

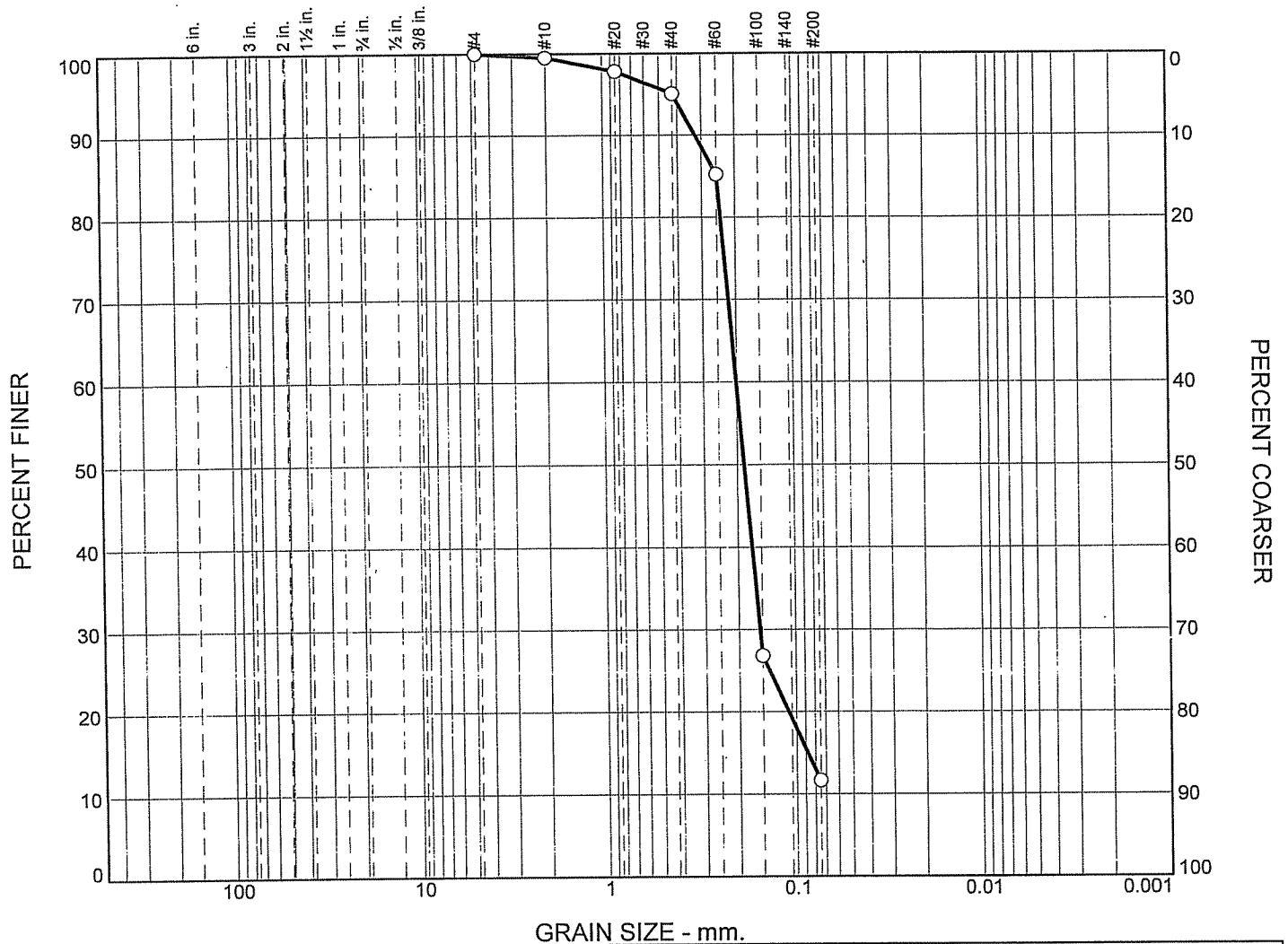
BORING LOG		DISTRICT	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT Galveston Channel and Pelican Island PA			7. ELEVATION OF HOLE	
2. LOCATION (Coordinates or Station) N=13692603 E=3301308			8. DATUM FOR ELEVATION	
3. DRILLING AGENCY Dempsey (Geotest Engineering, Inc.)			9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:	
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, Inc.			10. DRILLING DATE and TIME STARTED: COMPLETED:	
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR:			11. CLASSIFICATION REFERENCE	
6. DEPTH OF HOLE 50 ft			12. ENGINEER	

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PENETROMETER (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% <200)
			FAT CLAY WITH SAND(CH) , soft to stiff, brown & gray -w/ shell fragments @ 0' - 2'		1			1.50	79.5	40.9				
					2			0.50	69.2	52.8				
5			FAT CLAY(CH) , firm, brown & gray, w/ ferrous nodules		3			0.75	73.0	49.8	99	30	69	95.9
			FAT CLAY WITH SAND(CH) , firm, brown & gray		4			0.75	71.6	44.9				
10			FAT CLAY(CH) , firm, brown & gray, w/ ferrous nodules & sand seams		5			1.00	71.3	44.8	92	29	63	85.6
			FAT CLAY WITH SAND(CH) , very soft, brown & gray, w/ ferrous nodules		6			0.25	69.2	49.8				
			FAT CLAY(CH) , soft, gray & tan, w/ ferrous nodules & slickensides		7			0.50	72.4	43.7	95	29	66	95.8
15			LEAN CLAY(CL) , soft, gray, w/ ferrous nodules		8			0.50	61.5	60.0				
			FAT CLAY(CH) , very soft, brown & gray -gray & tan @ 18' - 20'		9			0.25	63.9	56.5				
20					10			0.00	64.6	55.7	99	30	69	95.7
			FAT CLAY WITH SAND(CH) , soft to firm, gray & reddish brown, w/ organics & sand seams		11			0.75	71.0	39.3				
					12			0.50	66.7	52.4				
25			FAT CLAY(CH) , soft, gray		13			0.25		42.5	88	27	61	92.4
			FAT CLAY WITH SAND(CH) , firm, gray & brown, w/ organics		14			0.75	65.6	56.6				
30			FAT CLAY(CH) , soft, gray -w/ slickensides @ 28' - 30'		15			0.50	67.7	48.2	107	29	78	99.1
					16			0.50	67.2	53.1				
			SANDY LEAN CLAY(CL) , very soft to firm, gray & tan -w/ shell fragments' -w/ clay seams @ 32' - 34'		17			0.00	94.2	22.7				

BORING LOG		DISTRICT	INSTALLATION	SHEET 2 OF 2 SHEETS
1. PROJECT Galveston Channel and Pelican Island PA			7. ELEVATION OF HOLE	
2. LOCATION (Coordinates or Station) N=13692603 E=3301308			8. DATUM FOR ELEVATION	
3. DRILLING AGENCY Dempsey (Geotest Engineering, Inc.)			9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:	
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, Inc.			10. DRILLING DATE and TIME STARTED: COMPLETED:	
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR:			11. CLASSIFICATION REFERENCE	
6. DEPTH OF HOLE 50 ft			12. ENGINEER	

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PENETROMETER (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% <200)
			-w/ sand seams below 36'		18			0.00	92.9	33.4	29	17	12	58.1
					19			0.75	74.9	48.5				
			FAT CLAY(CH) , soft, gray, w/ sand seams & shell fragments		20			0.50	66.5	52.4	81	25	56	86.9
40			LEAN CLAY(CL) , very soft, gray, w/ sand seams		21			0.25	68.8	48.4				
			SILT WITH SAND(ML) , very dense, gray & tan, w/ shell fragments	X	22		61							11.7
45														
			POORLY GRADED SAND WITH SILT(SP-SM) , very dense, gray & tan, w/ shell fragments	X	23		100							8.4
			CLAYEY SAND(SC) , medium dense, gray & tan, w/ shell fragments	X	24		28							
50														
55														
60														
65														

Particle Size Analysis - ASTM D 422



GRAIN SIZE - mm.

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.5	4.4	83.4	11.7	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	07-196	22	42-43.5	Gray and tan SILT with SAND; shell fragments	SP-SM

**Tolunay-Wong
Engineers, Inc.
Houston, Texas**

Client: United States Army Corps of Engineers
Project: Galveston Channel and Pelican Island PA
 Contract No. DACW64-03-D-0008, Task Order No. 0077
Project No.: 08.18.918

GRAIN SIZE DISTRIBUTION TEST DATA

7/22/2008

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Contract No. DACW64-03-D-0008, Task Order No. 0077

Project Number: 08.18.918

Location: 07-196

Depth: 42-43.5

Sample Number: 22

Material Description: Gray and tan SILT with SAND; shell fragments

USCS: SP-SM

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
277.77	212.00	212.00	3"		
			0.75"		
			#4	212.00	100.0
			#10	212.33	99.5
			#20	213.46	97.8
			#40	215.25	95.1
			#60	221.71	85.2
			#100	260.13	26.8
			#200	270.10	11.7

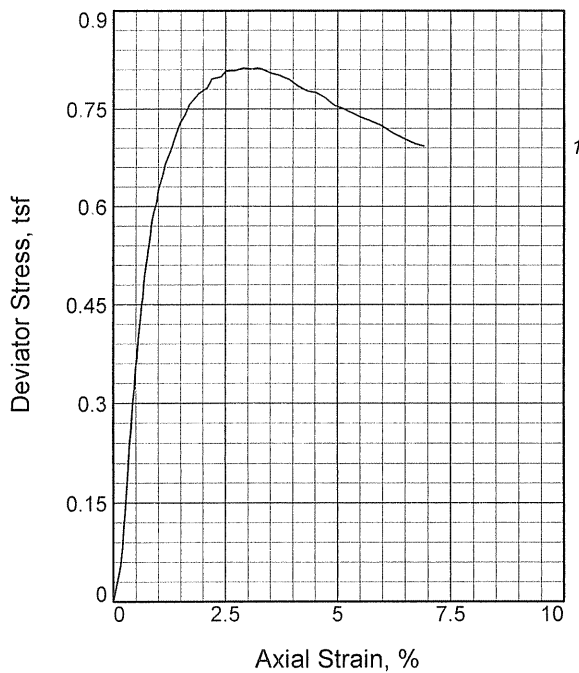
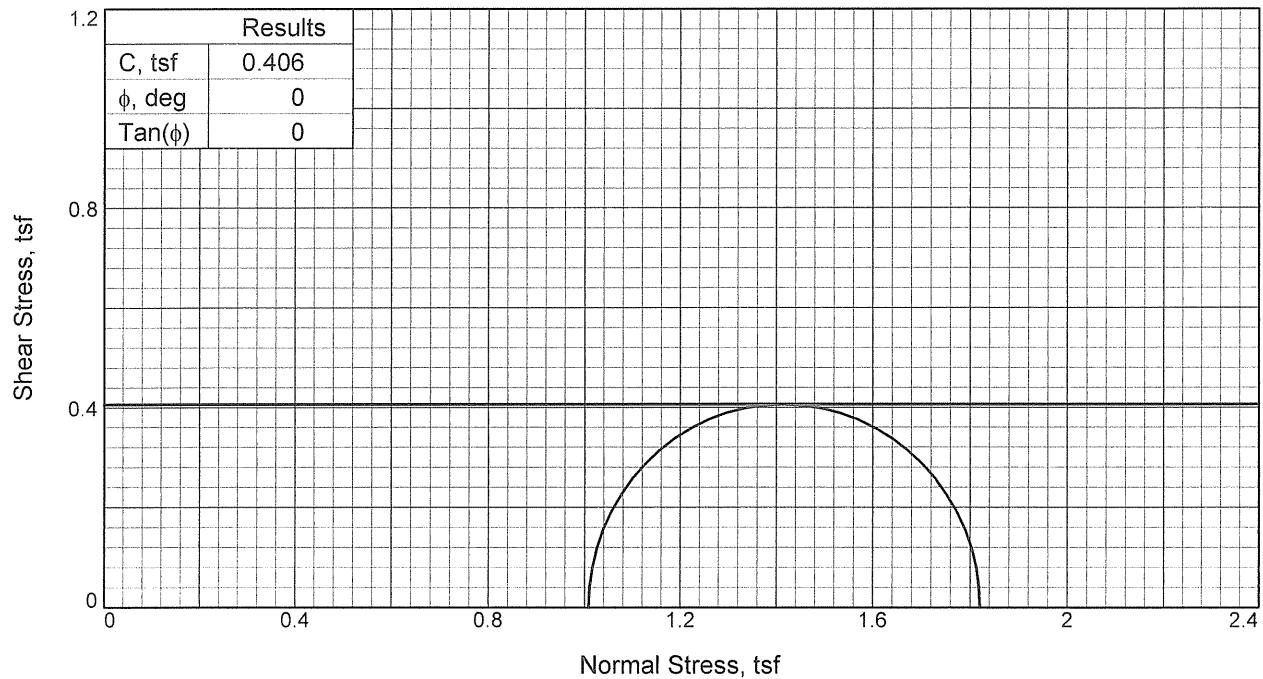
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.5	4.4	83.4	88.3			11.7

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0874	0.1098	0.1542	0.1837	0.2005	0.2388	0.2495	0.3234	0.4237

Fineness Modulus

0.90



Sample No.		1
Initial	Water Content, %	56.5
	Dry Density, pcf	63.9
	Saturation, %	93.0
	Void Ratio	1.6393
	Diameter, in.	2.79
	Height, in.	5.99
At Test	Water Content, %	51.2
	Dry Density, pcf	63.9
	Saturation, %	84.4
	Void Ratio	1.6393
	Diameter, in.	2.79
	Height, in.	5.99
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		1.01
Fail. Stress, tsf		0.81
Ult. Stress, tsf		
σ_1 Failure, tsf		1.82
σ_3 Failure, tsf		1.01

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown and gray FAT CLAY

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 2850

Pocket pen; tsf: 0.75

Failure type: 60 degree

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Contract No. DACW64-03-D-0008, Task Order No. 0077

Source of Sample: 07-196

Depth: 16-18

Sample Number: 9

Proj. No.: 08.18.918

Date Sampled: 7/18/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

10/17/2008
9:51 AM

Date: 7/18/08
Client: United States Army Corps of Engineers
Project: Galveston Channel and Pelican Island PA
Contract No. DACW64-03-D-0008, Task Order No. 0077
Project No.: 08.18.918
Location: 07-196
Depth: 16-18 **Sample Number:** 9
Description: Brown and gray FAT CLAY
Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 0.75
Failure type: 60 degree
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1		
Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	129.950	114.590
Moisture content: Dry soil+tare, gms.	94.620	86.490
Moisture content: Tare, gms.	32.070	31.660
Moisture, %	56.5	51.2
Moist specimen weight, gms.	960.8	
Diameter, in.	2.79	
Area, in. ²	6.11	
Height, in.	5.99	
Wet Density, pcf	99.9	
Dry density, pcf	63.9	
Void ratio	1.6393	
Saturation, %	93.0	

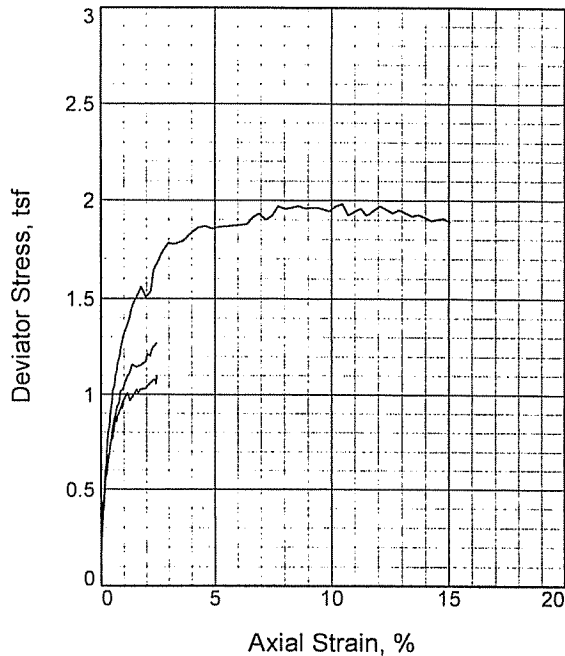
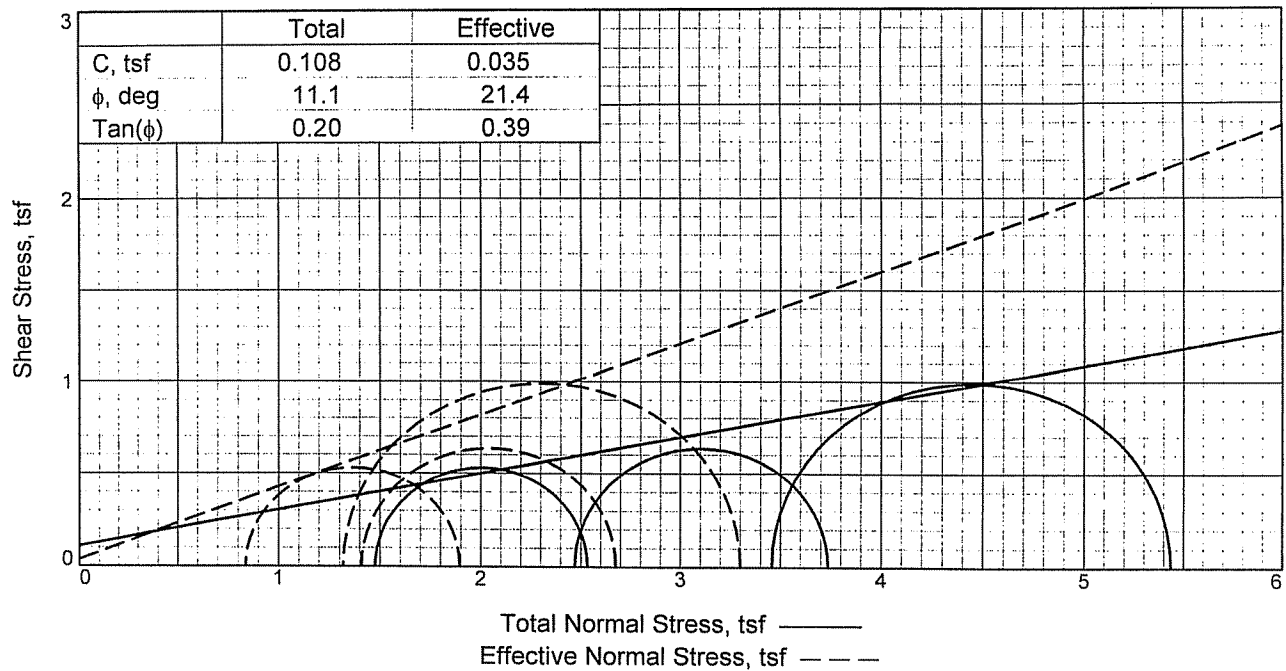
Test Readings for Specimen No. 1	
Membrane modulus = .130 kN/cm ²	
Membrane thickness = .031 cm	
Cell pressure = 14.00 psi (1.008 tsf)	
Back pressure = 0.00 psi (0.000 tsf)	
Strain rate, %/min. = 1.00	
Fail. Stress = 0.813 tsf at reading no. 46	

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Princ. Stress tsf	Major Princ. Stress tsf	1:3 Ratio	P tsf	Q tsf
0	0.0360	0.000	0.0	0.0	0.000	1.008	1.008	1.00	1.008	0.000
1	0.0451	4.526	4.5	0.2	0.053	1.008	1.061	1.05	1.035	0.027
2	0.0482	7.131	7.1	0.2	0.084	1.008	1.092	1.08	1.050	0.042
3	0.0495	9.163	9.2	0.2	0.108	1.008	1.116	1.11	1.062	0.054
4	0.0514	11.602	11.6	0.3	0.136	1.008	1.144	1.14	1.076	0.068
5	0.0527	13.533	13.5	0.3	0.159	1.008	1.167	1.16	1.087	0.079
6	0.0547	15.875	15.9	0.3	0.186	1.008	1.194	1.18	1.101	0.093
7	0.0559	17.959	18.0	0.3	0.211	1.008	1.219	1.21	1.113	0.105
8	0.0572	20.064	20.1	0.4	0.235	1.008	1.243	1.23	1.126	0.118
9	0.0593	22.052	22.1	0.4	0.259	1.008	1.267	1.26	1.137	0.129
10	0.0606	23.917	23.9	0.4	0.281	1.008	1.289	1.28	1.148	0.140
11	0.0619	25.601	25.6	0.4	0.300	1.008	1.308	1.30	1.158	0.150
12	0.0639	27.597	27.6	0.5	0.324	1.008	1.332	1.32	1.170	0.162
13	0.0652	29.852	29.9	0.5	0.350	1.008	1.358	1.35	1.183	0.175
14	0.0671	31.487	31.5	0.5	0.369	1.008	1.377	1.37	1.192	0.184
15	0.0684	33.400	33.4	0.5	0.391	1.008	1.399	1.39	1.204	0.196
16	0.0697	34.862	34.9	0.6	0.408	1.008	1.416	1.41	1.212	0.204
17	0.0717	36.255	36.3	0.6	0.424	1.008	1.432	1.42	1.220	0.212
18	0.0729	37.920	37.9	0.6	0.444	1.008	1.452	1.44	1.230	0.222
19	0.0749	39.416	39.4	0.6	0.461	1.008	1.469	1.46	1.239	0.231
20	0.0761	41.236	41.2	0.7	0.482	1.008	1.490	1.48	1.249	0.241
21	0.0774	42.500	42.5	0.7	0.497	1.008	1.505	1.49	1.257	0.249
22	0.0794	43.838	43.8	0.7	0.513	1.008	1.521	1.51	1.264	0.256
23	0.0807	44.693	44.7	0.7	0.522	1.008	1.530	1.52	1.269	0.261
24	0.0820	45.724	45.7	0.8	0.534	1.008	1.542	1.53	1.275	0.267
25	0.0840	46.742	46.7	0.8	0.546	1.008	1.554	1.54	1.281	0.273
26	0.0853	47.740	47.7	0.8	0.558	1.008	1.566	1.55	1.287	0.279
27	0.0866	49.163	49.2	0.8	0.574	1.008	1.582	1.57	1.295	0.287
28	0.0899	50.720	50.7	0.9	0.592	1.008	1.600	1.59	1.304	0.296
29	0.0932	51.866	51.9	1.0	0.605	1.008	1.613	1.60	1.310	0.302
30	0.0945	52.678	52.7	1.0	0.614	1.008	1.622	1.61	1.315	0.307
31	0.0958	53.634	53.6	1.0	0.625	1.008	1.633	1.62	1.321	0.313
32	0.0991	54.753	54.8	1.1	0.638	1.008	1.646	1.63	1.327	0.319
33	0.1024	55.929	55.9	1.1	0.651	1.008	1.659	1.65	1.334	0.326
34	0.1050	57.115	57.1	1.2	0.665	1.008	1.673	1.66	1.340	0.332
35	0.1127	59.095	59.1	1.3	0.687	1.008	1.695	1.68	1.352	0.344
36	0.1192	61.143	61.1	1.4	0.710	1.008	1.718	1.70	1.363	0.355
37	0.1249	62.720	62.7	1.5	0.728	1.008	1.736	1.72	1.372	0.364
38	0.1313	63.878	63.9	1.6	0.740	1.008	1.748	1.73	1.378	0.370
39	0.1371	65.338	65.3	1.7	0.756	1.008	1.764	1.75	1.386	0.378
40	0.1493	66.900	66.9	1.9	0.773	1.008	1.781	1.77	1.394	0.386
41	0.1615	67.860	67.9	2.1	0.782	1.008	1.790	1.78	1.399	0.391
42	0.1672	69.107	69.1	2.2	0.796	1.008	1.804	1.79	1.406	0.398
43	0.1794	69.523	69.5	2.4	0.799	1.008	1.807	1.79	1.408	0.400
44	0.1858	70.369	70.4	2.5	0.808	1.008	1.816	1.80	1.412	0.404
45	0.1974	70.572	70.6	2.7	0.809	1.008	1.817	1.80	1.412	0.404
46	0.2096	71.068	71.1	2.9	0.813	1.008	1.821	1.81	1.414	0.406

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Princ. Stress tsf	Major Princ. Stress tsf	1:3 Ratio	P tsf	Q tsf
47	0.2218	71.090	71.1	3.1	0.811	1.008	1.819	1.80	1.414	0.406
48	0.2282	71.278	71.3	3.2	0.813	1.008	1.821	1.81	1.414	0.406
49	0.2340	71.222	71.2	3.3	0.811	1.008	1.819	1.80	1.414	0.406
50	0.2461	70.849	70.8	3.5	0.805	1.008	1.813	1.80	1.411	0.403
51	0.2584	70.663	70.7	3.7	0.801	1.008	1.809	1.79	1.409	0.401
52	0.2705	70.309	70.3	3.9	0.796	1.008	1.804	1.79	1.406	0.398
53	0.2827	69.537	69.5	4.1	0.785	1.008	1.793	1.78	1.401	0.393
54	0.2949	69.033	69.0	4.3	0.778	1.008	1.786	1.77	1.397	0.389
55	0.3071	68.926	68.9	4.5	0.775	1.008	1.783	1.77	1.396	0.388
56	0.3186	68.361	68.4	4.7	0.767	1.008	1.775	1.76	1.392	0.384
57	0.3309	67.518	67.5	4.9	0.756	1.008	1.764	1.75	1.386	0.378
58	0.3430	67.189	67.2	5.1	0.751	1.008	1.759	1.74	1.383	0.375
59	0.3641	66.361	66.4	5.5	0.739	1.008	1.747	1.73	1.377	0.369
60	0.3794	65.940	65.9	5.7	0.732	1.008	1.740	1.73	1.374	0.366
61	0.3941	65.444	65.4	6.0	0.725	1.008	1.733	1.72	1.370	0.362
62	0.4094	64.514	64.5	6.2	0.712	1.008	1.720	1.71	1.364	0.356
63	0.4242	63.948	63.9	6.5	0.704	1.008	1.712	1.70	1.360	0.352
64	0.4390	63.373	63.4	6.7	0.696	1.008	1.704	1.69	1.356	0.348
65	0.4500	63.206	63.2	6.9	0.693	1.008	1.701	1.69	1.354	0.346



Sample No.		1	2	3
Initial	Water Content, %	51.4	51.4	51.4
	Dry Density, pcf	69.0	69.0	69.0
	Saturation, %	96.2	96.2	96.2
	Void Ratio	1.4426	1.4426	1.4426
	Diameter, in.	2.02	2.02	2.02
	Height, in.	3.99	3.99	3.99
At Test	Water Content, %	43.6	43.6	43.6
	Dry Density, pcf	77.4	77.4	77.4
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.1774	1.1774	1.1774
	Diameter, in.	1.91	1.95	1.97
	Height, in.	3.94	3.81	3.73
Strain rate, %/min.		0.02	0.0044	0.0036
Back Pressure, tsf		2.17	2.19	2.20
Cell Pressure, tsf		3.65	4.66	5.66
Fail. Stress, tsf		1.06	1.27	1.98
Excess Pore Pr., tsf		0.64	1.06	2.14
Ult. Stress, tsf		1.10	1.27	1.89
Excess Pore Pr., tsf		0.63	1.06	2.25
$\bar{\sigma}_1$ Failure, tsf		1.89	2.68	3.30
$\bar{\sigma}_3$ Failure, tsf		0.84	1.41	1.32

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray FAT CLAY

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D4767

Pocket pen; tsf: 1.50

Failure type: Bulge

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Contract No. DACW64-03-D-0008, Task Order No. 0077

Source of Sample: 07-196

Depth: 30-32

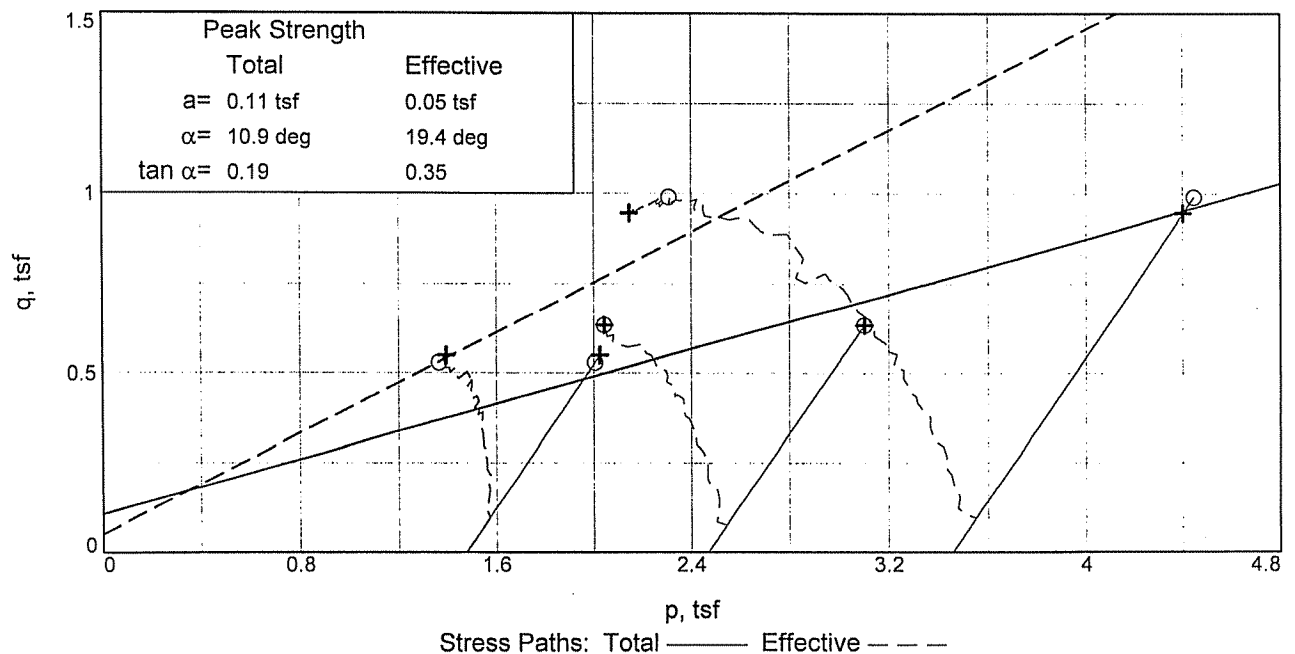
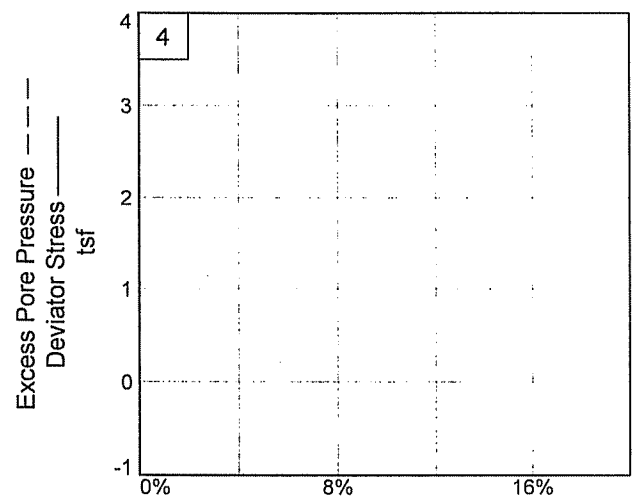
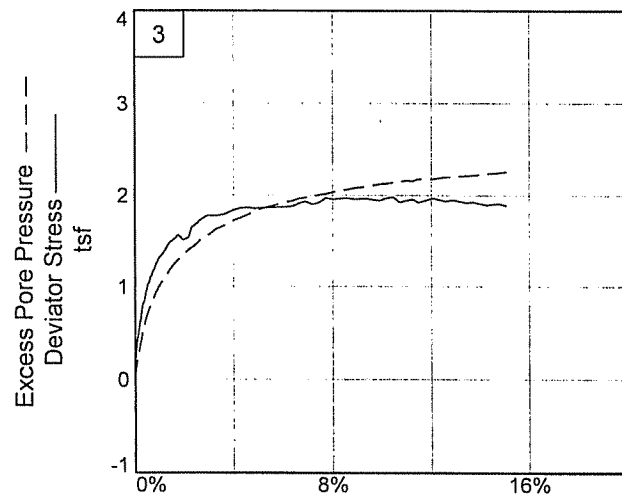
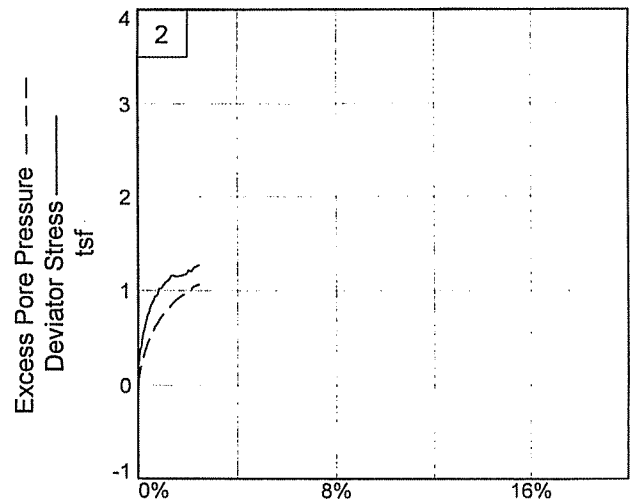
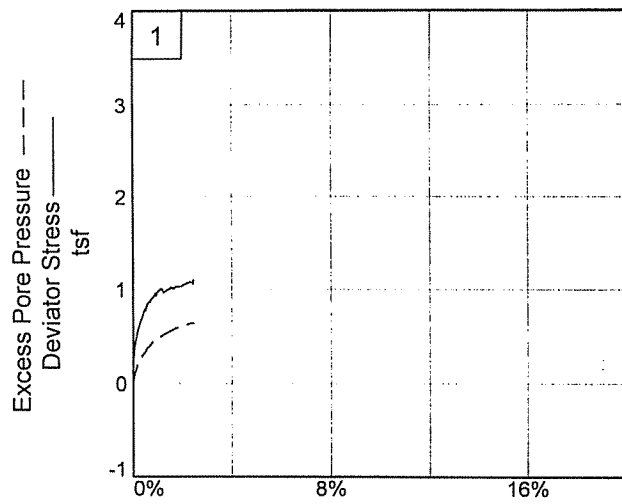
Sample Number: 16

Proj. No.: 08.18.918

Date Sampled: 8/28/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.



Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Source of Sample: 07-196

Depth: 30-32

Sample Number: 16

Project No.: 08.18.918

TOLUNAY-WONG ENGINEERS, INC.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

9/8/2008

2:07 PM

Date: 8/28/08
Client: United States Army Corps of Engineers
Project: Galveston Channel and Pelican Island PA
 Contract No. DACW64-03-D-0008, Task Order No. 0077
Project No.: 08.18.918
Location: 07-196
Depth: 30-32 **Sample Number:** 16
Description: Gray FAT CLAY
Remarks:
 Test method: ASTM D4767
 Pocket pen; tsf: 1.50
 Failure type: Bulge
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL**= **PL**= **PI**=
Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	79.700			100.090
Moisture content: Dry soil+tare, gms.	63.010			78.940
Moisture content: Tare, gms.	30.530			30.440
Moisture, %	51.4	49.7	43.6	43.6
Moist specimen weight, gms.	348.9			
Diameter, in.	2.02	1.96	1.91	
Area, in. ²	3.19	3.01	2.88	
Height, in.	3.99	4.05	3.94	
Net decrease in height, in.		-0.06	0.11	
Net decrease in water volume, cc.			14.00	
Wet Density, pcf	104.5	107.8	111.2	
Dry density, pcf	69.0	72.0	77.4	
Void ratio	1.4426	1.3414	1.1774	
Saturation, %	96.2	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 50.70 psi (3.650 tsf)
 Consolidation back pressure = 30.20 psi (2.174 tsf)
 Consolidation effective confining stress = 1.476 tsf
 Strain rate, %/min. = 0.02
 Fail. Stress = 1.057 tsf at reading no. 39
 Ult. Stress = 1.097 tsf at reading no. 40

Test Readings for Specimen No. J

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0013	0.000	0.0	0.0	0.000	1.476	1.476	1.00	30.20	1.476	0.000
1	0.0014	7.689	7.7	0.0	0.192	1.476	1.668	1.13	30.20	1.572	0.096
2	0.0015	9.329	9.3	0.0	0.234	1.443	1.676	1.16	30.66	1.559	0.117
3	0.0022	11.354	11.4	0.0	0.284	1.424	1.708	1.20	30.93	1.566	0.142
4	0.0030	14.086	14.1	0.0	0.352	1.396	1.748	1.25	31.31	1.572	0.176
5	0.0039	15.868	15.9	0.1	0.397	1.368	1.765	1.29	31.70	1.566	0.198
6	0.0047	17.328	17.3	0.1	0.433	1.359	1.792	1.32	31.83	1.575	0.217
7	0.0056	18.610	18.6	0.1	0.465	1.328	1.794	1.35	32.25	1.561	0.233
8	0.0068	19.652	19.7	0.1	0.491	1.315	1.807	1.37	32.43	1.561	0.246
9	0.0074	20.889	20.9	0.2	0.522	1.300	1.822	1.40	32.64	1.561	0.261
10	0.0082	22.010	22.0	0.2	0.550	1.275	1.825	1.43	32.99	1.550	0.275
11	0.0094	23.116	23.1	0.2	0.577	1.269	1.846	1.46	33.08	1.557	0.289
12	0.0106	23.780	23.8	0.2	0.594	1.250	1.844	1.48	33.34	1.547	0.297
13	0.0127	26.258	26.3	0.3	0.655	1.217	1.873	1.54	33.79	1.545	0.328
14	0.0147	27.356	27.4	0.3	0.682	1.200	1.882	1.57	34.04	1.541	0.341
15	0.0156	27.848	27.8	0.4	0.695	1.186	1.880	1.59	34.23	1.533	0.347
16	0.0175	29.796	29.8	0.4	0.743	1.171	1.914	1.63	34.44	1.542	0.371
17	0.0196	31.368	31.4	0.5	0.781	1.153	1.935	1.68	34.68	1.544	0.391
18	0.0211	30.752	30.8	0.5	0.766	1.142	1.907	1.67	34.84	1.525	0.383
19	0.0222	32.871	32.9	0.5	0.818	1.125	1.943	1.73	35.08	1.534	0.409
20	0.0230	32.248	32.2	0.5	0.803	1.109	1.912	1.72	35.30	1.510	0.401
21	0.0238	33.742	33.7	0.6	0.840	1.108	1.948	1.76	35.30	1.528	0.420
22	0.0279	34.960	35.0	0.7	0.869	1.085	1.954	1.80	35.63	1.519	0.435
23	0.0285	34.425	34.4	0.7	0.856	1.077	1.933	1.79	35.74	1.505	0.428
24	0.0292	35.305	35.3	0.7	0.877	1.071	1.948	1.82	35.83	1.510	0.439
25	0.0322	36.404	36.4	0.8	0.904	1.043	1.947	1.87	36.22	1.495	0.452
26	0.0349	37.218	37.2	0.9	0.924	1.038	1.962	1.89	36.28	1.500	0.462
27	0.0376	38.675	38.7	0.9	0.959	1.020	1.979	1.94	36.54	1.499	0.480
28	0.0384	37.328	37.3	0.9	0.926	1.018	1.944	1.91	36.56	1.481	0.463
29	0.0393	38.888	38.9	1.0	0.964	1.015	1.979	1.95	36.60	1.497	0.482
30	0.0467	40.679	40.7	1.2	1.006	0.976	1.983	2.03	37.14	1.479	0.503
31	0.0507	41.332	41.3	1.3	0.968	0.960	1.928	2.01	37.37	1.444	0.484
32	0.0585	43.100	43.1	1.5	1.001	0.931	1.932	2.07	37.77	1.431	0.500
33	0.0630	44.324	44.3	1.6	1.025	0.917	1.942	2.12	37.97	1.429	0.512
34	0.0657	43.735	43.7	1.6	1.007	0.908	1.915	2.11	38.08	1.412	0.503
35	0.0700	44.816	44.8	1.7	1.027	0.894	1.921	2.15	38.29	1.407	0.514
36	0.0780	45.399	45.4	1.9	1.031	0.876	1.906	2.18	38.54	1.391	0.515
37	0.0824	46.199	46.2	2.1	1.047	0.867	1.914	2.21	38.66	1.390	0.523
38	0.0938	47.736	47.7	2.3	1.081	0.841	1.922	2.29	39.02	1.381	0.540
39	0.0973	46.808	46.8	2.4	1.057	0.838	1.895	2.26	39.06	1.366	0.529
40	0.0976	48.450	48.5	2.4	1.097	0.846	1.943	2.30	38.95	1.395	0.549

Parameters for Specimen No. 2				
Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	79.700			100.090
Moisture content: Dry soil+tare, gms.	63.010			78.940
Moisture content: Tare, gms.	30.530			30.440
Moisture, %	51.4	52.7	43.6	43.6
Moist specimen weight, gms.	348.9			
Diameter, in.	2.02	1.99	1.95	
Area, in. ²	3.19	3.11	2.97	
Height, in.	3.99	4.05	3.81	
Net decrease in height, in.		-0.06	0.24	
Net decrease in water volume, cc.			21.00	
Wet Density, pcf	104.5	106.2	111.2	
Dry density, pcf	69.0	69.6	77.4	
Void ratio	1.4426	1.4234	1.1774	
Saturation, %	96.2	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Filter paper coefficient = 0.0019 kN/cm

Filter paper coverage = 50%

Consolidation cell pressure = 64.70 psi (4.658 tsf)

Consolidation back pressure = 30.40 psi (2.189 tsf)

Consolidation effective confining stress = 2.470 tsf

Strain rate, %/min. = 0.0044

Fail. Stress = 1.267 tsf at reading no. 41

Ult. Stress = 1.267 tsf at reading no. 41

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0006	0.000	0.0	0.0	0.000	2.470	2.470	1.00	30.39	2.470	0.000
1	0.0007	6.296	6.3	0.0	0.152	2.470	2.623	1.06	30.39	2.546	0.076
2	0.0008	6.991	7.0	0.0	0.169	2.420	2.589	1.07	31.09	2.504	0.085
3	0.0016	9.494	9.5	0.0	0.230	2.398	2.628	1.10	31.40	2.513	0.115
4	0.0027	12.262	12.3	0.1	0.297	2.367	2.663	1.13	31.83	2.515	0.148
5	0.0035	14.376	14.4	0.1	0.348	2.333	2.681	1.15	32.30	2.507	0.174
6	0.0043	15.862	15.9	0.1	0.384	2.286	2.669	1.17	32.96	2.477	0.192
7	0.0057	16.935	16.9	0.1	0.409	2.263	2.673	1.18	33.27	2.468	0.205
8	0.0062	19.380	19.4	0.1	0.469	2.233	2.702	1.21	33.68	2.468	0.234
9	0.0072	20.426	20.4	0.2	0.494	2.220	2.714	1.22	33.86	2.467	0.247
10	0.0080	22.813	22.8	0.2	0.551	2.178	2.730	1.25	34.44	2.454	0.276
11	0.0099	23.906	23.9	0.2	0.577	2.153	2.730	1.27	34.80	2.441	0.289
12	0.0108	24.860	24.9	0.3	0.600	2.121	2.722	1.28	35.24	2.421	0.300
13	0.0115	26.082	26.1	0.3	0.630	2.106	2.735	1.30	35.45	2.421	0.315
14	0.0129	27.563	27.6	0.3	0.665	2.079	2.744	1.32	35.82	2.412	0.333
15	0.0139	28.574	28.6	0.3	0.689	2.065	2.755	1.33	36.02	2.410	0.345
16	0.0148	30.076	30.1	0.4	0.725	2.036	2.761	1.36	36.43	2.398	0.363
17	0.0156	30.862	30.9	0.4	0.744	2.020	2.764	1.37	36.65	2.392	0.372
18	0.0176	31.548	31.5	0.4	0.760	1.995	2.756	1.38	36.99	2.375	0.380
19	0.0183	32.745	32.7	0.5	0.789	1.976	2.765	1.40	37.25	2.371	0.395
20	0.0187	33.444	33.4	0.5	0.806	1.971	2.777	1.41	37.33	2.374	0.403

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
21	0.0198	34.476	34.5	0.5	0.830	1.955	2.785	1.42	37.55	2.370	0.415
22	0.0213	35.338	35.3	0.5	0.851	1.942	2.793	1.44	37.73	2.367	0.425
23	0.0230	36.539	36.5	0.6	0.879	1.903	2.782	1.46	38.27	2.343	0.440
24	0.0237	35.964	36.0	0.6	0.865	1.900	2.765	1.46	38.31	2.333	0.433
25	0.0254	37.534	37.5	0.6	0.903	1.883	2.785	1.48	38.55	2.334	0.451
26	0.0267	38.771	38.8	0.7	0.932	1.854	2.787	1.50	38.95	2.320	0.466
27	0.0306	39.658	39.7	0.8	0.953	1.822	2.775	1.52	39.39	2.298	0.476
28	0.0315	40.854	40.9	0.8	0.981	1.814	2.795	1.54	39.51	2.304	0.491
29	0.0327	42.203	42.2	0.8	1.013	1.791	2.804	1.57	39.83	2.297	0.507
30	0.0373	42.830	42.8	1.0	1.027	1.748	2.775	1.59	40.43	2.261	0.513
31	0.0405	44.386	44.4	1.0	1.063	1.718	2.781	1.62	40.84	2.250	0.532
32	0.0448	45.735	45.7	1.2	1.094	1.689	2.784	1.65	41.24	2.236	0.547
33	0.0481	46.455	46.5	1.2	1.111	1.658	2.769	1.67	41.67	2.213	0.555
34	0.0527	48.530	48.5	1.4	1.159	1.619	2.778	1.72	42.21	2.199	0.579
35	0.0597	50.699	50.7	1.6	1.144	1.568	2.712	1.73	42.92	2.140	0.572
36	0.0676	51.642	51.6	1.8	1.155	1.528	2.683	1.76	43.48	2.105	0.578
37	0.0751	52.857	52.9	2.0	1.173	1.492	2.665	1.79	43.98	2.078	0.587
38	0.0784	54.678	54.7	2.0	1.214	1.475	2.688	1.82	44.22	2.082	0.607
39	0.0828	54.278	54.3	2.2	1.203	1.454	2.656	1.83	44.51	2.055	0.601
40	0.0865	55.920	55.9	2.3	1.240	1.430	2.670	1.87	44.84	2.050	0.620
41	0.0938	57.160	57.2	2.4	1.267	1.409	2.676	1.90	45.13	2.042	0.633

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	79.700			100.090
Moisture content: Dry soil+tare, gms.	63.010			78.940
Moisture content: Tare, gms.	30.530			30.440
Moisture, %	51.4	57.0	43.6	43.6
Moist specimen weight, gms.	348.9			
Diameter, in.	2.02	2.04	1.97	
Area, in. ²	3.19	3.26	3.04	
Height, in.	3.99	4.05	3.73	
Net decrease in height, in.		-0.06	0.33	
Net decrease in water volume, cc.			30.80	
Wet Density, pcf	104.5	104.2	111.2	
Dry density, pcf	69.0	66.4	77.4	
Void ratio	1.4426	1.5382	1.1774	
Saturation, %	96.2	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Filter paper coefficient = 0.0019 kN/cm

Filter paper coverage = 50%

Consolidation cell pressure = 78.60 psi (5.659 tsf)

Consolidation back pressure = 30.60 psi (2.203 tsf)

Consolidation effective confining stress = 3.456 tsf

Strain rate, %/min. = 0.0036

Fail. Stress = 1.980 tsf at reading no. 64

Ult. Stress = 1.889 tsf at reading no. 76

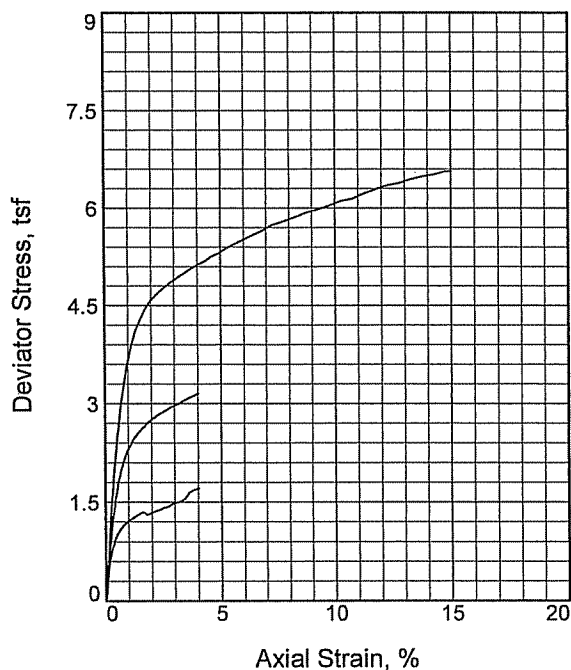
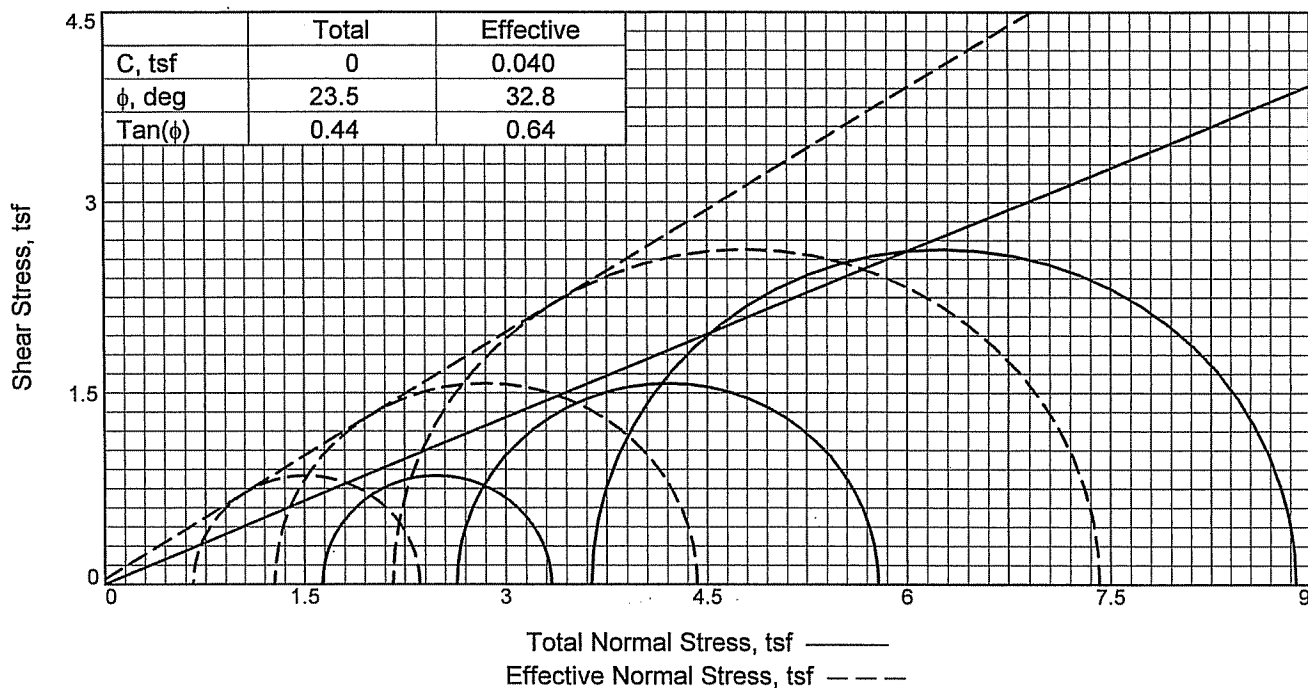
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0006	0.000	0.0	0.0	0.000	3.456	3.456	1.00	30.60	3.456	0.000
1	0.0007	8.013	8.0	0.0	0.190	3.456	3.646	1.05	30.60	3.551	0.095
2	0.0008	8.953	9.0	0.0	0.212	3.401	3.612	1.06	31.37	3.507	0.106
3	0.0014	10.321	10.3	0.0	0.244	3.356	3.600	1.07	31.99	3.478	0.122
4	0.0022	13.128	13.1	0.0	0.310	3.330	3.640	1.09	32.36	3.485	0.155
5	0.0031	16.109	16.1	0.1	0.381	3.270	3.651	1.12	33.18	3.460	0.190
6	0.0039	18.454	18.5	0.1	0.436	3.234	3.670	1.13	33.69	3.452	0.218
7	0.0048	19.918	19.9	0.1	0.471	3.197	3.667	1.15	34.20	3.432	0.235
8	0.0061	22.715	22.7	0.1	0.537	3.164	3.700	1.17	34.66	3.432	0.268
9	0.0072	24.897	24.9	0.2	0.588	3.125	3.713	1.19	35.19	3.419	0.294
10	0.0079	26.093	26.1	0.2	0.616	3.083	3.699	1.20	35.78	3.391	0.308
11	0.0092	27.262	27.3	0.2	0.643	3.055	3.699	1.21	36.17	3.377	0.322
12	0.0098	29.284	29.3	0.2	0.691	3.021	3.712	1.23	36.65	3.366	0.346
13	0.0105	31.764	31.8	0.3	0.749	2.991	3.741	1.25	37.05	3.366	0.375
14	0.0113	32.938	32.9	0.3	0.777	2.962	3.739	1.26	37.45	3.351	0.389
15	0.0123	34.191	34.2	0.3	0.806	2.926	3.732	1.28	37.96	3.329	0.403
16	0.0140	35.292	35.3	0.4	0.832	2.899	3.731	1.29	38.34	3.315	0.416
17	0.0148	36.816	36.8	0.4	0.868	2.875	3.743	1.30	38.67	3.309	0.434
18	0.0153	37.925	37.9	0.4	0.894	2.842	3.736	1.31	39.13	3.289	0.447
19	0.0172	40.009	40.0	0.4	0.942	2.802	3.744	1.34	39.68	3.273	0.471
20	0.0184	41.208	41.2	0.5	0.970	2.774	3.744	1.35	40.07	3.259	0.485

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
21	0.0193	43.221	43.2	0.5	1.017	2.752	3.769	1.37	40.38	3.261	0.509
22	0.0219	44.293	44.3	0.6	1.042	2.698	3.740	1.39	41.12	3.219	0.521
23	0.0239	46.914	46.9	0.6	1.103	2.682	3.785	1.41	41.35	3.233	0.551
24	0.0261	47.952	48.0	0.7	1.127	2.623	3.750	1.43	42.17	3.186	0.563
25	0.0271	49.409	49.4	0.7	1.161	2.612	3.772	1.44	42.33	3.192	0.580
26	0.0312	51.459	51.5	0.8	1.207	2.538	3.746	1.48	43.35	3.142	0.604
27	0.0321	52.901	52.9	0.8	1.241	2.521	3.762	1.49	43.58	3.142	0.620
28	0.0351	54.392	54.4	0.9	1.275	2.490	3.765	1.51	44.02	3.127	0.637
29	0.0358	55.406	55.4	0.9	1.298	2.470	3.769	1.53	44.29	3.120	0.649
30	0.0419	57.634	57.6	1.1	1.348	2.402	3.751	1.56	45.23	3.077	0.674
31	0.0461	59.609	59.6	1.2	1.393	2.356	3.749	1.59	45.88	3.052	0.697
32	0.0501	61.852	61.9	1.3	1.444	2.312	3.756	1.62	46.49	3.034	0.722
33	0.0540	63.475	63.5	1.4	1.480	2.270	3.750	1.65	47.07	3.010	0.740
34	0.0620	65.596	65.6	1.6	1.526	2.198	3.725	1.69	48.07	2.962	0.763
35	0.0661	67.071	67.1	1.8	1.559	2.166	3.725	1.72	48.51	2.946	0.779
36	0.0739	68.421	68.4	2.0	1.507	2.112	3.619	1.71	49.26	2.866	0.754
37	0.0820	69.777	69.8	2.2	1.534	2.059	3.593	1.74	50.00	2.826	0.767
38	0.0865	70.988	71.0	2.3	1.641	2.037	3.678	1.81	50.30	2.858	0.820
39	0.0955	73.509	73.5	2.5	1.695	1.983	3.678	1.85	51.05	2.831	0.847
40	0.0991	74.652	74.7	2.6	1.719	1.954	3.674	1.88	51.46	2.814	0.860
41	0.1030	75.673	75.7	2.7	1.741	1.941	3.683	1.90	51.64	2.812	0.871
42	0.1106	77.424	77.4	3.0	1.778	1.902	3.679	1.93	52.19	2.791	0.889
43	0.1232	77.624	77.6	3.3	1.776	1.834	3.610	1.97	53.13	2.722	0.888
44	0.1361	78.534	78.5	3.6	1.790	1.793	3.584	2.00	53.70	2.688	0.895
45	0.1474	80.438	80.4	3.9	1.828	1.745	3.573	2.05	54.36	2.659	0.914
46	0.1599	82.072	82.1	4.3	1.859	1.708	3.567	2.09	54.87	2.638	0.929
47	0.1719	82.667	82.7	4.6	1.866	1.667	3.533	2.12	55.44	2.600	0.933
48	0.1828	82.379	82.4	4.9	1.854	1.631	3.484	2.14	55.95	2.557	0.927
49	0.1956	83.095	83.1	5.2	1.863	1.598	3.461	2.17	56.41	2.529	0.932
50	0.2084	83.525	83.5	5.6	1.866	1.574	3.440	2.19	56.74	2.507	0.933
51	0.2289	84.336	84.3	6.1	1.873	1.530	3.403	2.22	57.35	2.467	0.937
52	0.2394	84.823	84.8	6.4	1.878	1.516	3.394	2.24	57.54	2.455	0.939
53	0.2482	86.494	86.5	6.6	1.910	1.494	3.404	2.28	57.86	2.449	0.955
54	0.2579	87.756	87.8	6.9	1.933	1.485	3.418	2.30	57.98	2.451	0.966
55	0.2689	86.527	86.5	7.2	1.900	1.470	3.369	2.29	58.19	2.420	0.950
56	0.2787	87.725	87.7	7.5	1.921	1.452	3.372	2.32	58.44	2.412	0.960
57	0.2889	90.163	90.2	7.7	1.968	1.442	3.410	2.37	58.58	2.426	0.984
58	0.3001	89.855	89.9	8.0	1.955	1.422	3.377	2.37	58.85	2.400	0.978
59	0.3205	91.108	91.1	8.6	1.970	1.396	3.367	2.41	59.21	2.382	0.985
60	0.3305	90.785	90.8	8.9	1.958	1.378	3.336	2.42	59.46	2.357	0.979
61	0.3510	91.506	91.5	9.4	1.961	1.361	3.322	2.44	59.70	2.341	0.981
62	0.3699	91.201	91.2	9.9	1.944	1.336	3.280	2.46	60.04	2.308	0.972
63	0.3801	92.642	92.6	10.2	1.969	1.330	3.298	2.48	60.13	2.314	0.984
64	0.3904	93.487	93.5	10.5	1.980	1.318	3.299	2.50	60.29	2.309	0.990
65	0.3999	91.114	91.1	10.7	1.925	1.308	3.233	2.47	60.43	2.270	0.962
66	0.4100	92.203	92.2	11.0	1.942	1.300	3.242	2.49	60.54	2.271	0.971
67	0.4196	93.221	93.2	11.2	1.958	1.301	3.259	2.50	60.53	2.280	0.979

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
68	0.4291	91.832	91.8	11.5	1.923	1.282	3.205	2.50	60.79	2.243	0.961
69	0.4505	94.686	94.7	12.1	1.970	1.283	3.253	2.54	60.78	2.268	0.985
70	0.4702	93.570	93.6	12.6	1.935	1.260	3.195	2.54	61.10	2.227	0.967
71	0.4813	94.605	94.6	12.9	1.950	1.259	3.208	2.55	61.12	2.233	0.975
72	0.5014	93.733	93.7	13.4	1.920	1.244	3.164	2.54	61.32	2.204	0.960
73	0.5117	94.399	94.4	13.7	1.927	1.240	3.168	2.55	61.37	2.204	0.964
74	0.5316	93.423	93.4	14.2	1.895	1.220	3.115	2.55	61.66	2.167	0.948
75	0.5511	94.614	94.6	14.8	1.908	1.211	3.119	2.58	61.78	2.165	0.954
76	0.5616	94.014	94.0	15.1	1.889	1.201	3.090	2.57	61.92	2.146	0.945



Sample No.		1	2	3
Initial	Water Content, %	25.5	25.5	25.5
	Dry Density, pcf	98.7	98.7	98.7
	Saturation, %	97.2	97.2	97.2
	Void Ratio	0.7073	0.7073	0.7073
	Diameter, in.	1.99	1.99	1.99
	Height, in.	4.01	4.01	4.01
At Test	Water Content, %	23.5	23.5	23.5
	Dry Density, pcf	103.2	103.2	103.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6334	0.6334	0.6334
	Diameter, in.	1.95	1.99	2.02
	Height, in.	3.97	3.85	3.73
Strain rate, %/min.		0.05	0.02	0.05
Back Pressure, tsf		2.16	2.17	2.17
Cell Pressure, tsf		3.79	4.80	5.80
Fail. Stress, tsf		1.70	3.15	5.26
Excess Pore Pr., tsf		0.98	1.36	1.48
Ult. Stress, tsf		1.70	3.15	6.56
Excess Pore Pr., tsf		0.98	1.36	0.81
$\bar{\sigma}_1$ Failure, tsf		2.36	4.42	7.42
$\bar{\sigma}_3$ Failure, tsf		0.66	1.27	2.16

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray SANDY LEAN CLAY

LL= 29 PL= 17 PI= 12

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 4767

Pocket pen; tsf: 0.75

Failure type: Bulge

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Contract No. DACW64-03-D-0008, Task Order No. 0077

Source of Sample: 07-196

Depth: 34-36

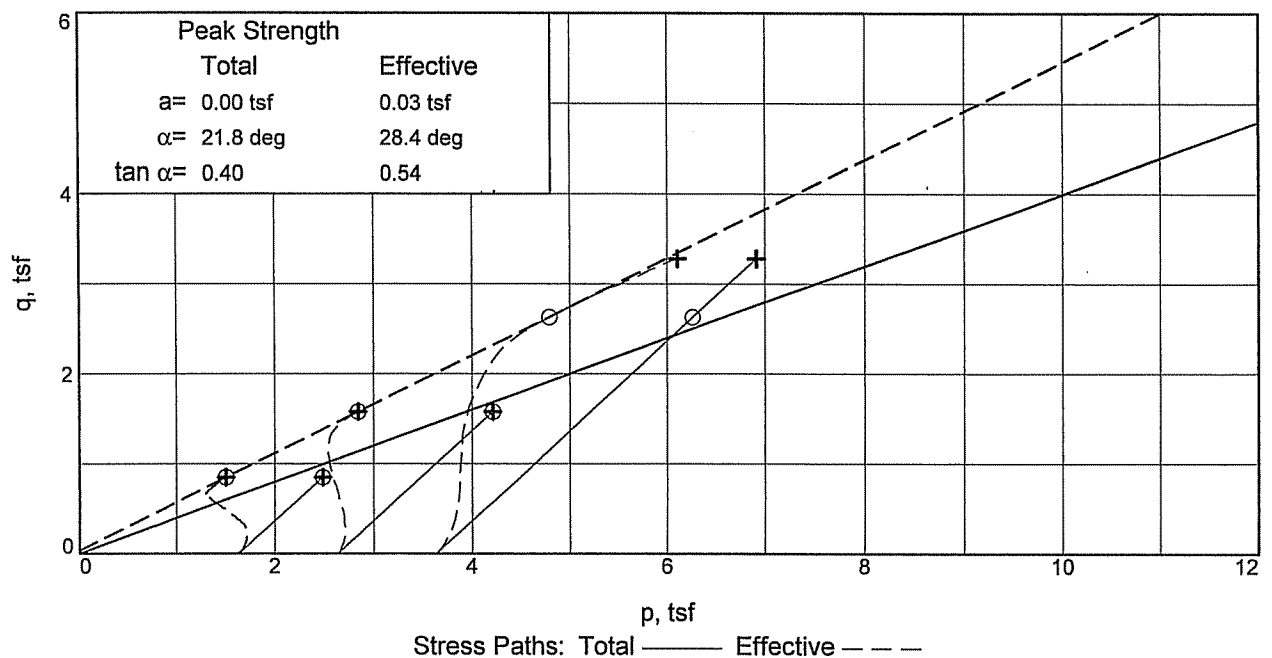
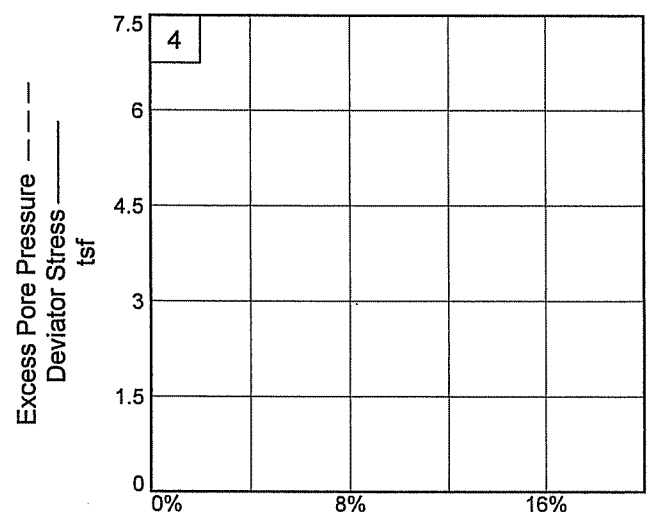
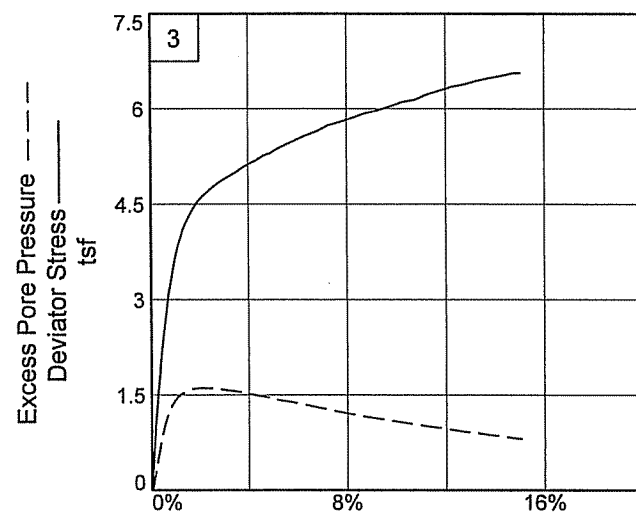
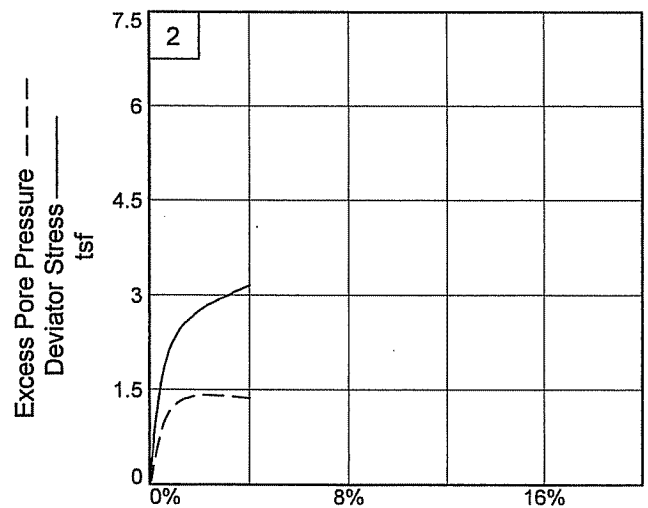
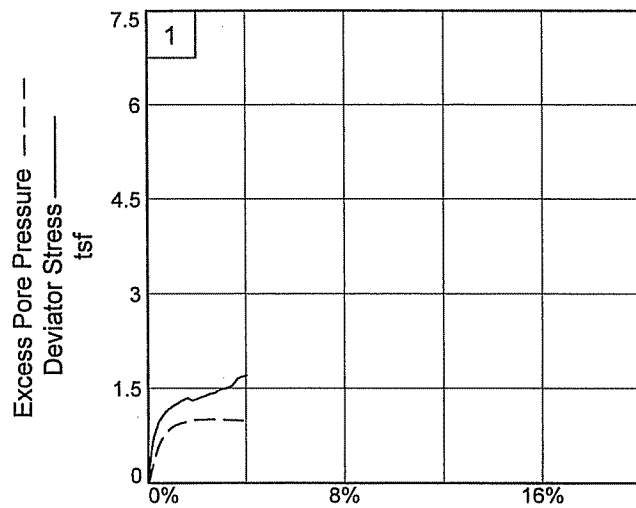
Sample Number: 18

Proj. No.: 08.18.918

Date Sampled: 7/23/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.



Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Source of Sample: 07-196

Depth: 34-36

Sample Number: 18

Project No.: 08.18.918

TOLUNAY-WONG ENGINEERS, INC.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

8/11/2008

6:13 PM

Date: 7/23/08
Client: United States Army Corps of Engineers
Project: Galveston Channel and Pelican Island PA
Contract No. DACW64-03-D-0008, Task Order No. 0077
Project No.: 08.18.918
Location: 07-196
Depth: 34-36
Description: Gray SANDY LEAN CLAY
Remarks:

Sample Number: 18

Test method: ASTM D 4767

Pocket pen; tsf: 0.75

Failure type: Bulge

Type of Sample: Undisturbed

Assumed Specific Gravity=2.70

LL=29

PL=17

PI=12

Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1				
Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	136.490			125.770
Moisture content: Dry soil+tare, gms.	114.980			107.820
Moisture content: Tare, gms.	30.540			31.300
Moisture, %	25.5	26.1	23.5	23.5
Moist specimen weight, gms.	405.2			
Diameter, in.	1.99	1.99	1.95	
Area, in. ²	3.11	3.11	3.00	
Height, in.	4.01	4.00	3.97	
Net decrease in height, in.		0.01	0.03	
Net decrease in water volume, cc.			8.60	
Wet Density, pcf	123.9	124.7	127.4	
Dry density, pcf	98.7	98.8	103.2	
Void ratio	0.7073	0.7053	0.6334	
Saturation, %	97.2	100.0	100.0	

Test Readings for Specimen No. 1	
Membrane modulus = .130 kN/cm ²	
Membrane thickness = .031 cm	
Filter paper coefficient = 0.0019 kN/cm	
Filter paper coverage = 50%	
Consolidation cell pressure = 52.70 psi (3.794 tsf)	
Consolidation back pressure = 30.00 psi (2.160 tsf)	
Consolidation effective confining stress = 1.634 tsf	
Strain rate, %/min. = 0.05	
Fail. Stress = 1.703 tsf at reading no. 46	
Ult. Stress = 1.703 tsf at reading no. 46	

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.2170	0.000	0.0	0.0	0.000	1.632	1.632	1.00	30.03	1.632	0.000
1	0.2180	0.000	0.0	0.0	0.000	1.632	1.632	1.00	30.03	1.632	0.000
2	0.2181	3.653	3.7	0.0	0.088	1.632	1.720	1.05	30.03	1.676	0.044
3	0.2191	6.925	6.9	0.1	0.166	1.605	1.771	1.10	30.40	1.688	0.083
4	0.2201	12.471	12.5	0.1	0.299	1.565	1.864	1.19	30.96	1.715	0.149
5	0.2211	16.111	16.1	0.1	0.386	1.523	1.909	1.25	31.54	1.716	0.193
6	0.2221	20.251	20.3	0.1	0.485	1.479	1.964	1.33	32.16	1.722	0.243
7	0.2231	22.977	23.0	0.2	0.550	1.436	1.986	1.38	32.76	1.711	0.275
8	0.2241	25.520	25.5	0.2	0.611	1.393	2.004	1.44	33.36	1.698	0.306
9	0.2251	27.765	27.8	0.2	0.665	1.352	2.017	1.49	33.92	1.684	0.332
10	0.2261	29.271	29.3	0.2	0.701	1.312	2.013	1.53	34.47	1.663	0.350
11	0.2271	31.264	31.3	0.3	0.748	1.274	2.022	1.59	35.01	1.648	0.374
12	0.2281	32.150	32.2	0.3	0.769	1.237	2.007	1.62	35.51	1.622	0.385
13	0.2291	33.953	34.0	0.3	0.812	1.205	2.017	1.67	35.97	1.611	0.406
14	0.2301	35.141	35.1	0.3	0.840	1.174	2.014	1.72	36.39	1.594	0.420
15	0.2311	35.984	36.0	0.4	0.860	1.143	2.003	1.75	36.83	1.573	0.430
16	0.2321	37.104	37.1	0.4	0.887	1.114	2.001	1.80	37.22	1.558	0.443
17	0.2331	38.871	38.9	0.4	0.929	1.087	2.015	1.85	37.61	1.551	0.464
18	0.2350	40.450	40.5	0.5	0.966	1.038	2.004	1.93	38.28	1.521	0.483
19	0.2360	41.269	41.3	0.5	0.985	1.015	2.001	1.97	38.60	1.508	0.493
20	0.2370	42.074	42.1	0.5	1.004	0.994	1.999	2.01	38.89	1.496	0.502
21	0.2390	43.039	43.0	0.6	1.027	0.957	1.984	2.07	39.41	1.470	0.513
22	0.2410	44.488	44.5	0.6	1.061	0.925	1.986	2.15	39.85	1.456	0.530
23	0.2440	46.079	46.1	0.7	1.098	0.881	1.979	2.25	40.46	1.430	0.549
24	0.2460	47.058	47.1	0.7	1.121	0.857	1.977	2.31	40.80	1.417	0.560
25	0.2480	47.858	47.9	0.8	1.139	0.826	1.965	2.38	41.23	1.395	0.570
26	0.2510	49.089	49.1	0.9	1.168	0.797	1.964	2.47	41.63	1.381	0.584
27	0.2539	49.874	49.9	0.9	1.185	0.774	1.959	2.53	41.96	1.366	0.593
28	0.2569	51.005	51.0	1.0	1.211	0.751	1.963	2.61	42.27	1.357	0.606
29	0.2619	52.273	52.3	1.1	1.240	0.723	1.963	2.71	42.66	1.343	0.620
30	0.2659	53.177	53.2	1.2	1.260	0.706	1.966	2.79	42.90	1.336	0.630
31	0.2699	54.459	54.5	1.3	1.289	0.691	1.981	2.86	43.10	1.336	0.645
32	0.2738	55.303	55.3	1.4	1.308	0.680	1.988	2.92	43.25	1.334	0.654
33	0.2818	56.991	57.0	1.6	1.345	0.656	2.001	3.05	43.59	1.329	0.673
34	0.2897	58.529	58.5	1.8	1.304	0.643	1.947	3.03	43.76	1.295	0.652
35	0.2937	59.486	59.5	1.9	1.321	0.639	1.960	3.07	43.83	1.299	0.661
36	0.3017	60.897	60.9	2.1	1.349	0.633	1.981	3.13	43.91	1.307	0.674
37	0.3096	62.106	62.1	2.3	1.374	0.633	2.007	3.17	43.90	1.320	0.687
38	0.3175	63.774	63.8	2.5	1.410	0.625	2.035	3.26	44.02	1.330	0.705
39	0.3255	64.640	64.6	2.7	1.427	0.627	2.054	3.28	44.00	1.340	0.714
40	0.3295	65.871	65.9	2.8	1.454	0.627	2.082	3.32	43.99	1.355	0.727
41	0.3374	67.285	67.3	3.0	1.484	0.630	2.114	3.35	43.94	1.372	0.742
42	0.3454	68.240	68.2	3.2	1.503	0.639	2.142	3.35	43.83	1.390	0.751
43	0.3533	70.053	70.1	3.4	1.542	0.636	2.177	3.42	43.87	1.407	0.771
44	0.3613	71.293	71.3	3.6	1.648	0.641	2.289	3.57	43.80	1.465	0.824
45	0.3692	72.875	72.9	3.8	1.681	0.647	2.328	3.60	43.72	1.487	0.841
46	0.3771	73.958	74.0	4.0	1.703	0.657	2.360	3.59	43.58	1.508	0.851

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	136.490			125.770
Moisture content: Dry soil+tare, gms.	114.980			107.820
Moisture content: Tare, gms.	30.540			31.300
Moisture, %	25.5	26.4	23.5	23.5
Moist specimen weight, gms.	405.2			
Diameter, in.	1.99	2.00	1.99	
Area, in. ²	3.11	3.13	3.10	
Height, in.	4.01	4.00	3.85	
Net decrease in height, in.		0.01	0.15	
Net decrease in water volume, cc.			9.60	
Wet Density, pcf	123.9	124.4	127.4	
Dry density, pcf	98.7	98.4	103.2	
Void ratio	0.7073	0.7136	0.6334	
Saturation, %	97.2	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Filter paper coefficient = 0.0019 kN/cm

Filter paper coverage = 50%

Consolidation cell pressure = 66.70 psi (4.802 tsf)

Consolidation back pressure = 30.10 psi (2.167 tsf)

Consolidation effective confining stress = 2.635 tsf

Strain rate, %/min. = 0.02

Fail. Stress = 3.151 tsf at reading no. 54

Ult. Stress = 3.151 tsf at reading no. 54

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.1980	0.000	0.0	0.0	0.000	2.635	2.635	1.00	30.10	2.635	0.000
1	0.1986	0.000	0.0	0.0	0.000	2.635	2.635	1.00	30.10	2.635	0.000
2	0.1987	2.666	2.7	0.0	0.062	2.635	2.697	1.02	30.10	2.666	0.031
3	0.1997	4.570	4.6	0.0	0.106	2.612	2.719	1.04	30.42	2.665	0.053
4	0.2006	10.566	10.6	0.1	0.245	2.575	2.820	1.10	30.94	2.697	0.123
5	0.2016	16.212	16.2	0.1	0.376	2.523	2.899	1.15	31.66	2.711	0.188
6	0.2025	20.945	20.9	0.1	0.486	2.467	2.952	1.20	32.44	2.709	0.243
7	0.2035	26.236	26.2	0.1	0.608	2.408	3.017	1.25	33.25	2.712	0.304
8	0.2045	30.225	30.2	0.2	0.701	2.351	3.052	1.30	34.04	2.702	0.350
9	0.2054	35.568	35.6	0.2	0.824	2.292	3.117	1.36	34.86	2.704	0.412
10	0.2064	39.634	39.6	0.2	0.918	2.236	3.154	1.41	35.65	2.695	0.459
11	0.2074	43.164	43.2	0.2	1.000	2.183	3.183	1.46	36.38	2.683	0.500
12	0.2083	47.027	47.0	0.3	1.089	2.130	3.219	1.51	37.12	2.674	0.545
13	0.2093	49.667	49.7	0.3	1.150	2.081	3.231	1.55	37.80	2.656	0.575
14	0.2103	53.175	53.2	0.3	1.231	2.035	3.266	1.60	38.43	2.651	0.616
15	0.2112	56.710	56.7	0.3	1.313	1.990	3.303	1.66	39.06	2.647	0.656
16	0.2122	59.654	59.7	0.4	1.380	1.949	3.329	1.71	39.64	2.639	0.690
17	0.2132	62.006	62.0	0.4	1.434	1.909	3.344	1.75	40.18	2.626	0.717
18	0.2141	65.132	65.1	0.4	1.506	1.871	3.378	1.80	40.71	2.625	0.753
19	0.2151	67.458	67.5	0.4	1.560	1.829	3.389	1.85	41.29	2.609	0.780
20	0.2161	69.789	69.8	0.5	1.613	1.794	3.407	1.90	41.78	2.601	0.807

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
21	0.2170	71.633	71.6	0.5	1.655	1.762	3.418	1.94	42.22	2.590	0.828
22	0.2180	74.187	74.2	0.5	1.714	1.730	3.444	1.99	42.67	2.587	0.857
23	0.2189	76.356	76.4	0.5	1.764	1.701	3.465	2.04	43.07	2.583	0.882
24	0.2209	80.269	80.3	0.6	1.853	1.648	3.501	2.12	43.81	2.575	0.927
25	0.2218	81.802	81.8	0.6	1.888	1.624	3.512	2.16	44.14	2.568	0.944
26	0.2228	83.497	83.5	0.6	1.927	1.603	3.529	2.20	44.44	2.566	0.963
27	0.2238	85.022	85.0	0.7	1.961	1.582	3.543	2.24	44.73	2.562	0.981
28	0.2247	86.531	86.5	0.7	1.996	1.561	3.557	2.28	45.01	2.559	0.998
29	0.2257	88.007	88.0	0.7	2.029	1.543	3.573	2.31	45.26	2.558	1.015
30	0.2276	90.531	90.5	0.8	2.086	1.510	3.596	2.38	45.73	2.553	1.043
31	0.2286	92.025	92.0	0.8	2.120	1.495	3.615	2.42	45.94	2.555	1.060
32	0.2305	94.066	94.1	0.8	2.166	1.466	3.632	2.48	46.34	2.549	1.083
33	0.2324	96.215	96.2	0.9	2.215	1.436	3.651	2.54	46.75	2.543	1.107
34	0.2344	98.292	98.3	0.9	2.261	1.413	3.674	2.60	47.07	2.544	1.131
35	0.2363	99.755	99.8	1.0	2.294	1.392	3.685	2.65	47.37	2.538	1.147
36	0.2411	103.734	103.7	1.1	2.382	1.351	3.733	2.76	47.94	2.542	1.191
37	0.2450	106.805	106.8	1.2	2.450	1.326	3.776	2.85	48.29	2.551	1.225
38	0.2488	109.249	109.2	1.3	2.504	1.300	3.803	2.93	48.65	2.551	1.252
39	0.2527	111.260	111.3	1.4	2.547	1.282	3.829	2.99	48.90	2.555	1.274
40	0.2565	113.089	113.1	1.5	2.586	1.269	3.855	3.04	49.08	2.562	1.293
41	0.2604	114.699	114.7	1.6	2.621	1.258	3.878	3.08	49.23	2.568	1.310
42	0.2642	116.338	116.3	1.7	2.655	1.245	3.900	3.13	49.41	2.572	1.328
43	0.2681	118.315	118.3	1.8	2.698	1.237	3.935	3.18	49.52	2.586	1.349
44	0.2758	121.122	121.1	2.0	2.756	1.231	3.987	3.24	49.61	2.609	1.378
45	0.2835	123.474	123.5	2.2	2.804	1.222	4.026	3.30	49.73	2.624	1.402
46	0.2873	124.975	125.0	2.3	2.835	1.221	4.056	3.32	49.74	2.638	1.418
47	0.2989	127.791	127.8	2.6	2.890	1.222	4.112	3.36	49.72	2.667	1.445
48	0.3066	130.191	130.2	2.8	2.938	1.228	4.166	3.39	49.64	2.697	1.469
49	0.3143	131.993	132.0	3.0	2.973	1.230	4.203	3.42	49.61	2.717	1.486
50	0.3220	133.613	133.6	3.2	3.003	1.239	4.242	3.42	49.49	2.740	1.502
51	0.3297	136.041	136.0	3.4	3.051	1.243	4.295	3.45	49.43	2.769	1.526
52	0.3374	137.770	137.8	3.6	3.084	1.254	4.337	3.46	49.29	2.795	1.542
53	0.3451	139.589	139.6	3.8	3.118	1.260	4.378	3.47	49.19	2.819	1.559
54	0.3527	141.384	141.4	4.0	3.151	1.272	4.423	3.48	49.04	2.847	1.576

Parameters for Specimen No. 3				
Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	136.490			125.770
Moisture content: Dry soil+tare, gms.	114.980			107.820
Moisture content: Tare, gms.	30.540			31.300
Moisture, %	25.5	26.6	23.5	23.5
Moist specimen weight, gms.	405.2			
Diameter, in.	1.99	2.00	2.02	
Area, in. ²	3.11	3.14	3.20	
Height, in.	4.01	4.00	3.73	
Net decrease in height, in.		0.01	0.27	
Net decrease in water volume, cc.			10.30	
Wet Density, pcf	123.9	124.1	127.4	
Dry density, pcf	98.7	98.0	103.2	
Void ratio	0.7073	0.7195	0.6334	
Saturation, %	97.2	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Filter paper coefficient = 0.0019 kN/cm

Filter paper coverage = 50%

Consolidation cell pressure = 80.60 psi (5.803 tsf)

Consolidation back pressure = 30.10 psi (2.167 tsf)

Consolidation effective confining stress = 3.636 tsf

Strain rate, %/min. = 0.05

Fail. Stress = 5.257 tsf at reading no. 51

Ult. Stress = 6.564 tsf at reading no. 73

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0170	0.000	0.0	0.0	0.000	3.635	3.635	1.00	30.12	3.635	0.000
1	0.0175	0.000	0.0	0.0	0.000	3.635	3.635	1.00	30.12	3.635	0.000
2	0.0176	3.445	3.4	0.0	0.078	3.635	3.712	1.02	30.12	3.673	0.039
3	0.0185	7.346	7.3	0.0	0.165	3.625	3.791	1.05	30.25	3.708	0.083
4	0.0194	13.649	13.6	0.1	0.307	3.590	3.897	1.09	30.75	3.743	0.154
5	0.0204	20.720	20.7	0.1	0.466	3.545	4.012	1.13	31.36	3.779	0.233
6	0.0213	27.942	27.9	0.1	0.629	3.495	4.124	1.18	32.05	3.810	0.314
7	0.0222	34.205	34.2	0.1	0.769	3.445	4.214	1.22	32.76	3.829	0.385
8	0.0232	40.408	40.4	0.2	0.909	3.388	4.297	1.27	33.54	3.843	0.454
9	0.0241	47.111	47.1	0.2	1.059	3.329	4.389	1.32	34.36	3.859	0.530
10	0.0250	52.514	52.5	0.2	1.180	3.273	4.453	1.36	35.15	3.863	0.590
11	0.0260	58.430	58.4	0.2	1.313	3.214	4.526	1.41	35.97	3.870	0.656
12	0.0269	63.948	63.9	0.3	1.437	3.156	4.592	1.46	36.77	3.874	0.718
13	0.0278	69.090	69.1	0.3	1.552	3.101	4.652	1.50	37.53	3.877	0.776
14	0.0288	74.195	74.2	0.3	1.666	3.046	4.712	1.55	38.29	3.879	0.833
15	0.0297	78.763	78.8	0.3	1.768	2.993	4.761	1.59	39.03	3.877	0.884
16	0.0306	83.732	83.7	0.4	1.879	2.941	4.821	1.64	39.75	3.881	0.940
17	0.0316	88.290	88.3	0.4	1.981	2.892	4.873	1.68	40.43	3.883	0.990
18	0.0325	93.419	93.4	0.4	2.095	2.843	4.938	1.74	41.12	3.891	1.048
19	0.0334	98.007	98.0	0.4	2.198	2.796	4.993	1.79	41.77	3.894	1.099
20	0.0344	101.719	101.7	0.5	2.280	2.754	5.034	1.83	42.36	3.894	1.140

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
21	0.0353	105.939	105.9	0.5	2.374	2.711	5.085	1.88	42.95	3.898	1.187
22	0.0362	110.060	110.1	0.5	2.466	2.670	5.136	1.92	43.52	3.903	1.233
23	0.0372	113.595	113.6	0.5	2.545	2.630	5.175	1.97	44.07	3.903	1.272
24	0.0381	117.122	117.1	0.6	2.623	2.593	5.216	2.01	44.58	3.905	1.312
25	0.0390	120.681	120.7	0.6	2.702	2.559	5.261	2.06	45.06	3.910	1.351
26	0.0400	124.121	124.1	0.6	2.778	2.527	5.306	2.10	45.50	3.916	1.389
27	0.0409	127.864	127.9	0.6	2.862	2.496	5.358	2.15	45.93	3.927	1.431
28	0.0428	134.117	134.1	0.7	3.000	2.442	5.442	2.23	46.69	3.942	1.500
29	0.0447	140.024	140.0	0.7	3.130	2.393	5.524	2.31	47.36	3.958	1.565
30	0.0465	144.888	144.9	0.8	3.238	2.351	5.588	2.38	47.95	3.969	1.619
31	0.0484	149.829	149.8	0.8	3.346	2.314	5.660	2.45	48.46	3.987	1.673
32	0.0503	155.249	155.2	0.9	3.466	2.279	5.745	2.52	48.94	4.012	1.733
33	0.0521	159.835	159.8	0.9	3.566	2.249	5.815	2.59	49.36	4.032	1.783
34	0.0540	163.631	163.6	1.0	3.649	2.222	5.871	2.64	49.73	4.047	1.825
35	0.0587	173.119	173.1	1.1	3.856	2.166	6.022	2.78	50.51	4.094	1.928
36	0.0624	178.965	179.0	1.2	3.982	2.133	6.115	2.87	50.97	4.124	1.991
37	0.0661	184.496	184.5	1.3	4.101	2.107	6.208	2.95	51.34	4.157	2.050
38	0.0699	188.998	189.0	1.4	4.197	2.086	6.283	3.01	51.63	4.184	2.098
39	0.0736	192.836	192.8	1.5	4.278	2.064	6.342	3.07	51.93	4.203	2.139
40	0.0811	199.789	199.8	1.7	4.423	2.041	6.463	3.17	52.26	4.252	2.211
41	0.0885	205.533	205.5	1.9	4.541	2.028	6.568	3.24	52.44	4.298	2.270
42	0.0960	209.461	209.5	2.1	4.618	2.026	6.644	3.28	52.46	4.335	2.309
43	0.1035	213.239	213.2	2.3	4.692	2.029	6.721	3.31	52.42	4.375	2.346
44	0.1109	216.702	216.7	2.5	4.758	2.030	6.788	3.34	52.41	4.409	2.379
45	0.1221	221.290	221.3	2.8	4.844	2.042	6.886	3.37	52.24	4.464	2.422
46	0.1333	225.425	225.4	3.1	4.919	2.060	6.979	3.39	51.99	4.519	2.460
47	0.1445	229.329	229.3	3.4	4.989	2.076	7.064	3.40	51.77	4.570	2.494
48	0.1557	233.527	233.5	3.7	5.064	2.095	7.159	3.42	51.51	4.627	2.532
49	0.1669	237.196	237.2	4.0	5.128	2.117	7.245	3.42	51.19	4.681	2.564
50	0.1781	240.538	240.5	4.3	5.184	2.140	7.324	3.42	50.88	4.732	2.592
51	0.1893	244.702	244.7	4.6	5.257	2.160	7.417	3.43	50.60	4.788	2.628
52	0.2005	247.446	247.4	4.9	5.299	2.184	7.483	3.43	50.27	4.833	2.650
53	0.2136	252.218	252.2	5.3	5.381	2.214	7.595	3.43	49.85	4.905	2.691
54	0.2323	257.778	257.8	5.8	5.471	2.248	7.719	3.43	49.37	4.984	2.735
55	0.2509	263.358	263.4	6.3	5.560	2.289	7.849	3.43	48.81	5.069	2.780
56	0.2696	268.493	268.5	6.8	5.638	2.328	7.966	3.42	48.27	5.147	2.819
57	0.2883	274.764	274.8	7.3	5.739	2.367	8.106	3.42	47.72	5.237	2.869
58	0.3069	278.853	278.9	7.8	5.793	2.406	8.199	3.41	47.18	5.303	2.896
59	0.3256	283.637	283.6	8.3	5.860	2.444	8.304	3.40	46.66	5.374	2.930
60	0.3442	288.526	288.5	8.8	5.928	2.478	8.406	3.39	46.19	5.442	2.964
61	0.3629	292.333	292.3	9.3	5.974	2.510	8.483	3.38	45.74	5.497	2.987
62	0.3816	297.080	297.1	9.8	6.037	2.541	8.578	3.38	45.31	5.560	3.019
63	0.4002	302.194	302.2	10.3	6.107	2.570	8.677	3.38	44.91	5.623	3.054
64	0.4189	305.578	305.6	10.8	6.141	2.601	8.742	3.36	44.48	5.671	3.071
65	0.4375	311.570	311.6	11.3	6.226	2.627	8.853	3.37	44.11	5.740	3.113
66	0.4562	316.459	316.5	11.8	6.288	2.657	8.945	3.37	43.70	5.801	3.144
67	0.4749	321.353	321.4	12.3	6.349	2.683	9.032	3.37	43.34	5.858	3.175

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
68	0.4935	324.970	325.0	12.8	6.384	2.713	9.097	3.35	42.92	5.905	3.192
69	0.5122	329.663	329.7	13.3	6.439	2.737	9.176	3.35	42.59	5.957	3.220
70	0.5308	333.929	333.9	13.8	6.485	2.764	9.249	3.35	42.21	6.006	3.242
71	0.5495	337.563	337.6	14.3	6.518	2.787	9.304	3.34	41.89	6.046	3.259
72	0.5681	342.003	342.0	14.8	6.565	2.814	9.379	3.33	41.52	6.096	3.282
73	0.5776	342.959	343.0	15.0	6.564	2.827	9.391	3.32	41.33	6.109	3.282

SUMMARY OF LABORATORY TESTS

Project No. 08.18.918

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Contract No. DACW64-03-D-0008, Task Order No. 0077

Boring No.	Sample No.	Depth (ft)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	Lab Vane (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
	11	19.5-21.5	Reddish-brown FAT CLAY	CH	37.6	82.9									
	12	21.5-23.5	Reddish-brown and gray FAT CLAY	CH	34.1	83.2	85	24	61	99.7		0.45	3.0		45 degree
	13	23.5-25	Reddish-brown FAT CLAY; shell fragments	CH	40.3										
	14	25-27	Gray FAT CLAY	CH	46.5	73.5									
	15	27-29	Gray FAT CLAY	CH	51.3	70.7									
	16	29-31	Gray FAT CLAY	CH	48.8	71.3									
	17	31-33	Brown and gray FAT CLAY	CH	53.8	64.3	109	29	80	99.7		0.60	4.2		Slickensided
	18	33-35	Gray FAT CLAY	CH	70.1	56.8									
	19	35-36.5	Gray and tan SILTY SAND; shell fragments	SM						12.5					
	20	38-40	Gray SANDY LEAN CLAY	CL	39.7	81.5									
	21	40-42	Gray FAT CLAY	CH	40.9	79.1	66	21	45	96.8		0.42	13.2		Bulge
	22	42-44	Gray and tan SANDY LEAN CLAY	CL	46.2	76.8									
	23	44-46	Gray SANDY LEAN CLAY; sand seams	CL	49.5	68.9									
	24	46-48	Gray FAT CLAY; sand seams	CH	54.2	64.9	92	27	65	91.8		0.49	7.2		Bulge
	25	48-50	Gray SANDY LEAN CLAY	CL	39.8	76.7									
07-196															
	1	0-2	Gray and brown FAT CLAY with SAND; shell fragments	CH	40.9	79.5									
	2	2-4	Brown and gray FAT CLAY with SAND	CH	52.8	69.2									
	3	4-6	Brown and gray FAT CLAY; ferrous nodules	CH	49.8	73.0	99	30	69	95.9		0.47	5.1		Vertical shear
	4	6-8	Gray and brown FAT CLAY with SAND	CH	44.9	71.6									
	5	8-10	Brown and gray FAT CLAY; sand seams and ferrous nodules	CH	44.8	71.3	92	29	63	85.6		0.50	4.2		60 degree
	6	10-12	Brown and gray FAT CLAY with SAND; ferrous nodules	CH	49.8	69.2									
	7	12-14	Gray and tan FAT CLAY; ferrous nodules	CH	43.7	72.4	95	29	66	95.8		1.12	3.0		Slickensided
	8	14-16	Gray LEAN CLAY; ferrous nodules	CL	60.0	61.5									
	9	16-18	Brown and gray FAT CLAY	CH	56.5	63.9						0.81	2.9	14.0	60 degree
	10	18-20	Gray and tan FAT CLAY	CH	55.7	64.6	99	30	69	95.7		0.37	3.6		60 degree
	11	20-22	Gray and reddish-brown FAT CLAY with SAND; organics	CH	39.3	71.0									
	12	22-24	Gray FAT CLAY with SAND; organics	CH	52.4	66.7									
	13	24-26	Gray FAT CLAY	CH	42.5		88	27	61	92.4					
	14	26-28	Gray and brown FAT CLAY with SAND; organics	CH	56.6	65.6									
	15	28-30	Gray FAT CLAY	CH	48.2	67.7	107	29	78	99.1					
	16	30-32	Gray FAT CLAY	CH	53.1	67.2									
	17	32-34	Gray and tan SANDY LEAN CLAY	CL	22.7	94.2						0.34	14.2		Bulge
	18	34-36	Gray SANDY LEAN CLAY	CL	33.4	92.9	29	17	12	58.1					
	19	36-38	Gray SANDY LEAN CLAY; shell fragments	CL	48.5	74.9									
	20	38-40	Gray FAT CLAY; sand seams and shell fragments	CH	52.4	66.5	81	25	56	86.9		0.42	4.1		45 degree

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TOLUNAY-WONG ENGINEERS, INC.



SUMMARY OF LABORATORY TESTS

Project No. 08.18.918

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Contract No. DACW64-03-D-0008, Task Order No. 0077

Boring No.	Sample No.	Depth (ft)	Soil Description	USCS	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plastic Limit	Plast. Index	Finer than #200 Sieve (%)	Lab Vane (tsf)	Uc/UU. Compr. (tsf)	Failure Strain (%)	Conf. Pres. (psi)	Failure Type
	21	40-42	Gray LEAN CLAY; sand seams	CL	48.4	68.8									
	22	42-43.5	Gray and tan POORLY GRADED SAND with SILT; shell fragments	SP-SM						11.7					
	23	47-48.5	Gray and tan POORLY GRADED SAND with SILT; shell fragments	SP-SM						8.4					
	24	48.5-50	Gray and tan CLAYEY SAND; shell fragments	SC											
07-197															
	1	0-2	Gray LEAN CLAY with SAND; grass roots	CL	27.7	89.3									
	2	2-4	Gray and brown FAT CLAY	CH	37.9	78.0	79	24	55	97.4		1.03	3.4		Vertical shear
	3	4-6	Gray and tan FAT CLAY; calcareous nodules	CH	48.8	72.1									
	4	6-8	Reddish-brown FAT CLAY	CH	34.6	82.1	96	28	68	95.8		0.92	5.0		60 degree
	5	8-10	Reddish-brown FAT CLAY; calcareous and ferrous nodules	CH	36.6	85.2									
	6	10-12	Reddish-brown FAT CLAY; shell fragments and organics	CH	37.1	84.3									
	7	12-14	Gray and brown FAT CLAY	CH	67.8	60.1	110	28	82	99.2		0.61	1.3		Slickensided
	8	14-16	Brown and gray FAT CLAY; shell fragments	CH	58.0	64.6						0.67	4.2		Slickensided
	9	16-18	Gray FAT CLAY; organics	CH	74.2	58.1									
	10	18-20	Gray SANDY LEAN CLAY; ferrous nodules	CL	30.7	90.4	40	20	20	56.1		0.34	5.4		Bulge
	11	20-22	Tan and gray SANDY SILTY CLAY	CL-ML	30.5	101.9									
	12	22-23.5	Gray CLAYEY SAND; shell fragments	SC	28.7										
	13	23.5-25.5	Gray LEAN CLAY	CL	32.8	76.3	40	20	20	93.1		0.26	8.7	15.0	60 degree
	14	25.5-27.5	Gray SILTY SAND; shell fragments	SM	30.0										
	15	27.5-29	Gray and tan SILTY SAND; shell fragments	SM						30.6					
	16	32.5-34	Gray and tan POORLY GRADED SAND with SILT; shell fragments	SP-SM						6.6					
	17	36-38	Gray LEAN CLAY with SAND; shell fragments	CL	28.5	92.4	42	18	24	82.7		0.49	9.2		Bulge
	18	38-40	Gray SANDY SILTY CLAY	CL-ML	24.1	96.4									
07-198															
	1	0-2	Gray FAT CLAY with SAND; tree roots	CH	25.5	94.3									
	2	2-4	Gray SANDY FAT CLAY	CH	35.1		93	29	64	68.8					
	3	4-5.5	Tan and gray SILTY SAND; grass roots	SM						18.3					
	4	9-10.5	Tan and gray SILTY SAND; shell fragments	SM						30.5					
	5	14-15.5	Tan and gray SILT with SAND; shell fragments	ML						76.3					
	6	19-20.5	Tan and gray SILTY SAND; shell fragments	SM						18.1					
	7	24-25.5	Tan and gray SILTY SAND; shell fragments	SM						19.1					
	8	29-30.5	Gray CLAYEY SAND; shell fragments	SC	29.1										
	9	30.5-32	Gray CLAYEY SAND; shell fragments	SC	29.3		27	18	9	46.5					
	10	32-33.5	Gray LEAN CLAY; shell fragments	CL	29.6										
	11	33.5-35	Gray FAT CLAY; shell fragments	CH	31.8										

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