Hole No. 07-194

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=13691674 E=3307580	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(CH), very soft to hard, brown & gray -w/ ferrous nodules & roots @ 0' - 2'		1			4.50	85.1	34.7				
					2			1.50	80.1	36.8				
5			-w/ sand seams & ferrous nodules @ 4' - 6'		3			0.50	69.6	48.1				
			-gray @ 6' - 8'		4			0.50	63.8	59.0	75	24	51	90.3
					5			0.50	64.7	53.5				
10			-gray @ 10' - 16' -w/ ferrous nodules @ 10' - 14'		6			0.75	72.4	45.2				
					7			0.25	63.5	58.6				
15					8			0.00	61.3	66.1	89	25	64	90.1
			-w/ sand seams @ 16' - 18'		9			0.00	78.3	40.8				
			FAT CLAY WITH SAND(CH), soft, gray		10			0.50	54.3	75.9				
20			**FAT CLAY(CH)**, very soft to firm, gray & tan -w/ ferrous nodules @ 20' - 22'		11			0.25	58.7	61.8	97	24	73	92.3
					12			0.00	72.8	40.5				
25			-gray w/ slickensides @ 24' - 28'		13			0.25	68.9	48.6	100	28	72	98.9
			-w/ ferrous nodules @ 26' - 32' -w/ sand seams @ 26' - 28'		14			0.25	65.9	53.1				
					15			0.75	71.2	46.5				
30			-gray & brown w/ slickensides @ 30' - 32'		16			0.75	64.8	50.8	116	30	86	96.5
			-gray @ 32' - 34'		17			0.25	58.3	65.0				
			CLAYEY SAND(SC), loose, gray & tan, w/	X	18		8							

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

ENG FORM: SWG 1836 BOR

Hole No. 07-194

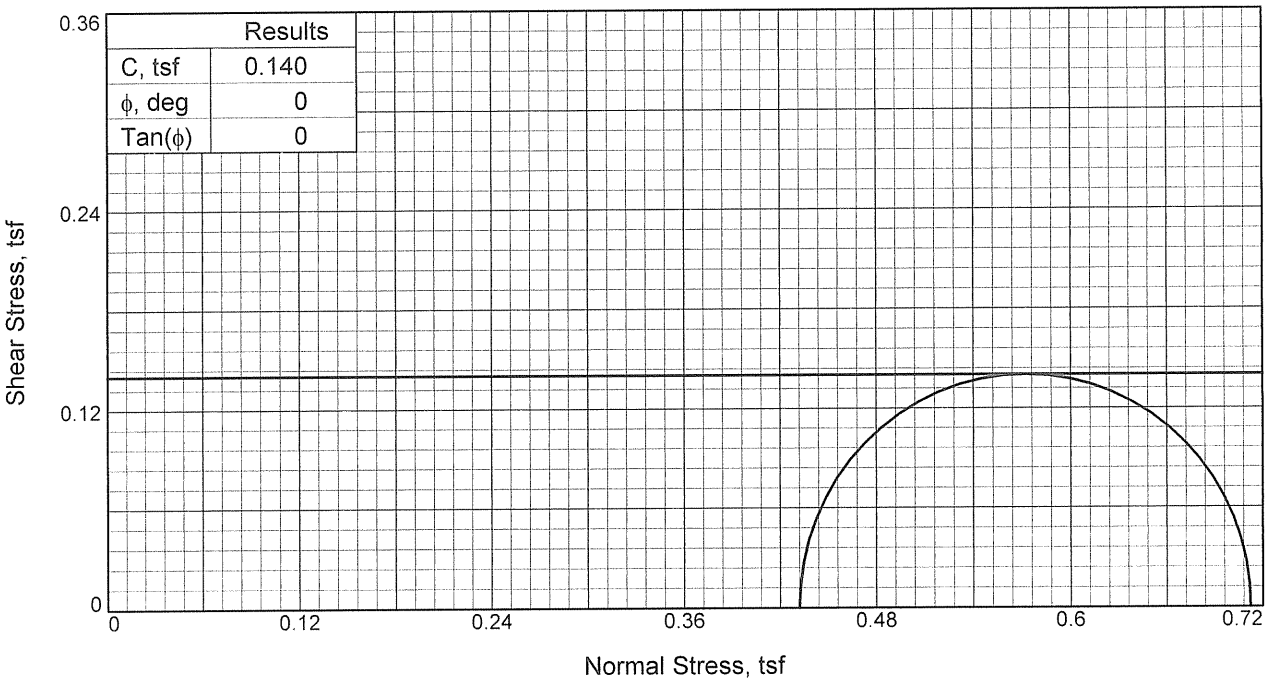
BORING LOG	DISTRICT	INSTALLATION	SHEET 2 OF 2 SHEETS

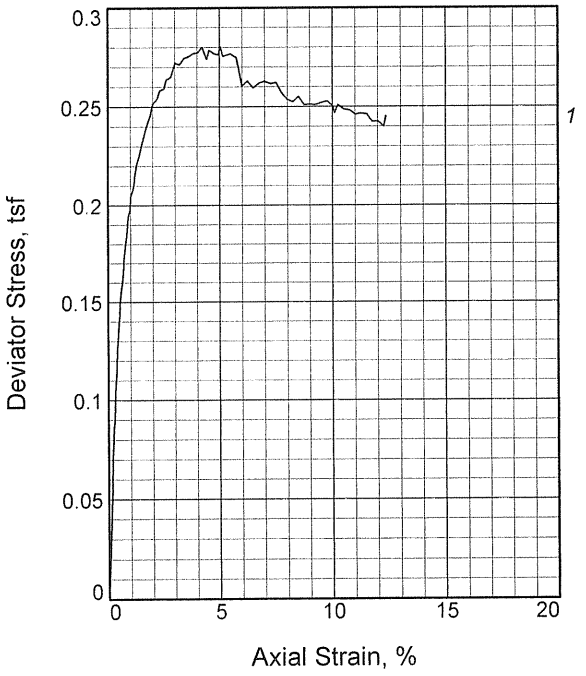
1. PROJECT Galveston Channel and Pelican Island PA	7. ELEVATION OF HOLE
2. LOCATION (Coordinates or Station) N=13691674 E=3307580	8. DATUM FOR ELEVATION
3. DRILLING AGENCY Dempsey (Geotest Engineering, Inc.)	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, 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)
			shell fragments	X										
			SANDY LEAN CLAY(CL), very soft, gray -w/ shell fragments @ 36' - 38'		19			0.25	95.9	28.2				
			-gray & tan @ 38' - 40'		20			0.25	80.5	36.2	46	17	29	57.3
40			**FAT CLAY(CH)**, very soft to soft, gray -w/ sand pockets @ 40' - 42'		21			0.25	78.0	47.1				
			-w/ sand seams @ 42' - 44'		22			0.50	70.1	47.6				
45			**SANDY LEAN CLAY(CL)**, very soft, gray, w/ shell fragments		23			0.00	77.7	40.9	48	20	28	57.1
			FAT CLAY(CH), very soft, gray		24			0.25	66.0	47.9	90	28	62	93.3
			-w/ sand seams & shell fragments @ 48' - 50'		25			0.25	76.8	37.5				
50														
55														
60														
65														

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

ENG FORM: SWG 1836 BOR





Sample No.		1
Initial	Water Content, %	59.0
	Dry Density, pcf	63.8
	Saturation, %	97.0
	Void Ratio	1.6426
	Diameter, in.	2.80
	Height, in.	5.98
At Test	Water Content, %	58.4
	Dry Density, pcf	63.8
	Saturation, %	96.0
	Void Ratio	1.6426
	Diameter, in.	2.80
	Height, in.	5.98
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.43
Fail. Stress, tsf		0.28
Ult. Stress, tsf		
σ_1 Failure, tsf		0.71
σ_3 Failure, tsf		0.43

Type of Test:
Unconsolidated Undrained
Sample Type: Undisturbed
Description: Gray FAT CLAY

LL= 75 **PL=** 24 **PI=** 51
Assumed Specific Gravity= 2.70
Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 0.25
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: 07-194 **Depth:** 6-8
Sample Number: 4
Proj. No.: 08.18.918 **Date Sampled:** 7/17/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

10/17/2008
9:49 AM

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: 07-194
Depth: 6-8 **Sample Number:** 4
Description: Gray FAT CLAY
Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 0.25
Failure type: Bulge
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=**75 **PL=**24 **PI=**51
Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	128.080	104.000
Moisture content: Dry soil+tare, gms.	92.250	77.300
Moisture content: Tare, gms.	31.550	31.600
Moisture, %	59.0	58.4
Moist specimen weight, gms.	980.4	
Diameter, in.	2.80	
Area, in.^{2}	6.16	
Height, in.	5.98	
Wet Density, pcf	101.4	
Dry density, pcf	63.8	
Void ratio	1.6426	
Saturation, %	97.0	

Test Readings for Specimen No. 1

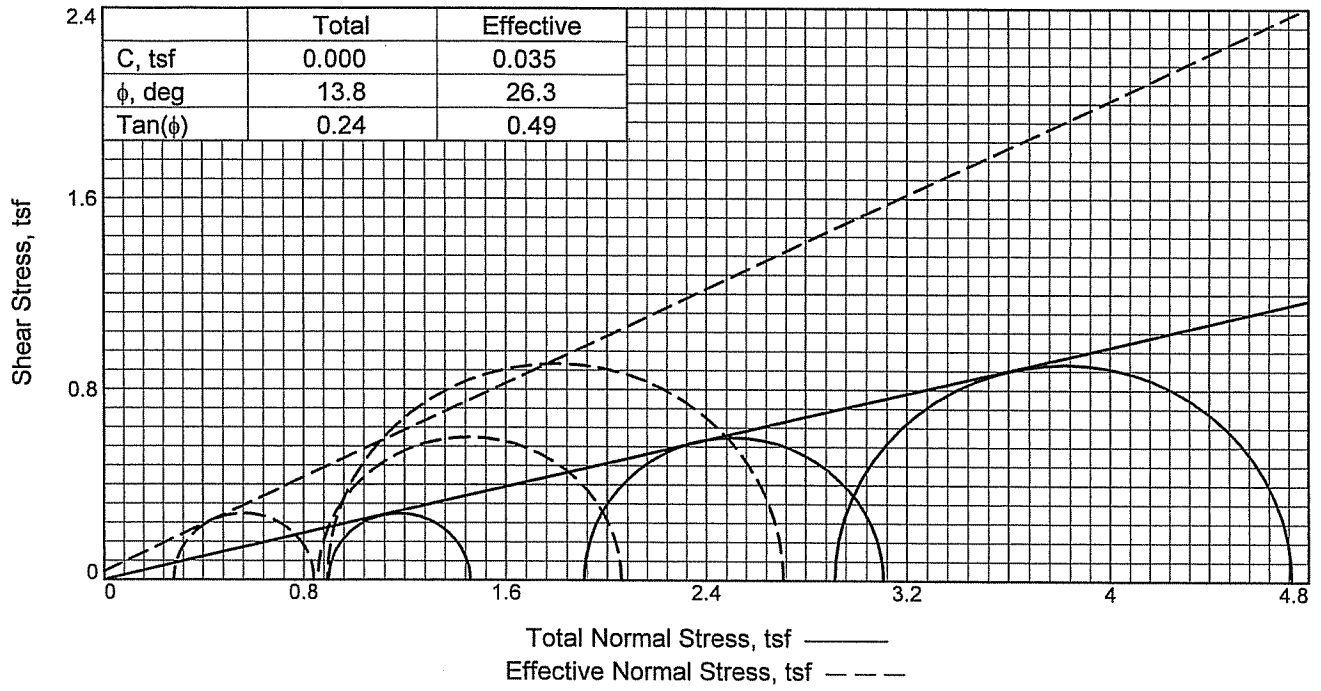
Membrane modulus = .130 kN/cm^2
Membrane thickness = .031 cm
Cell pressure = 6.00 psi (0.432 tsf)
Back pressure = 0.00 psi (0.000 tsf)
Strain rate, %/min. = 1.00
Fail. Stress = 0.280 tsf **at reading no.** 49

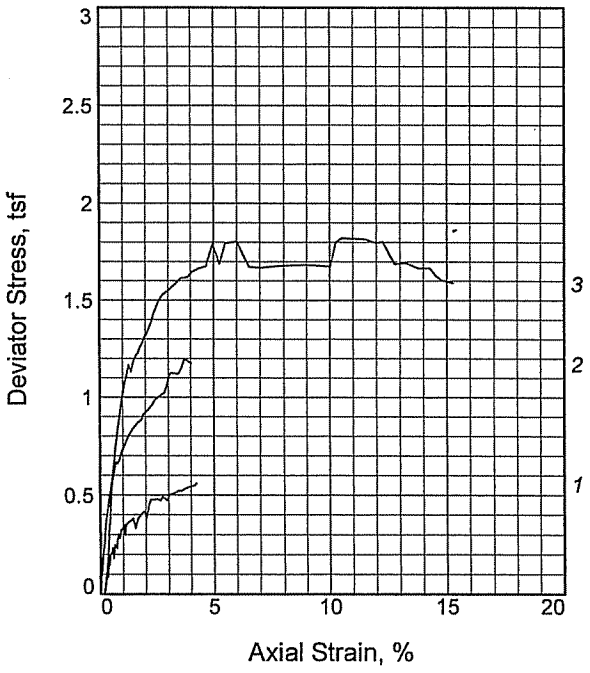
Test Readings for Specimen No. 1

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	0.0209	0.000	0.0	0.0	0.000	0.432	0.432	1.00	0.432	0.000
1	0.0309	4.714	4.7	0.2	0.055	0.432	0.487	1.13	0.460	0.028
2	0.0320	6.037	6.0	0.2	0.070	0.432	0.502	1.16	0.467	0.035
3	0.0340	6.833	6.8	0.2	0.080	0.432	0.512	1.18	0.472	0.040
4	0.0353	7.341	7.3	0.2	0.086	0.432	0.518	1.20	0.475	0.043
5	0.0372	7.688	7.7	0.3	0.090	0.432	0.522	1.21	0.477	0.045
6	0.0385	8.403	8.4	0.3	0.098	0.432	0.530	1.23	0.481	0.049
7	0.0398	9.220	9.2	0.3	0.107	0.432	0.539	1.25	0.486	0.054
8	0.0418	9.509	9.5	0.3	0.111	0.432	0.543	1.26	0.487	0.055
9	0.0431	10.060	10.1	0.4	0.117	0.432	0.549	1.27	0.491	0.059
10	0.0443	10.720	10.7	0.4	0.125	0.432	0.557	1.29	0.494	0.062
11	0.0476	11.440	11.4	0.4	0.133	0.432	0.565	1.31	0.499	0.067
12	0.0489	11.720	11.7	0.5	0.136	0.432	0.568	1.32	0.500	0.068
13	0.0509	12.303	12.3	0.5	0.143	0.432	0.575	1.33	0.504	0.072
14	0.0522	12.784	12.8	0.5	0.149	0.432	0.581	1.34	0.506	0.074
15	0.0555	13.392	13.4	0.6	0.156	0.432	0.588	1.36	0.510	0.078
16	0.0581	13.702	13.7	0.6	0.159	0.432	0.591	1.37	0.512	0.080
17	0.0614	14.212	14.2	0.7	0.165	0.432	0.597	1.38	0.515	0.083
18	0.0627	14.879	14.9	0.7	0.173	0.432	0.605	1.40	0.518	0.086
19	0.0673	15.510	15.5	0.8	0.180	0.432	0.612	1.42	0.522	0.090
20	0.0706	15.958	16.0	0.8	0.185	0.432	0.617	1.43	0.525	0.093
21	0.0739	16.717	16.7	0.9	0.194	0.432	0.626	1.45	0.529	0.097
22	0.0797	17.134	17.1	1.0	0.198	0.432	0.630	1.46	0.531	0.099
23	0.0810	17.643	17.6	1.0	0.204	0.432	0.636	1.47	0.534	0.102
24	0.0856	17.918	17.9	1.1	0.207	0.432	0.639	1.48	0.536	0.104
25	0.0902	18.191	18.2	1.2	0.210	0.432	0.642	1.49	0.537	0.105
26	0.0922	18.576	18.6	1.2	0.215	0.432	0.647	1.50	0.539	0.107
27	0.0979	19.169	19.2	1.3	0.221	0.432	0.653	1.51	0.543	0.111
28	0.1037	19.512	19.5	1.4	0.225	0.432	0.657	1.52	0.544	0.112
29	0.1102	20.033	20.0	1.5	0.231	0.432	0.663	1.53	0.547	0.115
30	0.1223	20.844	20.8	1.7	0.240	0.432	0.672	1.55	0.552	0.120
31	0.1345	21.458	21.5	1.9	0.246	0.432	0.678	1.57	0.555	0.123
32	0.1403	21.945	21.9	2.0	0.251	0.432	0.683	1.58	0.558	0.126
33	0.1524	22.201	22.2	2.2	0.254	0.432	0.686	1.59	0.559	0.127
34	0.1588	22.591	22.6	2.3	0.258	0.432	0.690	1.60	0.561	0.129
35	0.1710	22.735	22.7	2.5	0.259	0.432	0.691	1.60	0.562	0.130
36	0.1767	23.155	23.2	2.6	0.264	0.432	0.696	1.61	0.564	0.132
37	0.1889	23.314	23.3	2.8	0.265	0.432	0.697	1.61	0.564	0.132
38	0.2011	24.003	24.0	3.0	0.272	0.432	0.704	1.63	0.568	0.136
39	0.2133	23.973	24.0	3.2	0.271	0.432	0.703	1.63	0.568	0.136
40	0.2254	24.307	24.3	3.4	0.274	0.432	0.706	1.64	0.569	0.137
41	0.2376	24.446	24.4	3.6	0.275	0.432	0.707	1.64	0.570	0.138
42	0.2497	24.627	24.6	3.8	0.277	0.432	0.709	1.64	0.570	0.138
43	0.2619	24.722	24.7	4.0	0.277	0.432	0.709	1.64	0.571	0.139
44	0.2740	25.007	25.0	4.2	0.280	0.432	0.712	1.65	0.572	0.140
45	0.2855	24.525	24.5	4.4	0.274	0.432	0.706	1.63	0.569	0.137
46	0.2920	24.959	25.0	4.5	0.279	0.432	0.711	1.64	0.571	0.139

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	0.3042	24.868	24.9	4.7	0.277	0.432	0.709	1.64	0.571	0.139
48	0.3163	24.855	24.9	4.9	0.276	0.432	0.708	1.64	0.570	0.138
49	0.3221	25.249	25.2	5.0	0.280	0.432	0.712	1.65	0.572	0.140
50	0.3285	24.835	24.8	5.1	0.275	0.432	0.707	1.64	0.570	0.138
51	0.3495	25.051	25.1	5.5	0.277	0.432	0.709	1.64	0.570	0.138
52	0.3642	24.934	24.9	5.7	0.275	0.432	0.707	1.64	0.569	0.137
53	0.3796	24.991	25.0	6.0	0.260	0.432	0.692	1.60	0.562	0.130
54	0.3943	25.342	25.3	6.2	0.263	0.432	0.695	1.61	0.564	0.132
55	0.4096	25.148	25.1	6.5	0.260	0.432	0.692	1.60	0.562	0.130
56	0.4243	25.482	25.5	6.7	0.262	0.432	0.694	1.61	0.563	0.131
57	0.4396	25.701	25.7	7.0	0.263	0.432	0.695	1.61	0.563	0.131
58	0.4543	25.706	25.7	7.2	0.262	0.432	0.694	1.61	0.563	0.131
59	0.4697	25.880	25.9	7.5	0.262	0.432	0.694	1.61	0.563	0.131
60	0.4844	25.535	25.5	7.8	0.257	0.432	0.689	1.60	0.561	0.129
61	0.4997	25.342	25.3	8.0	0.254	0.432	0.686	1.59	0.559	0.127
62	0.5144	25.355	25.4	8.3	0.252	0.432	0.684	1.58	0.558	0.126
63	0.5291	25.727	25.7	8.5	0.255	0.432	0.687	1.59	0.560	0.128
64	0.5446	25.468	25.5	8.8	0.251	0.432	0.683	1.58	0.557	0.125
65	0.5593	25.601	25.6	9.0	0.251	0.432	0.683	1.58	0.558	0.126
66	0.5746	25.719	25.7	9.3	0.251	0.432	0.683	1.58	0.557	0.125
67	0.5893	25.943	25.9	9.5	0.252	0.432	0.684	1.58	0.558	0.126
68	0.6046	26.154	26.2	9.8	0.253	0.432	0.685	1.59	0.558	0.126
69	0.6193	26.044	26.0	10.0	0.250	0.432	0.682	1.58	0.557	0.125
70	0.6244	25.772	25.8	10.1	0.247	0.432	0.679	1.57	0.556	0.124
71	0.6341	26.214	26.2	10.3	0.251	0.432	0.683	1.58	0.557	0.125
72	0.6495	26.152	26.2	10.5	0.249	0.432	0.681	1.58	0.556	0.124
73	0.6643	26.231	26.2	10.8	0.248	0.432	0.680	1.57	0.556	0.124
74	0.6796	26.149	26.1	11.0	0.246	0.432	0.678	1.57	0.555	0.123
75	0.6943	26.338	26.3	11.3	0.247	0.432	0.679	1.57	0.555	0.123
76	0.7097	26.443	26.4	11.5	0.246	0.432	0.678	1.57	0.555	0.123
77	0.7244	26.206	26.2	11.8	0.243	0.432	0.675	1.56	0.553	0.121
78	0.7397	26.342	26.3	12.0	0.243	0.432	0.675	1.56	0.553	0.121
79	0.7544	26.233	26.2	12.3	0.240	0.432	0.672	1.56	0.552	0.120
80	0.7595	26.763	26.8	12.4	0.245	0.432	0.677	1.57	0.555	0.123





Sample No.		1	2	3
Initial	Water Content, %	66.1	66.1	66.1
	Dry Density, pcf	61.3	61.3	61.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.8499	1.8499	1.8499
	Diameter, in.	2.01	2.01	2.01
	Height, in.	4.11	4.11	4.11
At Test	Water Content, %	42.0	42.0	42.0
	Dry Density, pcf	80.3	80.3	80.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.1771	1.1771	1.1771
	Diameter, in.	1.78	1.84	1.88
	Height, in.	4.00	3.74	3.60
Strain rate, %/min.		0.0083	0.0051	0.0055
Back Pressure, tsf		2.16	2.16	2.16
Cell Pressure, tsf		3.06	4.07	5.08
Fail. Stress, tsf		0.56	1.20	1.82
Excess Pore Pr., tsf		0.62	1.05	2.02
Ult. Stress, tsf		0.56	1.18	1.59
Excess Pore Pr., tsf		0.62	1.07	2.07
$\bar{\sigma}_1$ Failure, tsf		0.84	2.06	2.71
$\bar{\sigma}_3$ Failure, tsf		0.28	0.86	0.89

Type of Test:
CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 89 **PL=** 25 **PI=** 64

Assumed Specific Gravity= 2.80

Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 0.26
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

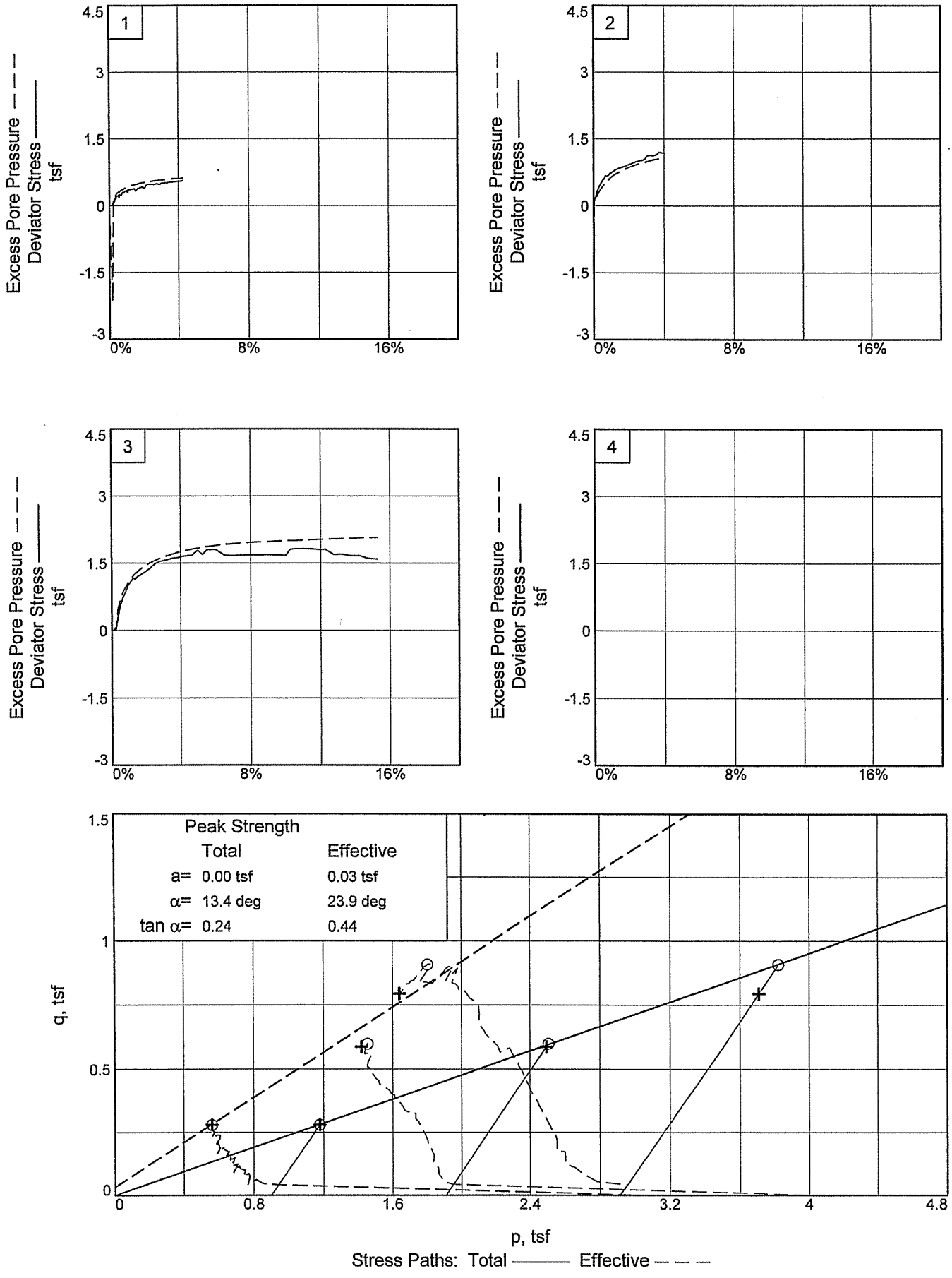
Source of Sample: 07-194 **Depth:** 14-16

Sample Number: 8

Proj. No.: 08.18.918 **Date Sampled:** 7/26/08

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: 07-194 **Depth:** 14-16 **Sample Number:** 8

Project No.: 08.18.918

TOLUNAY-WONG ENGINEERS, INC.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

8/11/2008
5:19 PM

Date: 7/26/08
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: 07-194
Depth: 14-16 **Sample Number:** 8
Description: Gray FAT CLAY
Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 0.26
Failure type: Bulge
Type of Sample: Undisturbed
Assumed Specific Gravity=2.80 **LL=**89 **PL=**25 **PI=**64
Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	85.010			97.220
Moisture content: Dry soil+tare, gms.	63.370			77.520
Moisture content: Tare, gms.	30.610			30.660
Moisture, %	66.1	45.8	42.0	42.0
Moist specimen weight, gms.	348.0			
Diameter, in.	2.01	1.81	1.78	
Area, in.^{2}	3.17	2.56	2.49	
Height, in.	4.11	4.07	4.00	
Net decrease in height, in.		0.04	0.07	
Net decrease in water volume, cc.			7.80	
Wet Density, pcf	101.9	111.7	114.0	
Dry density, pcf	61.3	76.6	80.3	
Void ratio	1.8499	1.2813	1.1771	
Saturation, %	100.0	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 = 42.50 psi (3.060 tsf)
Consolidation back pressure = 30.00 psi (2.160 tsf)
Consolidation effective confining stress = 0.900 tsf
Strain rate, %/min. = 0.0083
Fail. Stress = 0.558 tsf **at reading no.** 52
Ult. Stress = 0.558 tsf **at reading no.** 52

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	0.2100	0.000	0.0	0.0	0.000	0.898	0.898	1.00	30.03	0.898	0.000
1	0.2171	0.000	0.0	0.2	0.000	3.060	3.060	1.00	0.00	3.060	0.000
2	0.2197	3.364	3.4	0.2	0.085	0.898	0.983	1.09	30.03	0.940	0.043
3	0.2207	3.767	3.8	0.3	0.096	0.803	0.898	1.12	31.35	0.850	0.048
4	0.2217	4.884	4.9	0.3	0.126	0.752	0.878	1.17	32.06	0.815	0.063
5	0.2227	3.520	3.5	0.3	0.086	0.723	0.809	1.12	32.45	0.766	0.043
6	0.2237	5.891	5.9	0.3	0.153	0.701	0.854	1.22	32.76	0.778	0.076
7	0.2247	6.656	6.7	0.4	0.174	0.683	0.856	1.25	33.02	0.770	0.087
8	0.2257	5.757	5.8	0.4	0.147	0.668	0.815	1.22	33.22	0.741	0.073
9	0.2267	7.184	7.2	0.4	0.186	0.657	0.844	1.28	33.37	0.751	0.093
10	0.2277	7.743	7.7	0.4	0.201	0.648	0.849	1.31	33.50	0.749	0.101
11	0.2297	8.192	8.2	0.5	0.212	0.618	0.829	1.34	33.92	0.724	0.106
12	0.2307	8.656	8.7	0.5	0.224	0.609	0.832	1.37	34.05	0.720	0.112
13	0.2317	9.030	9.0	0.5	0.233	0.601	0.834	1.39	34.16	0.717	0.117
14	0.2327	7.274	7.3	0.6	0.181	0.594	0.775	1.31	34.25	0.685	0.091
15	0.2337	7.916	7.9	0.6	0.198	0.592	0.791	1.34	34.28	0.691	0.099
16	0.2347	9.650	9.6	0.6	0.247	0.587	0.834	1.42	34.35	0.710	0.124
17	0.2387	9.308	9.3	0.7	0.232	0.554	0.786	1.42	34.81	0.670	0.116
18	0.2397	10.878	10.9	0.7	0.276	0.549	0.825	1.50	34.87	0.687	0.138
19	0.2407	11.343	11.3	0.8	0.288	0.546	0.834	1.53	34.91	0.690	0.144
20	0.2417	11.817	11.8	0.8	0.300	0.543	0.843	1.55	34.96	0.693	0.150
21	0.2437	11.247	11.2	0.8	0.281	0.525	0.806	1.53	35.20	0.666	0.141
22	0.2447	11.707	11.7	0.9	0.293	0.520	0.813	1.56	35.28	0.666	0.146
23	0.2457	12.447	12.4	0.9	0.313	0.517	0.830	1.61	35.32	0.673	0.156
24	0.2467	12.736	12.7	0.9	0.320	0.514	0.834	1.62	35.36	0.674	0.160
25	0.2487	13.048	13.0	1.0	0.326	0.506	0.832	1.64	35.48	0.669	0.163
26	0.2507	13.464	13.5	1.0	0.335	0.493	0.828	1.68	35.66	0.660	0.168
27	0.2517	12.376	12.4	1.0	0.303	0.490	0.793	1.62	35.69	0.642	0.151
28	0.2527	13.932	13.9	1.1	0.346	0.487	0.833	1.71	35.74	0.660	0.173
29	0.2537	12.267	12.3	1.1	0.297	0.486	0.783	1.61	35.75	0.635	0.149
30	0.2547	13.961	14.0	1.1	0.344	0.485	0.830	1.71	35.76	0.657	0.172
31	0.2567	14.383	14.4	1.2	0.354	0.471	0.824	1.75	35.96	0.648	0.177
32	0.2637	15.206	15.2	1.3	0.368	0.446	0.814	1.82	36.31	0.630	0.184
33	0.2677	15.826	15.8	1.4	0.380	0.438	0.818	1.87	36.41	0.628	0.190
34	0.2717	14.345	14.3	1.5	0.332	0.424	0.756	1.78	36.61	0.590	0.166
35	0.2757	16.076	16.1	1.6	0.376	0.421	0.798	1.89	36.65	0.609	0.188
36	0.2797	16.806	16.8	1.7	0.392	0.406	0.797	1.97	36.86	0.602	0.196
37	0.2837	17.462	17.5	1.8	0.405	0.396	0.801	2.02	37.00	0.598	0.202
38	0.2877	18.050	18.1	1.9	0.416	0.389	0.805	2.07	37.09	0.597	0.208
39	0.2918	17.132	17.1	2.0	0.387	0.383	0.770	2.01	37.18	0.577	0.193
40	0.2958	19.328	19.3	2.1	0.448	0.381	0.829	2.18	37.21	0.605	0.224
41	0.2998	20.298	20.3	2.2	0.475	0.370	0.845	2.29	37.36	0.608	0.238
42	0.3118	20.482	20.5	2.5	0.479	0.354	0.833	2.35	37.58	0.593	0.239
43	0.3158	20.179	20.2	2.6	0.470	0.344	0.814	2.36	37.72	0.579	0.235
44	0.3198	20.994	21.0	2.7	0.492	0.337	0.829	2.46	37.82	0.583	0.246
45	0.3278	20.313	20.3	2.9	0.472	0.328	0.799	2.44	37.95	0.564	0.236
46	0.3318	21.400	21.4	3.0	0.502	0.328	0.830	2.53	37.94	0.579	0.251

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
47	0.3438	21.860	21.9	3.3	0.513	0.311	0.823	2.65	38.19	0.567	0.256
48	0.3478	22.210	22.2	3.4	0.522	0.307	0.829	2.70	38.23	0.568	0.261
49	0.3518	22.158	22.2	3.5	0.520	0.305	0.825	2.70	38.26	0.565	0.260
50	0.3638	22.854	22.9	3.8	0.537	0.293	0.830	2.83	38.43	0.562	0.269
51	0.3758	23.271	23.3	4.1	0.547	0.293	0.840	2.87	38.43	0.566	0.273
52	0.3797	23.714	23.7	4.2	0.558	0.283	0.841	2.97	38.57	0.562	0.279

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	85.010			97.220
Moisture content: Dry soil+tare, gms.	63.370			77.520
Moisture content: Tare, gms.	30.610			30.660
Moisture, %	66.1	52.4	42.0	42.0
Moist specimen weight, gms.	348.0			
Diameter, in.	2.01	1.88	1.84	
Area, in.^{2}	3.17	2.77	2.66	
Height, in.	4.11	4.07	3.74	
Net decrease in height, in.		0.04	0.33	
Net decrease in water volume, cc.			21.80	
Wet Density, pcf	101.9	108.0	114.0	
Dry density, pcf	61.3	70.8	80.3	
Void ratio	1.8499	1.4684	1.1771	
Saturation, %	100.0	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .130 kN/cm^2

Membrane thickness = .031 cm

Filter paper coefficient = 0.0019 kN/cm

Filter paper coverage = 50%

Consolidation cell pressure = 56.50 psi (4.068 tsf)

Consolidation back pressure = 30.00 psi (2.160 tsf)

Consolidation effective confining stress = 1.908 tsf

Strain rate, %/min. = 0.0051

Fail. Stress = 1.198 tsf **at reading no.** 46

Ult. Stress = 1.175 tsf **at reading no.** 48

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	-0.0070	0.000	0.0	0.0	0.000	1.906	1.906	1.00	30.03	1.906	0.000
1	-0.0064	0.000	0.0	0.0	0.000	4.068	4.068	1.00	0.00	4.068	0.000
2	-0.0060	3.245	3.2	0.0	0.088	1.906	1.994	1.05	30.03	1.950	0.044
3	-0.0051	4.018	4.0	0.1	0.109	1.847	1.956	1.06	30.85	1.901	0.054
4	-0.0042	5.186	5.2	0.1	0.140	1.811	1.951	1.08	31.35	1.881	0.070
5	-0.0032	6.280	6.3	0.1	0.170	1.780	1.951	1.10	31.77	1.865	0.085
6	-0.0023	8.106	8.1	0.1	0.219	1.754	1.974	1.13	32.14	1.864	0.110
7	-0.0004	9.560	9.6	0.2	0.259	1.705	1.963	1.15	32.83	1.834	0.129
8	0.0005	11.756	11.8	0.2	0.318	1.680	1.998	1.19	33.16	1.839	0.159
9	0.0015	12.508	12.5	0.2	0.338	1.661	2.000	1.20	33.43	1.831	0.169
10	0.0024	13.506	13.5	0.3	0.365	1.640	2.005	1.22	33.72	1.823	0.183

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
11	0.0033	14.429	14.4	0.3	0.390	1.620	2.010	1.24	34.01	1.815	0.195
12	0.0043	14.945	14.9	0.3	0.404	1.602	2.006	1.25	34.25	1.804	0.202
13	0.0052	15.883	15.9	0.3	0.429	1.587	2.016	1.27	34.46	1.802	0.215
14	0.0071	17.497	17.5	0.4	0.473	1.553	2.026	1.30	34.93	1.789	0.236
15	0.0089	18.808	18.8	0.4	0.508	1.524	2.032	1.33	35.33	1.778	0.254
16	0.0099	19.395	19.4	0.5	0.523	1.507	2.030	1.35	35.57	1.768	0.262
17	0.0108	20.052	20.1	0.5	0.541	1.491	2.032	1.36	35.79	1.762	0.271
18	0.0117	20.752	20.8	0.5	0.560	1.478	2.037	1.38	35.98	1.758	0.280
19	0.0136	21.741	21.7	0.6	0.586	1.455	2.041	1.40	36.29	1.748	0.293
20	0.0155	22.535	22.5	0.6	0.607	1.428	2.035	1.43	36.67	1.731	0.304
21	0.0173	24.033	24.0	0.7	0.647	1.407	2.054	1.46	36.96	1.731	0.324
22	0.0192	24.780	24.8	0.7	0.667	1.383	2.050	1.48	37.30	1.716	0.334
23	0.0211	25.783	25.8	0.8	0.659	1.366	2.025	1.48	37.53	1.695	0.329
24	0.0239	26.413	26.4	0.8	0.672	1.335	2.007	1.50	37.96	1.671	0.336
25	0.0276	28.065	28.1	0.9	0.711	1.299	2.010	1.55	38.45	1.655	0.355
26	0.0295	28.803	28.8	1.0	0.728	1.282	2.010	1.57	38.69	1.646	0.364
27	0.0351	30.460	30.5	1.1	0.764	1.239	2.003	1.62	39.30	1.621	0.382
28	0.0389	31.883	31.9	1.2	0.797	1.209	2.006	1.66	39.70	1.608	0.398
29	0.0426	32.659	32.7	1.3	0.812	1.186	1.998	1.69	40.03	1.592	0.406
30	0.0463	33.687	33.7	1.4	0.834	1.162	1.996	1.72	40.36	1.579	0.417
31	0.0538	35.220	35.2	1.6	0.864	1.120	1.984	1.77	40.95	1.552	0.432
32	0.0613	36.390	36.4	1.8	0.884	1.083	1.967	1.82	41.46	1.525	0.442
33	0.0650	37.644	37.6	1.9	0.912	1.064	1.976	1.86	41.72	1.520	0.456
34	0.0688	38.201	38.2	2.0	0.922	1.047	1.969	1.88	41.96	1.508	0.461
35	0.0725	38.727	38.7	2.1	0.935	1.032	1.967	1.91	42.17	1.499	0.467
36	0.0800	39.886	39.9	2.3	0.963	1.004	1.967	1.96	42.56	1.485	0.482
37	0.0837	40.728	40.7	2.4	0.985	0.991	1.975	1.99	42.74	1.483	0.492
38	0.0912	41.576	41.6	2.6	1.005	0.969	1.973	2.04	43.05	1.471	0.502
39	0.0987	42.290	42.3	2.8	1.021	0.945	1.966	2.08	43.38	1.455	0.511
40	0.1024	43.445	43.4	2.9	1.051	0.934	1.985	2.12	43.53	1.459	0.525
41	0.1062	45.623	45.6	3.0	1.107	0.925	2.031	2.20	43.66	1.478	0.553
42	0.1099	46.427	46.4	3.1	1.127	0.913	2.040	2.23	43.82	1.476	0.563
43	0.1211	46.318	46.3	3.4	1.120	0.880	1.999	2.27	44.28	1.440	0.560
44	0.1249	46.976	47.0	3.5	1.136	0.871	2.007	2.30	44.40	1.439	0.568
45	0.1286	47.965	48.0	3.6	1.160	0.864	2.025	2.34	44.49	1.445	0.580
46	0.1324	49.470	49.5	3.7	1.198	0.857	2.055	2.40	44.60	1.456	0.599
47	0.1361	49.227	49.2	3.8	1.191	0.850	2.041	2.40	44.69	1.446	0.595
48	0.1436	48.728	48.7	4.0	1.175	0.833	2.008	2.41	44.93	1.421	0.588

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	85.010			97.220
Moisture content: Dry soil+tare, gms.	63.370			77.520
Moisture content: Tare, gms.	30.610			30.660
Moisture, %	66.1	55.1	42.0	42.0
Moist specimen weight, gms.	348.0			
Diameter, in.	2.01	1.91	1.88	
Area, in.^{2}	3.17	2.85	2.77	
Height, in.	4.11	4.07	3.60	
Net decrease in height, in.		0.04	0.48	
Net decrease in water volume, cc.			27.40	
Wet Density, pcf	101.9	106.6	114.0	
Dry density, pcf	61.3	68.7	80.3	
Void ratio	1.8499	1.5432	1.1771	
Saturation, %	100.0	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .130 kN/cm^2

Membrane thickness = .031 cm

Filter paper coefficient = 0.0019 kN/cm

Filter paper coverage = 50%

Consolidation cell pressure = 70.50 psi (5.076 tsf)

Consolidation back pressure = 30.00 psi (2.160 tsf)

Consolidation effective confining stress = 2.916 tsf

Strain rate, %/min. = 0.0055

Fail. Stress = 1.816 tsf **at reading no.** 66

Ult. Stress = 1.589 tsf **at reading no.** 75

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	0.1355	0.000	0.0	0.0	0.000	2.913	2.913	1.00	30.04	2.913	0.000
1	0.1405	0.000	0.0	0.1	0.000	2.913	2.913	1.00	30.04	2.913	0.000
2	0.1450	3.724	3.7	0.3	0.085	2.913	2.998	1.03	30.04	2.955	0.042
3	0.1459	4.746	4.7	0.3	0.110	2.730	2.840	1.04	32.59	2.785	0.055
4	0.1468	7.083	7.1	0.3	0.170	2.622	2.792	1.06	34.08	2.707	0.085
5	0.1477	9.114	9.1	0.3	0.221	2.547	2.768	1.09	35.13	2.657	0.111
6	0.1486	10.212	10.2	0.4	0.249	2.481	2.730	1.10	36.04	2.606	0.124
7	0.1495	13.434	13.4	0.4	0.348	2.426	2.774	1.14	36.81	2.600	0.174
8	0.1504	14.224	14.2	0.4	0.350	2.380	2.730	1.15	37.45	2.555	0.175
9	0.1513	16.600	16.6	0.4	0.430	2.339	2.769	1.18	38.02	2.554	0.215
10	0.1522	18.783	18.8	0.5	0.487	2.302	2.788	1.21	38.53	2.545	0.243
11	0.1531	20.093	20.1	0.5	0.521	2.266	2.786	1.23	39.03	2.526	0.260
12	0.1549	22.971	23.0	0.5	0.595	2.202	2.797	1.27	39.91	2.500	0.297
13	0.1567	25.182	25.2	0.6	0.652	2.151	2.802	1.30	40.63	2.476	0.326
14	0.1576	26.448	26.4	0.6	0.684	2.122	2.807	1.32	41.02	2.465	0.342
15	0.1585	27.416	27.4	0.6	0.709	2.099	2.808	1.34	41.35	2.453	0.355
16	0.1594	28.585	28.6	0.7	0.739	2.075	2.814	1.36	41.68	2.445	0.370
17	0.1612	30.298	30.3	0.7	0.783	2.034	2.818	1.38	42.24	2.426	0.392
18	0.1621	31.106	31.1	0.7	0.804	2.014	2.818	1.40	42.53	2.416	0.402
19	0.1630	32.029	32.0	0.8	0.827	1.992	2.819	1.42	42.84	2.406	0.414
20	0.1639	32.923	32.9	0.8	0.850	1.975	2.826	1.43	43.06	2.400	0.425

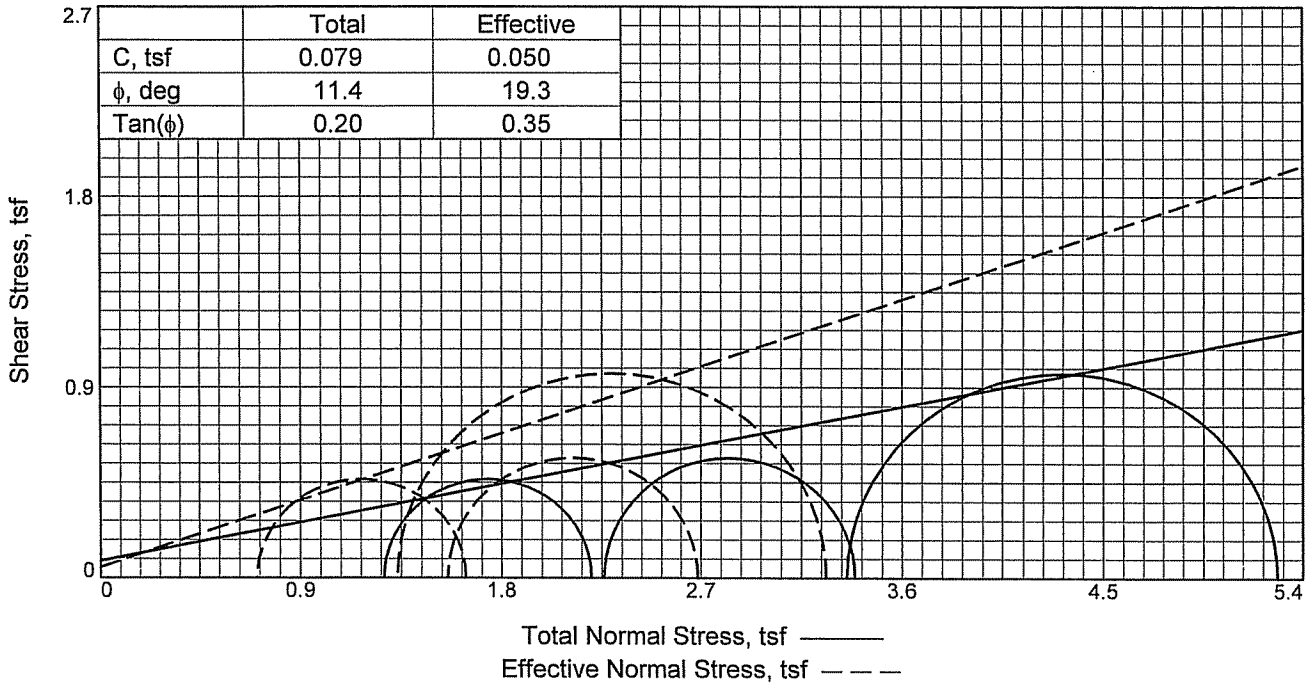
Test Readings for Specimen No. 3

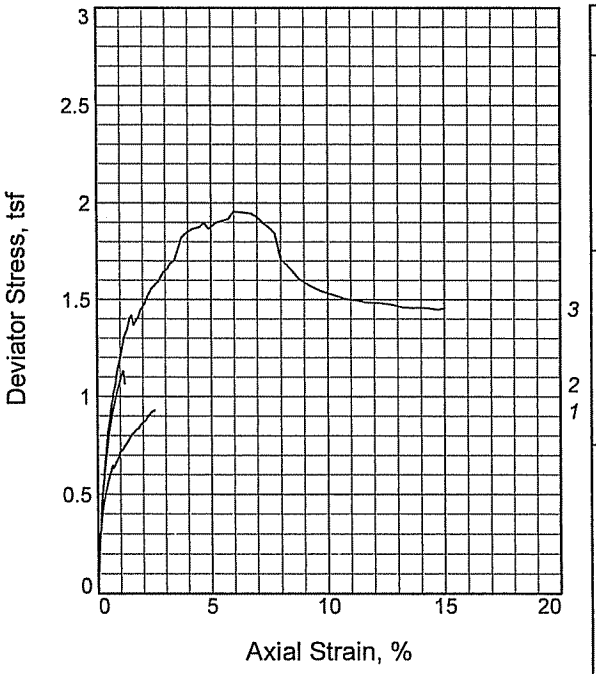
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
21	0.1657	34.627	34.6	0.8	0.894	1.938	2.832	1.46	43.58	2.385	0.447
22	0.1675	35.916	35.9	0.9	0.927	1.906	2.832	1.49	44.03	2.369	0.463
23	0.1684	37.017	37.0	0.9	0.955	1.888	2.843	1.51	44.27	2.366	0.477
24	0.1702	38.557	38.6	1.0	0.994	1.855	2.849	1.54	44.74	2.352	0.497
25	0.1720	39.720	39.7	1.0	1.023	1.825	2.849	1.56	45.15	2.337	0.512
26	0.1729	40.510	40.5	1.0	1.044	1.813	2.856	1.58	45.32	2.334	0.522
27	0.1747	41.821	41.8	1.1	1.077	1.784	2.860	1.60	45.73	2.322	0.538
28	0.1765	42.768	42.8	1.1	1.101	1.761	2.861	1.63	46.05	2.311	0.550
29	0.1783	43.682	43.7	1.2	1.124	1.736	2.859	1.65	46.39	2.298	0.562
30	0.1810	45.356	45.4	1.3	1.166	1.701	2.867	1.69	46.88	2.284	0.583
31	0.1846	46.437	46.4	1.4	1.131	1.662	2.793	1.68	47.42	2.227	0.566
32	0.1882	48.581	48.6	1.5	1.181	1.624	2.804	1.73	47.95	2.214	0.590
33	0.1918	49.920	49.9	1.6	1.209	1.589	2.799	1.76	48.42	2.194	0.605
34	0.1954	50.884	50.9	1.7	1.228	1.557	2.786	1.79	48.87	2.171	0.614
35	0.1990	52.243	52.2	1.8	1.257	1.528	2.785	1.82	49.28	2.156	0.629
36	0.2026	53.303	53.3	1.9	1.279	1.503	2.781	1.85	49.63	2.142	0.639
37	0.2062	54.691	54.7	2.0	1.308	1.477	2.785	1.89	49.99	2.131	0.654
38	0.2098	55.660	55.7	2.1	1.330	1.451	2.781	1.92	50.35	2.116	0.665
39	0.2170	57.956	58.0	2.3	1.385	1.410	2.795	1.98	50.92	2.102	0.693
40	0.2206	59.783	59.8	2.4	1.430	1.391	2.821	2.03	51.19	2.106	0.715
41	0.2242	60.912	60.9	2.5	1.457	1.374	2.831	2.06	51.42	2.102	0.729
42	0.2278	62.329	62.3	2.6	1.492	1.356	2.848	2.10	51.66	2.102	0.746
43	0.2350	63.857	63.9	2.8	1.527	1.317	2.844	2.16	52.21	2.080	0.764
44	0.2458	65.235	65.2	3.1	1.557	1.270	2.827	2.23	52.86	2.048	0.778
45	0.2566	66.780	66.8	3.4	1.591	1.235	2.826	2.29	53.34	2.031	0.795
46	0.2638	67.833	67.8	3.6	1.614	1.209	2.823	2.33	53.70	2.016	0.807
47	0.2746	68.250	68.2	3.9	1.619	1.177	2.796	2.38	54.15	1.987	0.809
48	0.2818	69.461	69.5	4.1	1.646	1.159	2.804	2.42	54.40	1.982	0.823
49	0.2925	70.469	70.5	4.4	1.665	1.132	2.798	2.47	54.77	1.965	0.833
50	0.3033	71.080	71.1	4.7	1.675	1.107	2.782	2.51	55.12	1.945	0.837
51	0.3141	72.243	72.2	5.0	1.787	1.085	2.872	2.65	55.43	1.978	0.894
52	0.3249	72.079	72.1	5.3	1.688	1.064	2.753	2.59	55.72	1.908	0.844
53	0.3339	72.986	73.0	5.5	1.795	1.052	2.847	2.71	55.89	1.950	0.898
54	0.3519	73.650	73.6	6.0	1.802	1.023	2.825	2.76	56.29	1.924	0.901
55	0.3699	72.400	72.4	6.5	1.673	0.999	2.671	2.68	56.63	1.835	0.836
56	0.3879	72.609	72.6	7.0	1.668	0.984	2.652	2.70	56.84	1.818	0.834
57	0.4059	73.271	73.3	7.5	1.675	0.966	2.641	2.73	57.08	1.803	0.837
58	0.4239	73.891	73.9	8.0	1.680	0.955	2.635	2.76	57.24	1.795	0.840
59	0.4419	74.315	74.3	8.5	1.681	0.945	2.626	2.78	57.37	1.786	0.840
60	0.4599	74.822	74.8	9.0	1.683	0.937	2.620	2.80	57.49	1.778	0.841
61	0.4778	75.098	75.1	9.5	1.680	0.925	2.605	2.82	57.65	1.765	0.840
62	0.4958	75.292	75.3	10.0	1.674	0.918	2.592	2.82	57.75	1.755	0.837
63	0.5048	76.995	77.0	10.3	1.798	0.915	2.713	2.97	57.80	1.814	0.899
64	0.5138	78.145	78.1	10.5	1.820	0.912	2.732	3.00	57.83	1.822	0.910
65	0.5318	78.510	78.5	11.0	1.818	0.901	2.720	3.02	57.98	1.811	0.909
66	0.5498	78.831	78.8	11.5	1.816	0.894	2.709	3.03	58.09	1.801	0.908
67	0.5678	78.435	78.4	12.0	1.796	0.889	2.686	3.02	58.15	1.787	0.898

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	0.5768	78.968	79.0	12.3	1.803	0.884	2.687	3.04	58.22	1.786	0.902
69	0.5948	78.286	78.3	12.8	1.688	0.875	2.564	2.93	58.34	1.720	0.844
70	0.6128	78.927	78.9	13.3	1.693	0.867	2.560	2.95	58.46	1.713	0.846
71	0.6308	78.178	78.2	13.8	1.666	0.861	2.526	2.94	58.55	1.694	0.833
72	0.6487	78.650	78.6	14.3	1.666	0.853	2.519	2.95	58.66	1.686	0.833
73	0.6577	77.189	77.2	14.5	1.628	0.851	2.479	2.91	58.69	1.665	0.814
74	0.6667	76.357	76.4	14.8	1.605	0.849	2.454	2.89	58.71	1.651	0.802
75	0.6847	76.072	76.1	15.3	1.589	0.845	2.433	2.88	58.77	1.639	0.794

	Total	Effective
C, tsf	0.079	0.050
ϕ, deg	11.4	19.3
Tan(ϕ)	0.20	0.35





Sample No.		1	2	3
Initial	Water Content, %	58.0	58.0	58.0
	Dry Density, pcf	64.3	64.3	64.3
	Saturation, %	95.4	96.4	96.4
	Void Ratio	1.6715	1.6229	1.6229
	Diameter, in.	2.02	2.02	2.02
	Height, in.	4.11	4.11	4.11
At Test	Water Content, %	41.6	41.6	41.6
	Dry Density, pcf	80.0	79.3	79.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.1453	1.1245	1.1245
	Diameter, in.	1.80	1.84	1.87
	Height, in.	4.14	4.00	3.89
Strain rate, %/min.		0.01	0.0033	0.0043
Back Pressure, tsf		2.20	2.20	2.20
Cell Pressure, tsf		3.47	4.46	5.55
Fail. Stress, tsf		0.93	1.13	1.93
Excess Pore Pr., tsf		0.57	0.70	2.02
Ult. Stress, tsf		0.93	1.07	1.46
Excess Pore Pr., tsf		0.57	0.68	2.06
$\bar{\sigma}_1$ Failure, tsf		1.64	2.69	3.26
$\bar{\sigma}_3$ Failure, tsf		0.71	1.56	1.33

Type of Test:
CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray FAT CLAY; ferrous nodules

Assumed Specific Gravity= 2.75

Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 1.00
Failure type: Slickensided

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA
Contract No. DACW64-03-D-0008, Task Order No. 0077

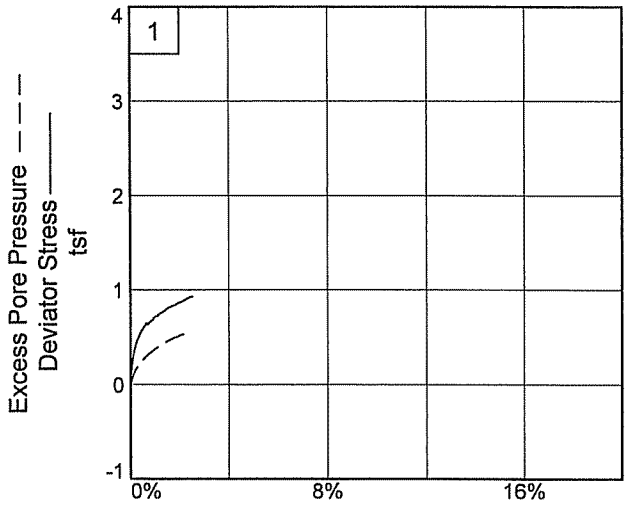
Source of Sample: 07-194 **Depth:** 26-28

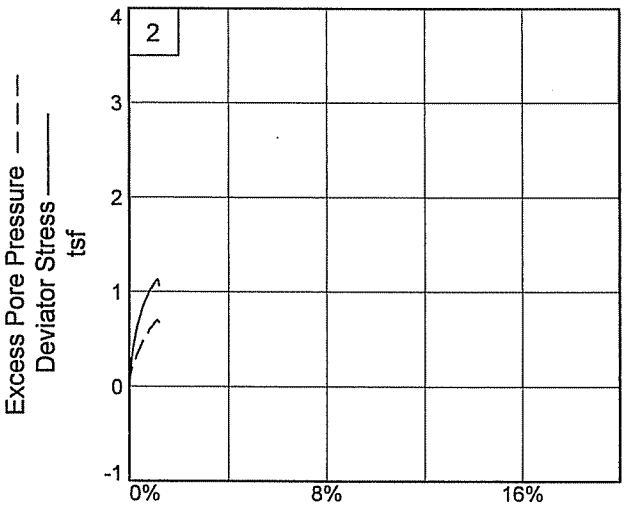
Sample Number: 14

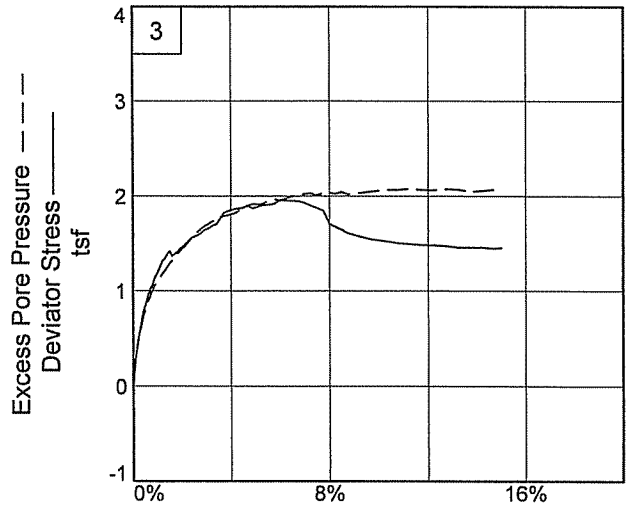
Proj. No.: 08.18.918 **Date Sampled:** 8/20/08

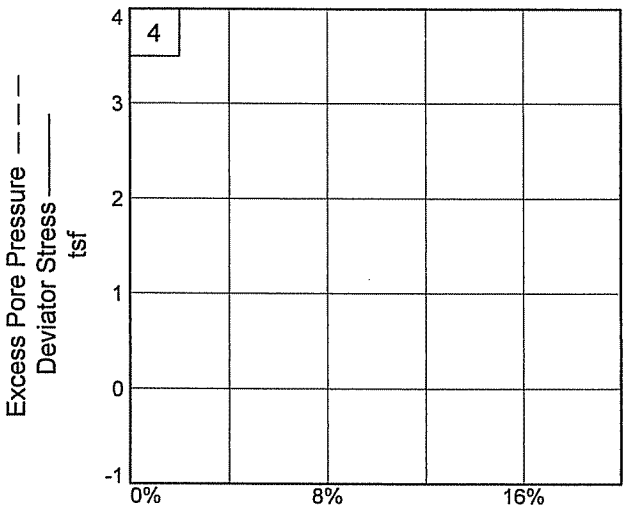
TRIAXIAL SHEAR TEST REPORT

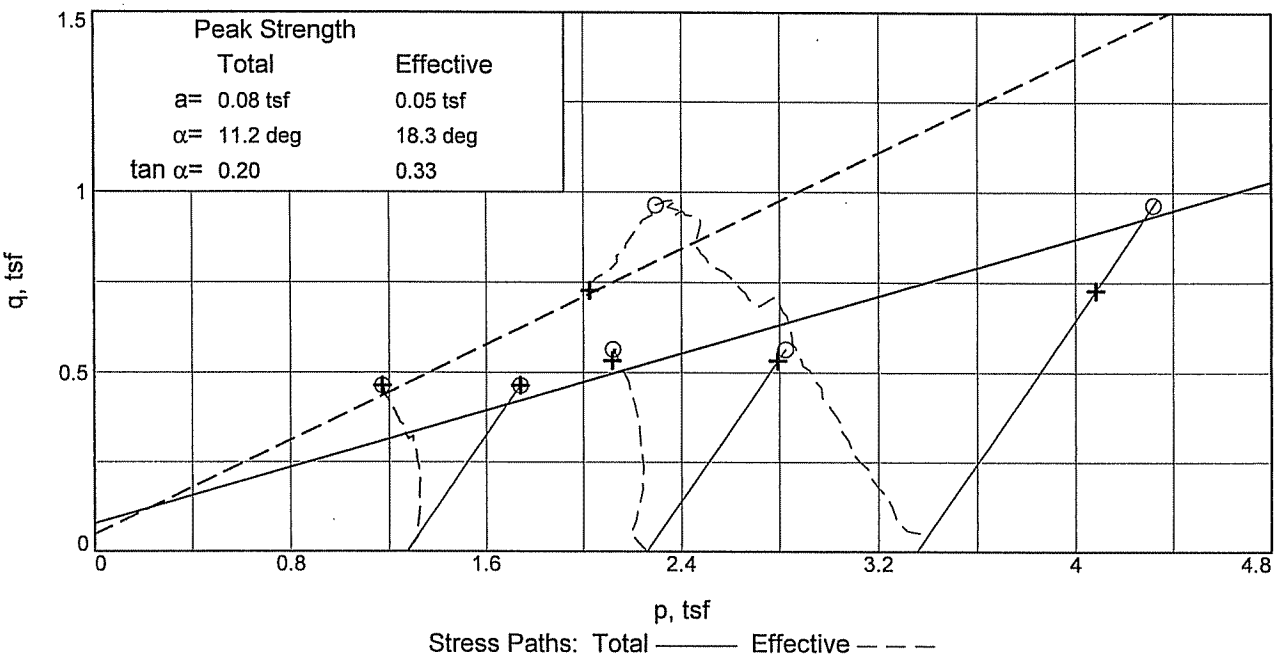
Tolunay-Wong Engineers, Inc.











Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Source of Sample: 07-194 **Depth:** 26-28 **Sample Number:** 14

Project No.: 08.18.918

TOLUNAY-WONG ENGINEERS, INC.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

9/9/2008
10:36 AM

Date: 8/20/08
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: 07-194
Depth: 26-28 **Sample Number:** 14
Description: Gray FAT CLAY; ferrous nodules
Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 1.00
Failure type: Slickensided
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **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.	103.900			111.830
Moisture content: Dry soil+tare, gms.	77.000			87.970
Moisture content: Tare, gms.	30.590			30.680
Moisture, %	58.0	47.5	41.6	41.6
Moist specimen weight, gms.	350.1			
Diameter, in.	2.02	1.85	1.80	
Area, in.^{2}	3.20	2.69	2.55	
Height, in.	4.11	4.21	4.14	
Net decrease in height, in.		-0.10	0.07	
Net decrease in water volume, cc.			13.00	
Wet Density, pcf	101.5	109.8	113.4	
Dry density, pcf	64.3	74.4	80.0	
Void ratio	1.6715	1.3066	1.1453	
Saturation, %	95.4	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 = 48.20 psi (3.470 tsf)
Consolidation back pressure = 30.50 psi (2.196 tsf)
Consolidation effective confining stress = 1.274 tsf
Strain rate, %/min. = 0.01
Fail. Stress = 0.929 tsf **at reading no.** 48
Ult. Stress = 0.929 tsf **at reading no.** 48

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	-0.1345	0.000	0.0	0.0	0.000	1.276	1.276	1.00	30.48	1.276	0.000
1	-0.1344	0.000	0.0	0.0	0.000	1.276	1.276	1.00	30.48	1.276	0.000
2	-0.1343	2.983	3.0	0.0	0.084	1.276	1.360	1.07	30.48	1.318	0.042
3	-0.1332	5.479	5.5	0.0	0.155	1.242	1.396	1.12	30.95	1.319	0.077
4	-0.1322	7.581	7.6	0.1	0.214	1.219	1.433	1.18	31.28	1.326	0.107
5	-0.1312	9.052	9.1	0.1	0.256	1.198	1.454	1.21	31.56	1.326	0.128
6	-0.1301	10.344	10.3	0.1	0.292	1.180	1.472	1.25	31.81	1.326	0.146
7	-0.1291	11.365	11.4	0.1	0.321	1.165	1.485	1.28	32.02	1.325	0.160
8	-0.1281	12.552	12.6	0.2	0.354	1.150	1.504	1.31	32.23	1.327	0.177
9	-0.1270	13.393	13.4	0.2	0.378	1.137	1.515	1.33	32.40	1.326	0.189
10	-0.1260	14.370	14.4	0.2	0.405	1.125	1.531	1.36	32.57	1.328	0.203
11	-0.1249	15.147	15.1	0.2	0.427	1.114	1.541	1.38	32.73	1.327	0.214
12	-0.1239	15.811	15.8	0.3	0.446	1.102	1.548	1.40	32.89	1.325	0.223
13	-0.1229	16.560	16.6	0.3	0.467	1.091	1.557	1.43	33.05	1.324	0.233
14	-0.1218	17.196	17.2	0.3	0.484	1.081	1.565	1.45	33.19	1.323	0.242
15	-0.1208	17.639	17.6	0.3	0.497	1.071	1.568	1.46	33.32	1.320	0.248
16	-0.1198	18.143	18.1	0.4	0.511	1.062	1.573	1.48	33.44	1.318	0.255
17	-0.1187	18.549	18.5	0.4	0.522	1.055	1.577	1.49	33.55	1.316	0.261
18	-0.1177	19.049	19.0	0.4	0.536	1.047	1.583	1.51	33.66	1.315	0.268
19	-0.1156	20.021	20.0	0.5	0.563	1.032	1.595	1.55	33.87	1.314	0.282
20	-0.1135	20.676	20.7	0.5	0.581	1.016	1.597	1.57	34.09	1.307	0.291
21	-0.1125	21.158	21.2	0.5	0.595	1.008	1.603	1.59	34.20	1.306	0.297
22	-0.1115	21.587	21.6	0.6	0.607	1.001	1.608	1.61	34.29	1.305	0.303
23	-0.1094	22.121	22.1	0.6	0.621	0.989	1.610	1.63	34.47	1.300	0.311
24	-0.1084	22.631	22.6	0.6	0.635	0.983	1.618	1.65	34.55	1.301	0.318
25	-0.1073	23.064	23.1	0.7	0.647	0.976	1.623	1.66	34.64	1.300	0.324
26	-0.1052	23.695	23.7	0.7	0.631	0.965	1.596	1.65	34.79	1.280	0.315
27	-0.1042	24.212	24.2	0.7	0.644	0.959	1.603	1.67	34.88	1.281	0.322
28	-0.1032	24.186	24.2	0.8	0.642	0.953	1.594	1.67	34.97	1.274	0.321
29	-0.1021	24.594	24.6	0.8	0.652	0.946	1.598	1.69	35.06	1.272	0.326
30	-0.1001	25.260	25.3	0.8	0.667	0.935	1.603	1.71	35.21	1.269	0.334
31	-0.0980	25.695	25.7	0.9	0.677	0.925	1.602	1.73	35.36	1.263	0.338
32	-0.0959	26.205	26.2	0.9	0.688	0.917	1.605	1.75	35.47	1.261	0.344
33	-0.0949	26.663	26.7	1.0	0.700	0.913	1.613	1.77	35.51	1.263	0.350
34	-0.0928	27.274	27.3	1.0	0.714	0.900	1.614	1.79	35.70	1.257	0.357
35	-0.0887	27.908	27.9	1.1	0.726	0.883	1.609	1.82	35.94	1.246	0.363
36	-0.0845	28.901	28.9	1.2	0.748	0.865	1.613	1.86	36.19	1.239	0.374
37	-0.0804	29.664	29.7	1.3	0.764	0.848	1.612	1.90	36.42	1.230	0.382
38	-0.0763	30.589	30.6	1.4	0.784	0.835	1.619	1.94	36.60	1.227	0.392
39	-0.0721	31.446	31.4	1.5	0.802	0.817	1.619	1.98	36.85	1.218	0.401
40	-0.0680	32.156	32.2	1.6	0.816	0.805	1.621	2.01	37.03	1.213	0.408
41	-0.0638	32.833	32.8	1.7	0.829	0.791	1.620	2.05	37.21	1.206	0.415
42	-0.0597	33.301	33.3	1.8	0.836	0.779	1.616	2.07	37.38	1.197	0.418
43	-0.0556	34.154	34.2	1.9	0.854	0.772	1.626	2.11	37.48	1.199	0.427
44	-0.0514	34.764	34.8	2.0	0.866	0.756	1.622	2.14	37.69	1.189	0.433
45	-0.0473	35.147	35.1	2.1	0.875	0.747	1.623	2.17	37.82	1.185	0.438
46	-0.0431	35.832	35.8	2.2	0.893	0.736	1.629	2.21	37.98	1.182	0.447

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
47	-0.0349	36.930	36.9	2.4	0.921	0.718	1.640	2.28	38.22	1.179	0.461
48	-0.0306	37.237	37.2	2.5	0.929	0.709	1.638	2.31	38.35	1.173	0.464

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	103.900			111.830
Moisture content: Dry soil+tare, gms.	77.000			87.970
Moisture content: Tare, gms.	30.590			30.680
Moisture, %	58.0	52.8	41.6	41.6
Moist specimen weight, gms.	350.1			
Diameter, in.	2.02	1.92	1.84	
Area, in.²	3.20	2.89	2.66	
Height, in.	4.11	4.21	4.00	
Net decrease in height, in.		-0.10	0.21	
Net decrease in water volume, cc.			24.80	
Wet Density, pcf	101.5	106.2	112.4	
Dry density, pcf	64.3	69.5	79.3	
Void ratio	1.6229	1.4266	1.1245	
Saturation, %	96.4	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 = 61.90 psi (4.457 tsf)
Consolidation back pressure = 30.50 psi (2.196 tsf)
Consolidation effective confining stress = 2.261 tsf
Strain rate, %/min. = 0.0033
Fail. Stress = 1.129 tsf **at reading no.** 17
Ult. Stress = 1.066 tsf **at reading no.** 19

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	0.0036	0.000	0.0	0.0	0.000	2.261	2.261	1.00	30.50	2.261	0.000
1	0.0046	3.600	3.6	0.0	0.097	2.143	2.241	1.05	32.13	2.192	0.049
2	0.0056	6.311	6.3	0.0	0.171	2.130	2.300	1.08	32.32	2.215	0.085
3	0.0066	8.714	8.7	0.1	0.236	2.105	2.340	1.11	32.67	2.223	0.118
4	0.0076	10.899	10.9	0.1	0.295	2.087	2.381	1.14	32.92	2.234	0.147
5	0.0087	12.946	12.9	0.1	0.350	2.068	2.418	1.17	33.17	2.243	0.175
6	0.0097	14.495	14.5	0.2	0.391	2.043	2.435	1.19	33.52	2.239	0.196
7	0.0107	16.115	16.1	0.2	0.435	2.027	2.462	1.21	33.75	2.244	0.218
8	0.0118	17.659	17.7	0.2	0.477	2.008	2.485	1.24	34.01	2.246	0.238
9	0.0159	22.874	22.9	0.3	0.617	1.924	2.541	1.32	35.17	2.233	0.308
10	0.0200	26.624	26.6	0.4	0.717	1.869	2.586	1.38	35.95	2.227	0.359
11	0.0241	30.404	30.4	0.5	0.818	1.802	2.620	1.45	36.88	2.211	0.409
12	0.0282	33.066	33.1	0.6	0.889	1.749	2.637	1.51	37.61	2.193	0.444
13	0.0323	35.280	35.3	0.7	0.947	1.713	2.660	1.55	38.11	2.186	0.474
14	0.0364	37.538	37.5	0.8	1.007	1.661	2.668	1.61	38.83	2.164	0.504

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
15	0.0405	39.023	39.0	0.9	1.046	1.630	2.676	1.64	39.26	2.153	0.523
16	0.0447	40.774	40.8	1.0	1.092	1.592	2.684	1.69	39.79	2.138	0.546
17	0.0488	42.217	42.2	1.1	1.129	1.558	2.687	1.72	40.27	2.122	0.565
18	0.0500	42.212	42.2	1.2	1.129	1.569	2.698	1.72	40.10	2.134	0.564
19	0.0522	42.009	42.0	1.2	1.066	1.585	2.651	1.67	39.88	2.118	0.533

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	103.900			111.830
Moisture content: Dry soil+tare, gms.	77.000			87.970
Moisture content: Tare, gms.	30.590			30.680
Moisture, %	58.0	55.3	41.6	41.6
Moist specimen weight, gms.	350.1			
Diameter, in.	2.02	1.94	1.87	
Area, in.²	3.20	2.97	2.74	
Height, in.	4.11	4.21	3.89	
Net decrease in height, in.		-0.10	0.32	
Net decrease in water volume, cc.			30.30	
Wet Density, pcf	101.5	105.0	112.4	
Dry density, pcf	64.3	67.6	79.3	
Void ratio	1.6229	1.4936	1.1245	
Saturation, %	96.4	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 = 77.10 psi (5.551 tsf)

Consolidation back pressure = 30.50 psi (2.196 tsf)

Consolidation effective confining stress = 3.355 tsf

Strain rate, %/min. = 0.0043

Fail. Stress = 1.928 tsf **at reading no.** 62

Ult. Stress = 1.455 tsf **at reading no.** 82

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	0.0702	0.000	0.0	0.0	0.000	3.356	3.356	1.00	30.49	3.356	0.000
1	0.0703	0.000	0.0	0.0	0.000	3.356	3.356	1.00	30.49	3.356	0.000
2	0.0704	3.539	3.5	0.0	0.093	3.356	3.449	1.03	30.49	3.402	0.047
3	0.0714	4.429	4.4	0.0	0.116	3.261	3.377	1.04	31.82	3.319	0.058
4	0.0723	6.750	6.7	0.1	0.177	3.185	3.362	1.06	32.86	3.274	0.089
5	0.0733	9.400	9.4	0.1	0.247	3.133	3.380	1.08	33.59	3.256	0.124
6	0.0743	11.981	12.0	0.1	0.315	3.072	3.387	1.10	34.43	3.229	0.157
7	0.0752	13.832	13.8	0.1	0.363	3.016	3.379	1.12	35.21	3.198	0.182
8	0.0762	15.583	15.6	0.2	0.409	2.968	3.377	1.14	35.88	3.172	0.205
9	0.0772	17.240	17.2	0.2	0.453	2.939	3.391	1.15	36.29	3.165	0.226
10	0.0782	18.620	18.6	0.2	0.489	2.894	3.383	1.17	36.91	3.138	0.244
11	0.0791	19.930	19.9	0.2	0.523	2.851	3.374	1.18	37.50	3.113	0.261

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
12	0.0801	21.199	21.2	0.3	0.556	2.817	3.373	1.20	37.98	3.095	0.278
13	0.0811	22.061	22.1	0.3	0.579	2.800	3.379	1.21	38.21	3.090	0.289
14	0.0821	23.868	23.9	0.3	0.626	2.763	3.389	1.23	38.72	3.076	0.313
15	0.0830	25.244	25.2	0.3	0.662	2.726	3.388	1.24	39.24	3.057	0.331
16	0.0840	26.362	26.4	0.4	0.691	2.697	3.388	1.26	39.64	3.043	0.345
17	0.0850	27.456	27.5	0.4	0.719	2.686	3.405	1.27	39.79	3.046	0.360
18	0.0859	28.865	28.9	0.4	0.756	2.652	3.408	1.29	40.26	3.030	0.378
19	0.0879	30.960	31.0	0.5	0.810	2.597	3.407	1.31	41.04	3.002	0.405
20	0.0898	32.255	32.3	0.5	0.844	2.563	3.407	1.33	41.51	2.985	0.422
21	0.0908	33.117	33.1	0.5	0.866	2.537	3.403	1.34	41.87	2.970	0.433
22	0.0927	35.046	35.0	0.6	0.916	2.511	3.428	1.36	42.22	2.970	0.458
23	0.0947	36.790	36.8	0.6	0.961	2.458	3.420	1.39	42.96	2.939	0.481
24	0.0966	37.922	37.9	0.7	0.990	2.440	3.430	1.41	43.22	2.935	0.495
25	0.0976	38.849	38.8	0.7	1.014	2.414	3.429	1.42	43.57	2.921	0.507
26	0.0995	39.832	39.8	0.8	1.040	2.375	3.415	1.44	44.11	2.895	0.520
27	0.1015	40.978	41.0	0.8	1.069	2.354	3.423	1.45	44.40	2.889	0.534
28	0.1025	41.867	41.9	0.8	1.092	2.333	3.425	1.47	44.70	2.879	0.546
29	0.1034	42.702	42.7	0.9	1.113	2.315	3.429	1.48	44.95	2.872	0.557
30	0.1054	43.789	43.8	0.9	1.141	2.294	3.435	1.50	45.24	2.865	0.571
31	0.1073	44.734	44.7	1.0	1.165	2.269	3.434	1.51	45.59	2.851	0.583
32	0.1093	45.767	45.8	1.0	1.191	2.256	3.447	1.53	45.77	2.851	0.596
33	0.1132	48.238	48.2	1.1	1.255	2.214	3.469	1.57	46.35	2.841	0.627
34	0.1170	50.540	50.5	1.2	1.313	2.172	3.485	1.60	46.93	2.829	0.657
35	0.1209	51.648	51.6	1.3	1.341	2.142	3.482	1.63	47.35	2.812	0.670
36	0.1248	53.665	53.7	1.4	1.391	2.101	3.493	1.66	47.92	2.797	0.696
37	0.1287	54.711	54.7	1.5	1.417	2.069	3.486	1.68	48.36	2.778	0.709
38	0.1326	55.654	55.7	1.6	1.368	2.034	3.401	1.67	48.85	2.718	0.684
39	0.1365	56.742	56.7	1.7	1.390	1.997	3.386	1.70	49.37	2.691	0.695
40	0.1404	57.615	57.6	1.8	1.406	1.971	3.377	1.71	49.73	2.674	0.703
41	0.1442	59.259	59.3	1.9	1.443	1.939	3.382	1.74	50.17	2.660	0.721
42	0.1481	60.172	60.2	2.0	1.460	1.913	3.373	1.76	50.53	2.643	0.730
43	0.1520	61.054	61.1	2.1	1.481	1.888	3.370	1.78	50.87	2.629	0.741
44	0.1559	62.347	62.3	2.2	1.513	1.855	3.368	1.82	51.33	2.612	0.757
45	0.1637	64.227	64.2	2.4	1.558	1.795	3.353	1.87	52.16	2.574	0.779
46	0.1753	65.910	65.9	2.7	1.596	1.717	3.313	1.93	53.25	2.515	0.798
47	0.1831	67.719	67.7	2.9	1.639	1.680	3.318	1.98	53.77	2.499	0.819
48	0.1909	68.765	68.8	3.1	1.662	1.648	3.310	2.01	54.21	2.479	0.831
49	0.1948	69.738	69.7	3.2	1.685	1.628	3.313	2.03	54.49	2.470	0.842
50	0.2025	70.572	70.6	3.4	1.702	1.604	3.306	2.06	54.82	2.455	0.851
51	0.2142	71.826	71.8	3.7	1.819	1.568	3.387	2.16	55.32	2.478	0.909
52	0.2220	72.900	72.9	3.9	1.842	1.556	3.398	2.18	55.49	2.477	0.921
53	0.2336	74.052	74.1	4.2	1.866	1.532	3.398	2.22	55.82	2.465	0.933
54	0.2453	74.649	74.6	4.5	1.875	1.479	3.353	2.27	56.56	2.416	0.937
55	0.2530	75.709	75.7	4.7	1.897	1.456	3.354	2.30	56.87	2.405	0.949
56	0.2608	74.658	74.7	4.9	1.867	1.438	3.305	2.30	57.12	2.372	0.934
57	0.2744	76.216	76.2	5.3	1.899	1.442	3.341	2.32	57.07	2.391	0.950
58	0.2938	77.320	77.3	5.8	1.916	1.386	3.302	2.38	57.85	2.344	0.958

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
59	0.3036	79.127	79.1	6.0	1.956	1.407	3.363	2.39	57.56	2.385	0.978
60	0.3230	79.302	79.3	6.5	1.950	1.355	3.305	2.44	58.28	2.330	0.975
61	0.3327	79.314	79.3	6.8	1.945	1.360	3.305	2.43	58.21	2.333	0.972
62	0.3424	78.852	78.9	7.0	1.928	1.333	3.261	2.45	58.59	2.297	0.964
63	0.3521	77.897	77.9	7.3	1.900	1.324	3.224	2.43	58.71	2.274	0.950
64	0.3618	77.042	77.0	7.5	1.874	1.348	3.222	2.39	58.37	2.285	0.937
65	0.3716	76.016	76.0	7.8	1.844	1.321	3.165	2.40	58.76	2.243	0.922
66	0.3813	74.315	74.3	8.0	1.708	1.319	3.027	2.29	58.78	2.173	0.854
67	0.3910	73.306	73.3	8.3	1.678	1.332	3.010	2.26	58.60	2.171	0.839
68	0.4007	72.204	72.2	8.5	1.647	1.312	2.959	2.26	58.88	2.136	0.823
69	0.4104	70.869	70.9	8.8	1.610	1.334	2.944	2.21	58.57	2.139	0.805
70	0.4298	69.683	69.7	9.3	1.573	1.323	2.896	2.19	58.72	2.110	0.786
71	0.4493	68.839	68.8	9.8	1.543	1.305	2.848	2.18	58.98	2.076	0.772
72	0.4687	68.447	68.4	10.3	1.525	1.289	2.814	2.18	59.20	2.052	0.763
73	0.4881	67.938	67.9	10.8	1.504	1.288	2.792	2.17	59.21	2.040	0.752
74	0.5076	67.957	68.0	11.3	1.496	1.277	2.773	2.17	59.36	2.025	0.748
75	0.5270	67.837	67.8	11.8	1.484	1.288	2.772	2.15	59.21	2.030	0.742
76	0.5464	68.155	68.2	12.3	1.482	1.291	2.773	2.15	59.18	2.032	0.741
77	0.5659	68.187	68.2	12.8	1.474	1.283	2.757	2.15	59.28	2.020	0.737
78	0.5853	67.926	67.9	13.3	1.459	1.286	2.745	2.13	59.24	2.015	0.730
79	0.6047	68.224	68.2	13.8	1.457	1.308	2.765	2.11	58.93	2.037	0.729
80	0.6241	68.654	68.7	14.3	1.458	1.297	2.755	2.12	59.08	2.026	0.729
81	0.6436	68.627	68.6	14.8	1.448	1.284	2.732	2.13	59.27	2.008	0.724
82	0.6540	69.171	69.2	15.0	1.455	1.299	2.754	2.12	59.06	2.026	0.728

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
	13	24-26	Tan and gray FAT CLAY; organics	CH	56.6	62.9									
	14	26-28	Gray and tan LEAN CLAY	CL	34.7	82.0									
	15	28-30	Dark gray and gray FAT CLAY	CH	34.0	88.0	115	32	83	99.9		0.70	10.2		Vertical shear
	16	30-32	Gray and tan SANDY LEAN CLAY	CL	23.0	93.5									
	17	32-33.5	Gray and tan SILTY SAND; shell fragments	SM											
	18	34.5-36	Gray and tan CLAYEY SAND; shell fragments	SC	30.1		42	19	23	48.4					
	19	36-38	Gray and tan CLAYEY SAND; shell fragments	SC	24.1	101.0									
	20	38.5-40	Gray and tan CLAYEY SAND; shell fragments	SC						19.8					
	21	43-45	Gray and tan CLAYEY SAND; shell fragments	SC						16.7					
	22	46-48	Gray LEAN CLAY with SAND	CL	46.8	73.5	46	22	24						
	23	48-50	Gray and tan SANDY LEAN CLAY	CL	33.8		46	19	27	69.4					
07-193															
	1	0-2	Brown FAT CLAY; ferrous nodules and grass roots	CH	15.7	105.5									
	2	2-4	Brown and gray FAT CLAY; sand seams	CH	32.7	86.7									
	3	4-6	Tan and gray FAT CLAY with SAND; ferrous nodules	CH	29.0										
	4	6-8	Brown and gray SANDY FAT CLAY	CH	28.3	84.5	69	23	46	58.6		0.44	5.6		Multiple shear
	5	8-10	Brown and gray FAT CLAY with SAND; calcareous nodules	CH	35.0	86.3									
	6	10-12	Tan and gray FAT CLAY	CH	38.5	80.1	75	24	51	94.3		0.45	5.6		Multiple shear
	7	12-14	Brown and gray FAT CLAY with SAND; calcareous nodules	CH	35.7	81.8									
	8	14-16	Brown and gray FAT CLAY; sand seams	CH	34.8	83.4	72	24	48	90.6		0.33	6.2		60 degree
	9	16-18	Gray and tan FAT CLAY with SAND	CH	32.7	85.4									
	10	18-20	Brown and gray FAT CLAY; sand seams	CH	47.5	75.8									
	11	20-22	Gray and brown FAT CLAY with SAND	CH	39.9	80.6	68	23	45	80.7	0.00	0.37	10.7		Multiple shear
	12	22-23.5	Gray and tan SILTY SAND; shell fragments	SM						13.6					
	13	26-28	Gray FAT CLAY; sand seams and ferrous nodules	CH	33.1	77.6									
	14	28-30	Gray and tan FAT CLAY; sand seams	CH	37.5	75.1	83	24	59	86.3		0.48	5.7		Bulge
	15	30-32	Gray LEAN CLAY; sand pockets	CL	54.8	64.3									
	16	32-34	Dark gray FAT CLAY; sand seams	CH	56.2	64.4									
	17	34.5-36	Tan and gray CLAYEY SAND; shell fragments	SC	40.9										
	18	36-38	Dark gray and tan LEAN CLAY; sand pockets	CL	34.6	85.9									
	19	38-40	Gray FAT CLAY with SAND	CH	40.7	77.4	67	24	43	77.5		0.62	9.1		Bulge
	20	40-42	Gray SILTY CLAYEY SAND; shell fragments	SC-SM	29.2										
	21	42-44	Gray and tan SANDY FAT CLAY	CH	44.2		52	20	32	61.1					
	22	44-46	Gray CLAYEY SAND	SC	26.6	90.2									
	23	46-48	Gray SANDY LEAN CLAY	CL	39.4	75.3						0.56	8.2	28.5	Bulge
	24	48-50	Gray SANDY LEAN CLAY; shell fragments	CL	37.3		42	20	22	61.4					
07-194															

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
	1	0-2	Brown and gray FAT CLAY; ferrous nodules	CH	34.7	85.1									
	2	2-4	Gray and brown FAT CLAY	CH	36.8	80.1									
	3	4-6	Gray and brown FAT CLAY; sand seams and ferrous nodules	CH	48.1	69.6									
	4	6-8	Gray FAT CLAY	CH	59.0	63.8	75	24	51	90.3		0.28	5.0	6.0	Bulge
	5	8-10	Gray and brown FAT CLAY	CH	53.5	64.7									
	6	10-12	Gray FAT CLAY; ferrous nodules	CH	45.2	72.4									
	7	12-14	Gray FAT CLAY; ferrous nodules	CH	58.6	63.5						0.25	1.9		Vertical shear
	8	14-16	Gray FAT CLAY	CH	66.1	61.3	89	25	64	90.1					
	9	16-18	Gray and brown FAT CLAY; sand seams	CH	40.8	78.3									
	10	18-20	Gray FAT CLAY with SAND	CH	75.9	54.3									
	11	20-22	Gray and tan FAT CLAY; ferrous nodules	CH	61.8	58.7	97	24	73	92.3		0.59	4.5		45 degree
	12	22-24	Gray and tan FAT CLAY	CH	40.5	72.8						0.66	4.7		60 degree
	13	24-26	Gray FAT CLAY	CH	48.6	68.9	100	28	72	98.9					
	14	26-28	Gray FAT CLAY; ferrous nodules	CH	53.1	65.9									
	15	28-30	Brown and gray FAT CLAY; ferrous nodules	CH	46.5	71.2									
	16	30-32	Gray and brown FAT CLAY; ferrous nodules	CH	50.8	64.8	116	30	86	96.5		0.76	3.5		Slickensided
	17	32-34	Gray FAT CLAY	CH	65.0	58.3									
	18	34-35.5	Gray and tan CLAYEY SAND; shell fragments	SC											
	19	36-38	Gray SANDY LEAN CLAY; shell fragments	CL	28.2	95.9									
	20	38-40	Gray and tan SANDY LEAN CLAY	CL	36.2	80.5	46	17	29	57.3		0.35	10.6		Bulge
	21	40-42	Gray FAT CLAY; sand pockets	CH	47.1	78.0									
	22	42-44	Gray FAT CLAY; sand seams	CH	47.6	70.1									
	23	44-46	Gray SANDY LEAN CLAY	CL	40.9	77.7	48	20	28	57.1		0.20	5.5		Vertical shear
	24	46-48	Gray FAT CLAY	CH	47.9	66.0	90	28	62	93.3		0.25	4.9		Multiple shear
	25	48-50	Gray FAT CLAY; sand seams and shell fragments	CH	37.5	76.8									
07-195															
	1	0-2	Gray and tan FAT CLAY; calcareous nodules and grass roots	CH	24.0	98.2									
	2	2-4	Gray and tan FAT CLAY	CH	32.0	84.3									
	3	4-6	Gray and tan FAT CLAY; ferrous nodules	CH	54.4	66.4	89	24	65	93.6		0.57	3.2		Slickensided
	4	6-8	Gray and tan FAT CLAY	CH	42.0	76.9									
	5	8-10	Gray and tan FAT CLAY; calcareous and ferrous nodules	CH	45.0	76.6									
	6	10-12	Reddish-brown and gray FAT CLAY	CH	41.8	75.8	87	24	63	95.7		0.29	0.9	9.0	60 degree
	7	12-14	Gray and tan FAT CLAY; calcareous nodules	CH	53.4	68.5									
	8	14-15.5	Tan and gray LEAN CLAY; shell deposits	CL	46.9										
	9	15.5-17.5	Gray FAT CLAY; shell fragments	CH	64.3	58.7	101	29	72	98.3		0.23	12.7		Multiple shear
	10	17.5-19.5	Gray and tan FAT CLAY	CH	45.4	73.2									