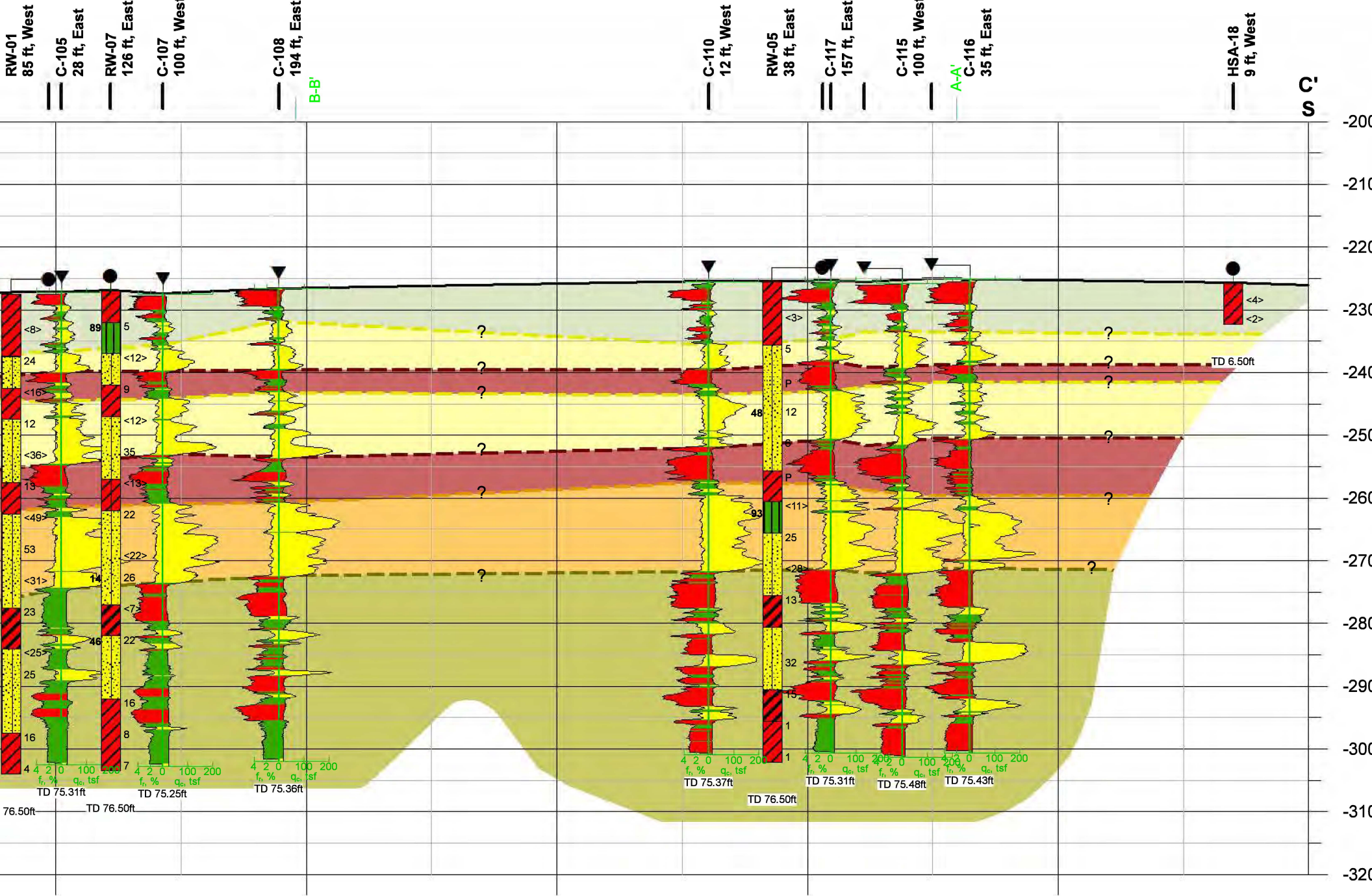


DOCKETED

Docket Number:	23-AFC-03
Project Title:	Black Rock Geothermal Project (BRGP)
TN #:	252492-3
Document Title:	Black Rock Geothermal Project Data Request Response Set 1 Part 3
Description:	N/A
Filer:	Jerry Salamy
Organization:	Jacobs
Submitter Role:	Applicant Consultant
Submission Date:	10/2/2023 8:45:46 PM
Docketed Date:	10/3/2023

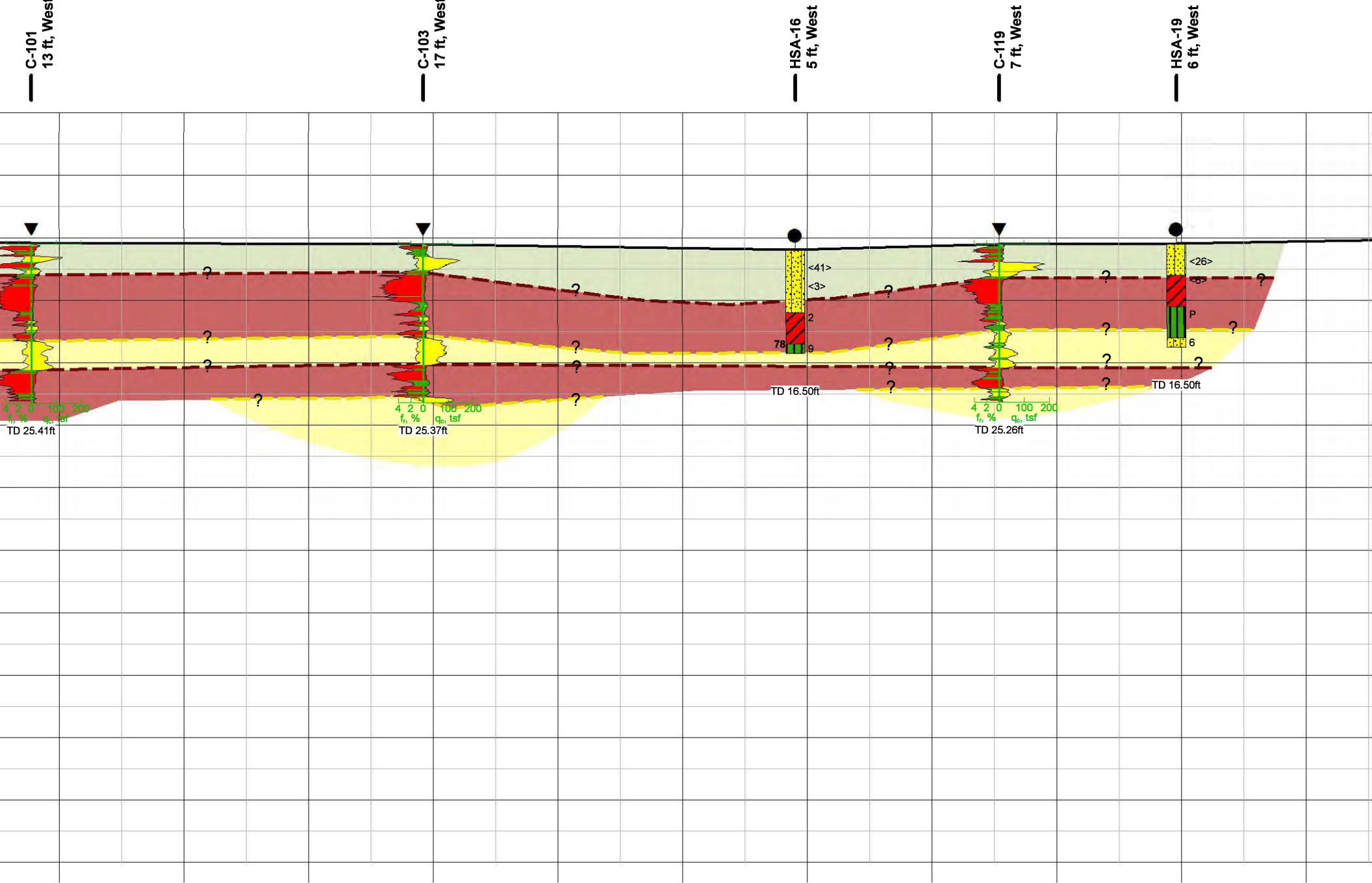


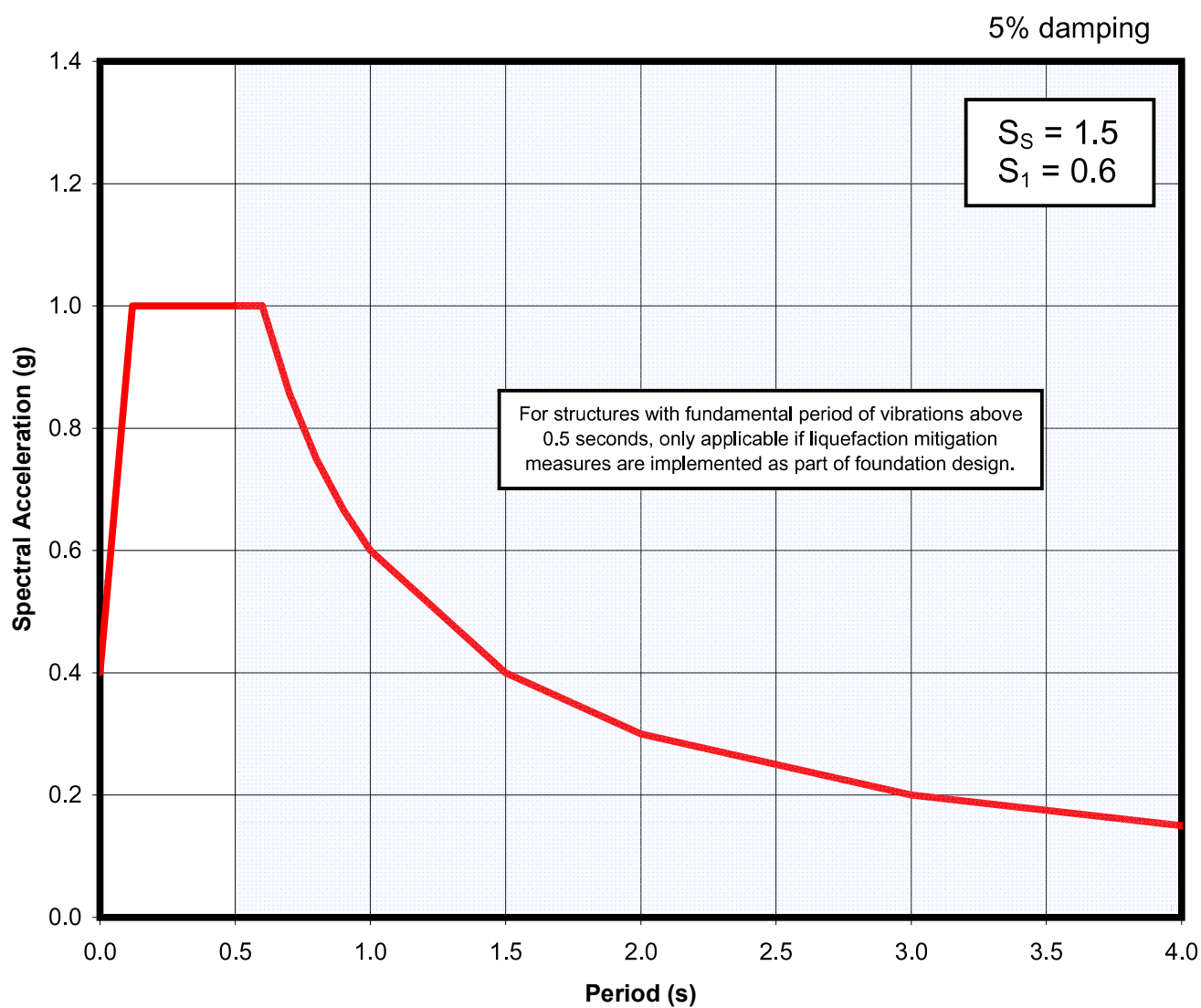
Interbedded Clays, Silts and Sands

Medium Dense to Dense Silty Sands

Clays and Silts Interbedded with Sand Layers

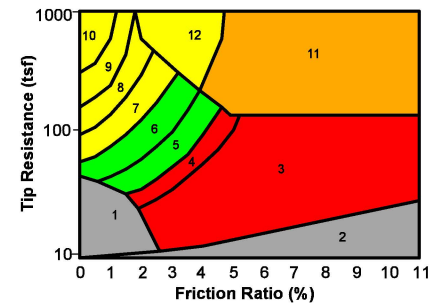
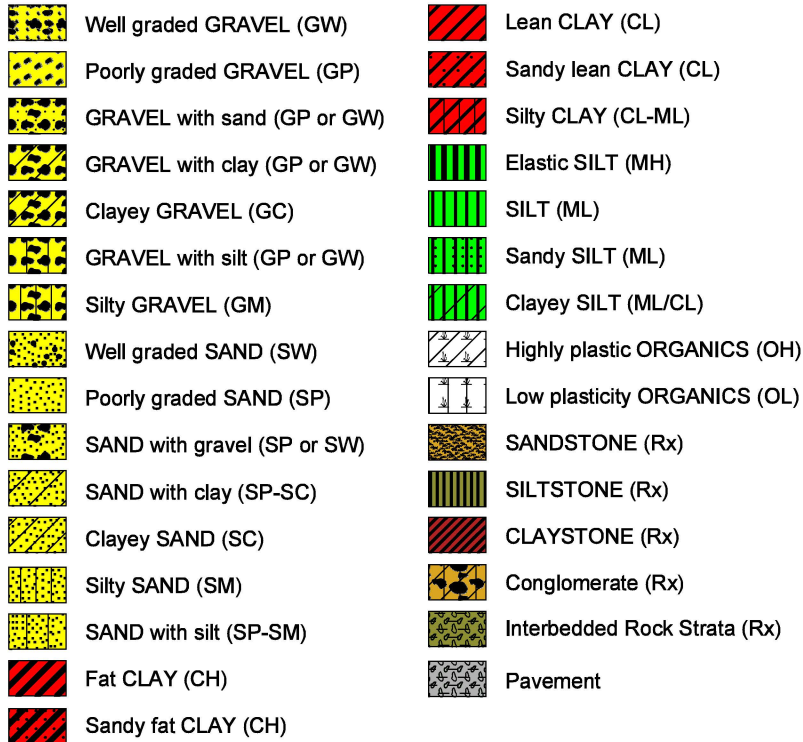
SUBSU





HORIZONTAL DESIGN SPECTRUM BASED ON CBC 2007
Black Rock Units 1, 2 a 3
Calipatria, California

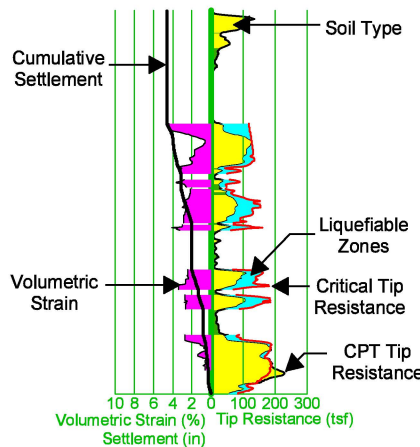
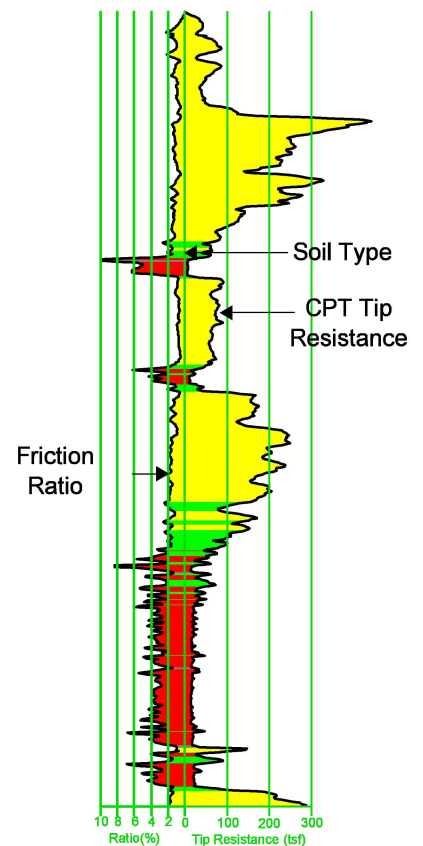
SOIL TYPES



Zone	Soil Behavior Type	U.S.C.S.
1	Sensitive Fine-grained	OL-CH
2	Organic Material	OL-OH
3	Clay	CH
4	Silty Clay to Clay	CL-CH
5	Clayey Silt to Silty Clay	MH-CL
6	Sandy Silt to Clayey Silt	ML-MH
7	Silty Sand to Sandy Silt	SM-ML
8	Sand to Silty Sand	SM-SP
9	Sand	SW-SP
10	Gravelly Sand to Sand	SW-GW
11	Very Stiff Fine-grained *	CH-CL
12	Sand to Clayey Sand *	SC-SM

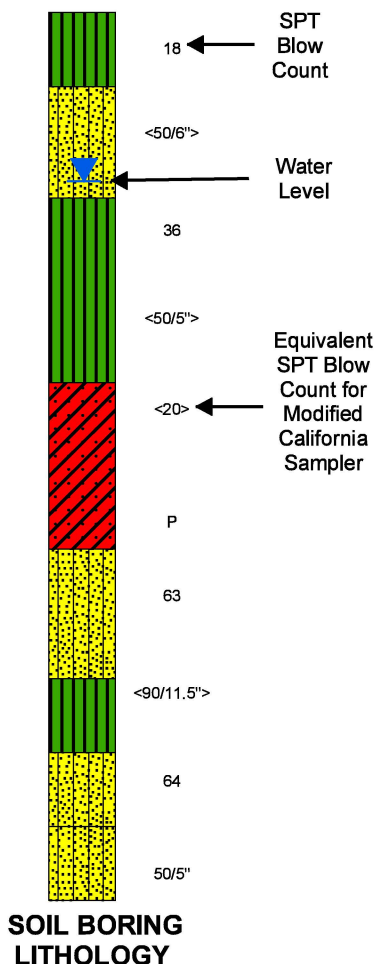
*overconsolidated or cemented

CPT CORRELATION CHART (Robertson and Campanella, 1984)



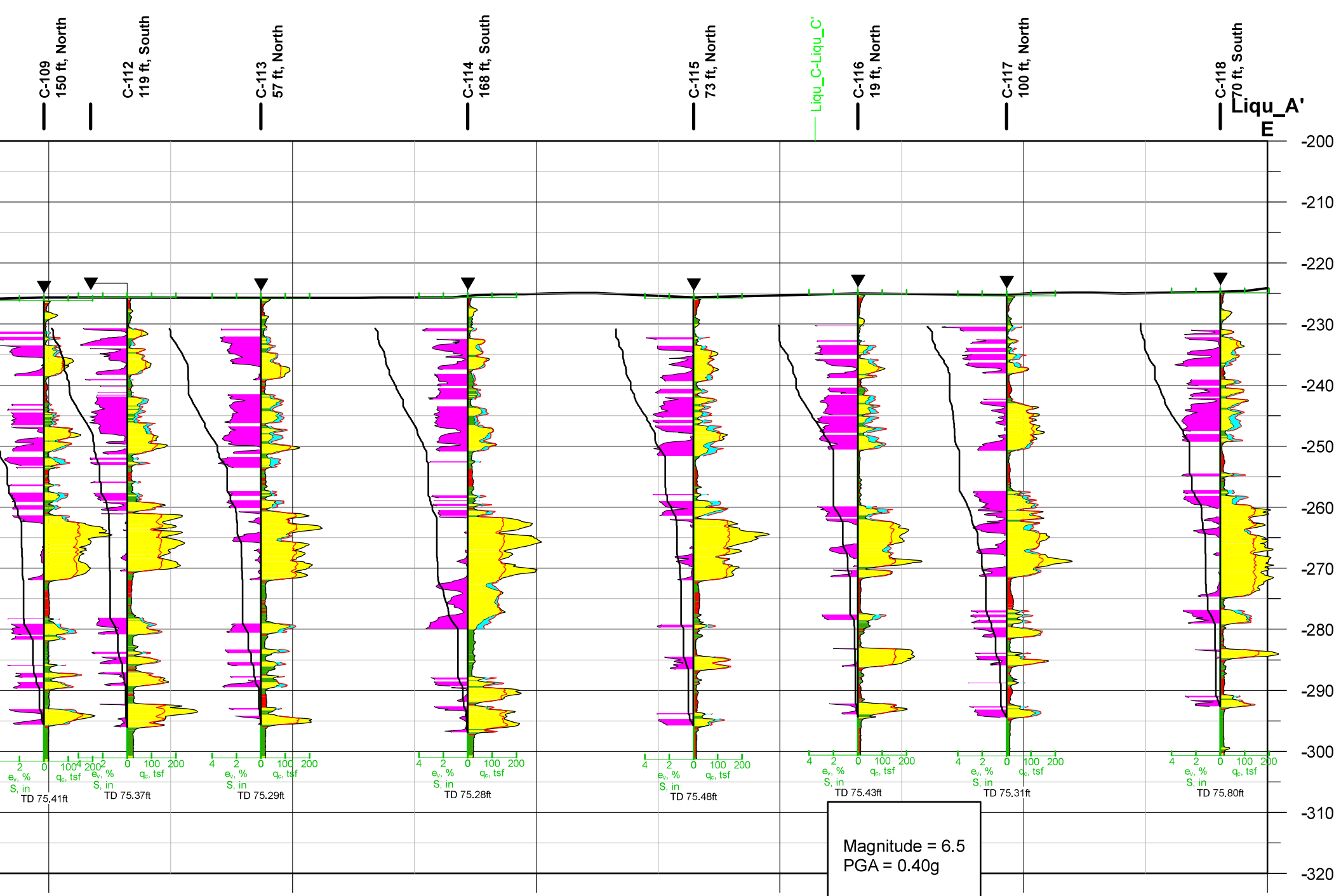
CPT SOUNDING WITH LIQUEFACTION EVALUATION

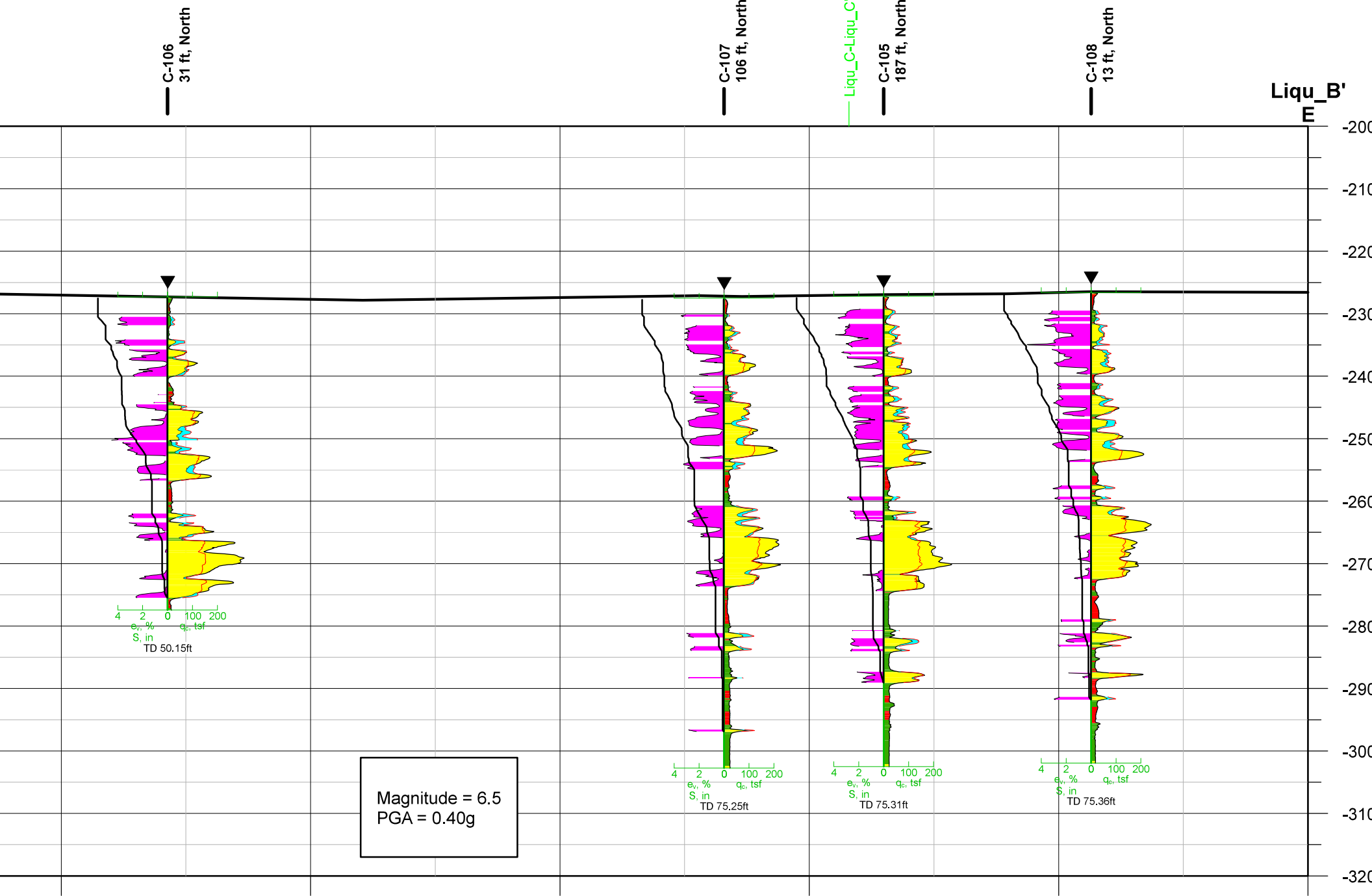
KEY TO LIQUEFACTION CROSS SECTIONS
P.G.A. = 0.40g and $M_w = 6.5$
Black Rock Units 1, 2 & 3
Calipatria, California



CPT SOUNDING WITH INTERPRETED LITHOLOGY

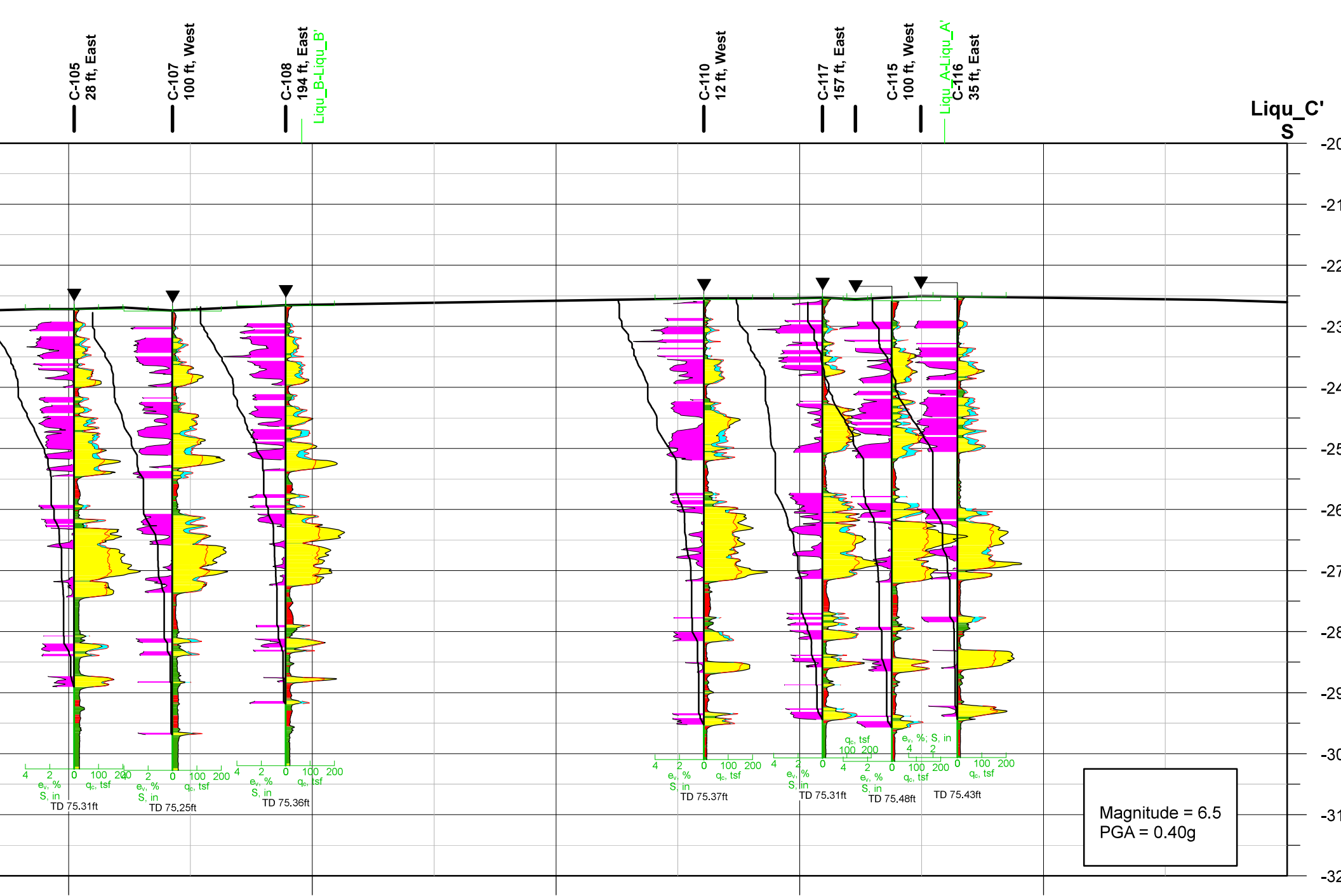
FIGURE 6-2





Liqu_B'
E

SUB

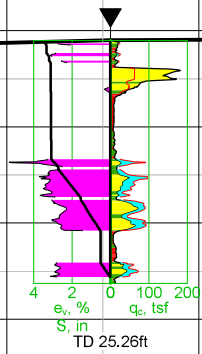
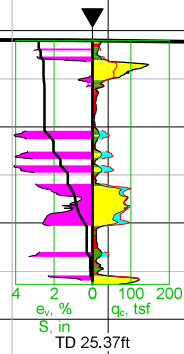
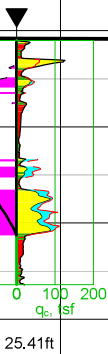


C-101
13 ft, West

C-103
17 ft, West

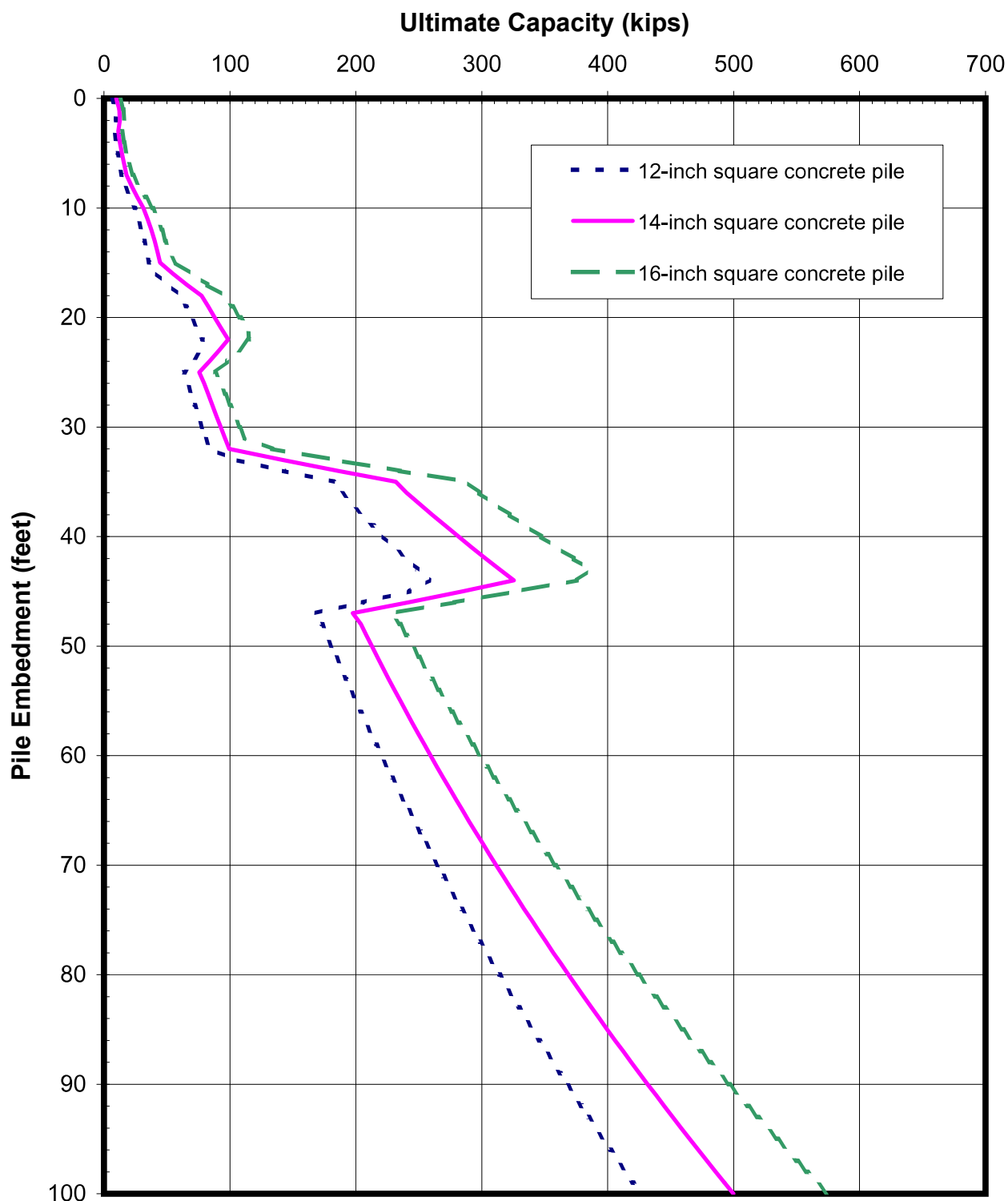
C-119
7 ft, West

Liq

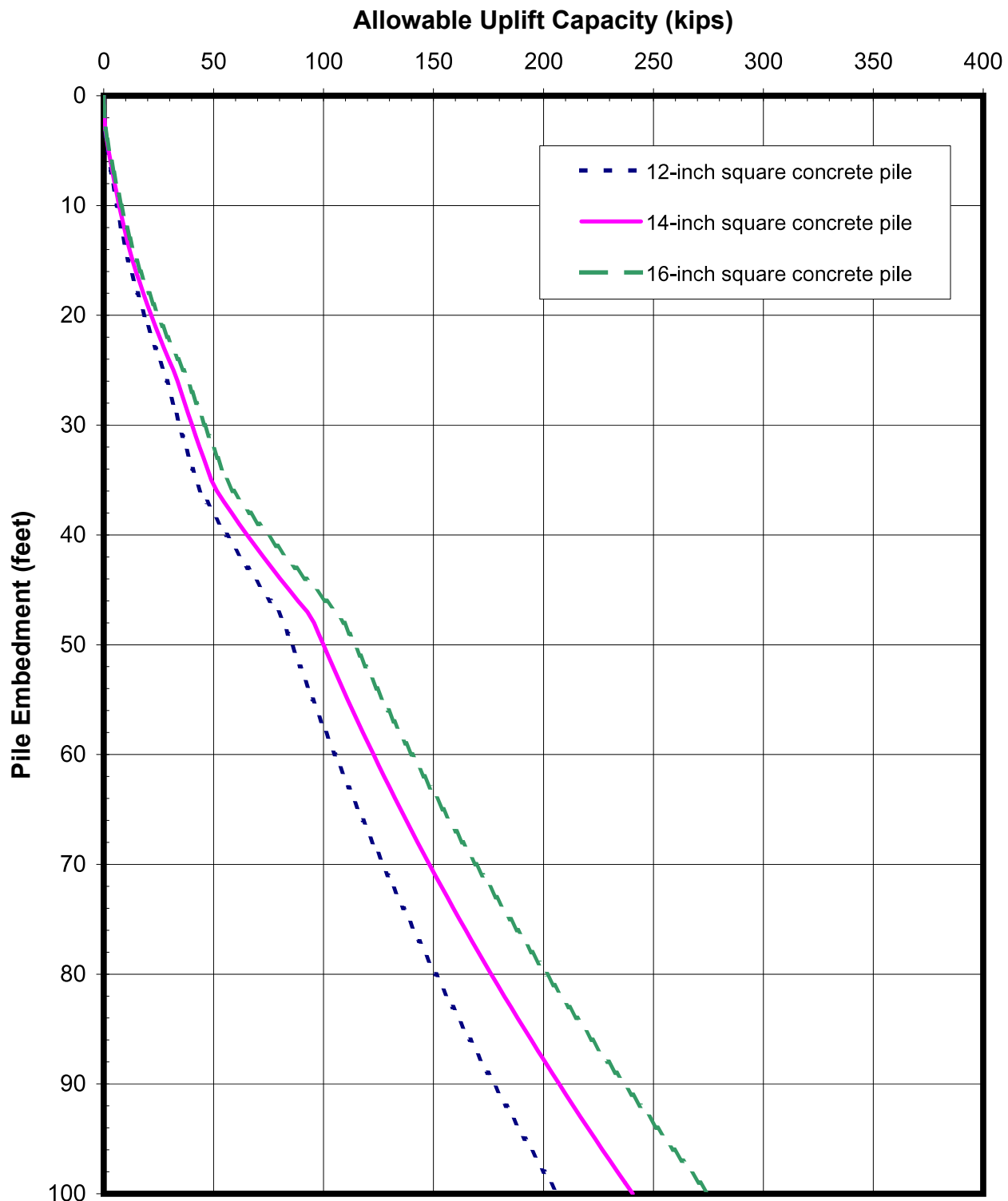


Magnitude = 6.5
PGA = 0.40g

SUB

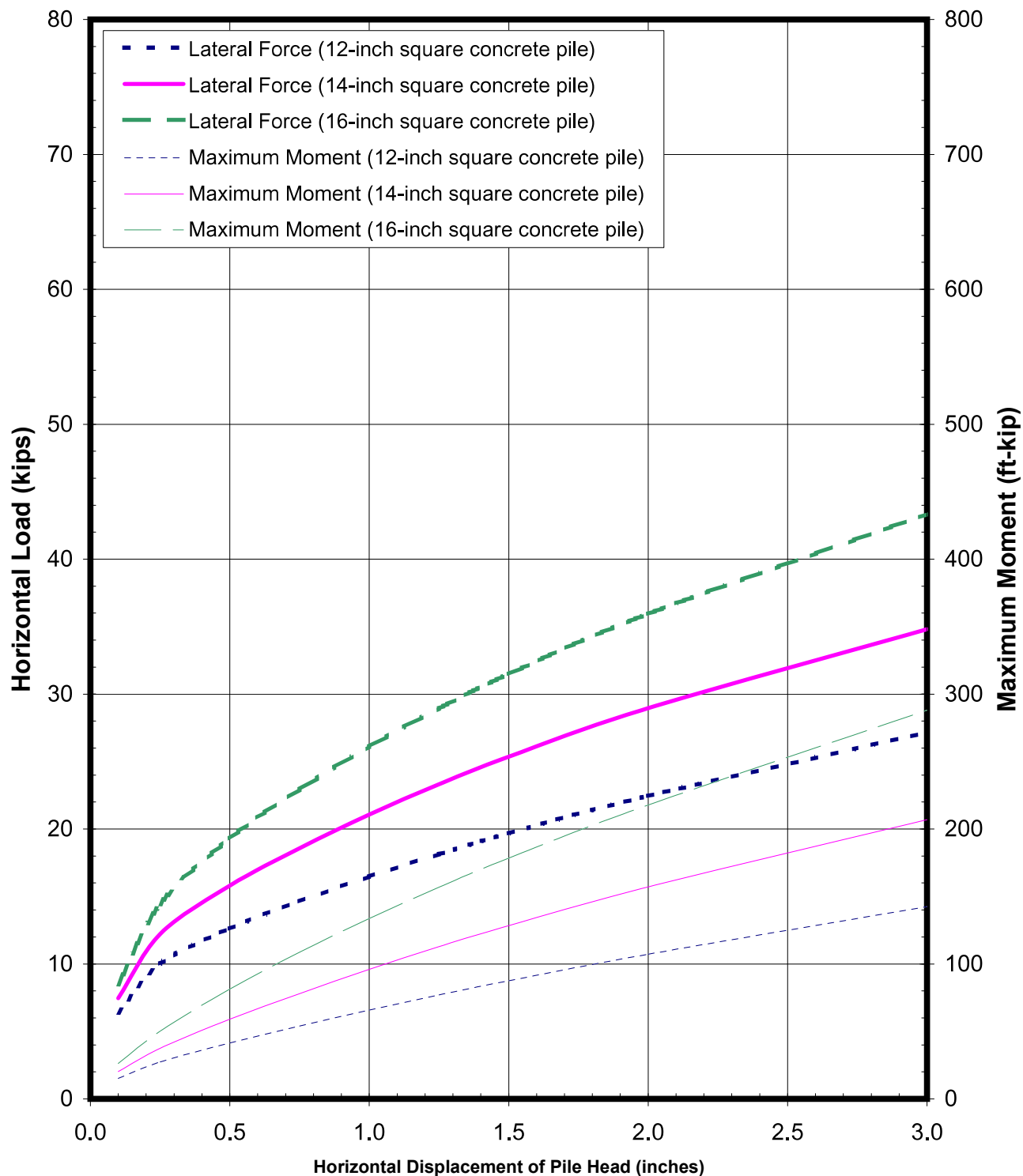


ULTIMATE AXIAL PILE CAPACITY
Black Rock Units 1, 2 & 3
Calipatria, California

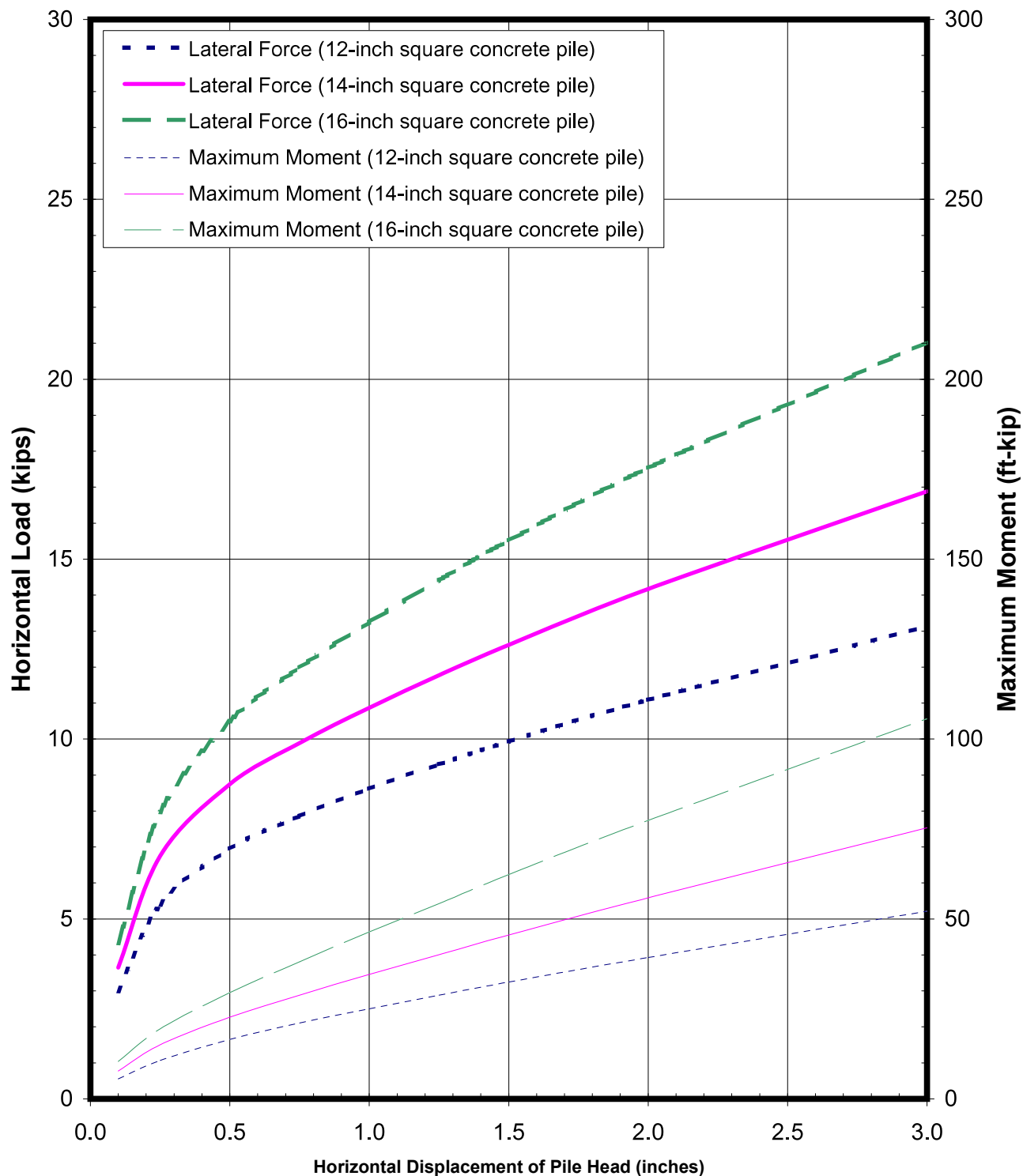


ALLOWABLE UPLIFT PILE CAPACITY
Black Rock Units 1, 2 & 3
Calipatria, California

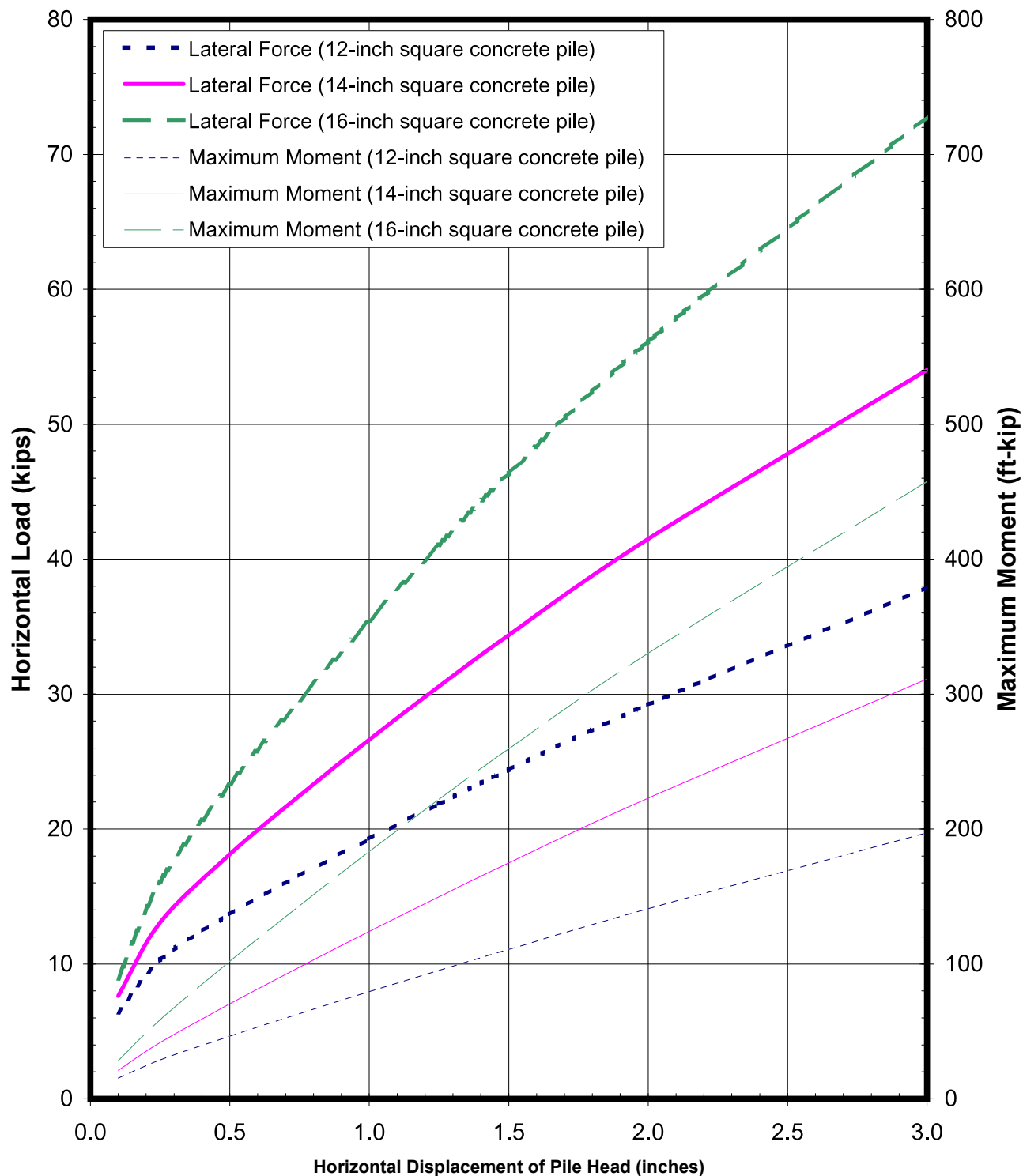
FIGURE 7-2



LATERAL PILE LOAD - DISPLACEMENT CURVE
Fixed Pile Head / Without Ground Improvement
 Black Rock Units 1, 2 & 3
 Calipatria, California

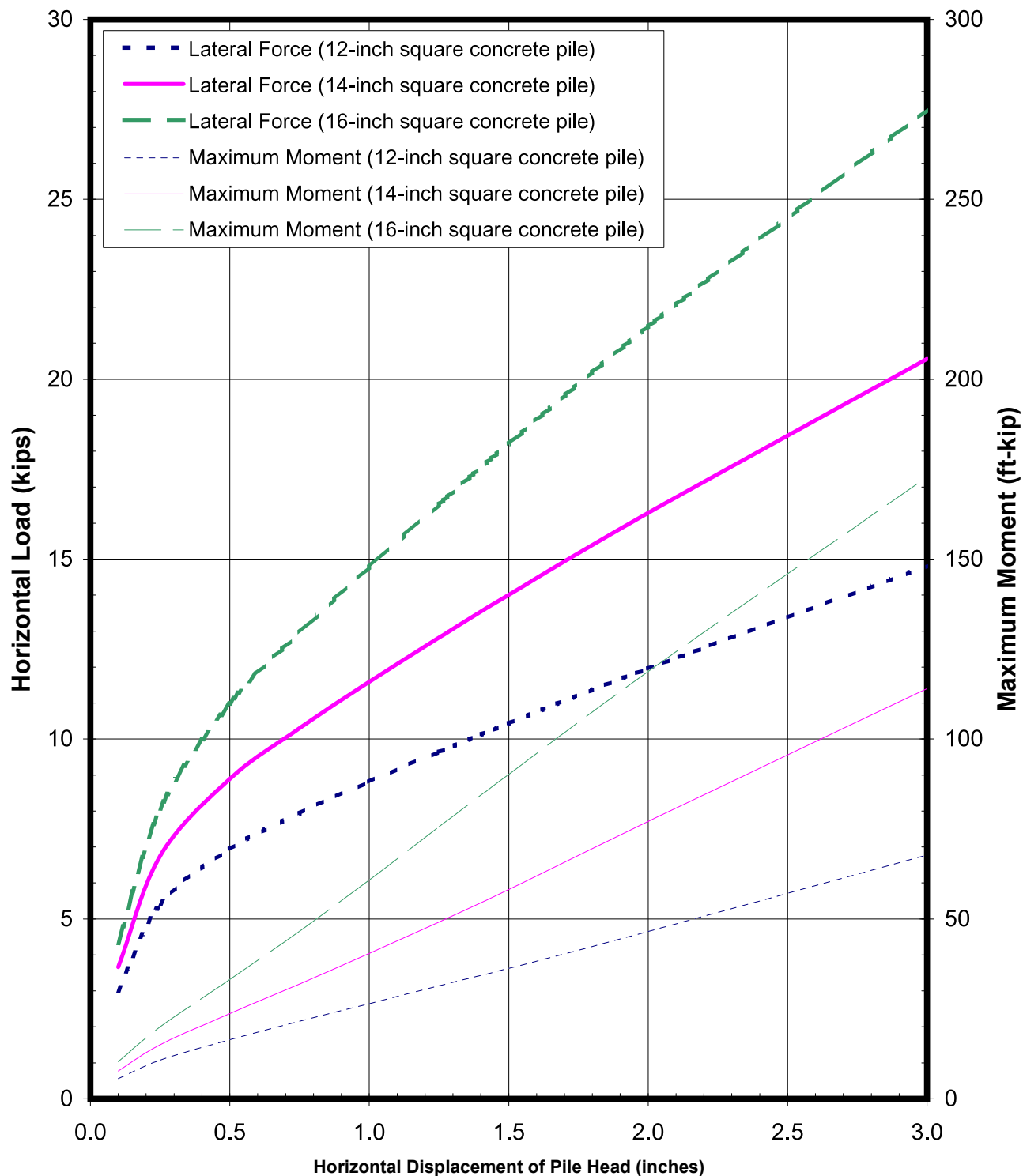


LATERAL PILE LOAD - DISPLACEMENT CURVE
Free Pile Head / Without Ground Improvement
Black Rock Units 1, 2 & 3
Calipatria, California



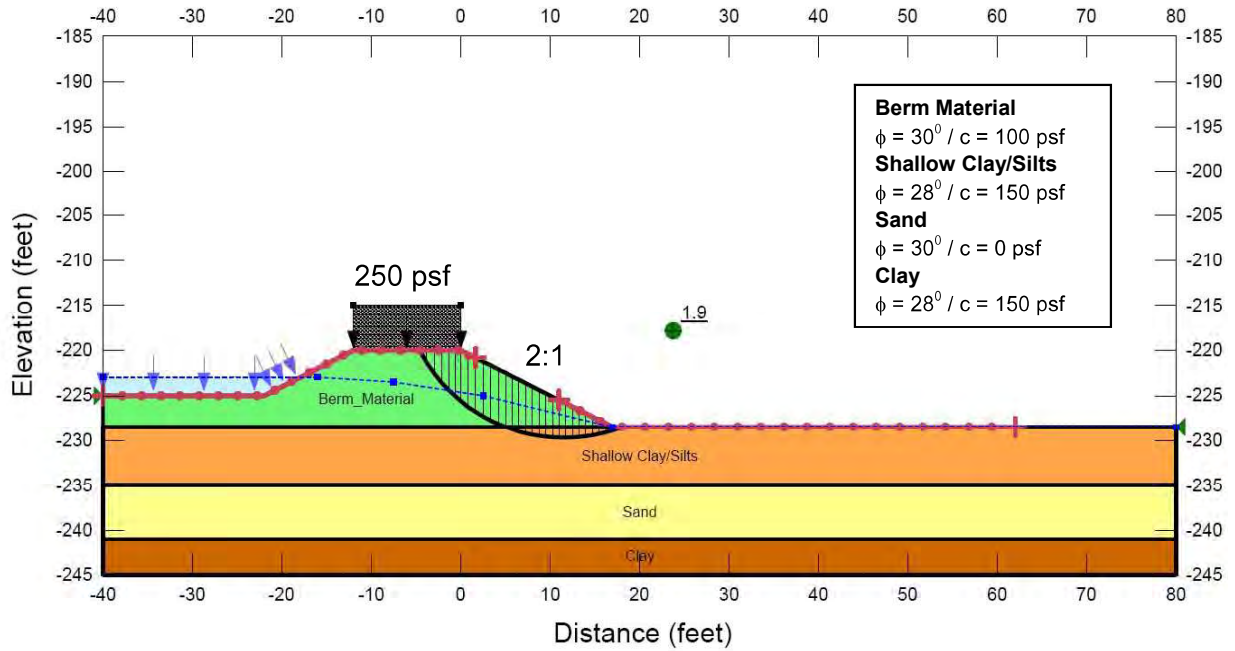
LATERAL PILE LOAD - DISPLACEMENT CURVE
Fixed Pile Head / With Ground Improvement
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE 7-5

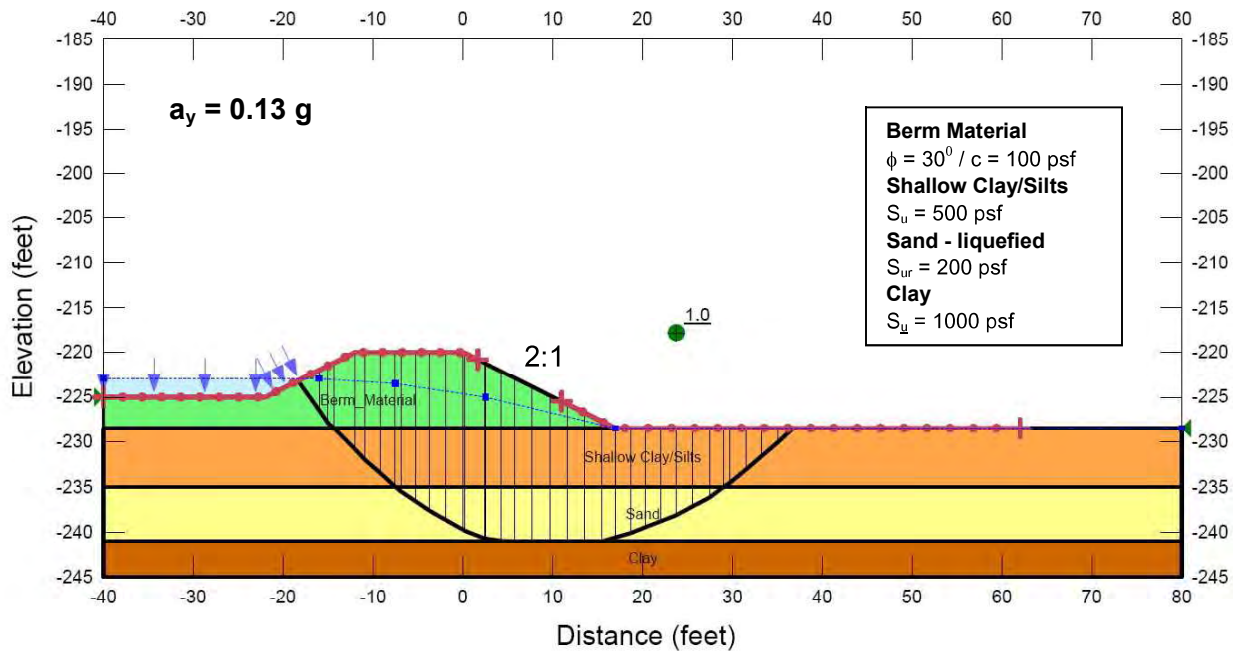


LATERAL PILE LOAD - DISPLACEMENT CURVE
Free Pile Head / With Ground Improvement
Black Rock Units 1, 2 & 3
Calipatria, California

a) Static Stability Evaluation



b) Pseudo-static Stability Evaluation



BERM STABILITY EVALUATIONS
 Black Rock Units 1, 2 & 3
 Calipatria, California

APPENDIX A
SUBSURFACE EXPLORATIONS



APPENDIX A - SUBSURFACE EXPLORATIONS

Introduction

The subsurface exploration program for the Black Rock Units 1, 2 and 3 project consisted of drilling 30 borings and advancing 21 Cone Penetration Tests (CPTs). The field exploration program was completed between October 7, 2008 and October 17, 2008. This appendix provides general information on the drilling and CPT equipment and soil sampling methods. Boring and CPT logs are also included in this appendix.

Exploration Locations and Elevations

The boring locations were selected prior to commencement of the field exploration program and located in the field by Fugro using a handheld GPS system. The horizontal datum for this project is California State Plane North American Datum 83 (NAD83), Zone 6, Feet.

Ground elevations at boring locations were estimated using the site topographic map provided by CalEnergy. The vertical datum reference for this project is North American Vertical Datum 88 (NAVD88).

Summary of Subsurface Exploration Program

A tabulation of the borings and CPTs completed during the field exploration program is presented in Table A-1. Table A-1 presents the coordinates, completion date, approximate ground surface elevation, and completion depth of the borings and CPTs for this phase of the project.

Drilling Methods and Equipment

Drilling services for the borings were provided by Gregg Drilling. Gregg Drilling's drilling equipment consisted of a truck-mounted Mobile B-53 D-1 drill rig and a support truck with a trailer-mounted water tank. Drilling operations were conducted under the technical guidance and observation of a Fugro geologist who also logged the soils in accordance with ASTM D2488 and packaged the recovered samples.

Both hollow-stem auger and rotary wash drilling methods were used during the field exploration program. Twenty-three (23) borings were drilled using 8-inch diameter hollow-stem augers. Seven (7) rotary wash borings were drilled using wet/rotary procedures that utilized a 4-inch diameter drag bit attached to a drill string of Mayhew Junior drill pipes. The rotary wash borings were advanced using non-toxic, bentonite-based drilling fluid to suspend and remove drill cuttings and to provide lateral support to the sides of the boreholes.

Following the completion of the drilling and sampling, all borings were backfilled with a soil-cement grout consisting of soil cuttings mixed with Portland cement. Bentonite chips were used to complete the backfilling in the top 3 to 5 feet. Excess drilling fluids, soil cuttings and grout mix were placed in a dumpster that was put on site by CalEnergy for our use. At the

completion of the exploration activities, CalEnergy removed the dumpster for disposal of the drilling wastes in accordance with their facility permit requirements.

Geotechnical Samples and Sampling Equipment.

Samples were generally taken at 5-foot intervals for the full boring depth. The nominal 5-foot spacing was occasionally adjusted to sample site-specific intervals. The sampling methods included driven sampling techniques using standard penetration test (SPT) and Modified California samplers (with rings). These samplers were driven using an out-of-hole, 140-pound automatic trip hammer falling 30 inches. When soft soil was encountered, selected samples were collected using the push method in place of the driven method.

Further details regarding the sampling and drilling procedures and the subsurface conditions are presented in Figure A1-1 – Key to Terms and Symbols used on logs and in Figures A1-2 through A1-31, Logs of Borings.

Descriptions of the procedures used for each sampling method are described in the following table:

Type of Sampling	Sampler Description	Description of Sampling Method
SPT Samples	2-inch-OD, 1-3/8-inch-ID	The SPT sampler was attached to an exploratory rod drill pipe that was lowered to the sample depth. The sampler was driven with a 140-pound automatic trip hammer attached to the top of the drill rod. The test was performed in general conformance with standard test method ASTM D1586. The number of blows required to drive the samplers the last 12 inches of the 18-inch penetration are shown on the boring logs.
Modified California Samples (California Liner Samples)	3-inch-OD, 2-3/8-inch-ID	The Modified California or California Liner test sampler was attached to an exploratory rod drill pipe that was lowered to the sample depth. The sampler was driven with a 140-pound automatic trip hammer attached to the top of the drill rod. The number of blows required to drive the samplers the last 12 inches of the 18-inch penetration are shown on the boring logs.
Push Samples	3-inch-OD, 2.83-inch-ID	Push samples were obtained by pushing a thin walled tube into the soil with the weight of the drill string. After the boring is drilled to the desired depth, the drill bit is raised from the borehole bottom and the sampler is lowered through the drill string until it rests on a catch ring above the drill bit. The sampler is then pushed about 24 to 30 inches into the formation by lowering the drill string. The sampler is retrieved by pulling it from the formation with the drill string and raising it with an overshot retrieving device attached to a wire line. The boring is then advanced to the next sampling interval.

Cone Penetrometer Testing Equipment.

CPT services were provided by Kehoe Testing & Engineering (Kehoe). Kehoe's CPT equipment is mounted on a 30-ton truck and consists of a steel rod with a 15-square-centimeter cone at the tip. The cone is equipped with electronic load cells that measure the point resistance on the tip and frictional resistance on a 225-square-centimeter sleeve (located behind the cone tip) and a transducer that measures pore pressures as the cone is hydraulically pushed through subsurface earth materials. The cone is pushed at a velocity of about 0.8 inches per second. Point resistance, frictional resistance, and pore pressure are recorded every second (i.e., about every 0.8 inches of penetration).

CPT soundings were terminated at depths of about 25, 50 or 75 feet, depending on location at the site. Abandonment of CPT soundings was performed by grouting each CPT sounding hole.

Figure A2-1 provides a key for the interpretation of soil classification based on the CPT tip resistance and friction ratio. Logs of the CPT soundings, which graphically present the CPT sleeve friction (f), CPT tip resistance (q_c), the ratio of sleeve friction to tip resistance (friction ratio or f/q_c), and pore pressure (u) at depth are provided on Figures A2-2 through A2-22 in this appendix.

During CPTs C-102, C-106, and C-118 shear wave measurements were obtained at approximately 5-foot intervals. The shear wave was generated using an air-actuated hammer, which is located inside the front jack of the CPT rig. The cone has a triaxial geophone, which recorded the shear wave signal generated by the air hammer. The cone was stopped to record the arrival of the shear waves from the excitation source at the surface. Interpreted shear wave velocity data are shown on Table A-2.



Table A-1. Subsurface Explorations Summary

Boring / CPT	Estimated Ground Surface Elevation (feet, NAVD88)	Completion Depth (ft)	Start Date	Completion Date	Coordinates (feet) California State Zone 6, NAD 83	
					Northing	Easting
Rotary Wash Borings						
RW-01	-227.5	76.5	10/7/2008	10/8/2008	2004839	6752288
RW-02	-228.0	51.5	10/10/2008	10/10/2008	2004568	6751983
RW-03	-226.0	76.5	10/14/2008	10/14/2008	2004120	6751781
RW-04	-225.9	86.5	10/14/2008	10/14/2008	2004092	6751986
RW-05	-225.6	76.5	10/13/2008	10/13/2008	2004222	6752411
RW-06	-225.0	76.5	10/10/2008	10/10/2008	2004172	6752610
RW-07	-227.0	76.5	10/8/2008	10/8/2008	2004790	6752499
Hollow Stem Auger Borings						
HSA-08	-223.0	6.5	10/17/2008	10/17/2008	2005823	6755553
HSA-09	-227.5	26.5	10/15/2008	10/15/2008	2004753	6751236
HSA-10	-227.0	6.5	10/15/2008	10/15/2008	2004617	6751677
HSA-11	-227.0	11.5	10/15/2008	10/15/2008	2004291	6751165
HSA-12	-223.0	6.5	10/17/2008	10/17/2008	2004491	6752434
HSA-13	-219.0	6.5	10/17/2008	10/17/2008	2005204	6753571
HSA-14	-226.0	16.5	10/16/2008	10/16/2008	2004317	6751970
HSA-15	-226.2	11.5	10/15/2008	10/15/2008	2003996	6751182
HSA-16	-222.0	16.5	10/16/2008	10/16/2008	2004195	6750966
HSA-17	-226.0	6.5	10/16/2008	10/16/2008	2003936	6751586
HSA-18	-225.8	6.5	10/16/2008	10/16/2008	2003894	6752364
HSA-19	-221.0	16.5	10/18/2008	10/18/2008	2003583	6750967
HSA-20	-224.6	26.5	10/16/2008	10/16/2008	2003443	6752397
HSA-21	-225.8	6.5	10/16/2008	10/16/2008	2003288	6751504
HSA-22	-225.5	11.5	10/16/2008	10/16/2008	2003352	6751853
HSA-23	-225.8	6.5	10/16/2008	10/16/2008	2003270	6752135
HSA-01	-228.5	6.5	10/15/2008	10/15/2008	2005752	6752870
HSA-02	-228.3	6.5	10/15/2008	10/15/2008	2005656	6752525
HSA-03	-228.9	26.5	10/15/2008	10/15/2008	2005555	6752124
HSA-04	-228.8	6.5	10/15/2008	10/15/2008	2005469	6751158
HSA-05	-224.0	6.5	10/17/2008	10/17/2008	2005837	6754161
HSA-06	-228.1	6.5	10/15/2008	10/15/2008	2005027	6752048
HSA-07	-228.0	6.5	10/15/2008	10/15/2008	2004934	6751075



Table A-1. Subsurface Explorations Summary - cont.

Boring / CPT	Estimate Ground Surface Elevation (feet, NAVD88)	Completion Depth (ft)	Start Date	Completion Date	Coordinates (feet) California State Zone 6, NAD 83	
					Northing	Easting
Cone Penetration Tests (CPTs)						
C-101	-221.0	25.41	10/8/2008	10/8/2008	2005421	6750956
C-102	-228.9	50.19	10/8/2008	10/8/2008	2005697	6752117
C-103	-221.0	25.37	10/8/2008	10/8/2008	2004791	6750954
C-104	-227.9	75.24	10/7/2008	10/7/2008	2004966	6752229
C-105	-227.2	75.31	10/7/2008	10/7/2008	2004829	6752401
C-106	-227.3	50.15	10/7/2008	10/7/2008	2004673	6751827
C-107	-227.5	75.25	10/7/2008	10/7/2008	2004748	6752273
C-108	-226.6	75.36	10/7/2008	10/7/2008	2004655	6752567
C-109	-226.2	75.41	10/8/2008	10/8/2008	2004265	6751740
C-110	-225.6	75.37	10/9/2008	10/9/2008	2004312	6752361
C-111	-226.2	75.34	10/8/2008	10/8/2008	2004119	6751643
C-112	-225.7	75.37	10/8/2008	10/8/2008	2003996	6751779
C-113	-225.8	75.29	10/8/2008	10/8/2008	2004171	6751918
C-114	-225.7	75.28	10/8/2008	10/8/2008	2003947	6752088
C-115	-225.8	75.48	10/9/2008	10/9/2008	2004188	6752273
C-116	-225.2	75.43	10/8/2008	10/8/2008	2004134	6752408
C-117	-225.4	75.31	10/9/2008	10/9/2008	2004215	6752530
C-118	-224.9	75.8	10/9/2008	10/9/2008	2004045	6752706
C-119	-221.0	25.26	10/8/2008	10/8/2008	2003867	6750965
C-120	-224.9	50.33	10/8/2008	10/8/2008	2003460	6752247
C-121	-225.9	50.38	10/8/2008	10/8/2008	2004311	6752168

Table A-2. Seismic CPT Shear Wave Measurements

CPT-102

Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
10.12	11.29	29.38	384.20	
21.20	21.78	48.93	445.16	536.77
30.06	30.47	65.52	465.09	523.89
40.17	40.48	83.19	486.60	566.33
50.19	50.44	100.09	503.93	589.26

CPT-106

Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
11.93	12.94	32.26	400.97	
20.25	20.86	47.82	436.18	509.17
30.14	30.55	63.30	482.65	626.21
40.16	40.47	80.87	500.43	564.49
50.19	50.44	94.98	531.04	706.48

CPT-118

Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
10.15	11.31	30.01	377.03	
20.35	20.96	48.90	428.53	510.35
30.37	30.78	71.09	432.96	442.70
40.33	40.64	87.07	466.74	617.02
50.26	50.51	100.15	504.32	754.54
60.25	60.46	117.15	516.07	585.24
70.34	70.52	134.34	524.92	585.25

Shear Wave Source Offset = 5 ft

S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

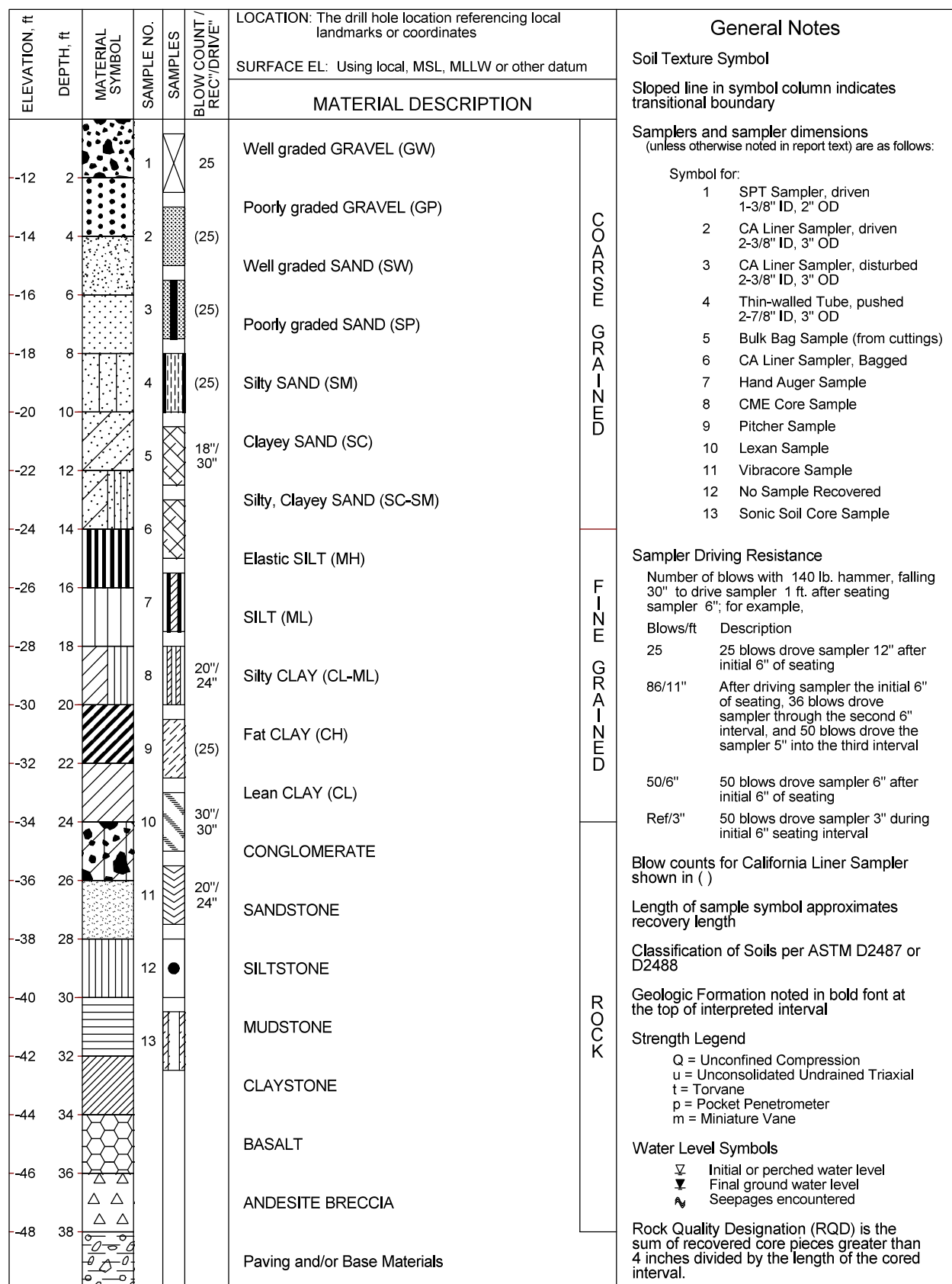


FIGURE A1-1



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,839 E 6,752,288 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -227.5 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-228	2					Lean CLAY (CL): - moderate yellowish brown and dry at 0.0'							
-230	4												
-232	6		1		(13)	- medium stiff, moderate brown, and wet, with a trace of sand and some rootlets at 5.0'	123	95	30				
-234	8												
-236	10		2		24	Silty Fine SAND (SM): medium dense, moderate yellowish brown, wet, with a trace of clay							
-238	12												
-240	14												
-242	16		3		(26)	Lean CLAY (CL): very stiff, moderate brown, wet, with a trace of sand	122	95	29				
-244	18												
-246	20		4		12	Silty Fine SAND (SM): moderate yellowish brown, wet - medium dense, with a trace of clay at 20.0'							
-248	22												
-250	24												
-252	26		5		(58)	- dense at 25.0'	125	103	22				
-254	28												
-256	30		6		13	Lean CLAY (CL): stiff, dark yellowish brown, wet					32	13	
-258	32												
-260	34												
-262	36		7		(78)	Silty Fine SAND (SM): dense, wet - dark yellowish brown at 35.0'	126	103	22				
-264	38												
-266													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 8, 2008

LOG OF BORING NO. RW-01

Black Rock Units 1, 2 & 3

Calipatria, California

FIGURE A1-2a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,839 E 6,752,288 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -227.5 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
-268			8		53	- very dense and light reddish brown at 40.0'				21			
-270	42												
-272	44												
-274	46		9		(49)	- with a trace of clay, 35.0' to 45.0'							
-276	48					- dense and light reddish brown to dark yellowish brown at 45.0'	127	103	23				
-278	50		10		23	Fat CLAY (CH): very stiff, light brown, wet					67	41	
-280	52												
-282	54												
-284	56		NR		19								
-286	58		11		(40)	Silty Fine SAND (SM): medium dense, light reddish brown, wet	127	103	23				
-288	60					- with a trace of clay at 56.5'							
-290	62		12		25	- interlayered with Lean CLAY (CL) below 60.0'							
-292	64												
-294	66		NR		22								
-296	68												
-298	70		13		16	Lean CLAY (CL): light reddish brown, wet, with a trace of sand							
-300	72					- very stiff at 70.0'							
-302	74												
-304	76		14		4	- soft at 75.0'							
-306	78												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 8, 2008

LOG OF BORING NO. RW-01 Black Rock Units 1, 2 & 3 Calipatria, California

FIGURE A1-2b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,568 E 6,751,983 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -228 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
MATERIAL DESCRIPTION													
-230	2		1		(10)	Lean CLAY (CL): - moderate yellowish brown and dry at 0.0'							
-232	4												
-234	6					- medium stiff, light reddish brown, and wet, with a trace of sand at 5.0'	123	97	27		27	8	
-236	8												
-238	10		2		13	Silty Fine SAND (SM): medium dense, light reddish brown, wet							
-240	12												
-242	14												
-244	16												
-246	18		3		(11)	Lean CLAY (CL): medium stiff, light reddish brown, wet	121	94	30		28	9	
-248	20												
-250	22												
-252	24												
-254	26		4		10	Silty Fine SAND (SM): loose, dark yellowish brown to light reddish brown, wet							
-256	28												
-258	30												
-260	32												
-262	34		5		(10)	SILT with sand (ML): firm, light reddish brown, wet, with some clay	122	94	29	76			
-264	36												
-266	38												
			6		6	Fat CLAY (CH): medium stiff, dark yellowish brown, wet					61	38	
			7		(20)	Silty Fine SAND (SM): wet - medium dense and light reddish brown at 35.0'	127	102	24				

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 51.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 10, 2008

LOG OF BORING NO. RW-02

Black Rock Units 1, 2 & 3

Calipatria, California

FIGURE A1-3a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,568 E 6,751,983 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -228 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
			8		38	- dense and dark yellowish brown to light reddish brown at 40.0'				21			
-270	42												
-272	44												
-274	46		9		(94)	- very dense and dark yellowish brown at 45.0'	125	102	23				
-276	48												
-278	50		10		10	Fat CLAY (CH): stiff, dark yellowish brown, wet							
-280	52												
-282	54												
-284	56												
-286	58												
-288	60												
-290	62												
-292	64												
-294	66												
-296	68												
-298	70												
-300	72												
-302	74												
-304	76												
-306	78												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 51.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 10, 2008

LOG OF BORING NO. RW-02 Black Rock Units 1, 2 & 3 Calipatria, California

FIGURE A1-3b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,120 E 6,751,781 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -226 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
MATERIAL DESCRIPTION													
-228	2		1		(2)	Lean CLAY (CL): - pale yellowish brown and dry at 0.0'							
-230	4												
-232	6					- very soft, moderate yellowish brown, and wet at 5.0'	121	93	30				
-234	8												
-236	10		2		6	Silty Fine SAND (SM): loose, moderate to dark yellowish brown, wet, with a trace of clay				41			
-238	12												
-240	14												
-242	16												
-242	16		3		(13)	Lean CLAY (CL): medium stiff, dark yellowish brown, wet	119	90	33				
-244	18												
-246	20												
-248	22												
-248	22		4		2	SILT (ML): soft, moderate yellowish brown, with some sand							
-250	24												
-252	26												
-254	28												
-252	26		5		(15)	Silty Fine SAND (SM): loose, moderate yellowish brown, wet	126	103	23				
-254	28												
-256	30												
-258	32												
-256	30		6		8	Lean CLAY (CL): wet - medium stiff and moderate to dark yellowish brown at 30.0' - with some sand at 31.0'							
-258	32												
-260	34												
-262	36												
-262	36		7		(27)	- very stiff and dark yellowish brown at 35.0' - with some sand at 36.0'	127	104	23		28	7	
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 14, 2008

LOG OF BORING NO. RW-03

Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-4a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,120 E 6,751,781 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -226 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
			8		9	Silty Fine SAND (SM): wet - loose and moderate yellowish brown at 40.0'							
-268	42												
-270	44												
-272	46		9		(32)	- medium dense and moderate to dark yellowish brown at 45.0'							
-274	48					Lean CLAY (CL): wet - very stiff and dark brown at 46.3'	121	94	29				
-276	50		10			- moderate yellowish brown at 50.0'							
-278	52						121	92	32				
-280	54												
-282	56		11		(11)	- medium stiff and dark yellowish brown at 55.0'							
-284	58						108	73	48				
-286	60		12		9	SILT with sand (ML): stiff, dark yellowish brown, wet							
-288	62												
-290	64												
-292	66		13		8	Lean CLAY (CL): wet - medium stiff and moderate to dark yellowish brown to 75.0'							
-294	68												
-296	70		14		5								
-298	72												
-300	74												
-302	76		15		1	- very soft and dark yellowish brown to dark grayish brown at 75.0'							
-304	78												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 14, 2008

LOG OF BORING NO. RW-03

Black Rock Units 1, 2 & 3

Calipatria, California

FIGURE A1-4b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,092 E 6,751,986 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.9 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-228	2					Lean CLAY (CL): pale yellowish brown, dry							
-230	4												
-232	6		1		2	SILT with sand (ML): soft, light reddish brown, wet, fine-grained sand				84			
-234	8												
-236	10		2		(15)	Silty Fine SAND (SM): loose, light reddish brown, wet	126	103	23				
-238	12												
-240	14												
-242	16		3		7	Lean CLAY (CL): medium stiff, dark yellowish brown, wet, with a trace of sand							
-244	18												
-246	20		4		(9)	Silty Fine SAND (SM): loose, light reddish brown, wet	121	96	26				
-248	22												
-250	24												
-252	26		5		9								
-254	28												
-256	30		6		(18)	Lean CLAY (CL): stiff, dark yellowish brown, wet	115	84	37				
-258	32												
-260	34												
-262	36		7		22	Silty Fine SAND (SM): dark yellowish brown, wet - medium dense at 35.0'							
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 86.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 14, 2008

LOG OF BORING NO. RW-04 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-5a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,092 E 6,751,986 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.9 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
			8		(51)	- dense at 40.0'	122	104	17				
-268	42												
-270	44												
-272	46		9		8	Lean CLAY (CL): medium stiff, dark yellowish brown, wet, with a trace of sand							
-274	48												
-276	50		10			Fat CLAY (CH): dark yellowish brown, wet	115	78	48		73	50	
-278	52												
-280	54												
-282	56		11		6	- medium stiff at 55.0'							
-284	58												
-286	60		12		14	SILT (ML): stiff, light reddish brown, wet, with a trace of sand - with a 2" silty clay seam at 61.5'							
-288	62												
-290	64												
-292	66		13		(12)	Fat CLAY (CH): stiff, moderate to dark yellowish brown, wet							
-294	68												
-296	70		14			Lean CLAY (CL): wet - moderate yellowish brown at 70.0'	128	103	24				
-298	72												
-300	74												
-302	76		15		1	- very soft and dark yellowish brown below 75.0'					31	16	
-304	78												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 86.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 14, 2008

LOG OF BORING NO. RW-04 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-5b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,092 E 6,751,986 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.9 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
			16		1								
-308	82												
-310	84												
-312	86		17		16	Fat CLAY (CH): very stiff, dark yellowish brown, wet					71	45	
-314	88												
-316	90												
-318	92												
-320	94												
-322	96												
-324	98												
-326	100												
-328	102												
-330	104												
-332	106												
-334	108												
-336	110												
-338	112												
-340	114												
-342	116												
-344	118												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 86.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 14, 2008

LOG OF BORING NO. RW-04 Black Rock Units 1, 2 & 3 Calipatria, California

FIGURE A1-5c



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,222 E 6,752,411 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.6 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-226						Lean CLAY (CL): - pale yellowish brown and dry at 0.0'							
-228	2												
-230	4												
-232	6		1		(5)	- soft, dark yellowish brown, and wet at 5.0'	111	87	28				
-234	8												
-236	10		2		5	Silty Fine SAND (SM): moderate yellowish brown, wet - very loose at 10.0'							
-238	12												
-240	14												
-242	16		3			- with a trace of clay at 15.0'	125	98	27				
-244	18												
-246	20		4		12	- medium dense at 20.0'				48			
-248	22												
-250	24												
-252	26		5		6	- loose, with a trace of clay at 25.0'							
-254	28												
-256	30		6			Lean CLAY (CL): moderate yellowish brown, wet	119	88	35				
-258	32												
-260	34												
-262	36		7		(18)	SILT (ML): stiff, moderate yellowish brown, wet	117	92	27	93			
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 13, 2008

LOG OF BORING NO. RW-05 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-6a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,222 E 6,752,411 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u , ksf
						SURFACE EL: -225.6 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
-266	42		8		25	Silty Fine SAND (SM): medium dense, wet - moderate to dark yellowish brown with some iron-oxide staining at 40.0'							
-268													
-270	44												
-272	46		9		(45)	- dark yellowish brown at 45.0'	123	101	22				
-274	48												
-276	50		10		13	Fat CLAY (CH): stiff, dark yellowish brown, wet					64	39	
-278	52												
-280	54												
-282	56		11		(28)	Silty Fine SAND (SM): wet - medium dense and dark yellowish brown at 55.0'	117	93	25				
-284	58												
-286	60		12		32	- with a 2" clay seam at 60.0' - dense and moderate yellowish brown at 60.0'							
-288	62												
-290	64												
-292	66		13		15	Fat CLAY (CH): stiff, moderate to dark yellowish brown, wet							
-294	68												
-296	70		14		1	Lean CLAY (CL): very soft, wet - dark yellowish brown at 70.0'							
-298	72												
-300	74												
-302	76		15		1	- moderate to dark yellowish brown at 75.0'							
-304	78												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 13, 2008

LOG OF BORING NO. RW-05

Black Rock Units 1, 2 & 3

Calipatria, California

FIGURE A1-6b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,172 E 6,752,610 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -225 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
-226	2					Lean CLAY (CL): moderate yellowish brown, dry							
-228	4												
-230	6		1		5	SILT (ML): medium stiff, light reddish brown, wet, with a trace of sand							
-232	8												
-234	10		2		(14)	Sandy SILT (ML): stiff, light reddish brown, wet	118	94	25	58			
-236	12												
-238	14												
-240	16		3			Fat CLAY (CH): light reddish brown, wet	123	94	30		71	50	
-242	18												
-244	20		4		9	Sandy SILT (ML): wet - stiff and dark yellowish brown to light reddish brown, with some clay at 20.0'				55			
-246	22												
-248	24												
-250	26		NS		(7)	- light reddish brown at 25.0'							
-252	28												
-254	30		5		10	Lean CLAY (CL): stiff, dark yellowish brown, wet							
-256	32												
-258	34												
-260	36		6		8	Silty Fine SAND (SM): dark yellowish brown, wet - loose, with a trace of clay at 35.0'							
-262	38												
-264													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 10, 2008

LOG OF BORING NO. RW-06 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-7a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,172 E 6,752,610 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-266	42		7		26	- medium dense at 40.0'							
-268	44												
-270	46		8		33	- dense at 45.0'							
-272	48												
-274	50												
-276	52		9		6	Fat CLAY (CH): medium stiff, moderate yellowish brown to dark yellowish brown, wet							
-278	54												
-280	56												
-282	58		10		5	Lean CLAY (CL): medium stiff, dark yellowish brown, wet, with some iron oxide staining and dark gray banding							
-284	60												
-286	62		11		16	Silty Fine SAND (SM): medium dense, dark yellowish brown, wet - with a 2" silty clay seam at 61.5'							
-288	64												
-290	66		12		13	Fat CLAY (CH): stiff, dark yellowish brown, wet					75	50	
-292	68												
-294	70												
-296	72		13		1	Lean CLAY (CL): dark yellowish brown, wet - very soft, with some iron oxide staining at 70.0'							
-298	74												
-300	76		14		5	- medium stiff, with a trace of sand and rock fragments at 75.0'							
-302	78												
-304													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 10, 2008

LOG OF BORING NO. RW-06 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-7b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,790 E 6,752,499 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -227 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-228	2					Lean CLAY (CL): moderate yellowish brown, dry							
-230	4												
-232	6		1		5	SILT (ML): medium stiff, dark yellowish brown, wet				89			
-234	8												
-236	10		2		(20)	Silty Fine SAND (SM): medium dense, dark yellowish brown, wet	121	98	24				
-238	12												
-240	14												
-242	16		3		9	Lean CLAY (CL): stiff, light reddish brown, wet					50	30	
-244	18												
-246	20		4		(19)	Silty Fine SAND (SM): medium dense, light reddish brown, wet	123	99	24				
-248	22												
-250	24												
-252	26		5		35								
-254	28												
-256	30		6		(21)	Lean CLAY (CL): stiff, dark yellowish brown to light reddish brown, wet, 1" clayey silt seam at 31.5'	118	88	34				
-258	32												
-260	34												
-262	36		7		22	Silty Fine SAND (SM): medium dense, light reddish brown, wet							
-264	38												
-266													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 8, 2008

LOG OF BORING NO. RW-07 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-8a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,790 E 6,752,499 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -227 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-268	42		NR	●	35								
-270	44		8	⊗	(35)		133	110	21				
-272	46		9	⊗	26					14			
-274	48												
-276	50		10	⊗	(11)	Fat CLAY (CH): medium stiff, light reddish brown, wet, with a trace of silt	116	85	38		72	48	
-278	52												
-280	54												
-282	56		11	⊗	22	Silty Fine SAND (SM): medium dense, light reddish brown, wet				46			
-284	58												
-286	60		NR	●	83								
-288	62												
-290	64												
-292	66		12	⊗	16	Lean CLAY (CL): wet - dark yellowish brown to 75.0' - very stiff at 65.0'							
-294	68												
-296	70		13	⊗	8	- medium stiff below 70.0'							
-298	72												
-300	74												
-302	76		14	⊗	7	- dark yellowish brown to light reddish brown at 75.0'							
-304	78												
-306													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 76.5 ft

DRILLING METHOD: 4-inch-dia. Mud Rotary Wash
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 8, 2008

LOG OF BORING NO. RW-07 Black Rock Units 1, 2 & 3 Calipatria, California

FIGURE A1-8b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,752 E 6,752,870 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -228.5 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
MATERIAL DESCRIPTION													
-230	2		1		(4)	Lean CLAY (CL): - pale yellowish brown and dry at 0.0' - soft, light brown, and slightly moist to moist at 2.0'	123	96	28				
-232	4												
-234	6		2		2	Silty Fine SAND (SM): very loose, moderate yellowish brown, very moist							
-236	8												
-238	10												
-240	12												
-242	14												
-244	16												
-246	18												
-248	20												
-250	22												
-252	24												
-254	26												
-256	28												
-258	30												
-260	32												
-262	34												
-264	36												
-266	38												
-268													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-01
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-9



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,656 E 6,752,525 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -228.3 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
MATERIAL DESCRIPTION													
-230	2		1		(3)	Lean CLAY (CL): - pale yellowish brown and dry at 0.0' - very soft, moderate yellowish brown, and very moist to wet at 2.0'	116	91	28				
-232	4												
-234	6		2		(2)	SILT (ML): very soft, moderate yellowish brown, very moist to wet, with a trace of sand	119	94	27				
-236	8												
-238	10												
-240	12												
-242	14												
-244	16												
-246	18												
-248	20												
-250	22												
-252	24												
-254	26												
-256	28												
-258	30												
-260	32												
-262	34												
-264	36												
-266	38												
-268													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-02
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-10



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,555 E 6,752,124 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -228.9 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
			B			BULK				96	38	25	
-230	2		1		(6)	Lean CLAY (CL): pale yellowish brown, dry							
-232	4					SILT (ML): moderate to dark yellowish brown, very moist to wet - soft at 2.0'	117	92	28				
-234	6		2		(3)	- very soft at 5.0'	122	98	24				
-236													
-238													
-240	10		3		5	Silty Fine SAND (SM): loose, moderate yellowish brown, wet							
-242	12												
-244	14												
-246	16		4		8	Lean CLAY (CL): medium stiff, dark yellowish brown, wet							
-248	18												
-250	20		5		4	Silty Fine SAND (SM): very loose, dark yellowish brown, wet							
-252	22												
-254	24												
-256	26		6		7	Silty Fine SAND (SM) to Sandy SILT (ML): loose, dark yellowish brown, wet							
-258	28												
-260	30												
-262	32												
-264	34												
-266	36												
-268	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 26.5 ft
DEPTH TO WATER: 5.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-03 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-11



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,469 E 6,751,158 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -228.8 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-230	2		B		BULK	Lean CLAY (CL): - pale yellowish brown and dry at 0.0'				98	33	17	
-232	4		1		(2)	- soft, moderate yellowish brown, and moist at 2.0'	117	89	31				
-234	6		2		(4)	Silty Fine SAND (SM) to Sandy SILT (ML): very loose, moderate yellowish brown, very moist to wet	126	101	25				
-236	8												
-238	10												
-240	12												
-242	14												
-244	16												
-246	18												
-248	20												
-250	22												
-252	24												
-254	26												
-256	28												
-258	30												
-260	32												
-262	34												
-264	36												
-266	38												
-268													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-04
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-12



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,837 E 6,754,161 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -224 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
			B		BULK	Lean CLAY with sand (CL): pale yellowish brown, dry - with a 6" silty sand layer at 0.0' (dirt road)				75			
-226	2		1		(8)	SILT (ML): medium stiff, moderate yellowish brown, very moist to wet	118	94	26				
-228	4												
-230	6		2		(5)	Silty Fine SAND (SM): very loose, moderate yellowish brown, very moist to wet	120	97	23				
-232	8												
-234	10												
-236	12												
-238	14												
-240	16												
-242	18												
-244	20												
-246	22												
-248	24												
-250	26												
-252	28												
-254	30												
-256	32												
-258	34												
-260	36												
-262	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 17, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-05
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-13



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,027 E 6,752,048 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -228.1 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
						Lean CLAY (CL): pale yellowish brown, dry							
-230	2		1		(8)	Silty Fine SAND (SM) to Sandy SILT (ML): loose, moderate yellowish brown, moist to very moist	115	92	26				
-232	4												
-234	6		2		(2)	Lean CLAY (CL): very soft, moderate yellowish brown, moist to very moist	115	88	31				
-236	8												
-238	10												
-240	12												
-242	14												
-244	16												
-246	18												
-248	20												
-250	22												
-252	24												
-254	26												
-256	28												
-258	30												
-260	32												
-262	34												
-264	36												
-266	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-06
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-14

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft	DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
DEPTH TO WATER: Not Encountered	HAMMER TYPE: Automatic Trip
BACKFILLED WITH: Grout with Bentonite Chips	DRILLED BY: Gregg Drilling
DRILLING DATE: October 15, 2008	LOGGED BY: S Varnell
	CHECKED BY: J Everett

FIGURE A1-15



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,823 E 6,755,553 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -223 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-224	2		B		BULK	Lean CLAY (CL): pale yellowish brown, dry - with a 6" silty sand layer at 0.0' (dirt road)				98			
-226	4		1		(2)	Sandy SILT (ML): very soft, moderate yellowish brown, moist	107	83	29				
-228	6		2		(7)	Silty Fine SAND (SM): loose, moderate yellowish brown, very moist to wet	115	92	25				
-230	8												
-232	10												
-234	12												
-236	14												
-238	16												
-240	18												
-242	20												
-244	22												
-246	24												
-248	26												
-250	28												
-252	30												
-254	32												
-256	34												
-258	36												
-260	38												
-262													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 17, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-08
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-16



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,753 E 6,751,236 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u , ksf
						SURFACE EL: -227.5 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
-228			B		BULK	Lean CLAY (CL): pale yellowish brown, dry							
-230	2		1		(6)	Silty Fine SAND (SM): very loose, moderate yellowish brown, very moist to wet	108	83	30				
-232	4		2		(6)	SILT (ML): soft, moderate yellowish brown, very moist to wet	115	91	26				
-234	6												
-236	8												
-238	10		3		10	Silty Fine SAND (SM): loose, moderate yellowish brown, wet							
-240	12												
-242	14												
-244	16		4		1	Lean CLAY (CL): very soft, moderate yellowish brown, wet, with a trace of sand							
-246	18												
-248	20		5		1	Silty Fine SAND (SM): moderate yellowish brown, wet - very loose at 20.0'							
-250	22												
-252	24												
-254	26		6		11	- medium dense at 25.0'							
-256	28												
-258	30												
-260	32												
-262	34												
-264	36												
-266	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 26.5 ft
DEPTH TO WATER: 5.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-09 Black Rock Units 1, 2 & 3 Calipatria, California

FIGURE A1-17



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,617 E 6,751,677 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -227 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-228	2		B		BULK	Fat CLAY (CH): pale yellowish brown, dry					52	33	
-230	4		1		(7)	Lean CLAY (CL): moderate yellowish brown, very moist to wet - medium stiff at 2.0'	114	90	27				
-232	6		2		(2)	- very soft at 5.0'	115	89	29				
-234													
-236													
-238													
-240													
-242													
-244													
-246													
-248													
-250													
-252													
-254													
-256													
-258													
-260													
-262													
-264													
-266													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-10
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-18



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,291 E 6,751,165 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -227 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-228	2		B		BULK	Lean CLAY (CL): - pale yellowish brown and dry at 0.0'					36	17	
-230	4		1		(2)	- very soft, moderate yellowish brown, and very moist at 2.0'	116	87	34				
-232	6		2		(7)	Silty Fine SAND (SM) to Sandy SILT (ML): loose, moderate yellowish brown, very moist to wet	121	98	24				
-234	8												
-236	10		3		5	Silty Fine SAND (SM): loose, moderate yellowish brown, wet							
-238	12												
-240	14												
-242	16												
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												
-266													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 11.5 ft
DEPTH TO WATER: 8.5 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-11
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-19



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,491 E 6,752,434 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -223 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-224	2		B		BULK	Lean CLAY (CL): - with a 6" silty sand layer at 0.0' (dirt road) - pale yellowish brown and dry at 0.5' - medium stiff, moderate yellowish brown, and moist at 2.0'				100			
-226	4		1		(12)		119	94	27				
-228	6		2		(3)	SILT (ML): very soft, moderate yellowish brown, very moist to wet	115	89	29				
-230	8												
-232	10												
-234	12												
-236	14												
-238	16												
-240	18												
-242	20												
-244	22												
-246	24												
-248	26												
-250	28												
-252	30												
-254	32												
-256	34												
-258	36												
-260	38												
-262													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 17, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-12
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-20



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,005,204 E 6,753,571 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -219 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-220	2		B		BULK	Lean CLAY (CL): - with a 6" silty sand layer at 0.0' (dirt road) - pale yellowish brown and dry at 0.5' - medium stiff at 2.0' - moderate yellowish brown and moist below 2.0'				87			
-222	4		1		(8)		110	86	29				
-224	6		2		(4)	- soft at 5.0'	115	86	34				
-226	8												
-228	10												
-230	12												
-232	14												
-234	16												
-236	18												
-238	20												
-240	22												
-242	24												
-244	26												
-246	28												
-248	30												
-250	32												
-252	34												
-254	36												
-256	38												
-258													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 17, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-13
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-21



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,317 E 6,751,970 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -226 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u , ksf
						MATERIAL DESCRIPTION							
			B		BULK	Lean CLAY (CL): pale yellowish brown, dry, with some clay				91	27	8	
-228	2		1		(9)	Silty Fine SAND (SM) to Sandy SILT (ML): loose, moderate yellowish brown, very moist to wet	115	91	27				
-230	4												
-232	6		2		(8)		129	97	33				
-234	8												
-236	10		3		10	Silty Fine SAND (SM): loose, moderate yellowish brown, wet							
-238	12												
-240	14												
-242	16		4		3	Lean CLAY (CL): soft, moderate yellowish brown, wet							
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 16.5 ft
DEPTH TO WATER: 5.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-14
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-22



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,996 E 6,751,182 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -226.2 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
MATERIAL DESCRIPTION													
-228	2		1		(4)	Lean CLAY (CL): - pale yellowish brown and dry at 0.0' - soft, moderate yellowish brown, and very moist to wet at 2.0'	118	89	33				
-230	4												
-232	6		2		(2)	Silty Fine SAND (SM) to Sandy SILT (ML): very loose, moderate yellowish brown, very moist to wet	116	89	30				
-234	8												
-236	10		3		3	Silty Fine SAND (SM): very loose, moderate yellowish brown, wet							
-238	12												
-240	14												
-242	16												
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												
-266													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 11.5 ft
DEPTH TO WATER: 8.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 15, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-15
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-23



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,004,195 E 6,750,966 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -222 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
MATERIAL DESCRIPTION													
-224	2		B		BULK	Silty SAND (SM): (0.0' to 0.5': dirt road) - pale yellowish brown and dry to 2.0' - dense, moderate yellowish brown, wet, fine- to coarse-grained, with some gravel and gray sand below 2.0'							
-226	4		1		(65)				14				
-228	6		NS		(5)								
-230	8												
-232	10		2		2	Lean CLAY (CL): soft, moderate yellowish brown, very moist					31	11	
-234	12												
-236	14												
-238	16		3		9	SILT with sand (ML): stiff, moderate yellowish brown, wet, with a trace of clay				78			
-240	18												
-242	20												
-244	22												
-246	24												
-248	26												
-250	28												
-252	30												
-254	32												
-256	34												
-258	36												
-260	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 16.5 ft
DEPTH TO WATER: 11.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-16
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-24



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,936 E 6,751,586 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -226 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
						Lean CLAY (CL): pale yellowish brown, dry							
-228	2		1		(4)	Silty Fine SAND (SM) to Sandy SILT (ML): very loose, moderate yellowish brown, very moist to wet	118	91	29				
-230	4												
-232	6		2		(4)	SILT (ML): soft, moderate yellowish brown, very moist to wet, with a trace of sand	117	93	26				
-234	8												
-236	10												
-238	12												
-240	14												
-242	16												
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-17
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-25



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,894 E 6,752,364 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.8 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-226						Lean CLAY (CL): - pale yellowish brown and damp at 0.0'							
-228	2		1		(6)	- moist at 2.0'	117	91	29				
-230	4					- soft and moderate yellowish brown below 2.0'							
-232	6		2		(4)	- very moist to wet at 5.0'	119	95	26				
-234	8												
-236	10												
-238	12												
-240	14												
-242	16												
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-18
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-26



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,583 E 6,750,967 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -221 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-222	2		B		BULK	Silty SAND (SM): (0.0' to 0.5': dirt road) - pale yellowish brown and dry to 2.0'							
-224	4		1		(42)	- medium dense, moderate yellowish brown, moist, fine- to coarse-grained, with some gravel at 2.0'			13				
-226	6		2		(9)	Lean CLAY (CL): medium stiff, dark yellowish brown, moist			29				
-230	10		3			SILT (ML): moderate yellowish brown, moist							
-232	12						118	88	34		34	9	
-234	14												
-236	16		4		6	Silty Fine SAND (SM) to Sandy SILT (ML): loose, moderate yellowish brown, wet, with some clay							
-238	18												
-240	20												
-242	22												
-244	24												
-246	26												
-248	28												
-250	30												
-252	32												
-254	34												
-256	36												
-258	38												
-260													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 16.5 ft
DEPTH TO WATER: 15.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 18, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-19
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-27



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,443 E 6,752,397 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -224.6 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
			B		BULK	Lean CLAY (CL): - pale yellowish brown and dry at 0.0'				94			
	2		1		(5)	- very loose, moderate yellowish brown, and very moist to wet at 2.0'	115	90	28				
	4												
	6		2		(5)	Silty Fine SAND (SM) to Sandy SILT (ML): very loose, moderate yellowish brown, very moist to wet	116	92	26				
	8												
	10		3		21	Silty Fine SAND (SM): medium dense, moderate to dark yellowish brown, wet							
	12												
	14												
	16		4		5	Lean CLAY (CL): medium stiff, moderate yellowish brown, very moist to wet, with a trace of sand							
	18												
	20		5		5	Silty Fine SAND (SM): loose, moderate yellowish brown, wet							
	22												
	24												
	26		6		7								
	28												
	30												
	32												
	34												
	36												
	38												
	26.5												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 26.5 ft
DEPTH TO WATER: 7.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-20
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-28



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,288 E 6,751,504 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.8 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-226						Lean CLAY (CL): - pale yellowish brown and dry at 0.0'							
-228	2		1		(7)	- medium stiff, moderate yellowish brown, and very moist to wet at 2.0'	111	85	30				
-230	4												
-232	6		2		(12)		118	95	24				
-234	8												
-236	10												
-238	12												
-240	14												
-242	16												
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-21
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-29

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,352 E 6,751,853 California State Plane, Zone 6, NAD83, Feet	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						SURFACE EL: -225.5 ft +/- (rel. NAVD88 datum)							
						MATERIAL DESCRIPTION							
-226			B		BULK	Lean CLAY (CL):				99	45	30	
	2		1		(5)	- pale yellowish brown and dry at 0.0'							
-228						- moist at 2.0'	116	88	31				
-230						- soft and moderate yellowish brown below 2.0'							
-232			2		(4)	- very moist to wet at 5.0'	118	92	28				
-234													
-236			3		7	Silty Fine SAND (SM): loose, moderate yellowish brown, wet							
-238													
-240													
-242													
-244													
-246													
-248													
-250													
-252													
-254													
-256													
-258													
-260													
-262													
-264													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 11.5 ft
DEPTH TO WATER: 8.0 ft
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-22 **Black Rock Units 1, 2 & 3** **Calipatria, California**

FIGURE A1-30



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: N 2,003,270 E 6,752,135 California State Plane, Zone 6, NAD83, Feet SURFACE EL: -225.8 ft +/- (rel. NAVD88 datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S _u , ksf
						MATERIAL DESCRIPTION							
-226						Lean CLAY (CL): - pale yellowish brown and dry at 0.0'							
-228	2		1		(4)	- soft, moderate yellowish brown, and very moist to wet at 2.0'	114	88	29				
-230	4												
-232	6		2		(13)	Silty Fine SAND (SM) to Sandy SILT (ML): loose, moderate yellowish brown, very moist to wet	119	96	24				
-234	8												
-236	10												
-238	12												
-240	14												
-242	16												
-244	18												
-246	20												
-248	22												
-250	24												
-252	26												
-254	28												
-256	30												
-258	32												
-260	34												
-262	36												
-264	38												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

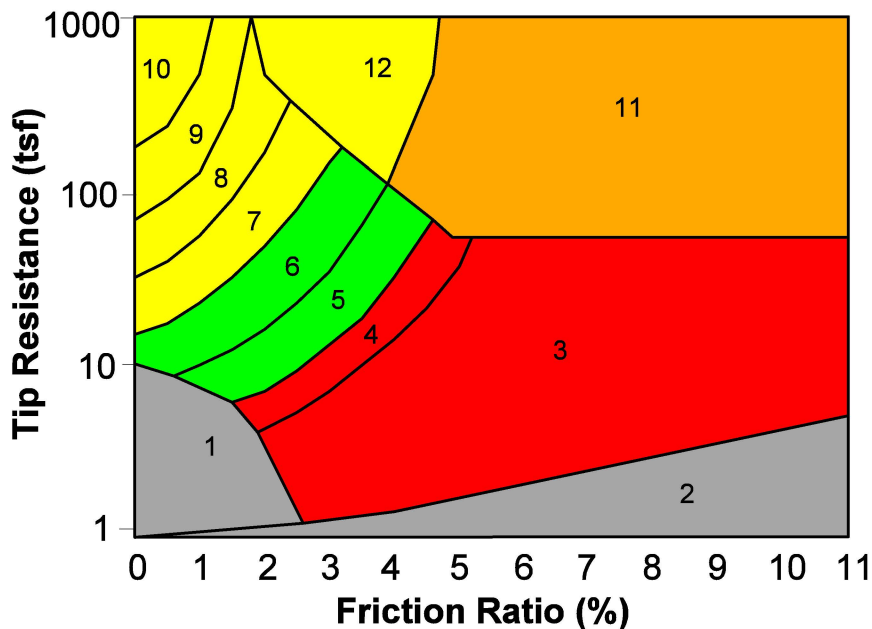
COMPLETION DEPTH: 6.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Grout with Bentonite Chips
DRILLING DATE: October 16, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Gregg Drilling
LOGGED BY: S Varnell
CHECKED BY: J Everett

LOG OF BORING NO. HSA-23
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A1-31

COLOR LEGEND FOR FRICTION RATIO TRACES



Zone	Soil Behavior Type	U.S.C.S.
1	Sensitive Fine-grained	OL-CH
2	Organic Material	OL-OH
3	Clay	CH
4	Silty Clay to Clay	CL-CH
5	Clayey Silt to Silty Clay	MH-CL
6	Sandy Silt to Clayey Silt	ML-MH
7	Silty Sand to Sandy Silt	SM-ML
8	Sand to Silty Sand	SM-SP
9	Sand	SW-SP
10	Gravelly Sand to Sand	SW-GW
11	Very Stiff Fine-grained *	CH-CL
12	Sand to Clayey Sand *	SC-SM

*overconsolidated or cemented

CPT CORRELATION CHART
(Robertson and Campanella, 1984)

KEY TO CPT LOGS
Black Rock Units 1, 2 & 3
Calpatia, California

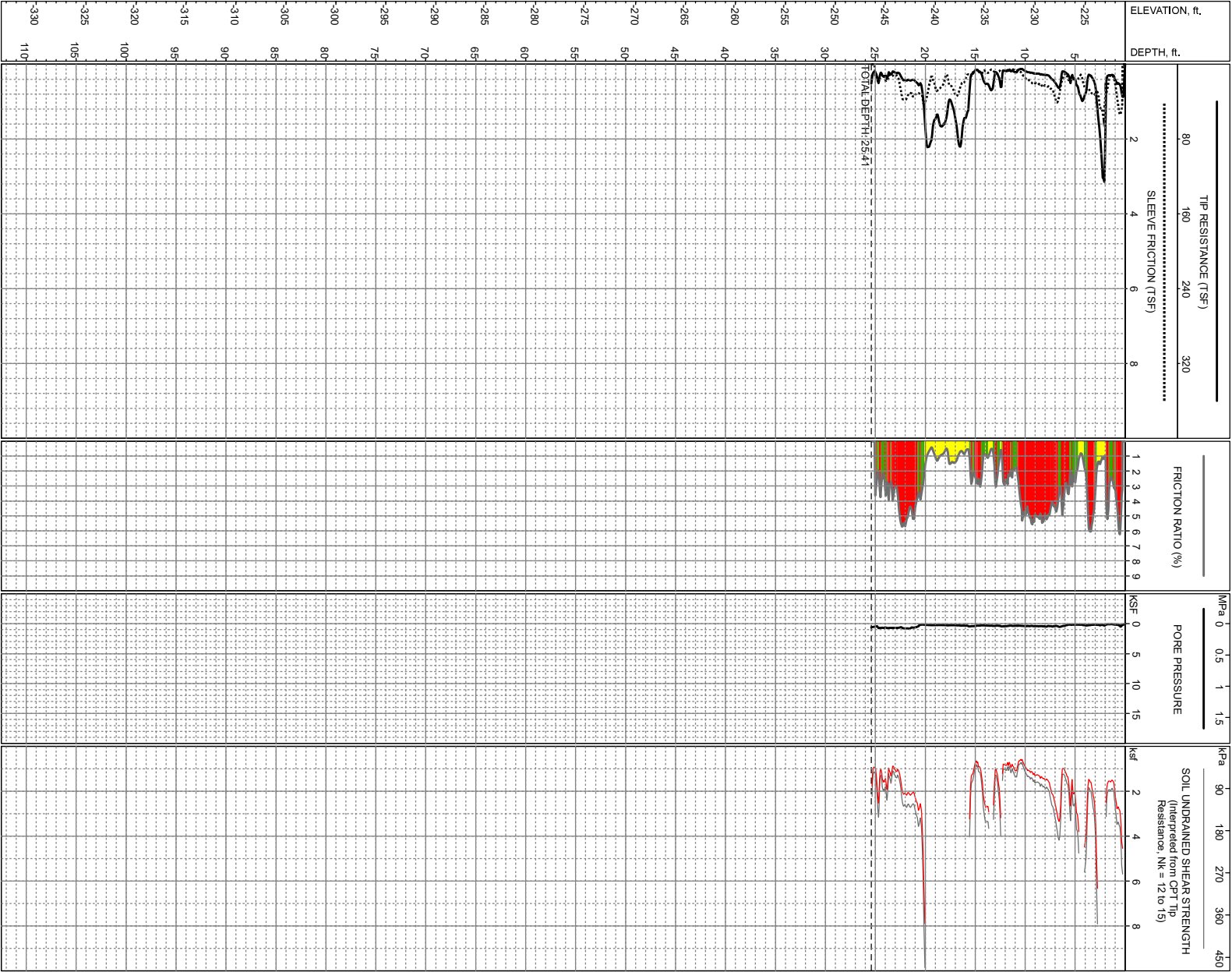
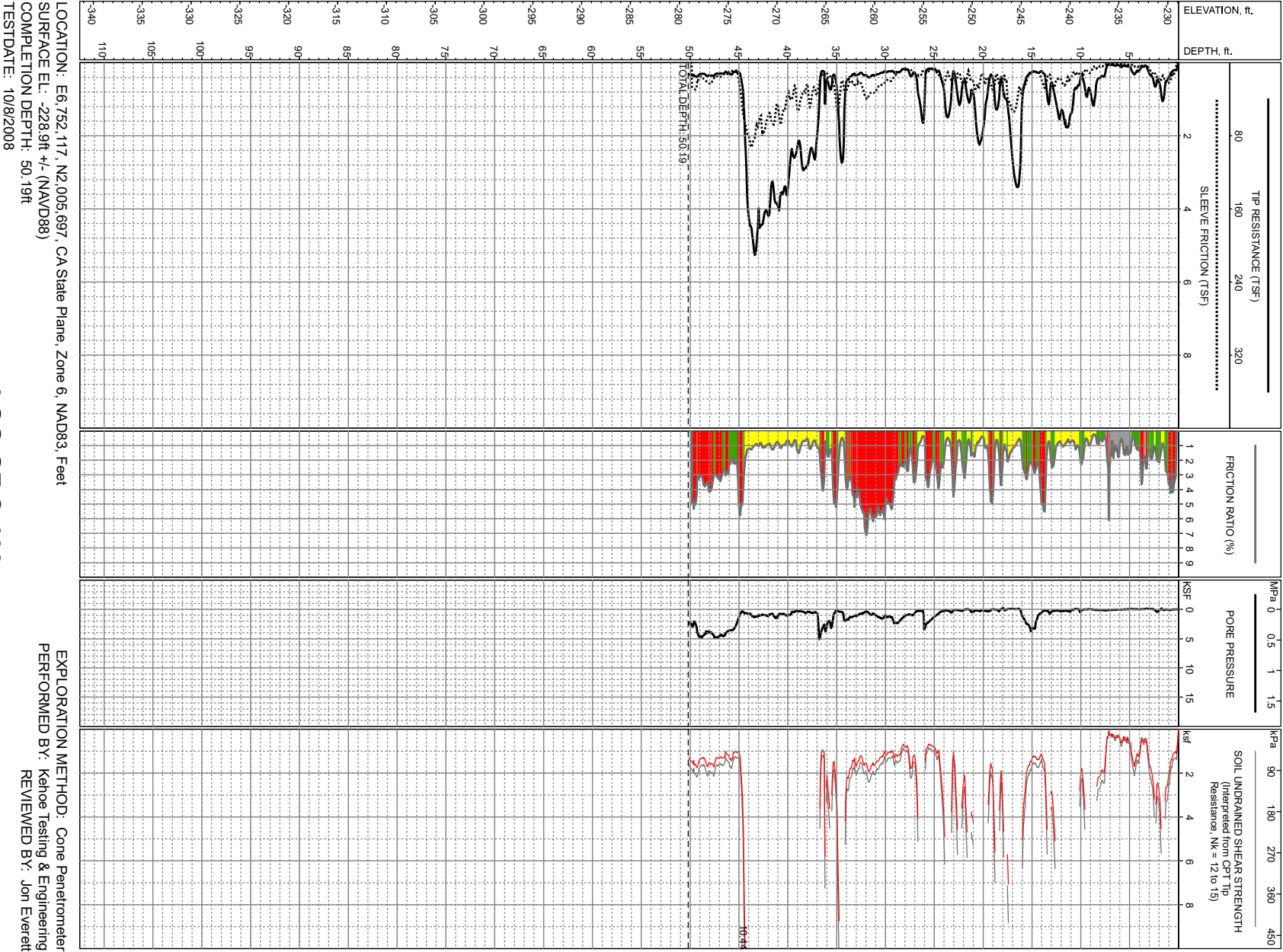
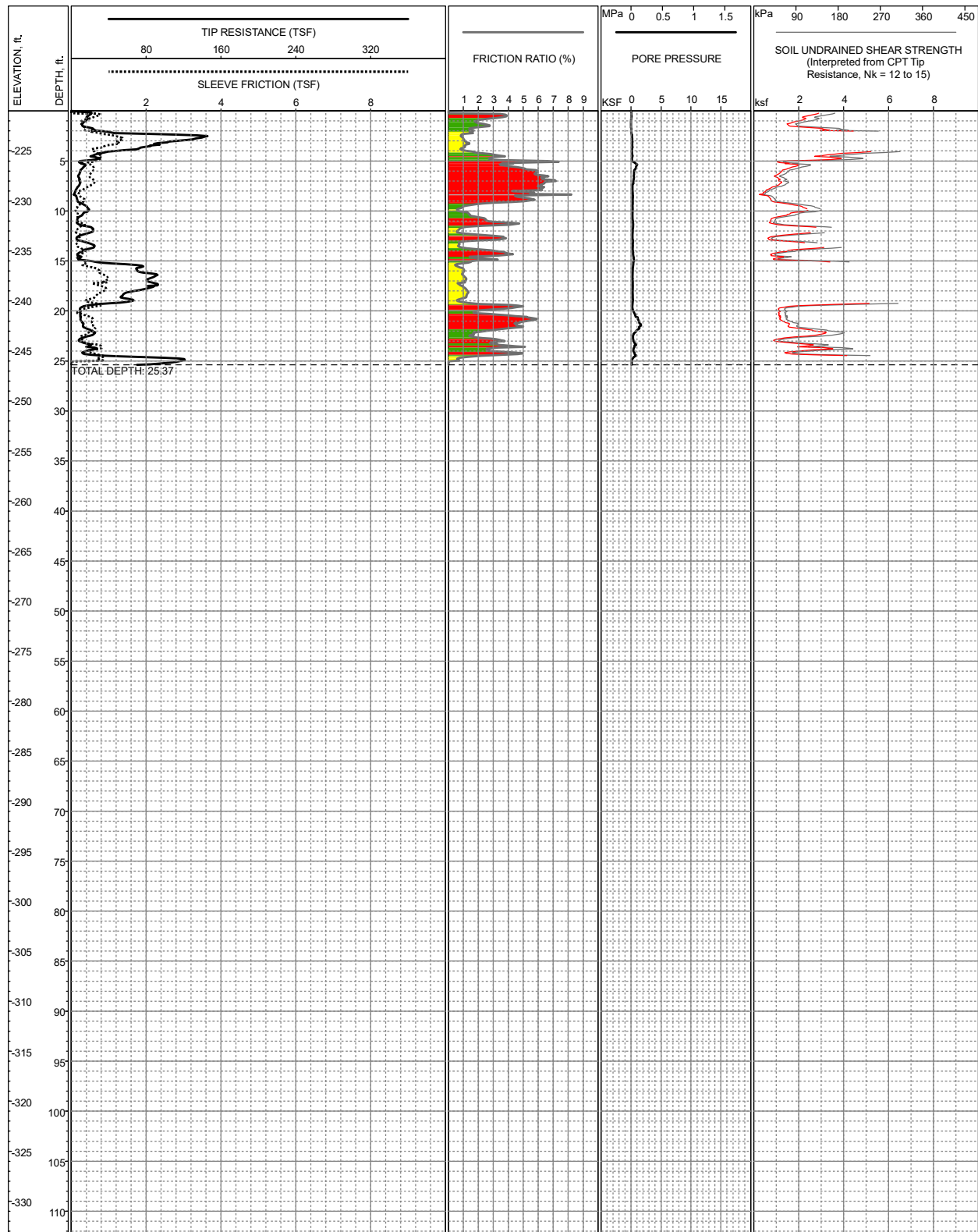


FIGURE A2-2



LOG OF C-102
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE A2-3

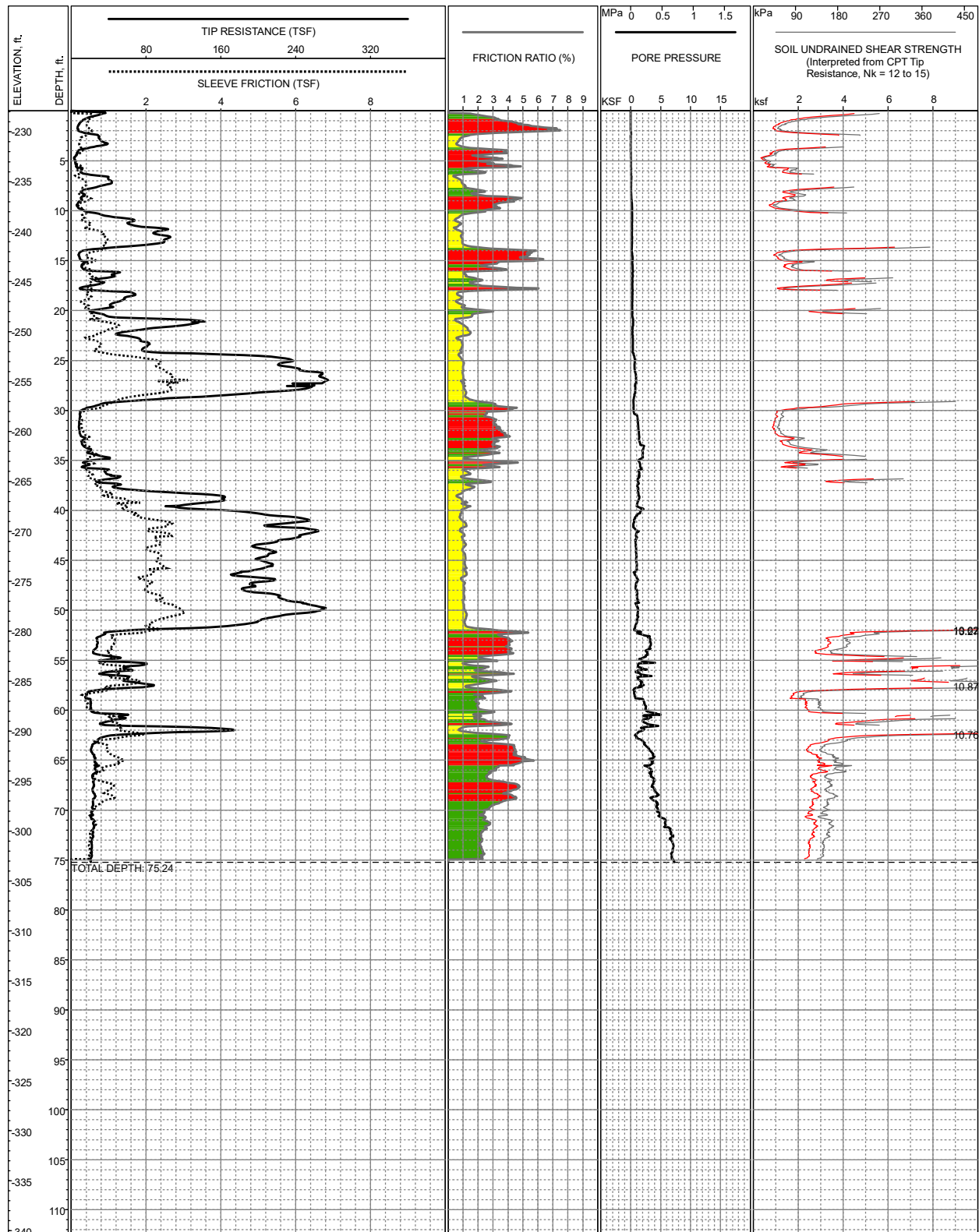


LOCATION: E6,750,954, N2,004,791, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -221.0ft +/- (NAVD88)
COMPLETION DEPTH: 25.37ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-103 **Black Rock Units 1,2 & 3** **Calipatria, California**

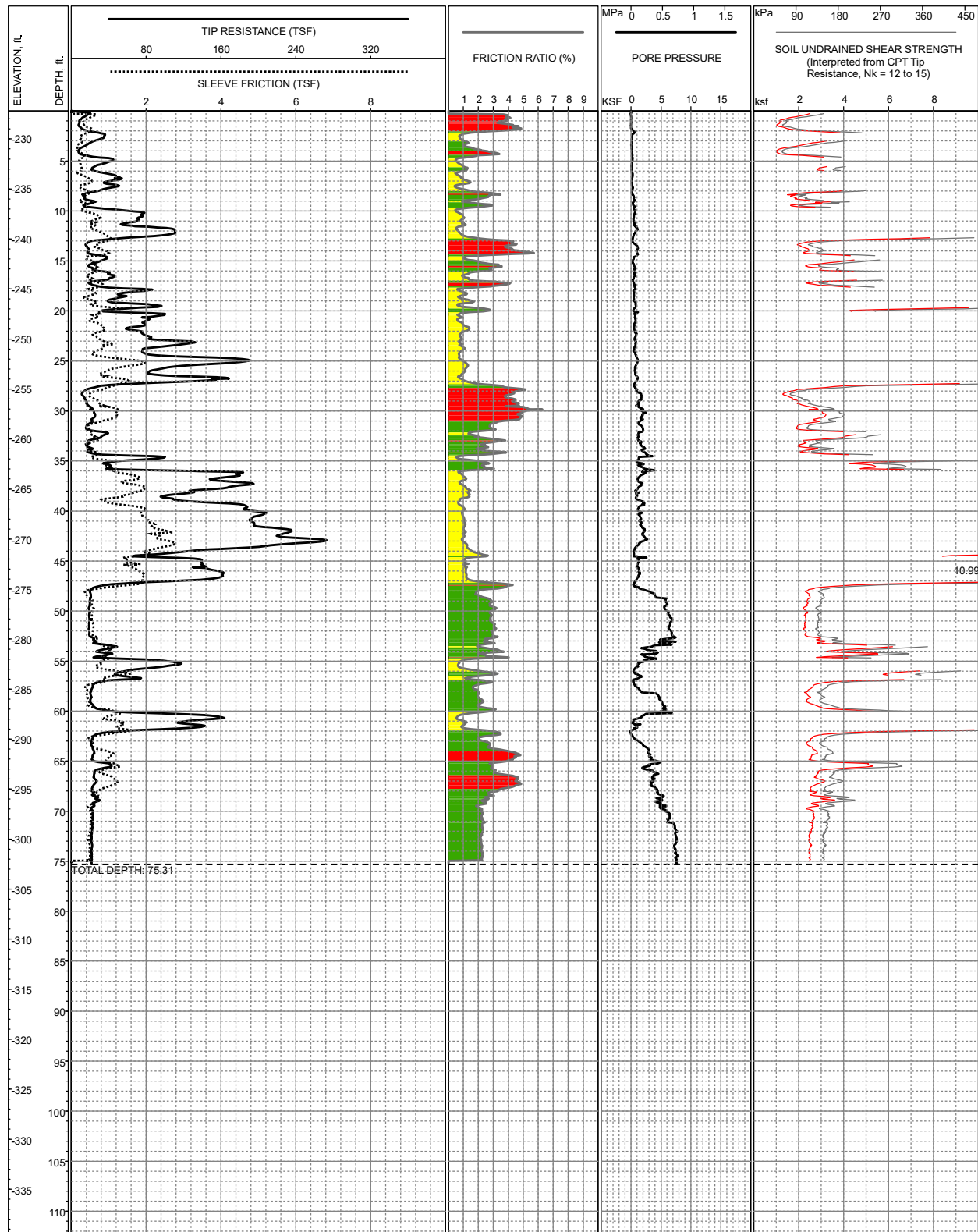
FIGURE A2-4



LOCATION: E6,752,229, N2,004,966, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -227.9ft +/- (NAVD88)
COMPLETION DEPTH: 75.24ft
TESTDATE: 10/7/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

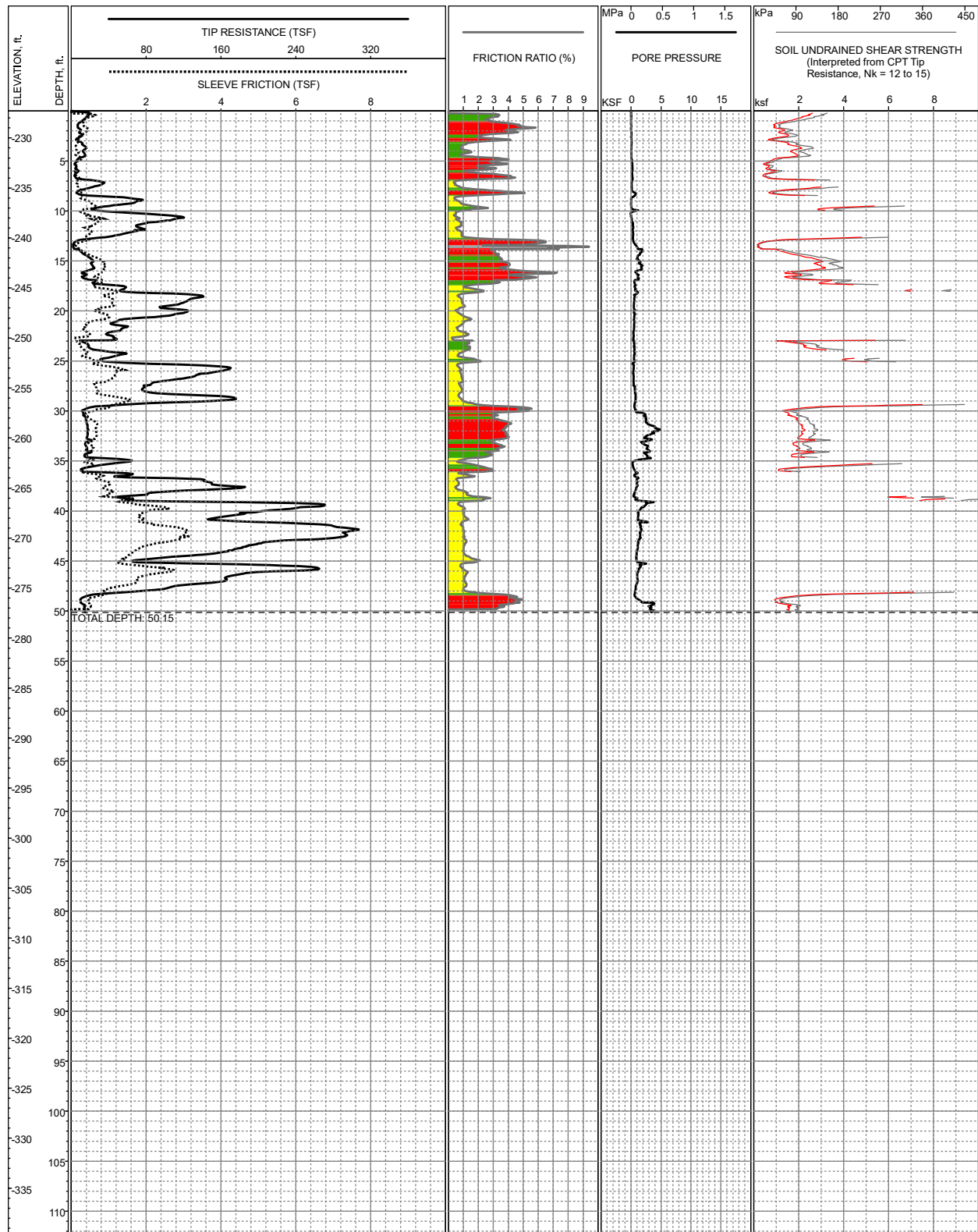
LOG OF C-104 **Black Rock Units 1,2 & 3** **Calipatria, California**



LOCATION: E6,752,401, N2,004,829, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -227.2ft +/- (NAVD88)
COMPLETION DEPTH: 75.31ft
TESTDATE: 10/7/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-105 **Black Rock Units 1,2 & 3** **Calipatria, California**

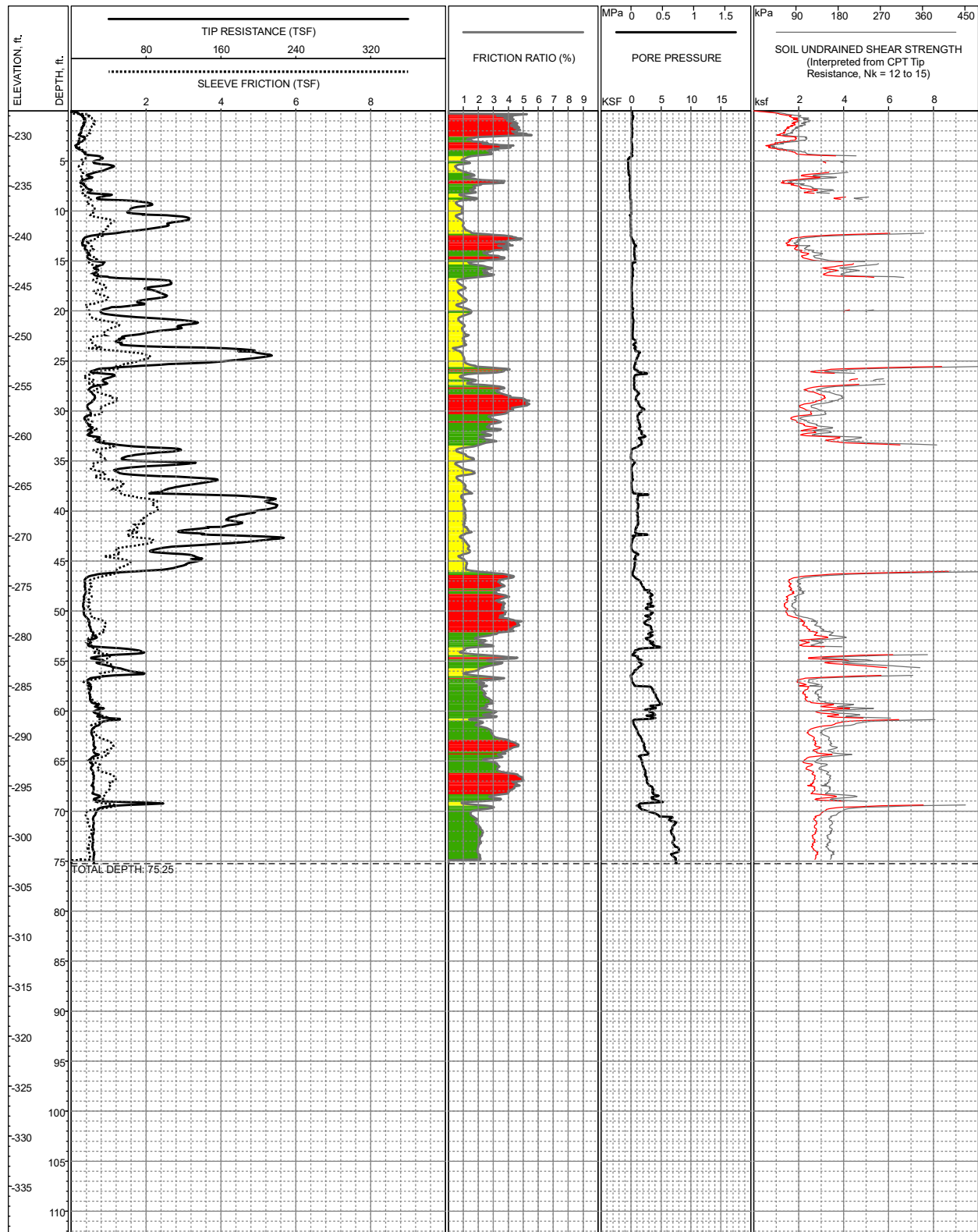


LOCATION: E6,751,827, N2,004,673, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -227.3ft +/- (NAVD88)
COMPLETION DEPTH: 50.15ft
TESTDATE: 10/7/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

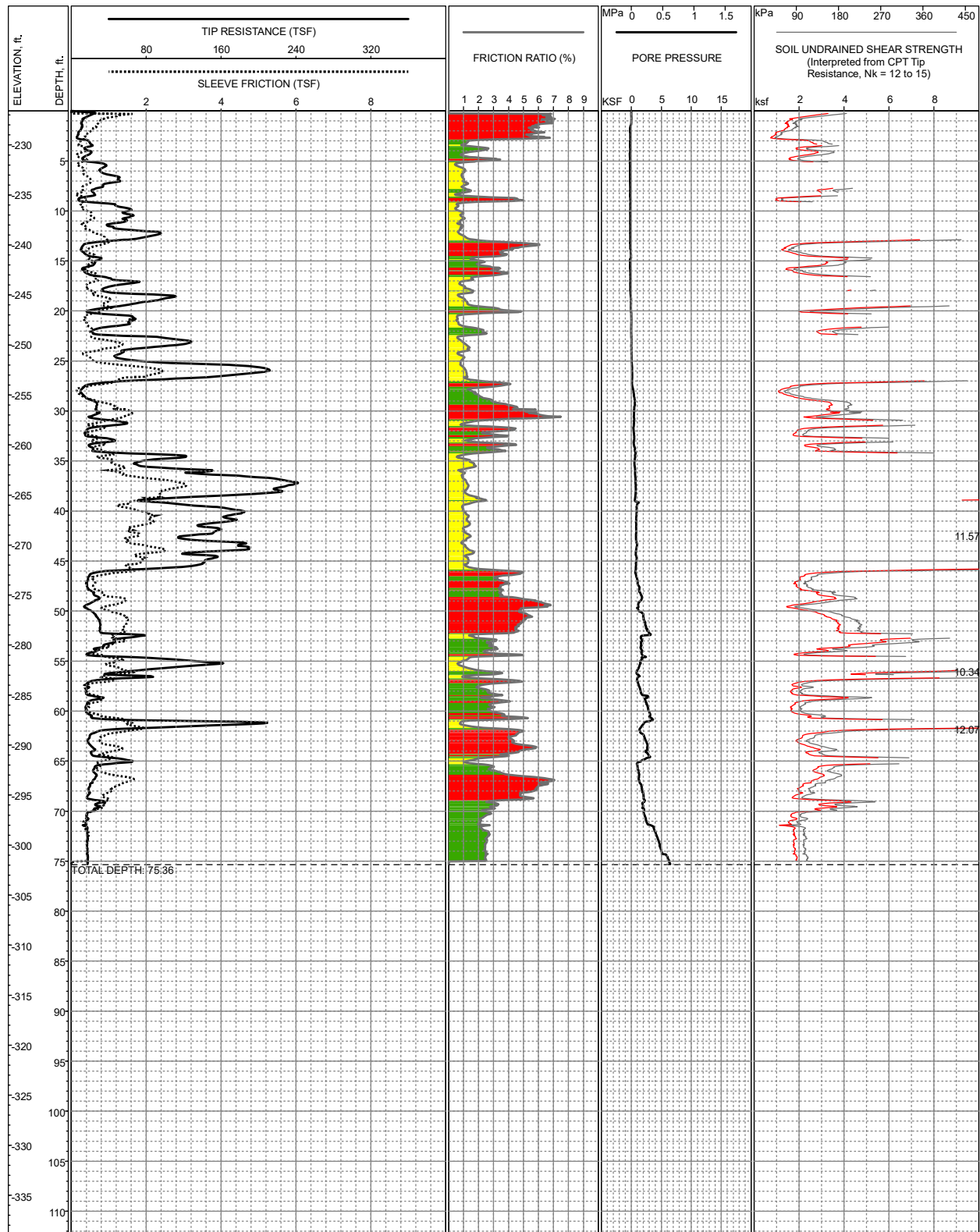
LOG OF C-106 **Black Rock Units 1,2 & 3** **Calipatria, California**

FIGURE A2-7



LOCATION: E6,752,273, N2,004,748, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -227.5ft +/- (NAVD88)
COMPLETION DEPTH: 75.25ft
TESTDATE: 10/7/2008

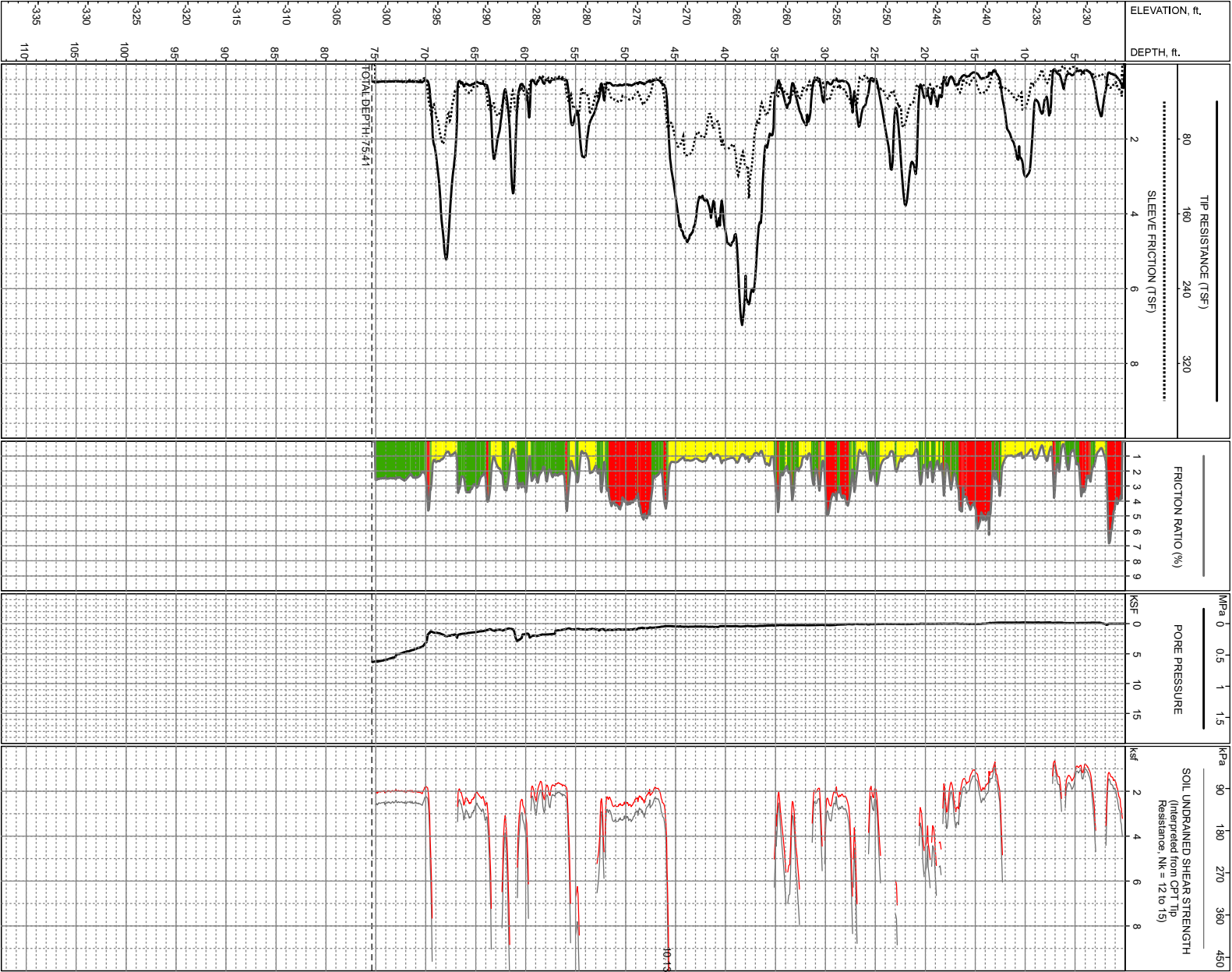
EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett



LOCATION: E6,752,567, N2,004,655, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -226.6ft +/- (NAVD88)
COMPLETION DEPTH: 75.36ft
TESTDATE: 10/7/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-108 **Black Rock Units 1,2 & 3** **Calipatria, California**

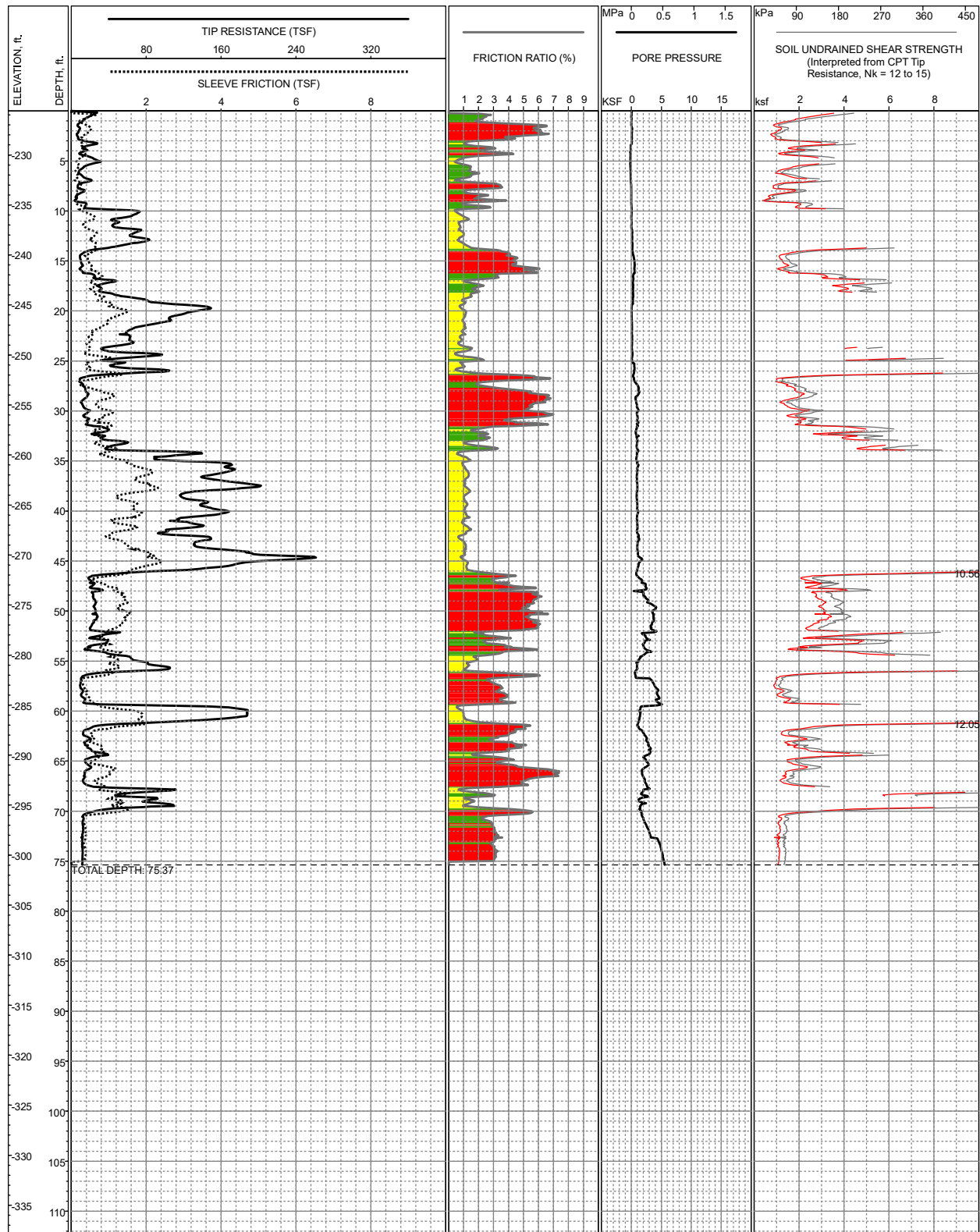


LOCATION: E6, 751, 740, N2, 004, 265, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -226.2ft +/- (NAVD88)
COMPLETION DEPTH: 75.41ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-109
Black Rock Units 1,2 & 3
Calipatria, California

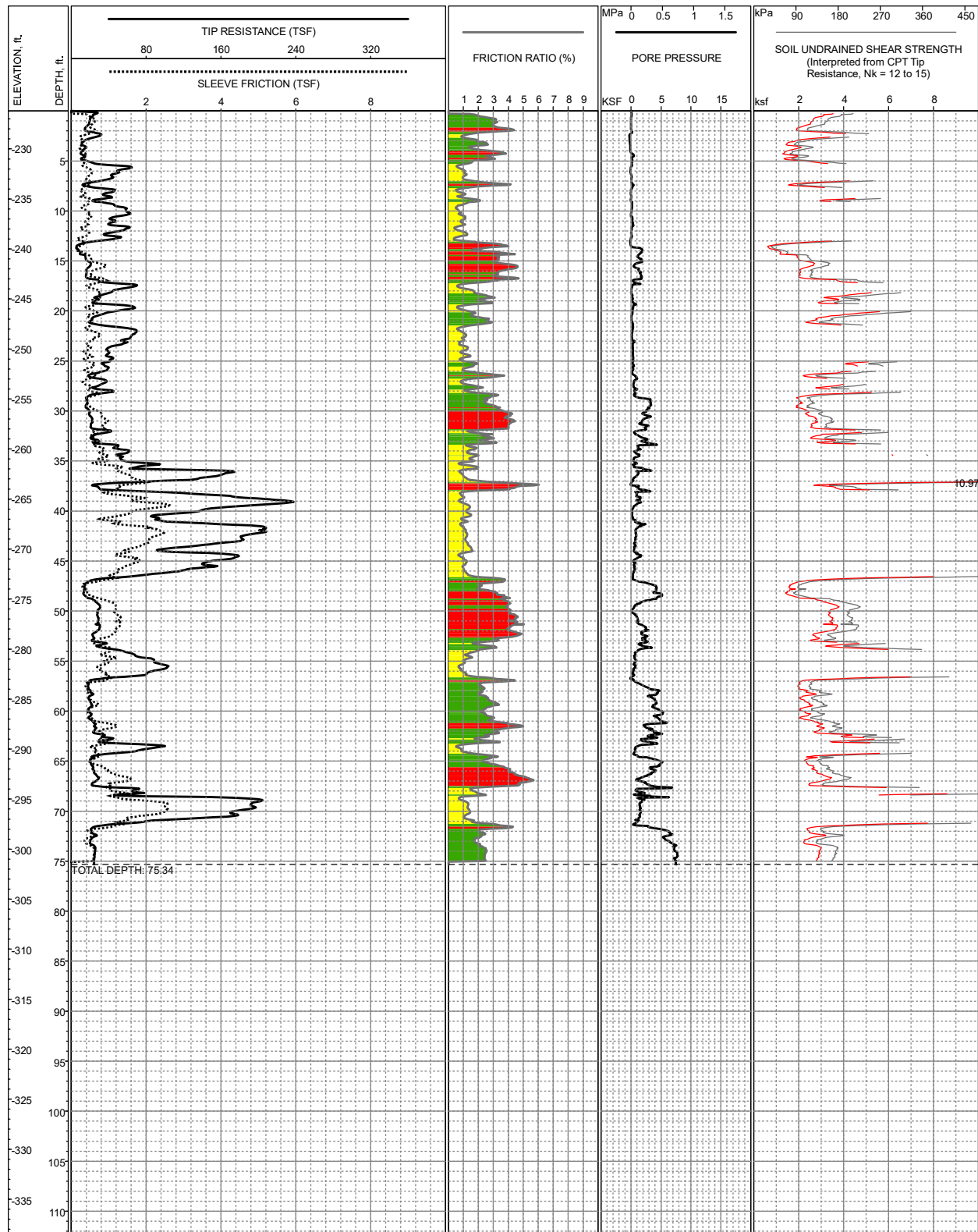
FIGURE A2-10



LOCATION: E6,752,361, N2,004,312, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.6ft +/- (NAVD88)
COMPLETION DEPTH: 75.37ft
TESTDATE: 10/9/2008

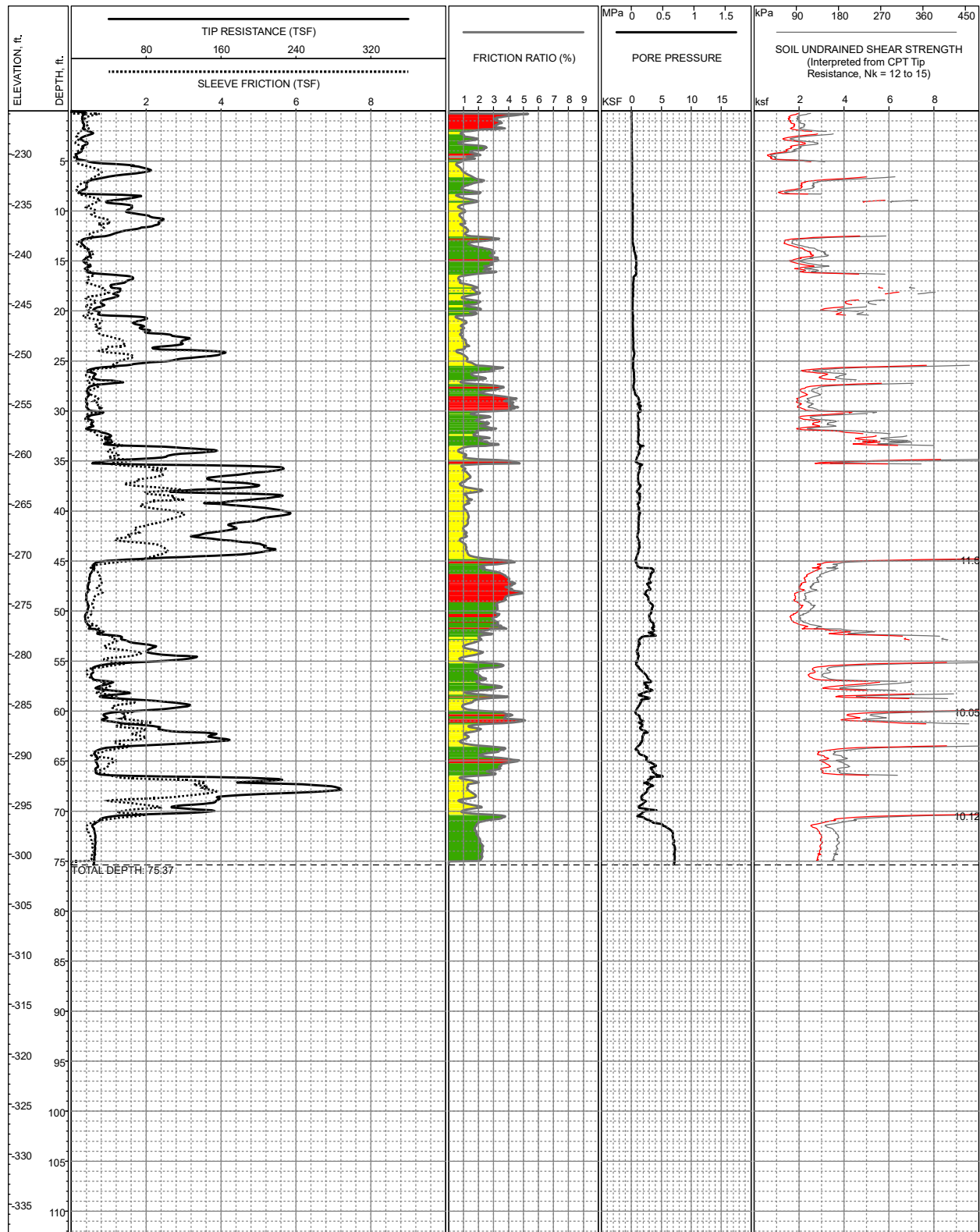
EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-110 **Black Rock Units 1,2 & 3** **Calipatria, California**



LOCATION: E6,751,643, N2,004,119, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -226.2ft +/- (NAVD88)
COMPLETION DEPTH: 75.34ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

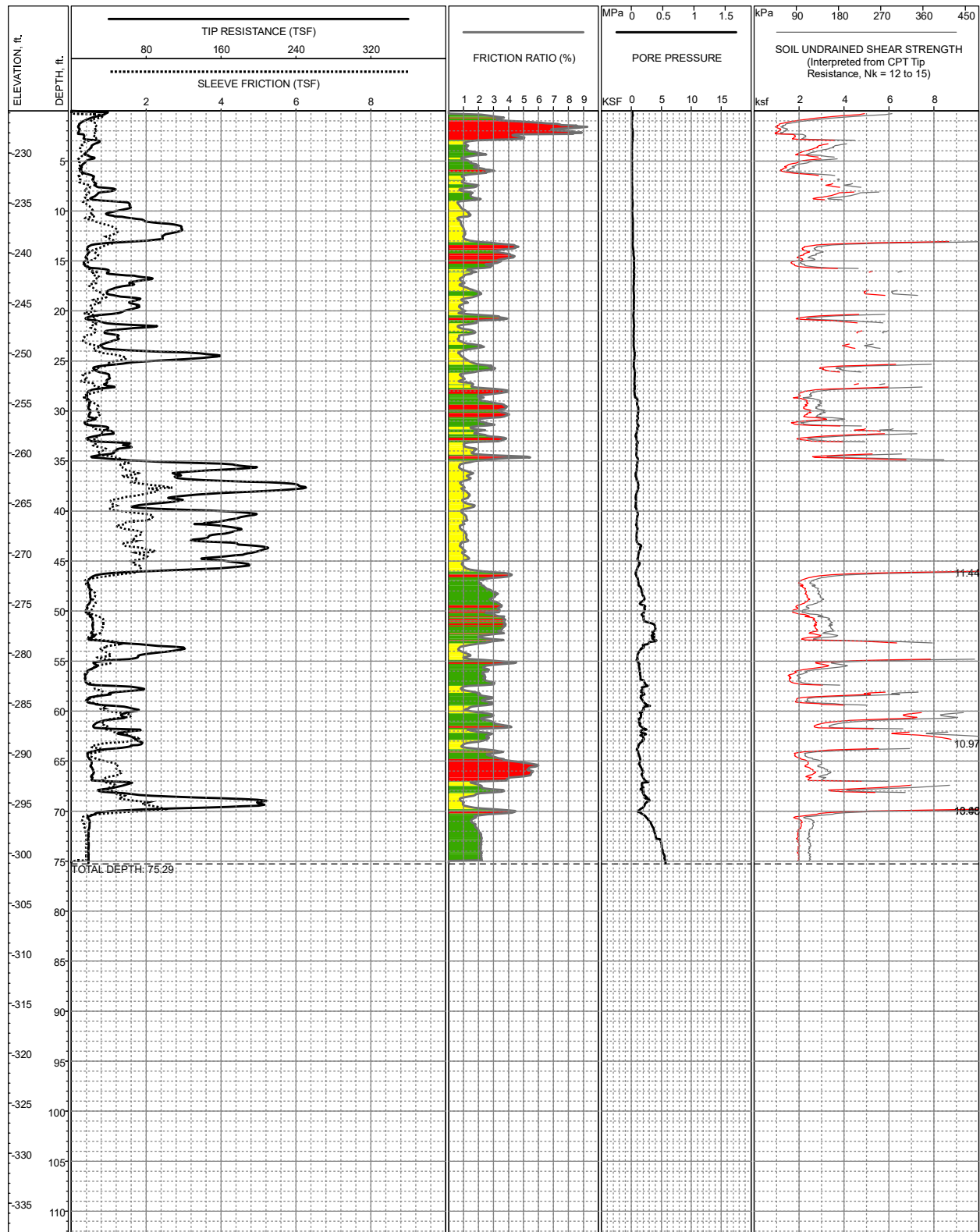


LOCATION: E6,751,779, N2,003,996, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.7ft +/- (NAVD88)
COMPLETION DEPTH: 75.37ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-112 **Black Rock Units 1,2 & 3** **Calipatria, California**

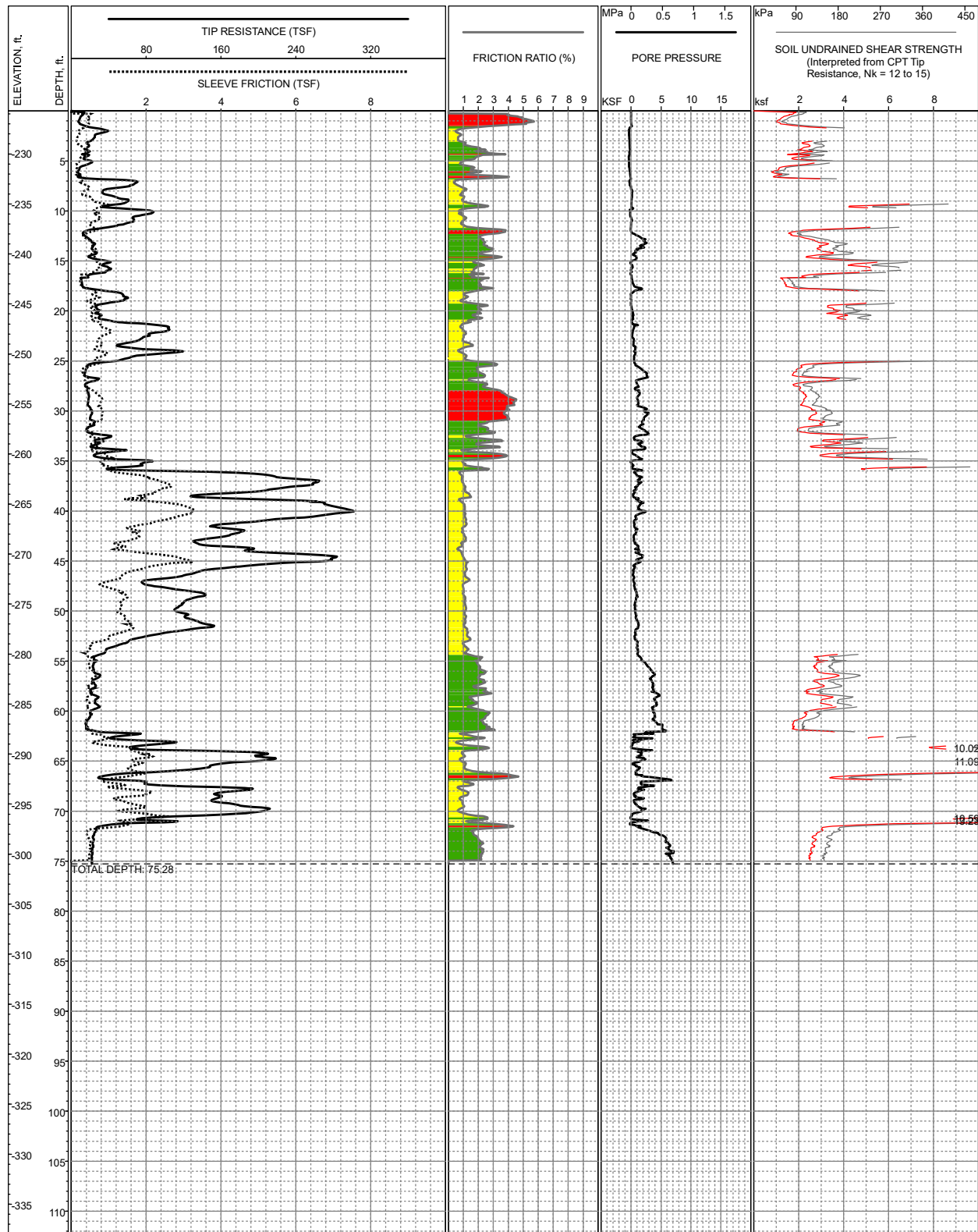
FIGURE A2-13



LOCATION: E6,751,918, N2,004,171, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.8ft +/- (NAVD88)
COMPLETION DEPTH: 75.29ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-113 **Black Rock Units 1,2 & 3** **Calipatria, California**

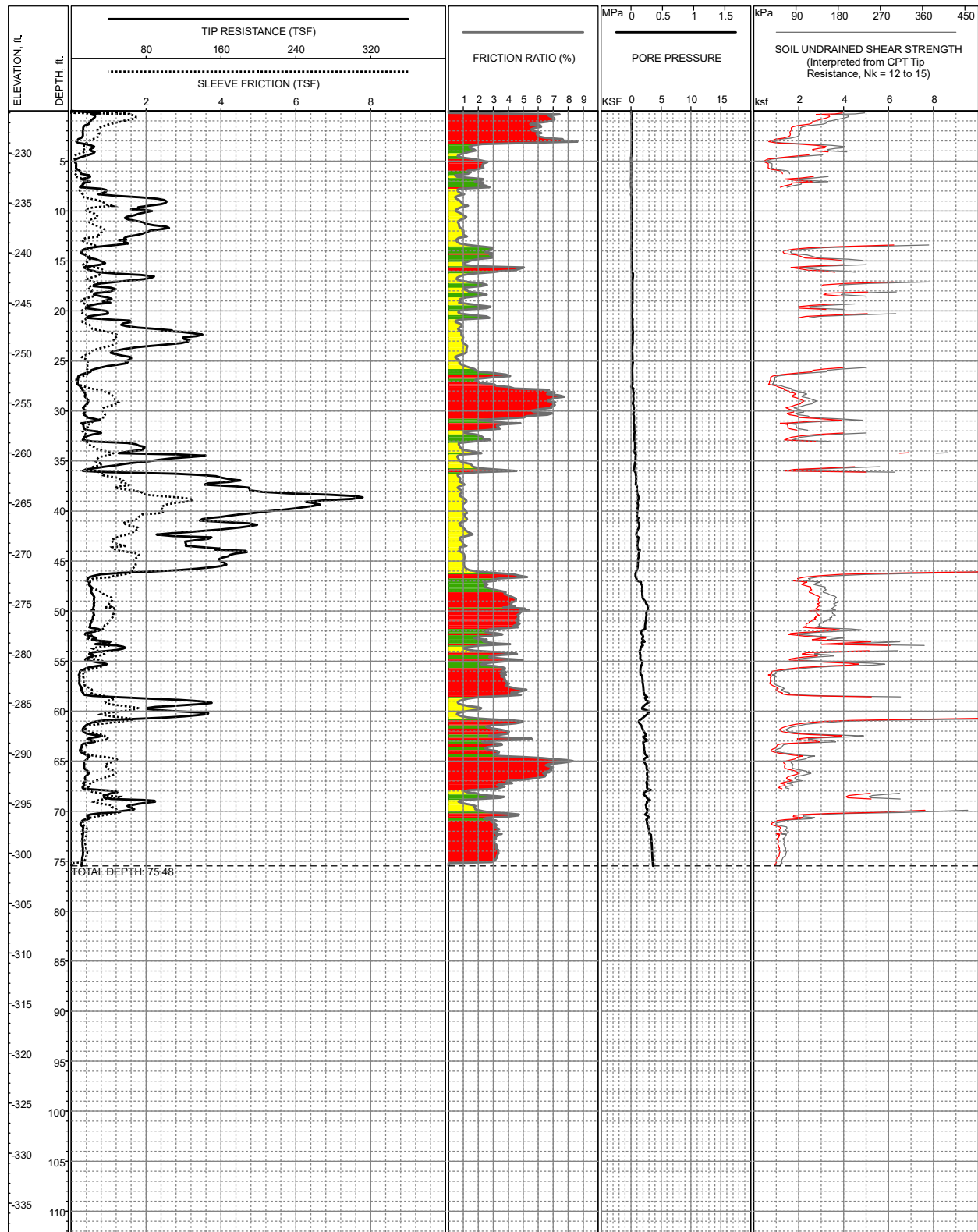


LOCATION: E6,752,088, N2,003,947, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.7ft +/- (NAVD88)
COMPLETION DEPTH: 75.28ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-114 **Black Rock Units 1,2 & 3** **Calipatria, California**

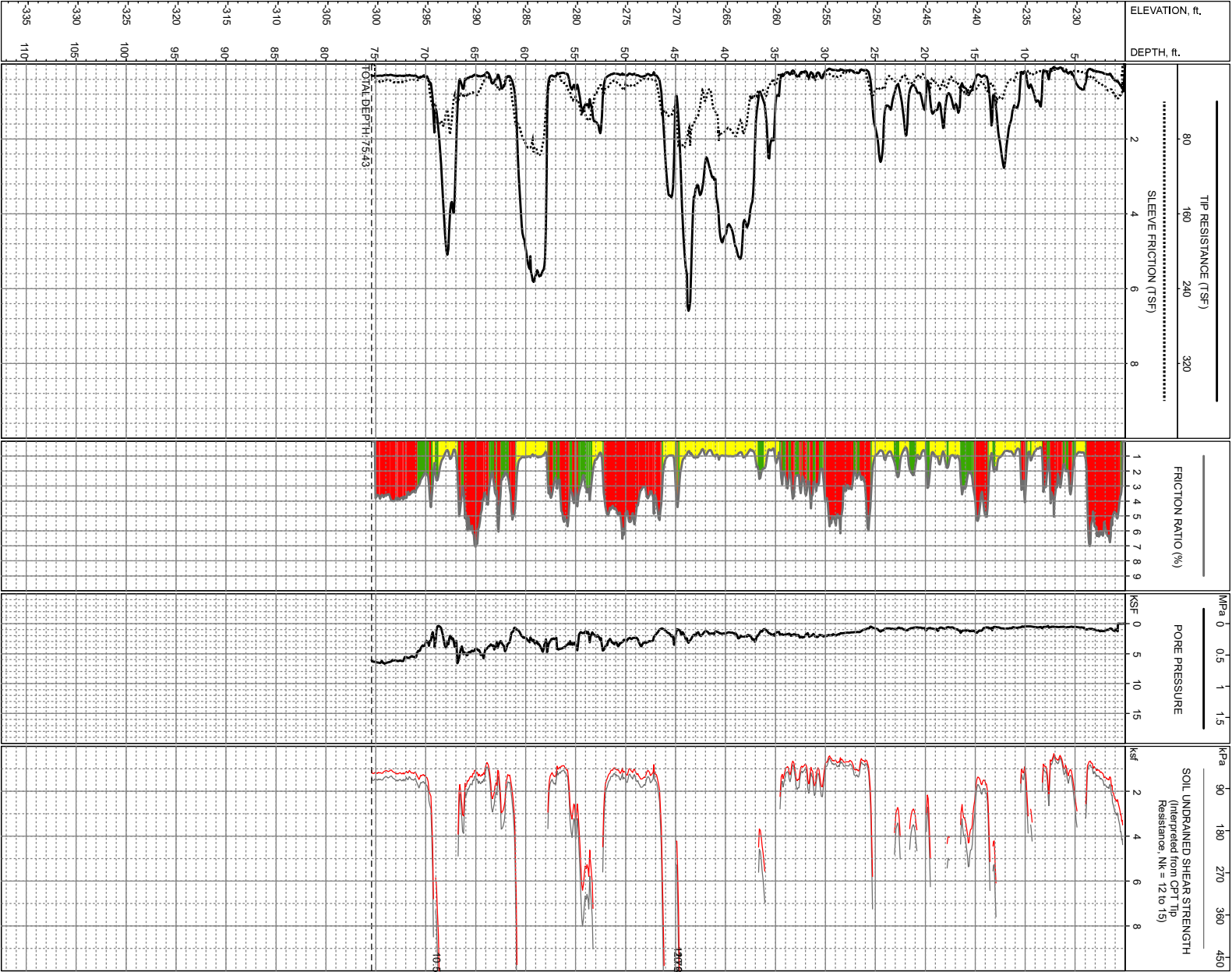
FIGURE A2-15



LOCATION: E6,752,273, N2,004,188, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.8ft +/- (NAVD88)
COMPLETION DEPTH: 75.48ft
TESTDATE: 10/9/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-115 **Black Rock Units 1,2 & 3** **Calipatria, California**

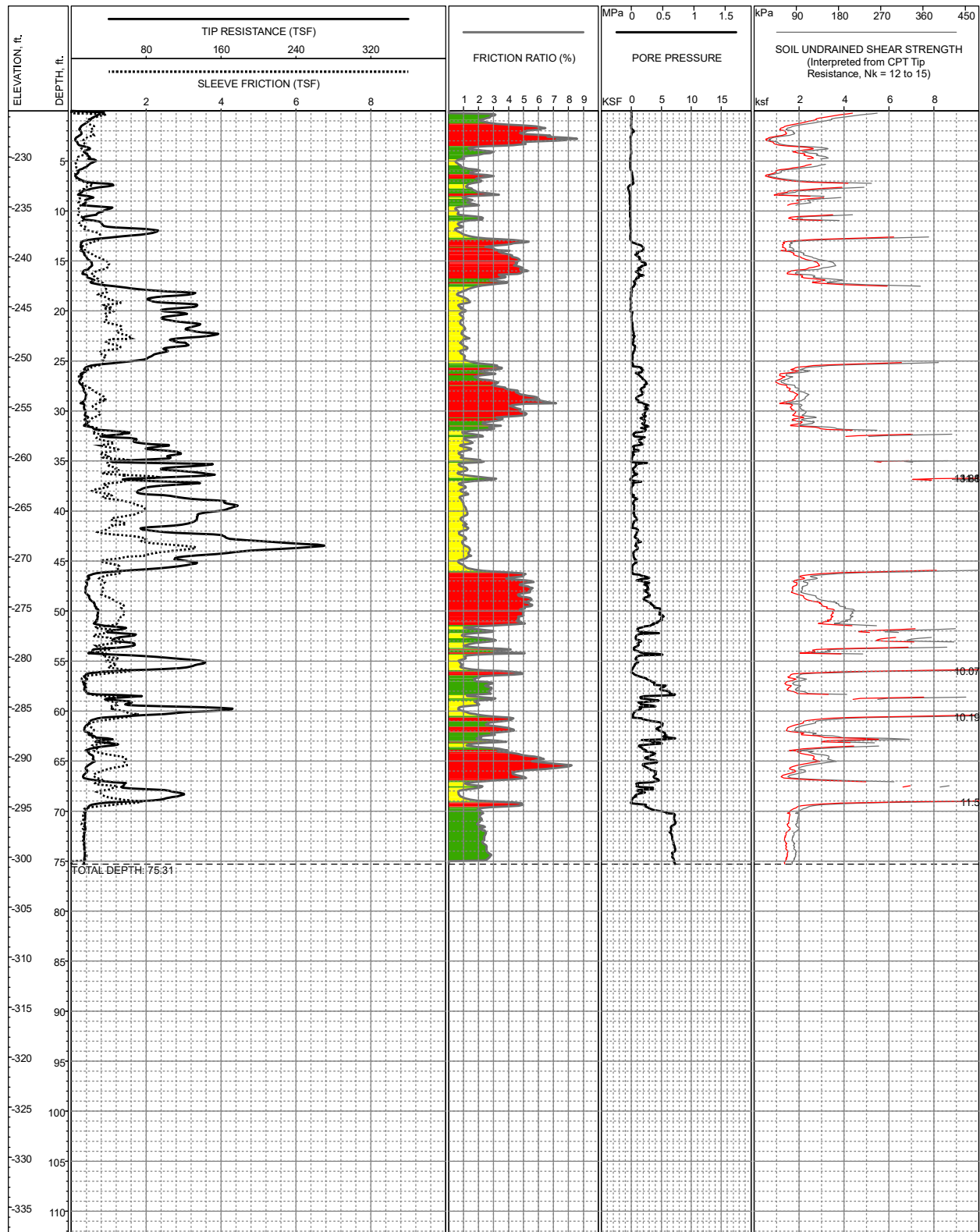


LOCATION: E6, 752, 408, N2, 004, 134, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.2ft +/- (NAD88)
COMPLETION DEPTH: 75.43ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-116
Black Rock Units 1, 2 & 3
Calipatria, California

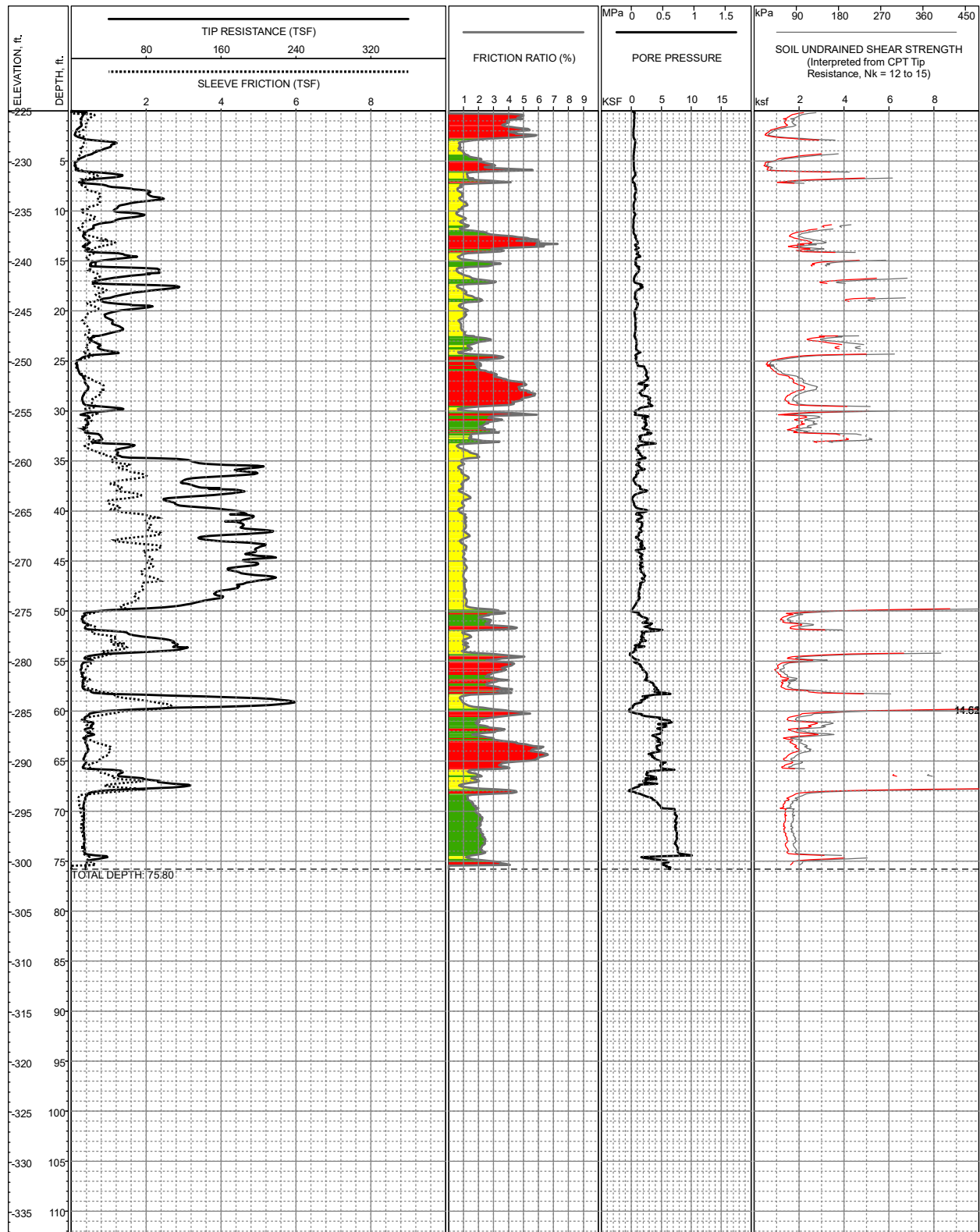
FIGURE A2-17



LOCATION: E6,752,530, N2,004,215, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.4ft +/- (NAVD88)
COMPLETION DEPTH: 75.31ft
TESTDATE: 10/9/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-117 **Black Rock Units 1,2 & 3** **Calipatria, California**



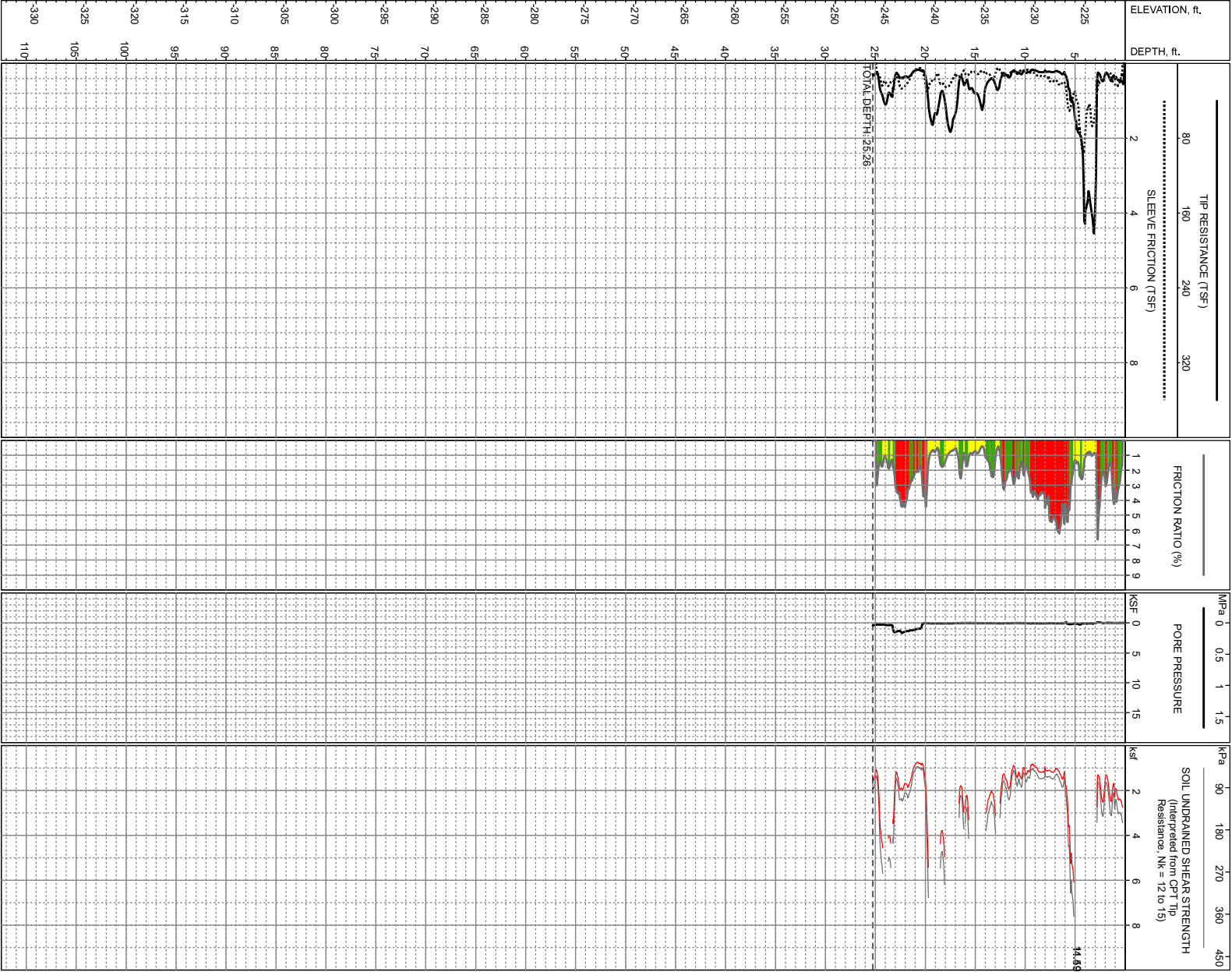
LOCATION: E6,752,706, N2,004,045, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -224.9ft +/- (NAVD88)
COMPLETION DEPTH: 75.80ft
TESTDATE: 10/9/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-118

Black Rock Units 1,2 & 3
Calipatria, California

FIGURE A2-19

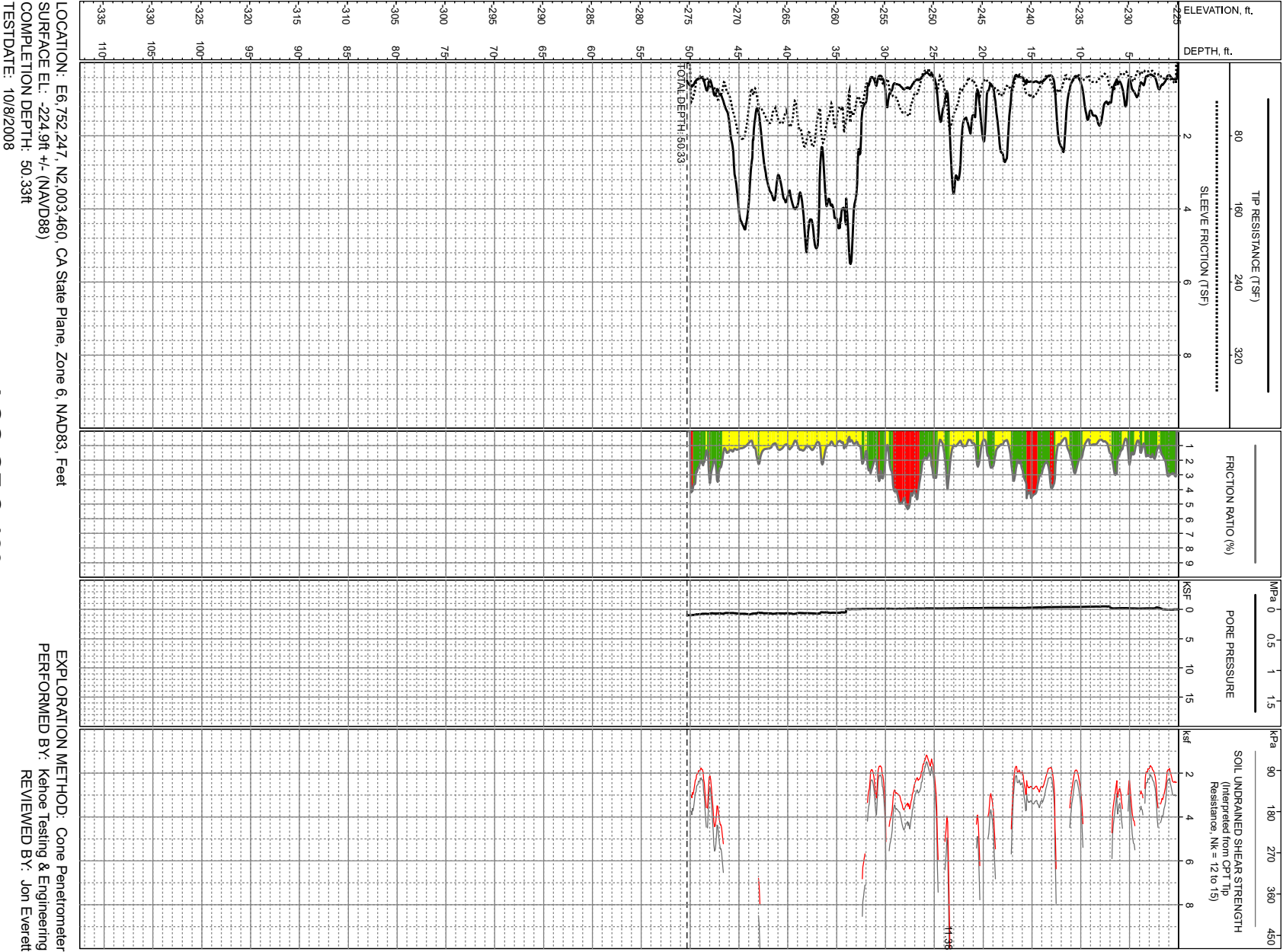


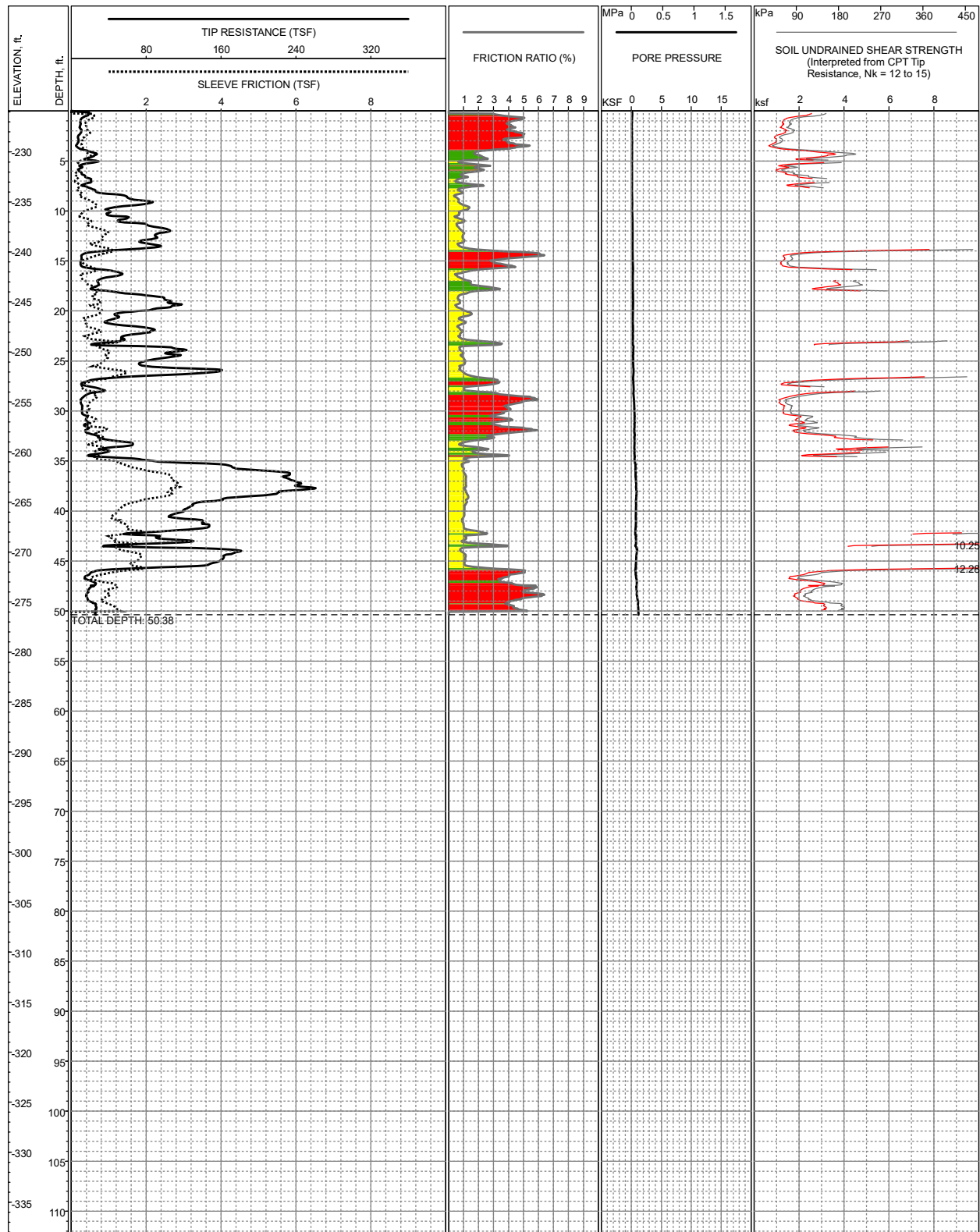
LOCATION: E6,750,965, N2,003,867, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -221.0ft +/- (NAVD88)
COMPLETION DEPTH: 25.26ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-119
Black Rock Units 1,2 & 3
Calipatria, California

FIGURE A2-20





LOCATION: E6,752,168, N2,004,311, CA State Plane, Zone 6, NAD83, Feet
SURFACE EL: -225.9ft +/- (NAVD88)
COMPLETION DEPTH: 50.38ft
TESTDATE: 10/8/2008

EXPLORATION METHOD: Cone Penetrometer
PERFORMED BY: Kehoe Testing & Engineering
REVIEWED BY: Jon Everett

LOG OF C-121 **Black Rock Units 1,2 & 3** **Calipatria, California**

APPENDIX B
LABORATORY TEST RESULTS

APPENDIX B - GEOTECHNICAL LABORATORY TESTING

Introduction

Laboratory testing was performed on samples obtained from the field exploration program described in Appendix A to define pertinent classification and engineering properties of site soils. The majority of the testing was performed at Fugro's soil mechanics laboratories in Oakland, San Luis Obispo and Ventura, California. Corrosivity testing was performed by a subcontractor laboratory specializing in corrosion analyses. A summary of the soil testing program is shown in Table B-1.

Table B-1: Summary of Sample Testing Program

Laboratory Test	Quantity	Testing Standard
Water Content	82	ASTM D2216
Density	79	ASTM D2937
Grain Size Distribution	3	ASTM D422
Percent Fines #200 Sieve	19	ASTM D1140
Atterberg Limits	22	ASTM D4318
Compaction	3	Cal. 216A
Consolidation (Incremental Load Control)	6	ASTM D2435
Direct Shear	1	ASTM D3080
R-Value	3	ASTM D2435
Expansion Index	3	ASTM D4828
Corrosivity	5	ASTM D1498 ASTM D4972 ASTM G57 ASTM D4327

The results of the soil laboratory testing are presented at the conclusion of this appendix. A short description of individual test types is presented in the following paragraphs.

Moisture Content and Dry Density

The in situ moisture content for selected bulk and ring samples recovered from the borings was evaluated in accordance with ASTM Test Designation D2116. These results are recorded on the Logs of Borings in Appendix A and in Figure B-1 - Summary of Soil Laboratory Data.

Dry density determinations were performed on ring and push samples of the subsurface soils to aid in evaluating their physical properties. The results of these tests are presented on the Logs of Borings in Appendix and in Figure B-1 - Summary of Soil Laboratory Data.

Gradation Tests

Gradation tests were performed on samples of the subsurface soils in accordance with ASTM 422. These tests were performed to assist in the classification of the soils and to determine their grain size distribution. The results of these tests are presented in Figure B-2 - Grain Size Curves.

Percent Passing #200 Sieve

The percent passing the #200 sieve was determined for selected samples to aid in the classification of these soils. This is a key index property because it separates coarse-grained soils from fine-grained soils. These tests were performed in accordance with ASTM Designation D-1140. The results of these tests are presented on the Logs of Borings in Appendix A and in Figure B-1 - Summary of Soil Laboratory Data.

Atterberg Limits

Atterberg Limits tests were performed on samples of selected samples of fine-grained soils to evaluate the range of water content over which these materials exhibit plasticity. The Atterberg Limits were determined in accordance with ASTM D-4318. These values are also used to classify the soil in accordance with the Unified Soil Classification System and as indications of a soil's compressibility and expansion potential. The results of these tests are presented on the Logs of Borings in Appendix, in Figure B-1 - Summary of Soil Laboratory Data, and in Figure B-3 - Plasticity Chart.

Compaction

Compaction tests were performed on bulk soil samples collected from the upper three feet to assist in evaluating the compaction characteristics of onsite soils. The compaction tests were performed in accordance with ASTM D1557. The results of the tests are presented in Table B-1 - Summary of Soil Laboratory Data, and in Figure B-4 - Compaction Curves.

Consolidation Tests (Incremental Load Control)

Consolidation tests were performed on relatively undisturbed samples of the subsurface clays to assist in evaluating the compressibility characteristics of these materials under anticipated foundation loads. The consolidation tests were performed in accordance with ASTM D-4186. The results of these tests are presented in Figure B-5 - Consolidation Test Data.

Direct Shear Test

Direct shear testing was performed to evaluate the drained shear strength of a sample of soil from the existing road embankment/berm along the west side of the site. The testing was conducted according to the testing procedure described in ASTM D3080. The samples were sheared at three different vertical stresses, approximately 1, 2, and 4 kips per square foot. The results of the test are presented in Figure B-1 - Summary of Soil Laboratory Data and in Figure B-6 - Direct Shear Test Report.

R-Value

R-value tests were performed on bulk soil samples collected from the upper three feet in areas where it is expected that pavement will be constructed. The R-value test measures the response of a compacted sample of soil to a vertically applied pressure under specific conditions. This test is typically used by many public agencies, such as Caltrans, as the basis for pavement design. The results of these tests are presented in Figure B-1 - Summary of Soil Laboratory Data and in Figure B-7 - R-Value Test Results.

Expansion Index

Expansion Index tests were performed on bulk soil samples collected from the upper 3 feet to evaluate the expansion potential of the onsite soils when inundated with water. The Expansion Index tests were performed in general accordance with ASTM D4828. The results of these tests are presented in Figure B-1 - Summary of Soil Laboratory Data and in Figure B-8 - Expansion Index.

Corrosivity Test

Corrosivity tests were performed at the specialty laboratory of Cerco Analytical, Inc. in Concord, California. A suite of tests was performed on selected samples to evaluate soil resistivity, redox potential, pH value and the chloride and sulfate ion concentrations. These findings are useful in the evaluating the corrosion potential that site soils may pose to buried concrete and ferrous metals. The findings of the corrosivity tests are presented in Figure B-9 - Cerco Analytical Corrosivity Analysis.



DRILL HOLE	DEPTH, ft	SAMPLE NUMBER	MATERIAL DESCRIPTION	UWW pcf	UDW pcf	MC %	FINES %	ATTERBERG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX SAND EQUIVALENT (SE)	SPECIFIC GRAVITY
								LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Qu, ksf	S _u (Cell Pres.) ksf	R	pH	Cl	So ₄ (%)			
RW-01	6.0	1	Lean CLAY (CL)	123	95	30																
RW-01	16.0	3	Lean CLAY (CL)	122	95	29																
RW-01	26.0	5	Silty Fine SAND (SM)	125	103	22																
RW-01	30.0	6	Lean CLAY (CL)					32	13													
RW-01	36.0	7	Silty Fine SAND (SM)	126	103	22																
RW-01	40.0	8	Silty Fine SAND (SM)				21															
RW-01	46.0	9	Silty Fine SAND (SM)	127	103	23																
RW-01	50.0	10	Fat CLAY (CH)					67	41													
RW-01	57.5	11	Silty Fine SAND (SM)	127	103	23																
RW-02	6.0	1	Lean CLAY (CL)	123	97	27		27	8													
RW-02	16.0	3	Lean CLAY (CL)	121	94	30		28	9													
RW-02	26.0	5	SILT with sand (ML)	122	94	29	76															
RW-02	30.0	6	Fat CLAY (CH)					61	38													
RW-02	36.0	7	Silty Fine SAND (SM)	127	102	24																
RW-02	40.0	8	Silty Fine SAND (SM)				21															
RW-02	46.0	9	Silty Fine SAND (SM)	125	102	23																
RW-03	6.0	1	Lean CLAY (CL)	121	93	30																
RW-03	10.0	2	Silty Fine SAND (SM)				41															
RW-03	16.0	3	Lean CLAY (CL)	119	90	33																
RW-03	26.0	5	Silty Fine SAND (SM)	126	103	23																
RW-03	36.0	7	Lean CLAY (CL)	127	104	23		28	7													
RW-03	46.0	9	Lean CLAY (CL)	121	94	29																
RW-03	51.0	10	Lean CLAY (CL)	121	92	32																
RW-03	56.0	11	Lean CLAY (CL)	108	73	48																
RW-04	5.0	1	SILT with sand (ML)				84															
RW-04	11.0	2	Silty Fine SAND (SM)	126	103	23																
RW-04	21.0	4	Silty Fine SAND (SM)	121	96	26																
RW-04	31.0	6	Lean CLAY (CL)	115	84	37																
RW-04	41.0	8	Silty Fine SAND (SM)	122	104	17																
RW-04	50.5	10	Fat CLAY (CH)	115	78	48		73	50													

SUMMARY OF LABORATORY TEST RESULTS
Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE B-1a

DRILL HOLE	DEPTH, ft	SAMPLE NUMBER	MATERIAL DESCRIPTION	UWW pcf	UDW pcf	MC %	FINES %	ATTERBERG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX	SAND EQUIVALENT (SE)	SPECIFIC GRAVITY
								LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Qu, ksf	S _u (Cell Pres.) ksf	R	pH	CI	So ₄ (%)				
RW-04	71.8	14	Lean CLAY (CL)	128	103	24																	
RW-04	75.0	15	Lean CLAY (CL)					31	16														
RW-04	85.0	17	Fat CLAY (CH)					71	45														
RW-05	6.0	1	Lean CLAY (CL)	111	87	28																	
RW-05	16.4	3	Silty Fine SAND (SM)	125	98	27																	
RW-05	20.0	4	Silty Fine SAND (SM)				48																
RW-05	31.5	6	Lean CLAY (CL)	119	88	35																	
RW-05	36.0	7	SILT (ML)	117	92	27	93																
RW-05	46.0	9	Silty Fine SAND (SM)	123	101	22																	
RW-05	50.0	10	Fat CLAY (CH)					64	39														
RW-05	56.0	11	Silty Fine SAND (SM)	117	93	25																	
RW-06	11.0	2	Sandy SILT (ML)	118	94	25	58																
RW-06	16.0	3	Fat CLAY (CH)	123	94	30		71	50														
RW-06	20.0	4	Sandy SILT (ML)				55																
RW-06	65.0	12	Fat CLAY (CH)					75	50														
RW-07	5.0	1	SILT (ML)				89																
RW-07	11.0	2	Silty Fine SAND (SM)	121	98	24																	
RW-07	15.0	3	Lean CLAY (CL)					50	30														
RW-07	21.0	4	Silty Fine SAND (SM)	123	99	24																	
RW-07	31.0	6	Lean CLAY (CL)	118	88	34																	
RW-07	42.0	7	Silty Fine SAND (SM)	133	110	21																	
RW-07	45.0	9	Silty Fine SAND (SM)				14																
RW-07	51.0	10	Fat CLAY (CH)	116	85	38		72	48														
RW-07	55.0	11	Silty Fine SAND (SM)				46																
HSA-01	3.0	1	Lean CLAY (CL)	123	96	28																	
HSA-02	3.0	1	Lean CLAY (CL)	116	91	28																	
HSA-02	6.0	2	SILT (ML)	119	94	27																	
HSA-03	0.0	B	Lean CLAY (CL)				96	38	25												62		
HSA-03	3.0	1	SILT (ML)	117	92	28																	
HSA-03	6.0	2	SILT (ML)	122	98	24																	

SUMMARY OF LABORATORY TEST RESULTS

Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE B-1b

DRILL HOLE	DEPTH, ft	SAMPLE NUMBER	MATERIAL DESCRIPTION	UWW pcf	UDW pcf	MC %	FINES %	ATTERBERG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX SAND EQUIVALENT (SE)	SPECIFIC GRAVITY
								LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Qu, ksf	S _u (Cell Pres.) ksf	R	pH	Cl	So ₄ (%)			
HSA-04	0.0	B	Lean CLAY (CL)				98	33	17	116.5	10.5											
HSA-04	3.0	1	Lean CLAY (CL)	117	89	31																
HSA-04	6.0	2	Silty Fine SAND (SM) to Sandy SILT (ML)	126	101	25																
HSA-05	0.0	B	Lean CLAY with sand (CL)				75															
HSA-05	3.0	1	SILT (ML)	118	94	26																
HSA-05	6.0	2	Silty Fine SAND (SM)	120	97	23																
HSA-06	3.0	1	Silty Fine SAND (SM) to Sandy SILT (ML)	115	92	26																
HSA-06	6.0	2	Lean CLAY (CL)	115	88	31																
HSA-07	3.0	1	Lean CLAY (CL)	114	88	30																
HSA-07	6.0	2	Silty Fine SAND (SM)	121	98	23																
HSA-08	0.0	B	Lean CLAY (CL)				98													4		
HSA-08	3.0	1	Sandy SILT (ML)	107	83	29																
HSA-08	6.0	2	Silty Fine SAND (SM)	115	92	25																
HSA-09	3.0	1	Silty Fine SAND (SM)	108	83	30																
HSA-09	6.0	2	SILT (ML)	115	91	26																
HSA-10	0.0	B	Fat CLAY (CH)					52	33											74		
HSA-10	3.0	1	Lean CLAY (CL)	114	90	27																
HSA-10	6.0	2	Lean CLAY (CL)	115	89	29																
HSA-11	0.0	B	Lean CLAY (CL)					36	17													
HSA-11	3.0	1	Lean CLAY (CL)	116	87	34																
HSA-11	6.0	2	Silty Fine SAND (SM) to Sandy SILT (ML)	121	98	24																
HSA-12	0.0	B	Lean CLAY (CL)				100													2		
HSA-12	3.0	1	Lean CLAY (CL)	119	94	27																
HSA-12	6.0	2	Lean CLAY (CL)	115	89	29																
HSA-13	0.0	B	Lean CLAY (CL)				87															
HSA-13	3.0	1	Lean CLAY (CL)	110	86	29																
HSA-13	6.0	2	Lean CLAY (CL)	115	86	34																
HSA-14	0.0	B	SILT (ML)				91	27	8	119.0	12.0											
HSA-14	3.0	1	Silty Fine SAND (SM) to Sandy SILT (ML)	115	91	27																
HSA-14	6.0	2	Silty Fine SAND (SM) to Sandy SILT (ML)	129	97	33																

SUMMARY OF LABORATORY TEST RESULTS

Black Rock Units 1, 2 & 3
Calipatria, California

FIGURE B-1c