

1.0 Introduction

Task Order DY08, Core Drilling, Soil Sampling, and Laboratory Testing for the Port Arthur Resident Office Shoreline Stabilization project, Port Arthur, Texas, was awarded to Quaternary Resource Investigations, LLC (QRI) on November 19, 2013 (Notice to Proceed (NTP) received on November 29, 2013). The primary purpose of this Task Order was to obtain geotechnical information for shoreline stabilization at the Port Arthur Resident Office, Jefferson County, Texas. A total of 5 borings, numbered 13-1001 through 13-1005, were drilled to depths of 80 and 100 feet as shown on [Table 1](#) below.

2.0 Borings

Below is a table summarizing the 5 borings drilled under Task Order DY08. The table includes Boring Number, Investigation Feature, Depth (ft), and a description of unusual subsurface conditions or difficulties in drilling that were encountered (if any). Boring Summary Sheets and Field boring logs ([Appendix A](#)) should be referenced for information concerning each boring.

Table 1			
Boring	Investigation Feature	Depth (ft)	Conditions / Difficulties Encountered
13-1001	East Bank SNWW PARO	100	See boring log
13-1002	East Bank SNWW PARO	80	See boring log
13-1003	East Bank SNWW PARO	100	See boring log
13-1004	East Bank SNWW PARO	80	See boring log
13-1005	East Bank SNWW PARO	100	See boring log

Final gINT Boring Logs are included in ([Appendix B](#)).

3.0 Test data

As per the Table of Required Services, test assignments were provided by the USACE POC as listed in Table 2. All tests were performed by QRI's contract laboratory, Terracon Consultants, Inc., on portions of the samples that were considered representative of the predominant material composition of the overall sample. The laboratory recorded on the final summary sheets the results of unit dry weight tests, moisture content tests, and visual classifications incidental to performing unconfined compression tests, triaxial tests (including UU and CU tests), and other tests. Results of moisture content testing and visual classifications incidental to performing moisture content, unit dry weight, Atterberg limits, and sieve analyses, were also included on the final test summary sheets provided by the laboratory. A complete set of

PORT ARTHUR RESIDENT OFFICE BORING SUMMARY SHEET

BORING ID:	<u>13-1001</u>
BORING TYPE:	<u>Continuous Sampling</u>
DEPTH:	<u>100'</u>
ELEVATION:	<u>7.47'</u>
X (US SURVEY FT):	<u>3574637.07</u>
Y (US SURVEY FT):	<u>13897757.98</u>
DEPTH TO WATER:	<u>13.8'</u>

Client: USACE-Galveston District W912HY-13-D-0001-DY08 Boring: 13-100/ Page 1 of

Date/Time Drilling Begun: 12/22/13 8:00am Date/Time Drilling Ended: 12/23/13 1630

Driller: Tom Logger: Pete Designated X (Easting): 3574637.073

Drill Rig: B57 Designated Y (Northing): 13897757.98 Designated Z (Elevation): 7.4651'

Total depth: 100 Initial Water Encounter (Depth, date/time): 15', 12/22/13, 949 Water Depth (15 min.): 13.8'

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
0	CI	0-2	16	ST	1	2.5	-	sandy clay, light brown and greenish gray modelling, moderately moist, moderately plastic, w. shell fragments
	CI	2-4	18	ST	1	2.7	-	Sandy clay, light brown, moderately moist, moderately plastic, sand seems, cracks
5	CI	4-6	17	ST	1	1.75	-	Slightly sandy clay, light brown, moderately moist, moderately plastic
	CI	6-8	19	ST	1	1.7	-	Slightly sandy clay, light brown and greenish gray modelling, moderately moist, moderately plastic, sand seems, cracks
	CI	8-10	19	ST	1	1.0	-	Sand clay, light brown and greenish gray modelling, moderately moist, moderately to low plasticity, sand seems, cracks
10	CI	10-12	19	ST	1	1.1	-	Slightly sandy clay, greenish gray and light brown modelling, moderately moist, moderately plastic, sand seems
	CI	12-14	19	ST	1	1.4	-	SAA↑
15	CI	14-16	14	ST	1	1.75	-	Slightly sandy clay, greenish gray and light brown modelling, moderately moist, moderately plastic
	CI	16-18	18	ST	1	2.25	-	SAA↑
20	CI	18-20	10	ST	1	2.25	-	SAA↑

Weather: Cloudy, lite breeze, 60's, lite rain

Comments: SAA = same as above

USCS Log Legend:



US Army Corps of Engineers, Southwestern Division
Galveston District
2000 Fort Point Road/P.O. Box 1229
Galveston, TX 77553-1229

Port Arthur Resident Office
Sabine Neches Waterway (SNWW)
Port Arthur, TX



Quaternary Resource Investigations, L.L.C.
Government & Industry in Harmony with the Environment
13588 Florida Boulevard, Baton Rouge, Louisiana 70819

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
20	CI	20-22	13	ST	1	1.8	—	slightly sandy clay, light brown, moderately moist, moderately plastic, sand seems
	CI	22-24	18	ST	1	1.8	—	SAA ↑
25	SP	24-26	16	ST	1 bag	—	—	slightly clayey fine sand, light brown, wet, no plasticity
	SP	26-28	18	SS	1 bag	—	—	Medium dense, fine sand, light brown, wet, no plasticity
	CI	28-30	18	SS	1 bag	1.4	—	medium stiff sandy clay, light brown and greenish gray modelling, moderately wet, moderately plastic, sand seems
30	CI	30-32	18	ST	1	2.4	—	slightly sandy clay, light brown and greenish gray modelling, moderately moist, moderately plastic, sand seems
	CI	32-34	18	ST	1	1.7	—	SAA ↑
35	CI	34-36	15	ST	1	2.0	—	SAA ↑ cracks
	CI	36-38	18	ST	1	2.0	—	slightly sandy clay, greenish gray, moderately moist, moderately plastic, sand seems and cracks
40	CI	38-40	17	ST	1	1.5	—	SAA ↑

Weather: Cloudy, light breeze, 60's, rain off and on,

Comments: SAA = same as above

USCS Log Legend:



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Government & Industry in Harmony with the Environment
13588 Florida Boulevard, Baton Rouge, Louisiana 70819

13-1001
12/24/13

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
40	CI	40-42	20	ST	1	1.1	-	slightly sandy clay, dark gray, moderately moist, moderately plastic, sand seems
	CI	42-44	17	ST	1	1.75	-	SAA ↑
45	CI	44-46	18	ST	1	1.5	-	SAA ↑
	CI	46-48	17	ST	2	1.8	-	SAA ↑
	CI	48-50	17	ST	1	1.5	-	SAA ↑
50	CH	50-52	16	ST	1	1.6	-	clay, dark gray, moderately moist, moderately plastic
	CH	52-54	18	ST	2	1.9	-	SAA ↑
55	CH	54-56	17	ST	1	1.8	-	SAA ↑
	CH	56-58	18	ST	1	1.9	-	SAA ↑
60	CH	58-60	17	ST	1	1.6	-	SAA ↑

Weather: cloudy, lite breeze, lite rain, 60's

Comments: SAA = same as above

USCS Log Legend:



US Army Corps of Engineers, Southwestern Division
Galveston District
2000 Fort Point Road/P.O. Box 1229
Galveston, TX 77553-1229

Port Arthur Resident Office
Sabine Neches Waterway (SNWW)
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Government & Industry in Harmony with the Environment
13588 Florida Boulevard, Baton Rouge, Louisiana 70819

13-1001
12/27/13, 12/23/13

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
60	CI	60-62	19	ST	2	1.8	-	slightly sandy clay, dark gray, moderately moist, moderately plastic, trace shell fragments
	CI	62-64	19	ST	1	1.75	-	SAA ↑
65	CI	64-66	15	ST	1	1.7	-	SAA ↑
	CH	66-68	19	ST	2	1.5	-	Clay, dark gray, moderately moist, moderate to highly plastic
	CI	68-70	18	ST	1	2.1	-	slightly sandy clay, greenish gray, moderately moist, moderately plastic, sand seems
70	CI	70-72	15	ST	1	2.0	-	SAA ↑ cracks
	CI	72-74	17	ST	1	1.7	-	SAA ↑
75	CI	74-76	19	ST	2	2.2	-	SAA ↑ no cracks
	CI	76-78	15	ST	1	2.25	-	slightly sandy clay, greenish gray, moderately moist, moderately plastic, trace organics
80	CI	78-80	17	ST	1	2.1	-	SAA ↑

Weather:

Comments:

cloudy, windy, 50's / wind, 30's
SAA = same as above

USCS Log Legend:

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Government & Industry in Harmony with the Environment
13588 Florida Boulevard, Baton Rouge, Louisiana 70819

12/23/13

ended 1630

TD=100'

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
80	CL	80-82	17	ST	1	3.5	-	slightly sandy clay, dark gray, moderately moist, moderately plastic, w organic S
	CL	82-84	18	ST	1	2.0	-	SAA
85	CL	84-86	19	ST	2	2.2	-	SAA
	CL	86-88	19	ST	1	1.8	-	SAA
	CL	88-90	19	ST	1	2.0	-	slightly sandy clay, greenish gray, moderately moist, moderately plastic
90	CL	90-92	19	ST	1	1.8	-	SAA
	CL	92-94	19	ST	1	1.7	-	very sandy clay, greenish gray, moderately wet, moderate to low plasticity
95	SP	94-96	20	SS, 1/2 lb bag	1	-	-	dense, greenish gray, wet, no plasticity, fine sand
		96-98						
100	SP	98-100		2 1/2 lb bag	1	-	-	loose, greenish gray, wet, no plasticity, fine sand

Weather: Clear, 40's, windy

Comments:

USCS Log Legend: SAA = same as above



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2000 Fort Point Road/P.O. Box 1229
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Port Arthur Resident Office
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Quaternary Resource Investigations, L.L.C.
Government & Industry in Harmony with the Environment
13588 Florida Boulevard, Baton Rouge, Louisiana 70819

COPY OF PEGGY LAKE GEOTECH BH - PEGGY LAKE TEMPLATE GDT - 3/14/14 16:11 - F:\QRI DATA\TECHNICAL\JOBS (CURRENT)\ACE - GALVESTON\2012-12-20 GEOTECHNICAL CONTRACT\TASK ORDER DY08 2013-11-07 PARO\DELIVERABLES\PARO-FINAL.GP.



Quaternary Resource Investigations, LLC
13588 Florida Boulevard
Baton Rouge, LA 70820
Telephone: 225-292-1400
Fax: 225-292-1404

BORING NUMBER 13-1001

PAGE 1 OF 3

CLIENT USACE-Galveston District PROJECT NAME Port Arthur Resident Office (PARO)
PROJECT NUMBER W912HY-13-D-0001, Task Order No.0008 PROJECT LOCATION Port Arthur, TX
DATE STARTED 12/22/2013 8:00:00 AM COMPLETED 12/23/2013 4:30:00 PM GROUND ELEVATION 7.4651 ft HOLE SIZE 8.25 inches
DRILLING CONTRACTOR QRI NORTHING 13897757.98 ft EASTING 3574637.07 ft
DRILLING METHOD Hollow Stem Auger DRILLING RIG MAKE/MODEL Mobile B57 on Gemco Articulated Platform
LOGGED BY Pete Herold TOTAL DEPTH 100 ft GROUND WATER LEVEL AT TIME OF DRILLING 15.00 ft / Elev -7.53 ft
WEATHER cloudy to clear, 60s to 40s, light breeze to windy, occasional light rain AFTER 15 MINUTES 13.80 ft / Elev -6.33 ft

GRAPHIC LOG	USCS SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE	RECOVERY (in)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	FIELD TORVANE (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	MINUS #200 SIEVE CONTENT (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)
	CL	Sandy CLAY, light brown and greenish gray mottled, moderately moist, moderately plastic, with shell fragments	0	ST	16		2.5			25							
		light brown, with sand seams and cracks		ST	18		2.7			25	49	21	28				
		less sand	5	ST	17		1.75			28							
		light brown and greenish gray mottled, with sand seams and cracks		ST	19		1.7		85	33							
	CL-ML	Silty CLAY, light brown and greenish gray mottled, more sand, low to moderate plasticity	10	ST	19		1.0		88	36	25	20	5	85	0.43	3	7
	CH	CLAY, light brown and greenish gray mottled, less sand, moderate plasticity		ST	19		1.1		87	34					0.28	15	0
				ST	19		1.4		97	29	60	17	43				
			15	ST	14		1.75			27							
	CL	Sandy CLAY, light brown and greenish gray mottled, moderately moist, moderate plasticity		ST	18		2.25			24	46	18	28				
		light brown	20	ST	10		2.25			23							
				ST	13		1.8		102	24					0.87	15	0
				ST	18		1.8			25							
	SM	Silty SAND, fine grained, light brown, wet, no plasticity	25	ST	16					24							
		medium dense		SS	18	5-7-11 (18)				24				36			
	CL	Sandy CLAY, light brown and greenish gray mottled, moderately wet, moderately plastic, medium stiff, with sand seams	30	SS	18	3-4-4 (8)	1.4			30							
		less sand, moderately moist		ST	18		2.4		85	41							
				ST	18		1.7		90	32	48	19	29	99	0.65	10	0
			35														

(Continued Next Page)



Quaternary Resource Investigations, LLC
13588 Florida Boulevard
Baton Rouge, LA 70820
Telephone: 225-292-1400
Fax: 225-292-1404

BORING NUMBER 13-1001

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CLIENT USACE-Galveston District

PROJECT NAME Port Arthur Resident Office (PARO)

PROJECT NUMBER W912HY-13-D-0001, Task Order No.0008

PROJECT LOCATION Port Arthur, TX

GRAPHIC LOG	USCS SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE	RECOVERY (in)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	FIELD TORVANE (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	MINUS #200 SIEVE CONTENT (%)	COMPRESSION STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)
	CL		35	ST	15		2.0			33							
		CLAY, greenish gray, moderately wet, moderately plastic, medium stiff, with sand seams and cracks		ST	18		2.0			39	55	23	32				
				ST	17		1.5			42							
		dark gray	40	ST	20		1.1		82	39	51	19	32	98	0.58	15	0
	CH			ST	17		1.75			56							
			45	ST	18		1.5		82	40	60	23	37	100	0.73	15	22
				ST	17		1.8			45							
			50	ST	17		1.5		76	45							
	CH	CLAY, dark gray, moderately moist, moderate to high plasticity		ST	16		1.6			49	85	25	60				
				ST	18		1.9			57							
	CH		55	ST	17		1.8		70	53	101	33	68				
				ST	18		1.9			57							
			60	ST	17		1.6		84	38	66	20	46		1.16	15	0
	CH	Slightly sandy CLAY, dark gray, moderately moist, moderately plastic, with a trace of shell fragments		ST	19		1.8			34							
				ST	19		1.75			37	57	22	35	76			
			65	ST	19		1.7			45							
	CH	CLAY, dark gray, moderately moist, moderately to highly plastic		ST	19		1.5		68	54					0.71	2	34
				ST	18		2.1			48							
	CH	Slightly sandy CLAY, greenish gray, moderately moist, moderately plastic, with sand seams with cracks	70	ST	19		2.0		73	50							
				ST	17		1.7		76	47	105	28	77	98	0.89	4	0
		no cracks	75														

(Continued Next Page)



Quaternary Resource Investigations, LLC
13588 Florida Boulevard
Baton Rouge, LA 70820
Telephone: 225-292-1400
Fax: 225-292-1404

BORING NUMBER 13-1001

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CLIENT USACE-Galveston District

PROJECT NAME Port Arthur Resident Office (PARO)

PROJECT NUMBER W912HY-13-D-0001, Task Order No.0008

PROJECT LOCATION Port Arthur, TX

GRAPHIC LOG	USCS SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE	RECOVERY (in)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	FIELD TORVANE (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	MINUS #200 SIEVE CONTENT (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)
	CH	Slightly sandy CLAY, greenish gray, moderately moist, moderately plastic, with sand seams (<i>continued</i>) with a trace of organics	75	ST	19		2.2			46							
				ST	19		2.25			49							
				ST	17		2.1			45	77	25	52				
			80	ST	17		3.5			57							
		dark gray		ST	18		2.0			40							
				ST	19		2.2			41							
			85	ST	19		1.8		86	35	79	24	55	95	1.53	3	0
				ST	19		2.0			32							
			90	ST	19		1.8		97	28							
				ST	19		1.7		104	24					0.58	7	0
	SP-SM	very sandy, moderately wet, low to moderate plasticity		ST	19		1.7										
		SAND, fine grained, with silt, greenish gray, wet, no plasticity, dense	95	SS	20	8-12-20 (32)				21				11			
		loose		SS	18	2-4-5 (9)				21							
			100														

Bottom of borehole at 100.0 feet.

SUMMARY TABLE OF LABORATORY TEST DATA																																												
Project Name: Port Arthur Resident Office																			Client: QRI								Terracon Project # : 92135321																	
Boring	Depth	Field Tests			Atterberg Limits			Grain Size Analysis											USCS Symbol	Wc %	γd pcf	Strenght Tests																						
		PP tsf	TV tsf	SPTn bl/ft	LL %	PL %	PI %	% by weight passing sieve							Soil Particle Content							Unconfined Compression				UU Triaxial Test				Direct Shear				CU Triaxial Test										
								3/8	4	10	40	100	200	gravel	sand	silt	clay	sieve 200				C ksf	Wc %	γd pcf	Symbol	C ksf	Wc %	γd pcf	Symbol	C ksf	φ °	Wc %	Symbol	C ksf	φ °	c' ksf	φ' °	Wc %	γd pcf	Symbol				
13-B1001	0-2	2.5																		25																								
	2-4	2.7			49	21	28												CL*	25																								
	4-6	1.75																		28																								
	6-8	1.7																		33	85																							
	8-10	1.0			25	20	5	100	98	96	95		85	2	13			85	CL-ML	36	88					0.43	36	88	CL**															
	10-12	1.1																		34	87	0.28		34	87	CH**																		
	12-14	1.4			60	17	43												CH*	29	97													0.34	10	0.24	22	29	97	CH**				
	14-16	1.75																		27																								
	16-18	2.25			46	18	28												CL*	24																								
	18-20	2.25																		23																								
	20-22	1.8																		24	102	0.87		24	102	CL**																		
	22-24	1.8																		25																								
	24-26																			24																								
	26-28			18				100	99	99	99		36	1	63			36	SM*	24									0.18	33	24	SM**												
	28-30	1.4		8																30																								
	30-32	2.4																		41	85																							
	32-34	1.7			48	19	29				100	100		99	0	1		99	CL	32	90	0.65		32	90	CL**																		
	34-36	2.0																		33																								
	36-38	2.0			55	23	32												CH*	39																								
	38-40	1.5																		42																								
	40-42	1.1			51	19	32				100	100		98	0	2		98	CH	39	82	0.58		39	82	CH**																		
	42-44	1.75																		56																								
	44-46	1.5			60	23	37					100	100	0	0			100	CH	40	82					0.73	40	82	CH**															
	46-48	1.8																		45																								
	48-50	1.5																		45	76																							
	50-52	1.6			85	25	60												CH*	49																								
	52-54	1.9																		57																								
	54-56	1.8			101	33	68												CH*	53	70																							
	56-58	1.9																		57																								
	58-60	1.6			66	20	46												CH*	38	84	1.16		38	84	CH**																		
	60-62	1.8																		34																								
	62-64	1.75			57	22	35	100	99	90	85		76	1	23			76	CH	37																								
	64-66	1.7																		45																								
	66-68	1.5																		54	68					0.71	54	68	CH**															
	68-70	2.1																		48																								
	70-72	2.0																		50	73																							
	72-74	1.7			105	28	77				1																																	

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014 Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B 1001 8'-10' Contract No.: W912HY-13-D-0001, DY08

Description: Fill So G.L. lean clay w/ CLRTS, SLRTS & Say Sil cl sm

Pan No. & Weight: CK-1 | 108.55 Wet Sample + Pan Weight: 202.67

Dry Sample + Pan Weight: 176.09 Dry Sample Weight: 67.54

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0		
No. 4	1.50		
No. 10	2.72		
No. 40	3.40		
No. 200	10.06		

Prepared By: ch Date: 2-14-14 Tested By: RE Date: 2-18

Computed By: Date: Checked By: Date:

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 30 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B1001/26-28 Contract No.: W912HY-13-D-0001, DY08

Description: _____

Pan No. & Weight : V2 / 49.73 Wet Sample + Pan Weight : 198.82

Dry Sample + Pan Weight: 169.43 Dry Sample Weight: 119.70

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0		
No. 4	1.20		
No. 10	1.48		
No. 40	6.71		
No. 200	76.77		

Prepared By: Rodrigo Date: 1/30

Tested By: RG Date: 2-19-14

Computed By: _____ Date: _____

Checked By: N Date: 2/19

ENT 1/29/2014

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-1001 32-34 Contract No: W912HY-13-D-0001, DY08

Description: G & T band clay w/ siftings & some CLPTTS CL/CH

Pan No. & Weight: C10 30.42 Wet Sample + Pan Weight: 164.72

Dry Sample + Pan Weight: 137.11 Dry Sample Weight: 86.69

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0		
No. 10	0		
No. 40	0.03		
No. 200	0.97		

Prepared By: ch

Date: 1-22-14

Tested By: KC

Date: 1-27-14

Computed By:

Date:

Checked By: JF

Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014 Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13B1001 40-42 Contract No: W912HY-13-D-0001, DY08

Description: G Fat clay w/ silt CH

Pan No. & Weight: E1 149.18 Wet Sample + Pan Weight: 192.21

Dry Sample + Pan Weight: 152.01 Dry Sample Weight: 102.83

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0		
No. 10	0		
No. 40	0.14		
No. 200	66.2		

Prepared By: ch Date: 1-22-14 Tested By: RC Date: 1-27-14
 Computed By: Date: Checked By: Y Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13B1001 44'-46' Contract No: W912HY-13-D-0001, DY08

Description: G Fat clay ct

Pan No. & Weight: CK-2 / 105.81 Wet Sample + Pan Weight: 185.76

Dry Sample + Pan Weight: 163.04 Dry Sample Weight: 57.23

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0		
No. 4	0		
No. 10	0		
No. 40	0		
No. 200	0.10		

Prepared By: ch

Date: 2-14-14

Tested By: RG

Date: 2-18

Computed By:

Date:

Checked By: BP

Date: 2/21

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 02-20-2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B100/62-64 Contract No: W912HY-13-D-0001, DY08

Description: G ft dry w/shell frag

Pan No. & Weight: N18/41.34 Wet Sample + Pan Weight: 139.99

Dry Sample + Pan Weight: 117.70 Dry Sample Weight: 76.36

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0		
No. 4	0.74		
No. 10	7.31		
No. 40	11.41		
No. 200	18.53		

Prepared By: Rodrigo Date: 2/20/14 Tested By: Rodrigo Date: 2/21/14

Computed By: _____ Date: _____ Checked By: [Signature] Date: 2/21/14

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014 Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13 B1001 72-74 Contract No.: W912HY-13-D-0001, DY08

Description: G Fair clay (CH)

Pan No. & Weight: V15 49.93 Wet Sample + Pan Weight: 133.51

Dry Sample + Pan Weight: 106.63 Dry Sample Weight: 56.70

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0		
No. 10	0.34		
No. 40	0.25		
No. 200	1.15		

Prepared By: ch Date: 1-22-14 Tested By: RG Date: 1-27-14
Computed By: Date: Checked By: JS Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014 Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13 B 1001 86-88 Contract No.: W912HY-13-D-0001, DY08

Description: 6 Fair clay w/ few s&gs cat

Pan No. & Weight: V19 49.77 Wet Sample + Pan Weight: 166.77

Dry Sample + Pan Weight: 136.25 Dry Sample Weight: 86.48

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0		
No. 10	0		
No. 40	0.02		
No. 200	4.12		

Prepared By: ch Date: 1-22-14 Tested By: RG Date: 1-22-14
 Computed By: Date: Checked By: Y Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 02 20-2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B 1001/94-96 Contract No: W912HY-13-D-0001, DY08

Description: G Sand

Pan No. & Weight : 1E / 41.94 Wet Sample + Pan Weight : 196.53

Dry Sample + Pan Weight: 170.05 Dry Sample Weight: 128.11

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0		
No. 4	0		
No. 10	0		
No. 40	0.84		
No. 200	114.54		

Prepared By: Rodriguez Date: 2/20/14 Tested By: Rodriguez Date: 2/21/14
 Computed By: _____ Date: _____ Checked By: [Signature] Date: 2/21

ENT //

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 Depth 2-4

Date: 1-17-2014

Material Description:

cat BRN fat clay

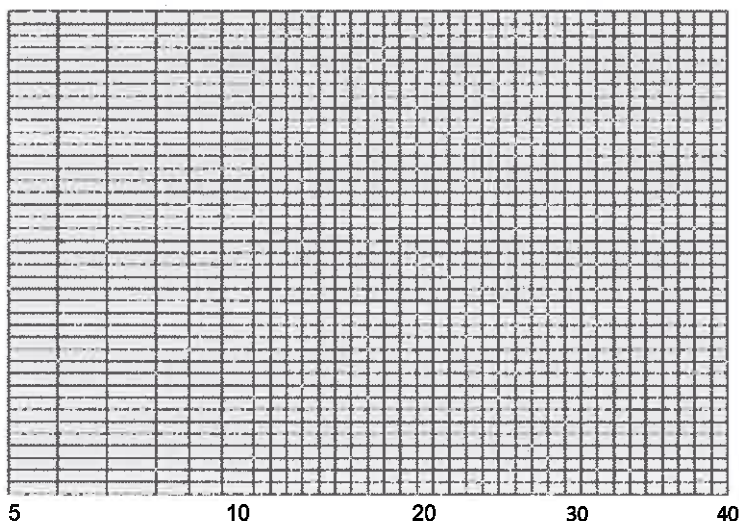
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	813	832	PP			
Weight in grams	Tare + Wet Soil	30.85	30.07	32.07		
	Tare + Dry Soil	25.75	25.21	26.26		
	Water W _w					
	Tare	15.03	15.24	15.09		
	Dry Soil W _d					
Water Content W						
No. of Blows		34	26	15		

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. 626105
Scale MTE No. 87894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	111	106				
Weight in grams	Tare + Wet Soil	36.62	36.21			
	Tare + Dry Soil	35.35	34.99			
	Water W _w					
	Tare	29.31	29.24			
	Dry Soil W _d					
Water Content W						
Plastic Limit						

Remarks

Technician ch/sc

Computed by _____

Checked by _____

Date: 01-15-14

Date: _____

Che Date: _____

1107

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 **Depth** 8+10

Date: 2/20/2014

Material Description: Grey silty cl w s&pkts.

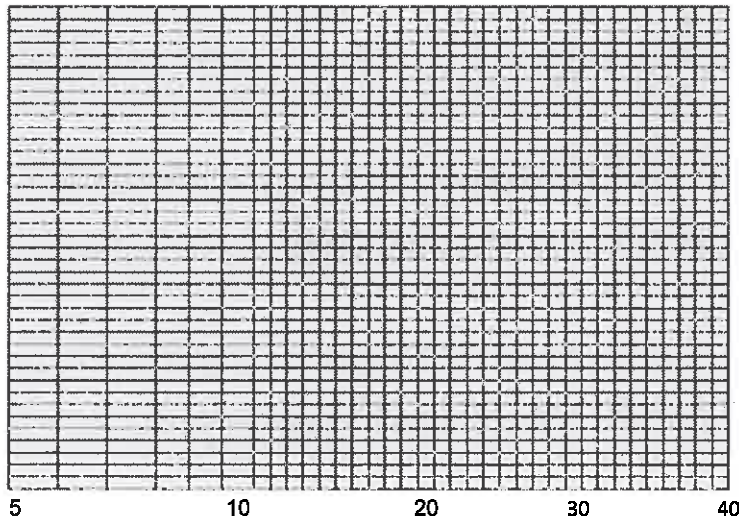
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	400A	502	910			
Weight in grams	Tare + Wet Soil	32.77	31.43	31.86		
	Tare + Dry Soil	29.37	28.13	28.23		
	Water W _w					
	Tare	15.12	15.07	15.20		
	Dry Soil W _d					
Water Content	W					
No. of Blows	35	25	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	4001	24				
Weight in grams	Tare + Wet Soil	22.62	22.14			
	Tare + Dry Soil	21.38	20.97			
	Water W _w					
	Tare	15.09	15.07			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by BP

Date: _____

Date: _____

Che Date: 2/21

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☐ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-100 **Depth 12-14**

Date: 2/5/2014

Material Description:

Light Grey fat clay

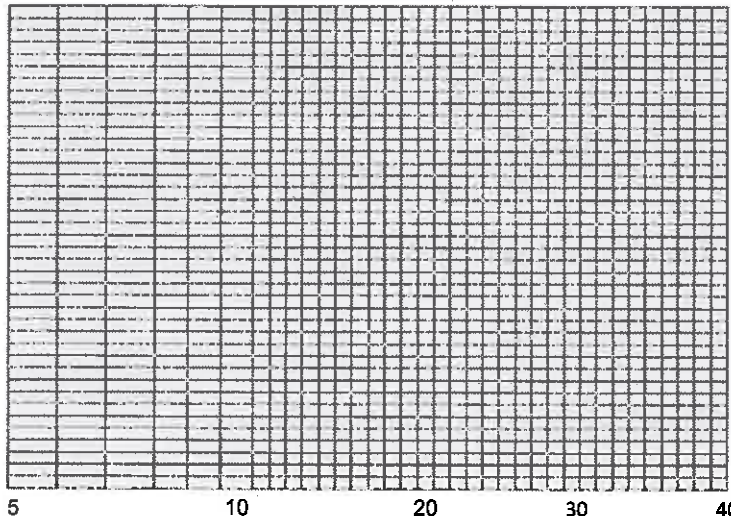
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	411	500	511			
Weight in grams	Tare + Wet Soil	32.76	32.71	32.39		
	Tare + Dry Soil	26.28	26.15	25.59		
	Water W _w					
	Tare	15.12	15.21	15.01		
	Dry Soil W _d					
Water Content	W					
No. of Blows	35	23	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	714	832				
Weight in grams	Tare + Wet Soil	22.22	22.58			
	Tare + Dry Soil	21.17	21.49			
	Water W _w					
	Tare	15.09	15.23			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by TBP

Date: _____

Date: _____

Che Date: 2/21

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 **Depth** 16-18

Date: 2/20/2014

Material Description: Lt Gray and tan lean clay

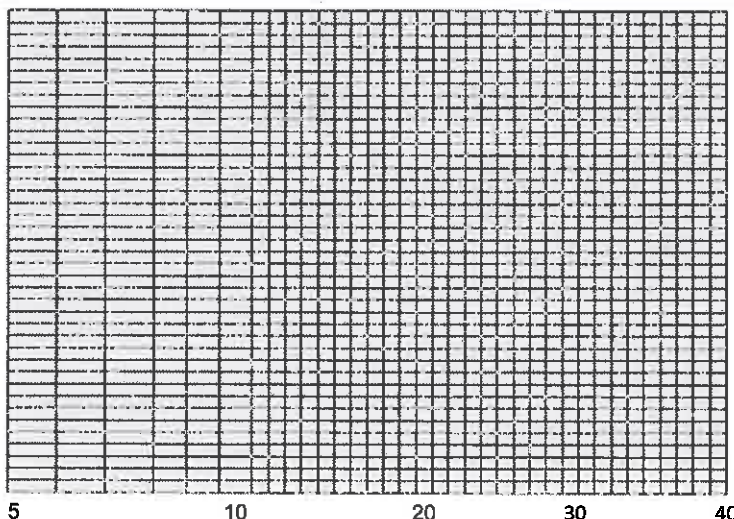
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	420	523	800			
Weight in grams	Tare + Wet Soil	33.44	30.68	32.64		
	Tare + Dry Soil	27.80	25.66	26.84		
	Water W _w					
	Tare	15.15	14.98	15.05		
	Dry Soil W _d					
Water Content	W					
No. of Blows	33	25	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105

Scale MTE No. B7854

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	813	830				
Weight in grams	Tare + Wet Soil	22.33	22.15			
	Tare + Dry Soil	21.25	21.10			
	Water W _w					
	Tare	15.03	15.19			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks _____

Technician JC

Computed by _____

Checked by JP

Date: _____

Date: _____

Che Date: 2/21

ENT/130/2014

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 Depth 32-34

Date: 1/23/2014

Material Description: G lean clay

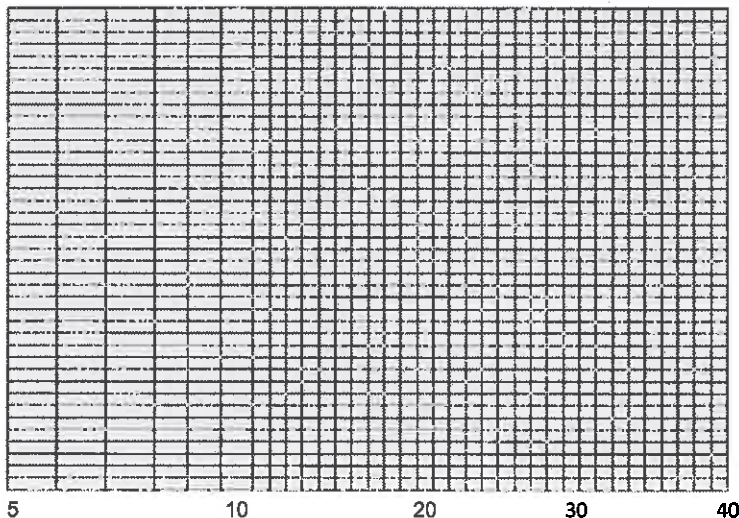
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	400A	522	820A			
Weight in grams	Tare + Wet Soil	31.10	29.81	30.39		
	Tare + Dry Soil	26.06	25.08	25.26		
	Water W _w					
	Tare	15.12	15.00	15.15		
	Dry Soil W _d					
Water Content W						
No. of Blows	34	27	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G-26105
Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	9001	2P				
Weight in grams	Tare + Wet Soil	22.65	22.72			
	Tare + Dry Soil	21.42	21.46			
	Water W _w					
	Tare	15.12	14.92			
	Dry Soil W _d					
Water Content W						
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by BP

Date: _____

Date: _____

Che Date: 2/21

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 **Depth** 36 - 38

Date: 1-17-2014

Material Description: CH Gray Fat clay

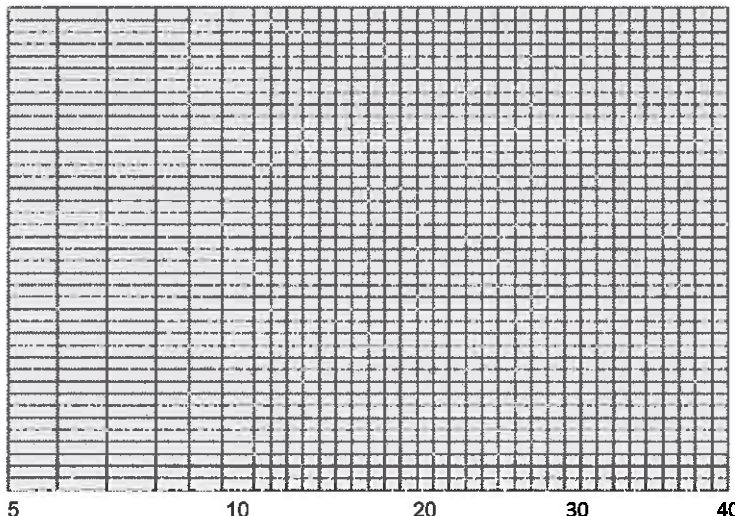
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	705	708	901			
Weight in grams	Tare + Wet Soil	31.59	32.34	32.08		
	Tare + Dry Soil	25.92	26.27	25.85		
	Water W _w					
	Tare	15.15	15.20	15.17		
	Dry Soil W _d					
Water Content	W					
No. of Blows	34	23	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	105	114				
Weight in grams	Tare + Wet Soil	37.08	36.93			
	Tare + Dry Soil	35.60	35.43			
	Water W _w					
	Tare	29.17	29.06			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician ch IC Computed by _____

Checked by 2 1/27
 Che Date: _____

Date: 01-16-14

Date: _____

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-¹⁰⁰¹ **Depth** 40-42

Date: 1/23/2014

Material Description:

Gray lean clay

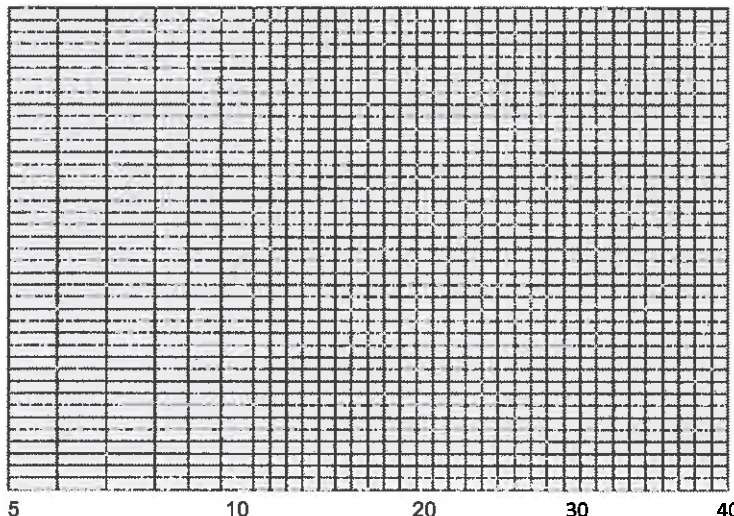
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	413	510	513			
Weight in grams	Tare + Wet Soil	29.16	31.15	31.72		
	Tare + Dry Soil	24.56	25.72	25.96		
	Water W _w					
	Tare	15.20	15.19	15.12		
	Dry Soil W _d					
Water Content	W					
No. of Blows	35	24	16			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	910	4P				
Weight in grams	Tare + Wet Soil	22.04	22.66			
	Tare + Dry Soil	20.97	21.43			
	Water W _w					
	Tare	15.20	14.82			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician TC

Computed by _____

Checked by BP

Date: _____

Date: _____

Che Date: 201

ENT 2/19/2014

Terracon Consultants, Inc.

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DYO8

Boring No: 13-1001 Depth 44-46

Date: 2/14/2014

Material Description: Gray fat clay

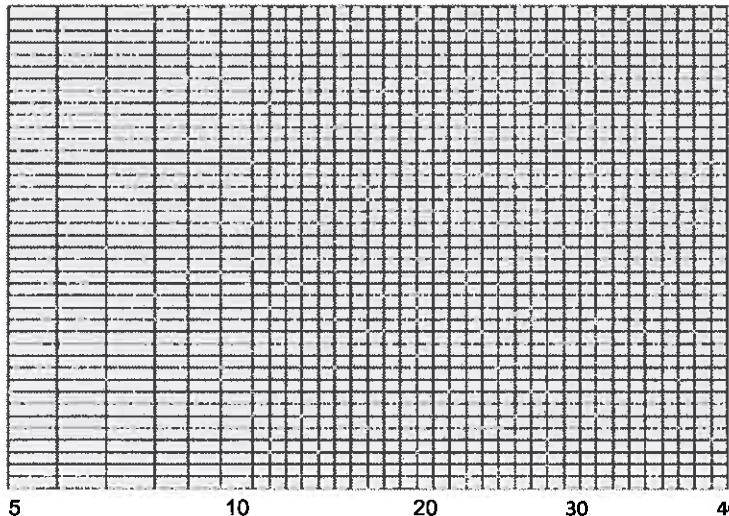
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	410	721	832			
Weight in grams	Tare + Wet Soil	29.28	31.34	31.68		
	Tare + Dry Soil	24.06	25.23	25.23		
	Water W _w					
	Tare	15.14	15.10	15.23		
	Dry Soil W _d					
Water Content	W					
No. of Blows		32	23	15		

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. B26105
Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	21	23				
Weight in grams	Tare + Wet Soil	22.28	23.32			
	Tare + Dry Soil	20.90	21.75			
	Water W _w					
	Tare	15.01	15.03			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by BZ

Date: _____

Date: _____

Che Date: 2/21

Terracon Consultants, Inc.

11555 Clay Road, Suite 100 Houston, TX 77043 P [713] 690 8989

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 **Depth 50-52**

Date: 2/20/2014

Material Description: Grey Fat clay

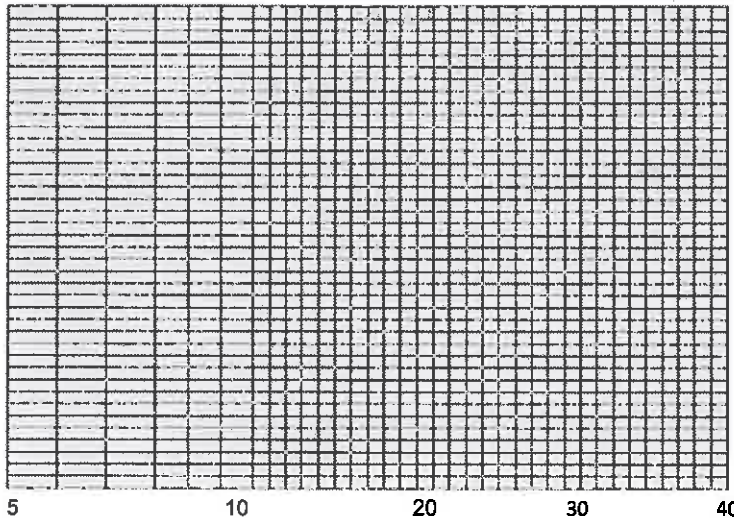
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	414	517	807			
Weight in grams	Tare + Wet Soil	30.32	30.29	30.74		
	Tare + Dry Soil	23.51	23.35	23.30		
	Water W_w					
	Tare	15.15	15.13	14.96		
	Dry Soil W_d					
Water Content	W					
No. of Blows	35	26	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. 626105
Scale MTE No. 157894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	89	29				
Weight in grams	Tare + Wet Soil	22.07	22.46			
	Tare + Dry Soil	20.66	20.93			
	Water W_w					
	Tare	15.06	14.86			
	Dry Soil W_d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by TJP

Date: _____

Date: _____

Che Date: 2/21

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 Depth 54-56

Date: 1-17-2014

Material Description: CH

Gray fat clay

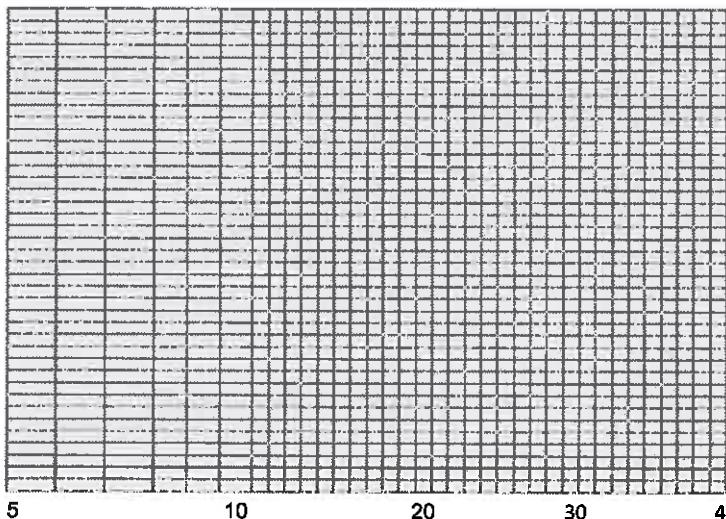
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	421	504	711			
Weight in grams	Tare + Wet Soil	31.78	30.02	29.50		
	Tare + Dry Soil	23.55	22.59	22.17		
	Water W _w					
	Tare	15.17	15.23	15.22		
	Dry Soil W _d					
Water Content	W					
No. of Blows	35	25	17			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B2894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	108	119				
Weight in grams	Tare + Wet Soil	36.89	37.20			
	Tare + Dry Soil	35.02	35.20			
	Water W _w					
	Tare	29.43	29.12			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician ch / JC Computed by

Checked by N 1/27

Date: 1-16-14

Date:

Che Date:

Terracon Consultants, Inc.
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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 1001 **Depth** 58-60

Date: 1-23-2014

Material Description:

Gray lean clay

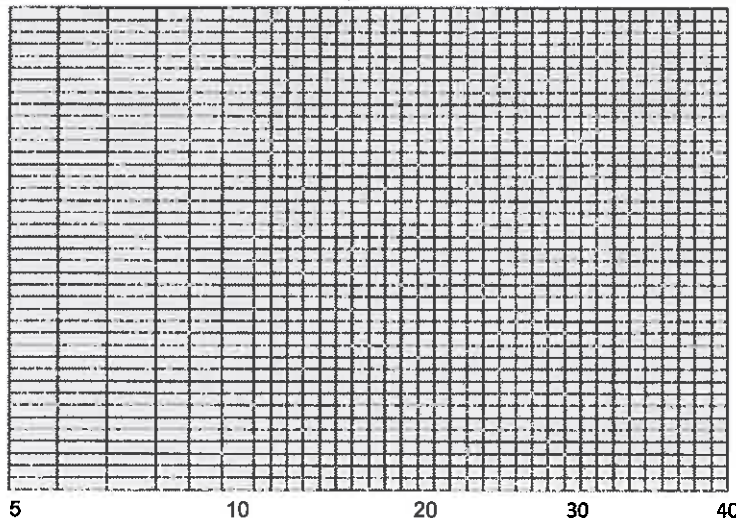
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	212	401	709			
Weight in grams	Tare + Wet Soil	29.02	30.82	31.21		
	Tare + Dry Soil	23.56	24.57	24.61		
	Water W _w					
	Tare	14.84	15.23	15.15		
	Dry Soil W _d					
Water Content W						
No. of Blows	35	26	17			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	824	907				
Weight in grams	Tare + Wet Soil	22.13	22.58			
	Tare + Dry Soil	20.92	21.34			
	Water W _w					
	Tare	15.03	15.18			
	Dry Soil W _d					
Water Content W						
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by TRP

Date: _____

Date: _____

Che Date: 2/21

Terracon Consultants, Inc.
11555 Clay Road, Suite 100 Houston, TX 77043 P [713] 690 8989

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 Depth 62.64

Date: 1-17-2014

Material Description: CH Gray Fat clay

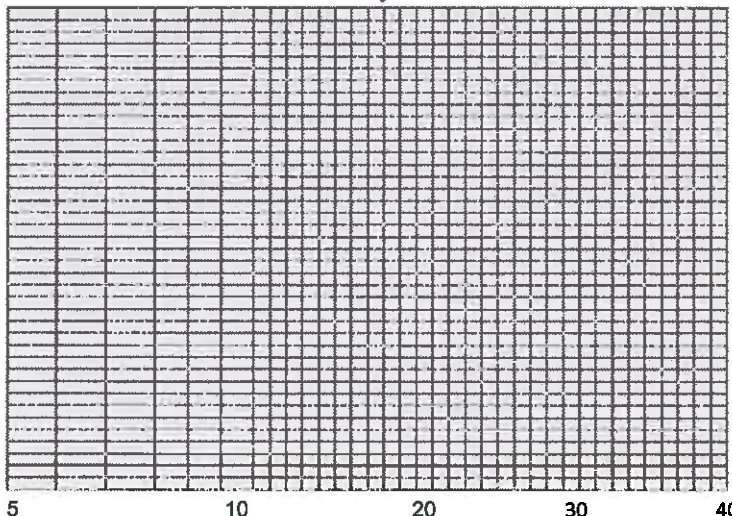
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	420	722	800			
Weight in grams	Tare + Wet Soil	32.39	32.60	31.03		
	Tare + Dry Soil	26.27	26.24	24.90		
	Water W _w					
	Tare	15.16	15.15	15.05		
	Dry Soil W _d					
Water Content W						
No. of Blows		33	24	15		

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	123	103				
Weight in grams	Tare + Wet Soil	37.00	37.10			
	Tare + Dry Soil	35.60	35.68			
	Water W _w					
	Tare	29.21	29.16			
	Dry Soil W _d					
Water Content W						
Plastic Limit						

Remarks _____
Technician CH SC **Computed by** _____ **Checked by** A/m
Date: 1-15-14 **Date:** _____ **Che Date:** _____

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13- ¹⁰⁰¹ **Depth** 72-74

Date: 1-23-2014

Material Description:

Grey fat clay

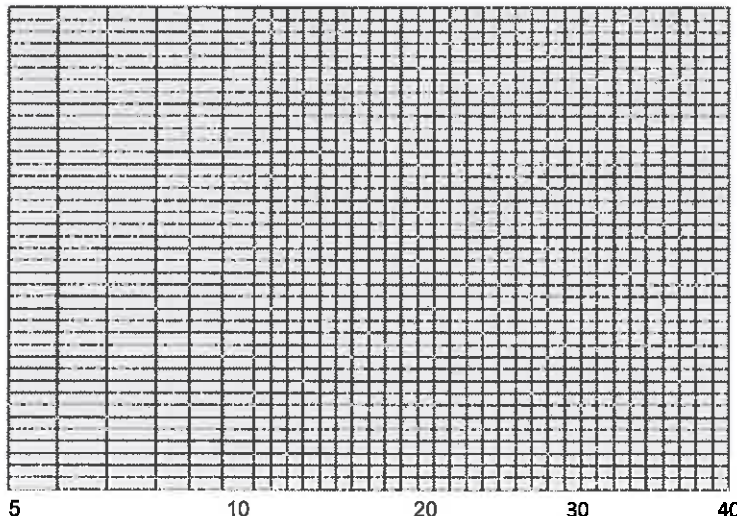
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	407	420	500			
Weight in grams	Tare + Wet Soil	29.83	29.44	30.38		
	Tare + Dry Soil	22.49	22.08	22.40		
	Water W _w					
	Tare	15.28	15.15	15.20		
	Dry Soil W _d					
Water Content	W					
No. of Blows	32	24	17			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	710	818				
Weight in grams	Tare + Wet Soil	22.76	22.20			
	Tare + Dry Soil	21.07	20.62			
	Water W _w					
	Tare	15.06	15.07			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician J.C. Computed by _____ Checked by TRP

Date: _____ Date: _____ Che Date: 2/21

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 Depth 78-80

Date: 1-22-2014

Material Description:

Gray fat clay

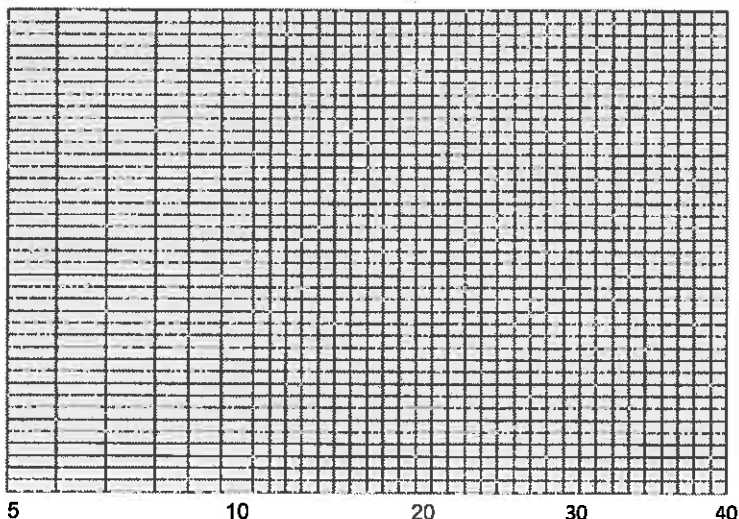
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	400A	401	410			
Weight in grams	Tare + Wet Soil	31.90	30.50	30.22		
	Tare + Dry Soil	24.74	23.88	23.59		
	Water W_w					
	Tare	15.13	15.24	15.14		
	Dry Soil W_d					
Water Content	W					
No. of Blows	33	26	18			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	807	910				
Weight in grams	Tare + Wet Soil	22.22	22.63			
	Tare + Dry Soil	20.74	21.14			
	Water W_w					
	Tare	14.96	15.22			
	Dry Soil W_d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by BP

Date: _____

Date: _____

Che Date: 2/21

Terracon Consultants, Inc.
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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

☒ ASTM D 4318 ☐ AASHTO T 89 & T 90 ☐ TEX 104, 105, & 106

Project: Port Arthur Resident Office - USACE

Project No. 92145005

USACE : Contract No. W912HY-13-D-0001-DY08

Boring No: 13-1001 **Depth** 86.88

Date: 1-23-2014

Material Description: Gray Fat clay

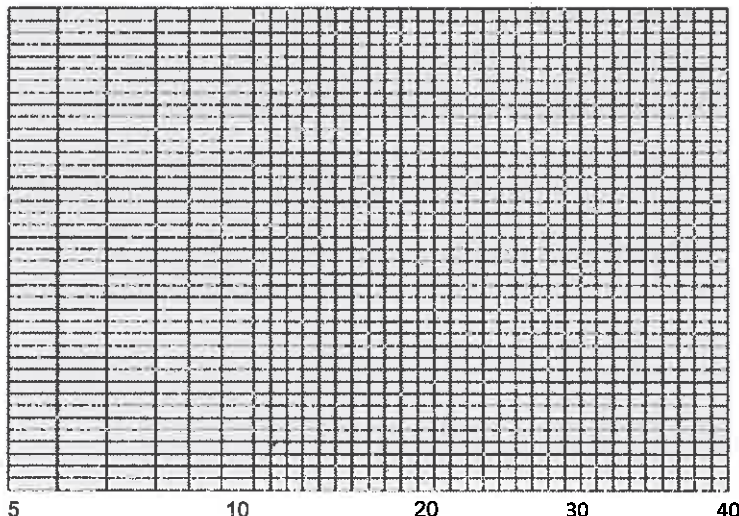
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	410	807	902			
Weight in grams	Tare + Wet Soil	30.75	29.20	29.93		
	Tare + Dry Soil	23.96	22.88	23.35		
	Water W _w					
	Tare	15.13	14.95	15.23		
	Dry Soil W _d					
Water Content	W					
No. of Blows	34	26	17			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	88	29				
Weight in grams	Tare + Wet Soil	22.09	22.55			
	Tare + Dry Soil	20.74	21.08			
	Water W _w					
	Tare	15.07	14.86			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks _____

Technician JC

Computed by _____

Checked by BP

Date: _____

Date: _____

Che Date: 2/21

TRIAxIAL TEST DATA SHEET

16

PROJECT & SAMPLE DATA

Project number: 92145005 Date: 1-24-2014

Client: QRI - USACE

Project: PORT ARTHUR RESIDENT OFFICE

Sample Location: 13-B-1001, 12-14

Sample Description: Gr+T, Pet el 4 cal & Fe

Type of Sample: (Undisturbed, Remolded, etc.)

Liquid Limit= Plastic Limit=

Remarks: Confining pressure ① 3

CONTRACT # W912HY-13-D-0001D408 ② 10.7

Fig no.: 2nd page Fig no. (if applicable):

TEST PROCEDURE OPTIONS

Test Type: ☐ UU ☐ CU ☐ CU w/pore pressures ☐ CD

Deformation Dial Constant:

Specimen parameter calculation method: ☐ ASTM method A ☐ ASTM method B

☐ ASTM B w/ Saturation Estimate ☐ CORPS uniform strain

☐ CORPS saturation assumed ☐ CORPS uniform strain w/saturation assumed

Staged test method: ☐ YES ☐ NO

SHEAR PROGRAM FILE NAME:

DESCRIPTION:

TRIAxIAL TEST DATA SHEET

SPECIMEN DATA

Project number: 92145005

Date: 1-24-2014

Test Specimen number: 13-B-1001
12-14

Tested by: MM / SAM

Sample Data

	Initial <u>302</u>	Final
Moist soil & tare	<u>163.60</u>	<u>214.52</u>
Dry soil and tare	<u>132.30</u>	<u>180.02</u>
Tare	<u>22.41</u>	<u>61.45</u> ²⁰³
Moisture content		

Saturation

Consolidation

Change in height
(Initial - final)

Change in water volume
(Initial - final)

Moist weight = 1171.68

Specific gravity = _____

Diameter @ top = 69.58 2.745

Diameter @ center = 69.78 2.755

Diameter @ bottom = 69.72 2.745 Average diameter = 2.765

Height 1 = 5.95

Height 2 = 5.95

Height 3 = 5.95

Height 4 = _____

Average height = 5.95

Wet density = _____

Dry density = _____

Saturation = _____

Void ratio = _____

Estimated final saturation = _____

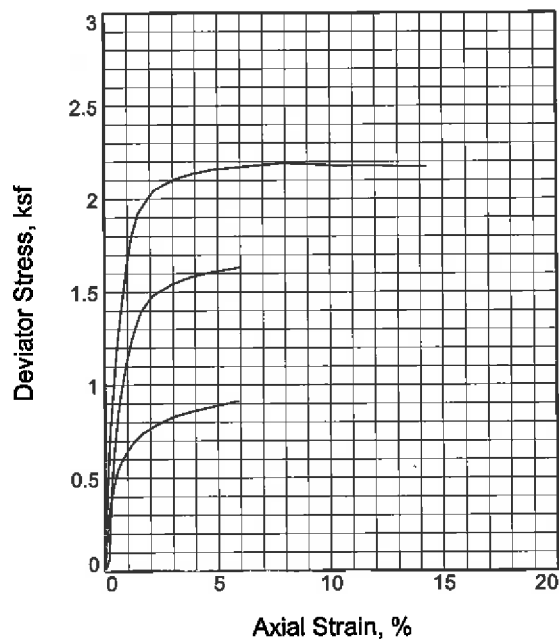
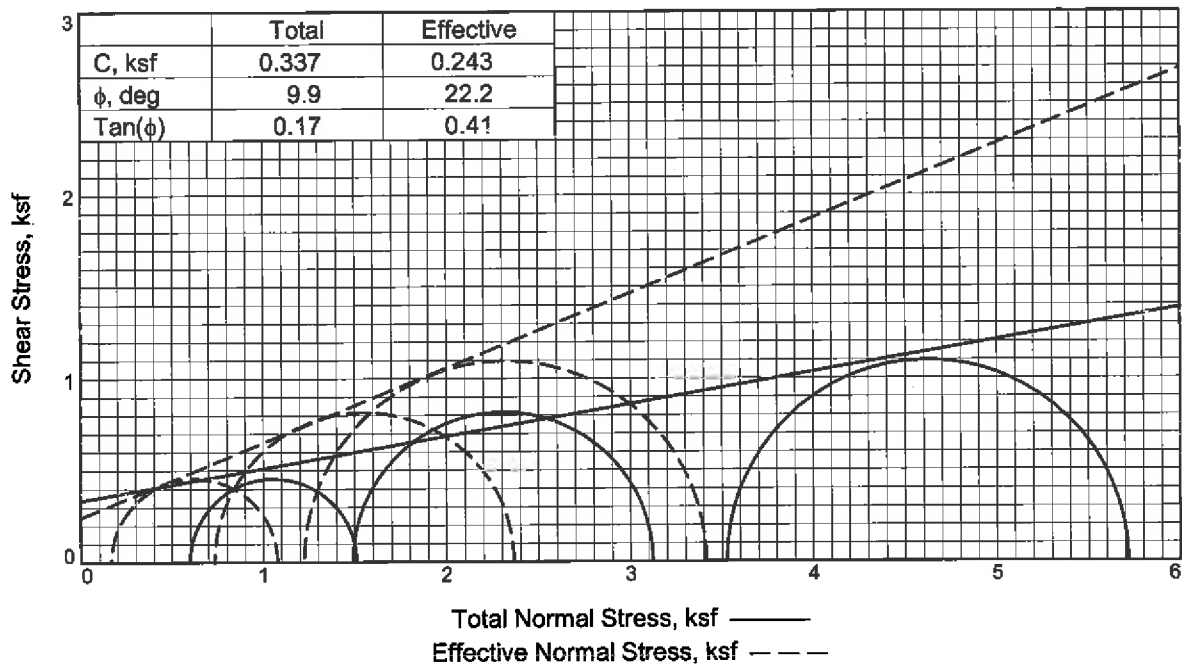


Shear _____

Bulge _____

Vertical Split _____

Project Name			Triaxial Board:			Technician				
Project No: 92-145.005			Boring No.: 1001-12-14			Depth 12-14				
Back Pressure Saturation						Consolidation				
Chamber Pressure	Back Pressure (psi)	Pore Pressure (psi)	Burette reading (cc)	Volume Change (cc)	"B" (Z)	Date	Clock Time	Elapsed Time (min.)	Burette Reading (cc)	Volume Change (cc)
10	8				60/70.7		60/63	24.0		
20	18		9.50	25	24.0		0.5	23.90		
30	28				13.15		1.0	23.70		
40	38		13.50		13.15		2.0	23.60		
50	48						4.0	23.55		
60	58	18.15			60/84.7		8	23.50		
		19.05			12.00		28	23.20		
		20.40			7.10		60	23.0		
		20.55			7.10		90	22.8		
		20.65			7.05		8.45	21.0		
		20.65					1.0	20.85		
1st Cell Pressure							20.8	20.70		
back Pressure							30.0	20.65		
1st Pore Pressure										
2nd Cell Pressure										
2nd Pore Pressure										
B value	4.82		1.02							
	4.70									
Remarks						Chamber Pressure		63 psi		
						Back Pressure		60 psi		
						Consolidation Pressure		3.0 psi		



Sample No.		1	2	3
Initial	Water Content, %	28.5	28.5	28.5
	Dry Density, pcf	97.2	97.2	97.2
	Saturation, %	100.4	100.4	100.4
	Void Ratio	0.7912	0.7912	0.7912
	Diameter, in.	2.765	2.765	2.765
	Height, in.	5.950	5.950	5.950
At Test	Water Content, %	28.4	28.4	28.4
	Dry Density, pcf	97.2	97.2	97.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7912	0.7912	0.7912
	Diameter, in.	2.765	2.765	2.765
	Height, in.	5.950	5.950	5.950
Strain rate, in./min.		0.000	0.000	0.000
Back Pressure, psi		60.000	60.000	60.000
Cell Pressure, psi		64.150	70.350	84.490
Fail. Stress, ksf		0.912	1.632	2.191
Excess Pore Pr., ksf		0.432	0.758	2.304
Ult. Stress, ksf				
Excess Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		1.078	2.365	3.414
$\bar{\sigma}_3$ Failure, ksf		0.165	0.733	1.223

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray and tan Fat Clay w/calcareous and ferrous nodules

Assumed Specific Gravity= 2.79

Remarks: ASTM D4767

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office

Location: 13-B1001

Sample Number: 7

Depth: 12-14 ft.

Proj. No.: 92145005

Date Sampled:

TRIAXIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

TRIAxIAL COMPRESSION TEST
CU with Pore Pressures

2/14/2014
11:50 AM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office
Project No.: 92145005
Location: 13-B1001
Depth: 12-14 ft. **Sample Number:** 7
Description: Gray and tan Fat Clay w/calcareous and ferrous nodules
Remarks: ASTM D4767
Type of Sample: Undisturbed
Assumed Specific Gravity=2.79 **LL**= **PL**= **PI**=
Test Method: COE uniform strain

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	163.600			214.520
Moisture content: Dry soil+tare, gms.	132.300			180.020
Moisture content: Tare, gms.	22.410			61.450
Moisture, %	28.5	28.4	28.4	29.1
Moist specimen weight, gms.	1171.68			
Diameter, in.	2.765	2.765	2.765	
Area, in. ²	6.005	6.005	6.005	
Height, in.	5.950	5.950	5.950	
Net decrease in height, in.		0.000	0.000	
Wet density, pcf	124.9	124.8	124.8	
Dry density, pcf	97.2	97.2	97.2	
Void ratio	0.7912	0.7912	0.7912	
Saturation, %	100.4	100.0	100.0	

Test Readings for Specimen No. 1

Consolidation cell pressure = 64.150 psi (9.238 ksf)
Consolidation back pressure = 60.000 psi (8.640 ksf)
Consolidation effective confining stress = 0.598 ksf
Strain rate, in./min. = 0.000
Fail. Stress = 0.912 ksf at reading no. 18

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	9.238	9.238	1.00	0.000	9.238	0.000
1	0.0007	2.708	2.7	0.0	0.065	0.535	0.600	1.12	60.438	0.567	0.032
2	0.0036	6.279	6.3	0.1	0.150	0.472	0.623	1.32	60.870	0.548	0.075
3	0.0065	9.367	9.4	0.1	0.224	0.427	0.651	1.53	61.186	0.539	0.112
4	0.0094	11.971	12.0	0.2	0.287	0.389	0.675	1.74	61.450	0.532	0.143
5	0.0123	14.066	14.1	0.2	0.337	0.316	0.653	2.07	61.955	0.484	0.168
6	0.0167	16.280	16.3	0.3	0.389	0.344	0.734	2.13	61.759	0.539	0.195
7	0.0210	18.395	18.4	0.4	0.440	0.309	0.749	2.42	62.002	0.529	0.220
8	0.0268	20.609	20.6	0.5	0.492	0.119	0.611	5.14	63.325	0.365	0.246
9	0.0341	22.670	22.7	0.6	0.541	0.075	0.615	8.22	63.630	0.345	0.270
10	0.0443	24.926	24.9	0.7	0.593	0.054	0.647	12.05	63.777	0.350	0.297
11	0.0588	27.150	27.2	1.0	0.645	0.050	0.695	13.78	63.800	0.373	0.322
12	0.0762	29.374	29.4	1.3	0.695	0.047	0.742	15.85	63.825	0.395	0.348
13	0.0994	31.399	31.4	1.7	0.740	0.052	0.792	15.25	63.789	0.422	0.370
14	0.1342	33.499	33.5	2.3	0.785	0.065	0.850	13.10	63.699	0.457	0.393
15	0.1806	35.692	35.7	3.0	0.830	0.086	0.916	10.67	63.554	0.501	0.415
16	0.2328	37.264	37.3	3.9	0.859	0.116	0.975	8.41	63.346	0.545	0.429
17	0.2850	38.627	38.6	4.8	0.882	0.140	1.022	7.32	63.181	0.581	0.441
18	0.3488	40.403	40.4	5.9	0.912	0.165	1.078	6.51	63.001	0.622	0.456
19	0.3489	40.358	40.4	5.9	0.911	0.165	1.077	6.51	63.001	0.621	0.456

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	163.600			214.520
Moisture content: Dry soil+tare, gms.	132.300			180.020
Moisture content: Tare, gms.	22.410			61.450
Moisture, %	28.5	28.4	28.4	29.1
Moist specimen weight, gms.	1171.68			
Diameter, in.	2.765	2.765	2.765	
Area, in. ²	6.005	6.005	6.005	
Height, in.	5.950	5.950	5.950	
Net decrease in height, in.		0.000	0.000	
Wet density, pcf	124.9	124.8	124.8	
Dry density, pcf	97.2	97.2	97.2	
Void ratio	0.7912	0.7912	0.7912	
Saturation, %	100.4	100.0	100.0	

Test Readings for Specimen No. 2

Consolidation cell pressure = 70.350 psi (10.130 ksf)

Consolidation back pressure = 60.000 psi (8.640 ksf)

Consolidation effective confining stress = 1.490 ksf

Strain rate, in./min. = 0.000

Fail. Stress = 1.632 ksf at reading no. 20

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	10.130	10.130	1.00	0.000	10.130	0.000
1	0.0097	2.810	2.8	0.2	0.067	1.422	1.490	1.05	60.472	1.456	0.034
2	0.0126	9.451	9.5	0.2	0.226	1.301	1.527	1.17	61.315	1.414	0.113
3	0.0155	15.114	15.1	0.3	0.362	1.201	1.562	1.30	62.010	1.382	0.181
4	0.0184	19.434	19.4	0.3	0.465	1.140	1.605	1.41	62.434	1.372	0.232
5	0.0213	23.061	23.1	0.4	0.551	1.106	1.657	1.50	62.668	1.382	0.276
6	0.0256	27.461	27.5	0.4	0.656	1.021	1.677	1.64	63.257	1.349	0.328
7	0.0300	31.244	31.2	0.5	0.746	1.037	1.782	1.72	63.152	1.409	0.373
8	0.0358	35.560	35.6	0.6	0.848	0.935	1.783	1.91	63.854	1.359	0.424
9	0.0416	39.317	39.3	0.7	0.936	0.868	1.804	2.08	64.325	1.336	0.468
10	0.0488	43.106	43.1	0.8	1.025	0.822	1.847	2.25	64.641	1.335	0.513
11	0.0575	47.233	47.2	1.0	1.122	0.825	1.947	2.36	64.619	1.386	0.561
12	0.0677	51.173	51.2	1.1	1.213	0.726	1.939	2.67	65.308	1.333	0.607
13	0.0793	54.956	55.0	1.3	1.300	0.727	2.027	2.79	65.304	1.377	0.650
14	0.0967	59.105	59.1	1.6	1.394	0.707	2.102	2.97	65.437	1.405	0.697
15	0.1257	63.087	63.1	2.1	1.481	0.623	2.104	3.38	66.027	1.363	0.740
16	0.1779	66.327	66.3	3.0	1.543	0.690	2.233	3.24	65.561	1.461	0.772
17	0.2301	68.623	68.6	3.9	1.582	0.654	2.236	3.42	65.810	1.445	0.791
18	0.2823	70.310	70.3	4.7	1.606	0.721	2.327	3.23	65.342	1.524	0.803
19	0.3432	72.002	72.0	5.8	1.627	0.736	2.363	3.21	65.238	1.550	0.814
20	0.3577	72.416	72.4	6.0	1.632	0.733	2.365	3.23	65.263	1.549	0.816

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	163.600			214.520
Moisture content: Dry soil+tare, gms.	132.300			180.020
Moisture content: Tare, gms.	22.410			61.450
Moisture, %	28.5	28.4	28.4	29.1
Moist specimen weight, gms.	1171.68			
Diameter, in.	2.765	2.765	2.765	
Area, in. ²	6.005	6.005	6.005	
Height, in.	5.950	5.950	5.950	
Net decrease in height, in.		0.000	0.000	
Wet density, pcf	124.9	124.8	124.8	
Dry density, pcf	97.2	97.2	97.2	
Void ratio	0.7912	0.7912	0.7912	
Saturation, %	100.4	100.0	100.0	

Test Readings for Specimen No. 3

Consolidation cell pressure = 84.490 psi (12.167 ksf)

Consolidation back pressure = 60.000 psi (8.640 ksf)

Consolidation effective confining stress = 3.527 ksf

Strain rate, in./min. = 0.000

Fail. Stress = 2.191 ksf at reading no. 20

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	12.167	12.167	1.00	0.000	12.167	0.000
1	0.0008	2.869	2.9	0.0	0.069	3.431	3.500	1.02	60.662	3.466	0.034
2	0.0037	11.707	11.7	0.1	0.281	3.040	3.320	1.09	63.382	3.180	0.140
3	0.0066	18.708	18.7	0.1	0.448	2.807	3.255	1.16	64.995	3.031	0.224
4	0.0109	26.085	26.1	0.2	0.624	2.604	3.228	1.24	66.410	2.916	0.312
5	0.0153	32.232	32.2	0.3	0.771	2.484	3.255	1.31	67.243	2.869	0.385
6	0.0211	39.015	39.0	0.4	0.932	2.258	3.191	1.41	68.806	2.725	0.466
7	0.0269	45.149	45.1	0.5	1.078	2.087	3.165	1.52	69.997	2.626	0.539
8	0.0342	51.880	51.9	0.6	1.237	1.952	3.189	1.63	70.933	2.571	0.619
9	0.0414	57.592	57.6	0.7	1.372	1.847	3.219	1.74	71.661	2.533	0.686
10	0.0487	62.974	63.0	0.8	1.498	1.798	3.296	1.83	72.006	2.547	0.749
11	0.0574	68.789	68.8	1.0	1.634	1.633	3.267	2.00	73.150	2.450	0.817
12	0.0704	75.699	75.7	1.2	1.794	1.517	3.311	2.18	73.955	2.414	0.897
13	0.0878	81.345	81.3	1.5	1.922	1.419	3.341	2.35	74.635	2.380	0.961
14	0.1284	87.171	87.2	2.2	2.045	1.372	3.417	2.49	74.963	2.395	1.023
15	0.1806	90.519	90.5	3.0	2.105	1.326	3.430	2.59	75.285	2.378	1.052
16	0.2328	92.687	92.7	3.9	2.136	1.256	3.391	2.70	75.771	2.323	1.068
17	0.2850	94.471	94.5	4.8	2.157	1.279	3.436	2.69	75.607	2.358	1.079
18	0.3488	96.077	96.1	5.9	2.169	1.298	3.467	2.67	75.479	2.382	1.085
19	0.4068	97.544	97.5	6.8	2.179	1.283	3.463	2.70	75.578	2.373	1.090
20	0.4648	99.101	99.1	7.8	2.191	1.223	3.414	2.79	75.998	2.318	1.095
21	0.5228	100.031	100.0	8.8	2.188	1.300	3.488	2.68	75.465	2.394	1.094
22	0.5808	100.778	100.8	9.8	2.181	1.293	3.474	2.69	75.512	2.383	1.090
23	0.6098	101.115	101.1	10.2	2.176	1.298	3.475	2.68	75.474	2.387	1.088
24	0.6678	102.351	102.4	11.2	2.179	1.308	3.487	2.67	75.409	2.397	1.090
25	0.7259	103.429	103.4	12.2	2.178	1.319	3.497	2.65	75.328	2.408	1.089
26	0.7839	104.283	104.3	13.2	2.171	1.335	3.506	2.63	75.221	2.421	1.086

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
27	0.8419	105.553	105.6	14.1	2.173	1.351	3.524	2.61	75.108	2.438	1.087
28	0.8504	105.715	105.7	14.3	2.173	1.299	3.472	2.67	75.469	2.386	1.086

DIRECT SHEAR TEST DATA SHEET

PROJECT DATA

Project number: 92145005 Date: 1-29-2014

Client: QRT - USACE

Project: PORT ARTHUR RESIDENT OFFICE

Sample Location: 13-B1001, 26-28'

Sample Description: Gray fine Sand

Type of Sample: (Undisturbed, Remolded, etc.) _____

Liquid Limit= _____ Plastic Limit= _____

Remarks: Normal loadings ① 3 psi

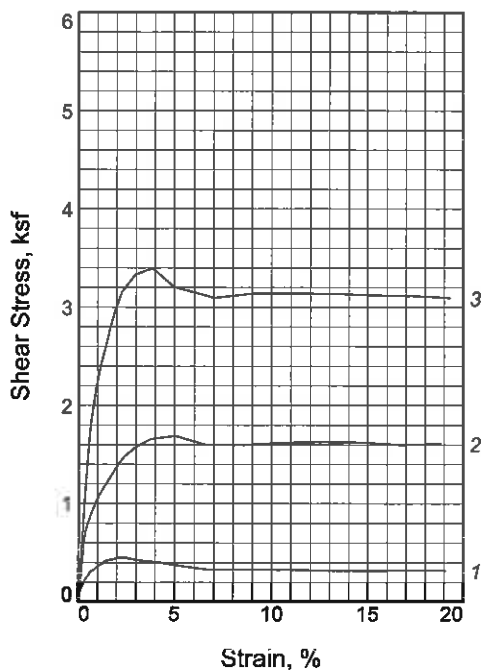
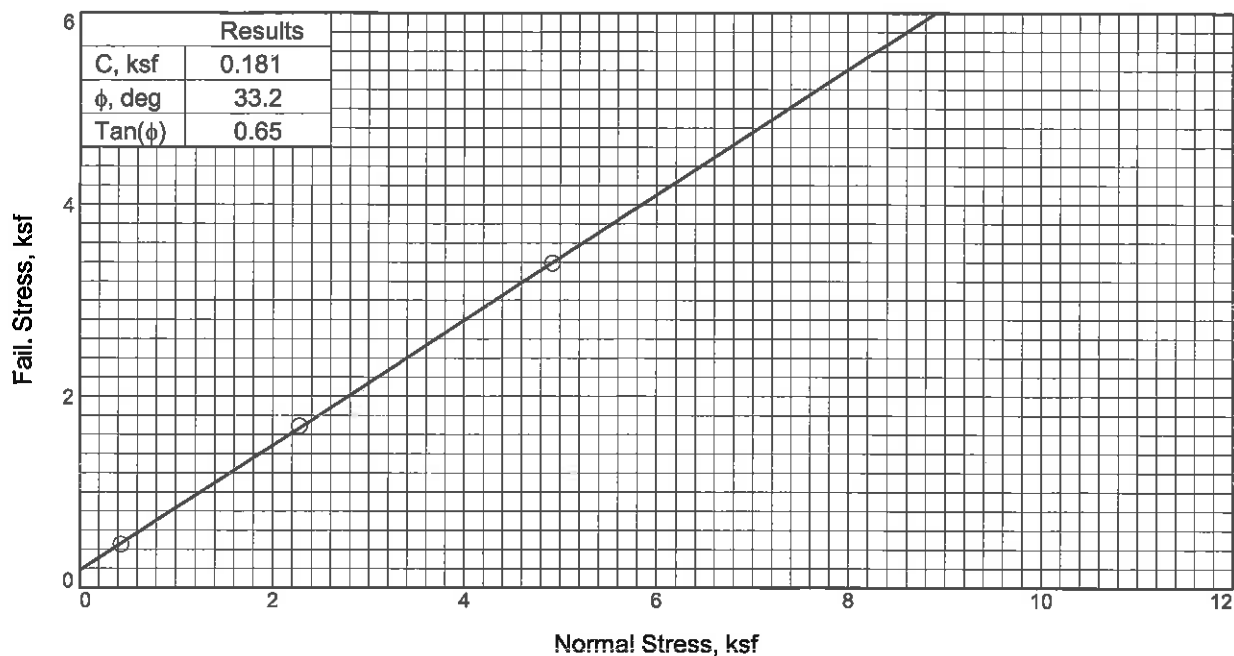
Contract # W912HY-13-D-0001 PY08 ② 15.8
③ 29.8

Strain Dial Constants, Horizontal: _____ Vertical: _____

SHEAR PROGRAM FILE NAME: _____

DESCRIPTION: _____

[illegible]



Sample No.		1	2	3
Initial	Water Content, %	24.0	24.0	24.0
	Dry Density, pcf	93.8	93.3	94.1
	Saturation, %	81.2	80.1	81.7
	Void Ratio	0.7967	0.8073	0.7915
	Diameter, in.	2.500	2.500	2.500
	Height, in.	1.000	1.000	1.000
At Test	Water Content, %	24.6	25.5	25.5
	Dry Density, pcf	93.8	93.3	94.1
	Saturation, %	83.2	85.3	87.0
	Void Ratio	0.7967	0.8073	0.7915
	Diameter, in.	2.500	2.500	2.500
	Height, in.	1.000	1.000	1.000
Normal Stress, ksf		0.432	2.275	4.922
Fail. Stress, ksf		0.452	1.687	3.390
Strain, %		2.2	5.0	3.9
Ult. Stress, ksf				
Strain, %				
Strain rate, in./min.		0.003	0.003	0.003

Sample Type: Laboratory molded
Description: Gray fine Sand

Assumed Specific Gravity= 2.70
Remarks: ASTM D3080

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office

Location: 13-B1001

Sample Number: 14

Depth: 26-28 ft.

Proj. No.: 92145005

Date Sampled:

DIRECT SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

DIRECT SHEAR TEST

2/14/2014

Date:**Client:** Quaternary Resource Investigations, L.L.C.**Project:** Port Arthur Resident Office**Project No.:** 92145005**Location:** 13-B1001**Depth:** 26-28 ft.**Sample Number:** 14**Description:** Gray fine Sand**Remarks:** ASTM D3080**Type of Sample:** Laboratory molded**Assumed Specific Gravity**=2.70**LL**=**PL**=**PI**=**Parameters for Specimen No. 1**

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	108.450		198.820
Moisture content: Dry soil+tare, gms.	93.480		169.430
Moisture content: Tare, gms.	31.010		49.730
Moisture, %	24.0	24.6	24.6
Moist specimen weight, gms.	149.85		
Diameter, in.	2.500	2.500	
Area, in. ²	4.909	4.909	
Height, in.	1.000	1.000	
Net decrease in height, in.		0.000	
Wet density, pcf	116.3	116.8	
Dry density, pcf	93.8	93.8	
Void ratio	0.7967	0.7967	
Saturation, %	81.2	83.2	

Test Readings for Specimen No. 1**Normal stress** = 0.432 ksf**Strain rate**, in./min. = 0.003**Fail. Stress** = 0.452 ksf at reading no. 17

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Strain %	Shear Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0000	0.381	0.4	0.0	0.011
2	0.0005	1.704	1.7	0.0	0.050
3	0.0010	2.577	2.6	0.0	0.076
4	0.0020	3.760	3.8	0.1	0.110
5	0.0035	5.029	5.0	0.1	0.148
6	0.0050	5.921	5.9	0.2	0.174
7	0.0075	7.044	7.0	0.3	0.207
8	0.0090	7.897	7.9	0.4	0.232
9	0.0111	8.763	8.8	0.4	0.257
10	0.0136	9.561	9.6	0.5	0.280
11	0.0156	10.499	10.5	0.6	0.308
12	0.0202	11.285	11.3	0.8	0.331
13	0.0237	12.116	12.1	0.9	0.355
14	0.0303	13.216	13.2	1.2	0.388

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Strain %	Shear Stress ksf
15	0.0348	14.217	14.2	1.4	0.417
16	0.0498	15.090	15.1	2.0	0.443
17	0.0543	15.412	15.4	2.2	0.452
18	0.0603	15.361	15.4	2.4	0.451
19	0.0738	14.568	14.6	3.0	0.427
20	0.1068	13.602	13.6	4.3	0.399
21	0.1249	12.827	12.8	5.0	0.376
22	0.1459	11.926	11.9	5.8	0.350
23	0.1699	11.149	11.1	6.8	0.327
24	0.2209	11.268	11.3	8.8	0.331
25	0.2720	11.153	11.2	10.9	0.327
26	0.3230	10.821	10.8	12.9	0.317
27	0.3741	10.859	10.9	15.0	0.319
28	0.4251	10.887	10.9	17.0	0.319
29	0.4762	10.991	11.0	19.0	0.322

Parameters for Specimen No. 2

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	108.450		192.370
Moisture content: Dry soil+tare, gms.	93.480		165.090
Moisture content: Tare, gms.	31.010		58.130
Moisture, %	24.0	25.5	25.5
Moist specimen weight, gms.	148.97		
Diameter, in.	2.500	2.500	
Area, in. ²	4.909	4.909	
Height, in.	1.000	1.000	
Net decrease in height, in.		0.000	
Wet density, pcf	115.6	117.1	
Dry density, pcf	93.3	93.3	
Void ratio	0.8073	0.8073	
Saturation, %	80.1	85.3	

Test Readings for Specimen No. 2

Normal stress = 2.2751 ksf

Strain rate, in./min. = 0.003

Fail. Stress = 1.687 ksf at reading no. 18

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Strain %	Shear Stress ksf
0	0.0000	-0.030	0.0	0.0	0.000
1	0.0005	0.055	0.1	0.0	0.002
2	0.0020	4.937	5.0	0.1	0.146
3	0.0030	9.255	9.3	0.1	0.272
4	0.0040	12.620	12.6	0.2	0.371
5	0.0055	16.748	16.8	0.2	0.492
6	0.0070	20.816	20.8	0.3	0.612
7	0.0096	24.202	24.2	0.4	0.711
8	0.0126	27.470	27.5	0.5	0.807
9	0.0167	30.472	30.5	0.7	0.895
10	0.0217	33.731	33.8	0.9	0.990
11	0.0273	37.195	37.2	1.1	1.092
12	0.0348	40.664	40.7	1.4	1.194
13	0.0423	43.588	43.6	1.7	1.280
14	0.0498	46.894	46.9	2.0	1.377
15	0.0603	50.508	50.5	2.4	1.483
16	0.0739	53.485	53.5	3.0	1.570
17	0.0934	56.376	56.4	3.7	1.655
18	0.1249	57.474	57.5	5.0	1.687
19	0.1279	57.407	57.4	5.1	1.685
20	0.1640	54.481	54.5	6.6	1.599
21	0.2150	54.348	54.4	8.6	1.595
22	0.2661	55.204	55.2	10.6	1.620
23	0.3171	55.436	55.5	12.7	1.627
24	0.3682	55.305	55.3	14.7	1.623
25	0.4192	54.391	54.4	16.8	1.596
26	0.4703	54.853	54.9	18.8	1.610

Parameters for Specimen No. 3

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	108.450		192.370
Moisture content: Dry soil+tare, gms.	93.480		165.090
Moisture content: Tare, gms.	31.010		58.130
Moisture, %	24.0	25.5	25.5
Moist specimen weight, gms.	150.28		
Diameter, in.	2.500	2.500	
Area, in. ²	4.909	4.909	
Height, in.	1.000	1.000	
Net decrease in height, in.		0.000	
Wet density, pcf	116.6	118.1	
Dry density, pcf	94.1	94.1	
Void ratio	0.7915	0.7915	
Saturation, %	81.7	87.0	

Test Readings for Specimen No. 3

Normal stress = 4.922 ksf

Strain rate, in./min. = 0.003

Fail. Stress = 3.390 ksf at reading no. 20

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Strain %	Shear Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0000	1.992	2.0	0.0	0.058
2	0.0020	9.387	9.4	0.1	0.275
3	0.0035	15.595	15.6	0.1	0.457
4	0.0055	23.120	23.1	0.2	0.678
5	0.0071	29.762	29.8	0.3	0.873
6	0.0086	36.141	36.1	0.3	1.060
7	0.0101	41.924	41.9	0.4	1.230
8	0.0121	49.054	49.1	0.5	1.439
9	0.0141	55.131	55.1	0.6	1.617
10	0.0167	61.998	62.0	0.7	1.819
11	0.0197	67.948	67.9	0.8	1.993
12	0.0232	73.949	73.9	0.9	2.169
13	0.0288	81.527	81.5	1.2	2.392
14	0.0348	88.014	88.0	1.4	2.582
15	0.0408	94.362	94.4	1.6	2.768
16	0.0483	101.280	101.3	1.9	2.971
17	0.0573	107.625	107.6	2.3	3.157
18	0.0738	113.445	113.4	3.0	3.328
19	0.0919	115.403	115.4	3.7	3.385
20	0.0979	115.559	115.6	3.9	3.390
21	0.1249	109.276	109.3	5.0	3.206
22	0.1760	105.427	105.4	7.0	3.093
23	0.2270	107.016	107.0	9.1	3.139
24	0.2781	107.061	107.1	11.1	3.141
25	0.3292	106.924	106.9	13.2	3.137
26	0.3802	106.326	106.3	15.2	3.119
27	0.4313	106.074	106.1	17.3	3.112
28	0.4823	105.483	105.5	19.3	3.094

ENT 1/29/2014

Moisture Content Tests (ASTM D2216)

Terracon

Date: 01 - 18 - 2014

Project No: 92145005

Project Name: Port Arthur Resident Office - USACE

Contract #W912HY-D-0001-DY08

Boring No.	Sample No	Depth (Ft.)	Torvane (tsf)	PPN (tsf)	Description of Material	Tare No.	Wet + Tare (g)	Dry + Tare (g)	Tare Wt. (g)	Water (g)	(%) Moisture
1001		0-2			Brown, Tan fat clay w/ Sand Rockets fill	T	249.76	211.61	59.32		
	P1	2-4			Brown fat clay w/ Sand Pockets, fc	S	196.19	168.96	61.90		
		4-6			Brown fat clay w/ fc, Sand Pockets	BAA	173.82	149.81	62.95		
		14-16			Grey Tan fat clay w/ fc	3A	215.73	182.74	60.57		
	P1	16-18									
		18-20			Tan, Brown lean clay w/ Silt Pockets	E	199.63	173.65	61.88		
		22-24			Tan, Brown lean clay w/ fc, Silt Pockets	HH	201.14	172.82	60.77		
		24-26			Brown Silty Sand	3H	194.58	168.37	58.11		
		28-30			Brown fat Silty clay	F	175.30	148.96	60.57		
		34-36			Gray, Brown fat clay w/ silt layers	N	182.40	151.68	57.82		
	P1	36-38			Gray fat clay w/ Silt Pockets w/ fc	3G	183.15	149.17	60.95		
		38-40			Gray fat Silty clay w/	AB	171.63	138.07	59.06		
		42-44			Gray fat clay w/ fc	200	197.10	147.31	58.55		
		46-48			Gray sub clay	3B	168.50	135.18	61.58		
	P1	50-52			Gray sub clay w/ fc	PMS	188.48	146.23	60.69		
		52-54			Gray fat clay	4B	160.82	128.61	61.16		

Technician:

Tested By:

Scale No.: ☐J350: ☐MTE B93: ☐B8449: ☐

Date: 01 - 18 - 2014 Reviewed By:

- 2014

Moisture Content Tests (ASTM D2216)

TerraconDate: 01 - 15 - 2014Project No: **92145005**Project Name: **Port Arthur Resident Office - USACE**Contract # **W912HY-D-0001-DY08**

Boring No.	Sample No	Depth (Ft.)	Torvane (tsf)	PPN (tsf)	Description of Material	Tare No.	Wet + Tare (g)	Dry + Tare (g)	Tare Wt. (g)	Water (g)	(%) Moisture
1001		56-58			Grey Fat Clay	BF	183.01	137.90	59.21		
		60-62			Grey Fat Clay w/ silt Pockets	B	173.49	144.47	58.16		
	P1 ABB	62-64			Grey Fat Clay w/ silt Pockets	N14	143.68	116.20	41.71		
		64-66			Grey Fat Clay w/ silt Pockets	20B	208.14	162.45	59.89		
		68-70			Grey Fat Clay	Q	178.04	139.89	60.61		
		74-76			Grey Fat Clay w/ Fe	O	172.32	136.33	58.88		
		76-78			Grey Fat Clay w/ Fe	J	186.95	144.97	58.47		
	P1	78-80			Grey Fat Clay w/ Fe silt Pockets	X	169.94	135.16	57.28		
		80-82			Grey Fat Clay w/ Fe	T	172.57	131.55	59.90		
		82-84			Grey Fat Clay w/ Fe	3D	184.88	149.19	59.52		
		84-86			Grey Fat Clay w/ Fe	RRR	175.61	142.62	62.22		
		88-90			Grey Fat Clay w/ Fe	3E	186.43	155.43	58.08		
	ABB	94-96			Grey Sand w/ clay Pockets	E19	200.13	174.18	50.21		
		98-100			Brown Grey Sand	L	187.47	165.36	58.64		

Technician: Scale No.: ☐J350: ☐MTE B93: ☐B8449: ☐Tested By: Date: 01 - 2014 Reviewed By:

- 2014

Terracon

Project No:92145005

Contract #W912HY-D-0001-DY08

13B1001

Rodrigo

Date: 01 20 -2014 Reviewed By: *[Signature]* *tlay*

B8449: ☐

- 2014

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. **92145005**

Material Description FTH L, T & C Fat Clay w/

Boring No.: **13- 1001**

cal, Fe & Crawfish hole CH

Depth (ft) 10.12

Sample Length (inch) 5.806 5.782 5.780 5.789

Cohesion (tsf)

Sample Diameter (inch) 2.715 2.730 2.706 2.717

Date of Test - 2013

Moist Weight (g) 1030.2 Ave

Contract No. W912HY-13-D-0001-DY06

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	



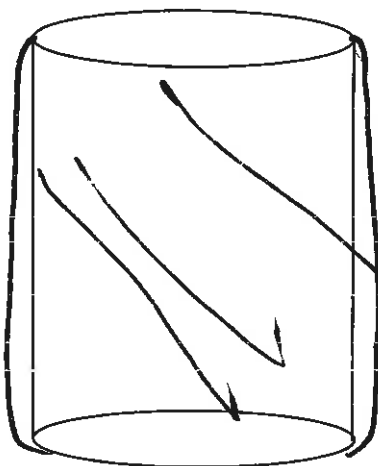
Unconfined

Moisture Content Determination	
Tare Number	<u>34</u>
Wet Soil + Tare (g)	<u>220.56</u>
Dry Soil + Tare (g)	<u>179.30</u>
Tare Weight (g)	<u>58.18</u>

Prepared By: ch Date: 01-22 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear 45°

Bulge /

Vertical Split

Tested By: SP 01- - 2014

Computed By: - - 2014

Machine: ☐ HM 2000 ☐ S 610

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. **92145005**

Material Description

*L.T. clay w/ Fe, some
cel nod. & Fat clay sm*

Boring No.: **13-1001**

Depth (ft) **20-22**

Sample Length (inch)

5.801 5.800 5.813 5.805

Cohesion (tsf)

Sample Diameter (inch)

2.755 2.750 2.760 2.753

Date of Test **-2013**

Moist Weight (g)

1151.0

Ave

Contract No. **W912HY-13-D-0001-DY06**

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

Unconfined

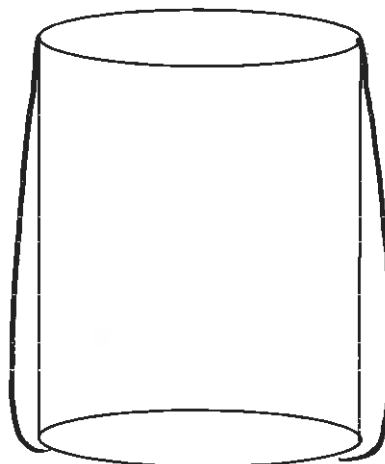
Moisture Content Determination	
Tare Number	D1
Wet Soil + Tare (g)	229.87
Dry Soil + Tare (g)	196.93
Tare Weight (g)	62.18

Prepared By: *chw*

Date: **01-22** -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear _____

Bulge */* _____

Vertical Split _____

Tested By: *SW* 01- -2014

Computed By: _____ -2014

Machine: ☐ HM 2000 ☐ S 610

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. 92145005

Material Description

Boring No.: 13-1001

Depth (ft) 32-34

Sample Length (inch)

Cohesion (tsf)

Sample Diameter (inch)

Date of Test -2013

Moist Weight (g)

Contract No. W912HY-13-D-0001-DY06

Caliper No.

☐ W10202

☐ W10203

☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

Unconfined

Moisture Content Determination

Tare Number	C10
Wet Soil + Tare (g)	164.72
Dry Soil + Tare (g)	137.11
Tare Weight (g)	50.42

Prepared By: CH

Date: 01-

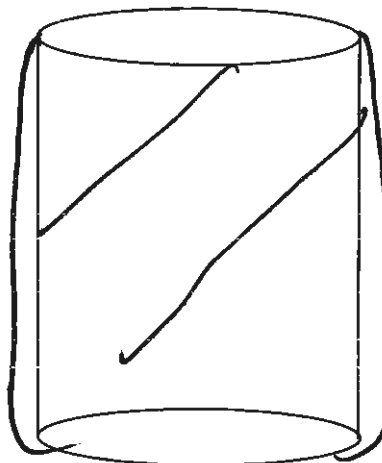
-2014

Scale No.: ☐ J350

☐ MTE B93

☐ B8449

Failed Sample Sketch



Shear

Bulge

Vertical

Split

Tested By: SK

01-

-2014

Computed By:

-

-2014

Machine: ☐ HM 2000

☐ S 610

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. 92145005

Material Description

G Fat Clay w/ silt
CH

Boring No.: 13-B1001

Depth (ft)

40-42

Sample Length (inch)

5.774

5.781

5.775

5.777

Cohesion (tsf)

Sample Diameter (inch)

2.765

2.785

2.795

2.780

Date of Test

-2013

Moist Weight (g)

100 1055.7

Ave

Contract No. W912HY-13-D-0001-DY06

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	



Unconfined

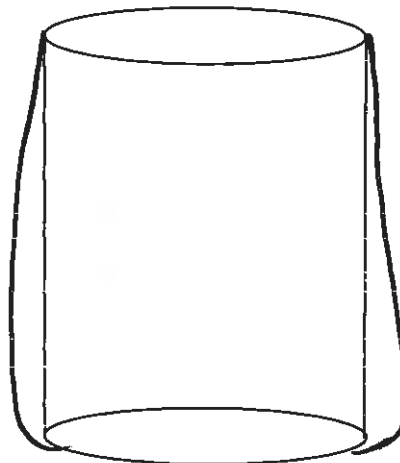
Moisture Content Determination	
Tare Number	E1
Wet Soil + Tare (g)	192.21
Dry Soil + Tare (g)	152.01
Tare Weight (g)	49.18

Prepared By:

Date: 01-22-2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

Bulge

Vertical

Split

Tested By:

01-2014

Computed By:

-2014

Machine: ☐ HM 2000 ☐ S 610

PF

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. **92145005**

Material Description

6 Fat clay CH

Boring No.: **13-B1001**

Depth (ft)

58-60

Sample Length (inch)

5.767

5.760

5.769

765

Cohesion (tsf)

Sample Diameter (inch)

2.675

2.680

2.701

2.685

Date of Test

- **-2013**

Moist Weight (g)

995.5

Ave

Contract No. **W912HY-13-D-0001-DY06**

Caliper No.

☐ W10202

☐ W10203

☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	



Unconfined

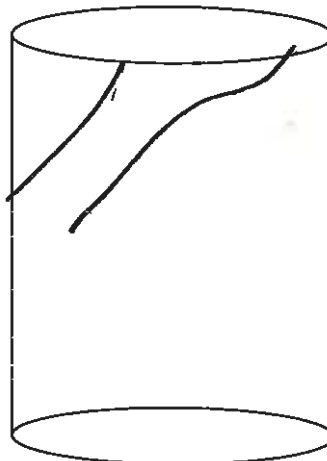
Moisture Content Determination	
Tare Number	<u>205</u>
Wet Soil + Tare (g)	<u>152.53</u>
Dry Soil + Tare (g)	<u>126.73</u>
Tare Weight (g)	<u>58.61</u>

Prepared By: UH

Date: 01-22 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

150'

Bulge

Vertical

Split

Tested By: SK

01- -2014

Computed By: _____

- -2014

Machine: ☐ HM 2000

☐ S 610

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. 92145005

Material Description G Fat Clay (CH)

Boring No.: 13-B1001

Depth (ft) 72-74

Sample Length (inch) 5.774 5.768 5.772 5.771

Cohesion (tsf)

Sample Diameter (inch) 2.745 2.755 2.755 2.752

Date of Test -2013

Moist Weight (g) 1003.3

Ave

Contract No. W912HY-13-D-0001-DY06

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

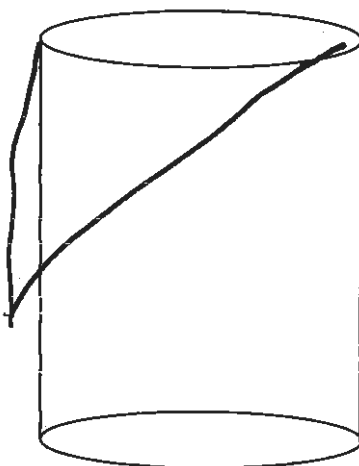
Unconfined

Moisture Content Determination	
Tare Number	41 V15
Wet Soil + Tare (g)	133.51
Dry Soil + Tare (g)	106.63
Tare Weight (g)	62.49.93

Prepared By: CH Date: 01-22-2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear 1/45

Bulge

Vertical

Split

Tested By: SA 01-2014

Computed By: 2014

Machine: ☐ HM 2000 ☐ S 610

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. **92145005**

Material Description

6 Foot clay

CH

Boring No.: **13-B1001**

Depth (ft)

86-88

Sample Length (inch)

5.752

5.743

5.756

5.750

Cohesion (tsf)

Sample Diameter (inch)

2.760

2.760

2.765

2.762

Date of Test

-2013

Moist Weight (g)

1046.5

Ave

Contract No. W912HY-13-D-0001-DY06

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	



Unconfined

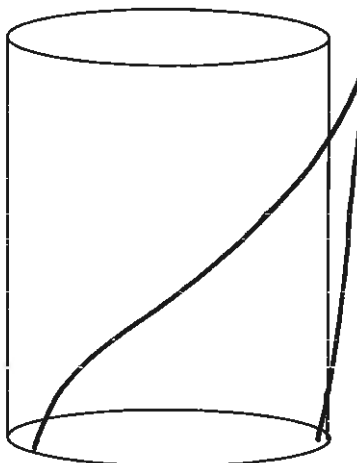
Moisture Content Determination	
Tare Number	<u>V19</u>
Wet Soil + Tare (g)	<u>166.77</u>
Dry Soil + Tare (g)	<u>136.25</u>
Tare Weight (g)	<u>49.77</u>

Prepared By: SW

Date: 01-22 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

145

Bulge

Vertical

Split

Tested By: SW

01- -2014

Computed By: _____

- -2014

Machine: ☐ HM 2000 ☐ S 610

Project: Port Arthur Resident Office - USACE
UNCONFINED COMPRESSION TEST (ASTM D2166)

Terracon

Job No. **92145005**

Material Description

⁶
Six clay sn sc-sm / cl-ml

Boring No.: **13-B1001**

Depth (ft)

92-94

Sample Length (inch)

5.747 5.755 5.756 5.753

Cohesion (tsf)

Sample Diameter (inch)

2.795 2.791 2.780 2.789

Date of Test

- **2013**

Moist Weight (g)

1186.3

Ave

Contract No. **W912HY-13-D-0001-DY06**

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204



Unconfined

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

Moisture Content Determination

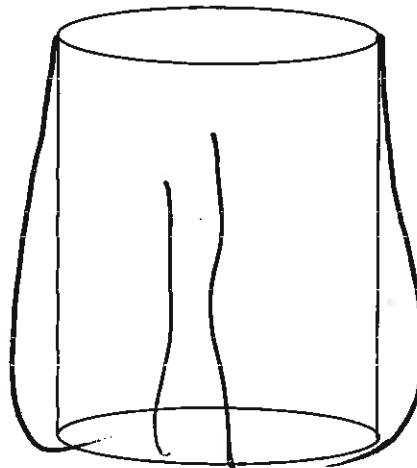
Tare Number	<u>U</u>
Wet Soil + Tare (g)	<u>201.60</u>
Dry Soil + Tare (g)	<u>174.83</u>
Tare Weight (g)	<u>61.70</u>

Prepared By: UW

Date: 01-23 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear _____

Bulge _____

Vertical Split _____

Tested By: SN

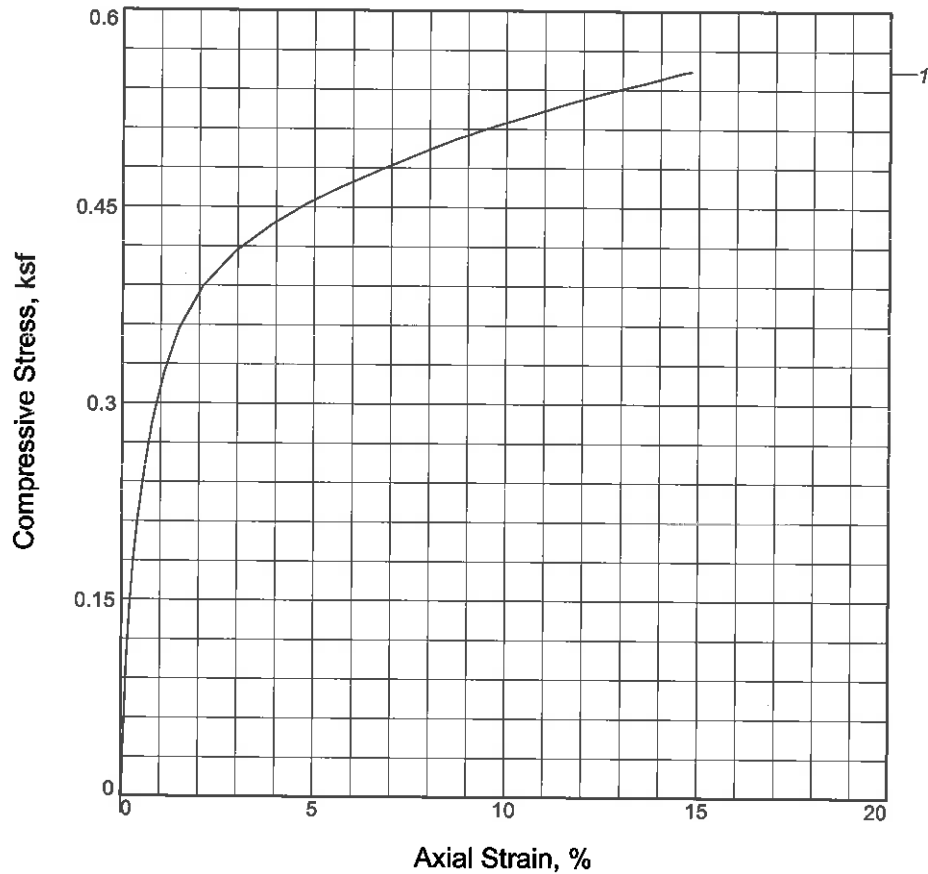
01- -2014

Computed By: _____

- -2014

Machine: ☐ HM 2000 ☐ S 610

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	0.554			
Undrained shear strength, ksf	0.277			
Failure strain, %	14.8			
Strain rate, in./min.	0.055			
Water content, %	34.1			
Wet density, pcf	116.9			
Dry density, pcf	87.2			
Saturation, %	96.7			
Void ratio	0.9683			
Specimen diameter, in.	2.717			
Specimen height, in.	5.789			
Height/diameter ratio	2.13			

Description: light gray and tan Fat Clay

LL =	PL =	PI =	Assumed GS= 2.75	Type: Undisturbed
------	------	------	------------------	-------------------

Project No.: 92145005

Date Sampled:

Remarks:

ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 6 **Depth:** 10-12 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office USACE
Project No.: 92145005
Location: 13-B1001
Depth: 10-12 ft. **Sample Number:** 6
Description: light gray and tan Fat Clay
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	220.560
Moisture content: Dry soil+tare, gms.	179.300
Moisture content: Tare, gms.	58.180
Moisture, %	34.1
Moist specimen weight, gms.	1030.20
Diameter, in.	2.717
Area, in. ²	5.798
Height, in.	5.789
Wet density, pcf	116.9
Dry density, pcf	87.2
Void ratio	0.9683
Saturation, %	96.7

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

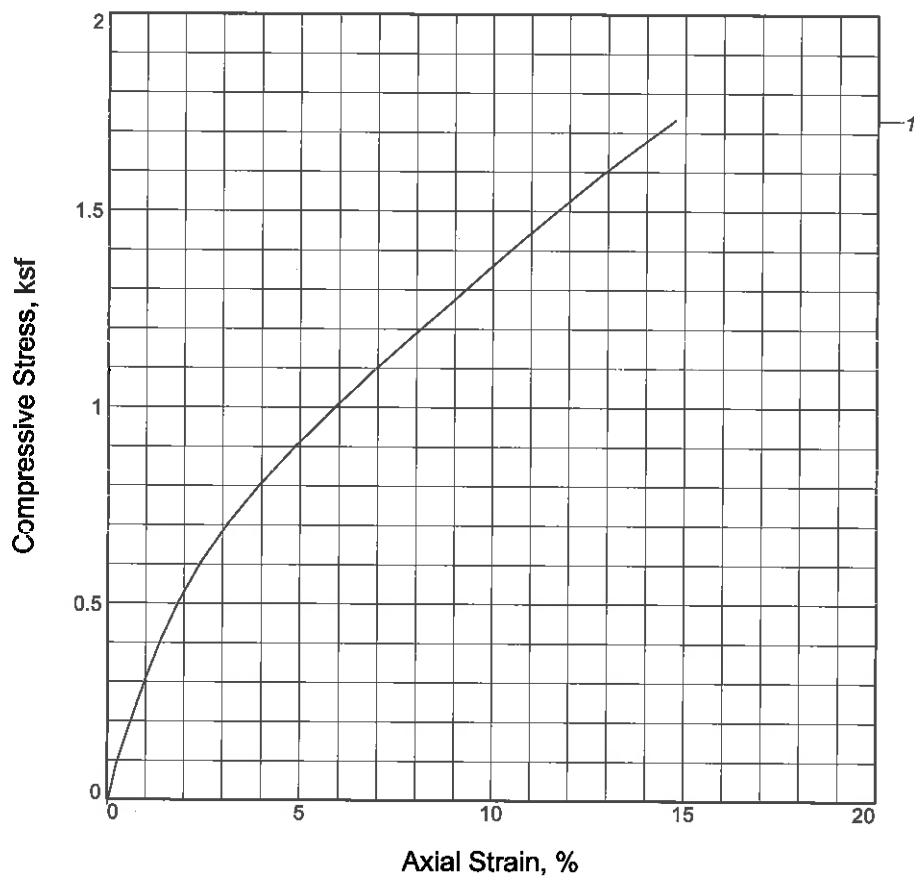
Unconfined compressive strength = 0.554 ksf at reading no. 26

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0000	-0.514	-0.5	0.0	-0.013
2	0.0026	1.200	1.2	0.0	0.030
3	0.0056	3.043	3.0	0.1	0.076
4	0.0081	4.397	4.4	0.1	0.109
5	0.0126	5.835	5.8	0.2	0.145
6	0.0181	7.311	7.3	0.3	0.181
7	0.0257	8.749	8.7	0.4	0.216
8	0.0342	10.147	10.1	0.6	0.251
9	0.0457	11.583	11.6	0.8	0.285
10	0.0632	13.162	13.2	1.1	0.323
11	0.0863	14.617	14.6	1.5	0.358
12	0.1209	16.014	16.0	2.1	0.389
13	0.1725	17.308	17.3	3.0	0.417
14	0.2242	18.270	18.3	3.9	0.436
15	0.2753	19.104	19.1	4.8	0.452
16	0.3300	19.869	19.9	5.7	0.465

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.3871	20.631	20.6	6.7	0.478
18	0.4437	21.377	21.4	7.7	0.490
19	0.5009	22.109	22.1	8.7	0.502
20	0.5581	22.785	22.8	9.6	0.511
21	0.6153	23.432	23.4	10.6	0.520
22	0.6724	24.121	24.1	11.6	0.529
23	0.7291	24.769	24.8	12.6	0.538
24	0.7862	25.380	25.4	13.6	0.545
25	0.8433	26.053	26.1	14.6	0.553
26	0.8563	26.177	26.2	14.8	0.554

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.731			
Undrained shear strength, ksf	0.866			
Failure strain, %	14.7			
Strain rate, in./min.	0.055			
Water content, %	24.4			
Wet density, pcf	126.7			
Dry density, pcf	101.8			
Saturation, %	98.0			
Void ratio	0.6861			
Specimen diameter, in.	2.755			
Specimen height, in.	5.805			
Height/diameter ratio	2.11			

Description: Light gray and tan Lean Clay w/calc. and ferrous nodules

LL = PL = PI = Assumed GS= 2.75 Type: Undisturbed

Project No.: 92145005

Date Sampled:

Remarks:

ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 11 **Depth:** 20-22 ft.

UNCONFINED COMPRESSION TEST

Terracon Consultants, Inc.

Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:**Client:** Quaternary Resource Investigations, L.L.C.**Project:** Port Arthur Resident Office USACE**Project No.:** 92145005**Location:** 13-B1001**Depth:** 20-22 ft. **Sample Number:** 11**Description:** Light gray and tan Lean Clay w/calc. and ferrous nodules**Remarks:** ASTM D2166**Type of Sample:** Undisturbed**Assumed Specific Gravity=**2.75**LL=****PL=****PI=****Parameters for Specimen No. 1**

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	229.870
Moisture content: Dry soil+tare, gms.	196.930
Moisture content: Tare, gms.	62.180
Moisture, %	24.4
Moist specimen weight, gms.	1151.00
Diameter, in.	2.755
Area, in.²	5.961
Height, in.	5.805
Wet density, pcf	126.7
Dry density, pcf	101.8
Void ratio	0.6861
Saturation, %	98.0

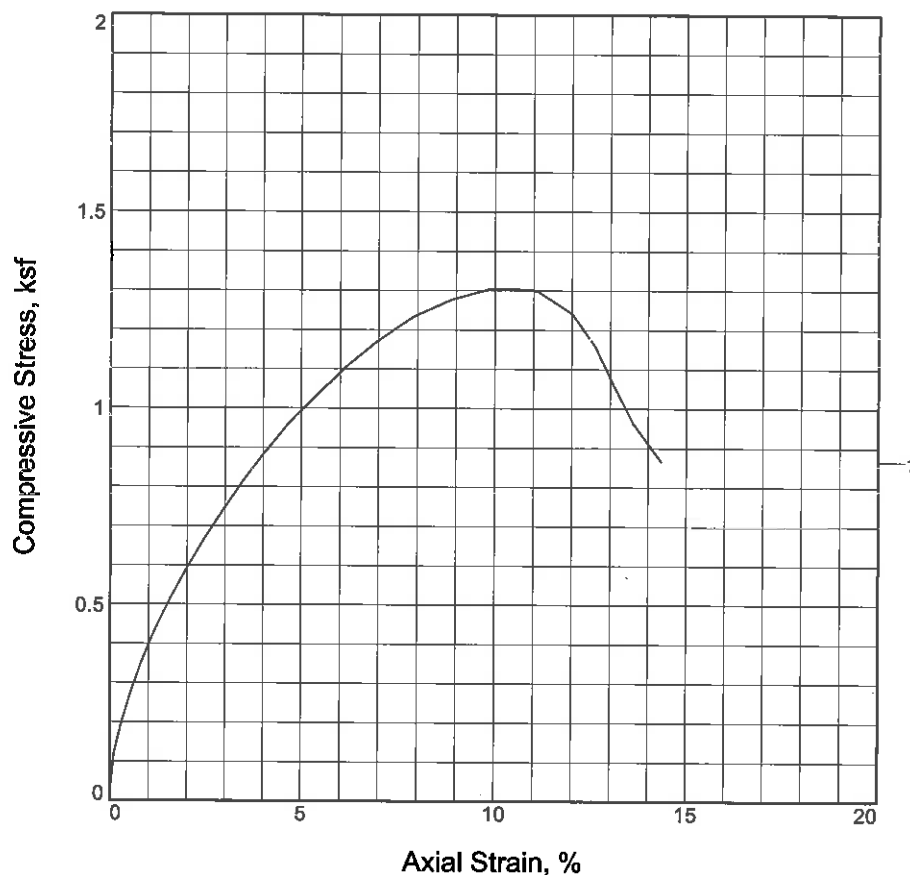
Test Readings for Specimen No. 1**Strain rate, in./min. =** 0.055**Unconfined compressive strength =** 1.731 ksf at reading no. 20

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0000	-0.514	-0.5	0.0	-0.012
2	0.0140	3.811	3.8	0.2	0.092
3	0.0345	8.064	8.1	0.6	0.194
4	0.0556	12.407	12.4	1.0	0.297
5	0.0803	16.919	16.9	1.4	0.403
6	0.1089	21.408	21.4	1.9	0.507
7	0.1431	25.848	25.8	2.5	0.609
8	0.1837	30.244	30.2	3.2	0.707
9	0.2294	34.575	34.6	4.0	0.802
10	0.2810	38.997	39.0	4.8	0.896
11	0.3437	44.109	44.1	5.9	1.002
12	0.4007	48.682	48.7	6.9	1.095
13	0.4578	53.046	53.0	7.9	1.180
14	0.5150	57.399	57.4	8.9	1.264
15	0.5722	61.903	61.9	9.9	1.348
16	0.6293	66.462	66.5	10.8	1.431

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.6864	70.944	70.9	11.8	1.511
18	0.7431	75.456	75.5	12.8	1.589
19	0.8003	79.856	79.9	13.8	1.663
20	0.8560	84.070	84.1	14.7	1.731

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, ksf	1.304		
Undrained shear strength, ksf	0.652		
Failure strain, %	9.9		
Strain rate, in./min.	0.055		
Water content, %	31.9		
Wet density, pcf	119.1		
Dry density, pcf	90.4		
Saturation, %	97.4		
Void ratio	0.9000		
Specimen diameter, in.	2.772		
Specimen height, in.	5.770		
Height/diameter ratio	2.08		

Description: Gray and tan Lean Clay w/sand pockets

LL = **PL =** **PI =** **Assumed GS= 2.75** **Type: Undisturbed**

Project No.: 92145005

Date Sampled:

Remarks:

ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 17 **Depth:** 32-34 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office USACE
Project No.: 92145005
Location: 13-B1001
Depth: 32-34 ft. **Sample Number:** 17
Description: Gray and tan Lean Clay w/sand pockets
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	164.720
Moisture content: Dry soil+tare, gms.	137.100
Moisture content: Tare, gms.	50.420
Moisture, %	31.9
Moist specimen weight, gms.	1089.10
Diameter, in.	2.772
Area, in. ²	6.035
Height, in.	5.770
Wet density, pcf	119.1
Dry density, pcf	90.4
Void ratio	0.9000
Saturation, %	97.4

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

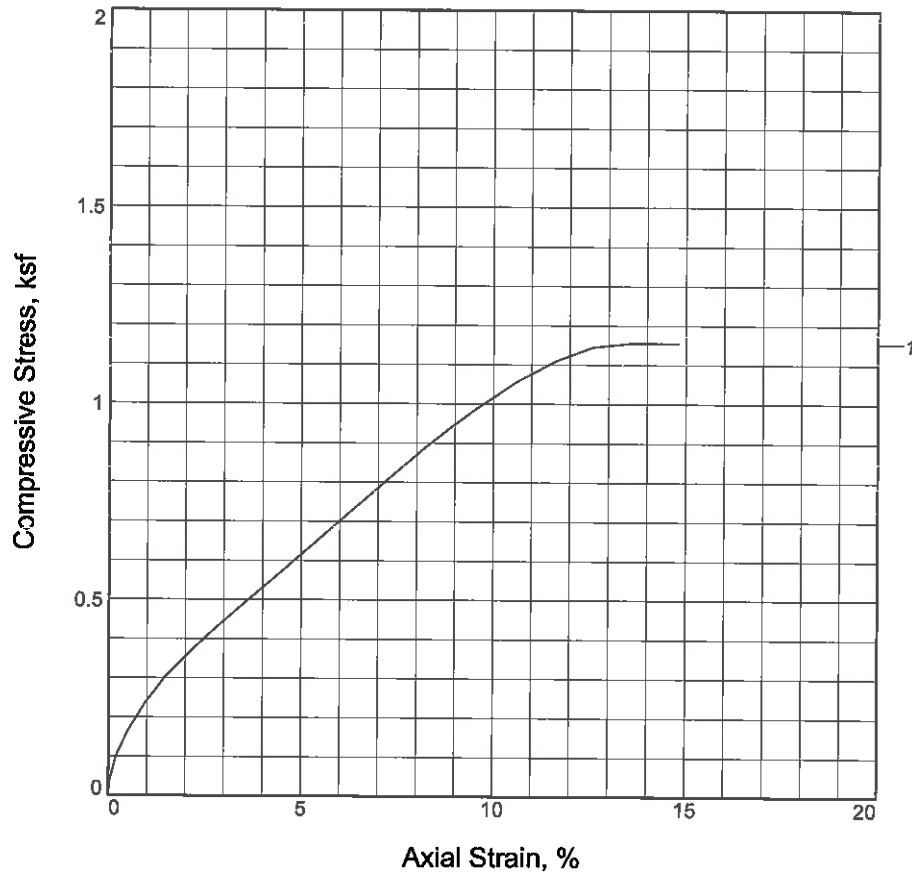
Unconfined compressive strength = 1.304 ksf at reading no. 19

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	-0.504	0.0	0.0	0.000
1	0.0013	1.150	1.7	0.0	0.039
2	0.0068	4.627	5.1	0.1	0.122
3	0.0184	8.024	8.5	0.3	0.203
4	0.0314	11.135	11.6	0.5	0.276
5	0.0470	14.363	14.9	0.8	0.352
6	0.0686	18.122	18.6	1.2	0.439
7	0.0916	21.625	22.1	1.6	0.520
8	0.1142	24.738	25.2	2.0	0.590
9	0.1428	28.310	28.8	2.5	0.671
10	0.1714	31.645	32.1	3.0	0.744
11	0.1999	34.849	35.4	3.5	0.814
12	0.2340	38.343	38.8	4.1	0.889
13	0.2686	41.684	42.2	4.7	0.960
14	0.3142	45.540	46.0	5.4	1.039
15	0.3570	48.987	49.5	6.2	1.108
16	0.3995	52.057	52.6	6.9	1.167

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.4567	55.664	56.2	7.9	1.234
18	0.5139	58.280	58.8	8.9	1.278
19	0.5711	60.165	60.7	9.9	1.304
20	0.6282	60.746	61.2	10.9	1.302
21	0.6423	60.655	61.2	11.1	1.297
22	0.6923	58.678	59.2	12.0	1.243
23	0.7279	54.980	55.5	12.6	1.157
24	0.7564	50.415	50.9	13.1	1.056
25	0.7849	46.188	46.7	13.6	0.963
26	0.8276	41.863	42.4	14.3	0.866

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.155			
Undrained shear strength, ksf	0.578			
Failure strain, %	14.6			
Strain rate, in./min.	0.055			
Water content, %	39.1			
Wet density, pcf	114.7			
Dry density, pcf	82.5			
Saturation, %	99.4			
Void ratio	1.0820			
Specimen diameter, in.	2.780			
Specimen height, in.	5.777			
Height/diameter ratio	2.08			

Description: Gray Fat Clay

LL =	PL =	PI =	Assumed GS= 2.75	Type: Undisturbed
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Project No.: 92145005

Date Sampled:

Remarks:
ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 21 **Depth:** 40-42 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office USACE
Project No.: 92145005
Location: 13-B1001
Depth: 40-42 ft. Sample Number: 21
Description: Gray Fat Clay
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 LL= PL= PI=

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	192.210
Moisture content: Dry soil+tare, gms.	152.010
Moisture content: Tare, gms.	49.180
Moisture, %	39.1
Moist specimen weight, gms.	1055.70
Diameter, in.	2.780
Area, in. ²	6.070
Height, in.	5.777
Wet density, pcf	114.7
Dry density, pcf	82.5
Void ratio	1.0820
Saturation, %	99.4

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

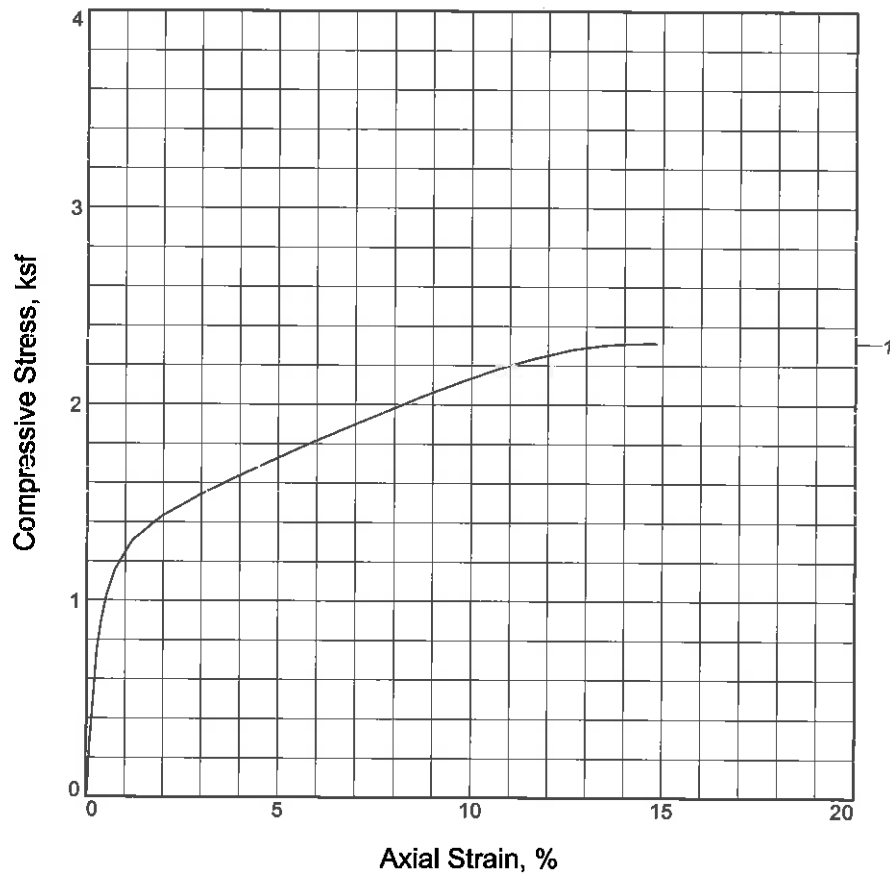
Unconfined compressive strength = 1.155 ksf at reading no. 21

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	-1.149	0.0	0.0	0.000
1	0.0014	0.255	1.4	0.0	0.033
2	0.0114	3.085	4.2	0.2	0.100
3	0.0299	5.900	7.0	0.5	0.166
4	0.0545	8.837	10.0	0.9	0.235
5	0.0855	11.801	12.9	1.5	0.303
6	0.1257	14.876	16.0	2.2	0.372
7	0.1653	17.684	18.8	2.9	0.434
8	0.2110	20.780	21.9	3.7	0.501
9	0.2571	23.927	25.1	4.5	0.568
10	0.2998	26.946	28.1	5.2	0.632
11	0.3424	30.001	31.1	5.9	0.695
12	0.3854	33.081	34.2	6.7	0.758
13	0.4280	36.211	37.4	7.4	0.821
14	0.4707	39.305	40.5	8.1	0.882
15	0.5138	42.318	43.5	8.9	0.939
16	0.5564	45.141	46.3	9.6	0.992

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.6136	48.696	49.8	10.6	1.057
18	0.6707	51.729	52.9	11.6	1.109
19	0.7278	54.087	55.2	12.6	1.145
20	0.7845	55.201	56.3	13.6	1.155
21	0.8416	55.859	57.0	14.6	1.155
22	0.8557	55.981	57.1	14.8	1.155
23	0.8557	55.980	57.1	14.8	1.155

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	2.314			
Undrained shear strength, ksf	1.157			
Failure strain, %	14.8			
Strain rate, in./min.	0.055			
Water content, %	37.9			
Wet density, pcf	116.2			
Dry density, pcf	84.3			
Saturation, %	100.4			
Void ratio	1.0373			
Specimen diameter, in.	2.685			
Specimen height, in.	5.765			
Height/diameter ratio	2.15			

Description: Gray Fat Clay

LL = **PL =** **PI =** **Assumed GS= 2.75** **Type: Undisturbed**

Project No.: 92145005

Date Sampled:

Remarks:

ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-1001

Sample Number: 30 **Depth:** 58-60 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:**Client:** Quaternary Resource Investigations, L.L.C.**Project:** Port Arthur Resident Office USACE**Project No.:** 92145005**Location:** 13-1001**Depth:** 58-60 ft.**Sample Number:** 30**Description:** Gray Fat Clay**Remarks:** ASTM D2166**Type of Sample:** Undisturbed**Assumed Specific Gravity=**2.75**LL=****PL=****PI=****Parameters for Specimen No. 1**

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	152.530
Moisture content: Dry soil+tare, gms.	126.730
Moisture content: Tare, gms.	58.610
Moisture, %	37.9
Moist specimen weight, gms.	995.50
Diameter, in.	2.685
Area, in.²	5.662
Height, in.	5.765
Wet density, pcf	116.2
Dry density, pcf	84.3
Void ratio	1.0373
Saturation, %	100.4

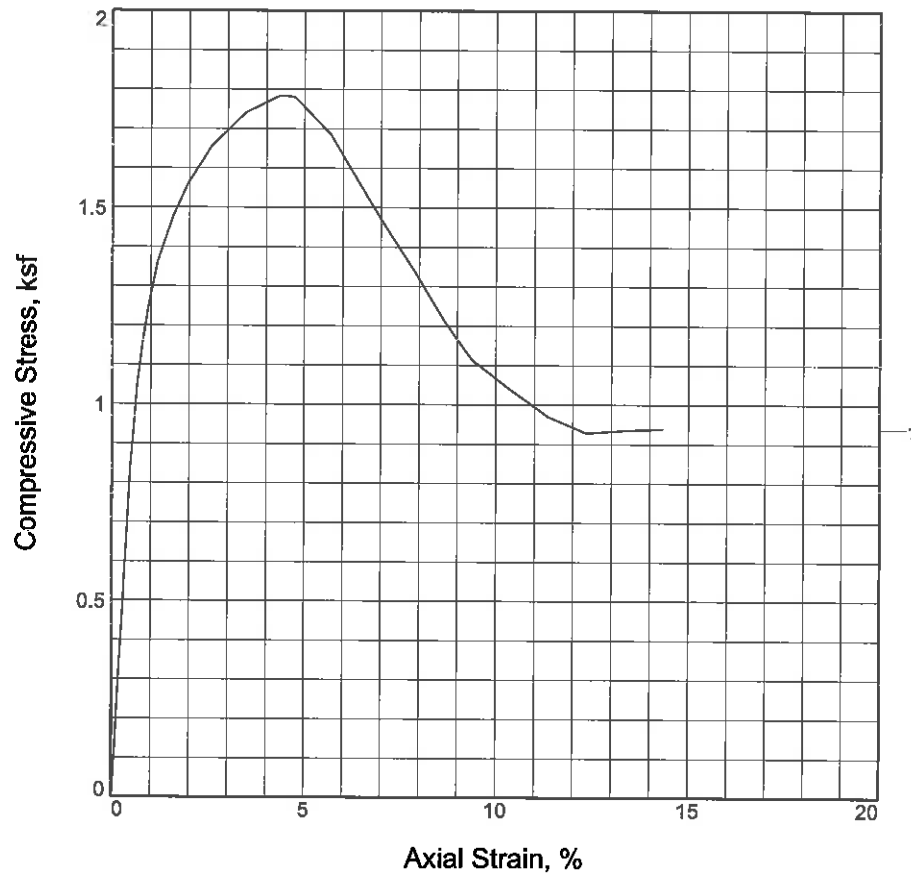
Test Readings for Specimen No. 1**Strain rate, in./min. =** 0.055**Unconfined compressive strength =** 2.314 ksf at reading no. 24

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.207	0.0	0.0	0.000
1	0.0013	2.078	1.9	0.0	0.048
2	0.0038	8.909	8.7	0.1	0.221
3	0.0068	14.681	14.5	0.1	0.368
4	0.0113	22.794	22.6	0.2	0.573
5	0.0153	29.506	29.3	0.3	0.743
6	0.0214	35.146	34.9	0.4	0.885
7	0.0299	40.871	40.7	0.5	1.029
8	0.0429	46.254	46.0	0.7	1.162
9	0.0684	52.218	52.0	1.2	1.307
10	0.1145	57.675	57.5	2.0	1.433
11	0.1661	62.189	62.0	2.9	1.531
12	0.2178	66.245	66.0	3.8	1.616
13	0.2694	70.249	70.0	4.7	1.698
14	0.3292	74.884	74.7	5.7	1.791
15	0.3863	79.227	79.0	6.7	1.875
16	0.4435	83.553	83.3	7.7	1.957

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.5007	87.927	87.7	8.7	2.037
18	0.5574	92.124	91.9	9.7	2.112
19	0.6144	96.108	95.9	10.7	2.179
20	0.6715	99.696	99.5	11.6	2.235
21	0.7286	102.870	102.7	12.6	2.281
22	0.7858	105.249	105.0	13.6	2.307
23	0.8428	106.728	106.5	14.6	2.313
24	0.8554	107.036	106.8	14.8	2.314

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.783			
Undrained shear strength, ksf	0.892			
Failure strain, %	4.3			
Strain rate, in./min.	0.055			
Water content, %	47.4			
Wet density, pcf	111.3			
Dry density, pcf	75.5			
Saturation, %	101.6			
Void ratio	1.2976			
Specimen diameter, in.	2.752			
Specimen height, in.	5.771			
Height/diameter ratio	2.10			

Description: Gray Fat Clay

LL = PL = PI = Assumed GS= 2.78 Type: Undisturbed

Project No.: 92145005

Date Sampled:

Remarks:
ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 37 **Depth:** 72-74 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office USACE
Project No.: 92145005
Location: 13-B1001
Depth: 72-74 ft. **Sample Number:** 37
Description: Gray Fat Clay
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.78 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	133.510
Moisture content: Dry soil+tare, gms.	106.630
Moisture content: Tare, gms.	49.930
Moisture, %	47.4
Moist specimen weight, gms.	1003.30
Diameter, in.	2.752
Area, in. ²	5.948
Height, in.	5.771
Wet density, pcf	111.3
Dry density, pcf	75.5
Void ratio	1.2976
Saturation, %	101.6

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

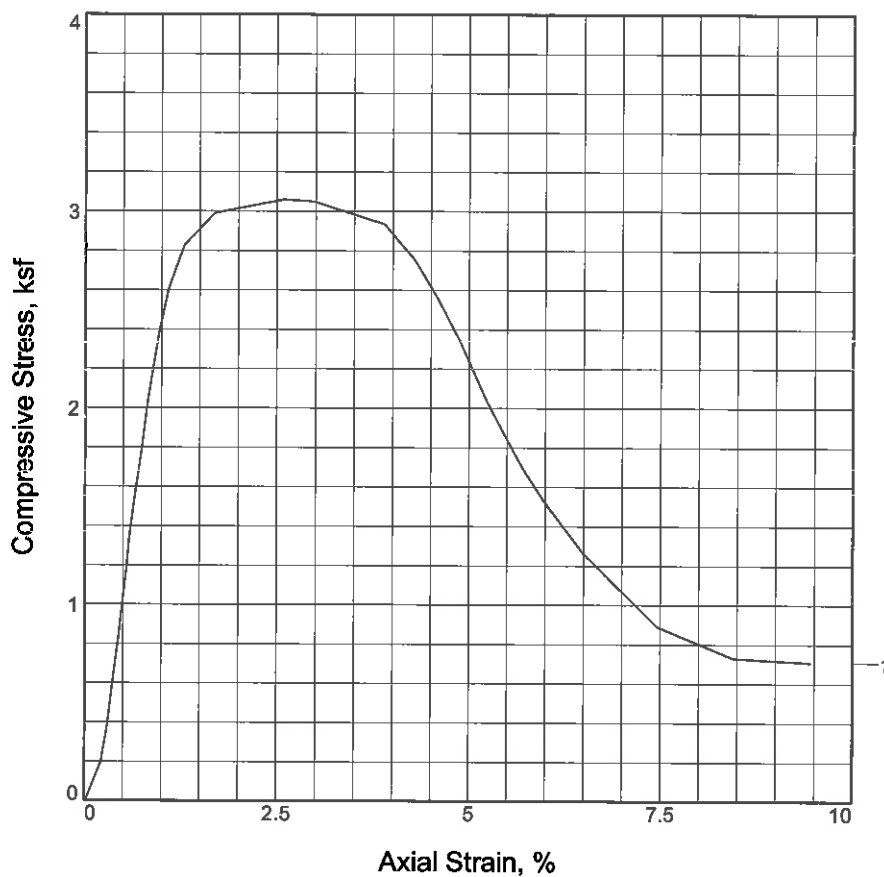
Unconfined compressive strength = 1.783 ksf at reading no. 18

No.	Def. Dial In.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	-0.563	0.0	0.0	0.000
1	0.0011	0.091	0.7	0.0	0.016
2	0.0041	4.190	4.8	0.1	0.115
3	0.0081	9.486	10.0	0.1	0.243
4	0.0127	15.005	15.6	0.2	0.376
5	0.0167	19.980	20.5	0.3	0.496
6	0.0197	24.067	24.6	0.3	0.594
7	0.0242	29.374	29.9	0.4	0.722
8	0.0282	34.254	34.8	0.5	0.839
9	0.0327	38.354	38.9	0.6	0.937
10	0.0382	42.954	43.5	0.7	1.047
11	0.0457	47.489	48.1	0.8	1.154
12	0.0542	51.391	52.0	0.9	1.246
13	0.0682	56.405	57.0	1.2	1.363
14	0.0913	61.421	62.0	1.6	1.477
15	0.1138	65.271	65.8	2.0	1.562
16	0.1484	69.622	70.2	2.6	1.655

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.1996	73.904	74.5	3.5	1.740
18	0.2506	76.441	77.0	4.3	1.783
19	0.2681	76.620	77.2	4.6	1.782
20	0.2737	76.571	77.1	4.7	1.779
21	0.3278	73.214	73.8	5.7	1.685
22	0.3709	68.361	68.9	6.4	1.561
23	0.4135	63.668	64.2	7.2	1.444
24	0.4562	59.274	59.8	7.9	1.334
25	0.4988	54.331	54.9	8.6	1.214
26	0.5415	50.200	50.8	9.4	1.114
27	0.5988	47.341	47.9	10.4	1.039
28	0.6559	44.619	45.2	11.4	0.969
29	0.7126	43.173	43.7	12.3	0.928
30	0.7698	43.989	44.6	13.3	0.935
31	0.8265	44.709	45.3	14.3	0.939

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, ksf	3.058		
Undrained shear strength, ksf	1.529		
Failure strain, %	2.6		
Strain rate, in./min.	0.055		
Water content, %	35.3		
Wet density, pcf	115.7		
Dry density, pcf	85.5		
Saturation, %	96.4		
Void ratio	1.0071		
Specimen diameter, in.	2.762		
Specimen height, in.	5.750		
Height/diameter ratio	2.08		

Description: Gray Fat Clay

LL = PL = PI = Assumed GS= 2.75 Type: Undisturbed

Project No.: 92145005

Date Sampled:

Remarks:

ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 44 **Depth:** 86-88 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office USACE
Project No.: 92145005
Location: 13-B1001
Depth: 86-88 ft. **Sample Number:** 44
Description: Gray Fat Clay
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	166.770
Moisture content: Dry soil+tare, gms.	136.250
Moisture content: Tare, gms.	49.770
Moisture, %	35.3
Moist specimen weight, gms.	1046.50
Diameter, in.	2.762
Area, in. ²	5.992
Height, in.	5.750
Wet density, pcf	115.7
Dry density, pcf	85.5
Void ratio	1.0071
Saturation, %	96.4

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

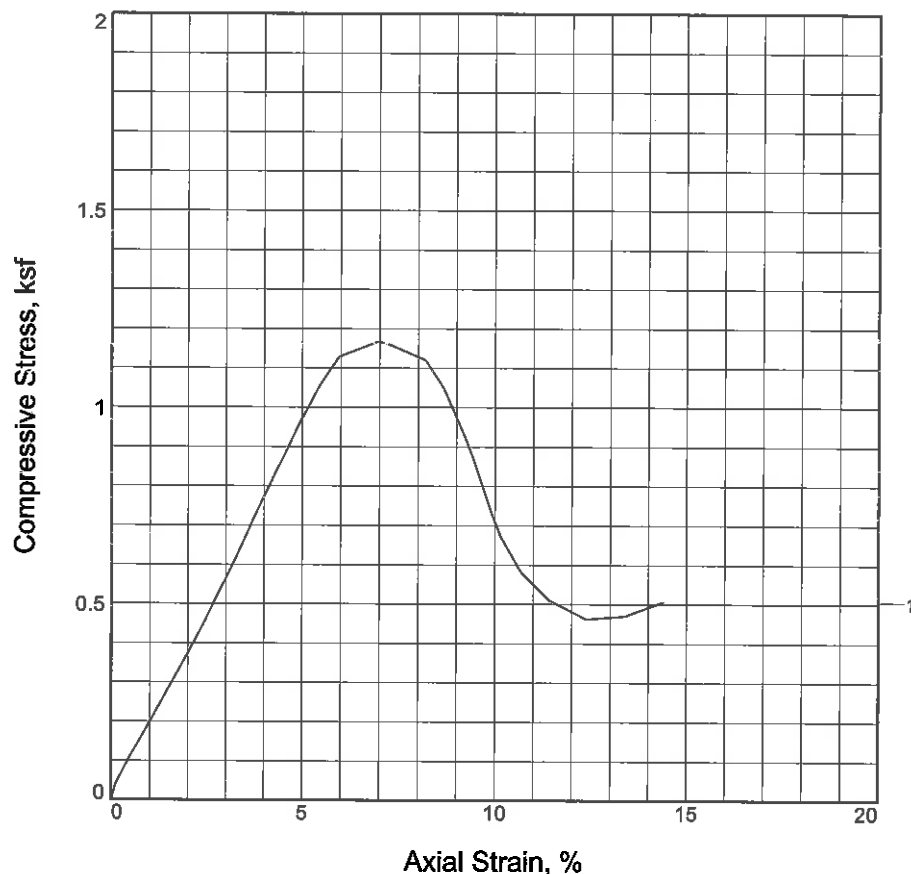
Unconfined compressive strength = 3.058 ksf at reading no. 18

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0000	0.157	0.2	0.0	0.004
2	0.0009	0.083	0.1	0.0	0.002
3	0.0124	8.233	8.2	0.2	0.197
4	0.0169	15.581	15.6	0.3	0.373
5	0.0209	24.634	24.6	0.4	0.590
6	0.0255	34.668	34.7	0.4	0.830
7	0.0285	42.002	42.0	0.5	1.004
8	0.0315	49.358	49.4	0.5	1.180
9	0.0340	56.935	56.9	0.6	1.360
10	0.0385	66.696	66.7	0.7	1.592
11	0.0430	75.709	75.7	0.7	1.806
12	0.0470	84.494	84.5	0.8	2.014
13	0.0515	92.753	92.8	0.9	2.209
14	0.0556	99.950	100.0	1.0	2.379
15	0.0631	109.835	109.8	1.1	2.611
16	0.0746	119.206	119.2	1.3	2.828

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.0972	126.552	126.6	1.7	2.990
18	0.1488	130.620	130.6	2.6	3.058
19	0.1663	130.789	130.8	2.9	3.052
20	0.1718	130.678	130.7	3.0	3.047
21	0.2235	127.028	127.0	3.9	2.934
22	0.2465	119.704	119.7	4.3	2.754
23	0.2635	111.601	111.6	4.6	2.559
24	0.2811	102.101	102.1	4.9	2.334
25	0.3012	89.271	89.3	5.2	2.033
26	0.3153	81.507	81.5	5.5	1.852
27	0.3293	74.149	74.1	5.7	1.680
28	0.3439	67.581	67.6	6.0	1.527
29	0.3725	56.468	56.5	6.5	1.269
30	0.4010	48.260	48.3	7.0	1.079
31	0.4291	39.960	40.0	7.5	0.889
32	0.4863	33.146	33.1	8.5	0.729
33	0.5434	32.582	32.6	9.5	0.709

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.166			
Undrained shear strength, ksf	0.583			
Failure strain, %	6.9			
Strain rate, in./min.	0.055			
Water content, %	23.7			
Wet density, pcf	128.6			
Dry density, pcf	104.0			
Saturation, %	100.0			
Void ratio	0.6511			
Specimen diameter, in.	2.789			
Specimen height, in.	5.753			
Height/diameter ratio	2.06			

Description: Gray Silty Sandy Clay

LL = PL = PI = Assumed GS= 2.75 Type: Undisturbed

Project No.: 92145005

Date Sampled:

Remarks:

ASTM D2166

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Resident Office USACE

Location: 13-B1001

Sample Number: 47 **Depth:** 92-94 ft.

UNCONFINED COMPRESSION TEST
Terracon Consultants, Inc.
Houston, TX

UNCONFINED COMPRESSION TEST

2/14/2014

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office USACE
Project No.: 92145005
Location: 13-B1001
Depth: 92-94 ft. **Sample Number:** 47
Description: Gray Silty Sandy Clay
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	201.600
Moisture content: Dry soil+tare, gms.	174.830
Moisture content: Tare, gms.	61.700
Moisture, %	23.7
Moist specimen weight, gms.	1186.30
Diameter, in.	2.789
Area, in. ²	6.109
Height, in.	5.753
Wet density, pcf	128.6
Dry density, pcf	104.0
Void ratio	0.6511
Saturation, %	100.0

Test Readings for Specimen No. 1**Strain rate, in./min. = 0.055****Unconfined compressive strength = 1.166 ksf at reading no. 19**

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0000	0.000	0.0	0.0	0.000
2	0.0070	1.763	1.8	0.1	0.042
3	0.0271	4.551	4.6	0.5	0.107
4	0.0486	7.346	7.3	0.8	0.172
5	0.0741	10.697	10.7	1.3	0.249
6	0.0972	13.753	13.8	1.7	0.319
7	0.1197	16.870	16.9	2.1	0.389
8	0.1428	20.156	20.2	2.5	0.463
9	0.1654	23.560	23.6	2.9	0.539
10	0.1828	26.302	26.3	3.2	0.600
11	0.1999	29.085	29.1	3.5	0.662
12	0.2169	31.926	31.9	3.8	0.724
13	0.2339	34.728	34.7	4.1	0.785
14	0.2509	37.548	37.5	4.4	0.846
15	0.2685	40.386	40.4	4.7	0.908
16	0.2855	43.157	43.2	5.0	0.967

Test Readings for Specimen No. 1

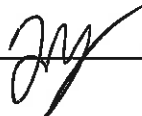
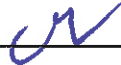
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.3141	47.483	47.5	5.5	1.058
18	0.3426	50.909	50.9	6.0	1.129
19	0.3998	53.181	53.2	6.9	1.166
20	0.4138	53.149	53.1	7.2	1.163
21	0.4709	51.750	51.8	8.2	1.120
22	0.4995	48.639	48.6	8.7	1.047
23	0.5281	43.670	43.7	9.2	0.935
24	0.5421	40.754	40.8	9.4	0.870
25	0.5566	37.457	37.5	9.7	0.797
26	0.5707	34.339	34.3	9.9	0.729
27	0.5852	31.507	31.5	10.2	0.667
28	0.6132	27.725	27.7	10.7	0.584
29	0.6563	24.459	24.5	11.4	0.511
30	0.7130	22.372	22.4	12.4	0.462
31	0.7701	23.035	23.0	13.4	0.470
32	0.8273	25.082	25.1	14.4	0.506

ENT 1/29/2013

Project Name: Port Arthur Resident Office - USACE

Project No.: 92145005

Boring No.	1001	1001	1001	1001 P1	1001	1001
Depth (ft)	6-8	30-32	48-50	54-56	70-72	90-92
Diameter (mm)	1. 69.4 2. 69.06 3. 69.05	70.03 70.04 70.02	70.94 70.98 71.01	70.23 70.20 70.24	70.72 70.70 70.75	69.79 69.78 69.81
Height (mm)	1. 140.20 2. 140.40 3. 140.50	141.60 141.63 141.70	142.05 142.01 141.99	142.25 142.26 142.24	141.82 141.80 141.84	138.68 138.64 138.69
Sample Wt.(g)	957.52	1050.67	995.18	945.19	974.17	1057.51
Tare No.	GG	H	3I	J	CC	BB
Wet Wt. + Tare (g)	179.70	217.08	184.08	192.24	182.64	176.54
Dry Wt. + Tare (g)	150.62	171.62	145.57	146.07	143.84	151.37
Tare Wt. (g)	61.56	60.29	59.85	58.47	65.48	59.62
Dry Soil Wt. (g)						
% Moisture						
Dry Unit Wt. (pcf)						
Discription	Brown fat clay w/ sand pockets, cal, fe	Gray fat clay w/ silt layers	Gray fat clay w/ silt layers	Gray fat clay w/ cl	Gray fat clay w/ fe	Gray fat clay w/ silt PK TS

Tested By:  Date 1-16-14 Reviewed By:  Date 1/29

Contract No. W912Hy-13-D-0001 DY08

Project: Port Arthur Resident Office - USACE
Unconsolidated Undrained TEST (ASTM D2850)

Terracon

Job No. **92145005**

Material Description

Fill
Grp. Lem. cl. w/ calc. & silt
Sap. & sam. silty cl. sm.

Boring No.: **13-1001**

Depth (ft) **8-10**

Sample Length (inch) **5-90** **5-90** **5-90** **5-90**

Cohesion (tsf) Sample Diameter (inch) **2.835** **2.756** **2.782** **2.792**

Date of Test **-2013**

Moist Weight (g) **1132.5** Ave

Contract No. W912HY-13-D-0001-DY08

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

☒ Confined

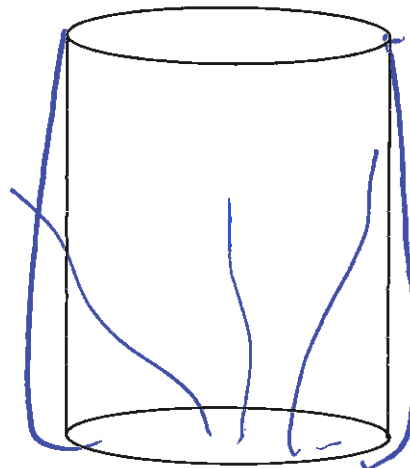
Pressure (psi) **7.2**

Moisture Content Determination	
Tare Number	CK-1
Wet Soil + Tare (g)	202.67
Dry Soil + Tare (g)	176.09
Tare Weight (g)	108.55

Prepared By: **ch** Date: **02-14** -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear ☒ **51**

Bulge ☒

Vertical Split ☒

Tested By: **SA** -2014

Computed By: -2014

Machine: ☐ HM 2000 ☐ S 610

Project: Port Arthur Resident Office - USACE
Unconsolidated Undrained TEST (ASTM D2850)

Terracon

Job No. **92145005**

Material Description Gw, Pot cl

Boring No.: **13- 1001**

Depth (ft) 44-46 Sample Length (inch) 5.774 5.770 5.772 5.772

Cohesion (tsf) Sample Diameter (inch) 2.735 2.735 2.760 2.743

Date of Test - **-2013**

Moist Weight (g) 1022.3 Ave

Contract No. W912HY-13-D-0001-DY08

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

☒ Confined

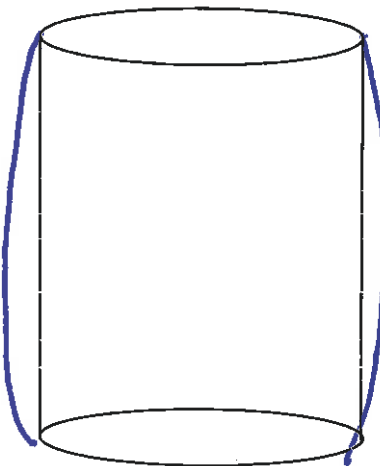
Pressure (psi) 22.4

Moisture Content Determination	
Tare Number	<u>CK-2</u>
Wet Soil + Tare (g)	<u>185.76</u>
Dry Soil + Tare (g)	<u>163.04</u>
Tare Weight (g)	<u>105.81</u>

Prepared By: ch Date: 02-14 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear _____

Bulge ☒

Vertical Split _____

Tested By: ch - 2014

Computed By: _____ - 2014

Machine: ☐ HM 2000 ☐ S 610

Project: Port Arthur Resident Office - USACE
Unconsolidated Undrained TEST (ASTM D2850)

Terracon

Job No. **92145005**

Material Description Gr. Fat cl

Boring No.: **13- 1001**

Depth (ft) 66-68

Sample Length (inch) 5.757 5.754 5.754 5.753

Cohesion (tsf)

Sample Diameter (inch) 2.791 2.746 2.727 2.754

Date of Test - **-2013**

Moist Weight (g)

947.3

Ave

Contract No. W912HY-13-D-0001-DY08

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

☒ Confined

Pressure (psi)

30.5

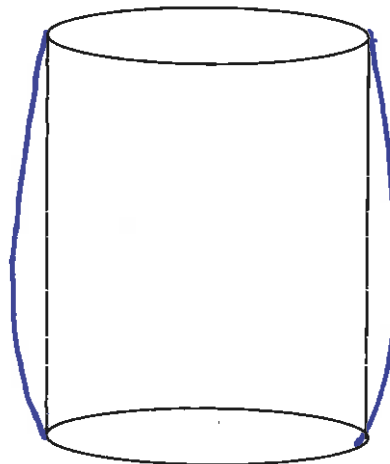
Moisture Content Determination

Tare Number	<u>I</u>
Wet Soil + Tare (g)	<u>129.38</u>
Dry Soil + Tare (g)	<u>105.52</u>
Tare Weight (g)	<u>61.35</u>

Prepared By: ch Date: 02-14 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

Bulge ☒

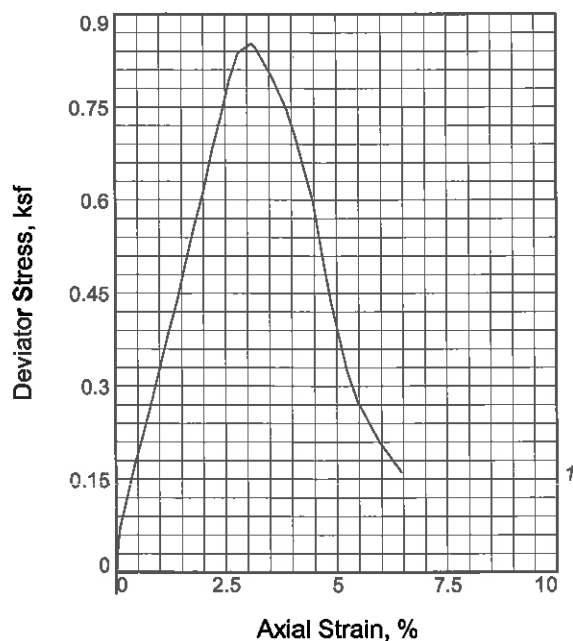
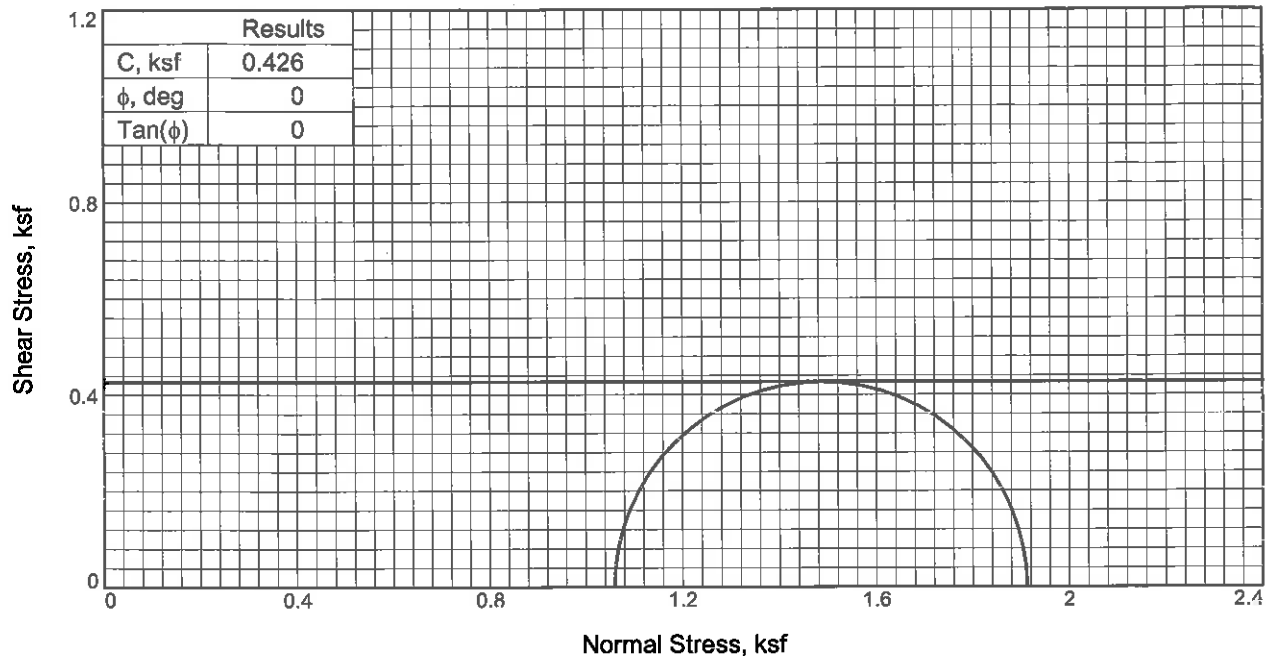
Vertical

Split

Tested By: 4 - 2014

Computed By: - 2014

Machine: ☐ HM 2000 ☐ S 610



Sample No.		1
Initial	Water Content, %	36.4
	Dry Density, pcf	87.6
	Saturation, %	102.7
	Void Ratio	0.9890
	Diameter, in.	2.792
	Height, in.	5.900
At Test	Water Content, %	36.4
	Dry Density, pcf	87.6
	Saturation, %	102.7
	Void Ratio	0.9890
	Diameter, in.	2.792
	Height, in.	5.900
Strain rate, in./min.		0.055
Back Pressure, psi		0.000
Cell Pressure, psi		7.360
Fail. Stress, ksf		0.853
Ult. Stress, ksf		
σ_1 Failure, ksf		1.912
σ_3 Failure, ksf		1.060

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray and light gray Lean Clay w/sand

Assumed Specific Gravity= 2.79

Remarks: ASTM D2850

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Residence Office - USACE

Location: 13-B1001

Sample Number: 5 **Depth:** 8-10 ft.

Proj. No.: 92145005

Date Sampled:

TRIAxIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

2/14/2014
4:45 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Residence Office - USACE
Project No.: 92145005
Location: 13-B1001
Depth: 8-10 ft. **Sample Number:** 5
Description: Gray and light gray Lean Clay w/sand
Remarks: ASTM D2850
Type of Sample: Undisturbed
Assumed Specific Gravity=2.79 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1

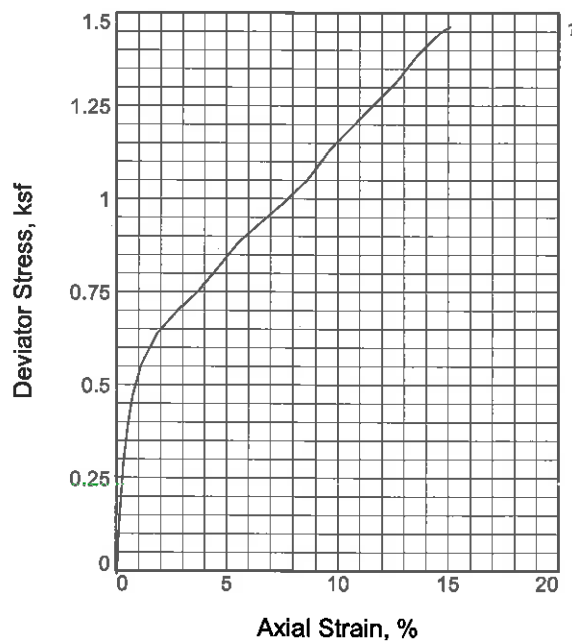
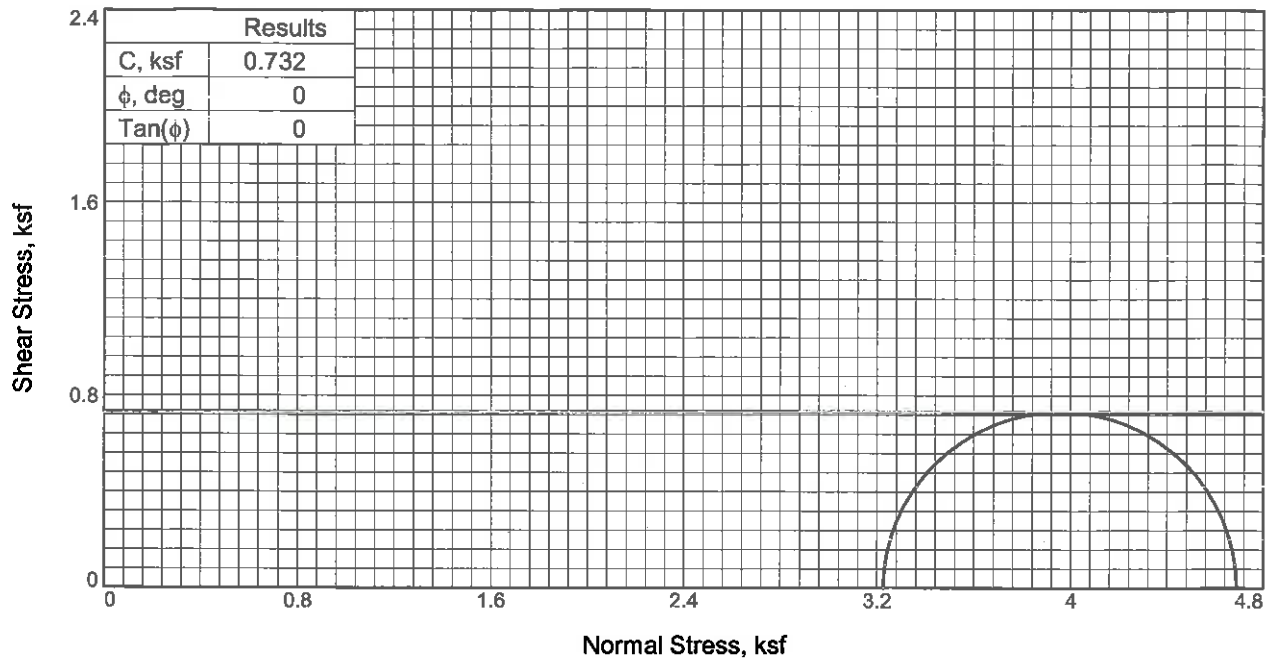
Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	200.670	200.670
Moisture content: Dry soil+tare, gms.	176.090	176.090
Moisture content: Tare, gms.	108.550	108.550
Moisture, %	36.4	36.4
Moist specimen weight, gms.	1132.50	
Diameter, in.	2.792	
Area, in. ²	6.122	
Height, in.	5.900	
Wet density, pcf	119.4	
Dry density, pcf	87.6	
Void ratio	0.9890	
Saturation, %	102.7	

Test Readings for Specimen No. 1

Cell pressure = 7.360 psi (1.060 ksf)
Back pressure = 0.000 psi (0.000 ksf)
Strain rate, in./min. = 0.055
Fail. Stress = 0.853 ksf at reading no. 18

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	1.060	1.060	1.00	1.060	0.000
1	0.0000	-1.464	-1.5	0.0	-0.034	1.060	1.025	0.97	1.043	-0.017
2	0.0015	1.134	1.1	0.0	0.027	1.060	1.087	1.03	1.073	0.013
3	0.0058	3.068	3.1	0.1	0.072	1.060	1.132	1.07	1.096	0.036
4	0.0159	5.278	5.3	0.3	0.124	1.060	1.184	1.12	1.122	0.062
5	0.0253	7.321	7.3	0.4	0.171	1.060	1.231	1.16	1.146	0.086
6	0.0358	9.259	9.3	0.6	0.216	1.060	1.276	1.20	1.168	0.108
7	0.0459	11.312	11.3	0.8	0.264	1.060	1.324	1.25	1.192	0.132
8	0.0567	13.496	13.5	1.0	0.314	1.060	1.374	1.30	1.217	0.157
9	0.0711	16.568	16.6	1.2	0.385	1.060	1.445	1.36	1.252	0.192
10	0.0830	18.937	18.9	1.4	0.439	1.060	1.499	1.41	1.279	0.220
11	0.0942	21.570	21.6	1.6	0.499	1.060	1.559	1.47	1.309	0.250
12	0.1060	24.203	24.2	1.8	0.559	1.060	1.619	1.53	1.339	0.280
13	0.1178	26.522	26.5	2.0	0.611	1.060	1.671	1.58	1.366	0.306
14	0.1296	29.440	29.4	2.2	0.677	1.060	1.737	1.64	1.398	0.339
15	0.1414	31.953	32.0	2.4	0.734	1.060	1.793	1.69	1.427	0.367
16	0.1532	34.687	34.7	2.6	0.795	1.060	1.855	1.75	1.457	0.397
17	0.1651	36.629	36.6	2.8	0.837	1.060	1.897	1.79	1.479	0.419
18	0.1825	37.404	37.4	3.1	0.853	1.060	1.912	1.80	1.486	0.426
19	0.1881	37.156	37.2	3.2	0.846	1.060	1.906	1.80	1.483	0.423
20	0.2117	35.034	35.0	3.6	0.794	1.060	1.854	1.75	1.457	0.397
21	0.2292	33.055	33.1	3.9	0.747	1.060	1.807	1.71	1.433	0.374
22	0.2411	31.116	31.1	4.1	0.702	1.060	1.762	1.66	1.411	0.351
23	0.2524	28.888	28.9	4.3	0.650	1.060	1.710	1.61	1.385	0.325
24	0.2642	26.554	26.6	4.5	0.597	1.060	1.656	1.56	1.358	0.298
25	0.2761	22.762	22.8	4.7	0.510	1.060	1.570	1.48	1.315	0.255
26	0.2873	19.451	19.5	4.9	0.435	1.060	1.495	1.41	1.277	0.218
27	0.3080	14.679	14.7	5.2	0.327	1.060	1.387	1.31	1.223	0.164
28	0.3228	12.349	12.3	5.5	0.275	1.060	1.334	1.26	1.197	0.137
29	0.3515	9.446	9.4	6.0	0.209	1.060	1.269	1.20	1.164	0.104
30	0.3808	7.305	7.3	6.5	0.161	1.060	1.221	1.15	1.140	0.080



Sample No.		1
Initial	Water Content, %	39.7
	Dry Density, pcf	81.7
	Saturation, %	99.2
	Void Ratio	1.1005
	Diameter, in.	2.743
	Height, in.	5.772
At Test	Water Content, %	39.7
	Dry Density, pcf	81.7
	Saturation, %	99.2
	Void Ratio	1.1005
	Diameter, in.	2.743
	Height, in.	5.772
Strain rate, in./min.		0.055
Back Pressure, psi		0.000
Cell Pressure, psi		22.400
Fail. Stress, ksf		1.463
Ult. Stress, ksf		
σ_1 Failure, ksf		4.689
σ_3 Failure, ksf		3.226

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray Fat Clay

Assumed Specific Gravity= 2.75

Remarks: ASTM D2850

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Residence Office - USACE

Location: 13-B1001

Sample Number: 23

Depth: 44-46 ft.

Proj. No.: 92145005

Date Sampled:

TRIAXIAL SHEAR TEST REPORT

Terracon Consultants, Inc.

Houston, TX

TRIAxIAL COMPRESSION TEST
Unconsolidated Undrained

2/14/2014
4:48 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Residence Office - USACE
Project No.: 92145005
Location: 13-B1001
Depth: 44-46 ft. **Sample Number:** 23
Description: Gray Fat Clay
Remarks: ASTM D2850
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1

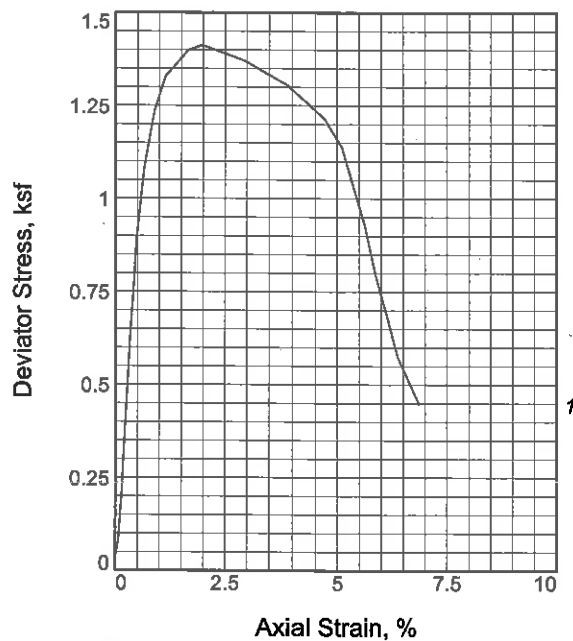
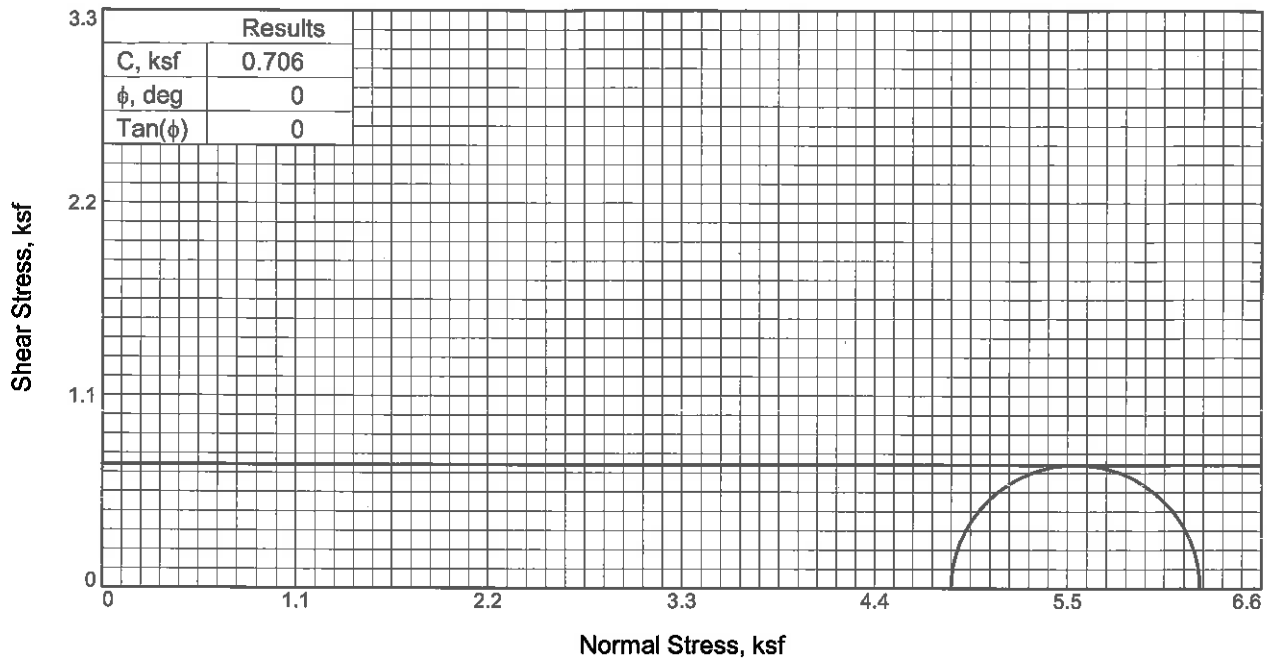
Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	185.760	185.760
Moisture content: Dry soil+tare, gms.	163.040	163.040
Moisture content: Tare, gms.	105.810	105.810
Moisture, %	39.7	39.7
Moist specimen weight, gms.	1022.30	
Diameter, in.	2.743	
Area, in. ²	5.909	
Height, in.	5.772	
Wet density, pcf	114.2	
Dry density, pcf	81.7	
Void ratio	1.1005	
Saturation, %	99.2	

Test Readings for Specimen No. 1

Cell pressure = 22.400 psi (3.226 ksf)
Back pressure = 0.000 psi (0.000 ksf)
Strain rate, in./min. = 0.055
Fail. Stress = 1.463 ksf at reading no. 23

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	3.226	3.226	1.00	3.226	0.000
1	0.0000	0.000	0.0	0.0	0.000	3.226	3.226	1.00	3.226	0.000
2	0.0016	-0.329	-0.3	0.0	-0.008	3.226	3.218	1.00	3.222	-0.004
3	0.0059	4.142	4.1	0.1	0.101	3.226	3.326	1.03	3.276	0.050
4	0.0122	8.334	8.3	0.2	0.203	3.226	3.428	1.06	3.327	0.101
5	0.0191	12.278	12.3	0.3	0.298	3.226	3.524	1.09	3.375	0.149
6	0.0285	15.818	15.8	0.5	0.384	3.226	3.609	1.12	3.417	0.192
7	0.0424	19.465	19.5	0.7	0.471	3.226	3.696	1.15	3.461	0.235
8	0.0657	23.036	23.0	1.1	0.555	3.226	3.781	1.17	3.503	0.277
9	0.1070	26.702	26.7	1.9	0.639	3.226	3.864	1.20	3.545	0.319
10	0.1593	29.483	29.5	2.8	0.699	3.226	3.924	1.22	3.575	0.349
11	0.2118	31.929	31.9	3.7	0.749	3.226	3.975	1.23	3.600	0.375
12	0.2648	35.020	35.0	4.6	0.814	3.226	4.040	1.25	3.633	0.407
13	0.3228	38.469	38.5	5.6	0.885	3.226	4.111	1.27	3.668	0.442
14	0.3812	41.223	41.2	6.6	0.938	3.226	4.164	1.29	3.695	0.469
15	0.4394	43.978	44.0	7.6	0.990	3.226	4.216	1.31	3.721	0.495
16	0.4977	47.183	47.2	8.6	1.051	3.226	4.276	1.33	3.751	0.525
17	0.5559	51.370	51.4	9.6	1.131	3.226	4.357	1.35	3.791	0.566
18	0.6137	54.749	54.7	10.6	1.192	3.226	4.418	1.37	3.822	0.596
19	0.6723	58.224	58.2	11.6	1.254	3.226	4.479	1.39	3.852	0.627
20	0.7304	61.774	61.8	12.7	1.315	3.226	4.540	1.41	3.883	0.657
21	0.7885	66.068	66.1	13.7	1.390	3.226	4.616	1.43	3.921	0.695
22	0.8468	69.638	69.6	14.7	1.448	3.226	4.674	1.45	3.950	0.724
23	0.8712	70.716	70.7	15.1	1.463	3.226	4.689	1.45	3.957	0.732



Sample No.		1
Initial	Water Content, %	54.0
	Dry Density, pcf	68.4
	Saturation, %	98.3
	Void Ratio	1.5109
	Diameter, in.	2.754
	Height, in.	5.753
At Test	Water Content, %	54.0
	Dry Density, pcf	68.4
	Saturation, %	98.3
	Void Ratio	1.5109
	Diameter, in.	2.754
	Height, in.	5.753
Strain rate, in./min.		0.055
Back Pressure, psi		0.000
Cell Pressure, psi		33.610
Fail. Stress, ksf		1.412
Ult. Stress, ksf		
σ_1 Failure, ksf		6.252
σ_3 Failure, ksf		4.840

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray Fat Clay

Assumed Specific Gravity= 2.75

Remarks: ASTM D2850

Client: Quaternary Resource Investigations, L.L.C.

Project: Port Arthur Residence Office - USACE

Location: 13-B1001

Sample Number: 34

Depth: 66-68 ft.

Proj. No.: 92145005

Date Sampled:

TRIAXIAL SHEAR TEST REPORT

Terracon Consultants, Inc.

Houston, TX

TRIAxIAL COMPRESSION TEST
Unconsolidated Undrained

2/14/2014
4:15 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Residence Office - USACE
Project No.: 92145005
Location: 13-B1001
Depth: 66-68 ft. **Sample Number:** 34
Description: Gray Fat Clay
Remarks: ASTM D2850
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	129.380	129.380
Moisture content: Dry soil+tare, gms.	105.520	105.520
Moisture content: Tare, gms.	61.350	61.350
Moisture, %	54.0	54.0
Moist specimen weight, gms.	947.30	
Diameter, in.	2.754	
Area, in. ²	5.957	
Height, in.	5.753	
Wet density, pcf	105.3	
Dry density, pcf	68.4	
Void ratio	1.5109	
Saturation, %	98.3	

Test Readings for Specimen No. 1

Cell pressure = 33.610 psi (4.840 ksf)
Back pressure = 0.000 psi (0.000 ksf)
Strain rate, in./min. = 0.055
Fail. Stress = 1.412 ksf at reading no. 18

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Princ. Stress ksf	Major Princ. Stress ksf	1:3 Ratio	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	4.840	4.840	1.00	4.840	0.000
1	0.0000	0.000	0.0	0.0	0.000	4.840	4.840	1.00	4.840	0.000
2	0.0000	1.550	1.6	0.0	0.037	4.840	4.877	1.01	4.859	0.019
3	0.0043	3.483	3.5	0.1	0.084	4.840	4.924	1.02	4.882	0.042
4	0.0075	7.606	7.6	0.1	0.184	4.840	5.023	1.04	4.932	0.092
5	0.0099	11.819	11.8	0.2	0.285	4.840	5.125	1.06	4.982	0.143
6	0.0131	16.432	16.4	0.2	0.396	4.840	5.236	1.08	5.038	0.198
7	0.0164	21.235	21.2	0.3	0.512	4.840	5.352	1.11	5.096	0.256
8	0.0194	25.937	25.9	0.3	0.625	4.840	5.465	1.13	5.152	0.312
9	0.0225	30.247	30.2	0.4	0.728	4.840	5.568	1.15	5.204	0.364
10	0.0256	34.077	34.1	0.4	0.820	4.840	5.660	1.17	5.250	0.410
11	0.0281	37.383	37.4	0.5	0.899	4.840	5.739	1.19	5.289	0.450
12	0.0331	41.475	41.5	0.6	0.997	4.840	5.837	1.21	5.338	0.498
13	0.0374	44.849	44.8	0.7	1.077	4.840	5.917	1.22	5.378	0.539
14	0.0438	48.244	48.2	0.8	1.157	4.840	5.997	1.24	5.419	0.579
15	0.0514	51.552	51.6	0.9	1.235	4.840	6.075	1.26	5.457	0.618
16	0.0658	55.626	55.6	1.1	1.329	4.840	6.169	1.27	5.504	0.665
17	0.0951	58.820	58.8	1.7	1.398	4.840	6.238	1.29	5.539	0.699
18	0.1127	59.566	59.6	2.0	1.412	4.840	6.252	1.29	5.546	0.706
19	0.1189	59.517	59.5	2.1	1.409	4.840	6.249	1.29	5.544	0.705
20	0.1712	58.387	58.4	3.0	1.369	4.840	6.209	1.28	5.525	0.685
21	0.2237	56.207	56.2	3.9	1.306	4.840	6.146	1.27	5.493	0.653
22	0.2705	52.773	52.8	4.7	1.216	4.840	6.056	1.25	5.448	0.608
23	0.2941	49.597	49.6	5.1	1.138	4.840	5.978	1.24	5.409	0.569
24	0.3234	40.715	40.7	5.6	0.929	4.840	5.769	1.19	5.304	0.464
25	0.3377	34.938	34.9	5.9	0.795	4.840	5.635	1.16	5.237	0.398
26	0.3526	30.279	30.3	6.1	0.687	4.840	5.527	1.14	5.183	0.344
27	0.3668	25.405	25.4	6.4	0.575	4.840	5.415	1.12	5.127	0.287
28	0.3950	19.928	19.9	6.9	0.449	4.840	5.288	1.09	5.064	0.224

