Hole No. 07-233

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=13693091 E=3314492	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 35 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(CH), very soft, gray	X	1		WOP							
				X	2		WOP			157.0				
5				X	3		WOP			146.2	115	30	85	93.5
				X	4		WOP			139.9				
				X	5		WOP			125.0				
10				X	6		WOP			136.0	119	30	89	95.4
				X	7		WOP			121.0				
15				X	8		WOP			120.3				
				X	9		2			105.5	114	28	86	90.9
			SANDY LEAN CLAY(CL), soft, gray, w/ shell fragments & silt seams		10			0.50	96.7	23.2				
20			**LEAN CLAY(CL)**, soft to firm, gray, w/ silt seams		11			0.50	98.5	26.1	33	16	17	96.3
			-tan & light gray @ 22' - 24'		12			0.50	96.2	27.3				
25					13			1.25	92.0	28.0	33	16	17	97.3
			SANDY SILT(ML), tan & gray, w/ clay seams		14			0.75	93.6	27.3				
			LEAN CLAY(CL), soft, tan & gray, w/ silt seams		15			0.25			30	16	14	98.2
30			**SANDY SILT(ML)**, tan & gray, w/ clay & sand seams		16			0.75	93.8	27.1				
			LEAN CLAY(CL), firm, tan & brown, w/ silt seams		17			1.00	85.3	36.5	43	18	25	99.5
			FAT CLAY(CH), stiff, gray, w/ sand & silt		18			1.50	87.4	33.0				

SWG 1836 BOR 08.18.918.GPJ TOLUNAY-WONG ENGINEERS.GDT 10/2/08

ENG FORM: SWG 1836 BOR

Hole No. 07-233

BORING LOG	DISTRICT	INSTALLATION	SHEET 2 OF 2 SHEETS

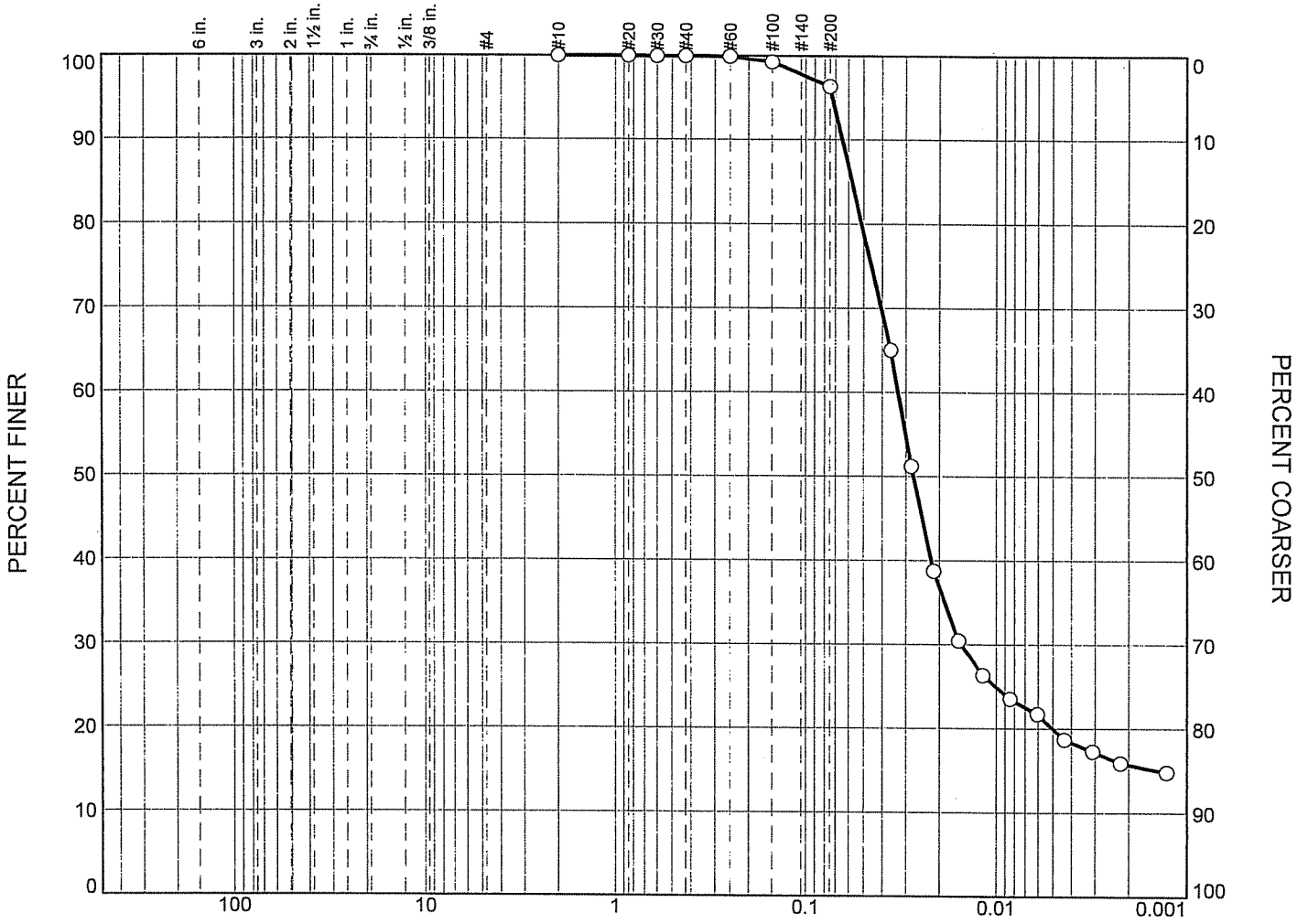
1. PROJECT Galveston Channel and Pelican Island PA	7. ELEVATION OF HOLE
2. LOCATION (Coordinates or Station) N=13693091 E=3314492	8. DATUM FOR ELEVATION
3. DRILLING AGENCY Dempsey (Geotest Engineering, Inc.)	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, Inc.	10. DRILLING DATE and TIME STARTED: COMPLETED:
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR:	11. CLASSIFICATION REFERENCE
6. DEPTH OF HOLE 35 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)
			seams											
40														
45														
50														
55														
60														
65														

SWG 1836 BOR 08.18.918.GPJ TOLUNAY-WONG ENGINEERS.GDT 10/2/08

ENG FORM: SWG 1836 BOR

Particle Size Analysis - ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	3.7	80.6	15.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	07-233	11	20-22	Gray LEAN CLAY	CL

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

7/27/2008

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: 07-233
Depth: 20-22 **Sample Number:** 11
Material Description: Gray LEAN CLAY
USCS: CL
Material specification: (no specification envelope)

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Lower Spec. Limit, %	Upper Spec. Limit, %	Deviation From Spec., %
285.78	215.10	215.10	3"					
			3/4"					
			#4					
			#10	215.10	100.0			
			#20	215.11	100.0			
			#30	215.12	100.0			
			#40	215.13	100.0			
			#60	215.15	99.9			
			#100	215.62	99.3			
			#200	217.70	96.3			

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =88.78
Hygroscopic moisture correction:
Moist weight and tare = 141.23
Dry weight and tare = 118.71
Tare weight = 25.60
Hygroscopic moisture = 24.2%
Table of composite correction values:

Temp., deg. C:	22.0	21.3
Comp. corr.:	-6.0	-6.5

Meniscus correction only = 0.5
Specific gravity of solids = 2.70
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

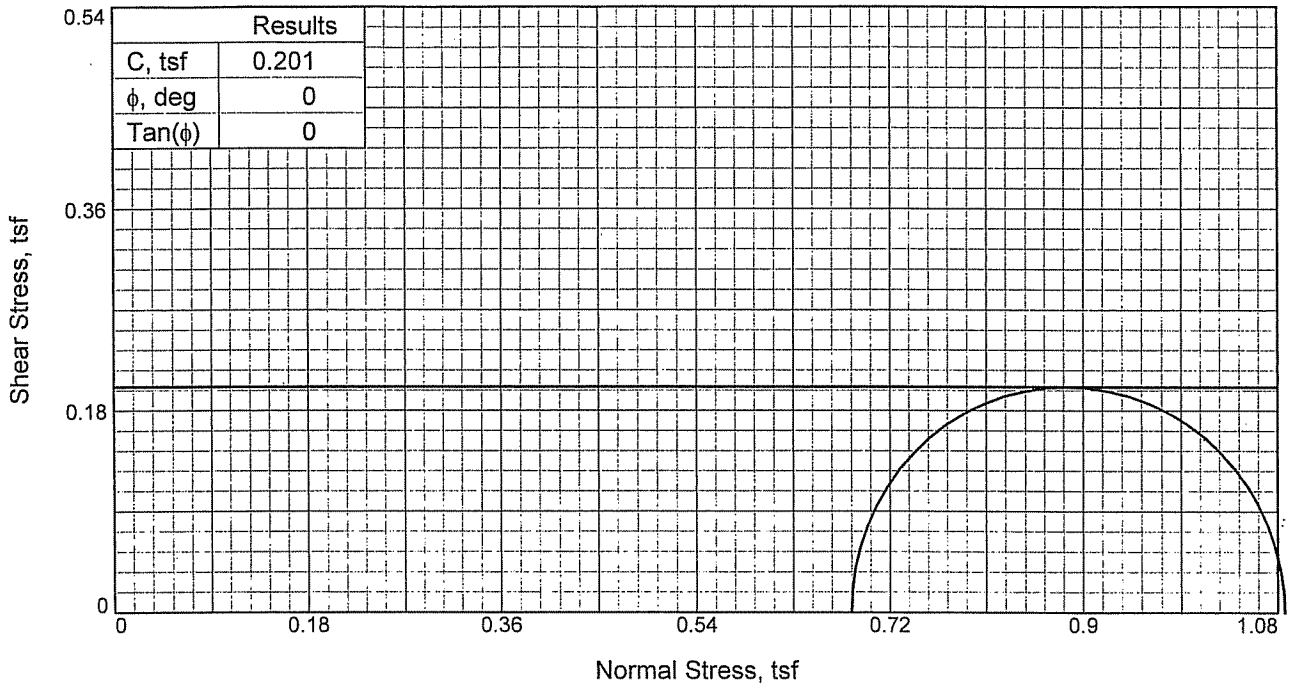
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	53.0	47.0	0.0131	53.5	7.5	0.0360	65.0
2.00	22.0	43.0	37.0	0.0131	43.5	9.2	0.0281	51.2
4.00	22.0	34.0	28.0	0.0131	34.5	10.6	0.0214	38.7
8.00	22.0	28.0	22.0	0.0131	28.5	11.6	0.0158	30.4
15.00	22.0	25.0	19.0	0.0131	25.5	12.1	0.0118	26.3
30.00	22.0	23.0	17.0	0.0131	23.5	12.4	0.0084	23.5
60.00	21.6	22.0	15.7	0.0132	22.5	12.6	0.0060	21.7
120.00	21.3	20.0	13.5	0.0132	20.5	12.9	0.0043	18.7
240.00	21.3	19.0	12.5	0.0132	19.5	13.1	0.0031	17.3
480.00	21.3	18.0	11.5	0.0132	18.5	13.3	0.0022	15.9
1440.00	21.6	17.0	10.7	0.0132	17.5	13.4	0.0013	14.8

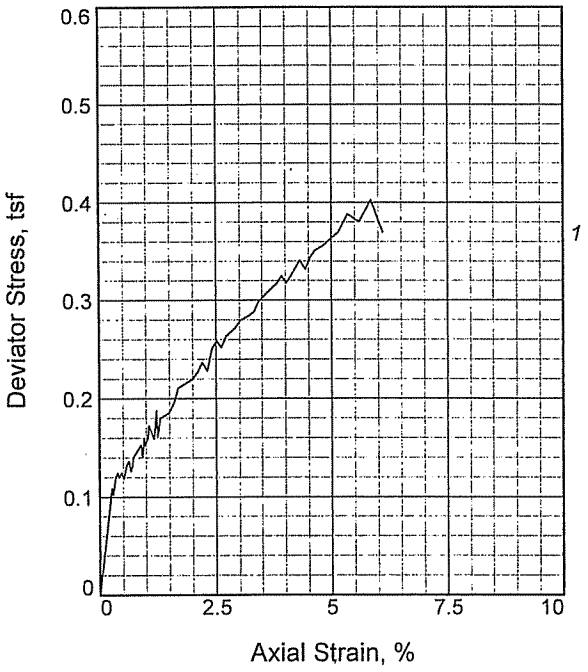
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	80.6	15.7	96.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0014	0.0050	0.0153	0.0274	0.0329	0.0511	0.0575	0.0647	0.0727

Fineness Modulus
0.01





Sample No.		1
Initial	Water Content, %	28.0
	Dry Density, pcf	91.9
	Saturation, %	90.8
	Void Ratio	0.8336
	Diameter, in.	2.01
	Height, in.	4.11
At Test	Water Content, %	27.3
	Dry Density, pcf	91.9
	Saturation, %	88.6
	Void Ratio	0.8336
	Diameter, in.	2.01
	Height, in.	4.11
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.68
Fail. Stress, tsf		0.40
Ult. Stress, tsf		
σ_1 Failure, tsf		1.09
σ_3 Failure, tsf		0.68

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray LEAN CLAY

LL= 33 **PL=** 16 **PI=** 17

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 1.00
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: 07-233 **Depth:** 24-26

Sample Number: 13

Proj. No.: 08.18.918 **Date Sampled:** 7/18/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

7/27/2008
3:27 PM

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: 07-233
Depth: 24-26 **Sample Number:** 13
Description: Gray LEAN CLAY
Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 1.00
Failure type: Bulge
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=**33 **PL=**16 **PI=**17
Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	131.380	111.760
Moisture content: Dry soil+tare, gms.	109.500	94.590
Moisture content: Tare, gms.	31.450	31.800
Moisture, %	28.0	27.3
Moist specimen weight, gms.	403.3	
Diameter, in.	2.01	
Area, in.^{2}	3.18	
Height, in.	4.11	
Wet Density, pcf	117.7	
Dry density, pcf	91.9	
Void ratio	0.8336	
Saturation, %	90.8	

Test Readings for Specimen No. 1

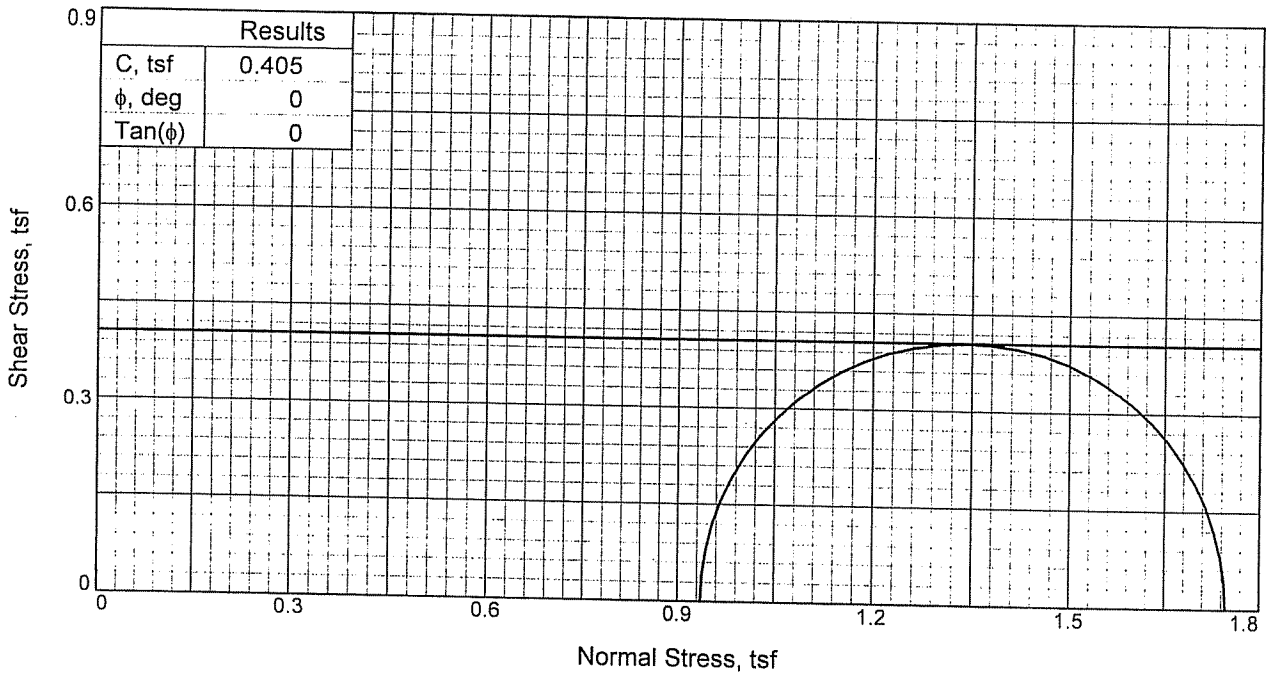
Membrane modulus = .130 kN/cm^2
Membrane thickness = .031 cm
Cell pressure = 9.50 psi (0.684 tsf)
Back pressure = 0.00 psi (0.000 tsf)
Strain rate, %/min. = 1.00
Fail. Stress = 0.402 tsf **at reading no.** 58

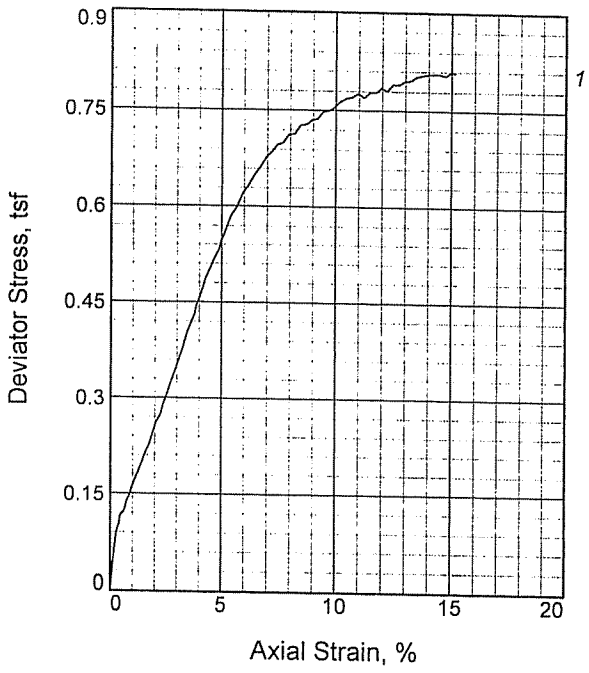
Test Readings for Specimen No. 1

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	0.0691	0.000	0.0	0.0	0.000	0.684	0.684	1.00	0.684	0.000
1	0.0798	4.797	4.8	0.3	0.108	0.684	0.792	1.16	0.738	0.054
2	0.0809	4.525	4.5	0.3	0.102	0.684	0.786	1.15	0.735	0.051
3	0.0818	4.855	4.9	0.3	0.110	0.684	0.794	1.16	0.739	0.055
4	0.0831	5.267	5.3	0.3	0.119	0.684	0.803	1.17	0.743	0.059
5	0.0849	5.508	5.5	0.4	0.124	0.684	0.808	1.18	0.746	0.062
6	0.0863	5.311	5.3	0.4	0.120	0.684	0.804	1.18	0.744	0.060
7	0.0885	5.516	5.5	0.5	0.124	0.684	0.808	1.18	0.746	0.062
8	0.0902	5.257	5.3	0.5	0.119	0.684	0.803	1.17	0.743	0.059
9	0.0925	5.820	5.8	0.6	0.131	0.684	0.815	1.19	0.750	0.066
10	0.0948	6.053	6.1	0.6	0.136	0.684	0.820	1.20	0.752	0.068
11	0.0965	5.605	5.6	0.7	0.126	0.684	0.810	1.18	0.747	0.063
12	0.0979	5.810	5.8	0.7	0.131	0.684	0.815	1.19	0.749	0.065
13	0.0988	6.200	6.2	0.7	0.140	0.684	0.824	1.20	0.754	0.070
14	0.1020	6.474	6.5	0.8	0.146	0.684	0.830	1.21	0.757	0.073
15	0.1060	6.797	6.8	0.9	0.153	0.684	0.837	1.22	0.760	0.076
16	0.1070	6.271	6.3	0.9	0.141	0.684	0.825	1.21	0.754	0.070
17	0.1084	7.101	7.1	1.0	0.159	0.684	0.843	1.23	0.764	0.080
18	0.1093	6.790	6.8	1.0	0.152	0.684	0.836	1.22	0.760	0.076
19	0.1115	7.084	7.1	1.0	0.159	0.684	0.843	1.23	0.763	0.079
20	0.1128	7.676	7.7	1.1	0.172	0.684	0.856	1.25	0.770	0.086
21	0.1150	7.400	7.4	1.1	0.166	0.684	0.850	1.24	0.767	0.083
22	0.1172	7.113	7.1	1.2	0.159	0.684	0.843	1.23	0.764	0.080
23	0.1181	7.464	7.5	1.2	0.167	0.684	0.851	1.24	0.768	0.084
24	0.1194	8.368	8.4	1.2	0.187	0.684	0.871	1.27	0.778	0.094
25	0.1203	7.201	7.2	1.2	0.161	0.684	0.845	1.24	0.765	0.081
26	0.1212	7.426	7.4	1.3	0.166	0.684	0.850	1.24	0.767	0.083
27	0.1226	8.035	8.0	1.3	0.180	0.684	0.864	1.26	0.774	0.090
28	0.1305	8.298	8.3	1.5	0.185	0.684	0.869	1.27	0.777	0.093
29	0.1350	8.745	8.7	1.6	0.195	0.684	0.879	1.29	0.782	0.098
30	0.1389	9.448	9.4	1.7	0.211	0.684	0.895	1.31	0.789	0.105
31	0.1513	9.878	9.9	2.0	0.219	0.684	0.903	1.32	0.794	0.110
32	0.1557	10.215	10.2	2.1	0.227	0.684	0.911	1.33	0.797	0.113
33	0.1597	10.663	10.7	2.2	0.236	0.684	0.920	1.35	0.802	0.118
34	0.1641	10.303	10.3	2.3	0.228	0.684	0.912	1.33	0.798	0.114
35	0.1680	11.299	11.3	2.4	0.250	0.684	0.934	1.37	0.809	0.125
36	0.1724	11.699	11.7	2.5	0.259	0.684	0.943	1.38	0.813	0.129
37	0.1764	11.404	11.4	2.6	0.252	0.684	0.936	1.37	0.810	0.126
38	0.1808	11.918	11.9	2.7	0.263	0.684	0.947	1.38	0.815	0.131
39	0.1887	12.352	12.4	2.9	0.272	0.684	0.956	1.40	0.820	0.136
40	0.1932	12.703	12.7	3.0	0.279	0.684	0.963	1.41	0.824	0.140
41	0.2011	12.939	12.9	3.2	0.284	0.684	0.968	1.42	0.826	0.142
42	0.2056	13.160	13.2	3.3	0.288	0.684	0.972	1.42	0.828	0.144
43	0.2096	13.620	13.6	3.4	0.298	0.684	0.982	1.44	0.833	0.149
44	0.2220	14.317	14.3	3.7	0.312	0.684	0.996	1.46	0.840	0.156
45	0.2264	14.571	14.6	3.8	0.318	0.684	1.002	1.46	0.843	0.159
46	0.2303	14.918	14.9	3.9	0.325	0.684	1.009	1.47	0.846	0.162

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	0.2347	14.607	14.6	4.0	0.318	0.684	1.002	1.46	0.843	0.159
48	0.2387	14.962	15.0	4.1	0.325	0.684	1.009	1.48	0.847	0.163
49	0.2431	15.374	15.4	4.2	0.334	0.684	1.018	1.49	0.851	0.167
50	0.2470	15.722	15.7	4.3	0.341	0.684	1.025	1.50	0.854	0.170
51	0.2514	15.309	15.3	4.4	0.332	0.684	1.016	1.48	0.850	0.166
52	0.2554	15.879	15.9	4.5	0.344	0.684	1.028	1.50	0.856	0.172
53	0.2598	16.222	16.2	4.6	0.351	0.684	1.035	1.51	0.859	0.175
54	0.2677	16.503	16.5	4.8	0.356	0.684	1.040	1.52	0.862	0.178
55	0.2805	17.181	17.2	5.1	0.369	0.684	1.053	1.54	0.869	0.185
56	0.2888	18.094	18.1	5.3	0.388	0.684	1.072	1.57	0.878	0.194
57	0.2990	17.766	17.8	5.6	0.380	0.684	1.064	1.56	0.874	0.190
58	0.3095	18.850	18.8	5.8	0.402	0.684	1.086	1.59	0.885	0.201
59	0.3200	18.310	18.3	6.1	0.370	0.684	1.054	1.54	0.869	0.185





Sample No.		1
Initial	Water Content, %	36.5
	Dry Density, pcf	85.3
	Saturation, %	99.2
	Void Ratio	1.0117
	Diameter, in.	2.80
	Height, in.	5.98
At Test	Water Content, %	33.0
	Dry Density, pcf	85.3
	Saturation, %	89.7
	Void Ratio	1.0117
	Diameter, in.	2.80
	Height, in.	5.98
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.94
Fail. Stress, tsf		0.81
Ult. Stress, tsf		
σ_1 Failure, tsf		1.75
σ_3 Failure, tsf		0.94

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and brown LEAN CLAY

LL= 43 **PL=** 18 **PI=** 25

Assumed Specific Gravity= 2.75

Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 0.50
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: 07-233 **Depth:** 32-34

Sample Number: 17

Proj. No.: 08.18.918 **Date Sampled:** 7/17/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

9/19/2008
2:28 PM

Date:	7/17/08
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:	07-233
Depth:	32-34 **Sample Number:** 17
Description:	Tan and brown LEAN CLAY
Remarks:	
	Test method: ASTM D 2850
	Pocket pen; tsf: 0.50
	Failure type: Bulge
Type of Sample:	Undisturbed

Assumed Specific Gravity=2.75 **LL=**43 **PL=**18 **PI=**25

Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	133.620	102.980
Moisture content: Dry soil+tare, gms.	106.300	85.230
Moisture content: Tare, gms.	31.450	31.450
Moisture, %	36.5	33.0
Moist specimen weight, gms.	1125.9	
Diameter, in.	2.80	
Area, in.²	6.16	
Height, in.	5.98	
Wet Density, pcf	116.5	
Dry density, pcf	85.3	
Void ratio	1.0117	
Saturation, %	99.2	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Cell pressure = 13.00 psi (0.936 tsf)

Back pressure = 0.00 psi (0.000 tsf)

Strain rate, %/min. = 1.00

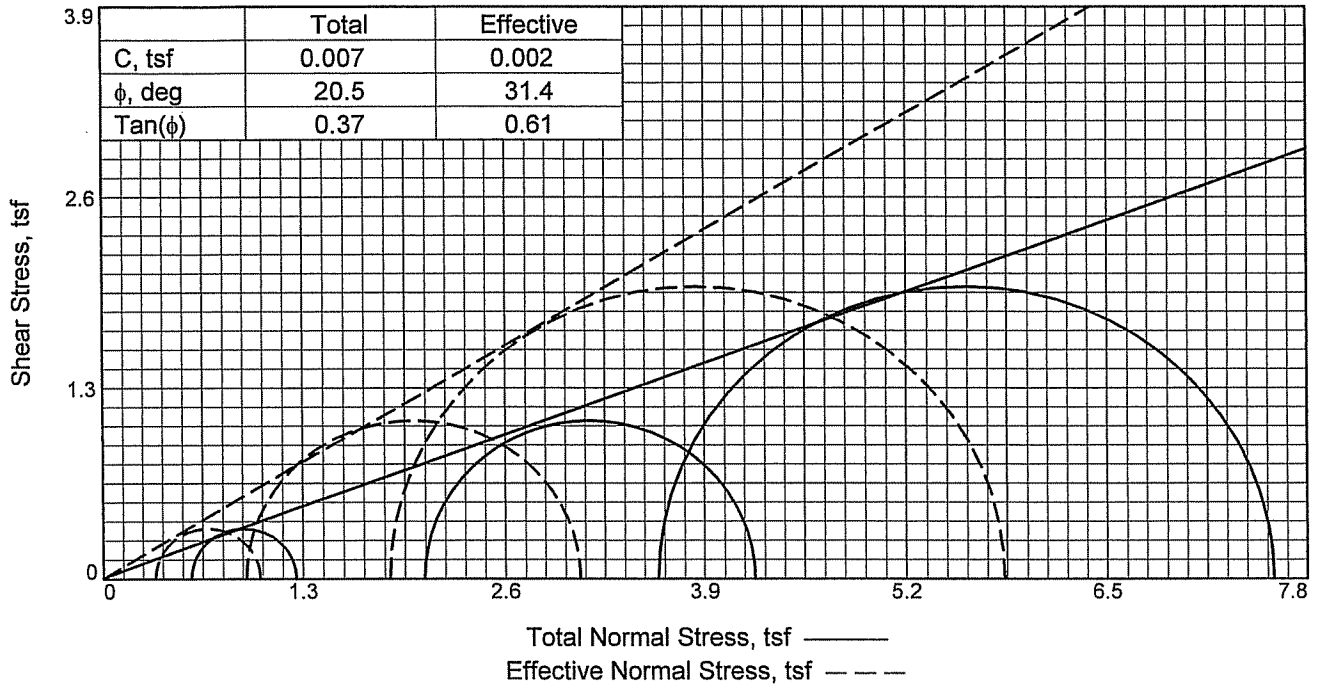
Fail. Stress = 0.810 tsf **at reading no.** 78

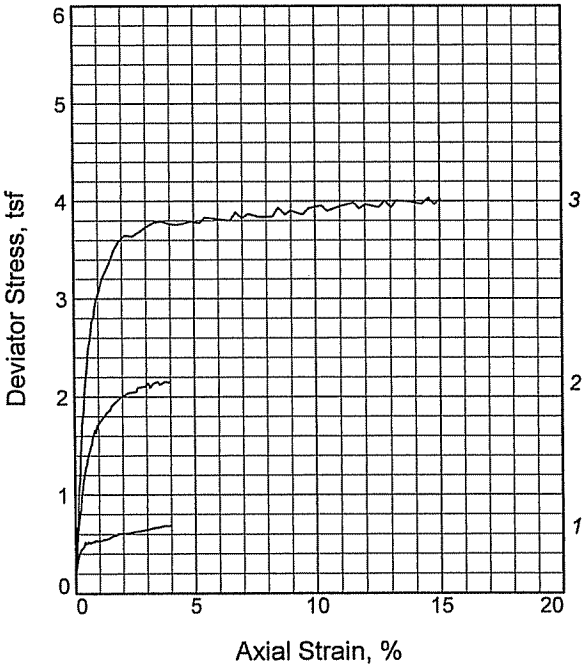
Test Readings for Specimen No. 1

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	0.0347	0.000	0.0	0.0	0.000	0.936	0.936	1.00	0.936	0.000
1	0.0431	4.584	4.6	0.1	0.054	0.936	0.990	1.06	0.963	0.027
2	0.0459	5.897	5.9	0.2	0.069	0.936	1.005	1.07	0.970	0.034
3	0.0505	7.564	7.6	0.3	0.088	0.936	1.024	1.09	0.980	0.044
4	0.0583	8.827	8.8	0.4	0.103	0.936	1.039	1.11	0.987	0.051
5	0.0609	9.854	9.9	0.4	0.115	0.936	1.051	1.12	0.993	0.057
6	0.0721	10.599	10.6	0.6	0.123	0.936	1.059	1.13	0.998	0.062
7	0.0780	11.796	11.8	0.7	0.137	0.936	1.073	1.15	1.004	0.068
8	0.0870	12.732	12.7	0.9	0.148	0.936	1.084	1.16	1.010	0.074
9	0.0916	13.665	13.7	1.0	0.158	0.936	1.094	1.17	1.015	0.079
10	0.0995	14.614	14.6	1.1	0.169	0.936	1.105	1.18	1.021	0.085
11	0.1099	15.772	15.8	1.3	0.182	0.936	1.118	1.19	1.027	0.091
12	0.1221	17.472	17.5	1.5	0.201	0.936	1.137	1.22	1.037	0.101
13	0.1285	18.399	18.4	1.6	0.212	0.936	1.148	1.23	1.042	0.106
14	0.1400	19.799	19.8	1.8	0.227	0.936	1.163	1.24	1.050	0.114
15	0.1465	20.750	20.8	1.9	0.238	0.936	1.174	1.25	1.055	0.119
16	0.1522	21.769	21.8	2.0	0.250	0.936	1.186	1.27	1.061	0.125
17	0.1586	22.901	22.9	2.1	0.262	0.936	1.198	1.28	1.067	0.131
18	0.1707	24.011	24.0	2.3	0.274	0.936	1.210	1.29	1.073	0.137
19	0.1765	25.252	25.3	2.4	0.288	0.936	1.224	1.31	1.080	0.144
20	0.1887	26.902	26.9	2.6	0.306	0.936	1.242	1.33	1.089	0.153
21	0.1945	27.967	28.0	2.7	0.318	0.936	1.254	1.34	1.095	0.159
22	0.2002	28.831	28.8	2.8	0.328	0.936	1.264	1.35	1.100	0.164
23	0.2125	30.635	30.6	3.0	0.348	0.936	1.284	1.37	1.110	0.174
24	0.2183	31.596	31.6	3.1	0.358	0.936	1.294	1.38	1.115	0.179
25	0.2306	33.522	33.5	3.3	0.379	0.936	1.315	1.41	1.126	0.190
26	0.2363	34.696	34.7	3.4	0.392	0.936	1.328	1.42	1.132	0.196
27	0.2428	35.715	35.7	3.5	0.403	0.936	1.339	1.43	1.138	0.202
28	0.2544	37.321	37.3	3.7	0.420	0.936	1.356	1.45	1.146	0.210
29	0.2609	38.218	38.2	3.8	0.430	0.936	1.366	1.46	1.151	0.215
30	0.2666	39.461	39.5	3.9	0.444	0.936	1.380	1.47	1.158	0.222
31	0.2730	40.455	40.5	4.0	0.454	0.936	1.390	1.49	1.163	0.227
32	0.2851	42.254	42.3	4.2	0.473	0.936	1.409	1.51	1.173	0.237
33	0.2909	43.366	43.4	4.3	0.485	0.936	1.421	1.52	1.179	0.243
34	0.3032	44.963	45.0	4.5	0.502	0.936	1.438	1.54	1.187	0.251
35	0.3153	46.537	46.5	4.7	0.519	0.936	1.455	1.55	1.195	0.259
36	0.3274	47.875	47.9	4.9	0.532	0.936	1.468	1.57	1.202	0.266
37	0.3332	49.134	49.1	5.0	0.546	0.936	1.482	1.58	1.209	0.273
38	0.3396	49.959	50.0	5.1	0.554	0.936	1.490	1.59	1.213	0.277
39	0.3454	50.779	50.8	5.2	0.563	0.936	1.499	1.60	1.217	0.281
40	0.3607	53.018	53.0	5.5	0.586	0.936	1.522	1.63	1.229	0.293
41	0.3754	54.359	54.4	5.7	0.599	0.936	1.535	1.64	1.236	0.300
42	0.3907	56.492	56.5	6.0	0.621	0.936	1.557	1.66	1.247	0.311
43	0.4054	57.760	57.8	6.2	0.634	0.936	1.570	1.68	1.253	0.317
44	0.4208	59.466	59.5	6.5	0.650	0.936	1.586	1.69	1.261	0.325
45	0.4355	60.760	60.8	6.7	0.663	0.936	1.599	1.71	1.267	0.331
46	0.4509	62.221	62.2	7.0	0.677	0.936	1.613	1.72	1.274	0.338

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	0.4656	63.176	63.2	7.2	0.685	0.936	1.621	1.73	1.279	0.343
48	0.4809	64.370	64.4	7.5	0.697	0.936	1.633	1.74	1.284	0.348
49	0.4956	64.895	64.9	7.7	0.700	0.936	1.636	1.75	1.286	0.350
50	0.5109	66.226	66.2	8.0	0.713	0.936	1.649	1.76	1.292	0.356
51	0.5256	66.477	66.5	8.2	0.714	0.936	1.650	1.76	1.293	0.357
52	0.5409	67.928	67.9	8.5	0.727	0.936	1.663	1.78	1.300	0.364
53	0.5557	68.276	68.3	8.7	0.729	0.936	1.665	1.78	1.300	0.364
54	0.5710	69.105	69.1	9.0	0.736	0.936	1.672	1.79	1.304	0.368
55	0.5857	69.446	69.4	9.2	0.737	0.936	1.673	1.79	1.305	0.369
56	0.6010	70.666	70.7	9.5	0.748	0.936	1.684	1.80	1.310	0.374
57	0.6158	70.993	71.0	9.7	0.749	0.936	1.685	1.80	1.311	0.375
58	0.6305	71.740	71.7	10.0	0.755	0.936	1.691	1.81	1.314	0.378
59	0.6460	72.829	72.8	10.2	0.765	0.936	1.701	1.82	1.318	0.382
60	0.6606	73.465	73.5	10.5	0.769	0.936	1.705	1.82	1.321	0.385
61	0.6760	73.890	73.9	10.7	0.771	0.936	1.707	1.82	1.322	0.386
62	0.6907	74.609	74.6	11.0	0.777	0.936	1.713	1.83	1.324	0.388
63	0.7060	74.224	74.2	11.2	0.770	0.936	1.706	1.82	1.321	0.385
64	0.7207	75.203	75.2	11.5	0.778	0.936	1.714	1.83	1.325	0.389
65	0.7361	75.381	75.4	11.7	0.778	0.936	1.714	1.83	1.325	0.389
66	0.7508	76.285	76.3	12.0	0.785	0.936	1.721	1.84	1.329	0.393
67	0.7662	76.076	76.1	12.2	0.781	0.936	1.717	1.83	1.326	0.390
68	0.7808	77.263	77.3	12.5	0.791	0.936	1.727	1.84	1.331	0.395
69	0.7962	77.409	77.4	12.7	0.790	0.936	1.726	1.84	1.331	0.395
70	0.8109	78.189	78.2	13.0	0.796	0.936	1.732	1.85	1.334	0.398
71	0.8262	78.522	78.5	13.2	0.797	0.936	1.733	1.85	1.334	0.398
72	0.8409	79.303	79.3	13.5	0.802	0.936	1.738	1.86	1.337	0.401
73	0.8563	79.748	79.7	13.7	0.804	0.936	1.740	1.86	1.338	0.402
74	0.8710	80.119	80.1	14.0	0.806	0.936	1.742	1.86	1.339	0.403
75	0.8863	80.384	80.4	14.2	0.806	0.936	1.742	1.86	1.339	0.403
76	0.9011	80.643	80.6	14.5	0.806	0.936	1.742	1.86	1.339	0.403
77	0.9164	80.634	80.6	14.7	0.804	0.936	1.740	1.86	1.338	0.402
78	0.9311	81.529	81.5	15.0	0.810	0.936	1.746	1.87	1.341	0.405
79	0.9413	81.444	81.4	15.2	0.808	0.936	1.744	1.86	1.340	0.404





Sample No.		1	2	3
Initial	Water Content, %	26.1	26.1	26.1
	Dry Density, pcf	98.5	98.5	98.5
	Saturation, %	96.6	96.6	96.6
	Void Ratio	0.7426	0.7426	0.7426
	Diameter, in.	1.99	1.99	1.99
	Height, in.	4.09	4.09	4.09
At Test	Water Content, %	21.4	21.4	21.4
	Dry Density, pcf	108.0	108.0	108.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5895	0.5895	0.5895
	Diameter, in.	1.91	1.97	2.00
	Height, in.	4.06	3.82	3.70
Strain rate, %/min.		0.05	0.05	0.05
Back Pressure, tsf		2.17	2.17	2.15
Cell Pressure, tsf		2.75	4.25	5.75
Fail. Stress, tsf		0.68	2.15	3.98
Excess Pore Pr., tsf		0.23	1.14	1.75
Ult. Stress, tsf		0.68	2.15	4.02
Excess Pore Pr., tsf		0.23	1.14	1.70
$\bar{\sigma}_1$ Failure, tsf		1.02	3.09	5.83
$\bar{\sigma}_3$ Failure, tsf		0.34	0.93	1.85

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Gray LEAN CLAY

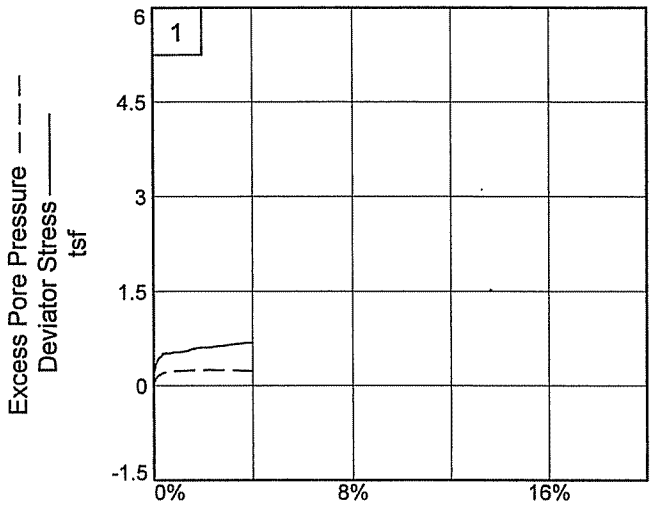
LL= 33 **PL=** 16 **PI=** 17
Assumed Specific Gravity= 2.75
Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 1.00
Failure type: Multiple shear

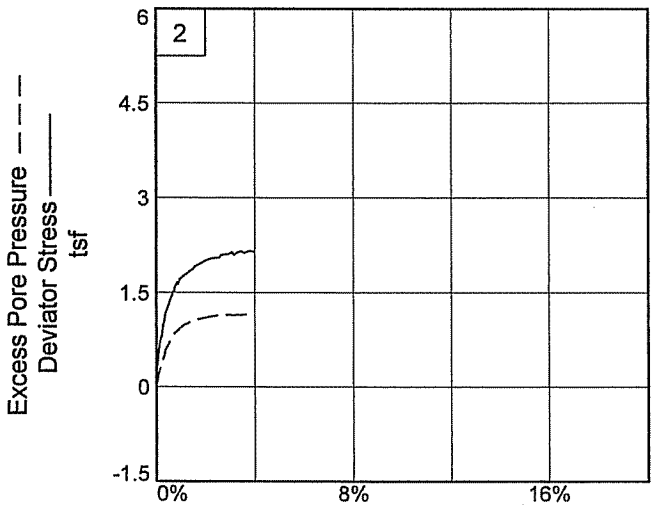
Client: United States Army Corps of Engineers

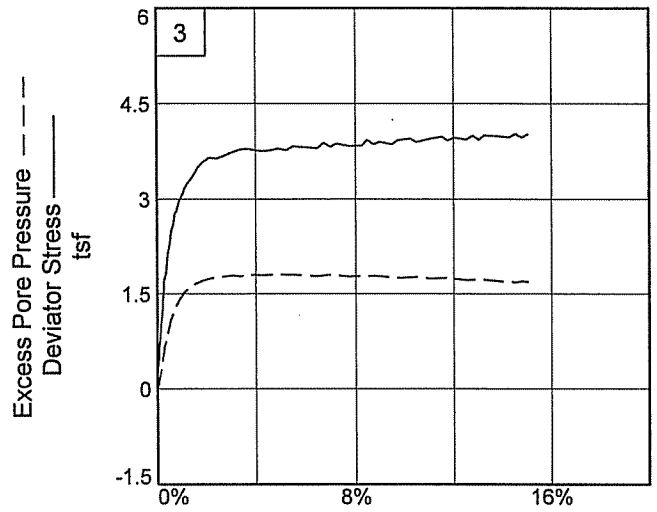
Project: Galveston Channel and Pelican Island PA
Contract No. DACW64-03-D-0008, Task Order No. 0077
Source of Sample: 07-233 **Depth:** 20-22
Sample Number: 11
Proj. No.: 08.18.918 **Date Sampled:** 7/22/08

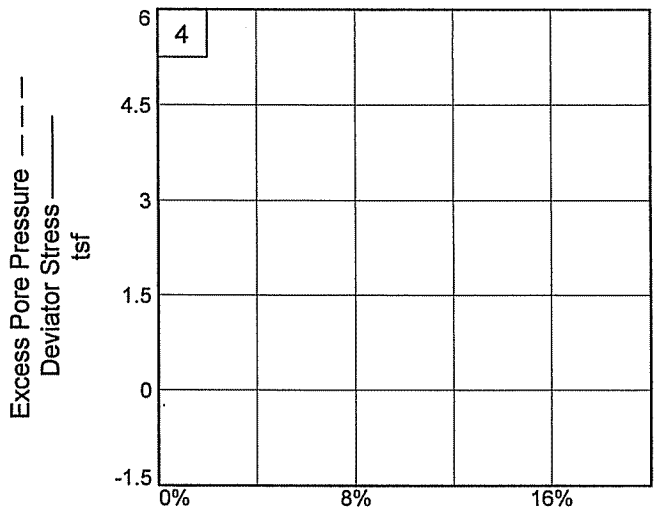
TRIAXIAL SHEAR TEST REPORT

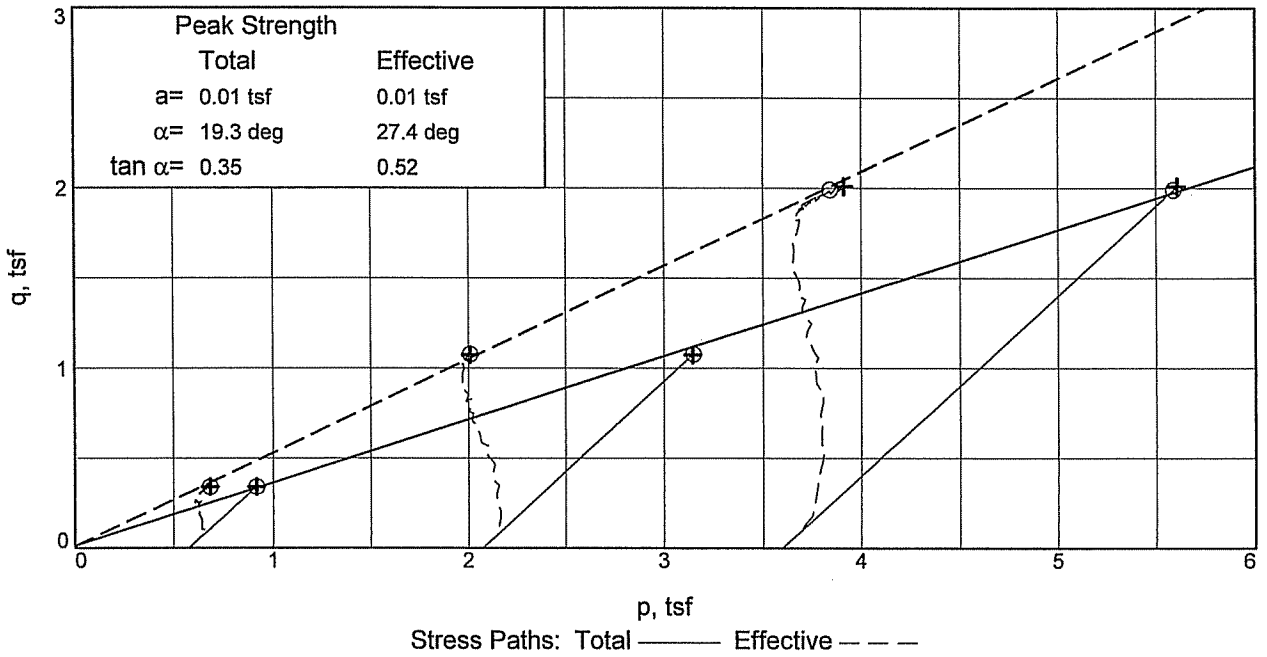
Tolunay-Wong Engineers, Inc.











Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Source of Sample: 07-233 **Depth:** 20-22 **Sample Number:** 11

Project No.: 08.18.918

TOLUNAY-WONG ENGINEERS, INC.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

8/11/2008
6:01 PM

Date: 7/22/08
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: 07-233
Depth: 20-22 **Sample Number:** 11
Description: Gray LEAN CLAY
Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 1.00
Failure type: Multiple shear
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=**33 **PL=**16 **PI=**17
Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	152.660			109.860
Moisture content: Dry soil+tare, gms.	127.370			95.880
Moisture content: Tare, gms.	30.400			30.660
Moisture, %	26.1	21.9	21.4	21.4
Moist specimen weight, gms.	415.3			
Diameter, in.	1.99	1.91	1.91	
Area, in.^{2}	3.12	2.88	2.86	
Height, in.	4.09	4.07	4.06	
Net decrease in height, in.		0.02	0.01	
Net decrease in water volume, cc.			1.60	
Wet Density, pcf	124.2	130.6	131.2	
Dry density, pcf	98.5	107.1	108.0	
Void ratio	0.7426	0.6028	0.5895	
Saturation, %	96.6	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 = 38.20 psi (2.750 tsf)
Consolidation back pressure = 30.20 psi (2.174 tsf)
Consolidation effective confining stress = 0.576 tsf
Strain rate, %/min. = 0.05
Fail. Stress = 0.682 tsf **at reading no.** 41
Ult. Stress = 0.682 tsf **at reading no.** 41

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	0.0005	0.000	0.0	0.0	0.000	0.575	0.575	1.00	30.21	0.575	0.000
1	0.0009	7.530	7.5	0.0	0.189	0.575	0.765	1.33	30.21	0.670	0.095
2	0.0010	8.589	8.6	0.0	0.216	0.533	0.749	1.41	30.80	0.641	0.108
3	0.0027	10.427	10.4	0.1	0.262	0.510	0.772	1.51	31.12	0.641	0.131
4	0.0032	11.950	12.0	0.1	0.300	0.491	0.792	1.61	31.38	0.641	0.150
5	0.0040	13.020	13.0	0.1	0.327	0.474	0.802	1.69	31.61	0.638	0.164
6	0.0049	13.932	13.9	0.1	0.350	0.461	0.811	1.76	31.80	0.636	0.175
7	0.0058	14.737	14.7	0.1	0.370	0.444	0.814	1.83	32.04	0.629	0.185
8	0.0070	15.616	15.6	0.2	0.392	0.433	0.825	1.91	32.18	0.629	0.196
9	0.0081	16.478	16.5	0.2	0.414	0.426	0.839	1.97	32.29	0.632	0.207
10	0.0090	16.944	16.9	0.2	0.425	0.412	0.837	2.03	32.48	0.625	0.213
11	0.0101	17.594	17.6	0.2	0.442	0.416	0.857	2.06	32.43	0.636	0.221
12	0.0123	18.045	18.0	0.3	0.453	0.396	0.849	2.14	32.70	0.622	0.226
13	0.0135	18.428	18.4	0.3	0.462	0.396	0.858	2.17	32.70	0.627	0.231
14	0.0155	19.267	19.3	0.4	0.483	0.382	0.865	2.26	32.89	0.624	0.241
15	0.0161	20.237	20.2	0.4	0.507	0.379	0.886	2.34	32.93	0.633	0.254
16	0.0170	20.620	20.6	0.4	0.517	0.379	0.896	2.36	32.93	0.637	0.258
17	0.0183	19.886	19.9	0.4	0.498	0.375	0.874	2.33	32.99	0.624	0.249
18	0.0213	20.305	20.3	0.5	0.508	0.364	0.872	2.40	33.15	0.618	0.254
19	0.0223	20.782	20.8	0.5	0.520	0.359	0.879	2.45	33.21	0.619	0.260
20	0.0264	21.380	21.4	0.6	0.507	0.352	0.859	2.44	33.32	0.605	0.254
21	0.0295	22.075	22.1	0.7	0.521	0.353	0.874	2.48	33.30	0.613	0.260
22	0.0335	22.413	22.4	0.8	0.524	0.347	0.872	2.51	33.38	0.610	0.262
23	0.0346	22.784	22.8	0.8	0.532	0.344	0.877	2.55	33.42	0.611	0.266
24	0.0445	23.140	23.1	1.1	0.530	0.341	0.870	2.55	33.47	0.606	0.265
25	0.0485	23.864	23.9	1.2	0.543	0.340	0.883	2.59	33.47	0.612	0.271
26	0.0529	24.189	24.2	1.3	0.546	0.339	0.885	2.61	33.49	0.612	0.273
27	0.0570	24.682	24.7	1.4	0.553	0.337	0.890	2.64	33.51	0.614	0.276
28	0.0606	25.456	25.5	1.5	0.568	0.335	0.903	2.69	33.55	0.619	0.284
29	0.0656	26.277	26.3	1.6	0.582	0.332	0.914	2.75	33.59	0.623	0.291
30	0.0692	26.649	26.6	1.7	0.587	0.331	0.918	2.77	33.60	0.624	0.293
31	0.0737	27.467	27.5	1.8	0.601	0.331	0.932	2.82	33.61	0.631	0.301
32	0.0815	27.976	28.0	2.0	0.605	0.332	0.937	2.82	33.59	0.634	0.302
33	0.0939	28.209	28.2	2.3	0.608	0.324	0.932	2.87	33.70	0.628	0.304
34	0.0978	28.609	28.6	2.4	0.617	0.326	0.943	2.89	33.67	0.635	0.309
35	0.1101	29.190	29.2	2.7	0.629	0.327	0.956	2.93	33.66	0.641	0.315
36	0.1182	29.605	29.6	2.9	0.638	0.328	0.965	2.95	33.65	0.647	0.319
37	0.1264	30.131	30.1	3.1	0.649	0.330	0.979	2.97	33.62	0.654	0.325
38	0.1342	30.643	30.6	3.3	0.660	0.332	0.992	2.99	33.59	0.662	0.330
39	0.1461	31.206	31.2	3.6	0.671	0.336	1.008	3.00	33.53	0.672	0.336
40	0.1508	31.584	31.6	3.7	0.680	0.338	1.018	3.01	33.50	0.678	0.340
41	0.1626	31.782	31.8	4.0	0.682	0.342	1.024	3.00	33.45	0.683	0.341

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	152.660			109.860
Moisture content: Dry soil+tare, gms.	127.370			95.880
Moisture content: Tare, gms.	30.400			30.660
Moisture, %	26.1	24.1	21.4	21.4
Moist specimen weight, gms.	415.3			
Diameter, in.	1.99	1.95	1.97	
Area, in.²	3.12	2.98	3.05	
Height, in.	4.09	4.07	3.82	
Net decrease in height, in.		0.02	0.26	
Net decrease in water volume, cc.			8.80	
Wet Density, pcf	124.2	128.1	131.2	
Dry density, pcf	98.5	103.2	108.0	
Void ratio	0.7426	0.6629	0.5895	
Saturation, %	96.6	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 = 59.00 psi (4.248 tsf)
Consolidation back pressure = 30.20 psi (2.174 tsf)
Consolidation effective confining stress = 2.074 tsf
Strain rate, %/min. = 0.05
Fail. Stress = 2.153 tsf **at reading no.** 44
Ult. Stress = 2.146 tsf **at reading no.** 47

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	0.0004	0.000	0.0	0.0	0.000	2.074	2.074	1.00	30.19	2.074	0.000
1	0.0009	6.878	6.9	0.0	0.163	2.074	2.237	1.08	30.19	2.155	0.081
2	0.0010	10.472	10.5	0.0	0.248	2.031	2.278	1.12	30.80	2.154	0.124
3	0.0017	13.954	14.0	0.0	0.330	1.998	2.328	1.17	31.25	2.163	0.165
4	0.0027	17.526	17.5	0.1	0.414	1.958	2.372	1.21	31.81	2.165	0.207
5	0.0030	20.768	20.8	0.1	0.491	1.901	2.392	1.26	32.60	2.146	0.245
6	0.0043	23.626	23.6	0.1	0.558	1.866	2.424	1.30	33.09	2.145	0.279
7	0.0047	26.178	26.2	0.1	0.618	1.835	2.453	1.34	33.51	2.144	0.309
8	0.0057	29.511	29.5	0.1	0.697	1.805	2.502	1.39	33.92	2.154	0.348
9	0.0068	31.757	31.8	0.2	0.750	1.757	2.507	1.43	34.59	2.132	0.375
10	0.0079	33.265	33.3	0.2	0.785	1.732	2.517	1.45	34.95	2.124	0.392
11	0.0093	35.713	35.7	0.2	0.842	1.704	2.546	1.49	35.34	2.125	0.421
12	0.0097	39.305	39.3	0.2	0.927	1.671	2.598	1.55	35.79	2.135	0.464
13	0.0110	42.473	42.5	0.3	1.001	1.611	2.612	1.62	36.63	2.112	0.501
14	0.0126	44.060	44.1	0.3	1.038	1.578	2.617	1.66	37.08	2.097	0.519
15	0.0132	47.876	47.9	0.3	1.128	1.543	2.671	1.73	37.57	2.107	0.564
16	0.0148	49.936	49.9	0.4	1.176	1.478	2.654	1.80	38.47	2.066	0.588
17	0.0171	53.026	53.0	0.4	1.248	1.437	2.685	1.87	39.05	2.061	0.624
18	0.0180	54.493	54.5	0.5	1.282	1.417	2.699	1.91	39.32	2.058	0.641
19	0.0201	55.774	55.8	0.5	1.312	1.384	2.695	1.95	39.78	2.039	0.656
20	0.0204	57.619	57.6	0.5	1.355	1.362	2.717	2.00	40.09	2.039	0.678

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	0.0214	58.799	58.8	0.6	1.383	1.345	2.728	2.03	40.31	2.037	0.691
22	0.0225	59.825	59.8	0.6	1.406	1.319	2.725	2.07	40.68	2.022	0.703
23	0.0246	61.647	61.6	0.6	1.448	1.297	2.745	2.12	40.99	2.021	0.724
24	0.0258	63.672	63.7	0.7	1.495	1.279	2.775	2.17	41.23	2.027	0.748
25	0.0285	64.720	64.7	0.7	1.519	1.244	2.763	2.22	41.72	2.003	0.759
26	0.0287	66.732	66.7	0.7	1.566	1.228	2.794	2.27	41.94	2.011	0.783
27	0.0332	70.795	70.8	0.9	1.659	1.186	2.845	2.40	42.53	2.016	0.830
28	0.0344	69.490	69.5	0.9	1.628	1.175	2.803	2.39	42.69	1.989	0.814
29	0.0364	72.803	72.8	0.9	1.705	1.148	2.853	2.48	43.05	2.001	0.853
30	0.0448	75.855	75.9	1.2	1.773	1.086	2.858	2.63	43.92	1.972	0.886
31	0.0485	77.210	77.2	1.3	1.802	1.075	2.877	2.68	44.07	1.976	0.901
32	0.0522	78.666	78.7	1.4	1.835	1.050	2.885	2.75	44.42	1.967	0.917
33	0.0564	79.813	79.8	1.5	1.859	1.041	2.901	2.79	44.54	1.971	0.930
34	0.0600	81.849	81.8	1.6	1.905	1.016	2.921	2.87	44.88	1.969	0.952
35	0.0641	83.025	83.0	1.7	1.930	1.004	2.935	2.92	45.05	1.970	0.965
36	0.0754	86.208	86.2	2.0	1.998	0.981	2.979	3.04	45.38	1.980	0.999
37	0.0871	88.290	88.3	2.3	2.040	0.955	2.995	3.14	45.74	1.975	1.020
38	0.0986	89.022	89.0	2.6	2.051	0.940	2.991	3.18	45.94	1.965	1.025
39	0.1017	90.879	90.9	2.7	2.092	0.950	3.042	3.20	45.80	1.996	1.046
40	0.1137	91.795	91.8	3.0	2.106	0.931	3.037	3.26	46.07	1.984	1.053
41	0.1180	93.280	93.3	3.1	2.137	0.934	3.071	3.29	46.03	2.002	1.069
42	0.1210	91.306	91.3	3.2	2.091	0.940	3.030	3.22	45.95	1.985	1.045
43	0.1255	93.026	93.0	3.3	2.127	0.928	3.055	3.29	46.12	1.991	1.064
44	0.1329	94.354	94.4	3.5	2.153	0.933	3.087	3.31	46.04	2.010	1.077
45	0.1368	93.006	93.0	3.6	2.120	0.924	3.044	3.29	46.17	1.984	1.060
46	0.1448	94.752	94.8	3.8	2.155	0.934	3.089	3.31	46.03	2.011	1.078
47	0.1519	94.519	94.5	4.0	2.146	0.938	3.083	3.29	45.98	2.010	1.073

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	152.660			109.860
Moisture content: Dry soil+tare, gms.	127.370			95.880
Moisture content: Tare, gms.	30.400			30.660
Moisture, %	26.1	24.9	21.4	21.4
Moist specimen weight, gms.	415.3			
Diameter, in.	1.99	1.96	2.00	
Area, in.²	3.12	3.02	3.14	
Height, in.	4.09	4.07	3.70	
Net decrease in height, in.		0.02	0.38	
Net decrease in water volume, cc.			11.30	
Wet Density, pcf	124.2	127.3	131.2	
Dry density, pcf	98.5	102.0	108.0	
Void ratio	0.7426	0.6838	0.5895	
Saturation, %	96.6	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 = 79.90 psi (5.753 tsf)
Consolidation back pressure = 29.90 psi (2.153 tsf)
Consolidation effective confining stress = 3.600 tsf
Strain rate, %/min. = 0.05
Fail. Stress = 3.981 tsf **at reading no.** 66
Ult. Stress = 4.017 tsf **at reading no.** 77

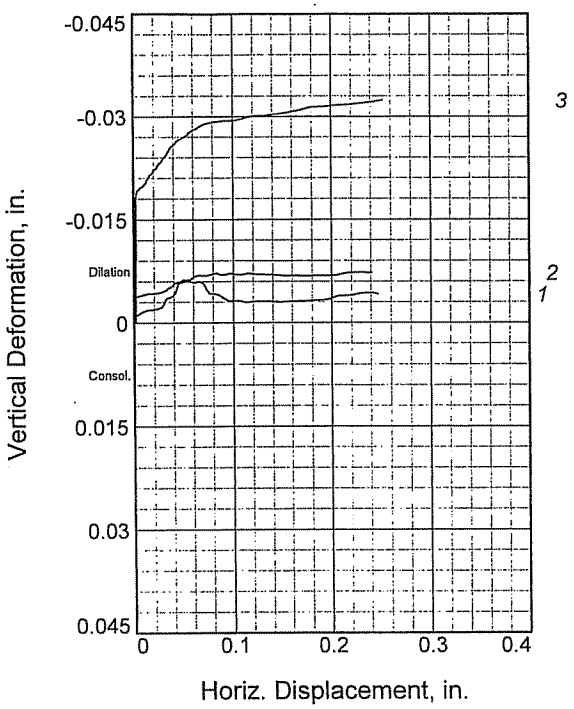
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0001	0.000	0.0	0.0	0.000	3.598	3.598	1.00	29.93	3.598	0.000
1	0.0003	6.774	6.8	0.0	0.155	3.598	3.753	1.04	29.93	3.676	0.078
2	0.0004	11.029	11.0	0.0	0.253	3.586	3.838	1.07	30.10	3.712	0.126
3	0.0014	15.680	15.7	0.0	0.359	3.572	3.931	1.10	30.29	3.752	0.180
4	0.0025	21.000	21.0	0.1	0.481	3.522	4.003	1.14	30.98	3.763	0.240
5	0.0030	25.759	25.8	0.1	0.590	3.478	4.067	1.17	31.60	3.773	0.295
6	0.0037	30.303	30.3	0.1	0.694	3.432	4.125	1.20	32.24	3.779	0.347
7	0.0051	36.145	36.1	0.1	0.827	3.374	4.201	1.25	33.03	3.788	0.414
8	0.0054	41.735	41.7	0.1	0.955	3.325	4.280	1.29	33.72	3.802	0.477
9	0.0065	46.686	46.7	0.2	1.068	3.278	4.346	1.33	34.37	3.812	0.534
10	0.0077	50.258	50.3	0.2	1.149	3.225	4.374	1.36	35.11	3.800	0.575
11	0.0083	55.135	55.1	0.2	1.260	3.170	4.430	1.40	35.87	3.800	0.630
12	0.0086	60.466	60.5	0.2	1.382	3.110	4.492	1.44	36.70	3.801	0.691
13	0.0098	64.977	65.0	0.3	1.485	3.051	4.535	1.49	37.53	3.793	0.742
14	0.0109	70.468	70.5	0.3	1.610	3.002	4.611	1.54	38.21	3.807	0.805
15	0.0111	75.057	75.1	0.3	1.715	2.950	4.664	1.58	38.93	3.807	0.857
16	0.0138	80.254	80.3	0.4	1.832	2.858	4.690	1.64	40.21	3.774	0.916
17	0.0146	84.848	84.8	0.4	1.936	2.802	4.738	1.69	40.98	3.770	0.968
18	0.0152	88.385	88.4	0.4	2.017	2.754	4.771	1.73	41.65	3.762	1.008
19	0.0161	92.713	92.7	0.4	2.115	2.725	4.841	1.78	42.05	3.783	1.058
20	0.0171	95.162	95.2	0.5	2.170	2.678	4.848	1.81	42.70	3.763	1.085

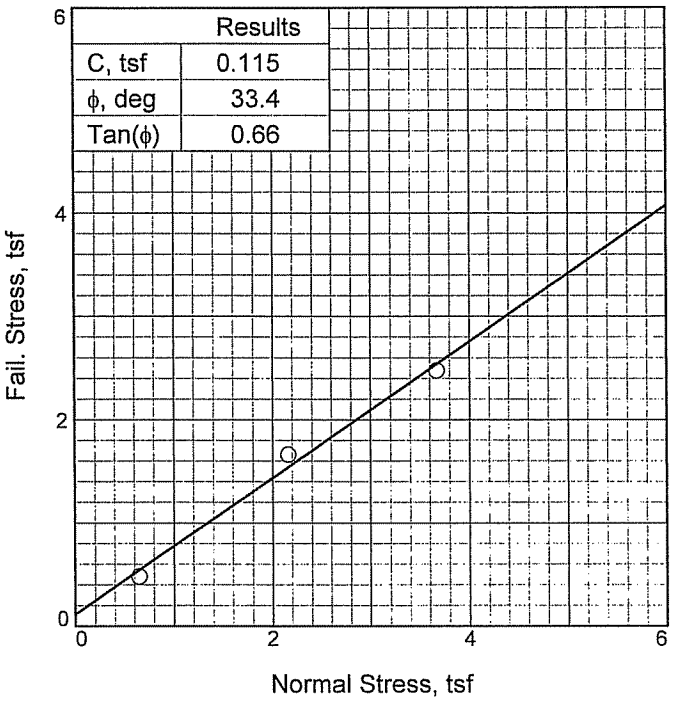
Test Readings for Specimen No. 3

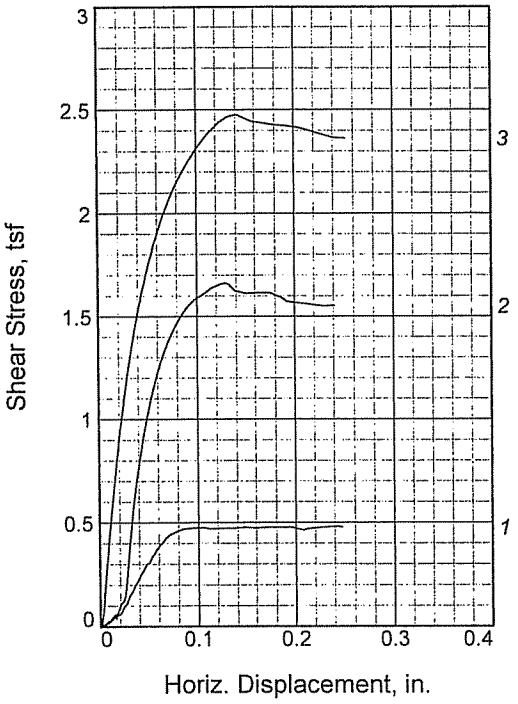
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
21	0.0190	99.994	100.0	0.5	2.279	2.601	4.880	1.88	43.77	3.741	1.140
22	0.0201	102.541	102.5	0.5	2.337	2.553	4.890	1.92	44.44	3.721	1.168
23	0.0205	105.689	105.7	0.6	2.408	2.521	4.929	1.96	44.88	3.725	1.204
24	0.0215	109.613	109.6	0.6	2.497	2.501	4.998	2.00	45.17	3.749	1.248
25	0.0244	113.215	113.2	0.7	2.577	2.416	4.993	2.07	46.34	3.705	1.288
26	0.0259	117.792	117.8	0.7	2.680	2.359	5.039	2.14	47.13	3.699	1.340
27	0.0270	121.353	121.4	0.7	2.760	2.338	5.098	2.18	47.43	3.718	1.380
28	0.0300	123.518	123.5	0.8	2.807	2.275	5.082	2.23	48.31	3.678	1.404
29	0.0315	127.673	127.7	0.9	2.900	2.239	5.139	2.30	48.81	3.689	1.450
30	0.0339	130.779	130.8	0.9	2.969	2.199	5.168	2.35	49.36	3.684	1.485
31	0.0388	135.967	136.0	1.0	3.083	2.115	5.198	2.46	50.52	3.657	1.541
32	0.0421	139.996	140.0	1.1	3.171	2.068	5.239	2.53	51.18	3.654	1.586
33	0.0458	143.128	143.1	1.2	3.239	2.037	5.276	2.59	51.61	3.656	1.619
34	0.0500	145.909	145.9	1.4	3.298	2.009	5.307	2.64	51.99	3.658	1.649
35	0.0539	148.527	148.5	1.5	3.353	1.980	5.334	2.69	52.40	3.657	1.677
36	0.0578	151.527	151.5	1.6	3.418	1.939	5.357	2.76	52.96	3.648	1.709
37	0.0617	154.959	155.0	1.7	3.491	1.926	5.417	2.81	53.15	3.671	1.746
38	0.0692	159.131	159.1	1.9	3.578	1.893	5.471	2.89	53.61	3.682	1.789
39	0.0793	162.752	162.8	2.1	3.649	1.862	5.511	2.96	54.04	3.687	1.825
40	0.0908	162.846	162.8	2.5	3.640	1.833	5.473	2.99	54.44	3.653	1.820
41	0.1020	165.279	165.3	2.8	3.683	1.828	5.511	3.01	54.51	3.669	1.841
42	0.1127	168.185	168.2	3.0	3.736	1.810	5.546	3.06	54.76	3.678	1.868
43	0.1244	170.629	170.6	3.4	3.778	1.821	5.599	3.08	54.61	3.710	1.889
44	0.1355	171.766	171.8	3.7	3.791	1.805	5.597	3.10	54.83	3.701	1.896
45	0.1464	171.287	171.3	4.0	3.769	1.803	5.572	3.09	54.86	3.688	1.885
46	0.1578	171.254	171.3	4.3	3.756	1.806	5.562	3.08	54.82	3.684	1.878
47	0.1690	172.225	172.2	4.6	3.766	1.802	5.568	3.09	54.87	3.685	1.883
48	0.1808	174.043	174.0	4.9	3.793	1.796	5.588	3.11	54.96	3.692	1.896
49	0.1941	173.731	173.7	5.2	3.772	1.795	5.567	3.10	54.96	3.681	1.886
50	0.2029	176.907	176.9	5.5	3.831	1.796	5.627	3.13	54.95	3.712	1.915
51	0.2220	177.127	177.1	6.0	3.815	1.809	5.623	3.11	54.78	3.716	1.907
52	0.2400	177.323	177.3	6.5	3.799	1.821	5.620	3.09	54.61	3.720	1.900
53	0.2491	181.770	181.8	6.7	3.884	1.813	5.697	3.14	54.72	3.755	1.942
54	0.2588	179.280	179.3	7.0	3.820	1.797	5.617	3.13	54.94	3.707	1.910
55	0.2682	182.082	182.1	7.3	3.869	1.806	5.676	3.14	54.81	3.741	1.935
56	0.2866	181.541	181.5	7.7	3.837	1.825	5.662	3.10	54.55	3.744	1.919
57	0.3056	182.753	182.8	8.3	3.841	1.818	5.659	3.11	54.65	3.739	1.921
58	0.3142	187.485	187.5	8.5	3.931	1.818	5.749	3.16	54.64	3.784	1.965
59	0.3239	184.757	184.8	8.8	3.862	1.815	5.677	3.13	54.70	3.746	1.931
60	0.3327	187.173	187.2	9.0	3.903	1.821	5.724	3.14	54.61	3.772	1.951
61	0.3512	186.153	186.2	9.5	3.860	1.842	5.702	3.10	54.31	3.772	1.930
62	0.3602	189.793	189.8	9.7	3.925	1.846	5.771	3.13	54.26	3.808	1.962
63	0.3791	192.211	192.2	10.3	3.952	1.843	5.796	3.14	54.30	3.820	1.976
64	0.3886	190.046	190.0	10.5	3.897	1.833	5.730	3.13	54.44	3.782	1.948
65	0.4075	193.612	193.6	11.0	3.947	1.855	5.802	3.13	54.14	3.828	1.974
66	0.4269	196.436	196.4	11.5	3.981	1.853	5.834	3.15	54.17	3.843	1.991
67	0.4358	194.051	194.1	11.8	3.922	1.848	5.771	3.12	54.23	3.810	1.961

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	0.4450	196.863	196.9	12.0	3.968	1.859	5.827	3.13	54.08	3.843	1.984
69	0.4637	196.351	196.4	12.5	3.935	1.882	5.816	3.09	53.77	3.849	1.967
70	0.4732	200.134	200.1	12.8	3.999	1.874	5.873	3.13	53.87	3.873	1.999
71	0.4825	197.403	197.4	13.0	3.933	1.880	5.813	3.09	53.79	3.846	1.966
72	0.4907	201.420	201.4	13.3	4.003	1.876	5.879	3.13	53.84	3.877	2.001
73	0.5099	202.178	202.2	13.8	3.994	1.898	5.892	3.10	53.53	3.895	1.997
74	0.5286	202.169	202.2	14.3	3.970	1.904	5.874	3.08	53.45	3.889	1.985
75	0.5381	205.782	205.8	14.6	4.029	1.915	5.943	3.10	53.31	3.929	2.014
76	0.5472	203.108	203.1	14.8	3.965	1.900	5.865	3.09	53.51	3.883	1.982
77	0.5562	206.385	206.4	15.0	4.017	1.905	5.922	3.11	53.45	3.913	2.009







Sample No.		1	2	3
Initial	Water Content, %	27.3	27.9	27.0
	Dry Density, pcf	96.2	95.7	97.3
	Saturation, %	98.0	99.0	99.4
	Void Ratio	0.7523	0.7615	0.7320
	Diameter, in.	2.50	2.50	2.50
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	26.8	25.8	23.5
	Dry Density, pcf	96.6	96.6	98.1
	Saturation, %	97.1	93.4	88.4
	Void Ratio	0.7447	0.7449	0.7178
	Diameter, in.	2.50	2.50	2.50
	Height, in.	1.00	0.99	0.99
Normal Stress, tsf		0.648	2.160	3.672
Fail. Stress, tsf		0.481	1.663	2.477
Displacement, in.		0.24	0.13	0.14
Ult. Stress, tsf				
Displacement, in.				
Strain rate, %/min.		0.0043	0.0046	0.02

Sample Type: Undisturbed
Description: Tan and light gray LEAN CLAY

Assumed Specific Gravity= 2.70
Remarks:
Test method: ASTM D 3080
Pocket pen; tsf: 1.75

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: 07-233 **Depth:** 22-24
Sample Number: 12
Proj. No.: 08.18.918 **Date Sampled:** 7/22/08

DIRECT SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

DIRECT SHEAR TEST

7/30/2008

Date: 7/22/08
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: 07-233
Depth: 22-24 **Sample Number:** 12
Description: Tan and light gray LEAN CLAY
Remarks:
Test method: ASTM D 3080
Pocket pen; tsf: 1.75
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	375.270		374.630
Moisture content: Dry soil+tare, gms.	341.360		341.360
Moisture content: Tare, gms.	217.190		217.190
Moisture, %	27.3	26.8	26.8
Moist specimen weight, gms.	158.1		
Diameter, in.	2.50	2.50	
Area, in.^{2}	4.91	4.91	
Height, in.	1.00	1.00	
Net decrease in height, in.		0.00	
Wet Density, pcf	122.5	122.5	
Dry density, pcf	96.2	96.6	
Void ratio	0.7523	0.7447	
Saturation, %	98.0	97.1	

Test Readings for Specimen No. 1

Normal stress = 0.648 tsf
Strain rate, %/min. = 0.0043
Fail. Stress = 0.481 tsf **at reading no.** 69

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.0001	-0.045	0.0	0.000	0.6617
1	0.0004	-0.044	0.0	0.000	0.6617
2	0.0005	-0.373	-0.3	-0.005	0.6652
3	0.0015	-0.014	0.0	0.000	0.6653
4	0.0035	0.463	0.5	0.007	0.6655
5	0.0055	0.929	1.0	0.014	0.6656
6	0.0085	1.611	1.7	0.024	0.6657
7	0.0105	2.010	2.1	0.030	0.6658
8	0.0110	2.338	2.4	0.035	0.6658
9	0.0125	2.794	2.8	0.042	0.6658
10	0.0135	3.238	3.3	0.048	0.6659
11	0.0150	3.866	3.9	0.057	0.6659

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
12	0.0160	2.460	2.5	0.037	0.6660
13	0.0165	2.989	3.0	0.044	0.6659
14	0.0170	3.454	3.5	0.051	0.6659
15	0.0205	4.119	4.2	0.061	0.6660
16	0.0215	4.536	4.6	0.067	0.6660
17	0.0220	4.971	5.0	0.074	0.6660
18	0.0230	5.404	5.4	0.080	0.6660
19	0.0235	5.892	5.9	0.087	0.6660
20	0.0245	6.393	6.4	0.094	0.6660
21	0.0255	6.845	6.9	0.101	0.6661
22	0.0270	7.413	7.5	0.109	0.6661
23	0.0285	8.616	8.7	0.127	0.6662
24	0.0300	9.892	9.9	0.146	0.6663
25	0.0330	11.445	11.5	0.168	0.6665
26	0.0345	12.437	12.5	0.183	0.6667
27	0.0360	13.465	13.5	0.198	0.6668
28	0.0374	14.289	14.3	0.210	0.6669
29	0.0389	15.052	15.1	0.221	0.6670
30	0.0404	15.986	16.0	0.235	0.6674
31	0.0419	16.916	17.0	0.249	0.6674
32	0.0434	17.833	17.9	0.262	0.6675
33	0.0449	18.672	18.7	0.274	0.6675
34	0.0464	19.597	19.6	0.288	0.6675
35	0.0479	20.400	20.4	0.300	0.6675
36	0.0509	21.134	21.2	0.310	0.6677
37	0.0524	22.393	22.4	0.329	0.6677
38	0.0539	23.164	23.2	0.340	0.6678
39	0.0554	23.673	23.7	0.348	0.6677
40	0.0569	24.748	24.8	0.363	0.6677
41	0.0584	25.267	25.3	0.371	0.6676
42	0.0599	25.879	25.9	0.380	0.6676
43	0.0614	26.722	26.8	0.392	0.6675
44	0.0629	27.086	27.1	0.398	0.6676
45	0.0644	27.575	27.6	0.405	0.6676
46	0.0659	28.234	28.3	0.414	0.6677
47	0.0674	28.915	29.0	0.424	0.6677
48	0.0689	29.292	29.3	0.430	0.6676
49	0.0704	29.838	29.9	0.438	0.6674
50	0.0734	30.372	30.4	0.446	0.6666
51	0.0764	30.786	30.8	0.452	0.6660
52	0.0779	31.129	31.2	0.457	0.6659
53	0.0809	31.459	31.5	0.462	0.6659
54	0.0854	31.964	32.0	0.469	0.6658
55	0.0959	32.243	32.3	0.473	0.6648
56	0.1064	32.402	32.4	0.476	0.6649
57	0.1123	31.944	32.0	0.469	0.6646
58	0.1243	32.155	32.2	0.472	0.6648

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
59	0.1363	32.119	32.2	0.471	0.6648
60	0.1483	32.482	32.5	0.477	0.6647
61	0.1603	32.262	32.3	0.473	0.6648
62	0.1723	32.494	32.5	0.477	0.6648
63	0.1842	32.533	32.6	0.477	0.6650
64	0.1962	32.508	32.6	0.477	0.6651
65	0.2082	31.532	31.6	0.463	0.6656
66	0.2112	31.967	32.0	0.469	0.6656
67	0.2202	32.300	32.3	0.474	0.6657
68	0.2322	32.575	32.6	0.478	0.6660
69	0.2441	32.777	32.8	0.481	0.6660
70	0.2471	32.593	32.6	0.478	0.6658

Parameters for Specimen No. 2

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	375.840		373.200
Moisture content: Dry soil+tare, gms.	341.360		341.360
Moisture content: Tare, gms.	217.840		217.840
Moisture, %	27.9	25.8	25.8
Moist specimen weight, gms.	158.0		
Diameter, in.	2.50	2.50	
Area, in.^{2}	4.91	4.91	
Height, in.	1.00	0.99	
Net decrease in height, in.		0.01	
Wet Density, pcf	122.4	121.5	
Dry density, pcf	95.7	96.6	
Void ratio	0.7615	0.7449	
Saturation, %	99.0	93.4	

Test Readings for Specimen No. 2

Normal stress = 2.16 tsf

Strain rate, %/min. = 0.0046

Fail. Stress = 1.663 tsf **at reading no.** 54

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.0002	-1.370	0.0	0.000	0.6722
1	0.0004	-1.374	0.0	0.000	0.6722
2	0.0005	-1.404	0.0	0.000	0.6729
3	0.0010	-1.538	-0.2	-0.002	0.6731
4	0.0090	-0.249	1.1	0.016	0.6738
5	0.0135	1.231	2.6	0.038	0.6740
6	0.0170	2.683	4.1	0.059	0.6741
7	0.0195	4.239	5.6	0.082	0.6741
8	0.0210	5.801	7.2	0.105	0.6741
9	0.0245	7.185	8.6	0.125	0.6743
10	0.0255	8.570	9.9	0.146	0.6743
11	0.0270	12.283	13.7	0.200	0.6744
12	0.0285	17.542	18.9	0.277	0.6745

Test Readings for Specimen No. 2

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
13	0.0300	22.653	24.0	0.352	0.6748
14	0.0315	28.105	29.5	0.432	0.6753
15	0.0330	32.820	34.2	0.501	0.6757
16	0.0345	37.072	38.4	0.563	0.6757
17	0.0360	41.099	42.5	0.622	0.6758
18	0.0374	44.430	45.8	0.671	0.6759
19	0.0389	47.999	49.4	0.724	0.6761
20	0.0404	51.198	52.6	0.770	0.6763
21	0.0419	54.102	55.5	0.813	0.6765
22	0.0434	57.216	58.6	0.859	0.6771
23	0.0449	59.998	61.4	0.899	0.6778
24	0.0464	62.623	64.0	0.938	0.6780
25	0.0479	65.250	66.6	0.976	0.6782
26	0.0494	67.812	69.2	1.014	0.6783
27	0.0509	69.959	71.3	1.045	0.6785
28	0.0524	72.329	73.7	1.080	0.6784
29	0.0539	74.410	75.8	1.111	0.6784
30	0.0554	76.254	77.6	1.138	0.6784
31	0.0569	78.189	79.6	1.166	0.6785
32	0.0584	79.985	81.4	1.192	0.6786
33	0.0599	81.812	83.2	1.219	0.6788
34	0.0614	83.404	84.8	1.242	0.6789
35	0.0629	85.125	86.5	1.268	0.6790
36	0.0644	86.638	88.0	1.290	0.6790
37	0.0659	88.068	89.4	1.311	0.6791
38	0.0674	89.466	90.8	1.331	0.6791
39	0.0689	90.682	92.1	1.349	0.6791
40	0.0704	91.987	93.4	1.368	0.6790
41	0.0719	93.112	94.5	1.385	0.6790
42	0.0749	95.209	96.6	1.415	0.6790
43	0.0779	97.232	98.6	1.445	0.6792
44	0.0809	99.066	100.4	1.472	0.6793
45	0.0839	100.833	102.2	1.498	0.6794
46	0.0869	102.337	103.7	1.520	0.6792
47	0.0899	103.597	105.0	1.538	0.6792
48	0.0929	104.734	106.1	1.555	0.6792
49	0.0974	106.261	107.6	1.577	0.6794
50	0.1033	107.501	108.9	1.596	0.6792
51	0.1093	108.802	110.2	1.615	0.6792
52	0.1153	110.327	111.7	1.637	0.6794
53	0.1243	111.570	112.9	1.655	0.6792
54	0.1303	112.104	113.5	1.663	0.6792
55	0.1333	111.522	112.9	1.655	0.6792
56	0.1393	109.493	110.9	1.625	0.6792
57	0.1513	108.585	110.0	1.611	0.6790
58	0.1633	108.785	110.2	1.614	0.6790
59	0.1752	108.847	110.2	1.615	0.6790

Test Readings for Specimen No. 2

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
60	0.1872	107.208	108.6	1.591	0.6790
61	0.1932	105.940	107.3	1.573	0.6790
62	0.2052	105.418	106.8	1.565	0.6791
63	0.2172	104.971	106.3	1.559	0.6795
64	0.2292	104.428	105.8	1.551	0.6795
65	0.2411	104.532	105.9	1.552	0.6795

Parameters for Specimen No. 3

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	371.200		366.860
Moisture content: Dry soil+tare, gms.	337.340		337.340
Moisture content: Tare, gms.	211.720		211.720
Moisture, %	27.0	23.5	23.5
Moist specimen weight, gms.	159.5		
Diameter, in.	2.50	2.50	
Area, in.^{2}	4.91	4.91	
Height, in.	1.00	0.99	
Net decrease in height, in.		0.01	
Wet Density, pcf	123.5	121.2	
Dry density, pcf	97.3	98.1	
Void ratio	0.7320	0.7178	
Saturation, %	99.4	88.4	

Test Readings for Specimen No. 3

Normal stress = 3.672 tsf

Strain rate, %/min. = 0.02

Fail. Stress = 2.477 tsf **at reading no.** 70

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.1260	0.000	0.0	0.000	0.6722
1	0.1279	0.000	0.0	0.000	0.6722
2	0.1281	2.548	2.5	0.037	0.6904
3	0.1291	4.718	4.7	0.069	0.6913
4	0.1301	7.595	7.6	0.111	0.6913
5	0.1306	9.599	9.6	0.141	0.6915
6	0.1311	11.988	12.0	0.176	0.6915
7	0.1316	13.740	13.7	0.201	0.6915
8	0.1321	15.763	15.8	0.231	0.6916
9	0.1326	18.050	18.1	0.265	0.6918
10	0.1331	19.933	19.9	0.292	0.6918
11	0.1341	23.411	23.4	0.343	0.6919
12	0.1346	25.343	25.3	0.371	0.6920
13	0.1351	27.192	27.2	0.399	0.6920
14	0.1361	30.669	30.7	0.449	0.6921
15	0.1371	33.817	33.8	0.496	0.6923
16	0.1381	36.849	36.8	0.540	0.6924
17	0.1391	39.958	40.0	0.586	0.6928
18	0.1396	41.703	41.7	0.611	0.6929

Test Readings for Specimen No. 3

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
19	0.1406	45.056	45.1	0.660	0.6932
20	0.1416	47.914	47.9	0.702	0.6933
21	0.1426	50.853	50.9	0.745	0.6937
22	0.1436	53.788	53.8	0.788	0.6937
23	0.1446	56.742	56.7	0.832	0.6938
24	0.1456	59.686	59.7	0.875	0.6941
25	0.1466	62.510	62.5	0.916	0.6944
26	0.1476	65.183	65.2	0.955	0.6945
27	0.1486	67.679	67.7	0.992	0.6946
28	0.1496	70.065	70.1	1.027	0.6949
29	0.1506	72.678	72.7	1.065	0.6951
30	0.1516	75.280	75.3	1.103	0.6953
31	0.1526	77.461	77.5	1.135	0.6954
32	0.1536	79.709	79.7	1.168	0.6955
33	0.1551	82.802	82.8	1.214	0.6958
34	0.1566	86.261	86.3	1.264	0.6962
35	0.1581	89.232	89.2	1.308	0.6964
36	0.1596	92.047	92.0	1.349	0.6967
37	0.1611	94.873	94.9	1.390	0.6971
38	0.1626	97.667	97.7	1.431	0.6975
39	0.1641	100.171	100.2	1.468	0.6977
40	0.1656	102.705	102.7	1.505	0.6980
41	0.1671	105.268	105.3	1.543	0.6981
42	0.1686	107.383	107.4	1.574	0.6983
43	0.1701	109.819	109.8	1.610	0.6986
44	0.1716	111.936	111.9	1.641	0.6988
45	0.1731	113.920	113.9	1.670	0.6988
46	0.1746	116.014	116.0	1.700	0.6990
47	0.1761	118.032	118.0	1.730	0.6991
48	0.1776	120.054	120.1	1.760	0.6992
49	0.1806	123.415	123.4	1.809	0.6995
50	0.1821	125.354	125.4	1.837	0.6997
51	0.1851	128.254	128.3	1.880	0.7001
52	0.1866	130.116	130.1	1.907	0.7002
53	0.1897	133.052	133.1	1.950	0.7003
54	0.1927	135.956	136.0	1.993	0.7007
55	0.1957	138.532	138.5	2.030	0.7009
56	0.1987	141.049	141.0	2.067	0.7011
57	0.2017	143.252	143.3	2.100	0.7012
58	0.2047	145.328	145.3	2.130	0.7013
59	0.2077	147.456	147.5	2.161	0.7014
60	0.2107	149.334	149.3	2.189	0.7014
61	0.2152	151.793	151.8	2.225	0.7015
62	0.2182	153.606	153.6	2.251	0.7016
63	0.2227	155.742	155.7	2.283	0.7016
64	0.2272	158.092	158.1	2.317	0.7016
65	0.2317	160.050	160.0	2.346	0.7017

Test Readings for Specimen No. 3

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
66	0.2377	162.464	162.5	2.381	0.7020
67	0.2437	164.342	164.3	2.409	0.7022
68	0.2497	166.404	166.4	2.439	0.7023
69	0.2587	168.319	168.3	2.467	0.7023
70	0.2677	168.996	169.0	2.477	0.7025
71	0.2707	168.577	168.6	2.471	0.7025
72	0.2827	166.946	166.9	2.447	0.7028
73	0.2947	166.308	166.3	2.437	0.7031
74	0.3067	165.592	165.6	2.427	0.7036
75	0.3187	165.302	165.3	2.423	0.7036
76	0.3307	164.798	164.8	2.415	0.7038
77	0.3427	163.755	163.8	2.400	0.7039
78	0.3547	162.571	162.6	2.383	0.7041
79	0.3667	161.445	161.4	2.366	0.7043
80	0.3783	161.212	161.2	2.363	0.7046

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
	12	35-36.5	Gray SILTY SAND; shell fragments	SM						19.2					
	13	38.5-40	Gray CLAYEY SAND; shell fragments	SC											
07-233															
	2	2.5-4	Gray FAT CLAY	CH	157.0										
	3	4.5-6	Gray FAT CLAY	CH	146.2		115	30	85	93.5					
	4	6.5-8	Gray FAT CLAY	CH	139.9										
	5	8.5-10	Gray FAT CLAY	CH	125.0										
	6	10.5-12	Gray FAT CLAY	CH	136.0		119	30	89	95.4					
	7	12.5-14	Gray FAT CLAY	CH	121.0										
	8	14.5-16	Gray FAT CLAY	CH	120.3										
	9	16.5-18	Gray FAT CLAY	CH	105.5		114	28	86	90.9					
	10	18-20	Gray SANDY LEAN CLAY	CL	23.2	96.7						0.78	10.6		Bulge
	11	20-22	Gray LEAN CLAY	CL	26.1	98.5	33	16	17	96.3					Multiple shear
	12	22-24	Tan and light gray LEAN CLAY	CL	27.3	96.2						0.48	9.8		
	13	24-26	Gray LEAN CLAY	CL	28.0	92.0	33	16	17	97.3		0.40	5.8	9.5	Bulge
	14	26-28	Tan and gray SANDY SILT; clay seams	ML	27.3	93.6									
	15	28-30	Tan and gray LEAN CLAY	CL			30	16	14	98.2					
	16	30-32	Tan and gray SANDY SILT; clay seams	ML	27.1	93.8									
	17	32-34	Tan and brown LEAN CLAY	CL	36.5	85.3	43	18	25	99.5		0.81	15.0	13.0	Bulge
	18	34-35	Gray FAT CLAY; sand seans	CH	33.0	87.4									
07-234															
	2	2.5-4	Gray SANDY LEAN CLAY; shell fragments	CL	51.0										
	3	4.5-6	Gray CLAYEY SAND; shell fragments	SC	40.7		42	17	25	24.0					
	4	6.5-8	Gray SANDY LEAN CLAY; shell fragments	CL	46.5										
	5	8-10	Tan and gray FAT CLAY	CH	30.9	88.0	75	24	51	98.4		1.08	2.0	3.5	Slickensided
	6	10-12	Gray FAT CLAY; sand seams	CH	20.6	102.5									
	7	12-14	Tan and gray SANDY SILT; clay seams	ML	24.6	98.2						0.66	5.5		Vertical shear
	8	14-16	Tan and gray LEAN CLAY	CL	25.7	97.7	26	15	11	98.0					
	9	16-18	Gray and tan FAT CLAY; sand seams	CH	30.3	92.2									
	10	18-20	Brown and gray SILTY CLAY with SAND	CL-ML	24.9	103.6						0.49	5.8	7.5	Bulge
	11	20-22	Tan and brown SILTY SAND; clay pockets	SM	25.6	96.8									
	12	22-24	Gray and tan FAT CLAY; sand seams	CH	27.2	93.8						0.81	3.3		Vertical shear
	13	24-26	Tan and brown FAT CLAY	CH	34.6	85.3	52	20	32	99.6		0.77	9.7	9.5	Bulge
	14	26-28	Gray FAT CLAY; sand seams	CH	32.4	86.3									
	15	28-30	Gray FAT CLAY	CH	31.2	86.7						0.98	8.1		Vertical shear
07-235															
	2	2.5-4	Gray FAT CLAY	CH	84.9										