

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	<i>See boring log</i>
13-1002	East Bank SNWW PARO	80	<i>See boring log</i>
13-1003	East Bank SNWW PARO	100	<i>See boring log</i>
13-1004	East Bank SNWW PARO	80	<i>See boring log</i>
13-1005	East Bank SNWW PARO	100	<i>See boring log</i>

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>13-1005</u>
BORING TYPE:	<u>Continuous Sampling</u>
DEPTH:	<u>100'</u>
ELEVATION:	<u>7.14'</u>
X (US SURVEY FT):	<u>3574844.09</u>
Y (US SURVEY FT):	<u>13898188.35</u>
DEPTH TO WATER:	<u>21.6'</u>

Client: USACE-Galveston District

W912HY-13-D-0001-DY08

Boring:

13-1005

Page 1 of 5

Date/Time Drilling Begun:

12/13/13 1310

Date/Time Drilling Ended:

12/13/13 1530

Driller:

Tom

Logger:

Pete

Designated X (Easting):

3574844.092

Drill Rig:

B-57

Designated Y (Northing):

13898188.35

Designated Z (Elevation): 7.143'

Total depth:

66'

Initial Water Encounter (Depth, date/time):

12/13/13 02' 00"

Water Depth (15 min.):

21.6

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	12	ST	1	3.0	-	sandy clay, light brown, slightly moist, moderately plastic, w roots
	CI	2-4	14	ST	1	1.9	-	sandy clay, light brown, slightly moist, moderately plastic, w sand seams, cracks, roots
5	CI	4-6	18	ST	1	1.5	-	sandy clay, light brown and greenish gray modelling, moderately moist, moderately plastic
	CI	6-8	17	ST	1	1.5	-	SAA ↑
	CI	8-10	19	ST	1	1.75	-	sandy clay, greenish gray and light brown modelling, moderately moist, moderately plastic, sand seams
10	CI	10-12	13	ST	1	2.75	-	SAA ↑
	CI	12-14	16	ST	1	2.7	-	slightly sandy clay, greenish gray and light brown modelling, moderately moist, moderately plastic
15	CI	14-16	12	ST	1	2.2	-	SAA ↑
	CI	16-18	18	ST	1	2.75	-	SAA ↑
20	CI	18-20	18	ST	1	1.75	-	SAA ↑

Weather: Clear, calm, 50's/60's

Comments:

USCS Log Legend: SAA = same as above



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

137/005
12/7/13, 12/18/13

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.)
20	CI	20-22	18	ST	2	2.25	-	slightly sandy clay, light brown and greenish gray modelling, moderately moist, moderately plastic
	CI	22-24	18	ST	1	2.4	-	sandy clay, light brown and greenish gray modelling, moderately moist, moderately plastic
25	SP	24-26	17	SS 6/6/13	1	-	-	Medium dense, fine sand, light brown, wet, no plasticity
		26-28						
	CI	28-30	18	SS 3/3/4	1	1.9	-	Medium stiff, slightly sandy clay, greenish gray and light brown modelling, moderately wet, moderately plastic
30	CI	30-32	18	ST	1	2.2	-	sandy clay, light brown, moderately wet, low plasticity
	CI	32-34	18	ST	1	2.1	-	slightly sandy clay, greenish gray and light brown modelling, moderately moist, moderately plastic, sand seems and cracks
35	CI	34-36	19	ST	1	1.9	-	SAA
	CI	36-38	17	ST	1	1.6	-	SAA
40	CI	38-40	17	ST	1	1.5	-	slightly sandy clay, greenish gray, moderately moist, moderately plastic, sand seems and cracks

Weather: Clear, lite breeze, 60's/40's
Comments: foggy, calm 30's/40's

USCS Log Legend:



13-1005
12/18/13

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	CL	40-42	17	ST	1	1.3	-	slightly sandy clay, greenish gray, moderately moist, moderately plastic; sand seems
	CL	42-44	18	ST	1	1.5	-	SAA ↑
45	CL	44-46	17	ST	1	1.9	-	SAA ↑
	CL	46-48	18	ST	1	1.7	-	SAA ↑
	CL	48-50	16	ST	1	2.0	-	clay, dark gray, moderately moist, moderately plastic
50	CL	50-52	18	ST	1	1.9	-	SAA ↑
	CL	52-54	18	ST	2	1.7	-	SAA ↑
55	CL	54-56	18	ST	1	1.7	-	SAA ↑
	CL	56-58	18	ST	1	2.0	-	SAA ↑
60	CL	58-60	19	ST	1	2.25	-	clay, greenish gray, moderately moist, moderately plastic

Weather: foggy, calm, 40's

Comments:

USCS Log Legend: SAA = same as above



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Sabine Neches Waterway (SNWW)
Port Arthur, TX



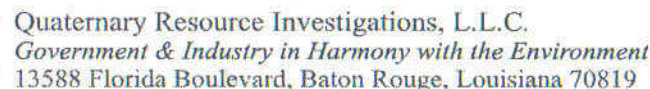
Quaternary Resource Investigations, L.L.C.
Government & Industry in Harmony with the Environment
13588 Florida Boulevard, Baton Rouge, Louisiana 70819

Boring: 13-1005
12/18/13

USCS Log Legend: SAA = same as above

Comments: SAA = same as above

GW	GP	GM	GC	SW	SP	SM	SC	ML	CL	OL	MH	CH	OH	PT



12/18/13, 12/19/13

TD=100
1530

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	CI	80-82	19	ST	1	1.3	-	Clay, Dark gray, moderately moist, moderately plastic, no organics
	CI	82-84	19	ST	2	1.9	-	SAA ↑
85	CI	84-86	19	ST	1	1.3	-	SAA ↑
	CI	86-88	19	ST	1	2.2	-	Slightly sandy clay, greenish gray, moderately plastic
	SP	88-90	18	SS 2 7/11	1 bag	-	-	Fine sand, greenish gray, wet, no plasticity, medium dense, with trace shell fragments
90		90-92						
		92-94		SS 9/10/24				No recovery
95		94-96						
		96-98						
100	SP	98-100	22	SS 3 7/5	1 bag	-	-	Medium dense, greenish gray, wet, no plasticity, with trace shell fragments

Weather:

Comments:

USCS Log Legend:

Clear, lite breeze, 50's, like breeze 50's cloudy

SAA = same as above, sand flowed in at 90'



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BORING NUMBER 13-1005

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 12/17/2013 1:10:00 PM COMPLETED 12/19/2013 3:30:00 PM GROUND ELEVATION 7.143 ft HOLE SIZE 8.25 inches
DRILLING CONTRACTOR QRI NORTHING 13898188.35 ft EASTING 3574844.09 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 22.00 ft / Elev -14.86 ft
WEATHER clear to foggy, 50s-60s to 30s-40s, calm to light breeze AFTER 15 MINUTES 21.60 ft / Elev -14.46 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 (%)	COMPRESSION STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)
	CL	Sandy CLAY, light brown, slightly moist, moderately plastic, with roots with sand seams and cracks light brown and greenish gray mottled, moderately moist	0	ST	12		3.0			27							
				ST	14		1.9			25	45	20	25	91			
			5	ST	18		1.5		84	43							
				ST	17		1.5			27							
			10	ST	19		1.75		98	28	40	15	25		0.50	15	0
	CH	CLAY, light brown and greenish gray mottled, moderately moist, moderately plastic, with sand seams and cracks		ST	13		2.75			21	45	16	29	87			
			15	ST	12		2.2			22							
				ST	18		2.75			29							
			20	ST	18		1.75		106	22	51	16	35	81	2.16	15	16
				ST	18		2.25		107	22							
	CL	Sandy CLAY, light brown and greenish gray mottled, moderately moist, moderately plastic		ST	18		2.4		103	23	32	17	15		1.02	6	0
	SM	Silty SAND, fine grained sand, light brown, wet, medium dense, no plasticity	25	SS	17	6-6-13 (19)				23				15			
					0												
	CH	CLAY, greenish gray and light brown mottled, moderately wet, moderately plastic, medium stiff	30	SS	18	3-3-4 (7)	1.9			34	54	21	33				
	CL	Sandy CLAY, light brown, moderately wet, low plasticity		ST	18		2.2			34							
	CH	CLAY, greenish gray and light brown mottled, moderately moist, moderately plastic, with sand seams and cracks		ST	18		2.1			33	55	20	35	97			
			35														

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BORING NUMBER 13-1005

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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 (%)	ATTERBERG LIMITS			MINUS #200 SIEVE CONTENT (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	
											LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX					
	CH	CLAY, greenish gray and light brown mottled, moderately moist, moderately plastic, with sand seams and cracks (continued)	35	ST	19		1.9		88	34					0.84	14	0	
		greenish gray		ST	17		1.6		91	32								
				ST	17		1.5				38							
			40	ST	17		1.3		91	33	54	22	32	99				
				ST	18		1.5		83	36					0.74	15	0	
				ST	17		1.9		80	46								
				ST	18		1.7			41								
				ST	16		2.0			51	80	28	52					
			50	ST	18		1.9		71	51								
				ST	18		1.7			48								
				ST	18		1.7		69	53	105	30	75		1.06	11	29	
				ST	18		2.0		69	54								
				ST	19		2.25			36								
				ST	19		1.4		85	36	77	25	52		0.86	15	0	
				ST	19		1.5			51	90	30	60					
				ST	19		2.1			41								
				ST	19		1.6			46								
				ST	19		1.7		73	47	90	25	65	98	1.10	8	0	
				ST	19		2.25			58								
				ST	19		1.9			51								
		with trace of organics	75															

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BORING NUMBER 13-1005

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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	CLAY, greenish gray and light brown mottled, moderately moist, moderately plastic, with sand seams and cracks (continued) with organics	75	ST	19		2.1			48	79	29	50	97			
				ST	19		2.6		72	51							
				ST	14		2.2			63							
		dark gray	80	ST	19		1.3		57	71	95	32	63	93	1.44	6	39
				ST	19		1.9			35							
			85	ST	19		1.3		84	39	77	23	54		1.08	14	0
				ST	19		2.2			24							
	CL	Slightly sandy CLAY, greenish gray, moderately plastic		ST	19												
	SM	Silty SAND, fine grained sand, greenish gray, wet, no plasticity, medium dense, with trace of shell fragments	90	SS	18	2-7-11 (18)				22				15			
			95	SS		9-10-24 (34)											
			100	SS	22	3-7-5 (12)				19							

Bottom of borehole at 100.0 feet.

Project Name: Port Arthur Resident Office																			Client: QRI										Terracon Project # : 92135321																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Notes:
USCS Symbol
USCS Symbol*
USCS Symbol**

- Classification based on laboratory test.
- Classification based partially on laboratory test results together with visual description.
- Classification based only on visual descriptions.

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 17 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B1005/2-4 Contract No.: W912HY-13-D-0001, DY08

Description: LT sandstone w/FE fill w/silty sandstone w/leandark

Pan No. & Weight: N20/49.13 Wet Sample + Pan Weight: 155.71

Dry Sample + Pan Weight: 134.51 Dry Sample Weight: 85.38

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0.41		
No. 10	0.52		
No. 40	0.98		
No. 200	7.25		

Prepared By: Rodrigo Date: 1/17

Tested By: RG Date: 1-21-14

Computed By: _____ Date: _____

Checked By: [Signature] Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 17 -2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B1005/10-12 Contract No: W912HY-13-D-0001, DY08

Description: LT fat clay w/some cal r/FE

Pan No. & Weight : N11/ 39.75 Wet Sample + Pan Weight : 146.41

Dry Sample + Pan Weight: 127.88 Dry Sample Weight: 88.13

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0.36		
No. 10	2.44		
No. 40	5.46		
No. 200	11.76		

Prepared By: Rodrigo Date: 1/17

Tested By: RG Date: 1-21-14

Computed By: Date:

Checked By: J Date: 1/22

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 02/14 -2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: B-1005/18-20
L6151, L6 Contract No: W912HY-13-D-0001, DY08

Description: L6151, Low cl

Pan No. & Weight: C22/50.49 Wet Sample + Pan Weight: 137.74

Dry Sample + Pan Weight: 121.91 Dry Sample Weight: 71.42

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0		
No. 4	0.11		
No. 10	0.44		
No. 40	0.89		
No. 200	13.42		

Prepared By: SK Date: 2/14/14 Tested By: ALG Date: 2-18

Computed By: _____ Date: _____ Checked By: TSP Date: 2/21

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 17 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B1005/24-26 Contract No: W912HY-13-D-0001, DY08

Description: G, T Silty Sand w/ clay & pebbles

Pan No. & Weight: N19/42.76 Wet Sample + Pan Weight: 179.59

Dry Sample + Pan Weight: 153.71 Dry Sample Weight: 110.95

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	0.52		
No. 200	94.84		

Prepared By: Rodrigo Date: 1/17

Tested By: RC Date: 1-21-14

Computed By: Date:

Checked By: J Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 17 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B1005/32-34 Contract No: W912HY-13-D-0001, DY08

Description: G fat clay w/silt w/lean clay seam

Pan No. & Weight : E10/49.41 Wet Sample + Pan Weight : 212.64

Dry Sample + Pan Weight: 172.25 Dry Sample Weight: 122.84

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	3.85		

Prepared By: Rodrigo Date: 1/17

Tested By: RC Date: 1-21-14

Computed By: _____ Date: _____

Checked By: [Signature] Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13B1005/40.42 Contract No: W912HY-13-D-0001, DY08

Description: G fast dry 1/50th pk

Pan No. & Weight: C9/50.48 Wet Sample + Pan Weight: 208.90

Dry Sample + Pan Weight: 169.94 Dry Sample Weight: 119.46

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	0.02		
No. 200	0.74		

Prepared By: W1

Date: 2/2

Tested By: Rodrigo

Date: 2/21/14

Computed By:

Date:

Checked By: J

Date: 2/2

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - -2014 Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: B1005 68-70 Contract No: W912HY-13-D-0001, DY08

Description: G Fat clay w/ silts CH

Pan No. & Weight: E11 49.74 Wet Sample + Pan Weight: 160.32

Dry Sample + Pan Weight: 125.15 Dry Sample Weight: 75.41

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	0.05		
No. 200	1.27		

Prepared By: ch Date: 1-25-14 Tested By: RG Date: 1-29-14

Computed By: Date: Checked By: ✓ Date: 1/29

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 17 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B1005/74-76 Contract No: W912HY-13-D-0001, DY08

Description: G Fort dux w/FF

Pan No. & Weight: E2/49.37 Wet Sample + Pan Weight: 161.06

Dry Sample + Pan Weight: 124.87 Dry Sample Weight: 75.51

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch	0		
No. 4	0.20		
No. 10	0.32		
No. 40	0.39		
No. 200	2.12		

Prepared By: Rodrigo Date: 1/17

Tested By: RC Date: 1-21-14

Computed By: Date:

Checked By:  Date: 1/28

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 02/14 -2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: B-10051-80-82 Contract No: W912HY-13-D-0001, DY08

Description: Gr, Fct cl 4 200s

Pan No. & Weight: NC29/25.11 Wet Sample + Pan Weight: 97.21

Dry Sample + Pan Weight: 67.32 Dry Sample Weight: 42.21

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch	0		
3/8 inch	0.38		
No. 4	0.96		
No. 10	1.31		
No. 40	1.93		
No. 200	2.84		

Prepared By: SR Date: 2/14/14 Tested By: LG Date: 2-18

Computed By: Date: Checked By: BP Date: 2/21

Abbreviated Sieve Analysis Worksheet (ASTM D422)

Date: 01 - 17 - 2014

Project No.: 92145005

Project Name.: Port Arthur resident Office - USACE

Boring No.: 13-B/005/88-90 Contract No: W912HY-13-D-0001, DY08

Description: G Silty Sand w/clay pck

Pan No. & Weight: NC19/36.09 Wet Sample + Pan Weight: 212.21

Dry Sample + Pan Weight: 180.43 Dry Sample Weight: 144.34

Sieve Size	Accum. Wt. of Sample	Percent of Retained	Percent Passing
1/2 inch			
3/8 inch			
No. 4			
No. 10			
No. 40	7.46		
No. 200	122.53		

Prepared By: Rodrigo Date: 1/17

Tested By: RG Date: 1-21-14

Computed By: _____ Date: _____

Checked By: M Date: 1/28

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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: 13-1005 **Depth** 2-4

Date: 1-20-2014

Material Description:

Fill CH BRN Tan (silty clay)

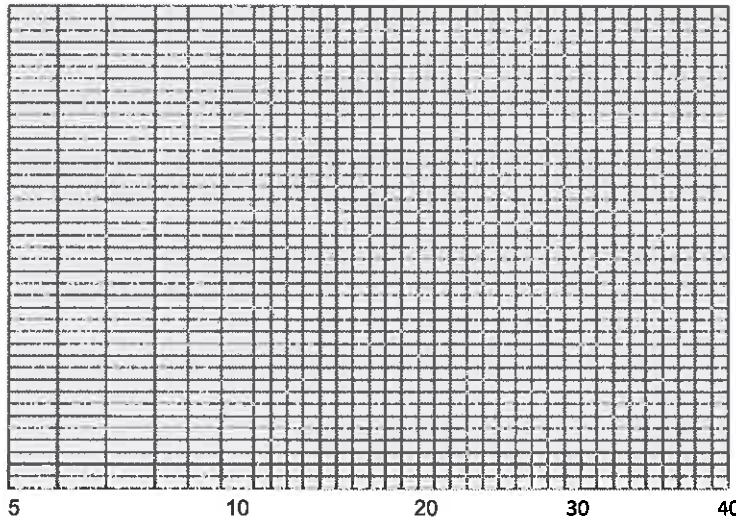
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	415	722	809			
Weight in grams	Tare + Wet Soil	31.10	30.88	30.44		
	Tare + Dry Soil	26.21	25.92	25.59		
	Water W _w					
	Tare	15.23	15.14	15.07		
	Dry Soil W _d					
Water Content	W					
No. of Blows	32	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.	115	114				
Weight in grams	Tare + Wet Soil	37.95	36.42			
	Tare + Dry Soil	36.46	35.17			
	Water W _w					
	Tare	29.13	29.05			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician CH JC Computed by _____

Checked by _____

Date: 01-20-14

Date: _____

Che Date: _____

JC 1/20/14

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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: 13-1005 **Depth** 8-10

Date: 2/14/2014

Material Description: Gray LTan lean clay

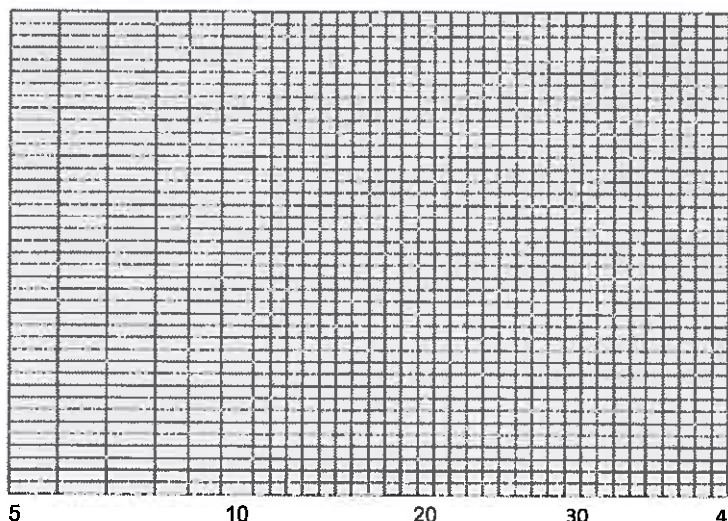
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit									
Run No.		1		2		3		4	
Tare No.		415		420		706			
Weight in grams	Tare + Wet Soil	31.51		31.65		32.68			
	Tare + Dry Soil	26.95		26.92		27.49			
	Water W _w								
	Tare	15.24		15.15		15.13			
	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.		7P	211				
Weight in grams	Tare + Wet Soil	22.16	23.34				
	Tare + Dry Soil	21.20	22.22				
	Water	W _w					
	Tare		14.98	14.98			
	Dry Soil	W _d					
Water Content		W					
Plastic Limit							

Remarks

Technician JC

Computed by _____

Checked by DR

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: 13-1005 **Depth** 10-12

Date: 1-20-2014

Material Description: lean clay w/ fine pits, cal

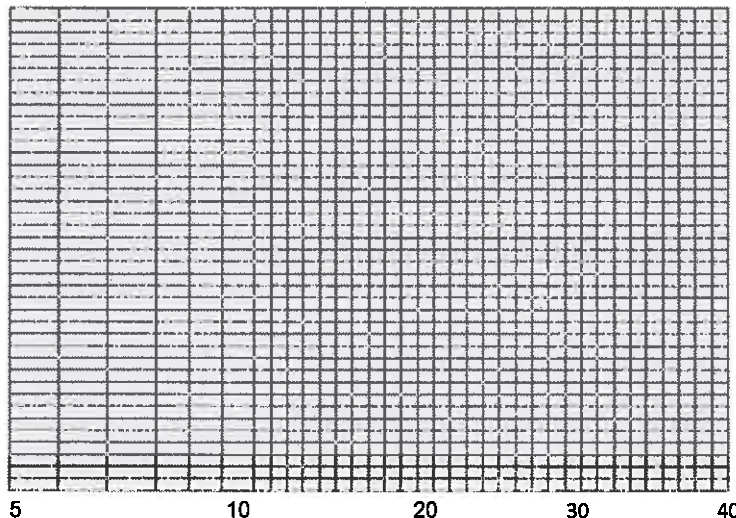
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	421	523	711			
Weight in grams	Tare + Wet Soil	29.46	30.17	31.33		
	Tare + Dry Soil	25.09	25.40	26.18		
	Water W_w					
	Tare	15.18	15.14.97	15.22		
	Dry Soil W_d					
Water Content	W					
No. of Blows	32	23	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.	109	106				
Weight in grams	Tare + Wet Soil	37.60	36.49			
	Tare + Dry Soil	36.41	35.47			
	Water W_w					
	Tare	29.24	29.24			
	Dry Soil W_d					
Water Content	W					
Plastic Limit						

Remarks

Technician ch Computed by JC

Date: 1-20-20

Date:

Checked by

Che Date:

1/27

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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: 13-1005 **Depth** 18-20

Date: 2/17/2014

Material Description:

L+Tan - lean clay / fat clay

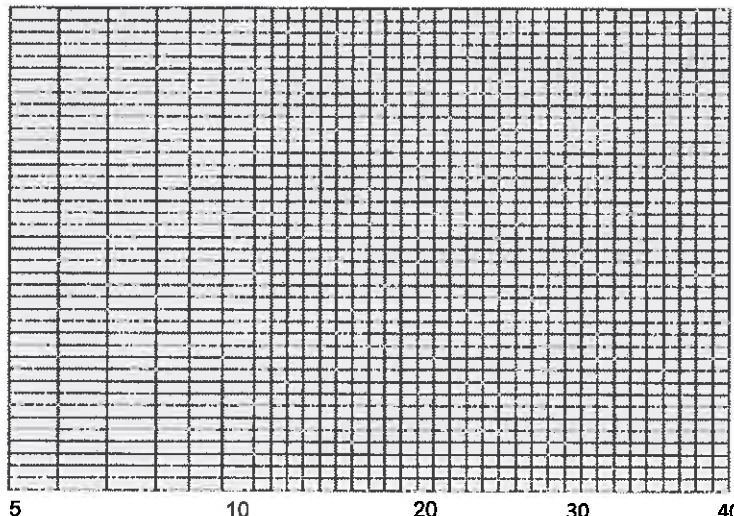
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	416	501	511			
Weight in grams	Tare + Wet Soil	31.15	31.83	31.30		
	Tare + Dry Soil	25.94	26.27	25.58		
	Water W _w					
	Tare	15.10	15.23	15.04		
	Dry Soil W _d					
Water Content W						
No. of Blows	35	25	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.	706	211				
Weight in grams	Tare + Wet Soil	22.05	22.77			
	Tare + Dry Soil	21.07	21.67			
	Water W _w					
	Tare	15.14	14.99			
	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: 13-1005 **Depth** 28-30

Date: 1-20-2014

Material Description: Fat clay w/ silt & few fine pits ch/cu

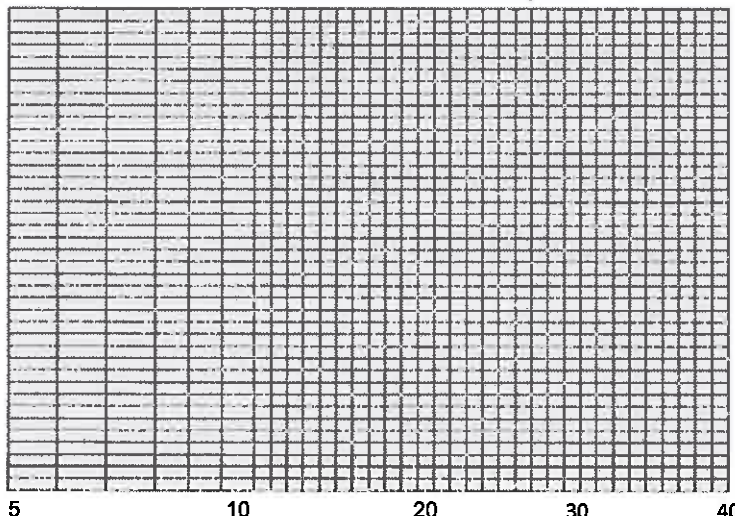
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	517	800	21			
Weight in grams	Tare + Wet Soil	30.95	31.74	31.39		
	Tare + Dry Soil	25.60	25.87	25.40		
	Water W _w					
	Tare	15.15	15.05	15.01		
	Dry Soil W _d					
Water Content	W					
No. of Blows	35	22	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	116				
Weight in grams	Tare + Wet Soil	37.45	37.03			
	Tare + Dry Soil	36.02	35.65			
	Water W _w					
	Tare	29.15	29.16			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks _____

Technician ch, JS Computed by _____

Checked by TP

Date: 1-20-14

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: 13-1005 Depth 74-76

Date: 1-20-2014

Material Description: CH

Gray at clay

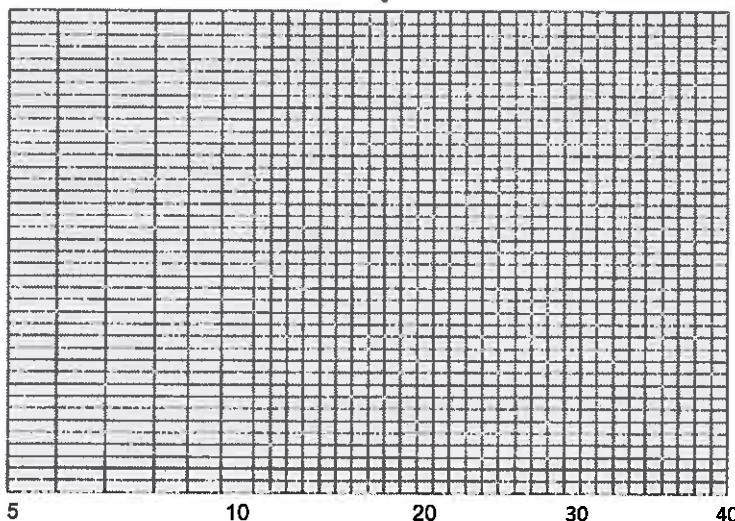
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	400A	910	29			
Weight in grams	Tare + Wet Soil	29.59	29.27	30.94		
	Tare + Dry Soil	23.34	23.02	23.72		
	Water W_w					
	Tare	15.12	15.21	14.87		
	Dry Soil W_d					
Water Content	W					
No. of Blows	35	24	15			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. G26105
 Scale MTE No. B7884

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	119	103				
Weight in grams	Tare + Wet Soil	37.61	36.77			
	Tare + Dry Soil	35.71	35.06			
	Water W_w					
	Tare	29.13	29.16			
	Dry Soil W_d					
Water Content	W					
Plastic Limit						

Remarks

Technician CH

Computed by JC

Checked by A

Date: 1-20-14

Date:

Che Date: 1/27

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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: 13-1005 **Depth** 22-24

Date: 1/27/2014

Material Description:

Tan lean clay

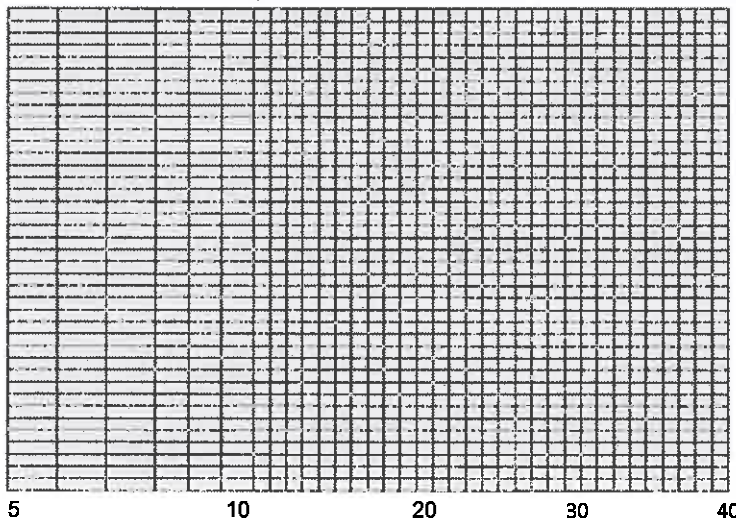
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	517	901	907			
Tare + Wet Soil	30.86	31.47	32.38			
Tare + Dry Soil	27.21	27.56	28.01			
Water W _w			1			
Tare	15.16	15.16	15.07			
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. 626105

Scale MTE No. B7891

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	2P	29				
Tare + Wet Soil	22.68	22.20				
Tare + Dry Soil	21.59	21.15				
Water W _w						
Tare	15.07	14.87				
Dry Soil W _d						
Water Content W						
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by Bd

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: 13-1005 Depth 32-34

Date: 1-22-2014

Material Description: 6 Fat clay w/ lean clay, silty, silty clay

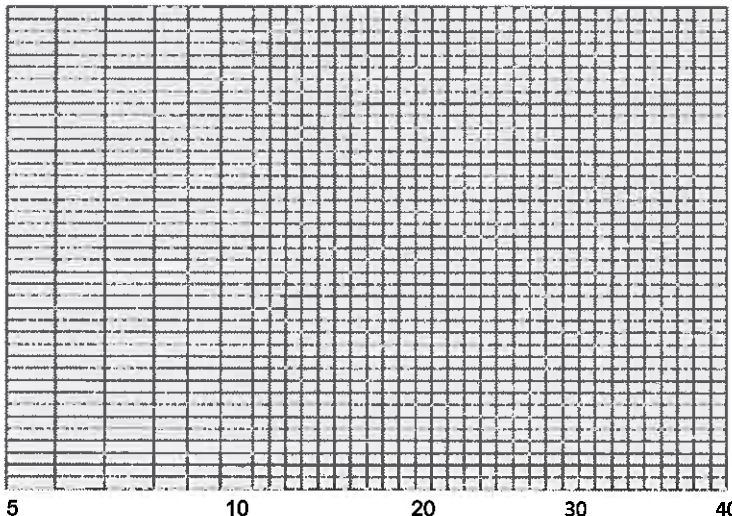
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	510	513	824			
Weight in grams	Tare + Wet Soil	29.94	29.30	30.49		
	Tare + Dry Soil	24.77	24.25	24.87		
	Water W _w					
	Tare	15.18	15.11	15.02		
	Dry Soil W _d					
Water Content	W					
No. of Blows	34	24	17			

Water Content, W



LL _____

PL _____

PI _____

Symbol from plasticity chart

LL MTE No. 62610.5
 Scale MTE No. 137894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	106	121				
Weight in grams	Tare + Wet Soil	37.26	37.07			
	Tare + Dry Soil	35.93	35.73			
	Water W _w					
	Tare	29.22	29.12			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician WJC Computed by _____

Checked by BA

Date: 1-21-14

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: 13-1005 **Depth** 40-42

Date: 2/5/2014

Material Description:

lean Gray fat clay w/ fat clay pths.

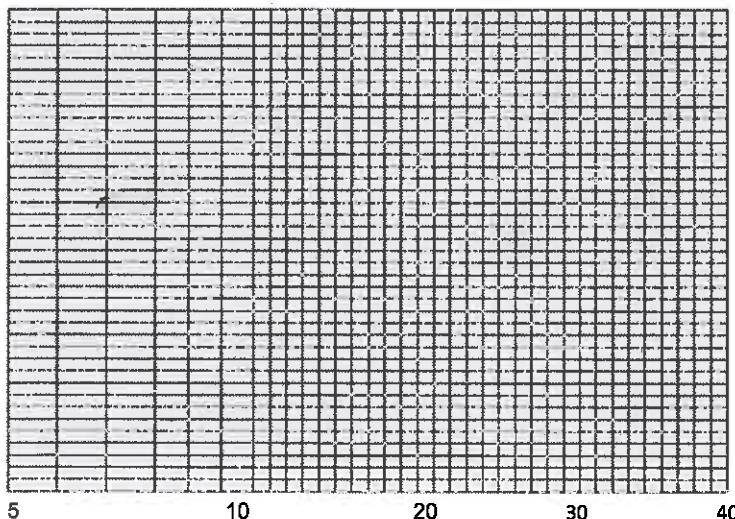
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	400A	507	818			
Weight in grams	Tare + Wet Soil	31.55	30.64	30.94		
	Tare + Dry Soil	25.98	25.30	25.08		
	Water W _w					
	Tare	15.13	15.19	15.07		
	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. 67894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	4P	8P				
Weight in grams	Tare + Wet Soil	22.18	22.75			
	Tare + Dry Soil	20.86	21.37			
	Water W _w					
	Tare	14.82	15.08			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician CC

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-B1005 Depth 48-50

Date: 1-22-2014

Material Description: CH Gray Sat clay

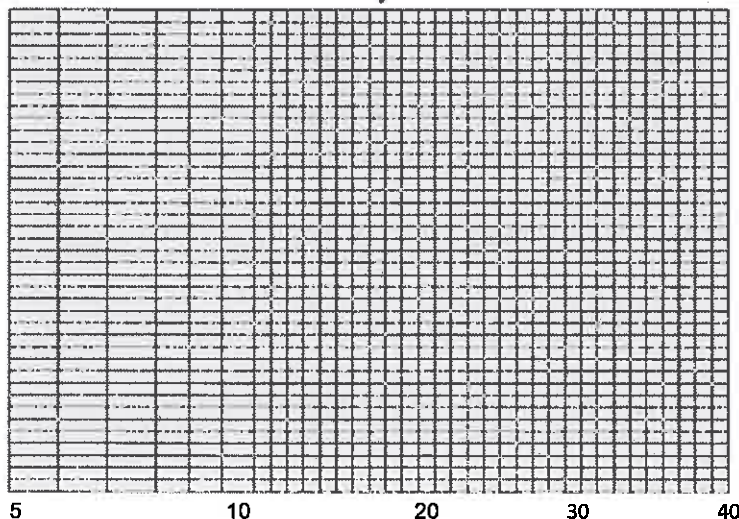
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit									
Run No.		1	2	3	4	5	6		
Tare No.		413	501	818					
Weight in grams	Tare + Wet Soil	32.13	30.33	29.74					
	Tare + Dry Soil	24.71	23.61	23.07					
	Water W_w								
	Tare	15.18	15.22	15.06					
	Dry Soil W_d								
Water Content W									
No. of Blows		33	24	16					

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.		105	109				
Weight in grams	Tare + Wet Soil	38.04	38.04				
	Tare + Dry Soil	36.09	36.14				
	Water W_w						
	Tare	29.17	29.25				
	Dry Soil W_d						
Water Content W							
Plastic Limit							

Remarks

Technician ch JC Computed by _____ Checked by JP

Date: 1-21-14 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-DYO8

Boring No: 131005 Depth 54.56

Date: 2/14/2014

Material Description: DK fat clay

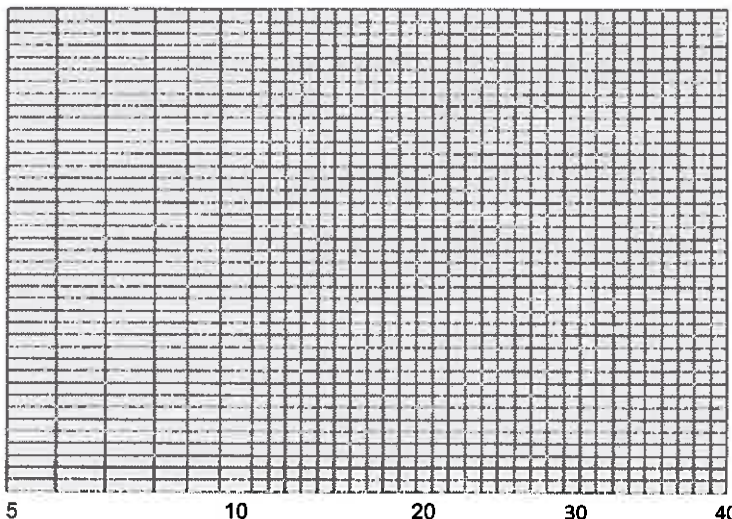
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	405	416	704			
Weight in grams	Tare + Wet Soil	29.34	30.05	29.53		
	Tare + Dry Soil	22.14	22.35	21.97		
	Water W_w					
	Tare	15.13	15.08	15.10		
	Dry Soil W_d					
Water Content	W					
No. of Blows	32	23	16			

Water Content, W



LL

PL

PI

Symbol from plasticity chart

LL MTE No. 626105
Scale MTE No. B7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	720	824				
Weight in grams	Tare + Wet Soil	22.53	22.36			
	Tare + Dry Soil	20.85	20.69			
	Water W_w					
	Tare	15.18	15.02			
	Dry Soil W_d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by

Checked by JP

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: 13-1005 **Depth** 60-62

Date: 1/27/2014

Material Description: Gray Sat clay

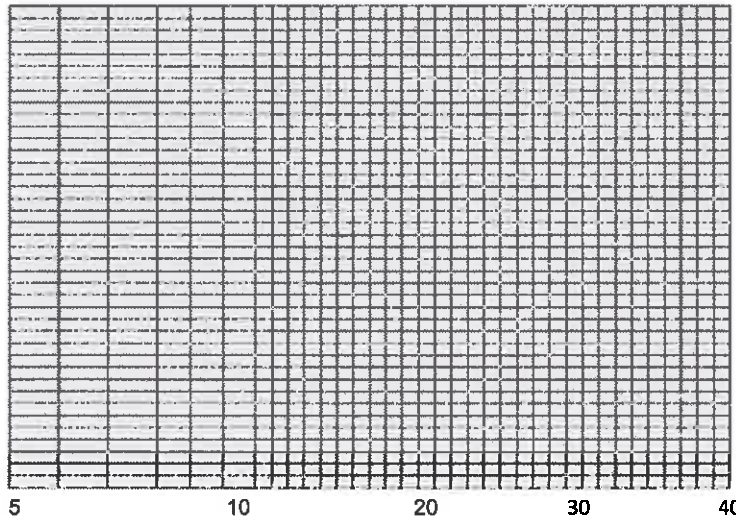
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	212	513	824			
Weight in grams	Tare + Wet Soil	31.27	30.82	31.98		
	Tare + Dry Soil	24.28	23.91	24.47		
	Water W _w					
	Tare	14.83	15.12	15.03		
	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.	2P	23				
Weight in grams	Tare + Wet Soil	22.19	22.02			
	Tare + Dry Soil	20.75	20.62			
	Water W _w					
	Tare	14.93	15.02			
	Dry Soil W _d					
Water Content W						
Plastic Limit						

Remarks _____

Technician JC

Computed by _____

Checked by JAP

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: 13-1005 **Depth** 62-64

Date: 1-22-2014

Material Description: cht Gray fat clay

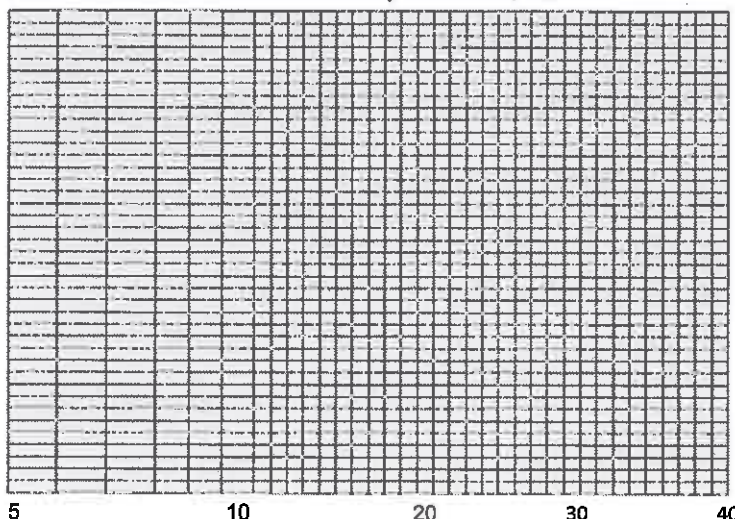
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	500	769	820A			
Weight in grams	Tare + Wet Soil	29.90	30.18	30.42		
	Tare + Dry Soil	23.07	23.03	22.99		
	Water W _w					
	Tare	15.20	15.14	15.14		
	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. 326105
 Scale MTE No. 17894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	117	102				
Weight in grams	Tare + Wet Soil	36.39	37.13			
	Tare + Dry Soil	34.76	35.39			
	Water W _w					
	Tare	29.27	29.53			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician ch Computed by JC Checked by BR

Date: 1-21-14 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: 1005 **Depth** 68-70

Date: 1/27/2014

Material Description:

Gray fat clay

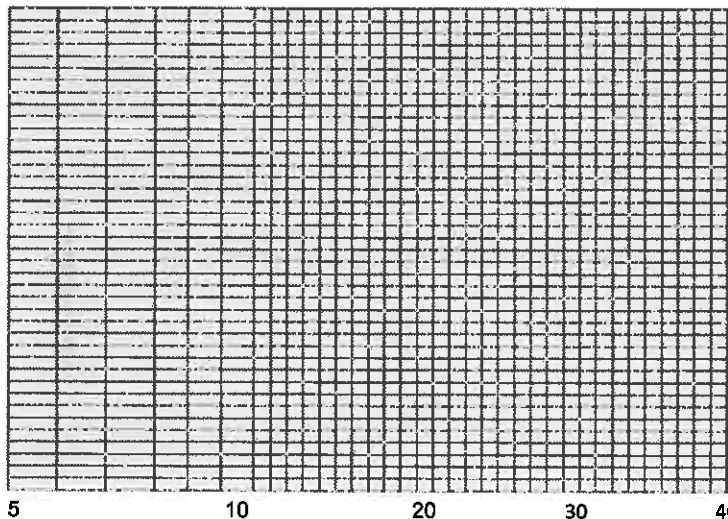
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	407	710	715			
Weight in grams	Tare + Wet Soil	31.63	29.72	32.21		
	Tare + Dry Soil	24.06	22.70	24.07		
	Water W _w					
	Tare	15.28	15.08	15.18		
	Dry Soil W _d					
Water Content W						
No. of Blows		34	24	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.	910	4P				
Weight in grams	Tare + Wet Soil	22.09	22.17			
	Tare + Dry Soil	20.74	20.72			
	Water W _w					
	Tare	15.22	14.82			
	Dry Soil W _d					
Water Content W						
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by JDP

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-DYO8

Boring No: 13-1005 **Depth 80-82**

Date: 2/14/2014

Material Description: DK Fat clay

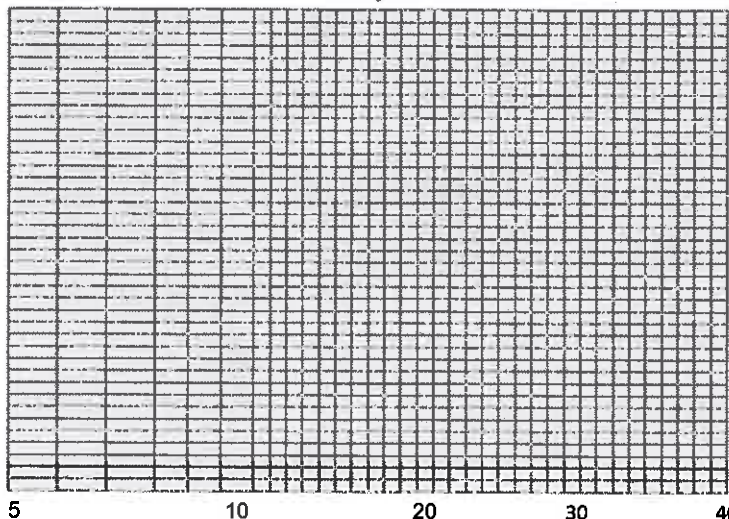
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	401	505	714			
Weight in grams	Tare + Wet Soil	29.68	30.32	30.57		
	Tare + Dry Soil	22.81	22.90	22.78		
	Water W _w					
	Tare	15.24	15.18	15.10		
	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. G-26105
Scale MTE No. B-7894

Plastic Limit						Natural Water Content
Run No.	1	2	3	4	5	
Tare No.	813	903				
Weight in grams	Tare + Wet Soil	22.21	22.21			
	Tare + Dry Soil	20.47	20.50			
	Water W _w					
	Tare	15.02	15.13			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician JK Computed by _____ Checked by 13P

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

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: 13-100^S **Depth 84-86**

Date: 1/27/2014

Material Description:

Gray fat clay

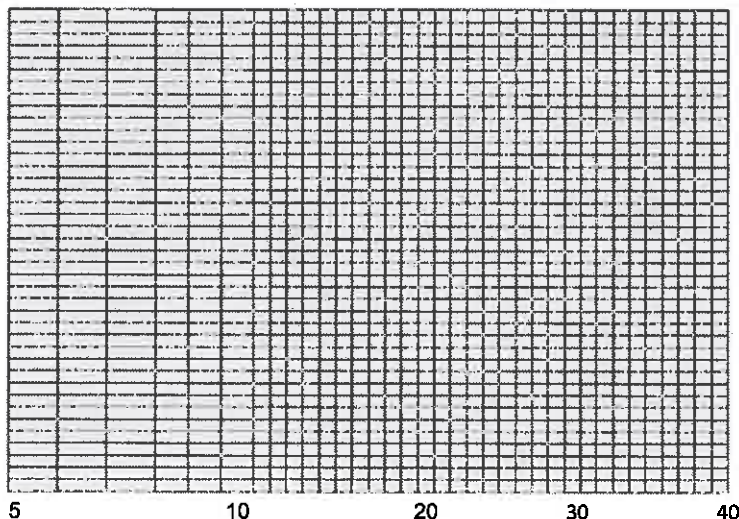
☐ One Point

☒ Three Points

☒ Pass #40 sieve

Liquid Limit						
Run No.	1	2	3	4	5	6
Tare No.	706	709	826			
Weight in grams	Tare + Wet Soil	30.48	31.27	30.54		
	Tare + Dry Soil	23.98	24.27	23.71		
	Water W _w					
	Tare	15.13	15.16	15.22		
	Dry Soil W _d					
Water Content	W					
No. of Blows	35	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.	830	902				
Weight in grams	Tare + Wet Soil	22.16	22.10			
	Tare + Dry Soil	20.87	20.82			
	Water W _w					
	Tare	15.19	15.23			
	Dry Soil W _d					
Water Content	W					
Plastic Limit						

Remarks

Technician JC

Computed by _____

Checked by BP

Date: _____

Date: _____

Che Date: 2/21

17

TRIAxIAL TEST DATA SHEET

PROJECT & SAMPLE DATA

Project number: 92145005

Date: 1-27-2014

Client: QRT - USACE

Project: PORT ARTHUR RESIDENT OFFICE

Sample Location: 13-B-1005, 40-42

Sample Description: Gr, fat cl w silt PKTS

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

Liquid Limit= Plastic Limit=

Remarks:

Confining pressure ① 10.3
② 24.3
③ 38.3

CONTRACT # W912HY-13-D-0001Dy08

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: 1-27-2014

Test Specimen number: 13-B

Tested by: MM / SAM

Sample Data

	Initial <u>CG</u>	Final
Moist soil & tare	<u>208.90</u>	<u>220.81</u> <u>DD</u>
Dry soil and tare	<u>169.94</u>	<u>180.40</u>
Tare	<u>50.48</u>	<u>64.44</u>
Moisture content		

Saturation

Consolidation

Change in height
(initial - final)

Change in water volume
(initial - final)

Moist weight = 1096.54

Specific gravity = _____

Diameter @ top = 2.71

Diameter @ center = 2.72

Diameter @ bottom = 2.69

Average diameter = 2.707

Height 1 = 6.01

Height 2 = 6.01

Height 3 = 6.01

Height 4 = _____

Average height = 6.01

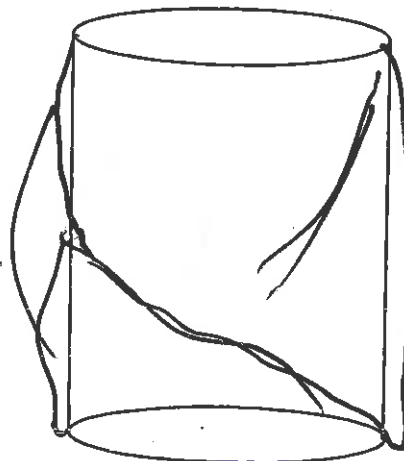
Wet density = _____

Dry density = _____

Saturation = _____

Void ratio = _____

Estimated final saturation = _____

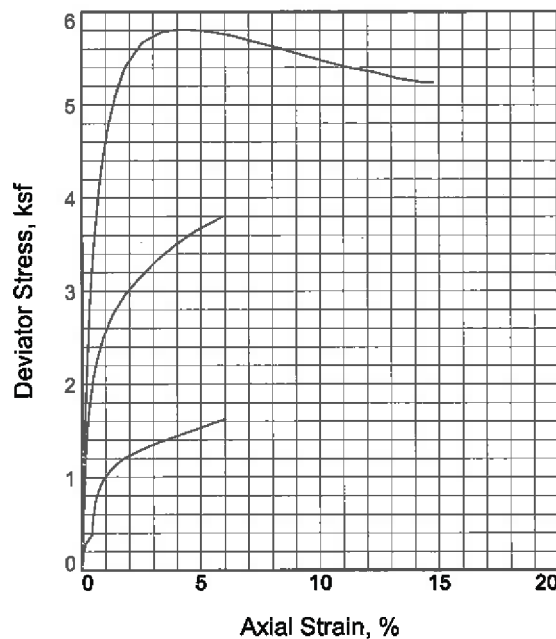
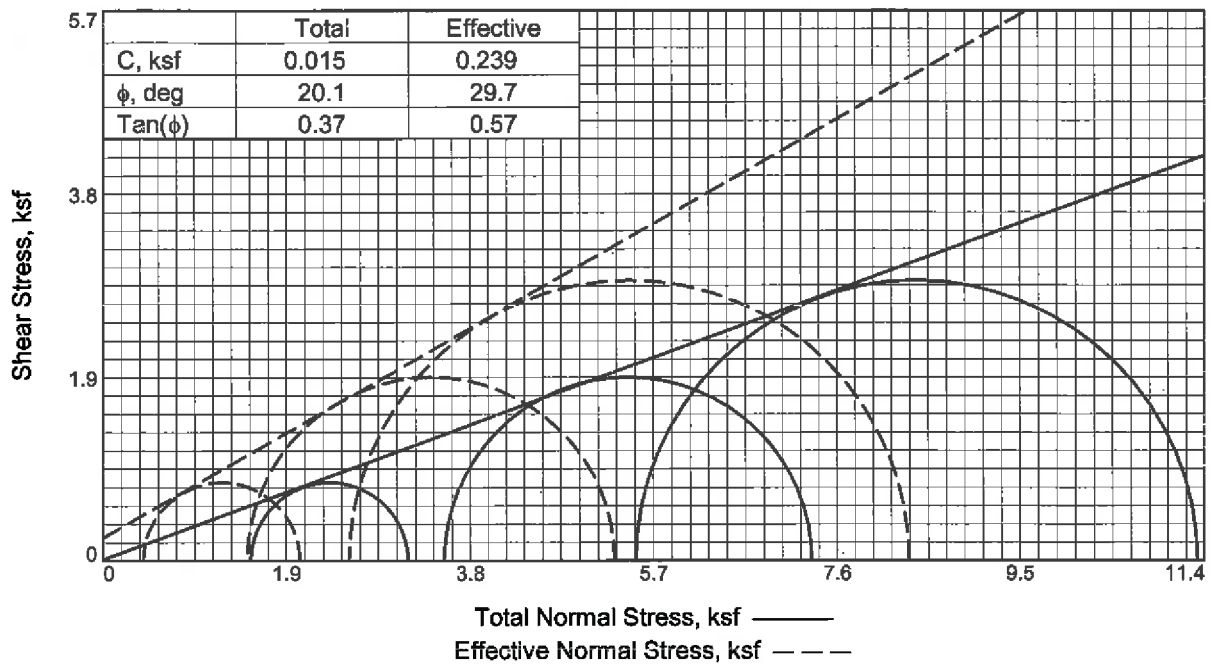


Shear _____

Bulge _____

Vertical Split _____

Project Name			Triaxial Board:			Technician				
Project No: 92145005			Boring No.: 1005, 40-4			Depth				
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					60/84.3	60/10.3	24.0		
20	18		10.60	7.50		24.0	0.5	22.50		
30	28					17.15	1.0	22.50		
40	38		9.50			17.15	2.0	22.10		
50	48						4.0	21.50		
60	58	12.55				60/98.3	8	20.70		
		13.10				24.0	28.	17.50		
		13.90				9.15	60	15.20		
		15.15				9.00	90	13.50		
		15.30				9.00	8-45	12.8		
		15.30					12.0	12.05		
							20.0	11.80		
1st Cell Pressure		60.02					34	11.65		
back Pressure		58.12								
1st Pore Pressure		58.13								
2nd Cell Pressure		65.08								
2nd Pore Pressure		63.34								
B value	5.24		5.06		21.03					
Remarks						Chamber Pressure		70.3 psi		
						Back Pressure		60.0 psi		
						Consolidation Pressure		10.3 psi		



Sample No.		1	2	3
Initial	Water Content, %	32.6	32.6	32.6
	Dry Density, pcf	91.1	91.1	91.1
	Saturation, %	100.1	100.1	100.1
	Void Ratio	0.9057	0.9057	0.9057
	Diameter, in.	2.707	2.707	2.707
	Height, in.	6.010	6.010	6.010
At Test	Water Content, %	32.6	32.6	32.6
	Dry Density, pcf	91.1	91.1	91.1
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.9057	0.9057	0.9057
	Diameter, in.	2.707	2.707	2.707
	Height, in.	6.010	6.010	6.010
Strain rate, in./min.		0.000	0.000	0.000
Back Pressure, psi		60.000	60.000	60.000
Cell Pressure, psi		70.640	84.520	98.330
Fail. Stress, ksf		1.622	3.806	5.808
Excess Pore Pr., ksf		1.115	2.035	2.972
Ult. Stress, ksf				
Excess Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		2.039	5.302	8.355
$\bar{\sigma}_3$ Failure, ksf		0.417	1.496	2.548

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray Fat Clay w/silt pockets

Assumed Specific Gravity= 2.78

Remarks: ASTM D4767

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

Project: Port Arthur Resident Office

Location: 13-B1005

Sample Number: 21

Depth: 40-42 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
12:17 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Resident Office
Project No.: 92145005
Location: 13-B1005
Depth: 40-42 ft. **Sample Number:** 21
Description: Gray Fat Clay w/silt pockets
Remarks: ASTM D4767
Type of Sample: Undisturbed
Assumed Specific Gravity=2.78 **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.	208.900			220.810
Moisture content: Dry soil+tare, gms.	169.940			180.400
Moisture content: Tare, gms.	50.480			64.440
Moisture, %	32.6	32.6	32.6	34.8
Moist specimen weight, gms.	1096.54			
Diameter, in.	2.707	2.707	2.707	
Area, in. ²	5.755	5.755	5.755	
Height, in.	6.010	6.010	6.010	
Net decrease in height, in.		0.000	0.000	
Wet density, pcf	120.8	120.7	120.7	
Dry density, pcf	91.1	91.1	91.1	
Void ratio	0.9057	0.9057	0.9057	
Saturation, %	100.1	100.0	100.0	

Test Readings for Specimen No. 1

Consolidation cell pressure = 70.640 psi (10.172 ksf)
Consolidation back pressure = 60.000 psi (8.640 ksf)
Consolidation effective confining stress = 1.532 ksf
Strain rate, in./min. = 0.000
Fail. Stress = 1.622 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	10.172	10.172	1.00	0.000	10.172	0.000
1	0.0013	3.037	3.0	0.0	0.076	1.494	1.570	1.05	60.266	1.532	0.038
2	0.0043	8.025	8.0	0.1	0.201	1.494	1.695	1.13	60.265	1.594	0.100
3	0.0088	11.560	11.6	0.1	0.289	1.517	1.806	1.19	60.104	1.662	0.144
4	0.0253	15.303	15.3	0.4	0.381	1.339	1.720	1.28	61.345	1.529	0.191
5	0.0268	18.832	18.8	0.4	0.469	1.286	1.755	1.36	61.708	1.521	0.235
6	0.0298	24.062	24.1	0.5	0.599	1.220	1.820	1.49	62.165	1.520	0.300
7	0.0343	28.957	29.0	0.6	0.720	1.098	1.818	1.66	63.017	1.458	0.360
8	0.0404	33.222	33.2	0.7	0.826	0.996	1.822	1.83	63.724	1.409	0.413
9	0.0479	36.740	36.7	0.8	0.912	0.898	1.810	2.02	64.402	1.354	0.456
10	0.0599	40.694	40.7	1.0	1.008	0.803	1.811	2.26	65.065	1.307	0.504
11	0.0794	44.787	44.8	1.3	1.106	0.687	1.793	2.61	65.868	1.240	0.553
12	0.1035	48.463	48.5	1.7	1.192	0.600	1.791	2.99	66.476	1.196	0.596
13	0.1395	52.174	52.2	2.3	1.275	0.535	1.810	3.38	66.924	1.173	0.638
14	0.1816	55.775	55.8	3.0	1.353	0.485	1.838	3.79	67.275	1.161	0.677
15	0.2297	59.247	59.2	3.8	1.426	0.457	1.882	4.12	67.469	1.170	0.713
16	0.2837	63.004	63.0	4.7	1.502	0.423	1.925	4.55	67.706	1.174	0.751
17	0.3318	66.869	66.9	5.5	1.581	0.427	2.008	4.70	67.676	1.217	0.790
18	0.3619	68.992	69.0	6.0	1.622	0.417	2.039	4.89	67.744	1.228	0.811
19	0.3620	68.834	68.8	6.0	1.619	0.421	2.039	4.85	67.719	1.230	0.809

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	208.900			220.810
Moisture content: Dry soil+tare, gms.	169.940			180.400
Moisture content: Tare, gms.	50.480			64.440
Moisture, %	32.6	32.6	32.6	34.8
Moist specimen weight, gms.	1096.54			
Diameter, in.	2.707	2.707	2.707	
Area, in. ²	5.755	5.755	5.755	
Height, in.	6.010	6.010	6.010	
Net decrease in height, in.		0.000	0.000	
Wet density, pcf	120.8	120.7	120.7	
Dry density, pcf	91.1	91.1	91.1	
Void ratio	0.9057	0.9057	0.9057	
Saturation, %	100.1	100.0	100.0	

Test Readings for Specimen No. 2

Consolidation cell pressure = 84.520 psi (12.171 ksf)

Consolidation back pressure = 60.000 psi (8.640 ksf)

Consolidation effective confining stress = 3.531 ksf

Strain rate, in./min. = 0.000

Fail. Stress = 3.806 ksf at reading no. 19

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	12.171	12.171	1.00	0.000	12.171	0.000
1	0.0008	3.288	3.3	0.0	0.082	3.441	3.524	1.02	60.621	3.483	0.041
2	0.0023	14.222	14.2	0.0	0.356	3.344	3.700	1.11	61.296	3.522	0.178
3	0.0038	24.442	24.4	0.1	0.611	3.242	3.853	1.19	62.008	3.547	0.306
4	0.0068	38.473	38.5	0.1	0.962	3.041	4.003	1.32	63.400	3.522	0.481
5	0.0099	48.988	49.0	0.2	1.224	2.883	4.107	1.42	64.500	3.495	0.612
6	0.0129	57.267	57.3	0.2	1.430	2.755	4.185	1.52	65.387	3.470	0.715
7	0.0174	66.536	66.5	0.3	1.660	2.577	4.236	1.64	66.627	3.407	0.830
8	0.0234	75.251	75.3	0.4	1.875	2.423	4.299	1.77	67.692	3.361	0.938
9	0.0309	83.989	84.0	0.5	2.091	2.221	4.312	1.94	69.095	3.267	1.045
10	0.0414	92.250	92.3	0.7	2.292	2.064	4.356	2.11	70.188	3.210	1.146
11	0.0549	100.750	100.8	0.9	2.498	1.930	4.428	2.29	71.119	3.179	1.249
12	0.0790	111.243	111.2	1.3	2.747	1.754	4.501	2.57	72.337	3.128	1.373
13	0.1090	120.346	120.3	1.8	2.956	1.647	4.603	2.80	73.083	3.125	1.478
14	0.1451	128.728	128.7	2.4	3.143	1.535	4.678	3.05	73.861	3.106	1.572
15	0.1871	136.920	136.9	3.1	3.319	1.506	4.825	3.20	74.060	3.166	1.660
16	0.2352	145.074	145.1	3.9	3.488	1.464	4.952	3.38	74.352	3.208	1.744
17	0.2893	153.266	153.3	4.8	3.650	1.453	5.103	3.51	74.429	3.278	1.825
18	0.3464	160.193	160.2	5.8	3.777	1.481	5.258	3.55	74.236	3.369	1.889
19	0.3602	161.796	161.8	6.0	3.806	1.496	5.302	3.54	74.131	3.399	1.903

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	208.900			220.810
Moisture content: Dry soil+tare, gms.	169.940			180.400
Moisture content: Tare, gms.	50.480			64.440
Moisture, %	32.6	32.6	32.6	34.8
Moist specimen weight, gms.	1096.54			
Diameter, in.	2.707	2.707	2.707	
Area, in. ²	5.755	5.755	5.755	
Height, in.	6.010	6.010	6.010	
Net decrease in height, in.		0.000	0.000	
Wet density, pcf	120.8	120.7	120.7	
Dry density, pcf	91.1	91.1	91.1	
Void ratio	0.9057	0.9057	0.9057	
Saturation, %	100.1	100.0	100.0	

Test Readings for Specimen No. 3

Consolidation cell pressure = 98.330 psi (14.160 ksf)

Consolidation back pressure = 60.000 psi (8.640 ksf)

Consolidation effective confining stress = 5.520 ksf

Strain rate, in./min. = 0.000

Fail. Stress = 5.808 ksf at reading no. 18

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	14.160	14.160	1.00	0.000	14.160	0.000
1	0.0007	3.587	3.6	0.0	0.090	5.452	5.542	1.02	60.467	5.497	0.045
2	0.0037	29.392	29.4	0.1	0.735	5.091	5.825	1.14	62.979	5.458	0.367
3	0.0052	41.793	41.8	0.1	1.045	4.908	5.953	1.21	64.248	5.430	0.522
4	0.0083	62.327	62.3	0.1	1.557	4.679	6.236	1.33	65.838	5.458	0.779
5	0.0113	78.699	78.7	0.2	1.965	4.425	6.391	1.44	67.598	5.408	0.983
6	0.0143	92.186	92.2	0.2	2.301	4.216	6.517	1.55	69.055	5.366	1.151
7	0.0188	108.992	109.0	0.3	2.719	3.969	6.687	1.69	70.771	5.328	1.359
8	0.0233	122.880	122.9	0.4	3.063	3.771	6.834	1.81	72.140	5.303	1.531
9	0.0293	137.424	137.4	0.5	3.422	3.576	6.998	1.96	73.496	5.287	1.711
10	0.0353	149.848	149.8	0.6	3.727	3.414	7.142	2.09	74.620	5.278	1.864
11	0.0428	162.881	162.9	0.7	4.046	3.283	7.329	2.23	75.534	5.306	2.023
12	0.0518	175.820	175.8	0.9	4.361	3.119	7.480	2.40	76.668	5.300	2.181
13	0.0669	192.285	192.3	1.1	4.758	2.950	7.708	2.61	77.844	5.329	2.379
14	0.0849	206.844	206.8	1.4	5.102	2.823	7.925	2.81	78.724	5.374	2.551
15	0.1089	219.805	219.8	1.8	5.400	2.697	8.097	3.00	79.600	5.397	2.700
16	0.1510	232.322	232.3	2.5	5.667	2.611	8.278	3.17	80.195	5.445	2.833
17	0.2051	239.520	239.5	3.4	5.788	2.549	8.337	3.27	80.632	5.443	2.894
18	0.2592	242.577	242.6	4.3	5.808	2.548	8.355	3.28	80.637	5.452	2.904
19	0.3163	244.328	244.3	5.3	5.792	2.507	8.298	3.31	80.922	5.403	2.896
20	0.3763	244.901	244.9	6.3	5.744	2.497	8.240	3.30	80.992	5.369	2.872
21	0.4364	244.664	244.7	7.3	5.677	2.515	8.192	3.26	80.866	5.353	2.839
22	0.4965	244.474	244.5	8.3	5.612	2.495	8.107	3.25	81.001	5.301	2.806
23	0.5566	243.844	243.8	9.3	5.536	2.486	8.022	3.23	81.068	5.254	2.768
24	0.6167	243.281	243.3	10.3	5.462	2.506	7.969	3.18	80.926	5.237	2.731
25	0.6768	243.150	243.2	11.3	5.399	2.485	7.883	3.17	81.075	5.184	2.699
26	0.7369	243.750	243.7	12.3	5.351	2.506	7.857	3.13	80.925	5.182	2.675

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	0.7970	243.446	243.4	13.3	5.283	2.505	7.789	3.11	80.931	5.147	2.642
28	0.8571	244.396	244.4	14.3	5.243	2.496	7.739	3.10	80.999	5.117	2.621
29	0.8858	245.779	245.8	14.7	5.243	2.514	7.757	3.09	80.873	5.135	2.622

Moisture Content Tests (ASTM D2216)

Terracon

Date: 01 - 17 - 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
13-Bloss	ABB	0-2			G.T. loam clay w/FE	RRR	184.	158.			
	PI	2-4			w/FE sand & silt	N20	87	59	62.23		
	ABB	6-8			L.T. sandy loam clay	3B	156.	136.			
	PI	10-12			w/FE	N11	32	21	61.53		
		12-14			L.T. fine clay	Q	146.	127.			
		14-16			w/FE	S	41	88	39.75		
		16-18			L.T. fine clay	Q	157.	139.			
		24-26			w/FE	S	41	90	60.66		
	ABB	28-30			L.T. fine clay	GD	170.	146.			
	PI	30-32			w/FE	N19	25	67	61.89		
		32-34			L.T. fine clay	GD	152	132.			
		38-40			w/FE	N19	27	03	61.48		
	ABB	46-48			G.T. silty sand	O	179.	153.			
	PI	52-54			w/FE	207	59	71	42.76		
		58-60			G.T. fine clay w/FE	E10	202.	166.			
					w/silty sand	G	83	12	58.88		
					G.T. fine clay w/FE	207	158.	133.			
					w/silty sand lenses w/loam clay	E10	78	63	59.08		
					G. fine clay w/silt	G	212.	172.			
					w/loam clay & silt	GD	64	25	49.41		
					G. fine clay	G	168.	138.			
					w/silt & p.k.	3D	36	03	58.36		
					G. fine clay	3D	176.	143.			
					w/silt & p.k.	3D	20	97	64.39		
					G. fine clay	3D	162.	127.			
					w/silt	3D	48	84	59.53		
					G. fine clay	3D	161.	128.			
					w/FE	3D	03	07	59.57		
					G. fine clay w/FE	3D	195.	159.			
					w/sand p.k.	3D	54	22	58.20		

Technician: Rodrigo

Scale No.: ☐J350: ☐MTE B93: ☐B8449: ☐

Tested By:

Date: 01 - 2014 Reviewed By:

- 2014

R 1/28

Terracon

Project No:92145005

Contract #W912HY-D-0001-DY08

13-B/005

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

✓ 1/28

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

Terracon

Job No. **92145005**

Material Description

*LIT & G lean clay w/ calite
& crawfish hole*

Boring No.: **13-B1005**

Depth (ft) **8-10**

Sample Length (inch)

5.780 5.779 5.772 5.777

Cohesion (tsf)

Sample Diameter (inch)

2.645 2.645 2.650 2.647

Date of Test **-2013**

Moist Weight (g)

1042.8 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

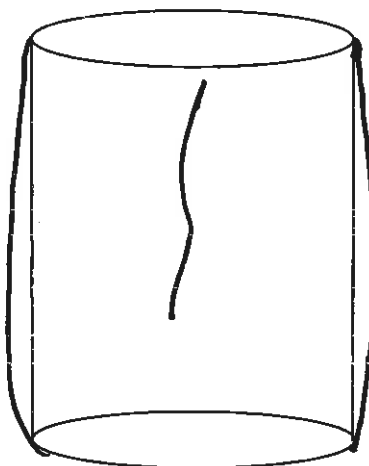
Moisture Content Determination

Tare Number	3I
Wet Soil + Tare (g)	181.92
Dry Soil + Tare (g)	155.18
Tare Weight (g)	59.90

Prepared By: *ch* Date: **01-24** -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear _____

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

*LT Say lean clay w/ some
sands*

Boring No.: **13-B100# 1005**

Depth (ft)

22-24

Sample Length (inch)

5.812 5.794 5.813 5.806

Cohesion (tsf)

Sample Diameter (inch)

2.705 2.72 2.700 2.708

Date of Test

- **2013**

Moist Weight (g)

1115.3

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

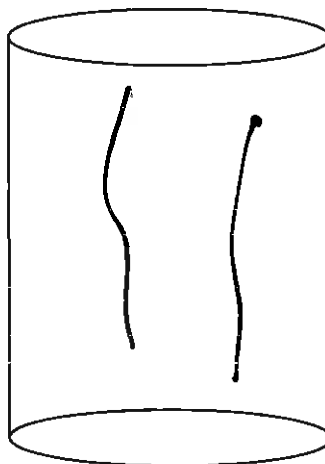
Tare Number	<i>DD</i>
Wet Soil + Tare (g)	<i>174.45</i>
Dry Soil + Tare (g)	<i>153.89</i>
Tare Weight (g)	<i>64.43</i>

Prepared By: *ch*

Date: *01-24* -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

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

*G Fat clay w/ lean clay ss ?
CH/CL*

Boring No.: **13-BLA04 1005**

Depth (ft)

34-36

Sample Length (inch)

5.805 5.808 5.797 5.803

Cohesion (tsf)

Sample Diameter (inch)

2.705 2.720 2.715 2.713

Date of Test

-2013

Moist Weight (g)

1039.0

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

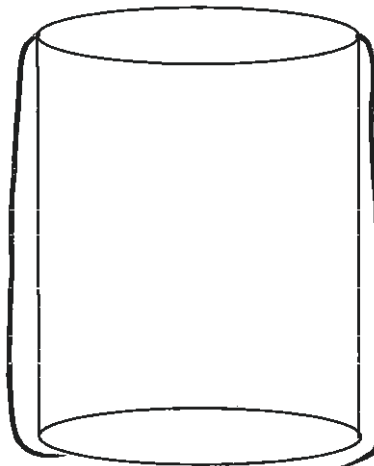
Moisture Content Determination	
Tare Number	<i>3E</i>
Wet Soil + Tare (g)	<i>179.36</i>
Dry Soil + Tare (g)	<i>148.49</i>
Tare Weight (g)	<i>58.11</i>

Prepared By: *ch*

Date: *01-25* -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/
lean clay pits (CH)

Boring No.: 13-B1005

Depth (ft) 42-44

Sample Length (inch) 5.710 5.776 5.716 5.774

Cohesion (tsf)

Sample Diameter (inch) 2.771 2.775 2.785 2.777

Date of Test - 2013

Moist Weight (g)

1036.1

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	

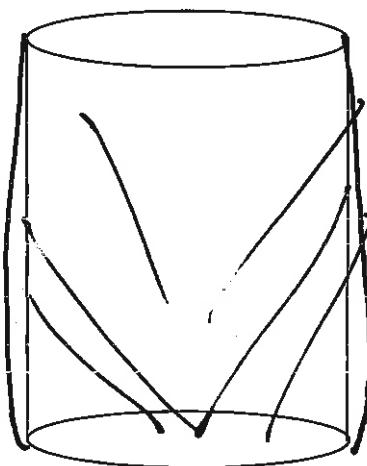
Moisture Content Determination

Tare Number	B'
Wet Soil + Tare (g)	194.63
Dry Soil + Tare (g)	158.75
Tare Weight (g)	58.22

Prepared By: CH Date: 01-25-2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear / 40°

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

*6 Fay Clay w/ silty
CH*

Boring No.: **13-B1005**

Depth (ft)

60-62

Sample Length (inch)

5.781 5.769 5.770 5.773

Cohesion (tsf)

Sample Diameter (inch)

2.691 2.705 2.699 2.698

Date of Test

-2013

Moist Weight (g)

997.6

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	

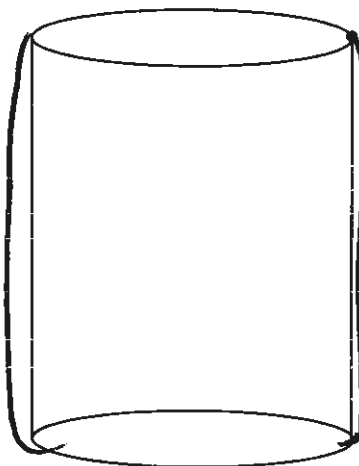
Moisture Content Determination

Tare Number	<i>3A</i>
Wet Soil + Tare (g)	<i>194.29</i>
Dry Soil + Tare (g)	<i>159.09</i>
Tare Weight (g)	<i>60.58</i>

Prepared By: *eh* Date: *01-25* -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

Bulge

Vertical Split

Tested By: *SR* 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/ S&PS

Boring No.: **13-B1005**

Depth (ft) 68-70

Sample Length (inch) 5.766 5.788 5.715 5.776

Cohesion (tsf)

Sample Diameter (inch) 2.776 2.770 2.779 2.775

Date of Test -2013

Moist Weight (g) 987.3

Ave

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

Caliper No. ☐ W10202 ☐ W10203 ☐ W10204

✓ Unconfined

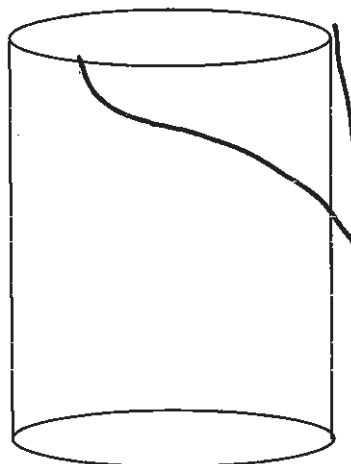
Strain Dial (0.001 inch)	Load (lbs.)
0	
20	
40	
60	
80	
100	
120	
140	
160	
180	
200	
220	
240	
260	
280	
300	
320	
340	
360	
380	
400	
420	
440	
460	
480	
500	
550	
600	
650	
700	
750	
800	
850	

Moisture Content Determination	
Tare Number	<u>20T E11</u>
Wet Soil + Tare (g)	<u>160.32</u>
Dry Soil + Tare (g)	<u>125.15</u>
Tare Weight (g)	<u>59.71</u> 49.74

Prepared By: uh Date: 01- 25 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear 145

Bulge

Vertical Split

Tested By: SN 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 Gr. Red cl

Boring No.: 13- B-1005

Depth (ft) 84-86

Sample Length (inch) 5.766 5.762 5.761 5.763

Cohesion (tsf)

Sample Diameter (inch) 2.72 2.72 2.72 2.72

Date of Test - -2013

Moist Weight (g) 1025.5 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

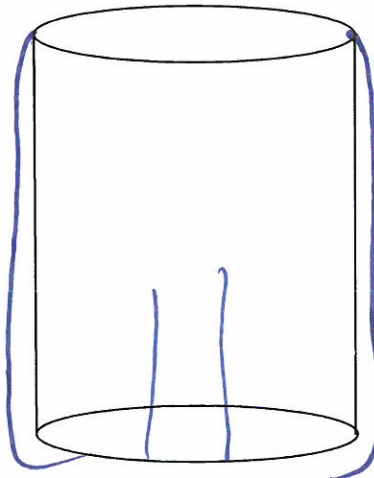
Moisture Content Determination

Tare Number	<u>3F</u>
Wet Soil + Tare (g)	<u>136.25</u>
Dry Soil + Tare (g)	<u>114.58</u>
Tare Weight (g)	<u>59.25</u>

Prepared By: SA Date: 01- 25 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear ☐

Bulge ☒

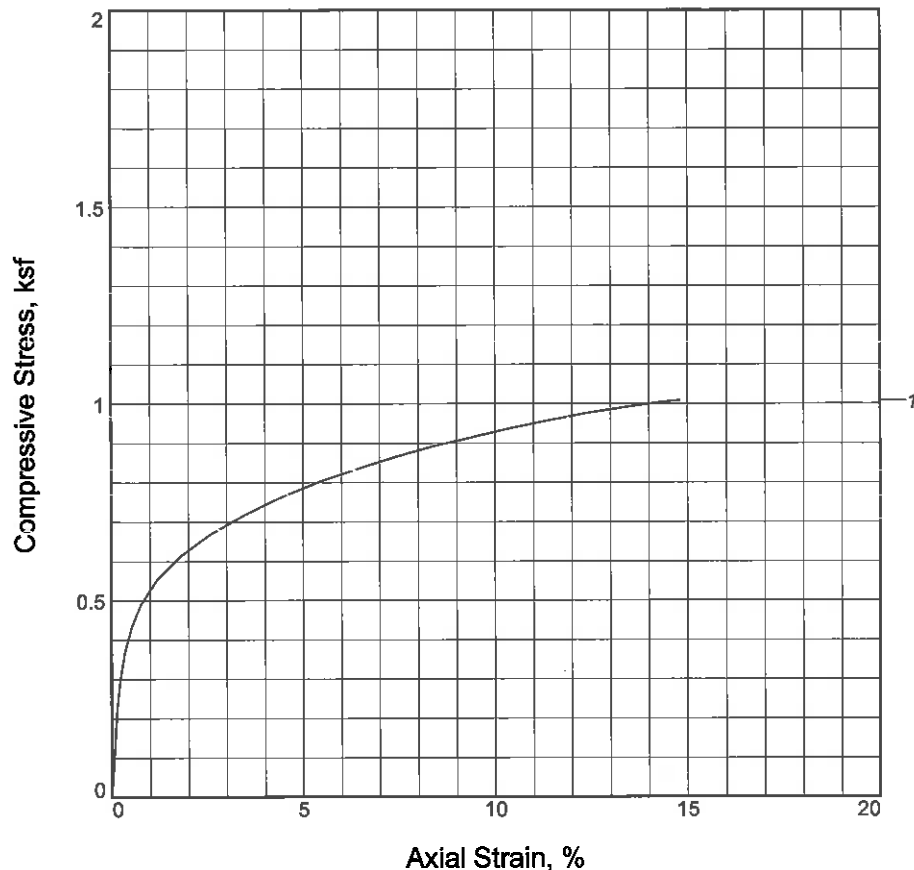
Vertical Split ☒

Tested By: SA 01- -2014

Computed By: - -2014

Machine: ☐ HM 2000 ☐ S 610

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.008			
Undrained shear strength, ksf	0.504			
Failure strain, %	14.8			
Strain rate, in./min.	0.055			
Water content, %	28.1			
Wet density, pcf	125.0			
Dry density, pcf	97.6			
Saturation, %	100.2			
Void ratio	0.7786			
Specimen diameter, in.	2.647			
Specimen height, in.	5.777			
Height/diameter ratio	2.18			

Description: Light gray, tan and gray Lean Clay w/calcareous nodules and shell

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-B1005

Sample Number: 5 **Depth:** 8-10 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-B1005
Depth: 8-10 ft. **Sample Number:** 5
Description: Light gray, tan and gray Lean Clay w/calcareous nodules and shell
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.	181.920
Moisture content: Dry soil+tare, gms.	155.180
Moisture content: Tare, gms.	59.900
Moisture, %	28.1
Moist specimen weight, gms.	1042.80
Diameter, in.	2.647
Area, in. ²	5.503
Height, in.	5.777
Wet density, pcf	125.0
Dry density, pcf	97.6
Void ratio	0.7786
Saturation, %	100.2

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

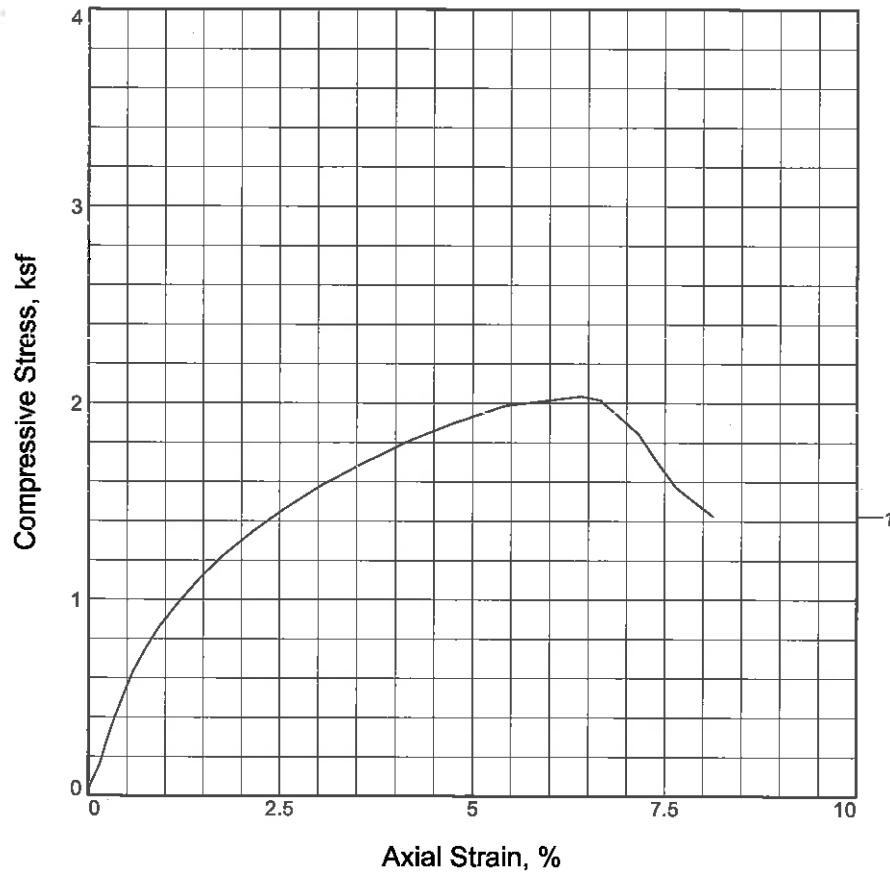
Unconfined compressive strength = 1.008 ksf at reading no. 24

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	0.0027	2.766	2.8	0.0	0.072
3	0.0058	5.960	6.0	0.1	0.156
4	0.0082	8.482	8.5	0.1	0.222
5	0.0128	11.432	11.4	0.2	0.298
6	0.0198	14.146	14.1	0.3	0.369
7	0.0298	16.539	16.5	0.5	0.431
8	0.0444	18.873	18.9	0.8	0.490
9	0.0690	21.458	21.5	1.2	0.555
10	0.1031	23.810	23.8	1.8	0.612
11	0.1488	26.235	26.2	2.6	0.669
12	0.2004	28.405	28.4	3.5	0.718
13	0.2516	30.344	30.3	4.4	0.759
14	0.3148	32.439	32.4	5.4	0.803
15	0.3720	34.106	34.1	6.4	0.835
16	0.4292	35.714	35.7	7.4	0.865

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.4864	37.240	37.2	8.4	0.892
18	0.5435	38.559	38.6	9.4	0.914
19	0.6007	39.961	40.0	10.4	0.937
20	0.6574	41.261	41.3	11.4	0.957
21	0.7146	42.540	42.5	12.4	0.975
22	0.7717	43.672	43.7	13.4	0.990
23	0.8289	44.787	44.8	14.3	1.004
24	0.8550	45.233	45.2	14.8	1.008

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	2.035			
Undrained shear strength, ksf	1.017			
Failure strain, %	6.4			
Strain rate, in./min.	0.055			
Water content, %	23.0			
Wet density, pcf	127.1			
Dry density, pcf	103.3			
Saturation, %	95.5			
Void ratio	0.6617			
Specimen diameter, in.	2.708			
Specimen height, in.	5.806			
Height/diameter ratio	2.14			

Description: Light 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-B1005

Sample Number: 12 **Depth:** 22-24 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-B1005
Depth: 22-24 ft, **Sample Number:** 12
Description: Light 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.	174.450
Moisture content: Dry soil+tare, gms.	153.890
Moisture content: Tare, gms.	64.430
Moisture, %	23.0
Moist specimen weight, gms.	1115.30
Diameter, in.	2.708
Area, in. ²	5.760
Height, in.	5.806
Wet density, pcf	127.1
Dry density, pcf	103.3
Void ratio	0.6617
Saturation, %	95.5

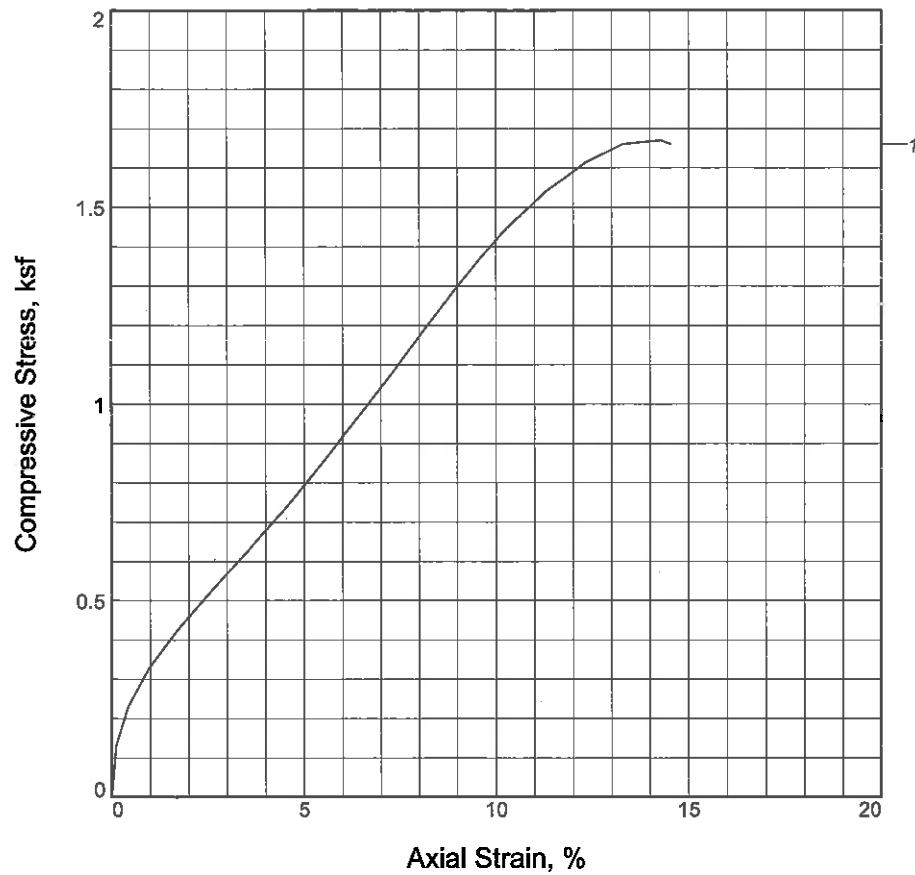
Test Readings for Specimen No. 1**Strain rate, in./min. = 0.055****Unconfined compressive strength = 2.035 ksf at reading no. 19**

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	-0.618	0.0	0.0	0.000
1	0.0010	1.266	1.9	0.0	0.047
2	0.0085	5.880	6.5	0.1	0.162
3	0.0140	10.977	11.6	0.2	0.289
4	0.0196	15.307	15.9	0.3	0.397
5	0.0271	20.489	21.1	0.5	0.525
6	0.0341	25.052	25.7	0.6	0.638
7	0.0426	29.418	30.0	0.7	0.745
8	0.0526	33.841	34.5	0.9	0.854
9	0.0687	39.470	40.1	1.2	0.990
10	0.0858	44.764	45.4	1.5	1.118
11	0.1028	49.359	50.0	1.8	1.227
12	0.1258	54.689	55.3	2.2	1.353
13	0.1489	59.444	60.1	2.6	1.463
14	0.1774	64.739	65.4	3.1	1.584
15	0.2065	69.444	70.1	3.6	1.689
16	0.2406	74.528	75.1	4.1	1.801

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.2752	79.011	79.6	4.7	1.897
18	0.3153	83.409	84.0	5.4	1.987
19	0.3720	86.330	86.9	6.4	2.035
20	0.3865	85.744	86.4	6.7	2.015
21	0.4152	78.926	79.5	7.2	1.847
22	0.4293	72.992	73.6	7.4	1.704
23	0.4433	67.608	68.2	7.6	1.576
24	0.4720	61.475	62.1	8.1	1.426

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.670			
Undrained shear strength, ksf	0.835			
Failure strain, %	14.3			
Strain rate, in./min.	0.055			
Water content, %	34.2			
Wet density, pcf	118.0			
Dry density, pcf	88.0			
Saturation, %	98.7			
Void ratio	0.9520			
Specimen diameter, in.	2.713			
Specimen height, in.	5.803			
Height/diameter ratio	2.14			

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-B1005

Sample Number: 18 **Depth:** 34-36 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-B1005
Depth: 34-36 ft. **Sample Number:** 18
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.	179.360
Moisture content: Dry soil+tare, gms.	148.490
Moisture content: Tare, gms.	58.110
Moisture, %	34.2
Moist specimen weight, gms.	1039.00
Diameter, in.	2.713
Area, in. ²	5.781
Height, in.	5.803
Wet density, pcf	118.0
Dry density, pcf	88.0
Void ratio	0.9520
Saturation, %	98.7

Test Readings for Specimen No. 1

Strain rate, in./min. = 0.055

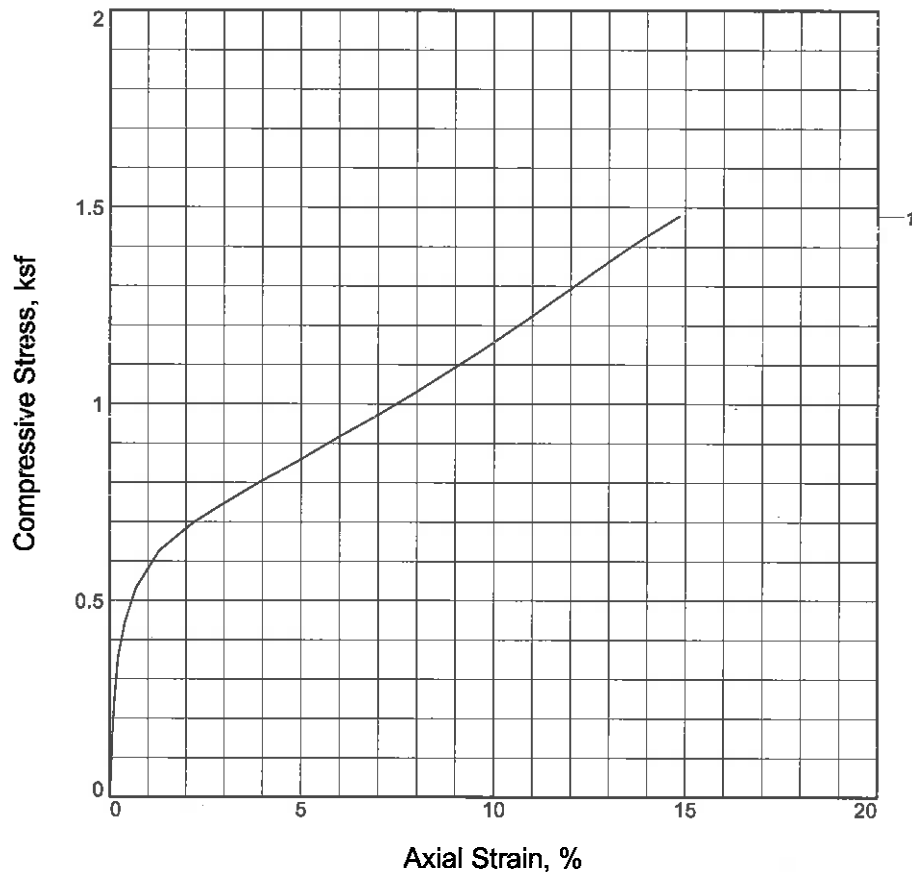
Unconfined compressive strength = 1.670 ksf at reading no. 20

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0013	1.239	1.2	0.0	0.031
2	0.0069	5.243	5.2	0.1	0.130
3	0.0254	9.298	9.3	0.4	0.231
4	0.0574	13.391	13.4	1.0	0.330
5	0.1030	17.698	17.7	1.8	0.433
6	0.1546	21.960	22.0	2.7	0.532
7	0.2062	26.165	26.2	3.6	0.629
8	0.2578	30.603	30.6	4.4	0.728
9	0.3009	34.528	34.5	5.2	0.816
10	0.3435	38.690	38.7	5.9	0.907
11	0.3861	42.937	42.9	6.7	0.998
12	0.4292	47.380	47.4	7.4	1.093
13	0.4717	51.940	51.9	8.1	1.189
14	0.5149	56.511	56.5	8.9	1.283
15	0.5574	60.976	61.0	9.6	1.373
16	0.6001	65.049	65.0	10.3	1.453

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.6573	69.816	69.8	11.3	1.542
18	0.7145	73.845	73.8	12.3	1.613
19	0.7716	76.871	76.9	13.3	1.660
20	0.8288	78.196	78.2	14.3	1.670
21	0.8428	77.981	78.0	14.5	1.660

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.477			
Undrained shear strength, ksf	0.739			
Failure strain, %	14.8			
Strain rate, in./min.	0.055			
Water content, %	35.7			
Wet density, pcf	112.9			
Dry density, pcf	83.2			
Saturation, %	92.2			
Void ratio	1.0640			
Specimen diameter, in.	2.777			
Specimen height, in.	5.774			
Height/diameter ratio	2.08			

Description: Gray Fat 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-B1005

Sample Number: 22 **Depth:** 42-44 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-B1005
Depth: 42-44 ft. **Sample Number:** 22
Description: Gray Fat 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.	194.630
Moisture content: Dry soil+tare, gms.	158.750
Moisture content: Tare, gms.	58.220
Moisture, %	35.7
Moist specimen weight, gms.	1036.10
Diameter, in.	2.777
Area, in. ²	6.057
Height, in.	5.774
Wet density, pcf	112.9
Dry density, pcf	83.2
Void ratio	1.0640
Saturation, %	92.2

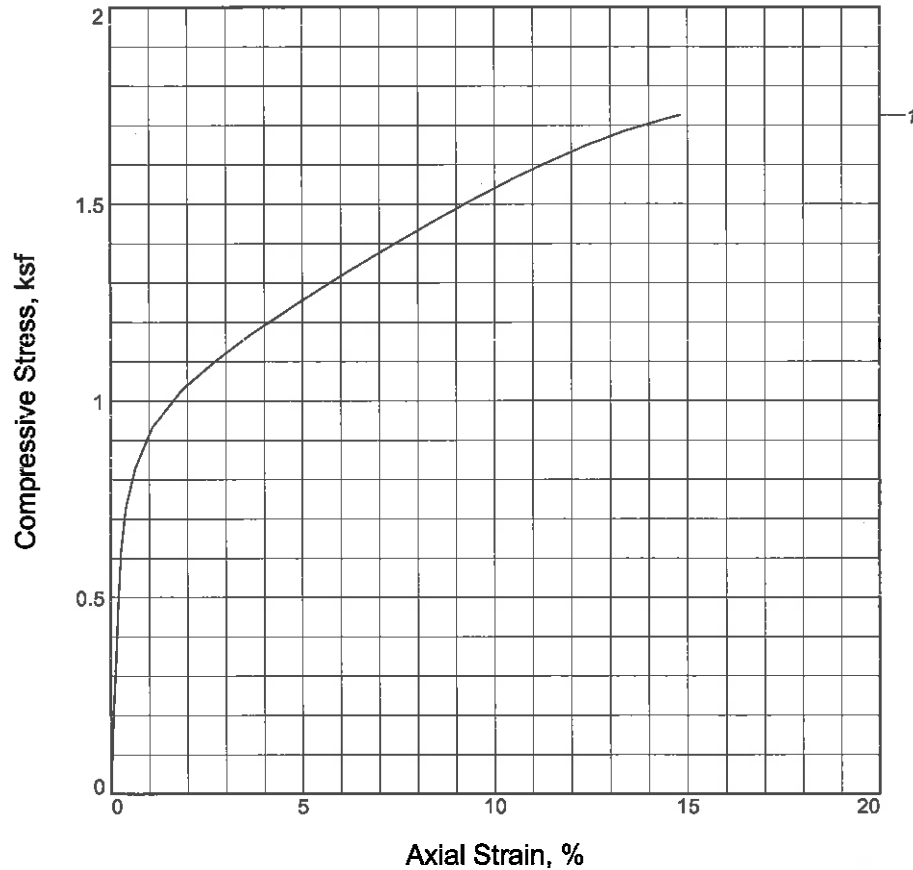
Test Readings for Specimen No. 1**Strain rate, in./min. = 0.055****Unconfined compressive strength = 1.477 ksf at reading no. 21**

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0010	1.297	1.3	0.0	0.031
2	0.0040	6.711	6.7	0.1	0.159
3	0.0070	10.536	10.5	0.1	0.250
4	0.0125	14.966	15.0	0.2	0.355
5	0.0231	18.741	18.7	0.4	0.444
6	0.0401	22.559	22.6	0.7	0.533
7	0.0747	26.674	26.7	1.3	0.626
8	0.1263	29.979	30.0	2.2	0.697
9	0.1779	32.642	32.6	3.1	0.752
10	0.2291	35.186	35.2	4.0	0.803
11	0.2807	37.638	37.6	4.9	0.851
12	0.3434	40.881	40.9	5.9	0.914
13	0.4007	43.800	43.8	6.9	0.969
14	0.4578	46.914	46.9	7.9	1.027
15	0.5144	50.224	50.2	8.9	1.088
16	0.5716	53.747	53.7	9.9	1.151

Test Readings for Specimen No. 1

No.	Def. Dial In.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.6289	57.419	57.4	10.9	1.216
18	0.6860	61.305	61.3	11.9	1.284
19	0.7432	65.274	65.3	12.9	1.352
20	0.7998	69.255	69.3	13.9	1.418
21	0.8565	72.964	73.0	14.8	1.477

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	1.726			
Undrained shear strength, ksf	0.863			
Failure strain, %	14.8			
Strain rate, in./min.	0.055			
Water content, %	35.7			
Wet density, pcf	115.1			
Dry density, pcf	84.8			
Saturation, %	96.0			
Void ratio	1.0237			
Specimen diameter, in.	2.698			
Specimen height, in.	5.773			
Height/diameter ratio	2.14			

Description: Gray Fat 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-B1005

Sample Number: 31 **Depth:** 60-62 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-B1005
Depth: 60-62 ft. **Sample Number:** 31
Description: Gray Fat 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.	194.290
Moisture content: Dry soil+tare, gms.	159.090
Moisture content: Tare, gms.	60.580
Moisture, %	35.7
Moist specimen weight, gms.	997.60
Diameter, in.	2.698
Area, in. ²	5.717
Height, in.	5.773
Wet density, pcf	115.1
Dry density, pcf	84.8
Void ratio	1.0237
Saturation, %	96.0

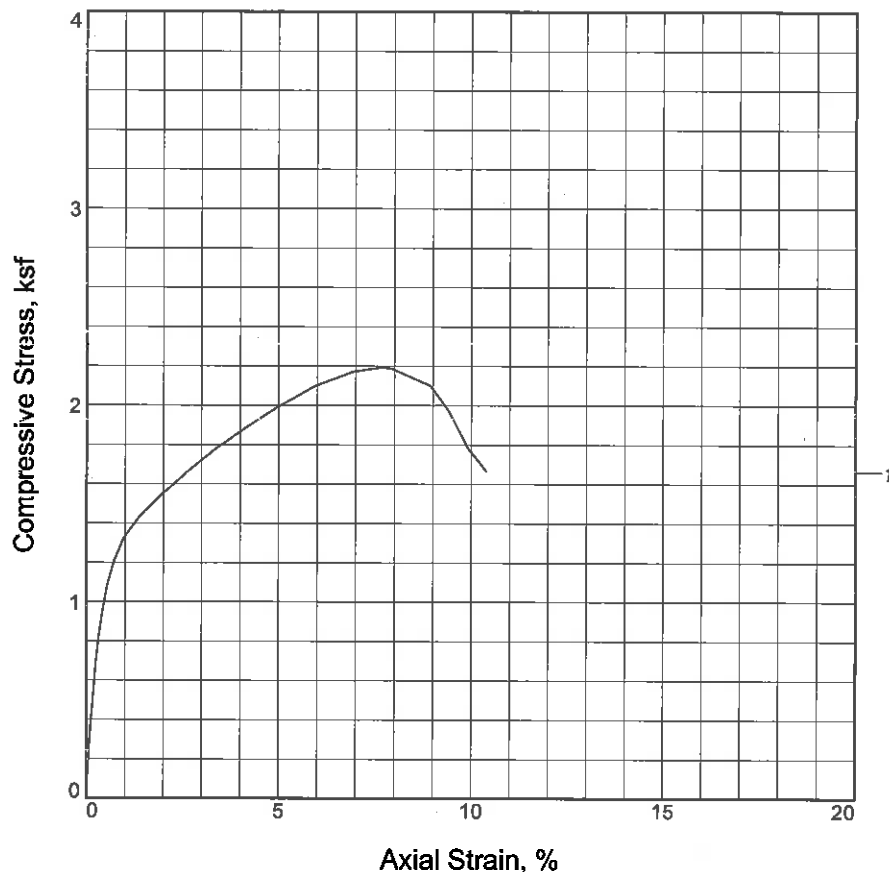
Test Readings for Specimen No. 1**Strain rate, in./min. = 0.055****Unconfined compressive strength = 1.726 ksf at reading no. 23**

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.329	0.0	0.0	0.000
1	0.0010	2.110	1.8	0.0	0.045
2	0.0040	8.562	8.2	0.1	0.207
3	0.0085	15.162	14.8	0.1	0.373
4	0.0110	19.450	19.1	0.2	0.481
5	0.0156	24.773	24.4	0.3	0.614
6	0.0226	29.289	29.0	0.4	0.727
7	0.0371	33.462	33.1	0.6	0.829
8	0.0632	37.837	37.5	1.1	0.934
9	0.1087	42.008	41.7	1.9	1.030
10	0.1603	45.472	45.1	2.8	1.105
11	0.2119	48.536	48.2	3.7	1.170
12	0.2634	51.414	51.1	4.6	1.228
13	0.3150	54.291	54.0	5.5	1.285
14	0.3721	57.365	57.0	6.4	1.344
15	0.4292	60.447	60.1	7.4	1.402
16	0.4863	63.493	63.2	8.4	1.457

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.5434	66.516	66.2	9.4	1.510
18	0.6005	69.460	69.1	10.4	1.560
19	0.6576	72.283	72.0	11.4	1.606
20	0.7147	75.007	74.7	12.4	1.648
21	0.7718	77.560	77.2	13.4	1.685
22	0.8289	79.783	79.5	14.4	1.714
23	0.8550	80.769	80.4	14.8	1.726

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	2.193			
Undrained shear strength, ksf	1.097			
Failure strain, %	7.7			
Strain rate, in./min.	0.055			
Water content, %	46.6			
Wet density, pcf	107.7			
Dry density, pcf	73.4			
Saturation, %	95.8			
Void ratio	1.3382			
Specimen diameter, in.	2.775			
Specimen height, in.	5.776			
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-B1005

Sample Number: 35 **Depth:** 68-70 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-B1005**Depth:** 68-70 ft.**Sample Number:** 35**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.	160.320
Moisture content: Dry soil+tare, gms.	125.150
Moisture content: Tare, gms.	49.740
Moisture, %	46.6
Moist specimen weight, gms.	987.30
Diameter, in.	2.775
Area, in.²	6.048
Height, in.	5.776
Wet density, pcf	107.7
Dry density, pcf	73.4
Void ratio	1.3382
Saturation, %	95.8

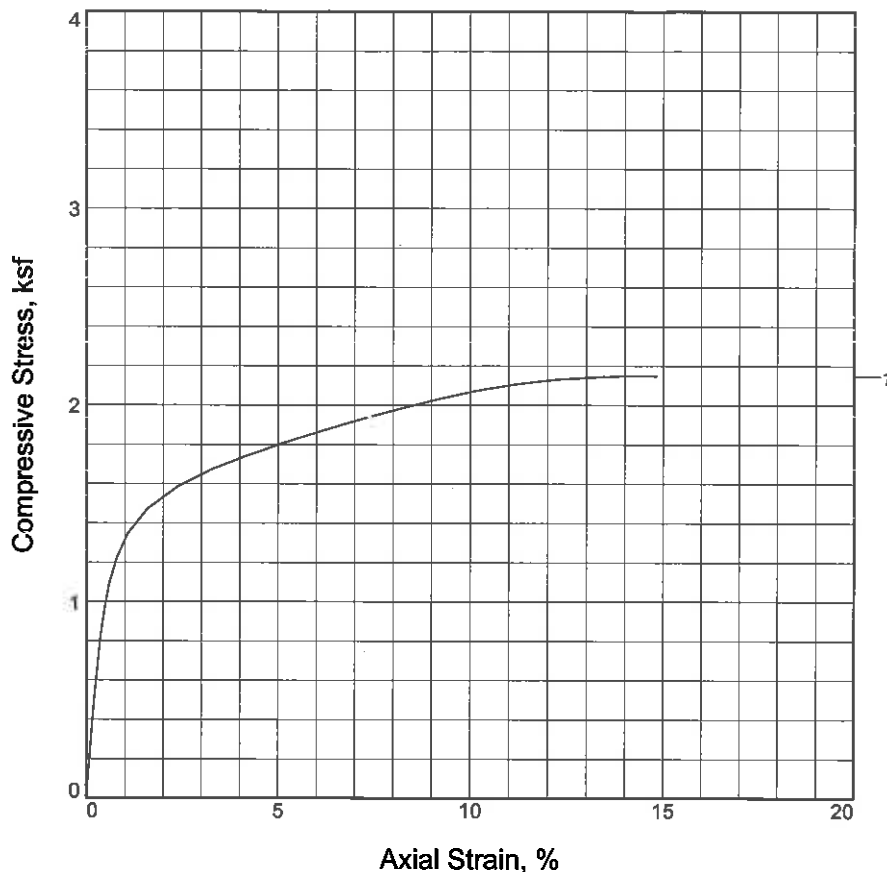
Test Readings for Specimen No. 1**Strain rate, in./min. =** 0.055**Unconfined compressive strength =** 2.193 ksf **at reading no.** 19

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	-0.754	0.0	0.0	0.000
1	0.0009	2.668	3.4	0.0	0.081
2	0.0039	9.377	10.1	0.1	0.241
3	0.0069	15.544	16.3	0.1	0.388
4	0.0099	21.410	22.2	0.2	0.527
5	0.0139	28.232	29.0	0.2	0.688
6	0.0184	33.771	34.5	0.3	0.819
7	0.0245	39.747	40.5	0.4	0.960
8	0.0315	44.973	45.7	0.5	1.083
9	0.0415	50.266	51.0	0.7	1.206
10	0.0561	55.405	56.2	1.0	1.324
11	0.0802	60.467	61.2	1.4	1.437
12	0.1148	65.770	66.5	2.0	1.552
13	0.1549	71.433	72.2	2.7	1.673
14	0.1950	76.619	77.4	3.4	1.780
15	0.2406	82.026	82.8	4.2	1.889
16	0.2868	87.209	88.0	5.0	1.990

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.3434	92.902	93.7	5.9	2.097
18	0.4010	97.246	98.0	6.9	2.171
19	0.4436	99.024	99.8	7.7	2.193
20	0.4576	99.018	99.8	7.9	2.187
21	0.5153	96.115	96.9	8.9	2.101
22	0.5439	90.606	91.4	9.4	1.970
23	0.5725	82.419	83.2	9.9	1.784
24	0.6006	77.240	78.0	10.4	1.664

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, ksf	2.150			
Undrained shear strength, ksf	1.075			
Failure strain, %	14.1			
Strain rate, in./min.	0.055			
Water content, %	39.2			
Wet density, pcf	116.7			
Dry density, pcf	83.8			
Saturation, %	101.4			
Void ratio	1.0777			
Specimen diameter, in.	2.720			
Specimen height, in.	5.763			
Height/diameter ratio	2.12			

Description: Gray Fat Clay

LL =

PL =

PI =

Assumed GS= 2.79

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-B1005

Sample Number: 43 **Depth:** 84-86 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-B1005
Depth: 84-86 ft. **Sample Number:** 43
Description: Gray Fat Clay
Remarks: ASTM D2166
Type of Sample: Undisturbed
Assumed Specific Gravity=2.79 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial
Moisture content: Moist soil+tare, gms.	136.250
Moisture content: Dry soil+tare, gms.	114.580
Moisture content: Tare, gms.	59.250
Moisture, %	39.2
Moist specimen weight, gms.	1025.50
Diameter, in.	2.720
Area, in. ²	5.811
Height, in.	5.763
Wet density, pcf	116.7
Dry density, pcf	83.8
Void ratio	1.0777
Saturation, %	101.4

Test Readings for Specimen No. 1**Strain rate, in./min. = 0.055****Unconfined compressive strength = 2.150 ksf at reading no. 24**

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
0	0.0000	0.000	0.0	0.0	0.000
1	0.0011	2.612	2.6	0.0	0.065
2	0.0056	10.238	10.2	0.1	0.253
3	0.0086	15.458	15.5	0.1	0.383
4	0.0126	21.505	21.5	0.2	0.532
5	0.0172	27.795	27.8	0.3	0.687
6	0.0212	33.139	33.1	0.4	0.818
7	0.0272	38.942	38.9	0.5	0.960
8	0.0342	44.235	44.2	0.6	1.090
9	0.0458	49.810	49.8	0.8	1.225
10	0.0629	55.051	55.1	1.1	1.349
11	0.0915	60.334	60.3	1.6	1.471
12	0.1372	65.564	65.6	2.4	1.586
13	0.1888	69.833	69.8	3.3	1.674
14	0.2403	73.282	73.3	4.2	1.740
15	0.3005	77.156	77.2	5.2	1.812
16	0.3572	80.534	80.5	6.2	1.872

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf
17	0.4144	83.938	83.9	7.2	1.931
18	0.4716	87.128	87.1	8.2	1.983
19	0.5288	90.219	90.2	9.2	2.031
20	0.5855	93.113	93.1	10.2	2.073
21	0.6426	95.644	95.6	11.2	2.106
22	0.6997	97.783	97.8	12.1	2.129
23	0.7569	99.498	99.5	13.1	2.142
24	0.8140	101.048	101.0	14.1	2.150
25	0.8551	101.834	101.8	14.8	2.149

Project Name: Port Arthur Resident Office - USACE

Project No.: 92145005

Boring No.	13-B1005	13-B1005	13-B1005	13-B1005	13-B1005	13-B1005
Depth (ft)	4 - 6	20 - 22	36 - 38	44 - 46	50 - 52	56 - 58
Diameter (mm)	1. 66.2 2. 66.3 3. 66.1 66.2	63.5 63.4 63.46 63.5	68.3 68.4 68.3 68.2 68.3	68.5 68.6 68.53 68.5 68.53	70.1 70.0 70.2 70.1	68.3 68.4 68.3 68.2 68.3
Height (mm)	1. 140.2 2. 140.3 3. 140.1 140.2	140.5 140.4 140.5 140.6 140.5	139.6 139.7 139.6 139.5 139.6	140.0 140.1 140.0 139.9 140.0	140.1 140.2 140.1 140.0 140.1	140.0 140.0 140.0 140.0 140.0
Sample Wt.(g)	932.61	923.80	988.32	966.84	930.23	876.13
Tare No.	3C	N	3E	CC	3F	J
Wet Wt. + Tare (g)	155.25	159.50	174.81	180.07	168.85	148.92
Dry Wt. + Tare (g)	126.38	141.53	146.42	144.04	131.91	117.35
Tare Wt. (g)	59.60	58.18	58.09	65.46	59.22	58.48
Dry Soil Wt. (g)						
% Moisture						
Dry Unit Wt. (pcf)						
Discription	G1 T fnt clay w/ silty sand pck w/FE	L1 T sandy loam clay w/FE	G sandy loam clay w/FE	G fnt clay	G fnt clay	G fnt clay w/FE

Tested By: Rodrigo Date: 1/17/14 Reviewed By: [Signature] Date: 1/27

Contract No. W912Hy-13-D-0001 DY08

Project Name: Port Arthur Resident Office - USACE

Project No.: 92145005

Boring No.	13-B1005					
Depth (ft)	76-78					
Diameter (mm)	1. 69.2 2. 69.1 3. 69.3 69.2					
Height (mm)	1. 140.0 2. 139.9 3. 140.1 140.0					
Sample Wt.(g)	918.47					
Tare No.	BB					
Wet Wt. + Tare (g)	160.66					
Dry Wt. + Tare (g)	126.67					
Tare Wt. (g)	59.63					
Dry Soil Wt. (g)						
% Moisture						
Dry Unit Wt. (pcf)						
Discription	Gfnt dnt w/FE					

Tested By: Rodrigo Date 1/17/14 Reviewed By [Signature] Date 1/27

Contract No.W912Hy-13-D-0001 DY08

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

Terracon

Job No. 92145005

Material Description LW+I, Lem cl

Boring No.: 13-B-1005

Depth (ft) 18-20

Sample Length (inch) 5.89 5.89 5.89 5.89

Cohesion (tsf)

Sample Diameter (inch) 2.55 2.55 2.55 2.55

Date of Test - -2013

Moist Weight (g) 1021.54

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

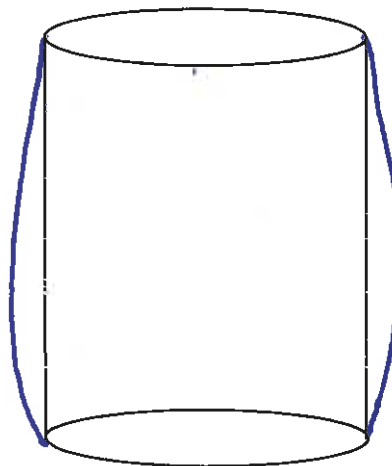
Pressure (psi) 16.3

Moisture Content Determination	
Tare Number	<u>C22</u>
Wet Soil + Tare (g)	<u>137.74</u>
Dry Soil + Tare (g)	<u>121.91</u>
Tare Weight (g)	<u>50.49</u>

Prepared By: SR Date: 02-14 -2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

Bulge ✓

Vertical Split

Tested By: SR - 2014

Computed By: - 2014

Machine: ☐ HM 2000 ☐ S 610

PR

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

Terracon

Job No. 92145005

Material Description Gr, Fct cl

Boring No.: 13-B-1025

Depth (ft) 54-56

Sample Length (inch) 5.84 5.84 5.84 5.84

Cohesion (tsf)

Sample Diameter (inch) 2.75 2.74 2.72 2.74

Date of Test -2013

Moist Weight (g) 956.89

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

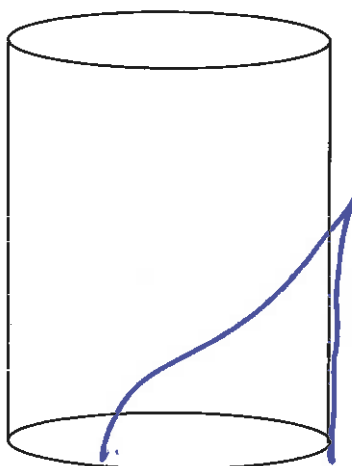
Pressure (psi) 29.5

Moisture Content Determination	
Tare Number	AA
Wet Soil + Tare (g)	140 → 141.57
Dry Soil + Tare (g)	114.35
Tare Weight (g)	63.00

Prepared By: SA Date: 02-14-2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear ☒

Bulge ☐

Vertical Split ☐

Tested By: SA - 2014

Computed By: - 2014

Machine: ☐ HM 2000 ☐ S 610

P2
AL

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

Terracon

Job No. 92145005

Material Description

Gr. Fat cl w/ Rcks
SIS

Boring No.: 13-B-1005

Depth (ft)

80-82

Sample Length (inch)

5.91 5.91 5.91 5.91

Cohesion (tsf)

Sample Diameter (inch)

2.75 2.80 2.79 2.78

Date of Test

- 2013

Moist Weight (g)

922.42

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)

38.9

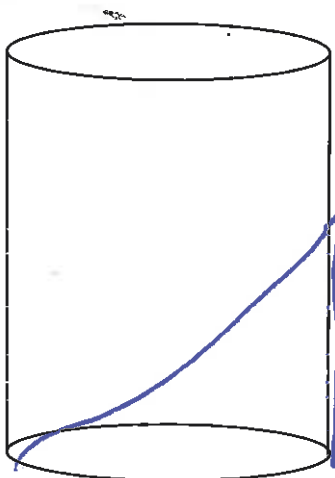
Moisture Content Determination

Tare Number	NC-29
Wet Soil + Tare (g)	97.21
Dry Soil + Tare (g)	
Tare Weight (g)	25.11

Prepared By: SR Date: 01-24-2014

Scale No.: ☐ J350 ☐ MTE B93 ☐ B8449

Failed Sample Sketch



Shear

45

Bulge

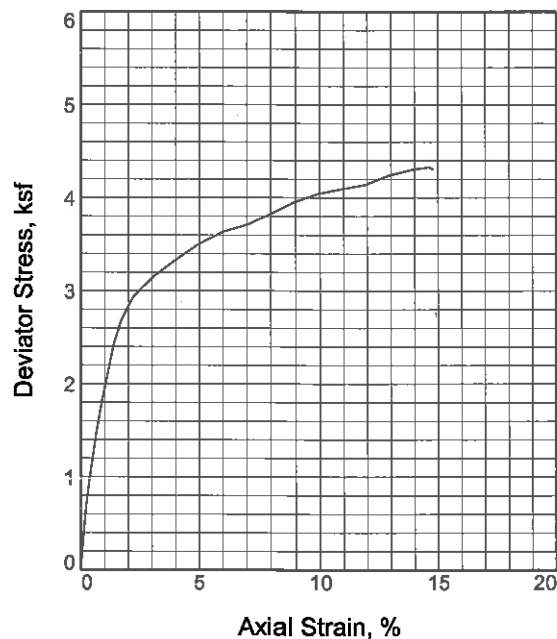
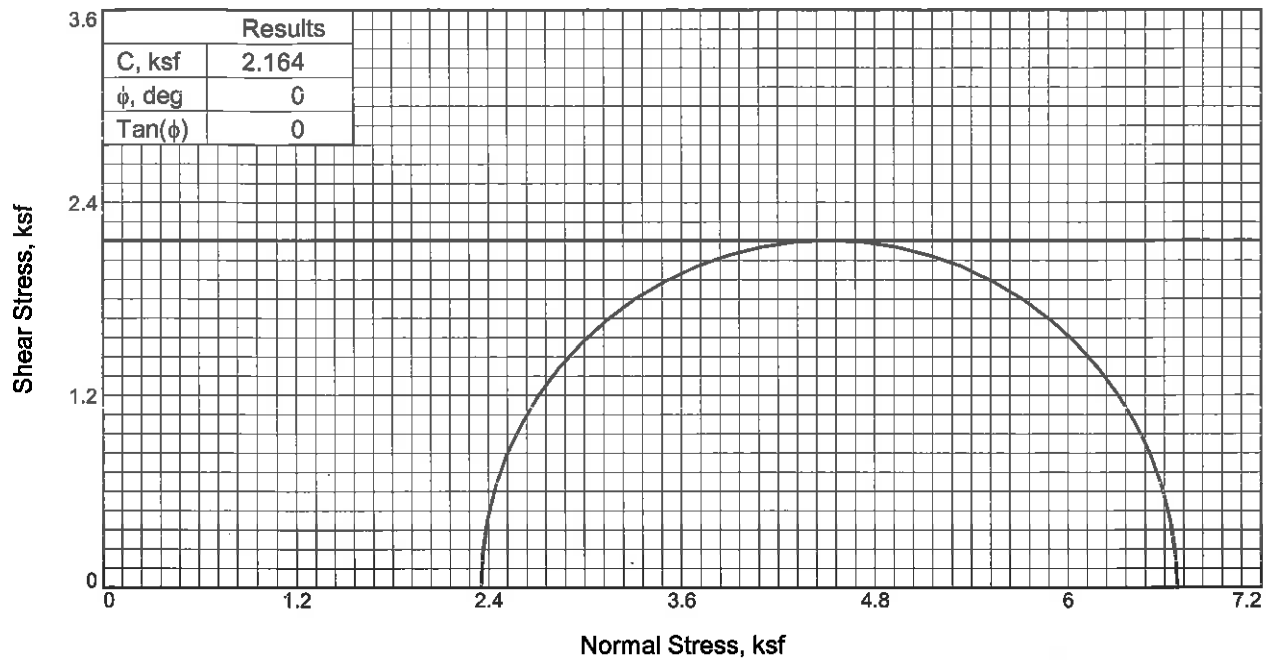
Vertical

Split

Tested By: SR - 2014

Computed By: - 2014

Machine: ☐ HM 2000 ☐ S 610



Sample No.		1
Initial	Water Content, %	22.2
	Dry Density, pcf	105.9
	Saturation, %	98.1
	Void Ratio	0.6211
	Diameter, in.	2.550
	Height, in.	5.890
At Test	Water Content, %	22.2
	Dry Density, pcf	105.9
	Saturation, %	98.1
	Void Ratio	0.6211
	Diameter, in.	2.550
	Height, in.	5.890
Strain rate, in./min.		0.055
Back Pressure, psi		0.000
Cell Pressure, psi		16.330
Fail. Stress, ksf		4.327
Ult. Stress, ksf		
σ_1 Failure, ksf		6.679
σ_3 Failure, ksf		2.352

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Light gray and tan Lean Clay

Assumed Specific Gravity= 2.75

Remarks: ASTM D2850

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

Project: Port Arthur Residence Office - USACE

Location: 13-B1005

Sample Number: 10

Depth: 18-20 ft.

Proj. No.: 92145005

Date Sampled:

TRIAXIAL SHEAR TEST REPORT

Terracon Consultants, Inc.

Houston, TX

TRIAxIAL COMPRESSION TEST
Unconsolidated Undrained

2/14/2014
5:31 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Residence Office - USACE
Project No.: 92145005
Location: 13-B1005
Depth: 18-20 ft. **Sample Number:** 10
Description: Light gray and tan Lean 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

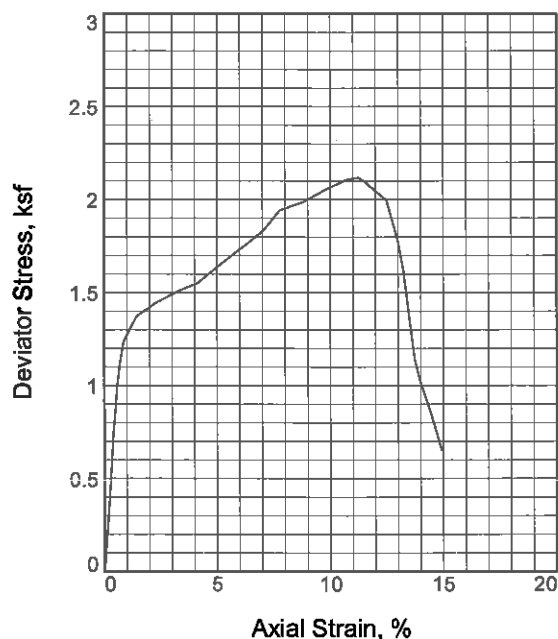
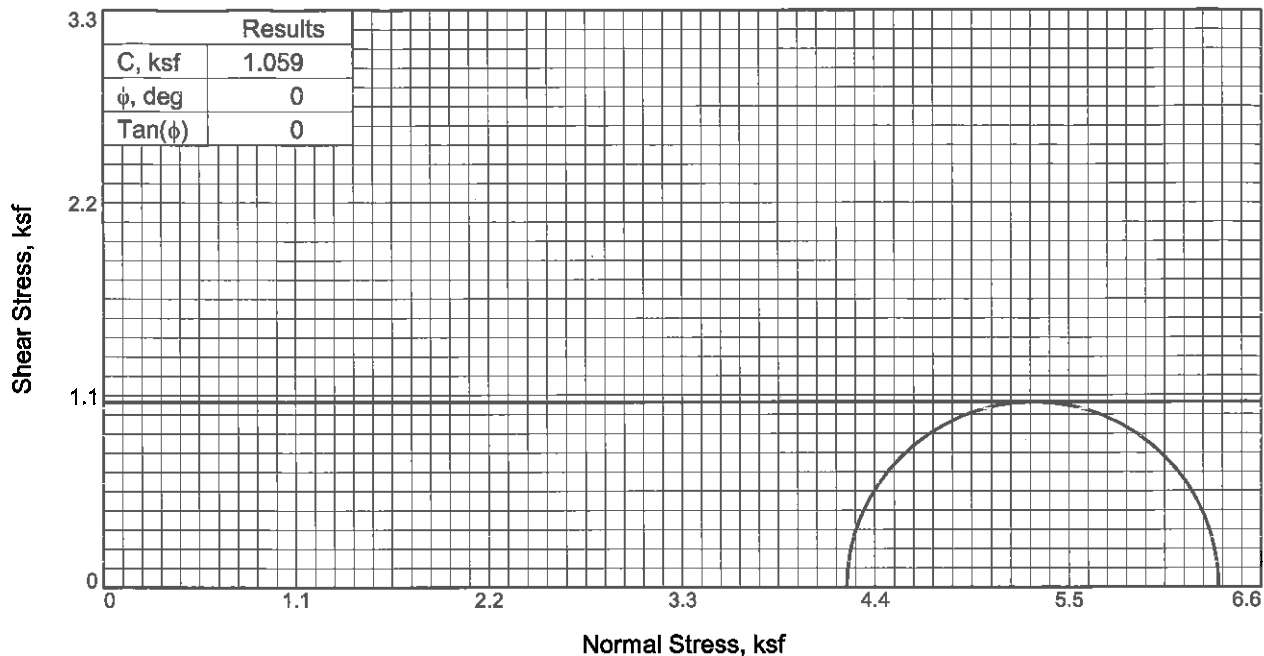
Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	137.740	137.740
Moisture content: Dry soil+tare, gms.	121.910	121.910
Moisture content: Tare, gms.	50.490	50.490
Moisture, %	22.2	22.2
Moist specimen weight, gms.	1021.54	
Diameter, in.	2.550	
Area, in. ²	5.107	
Height, in.	5.890	
Wet density, pcf	129.4	
Dry density, pcf	105.9	
Void ratio	0.6211	
Saturation, %	98.1	

Test Readings for Specimen No. 1

Cell pressure = 16.330 psi (2.352 ksf)
Back pressure = 0.000 psi (0.000 ksf)
Strain rate, in./min. = 0.055
Fail. Stress = 4.327 ksf at reading no. 24

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	-3.476	0.0	0.0	0.000	2.352	2.352	1.00	2.352	0.000
1	0.0015	2.132	5.6	0.0	0.158	2.352	2.510	1.07	2.431	0.079
2	0.0072	11.728	15.2	0.1	0.428	2.352	2.780	1.18	2.566	0.214
3	0.0129	21.125	24.6	0.2	0.692	2.352	3.044	1.29	2.698	0.346
4	0.0204	31.008	34.5	0.3	0.969	2.352	3.320	1.41	2.836	0.484
5	0.0298	41.069	44.5	0.5	1.250	2.352	3.601	1.53	2.976	0.625
6	0.0391	50.321	53.8	0.7	1.507	2.352	3.858	1.64	3.105	0.753
7	0.0493	59.231	62.7	0.8	1.753	2.352	4.105	1.75	3.228	0.877
8	0.0657	72.257	75.7	1.1	2.112	2.352	4.463	1.90	3.407	1.056
9	0.0830	84.574	88.1	1.4	2.448	2.352	4.799	2.04	3.575	1.224
10	0.1011	93.850	97.3	1.7	2.697	2.352	5.049	2.15	3.700	1.349
11	0.1302	103.143	106.6	2.2	2.940	2.352	5.291	2.25	3.821	1.470
12	0.1834	112.181	115.7	3.1	3.160	2.352	5.511	2.34	3.931	1.580
13	0.2357	119.609	123.1	4.0	3.332	2.352	5.683	2.42	4.017	1.666
14	0.2887	126.684	130.2	4.9	3.490	2.352	5.842	2.48	4.097	1.745
15	0.3528	133.520	137.0	6.0	3.631	2.352	5.983	2.54	4.167	1.816
16	0.4106	137.839	141.3	7.0	3.707	2.352	6.058	2.58	4.205	1.853
17	0.4691	143.644	147.1	8.0	3.818	2.352	6.169	2.62	4.260	1.909
18	0.5270	150.510	154.0	8.9	3.953	2.352	6.305	2.68	4.328	1.977
19	0.5849	155.746	159.2	9.9	4.044	2.352	6.395	2.72	4.373	2.022
20	0.6436	159.623	163.1	10.9	4.096	2.352	6.448	2.74	4.400	2.048
21	0.7015	163.194	166.7	11.9	4.140	2.352	6.491	2.76	4.421	2.070
22	0.7601	169.207	172.7	12.9	4.241	2.352	6.592	2.80	4.472	2.120
23	0.8180	173.633	177.1	13.9	4.300	2.352	6.652	2.83	4.502	2.150
24	0.8620	176.301	179.8	14.6	4.327	2.352	6.679	2.84	4.515	2.164
25	0.8701	175.973	179.4	14.8	4.312	2.352	6.664	2.83	4.508	2.156



Sample No.		1
Initial	Water Content, %	53.0
	Dry Density, pcf	69.2
	Saturation, %	97.7
	Void Ratio	1.5089
	Diameter, in.	2.740
	Height, in.	5.840
At Test	Water Content, %	53.0
	Dry Density, pcf	69.2
	Saturation, %	97.7
	Void Ratio	1.5089
	Diameter, in.	2.740
	Height, in.	5.840
Strain rate, in./min.		0.055
Back Pressure, psi		0.000
Cell Pressure, psi		29.450
Fail. Stress, ksf		2.118
Ult. Stress, ksf		
σ_1 Failure, ksf		6.358
σ_3 Failure, ksf		4.241

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray Fat Clay

Assumed Specific Gravity= 2.78

Remarks: ASTM D2580

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

Project: Port Arthur Residence Office - USACE

Location: 13-B1005

Sample Number: 23

Depth: 54-56 ft.

Proj. No.: 92145005

Date Sampled:

TRIAXIAL SHEAR TEST REPORT

Terracon Consultants, Inc.

Houston, TX

TRIAxIAL COMPRESSION TEST
Unconsolidated Undrained

2/14/2014
5:07 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Residence Office - USACE
Project No.: 92145005
Location: 13-B1005
Depth: 54-56 ft. **Sample Number:** 23
Description: Gray Fat Clay
Remarks: ASTM D2580
Type of Sample: Undisturbed
Assumed Specific Gravity=2.78 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1

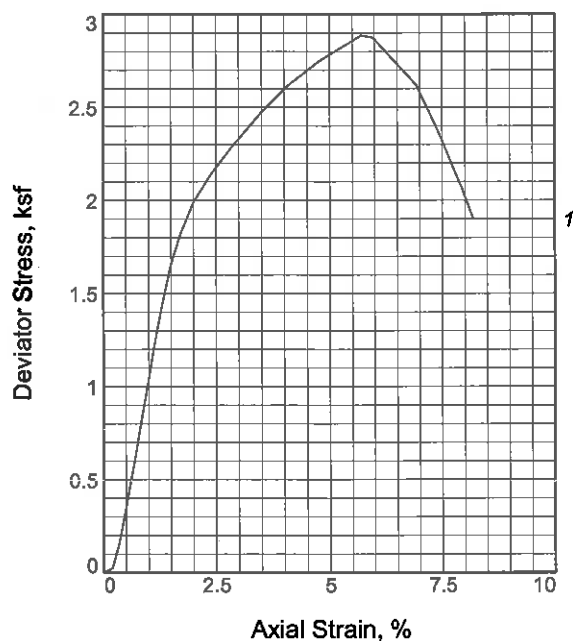
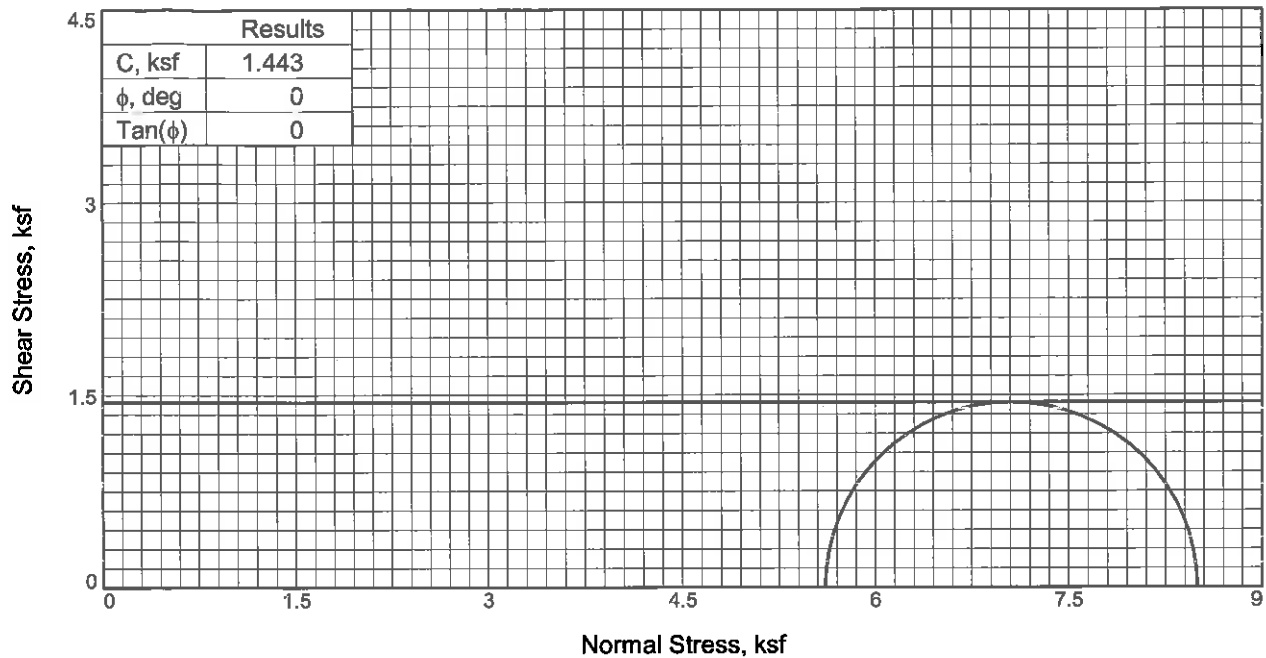
Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	141.570	141.570
Moisture content: Dry soil+tare, gms.	114.340	114.340
Moisture content: Tare, gms.	63.000	63.000
Moisture, %	53.0	53.0
Moist specimen weight, gms.	956.89	
Diameter, in.	2.740	
Area, in.²	5.896	
Height, in.	5.840	
Wet density, pcf	105.9	
Dry density, pcf	69.2	
Void ratio	1.5089	
Saturation, %	97.7	

Test Readings for Specimen No. 1

Cell pressure = 29.450 psi (4.241 ksf)
Back pressure = 0.000 psi (0.000 ksf)
Strain rate, in./min. = 0.055
Fail. Stress = 2.118 ksf at reading no. 22

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	4.241	4.241	1.00	4.241	0.000
1	0.0015	0.244	0.2	0.0	0.006	4.241	4.247	1.00	4.244	0.003
2	0.0059	5.960	6.0	0.1	0.145	4.241	4.386	1.03	4.314	0.073
3	0.0104	11.416	11.4	0.2	0.278	4.241	4.519	1.07	4.380	0.139
4	0.0148	17.291	17.3	0.3	0.421	4.241	4.662	1.10	4.451	0.211
5	0.0191	23.531	23.5	0.3	0.573	4.241	4.814	1.14	4.527	0.286
6	0.0236	30.414	30.4	0.4	0.740	4.241	4.981	1.17	4.611	0.370
7	0.0281	35.302	35.3	0.5	0.858	4.241	5.099	1.20	4.670	0.429
8	0.0325	40.719	40.7	0.6	0.989	4.241	5.230	1.23	4.735	0.494
9	0.0400	45.949	45.9	0.7	1.114	4.241	5.355	1.26	4.798	0.557
10	0.0502	51.242	51.2	0.9	1.241	4.241	5.481	1.29	4.861	0.620
11	0.0827	56.992	57.0	1.4	1.372	4.241	5.613	1.32	4.927	0.686
12	0.1358	60.702	60.7	2.3	1.448	4.241	5.689	1.34	4.965	0.724
13	0.1881	63.649	63.6	3.2	1.504	4.241	5.745	1.35	4.993	0.752
14	0.2411	66.164	66.2	4.1	1.549	4.241	5.790	1.37	5.015	0.775
15	0.2936	70.652	70.7	5.0	1.639	4.241	5.879	1.39	5.060	0.819
16	0.3518	75.536	75.5	6.0	1.734	4.241	5.974	1.41	5.108	0.867
17	0.4097	80.492	80.5	7.0	1.828	4.241	6.069	1.43	5.155	0.914
18	0.4533	86.112	86.1	7.8	1.940	4.241	6.181	1.46	5.211	0.970
19	0.5119	89.088	89.1	8.8	1.985	4.241	6.226	1.47	5.233	0.992
20	0.5698	93.090	93.1	9.8	2.052	4.241	6.292	1.48	5.267	1.026
21	0.6284	96.683	96.7	10.8	2.107	4.241	6.348	1.50	5.294	1.054
22	0.6575	97.710	97.7	11.3	2.118	4.241	6.358	1.50	5.300	1.059
23	0.6718	97.130	97.1	11.5	2.099	4.241	6.340	1.49	5.290	1.050
24	0.7297	93.442	93.4	12.5	1.997	4.241	6.238	1.47	5.239	0.998
25	0.7589	83.848	83.8	13.0	1.782	4.241	6.022	1.42	5.132	0.891
26	0.7732	76.800	76.8	13.2	1.627	4.241	5.868	1.38	5.054	0.814
27	0.7883	64.393	64.4	13.5	1.360	4.241	5.601	1.32	4.921	0.680
28	0.8026	54.106	54.1	13.7	1.140	4.241	5.381	1.27	4.811	0.570
29	0.8174	48.431	48.4	14.0	1.017	4.241	5.258	1.24	4.749	0.509
30	0.8461	39.990	40.0	14.5	0.835	4.241	5.076	1.20	4.658	0.418
31	0.8710	31.558	31.6	14.9	0.656	4.241	4.897	1.15	4.569	0.328



Sample No.		1
Initial	Water Content, %	71.0
	Dry Density, pcf	57.3
	Saturation, %	97.8
	Void Ratio	1.9969
	Diameter, in.	2.780
	Height, in.	5.910
At Test	Water Content, %	71.0
	Dry Density, pcf	57.3
	Saturation, %	97.8
	Void Ratio	1.9969
	Diameter, in.	2.780
	Height, in.	5.910
Strain rate, in./min.		0.055
Back Pressure, psi		0.000
Cell Pressure, psi		38.960
Fail. Stress, ksf		2.886
Ult. Stress, ksf		
σ_1 Failure, ksf		8.496
σ_3 Failure, ksf		5.610

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray Fat Clay w/roots

Assumed Specific Gravity= 2.75

Remarks: ASTM D2850

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

Project: Port Arthur Residence Office - USACE

Location: 13-B1005

Sample Number: 41

Depth: 80-82 ft.

Proj. No.: 92145005

Date Sampled:

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

TRIAxIAL COMPRESSION TEST
Unconsolidated Undrained

2/14/2014
4:51 PM

Date:
Client: Quaternary Resource Investigations, L.L.C.
Project: Port Arthur Residence Office - USACE
Project No.: 92145005
Location: 13-B1005
Depth: 80-82 ft. **Sample Number:** 41
Description: Gray Fat Clay w/roots
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.	97.290	97.290
Moisture content: Dry soil+tare, gms.	67.320	67.320
Moisture content: Tare, gms.	25.110	25.110
Moisture, %	71.0	71.0
Moist specimen weight, gms.	922.42	
Diameter, in.	2.780	
Area, in. ²	6.070	
Height, in.	5.910	
Wet density, pcf	98.0	
Dry density, pcf	57.3	
Void ratio	1.9969	
Saturation, %	97.8	

Test Readings for Specimen No. 1

Cell pressure = 38.960 psi (5.610 ksf)
Back pressure = 0.000 psi (0.000 ksf)
Strain rate, in./min. = 0.055
Fail. Stress = 2.886 ksf at reading no. 19

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	5.610	5.610	1.00	5.610	0.000
1	0.0000	0.000	0.0	0.0	0.000	5.610	5.610	1.00	5.610	0.000
2	0.0116	1.100	1.1	0.2	0.026	5.610	5.636	1.00	5.623	0.013
3	0.0204	6.712	6.7	0.3	0.159	5.610	5.769	1.03	5.690	0.079
4	0.0280	13.433	13.4	0.5	0.317	5.610	5.927	1.06	5.769	0.159
5	0.0356	20.778	20.8	0.6	0.490	5.610	6.100	1.09	5.855	0.245
6	0.0432	27.994	28.0	0.7	0.659	5.610	6.269	1.12	5.940	0.330
7	0.0502	35.420	35.4	0.8	0.833	5.610	6.443	1.15	6.027	0.417
8	0.0583	43.170	43.2	1.0	1.014	5.610	6.624	1.18	6.117	0.507
9	0.0651	50.371	50.4	1.1	1.182	5.610	6.792	1.21	6.201	0.591
10	0.0770	61.163	61.2	1.3	1.432	5.610	7.042	1.26	6.326	0.716
11	0.0887	70.678	70.7	1.5	1.652	5.610	7.262	1.29	6.436	0.826
12	0.1005	77.567	77.6	1.7	1.809	5.610	7.419	1.32	6.515	0.904
13	0.1180	85.547	85.5	2.0	1.989	5.610	7.599	1.35	6.605	0.994
14	0.1412	92.461	92.5	2.4	2.141	5.610	7.751	1.38	6.681	1.071
15	0.1705	99.728	99.7	2.9	2.298	5.610	7.908	1.41	6.759	1.149
16	0.2055	107.709	107.7	3.5	2.466	5.610	8.077	1.44	6.843	1.233
17	0.2409	114.904	114.9	4.1	2.615	5.610	8.225	1.47	6.918	1.307
18	0.2818	121.634	121.6	4.8	2.748	5.610	8.358	1.49	6.984	1.374
19	0.3371	128.988	129.0	5.7	2.886	5.610	8.496	1.51	7.053	1.443
20	0.3520	128.935	128.9	6.0	2.877	5.610	8.487	1.51	7.049	1.438
21	0.4100	118.505	118.5	6.9	2.616	5.610	8.227	1.47	6.918	1.308
22	0.4392	107.319	107.3	7.4	2.357	5.610	7.967	1.42	6.789	1.178
23	0.4685	94.883	94.9	7.9	2.073	5.610	7.683	1.37	6.647	1.036
24	0.4840	87.288	87.3	8.2	1.901	5.610	7.511	1.34	6.561	0.951

