) =	10.8

CONSOLIDATED UNDRAINED TRIAXIAL TEST

ASTM D 4767

Project Name:	Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA	Tested By:	RA	Date:	07/23/02
Project No:	2384095-D-07060-1000	Checked By:	LF	Date:	08/05/02
LOCATION:	B-756	Sample Description:	Dark olive gray sandy lean clay s(CL)		
SAMPLE ID:	095-2-167				
Sample Depth (ft.):	40.0-42.5				
Sample Type:	Shelby Tube				

Diameter (in)	2.877	2.878	2.875	Avg. =	2.877
Height (in)	5.983	5.987	5.990	Avg. =	5.987

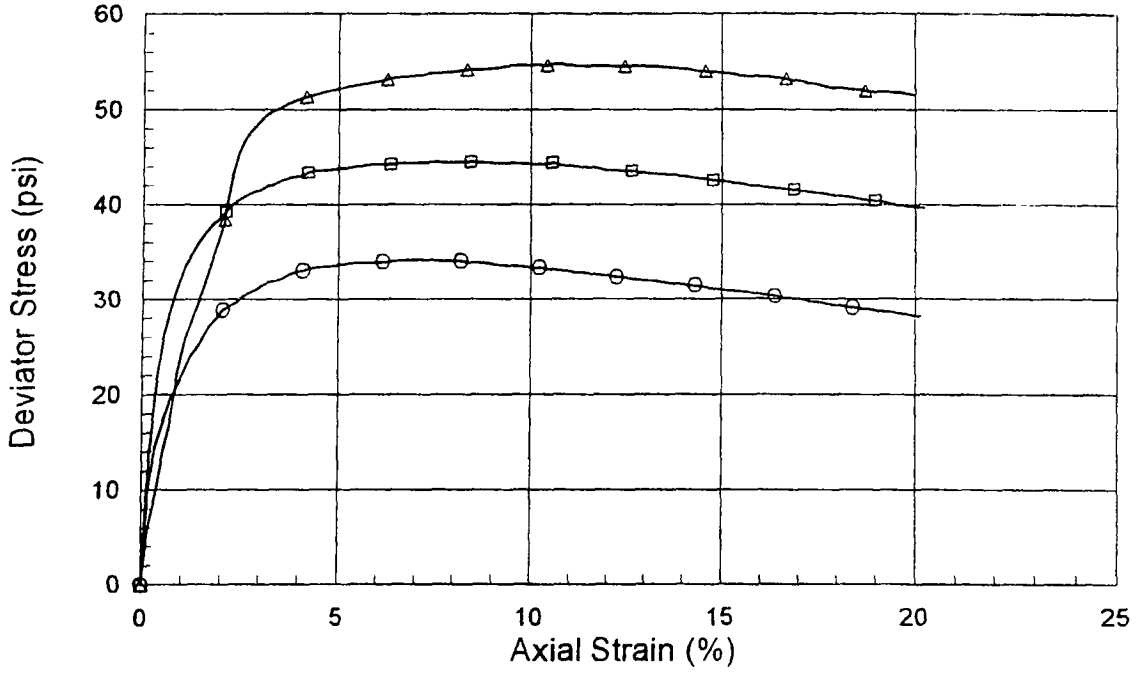
	Before Saturation	Pre-Consol.	Post Consol.	Post Test
Area (in²)	6.499	6.478	5.607	
Moisture Content (%)	47.12			35.96
Wt. Wet Sample + Container (gms)	157.44			1122.42
Wt. Dry Sample + Container (gms)	119.84			854.12
Wt. Container (gms)	40.05			108.01
Density and Saturation				
Wt. Wet Sample + Container (gms)	1108.62			1122.42
Wt. Container (gms)	0.00			108.01
Wet Density (pcf)	108.5			117.4
Dry Density (pcf)	73.8			86.4
Void Ratio	1.250			0.922
% Saturation	100.0			100.0

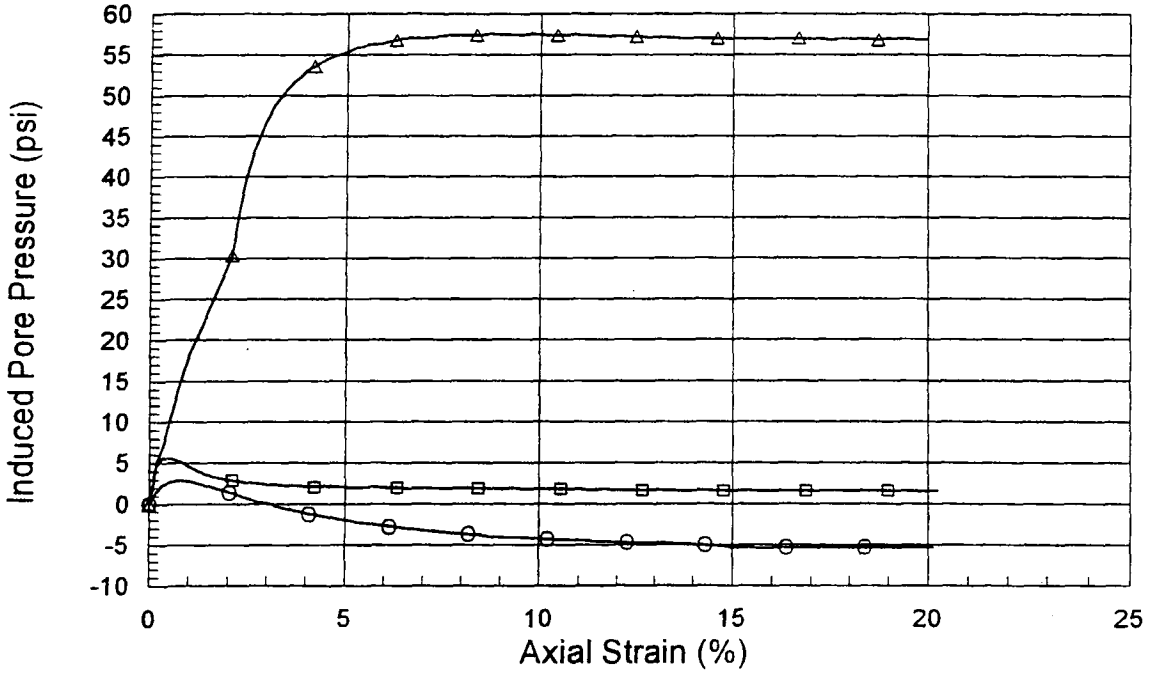
Specific Gravity = 2.66

Back Pressure Saturation		Burette Area (sq. in.)=	0.393
		Initial Burette Ht.(cm)=	25.0
		Final Burette Ht.(cm)=	21.3
		Volume of water during saturation (cc):	9.4
B Value (%) =	96	Change in Ht. of the Specimen (in)=	0.01

Consolidation	NOTE: Consolidated to 80.0 psi eff. then backed off to 8 psi eff.			
	Cell Pressure (psi) =	59.85	Burette Area (sq. in.)=	0.3930
	Back Pressure(psi) =	51.85	Initial Burette Ht.(cm)=	2.9
	Eff. Consol. Stress (psi) =	8.00	Final Burette Ht.(cm)=	40.5
	Change in Ht. of Specimen (in) =	0.1080	Final Height (in)=	5.869

Shear		At Failure	
Rate of Deformation (in/min)=	0.0024	Deviator Stress (psi) =	34.2
Time to 50% primary Consolidation =		Eff. Minor Principal stress (psi) =	11.2
Failure Criterian:		Eff. Major Principal stress (psi) =	45.4
Condition at which maximum deviator stress occurs		Axial Strain (%) =	7.0





	Location	Sample ID	Sample Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
⊕	B-756	095-2-167	40.0-42.5	8.0	34.2
□	B-754	095-2-156	30.0-32.5	20.0	44.6
△	B-755	095-2-141	30.0-32.5	80.0	54.9

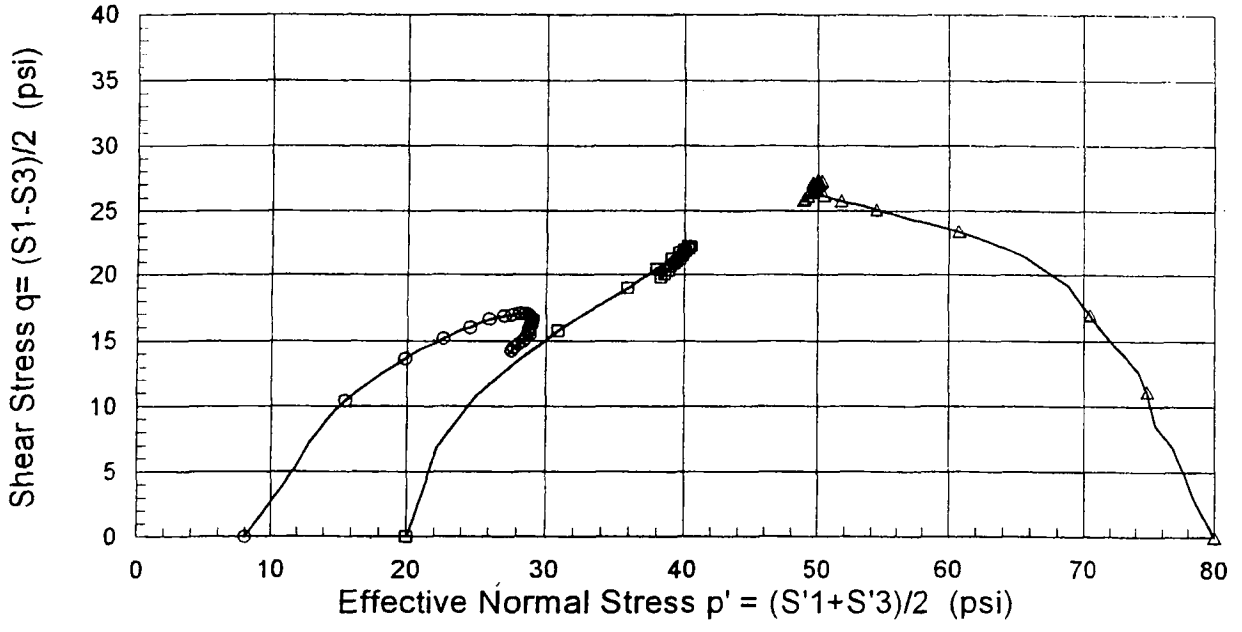
TERATEST LABS

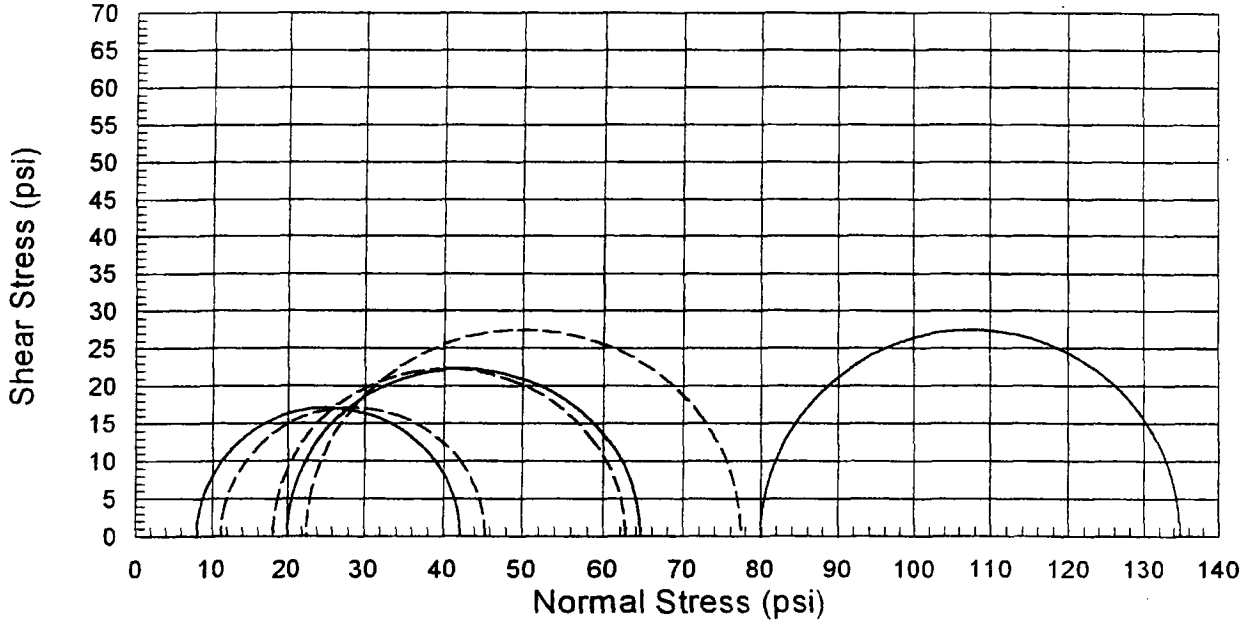
Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Consolidated-Undrained Triaxial Compression Test [ASTM D 4767]

08-02





	Location	Sample ID	Sample Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○	B-756	095-2-167	40.0-42.5	8.0	34.2
□	B-754	095-2-156	30.0-32.5	20.0	44.6
△	B-755	095-2-141	30.0-32.5	80.0	54.9

——— Mohr Circle based on Total Stress
- - - - Mohr Circle based on Effective Stress

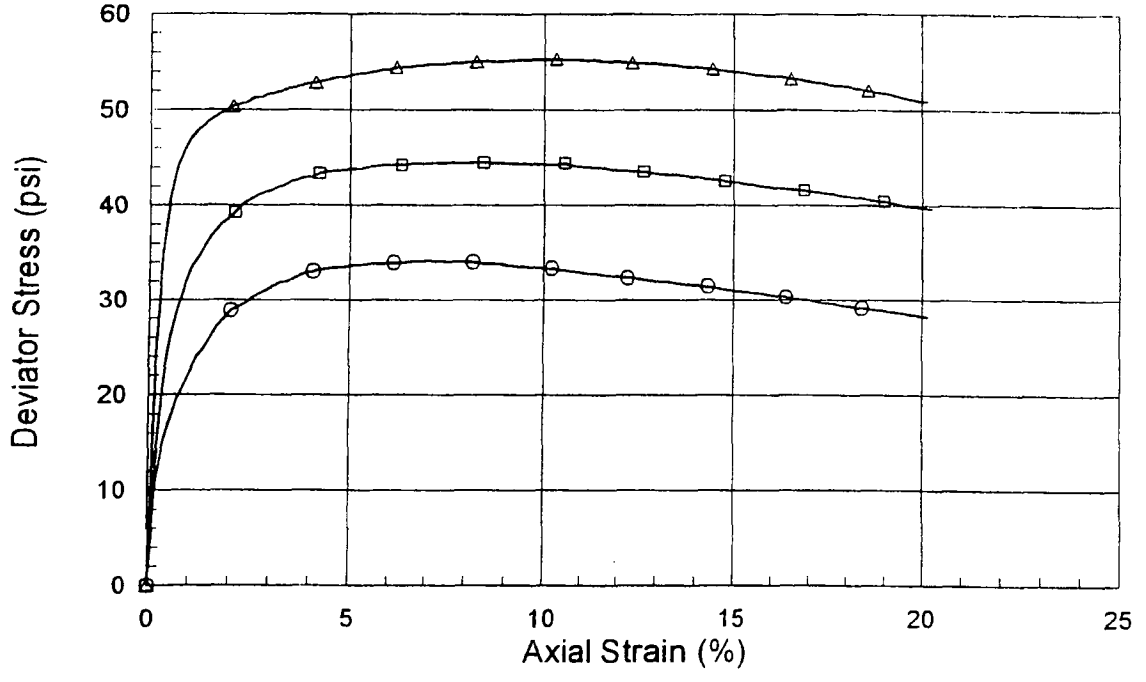
TERRATEST LABS

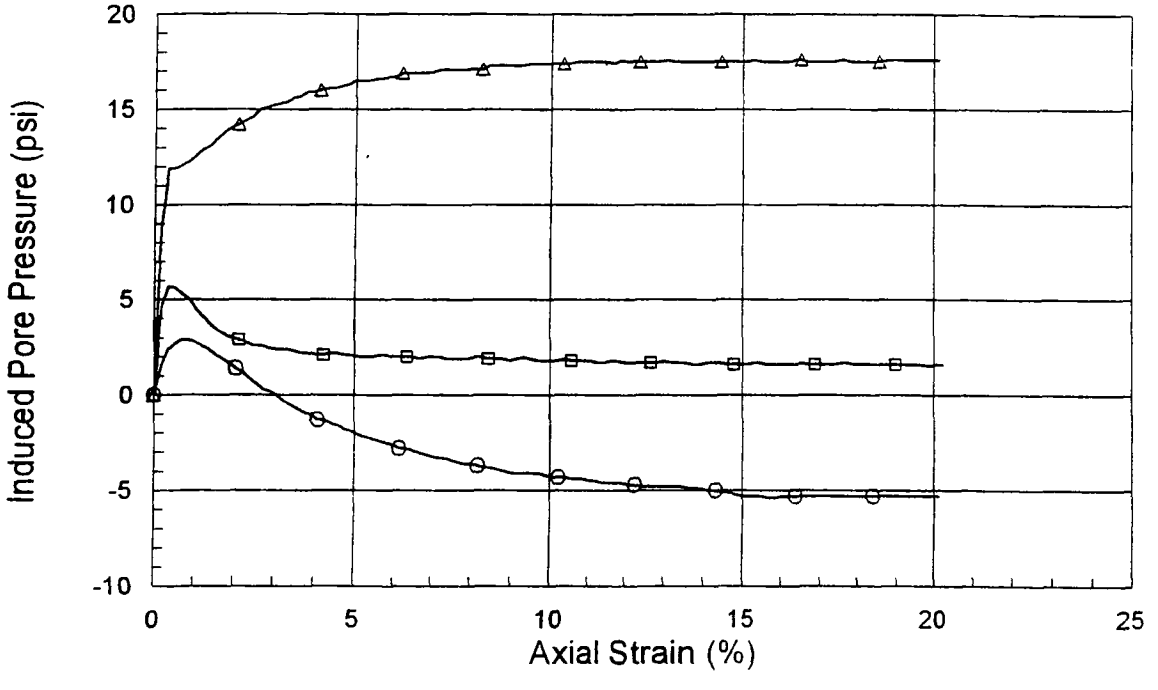
Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Consolidated-Undrained
Triaxial Compression Test
(ASTM D 4767)

08-02





	Location	Sample ID	Sample Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
⊕	B-756	095-2-167	40.0-42.5	8.0	34.2
□	B-754	095-2-156	30.0-32.5	20.0	44.6
△	B-754	095-2-156	30.0-32.5	40.0	55.3

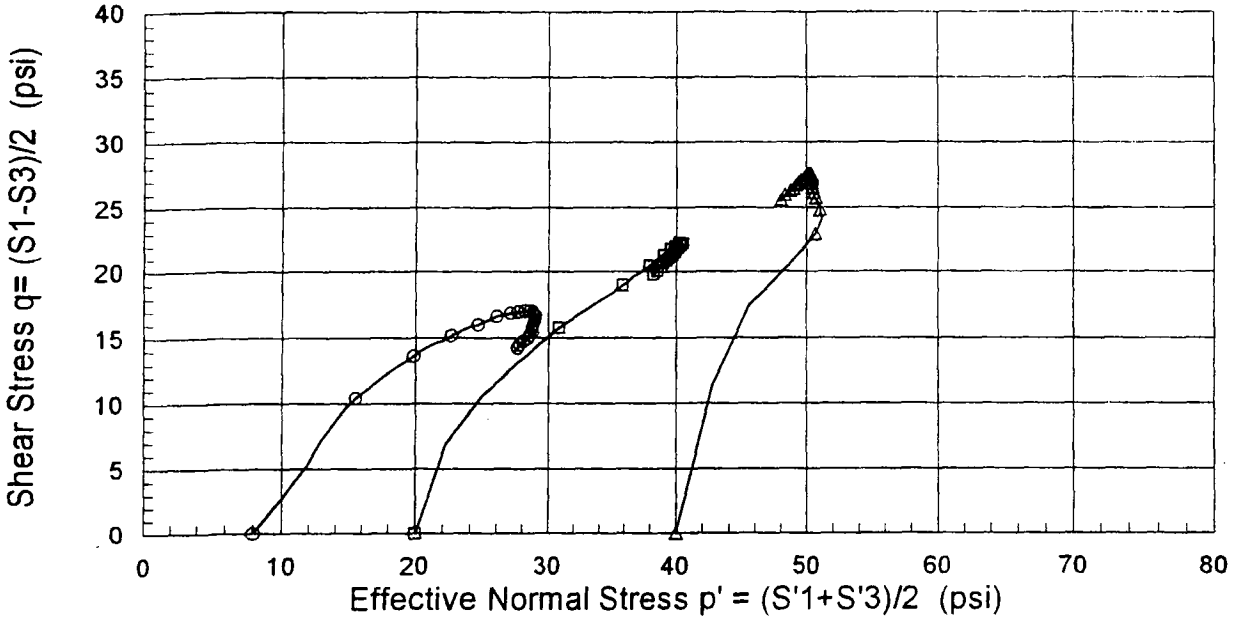
TERATEST LABS

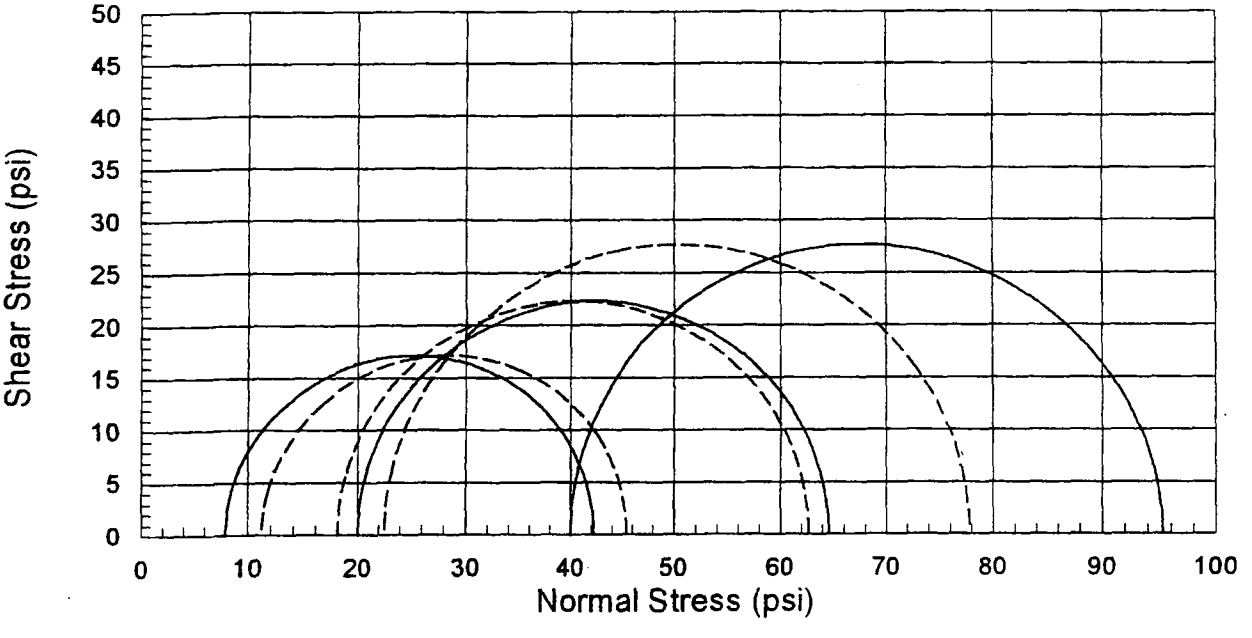
Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Consolidated-Undrained Triaxial Compression Test [ASTM D 4767]

08-02





	Location	Sample ID	Sample Depth (ft.)	Eff. Conf. Pressure (psi)	Max. Dev. Stress (psi)
○	B-756	095-2-167	40.0-42.5	8.0	34.2
□	B-754	095-2-156	30.0-32.5	20.0	44.6
△	B-754	095-2-156	30.0-32.5	40.0	55.3

——— Mohr Circle based on Total Stress
– – – – – Mohr Circle based on Effective Stress

TERRATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Consolidated-Undrained
Triaxial Compression Test
(ASTM D 4767)

08-02

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

TERATEST LABS

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/0

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/12/02

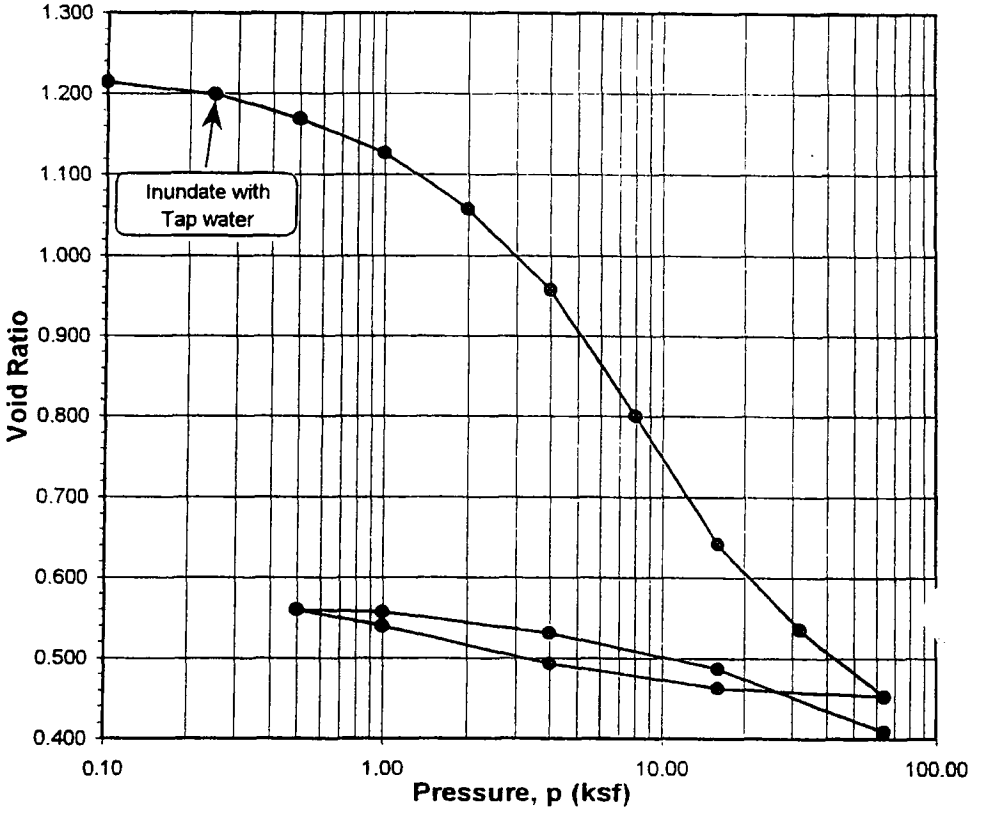
LOCATION: B-754

Depth (ft.) 30.0-32.5

SAMPLE ID: 095-2-156

Sample Desccription: Dark gray lean clay with sand (CL)s and shells

Sample Diameter (in.):	2.865
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	265.23
Weight of Ring (g):	83.64
Height after consol. (in.):	0.6360
Before Test	
Wt. of Wet Sample+Cont. (g):	114.76
Wt. of Dry Sample+Cont. (g):	99.15
Weight of Container (g):	62.51
Initial Moisture Content (%)	42.6
Initial Dry Density (pcf)	75.2
Initial Saturation (%):	94
Initial Vertical Reading (in.)	0.6106
After Test	
Wt. of Wet Sample+Cont. (g):	309.44
Wt. of Dry Sample+Cont. (g):	282.35
Weight of Container (g):	78.80
Final Moisture Content (%)	22.59
Final Dry Density (pcf):	111.4
Final Saturation (%):	122
Final Vertical Reading (in.)	0.2340
Specific Gravity :	2.67
Water Density (pcf):	62.43



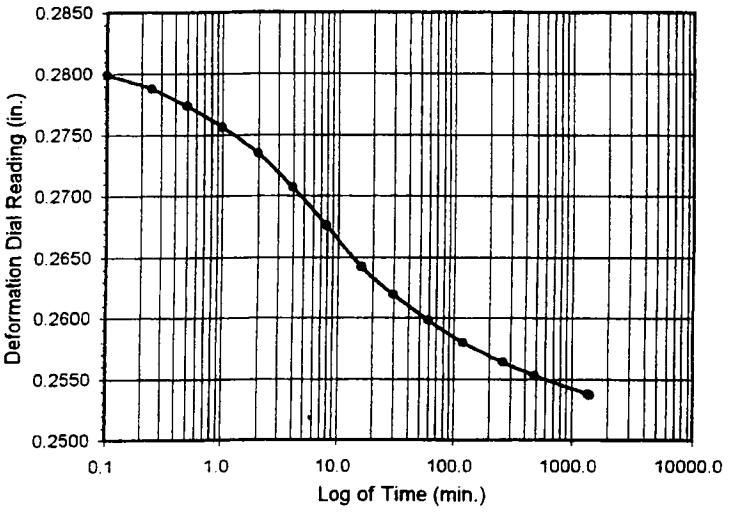
INUNDATE @ 0.25 ksf

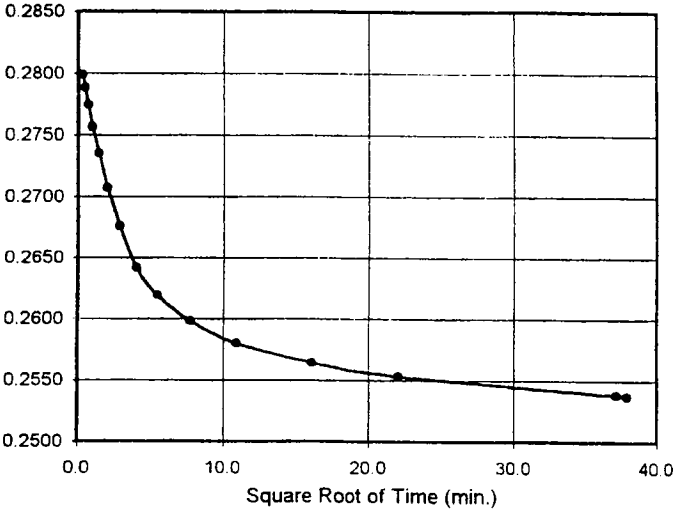
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.6103	0.9997	0.00	0.03	1.215	0.03
0.25	0.6027	0.9921	0.04	0.79	1.199	0.75
0.25	0.6029	0.9923	0.04	0.77	1.199	0.73
0.50	0.5889	0.9783	0.07	2.17	1.169	2.10
1.00	0.5699	0.9593	0.09	4.07	1.127	3.98
2.00	0.5376	0.9270	0.15	7.30	1.057	7.15
4.00	0.4915	0.8809	0.28	11.92	0.957	11.64
8.00	0.4179	0.8073	0.52	19.27	0.800	18.75
16.00	0.3443	0.7337	0.71	26.63	0.641	25.92
32.00	0.2942	0.6836	0.95	31.64	0.535	30.69
64.00	0.2533	0.6427	1.26	35.73	0.452	34.47
16.00	0.2616	0.6510	0.89	34.90	0.462	34.01
4.00	0.2790	0.6684	0.56	33.16	0.493	32.60
1.00	0.3014	0.6908	0.40	30.92	0.539	30.52
0.50	0.3109	0.7003	0.36	29.97	0.559	29.61
1.00	0.3096	0.6990	0.37	30.10	0.557	29.73
4.00	0.2964	0.6858	0.52	31.42	0.531	30.90
16.00	0.2729	0.6623	0.87	33.77	0.486	32.90
64.00	0.2340	0.6234	1.26	37.66	0.409	36.40

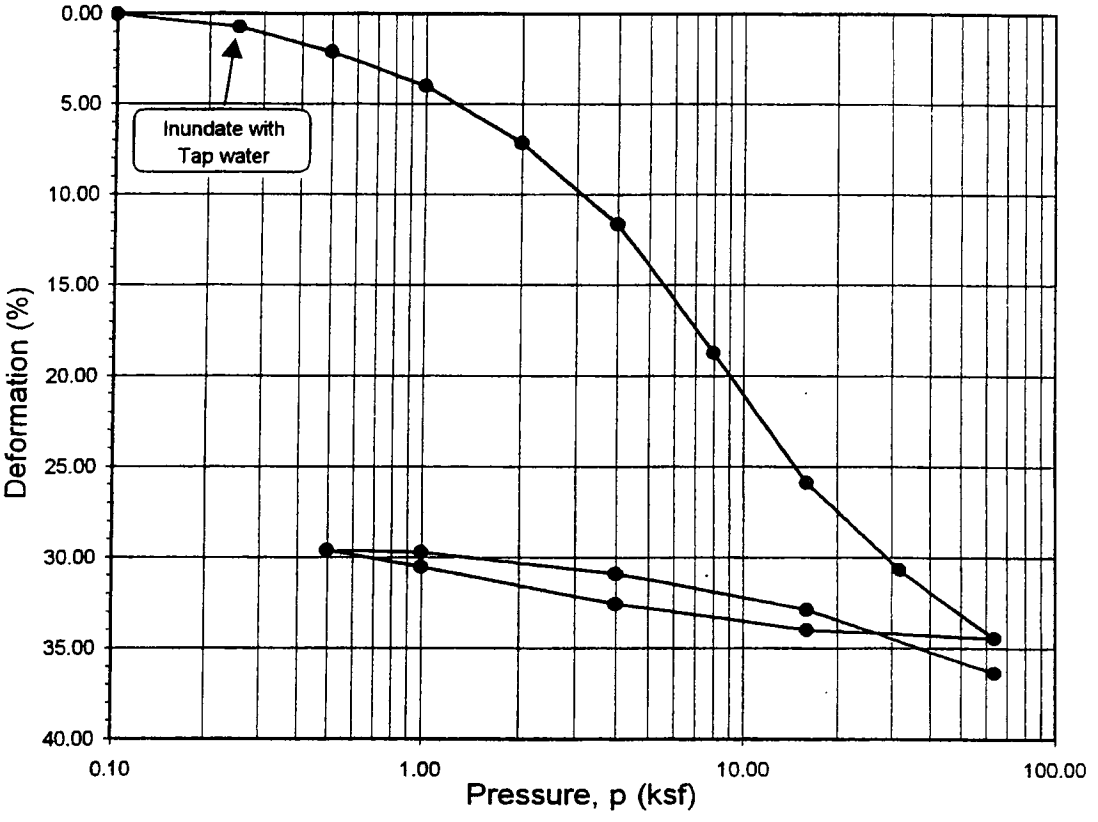
Time Readings @ 2.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/25/02	9:06:00	0.0		
7/25/02	9:06:06	0.1	0.3	0.2799
7/25/02	9:06:15	0.2	0.5	0.2788
7/25/02	9:06:30	0.5	0.7	0.2774
7/25/02	9:07:00	1.0	1.0	0.2756
7/25/02	9:08:00	2.0	1.4	0.2735
7/25/02	9:10:00	4.0	2.0	0.2707
7/25/02	9:14:00	8.0	2.8	0.2676
7/25/02	9:22:00	16.0	4.0	0.2642
7/25/02	9:36:00	30.0	5.5	0.2619
7/25/02	10:06:00	60.0	7.7	0.2598
7/25/02	11:06:00	120.0	11.0	0.2580
7/25/02	13:27:00	261.0	16.2	0.2564
7/25/02	17:12:00	486.0	22.0	0.2553
7/26/02	8:08:00	1382.0	37.2	0.2538
7/26/02	9:08:00	1442.0	38.0	0.2537

Time Readings @ 2.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-754	**095-2-156**	**30.0-32.5**	**42.6**	**22.6**	**75.2**	**111.4**	**1.215**	**0.409**	**94**	**122**

Sample Description:

Dark gray lean clay with sand (CL)s and shells

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

TERATEST LABS

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By RA . Date: 07/22/0

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/12/02

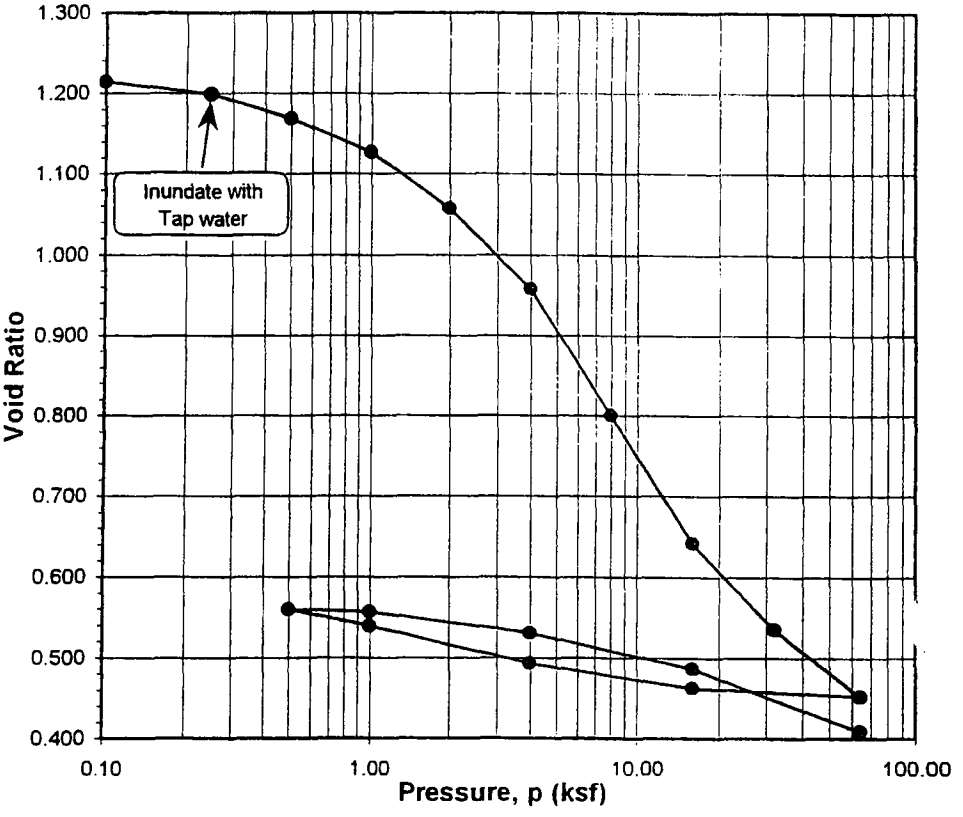
LOCATION: B-754

Depth (ft.) 30.0-32.5

SAMPLE ID: 095-2-156

Sample Desccription: Dark gray lean clay with sand (CL)s and shells

Sample Diameter (in.):	2.865
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	265.23
Weight of Ring (g):	83.64
Height after consol. (in.):	0.6360
Before Test	
Wt. of Wet Sample+Cont. (g):	114.76
Wt. of Dry Sample+Cont. (g):	99.15
Weight of Container (g):	62.51
Initial Moisture Content (%)	42.6
Initial Dry Density (pcf)	75.2
Initial Saturation (%):	94
Initial Vertical Reading (in.)	0.6106
After Test	
Wt. of Wet Sample+Cont. (g):	309.44
Wt. of Dry Sample+Cont. (g):	282.35
Weight of Container (g):	78.80
Final Moisture Content (%)	22.59
Final Dry Density (pcf):	111.4
Final Saturation (%):	122
Final Vertical Reading (in.)	0.2340
Specific Gravity :	2.67
Water Density (pcf):	62.43



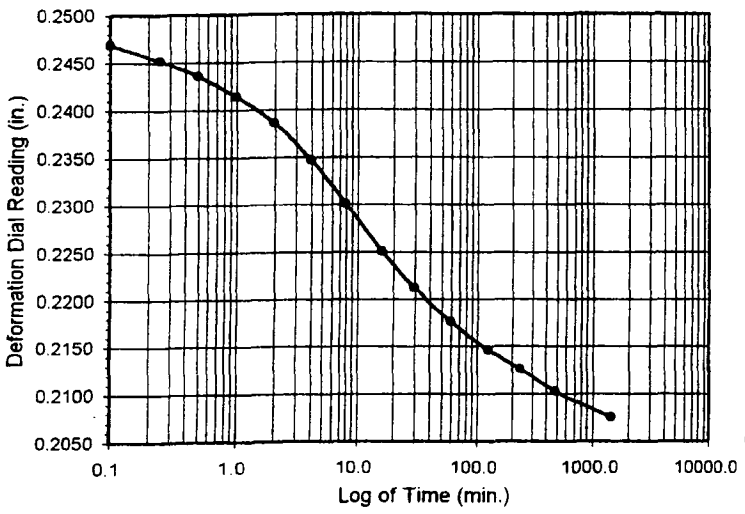
INUNDATE @ 0.25 ksf

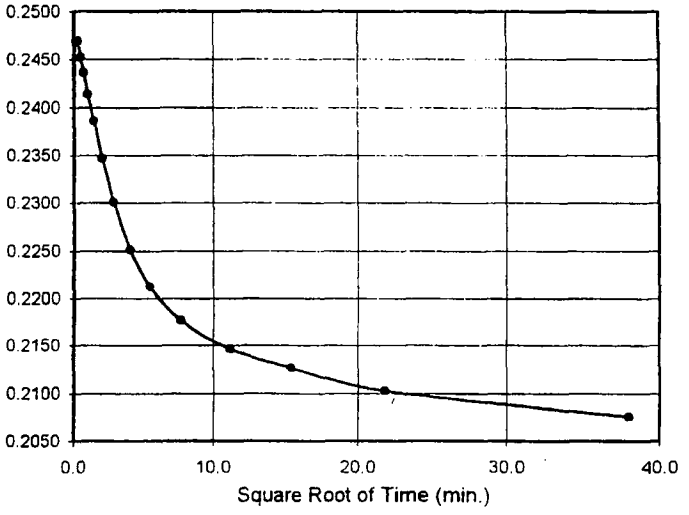
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.6103	0.9997	0.00	0.03	1.215	0.03
0.25	0.6027	0.9921	0.04	0.79	1.199	0.75
0.25	0.6029	0.9923	0.04	0.77	1.199	0.73
0.50	0.5889	0.9783	0.07	2.17	1.169	2.10
1.00	0.5699	0.9593	0.09	4.07	1.127	3.98
2.00	0.5376	0.9270	0.15	7.30	1.057	7.15
4.00	0.4915	0.8809	0.28	11.92	0.957	11.64
8.00	0.4179	0.8073	0.52	19.27	0.800	18.75
16.00	0.3443	0.7337	0.71	26.63	0.641	25.92
32.00	0.2942	0.6836	0.95	31.64	0.535	30.69
64.00	0.2533	0.6427	1.26	35.73	0.452	34.47
16.00	0.2616	0.6510	0.89	34.90	0.462	34.01
4.00	0.2790	0.6684	0.56	33.16	0.493	32.60
1.00	0.3014	0.6908	0.40	30.92	0.539	30.52
0.50	0.3109	0.7003	0.36	29.97	0.559	29.61
1.00	0.3096	0.6990	0.37	30.10	0.557	29.73
4.00	0.2964	0.6858	0.52	31.42	0.531	30.90
16.00	0.2729	0.6623	0.87	33.77	0.486	32.90
64.00	0.2340	0.6234	1.26	37.66	0.409	36.40

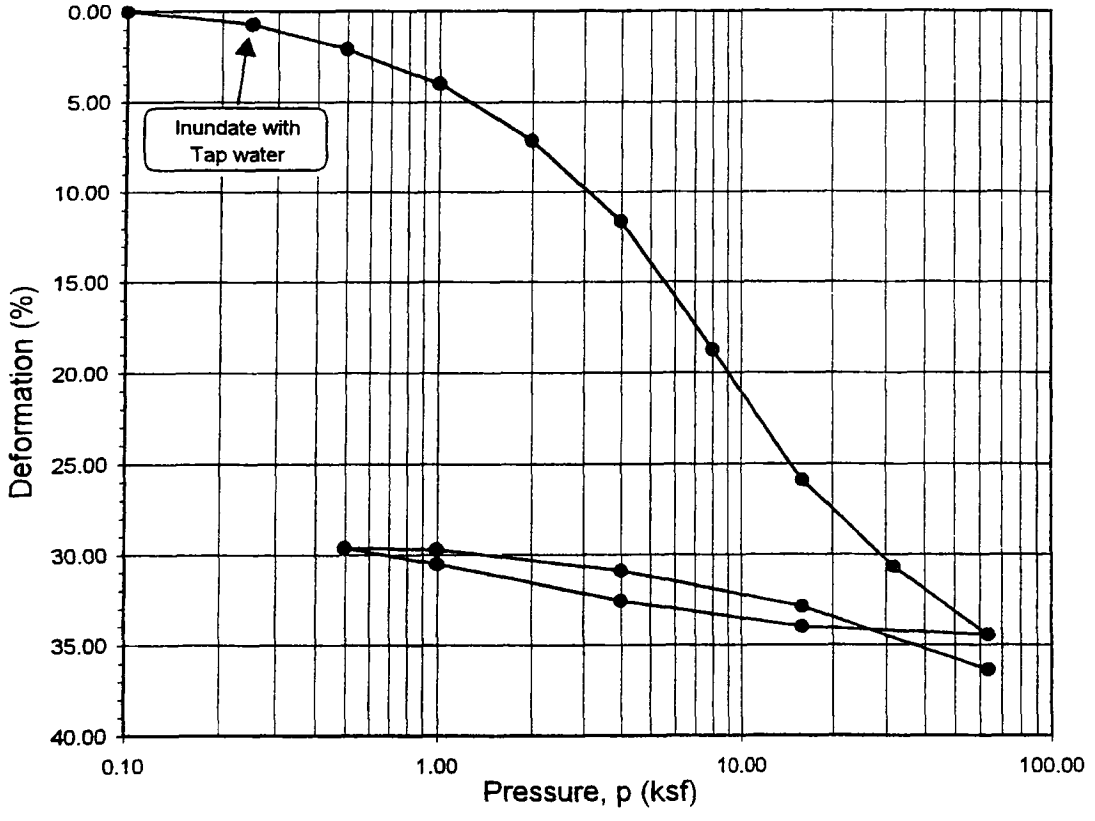
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/26/02	9:07:00	0.0		
7/26/02	9:07:06	0.1	0.3	0.2469
7/26/02	9:07:15	0.2	0.5	0.2452
7/26/02	9:07:30	0.5	0.7	0.2436
7/26/02	9:08:00	1.0	1.0	0.2414
7/26/02	9:09:00	2.0	1.4	0.2386
7/26/02	9:11:00	4.0	2.0	0.2347
7/26/02	9:15:00	8.0	2.8	0.2301
7/26/02	9:23:00	16.0	4.0	0.2251
7/26/02	9:37:00	30.0	5.5	0.2212
7/26/02	10:07:00	60.0	7.7	0.2176
7/26/02	11:13:00	126.0	11.2	0.2146
7/26/02	13:07:00	240.0	15.5	0.2126
7/26/02	17:07:00	480.0	21.9	0.2103
7/27/02	9:07:00	1440.0	37.9	0.2076

Time Readings @ 4.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-754	**095-2-156**	**30.0-32.5**	**42.6**	**22.6**	**75.2**	**111.4**	**1.215**	**0.409**	**94**	**122**

Sample Description:

Dark gray lean clay with sand (CL)s and shells

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

TERATEST LABS

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/(

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/09/0

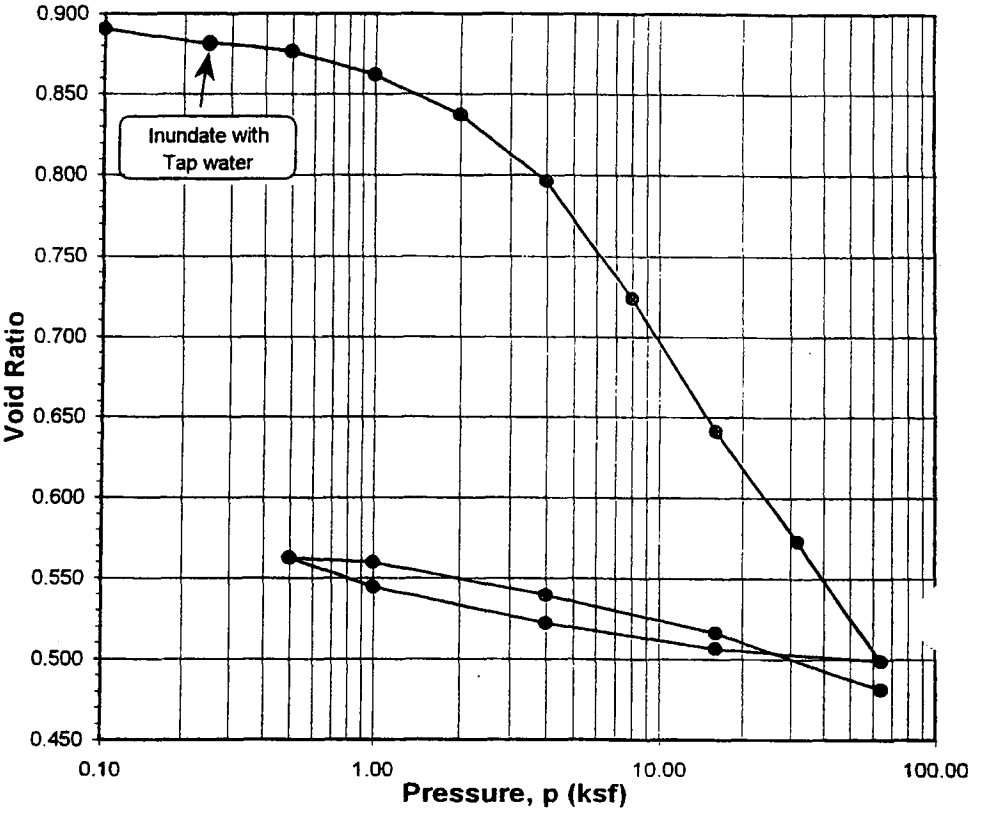
LOCATION: B-755

Depth (ft.) 30.0-32.5

SAMPLE ID: 095-2-141

Sample Desccription: Very dark gray lean clay with sand (CL)s

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	185.30
Weight of Ring (g):	41.70
Height after consol. (in.):	0.7831
Before Test	
Wt. of Wet Sample+Cont. (g):	204.97
Wt. of Dry Sample+Cont. (g):	165.83
Weight of Container (g):	57.10
Initial Moisture Content (%)	36.0
Initial Dry Density (pcf)	87.8
Initial Saturation (%):	107
Initial Vertical Reading (in.)	0.3235
After Test	
Wt. of Wet Sample+Cont. (g):	224.59
Wt. of Dry Sample+Cont. (g):	202.83
Weight of Container (g):	53.90
Final Moisture Content (%)	20.29
Final Dry Density (pcf):	113.9
Final Saturation (%):	118
Final Vertical Reading (in.)	0.0956
Specific Gravity :	2.66
Water Density (pcf):	62.43



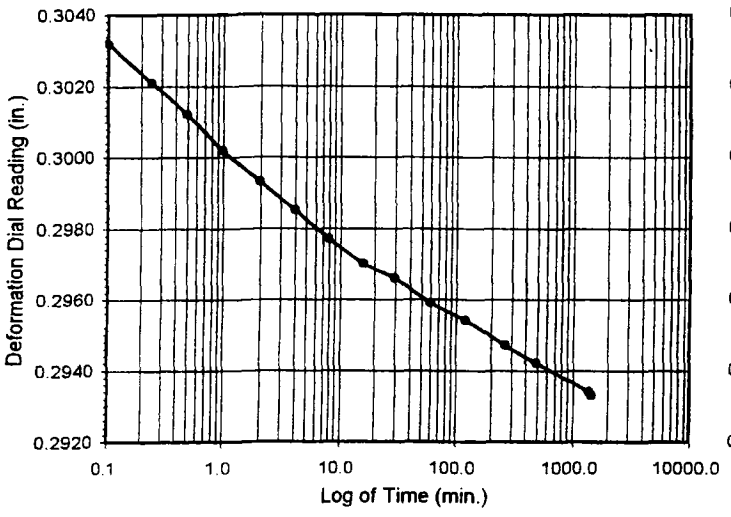
INUNDATE @ 0.25 ksf

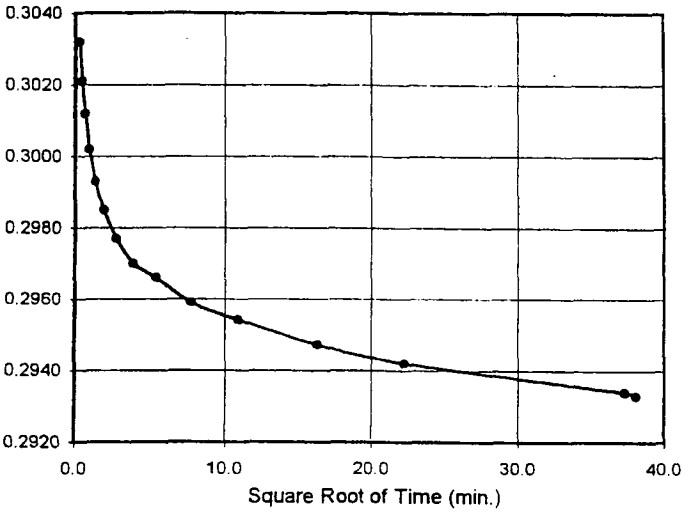
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.3233	0.9998	0.00	0.02	0.891	0.02
0.25	0.3178	0.9943	0.03	0.57	0.881	0.54
0.25	0.3184	0.9949	0.03	0.51	0.882	0.48
0.50	0.3152	0.9917	0.06	0.83	0.877	0.77
1.00	0.3070	0.9835	0.10	1.65	0.862	1.55
2.00	0.2933	0.9698	0.16	3.02	0.837	2.86
4.00	0.2708	0.9473	0.26	5.27	0.796	5.01
8.00	0.2306	0.9071	0.43	9.29	0.724	8.86
16.00	0.1850	0.8615	0.63	13.85	0.641	13.22
32.00	0.1465	0.8230	0.87	17.70	0.573	16.83
64.00	0.1047	0.7812	1.13	21.88	0.499	20.75
16.00	0.1124	0.7889	0.75	21.11	0.506	20.36
4.00	0.1235	0.8000	0.48	20.00	0.522	19.52
1.00	0.1369	0.8134	0.33	18.66	0.544	18.33
0.50	0.1469	0.8234	0.29	17.66	0.563	17.37
1.00	0.1451	0.8216	0.32	17.84	0.560	17.52
4.00	0.1330	0.8095	0.45	19.05	0.539	18.60
16.00	0.1178	0.7943	0.73	20.57	0.516	19.84
64.00	0.0956	0.7721	1.10	22.79	0.481	21.69

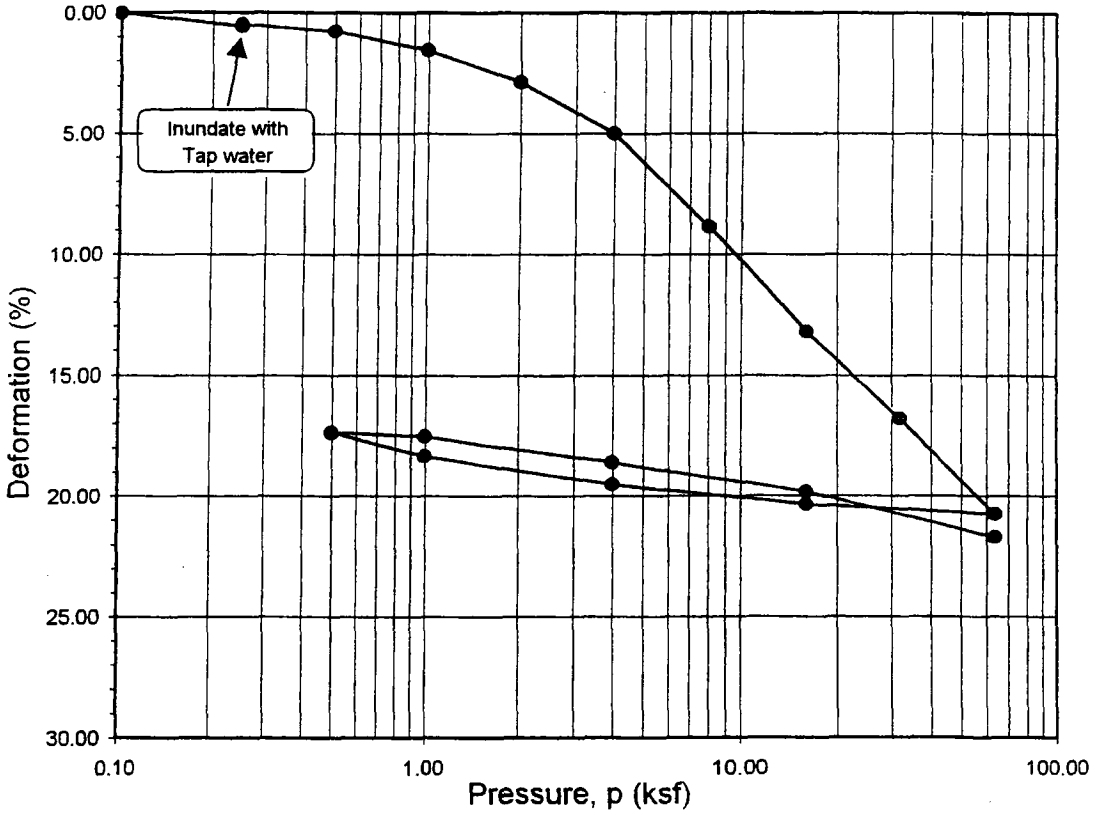
Time Readings @ 2.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/25/02	8:57:00	0.0		
7/25/02	8:57:06	0.1	0.3	0.3032
7/25/02	8:57:15	0.3	0.5	0.3021
7/25/02	8:57:30	0.5	0.7	0.3012
7/25/02	8:58:00	1.0	1.0	0.3002
7/25/02	8:59:00	2.0	1.4	0.2993
7/25/02	9:01:00	4.0	2.0	0.2985
7/25/02	9:05:00	8.0	2.8	0.2977
7/25/02	9:13:00	16.0	4.0	0.2970
7/25/02	9:27:00	30.0	5.5	0.2966
7/25/02	9:57:00	60.0	7.7	0.2959
7/25/02	10:57:00	120.0	11.0	0.2954
7/25/02	13:27:00	270.0	16.4	0.2947
7/25/02	17:11:00	494.0	22.2	0.2942
7/26/02	8:06:00	1389.0	37.3	0.2934
7/26/02	9:06:00	1449.0	38.1	0.2933

Time Readings @ 2.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-755	**095-2-141**	**30.0-32.5**	**36.0**	**20.3**	**87.8**	**113.9**	**0.891**	**0.481**	**107**	**118**

Sample Description:

Very dark gray lean clay with sand (CL)s

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

TERATEST LABS

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/0

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/09/02

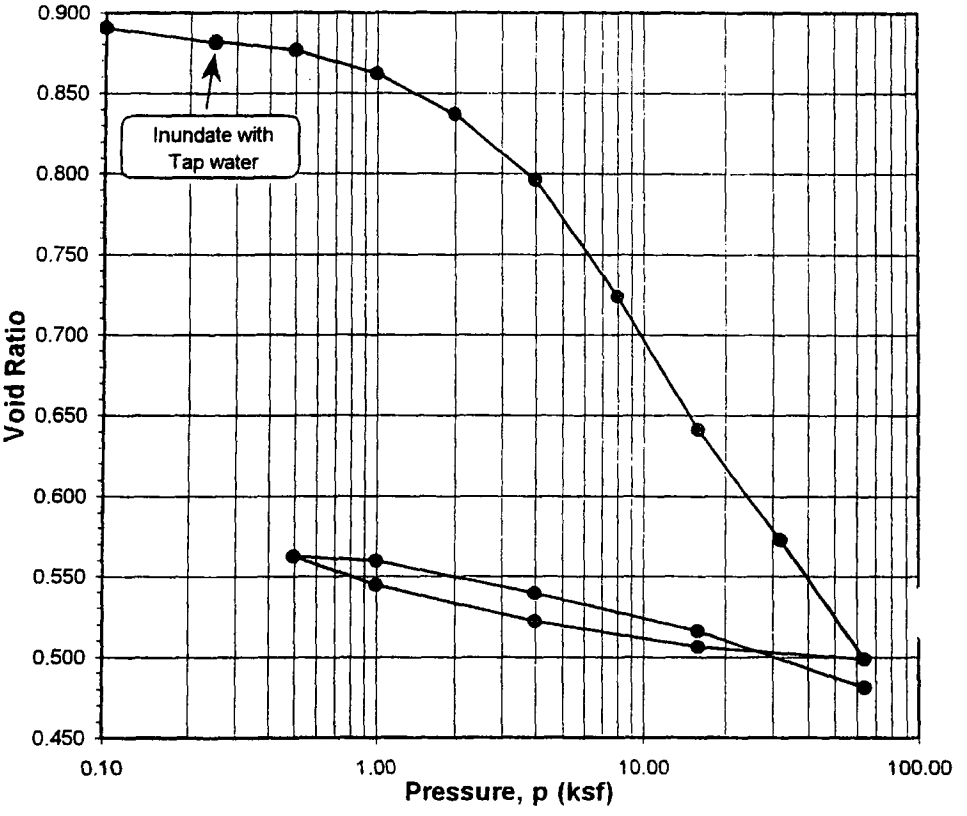
LOCATION: B-755

Depth (ft.) 30.0-32.5

SAMPLE ID: 095-2-141

Sample Desccription: Very dark gray lean clay with sand (CL)s

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	185.30
Weight of Ring (g):	41.70
Height after consol. (in.):	0.7831
Before Test	
Wt. of Wet Sample+Cont. (g):	204.97
Wt. of Dry Sample+Cont. (g):	165.83
Weight of Container (g):	57.10
Initial Moisture Content (%)	36.0
Initial Dry Density (pcf)	87.8
Initial Saturation (%):	107
Initial Vertical Reading (in.)	0.3235
After Test	
Wt. of Wet Sample+Cont. (g):	224.59
Wt. of Dry Sample+Cont. (g):	202.83
Weight of Container (g):	53.90
Final Moisture Content (%)	20.29
Final Dry Density (pcf):	113.9
Final Saturation (%):	118
Final Vertical Reading (in.)	0.0956
Specific Gravity :	2.66
Water Density (pcf):	62.43



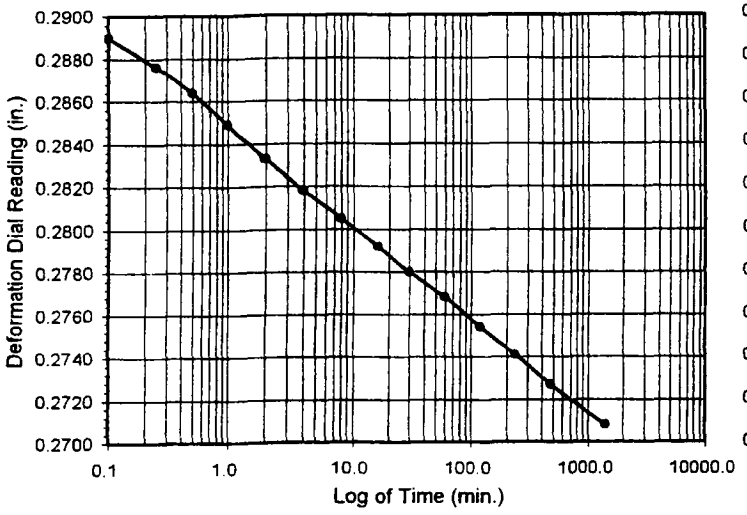
INUNDATE @ 0.25 ksf

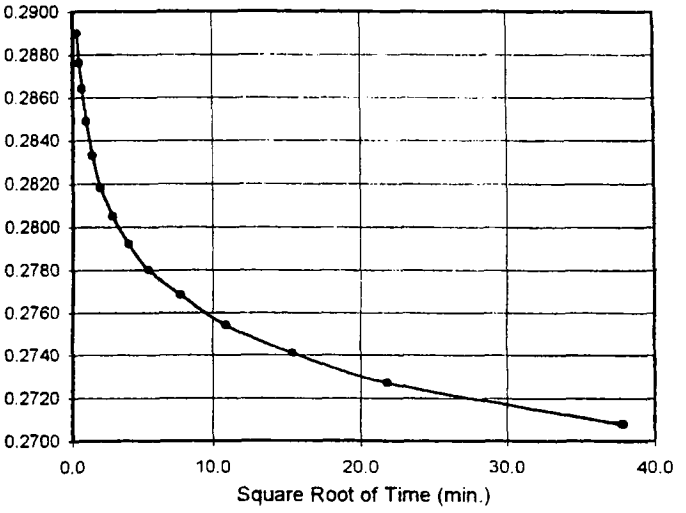
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.3233	0.9998	0.00	0.02	0.891	0.02
0.25	0.3178	0.9943	0.03	0.57	0.881	0.54
0.25	0.3184	0.9949	0.03	0.51	0.882	0.48
0.50	0.3152	0.9917	0.06	0.83	0.877	0.77
1.00	0.3070	0.9835	0.10	1.65	0.862	1.55
2.00	0.2933	0.9698	0.16	3.02	0.837	2.86
4.00	0.2708	0.9473	0.26	5.27	0.796	5.01
8.00	0.2306	0.9071	0.43	9.29	0.724	8.86
16.00	0.1850	0.8615	0.63	13.85	0.641	13.22
32.00	0.1465	0.8230	0.87	17.70	0.573	16.83
64.00	0.1047	0.7812	1.13	21.88	0.499	20.75
16.00	0.1124	0.7889	0.75	21.11	0.506	20.36
4.00	0.1235	0.8000	0.48	20.00	0.522	19.52
1.00	0.1369	0.8134	0.33	18.66	0.544	18.33
0.50	0.1469	0.8234	0.29	17.66	0.563	17.37
1.00	0.1451	0.8216	0.32	17.84	0.560	17.52
4.00	0.1330	0.8095	0.45	19.05	0.539	18.60
16.00	0.1178	0.7943	0.73	20.57	0.516	19.84
64.00	0.0956	0.7721	1.10	22.79	0.481	21.69

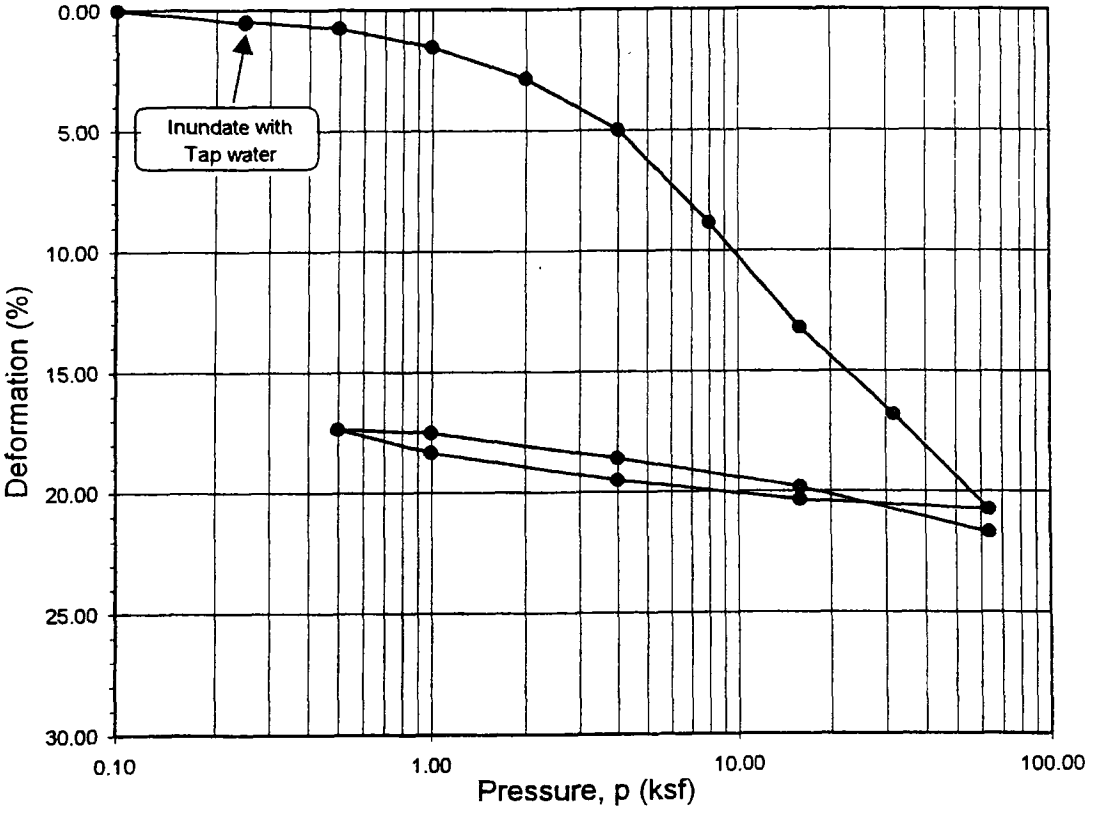
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/26/02	9:12:00	0.0		
7/26/02	9:12:06	0.1	0.3	0.2890
7/26/02	9:12:15	0.3	0.5	0.2876
7/26/02	9:12:30	0.5	0.7	0.2864
7/26/02	9:13:00	1.0	1.0	0.2849
7/26/02	9:14:00	2.0	1.4	0.2833
7/26/02	9:16:00	4.0	2.0	0.2818
7/26/02	9:20:00	8.0	2.8	0.2805
7/26/02	9:28:00	16.0	4.0	0.2792
7/26/02	9:42:00	30.0	5.5	0.2780
7/26/02	10:12:00	60.0	7.7	0.2768
7/26/02	11:12:00	120.0	11.0	0.2754
7/26/02	13:12:00	240.0	15.5	0.2741
7/26/02	17:09:00	477.0	21.8	0.2727
7/27/02	9:12:00	1440.0	37.9	0.2708

Time Readings @ 4.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-755	**095-2-141**	**30.0-32.5**	**36.0**	**20.3**	**87.8**	**113.9**	**0.891**	**0.481**	**107**	**118**

Sample Description:

Very dark gray lean clay with sand (CL)s

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

TERATEST LABS

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/0

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/14/02

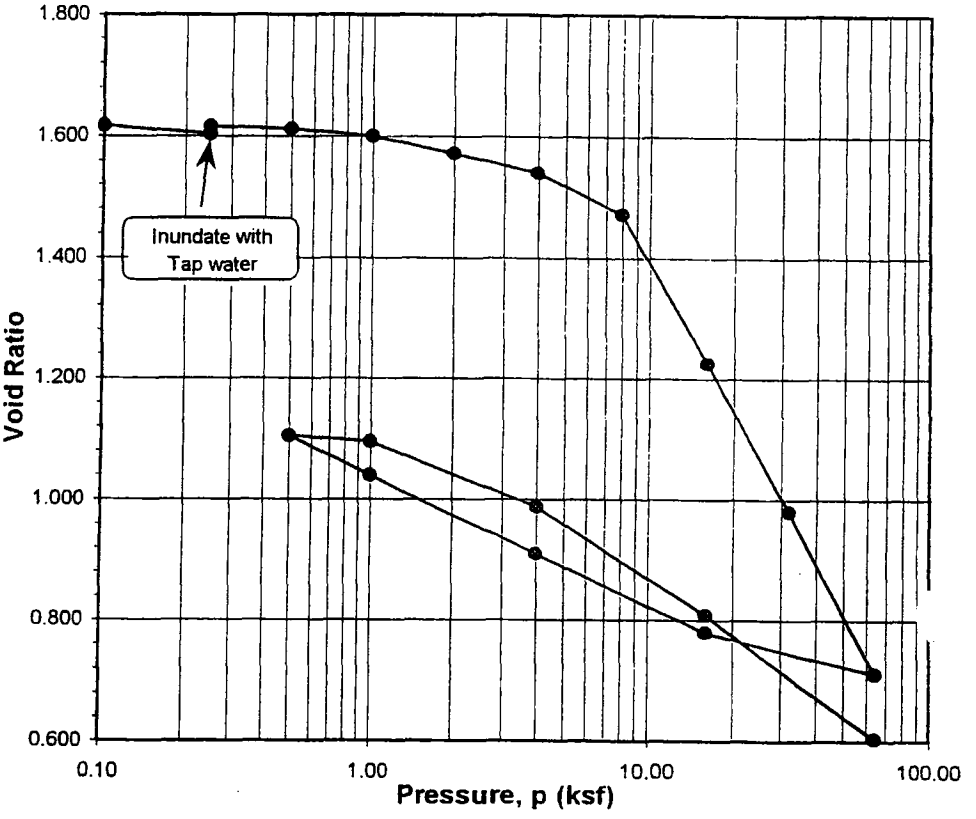
LOCATION: B-755

Depth (ft.) 88.0-90.5

SAMPLE ID: 095-2-147

Sample Desccription: Very dark gray sandy lean clay s(CL)

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	168.23
Weight of Ring (g):	41.58
Height after consol. (in.):	0.6139
Before Test	
Wt. of Wet Sample+Cont. (g):	194.32
Wt. of Dry Sample+Cont. (g):	141.43
Weight of Container (g):	57.91
Initial Moisture Content (%)	63.3
Initial Dry Density (pcf)	64.5
Initial Saturation (%):	106
Initial Vertical Reading (in.)	0.5655
After Test	
Wt. of Wet Sample+Cont. (g):	197.99
Wt. of Dry Sample+Cont. (g):	175.28
Weight of Container (g):	56.83
Final Moisture Content (%)	29.54
Final Dry Density (pcf):	104.1
Final Saturation (%):	129
Final Vertical Reading (in.)	0.1675
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43



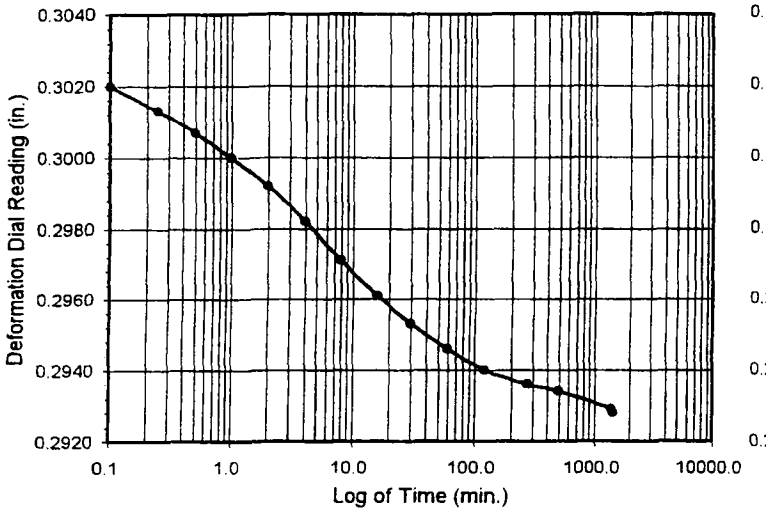
INUNDATE @ 0.25 ksf

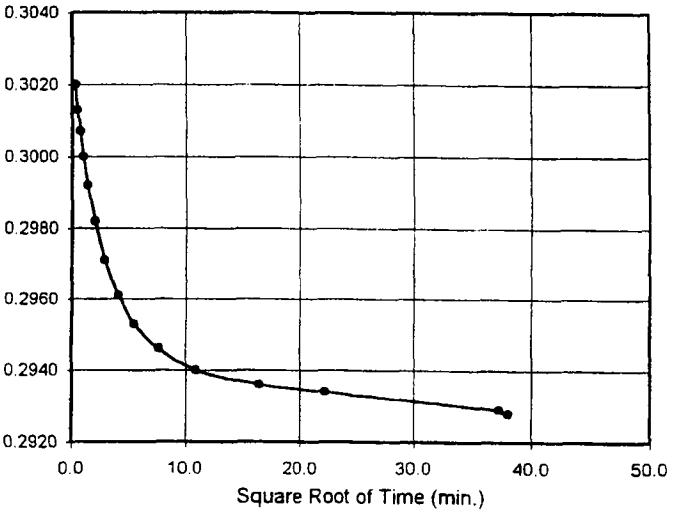
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.5666	1.0011	0.00	-0.11	1.617	-0.11
0.25	0.5610	0.9955	0.05	0.45	1.603	0.40
0.25	0.5655	1.0000	0.05	0.00	1.615	-0.05
0.50	0.5637	0.9982	0.08	0.18	1.611	0.10
1.00	0.5587	0.9932	0.13	0.68	1.599	0.55
2.00	0.5473	0.9818	0.21	1.82	1.572	1.61
4.00	0.5341	0.9686	0.28	3.14	1.539	2.86
8.00	0.5064	0.9409	0.45	5.91	1.471	5.46
16.00	0.4095	0.8440	0.70	15.60	1.224	14.90
32.00	0.3141	0.7486	0.90	25.14	0.980	24.24
64.00	0.2084	0.6429	1.19	35.71	0.711	34.52
16.00	0.2375	0.6720	0.87	32.80	0.779	31.93
4.00	0.2901	0.7246	0.57	27.54	0.909	26.97
1.00	0.3415	0.7760	0.42	22.40	1.039	21.98
0.50	0.3670	0.8015	0.37	19.85	1.105	19.48
1.00	0.3628	0.7973	0.40	20.27	1.094	19.87
4.00	0.3205	0.7550	0.54	24.50	0.987	23.96
16.00	0.2488	0.6833	0.85	31.67	0.808	30.82
64.00	0.1675	0.6020	1.19	39.80	0.605	38.61

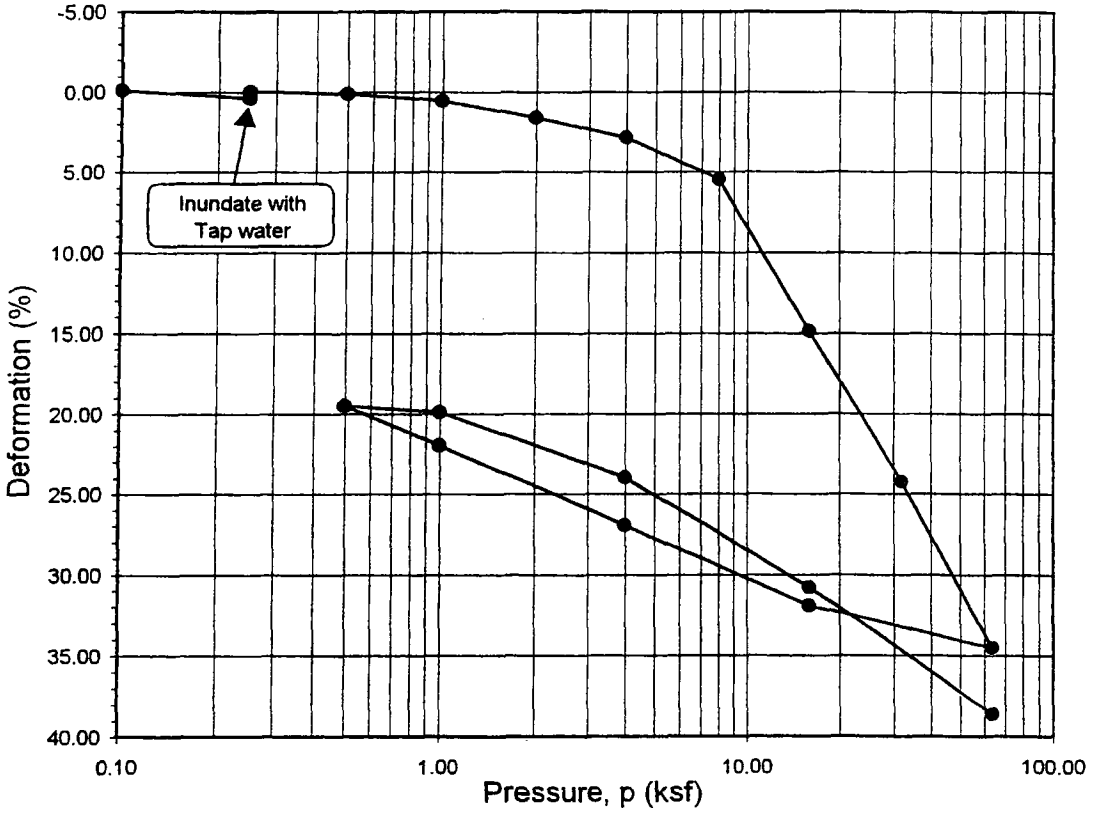
Time Readings @ 2.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/25/02	8:55:00	0.0		
7/25/02	8:55:06	0.1	0.3	0.3020
7/25/02	8:55:15	0.3	0.5	0.3013
7/25/02	8:55:30	0.5	0.7	0.3007
7/25/02	8:56:00	1.0	1.0	0.3000
7/25/02	8:57:00	2.0	1.4	0.2992
7/25/02	8:59:00	4.0	2.0	0.2982
7/25/02	9:03:00	8.0	2.8	0.2971
7/25/02	9:11:00	16.0	4.0	0.2961
7/25/02	9:25:00	30.0	5.5	0.2953
7/25/02	9:55:00	60.0	7.7	0.2946
7/25/02	10:55:00	120.0	11.0	0.2940
7/25/02	13:26:00	271.0	16.5	0.2936
7/25/02	17:10:00	495.0	22.2	0.2934
7/26/02	8:06:00	1391.0	37.3	0.2929
7/26/02	9:05:00	1450.0	38.1	0.2928

Time Readings @ 2.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-755	**095-2-147**	**88.0-90.5**	**63.3**	**29.5**	**64.5**	**104.1**	**1.614**	**0.605**	**106**	**129**

Sample Description:

Very dark gray sandy lean clay s(CL)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

TERATEST LABS

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/(

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/14/02

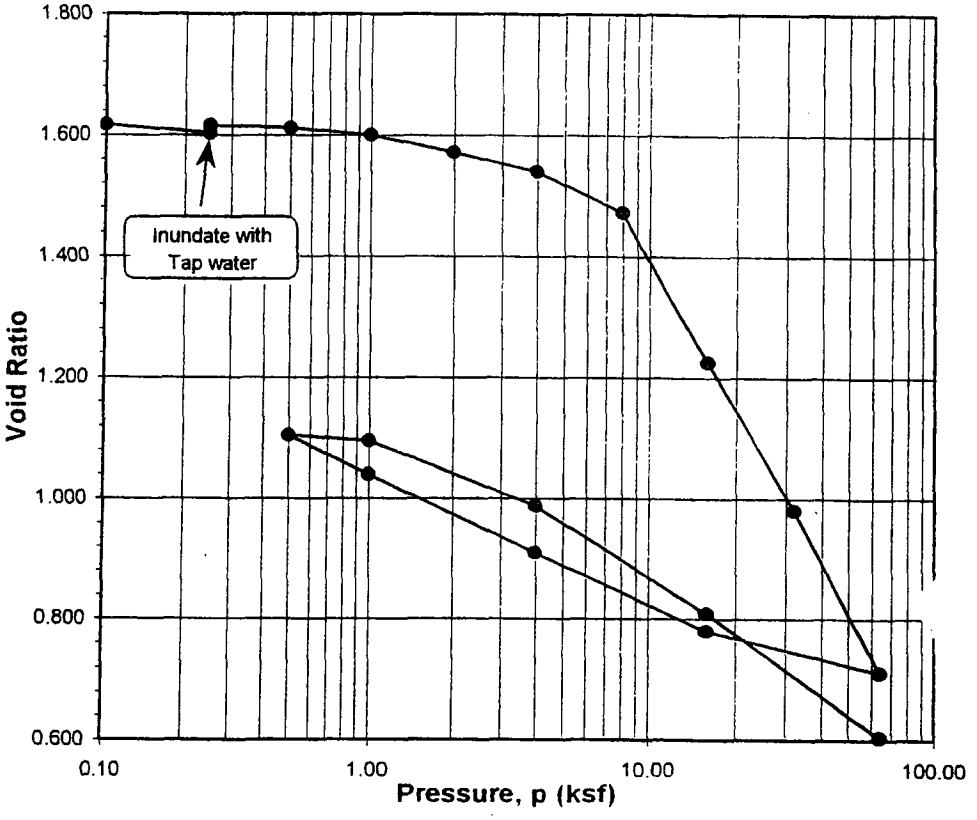
LOCATION: B-755

Depth (ft.) 88.0-90.5

SAMPLE ID: 095-2-147

Sample Desccription: Very dark gray sandy lean clay s(CL)

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	168.23
Weight of Ring (g):	41.58
Height after consol. (in.):	0.6139
Before Test	
Wt. of Wet Sample+Cont. (g):	194.32
Wt. of Dry Sample+Cont. (g):	141.43
Weight of Container (g):	57.91
Initial Moisture Content (%)	63.3
Initial Dry Density (pcf)	64.5
Initial Saturation (%):	106
Initial Vertical Reading (in.)	0.5655
After Test	
Wt. of Wet Sample+Cont. (g):	197.99
Wt. of Dry Sample+Cont. (g):	175.28
Weight of Container (g):	56.83
Final Moisture Content (%)	29.54
Final Dry Density (pcf):	104.1
Final Saturation (%):	129
Final Vertical Reading (in.)	0.1675
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43



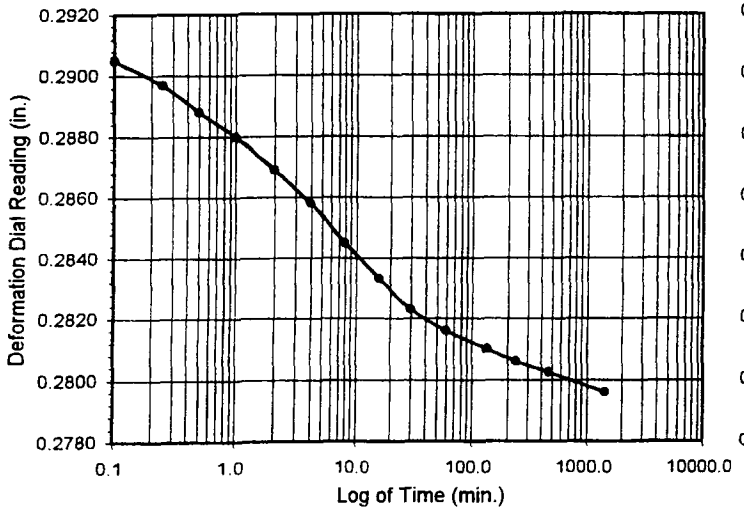
INUNDATE @ 0.25 ksf

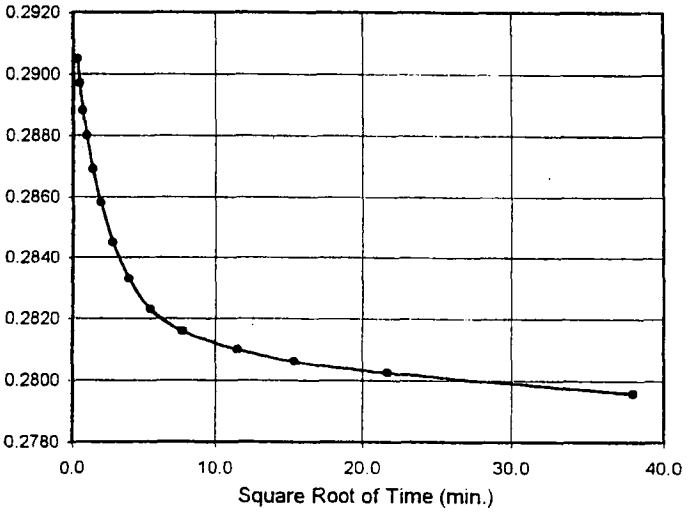
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.5666	1.0011	0.00	-0.11	1.617	-0.11
0.25	0.5610	0.9955	0.05	0.45	1.603	0.40
0.25	0.5655	1.0000	0.05	0.00	1.615	-0.05
0.50	0.5637	0.9982	0.08	0.18	1.611	0.10
1.00	0.5587	0.9932	0.13	0.68	1.599	0.55
2.00	0.5473	0.9818	0.21	1.82	1.572	1.61
4.00	0.5341	0.9686	0.28	3.14	1.539	2.86
8.00	0.5064	0.9409	0.45	5.91	1.471	5.46
16.00	0.4095	0.8440	0.70	15.60	1.224	14.90
32.00	0.3141	0.7486	0.90	25.14	0.980	24.24
64.00	0.2084	0.6429	1.19	35.71	0.711	34.52
16.00	0.2375	0.6720	0.87	32.80	0.779	31.93
4.00	0.2901	0.7246	0.57	27.54	0.909	26.97
1.00	0.3415	0.7760	0.42	22.40	1.039	21.98
0.50	0.3670	0.8015	0.37	19.85	1.105	19.48
1.00	0.3628	0.7973	0.40	20.27	1.094	19.87
4.00	0.3205	0.7550	0.54	24.50	0.987	23.96
16.00	0.2488	0.6833	0.85	31.67	0.808	30.82
64.00	0.1675	0.6020	1.19	39.80	0.605	38.61

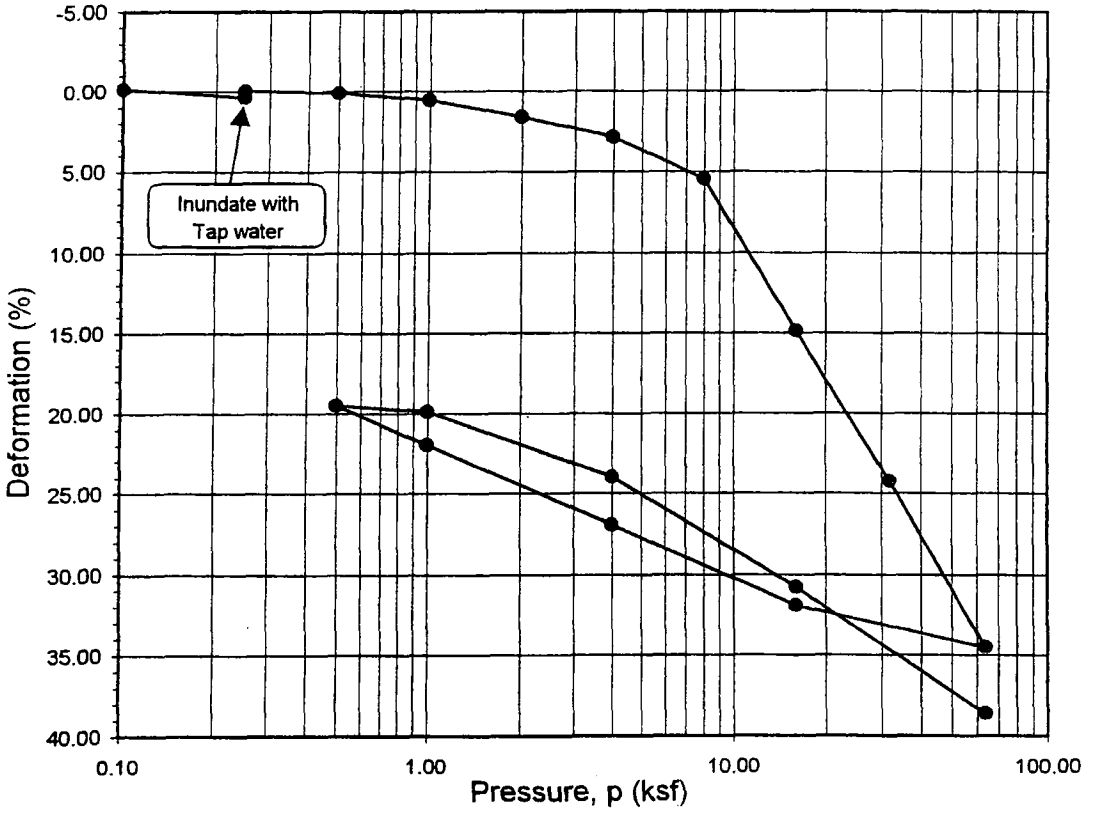
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/26/02	9:18:00	0.0		
7/26/02	9:18:06	0.1	0.3	0.2905
7/26/02	9:18:15	0.3	0.5	0.2897
7/26/02	9:18:30	0.5	0.7	0.2888
7/26/02	9:19:00	1.0	1.0	0.2880
7/26/02	9:20:00	2.0	1.4	0.2869
7/26/02	9:22:00	4.0	2.0	0.2858
7/26/02	9:26:00	8.0	2.8	0.2845
7/26/02	9:34:00	16.0	4.0	0.2833
7/26/02	9:48:00	30.0	5.5	0.2823
7/26/02	10:18:00	60.0	7.7	0.2816
7/26/02	11:33:00	135.0	11.6	0.2810
7/26/02	13:18:00	240.0	15.5	0.2806
7/26/02	17:10:00	472.0	21.7	0.2803
7/27/02	9:18:00	1440.0	37.9	0.2796

Time Readings @ 4.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-755	**095-2-147**	**88.0-90.5**	**63.3**	**29.5**	**64.5**	**104.1**	**1.614**	**0.605**	**106**	**129**

Sample Description:

Very dark gray sandy lean clay s(CL)

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

TERATEST LABS

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/0

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/12/02

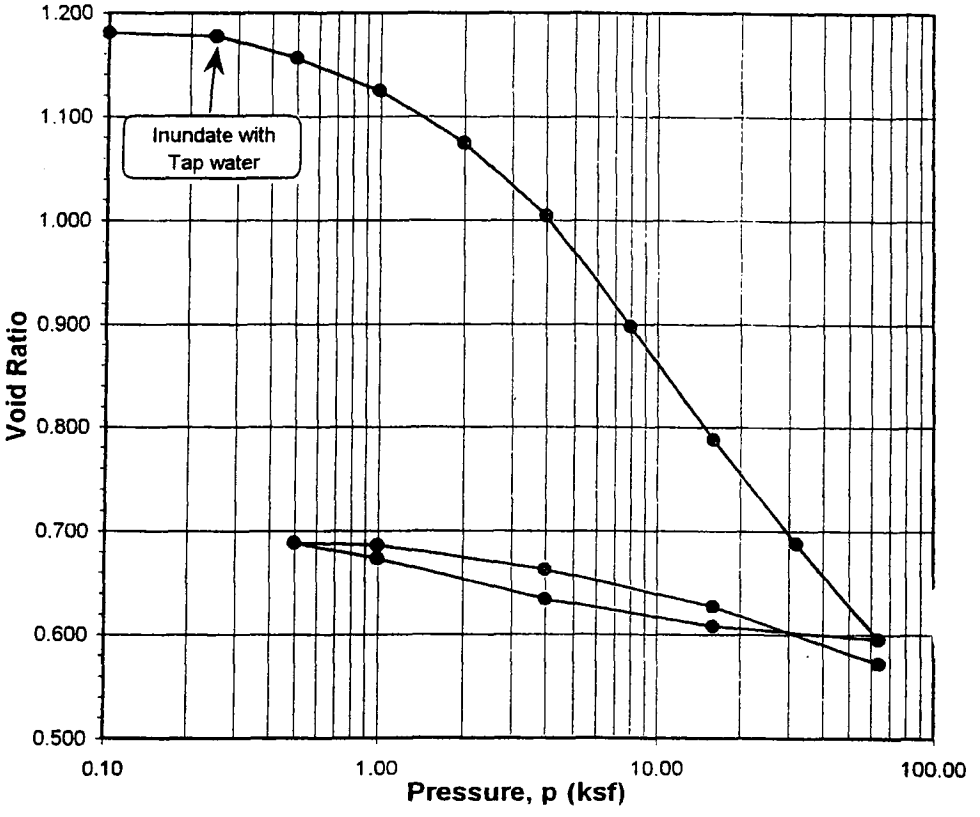
LOCATION: B-756

Depth (ft.) 40.0-42.5

SAMPLE ID: 095-2-167

Sample Desccription: Dark olive gray sandy lean clay s(CL) with shells

Sample Diameter (in.):	2.865
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	275.02
Weight of Ring (g):	83.21
Height after consol. (in.):	0.7195
Before Test	
Wt. of Wet Sample+Cont. (g):	253.18
Wt. of Dry Sample+Cont. (g):	188.67
Weight of Container (g):	57.37
Initial Moisture Content (%)	49.1
Initial Dry Density (pcf)	76.0
Initial Saturation (%):	110
Initial Vertical Reading (in.)	0.3282
After Test	
Wt. of Wet Sample+Cont. (g):	324.81
Wt. of Dry Sample+Cont. (g):	297.35
Weight of Container (g):	76.19
Final Moisture Content (%)	19.91
Final Dry Density (pcf):	113.3
Final Saturation (%):	114
Final Vertical Reading (in.)	0.0346
Specific Gravity :	2.66
Water Density (pcf):	62.43



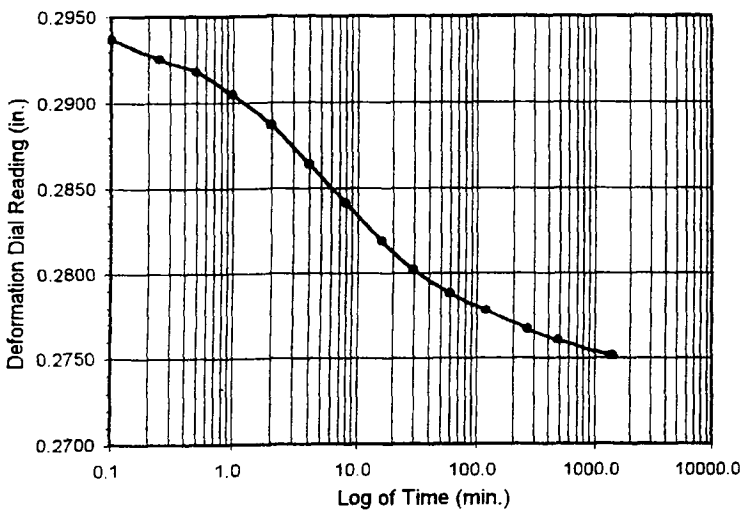
INUNDATE @ 0.25 ksf

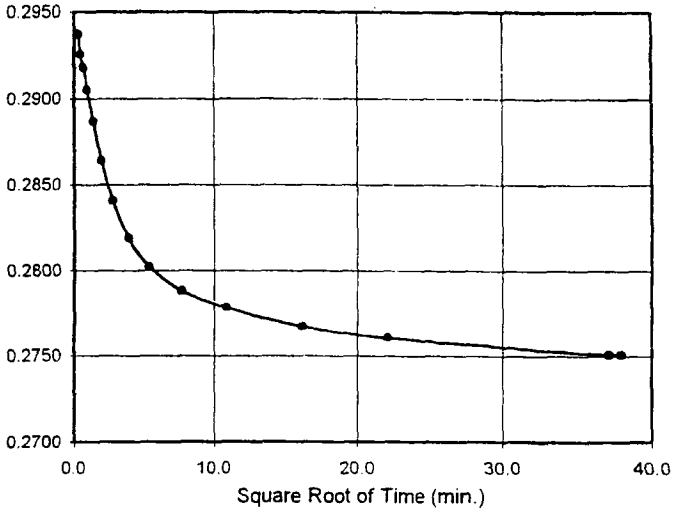
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.3262	0.9980	0.00	0.20	1.181	0.20
0.25	0.3239	0.9957	0.05	0.43	1.177	0.38
0.25	0.3242	0.9960	0.05	0.40	1.177	0.35
0.50	0.3137	0.9855	0.11	1.45	1.156	1.34
1.00	0.2987	0.9705	0.17	2.95	1.124	2.78
2.00	0.2751	0.9469	0.26	5.31	1.075	5.05
4.00	0.2415	0.9133	0.40	8.67	1.004	8.27
8.00	0.1909	0.8627	0.56	13.73	0.897	13.17
16.00	0.1389	0.8107	0.77	18.93	0.788	18.16
32.00	0.0905	0.7623	1.01	23.77	0.688	22.76
64.00	0.0452	0.7170	1.31	28.30	0.595	26.99
16.00	0.0547	0.7265	0.94	27.35	0.608	26.41
4.00	0.0697	0.7415	0.62	25.85	0.634	25.23
1.00	0.0892	0.7610	0.47	23.90	0.673	23.43
0.50	0.0968	0.7686	0.42	23.14	0.689	22.72
1.00	0.0952	0.7670	0.45	23.30	0.686	22.85
4.00	0.0832	0.7550	0.60	24.50	0.663	23.90
16.00	0.0637	0.7355	0.93	26.45	0.627	25.52
64.00	0.0346	0.7064	1.31	29.36	0.572	28.05

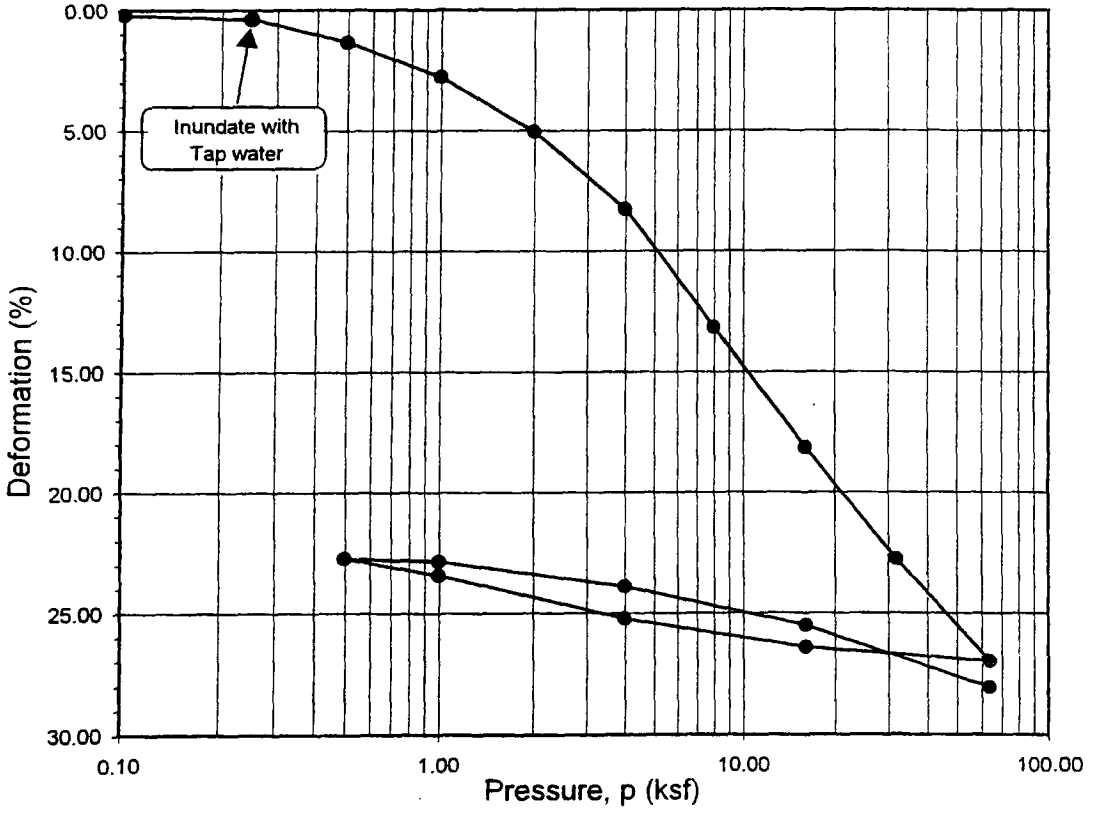
Time Readings @ 2.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/25/02	9:02:00	0.0		
7/25/02	9:02:06	0.1	0.3	0.2937
7/25/02	9:02:15	0.3	0.5	0.2926
7/25/02	9:02:30	0.5	0.7	0.2918
7/25/02	9:03:00	1.0	1.0	0.2905
7/25/02	9:04:00	2.0	1.4	0.2887
7/25/02	9:06:00	4.0	2.0	0.2864
7/25/02	9:10:00	8.0	2.8	0.2841
7/25/02	9:18:00	16.0	4.0	0.2819
7/25/02	9:32:00	30.0	5.5	0.2802
7/25/02	10:02:00	60.0	7.7	0.2788
7/25/02	11:02:00	120.0	11.0	0.2778
7/25/02	13:27:00	265.0	16.3	0.2767
7/25/02	17:12:00	490.0	22.1	0.2761
7/26/02	8:07:00	1385.0	37.2	0.2751
7/26/02	9:06:00	1444.0	38.0	0.2751

Time Readings @ 2.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-756	**095-2-167**	**40.0-42.5**	**49.1**	**19.9**	**76.0**	**113.3**	**1.185**	**0.572**	**110**	**114**

Sample Description:

Dark olive gray sandy lean clay s(CL) with shells

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

TERATEST LABS

CONSOLIDATION TEST RESULTS

(ASTM D 2435)

Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

Tested By: RA Date: 07/22/0

Project No.: 2384095-D-07060-1000

Checked By: LF Date: 08/12/0

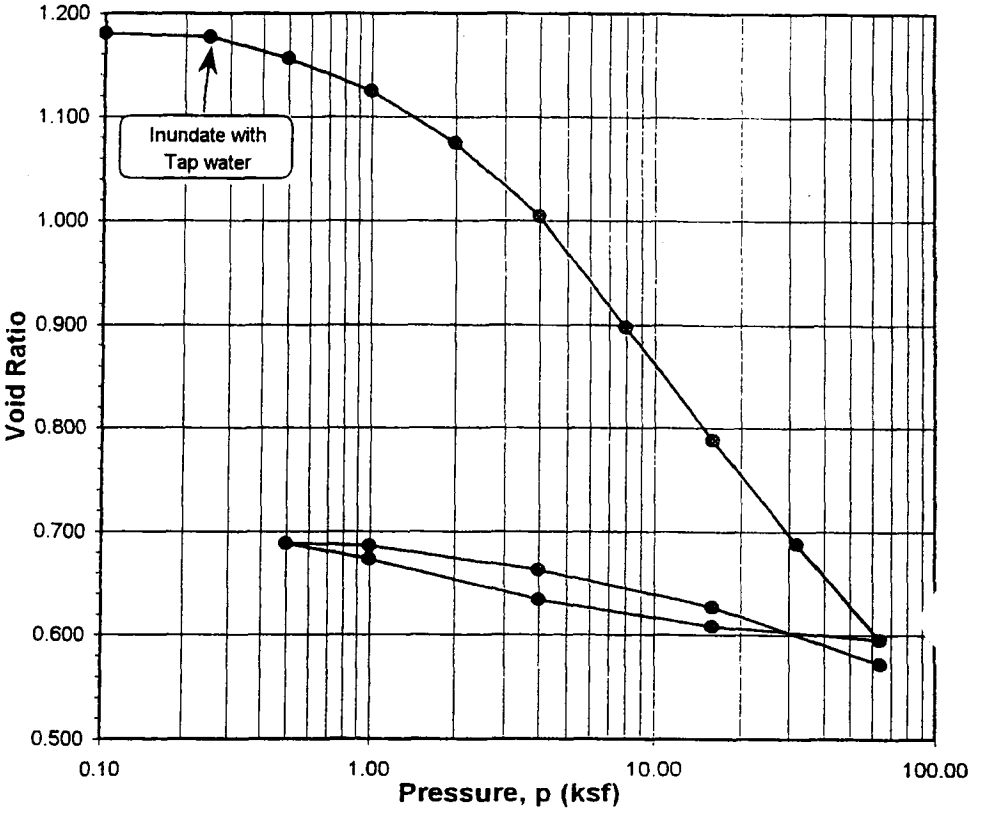
LOCATION: B-756

Depth (ft.) 40.0-42.5

SAMPLE ID: 095-2-167

Sample Desccription: Dark olive gray sandy lean clay s(CL) with shells

Sample Diameter (in.):	2.865
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	275.02
Weight of Ring (g):	83.21
Height after consol. (in.):	0.7195
Before Test	
Wt. of Wet Sample+Cont. (g):	253.18
Wt. of Dry Sample+Cont. (g):	188.67
Weight of Container (g):	57.37
Initial Moisture Content (%)	49.1
Initial Dry Density (pcf)	76.0
Initial Saturation (%):	110
Initial Vertical Reading (in.)	0.3282
After Test	
Wt. of Wet Sample+Cont. (g):	324.81
Wt. of Dry Sample+Cont. (g):	297.35
Weight of Container (g):	76.19
Final Moisture Content (%)	19.91
Final Dry Density (pcf):	113.3
Final Saturation (%):	114
Final Vertical Reading (in.)	0.0346
Specific Gravity :	2.66
Water Density (pcf):	62.43



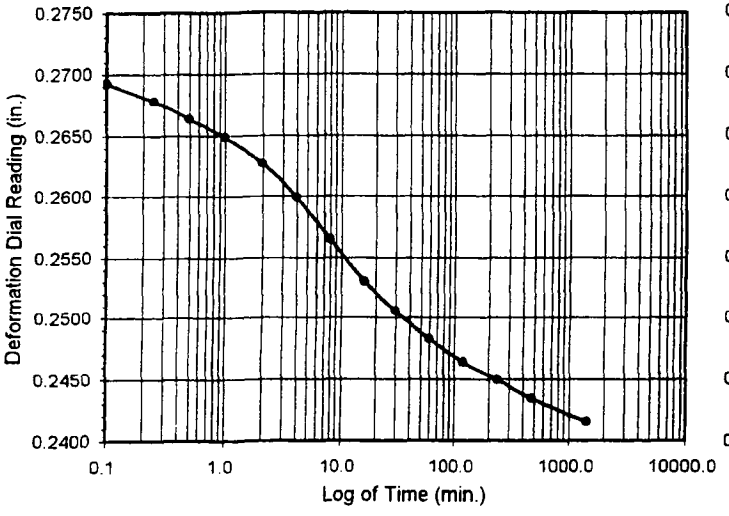
INUNDATE @ 0.25 ksf

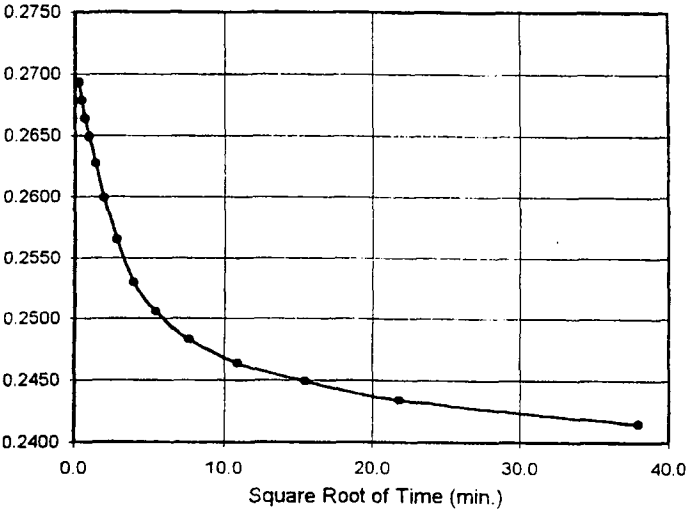
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.3262	0.9980	0.00	0.20	1.181	0.20
0.25	0.3239	0.9957	0.05	0.43	1.177	0.38
0.25	0.3242	0.9960	0.05	0.40	1.177	0.35
0.50	0.3137	0.9855	0.11	1.45	1.156	1.34
1.00	0.2987	0.9705	0.17	2.95	1.124	2.78
2.00	0.2751	0.9469	0.26	5.31	1.075	5.05
4.00	0.2415	0.9133	0.40	8.67	1.004	8.27
8.00	0.1909	0.8627	0.56	13.73	0.897	13.17
16.00	0.1389	0.8107	0.77	18.93	0.788	18.16
32.00	0.0905	0.7623	1.01	23.77	0.688	22.76
64.00	0.0452	0.7170	1.31	28.30	0.595	26.99
16.00	0.0547	0.7265	0.94	27.35	0.608	26.41
4.00	0.0697	0.7415	0.62	25.85	0.634	25.23
1.00	0.0892	0.7610	0.47	23.90	0.673	23.43
0.50	0.0968	0.7686	0.42	23.14	0.689	22.72
1.00	0.0952	0.7670	0.45	23.30	0.686	22.85
4.00	0.0832	0.7550	0.60	24.50	0.663	23.90
16.00	0.0637	0.7355	0.93	26.45	0.627	25.52
64.00	0.0346	0.7064	1.31	29.36	0.572	28.05

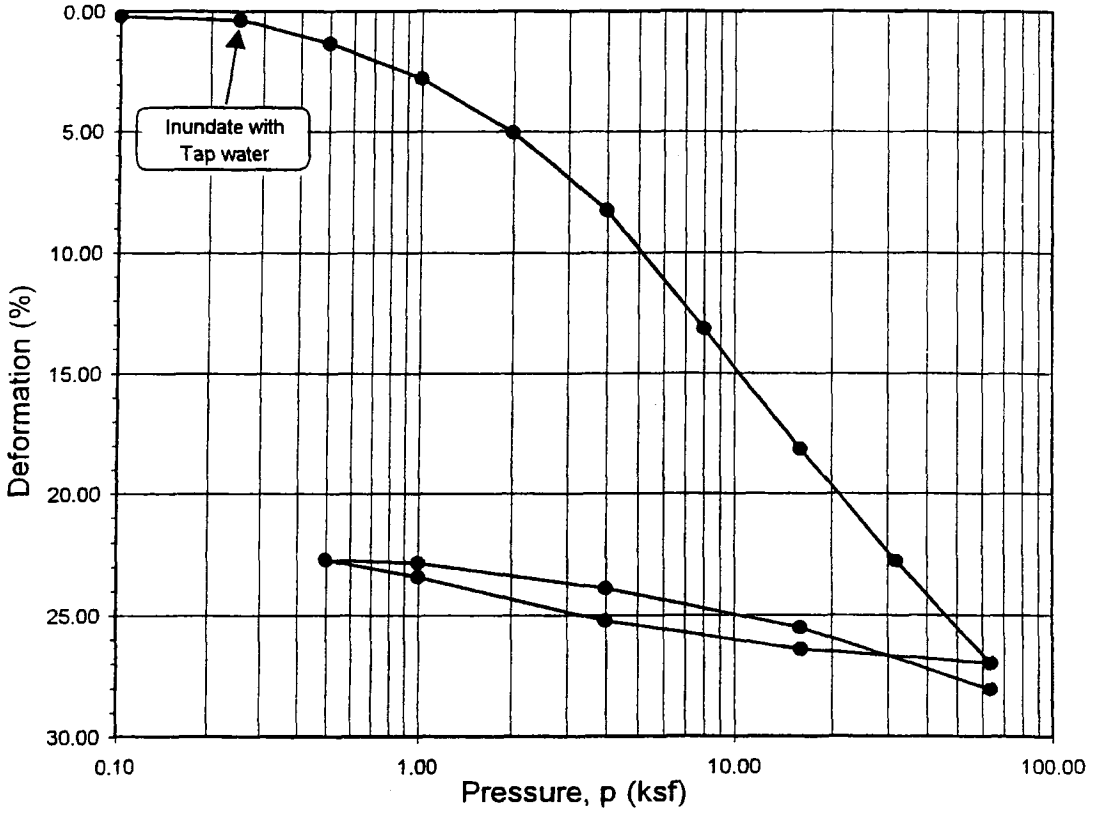
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
7/26/02	9:10:00	0.0		
7/26/02	9:10:06	0.1	0.3	0.2693
7/26/02	9:10:15	0.2	0.5	0.2678
7/26/02	9:10:30	0.5	0.7	0.2664
7/26/02	9:11:00	1.0	1.0	0.2649
7/26/02	9:12:00	2.0	1.4	0.2627
7/26/02	9:14:00	4.0	2.0	0.2599
7/26/02	9:18:00	8.0	2.8	0.2565
7/26/02	9:26:00	16.0	4.0	0.2530
7/26/02	9:40:00	30.0	5.5	0.2506
7/26/02	10:10:00	60.0	7.7	0.2483
7/26/02	11:10:00	120.0	11.0	0.2464
7/26/02	13:10:00	240.0	15.5	0.2449
7/26/02	17:08:00	478.0	21.9	0.2434
7/27/02	9:10:00	1440.0	37.9	0.2415

Time Readings @ 4.0 ksf







LOCATION	SAMPLE ID	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-756	**095-2-167**	**40.0-42.5**	**49.1**	**19.9**	**76.0**	**113.3**	**1.185**	**0.572**	**110**	**114**

Sample Description:

Dark olive gray sandy lean clay s(CL) with shells

TERATEST LABS

Project No.: 2384095-D-07060-1000

Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA

ONE - DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

(ASTM D 2435)

08-02

TERATEST LABS INC.

Materials Testing
Special Inspection Services
Geotechnical Testing

August 14 , 2002

Foster Wheeler Environmental Corporation
1940 East Deere Avenue, Suite 200
Santa Ana, CA 92705

Attention: Mr. Vince Richards

Subject: **Report / Laboratory Testing Results / Certificate of Compliance**
Project Name: Geotechnical Evaluation, Between IR Sites 1 & 2, Alameda Point, Alameda, CA
Project No.: 2384095-D-07060-1000
Purchase Order No.: 040413 Mod-002
TERATEST No.: 015190 C02
Cover Sheet for Submittal of Signed Copies of the Chain of Custody (COC) Forms / After Completion of Project

Dear Mr. Richards:

Enclosed please find laboratory testing results for the soil samples from the above referenced project. The requested tests were conducted in essential accordance with the standard test methods listed below.

TYPE OF TEST	TEST METHOD
Liquid Limit, Plastic Limit and Plasticity Index of Soils	ASTM D 4318
Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	ASTM D 2216
Density of Soil in Place by the Drive-Cylinder Method	ASTM D 2937
Particle-Size Analysis of Soils	ASTM D 422
Amount of Material in Soils Finer Than the No. 200 Sieve	ASTM D 1140
Specific Gravity of Soils	ASTM D 854
Consolidated Undrained Triaxial Compression Test for Cohesive Soils	ASTM D 4767
Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils	ASTM D 2850
Laboratory Miniature Vane Shear Test for Saturated Fine-Grained Clayey Soil	ASTM D 4648
One-Dimensional Consolidation Properties of Soils	ASTM D 2435

Test results are presented in Table 1 and the attached Data Sheets.

17781 Cowan Ave., Ste.150
Irvine, CA 92614
949 . 253 . 5922
dispatch 949 . 222 . 5321
fax 949 . 263 . 8843

ASTM: American Society for Testing and Materials, Annual Book of ASTM Standards, Section 4 Construction, Volume 04.08 Soil and Rock (I), 2000.

Thank you for selecting Teratest Labs, Inc. to provide laboratory testing services to Foster Wheeler Environmental Corporation. Please feel free to contact us if you should have any questions concerning these results.

Very truly yours,

TERATEST LABS, INC.
Laboratory Testing Services

Lester Fruth

Lester Fruth, Ph.D.
Soils Laboratory Supervisor

Enclosures

TERATEST LABS

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 04006

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: DC 95D/Between IR 1+2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: Alameda Pt. Alameda CA	PROJECT NO.: DO 95D
SAMPLER NAME: V. Richards	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: V. Richards/T. Lai	AIRBILL NUMBER:

LABORATORY NAME: TeraTest 949-253-5922

LABORATORY ID (FOR LABORATORY):

ANALYSES REQUIRED: Atterberg Limit; Min Vane Shear; Water Content; Moisture/Dry Density; HYDROMETER; DIRECT SHEAR; CONSOLIDATION; TX-ICU WPP MEASURE; TX-UU (one point); Specific Gravity

Project Information Section Do not submit to Laboratory

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Atterberg Limit	Min Vane Shear	Water Content	Moisture/Dry Density	HYDROMETER	DIRECT SHEAR	CONSOLIDATION	TX-ICU WPP MEASURE	TX-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-170	6-29-02	1237	1			S		/	/	/	/					/		ST 30"x3"	B-756	90	92.5	
095-2-171	6-29-02	1511	1			S				/	/							ST 30"x3"	B-756	100	102.5	

RELINQUISHED BY (Signature): [signature]	DATE: 07/09/02	RECEIVED BY (Signature): [signature]	LABORATORY INSTRUCTIONS/COMMENTS: Hydrometer = Sieve + Hydro
COMPANY: FWENC	TIME: 4:30	COMPANY: HAI	
RELINQUISHED BY (Signature): [signature]	DATE: 07/09/02	RECEIVED BY (Signature): Les Faust	COMPOSITE DESCRIPTION: Final testing assigned by Julie 7-11-02
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest	
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY) TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COMPANY	TIME	COMPANY	COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Can... - Project File; Manila - Data Management

FOSTER WI ENVIRONMENTAL CORPORATION
1230 Columbia Street, Su... ...an Diego, CA 92101 (619) 234-8696

NUMBER 03742

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: DO 95D/Between IR 1+2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: Alameda Pt, Alameda CA	PROJECT NO.: DO 95D
SAMPLER NAME: V. Richards	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: V. Richards/T. Lai	AIRBILL NUMBER:

LABORATORY NAME: Tera Test 949-253-5922

LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Attenberg Limits	Min Vane Shear	Water Content	Moisture/Dry Density	Hydrometer	Direct Shear	Consolidation	Tx-ICU w/ PP Measure	Tx-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-159	6-27-02	1545	1			S												SPT BAG	B-754	60	61.5	
095-2-160	6-27-02	1630																SPT BAG		70	71.5	
095-2-161	6-27-02	1758																SPT BAG		80	80.8	
095-2-162	6-27-02	1901						/			/	/				/		ST 30"x3"		90	92.5	
095-2-163	6-27-02	1957									/							ST 30"x3"		100	102.5	
095-2-164	6-28-02	0827														/		ST 30"x3"		120	122.25	
095-2-165	6-28-02	1021														/		ST 30"x3"		150	152.5	
095-2-166	6-28-02	1620						/	/		/	/						mc 2"x6"	B-756	25.5	26	
095-2-167	6-28-02	1728						/			/	/		/	/		/	ST 30"x3"		40	42.5	
095-2-168	6-29-02	1003							OK B		/							mc 2"x6"		70.5	71	
095-2-169	6-29-02	1050																SPT BAG		80	81.5	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	07/09/02	Wio G. Bodel
COMPANY: FWENC	TIME: 8:30	COMPANY: HAI
RELINQUISHED BY (Signature): Wio G. Bodel	DATE: 07/9/02	RECEIVED BY (Signature): Lee Fruth
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Vane Shear - 167 not cancelled
Hydrometer = Sieve & hydro.

COMPOSITE DESCRIPTION: Final testing assigned by Julia 7-11-02

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

FOSTER WHEELER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Suite 640 San Diego, CA 92101 (619) 234-8696

NUMBER 03745

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: DO 95D/Between IR 1+2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: Alameda Pt., Alameda, Ca.	PROJECT NO.: DO 95D
SAMPLER NAME: V. Richards	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: V. Richards / T. Lai	AIRBILL NUMBER:

LABORATORY NAME: Tera Test 949-253-5922

LABORATORY ID (FOR LABORATORY):

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Atterberg Limits	Min Vane Shear	Water Content	Moisture Dry Dens.	HYDROMETER	DIRECT SHEAR	CONSOLIDATION	Tx-KCU W/ PP MEASURE	Tx-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-148	6-26-02	1046	1			S					/							ST 30"x3"	B-755	111	113.5	
095-2-149	6-26-02	1341																ST 30"x3"		161	163	
095-2-150	6-26-02	1601																SPT BAG		180	181.5	
095-2-151	6-26-02	1746																SPT BAG		191	192.5	
095-2-152	6-26-02	1123																MC 2"x6"	B-754	5.5	6	
095-2-153	6-27-02	1148						SAMPLE MISSING										SPT BAG		10	11.5	
095-2-154	6-27-02	1218																ST 30"x3"		15	17.5	
095-2-155	6-27-02	1241																MC 2"x6"		19	19.5	
095-2-156	6-27-02	1342						/			/	/		/	/		/	ST 30"x3"		30	32.5	
095-2-157	6-27-02	1440							/		/				/			ST 30"x3"		40	42.5	
095-2-158	6-27-02	1521																MC 2"x6"		50		

OK B.

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	7/9/02	[signature]
COMPANY: FWENC	TIME: 4:30	COMPANY: HAI
RELINQUISHED BY (Signature): [signature]	DATE: 7/9/02	RECEIVED BY (Signature): Lea Frith
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Vane Shear - 156 not cancelled
Hydrometer = Sieve + hydro

COMPOSITE DESCRIPTION: Final testing assigned by Julio 7-11-02

SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

FOSTER ENVIRONMENTAL CORPORATION
1230 Columbia Street, Su... San Diego, CA 92101 (619) 234-8696

NUMBER 03744

CHAIN-OF-CUSTODY RECORD

PROJECT NAME: D095D/Between IR 1+2	PURCHASE ORDER NO.: 40413
PROJECT LOCATION: ALAMEDA PT, ALAMEDA CA	PROJECT NO.: D095D
SAMPLER NAME: V. Richards	SAMPLER SIGNATURE: [signature]
PROJECT CONTACT: ~~G. Tait~~ V. Richards/TIM LAI	AIRBILL NUMBER:

LABORATORY NAME: TERATEST 949-253-5922

Project Information Section Do not submit to Laboratory

ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	Atterberg Limits	Min Vane Shear	Water Content	Moisture/Dry Density	HYDROMETER	DIRECT SHEAR	CONSOLIDATION	TX-ICU W/ PP MEASUR.	TX-UU (one point)	Specific Gravity	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC
095-2-137	6-25-02	0924	1			S												MC 2"x6"	B-755	5.5	6	
095-2-138	6-25-02	0951																SPT BAG		10	11.5	
095-2-139	6-25-02	1029																ST 30"x3"		15	17	
095-2-140	6-25-02	1107																MC 2"x6"		20.5	21	
095-2-141	6-25-02	1146						/	/	[illegible]	/			/	/		/	ST 30"x3"		30	32.5	
095-2-142	6-25-02	1226							/		/	/			/			ST 30"x3"		40	42.5	
095-2-143	6-25-02	1346																MC 2"x6"		50	50.5	
095-2-144	6-25-02	1610																SPT BAG		60	60.5	
095-2-145	6-25-02	1706																SPT BAG		70	71.5	
095-2-146	6-25-02	1750																SPT BAG		80	81.5	
095-2-147	6-25-02	1923						/		[illegible]	/			/		/		30"x3"		88	90.5	

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
[signature]	07/09/02	Wio E. Bodel
COMPANY: FWENC	TIME: 4:30	COMPANY: HAI
RELINQUISHED BY (Signature): Wio E. Bodel	DATE: 07/09/02	RECEIVED BY (Signature): Les Fruth
COMPANY: HAI	TIME: 4:30	COMPANY: Teratest
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)
COMPANY	TIME	COMPANY

LABORATORY INSTRUCTIONS/COMMENTS: Hydrometer = Sieve + Hydro

COMPOSITE DESCRIPTION: Final testing assigned by Julio 7-11-02

SAMPLE CONDITION UPON RECEIPT FOR LABORATORY
TEMPERATURE: SAMPLE CONDITION: ☐ INTACT ☐ BROKEN
COOLER SEAL: ☐ INTACT ☐ BROKEN

SAMPLING COMMENT:

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

Laboratory Miniature Vane Shear Test

ASTM D 4648

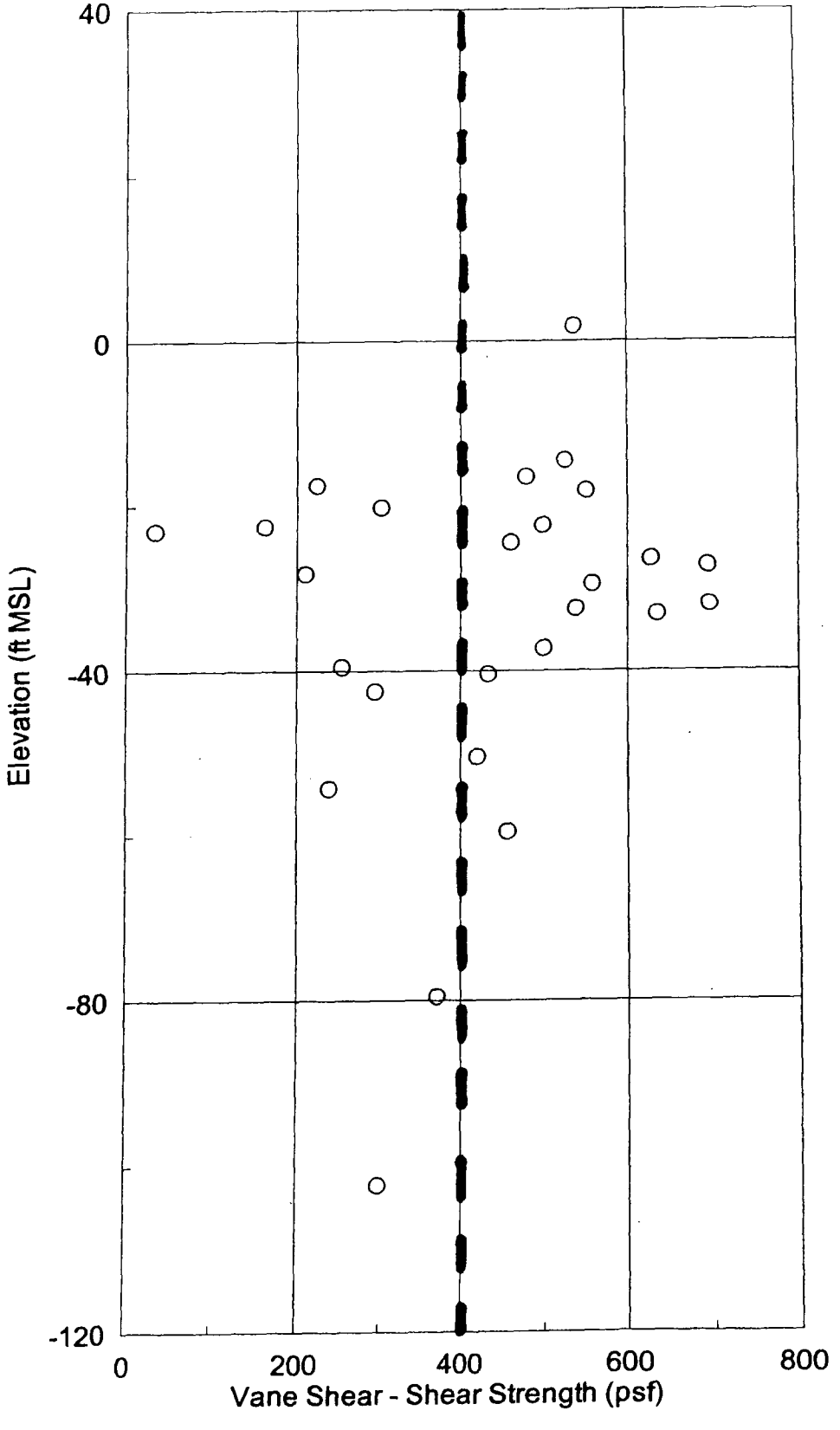
Project Number: 2384095-D-07060-1000 Task No.

Project Name: Geotechnical Evaluation, IR Site 2

Project Engineer:

Spring No.	Constant
1	4.466
2	9.154
3	17.425
4	28.398

Sample Number	Location	Depth (ft)	USCS Symbol	Spring Number	Reading (deg) Initial	Final	Difference	Shear Strength (psf) point	average
095-2-141	top	30.0	CL	1	21	30	9	40	33
	bottom		CL	1	15	21	6	27	
095-2-142	top	40.0	CH	4	42	66	24	682	696
	bottom		CH	4	42	67	25	710	
095-2-156	top	30.0	CH	not tested	NA	NA	NA	NA	1363
	bottom		CL	4	42	90	48	1363	
095-2-157	top	40.0	CH	2	87	147	60	549	774
	bottom		CH	2	91	200	109	998	
095-2-166	top	25.5	CL	2	87	115	28	256	224
	bottom		CL	2	89	110	21	192	
095-2-167	top	40.0	CH	4	43	113	70	1988	1491
	bottom		CH	4	43	78	35	994	
095-2-170	top	90.0	CH	4	43	120	77	2187	2343
	bottom		CH	4	43	131	88	2499	


40
0
-40
-80
-120
Elevation (ft MSL)
0
200
400
600
800
Vane Shear - Shear Strength (psf)

APPENDIX I

FIELD CHANGE REQUEST (FCR) FORMS

PLEASE SEE PROJECT FILES
IN THE FWENC SANTA ANA OFFICE
FOR ORIGINAL SIGNATURES ON FCRs

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-001
To	Location	Date
	IR Site 1	11/26/01

RE: Drawing No. N/A Title N/A

Specification Section: Appendix B, Standard Operating Procedures, Ordnance and Explosives/Unexploded Ordnance Disposal Disposition

Title: Final Focused Remedial Investigation Work Plan

Description (items involved, submit sketch, if applicable):
P 4-7, Para 4.3 line 8 (5th sentence.) Change "spaced 100 feet apart, creating a network of 100 x 100 foot grids" to read " spaced 200 feet apart to form a network of 200 x 200 foot grids."

Reason for Change
Due to the relatively flat clear terrain of the site and considering that a large number of grids are on paved or graded surfaces (runways, tarmac, roads), a 100 foot grid spacing is not necessary and would not enhance the effectiveness of the surface sweep.

Recommended Disposition (submit sketch, if applicable):
N/A

X Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☐ Yes X No

Estimate of contract cost or time charge (if any) N/A

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date

Disposition

☐ Not approved (give reason).
☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.
☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Operations Manager (signature) (if UXO related) N/A ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (signature) ☐ Comments (attached) ☐ No Comments	Date
CIH (signature) (if health and safety related) ☐ Comments (attached) ☐ No Comments	Date	Project Scientist(signature) (if science related) **N/A** ☐ Comments (attached) ☐ No Comments	Date
		QC Program Manager (signature) (if science related) **N/A** ☐ Comments (attached) ☐ No Comments	Date

Distribution:		Date
PJM:	Abid Loan	11/27/01
SUXOS:	Walt Hess	11/27/01
Site Superintendent:	Lance Humphrey	11/27/01
CIH	Roger Margotto	11/27/01
Navy RPM:	Rick Weissenborn	11/27/01
ROICC:	Izzat Ahmadiyya	11/27/01
ECM:	Doug Delong	11/27/01
CTA:	Bob Perricone	11/27/01

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-002
	Location	Date
	IR Site 1 and 2	02/07/02

RE: Drawing No. N/A

Title

Specification Section 4.5.7 Geotechnical Testing, Table 4-1

Title Final Focused Remedial Investigation Workplan

Other

Description (items involved, submit sketch, if applicable):
Include additional geotechnical analysis laboratory test (see revised Table 4-1) and modify the number of samples for existing test.

Reason for Change
Based on field sampling and verification of site geology, the geotechnical engineer requires additional types of soil test in addition to a reallocation of the approximate number of sample to be tested to fully characterize the geotechnical properties of the site lithologies.

Recommended Disposition (submit sketch, if applicable):
See revised Table 4-1 (attached).

X Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☒ Yes **No**

Estimate of contract cost or time charge (if any) $1,500.00

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
		Sr. Project Geologist		

Disposition

☐ Not approved (give reason).
☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.
☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Discipline Lead (signature) (if UXO related)	Date	FWENC Project Manager (signature)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☒ No Comments	
CIH (signature) (if health and safety related)	Date	Project Scientist (signature) (if science related	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☒ No Comments	
		QC Program Manager (signature) (if science related	Date
		☐ Comments (attached) ☐ No Comments	

Distribution:		Date
PJM:	Abid Loan	1/30/02
SUXOS:	James Cocchiola	1/30/02
Site Superintendent:	Lance Humphrey	1/30/02
CIH	Roger Margotto	1/30/02
Navy RPM:	Rick Weissenborn	1/30/02
ROICC:	Izzat Ahmadiyya	1/30/02
ECM:	Doug Delong	1/30/02
CTA:	Bob Perricone	1/30/02

TABLE 4-1

LABORATORY TESTING AND TEST METHODS

Test	Method	Sample Type and Quantity	Approximate Number	Total Sample Quantity
Atterberg Limits	ASTM D-4318-95a	Grab - 1 pound	*11*	*11 pounds*
Compaction Characteristics Using Modified Effort (Modified Proctor) (if needed)	ASTM D-1557-91	Grab - 40 pounds	*0*	*40 pounds (if needed)*
Moisture/Density	ASTM D-2937-00 ASTM D-2216	*Shelby Tube or sample sleeve (if needed)*	*36*	*36 Shelby Tubes or sample sleeves*
Organic Content	ASTM D-2974-00	Grab -1/2 pound	*1*	3 pounds
Particle Size with Hydrometer	ASTM D-422-63	Grab - 2 pound	*4*	8 pounds
Saturated Hydraulic Conductivity (if needed)	ASTM D-5084-90	*Shelby Tube or sample sleeve*	*0*	*Shelby Tube or sample sleeve (if needed)*
Unconsolidated, Undrained Triaxial Shear	ASTM D-2850-95	*Shelby Tube or sample sleeve*	*3*	*3 Shelby Tubes or sample sleeves*
Consolidated, Undrained Triaxial Shear	ASTM D-4767	*Shelby Tube or sample sleeve*	*3*	*3 Shelby Tubes or sample sleeves*
Water Contents	ASTM D-2216-92	Grab - 1 pound	*3*	*3 pounds*
Sieve Analysis (Particle Size Sieve only to #200)	*ASTM D-422*	*Grab 1 pounds*	*2*	*2 pounds*
Sieve Analysis (Minus 200)	*ASTM D-1140*	*Grab 1 pounds*	*37*	*37 pounds*
Specific Gravity	*ASTM D-854*	*Grab ½ pounds*	*2*	*1 pound*
Consolidation	*ASTM D-2435*	*Shelby Tube sample sleeve*	*2*	*2 Shelby Tubes or sample sleeves*
Direct Shear	*ASTM D-3030*	*Shelby Tube sample sleeve*	*8*	*8 Shelby Tubes or sample sleeves*

Notes: Italic text indicates revisions from the Work Plan.
The approximate values are specific for the IR Site 1 work, however the analytical test methods and sample types/quantities are applicable for IR Site 2.

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-003
To	Location	Date
	I R Site 2	2/07/02

RE: Drawing No.	N/A	Title	
Specification Section	Section 4.5.3 – Removal Action Excavation	Title	Final Focused Remedial Investigation Work Plan
Other			

Current Work Plan description: Page 4-11, Section 4.5.3, introductory paragraph:
"Access to the site for the excavating equipment will be through the south gate. Following the grass cutting and surface OEW sweep, the removal action will be conducted as follows:"

Replace with: Page 4-11, Section 4.5.3, introductory paragraph:
"Based on available geophysical data, it is anticipated that a high concentration of metal objects will occur throughout the burial site. This will require the use of a programmable magnetometer and a bulldozer to complete the excavation. Access to the site for the excavation equipment will be through the south gate. Following the grass cutting and surface OEW sweep, the removal action will be conducted as follows:"

Current Work Plan description: Page 4-11, Section 4.5.3, bullets 3 - 5:

- UXO Technicians will check the first grid with the magnetometer. If metal is detected, theUXO Technician will localize the site and probe the area to determine if the anomaly is located within 6 inches of the surface. If it is within 6 inches of the surface, the UXO Technician will carefully remove the soil covering the object until the identity of the object is ascertained. If the object(s) is not OEW, this process will be repeated until the entire grid is cleared.
- If OEW is unearthed, all work on the site will stop and non-UXO personnel will leave the site and proceed outside the EZ, or to a distance determined by the SUXOS. The SUXOS will positively identify the OEW, determine its status (unarmed, fuzed and fired, inert, etc.) and follow disposition procedures found in Appendix B, SOP-1.
- When the grid is cleared, the excavators will be positioned on the grid boundary and the bucket arm extended to the opposite side of the grid. The top 6 inches of soil will be dragged 20 feet to the edge of the grid line, removed, and placed in small stockpiles behind the excavators. The UXO Technicians will monitor the depth of the bucket to ensure that the 6-inch lifts are consistent. This process will be repeated until the top 6 inches of soil are removed from the grid.
- The UXO Technician will re-check the grid and ensure that there are no metal objects within the next 6 inches of soil. The excavators will repeat the soil removal process in 6-inch lifts until the grid is cleared to a depth of 1 foot. The finished grid will now become a clean cell and annotated on the field map.
- The magnetometer-scan and 6-inch removal process will be repeated in each grid until the entire Possible OEW Burial Site is cleared."

Replace with: Page 4-11, Section 4.5.3, bullets 3 - 4:

- UXO Technicians will sweep the planned bulldozer path across the grid using Vallon mine detectors (1600 series) set for operation in magnetic soils (program 4). Significant magnetic anomalies will be hand excavated to ensure they are not OEW items.

- When the path is completely swept, the bulldozer will remove soil from the path in 6 inch lifts (or less, depending on soil type). UXO technicians will walk beside the bulldozer blade as it advances to verify a consistent cut is being made and to monitor the cuttings for small OEW items if they are bladed up. If an OEW item is observed in the blade cuttings, the UXO Technicians will signal the bulldozer operator to stop and the item will be investigated. The Senior UXO Supervisor will determine when the excavation can resume.
- As the bulldozer works through the lane, a furrow of topsoil will be produced on both sides of the bulldozer blade. UXO technicians will use the magnetometers to check these furrows before they are excavated in the next bulldozer lane.
- This procedure will be repeated until the entire grid is excavated to a depth of one foot and repeated again in the adjacent grids until the entire Possible OEW Burial Site has been excavated.
- The excavated soil will be placed in stockpiles adjacent to the grids for later screening.

Reason for Change:
During on-going surface sweep activities at Site 2, random sampling of 50 grids within the Possible OEW Burial Site resulted in an average of at least 130 anomalies per grid. If these grids are representative of a majority of the grids at the site, hand investigation of every anomaly in the top 12 inches of soil will not be practical. It will be more practical to use a programmable magnetometer with a discrimination capability for soil that is heavily saturated with metal debris. Only significant anomalies will be hand excavated and the soil removed in 6-inch lifts (or less) while observing the cut. This procedure will allow a reasonable production rate while still addressing Health and Safety concerns associated with UXO avoidance.

Recommended Disposition (submit sketch, if applicable):

N/A X Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☐ Yes X No
Estimate of contract cost or time charge (if any) N/A

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
	2/07/02	APjM		

Disposition

☐ Not approved (give reason).
☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.
☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Operations Manager (signature) (if UXO related)	Date	FWENC Project Manager (signature)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☐ No Comments	
CIH (signature) (if health and safety related)	Date	Project Scientist(signature) (if science related **N/A**	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☐ No Comments	
☐ Comments (attached)		QC Program Manager (signature) (if science related	Date
		☐ Comments (attached) ☐ No Comments	

Distribution:

PjM:	Abid Loan	
APjM:	Lance Humphrey	
UXO Ops. Mgr.	Dave Keller	
QCM:	Mary Schneider	
ROICC:	Izzat Ahmadiyya	

Navy RPM:	Rick Weissenborn	
ECM	Doug Delong	
SUXOS:	James Cocchiola	
CTA	Bob Perricone	

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-004
To	Location	Date
	IR Site 2	2/08/02

RE: Drawing No. N/A Title N/A

Specification Section: Section 4.1.3 –Mobilization of Equipment and Personnel, 4.5.1 – Equipment, and 4.5.3- Removal Action Excavation

Title: Final Focused Remedial Investigation Work Plan

Other

Description (items involved, submit sketch, if applicable):

Current Work Plan description:

Page 4-2, Section 4.1.3, second set of bulleted items, 8th bullet: "Reed screen-all screening plant with a 4-inch Grizzly and ½ inch shaker screen."
Page 4-10, Section 4.5.1, second set of bullet items, 8th bullet: "Reed screen-all screening plant with a 4-inch Grizzly and ½ inch shaker screen."

Change to:

Page 4-2, Section 4.1.3, second set of bulleted items, 8th bullet: "Screen plant with a ¾ x 3-inch screen. A conveyor with a magnetic separator may be used in conjunction with the screen plant."
Page 4-10, Section 4.5.1, second set of bullet items, 8th bullet: "Screen plant with a ¾ x 3-inch screen. A conveyor with a magnetic separator may be used in conjunction with the screen plant."

Current Work Plan description:

Page 4-11, section 4.5.3, 8th bullet: "A loader will transport the stockpiled soil to the screening plant. The screening plant will be equipped with a 4-inch Grizzly and a ½-inch shaker screen. A UXO Technician will monitor the tailings and the debris removed by the Grizzly and shaker screen. If any OEW is discovered in the tailings or debris stream, all work will stop, non-UXO personnel will leave the area, and the procedures established above will be followed."

Change to:

Page 4-11, section 4.5.3, 8th bullet: "A loader will transport the stockpiled soil to the screening plant which will be equipped with a ¾ x 3-inch screen. A UXO Technician will monitor the tailings and the debris retained on the screen. If any OEW is discovered in the tailings or debris stream, all work will stop, non-UXO personnel will leave the area, and the procedures established above will be followed."

Reason for Change

Screening plant other than the Reed Screen specified in the Site 2 Work Plan will be used at the OEW Burial Site to accelerate sifting production. Screen size will be enlarged to address vegetation and other landfill waste/debris. The screen to be utilized will effectively sift out the Most Probable Munition. A conveyor with magnetic separator will also be added to improve recovery of metallic objects.

Recommended Disposition (submit sketch, if applicable):

N/A

X Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☐ Yes X No

Estimate of contract cost or time charge (if any) N/A

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
	2/08/02	APjM		

Disposition

- ☐ Not approved (give reason).
- ☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.
- ☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Operations Manager (signature) (if UXO related) ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (signature) ☐ Comments (attached) ☐ No Comments	Date
CIH (signature) (if health and safety related) **N/A** ☐ Comments (attached) ☐ No Comments	Date	Project Scientist(signature) (if science related **N/A** ☐ Comments (attached) ☐ No Comments	Date
Distribution:	Date	QC Program Manager (signature) (if science related **N/A** ☐ Comments (attached) ☐ No Comments	Date

PjM:	Abid Loan	
APjM:	Lance Humphrey	
UXO Ops. Mgr.	Dave Keller	
QCM:	Mary Schneider	
ROICC:	Izzat Ahmadiyya	
Navy RPM:	Rick Weissenborn	
ECM	Doug Delong	
SUXOS:	James Cocchiola	
CTA	Bob Perricone	

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-005
To	Location	Date
	IR Site 2	2/10/02

RE: Drawing No. N/A Title N/A

Specification Section Section 4.5 –OEW Removal Action Title Final Focused Remedial Investigation Work Plan

Other

Description (items involved, submit sketch, if applicable):

Current Work Plan description: Page 4-10, Section 4.5

"One foot of topsoil will be removed from the entire 2.5 acre (approximate) Possible OEW Burial Site which will meet established remediation depth requirements for game refuges (DOD, 1999). UXO avoidance procedures will be followed and the soil will be removed in 6-inch lifts. The soil will be screened to separate trash and debris for recycling and disposal. The screened soil will be used to backfill the excavation site."

Change to: Page 4-10, Section 4.5

"One foot of topsoil will be removed from the entire 2.5 acre (approximate) Possible OEW Burial Site which will meet established remediation depth requirements for game refuges (DOD, 1999). UXO avoidance procedures will be followed and the soil will be removed in 6-inch lifts. The soil will be screened to separate trash, green waste and debris. The green waste will be spread in a thin layer within the boundary of IR Site 2. The debris will be either recycled or disposed of in a Class 3 landfill. The screened soil will be used to backfill the excavation site using earthmoving equipment. After placement of backfill the sight will be graded to minimize ponding."

Current Work Plan description: Page 4-12, section 4.5.3, second bulleted item:

"When the entire Possible OEW Burial Site is excavated, the tailings will be used to backfill the excavation site and the screened materials will be segregated for recycling or landfill disposal, as appropriate."

Change to: Page 4-12, section 4.5.3, second bulleted item

"When the entire Possible OEW Burial Site is excavated, the soil will be screened to separate trash, green waste and debris. The green waste will be spread in a thin layer within the boundary of Site IR 2 and left to decompose. The debris will be either recycled or disposed of in a Class 3 landfill. The screened soil will be used to backfill the excavation site, and earthmoving equipment will be used to contour the site to minimize ponding."

Reason for Change

Based on site conditions at Site 2, the majority of material remaining after soil screening is anticipated to be greenwaste. This material is non-hazardous and will be beneficial to the site as compost. It is also anticipated that 10% to 15% of soil volume will be lost during the screening process. This loss of soil volume will likely result in a loss of grade to the backfilled excavation. Simple contouring and grading with heavy equipment may bring the site to grade, however some imported fill may be required to prevent ponding in remaining depressions.

Recommended Disposition (submit sketch, if applicable):

N/A

X Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☐ Yes X No

Estimate of contract cost or time charge (if any) N/A

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
		APjM		

Disposition

- ☐ Not approved (give reason).
- ☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.
- ☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Operations Manager (signature) (if UXO related) ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (signature) ☐ Comments (attached) ☐ No Comments	Date
CIH (signature) (if health and safety related) ☐ Comments (attached) ☐ No Comments	Date	Project Scientist(signature) (if science related **N/A** ☐ Comments (attached) ☐ No Comments	Date
Distribution:	Date	QC Program Manager (signature) (if science related ☐ Comments (attached) ☐ No Comments	Date

PjM:	Abid Loan	
APjM:	Lance Humphrey	
UXO Ops. Mgr.	Dave Keller	
QCM:	Mary Schneider	
ROICC:	Izzat Ahmadiyya	
Navy RPM:	Rick Weissenborn	
ECM	Doug Delong	
SUXOS:	James Cocchiola	
CTA	Bob Perricone	

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-006
To	Location	Date
	IR Site 2	02/13/02

RE: Drawing No. N/A Title

Specification Section Section 4.5.3 – Removal Action Excavation, page 4-12 Title Final Focused Remedial Investigation Work Plan

Other

Description (items involved, submit sketch, if applicable):

Current Work Plan description: Page 4-12, Section 4.5.3, 1st bullet: "When the entire Possible OEW Burial Site is excavated, the tailings will be used to backfill the excavation site and the screened materials will be segregated for recycling or landfill disposal, as appropriate."

Change to: Page 4-12, Section 4.5.3, 1st bullet: "Soil cuttings and excavated materials will be stockpiled adjacent to their point of origin. These materials will be re-graded into the soil surface as backfill "

Reason for Change

Procedures for eventual disposition of soil cuttings and excavated materials in Section 4.5.3 (Removal Action Excavation) are inconsistent with procedures found in Section 7.4.1 (Waste Characterization/Classification). This change will make the procedures in both sections consistent.

Recommended Disposition (submit sketch, if applicable):

X Minor change ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change Yes **No X**

Estimate of contract cost or time charge (if any)

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
		APjM		

Disposition

☐ Not approved (give reason).

☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.

☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Discipline Lead (signature) (if UXO related)	Date	FWENC Project Manager (signature)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☒ No Comments	
CIH (signature) (if health and safety related)	Date	Project Scientist (signature) (if science related)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☒ No Comments	
		QC Program Manager (signature) (if science related)	Date
		☐ Comments (attached) ☐ No Comments	

Distribution:		Date
PJM:	Abid Loan	2/14/02
SUXOS:	James Cocchiola	2/14/02
APjM:	Lance Humphrey	2/14/02
CIH	Roger Margotto	2/14/02
Navy RPM:	Rick Weissenborn	2/14/02
ROICC:	Izzat Ahmadiyya	2/14/02
ECM:	Doug Delong	2/14/02
CTA:	Bob Perricone	2/14/02

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-007
o	Location	Date
	IR Site 2	04/08/02

RE: Drawing No. N/A

Title

Specification Section: Tables – Table 5-1, Definable Features of Work, page 5-2

Title: Final Focused Remedial Investigation Work Plan, Attachment A, Final Project CQC Plan

Other

Description (items involved, submit sketch, if applicable):

The DON requests the installation of a 12 mm liner over a 7acre area (approximately) that includes the 2.5 acre OEW excavation area within IR Site 2. Liner will serve as a deterrent to nesting by the California Least Tern within the low-lying upland area adjacent to the wetlands. Installation will be according to the selected manufacturers specifications. See attached Definable Features of Work table amended to include the liner installation task. CQC submittals for the material specification and manufacturers installation specifications will be attached to the Preparatory Checklist for submittal to the ROICC for review and signature, forty eight hours prior to start of liner installation. Liner installation will include the following CQC documentation:

- Preparatory Phase Checklist
- Initial Phase Checklist
- Follow-up Phase Checklist
- Materials Inspection Checklist
- Completion Inspection Checklist

All submittals will be listed on the Final CQC submittal register including:

- SD-01 Pre-construction Submittals,
- SD-02 Shop Drawings,
- SD-07 Certificates.
- SD-08 Manufacturer's Instructions
- SD-09 Manufacturer's Field Reports

The liner will be removed after the avian nesting period (approximately three months) and minimized for off-site transportation and disposal by an approved disposal facility.

Reason for Change

Additional scope of work request from the DON.

Recommended Disposition (submit sketch, if applicable):

X **Minor change** ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change Yes X No ☐

Estimate of contract cost or time charge (if any) $200 K

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
Tony Crino	4/8/02	PQCM	Lance Humphrey	4/8/02

Disposition

☐ Not approved (give reason).

☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.

☐ Considered major change

FWENC UXO Discipline Lead (signature) (if UXO related) ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (signature) ☐ Comments (attached) ☐ No Comments	Date
CIH (signature) (if health and safety related) ☐ Comments (attached) ☐ No Comments	Date	Project Scientist (signature) (if science related) N/A ☐ Comments (attached) ☐ No Comments	Date
Distribution:	Date	QC Program Manager (signature) (if science related) ☐ Comments (attached) ☐ No Comments	Date

PJM:	Abid Loan	4/08/02
SUXOS:	Lance Humphrey	4/08/02
CIH	Roger Margotto	4/08/02
Navy RPM:	Rick Weissenborn	4/08/02
ROICC:	Izzat Ahmadiyya	4/08/02
ECM:	Doug Delong	4/08/02
CTA:	Bob Perricone	4/08/02

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-008
To	Location	Date
	IR Site 1 and 2	05/21/02

RE: Drawing No. N/A

Title: Final Focused Remedial Investigation Work Plan, IR Site 1 and IR Site 2, Alameda Point, DCN: FWSD-RACII-01-0299 and -02-0132

Specification Section: 4.5.7 Geotechnical Testing, Table 4-1

Other

Description (items involved, submit sketch, if applicable):

Include additional geotechnical analysis laboratory test (see revised Table 4-1)

Reason for Change

Laboratory Miniature Vane Shear Tests (ASTM D4648-94) is necessary to measure the undrained shear strength of very soft, saturated, fine grained sea-bed sediments. This test method was selected because it allows measurement of shear strength without having to extrude the soils from the shelby tubes or sample sleeve. Very soft seabed sediments (with shear strength ranging from 200 to 500 psf) can not be extruded from the shelby tubes or rings because of their consistency, and the miniature vane shear testing is the preferred way to obtain reliable shear strength measurements.

Recommended Disposition (submit sketch, if applicable):

See revised Table 4-1 (attached).

☒ **Minor change** ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☒ Yes **No**

Estimate of contract cost or time charge (if any) $2,500.00

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
		Sr. Project Geologist		

Disposition

☐ Not approved (give reason).

☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.

☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Discipline Lead (signature) (if UXO related) N/A	Date	FWENC Project Manager (signature)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☒ No Comments	
CIH (signature) (if health and safety related) N/A	Date	Project Scientist (signature) (if science related)	Date
☐ Comments (attached) ☐ No Comments		☐ Comments (attached) ☒ No Comments	
		QC Program Manager (signature) (if science related)	Date
		☐ Comments (attached) ☐ No Comments	

Distribution:		Date
PJM:	Abid Loan	5/22/02
Site Superintendent:	Lance Humphrey	5/22/02
CIH	Roger Margotto	5/22/02
Navy RPM:	Rick Weissenborn	5/22/02
ROICC:	Izzat Ahmadiyya	5/22/02
ECM:	Doug Delong	5/22/02
CTA:	Bob Perricone	5/22/02

REVISEDTABLE 4-1

LABORATORY TESTING AND TEST METHODS

Test	Method	Sample Type and Quantity	Approximate Number	Total Sample Quantity
Atterberg Limits	ASTM D-4318-95a	Grab – 1 pound	*11*	*11 pounds*
Compaction Characteristics Using Modified Effort (Modified Proctor) (if needed)	ASTM D-1557-91	Grab – 40 pounds	*O*	*40 pounds (if needed)*
Moisture/Density	ASTM D-2937-00 ASTM D-2216	*Shelby Tube sample sleeve*	*36*	*36 Shelby Tubes or sample sleeves*
Organic Content	ASTM D-2974-00	Grab -1/2 pound	*1*	3 pounds
Particle Size with Hydrometer	ASTM D-422-63	Grab - 2 pound	*4*	8 pounds
Saturated Hydraulic Conductivity (if needed)	ASTM D-5084-90	*Shelby Tube or sleeve sample*	*0*	*Shelby Tube or sleeve sample (if needed)*
Unconsolidated, Undrained Triaxial Shear	ASTM D-2850-95	*Shelby Tube or sleeve sample*	*3*	*3 Shelby Tubes or sleeve samples*
Consolidated, Undrained Triaxial Shear	ASTM D-4767	*Shelby Tube or sleeve sample*	*3*	*3 Shelby Tubes or sleeve samples*
Water Contents	ASTM D-2216-92	Grab -1 pound	*3*	*3 pounds*
Sieve Analysis (Particle Size Sieve only to #200))	*ASTM D-422*	*Grab - 2 pound*	*2*	*2 pounds*
Sieve Analysis (Minus 200)	*ASTM D-1140*	*Grab - 1 pound*	*37*	*37 pounds*
Specific Gravity	*ASTM D-854*	*Grab 1/2 pound*	*2*	*1 pound*
Consolidation	*ASTM D-2435*	*Shelby Tube sample sleeve*	*2*	*2 ShelbyTubes or sample sleeves*
Direct Shear	*ASTM D-3030*	*Shelby Tube sample sleeve*	*8*	*8 Shelby Tubes or sample sleeves*
Laboratory Miniature Vane Shear Tests	**ASTM D4648-94**	**Shelby Tube sample sleeve**	**14**	**14 Shelby Tubes or sample sleeves**

Notes:

Italic text indicate revisions provided in Field Change Request 002
Bold text indicate revisions provided in Field Change Request 008
The approximate values are specific for the IR Site 1 work; however, the analytical test methods and sample types/quantities are applicable for IR Site 2.

FIELD CHANGE REQUEST FORM

Contract No.	DO No.	Field Change Request Form No.
N44255-95-D-6030	0095	FCRF-009
o	Location IR Site 2	Date 05/30/02

RE: Drawing No. N/A

Title

Specification Section WorkPlan Section4.6 Geotechnical Investigation

Title Final Focused Remedial Investigation Work Plan, IR Site 2, Alameda Point, DCN: FWSD-RACII-01-0299

Other

Description (items involved, submit sketch, if applicable):

Perform additional geotechnical/seismic field investigation and interpretive analysis for area between IR Sites 1 and 2, Alameda Point.

Reason for Change

The results of the geotechnical and seismic investigation for IR Site 2 indicates a potential for considerable variability in subsurface conditions in the area located between IR Sites 1 and 2. These differences are considered significant, and may affect geotechnical and seismic findings for Site 2. Information obtained from IR Sites 1 and 2 investigations does not allow FWENC to extrapolate or interpolate with acceptable confidence the subsurface conditions in this area. For these reasons, an additional investigation is necessary to adequately characterize the subsurface conditions in the area between the two sites.

Recommended Disposition (submit sketch, if applicable):

See attached drawing of CPT and boring locations at area between IR Sites 1 and 2. Add additional text following Paragraph 5, Section 4.6 Geotechnical Investigation, Final Focused Remedial Investigation Work Plan:

"Additional investigative fieldwork will be conducted in an area between Sites 1 and 2 due to insufficient geological data that does not differentiate between various soil types or provide adequate information to extrapolate subsurface conditions. Approximately 6 CPT locations and 4 soil borings will be performed along 3 transects, with two borings and one CPT per transect. Figure 4-2a shows the locations of the various CPTs and soil boring locations. Sampling and collection of geotechnical data will be performed as previously described for the field exploration activities and sampling methods conducted at IR Site 2. Concrete coring or cutting will be necessary due to a section of aircraft runway currently overlaying the site. The additional geotechnical analytical and interpretive analysis will be presented in a supplemental section of the Pre-Draft OE/Geotechnical Characterization Report for Site 2. "

☒ **Minor change** ☐ Major change (impacts cost, schedule or technical)

Will this change result in a contract cost or time change ☒ Yes **No**

Estimate of contract cost or time charge (if any) 100 K (approx.)

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date
		Sr. Project Geologist		

Disposition

☐ Not approved (give reason).

☐ Considered minor change – approved per Recommended Disposition – Documents will not formally be revised, field to maintain as-built records.

☐ Considered major change – Design Change Notice Form to be completed.

FWENC UXO Discipline Lead (signature) (if UXO related) N/A ☐ Comments (attached) ☐ No Comments	Date	FWENC Project Manager (signature) ☐ Comments (attached) ☒ No Comments	Date
CIH (signature) (if health and safety related)	Date	Project Scientist (signature) (if science related)	Date

☐ Comments (attached) ☐ No Comments			☐ Comments (attached) ☒ No Comments	
Distribution:		Date	QC Program Manager (signature) (if science related)	Date
PJM:	Abid Loan	5/31/02		
Site Superintendent:	Lance Humphrey	5/31/02		
CIH	Roger Margotto	5/31/02	☐ Comments (attached) ☐ No Comments	
Navy RPM:	Rick Weissenborn	5/31/02		
ROICC:	Izzat Ahmadiyya	5/31/02		
ECM:	Doug Delong	5/31/02		
CTA:	Bob Perricone	5/31/02		

APPENDIX J

TEST PIT LOGS

FIELD LOG OF TEST PIT

LENGTH 6'
WIDTH 2'
DEPTH 1.5'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-1

SHEET 1 OF 1

CORDINATES: N 471853.35 E 1472682.76

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-8-02

DATE FINISHED: 2-8-02

GROUND SURFACE EL.: 9.28

SOIL DESCRIPTION & REMARKS

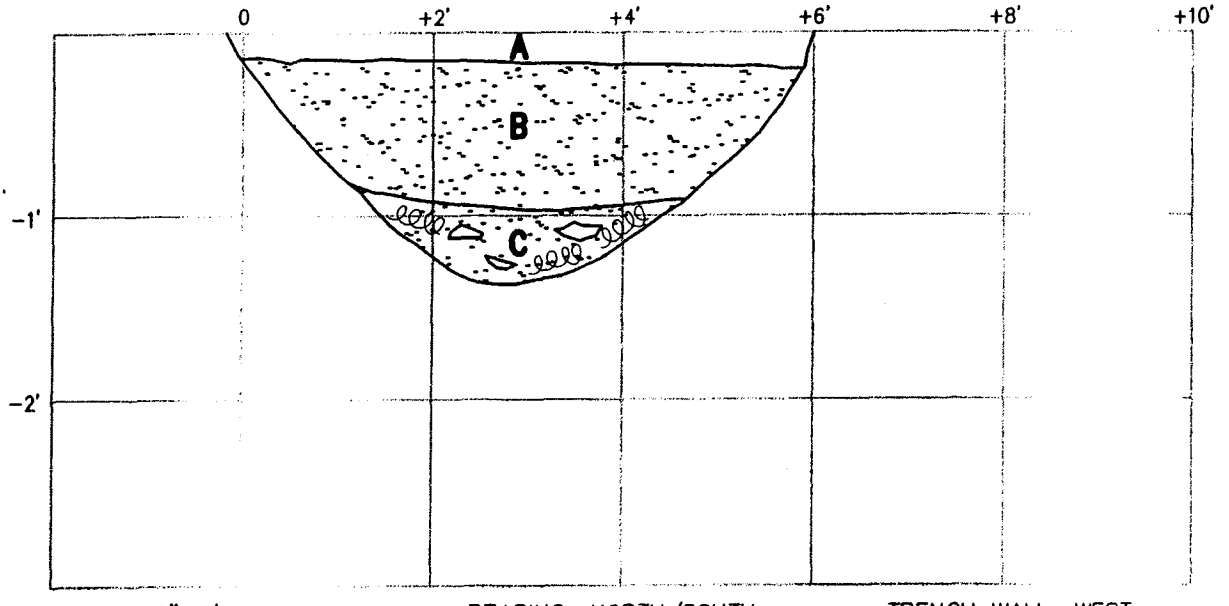
A) 0-4" - SOIL/GRASS COVER W/ 3"-4" ROOT ZONE - SM, SILTY SAND, OLIVE BROWN (2.5Y 4/3), LOW PLASTICITY

B) 3"-1' - FILL - SP, FINE SAND W/SHELL FRAGMENTS, OLIVE BROWN (2.5Y 3/4), SLIGHT MOIST AND LOOSE

C) 1'-1.5' - REFUSE WOOD, PAPER, MINOR METAL, PLASTIC IN SOIL (FINE SAND MATRIX)

COLLECT SAMPLE #095-02-051 FROM HORIZON B

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2' BEARING: NORTH/SOUTH TRENCH WALL: WEST

PNZG-6-WALL

CLIENT SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-1.dwg 08/02/2002 10:08:40 AM PDT

FIELD LOG OF TEST PIT

LENGTH 9'
WIDTH 2'
DEPTH 2.5'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-2

SHEET 1 OF 1

CORDINATES: N 471851.57
E 1472332.76

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS
EDITED BY:
CHECKED BY:

DATE BEGAN: 2-8-02
DATE FINISHED: 2-8-02
GROUND SURFACE EL.: 8.39

SOIL DESCRIPTION & REMARKS

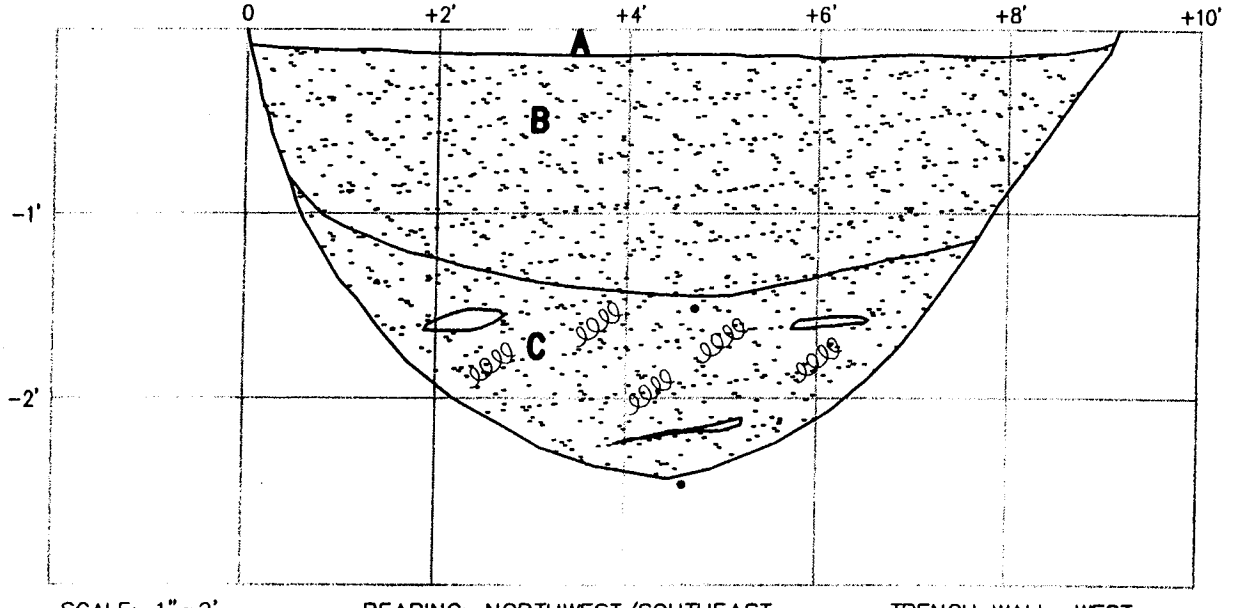
A) 0-4" - SOIL/GRASS COVER W/ 3"-4" ROOT ZONE - SM, SILTY SAND

B) 3"-1.5' - FILL - SP - FINE MED SAND W/ SHELL FRAGMENTS, OLIVE BROWN (2.5Y 4/3), SLIGHT MOISTURE, LOOSE

C) 1.5'-2.5 '- REFUSE - PAPER, PLASTIC, WOOD, ETC. NO ODOR

COLLECT SOIL SAMPLE 095-2-050 FROM HORIZON B

PROFILE OF PITWALL: ← NORTHWEST SOUTHEAST →



SCALE: 1"=2'

BEARING: NORTHWEST/SOUTHEAST

TRENCH WALL: WEST
PHOTO: IR2G-3

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.0950
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-2.dwg 08/02/2002 11:18:41 AM PDT

FIELD LOG OF TEST PIT

LENGTH 8'
WIDTH 2'
DEPTH 2'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-3

SHEET 1 OF 1

CORDINATES: N 472542.10
E 1472735.10

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS
EDITED BY:
CHECKED BY:

DATE BEGAN: 2-8-02
DATE FINISHED: 2-8-02
GROUND SURFACE EL.: 9.48

SOIL DESCRIPTION & REMARKS

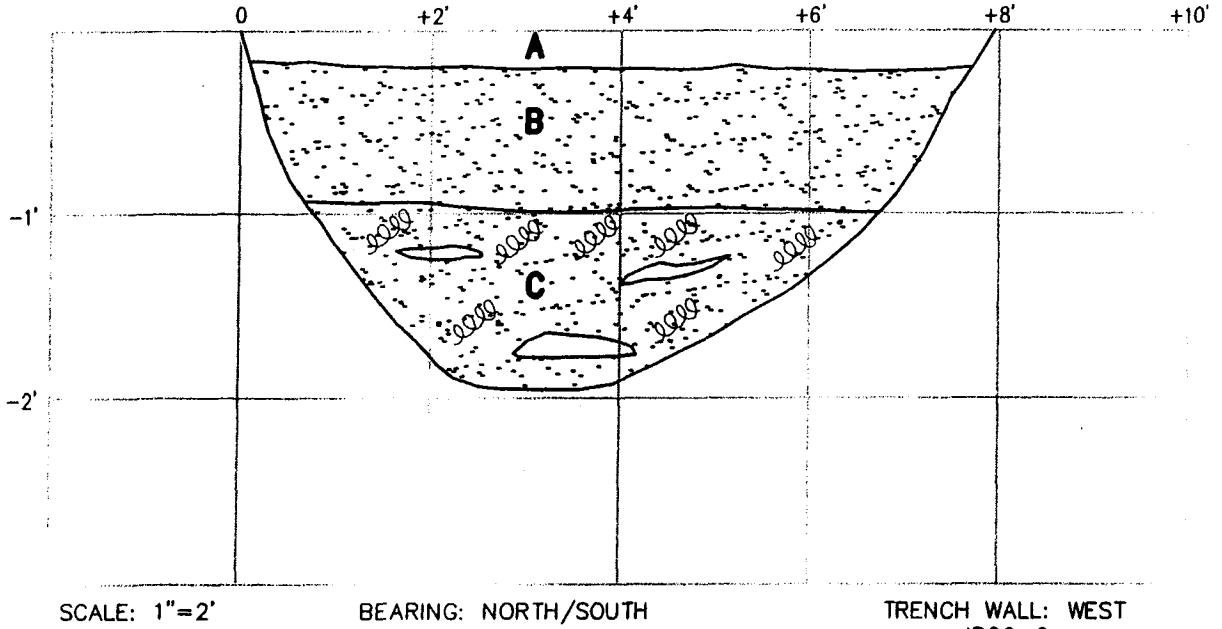
A) 0-4" - SOIL/GRASS COVER W/ 3"-4" ROOT ZONE - SM, SILTY SAND, FINE SAND W/MED. PLASTIC FINES OLIVE GREY (5Y 4/2)

B) 4"-1' - FILL - SP, FINE MED SAND W/ SHELL FRAGMENTS, OLIVE BROWN (2.5Y 4/3), SLIGHT MOISTURE, LOOSE

C) 1'-2' REFUSE - RUBBER HOSE, FIRE HOSE, PLASTIC ELS IN SANDY SOIL MATRIX

COLLECT SOIL SAMPLE 095-2-052 FROM HORIZON B

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2' BEARING: NORTH/SOUTH TRENCH WALL: WEST
IR2G-9

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-3.dwg 08/02/2002 10:16:19 AM PDT

FIELD LOG OF TEST PIT

LENGTH 9'
WIDTH 2'
DEPTH 2.5'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-4 (STAKE 718)

SHEET 1 OF 1

CORDINATES: N 472581.08
E 1472228.51

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS
EDITED BY:
CHECKED BY:

DATE BEGAN: 2-8-02
DATE FINISHED: 2-8-02
GROUND SURFACE EL.: 13.18

SOIL DESCRIPTION & REMARKS

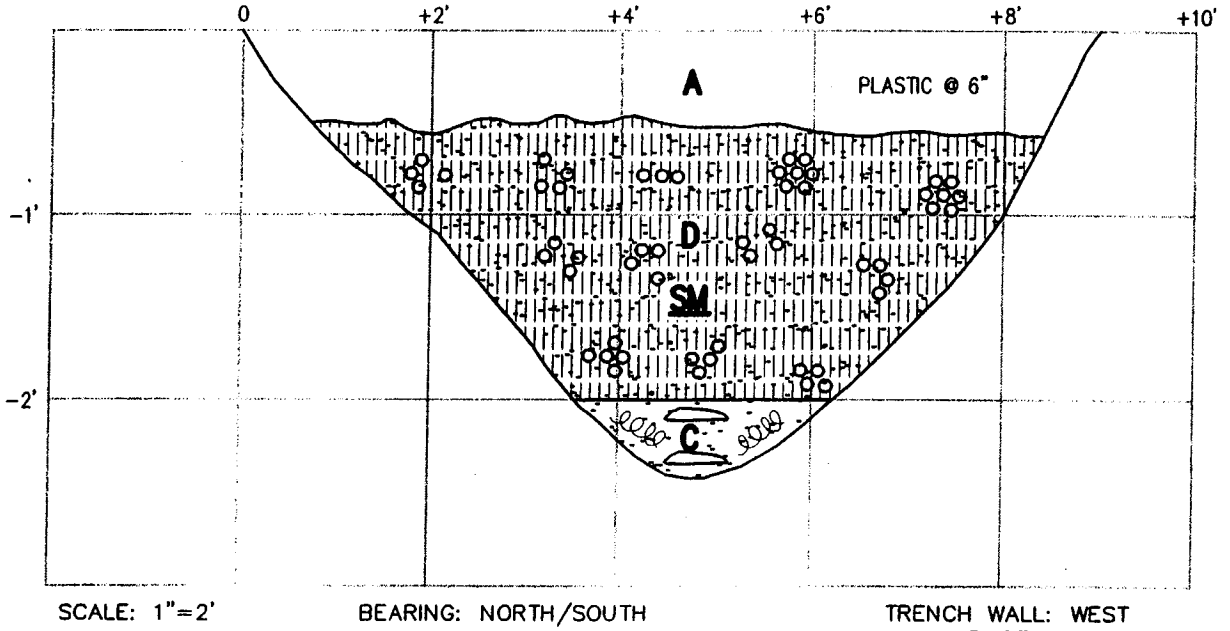
A) 0-5" - SOIL/GRASS COVER W/ 5" ROOT ZONE - SILTY SAND/SANDY SILT

D) 5"-2' - FILL - SANDY SILT, VERY GRAYISH BROWN (2.5y 4/2), MED-HIGH PLASTICITY CONSOLIDATED-FIRM CONSISTENCY, SLIGHT MOISTURE

C) 2'-2.5' REFUSE - PLASTIC, PAPER >20% IN SANDY SILT SOIL MATRIX , SLIGHT MOISTURE, NO ODOR

COLLECT 095-2-053 FROM D HORIZON

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2' BEARING: NORTH/SOUTH TRENCH WALL: WEST
PHOTO: IR2G-12

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-4.dwg 08/02/2002 10:25:20 AM PDT

FIELD LOG OF TEST PIT

LENGTH 10'
WIDTH 2'
DEPTH 2'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-5 (STAKE 709)

SHEET 1 OF 1

CORDINATES: N 473332.75
E 1471767.37

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-8-02

DATE FINISHED: 2-8-02

GROUND SURFACE EL.: 6.57

SOIL DESCRIPTION & REMARKS

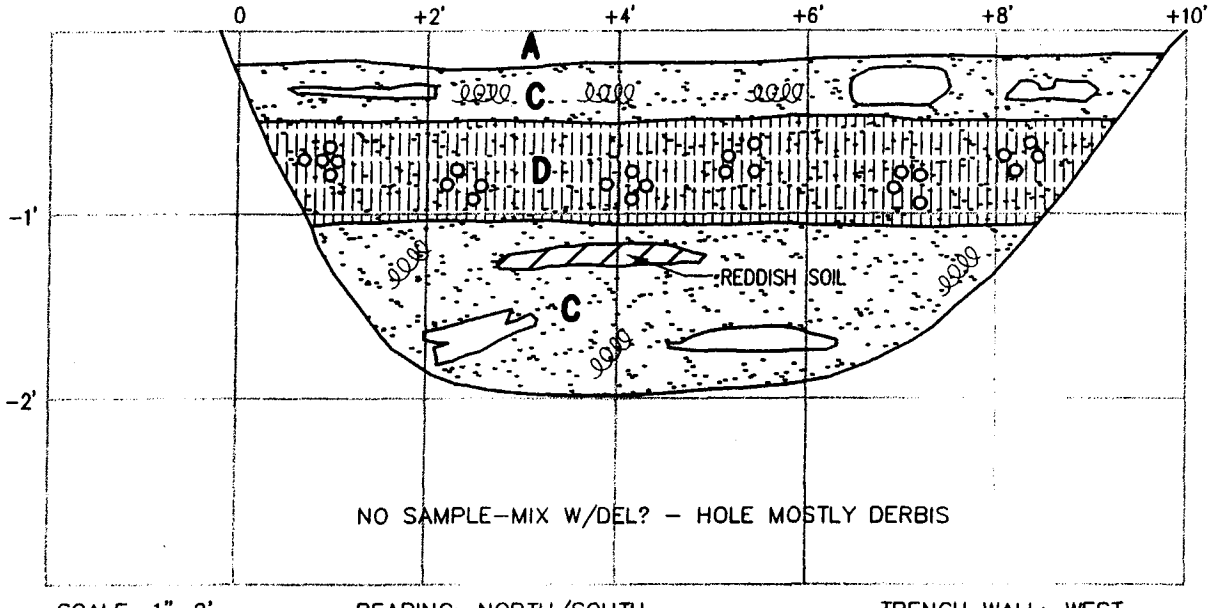
A) 0"-2" SOIL/GRASS COVER W/ 2" ROOT ZONE - SM, SANDY SILT, DARK GRAYISH BROWN (2.5y, 4/2)

C) 2" -6" REFUSE - CONSTRUCTION DEBRIS, CONCRETE, PIPE, SMALL PIECES OF BRICKS - 15%-20% IN SANDY SILT MATRIX W/GRAVEL.

D) 6"-1' - FILL, SANDY SILT W/MINOR DEBRIS AND ROCK, DARK BROWN

C) 1'-2' REFUSE - CONSTRUCTION DEBRIS W/ PAPER, WIRE, ASPHALT, WOOD IN A SANDY SOIL MATRIX, 25% REDDISH COLORED (OXIDATION STAINING).

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2' BEARING: NORTH/SOUTH TRENCH WALL: WEST
IN2G-14

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-5.dwg 08/02/2002 10:48:04 AM PDT

FIELD LOG OF TEST PIT

LENGTH 8'
WIDTH 2'
DEPTH 2'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-6

SHEET 1 OF 1

CORDINATES: N 473377.52
E 1472338.54

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-11-02

DATE FINISHED: 2-11-02

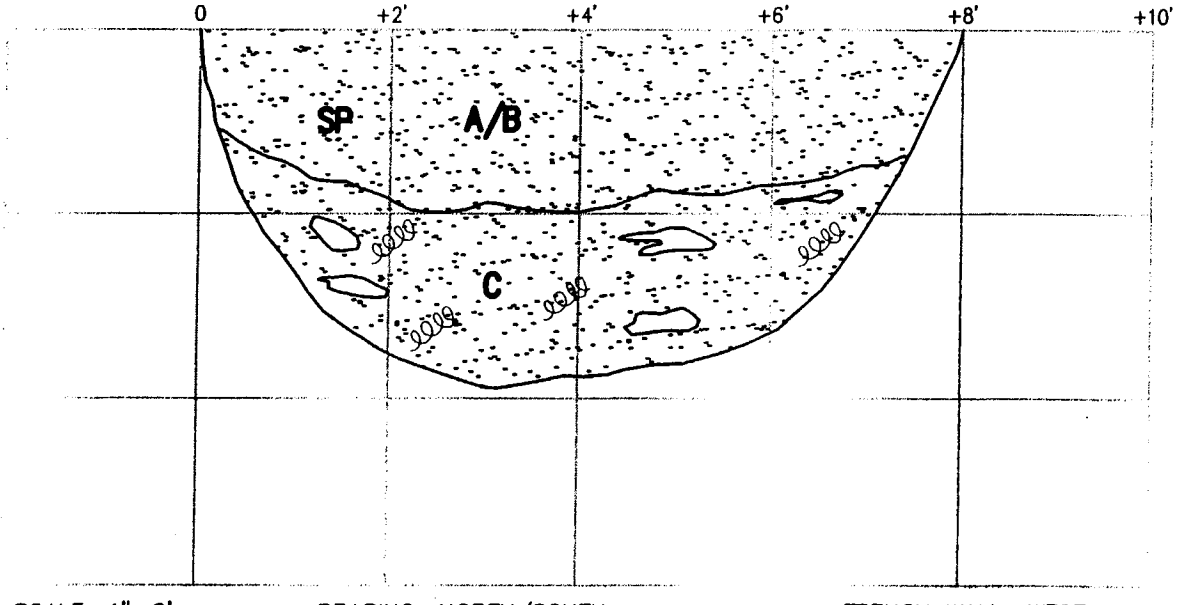
GROUND SURFACE EL.: 8.34

SOIL DESCRIPTION & REMARKS

A/B) 0"-1' SOIL/GRASS COVER W/UNDULATING ROOT ZONE MIXED WITH A SANDY SOIL, IRREGULAR THICKNESS OF FINE SAND W/SLIGHT MOISTURE, OLIVE BROWN (2.5Y 4/3)

C) 1'-2' REFUSE - OXIDIZED STAINED PAPER, PLASTIC, WIRE AND WOOD IN A SAND/SILTY SAND MATRIX, FINE GRAINED

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2' BEARING: NORTH/SOUTH TRENCH WALL: WEST

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-6.dwg 08/02/2002 10:53:15 AM PDT

FIELD LOG OF TEST PIT

LENGTH 10'
WIDTH 2'
DEPTH 4'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-7

SHEET 1 OF 1

CORDINATES: N 473330.83
E 1472857.12

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-11-02

DATE FINISHED: 2-11-02

GROUND SURFACE EL.: 11.74

SOIL DESCRIPTION & REMARKS

A) 0"-3" SOIL/GRASS COVER W/ 3" ROOT ZONE ON SILTY SAND

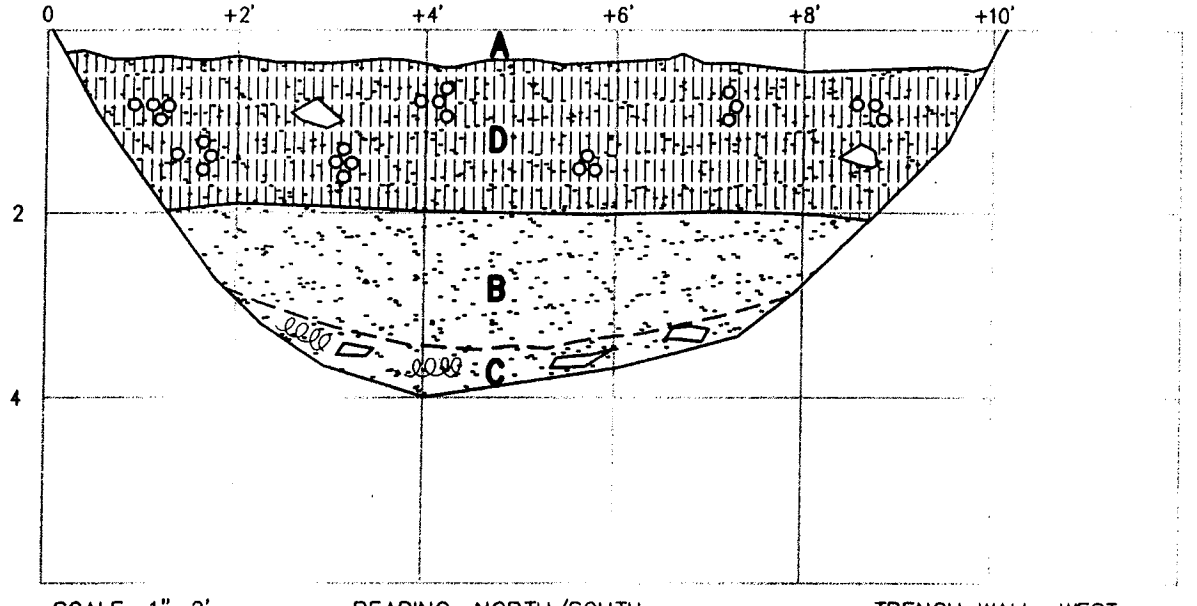
D) 3"-2' FILL - SANDY SILT/SILTY SAND, FINE SAND AND SILT W/ APPROXIMATELY 5% ASPHALT, BRICK, STONE 2.5y 2/3 V/DARK GRAYISH BROWN

B) 2'-3' FILL- SP, FINE SAND, OLIVE BROWN (2.5Y 4/3), SLIGHT MOISTURE, LOOSE

C) 3'-4' REFUSE - OXIDIZED STAINED PAPER, PLASTER, WIRE AND WOOD IN A SAND/SILT MATRIX, FINE-GRAINED

COLLECT SOIL SAMPLE #092-2-056

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2' BEARING: NORTH/SOUTH TRENCH WALL: WEST
IR2G-9

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-7.dwg 08/02/2002 10:57:01 AM PDT

FIELD LOG OF TEST PIT

LENGTH 8'
WIDTH 2'
DEPTH 2.5"

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-8

SHEET 1 OF 1

CORDINATES: N 473601.31
E 1471252.62

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-11-02

DATE FINISHED: 2-11-02

GROUND SURFACE EL.: 4.15

SOIL DESCRIPTION & REMARKS

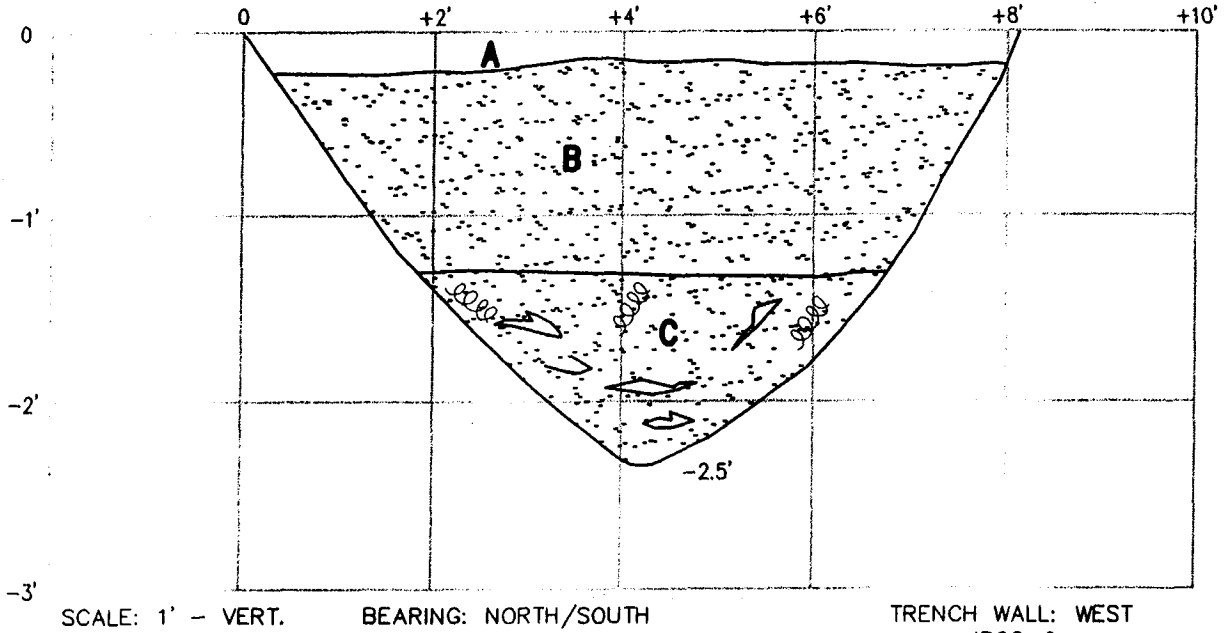
A) 0"-3" SOIL/GRASS COVER W/ 3" ROOT ZONE ON SILTY SAND

B) 3"-1.5' FILL - SP, FINE SAND, OLIVE BROWN (2.5Y 4/3), SLIGHT MOISTURE

C) 1.5'-2.5' REFUSE - OXIDIZED LAYER OF WOOD, METAL , ETC. IN A DARK SILTY SAND. MATRIX

COLLECT SOIL SAMPLE 095-055 FROM HORIZON B

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1' - VERT.
2' - HORZ.

BEARING: NORTH/SOUTH

TRENCH WALL: WEST
IR2G-9

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b04190100D\dwg\TP-2-8.dwg 08/02/2002 11:36:32 AM PDT

FIELD LOG OF TEST PIT

LENGTH 8'
WIDTH 2'
DEPTH 3'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-9

SHEET 1 OF 1

CORDINATES: N 473991.83
E 1471836.37

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-11-02

DATE FINISHED: 2-11-02

GROUND SURFACE EL.: 5.98

SOIL DESCRIPTION & REMARKS

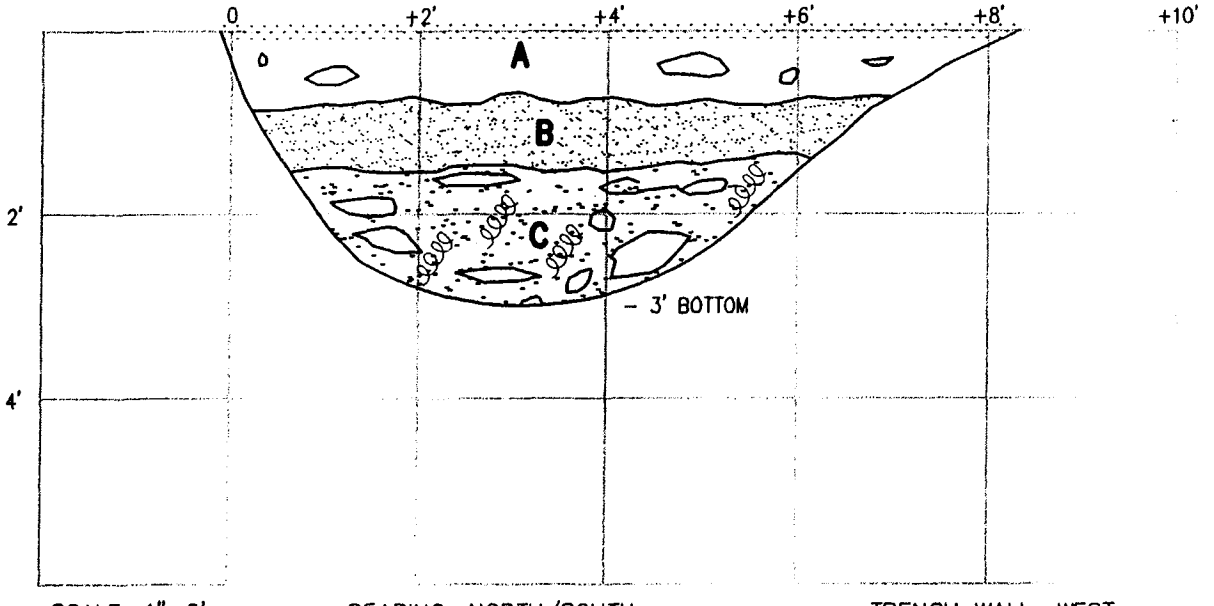
D) 0-1' FILL- GRASS COVER W/ 2" ROOT ZONE MIXED W/ROCK, MINOR BRICK AND CONCRETE DEBRIS IN SILTY SAND/SANDY SILT SOIL MATRIX

B) 1'-1.5' FILL - SP, FINE SAND W/TRACESILT, SILT < 5% OLIVE BROWN (2.5y 4/3)

C) 1.5'-3.0' - REFUSE - WOOD, METAL, PAPER W/OXIDIZED LAYERS OF SANDY SILT.

NO SAMPLE, COVER INCONSISTENT

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1"=2'

BEARING: NORTH/SOUTH

TRENCH WALL: WEST
IR2G-9

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-9.dwg 08/02/2002 11:40:40 AM PDT

FIELD LOG OF TEST PIT

LENGTH 7'
WIDTH 2'
DEPTH 2.5'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-10

SHEET 1 OF 1

CORDINATES: N 474003.87
E 1472375.30

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS
EDITED BY: -
CHECKED BY: -

DATE BEGAN: 2-11-02
DATE FINISHED: 2-11-02
GROUND SURFACE EL.: 5.38

SOIL DESCRIPTION & REMARKS

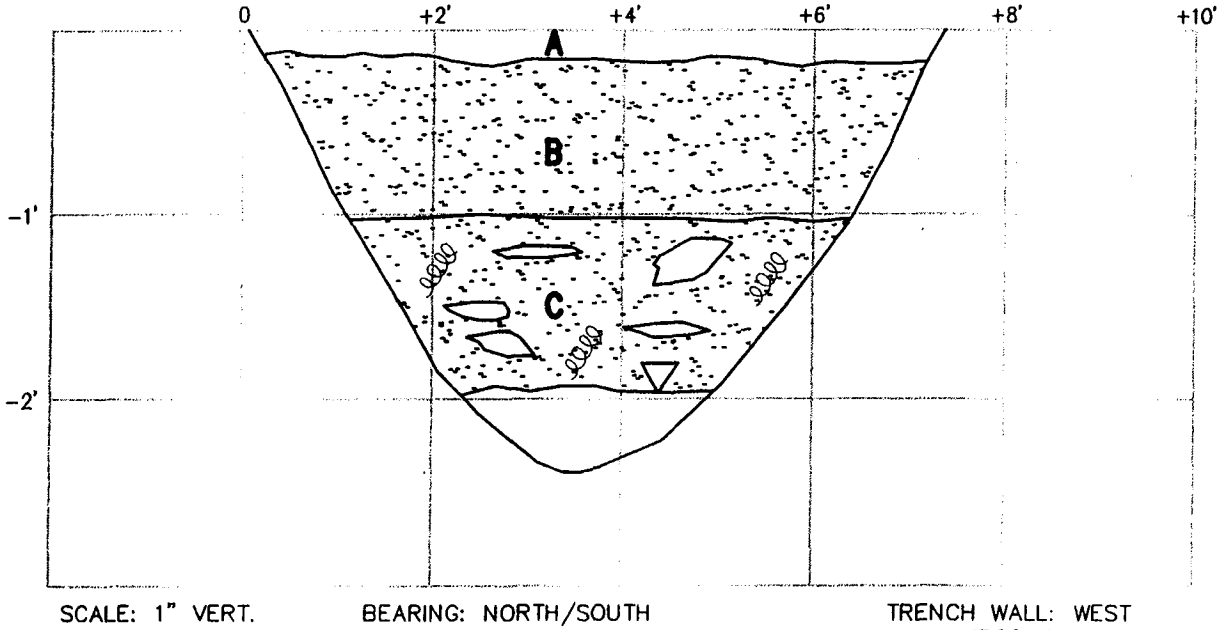
A) 0"-3" SOIL/GRASS COVER W/ 3" ROOT ZONE ON SILTY SAND, OLIVE GREY (5Y 4/2)

B) 3"-1' FILL - SM, SANDY SILT, FINE - MED SAND W/SILT,MED PLASTICITY, SLIGHT MOISTURE OLIVE BROWN (2.5Y 4/3)

C) 1'-2.5' REFUSE - , METAL, WOOD, CLOTH 20%-30% IN SANDY SILT MATRIX, WATER FILLS TRENCH 2'BELOW GROUND SURFACE

COLLECT SOIL SAMPLE 095-2-054 FROM HORIZON B

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1" VERT.
2' HORZ.

BEARING: NORTH/SOUTH

TRENCH WALL: WEST
IR2G-9

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-10.dwg 08/02/2002 11:47:14 AM PDT

FIELD LOG OF TEST PIT

LENGTH 8'
WIDTH 2'
DEPTH 2'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-11

SHEET 1 OF 1

CORDINATES: N 474315.71
E 1471436.68

FIELD ENGINEER/ GEOLOGIST: VINCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-11-02

DATE FINISHED: 2-11-02

GROUND SURFACE EL.: 8.76

SOIL DESCRIPTION & REMARKS

A) 0-2" SOIL/GRASS COVER W/ 2" ROOT ZONE ON SILTY SAND

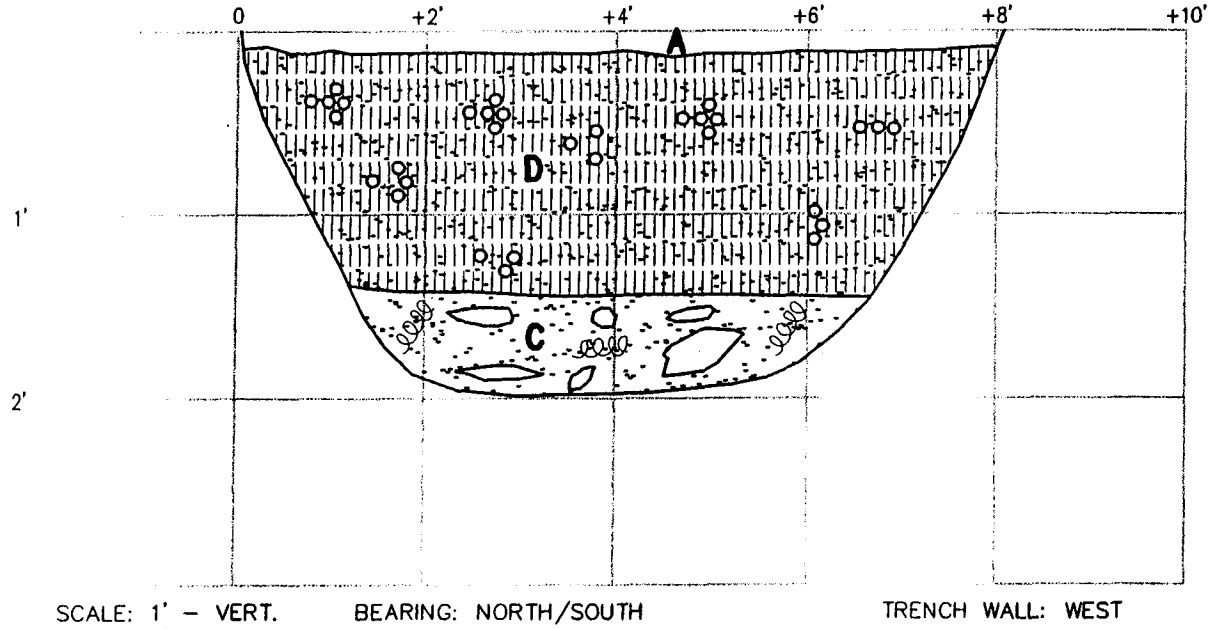
D) 2"-1.5' - FILL - CONSTRUCTION DEBRIS, ROCK, CONCRETE CHIPS. ASPHALT IN DARK OLIVE BROWN.SILTY SAND,/SANDY SILT SOIL MATRIX, SLIGHT MOISTURE

C) 1.5'-2' - REFUSE - MOSTLY WOOD AND ROCK MATERIAL

PILES OF CONSTRUCTION DEBRIS IN AREA

NO SAMPLE

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1' - VERT.
2' - HORZ.

BEARING: NORTH/SOUTH

TRENCH WALL: WEST

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b04190100\dwg\TP-2-11.dwg 08/02/2002 12:24:04 PM PDT

FIELD LOG OF TEST PIT

LENGTH 6'
WIDTH 2'
DEPTH 3'

CASE BACKHOE
580 SUPER L

TEST PIT NUMBER TP-2-12

SHEET 1 OF 1

CORDINATES: N 474067.01
E 1472892.43

FIELD ENGINEER/ GEOLOGIST: VIENCE RICHARDS

EDITED BY:

CHECKED BY:

DATE BEGAN: 2-11-02

DATE FINISHED: 2-11-02

GROUND SURFACE EL.: 6.21

SOIL DESCRIPTION & REMARKS

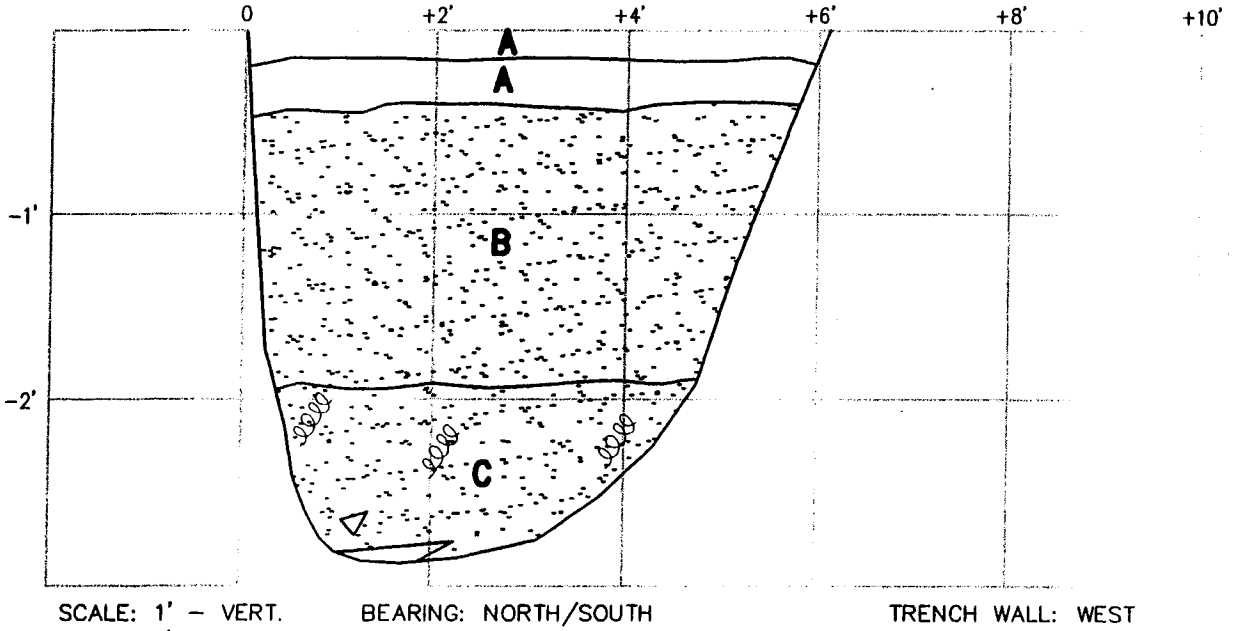
A) 0"-6" TOPSOIL/ROOT GRASS COVER - SURFACE DEBRIS. MIX IN - PIPE, PAPER UNDER COVER OF ICE PLANTS.

B) 6"-2' FILL - SP, SAND WITH SILT, FINE SAND W/10-15% LOW PLASTIC FINE OLIVE BROWN (2.5Y 4/3), SLIGHT MOISTURE)

C) 2-3' REFUSE - GLASS, PAPER, PLASTER WITH APPROXIMATELY 10% FINE SILTY SAND.

H20 AT APPROXIMATELY 3'. NO SAMPLE

PROFILE OF PITWALL: ← NORTH SOUTH →



SCALE: 1' - VERT.
2' - HORZ.

BEARING: NORTH/SOUTH

TRENCH WALL: WEST

CLIENT US NAVY/SWDIV
PROJECT NO. 2384.095D
LOCATION ALAMEDA, IN SITE 2

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

I:\Projects\2384095b041901000\dwg\TP-2-12.dwg 08/02/2002 12:36:54 PM PDT

APPENDIX K

LONG-TERM AND IMMEDIATE STATIC SETTLEMENT CALCULATIONS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PROJECT:	1990.054D.0419.02000	CALC NO:		REV:	1	PAGE	1	OF	20
SUBJECT:	Settlement Calculations								
PREPARED BY:	T.Y. Lai	DATE:	8/7/02	CHECKED BY:	F. Ahtchi-Ali	DATE:	8/8/02		

1.0 CALCULATION COVER SHEET

PROJECT: IR Site 2, Alameda Point, Alameda California

SUBJECT: Settlement Calculations

IMPORTANT TO SAFETY ☒ **ASME** ☐ **NOT IMPORTANT TO SAFETY** ☐

CLIENT: Department of the Navy **PROJECT NO:** 1990.054D.0419.02000

CALCULATION NO: _____ **NUMBER OF PAGES:** 20

CALCULATION BY OTHERS: YES ☐ NO ☒

PREPARER: Timothy Y. Lai

CHECKER: Faouzi Ahtchi-Ali, Faouzi Ahtchi-Ali

VERIFIER: Faouzi Ahtchi-Ali, Faouzi Ahtchi-Ali

APPROVED BY: _____ **DATE:** _____

ASSUMPTIONS THAT REQUIRE CONFIRMATION: YES ☐ NO ☒

CONFIRMED BY: _____ **DATE:** _____ **INITIAL:** _____

PRINT NAME, DATE AND INITIAL

Rev No	Affected Pages	Prepared by Date	Checked by Date	Verified by Date
1	ALL	Timothy Y. Lai 8/7/02	F. Ahtchi-Ali, FAA 8/8/02	F. Ahtchi-Ali, FAA 8/8/02

2.0 TABLE OF CONTENTS

1.0 CALCULATION COVER SHEET 1
2.0 TABLE OF CONTENTS 2
3.0 PURPOSE 3
4.0 RESULTS SUMMARY 3
5.0 INPUTS 5
6.0 METHODOLOGY 5
7.0 REFERENCES 6
8.0 CALCULATION DETAIL 7

3.0 PURPOSE

The purpose of this calculation is to estimate total and differential ground settlements at the project site (IR Site 2 and the area between IR Site 1 and 2) resulting from an assumed 4 feet thick landfill cap and additional fill material. The additional fill material to be used for final grading of the site was assumed to be a maximum of 10 feet thick.

4.0 RESULTS SUMMARY

IR site 2 consists of the following stratigraphic units: Fill, Young Bay Mud (Bay Sediments), Merritt Sand, San Antonio Formation, Yerba Buena Mud (Old Bay Mud), Alameda Formation, and Franciscan Formation (see Geologic Cross Sections in Figures 4-4 and 4-5). Ground settlements from applied loading will occur mainly from (1) elastic settlement of the Fill layer and (2) consolidation/compression of the Young Bay Mud and Old Bay Mud. Settlements from the Merritt Sand, San Antonio Formation, Alameda Formation, and Franciscan Formation are considered negligible since they are very dense/stiff compared to the other soil layers [see cone penetration test (CPT) data in Appendix B].

Settlements were calculated for two loading conditions: (1) landfill cap and (2) landfill cap with additional fill material. Table 1 summarizes the settlement results for each CPT hole location considered. The maximum total settlements calculated are 12.86 and 33.87 inches respectively for the two loading conditions. Differential settlements were obtained by taking the difference of the values computed from the two loading conditions.

The settlements calculated on top of the perimeter berm (CPT hole locations C-2-1 to C-2-10 are mostly elastic and significantly less than those calculated at the northern part of the site where the West Beach Landfill is located. The settlements on top of the berm were calculated using an assumed loading (4 to 14 feet of fill) but are not expected to occur because no cap or additional fill is expected in this area.

Potential grading material and landfill cap (up to 4 to 14 feet soil thickness) could be placed at the West Beach Landfill area in the future. Larger settlements in this area (C-2-11 to C-2-15) are expected due to the presence of the Young Bay Mud/Old Bay Mud layers and sensitive fine-grained material just below the ground surface. These settlements are expected to occur over a long period of time (up to 40 years) after load application because of the low permeability of the

Young Bay Mud/Old Bay Mud and fine-grained material (Coefficient of consolidation, C_v = 0.000032 in^2/sec).

In the area between IR Sites 1 and 2, the Old Bay Mud layer (See Figure 4-8i) existing beneath the Merritt Sand extends up to approximately 200 feet below ground surface. This layer, which consists of fine-grained sensitive soil similar to the Young Bay Mud, contributes additional consolidation settlement. The maximum total settlements calculated in this area (C-2-16 to C-2-21) are 8.47 and 27.5 inches respectively for the two loading conditions considered. Differential settlements were estimated to be 13 to 19 inches. These settlements are expected to occur over a very long period of time (up to 400 years) after load application because of the depth and thickness of the Old Bay Mud layer.

Table 1: Summary Table of Settlements

CPT No.	Elastic (landfill cap) (inch)	Elastic (cap+fill) (inch)	Consolidation (landfill cap) (inch)	Consolidation (cap+fill) (inch)	Secondary Compression (inch)	Total (landfill cap) (inch)	Total (cap+fill) (inch)	Differential (inch)
C-2-1	1.11	3.88	1.03	3.01	1.00	3.13	7.88	4.75
C-2-2	0.95	3.34	0.60	1.77	0.87	2.42	5.98	3.56
C-2-3	1.66	5.83	0.45	1.35	0.79	2.91	7.96	5.06
C-2-4	1.09	3.81	0.60	1.77	0.87	2.56	6.45	3.89
C-2-5	1.13	3.94	0.54	1.62	0.87	2.54	6.43	3.90
C-2-6	1.36	4.77	0.97	2.94	1.01	3.35	8.73	5.38
C-2-7	1.42	4.98	0.78	2.38	1.00	3.20	8.36	5.15
C-2-8	1.70	5.95	0.77	2.34	1.00	3.47	9.29	5.82
C-2-9	2.93	10.24	1.26	3.82	0.96	5.15	15.03	9.88
C-2-10	0.98	3.44	5.30	15.32	1.17	7.45	19.93	12.47
C-2-11	0.80	2.79	7.83	20.06	1.00	9.63	23.84	14.21
C-2-12	0.81	2.83	5.40	15.95	1.41	7.61	20.18	12.57
C-2-13	0.94	3.28	11.50	30.17	0.42	12.86	33.87	21.01
C-2-14	0.26	0.92	11.56	30.36	0.00	11.82	31.29	19.47
C-2-15	1.30	4.54	4.45	13.28	1.01	6.76	18.84	12.08
C-2-16	0.88	3.07	7.84	24.43	0.00	8.71	27.50	18.79
C-2-17	0.39	1.37	7.85	24.15	0.00	8.24	25.53	17.29
C-2-18	0.53	1.85	5.98	18.60	0.42	6.93	20.88	13.95
C-2-19	0.54	1.87	6.64	20.88	0.51	7.69	23.26	15.57
C-2-20	0.54	1.89	5.78	17.98	0.42	6.75	20.30	13.55
C-2-21	0.27	0.93	8.21	25.14	0.00	8.47	26.07	17.60

5.0 INPUTS

Thickness of the landfill cap and additional fill material was assumed to be 4 and 10 feet respectively. The material unit weights for the landfill cap and additional fill were assumed to be 125 pounds per cubic feet (pcf). Unit weights of the Fill and Young Bay Mud layer were taken from Table 4-6, "Summary of Material Design Parameters." CPT data in Appendix H provides depths of the different soil layers and variation of strength parameters (tip resistance) with depth. Material parameters such as the compressibility (C), coefficient of consolidation (C_v), and coefficient of secondary compression ($C_{\alpha\varepsilon}$) used for computing consolidation/compression settlements were obtained from laboratory testing of field samples (Summary of Laboratory Test Results Table, p. G-3, Appendix G). Averaged values were used and compared with published data for the Young Bay Mud (Pyke, 1989; Terzaghi et. al., 1996). A ground water table of 5 feet below ground surface was considered appropriate base on observations from test pit and bore hole explorations.

6.0 METHODOLOGY

Elastic settlements of the Fill layer were estimated using the theory of elasticity. In this method, the Fill layer was subdivided into sub-layers with varying strength parameters (tip resistance). An averaged elastic modulus for each sub-layer was obtained by correlation with the tip resistance (Das,1990). The strain (settlement) of each sub-layer was then calculated for two different loading conditions (landfill cap and landfill cap with additional fill material). The total elastic settlement was obtained by adding the settlements from each sub-layer. This calculation was made for each CPT hole location.

Settlements of the Young Bay Mud layer, Old Bay Mud layer and upper sensitive fine-grained materials consist of primary consolidation, secondary compression and elastic/immediate settlement. Consolidation settlements are estimated using 1-D consolidation theory (Terzaghi as described by Coduto, 1994). This method is appropriate since the loading condition is generally uniform and extends laterally throughout the site. Secondary compression settlement due to creep, compression and decomposition of organic matter was calculated for a period of 30 years after load application and added to the overall settlement. If the primary consolidation exceeds 30 years to complete, the secondary compression settlement will be zero. Elastic/immediate settlement is only a concern for unsaturated and highly over-consolidated clays. Since the Young Bay Mud and Old Bay Mud layer are under the water table and classified as normally consolidated to slightly under-consolidated, elastic/immediate settlement was considered to be negligible and not calculated.

To maintain proper drainage and slope design, additional fill materials will be placed at the site causing uneven loading. Differential settlements were conservatively estimated by taking the difference between the settlement values calculated from the maximum assumed loading (landfill cap with additional fill) and the settlement caused by the minimum assumed loading (landfill cap only).

7.0 REFERENCES

Coduto, D.P. 1994. *Foundation Design: Principles and Practices*. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

Das, B. 1990. *Principles of Foundation Engineering*, 2nd Edition, PWS-Kent Publishing Company, Boston, MA.

Foster Wheeler Environmental Corporation (FWENC). 2002. *Draft-Final Ordnance and Explosives Waste/ Geotechnical Characterization Report*. Ordnance and Explosives Waste Characterization, and Geotechnical and Seismic Evaluations at Installation Restoration Site 1. Alameda Point, Alameda, California.

Naval Facilities Engineering Command (NAVFAC) Design Manual (DM-7.01: Soil Mechanics), 1982.

Peck, R. B., Hanson, W.E. and Thornburn, T. H. 1974. *Foundation Engineering*, John Wiley & Sons, Inc., New York, NY.

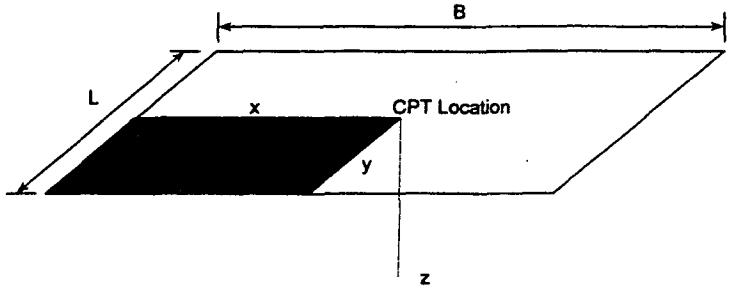
Pyke, R. May 13, 1989. One-Day Symposium on the Geotechnical and Hydrological Properties of San Francisco Bay Mud. The Lafayette Park Hotel, Lafayette, California.

Terzaghi, K., Peck, R.B. and Mesri, G. 1996. *Soil Mechanics in Engineering Practice*, 3rd Edition, John Wiley & Sons, Inc., New York, NY.

8.0 CALCULATION DETAIL

Elastic Settlement of Fill Layer (Based on Cone Penetration Tests).

The site is predominantly underlain by fill material consisting of silty sand. Elastic settlements at IR Site 2 can be estimated by using test results from cone penetration tests (CPT). Loading from a landfill cap and additional fill material are considered. Settlement calculations are based on theory of elasticity. Stress distribution from a uniform load can be obtained using influence values (NAVFAC DM-7.1, 1982.)



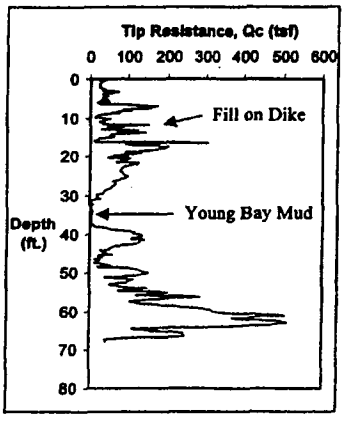
- Input Data/Preliminary Calculation:

B = Effective Width of Cover;	$B = 100$ ft.	
L = Effective Length of Cover;	$L = 100$ ft.	
x,y = Influence Dimensions;	$x = \frac{B}{2}$ $y = \frac{L}{2}$	
t = Time Since Application of Load;	$t = 0.1$ yr.	
th_{cap} = Thickness of landfill cap;	$th_{cap} := 4$ ft.	
th_{fill} = Thickness of additional fill;	$th_{fill} := 10$ ft.	
γ = Soil Unit Weight;	$\gamma = 125$ pcf (assumed value)	
q' = Net Bearing Pressure at ground surface (landfill cap);	$q' = \gamma \cdot th_{cap}$	$q' = 500$ psf
q' = Net Bearing Pressure at ground surface (landfill cap with additional fill);	$q'' = \gamma \cdot (th_{cap} + th_{fill})$	$q'' = 1750$ psf

- Elastic Settlement Equation, $\delta_e = \Sigma\,(q' I_{zi} H_i / E_i)$

where δ_e = Elastic Settlement
q' = Net Bearing Pressure
I_{zi} = Influence Factor at Midpoint of Soil Layer i
H_i = Thickness of Soil Layer i
E_i = Modulus of Soil Layer i

- CPT Tip Resistance vs. Depth for Hole C-2-1:



- Calculation of Elastic Settlement (using data from CPT hole C-2-1):

$$\begin{pmatrix} \delta'_{c1} \\ \delta''_{c1} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	2	1	50.00	50.00	0.25	500	1750	25	50000	100000	2	0.0100	0.0350
2	2	6	4	12.50	12.50	0.25	500	1750	45	90000	180000	4	0.0111	0.0389
3	6	8	7	7.14	7.14	0.25	500	1750	120	240000	480000	2	0.0021	0.0073
4	8	10	9	5.56	5.56	0.25	500	1750	50	100000	200000	2	0.0050	0.0175
5	10	12	11	4.55	4.55	0.25	500	1750	40	80000	160000	2	0.0063	0.0219
6	12	16	14	3.57	3.57	0.25	500	1750	75	150000	300000	4	0.0067	0.0233
7	16	19	17.5	2.86	2.86	0.24	480	1680	200	400000	800000	3	0.0018	0.0063
8	19	27	23	2.17	2.17	0.24	480	1680	75	150000	300000	8	0.0128	0.0448
9	27	31	29	1.72	1.72	0.22	440	1540	40	80000	160000	4	0.0110	0.0385
10	39	43	41	1.22	1.22	0.2	400	1400	125	250000	500000	4	0.0032	0.0112
11	43	49	46	1.09	1.09	0.18	360	1260	35	70000	140000	6	0.0154	0.0540
12	49	55	.52	0.96	0.96	0.17	340	1190	100	200000	400000	6	0.0051	0.0179
13	55	60	57.5	0.87	0.87	0.15	300	1050	200	400000	800000	5	0.0019	0.0066
											sum	(ft.) =	0.092	0.323

(x y q' q")

$\delta'_{c1} = 9.231 \times 10^{-2}$

$\delta''_{c1} = 0.323$

where z = Depth to midpoint of soil layer
I = Influence Factor
s_z = Stress at depth z
q_c = Cone Tip Resistance
E = Soil Modulus = 2.0 * q_c [Ref. Das, 1990]

- Calculate Elastic Settlement Due to Landfill Cap, $\delta_{cpt'}$ (inches):

$\delta_{cpt1'} := 12 \cdot \delta'_{c1}$ $\qquad$ $\delta_{cpt1'} = 1.108$ inch

- Calculate Elastic Settlement Due to Landfill Cap+Additional Fill, $\delta_{cpt''}$ (inches):

$\delta_{cpt1''} := 12 \cdot \delta''_{c1}$ $\qquad$ $\delta_{cpt1''} = 3.877$ inch

- Settlement Calculations Using other CPT Data (See Appendix H for CPT logs):

CPT Hole Location C-2-2:

$$\begin{pmatrix} \delta'_{c2} \\ \delta''_{c2} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	6	3	16.67	16.67	0.25	500	1750	40	80000	160000	6	0.0188	0.0656
2	6	8	7	7.14	7.14	0.25	500	1750	75	150000	300000	2	0.0033	0.0117
3	8	10	9	5.56	5.56	0.25	500	1750	250	500000	1E+06	2	0.0010	0.0035
4	10	14	12	4.17	4.17	0.25	500	1750	150	300000	600000	4	0.0033	0.0117
5	14	17	15.5	3.23	3.23	0.25	500	1750	200	400000	800000	3	0.0019	0.0066
6	17	20	18.5	2.70	2.70	0.24	480	1680	100	200000	400000	3	0.0036	0.0126
7	20	24	22	2.27	2.27	0.24	480	1680	75	150000	300000	4	0.0064	0.0224
8	24	35	29.5	1.69	1.69	0.22	440	1540	50	100000	200000	11	0.0242	0.0847
9	40	44	42	1.19	1.19	0.19	380	1330	150	300000	600000	4	0.0025	0.0089
10	44	50	47	1.06	1.06	0.18	360	1260	70	140000	280000	6	0.0077	0.0270
11	50	58	54	0.93	0.93	0.17	340	1190	100	200000	400000	8	0.0068	0.0238
											sum	(ft.) =	0.080	0.278

(x y q' q") $\delta'_{c2} = 7.954 \times 10^{-2}$ $\delta''_{c2} = 0.278$

CPT Hole Location C-2-3:

$$\begin{pmatrix} \delta'_{c3} \\ \delta''_{c3} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	10	5	10.0	10.0	0.25	500	1750	30	60000	120000	10	0.0417	0.1458
2	10	12	11	4.5	4.5	0.25	500	1750	110	220000	440000	2	0.0023	0.0080
3	12	14	13	3.8	3.8	0.25	500	1750	80	160000	320000	2	0.0031	0.0109
4	14	23	18.5	2.7	2.7	0.24	480	1680	32	64000	128000	9	0.0338	0.1181
5	23	25	24	2.1	2.1	0.24	480	1680	15	30000	60000	2	0.0160	0.0560
6	25	30	27.5	1.8	1.8	0.23	460	1610	90	180000	360000	5	0.0064	0.0224
7	30	38	34	1.5	1.5	0.22	440	1540	35	70000	140000	8	0.0251	0.0880
8	42	47	44.5	1.1	1.1	0.19	380	1330	150	300000	600000	5	0.0032	0.0111
9	47	55	51	1.0	1.0	0.18	360	1260	100	200000	400000	8	0.0072	0.0252
											sum	(ft.) =	0.139	0.485

(x y q' q") $\delta'_{c3} = 1.387 \times 10^{-1}$ $\delta''_{c3} = 0.485$

CPT Hole Location C-2-4:

$$\begin{pmatrix} \delta'_{c4} \\ \delta''_{c4} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	6	3	16.7	16.7	0.25	500	1750	35	70000	140000	6	0.0214	0.0750
2	6	10	8	6.3	6.3	0.25	500	1750	125	250000	500000	4	0.0040	0.0140
3	10	15	12.5	4.0	4.0	0.25	500	1750	35	70000	140000	5	0.0179	0.0625
4	15	19	17	2.9	2.9	0.24	480	1680	50	100000	200000	4	0.0096	0.0336
5	19	21	20	2.5	2.5	0.24	480	1680	35	70000	140000	2	0.0069	0.0240
6	21	25	23	2.2	2.2	0.24	480	1680	50	100000	200000	4	0.0096	0.0336
7	25	30	27.5	1.8	1.8	0.23	460	1610	90	180000	360000	5	0.0064	0.0224
8	30	35	32.5	1.5	1.5	0.21	420	1470	35	70000	140000	5	0.0150	0.0525
											sum	(ft.) =	0.091	0.318

(x y q' q") $\delta'_{c4} = 9.073 \times 10^{-2}$ $\delta''_{c4} = 0.318$

CPT Hole Location C-2-5:

$$\begin{pmatrix} \delta'_{c5} \\ \delta''_{c5} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	s'_z*H_i/E	s''_z*H_i/E
1	0	6	3	16.7	16.7	0.25	500	1750	40	80000	160000	6	0.0188	0.0656
2	6	10	8	6.3	6.3	0.25	500	1750	70	140000	280000	4	0.0071	0.0250
3	10	15	12.5	4.0	4.0	0.25	500	1750	150	300000	600000	5	0.0042	0.0146
4	15	33	24	2.1	2.1	0.24	480	1680	50	100000	200000	18	0.0432	0.1512
5	33	38	35.5	1.4	1.4	0.21	420	1470	90	180000	360000	5	0.0058	0.0204
6	38	40	39	1.3	1.3	0.21	420	1470	50	100000	200000	2	0.0042	0.0147
7	45	50	47.5	1.1	1.1	0.19	380	1330	125	250000	500000	5	0.0038	0.0133
8	50	58	54	0.9	0.9	0.17	340	1190	100	200000	400000	8	0.0068	0.0238
											sum	(ft.) =	0.094	0.329

(x y q' q") $\delta'_{c5} = 9.389 \times 10^{-2}$ $\delta''_{c5} = 0.329$

CPT Hole Location C-2-6:

$$\begin{pmatrix} \delta'_{c6} \\ \delta''_{c6} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	s'_z*H_i/E	s''_z*H_i/E
1	0	11	5.5	9.1	9.1	0.25	500	1750	30	60000	120000	11	0.0458	0.1604
2	11	16	13.5	3.7	3.7	0.25	500	1750	55	110000	220000	5	0.0114	0.0398
3	16	22	19	2.6	2.6	0.24	480	1680	40	80000	160000	6	0.0180	0.0630
4	22	37	29.5	1.7	1.7	0.22	440	1540	55	110000	220000	15	0.0300	0.1050
5	37	40	38.5	1.3	1.3	0.21	420	1470	100	200000	400000	3	0.0032	0.0110
6	40	44	42	1.2	1.2	0.2	400	1400	75	150000	300000	4	0.0053	0.0187
											sum	(ft.) =	0.114	0.398

(x y q' q") $\delta'_{c6} = 1.137 \times 10^{-1}$ $\delta''_{c6} = 0.398$

CPT Hole Location C-2-7:

$$\begin{pmatrix} \delta'_{c7} \\ \delta''_{c7} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	s'_z*H_i/E	s''_z*H_i/E
1	0	4	2	25.0	25.0	0.25	500	1750	22	44000	88000	4	0.0227	0.0795
2	4	12	8	6.3	6.3	0.25	500	1750	40	80000	160000	8	0.0250	0.0875
3	12	14	13	3.8	3.8	0.25	500	1750	65	130000	260000	2	0.0038	0.0135
4	14	27	20.5	2.4	2.4	0.24	480	1680	40	80000	160000	13	0.0390	0.1365
5	27	30	28.5	1.8	1.8	0.23	460	1610	65	130000	260000	3	0.0053	0.0186
6	30	33	31.5	1.6	1.6	0.22	440	1540	45	90000	180000	3	0.0073	0.0257
7	33	40	36.5	1.4	1.4	0.21	420	1470	85	170000	340000	7	0.0086	0.0303
8	40	44	42	1.2	1.2	0.2	400	1400	60	120000	240000	4	0.0067	0.0233
											sum	(ft.) =	0.119	0.415

(x y q' q") $\delta'_{c7} = 1.185 \times 10^{-1}$ $\delta''_{c7} = 0.415$

CPT Hole Location C-2-8:

$$\begin{pmatrix} \delta'_{c8} \\ \delta''_{c8} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	10	5	10.0	10.0	0.25	500	1750	25	50000	100000	10	0.0500	0.1750
2	10	13	11.5	4.3	4.3	0.25	500	1750	20	40000	80000	3	0.0188	0.0656
3	13	15	14	3.6	3.6	0.25	500	1750	125	250000	500000	2	0.0020	0.0070
4	15	20	17.5	2.9	2.9	0.24	480	1680	80	160000	320000	5	0.0075	0.0263
5	20	22	21	2.4	2.4	0.24	480	1680	35	70000	140000	2	0.0069	0.0240
6	22	35	28.5	1.8	1.8	0.23	460	1610	50	100000	200000	13	0.0299	0.1047
7	35	38	36.5	1.4	1.4	0.21	420	1470	75	150000	300000	3	0.0042	0.0147
8	38	40	39	1.3	1.3	0.21	420	1470	40	80000	160000	2	0.0053	0.0184
9	40	43	41.5	1.2	1.2	0.2	400	1400	80	160000	320000	3	0.0038	0.0131
10	43	45	44	1.1	1.1	0.19	380	1330	50	100000	200000	2	0.0038	0.0133
11	53	57	55	0.9	0.9	0.17	340	1190	35	70000	140000	4	0.0097	0.0340
											sum	(ft.) =	0.142	0.496

(x y q' q") $\delta'_{c8} = 1.417 \times 10^{-1}$ $\delta''_{c8} = 0.496$

CPT Hole Location C-2-9:

$$\begin{pmatrix} \delta'_{c9} \\ \delta''_{c9} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	13	6.5	7.7	7.7	0.25	500	1750	30	60000	120000	13	0.0542	0.1896
2	13	17	15	3.3	3.3	0.25	500	1750	10	20000	40000	4	0.0500	0.1750
3	17	19	18	2.8	2.8	0.24	480	1680	100	200000	400000	2	0.0024	0.0084
4	19	22	20.5	2.4	2.4	0.24	480	1680	75	150000	300000	3	0.0048	0.0168
5	22	27	24.5	2.0	2.0	0.24	480	1680	25	50000	100000	5	0.0240	0.0840
6	27	30	28.5	1.8	1.8	0.23	460	1610	40	80000	160000	3	0.0086	0.0302
7	30	36	33	1.5	1.5	0.22	440	1540	12	24000	48000	6	0.0550	0.1925
8	36	38	37	1.4	1.4	0.21	420	1470	25	50000	100000	2	0.0084	0.0294
9	38	41	39.5	1.3	1.3	0.21	420	1470	10	20000	40000	3	0.0315	0.1103
10	41	43	42	1.2	1.2	0.2	400	1400	40	80000	160000	2	0.0050	0.0175
											sum	(ft.) =	0.244	0.854

(x y q' q") $\delta'_{c9} = 2.439 \times 10^{-1}$ $\delta''_{c9} = 0.854$

CPT Hole Location C-2-10:

$$\begin{pmatrix} \delta'_{c10} \\ \delta''_{c10} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	2	1	50.0	50.0	0.25	500	1750	20	40000	80000	2	0.0125	0.0438
2	2	5	3.5	14.3	14.3	0.25	500	1750	40	80000	160000	3	0.0094	0.0328
3	5	6	5.5	9.1	9.1	0.25	500	1750	175	350000	700000	1	0.0007	0.0025
4	6	9	7.5	6.7	6.7	0.25	500	1750	30	60000	120000	3	0.0125	0.0438
5	9	12	10.5	4.8	4.8	0.25	500	1750	15	30000	60000	3	0.0250	0.0875
6	12	17	14.5	3.4	3.4	0.25	500	1750	35	70000	140000	5	0.0179	0.0625
7	37	40	38.5	1.3	1.3	0.21	420	1470	80	160000	320000	3	0.0039	0.0138
											sum	(ft.) =	0.082	0.287

(x y q' q") $\delta'_{c10} = 8.188 \times 10^{-2}$ $\delta''_{c10} = 0.287$

CPT Hole Location C-2-11:

$$\begin{pmatrix} \delta'_{c11} \\ \delta''_{c11} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	8	10	9	5.6	5.6	0.25	500	1750	90	180000	360000	2	0.0028	0.0097
2	10	13	11.5	4.3	4.3	0.25	500	1750	40	80000	160000	3	0.0094	0.0328
3	13	16	14.5	3.4	3.4	0.25	500	1750	75	150000	300000	3	0.0050	0.0175
4	16	17	16.5	3.0	3.0	0.25	500	1750	25	50000	100000	1	0.0050	0.0175
5	17	18	17.5	2.9	2.9	0.24	480	1680	125	250000	500000	1	0.0010	0.0034
6	18	27	22.5	2.2	2.2	0.24	480	1680	25	50000	100000	9	0.0432	0.1512
											sum	(ft.) =	0.066	0.232

(x y q' q") $\delta'_{c11} = 6.631 \times 10^{-2}$ $\delta''_{c11} = 0.232$

CPT Hole Location C-2-12:

$$\begin{pmatrix} \delta'_{c12} \\ \delta''_{c12} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	2	1	50.0	50.0	0.25	500	1750	50	100000	200000	2	0.0050	0.0175
2	2	3	2.5	20.0	20.0	0.25	500	1750	275	550000	1E+06	1	0.0005	0.0016
3	3	6	4.5	11.1	11.1	0.25	500	1750	100	200000	400000	3	0.0038	0.0131
4	6	9	7.5	6.7	6.7	0.25	500	1750	35	70000	140000	3	0.0107	0.0375
5	9	10	9.5	5.3	5.3	0.25	500	1750	225	450000	900000	1	0.0006	0.0019
6	10	15	12.5	4.0	4.0	0.25	500	1750	50	100000	200000	5	0.0125	0.0438
7	17	22	19.5	2.6	2.6	0.24	480	1680	25	50000	100000	5	0.0240	0.0840
8	22	23	22.5	2.2	2.2	0.24	480	1680	15	30000	60000	1	0.0080	0.0280
9	28	30	29	1.7	1.7	0.22	440	1540	90	180000	360000	2	0.0024	0.0086
											sum	(ft.) =	0.067	0.236

(x y q' q") $\delta'_{c12} = 6.742 \times 10^{-2}$ $\delta''_{c12} = 0.236$

CPT Hole Location C-2-13:

$$\begin{pmatrix} \delta'_{c13} \\ \delta''_{c13} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	17	22	19.5	2.6	2.6	0.25	500	1750	15	30000	60000	5	0.0417	0.1458
2	22	28	25	2.0	2.0	0.24	480	1680	50	100000	200000	6	0.0144	0.0504
3	28	32	30	1.7	1.7	0.22	440	1540	20	40000	80000	4	0.0220	0.0770
											sum	(ft.) =	0.078	0.273

(x y q' q") $\delta'_{c13} = 7.807 \times 10^{-2}$ $\delta''_{c13} = 0.273$

CPT Hole Location C-2-14:

$$\begin{pmatrix} \delta'_{c14} \\ \delta''_{c14} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	28	33	30.5	1.6	1.6	0.22	440	1540	25	50000	100000	5	0.0220	0.0770
											sum	(ft.) =	0.022	0.077

(x y q' q") $\delta'_{c14} = 2.2 \times 10^{-2}$ $\delta''_{c14} = 0.077$

CPT Hole Location C-2-15:

$$\begin{pmatrix} \delta'_{c15} \\ \delta''_{c15} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	0	2	1	50.00	50.00	0.25	500	1750	350	700000	1E+06	2	0.0007	0.0025
2	2	4	3	16.67	16.67	0.25	500	1750	50	100000	200000	2	0.0050	0.0175
3	4	7	5.5	9.09	9.09	0.25	500	1750	400	800000	2E+06	3	0.0009	0.0033
4	7	10	8.5	5.88	5.88	0.25	500	1750	75	150000	300000	3	0.0050	0.0175
5	10	15	12.5	4.00	4.00	0.25	500	1750	25	50000	100000	5	0.0250	0.0875
6	15	18	16.5	3.03	3.03	0.25	500	1750	100	200000	400000	3	0.0038	0.0131
7	18	20	19	2.63	2.63	0.24	480	1680	25	50000	100000	2	0.0096	0.0336
8	20	26	23	2.17	2.17	0.24	480	1680	60	120000	240000	6	0.0120	0.0420
9	31	32	31.5	1.59	1.59	0.22	440	1540	50	100000	200000	1	0.0022	0.0077
10	57	59	58	0.86	0.86	0.15	300	1050	65	130000	260000	2	0.0023	0.0081
11	59	61	60	0.83	0.83	0.15	300	1050	175	350000	700000	2	0.0009	0.0030
12	106	140	123	0.41	0.41	0.06	120	420	25	50000	100000	34	0.0408	0.1428
											sum	(ft.) =	0.108	0.379

(x y q' q") $\delta'_{c15} = 1.082 \times 10^{-1}$ $\delta''_{c15} = 0.379$

CPT Hole Location C-2-16:

$$\begin{pmatrix} \delta'_{c16} \\ \delta''_{c16} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	12	20	16	3.13	3.13	0.25	500	1750	65	130000	260000	8	0.0154	0.0538
2	20	25	22.5	2.22	2.22	0.24	480	1680	20	40000	80000	5	0.0300	0.1050
3	55	58	56.5	0.88	0.88	0.15	300	1050	150	300000	600000	3	0.0015	0.0053
4	58	63	60.5	0.83	0.83	0.15	300	1050	260	520000	1E+06	5	0.0014	0.0050
5	63	66	64.5	0.78	0.78	0.13	260	910	20	40000	80000	3	0.0098	0.0341
6	66	77	71.5	0.70	0.70	0.13	260	910	100	200000	400000	11	0.0072	0.0250
7	77	81	79	0.63	0.63	0.11	220	770	35	70000	140000	4	0.0063	0.0220
8	81	85	83	0.60	0.60	0.11	220	770	150	300000	600000	4	0.0015	0.0051
											sum	(ft.) =	0.073	0.255

(x y q' q") $\delta'_{c16} = 7.298 \times 10^{-2}$ $\delta''_{c16} = 0.255$

CPT Hole Location C-2-17:

$$\begin{pmatrix} \delta'_{c17} \\ \delta''_{c17} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	12	20	16	3.13	3.13	0.25	500	1750	75	150000	300000	8	0.0133	0.0467
2	47	51	49	1.02	1.02	0.18	360	1260	120	240000	480000	4	0.0030	0.0105
3	51	60	55.5	0.90	0.90	0.17	340	1190	300	600000	1E+06	9	0.0026	0.0089
4	60	63	61.5	0.81	0.81	0.15	300	1050	110	220000	440000	3	0.0020	0.0072
5	63	68	65.5	0.76	0.76	0.13	260	910	100	200000	400000	5	0.0033	0.0114
6	68	70	69	0.72	0.72	0.13	260	910	200	400000	800000	2	0.0007	0.0023
7	70	72	71	0.70	0.70	0.13	260	910	100	200000	400000	2	0.0013	0.0046
8	72	76	74	0.68	0.68	0.11	220	770	180	360000	720000	4	0.0012	0.0043
9	76	77	76.5	0.65	0.65	0.11	220	770	65	130000	260000	1	0.0008	0.0030
10	77	86	81.5	0.61	0.61	0.11	220	770	110	220000	440000	9	0.0045	0.0158
											sum	(ft.) =	0.033	0.114

(x y q' q") $\delta'_{c17} = 3.27 \times 10^{-2}$ $\delta''_{c17} = 0.114$

CPT Hole Location C-2-18:

$$\begin{pmatrix} \delta'_{c18} \\ \delta''_{c18} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	12	17	14.5	3.45	3.45	0.25	500	1750	100	200000	400000	5	0.0063	0.0219
2	17	21	19	2.63	2.63	0.24	480	1680	65	130000	260000	4	0.0074	0.0258
3	21	24	22.5	2.22	2.22	0.24	480	1680	100	200000	400000	3	0.0036	0.0126
4	24	28	26	1.92	1.92	0.23	460	1610	35	70000	140000	4	0.0131	0.0460
5	50	52	51	0.98	0.98	0.17	340	1190	40	80000	160000	2	0.0043	0.0149
6	52	60	56	0.89	0.89	0.15	300	1050	370	740000	1E+06	8	0.0016	0.0057
7	60	63	61.5	0.81	0.81	0.15	300	1050	200	400000	800000	3	0.0011	0.0039
8	63	70	66.5	0.75	0.75	0.13	260	910	110	220000	440000	7	0.0041	0.0145
9	70	79	74.5	0.67	0.67	0.11	220	770	210	420000	840000	9	0.0024	0.0083
10	79	81	80	0.63	0.63	0.11	220	770	370	740000	1E+06	2	0.0003	0.0010
											sum	(ft.) =	0.044	0.155

(x y q' q") $\delta'_{c18} = 4.416 \times 10^{-2}$ $\delta''_{c18} = 0.155$

CPT Hole Location C-2-19:

$$\begin{pmatrix} \delta'_{c19} \\ \delta''_{c19} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	3	6	4.5	11.11	11.11	0.25	500	1750	220	440000	880000	3	0.0017	0.0060
2	6	13	9.5	5.26	5.26	0.25	500	1750	115	230000	460000	7	0.0076	0.0266
3	13	15	14	3.57	3.57	0.25	500	1750	60	120000	240000	2	0.0042	0.0146
4	18	28	23	2.17	2.17	0.24	480	1680	65	130000	260000	10	0.0185	0.0646
5	49	58	53.5	0.93	0.93	0.17	340	1190	320	640000	1E+06	9	0.0024	0.0084
6	58	60	59	0.85	0.85	0.15	300	1050	250	500000	1E+06	2	0.0006	0.0021
7	60	62	61	0.82	0.82	0.15	300	1050	150	300000	600000	2	0.0010	0.0035
8	62	70	66	0.76	0.76	0.13	260	910	110	220000	440000	8	0.0047	0.0165
9	70	80	75	0.67	0.67	0.11	220	770	250	500000	1E+06	10	0.0022	0.0077
10	80	82	81	0.62	0.62	0.11	220	770	450	900000	2E+06	2	0.0002	0.0009
11	82	85	83.5	0.60	0.60	0.11	220	770	110	220000	440000	3	0.0015	0.0053
											sum	(ft.) =	0.045	0.156

(x y q' q") $\delta'_{c19} = 4.46 \times 10^{-2}$ $\delta''_{c19} = 0.156$

CPT Hole Location C-2-20:

$$\begin{pmatrix} \delta'_{c20} \\ \delta''_{c20} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	12	18	15	3.33	3.33	0.25	500	1750	100	200000	400000	6	0.0075	0.0263
2	18	21	19.5	2.56	2.56	0.24	480	1680	50	100000	200000	3	0.0072	0.0252
3	21	26	23.5	2.13	2.13	0.24	480	1680	65	130000	260000	5	0.0092	0.0323
4	26	28	27	1.85	1.85	0.23	460	1610	40	80000	160000	2	0.0058	0.0201
5	50	60	55	0.91	0.91	0.17	340	1190	300	600000	1E+06	10	0.0028	0.0099
6	60	68	64	0.78	0.78	0.13	260	910	70	140000	280000	8	0.0074	0.0260
7	68	71	69.5	0.72	0.72	0.13	260	910	170	340000	680000	3	0.0011	0.0040
8	71	77	74	0.68	0.68	0.11	220	770	315	630000	1E+06	6	0.0010	0.0037
9	77	80	78.5	0.64	0.64	0.11	220	770	180	360000	720000	3	0.0009	0.0032
10	80	82	81	0.62	0.62	0.11	220	770	65	130000	260000	2	0.0017	0.0059
11	82	84	83	0.60	0.60	0.11	220	770	315	630000	1E+06	2	0.0003	0.0012
											sum	(ft.) =	0.045	0.158

(x y q' q") $\delta'_{c20} = 4.51 \times 10^{-2}$ $\delta''_{c20} = 0.158$

CPT Hole Location C-2-21:

$$\begin{pmatrix} \delta'_{c21} \\ \delta''_{c21} \end{pmatrix} :=$$

x (ft.) =	50	y (ft.) =	50	q'(psf) =	500	q"(psf) =	1750							
Layer	From (ft.)	To (ft.)	z(ft.)	m = x/z	n = y/z	I	s'_z(psf)	s''_z(psf)	q_c (tsf)	q_c (psf)	E (psf)	H_i (ft.)	$s'_z{}^*H_i/E$	$s''_z{}^*H_i/E$
1	12	19	15.5	3.23	3.23	0.25	500	1750	70	140000	280000	7	0.0125	0.0438
2	49	60	54.5	0.92	0.92	0.17	340	1190	300	600000	1E+06	11	0.0031	0.0109
3	60	84	72	0.69	0.69	0.11	220	770	200	400000	800000	24	0.0066	0.0231
											sum	(ft.) =	0.022	0.078

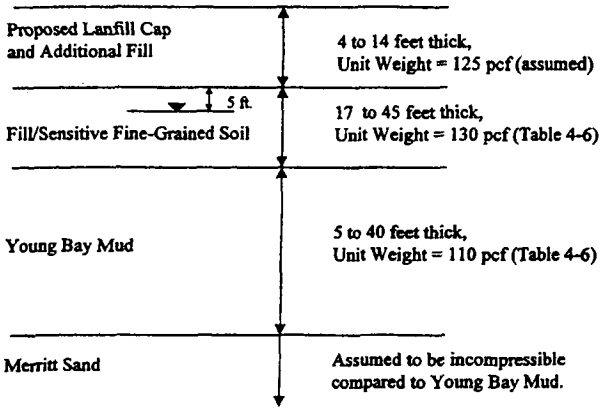
(x y q' q") $\delta'_{c21} = 2.222 \times 10^{-2}$ $\delta''_{c21} = 0.078$

- Elastic Settlement Due to Landfill Cap, δ'_e (inch) = $12\delta'_c$:
- Elastic Settlement Due to Landfill Cap and Additional Fill, δ''_e (inch) = $12\delta''_c$:

$$\delta'_e := 12 \cdot \begin{pmatrix} \delta'_{c1} \\ \delta'_{c2} \\ \delta'_{c3} \\ \delta'_{c4} \\ \delta'_{c5} \\ \delta'_{c6} \\ \delta'_{c7} \\ \delta'_{c8} \\ \delta'_{c9} \\ \delta'_{c10} \\ \delta'_{c11} \\ \delta'_{c12} \\ \delta'_{c13} \\ \delta'_{c14} \\ \delta'_{c15} \\ \delta'_{c16} \\ \delta'_{c17} \\ \delta'_{c18} \\ \delta'_{c19} \\ \delta'_{c20} \\ \delta'_{c21} \end{pmatrix} \qquad \delta'_e = \begin{pmatrix} 1.108 \\ 0.954 \\ 1.665 \\ 1.089 \\ 1.127 \\ 1.364 \\ 1.422 \\ 1.701 \\ 2.927 \\ 0.983 \\ 0.796 \\ 0.809 \\ 0.937 \\ 0.264 \\ 1.298 \\ 0.876 \\ 0.392 \\ 0.53 \\ 0.535 \\ 0.541 \\ 0.267 \end{pmatrix}$$

$$\delta''_e := 12 \cdot \begin{pmatrix} \delta''_{c1} \\ \delta''_{c2} \\ \delta''_{c3} \\ \delta''_{c4} \\ \delta''_{c5} \\ \delta''_{c6} \\ \delta''_{c7} \\ \delta''_{c8} \\ \delta''_{c9} \\ \delta''_{c10} \\ \delta''_{c11} \\ \delta''_{c12} \\ \delta''_{c13} \\ \delta''_{c14} \\ \delta''_{c15} \\ \delta''_{c16} \\ \delta''_{c17} \\ \delta''_{c18} \\ \delta''_{c19} \\ \delta''_{c20} \\ \delta''_{c21} \end{pmatrix} \qquad \delta''_e = \begin{pmatrix} 3.877 \\ 3.341 \\ 5.826 \\ 3.811 \\ 3.943 \\ 4.775 \\ 4.978 \\ 5.952 \\ 10.243 \\ 3.439 \\ 2.785 \\ 2.832 \\ 3.279 \\ 0.924 \\ 4.543 \\ 3.065 \\ 1.373 \\ 1.855 \\ 1.873 \\ 1.894 \\ 0.933 \end{pmatrix}$$

Consolidation Settlement of Young Bay Mud (Based on 1-D Consolidation Theory).



Simplified soil profile at IR Site 2. (Note In Area Between IR Site 1 and 2, the Old Bay Mud is underneath the Merritt Sand and extends up to 200 feet below ground surface)

- Input Data:

D_{GW} = Depth of Ground Water Table;	$D_{GW} := 5$ ft.	
th_{cap} = Thickness of Landfill Cap;	$th_{cap} := 4$ ft.	
th_{fill} = Thickness of Additional Fill;	$th_{fill} := 10$ ft.	
$\gamma_{cap.fill}$ = Unit Weight of Landfill Cap and Additional Fill;	$\gamma_{cap.fill} = 125$ pcf	
γ_{Fill} = Unit Weight of Fill Layer;	$\gamma_{Fill} = 130$ pcf	
γ_{YBM} = Unit Weight of Young Bay Mud Layer (YBM);	$\gamma_{YBM} = 110$ pcf	
C = Compressibility of Normally Consolidated YBM;	$C = 0.14$	(Average of lab test results)
$C_{\alpha\varepsilon}$ = Coefficient of Secondary Compression (for YBM);	$C_{\alpha\varepsilon} := 0.01$	(Consolidation results: 0.0035 to 0.005; Average moisture content of 50% correlated with $C_{\alpha\varepsilon}$ –Ref. Terzaghi et. al., 1995)
t = Time After Application of Load;	$t := 30$ years	
C_v = Coefficient of Consolidation	$C_v := 0.000032$ in^2/sec	[7 ft^2/year, average of 4-10 ft^2/year (Table 4-6)]
T_v = Time Factor	$T_v := 1.2$	(Value at Degree of Consolidation U = 95%)

- Preliminary Calculations:

q' = Net Bearing Pressure at ground surface (landfill cap);	$q' = \gamma_{cap.fill} \cdot th_{cap}$	$q' = 500$ psf
q" = Net Bearing Pressure at ground surface (landfill cap with additional fill);	$q'' = \gamma_{cap.fill} \cdot (th_{cap} + th_{fill})$	$q'' = 1750$ psf

- Primary Consolidation Settlement Equation, $\delta_{pc} = CH\log[(\sigma'_{vo}+\Delta\sigma'_v)/\sigma'_{vo}]$ Ref. Coduto (1994), Eq. 3.31, p.75.

  where δ_{pc} = primary consolidation settlement of soil layer with height, H
  C = compressibility (compression ratio)
  H = height of the soil layer
  σ'_{vo} = initial vertical effective stress

  $\Delta\sigma'_v$ = increase in vertical effective stress

- Secondary Compression Settlement Equation, $\delta_s = C_{\alpha\varepsilon}H\log(t/t_p)$ Ref. Coduto (1994), Eq. 3.32, p.77.

  where δ_s = secondary compression settlement of soil layer with height, H
  $C_{\alpha\varepsilon}$ = coefficient of secondary compression
  H = height of the soil layer
  t = time after application of load
  t_p = time required to complete primary consolidation

- Time Required to Complete Primary Consolidation, $t_p = (0.5H)^2T_v/C_v$ Ref. Peck, Hanson, Thornburn (1994), Eq. 3.9, p.71.

  where Tv = time factor (Tv = 1.2 for U = 95%)
  Cv = coefficient of consolidation
  H = height of the soil layer

- Calculate primary consolidation and secondary compression settlements due to landfill cap and landfill cap+fill at different CPT hole locations:

$$\begin{pmatrix} \delta'_{pc} \\ \delta''_{pc} \\ \delta_s \end{pmatrix} :=$$

$UnitWt_{Fill}$ (pcf)=	130	$UnitWt_{YBM}$ (pcf)=	110	ds'(psf)=	500	ds"(psf)=	1750	t (yr)=	30		
D_{GW} (ft.)=	5	C=	0.14	C_{alpha}=	0.010	C_v(in²/sec)=	3E-05	T_v=	1.2		
	Fill	Depth		YBM	Depth		s'_o	t_p	$setl_{pc}'$	$setl_{pc}''$	$setl_s$
CPT No.	From (ft.)	To (ft.)	H_{fill}(ft.)	From (ft.)	To (ft.)	H_{YBM}(ft.)	(psf)	(yr)	(inch)	(inch)	(inch)
1	0	31	31	31	39	8.0	2598.0	2.7	1.0274	3.0059	0.9978
2	0	35	35	35	40	5.0	2797.0	1.1	0.6000	1.7727	0.8686
3	0	38	38	38	42	4.0	2976.0	0.7	0.4532	1.3498	0.7879
4	0	35	35	35	40	5.0	2797.0	1.1	0.6000	1.7727	0.8686
5	0	40	40	40	45	5.0	3135.0	1.1	0.5398	1.6181	0.8686
6	0	44	44	44	54	10.0	3524.4	4.3	0.9679	2.9415	1.0147
7	0	44	44	44	52	8.0	3476.8	2.7	0.7843	2.3796	0.9978
8	0	45	45	45	53	8.0	3544.4	2.7	0.7703	2.3422	0.9978
9	0	43	43	43	56	13.0	3528.2	7.2	1.2571	3.8205	0.9636
10	0	17	17	17	37	20.0	1937.2	17.1	3.3505	9.3919	0.5845
10*	0	40	40	40	60	20.0	3492.0	17.1	1.9527	5.9278	0.5845
11	0	0	0	0	8	8.0	502.4	2.7	4.0319	8.7574	0.9978
11*	0	27	27	27	60	33.0	2922.6	46.6	3.8025	11.2981	-0.7581
12	0	15	15	15	17	2.0	1373.6	0.2	0.4530	1.1988	0.5384
12*	0	23	23	23	28	5.0	1985.8	1.1	0.8193	2.3054	0.8686
12*	0	30	30	30	70	40.0	3292.0	68.5	4.1267	12.4416	-1.7209
13	0	0	0	0	22	22.0	835.6	20.7	7.5279	18.1312	0.4244
13*	0	32	32	32	72	40.0	3427.2	68.5	3.9744	12.0392	-1.7209
14	0	0	0	0	28	28.0	978.4	33.6	8.4331	20.9512	-0.1637
14*	0	33	33	33	63	30.0	3256.8	38.5	3.1262	9.4132	-0.3911
15	0	26	26	26	57	31.0	2807.4	41.1	3.7072	10.9583	-0.5101
15*	0	61	61	61	71	10.0	4673.6	4.3	0.7416	2.3205	1.0147
16	0	25	25	25	55	30.0	2716.0	38.5	3.6987	10.8858	-0.3911
16*	0	86	86	86	185	99.0	8481.8	419.6	4.1373	13.5491	-13.6106
17	0	20	20	20	47	27.0	2306.6	31.2	3.8650	11.1218	-0.0555
17*	0	86	86	86	180	94.0	8362.8	378.3	3.9826	13.0315	-12.4155
18	0	28	28	28	50	22.0	2728.4	20.7	2.7010	7.9543	0.4244
18*	0	81	81	81	150	69.0	7429.8	203.8	3.2788	10.6480	-6.8898
19	0	28	28	28	49	21.0	2704.6	18.9	2.5991	7.6454	0.5069
19*	0	85	85	85	180	95.0	8319.0	386.3	4.0456	13.2333	-12.6523
20	0	28	28	28	50	22.0	2728.4	20.7	2.7010	7.9543	0.4244
20*	0	84	84	84	150	66.0	7561.2	186.5	3.0835	10.0252	-6.2845
21	0	19	19	19	49	30.0	2310.4	38.5	4.2881	12.3420	-0.3911
21*	0	84	84	84	174	90.0	8132.4	346.7	3.9180	12.7981	-11.4792

$(\gamma_{Fill}\ \gamma_{YBM}\ q'\ q''\ D_{GW}\ C\ C_{\alpha\varepsilon}\ t\ C_v\ T_v)$

*Multiple layers of YBM or sensitive fine grained material. Initial verical stress of 2nd or 3rd layer of YBM assuming all fill material on top.

Note: If (t_p > t), the primary consolidation is not completed for the time period (t) and secondary compression ($setl_s$) calculated is negative. Therefore, in theory, $setl_s$ = 0.

where $UnitWt_{Fill}$ = Unit weight of Fill
$UnitWt_{YBM}$ = Unit weight of Young Bay Mud
ds' = q' = Increase in vertical effective stress due to landfill cap
ds" = q" = Increase in vertical effective stress due to landfill cap+additional fill
C_{alpha} = Coefficient of secondary compression
s'_o = Initial vertical effective stress
$setl_{pc}'$ = Consolidation settlement due to landfill cap
$setl_{pc}''$ = Consolidation settlement due to landfill cap+additional fill
$setl_s$ = Secondary compression settlement

- **Summary of Settlement Calculations:**

CPT No.	Elastic (landfill cap) (inch)	Elastic (cap+fill) (inch)	Consolidation (landfill cap) (inch)	Consolidation (cap+fill) (inch)	Secondary Compression (inch)	Total (landfill cap) (inch)	Total (cap+fill) (inch)	Differential (inch)
C-2-1	1.11	3.88	1.03	3.01	1.00	3.13	7.88	4.75
C-2-2	0.95	3.34	0.60	1.77	0.87	2.42	5.98	3.56
C-2-3	1.66	5.83	0.45	1.35	0.79	2.91	7.96	5.06
C-2-4	1.09	3.81	0.60	1.77	0.87	2.56	6.45	3.89
C-2-5	1.13	3.94	0.54	1.62	0.87	2.54	6.43	3.90
C-2-6	1.36	4.77	0.97	2.94	1.01	3.35	8.73	5.38
C-2-7	1.42	4.98	0.78	2.38	1.00	3.20	8.36	5.15
C-2-8	1.70	5.95	0.77	2.34	1.00	3.47	9.29	5.82
C-2-9	2.93	10.24	1.26	3.82	0.96	5.15	15.03	9.88
C-2-10	0.98	3.44	5.30	15.32	1.17	7.45	19.93	12.47
C-2-11	0.80	2.79	7.83	20.06	1.00	9.63	23.84	14.21
C-2-12	0.81	2.83	5.40	15.95	1.41	7.61	20.18	12.57
C-2-13	0.94	3.28	11.50	30.17	0.42	12.86	33.87	21.01
C-2-14	0.26	0.92	11.56	30.36	0.00	11.82	31.29	19.47
C-2-15	1.30	4.54	4.45	13.28	1.01	6.76	18.84	12.08
C-2-16	0.88	3.07	7.84	24.43	0.00	8.71	27.50	18.79
C-2-17	0.39	1.37	7.85	24.15	0.00	8.24	25.53	17.29
C-2-18	0.53	1.85	5.98	18.60	0.42	6.93	20.88	13.95
C-2-19	0.54	1.87	6.64	20.88	0.51	7.69	23.26	15.57
C-2-20	0.54	1.89	5.78	17.98	0.42	6.75	20.30	13.55
C-2-21	0.27	0.93	8.21	25.14	0.00	8.47	26.07	17.60

$(\delta'_e \ \delta''_e \ \delta'_{pc} \ \delta''_{pc} \ \delta_s)$

APPENDIX L

ONE-DIMENSIONAL SITE RESPONSE AND LIQUEFACTION-INDUCED DEFORMATION ANALYSES

1.0 CALCULATION COVER SHEET

PROJECT: NAS Alameda IR Site 2 (Former Naval Air Station, Alameda, California)

SUBJECT: Liquefaction Potential and Liquefaction-Induced Settlement Calculations

IMPORTANT TO SAFETY ☒ **ASME** ☐ **NOT IMPORTANT TO SAFETY** ☐

CLIENT: Foster Wheeler / USNAVY **PROJECT NO:** 01-0810

CALCULATION NO: 01 **NUMBER OF PAGES:** 77

CALCULATION BY OTHERS: YES ☐ NO ☒

PREPARER: Ben Hushmand Ben Hushmand

CHECKER: Julio E. Badel Julio E. Badel

VERIFIER: Dr. Bill Lu Julio E. Badel For

APPROVED BY: Ben Hushmand Ben Hushmand **DATE:** 9-5-2002

ASSUMPTIONS THAT REQUIRE CONFIRMATION: YES ☐ NO ☒

CONFIRMED BY: _____ **DATE:** _____ **INITIAL:** _____

PRINT NAME, DATE AND INITIAL

Rev No	Affected Pages	Prepared by Date	Checked by Date	Verified by Date
1	ALL	Ben Hushmand BH 9/5/02	Julio E. Badel Badel 9/5/02	Bill Lu BL 9/5/02

2.0 TABLE OF CONTENTS

1.0 CALCULATION COVER SHEET
2.0 CALCULATION THEORY AND PROCEDURES
3.0 EXAMPLE SHAKE91 INPUT AND OUTPUT PRINTOUTS
4.0 LIQUEFACTION ANALYSIS PLOTS (BASED ON CPT DATA)
5.0 LIQUEFACTION ANALYSIS PLOTS (BASED ON SPT DATA)
ATTACHMENT L1 LIQUEFACTION EVALUATION SPREADSHEET
ATTACHMENT L2 LATERAL SPREADING EVAULATION SPREADSHEET

APPENDIX L

ONE-DIMENSIONAL SITE RESPONSE AND LIQUEFACTION-INDUCED DEFORMATION ANALYSES

L.1 ONE-DIMENSIONAL SITE RESPONSE ANALYSES

Dynamic one-dimensional response analyses were performed for three 410-foot-thick "infinitely long" layered soil systems representing the site subsurface conditions at three cone penetration test (CPT) locations within the site. These are:

a) Profile 1 at CPT Location C-2-6 representing site soils along Installation Restoration (IR) Site 2 southern boundary

b) Profile 2 at CPT Location C-2-13 representing site soils along IR Site 2 western boundary

c) Profile 3 at CPT Location C-2-19 representing site soils within the area between IR Sites 1 and 2

Computations were conducted using the computer program SHAKE91 (Schnabel et al., 1972; Idriss and Sun, 1991). The program computes the response of a semi-infinite horizontally layered soil deposit overlying a uniform half-space subjected to vertically propagating shear waves. The analysis is done in the frequency domain, and therefore, for any set of properties, it is a linear analysis. An iterative procedure is used to account for the nonlinear behavior of the soils. The object motions (input motions that are considered to be known) were specified at the top of the bedrock underlying the site.

Five generalized soil type layers overlying the foundation Franciscan Formation bedrock were used to model the subsurface soil conditions in the one-dimensional SHAKE91 analyses (Figures L1a, L1b, and L1c). The unit weight and shear-wave velocity profiles used in the dynamic site response analyses were derived from the site-specific field and laboratory test results obtained for IR Site 2 and the area between IR Sites 1 and 2 soils during this investigation (generally at depths less than 100 feet), and the data provided for the San Francisco-Oakland Bay Bridge (SFOBB) project for the deeper soil layers to the depth of bedrock (Fugro-EMI, 2001a; 2001b). Field exploration including CPT soundings and soil borings were performed at the site to measure in situ penetration resistance and seismic wave velocities and to recover soil samples for measuring in situ moisture and density. The unit weight and shear-wave velocity of the foundation Franciscan Formation bedrock were assumed to be equal to 140 pounds per cubic foot (pcf) and 5,000 feet/second^2, respectively. Relations used for the site soils to define the reduction of shear modulus ratio (G/G_{max}) and the increase of damping ratio ($\exists$) versus shear strain were:

Type 1: Average modulus and damping relations for loose sand (Seed and Idriss, 1971)

Type 2: Modulus and damping relations for Young Bay Mud (Idriss, 1990; Pyke, 1995)

Type 3: Upper bound shear modulus ratio relation for dense sand (Seed and Idriss, 1970), and the lower bound damping ratio relation for dense sand (Idriss, 1990)

Type 4: Modulus and damping relations for Old Bay Mud (Idriss, 1990; Pyke, 1995)

Type 5: Modulus (upper range) for clay (Sun et al, 1989) and damping for clay (Idriss, 1990)

The above relations are plotted in Figure L2. Figures L1a, L1b, L1c, and L2 summarize soil profile layers and material properties used in SHAKE91 analyses.

Example SHAKE91 input files for the three soil profiles analyzed and an example output file for soil profile No. 1 and Set 1 Record, used as the outcrop rock input motion (one of the selected site design ground motions discussed in Section 4.6.5.2 of the report), are presented here. The results of SHAKE91 site response analyses for ground surface accelerations are summarized in Table L1 below.

TABLE L1

ESTIMATED SHAKE91 PEAK HORIZONTAL GROUND SURFACE ACCELERATIONS

Site Soil Profile	Peak Acceleration of Input Rock Motion (g)	SHAKE91 Peak Ground Surface Acceleration Results (g)		
		Set 1 Record	Set 2 Record	Set 3 Record
1 (IR Site 2 Southern Boundary)	0.4	0.41	0.43	0.37
2 (IR Site 2 Western Boundary)	0.4	0.43	0.45	0.34
3 (Area Between IR Sites 1 and 2)	0.4	0.40	0.41	0.43

The site response analyses provided the maximum site peak horizontal ground acceleration (PHGA) of 0.45g. This was used in evaluation of the site liquefaction potential and liquefaction-induced settlements and lateral displacements. Additionally, the analyses provided average acceleration time histories for different potential sliding mass configurations, which were used in simplified, Newmark-type permanent slope displacement analyses. Figure L3 presents input and output acceleration time histories for Soil Profile 2 and Set 2 Acceleration Record. The figure illustrates input rock outcrop acceleration record (Set 2) and time histories of the ground surface acceleration and average acceleration of the potential sliding mass computed using SHAKE91.

L.2 LIQUEFACTION POTENTIAL EVALUATION

Based on the field exploration data at IR Site 2 and the area between IR Sites 1 and 2 including the measured soil penetration resistance (Standard Penetration Test [SPT]-N and CPT tip resistance and friction ratio values), the observed soil types, groundwater depth, laboratory test results (index properties), and our liquefaction potential evaluation analyses, silts and sands underlying the site may be susceptible to liquefaction. Liquefaction susceptibility of these soils depends on their consistency/relative density and earthquake duration and shaking level (e.g., earthquake magnitude and cyclic shear stresses developed in the soil). As such, soils in Stratum I (fill) and some of the non-plastic, granular soils interbedded in Stratum II (non-plastic silty soils in Young Bay sediments) are considered potentially liquefiable at this site. The Merritt Sand layer (Stratum III), based on the observed SPT blow counts (generally > 30), the measured CPT-tip resistance, and the anticipated level of design ground motions at the site, is generally non-liquefiable.

Standard procedures for evaluating soil liquefaction potential are primarily based on empirical relationships between soil penetration resistance, particularly SPT-N values used to estimate the cyclic resistance ratio (CRR), the cyclic shear stress ratio (CSR), and other factors. Similarly, methods based on the CPT penetration resistance values (Q_t) in place of SPT-N values are increasingly used to evaluate liquefaction potential and estimate liquefaction-induced settlements.

L.3 LIQUEFACTION POTENTIAL EVALUATION APPROACH

The liquefaction potential of the site was analyzed utilizing a maximum peak site acceleration of about 0.45g for a magnitude 7.9 seismic event or an equivalent weighted peak ground acceleration of approximately 0.50g for a magnitude 7.5 earthquake. The site design PHGA and earthquake magnitude were scaled to equivalent values of approximately 0.5g and 7.5, respectively, using a "Magnitude Weighting Factor" (MWF) developed by Idriss (1998). The analysis was performed using a groundwater elevation of about 2 feet mean sea level (msl), which is considered to be a relatively conservative estimate of the groundwater table.

The basic evaluation procedure developed by Seed and Idriss (1982), as applied to this study involves the following three basic steps:

1. *Estimating cyclic shear stress induced by earthquake ground motions (or CSR: Cyclic Stress Ratio)* at different depths using a simplified approach. The intensity and duration of ground shaking and the variations of earthquake-induced shear stresses with depth are incorporated in the evaluation.

2. *Estimating cyclic shear resistance (or CRR: Cyclic Resistance Ratio)* at different depths (namely, cyclic shear stresses that would be required to cause liquefaction in a number of uniform shear stress cycles corresponding to the design earthquake ground motions). This was accomplished using available empirical correlations between documented cases of field performance (liquefaction versus non-liquefaction) and normalized soil penetration resistance, properly corrected for confining pressure, soil grain characteristics, fines fraction, in-situ testing procedures. The soil type, in-situ conditions, seismic and geologic histories of the deposit, and the initial effective stress conditions are approximately incorporated in the evaluation. Empirical relations and charts to estimate CRR as a function of corrected SPT-N values or CPT tip resistance are presented in recent publications by Youd and Idriss (1997) and Martin and Lew (1999).

3. *Comparing shear stresses induced by the earthquake (Step 1) with those required to cause liquefaction (Step 2), [or CSR versus CRR]* to evaluate the potential zone (or depth range) of liquefaction in the soil deposit, corresponding to places where induced cyclic shear stresses exceed those required to cause liquefaction (CSR greater than CRR). A factor of safety against liquefaction may be defined as the ratio of CRR to CSR. Therefore, if the factor of safety for a soil layer is less than 1, the soil layer is potentially liquefiable.

Soil penetration resistance data were modified for use in the liquefaction potential analysis. The CPT-tip resistance and friction ratio were corrected and normalized as proposed by Robertson and Wride (1997). Figures L4 to L24 present the integrated CPT profiles for estimating the cyclic resistance ratio (CRR) at different CPT locations at IR Site 2 Alameda Point and the area between IR Sites 1 and 2. The CPT profiles summarize measured CPT tip resistance (Q_t) and friction ratio (FR), as well as interpreted soil behavior type index (I_c), and "clean-sand equivalent" normalized soil penetration resistance ($(q_{c1N})_{cs}$).

The integrated CPT profiles aided in the evaluation of consistency (density and/or stiffness), other engineering properties such as soil type and fines content, and the sandy soils cyclic resistance ratio for the equivalent Magnitude 7.5 earthquake ($CRR_{7.5}$). The $CRR_{7.5}$ is compared to the cyclic stress ratio ($CSR_{7.5}$) induced by the design earthquake for subsurface saturated sandy soils (corrected for magnitude using a MWF). If the computed value of CSR is greater than the CRR of a saturated sandy soil layer ($FS = [CRR_{7.5}/CSR_{7.5}] < 1$), potential of earthquake-induced liquefaction may exist. These sandy soil layers are typically characterized in the CPT sounding records by normalized FR less than approximately 2, and by soil index (I_c) less than 2.6.

In situ testing at the site also included SPT measurements. The test borings were drilled using mud rotary drilling technique, which provide generally more reliable SPT-N values. The SPT blow counts measured at the site were also used in liquefaction evaluations. SPT field blow

counts were modified to include a correction for normalizing to an overburden pressure of 2,000 pounds per square foot (psf), or 1 tsf, which approximately corresponds to 100 kilopascals (KPa), correction for the amount of fines (percent of soil passing U.S. standard sieve No. 200), hammer energy, hammer type, sampler type, and lining (or not lining) of SPT samplers. Figures L25, L26, and L27 present compilation of corrected SPT-N values, and comparison of CRR and CSR values versus depth for onshore and offshore borings. These figures illustrate the zones within the onshore and offshore soil profiles that are potentially liquefiable. The SPT base method used to produce the above figures was formulated in a spreadsheet based on the approach presented by Youd et al. (2001). The CRR calculated in the SPT base method (using corrected SPT blow counts) was derived from empirical relations that were recently improved in a workshop organized by National Center for Earthquake Engineering Research (Youd and Idriss, 1997; Youd et al., 2001).

L.4 ESTIMATED LIQUEFACTION-INDUCED DEFORMATIONS

Due to uncertainties associated with empirical methods, emphasis in this study was placed in assessing the likely order of magnitude of the liquefaction-induced settlements at ground surface and permanent lateral displacements due to lateral spreads. These evaluations consisted of simplified, empirical, order-of-magnitude-type of estimates based on available soil penetration resistance data and known empirical correlations, to aid in assessing whether remedial measure would, or would not, be necessary. The following describes the approach used and the estimated values for liquefaction-induced ground settlements and lateral displacements.

Ground Settlements

Estimates of liquefaction-induced permanent vertical strains were made at various CPT sounding and boring locations. Values were calculated where CSR exceeded estimated CRR values. These estimates were made based on available empirical correlations between volumetric strains and corrected soil penetration resistance [equivalent clean-sand CPT $(q_c)_1$ or SPT-N_1 values]. The CPT-based settlements were estimated using the relation developed by Ishihara and Yoshimine (1992) based on the laboratory cyclic simple shear tests performed on sands. The estimated values of the volumetric strains were multiplied by the approximate thickness of potentially liquefiable soil layers to calculate permanent ground surface settlements, as summarized in Figures L4 through L24. SPT data obtained from borings drilled at the site, although used to estimate the site liquefaction potential, was not used for estimating liquefaction-induced settlements because of being relatively sparse compared to the CPT data and therefore, not providing a reliable estimate of settlements.

Table L2 summarizes the estimated liquefaction-induced settlements at the onshore CPT locations. The maximum estimated liquefaction-induced settlement is on the order of 12 inches based on the CPT results. The estimated total liquefaction-induced ground surface settlement in areas away from the site perimeter slopes, including an additional conservatively assumed settlement of approximately 4 to 5 inches due to possible liquefaction/consolidation of silty soils in Young Bay Sediments, will be on the order of 1.5 feet.

TABLE L2

ESTIMATED LIQUEFACTION-INDUCED SETTLEMENTS AT LOCATIONS OF CPTS

CPT Locations	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-7
Settlement (inch)	7.6	10.4	10.4	8.4	11.7	11.3	9.3
CPT Locations	C-2-8	C-2-9	C-2-10	C-2-11E	C-2-12A	C-2-13	C-2-14
Settlement (inch)	12.3	8.1	5.7	4.0	3.9	6.4	1.5
CPT Locations	C-2-15A	C-2-16	C-2-17	C-2-18	C-2-19	C-2-20	C-2-21
Settlement (inch)	8.9	8.1	8.4	9.0	8.4	7.0	6.8

The integrated CPT-based analytical method, used for estimating site liquefaction potential and liquefaction-induced settlements, is based on a relatively large number of field CPT tests, providing an approximately continuous profile of the subsurface soil conditions at these CPT locations. Therefore, this method provides a more reliable estimate of the site liquefaction hazards and is discussed in more detail here.

The integrated CPT-based method was numerically modeled using an in-house proprietary computer program based on an Excel spreadsheet consisted of five separate calculation sheets. Attachment L1 presents an example of the spreadsheet and the backup information used for its development. Similar numerical codes are also available commercially. An example of a commercially available software is the computer program LiquefyPro developed by CivilTech Corporation in Bellevue, Washington (2002).

LATERAL SPREAD DISPLACEMENTS

Permanent horizontal ground displacements, resulting from liquefaction-induced lateral spread, were estimated based on an empirical model developed by Bartlett and Youd (1995) (revised by Youd et al., 2002) for a "free face" slope, the condition existent along the western and southern perimeter slopes of IR Site 2. The definition of the "free face" slope condition in the literature on the topic of liquefaction and lateral spreading includes embankments, quay walls, stream or river banks, embankment slopes of canals, and so forth (Bardet et al., 2002; Rauch, 1997). Once liquefaction transforms a subsurface liquefiable layer into a fluidized mass, gravity plus inertial forces that result from the earthquake may cause the mass to move down-slope toward a cut

slope or free face (such as a river channel or a canal). Lateral spreads most commonly occur on gentle slopes that range between 0.3 and 5 percent, and commonly displace the surface by several meters to tens of meters. The geologic conditions conducive to lateral spreading (gentle surface slope, shallow water table, and liquefiable and cohesionless soils) are frequently found along streams and other waterfronts in recent alluvial or deltaic deposits, as well as in loosely placed, saturated, sandy fills (Youd and Hoose, 1976). Surface displacements proceed down-slope or toward a steep free face (such as a stream bank) with the formation of fissures, scarps, and grabens as shown in the illustrations below taken from the PhD dissertation of Alan F. Rauch (1997). This figure clearly shows that the "free face" condition includes river or stream banks or any waterfront slope.

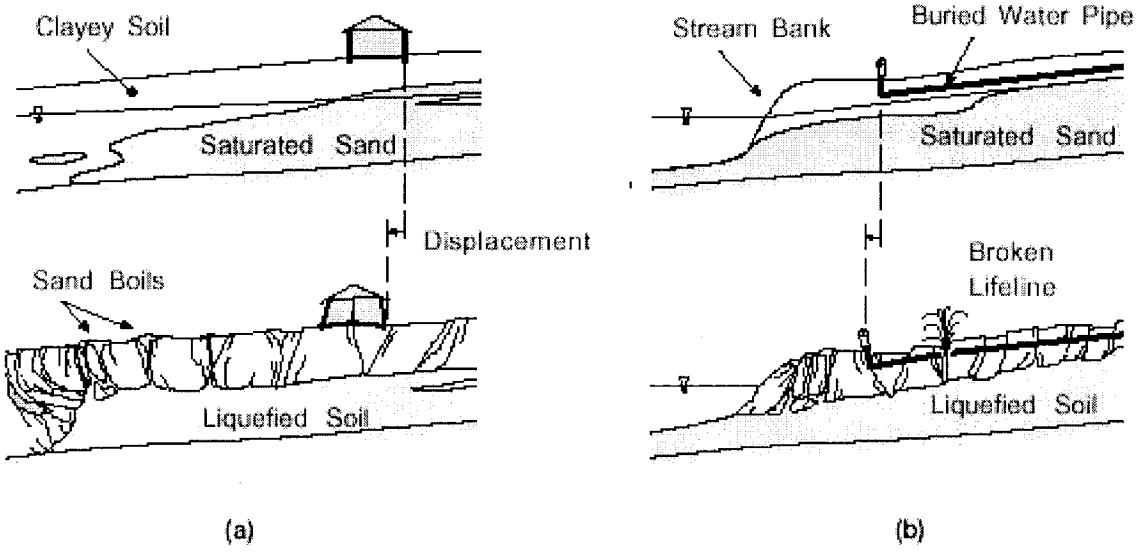


Figure 3.1. Soil liquefaction and lateral spreading of (a) gently sloping ground and (b) toward a free face.

The magnitude of lateral displacements associated with the presence of a slope "free face" is strongly correlated to height of and distance from the slope free face. Other factors, such as earthquake magnitude, distance to the seismic energy source, thickness of liquefiable sediments, and the fines content and particle size of those sediments are also correlated with ground displacements. Due to the lack of sufficient case history data for large lateral displacements, predicted displacements greater than approximately 20 feet, using the above empirical method, are not reliable.

Thickness of liquefiable sediments (T_{15}) was based on the integrated CPT-based liquefaction evaluation approach developed by Robertson and Wride (1997). The fines content and particle-size (D_{50}) data for liquefiable soils were derived from the results of the laboratory tests (grain-

size distribution analyses) performed on soil samples obtained from boreholes drilled at the site (Appendix H). The design earthquake parameters used in this method are the earthquake magnitude and the site horizontal distance from the seismic energy source. An earthquake magnitude of 7.9 and a distance of 19 kilometers to the earthquake source were used.

Lateral spread displacements of the water front slopes, preliminarily estimated using the above empirical method, appear to greatly exceed 20 feet. These estimated relatively large liquefaction induced horizontal displacements are beyond the limit of the accuracy of the above empirical method (Youd et al., 2002). Horizontal displacement calculations are summarized in an Excel spreadsheet provided in Attachment L2.

ADDED REFERENCES

Bardet, J. P., T. Tobita, N. Mace, and J. Hu. 2002. "Regional Modeling of Liquefaction-Induced Ground Deformation," Earthquake Engineering Research Institute. *Earthquake Spectra*. Vol. 18, No. 1, February, pp. 19-46.

Rauch, A. F. 1997. EPOLLS: An Empirical Method for Predicting Surface Displacements Due to Liquefaction-Induced Lateral Spreading in Earthquakes. PhD Dissertation, Virginia Tech, Civil Engineering Department.

Youd, T. L. and S. N. Hoose. 1976. Liquefaction During 1906 San Francisco Earthquake. *Journal of Geotechnical Engineering Division*. ASCE, Vol. 102, No. 102, No. GT5. May. pp. 425-439.

EXAMPLE SHAKE91 INPUT AND OUTPUT PRINTOUTS

SHAKE91 INPUT FILES
FOR
SOIL PROFILES 1, 2, AND 3

Soil Profile 1: Along IR Site 2 Southern Boundary
Soil Profile 2: Along IR Site 2 Western Boundary
Soil Profile 3: In the Area between IR Sites 1 & 2

```
option 1 - dynamic soil properties - (max is thirteen):
    1
    6
   10      #1 modulus for loose sand (Seed & Idriss 1970) - Average
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
1.000      0.993      0.960      0.895      0.743      0.540      0.298      0.150
0.063      0.04
   10        damping for loose sand (Seed & Idriss 1970) - Average
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
0.52       0.83       1.66       3.03       5.66       9.66       15.4       20.8
24.6       25.
    9      #2 modulus for Young Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
1.000      1.000      1.000      0.977      0.943      0.846      0.651      0.389
0.171
    9        damping for Young Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
   1.0       1.0        1.0       1.42       3.79       5.37       9.84       15.84
20.95
   11      #3 modulus for dense sand (Seed & Idriss 1970) - Upper Range
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
1.000      1.000      0.990      0.960      0.850      0.640      0.370      0.180
0.080      0.050      0.035
   11        damping for dense sand (Idriss 1990) - (about LRng from SI 1970)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
0.24       0.42       0.8        1.4        2.8        5.1        9.8        15.5
21.        25.        28.
    9      #4 modulus for Old Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
1.000      1.000      1.000      0.977      0.943      0.846      0.651      0.389
0.171
    9        damping for Old Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
1.0        1.0        1.0        1.09       1.41       2.72       5.0        8.68
13.32
   11      #5 modulus for clay (seed & sun 1989) upper range
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
1.000      1.000      1.000      0.981      0.941      0.847      0.656      0.438
0.238      0.144      0.110
   11        damping for clay (Idriss 1990) -
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.16       10.
0.24       0.42       0.8        1.4        2.8        5.1        9.8        15.5
21.        25.        28.
    8      #6 ATTENUATION OF  ROCK  AVERAGE
 .0001     0.0003     0.001      0.003      0.01       0.03       0.1        1.0
 1.000     1.000      0.9875     0.9525     0.900      0.810      0.725      0.550
    5       DAMPING IN ROCK
```

```
 .0001    0.001     0.01        0.1       1.
  0.4     0.8       1.5         3.0       4.6
    5    1    2    3    4    5    6
Option 2 -- Soil Profile
    2
    1   17      Alameda NAS Site 2 (South); 410-ft layer; Input Motion PGA=0.4g
    1    1          10.00                .050      .130      656.
    2    1          15.00                .050      .130      656.
    3    1          19.00                .050      .130      656.
    4    2          11.00                .050      .110      656.
    5    3           5.00                .050      .130      656.
    6    3          20.00                .050      .130     1353.
    7    4          10.00                .050      .125     1353.
    8    4          15.00                .050      .125      688.
    9    4          23.00                .050      .125      826.
   10    4          20.00                .050      .125      902.
   11    4           9.50                .050      .125      678.
   12    4          19.50                .050      .125      995.
   13    4          22.00                .050      .125      800.
   14    4          41.00                .050      .125      895.
   15    5          15.00                .050      .125      950.
   16    3         155.00                .050      .125     1500.
   17    6                               .010      .140     5000.
Option 3 -- input motion:
    3
 2999 4096   .02    cutlfn.acc                        (4e15.6)
             .40      25.         5    4
Option 4 -- sublayer for input motion {within (1) or outcropping (0):
    4
   17    0
Option 5 -- number of iterations & ratio of avg strain to max strain
    5
    0    5    0.69
Option 6 -- sublayers for which accn time histories are computed & saved:
    6
    1    1    2    3    4    5    6    7    8    9   10   11   12   13   14
    0    1    1    1    1    1    1    1    1    1    1    1    1    1    1
    1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
Option 6 -- sublayers for which accn time histories are computed & saved:
    6
   15   16   17
    1    1    0
    0    0    0
option 9 -- compute & save response spectrum:
    9
    1    0
    1    0     981.0
   0.05
option 10 -- compute & save amplification spectrum:
   10
   15    0    1    0       0.125       - surface/rock outcrop
execution will stop when program encounters 0
    0
```

```
option 1 - dynamic soil properties - (max is thirteen):
    1
    6
   10      #1 modulus for loose sand (Seed & Idriss 1970) - Average
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
1.000      0.993      0.960      0.895      0.743      0.540      0.298      0.150
0.063      0.04
   10        damping for loose sand (Seed & Idriss 1970) - Average
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
0.52       0.83       1.66       3.03       5.66       9.66       15.4       20.8
24.6       25.
    9      #2 modulus for Young Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
1.000      1.000      1.000      0.977      0.943      0.846      0.651      0.389
0.171
    9        damping for Young Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
   1.0       1.0        1.0       1.42       3.79       5.37       9.84       15.84
20.95
   11      #3 modulus for dense sand (Seed & Idriss 1970) - Upper Range
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
1.000      1.000      0.990      0.960      0.850      0.640      0.370      0.180
0.080      0.050      0.035
   11        damping for dense sand (Idriss 1990) - (about LRng from SI 1970)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
0.24       0.42       0.8        1.4        2.8        5.1        9.8        15.5
21.        25.        28.
    9      #4 modulus for Old Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
1.000      1.000      1.000      0.977      0.943      0.846      0.651      0.389
0.171
    9        damping for Old Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.
1.0        1.0        1.0        1.09       1.41       2.72       5.0        8.68
13.32
   11      #5 modulus for clay (seed & sun 1989) upper range
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
1.000      1.000      1.000      0.981      0.941      0.847      0.656      0.438
0.238      0.144      0.110
   11        damping for clay (Idriss 1990) -
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.16       10.
0.24       0.42       0.8        1.4        2.8        5.1        9.8        15.5
21.        25.        28.
    8      #6 ATTENUATION OF  ROCK  AVERAGE
 .0001     0.0003     0.001      0.003      0.01       0.03       0.1        1.0
 1.000     1.000      0.9875     0.9525     0.900      0.810      0.725      0.550
    5       DAMPING IN ROCK
```

```
 .0001    0.001     0.01        0.1       1.
 0.4      0.8       1.5         3.0       4.6
   5    1    2    3    4    5    6
Option 2 -- Soil Profile
   2
   1   16      Alameda NAS Site 2 (West); 410-ft layer; Input Motion PGA=0.4g
   1    1          10.00                .050      .130      492.
   2    1          23.00                .050      .130      492.
   3    2          17.00                .050      .110      492.
   4    2          10.00                .050      .110      492.
   5    2          10.00                .050      .110      558.
   6    3          15.00                .050      .130      774.
   7    3          20.00                .050      .130      774.
   8    4          23.00                .050      .125      826.
   9    4          20.00                .050      .125      902.
  10    4           9.50                .050      .125      678.
  11    4          19.50                .050      .125      995.
  12    4          22.00                .050      .125      800.
  13    4          41.00                .050      .125      895.
  14    5          15.00                .050      .125      950.
  15    3         155.00                .050      .125     1500.
  16    6                               .010      .140     5000.
Option 3 -- input motion:
   3
 2999 4096   .02    cut1fn.acc                    (4e15.6)
             .40      25.         5    4
Option 4 -- sublayer for input motion {within (1) or outcropping (0):
   4
  16    0
Option 5 -- number of iterations & ratio of avg strain to max strain
   5
   0   10    0.69
Option 6 -- sublayers for which accn time histories are computed & saved:
   6
   1    1    2    3    4    5    6    7    8    9   10   11   12   13   14
   0    1    1    1    1    1    1    1    1    1    1    1    1    1    1
   1    1    1    1    1    0    0    0    0    0    0    0    0    0    0
Option 6 -- sublayers for which accn time histories are computed & saved:
   6
  15   16
   1    0
   0    0
option 9 -- compute & save response spectrum:
   9
   1    0
   1    0     981.0
  0.05
option 10 -- compute & save amplification spectrum:
  10
  16    0    1    0       0.125       - surface/rock outcrop
execution will stop when program encounters 0
   0
```

```
option 1 - dynamic soil properties - (max is thirteen):
    1
    6
   10      #1 modulus for loose sand (Seed & Idriss 1970) - Average
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
1.000      0.993      0.960      0.895      0.743      0.540      0.298      0.150
0.063      0.04
   10        damping for loose sand (Seed & Idriss 1970) - Average
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
0.52       0.83       1.66       3.03       5.66       9.66       15.4       20.8
24.6       25.
    9      #2 modulus for Young Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
1.000      1.000      1.000      0.977      0.943      0.846      0.651      0.389
0.171      .063
    9        damping for Young Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
   1.0       1.0        1.0       1.42       3.79       5.37       9.84       15.84
20.95      25.
   11      #3 modulus for dense sand (Seed & Idriss 1970) - Upper Range
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
1.000      1.000      0.990      0.960      0.850      0.640      0.370      0.180
0.080      0.050      0.035
   11        damping for dense sand (Idriss 1990) - (about LRng from SI 1970)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
0.24       0.42       0.8        1.4        2.8        5.1        9.8        15.5
21.        25.        28.
    9      #4 modulus for Old Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
1.000      1.000      1.000      0.977      0.943      0.846      0.651      0.389
0.171      0.06
    9        damping for Old Bay Mud (Idriss 1990, Pyke 1995)
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.
1.0        1.0        1.0        1.09       1.41       2.72       5.0        8.68
13.32      17.
   11      #5 modulus for clay (seed & sun 1989) upper range
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.         10.
1.000      1.000      1.000      0.981      0.941      0.847      0.656      0.438
0.238      0.144      0.110
   11        damping for clay (Idriss 1990) -
0.0001     0.0003     0.001      0.003      0.01       0.03       0.1        0.3
1.         3.16       10.
0.24       0.42       0.8        1.4        2.8        5.1        9.8        15.5
21.        25.        28.
    8      #6 ATTENUATION OF  ROCK  AVERAGE
 .0001     0.0003     0.001      0.003      0.01       0.03       0.1        1.0
 1.000     1.000      0.9875     0.9525     0.900      0.810      0.725      0.550
    5       DAMPING IN ROCK
```

```
 .0001     0.001      0.01         0.1        1.
  0.4      0.8        1.5          3.0        4.6
    5    1    2    3    4    5    6
Option 2 -- Soil Profile
    2
    1   15    Alameda NAS Between Sites 1&2; 410-ft layer; Input Motion PGA=0.4g
    1    1          28.00                .050      .130      600.
    2    2           7.00                .050      .110      600.
    3    2          18.00                .050      .110      600.
    4    3          28.00                .050      .130     1050.
    5    4           9.00                .050      .125     1050.
    6    4          15.00                .050      .125      688.
    7    4          23.00                .050      .125      826.
    8    4          20.00                .050      .125      902.
    9    4           9.50                .050      .125      678.
   10    4          19.50                .050      .125      995.
   11    4          22.00                .050      .125      800.
   12    4          41.00                .050      .125      895.
   13    5          15.00                .050      .125      950.
   14    3         155.00                .050      .125     1500.
   15    6                               .010      .140     5000.
Option 3 -- input motion:
    3
 2999 4096   .02    cut1fn.acc                        (4e15.6)
             .40      25.         5    4
Option 4 -- sublayer for input motion {within (1) or outcropping (0):
    4
   15    0
Option 5 -- number of iterations & ratio of avg strain to max strain
    5
    0    4    0.69
Option 6 -- sublayers for which accn time histories are computed & saved:
    6
    1    1    2    3    4    5    6    7    8    9   10   11   12   13   14
    0    1    1    1    1    1    1    1    1    1    1    1    1    1    1
    1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
Option 6 -- sublayers for which accn time histories are computed & saved:
    6
   15
    0
    0
option 9 -- compute & save response spectrum:
    9
    1    0
    1    0     981.0
   0.05
option 10 -- compute & save amplification spectrum:
   10
   15    0    1    0       0.125       - surface/rock outcrop
execution will stop when program encounters 0
    0
```

SHAKE91 OUTPUT FILE
FOR
SOIL PROFILE 1, SET 1 RECORD

```
*****************************************************
 * SHAKE  --   A COMPUTER PROGRAM FOR EARTHQUAKE RESPONSE  *
 *             ANALYSIS OF HORIZONTALLY LAYERED SITES      *
 *             by: Per B. Schnabel & John Lysmer -- 1970   *
 * ---------------------------------------------------- *
 * shake85     IBM-PC version of SHAKE                     *
 *             by: S.S. (Willie) Lai, January 1985         *
 * ---------------------------------------------------- *
 * shake88   : New modulus reduction curves for clays added*
 *             using results from Sun et al (1988)         *
 *             by: J. I. Sun & Ramin Golesorkhi            *
 *             February 26, 1988                           *
 * ---------------------------------------------------- *
 * SHAKE90/91: Adjust last iteration; Input now is either  *
 *             Gmax or max Vs; up to 13 material types can *
 *             be specified by user; up to 50 Layers can   *
 *             be specified; object motion can be read in  *
 *             from a separate file and can have user      *
 *             specified format; Different periods for     *
 *             response spectral calculations; options     *
 *             are renumbered; and general cleanup         *
 *             by: J. I. Sun, I. M. Idriss & P. Dirrim     *
 *             June 1990 - February 1991                   *
 * ---------------------------------------------------- *
 * SHAKE91   : General cleanup and finalization of input/  *
 *             output format ... etc                       *
 *             by: I. M. Idriss                            *
 *             December 1991                               *
 *************************************************************
 MAX. NUMBER OF TERMS IN FOURIER TRANSFORM =      4096
 NECESSARY LENGTH OF BLANK COMMON X        =     25619

1******   OPTION  1  ***  READ RELATION BETWEEN SOIL PROPERTIES AND STRAIN

 **********************
  MATERIAL TYPE NO. 1
 **********************

 CURVE NO.  1:      #1 modulus for loose sand (Seed & Idriss 1970) - Averag
 CURVE NO.  2:        damping for loose sand (Seed & Idriss 1970) - Average
```

CURVE NO. 1		CURVE NO. 2	
STRAIN	G/Gmax	STRAIN	DAMPING
.0001	1.000	.0001	.52
.0003	.993	.0003	.83
.0010	.960	.0010	1.66
.0030	.895	.0030	3.03
.0100	.743	.0100	5.66
.0300	.540	.0300	9.66
.1000	.298	.1000	15.40
.3000	.150	.3000	20.80
1.0000	.063	1.0000	24.60
3.0000	.040	3.0000	25.00

****
MATERIAL TYPE NO. 2
****

CURVE NO. 3: #2 modulus for Young Bay Mud (Idriss 1990, Pyke 1995)
CURVE NO. 4: damping for Young Bay Mud (Idriss 1990, Pyke 1995)

CURVE NO. 3		CURVE NO. 4	
STRAIN	G/Gmax	STRAIN	DAMPING
.0001	1.000	.0001	1.00
.0003	1.000	.0003	1.00
.0010	1.000	.0010	1.00
.0030	.977	.0030	1.42
.0100	.943	.0100	3.79
.0300	.846	.0300	5.37
.1000	.651	.1000	9.84
.3000	.389	.3000	15.84
1.0000	.171	1.0000	20.95

****
MATERIAL TYPE NO. 3
****

CURVE NO. 5: #3 modulus for dense sand (Seed & Idriss 1970) - Upper
CURVE NO. 6: damping for dense sand (Idriss 1990) - (about LRng fr

CURVE NO. 5		CURVE NO. 6	
STRAIN	G/Gmax	STRAIN	DAMPING
.0001	1.000	.0001	.24
.0003	1.000	.0003	.42
.0010	.990	.0010	.80
.0030	.960	.0030	1.40
.0100	.850	.0100	2.80
.0300	.640	.0300	5.10
.1000	.370	.1000	9.80
.3000	.180	.3000	15.50
1.0000	.080	1.0000	21.00
3.0000	.050	3.0000	25.00
10.0000	.035	10.0000	28.00

****
MATERIAL TYPE NO. 4
****

CURVE NO. 7: #4 modulus for Old Bay Mud (Idriss 1990, Pyke 1995)
CURVE NO. 8: damping for Old Bay Mud (Idriss 1990, Pyke 1995)

CURVE NO. 7

STRAIN	G/Gmax
.0001	1.000
.0003	1.000
.0010	1.000
.0030	.977
.0100	.943
.0300	.846
.1000	.651
.3000	.389
1.0000	.171

CURVE NO. 8

STRAIN	DAMPING
.0001	1.00
.0003	1.00
.0010	1.00
.0030	1.09
.0100	1.41
.0300	2.72
.1000	5.00
.3000	8.68
1.0000	13.32

****
MATERIAL TYPE NO. 5
****

CURVE NO. 9: #5 modulus for clay (seed & sun 1989) upper range
CURVE NO. 10: damping for clay (Idriss 1990) -

CURVE NO. 9

STRAIN	G/Gmax
.0001	1.000
.0003	1.000
.0010	1.000
..0030	.981
.0100	.941
.0300	.847
.1000	.656
.3000	.438
1.0000	.238
3.0000	.144
10.0000	.110

CURVE NO.10

STRAIN	DAMPING
.0001	.24
.0003	.42
.0010	.80
.0030	1.40
.0100	2.80
.0300	5.10
.1000	9.80
.3000	15.50
1.0000	21.00
3.1600	25.00
10.0000	28.00

```
1******   OPTION  2  ***  READ SOIL PROFILE
NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record
 NUMBER OF LAYERS                    17          DEPTH TO BEDROCK        410.00
```

NO.	TYPE	THICKNESS (ft)	DEPTH (ft)	Tot. PRESS. (ksf)	MODULUS (ksf)	DAMPING	UNIT WT. (kcf)	SHEAR VEL (fps)
1	1	10.00	5.00	.65	1737.	.050	.130	656.0
2	1	15.00	17.50	1.81	1737.	.050	.130	656.0
3	1	19.00	34.50	2.96	1737.	.050	.130	656.0
4	2	11.00	49.50	3.86	1470.	.050	.110	656.0
5	3	5.00	57.50	4.29	1737.	.050	.130	656.0
6	3	20.00	70.00	5.14	7391.	.050	.130	1353.0
7	4	10.00	85.00	6.12	7106.	.050	.125	1353.0
8	4	15.00	97.50	6.91	1838.	.050	.125	688.0
9	4	23.00	116.50	8.10	2649.	.050	.125	826.0
10	4	20.00	138.00	9.44	3158.	.050	.125	902.0
11	4	9.50	152.75	10.37	1784.	.050	.125	678.0
12	4	19.50	167.25	11.27	3843.	.050	.125	995.0
13	4	22.00	188.00	12.57	2484.	.050	.125	800.0
14	4	41.00	219.50	14.54	3110.	.050	.125	895.0
15	5	15.00	247.50	16.30	3503.	.050	.125	950.0
16	3	155.00	332.50	21.62	8734.	.050	.125	1500.0
17	BASE				108696.	.010	.140	5000.0

```
  PERIOD = 1.48 FROM AVERAGE SHEAR VELOCITY =   1108.


  FREQUENCY    AMPLITUDE
 MAXIMUM AMPLIFICATION =  13.64
 FOR FREQUENCY         =    .70 C/SEC.
     PERIOD            =   1.44 SEC.

1******   OPTION  3  ***  READ INPUT MOTION

  FILE NAME FOR INPUT MOTION = cut1fn.acc
    NO. OF INPUT ACC. POINTS =  2999
   NO. OF POINTS USED IN FFT =  4096
        NO. OF HEADING LINES =     5
      NO. OF POINTS PER LINE =     4
  TIME STEP FOR INPUT MOTION =  .0200
  FORMAT FOR OF TIME HISTORY =  (4e15.6)


 ***** H E A D E R
  Time history matched to spectrum:::Targets:ybi_fn_1500.target
   MIN & MAX VALUES =   -6.066470E-01    6.157570E-01
        2999
    2.000000E-02
(4E15.6)
```

```
 **  FIRST & LAST 5 LINES OF INPUT MOTION *****

     1   .000000 -.000649 -.001690 -.001859
     2  -.001848 -.001836 -.001826 -.001819
     3  -.001824 -.001859 -.001950 -.002110
     4  -.002358 -.002686 -.003034 -.003306
     5  -.003364 -.003263 -.003082 -.002843
   ........ INPUT MOTION READ NOT ECHOED...........
   746  -.000179 -.000157 -.000135 -.000114
   747  -.000093 -.000073 -.000054 -.000036
   748  -.000020 -.000004  .000010  .000023
   749   .000034  .000044  .000053  .000060
   750   .000065  .000069  .000071  .000000

 MAXIMUM ACCELERATION =    .58868
 AT TIME              = 25.88 SEC
 THE VALUES WILL BE MULTIPLIED BY A FACTOR =    .679
 TO GIVE NEW MAXIMUM ACCELERATION          =    .40000
 MEAN SQUARE FREQUENCY =       3.30 C/SEC.
  MAX ACCELERATION =      .40000 FOR FREQUENCIES REMOVED ABOVE      25.00 C/SEC.
1******   OPTION  4  ***  READ WHERE OBJECT MOTION IS GIVEN
   OBJECT MOTION IN LAYER NUMBER  17 OUTCROPPING

1******   OPTION  5  ***  OBTAIN STRAIN COMPATIBLE SOIL PROPERTIES
  MAXIMUM NUMBER OF ITERATIONS                =     5
  FACTOR FOR UNIFORM STRAIN IN TIME DOMAIN    =    .69

     EARTHQUAKE   - cut1fn.acc
NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

  ITERATION NUMBER  1

  VALUES IN TIME DOMAIN
```

NO	TYPE	DEPTH (FT)	UNIFRM. STRAIN	<---- DAMPING ----> NEW	USED	ERROR	<---- SHEAR MODULUS -----> NEW	USED	ERROR	G/Go RATIO
1	1	5.0	.01855	.079	.050	36.8	1092.6	1737.4	-59.0	1.000
2	1	17.5	.06290	.132	.050	62.1	679.6	1737.4	-155.6	1.000
3	1	34.5	.11337	.160	.050	68.8	488.4	1737.4	-255.8	1.000
4	2	49.5	.16943	.127	.050	60.7	772.2	1470.1	-90.4	1.000
5	3	57.5	.15510	.121	.050	58.6	510.9	1737.4	-240.0	1.000
6	3	70.0	.04110	.063	.050	21.0	4208.2	7390.7	-75.6	1.000
7	4	85.0	.04808	.036	.050	-38.4	5469.1	7106.4	-29.9	1.000
8	4	97.5	.19977	.073	.050	31.7	893.0	1837.5	-105.8	1.000
9	4	116.5	.15330	.064	.050	22.3	1454.4	2648.6	-82.1	1.000
10	4	138.0	.15512	.065	.050	22.7	1725.4	3158.4	-83.1	1.000
11	4	152.8	.30639	.088	.050	42.9	687.4	1784.5	-159.6	1.000
12	4	167.3	.15428	.065	.050	22.5	2104.6	3843.3	-82.6	1.000
13	4	188.0	.26135	.082	.050	39.2	1048.2	2484.5	-137.0	1.000
14	4	219.5	.22769	.078	.050	35.5	1414.1	3109.6	-119.9	1.000
15	5	247.5	.20526	.135	.050	63.0	1798.4	3503.5	-94.8	1.000
16	3	332.5	.09165	.095	.050	47.1	3402.5	8734.5	-156.7	1.000

```
1
     EARTHQUAKE   - cut1fn.acc
NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record
```

ITERATION NUMBER 2

VALUES IN TIME DOMAIN

NO	TYPE	DEPTH (FT)	UNIFRM. STRAIN	<---- DAMPING ----> NEW	USED	ERROR	<---- SHEAR MODULUS -----> NEW	USED	ERROR	G/Go RATIO
1	1	5.0	.01768	.077	.079	-2.2	1107.9	1092.6	1.4	.629
2	1	17.5	.10103	.155	.132	14.6	515.4	679.6	-31.9	.391
3	1	34.5	.26871	.203	.160	20.9	286.4	488.4	-70.5	.281
4	2	49.5	.22839	.144	.127	11.4	667.5	772.2	-15.7	.525
5	3	57.5	.39366	.167	.121	27.9	273.5	510.9	-86.8	.294
6	3	70.0	.05843	.077	.063	17.8	3625.0	4208.2	-16.1	.569
7	4	85.0	.05436	.038	.036	6.0	5327.8	5469.1	-2.7	.770
8	4	97.5	.37453	.095	.073	23.3	641.0	893.0	-39.3	.486
9	4	116.5	.25393	.081	.064	20.8	1135.6	1454.4	-28.1	.549
10	4	138.0	.23367	.078	.065	17.5	1416.8	1725.4	-21.8	.546
11	4	152.8	.63180	.116	.088	24.1	453.5	687.4	-51.6	.385
12	4	167.3	.21214	.075	.065	14.2	1812.6	2104.6	-16.1	.548
13	4	188.0	.44618	.102	.082	19.5	787.9	1048.2	-33.0	.422
14	4	219.5	.34018	.092	.078	15.4	1138.8	1414.1	-24.2	.455
15	5	247.5	.27181	.150	.135	9.7	1603.1	1798.4	-12.2	.513
16	3	332.5	.14934	.119	.095	20.4	2625.9	3402.5	-29.6	.390

1

EARTHQUAKE - cut1fn.acc

NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

ITERATION NUMBER 3

VALUES IN TIME DOMAIN

NO	TYPE	DEPTH (FT)	UNIFRM. STRAIN	<---- DAMPING ----> NEW	USED	ERROR	<---- SHEAR MODULUS -----> NEW	USED	ERROR	G/Go RATIO
1	1	5.0	.01715	.076	.077	-1.5	1117.8	1107.9	.9	.638
2	1	17.5	.13063	.167	.155	7.6	455.2	515.4	-13.2	.297
3	1	34.5	.44326	.220	.203	8.0	211.6	286.4	-35.3	.165
4	2	49.5	.25221	.149	.144	3.6	632.7	667.5	-5.5	.454
5	3	57.5	.68686	.193	.167	13.2	193.2	273.5	-41.6	.157
6	3	70.0	.06085	.079	.077	2.0	3557.9	3625.0	-1.9	.490
7	4	85.0	.04844	.036	.038	-6.0	5460.5	5327.8	2.4	.750
8	4	97.5	.44217	.102	.095	6.3	585.7	641.0	-9.4	.349
9	4	116.5	.27057	.083	.081	2.6	1095.5	1135.6	-3.7	.429
10	4	138.0	.23777	.079	.078	.7	1403.7	1416.8	-.9	.449
11	4	152.8	.78488	.124	.116	6.8	383.4	453.5	-18.3	.254
12	4	167.3	.20066	.073	.075	-2.5	1863.7	1812.6	2.7	.472
13	4	188.0	.48789	.106	.102	3.3	747.7	787.9	-5.4	.317
14	4	219.5	.35145	.093	.092	1.4	1120.5	1138.8	-1.6	.366
15	5	247.5	.25654	.147	.150	-2.0	1643.3	1603.1	2.4	.458
16	3	332.5	.16188	.123	.119	3.4	2504.2	2625.9	-4.9	.301

1

EARTHQUAKE - cut1fn.acc

NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

ITERATION NUMBER 4

VALUES IN TIME DOMAIN

NO	TYPE	DEPTH (FT)	UNIFRM. STRAIN	<---- DAMPING ----> NEW	USED	ERROR	<---- SHEAR MODULUS -----> NEW	USED	ERROR	G/Go RATIO
1	1	5.0	.01701	.076	.076	-.4	1120.3	1117.8	.2	.643
2	1	17.5	.14862	.173	.167	3.7	425.0	455.2	-7.1	.262
3	1	34.5	.59650	.230	.220	4.1	174.3	211.6	-21.4	.122
4	2	49.5	.26055	.151	.149	1.2	621.3	632.7	-1.8	.430
5	3	57.5	.94271	.207	.193	7.0	147.5	193.2	-31.0	.111
6	3	70.0	.05939	.078	.079	-1.2	3598.1	3557.9	1.1	.481
7	4	85.0	.04520	.035	.036	-3.8	5540.2	5460.5	1.4	.768
8	4	97.5	.46288	.104	.102	1.7	570.5	585.7	-2.7	.319
9	4	116.5	.27085	.083	.083	.0	1094.9	1095.5	-.1	.414
10	4	138.0	.23092	.078	.079	-1.3	1425.7	1403.7	1.5	.444
11	4	152.8	.89204	.129	.124	3.8	342.1	383.4	-12.1	.215
12	4	167.3	.19026	.072	.073	-2.5	1912.4	1863.7	2.5	.485
13	4	188.0	.50311	.107	.106	1.1	733.9	747.7	-1.9	.301
14	4	219.5	.34914	.093	.093	-.3	1124.2	1120.5	.3	.360
15	5	247.5	.24155	.144	.147	-2.2	1685.2	1643.3	2.5	.469
16	3	332.5	.15947	.122	.123	-.6	2526.8	2504.2	.9	.287

1

EARTHQUAKE - cut1fn.acc

NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

ITERATION NUMBER 5

VALUES IN TIME DOMAIN

NO	TYPE	DEPTH (FT)	UNIFRM. STRAIN	<---- DAMPING ----> NEW	USED	ERROR	<---- SHEAR MODULUS -----> NEW	USED	ERROR	G/Go RATIO
1	1	5.0	.01698	.076	.076	-.1	1121.0	1120.3	.1	.645
2	1	17.5	.15962	.177	.173	2.0	408.3	425.0	-4.1	.245
3	1	34.5	.72440	.236	.230	2.6	149.9	174.3	-16.3	.100
4	2	49.5	.26274	.151	.151	.3	618.4	621.3	-.5	.423
5	3	57.5	1.21840	.217	.207	4.6	129.6	147.5	-13.8	.085
6	3	70.0	.05755	.076	.078	-1.6	3650.3	3598.1	1.4	.487
7	4	85.0	.04358	.034	.035	-2.0	5582.3	5540.2	.8	.780
8	4	97.5	.46559	.104	.104	.2	568.6	570.5	-.3	.310
9	4	116.5	.26769	.083	.083	-.5	1102.3	1094.9	.7	.413
10	4	138.0	.22494	.077	.078	-1.1	1445.5	1425.7	1.4	.451
11	4	152.8	.99087	.133	.129	3.0	308.1	342.1	-11.0	.192
12	4	167.3	.18547	.071	.072	-1.2	1935.8	1912.4	1.2	.498
13	4	188.0	.51261	.107	.107	.7	725.5	733.9	-1.2	.295
14	4	219.5	.34546	.092	.093	-.4	1130.2	1124.2	.5	.362
15	5	247.5	.23220	.142	.144	-1.4	1712.6	1685.2	1.6	.481
16	3	332.5	.15411	.120	.122	-1.5	2578.4	2526.8	2.0	.289

VALUES IN TIME DOMAIN

LAYER	TYPE	THICKNESS FT	DEPTH FT	MAX STRAIN PRCNT	MAX STRESS PSF	TIME SEC
1	1	10.0	5.0	.02460	275.63	3.92
2	1	15.0	17.5	.23133	983.19	3.94
3	1	19.0	34.5	1.04986	1830.13	3.94
4	2	11.0	49.5	.38078	2365.76	3.86
5	3	5.0	57.5	1.76579	2604.61	3.88
6	3	20.0	70.0	.08341	3001.07	3.80
7	4	10.0	85.0	.06316	3499.07	3.76
8	4	15.0	97.5	.67476	3849.52	3.76
9	4	23.0	116.5	.38795	4247.55	3.78
10	4	20.0	138.0	.32600	4647.92	3.80
11	4	9.5	152.8	1.43605	4912.18	3.80
12	4	19.5	167.3	.26879	5140.34	3.74
13	4	22.0	188.0	.74291	5452.00	3.74
14	4	41.0	219.5	.50067	5628.60	3.68
15	5	15.0	247.5	.33653	5671.11	3.72
16	3	155.0	332.5	.22335	5643.59	3.62

PERIOD = 2.55 FROM AVERAGE SHEAR VELOCITY = 643.

FREQUENCY AMPLITUDE
MAXIMUM AMPLIFICATION = 6.19
FOR FREQUENCY = .39 C/SEC.
PERIOD = 2.55 SEC.

1****** OPTION 6 *** COMPUTE MOTION IN NEW SUBLAYERS

EARTHQUAKE -cutlfn.acc
NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

LAYER	DEPTH FT	MAX. ACC. G	TIME SEC	MEAN SQ. FR. C/SEC	ACC. RATIO QUIET ZONE	TH SAVED ACC. RECORD
OUTCR.	.0	.40890	3.90	.82	.001	512
WITHIN	.0	.40890	3.90	.82	.001	512
WITHIN	10.0	.40634	3.90	.81	.001	512
WITHIN	25.0	.38832	3.86	.72	.001	512
WITHIN	44.0	.35408	3.78	.90	.001	0
WITHIN	55.0	.33118	3.76	.91	.001	0
WITHIN	60.0	.31467	3.72	.98	.001	0
WITHIN	80.0	.30593	3.70	.95	.001	0
WITHIN	90.0	.30200	3.70	.93	.001	0
WITHIN	105.0	.29595	3.64	.97	.001	0
WITHIN	128.0	.30933	3.60	1.21	.001	0
WITHIN	148.0	.28568	3.58	1.23	.001	0
WITHIN	157.5	.31170	4.94	1.61	.001	0
WITHIN	177.0	.29757	4.92	1.58	.001	0
WITHIN	199.0	.34586	4.86	1.76	.000	0

1****** OPTION 6 *** COMPUTE MOTION IN NEW SUBLAYERS

EARTHQUAKE -cutlfn.acc
NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

LAYER	DEPTH FT	MAX. ACC. G	TIME SEC	MEAN SQ. FR. C/SEC	ACC. RATIO QUIET ZONE	TH SAVED ACC. RECORD
WITHIN	240.0	.28902	4.80	1.88	.000	0
WITHIN	255.0	.28935	4.78	1.94	.000	0
OUTCR.	410.0	.40000	25.88	3.30	.000	0

```
1******   OPTION  9  ***  COMPUTE RESPONSE SPECTRUM
  RESPONSE SPECTRUM ANALYSIS FOR LAYER NUMBER        1
 CALCULATED FOR DAMPING          .050

     TIMES AT WHICH MAX. SPECTRAL VALUES OCCUR
          TD = TIME FOR MAX. RELATIVE DISP.
          TV = TIME FOR MAX. RELATIVE VEL.
          TA = TIME FOR MAX. ABSOLUTE ACC.
     DAMPING RATIO =  .05
     PER =  .01     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6600   TA =  3.8800
     PER =  .03     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .04     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .05     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .06     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .07     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .08     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .09     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .10     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .11     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .12     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .13     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .14     TIMES FOR MAXIMA --   TD =  3.9000   TV =  2.6400   TA =  3.8800
     PER =  .15     TIMES FOR MAXIMA --   TD =  3.8800   TV =  4.0000   TA =  3.8800
     PER =  .16     TIMES FOR MAXIMA --   TD =  3.8800   TV =  5.5400   TA =  3.8800
     PER =  .17     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .18     TIMES FOR MAXIMA --   TD =  3.8800   TV =  2.6400   TA =  3.8800
     PER =  .19     TIMES FOR MAXIMA --   TD =  3.8800   TV = 26.7600   TA =  3.8800
     PER =  .20     TIMES FOR MAXIMA --   TD =  3.9000   TV = 26.7600   TA =  3.8800
     PER =  .21     TIMES FOR MAXIMA --   TD =  3.9000   TV = 13.0400   TA =  3.9000
     PER =  .22     TIMES FOR MAXIMA --   TD =  3.9200   TV =  4.0000   TA =  3.9200
     PER =  .23     TIMES FOR MAXIMA --   TD =  3.9200   TV =  4.0200   TA =  3.9200
     PER =  .24     TIMES FOR MAXIMA --   TD =  3.9400   TV = 13.0800   TA =  3.9400
     PER =  .25     TIMES FOR MAXIMA --   TD =  3.9400   TV = 26.7800   TA =  3.9400
     PER =  .26     TIMES FOR MAXIMA --   TD =  3.9400   TV = 26.7800   TA =  3.9400
     PER =  .27     TIMES FOR MAXIMA --   TD =  3.9200   TV =  8.2200   TA =  3.9200
     PER =  .28     TIMES FOR MAXIMA --   TD =  5.3200   TV = 12.5200   TA =  5.3200
     PER =  .29     TIMES FOR MAXIMA --   TD =  5.3200   TV = 26.8000   TA =  5.3200
     PER =  .30     TIMES FOR MAXIMA --   TD =  5.3400   TV = 26.8200   TA =  5.3400
     PER =  .31     TIMES FOR MAXIMA --   TD =  5.3600   TV = 26.8200   TA =  5.3600
     PER =  .32     TIMES FOR MAXIMA --   TD =  5.3800   TV = 26.8400   TA =  5.3800
     PER =  .33     TIMES FOR MAXIMA --   TD =  5.4000   TV =  8.4800   TA =  5.4000
     PER =  .34     TIMES FOR MAXIMA --   TD =  3.7000   TV =  8.4800   TA =  3.7000
     PER =  .35     TIMES FOR MAXIMA --   TD =  3.7200   TV = 25.7600   TA =  3.7000
     PER =  .36     TIMES FOR MAXIMA --   TD =  3.7200   TV = 25.7800   TA =  3.7200
     PER =  .37     TIMES FOR MAXIMA --   TD =  3.7400   TV = 25.7800   TA =  3.7400
     PER =  .38     TIMES FOR MAXIMA --   TD =  3.7600   TV = 25.8000   TA =  3.7600
     PER =  .39     TIMES FOR MAXIMA --   TD =  3.7800   TV = 26.8600   TA =  3.7800
     PER =  .40     TIMES FOR MAXIMA --   TD =  3.8000   TV = 26.8800   TA =  3.7800
     PER =  .41     TIMES FOR MAXIMA --   TD = 27.0200   TV = 26.8800   TA = 27.0000
     PER =  .42     TIMES FOR MAXIMA --   TD = 27.0200   TV = 26.9000   TA = 27.0200
     PER =  .43     TIMES FOR MAXIMA --   TD = 27.0400   TV = 26.9200   TA = 27.0400
     PER =  .44     TIMES FOR MAXIMA --   TD = 27.0600   TV =  6.6600   TA = 27.0400
     PER =  .45     TIMES FOR MAXIMA --   TD = 27.0600   TV = 27.2000   TA = 27.0600
     PER =  .46     TIMES FOR MAXIMA --   TD = 27.0800   TV = 27.2200   TA = 27.0800
     PER =  .47     TIMES FOR MAXIMA --   TD = 27.1000   TV = 27.2200   TA = 27.0800
     PER =  .48     TIMES FOR MAXIMA --   TD = 27.1000   TV = 27.2400   TA = 27.1000
     PER =  .49     TIMES FOR MAXIMA --   TD =  5.4400   TV =  3.0000   TA =  5.4400
     PER =  .50     TIMES FOR MAXIMA --   TD =  5.4600   TV =  5.6000   TA =  5.4400
     PER =  .51     TIMES FOR MAXIMA --   TD =  5.4800   TV =  5.6200   TA =  5.4600
     PER =  .52     TIMES FOR MAXIMA --   TD =  3.7400   TV =  5.6400   TA =  3.7200
     PER =  .53     TIMES FOR MAXIMA --   TD =  3.7600   TV =  5.6600   TA =  3.7400
```

PER = .54	TIMES FOR MAXIMA --	TD = 3.7800	TV = 5.6800	TA = 3.7600
PER = .55	TIMES FOR MAXIMA --	TD = 3.7800	TV = 3.6400	TA = 3.7800
PER = .56	TIMES FOR MAXIMA --	TD = 3.8000	TV = 3.6400	TA = 3.8000
PER = .57	TIMES FOR MAXIMA --	TD = 3.8200	TV = 3.6600	TA = 3.8200
PER = .58	TIMES FOR MAXIMA --	TD = 3.8400	TV = 12.5600	TA = 3.8200
PER = .60	TIMES FOR MAXIMA --	TD = 3.8600	TV = 27.2600	TA = 3.8600
PER = .62	TIMES FOR MAXIMA --	TD = 3.9000	TV = 27.2800	TA = 3.8800
PER = .64	TIMES FOR MAXIMA --	TD = 3.9200	TV = 27.3200	TA = 3.9200
PER = .66	TIMES FOR MAXIMA --	TD = 3.9600	TV = 6.8000	TA = 3.9400
PER = .68	TIMES FOR MAXIMA --	TD = 8.7800	TV = 8.9600	TA = 8.7600
PER = .70	TIMES FOR MAXIMA --	TD = 8.8200	TV = 9.0000	TA = 8.8000
PER = .72	TIMES FOR MAXIMA --	TD = 8.8600	TV = 9.0200	TA = 8.8400
PER = .74	TIMES FOR MAXIMA --	TD = 27.6000	TV = 8.7000	TA = 27.5800
PER = .76	TIMES FOR MAXIMA --	TD = 27.6000	TV = 27.8000	TA = 27.6000
PER = .78	TIMES FOR MAXIMA --	TD = 27.6200	TV = 27.8200	TA = 27.6200
PER = .80	TIMES FOR MAXIMA --	TD = 27.6600	TV = 27.8600	TA = 27.6400
PER = .82	TIMES FOR MAXIMA --	TD = 27.6800	TV = 27.8800	TA = 27.6600
PER = .84	TIMES FOR MAXIMA --	TD = 5.9400	TV = 27.9000	TA = 27.6800
PER = .86	TIMES FOR MAXIMA --	TD = 5.9600	TV = 27.9200	TA = 5.9600
PER = .88	TIMES FOR MAXIMA --	TD = 5.9800	TV = 27.9400	TA = 5.9800
PER = .90	TIMES FOR MAXIMA --	TD = 6.0000	TV = 6.2400	TA = 6.0000
PER = .92	TIMES FOR MAXIMA --	TD = 6.0200	TV = 6.2600	TA = 6.0200
PER = .94	TIMES FOR MAXIMA --	TD = 6.0400	TV = 6.2800	TA = 6.0400
PER = .96	TIMES FOR MAXIMA --	TD = 6.0600	TV = 6.3000	TA = 6.0600
PER = .98	TIMES FOR MAXIMA --	TD = 6.0800	TV = 6.3200	TA = 6.0600
PER = 1.00	TIMES FOR MAXIMA --	TD = 6.1000	TV = 6.3400	TA = 6.0800
PER = 1.05	TIMES FOR MAXIMA --	TD = 6.1400	TV = 5.9000	TA = 6.1400
PER = 1.10	TIMES FOR MAXIMA --	TD = 6.2000	TV = 5.9400	TA = 6.1800
PER = 1.15	TIMES FOR MAXIMA --	TD = 6.2600	TV = 5.9800	TA = 6.2400
PER = 1.20	TIMES FOR MAXIMA --	TD = 6.3200	TV = 6.0400	TA = 6.3000
PER = 1.25	TIMES FOR MAXIMA --	TD = 4.7000	TV = 6.0800	TA = 4.6800
PER = 1.30	TIMES FOR MAXIMA --	TD = 4.7200	TV = 4.4400	TA = 4.7000
PER = 1.35	TIMES FOR MAXIMA --	TD = 4.7600	TV = 4.4600	TA = 4.7400
PER = 1.40	TIMES FOR MAXIMA --	TD = 4.8000	TV = 4.4800	TA = 4.7800
PER = 1.45	TIMES FOR MAXIMA --	TD = 4.8400	TV = 4.5000	TA = 4.8200
PER = 1.50	TIMES FOR MAXIMA --	TD = 4.8600	TV = 4.5000	TA = 4.8400
PER = 1.55	TIMES FOR MAXIMA --	TD = 4.9000	TV = 4.5200	TA = 4.8800
PER = 1.60	TIMES FOR MAXIMA --	TD = 4.9400	TV = 4.5400	TA = 4.9200
PER = 1.65	TIMES FOR MAXIMA --	TD = 4.9800	TV = 4.5800	TA = 4.9600
PER = 1.70	TIMES FOR MAXIMA --	TD = 36.0000	TV = 4.6000	TA = 35.9600
PER = 1.75	TIMES FOR MAXIMA --	TD = 36.0600	TV = 4.6200	TA = 36.0400
PER = 1.80	TIMES FOR MAXIMA --	TD = 36.1000	TV = 4.6400	TA = 36.0800
PER = 1.85	TIMES FOR MAXIMA --	TD = 36.1200	TV = 4.6600	TA = 36.0800
PER = 1.90	TIMES FOR MAXIMA --	TD = 36.1400	TV = 4.6800	TA = 36.1000
PER = 1.95	TIMES FOR MAXIMA --	TD = 36.1800	TV = 36.6600	TA = 36.1400
PER = 2.00	TIMES FOR MAXIMA --	TD = 36.2200	TV = 6.9600	TA = 36.1800
PER = 2.05	TIMES FOR MAXIMA --	TD = 37.3800	TV = 7.0000	TA = 37.3400
PER = 2.10	TIMES FOR MAXIMA --	TD = 7.6000	TV = 7.0600	TA = 7.5600
PER = 2.15	TIMES FOR MAXIMA --	TD = 7.6600	TV = 7.1000	TA = 7.6400
PER = 2.20	TIMES FOR MAXIMA --	TD = 7.7400	TV = 7.1400	TA = 7.7000
PER = 2.25	TIMES FOR MAXIMA --	TD = 37.5200	TV = 7.2000	TA = 37.4800
PER = 2.30	TIMES FOR MAXIMA --	TD = 37.5800	TV = 7.2400	TA = 37.5400
PER = 2.35	TIMES FOR MAXIMA --	TD = 6.7400	TV = 7.2800	TA = 6.7200
PER = 2.40	TIMES FOR MAXIMA --	TD = 6.7800	TV = 6.1400	TA = 6.7400
PER = 2.50	TIMES FOR MAXIMA --	TD = 6.8600	TV = 7.4800	TA = 6.8200
PER = 2.60	TIMES FOR MAXIMA --	TD = 13.5800	TV = 13.0000	TA = 13.5400
PER = 2.70	TIMES FOR MAXIMA --	TD = 13.8200	TV = 13.0800	TA = 13.7600
PER = 2.80	TIMES FOR MAXIMA --	TD = 15.4000	TV = 13.2200	TA = 15.3600
PER = 2.90	TIMES FOR MAXIMA --	TD = 15.5600	TV = 6.5600	TA = 15.5200
PER = 3.00	TIMES FOR MAXIMA --	TD = 5.9000	TV = 6.6000	TA = 5.8400
PER = 3.10	TIMES FOR MAXIMA --	TD = 5.9400	TV = 6.6400	TA = 5.8800

PER = 3.20	TIMES FOR MAXIMA --	TD = 5.9800	TV = 6.6600	TA = 5.9200
PER = 3.30	TIMES FOR MAXIMA --	TD = 6.0200	TV = 6.7000	TA = 5.9600
PER = 3.40	TIMES FOR MAXIMA --	TD = 6.0600	TV = 5.5000	TA = 6.0000
PER = 3.50	TIMES FOR MAXIMA --	TD = 6.1000	TV = 5.5200	TA = 6.0400
PER = 3.60	TIMES FOR MAXIMA --	TD = 6.1600	TV = 5.5400	TA = 6.1000
PER = 3.70	TIMES FOR MAXIMA --	TD = 38.5400	TV = 5.5400	TA = 38.4800
PER = 3.80	TIMES FOR MAXIMA --	TD = 37.0200	TV = 5.5600	TA = 36.9600
PER = 3.90	TIMES FOR MAXIMA --	TD = 6.3400	TV = 5.5600	TA = 6.2800
PER = 4.00	TIMES FOR MAXIMA --	TD = 6.3800	TV = 5.5800	TA = 6.3200
PER = 4.10	TIMES FOR MAXIMA --	TD = 6.4200	TV = 5.5800	TA = 6.3600
PER = 4.20	TIMES FOR MAXIMA --	TD = 6.4600	TV = 5.6000	TA = 6.3800
PER = 4.30	TIMES FOR MAXIMA --	TD = 37.0800	TV = 5.6000	TA = 37.0200
PER = 4.40	TIMES FOR MAXIMA --	TD = 37.1400	TV = 5.6200	TA = 37.0800
PER = 4.50	TIMES FOR MAXIMA --	TD = 37.2200	TV = 5.6200	TA = 37.1400
PER = 4.60	TIMES FOR MAXIMA --	TD = 4.9000	TV = 5.6400	TA = 4.8200
PER = 4.70	TIMES FOR MAXIMA --	TD = 4.9200	TV = 5.6400	TA = 4.8400
PER = 4.80	TIMES FOR MAXIMA --	TD = 4.9400	TV = 5.6400	TA = 4.8800
PER = 4.90	TIMES FOR MAXIMA --	TD = 4.9600	TV = 5.6600	TA = 4.9000
PER = 5.00	TIMES FOR MAXIMA --	TD = 4.9800	TV = 5.6600	TA = 4.9200
PER = 5.10	TIMES FOR MAXIMA --	TD = 5.0000	TV = 4.1400	TA = 4.9200
PER = 5.20	TIMES FOR MAXIMA --	TD = 5.0400	TV = 4.1400	TA = 4.9400
PER = 5.40	TIMES FOR MAXIMA --	TD = 5.0800	TV = 4.1600	TA = 4.9800
PER = 5.60	TIMES FOR MAXIMA --	TD = 5.1200	TV = 4.1600	TA = 5.0400
PER = 5.80	TIMES FOR MAXIMA --	TD = 5.1600	TV = 4.1600	TA = 5.0800
PER = 6.00	TIMES FOR MAXIMA --	TD = 5.1800	TV = 4.1600	TA = 5.1000
PER = 6.20	TIMES FOR MAXIMA --	TD = 5.2000	TV = 4.1600	TA = 5.1200
PER = 6.40	TIMES FOR MAXIMA --	TD = 5.2200	TV = 4.1600	TA = 5.1400
PER = 6.60	TIMES FOR MAXIMA --	TD = 5.2400	TV = 4.1800	TA = 5.1600
PER = 6.80	TIMES FOR MAXIMA --	TD = 5.2600	TV = 4.1800	TA = 5.1800
PER = 7.00	TIMES FOR MAXIMA --	TD = 5.2600	TV = 4.1800	TA = 5.1800
PER = 7.20	TIMES FOR MAXIMA --	TD = 37.3200	TV = 4.1800	TA = 37.1800
PER = 7.40	TIMES FOR MAXIMA --	TD = 5.2800	TV = 4.1800	TA = 5.2000
PER = 7.60	TIMES FOR MAXIMA --	TD = 5.3000	TV = 4.1800	TA = 5.2000
PER = 7.80	TIMES FOR MAXIMA --	TD = 5.3000	TV = 4.1800	TA = 5.2000
PER = 8.00	TIMES FOR MAXIMA --	TD = 5.3000	TV = 4.1800	TA = 5.2000
PER = 8.50	TIMES FOR MAXIMA --	TD = 5.3200	TV = 4.1800	TA = 5.2200
PER = 9.00	TIMES FOR MAXIMA --	TD = 5.3200	TV = 4.1800	TA = 5.2200
PER = 9.50	TIMES FOR MAXIMA --	TD = 35.7400	TV = 4.1800	TA = 35.5800

SPECTRAL VALUES --
[Acceleration of gravity used = 981.00]
NEW SOIL PROFILE NO. 1, IDENTIFICATION: Alameda NAS Site 2 (South), Set 1 Record

NO.	PERIOD	REL. DISP.	REL. VEL.	PSU.REL.VEL.	ABS. ACC.	PSU.ABS.ACC.	FREQ.
1	.01	.00102	.00465	.63834	.40890	.40885	100.00
2	.03	.00914	.04551	1.91324	.40850	.40847	33.33
3	.04	.01626	.08041	2.55354	.40891	.40888	25.00
4	.05	.02542	.12587	3.19495	.40930	.40927	20.00
5	.06	.03665	.18208	3.83801	.40975	.40970	16.67
6	.07	.04994	.24941	4.48299	.41026	.41019	14.29
7	.08	.06532	.32831	5.13059	.41086	.41076	12.50
8	.09	.08279	.41875	5.77956	.41144	.41130	11.11
9	.10	.10241	.52462	6.43459	.41230	.41213	10.00
10	.11	.12404	.64476	7.08494	.41276	.41253	9.09
11	.12	.14780	.77541	7.73889	.41330	.41306	8.33
12	.13	.17400	.91941	8.40980	.41461	.41434	7.69
13	.14	.20230	1.06832	9.07905	.41508	.41536	7.14
14	.15	.23192	1.24206	9.71465	.41508	.41481	6.67
15	.16	.26521	1.45429	10.41475	.41706	.41691	6.25
16	.17	.30311	1.68696	11.20287	.42207	.42208	5.88
17	.18	.34566	1.94453	12.06572	.42970	.42933	5.56
18	.19	.38723	2.26319	12.80559	.43249	.43167	5.26
19	.20	.43954	2.53745	13.80857	.44231	.44221	5.00
20	.21	.50060	3.00694	14.97802	.45722	.45682	4.76
21	.22	.55672	3.92423	15.89988	.46217	.46289	4.55
22	.23	.60160	4.73427	16.43471	.45935	.45766	4.35
23	.24	.64191	5.53883	16.80527	.44823	.44848	4.17
24	.25	.67339	6.75604	16.92425	.43413	.43359	4.00
25	.26	.71005	7.30998	17.15910	.42282	.42270	3.85
26	.27	.76236	8.34672	17.74098	.42160	.42085	3.70
27	.28	.90752	9.56054	20.36468	.46425	.46583	3.57
28	.29	1.05641	11.08587	22.88834	.50896	.50551	3.45
29	.30	1.21886	12.90470	25.52773	.54745	.54501	3.33
30	.31	1.34800	13.98801	27.32180	.56689	.56449	3.23
31	.32	1.40652	14.54073	27.61704	.55521	.55276	3.13
32	.33	1.38041	16.12368	26.28294	.51125	.51012	3.03
33	.34	1.41452	16.93928	26.14034	.49203	.49243	2.94
34	.35	1.58531	18.91376	28.45940	.52235	.52080	2.86
35	.36	1.75877	19.46006	30.69626	.54857	.54613	2.78
36	.37	1.92516	20.42935	32.69229	.56678	.56592	2.70
37	.38	2.07429	21.51934	34.29769	.57766	.57809	2.63

38	.39	2.20486	21.82273	35.52188	.58217	.58337	2.56
39	.40	2.31526	24.68275	36.36802	.58137	.58233	2.50
40	.41	2.47522	26.03957	37.93230	.59630	.59257	2.44
41	.42	2.68175	26.96767	40.11895	.61468	.61180	2.38
42	.43	2.87201	27.51518	41.96598	.62457	.62509	2.33
43	.44	3.05796	30.55321	43.66758	.63994	.63565	2.27
44	.45	3.29814	32.48385	46.05075	.65773	.65544	2.22
45	.46	3.47201	35.16409	47.42448	.66056	.66032	2.17
46	.47	3.48586	35.99047	46.60071	.63443	.63505	2.13
47	.48	3.39950	35.62243	44.49936	.59827	.59378	2.08
48	.49	3.51644	35.70559	45.09067	.59040	.58939	2.04
49	.50	3.91075	37.93677	49.14391	.62952	.62952	2.00
50	.51	4.17519	42.05033	51.43825	.64814	.64599	1.96
51	.52	4.38848	44.09267	53.02625	.65285	.65313	1.92
52	.53	4.82775	43.82696	57.23335	.69313	.69165	1.89
53	.54	5.24641	41.46307	61.04471	.72762	.72404	1.85
54	.55	5.65996	39.87948	64.65927	.75628	.75297	1.82
55	.56	6.06118	42.02625	68.00632	.77938	.77781	1.79
56	.57	6.43980	44.17078	70.98674	.79735	.79765	1.75
57	.58	6.79558	48.92097	73.61704	.81485	.81295	1.72
58	.60	7.47232	57.12605	78.24995	.83801	.83530	1.67
59	.62	8.10289	64.67950	82.11602	.84994	.84830	1.61
60	.64	8.66703	70.60051	85.08839	.85379	.85153	1.56
61	.66	9.14548	74.64172	87.06473	.84867	.84491	1.52
62	.68	9.98092	85.49123	92.22353	.87009	.86865	1.47
63	.70	10.80365	91.73550	96.97335	.88936	.88729	1.43
64	.72	10.65297	89.11147	92.96472	.83381	.82698	1.39
65	.74	11.27185	86.82966	95.70694	.83178	.82837	1.35
66	.76	12.49710	94.67339	103.31790	.87667	.87071	1.32
67	.78	13.90860	104.12310	112.03890	.92636	.91999	1.28
68	.80	14.72597	109.39610	115.65750	.93114	.92597	1.25
69	.82	14.92973	109.71610	114.39790	.89834	.89354	1.22
70	.84	15.25418	110.69670	114.10100	.87492	.87000	1.19
71	.86	17.01023	113.89880	124.27720	.92777	.92556	1.16
72	.88	18.53151	121.38330	132.31470	.96759	.96302	1.14
73	.90	19.89791	127.95240	138.91360	.99433	.98858	1.11
74	.92	21.18643	134.70640	144.69380	1.01316	1.00733	1.09
75	.94	22.45623	140.47110	150.10280	1.02784	1.02276	1.06
76	.96	23.74108	145.49640	155.38500	1.04050	1.03669	1.04
77	.98	25.04881	149.82880	160.59830	1.05338	1.04960	1.02
78	1.00	26.36494	153.36540	165.65580	1.06544	1.06101	1.00
79	1.05	29.42751	161.10020	176.09380	1.07915	1.07415	.95

80	1.10	31.67641	172.80950	180.93530	1.05890	1.05352	.91
81	1.15	32.33943	176.33400	176.69100	.98937	.98407	.87
82	1.20	31.20127	169.89480	163.36950	.87628	.87197	.83
83	1.25	31.61442	153.06430	158.91140	.81817	.81425	.80
84	1.30	34.78763	157.52330	168.13630	.83254	.82838	.77
85	1.35	37.70884	168.43540	175.50490	.83687	.83266	.74
86	1.40	40.25797	177.02400	180.67740	.83062	.82658	.71
87	1.45	42.44403	183.37490	183.91980	.81607	.81240	.69
88	1.50	44.32266	187.73510	185.65830	.79706	.79275	.67
89	1.55	45.98825	190.43480	186.42110	.77423	.77033	.65
90	1.60	47.47152	191.78400	186.42020	.74979	.74625	.63
91	1.65	48.84346	192.17790	185.99550	.72526	.72199	.61
92	1.70	53.06199	191.89140	196.11670	.74180	.73888	.59
93	1.75	55.96752	191.13920	200.94530	.73875	.73545	.57
94	1.80	55.02168	190.07940	192.06190	.68666	.68341	.56
95	1.85	55.29754	188.81980	187.80790	.65279	.65021	.54
96	1.90	61.59600	187.43620	203.69430	.69003	.68665	.53
97	1.95	67.26456	192.74860	216.73630	.71525	.71188	.51
98	2.00	69.16327	205.50580	217.28280	.69896	.69583	.50
99	2.05	70.96449	218.52450	217.50390	.68255	.67955	.49
100	2.10	74.86302	228.88160	223.98970	.68599	.68316	.48
101	2.15	79.77267	237.24820	233.12860	.69753	.69449	.47
102	2.20	84.47803	243.71340	241.26870	.70585	.70241	.45
103	2.25	90.30726	248.48800	252.18550	.72122	.71787	.44
104	2.30	94.69619	251.51360	258.69290	.72362	.72039	.43
105	2.35	95.27361	252.84290	254.73270	.69801	.69427	.43
106	2.40	98.32014	253.28900	257.40150	.69076	.68693	.42
107	2.50	103.07490	254.70100	259.05560	.66754	.66369	.40
108	2.60	111.49850	277.86650	269.44830	.66688	.66376	.38
109	2.70	123.16170	303.73910	286.61030	.68278	.67989	.37
110	2.80	126.06960	284.87710	282.89950	.65042	.64712	.36
111	2.90	117.14280	264.87930	253.80350	.56407	.56054	.34
112	3.00	114.82780	263.24810	240.49480	.51707	.51345	.33
113	3.10	116.58460	257.54230	236.29770	.49189	.48821	.32
114	3.20	117.49680	248.70980	230.70440	.46526	.46176	.31
115	3.30	117.66450	236.99190	224.03260	.43800	.43482	.30
116	3.40	117.19990	239.08530	216.58490	.41079	.40800	.29
117	3.50	116.22160	241.83570	208.64050	.38419	.38180	.29
118	3.60	114.88590	243.04500	200.51380	.35870	.35674	.28
119	3.70	114.24740	243.06390	194.01020	.33783	.33584	.27
120	3.80	114.01910	242.00280	188.52720	.32001	.31776	.26
121	3.90	110.12940	239.93370	177.42660	.29292	.29138	.26

122	4.00	108.20080	237.17270	169.96140	.27387	.27215	.25
123	4.10	105.90000	233.64450	162.29010	.25542	.25352	.24
124	4.20	103.19090	229.67110	154.37330	.23741	.23541	.24
125	4.30	101.47690	225.18390	148.27870	.22267	.22086	.23
126	4.40	108.69430	220.39470	155.21500	.22787	.22594	.23
127	4.50	105.58040	215.33450	147.41810	.21159	.20982	.22
128	4.60	101.14270	210.02420	138.15190	.19340	.19236	.22
129	4.70	101.78590	204.67860	136.07220	.18648	.18543	.21
130	4.80	102.35190	199.18760	133.97840	.17986	.17877	.21
131	4.90	102.84440	193.62380	131.87560	.17350	.17238	.20
132	5.00	103.26490	188.15440	129.76650	.16737	.16623	.20
133	5.10	103.61950	184.49230	127.65890	.16146	.16032	.20
134	5.20	103.92560	184.04810	125.57380	.15578	.15467	.19
135	5.40	104.38620	183.04040	121.45880	.14506	.14406	.19
136	5.60	104.65880	181.89770	117.42690	.13523	.13430	.18
137	5.80	104.72750	180.59260	113.45210	.12624	.12528	.17
138	6.00	104.56570	179.17220	109.50090	.11792	.11689	.17
139	6.20	104.17360	177.67170	105.57130	.11018	.10906	.16
140	6.40	103.57780	176.12290	101.68730	.10297	.10176	.16
141	6.60	102.79560	174.55310	97.86118	.09624	.09497	.15
142	6.80	101.84000	173.03160	94.09991	.08995	.08863	.15
143	7.00	100.74150	171.51030	90.42538	.08412	.08274	.14
144	7.20	103.38390	169.99970	90.21944	.08132	.08026	.14
145	7.40	98.23125	168.50970	83.40611	.07363	.07219	.14
146	7.60	96.85558	167.04700	80.07389	.06894	.06748	.13
147	7.80	95.42458	165.61770	76.86799	.06459	.06312	.13
148	8.00	93.93455	164.22430	73.77602	.06055	.05907	.13
149	8.50	90.14349	160.91680	66.63391	.05170	.05021	.12
150	9.00	86.28928	157.86890	60.24129	.04437	.04287	.11
151	9.50	111.67660	155.08280	73.86152	.05124	.04980	.11
152	10.00	.00000	.00000	.00000	.00000	.00000	.10

VALUES IN PERIOD RANGE .1 TO 2.5 SEC.

AREA OF ACC. RESPONSE SPECTRUM = 1.811
AREA OF VEL. RESPONSE SPECTRUM = 353.989
MAX. ACCELERATION RESPONSE VALUE = 1.079
MAX. VELOCITY RESPONSE VALUE = 254.701

1****** OPTION 10 *** COMPUTE AMPLIFICATION FUNCTION

AMPLIFICATION SPECTRUM BETWEEN LAYER 15 AND 1
OUTPUT LAYER OUTCROPPING
INPUT LAYER OUTCROPPING

FREQUENCY	AMPLITUDE
.0000	1.0000
.1000	.9920
.2000	1.0288
.3000	1.0995
.4000	1.1793
.5000	1.2249
.6000	1.2064
.7000	1.1422
.8000	1.0717
.9000	1.0164
1.0000	.9750
1.1000	.9325
1.2000	.8714
1.3000	.7873
1.4000	.6935
1.5000	.6068
1.6000	.5355
1.7000	.4804
1.8000	.4384
1.9000	.4058
2.0000	.3788
2.1000	.3547
2.2000	.3319
2.3000	.3102
2.4000	.2899
2.5000	.2718
2.6000	.2562
2.7000	.2430
2.8000	.2318
2.9000	.2219
3.0000	.2126
3.1000	.2033
3.2000	.1936
3.3000	.1834
3.4000	.1728
3.5000	.1619
3.6000	.1508
3.7000	.1395
3.8000	.1280
3.9000	.1166
4.0000	.1054
4.1000	.0948
4.2000	.0851
4.3000	.0764
4.4000	.0688
4.5000	.0622
4.6000	.0564
4.7000	.0516
4.8000	.0474
4.9000	.0438
5.0000	.0407

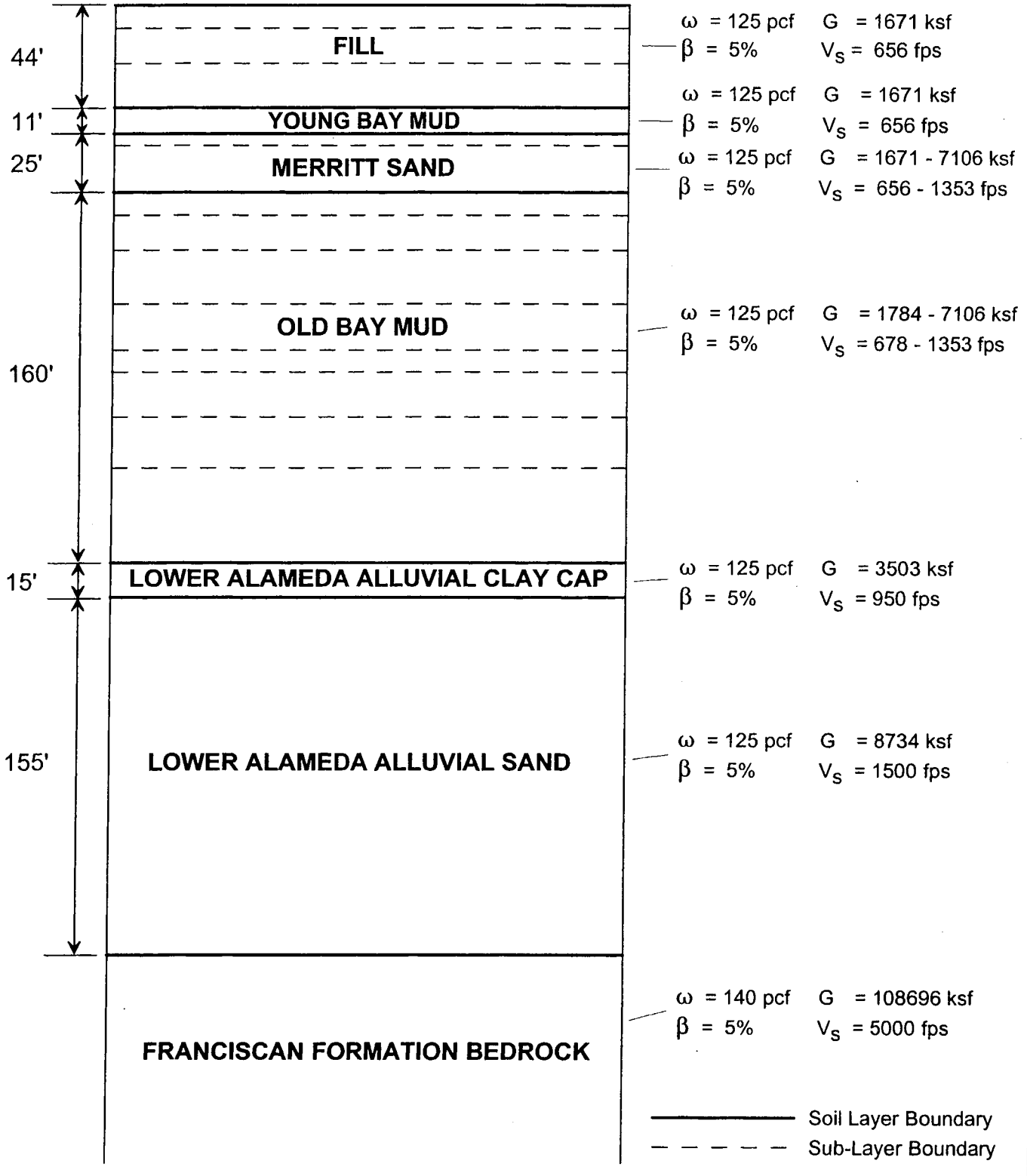
5.1000	.0380
5.2000	.0356
5.3000	.0335
5.4000	.0316
5.5000	.0299
5.6000	.0284
5.7000	.0270
5.8000	.0257
5.9000	.0246
6.0000	.0237
6.1000	.0228
6.2000	.0220
6.3000	.0214
6.4000	.0207
6.5000	.0200
6.6000	.0193
6.7000	.0184
6.8000	.0174
6.9000	.0163
7.0000	.0151
7.1000	.0139
7.2000	.0127
7.3000	.0116
7.4000	.0106
7.5000	.0097
7.6000	.0088
7.7000	.0081
7.8000	.0075
7.9000	.0069
8.0000	.0064
8.1000	.0059
8.2000	.0055
8.3000	.0052
8.4000	.0049
8.5000	.0046
8.6000	.0043
8.7000	.0041
8.8000	.0039
8.9000	.0038
9.0000	.0037
9.1000	.0035
9.2000	.0035
9.3000	.0034
9.4000	.0033
9.5000	.0033
9.6000	.0033
9.7000	.0033
9.8000	.0032
9.9000	.0032
10.0000	.0032
10.1000	.0032
10.2000	.0032
10.3000	.0032
10.4000	.0031
10.5000	.0031
10.6000	.0030
10.7000	.0029
10.8000	.0028

10.9000	.0027
11.0000	.0026
11.1000	.0026
11.2000	.0025
11.3000	.0024
11.4000	.0023
11.5000	.0022
11.6000	.0021
11.7000	.0021
11.8000	.0020
11.9000	.0019
12.0000	.0019
12.1000	.0018
12.2000	.0018
12.3000	.0018
12.4000	.0017
12.5000	.0017
12.6000	.0017
12.7000	.0016
12.8000	.0016
12.9000	.0016
13.0000	.0015
13.1000	.0015
13.2000	.0015
13.3000	.0014
13.4000	.0014
13.5000	.0014
13.6000	.0013
13.7000	.0013
13.8000	.0012
13.9000	.0012
14.0000	.0012
14.1000	.0011
14.2000	.0011
14.3000	.0011
14.4000	.0010
14.5000	.0010
14.6000	.0010
14.7000	.0009
14.8000	.0009
14.9000	.0009
15.0000	.0009
15.1000	.0008
15.2000	.0008
15.3000	.0008
15.4000	.0007
15.5000	.0007
15.6000	.0007
15.7000	.0007
15.8000	.0006
15.9000	.0006
16.0000	.0006
16.1000	.0005
16.2000	.0005
16.3000	.0005
16.4000	.0005
16.5000	.0005
16.6000	.0004

16.7000	.0004
16.8000	.0004
16.9000	.0004
17.0000	.0004
17.1000	.0003
17.2000	.0003
17.3000	.0003
17.4000	.0003
17.5000	.0003
17.6000	.0003
17.7000	.0003
17.8000	.0002
17.9000	.0002
18.0000	.0002
18.1000	.0002
18.2000	.0002
18.3000	.0002
18.4000	.0002
18.5000	.0002
18.6000	.0002
18.7000	.0001
18.8000	.0001
18.9000	.0001
19.0000	.0001
19.1000	.0001
19.2000	.0001
19.3000	.0001
19.4000	.0001
19.5000	.0001
19.6000	.0001
19.7000	.0001
19.8000	.0001
19.9000	.0001

```
MAXIMUM AMPLIFICATION =   1.22
FOR FREQUENCY         =    .50 C/SEC.
    PERIOD            =   2.00 SEC.
```

INTEGRATED CPT LIQUEFACTION POTENTIAL EVALUATION PLOTS

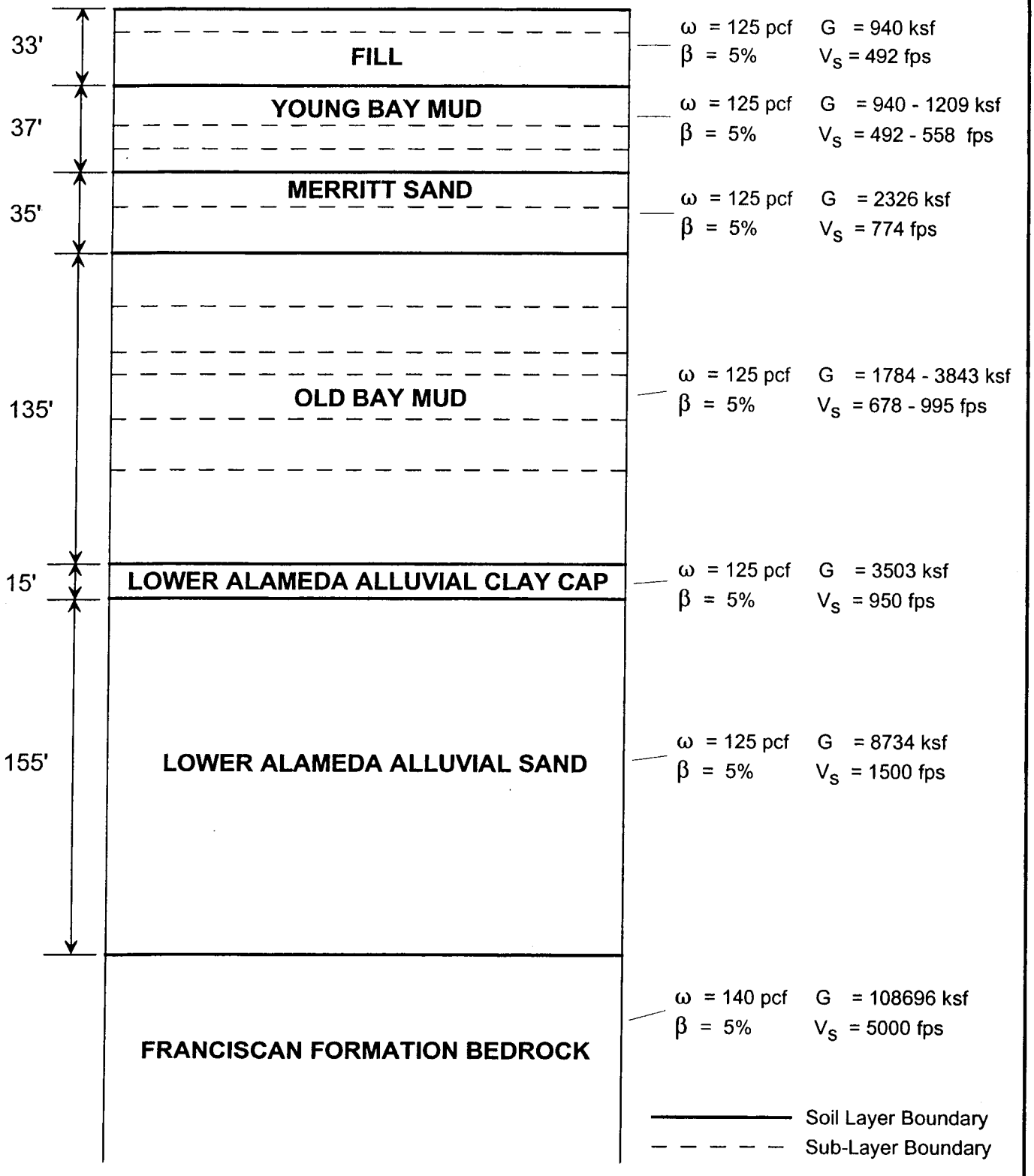


ω = unit weight G = shear modulus

β = damping ratio V_S = shear wave velocity

Project No. 01-0810	ALAMEDA NAS Alameda Point, Alameda, California	Soil Layers for SHAKE91 Analyses Soil Profile 1, (Site Southern Boundary)	Figure L1a
HAI	*HUSHMAND ASSOCIATES INC.* *Geotechnical and Earthquake Engineers*		

Date: 8/30/01

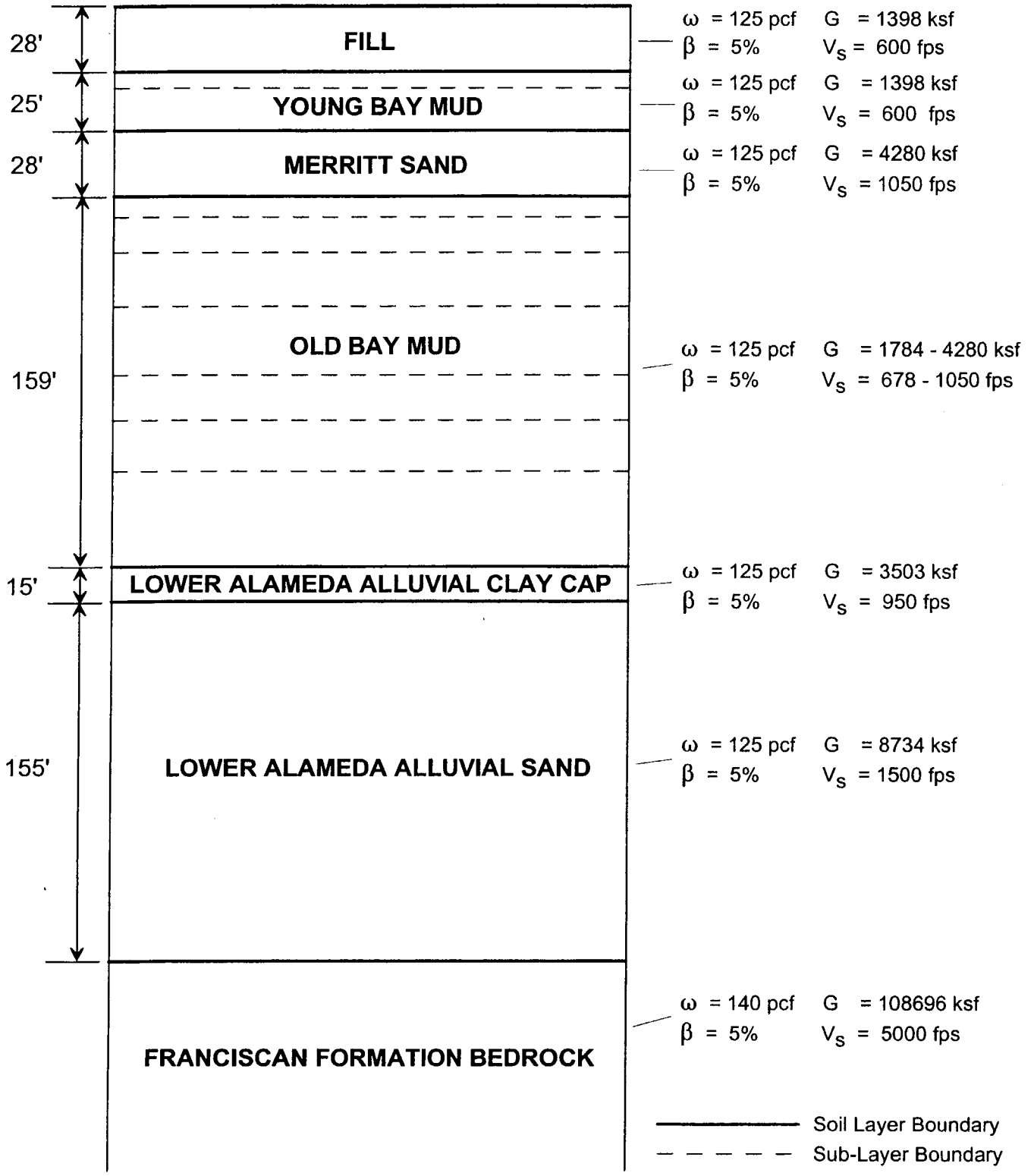


ω = unit weight G = shear modulus

β = damping ratio V_S = shear wave velocity

Project No. 01-0810	ALAMEDA NAS Alameda Point, Alameda, California	Soil Layers for SHAKE91 Analyses Soil Profile 2, (Site Western Boundary)	Figure L1b
HAI	HUSHMAND ASSOCIATES INC. Geotechnical and Earthquake Engineers		

Date: 8/30/01

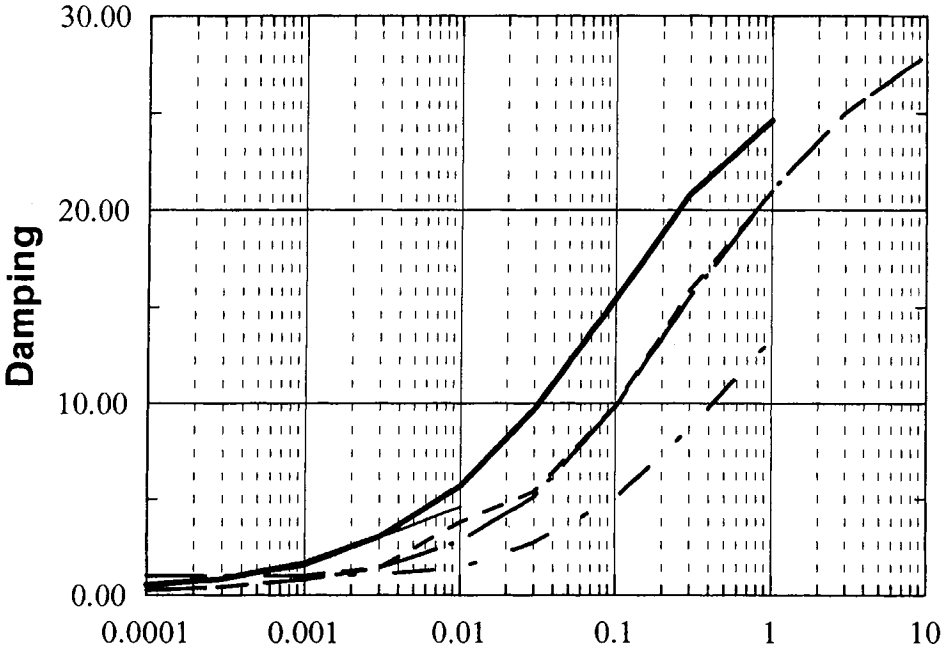


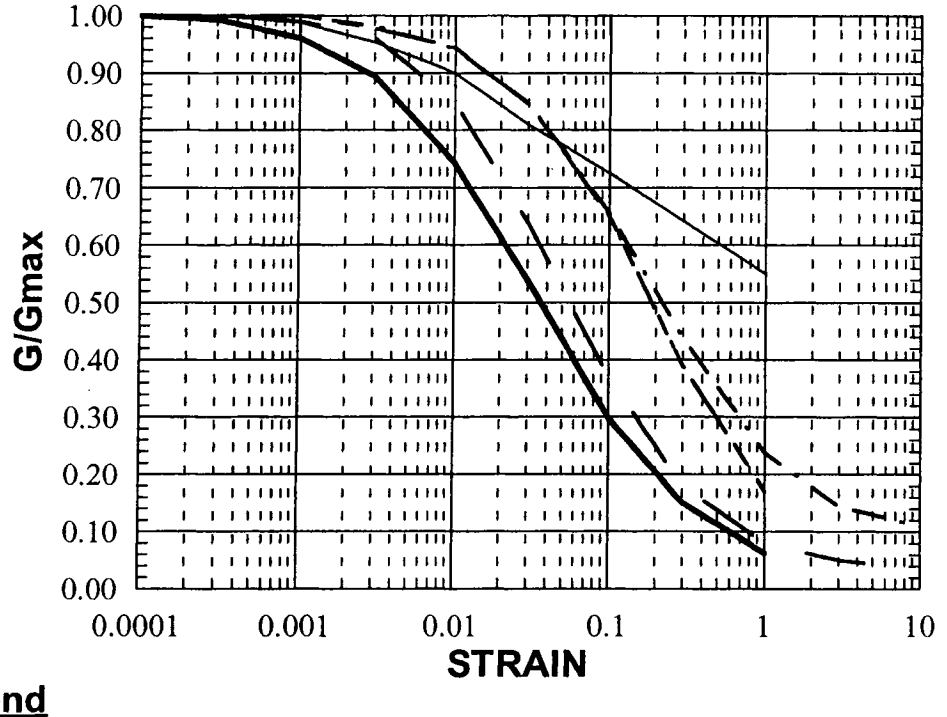
ω = unit weight G = shear modulus

β = damping ratio V_S = shear wave velocity

Project No. 01-0810	ALAMEDA NAS Alameda Point, Alameda, California	Soil Layers for SHAKE91 Analyses Soil Profile 3, (Area Between IR Sites 1 and 2)	Figure L1c
	HUSHMAND ASSOCIATES INC. Geotechnical and Earthquake Engineers		

Date: 8/30/01

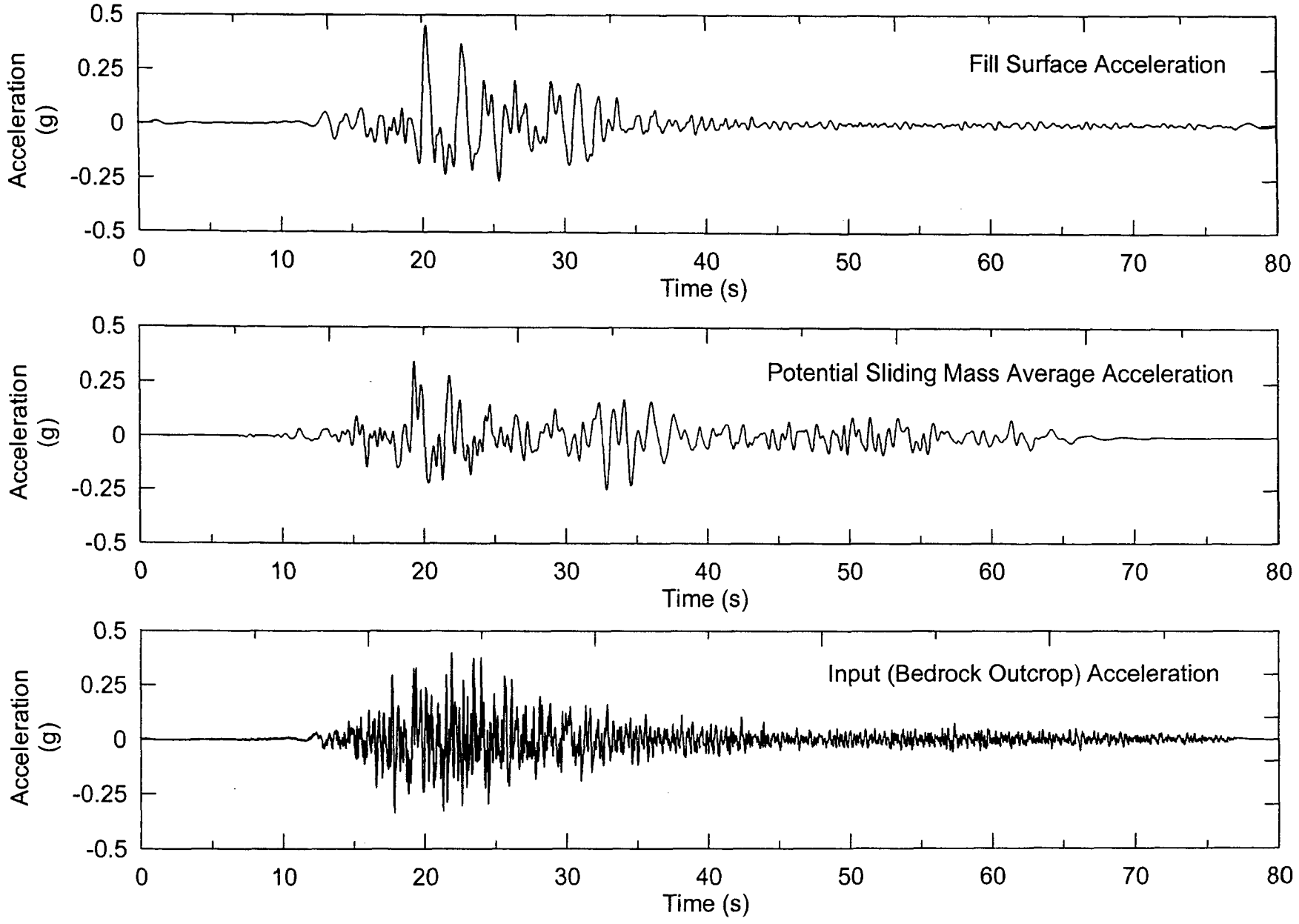




Legend

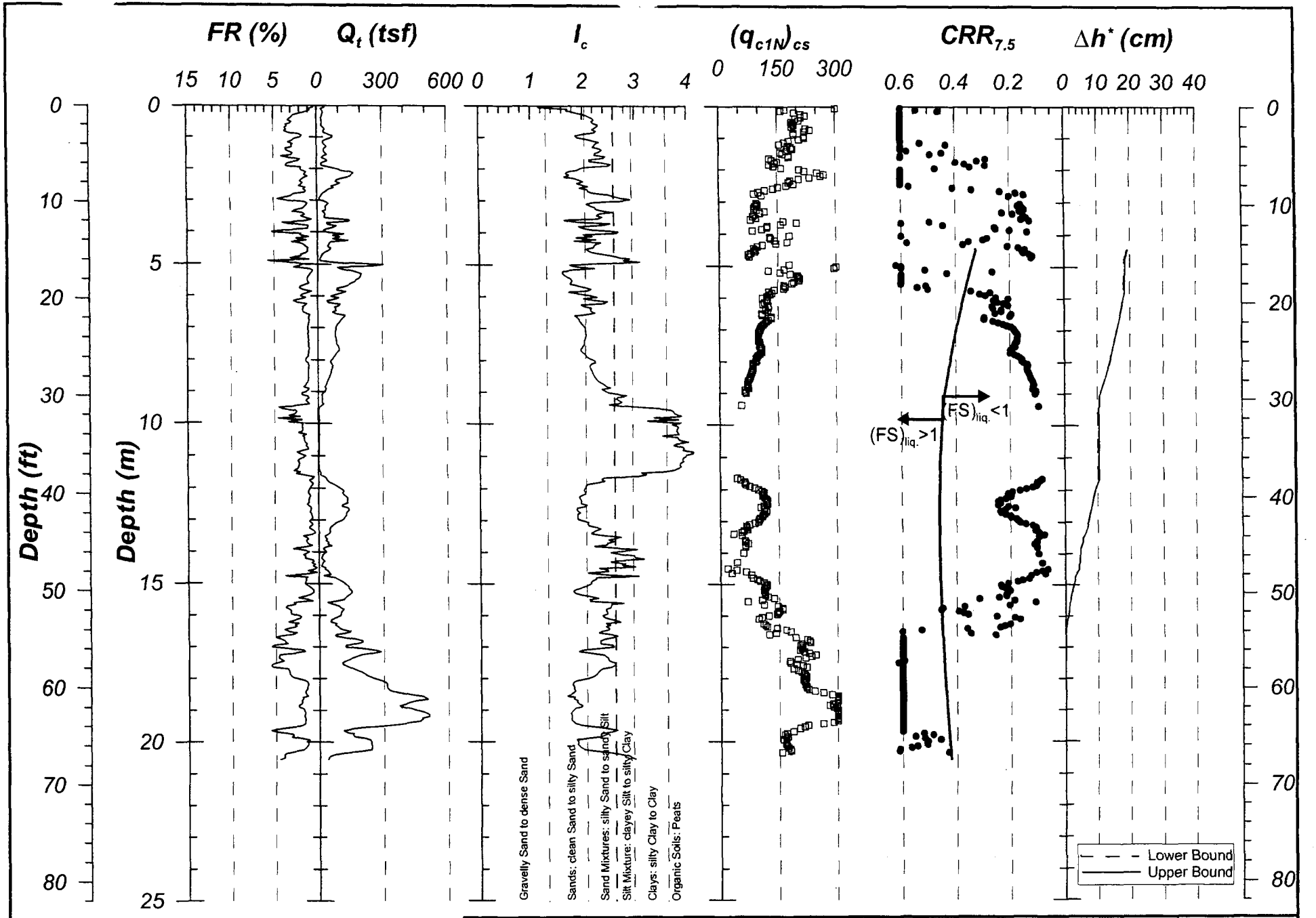
- Loose Sand (Seed & Idriss 1970)
- Young Bay Mud (Idriss 1990; Pyke, 1995)
- Dense Sand (Modulus: Seed & Idriss 1970, upper range; Damping: Idriss, 1990)
- Old Bay Mud (Idriss, 1990; Pyke, 1995)
- Clay (Modulus: Sun et al., 1988, upper range; Damping: Idriss 1990)
- Rock-Average (Schnabel et al., 1972)

Project No. 01-0810	ALAMEDA NAS Alameda Point, Alameda, California	Modulus Reduction and Damping Ratio Curves for Soil Profile in SHAKE91 Analyses	Figure L2
	HUSHMAND ASSOCIATES INC. Geotechnical and Earthquake Engineers		



Project No. 01-0810	ALAMEDA NAS Alameda Point, Alameda, California	Input, Potential Sliding Mass, and Surface Acceleration Time Histories for Set 2 Record SHAKE91 Analyses (Soil Profile 2)	Figure L3
HAI	*HUSHMAND ASSOCIATES INC.* *Geotechnical and Earthquake Engineers*		

Opti:\c:\HAI\projects-2001\AL-NAS\Shake91\StrongMotion\Acc-Plot-L3.grf



NOTE:
$(q_{c1N})_{cs}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

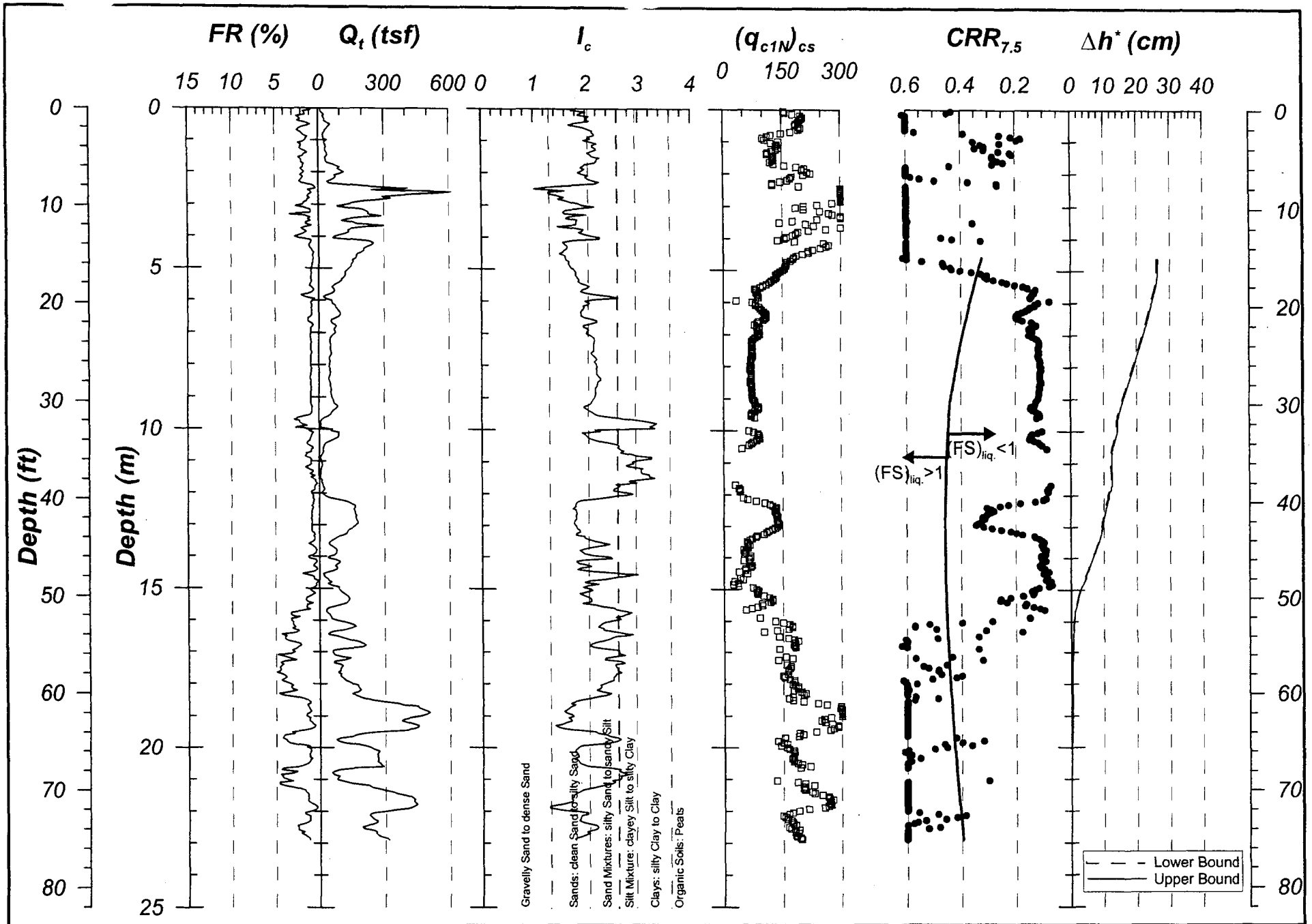
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-1

Figure L4

Opt\HAI\Projects\Project-2002\Site2&Site12\CPTs\CPT01-liq.xls, CPT01-liq.grf

Date: July 2002



NOTE:
$(q_{c1N})_{cs}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

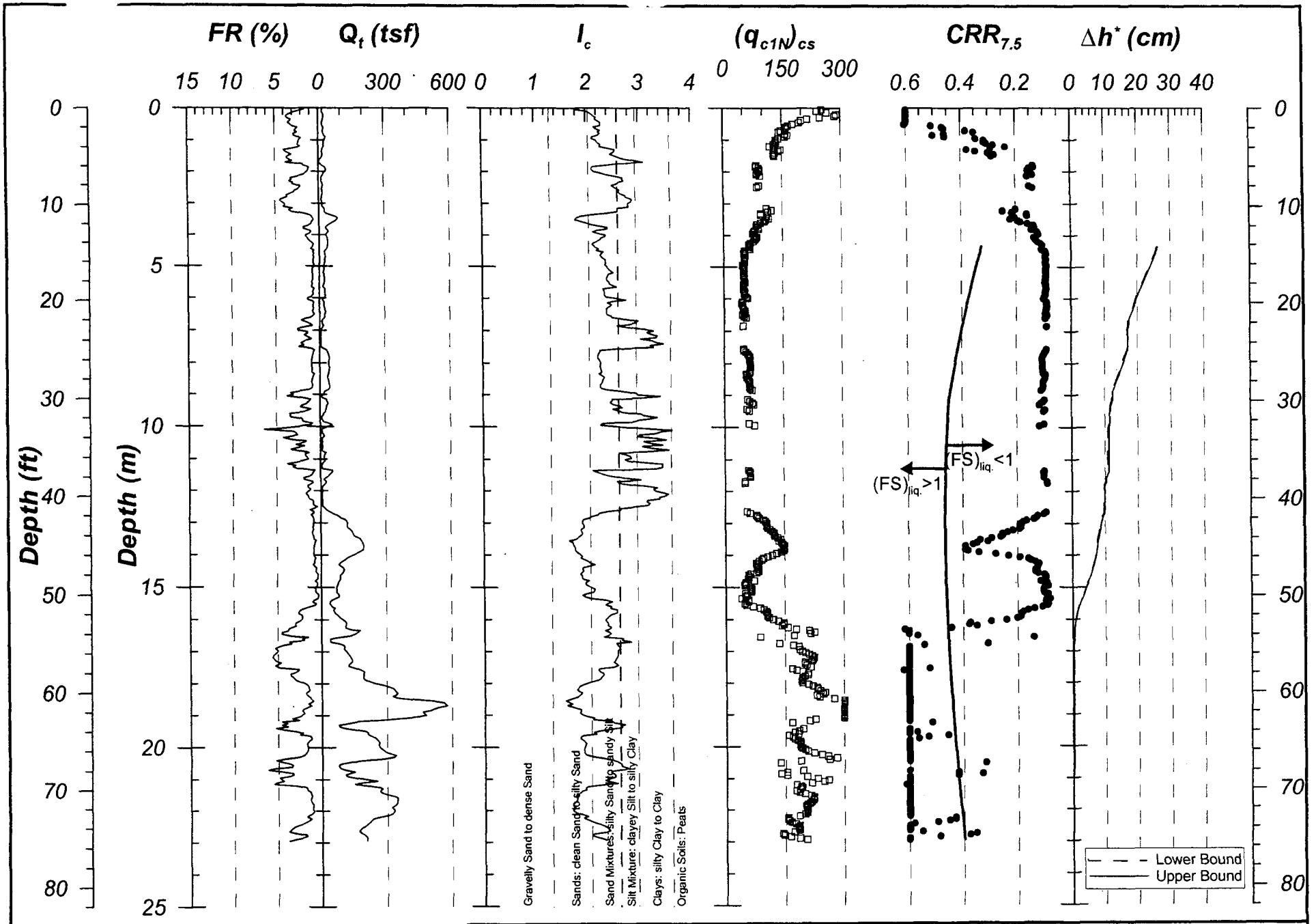
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-2

Figure L5

Date: July 2002

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT02liq.xls, CPT02-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

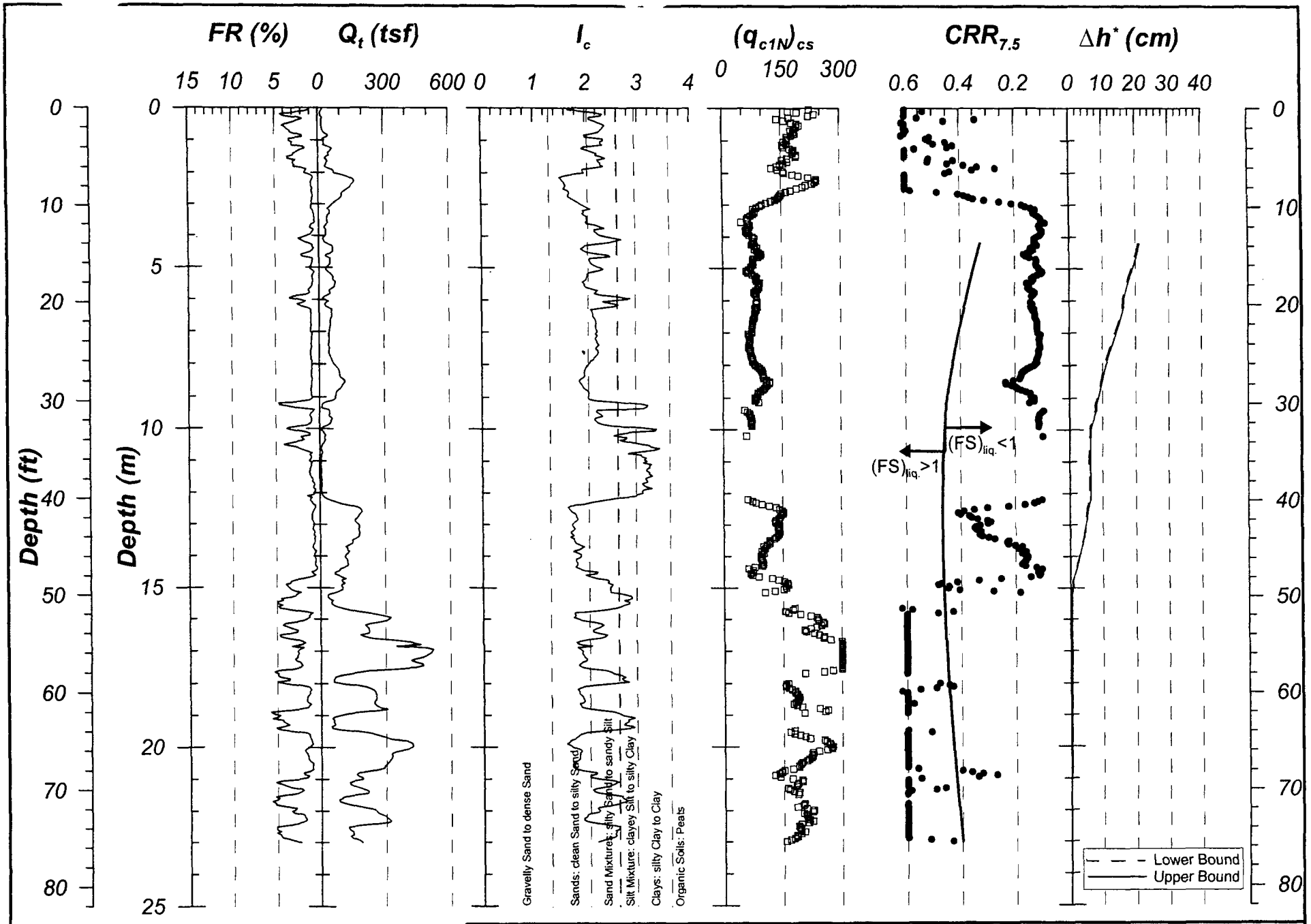
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-3

Figure L6

Date: July 2002

Opt\HAI\Projects\Project-2002\Site2&Site12\CPTs\CPT03-liq.xls, CPT03-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

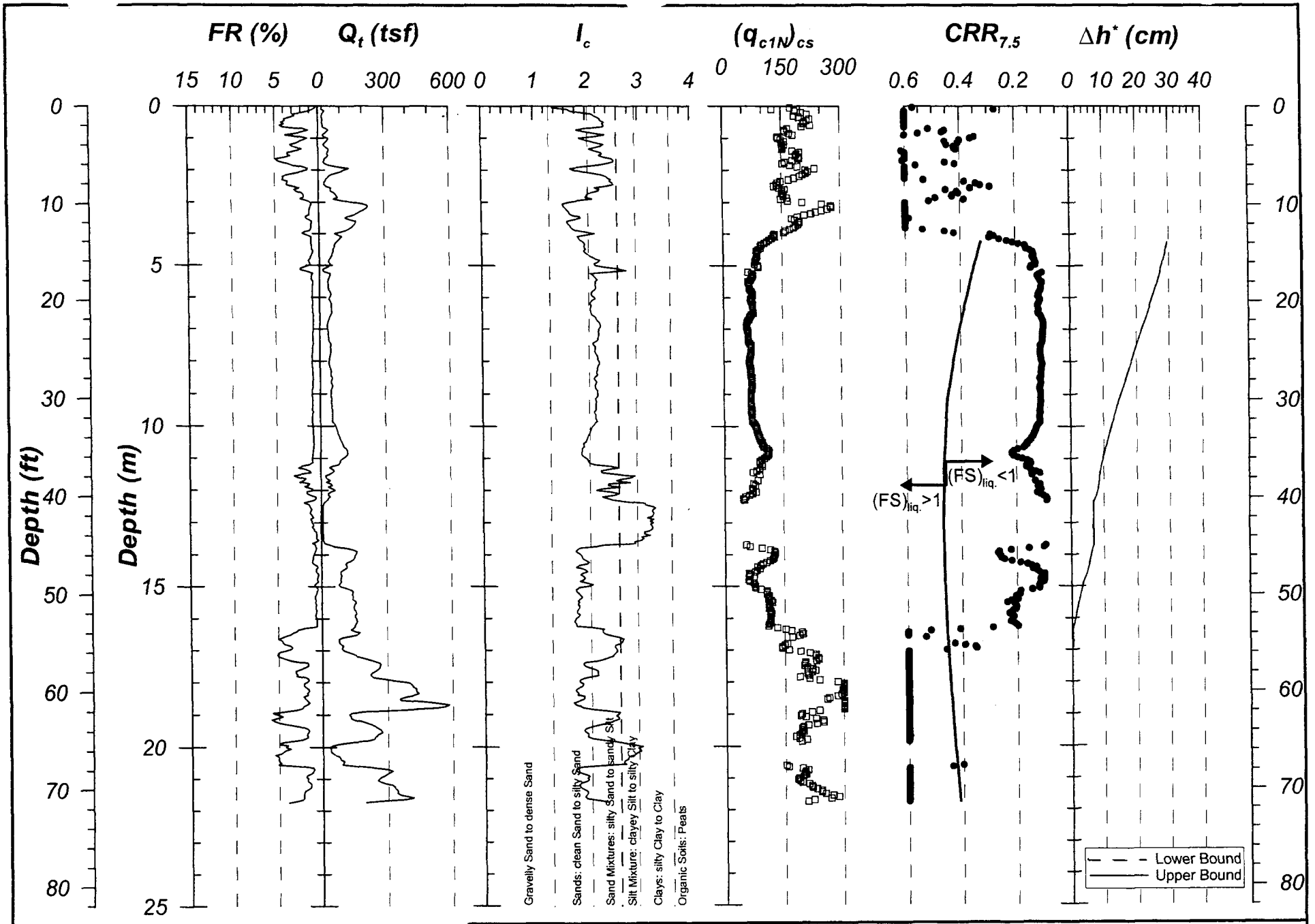
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-4

Figure L7

Date: July 2002

Opt\HAA\Projects\Project-2002\Site2&Site12\CPTs\CPT04-liq.xls, CPT04-liq.grf



NOTE:
$(q_{c1N})_{cs}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

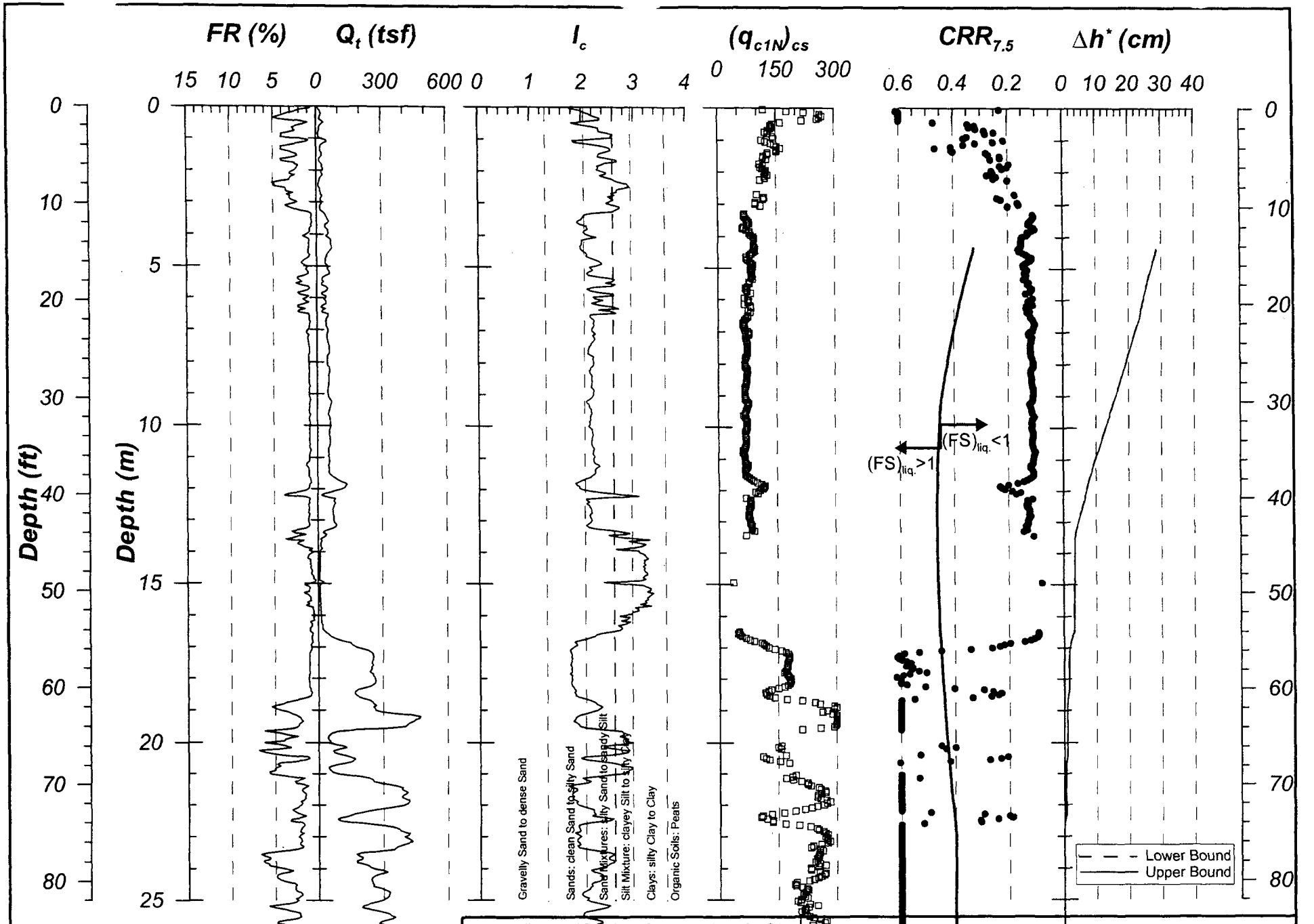
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-5

Figure L8

Date: July 2002

Opt\HAI\Projects\Project-2002\Site2&Site12\CPTs\CPT05-liq.xls, CPT05-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

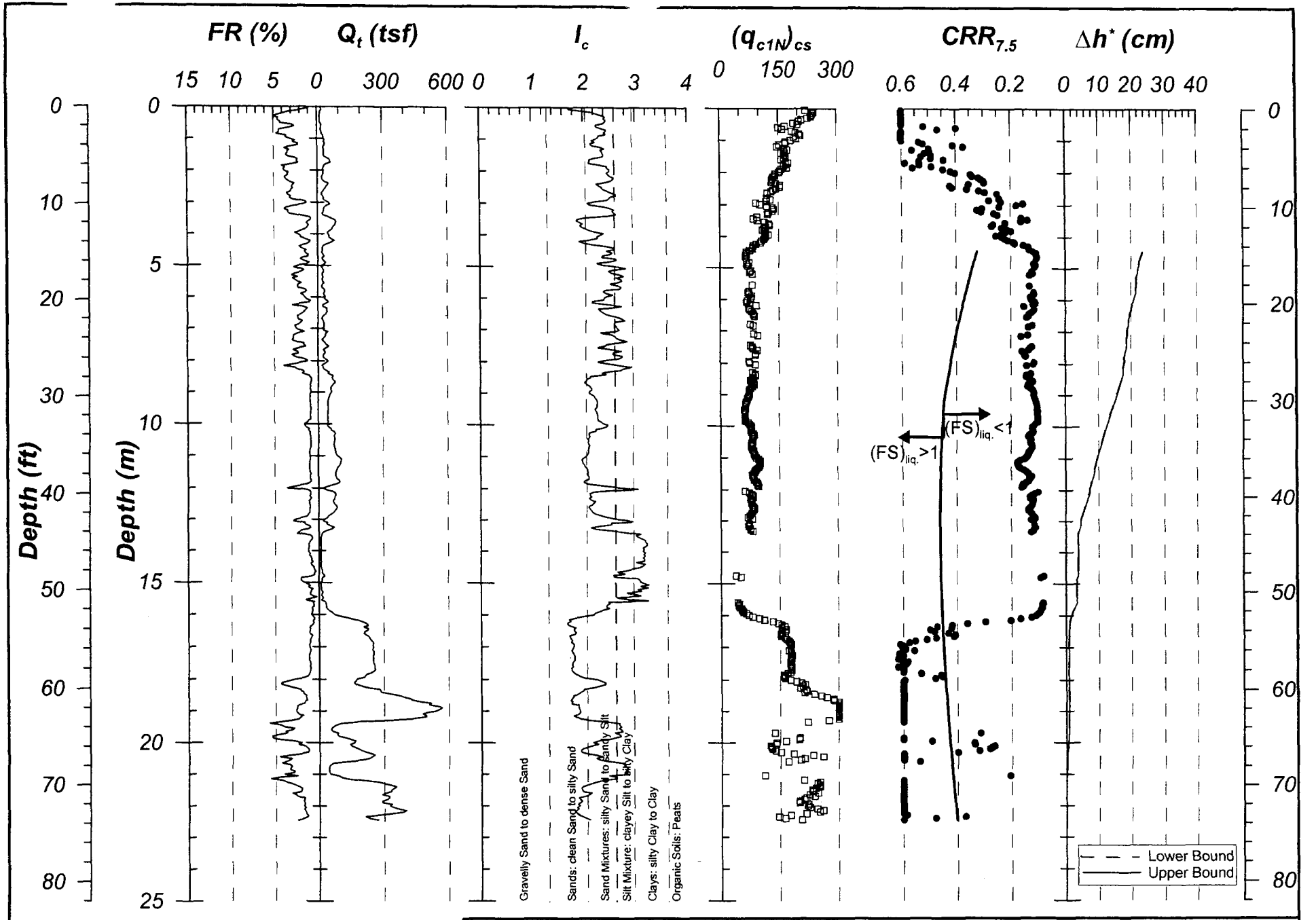
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-6

Figure L9

Date: July 2002

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT06-liq.xls, CPT06-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

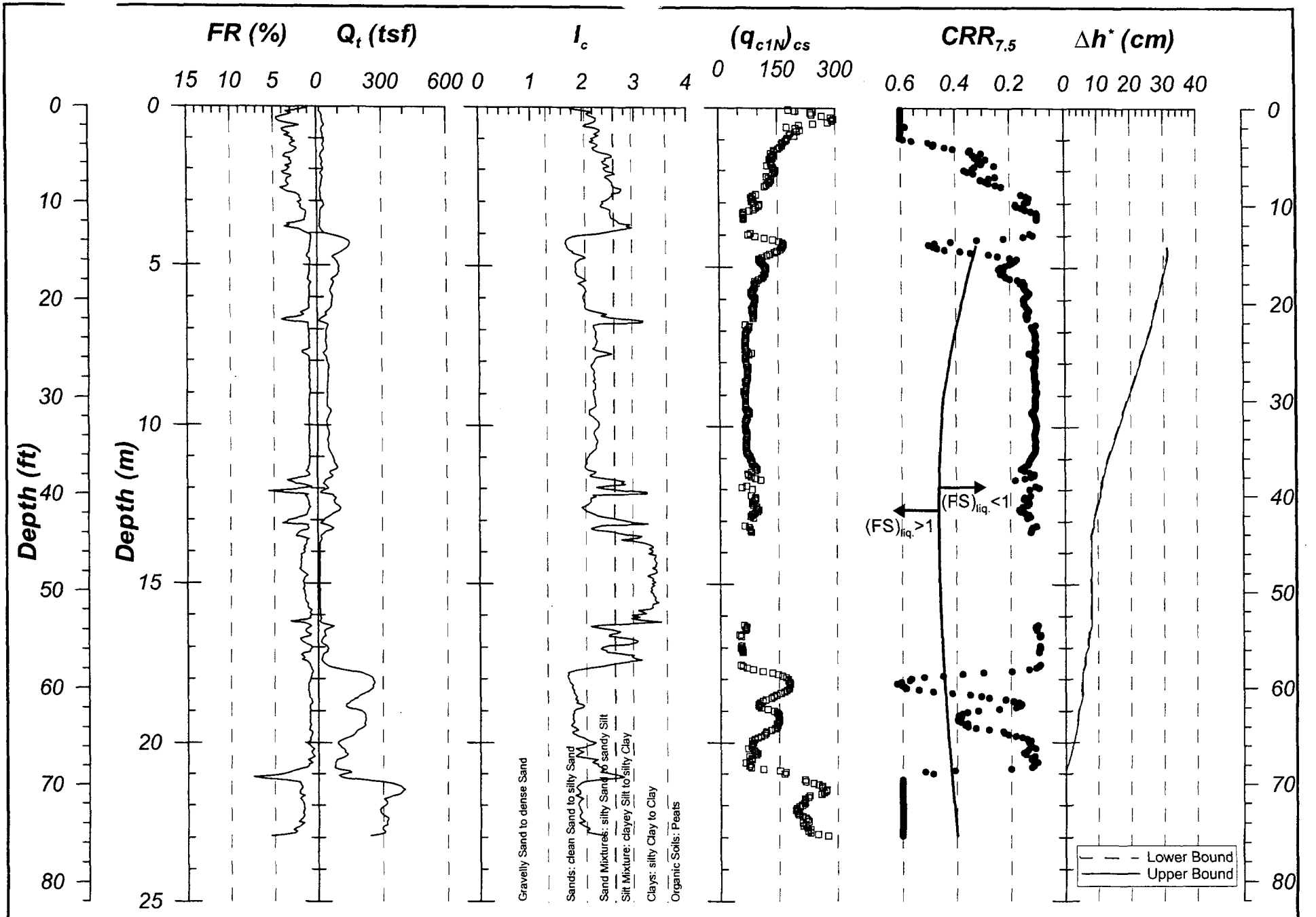
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-7

Figure L10

Date: July 2002

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT07-liq.xls, CPT07-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

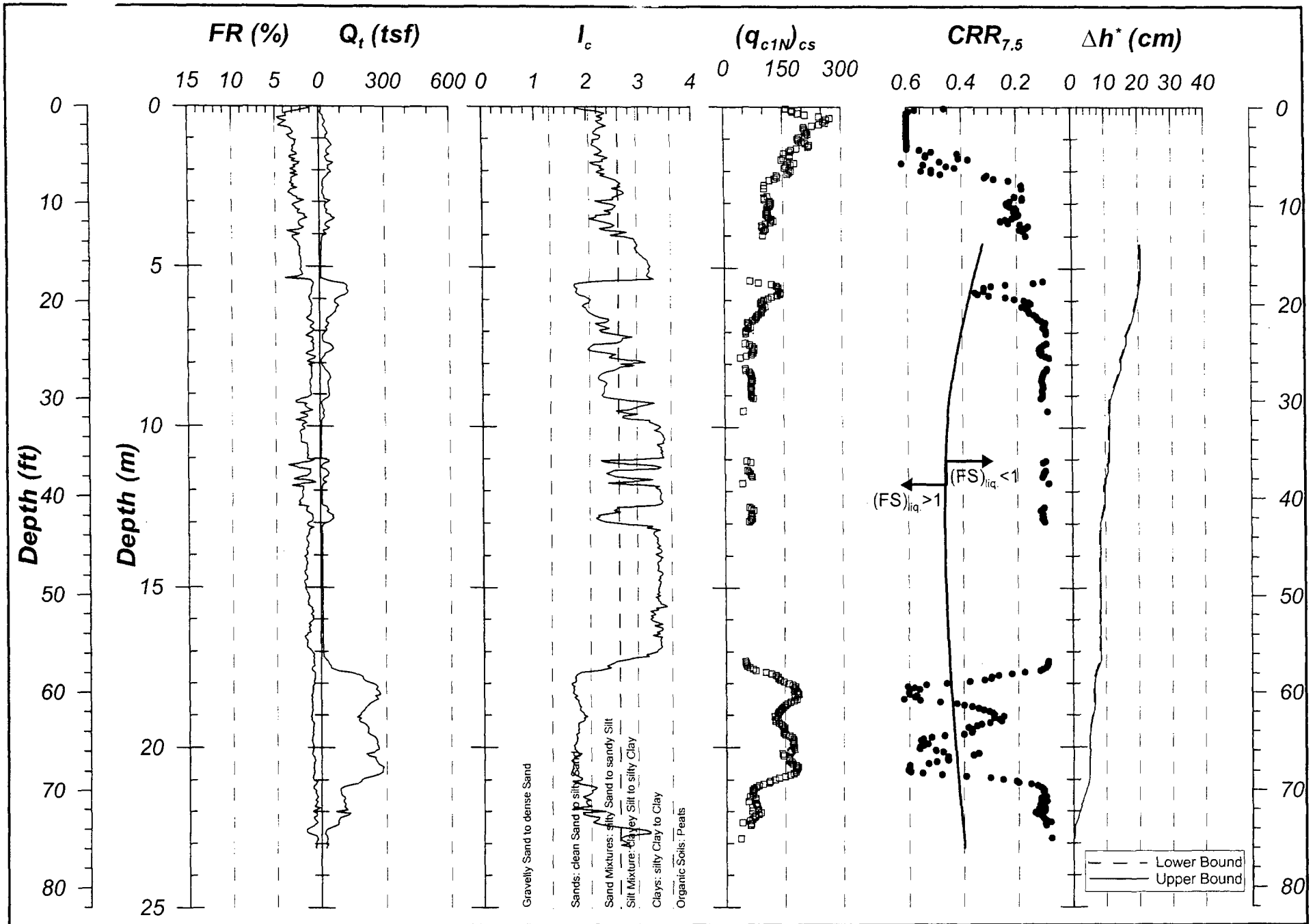
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-8

Figure L11

Date: July 2002

OptiNHA\Projects\Project-2002\Site2&Site12\CPTs\CPT08-liq.xls, CPT08liq.grf



NOTE:
$(q_{c1N})_{cs}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

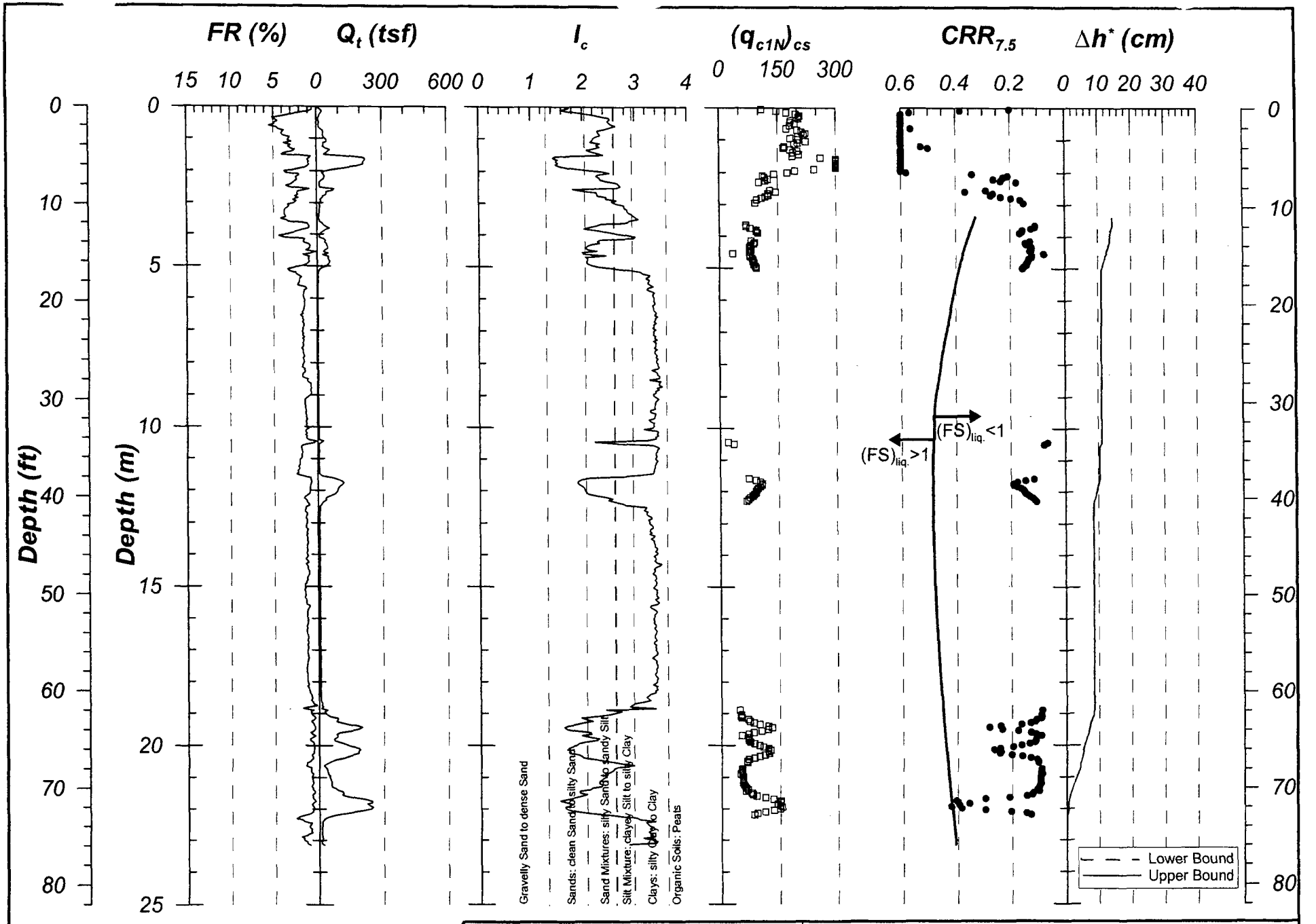
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-9

Figure L12

Date: July 2002

Ops\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT09-liq.xls, CPT09-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

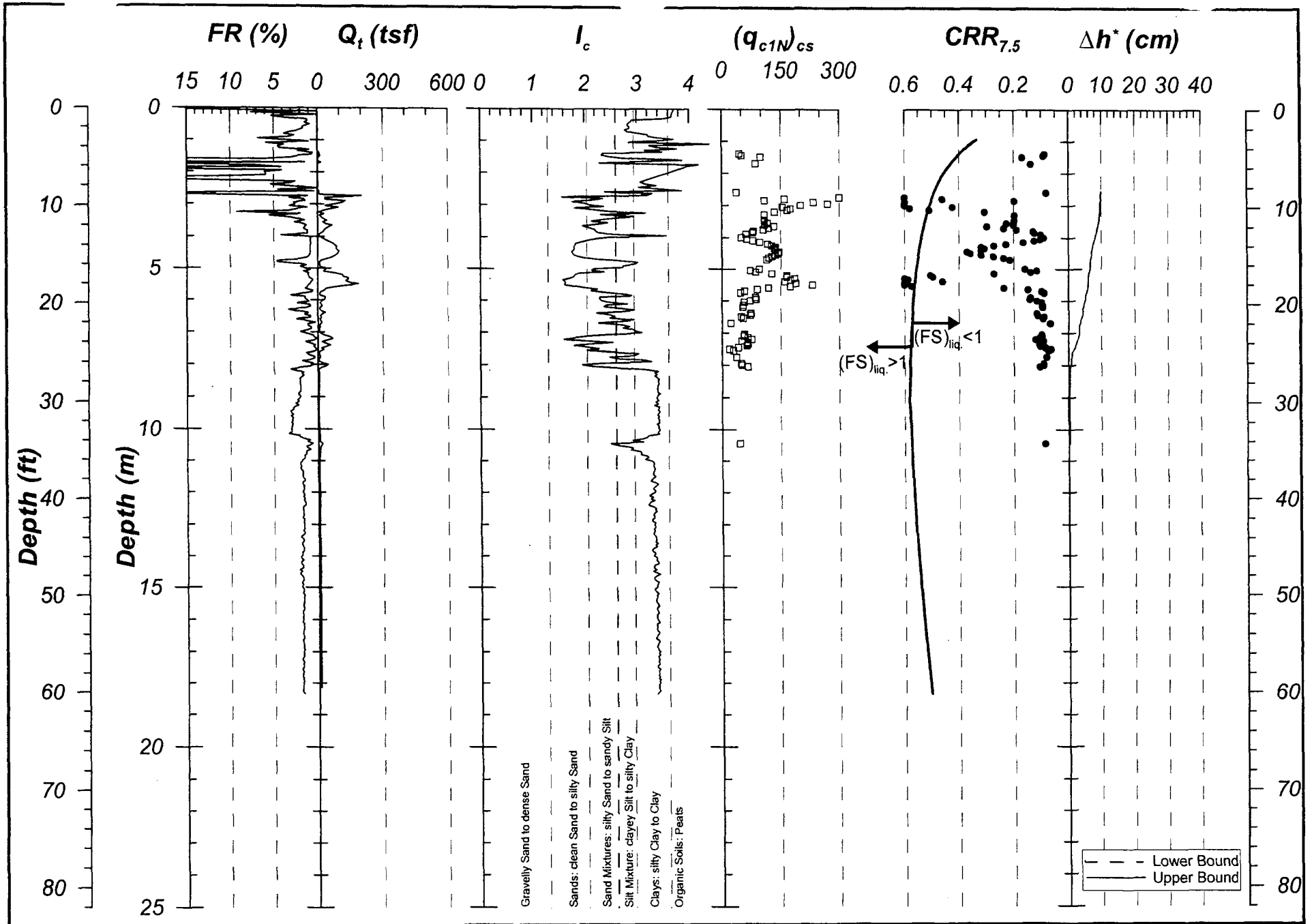
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-10

Figure L13

Date: July 2002

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT10-liq.xls, CPT10-liq.grf



NOTE:
$(q_{c1N})_{cs}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

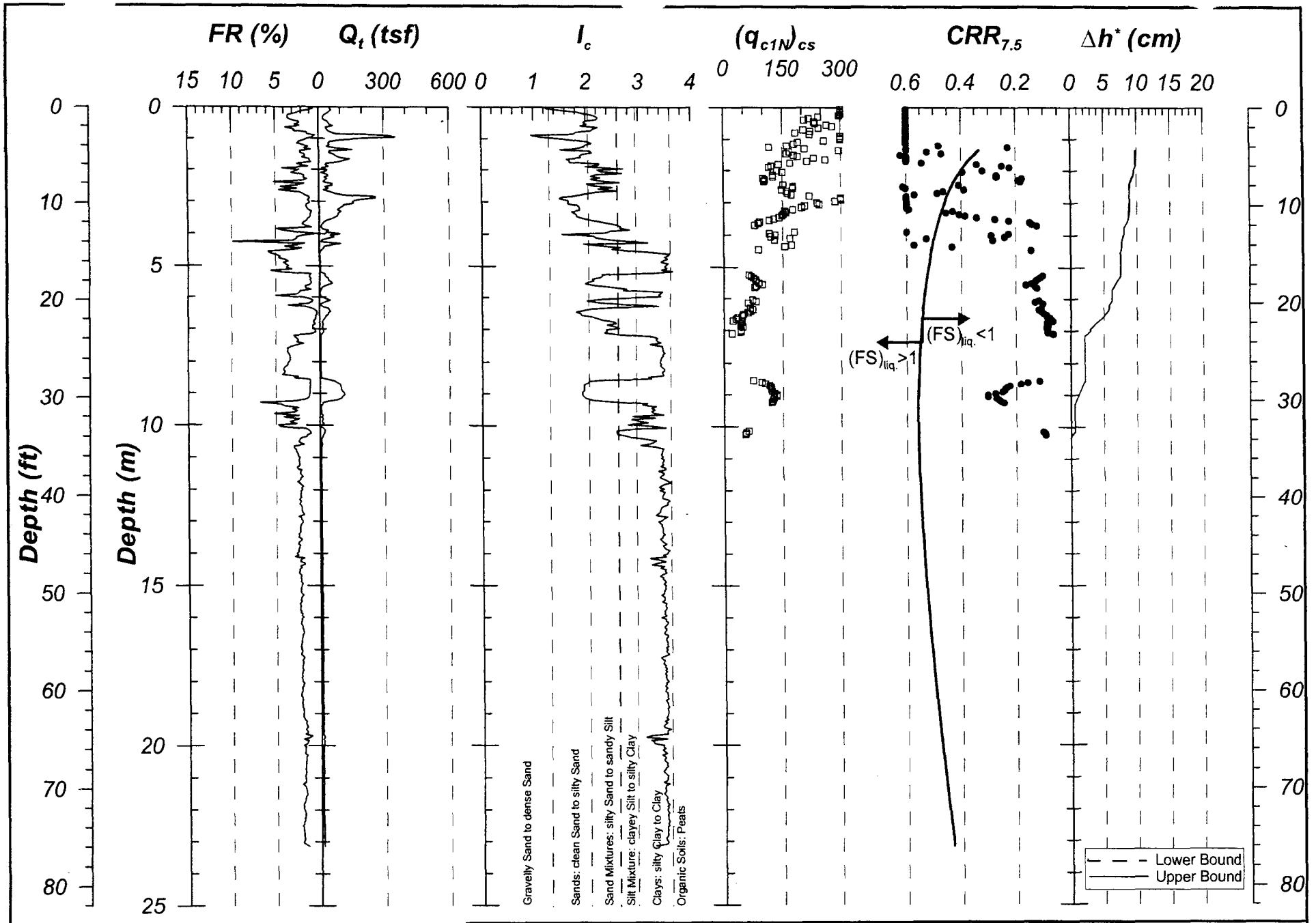
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-11E

Figure L14

Date: July 2002

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT11E-liq.xls, CPT11E-liq.grf



NOTE:
$(q_{c1N})_{cs}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

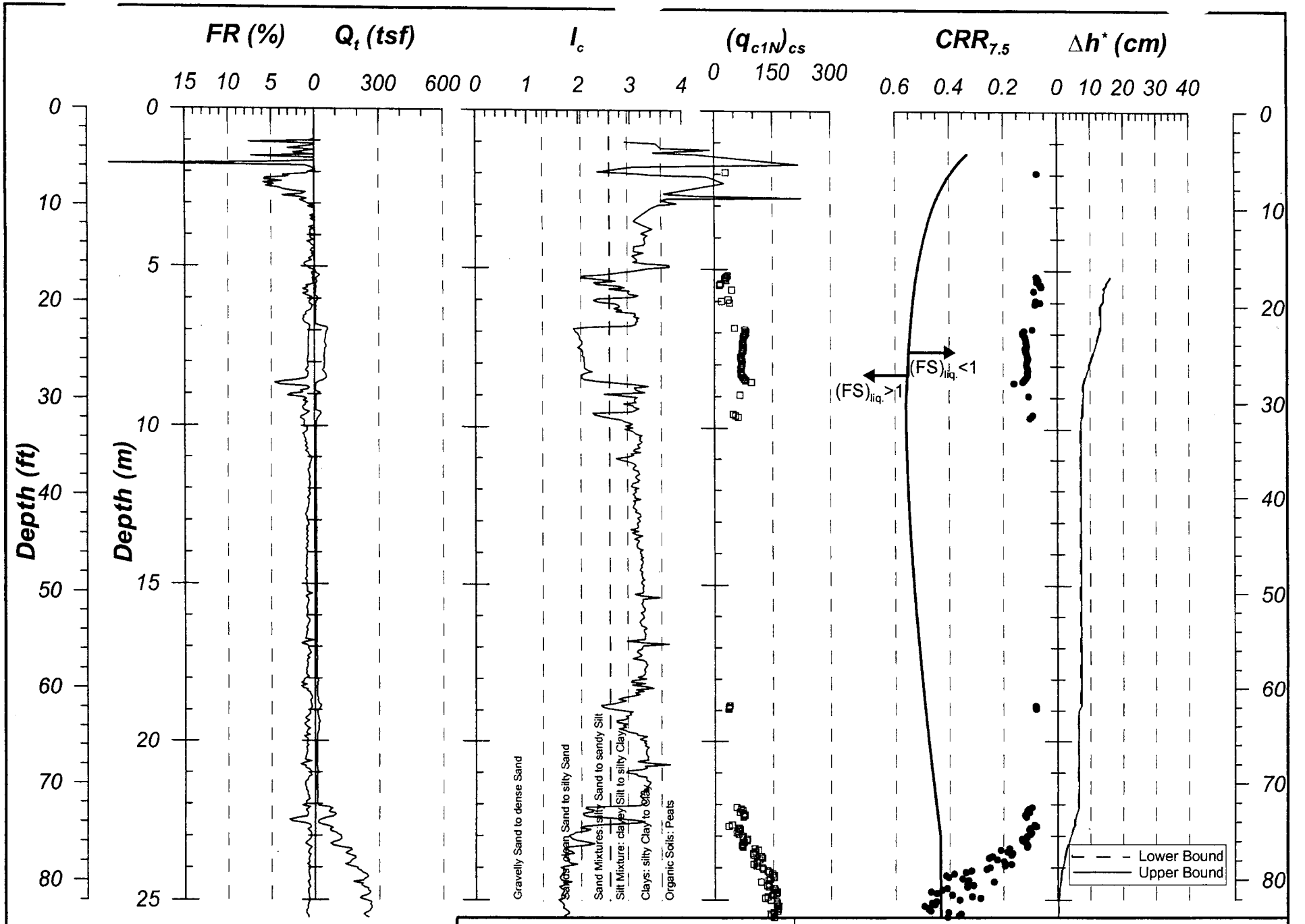
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-12A

Figure L15

Date: July 2002

Opt\HAN\Projects\Project-2002\Site2&Site12\CPTs\CPT12A-liq.xls, CPT12A-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

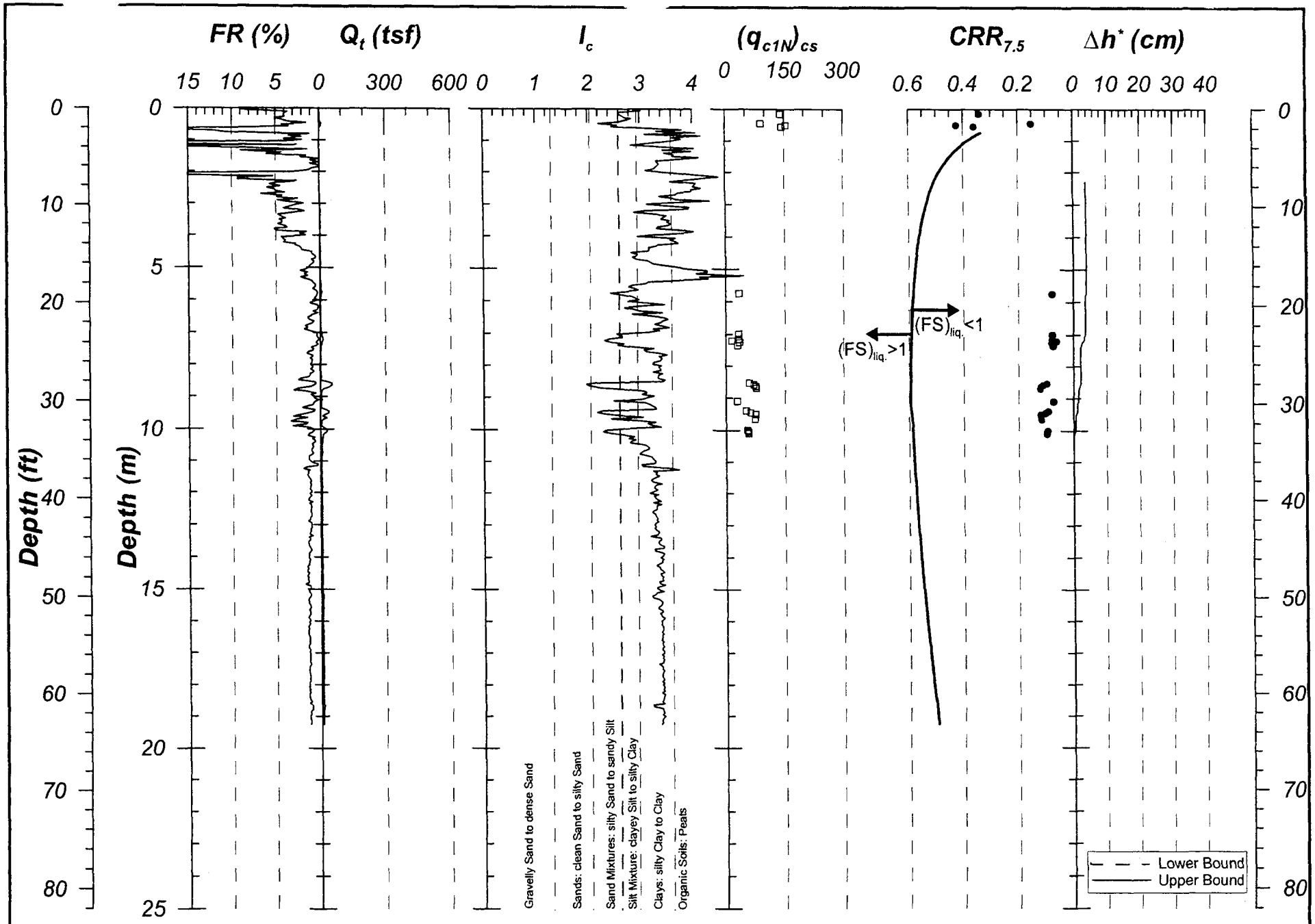
Project No. 01-0810

HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-13

Figure L16

Date: July 2002

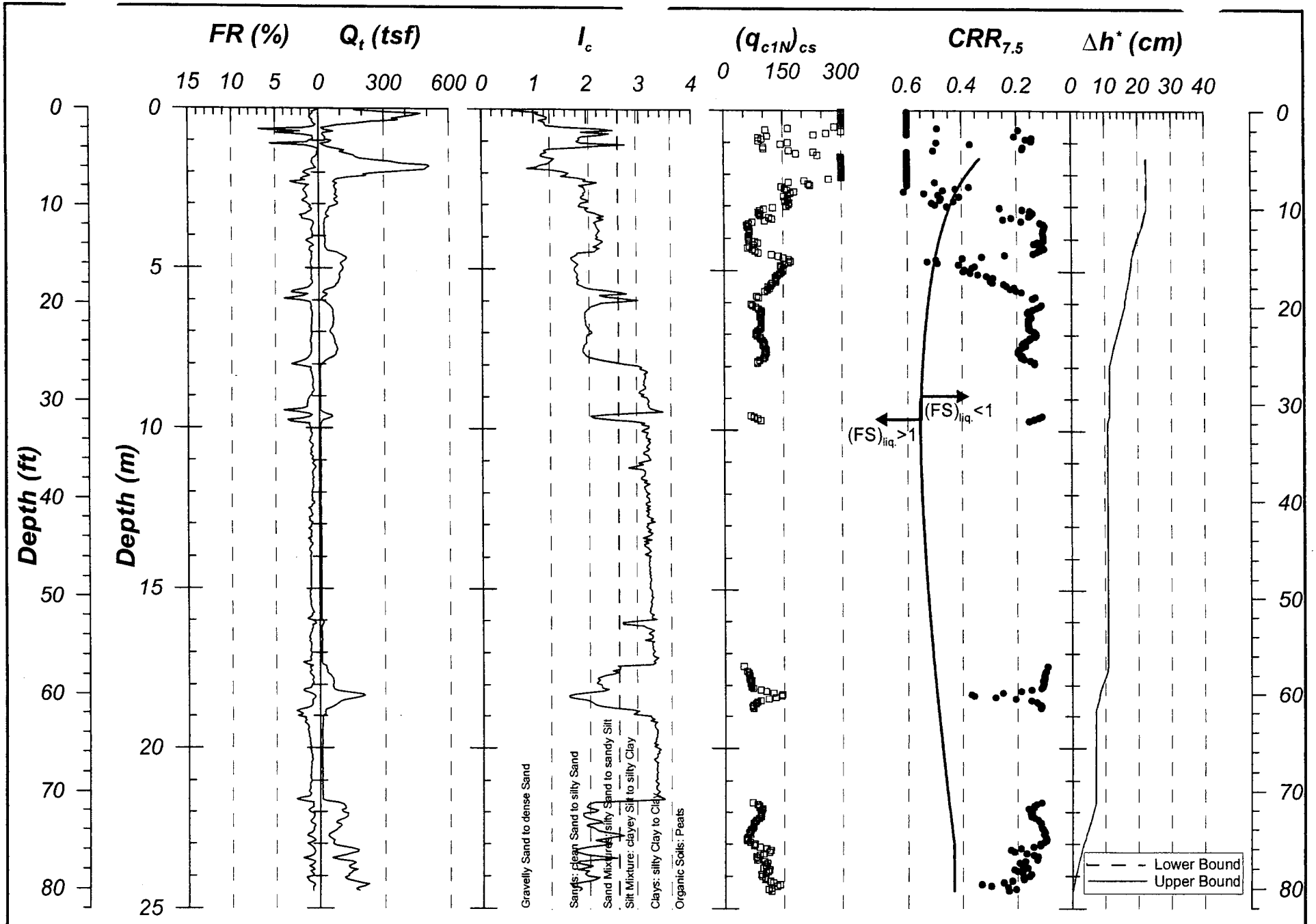


NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA	Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-14
Project No. 01-0810	
HUSHMAND ASSOCIATES INC.	Figure L17

Date: July 2002

Opt\HAI\Projects\Project-2002\Site2&Site12\CPTs\CPT14-liq.xls, CPT14-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

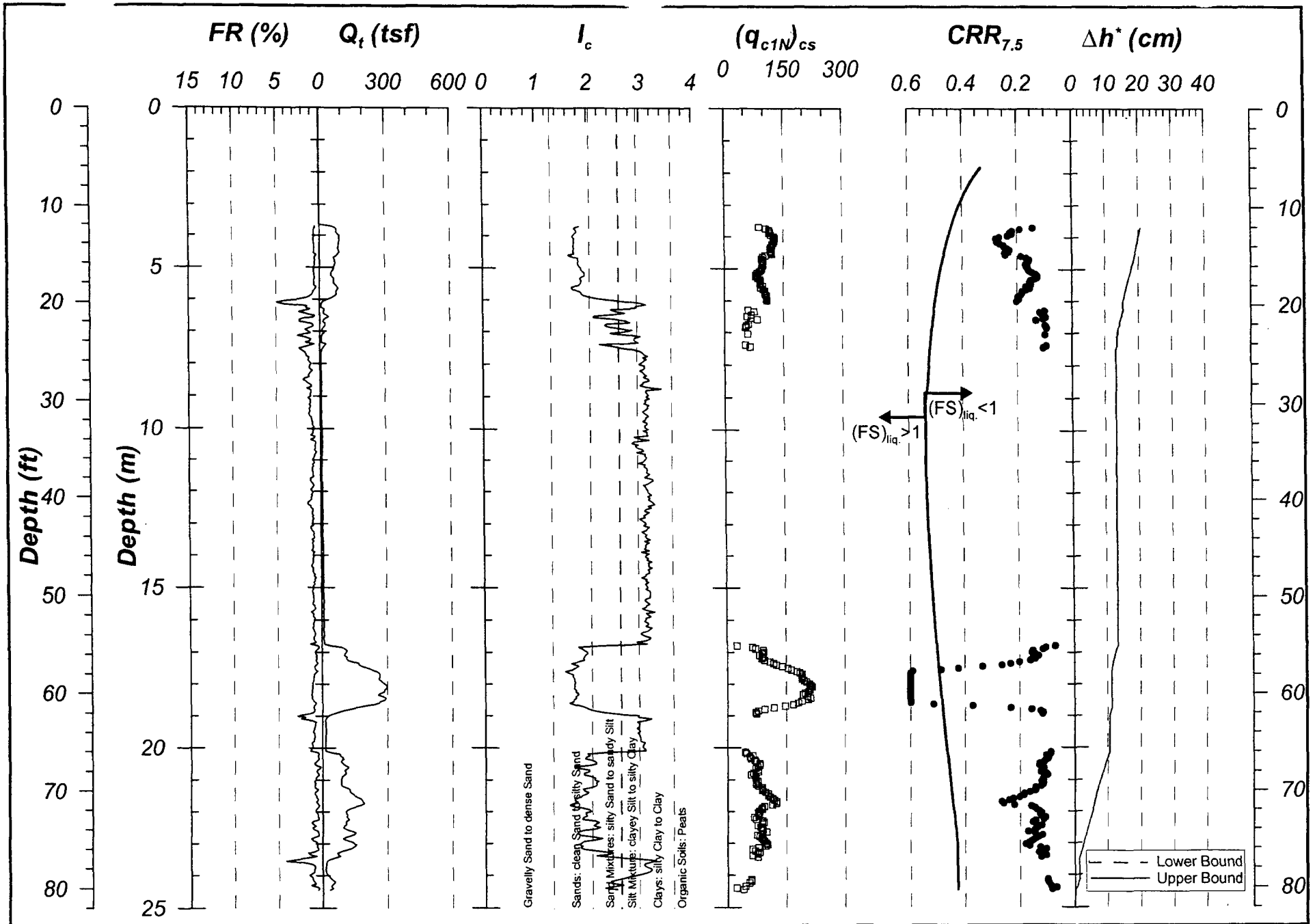
Project No. 01-0810

HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-15A

Figure L18

Date: July 2002



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

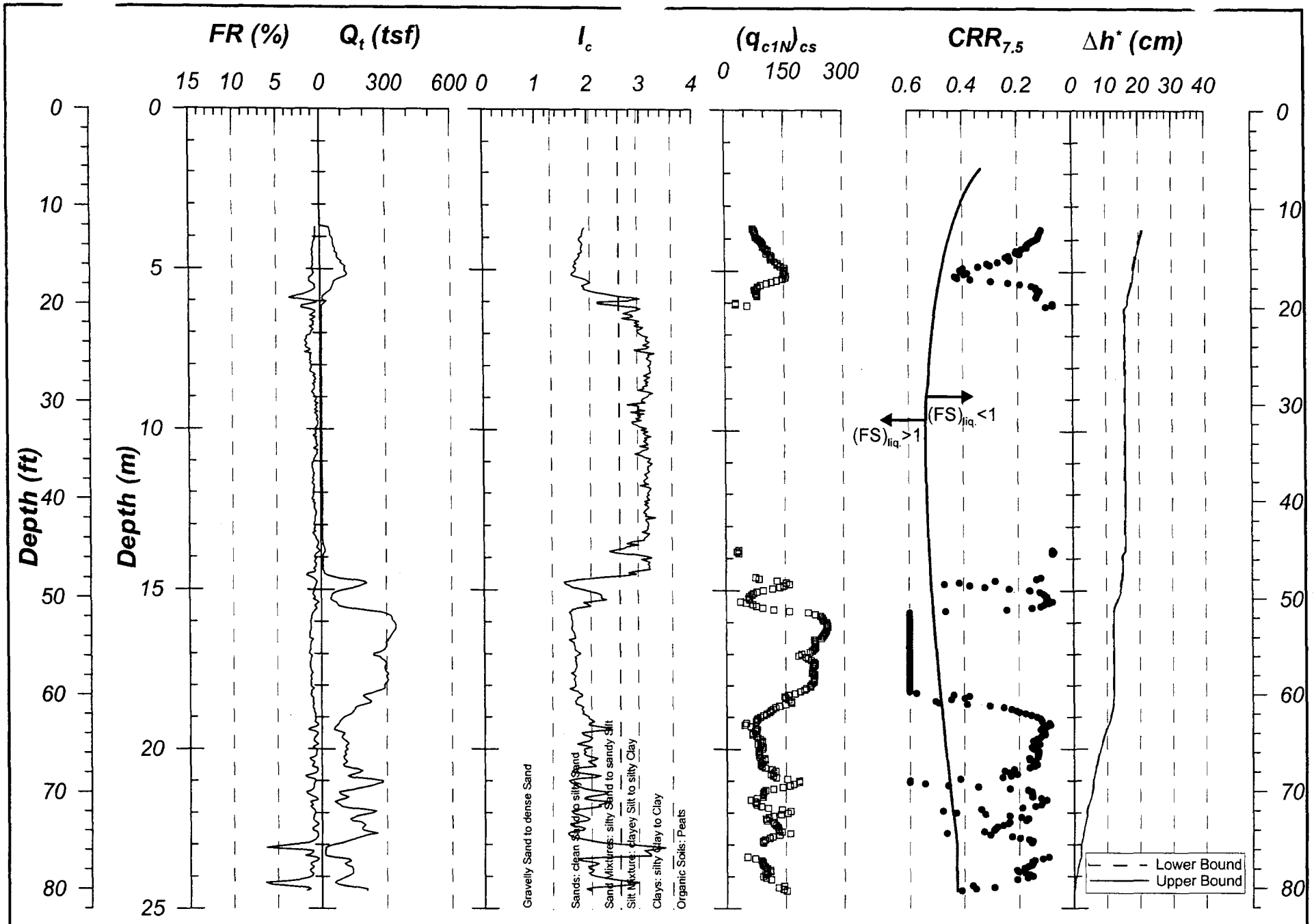
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-16

Figure L19

Date: July 2002

Op#HAA\Projects\Project-2002\Site2&Site12\CPTs\CPT757-liq.xls, CPT757-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

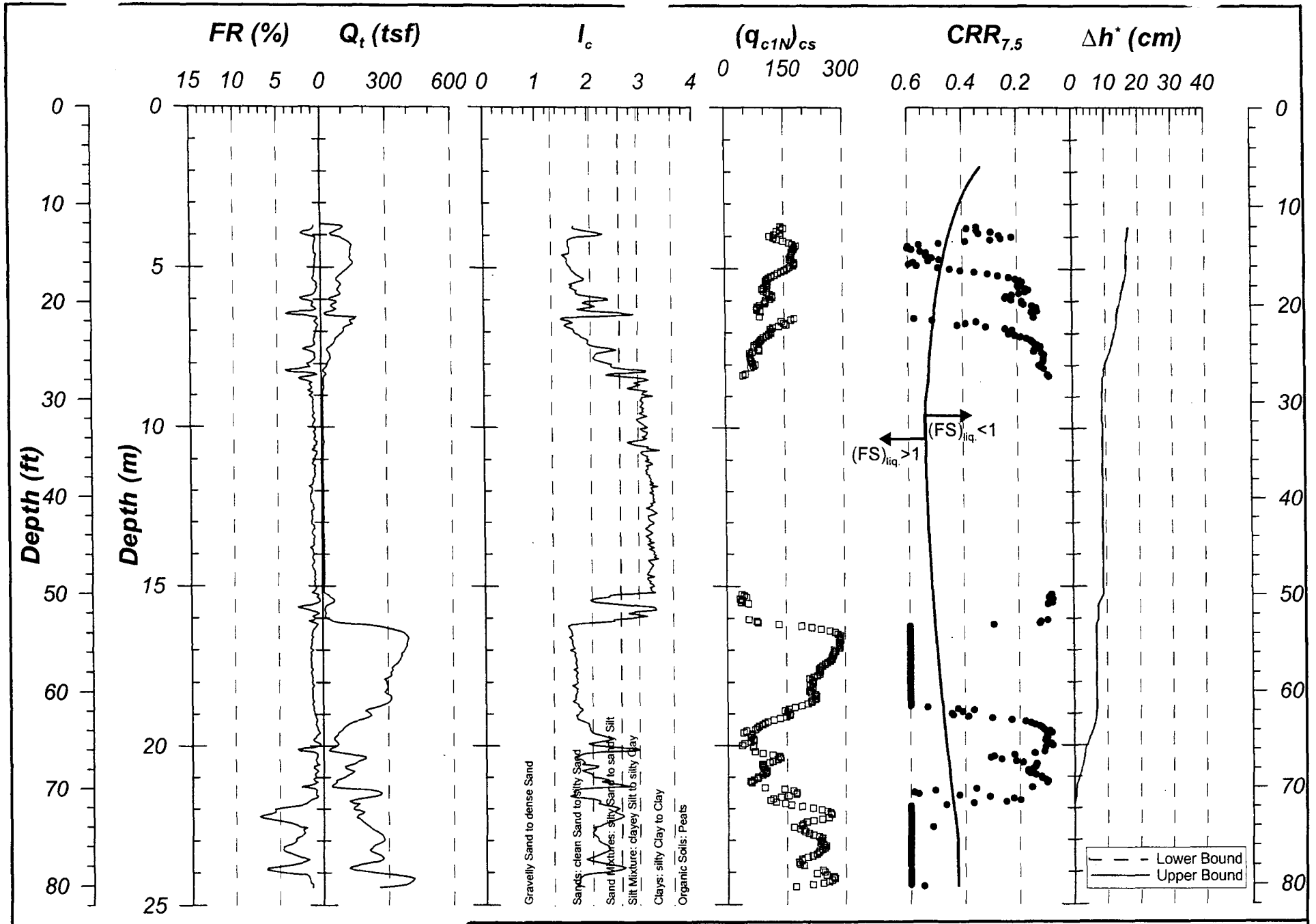
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-17

Figure L20

Opt\HAI\Projects\Project-2002\Site2&Site12\CPTs\CPT758-liq.xls, CPT758-liq.grf

Date: July 2002



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

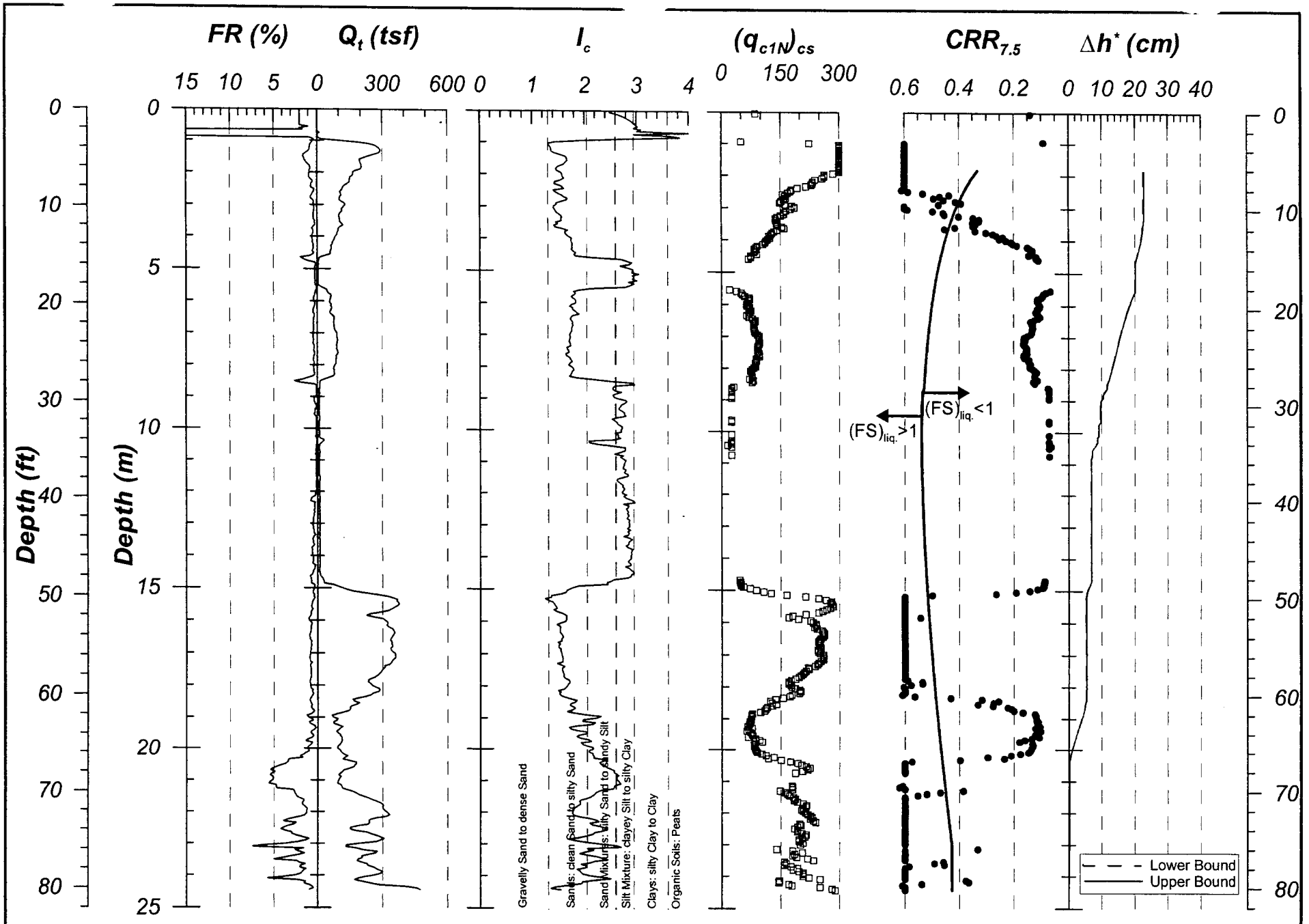
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-18

Figure L21

Date: July 2002

Opt/HAA\Projects\Project-2002\Site2&Site12\CPTs\CPT752-liq.xls, CPT752-liq.grf



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

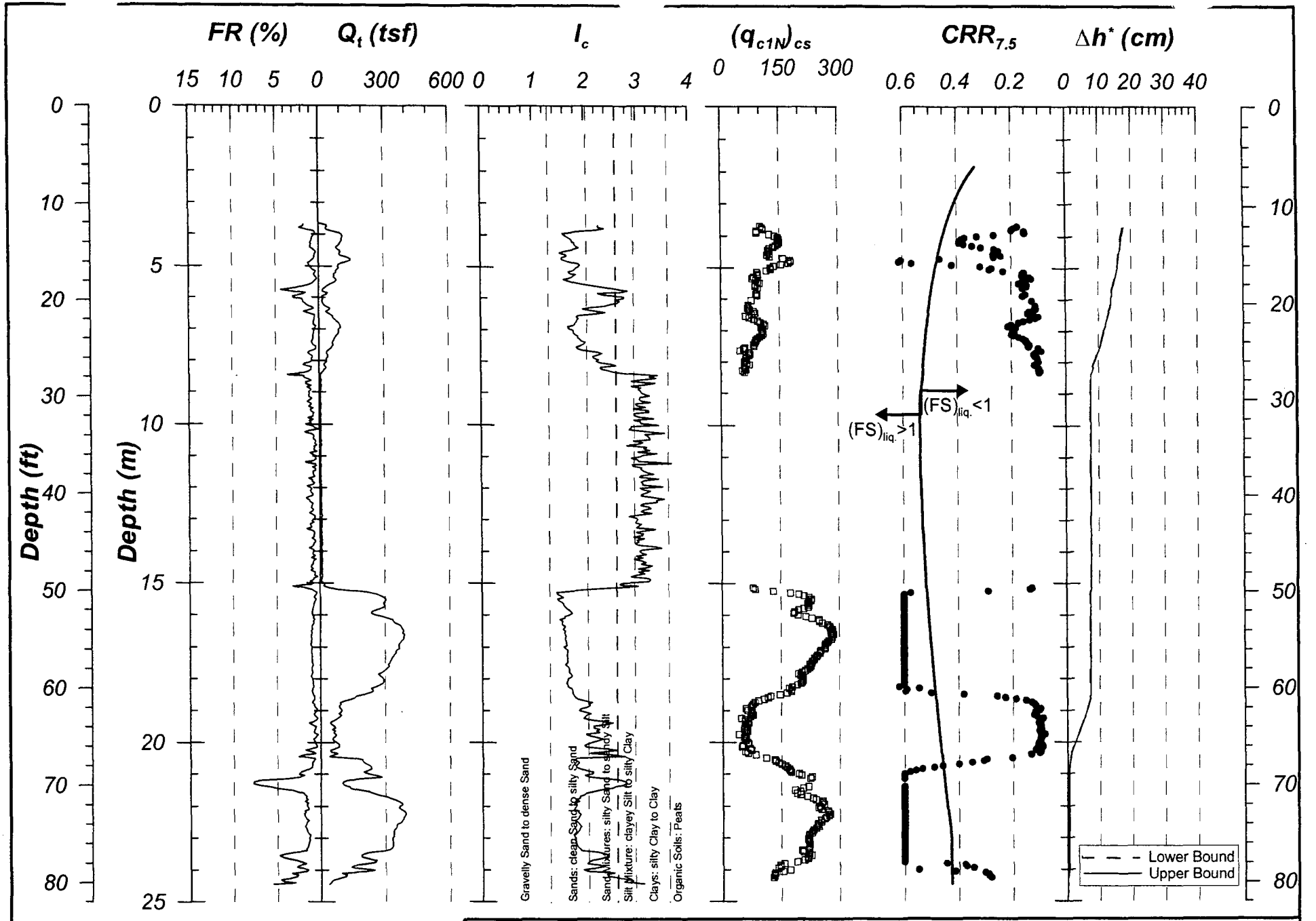
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-19

Figure L22

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT752-liq.xls, CPT752-liq.grf

Date: July 2002

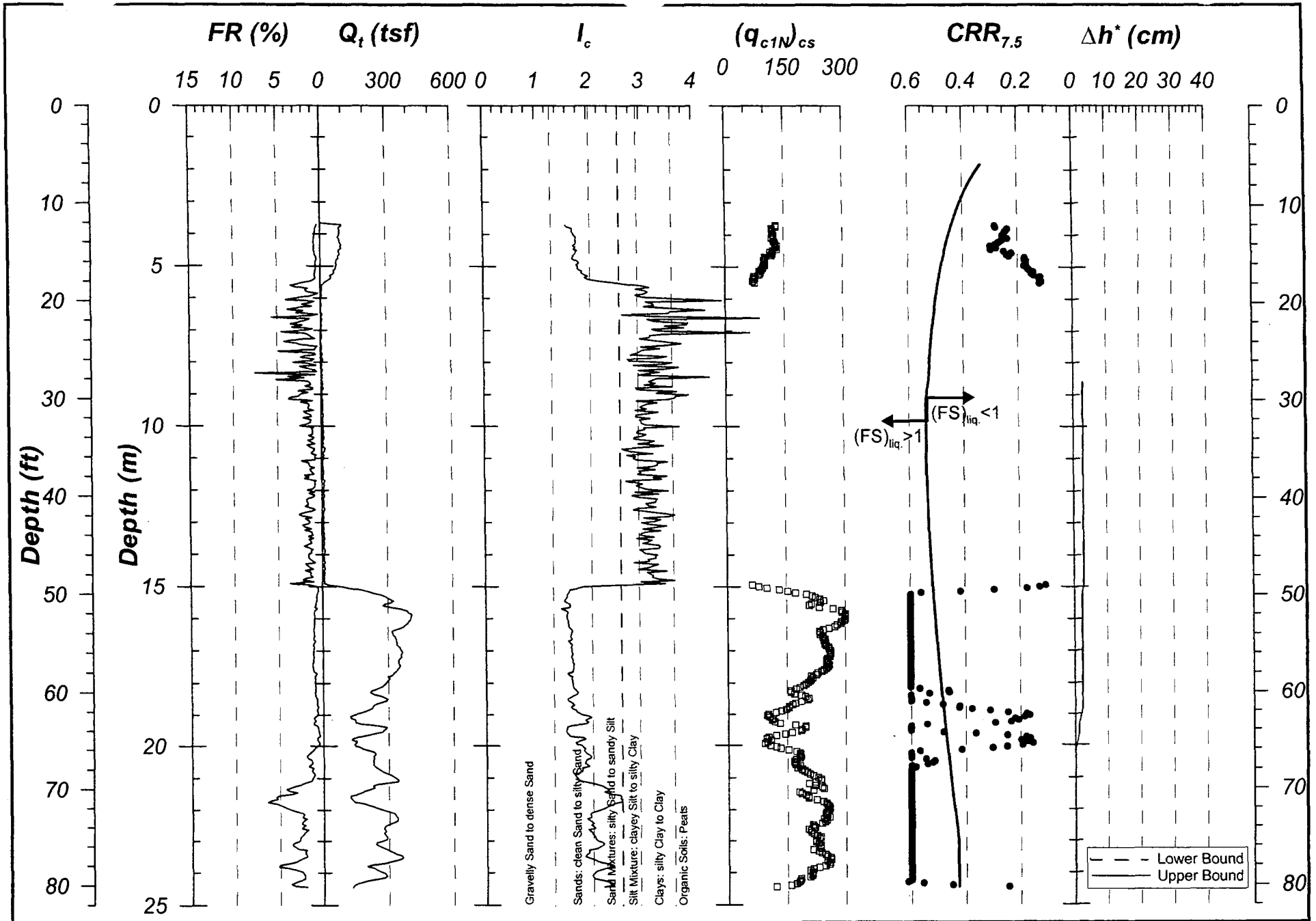


NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA	Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-20
Project No. 01-0810	
HUSHMAND ASSOCIATES INC.	Figure L23

Op#HAI\Projects\Project-2002\Site2&Site12\CPTs\CPT750-liq.xls, CPT750-liq.grf

Date: July 2002



NOTE:
$(q_{c1N})_{CS}$ and CRR plots are truncated at 300 and 0.6, respectively.
* Δh is liquefaction-induced settlement and does not include earthquake-induced settlement of unsaturated soils.

ALAMEDA NAS - Alameda Point, Alameda, CA

Project No. 01-0810

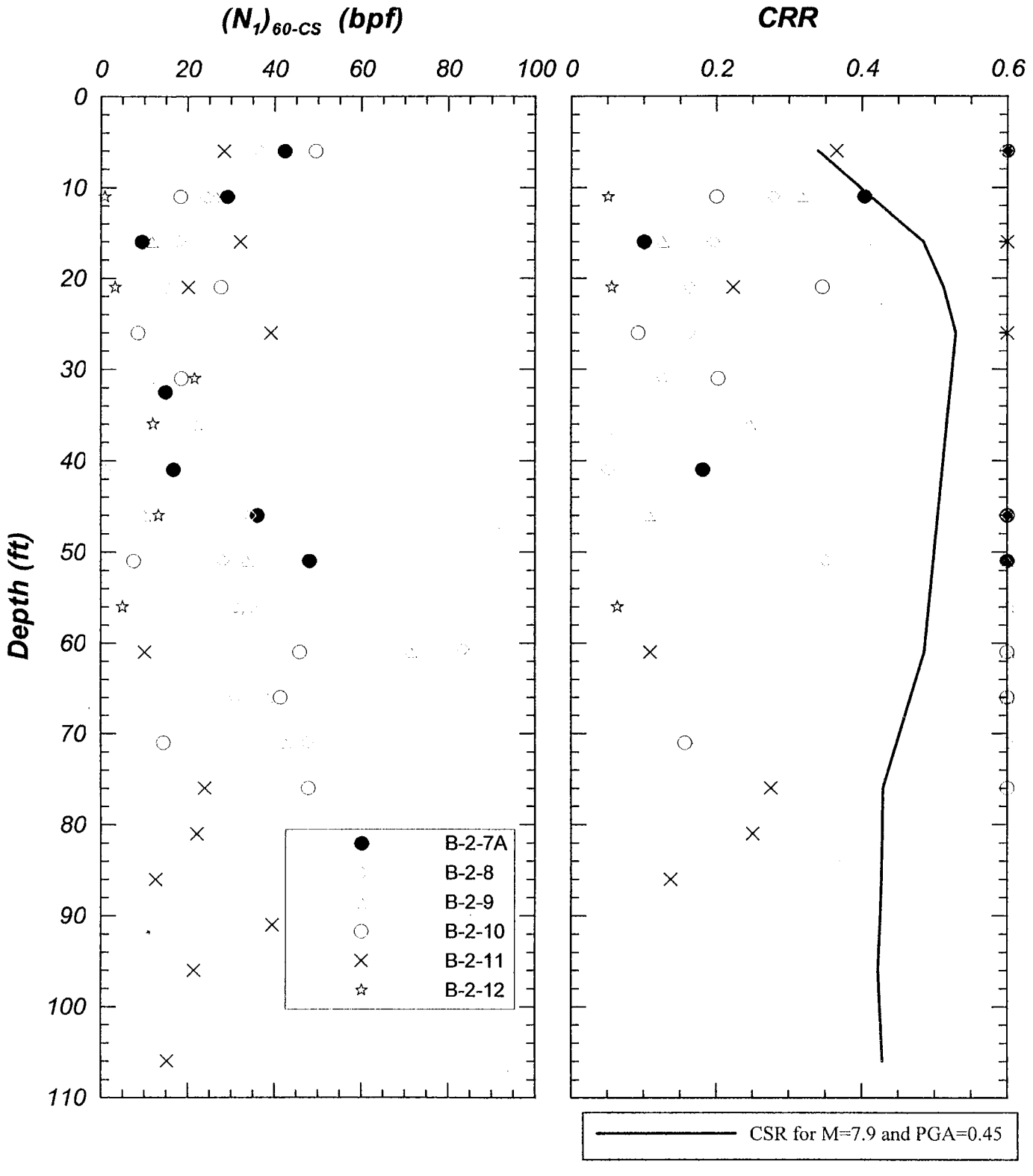
HUSHMAND ASSOCIATES INC.

Integrated CPT Method for Estimating Subsurface Stratification at CPT C-2-21

Figure L24

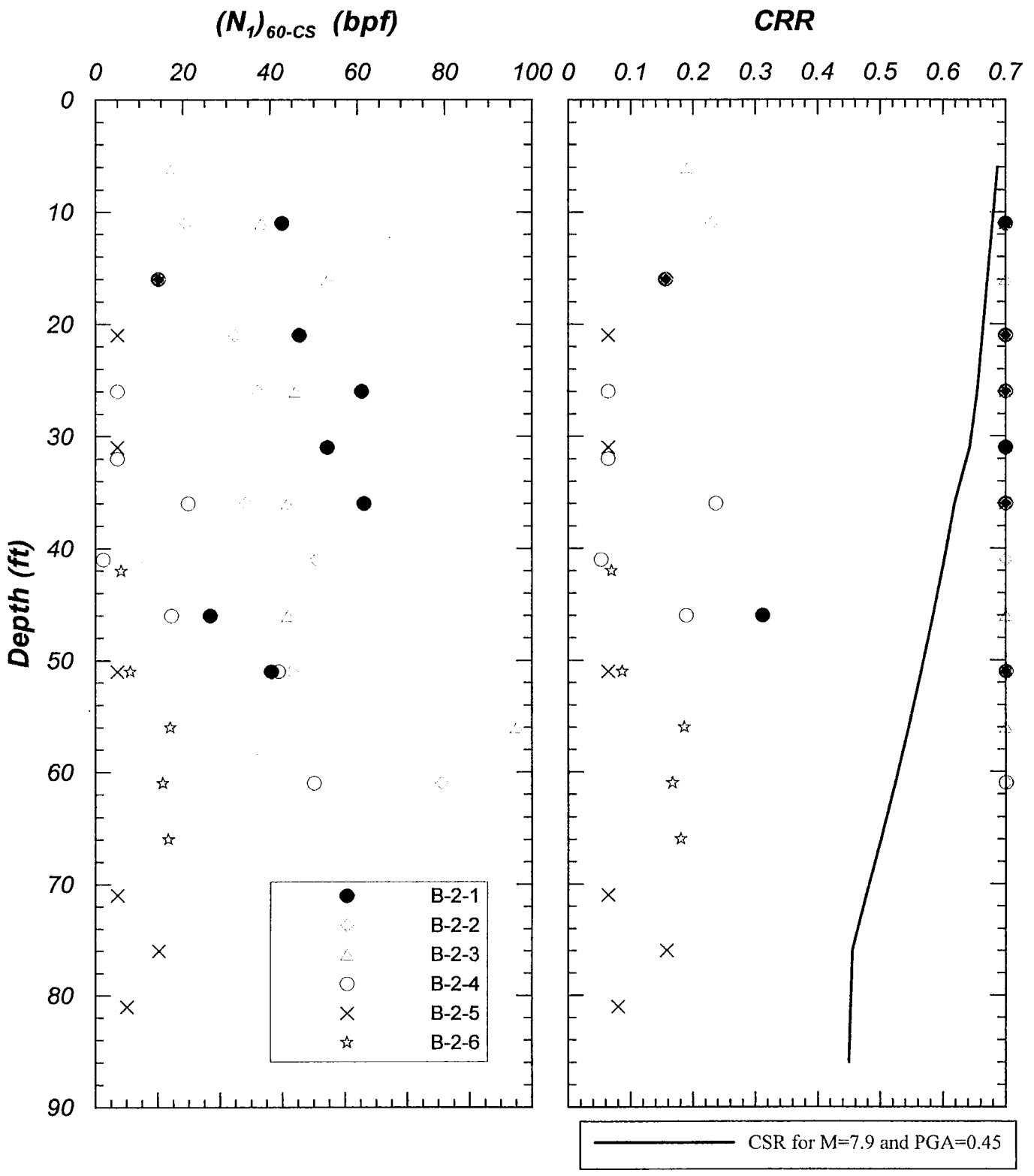
Date: July 2002

Opt\HA\Projects\Project-2002\Site2&Site12\CPTs\CPT751-liq.xls, CPT751-liq.grf



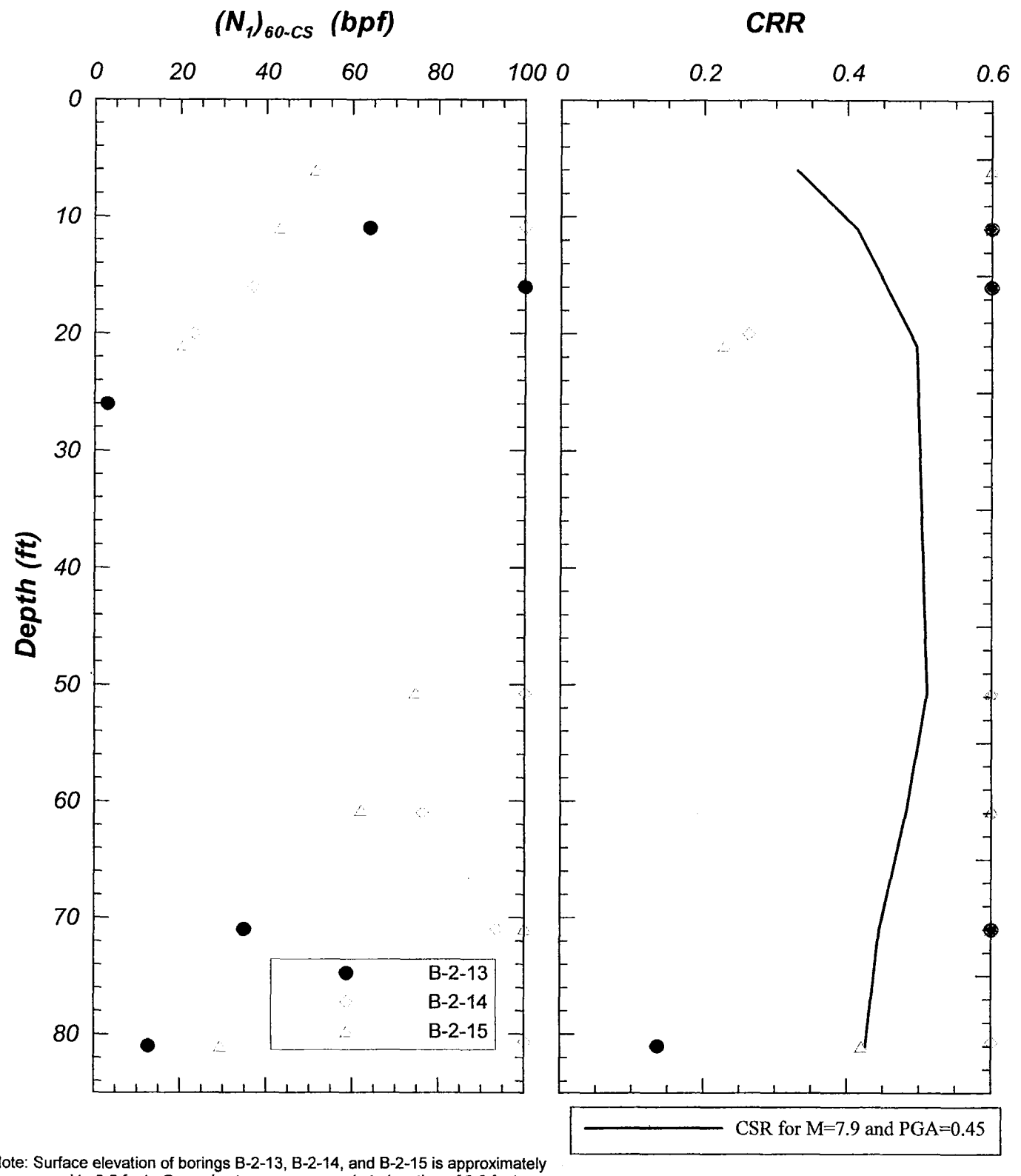
Note: Surface elevations of borings B-2-7A, B-2-8, B-2-9, B-2-10, B-2-11, and B-2-12 are approximately equal to 8.5, 16.8, 16.2, 16.8, 7.7, and 4.6 feet, respectively. Groundwater was assumed at elevation of 2.0 feet.

Project No. 01-0810	Alameda NAS Alameda Point, Alameda, CA	Compilation of Site 2 Onshore Borings SPT Blow Counts and Comparison of CRR and CSR for Liquefaction Potential Evaluation	Figure L25
HAI HUSHMAND ASSOCIATES INC. Geotechnical and Earthquake Engineers			



Note: Surface elevations of borings B-2-1, B-2-2, B-2-3, B-2-4, B-2-5, and B-2-6 are approximately equal to -15.1, -17.7, -35.5, -19.0, -9.5, and -10.5 feet, respectively. Water elevation was assumed at 0 feet (MLLW).

Project No. 01-0810	Alameda NAS Alameda Point, Alameda, California	Compilation of Site 2 Offshore Borings SPT Blow Counts and Comparison of CRR and CSR for Liquefaction Potential Evaluation	Figure L26
HAI HUSHMAND ASSOCIATES INC. Geotechnical and Earthquake Engineers			



Note: Surface elevation of borings B-2-13, B-2-14, and B-2-15 is approximately equal to 8.5 feet. Groundwater was assumed at elevation of 2.0 feet.

Project No. 01-0810	Alameda NAS Alameda Point, Alameda, CA	Compilation of Onshore Borings SPT Blow Counts and Comparison of CRR and CSR for Liquefaction Potential Evaluation Area Between IR Sites 1 and 2	Figure L27
HAI	HUSHMAND ASSOCIATES INC. Geotechnical and Earthquake Engineers		