Hole No. 07-192

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=13695590 E=3306279	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 firm, gray -w/ grass roots @ 0' - 2'		1			1.25	82.8	30.9				
					2			1.00	60.2	66.0				
5					3			0.00	57.2	65.6	95	28	67	98
					4			0.25	66.9	52.3				
					5			0.50	57.0	74.7				
10					6			0.50	69.8	48.7	101	29	72	99.4
					7			0.50	60.6	67.8				
15			-w/ ferrous nodules @ 14' - 16'		8			0.25	56.0	71.4				
			-gray & tan @ 16' - 18'		9			0.00	56.4	65.5	112	30	82	99.7
			SANDY LEAN CLAY(CL), soft to stiff, gray & tan		10			0.50	70.9	58.7				
20			-gray w/ silt seams @ 20' - 22'		11			1.50	100.1	24.0				
			FAT CLAY(CH), very soft, gray, w/ silt seams		12			0.00	79.8	40.6	63	24	39	92.7
25			-tan & gray w/ organics @ 24' - 26'		13			0.25	62.9	56.6				
			LEAN CLAY(CL), soft, gray & tan		14			0.50	82.0	34.7				
			FAT CLAY(CH), very soft, dark gray & gray, w/ silt & sand seams		15			0.25	88.0	34.0	115	32	83	99.9
30			**SANDY LEAN CLAY(CL)**, very soft, gray & tan -w/ sand seams @ 31' - 32'		16			0.25	93.5	23.0				
			SILTY SAND(SM), very loose, tan & gray, w/ shell fragments		17		3							
			CLAYEY SAND(SC), very loose to medium		18		WOP			30.1	42	19	23	48.4

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

ENG FORM: SWG 1836 BOR

Hole No. 07-192

BORING LOG	DISTRICT	INSTALLATION	SHEET 2 OF 2 SHEETS

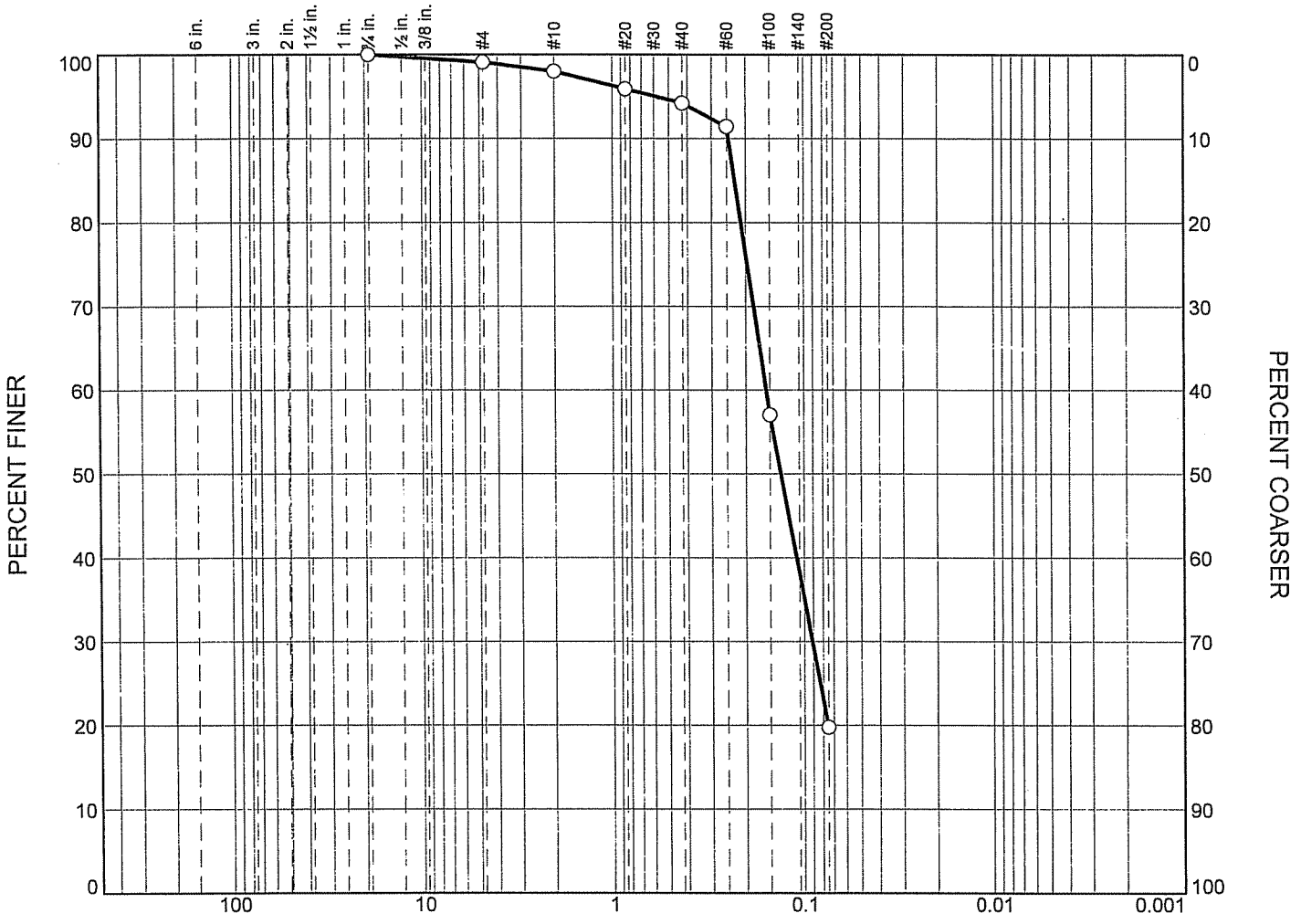
1. PROJECT Galveston Channel and Pelican Island PA	7. ELEVATION OF HOLE
2. LOCATION (Coordinates or Station) N=13695590 E=3306279	8. DATUM FOR ELEVATION
3. DRILLING AGENCY Dempsey (Geotest Engineering, Inc.)	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, 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)
			dense, tan & gray, w/ shell fragments -w/ sand seams @ 34' - 34.5' -w/ shell fragments @ 36' - 38'		19			0.75	101	24.1				
			-w/ clay seams @ 38' - 40' -w/ shell fragments below 38'		20		7							19.8
40														
					21		15							16.7
45			**LEAN CLAY WITH SAND(CL)**, very soft, gray, w/ sand seams		22			0.25	73.5	46.8	46	22	24	
			SANDY LEAN CLAY(CL), very soft, gray & tan, w/ sand seams		23			0.25		33.8	46	19	27	69.4
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	0.9	1.1	3.8	74.4	19.8	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	07-192		38.5-40	Gray and tan CLAYEY SAND; shell fragments	SC

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: United States Army Corps of Engineers

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

Project No.: 08.18.918

GRAIN SIZE DISTRIBUTION TEST DATA

7/22/2008

Client: United States Army Corps of Engineers
Project: Galveston Channel and Pelican Island PA
Contract No. DACW64-03-D-0008, Task Order No. 0077
Project Number: 08.18.918
Location: 07-192
Depth: 38.5-40
Material Description: Gray and tan CLAYEY SAND; shell fragments
USCS: SC

Sieve Test Data

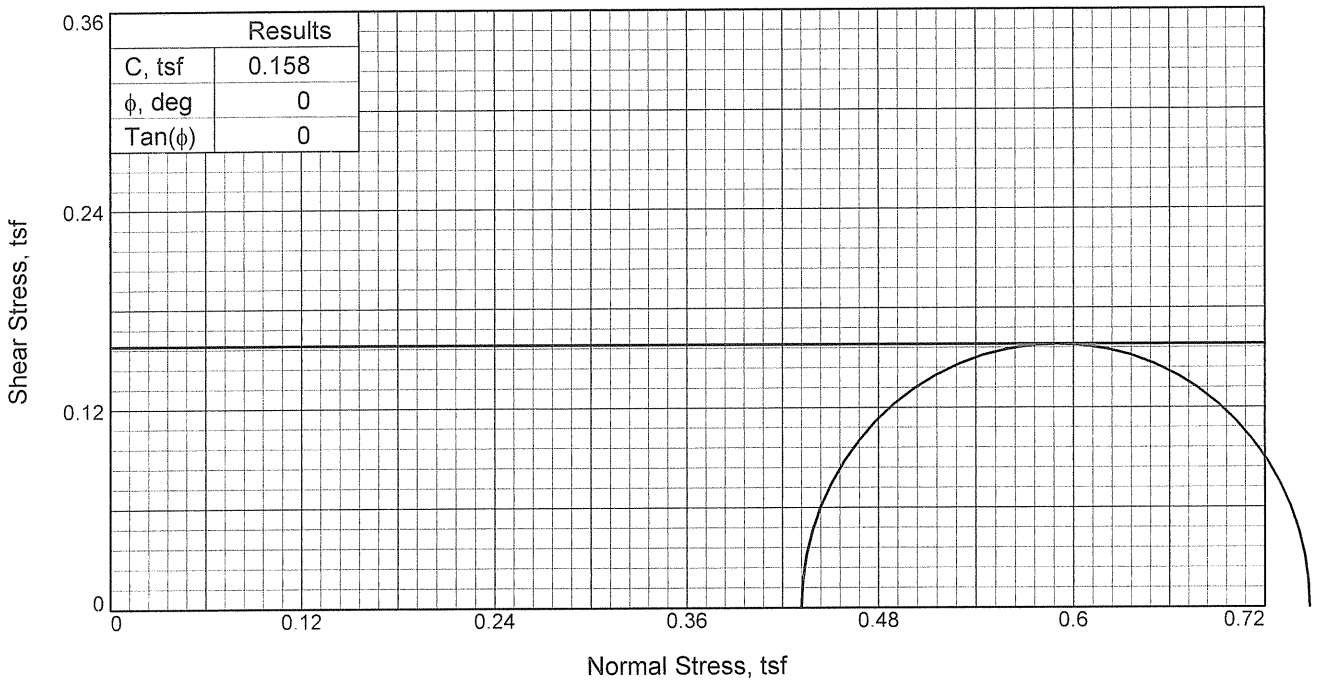
Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
278.12	182.27	182.27	3"		
			0.75"	182.27	100.0
			#4	183.16	99.1
			#10	184.20	98.0
			#20	186.21	95.9
			#40	187.81	94.2
			#60	190.49	91.4
			#100	223.49	57.0
			#200	259.16	19.8

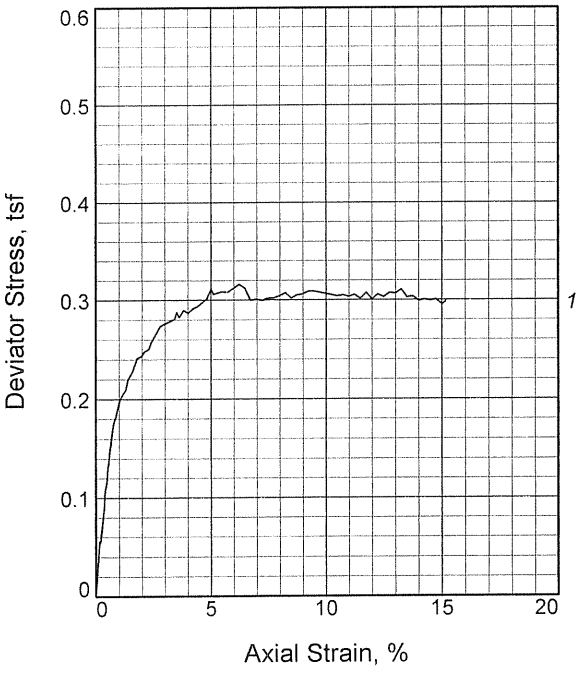
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.9	0.9	1.1	3.8	74.4	79.3			19.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0753	0.0907	0.1317	0.1568	0.2110	0.2273	0.2448	0.5875

Fineness Modulus
0.62





Sample No.		1
Initial	Water Content, %	52.3
	Dry Density, pcf	66.9
	Saturation, %	92.9
	Void Ratio	1.5189
	Diameter, in.	2.75
	Height, in.	5.98
At Test	Water Content, %	50.7
	Dry Density, pcf	66.9
	Saturation, %	90.2
	Void Ratio	1.5189
	Diameter, in.	2.75
	Height, in.	5.98
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.43
Fail. Stress, tsf		0.32
Ult. Stress, tsf		
σ_1 Failure, tsf		0.75
σ_3 Failure, tsf		0.43

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D 2850
Torvane; tsf: 0.20
Failure type: 60 degree

Client: United States Army Corps of Engineers

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

Source of Sample: 07-192 **Depth:** 6-8

Sample Number: 4

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

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

10/17/2008
9:47 AM

Date: 7/18/08
Client: United States Army Corps of Engineers
Project: Galveston Channel and Pelican Island PA
Contract No. DACW64-03-D-0008, Task Order No. 0077
Project No.: 08.18.918
Location: 07-192
Depth: 6-8 **Sample Number:** 4
Description: Gray FAT CLAY
Remarks:
Test method: ASTM D 2850
Torvane; tsf: 0.20
Failure type: 60 degree
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	130.780	95.940
Moisture content: Dry soil+tare, gms.	96.760	74.200
Moisture content: Tare, gms.	31.700	31.340
Moisture, %	52.3	50.7
Moist specimen weight, gms.	950.6	
Diameter, in.	2.75	
Area, in.^{2}	5.94	
Height, in.	5.98	
Wet Density, pcf	101.9	
Dry density, pcf	66.9	
Void ratio	1.5189	
Saturation, %	92.9	

Test Readings for Specimen No. 1

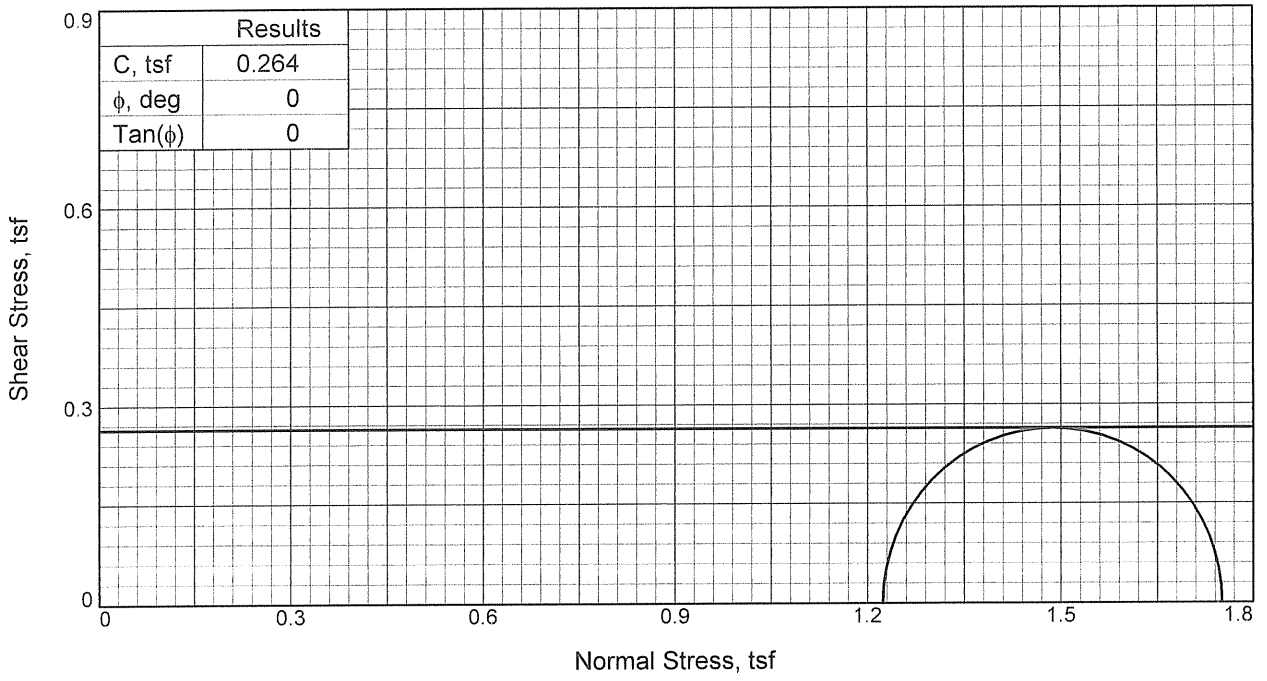
Membrane modulus = .130 kN/cm^2
Membrane thickness = .031 cm
Cell pressure = 6.00 psi (0.432 tsf)
Back pressure = 0.00 psi (0.000 tsf)
Strain rate, %/min. = 1.00
Fail. Stress = 0.316 tsf **at reading no.** 49

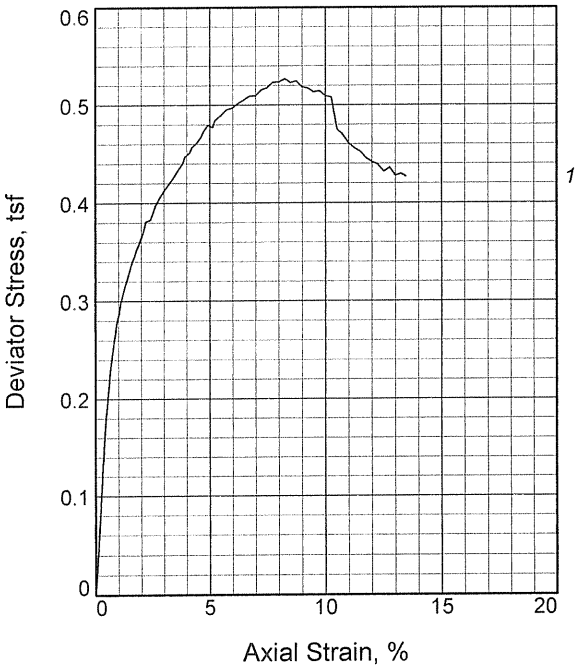
Test Readings for Specimen No. 1

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	0.0337	0.000	0.0	0.0	0.000	0.432	0.432	1.00	0.432	0.000
1	0.0431	4.611	4.6	0.2	0.056	0.432	0.488	1.13	0.460	0.028
2	0.0460	4.541	4.5	0.2	0.055	0.432	0.487	1.13	0.459	0.027
3	0.0472	5.103	5.1	0.2	0.062	0.432	0.494	1.14	0.463	0.031
4	0.0492	5.541	5.5	0.3	0.067	0.432	0.499	1.16	0.465	0.033
5	0.0525	6.590	6.6	0.3	0.080	0.432	0.512	1.18	0.472	0.040
6	0.0550	7.428	7.4	0.4	0.090	0.432	0.522	1.21	0.477	0.045
7	0.0570	8.900	8.9	0.4	0.107	0.432	0.539	1.25	0.486	0.054
8	0.0616	9.581	9.6	0.5	0.116	0.432	0.548	1.27	0.490	0.058
9	0.0629	10.252	10.3	0.5	0.124	0.432	0.556	1.29	0.494	0.062
10	0.0642	10.835	10.8	0.5	0.131	0.432	0.563	1.30	0.497	0.065
11	0.0662	11.217	11.2	0.5	0.135	0.432	0.567	1.31	0.500	0.068
12	0.0675	11.578	11.6	0.6	0.140	0.432	0.572	1.32	0.502	0.070
13	0.0687	12.152	12.2	0.6	0.146	0.432	0.578	1.34	0.505	0.073
14	0.0733	13.056	13.1	0.7	0.157	0.432	0.589	1.36	0.511	0.079
15	0.0754	13.811	13.8	0.7	0.166	0.432	0.598	1.38	0.515	0.083
16	0.0799	14.644	14.6	0.8	0.176	0.432	0.608	1.41	0.520	0.088
17	0.0845	15.096	15.1	0.8	0.181	0.432	0.613	1.42	0.523	0.091
18	0.0877	15.575	15.6	0.9	0.187	0.432	0.619	1.43	0.526	0.094
19	0.0903	15.952	16.0	0.9	0.192	0.432	0.624	1.44	0.528	0.096
20	0.0936	16.366	16.4	1.0	0.196	0.432	0.628	1.45	0.530	0.098
21	0.0969	16.724	16.7	1.1	0.201	0.432	0.633	1.46	0.532	0.100
22	0.1028	17.066	17.1	1.2	0.204	0.432	0.636	1.47	0.534	0.102
23	0.1106	17.472	17.5	1.3	0.209	0.432	0.641	1.48	0.537	0.105
24	0.1163	18.334	18.3	1.4	0.219	0.432	0.651	1.51	0.542	0.110
25	0.1286	19.127	19.1	1.6	0.228	0.432	0.660	1.53	0.546	0.114
26	0.1401	20.237	20.2	1.8	0.241	0.432	0.673	1.56	0.552	0.120
27	0.1524	20.504	20.5	2.0	0.244	0.432	0.676	1.56	0.554	0.122
28	0.1588	20.861	20.9	2.1	0.248	0.432	0.680	1.57	0.556	0.124
29	0.1709	21.145	21.1	2.3	0.250	0.432	0.682	1.58	0.557	0.125
30	0.1767	21.711	21.7	2.4	0.257	0.432	0.689	1.59	0.560	0.128
31	0.1889	22.493	22.5	2.6	0.266	0.432	0.698	1.61	0.565	0.133
32	0.2005	23.195	23.2	2.8	0.273	0.432	0.705	1.63	0.569	0.137
33	0.2128	23.469	23.5	3.0	0.276	0.432	0.708	1.64	0.570	0.138
34	0.2250	23.726	23.7	3.2	0.278	0.432	0.710	1.64	0.571	0.139
35	0.2372	23.971	24.0	3.4	0.281	0.432	0.713	1.65	0.572	0.140
36	0.2430	24.555	24.6	3.5	0.287	0.432	0.719	1.66	0.576	0.144
37	0.2494	24.203	24.2	3.6	0.283	0.432	0.715	1.65	0.573	0.141
38	0.2609	24.822	24.8	3.8	0.289	0.432	0.721	1.67	0.577	0.145
39	0.2732	24.647	24.6	4.0	0.287	0.432	0.719	1.66	0.575	0.143
40	0.2853	25.090	25.1	4.2	0.291	0.432	0.723	1.67	0.578	0.146
41	0.2975	25.334	25.3	4.4	0.294	0.432	0.726	1.68	0.579	0.147
42	0.3097	25.712	25.7	4.6	0.297	0.432	0.729	1.69	0.581	0.149
43	0.3219	26.081	26.1	4.8	0.301	0.432	0.733	1.70	0.582	0.150
44	0.3334	27.025	27.0	5.0	0.311	0.432	0.743	1.72	0.588	0.156
45	0.3399	26.603	26.6	5.1	0.306	0.432	0.738	1.71	0.585	0.153
46	0.3610	26.946	26.9	5.5	0.309	0.432	0.741	1.71	0.586	0.154

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	0.3758	26.945	26.9	5.7	0.308	0.432	0.740	1.71	0.586	0.154
48	0.3912	27.376	27.4	6.0	0.312	0.432	0.744	1.72	0.588	0.156
49	0.4059	27.821	27.8	6.2	0.316	0.432	0.748	1.73	0.590	0.158
50	0.4212	27.551	27.6	6.5	0.312	0.432	0.744	1.72	0.588	0.156
51	0.4360	27.946	27.9	6.7	0.300	0.432	0.732	1.69	0.582	0.150
52	0.4507	28.151	28.2	7.0	0.301	0.432	0.733	1.70	0.582	0.150
53	0.4662	28.186	28.2	7.2	0.300	0.432	0.732	1.69	0.582	0.150
54	0.4808	28.511	28.5	7.5	0.302	0.432	0.734	1.70	0.583	0.151
55	0.4962	28.669	28.7	7.7	0.302	0.432	0.734	1.70	0.583	0.151
56	0.5109	29.003	29.0	8.0	0.304	0.432	0.736	1.70	0.584	0.152
57	0.5262	29.416	29.4	8.2	0.307	0.432	0.739	1.71	0.586	0.154
58	0.5409	29.034	29.0	8.5	0.302	0.432	0.734	1.70	0.583	0.151
59	0.5563	29.463	29.5	8.7	0.305	0.432	0.737	1.71	0.584	0.152
60	0.5710	29.709	29.7	9.0	0.306	0.432	0.738	1.71	0.585	0.153
61	0.5864	30.100	30.1	9.2	0.309	0.432	0.741	1.72	0.586	0.154
62	0.6011	30.230	30.2	9.5	0.309	0.432	0.741	1.71	0.586	0.154
63	0.6164	30.249	30.2	9.7	0.307	0.432	0.739	1.71	0.586	0.154
64	0.6311	30.310	30.3	10.0	0.307	0.432	0.739	1.71	0.585	0.153
65	0.6465	30.328	30.3	10.2	0.305	0.432	0.737	1.71	0.585	0.153
66	0.6612	30.359	30.4	10.5	0.304	0.432	0.736	1.70	0.584	0.152
67	0.6765	30.578	30.6	10.7	0.305	0.432	0.737	1.71	0.584	0.152
68	0.6913	30.556	30.6	11.0	0.303	0.432	0.735	1.70	0.584	0.152
69	0.7066	30.885	30.9	11.2	0.305	0.432	0.737	1.71	0.585	0.153
70	0.7213	30.683	30.7	11.5	0.302	0.432	0.734	1.70	0.583	0.151
71	0.7367	31.380	31.4	11.7	0.307	0.432	0.739	1.71	0.586	0.154
72	0.7514	30.890	30.9	12.0	0.301	0.432	0.733	1.70	0.582	0.150
73	0.7661	31.521	31.5	12.2	0.306	0.432	0.738	1.71	0.585	0.153
74	0.7816	31.414	31.4	12.5	0.303	0.432	0.735	1.70	0.584	0.152
75	0.7963	31.973	32.0	12.7	0.307	0.432	0.739	1.71	0.586	0.154
76	0.8116	32.038	32.0	13.0	0.307	0.432	0.739	1.71	0.585	0.153
77	0.8264	32.560	32.6	13.2	0.310	0.432	0.742	1.72	0.587	0.155
78	0.8417	31.981	32.0	13.5	0.303	0.432	0.735	1.70	0.583	0.151
79	0.8564	32.213	32.2	13.8	0.304	0.432	0.736	1.70	0.584	0.152
80	0.8718	31.946	31.9	14.0	0.299	0.432	0.731	1.69	0.582	0.150
81	0.8865	32.201	32.2	14.3	0.300	0.432	0.732	1.70	0.582	0.150
82	0.9018	32.266	32.3	14.5	0.299	0.432	0.731	1.69	0.582	0.150
83	0.9165	32.517	32.5	14.8	0.300	0.432	0.732	1.70	0.582	0.150
84	0.9319	32.169	32.2	15.0	0.295	0.432	0.727	1.68	0.580	0.148
85	0.9408	32.579	32.6	15.2	0.299	0.432	0.731	1.69	0.581	0.149





Sample No.		1
Initial	Water Content, %	40.6
	Dry Density, pcf	79.8
	Saturation, %	98.5
	Void Ratio	1.1133
	Diameter, in.	2.73
	Height, in.	5.98
At Test	Water Content, %	40.3
	Dry Density, pcf	79.8
	Saturation, %	97.7
	Void Ratio	1.1133
	Diameter, in.	2.72
	Height, in.	5.98
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		1.22
Fail. Stress, tsf		0.53
Ult. Stress, tsf		
σ_1 Failure, tsf		1.75
σ_3 Failure, tsf		1.22

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 63 **PL=** 24 **PI=** 39

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D 2850
Torvane; tsf: 0.275
Failure type: 60 degree

Client: United States Army Corps of Engineers

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

Source of Sample: 07-192 **Depth:** 22-24

Sample Number: 12

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

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

10/17/2008
9:48 AM

Date:	7/18/08
Client:	United States Army Corps of Engineers
Project:	Galveston Channel and Pelican Island PA
	Contract No. DACW64-03-D-0008, Task Order No. 0077
Project No.:	08.18.918
Location:	07-192
Depth:	22-24 **Sample Number:** 12
Description:	Gray FAT CLAY
Remarks:	
	Test method: ASTM D 2850
	Torvane; tsf: 0.275
	Failure type: 60 degree
Type of Sample:	Undisturbed

Assumed Specific Gravity=2.70 **LL=**63 **PL=**24 **PI=**39

Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	123.870	98.440
Moisture content: Dry soil+tare, gms.	97.130	78.890
Moisture content: Tare, gms.	31.290	30.380
Moisture, %	40.6	40.3
Moist specimen weight, gms.	1027.2	
Diameter, in.	2.73	
Area, in.²	5.83	
Height, in.	5.98	
Wet Density, pcf	112.2	
Dry density, pcf	79.8	
Void ratio	1.1133	
Saturation, %	98.5	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm²
Membrane thickness = .031 cm
Cell pressure = 17.00 psi (1.224 tsf)
Back pressure = 0.00 psi (0.000 tsf)
Strain rate, %/min. = 1.00
Fail. Stress = 0.527 tsf **at reading no.** 61

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	-0.4760	0.000	0.0	0.0	0.000	1.224	1.224	1.00	1.224	0.000
1	-0.4661	5.027	5.0	0.2	0.062	1.224	1.286	1.05	1.255	0.031
2	-0.4644	5.922	5.9	0.2	0.073	1.224	1.297	1.06	1.260	0.036
3	-0.4631	6.675	6.7	0.2	0.082	1.224	1.306	1.07	1.265	0.041
4	-0.4618	8.001	8.0	0.2	0.099	1.224	1.323	1.08	1.273	0.049
5	-0.4598	8.896	8.9	0.3	0.110	1.224	1.334	1.09	1.279	0.055
6	-0.4585	9.738	9.7	0.3	0.120	1.224	1.344	1.10	1.284	0.060
7	-0.4573	10.755	10.8	0.3	0.132	1.224	1.356	1.11	1.290	0.066
8	-0.4552	11.283	11.3	0.3	0.139	1.224	1.363	1.11	1.293	0.069
9	-0.4539	12.080	12.1	0.4	0.149	1.224	1.373	1.12	1.298	0.074
10	-0.4527	13.033	13.0	0.4	0.160	1.224	1.384	1.13	1.304	0.080
11	-0.4507	13.796	13.8	0.4	0.170	1.224	1.394	1.14	1.309	0.085
12	-0.4494	14.677	14.7	0.4	0.180	1.224	1.404	1.15	1.314	0.090
13	-0.4461	15.635	15.6	0.5	0.192	1.224	1.416	1.16	1.320	0.096
14	-0.4435	16.721	16.7	0.5	0.205	1.224	1.429	1.17	1.327	0.103
15	-0.4402	17.595	17.6	0.6	0.216	1.224	1.440	1.18	1.332	0.108
16	-0.4389	18.279	18.3	0.6	0.224	1.224	1.448	1.18	1.336	0.112
17	-0.4356	19.105	19.1	0.7	0.234	1.224	1.458	1.19	1.341	0.117
18	-0.4310	20.267	20.3	0.8	0.248	1.224	1.472	1.20	1.348	0.124
19	-0.4278	21.171	21.2	0.8	0.259	1.224	1.483	1.21	1.354	0.130
20	-0.4245	21.745	21.7	0.9	0.266	1.224	1.490	1.22	1.357	0.133
21	-0.4220	22.518	22.5	0.9	0.275	1.224	1.499	1.23	1.362	0.138
22	-0.4141	23.508	23.5	1.0	0.287	1.224	1.511	1.23	1.368	0.144
23	-0.4108	24.268	24.3	1.1	0.296	1.224	1.520	1.24	1.372	0.148
24	-0.3992	25.786	25.8	1.3	0.314	1.224	1.538	1.26	1.381	0.157
25	-0.3926	26.488	26.5	1.4	0.322	1.224	1.546	1.26	1.385	0.161
26	-0.3811	27.895	27.9	1.6	0.339	1.224	1.563	1.28	1.393	0.169
27	-0.3746	28.404	28.4	1.7	0.345	1.224	1.569	1.28	1.396	0.172
28	-0.3688	29.045	29.0	1.8	0.352	1.224	1.576	1.29	1.400	0.176
29	-0.3624	29.572	29.6	1.9	0.358	1.224	1.582	1.29	1.403	0.179
30	-0.3503	30.704	30.7	2.1	0.371	1.224	1.595	1.30	1.410	0.186
31	-0.3445	31.532	31.5	2.2	0.381	1.224	1.605	1.31	1.414	0.190
32	-0.3324	31.779	31.8	2.4	0.383	1.224	1.607	1.31	1.415	0.191
33	-0.3260	32.361	32.4	2.5	0.389	1.224	1.613	1.32	1.419	0.195
34	-0.3202	32.993	33.0	2.6	0.397	1.224	1.621	1.32	1.422	0.198
35	-0.3079	33.752	33.8	2.8	0.405	1.224	1.629	1.33	1.426	0.202
36	-0.2964	34.429	34.4	3.0	0.412	1.224	1.636	1.34	1.430	0.206
37	-0.2841	35.047	35.0	3.2	0.419	1.224	1.643	1.34	1.433	0.209
38	-0.2718	35.679	35.7	3.4	0.425	1.224	1.649	1.35	1.437	0.213
39	-0.2597	36.447	36.4	3.6	0.434	1.224	1.658	1.35	1.441	0.217
40	-0.2476	37.041	37.0	3.8	0.440	1.224	1.664	1.36	1.444	0.220
41	-0.2418	37.683	37.7	3.9	0.447	1.224	1.671	1.37	1.448	0.224
42	-0.2297	38.100	38.1	4.1	0.451	1.224	1.675	1.37	1.450	0.226
43	-0.2239	38.592	38.6	4.2	0.456	1.224	1.680	1.37	1.452	0.228
44	-0.2117	39.073	39.1	4.4	0.461	1.224	1.685	1.38	1.455	0.231
45	-0.1995	39.680	39.7	4.6	0.467	1.224	1.691	1.38	1.458	0.234
46	-0.1931	40.224	40.2	4.7	0.473	1.224	1.697	1.39	1.461	0.237

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	-0.1816	40.847	40.8	4.9	0.479	1.224	1.703	1.39	1.464	0.240
48	-0.1694	40.768	40.8	5.1	0.478	1.224	1.702	1.39	1.463	0.239
49	-0.1636	41.386	41.4	5.2	0.484	1.224	1.708	1.40	1.466	0.242
50	-0.1481	41.916	41.9	5.5	0.489	1.224	1.713	1.40	1.469	0.245
51	-0.1334	42.540	42.5	5.7	0.495	1.224	1.719	1.40	1.472	0.248
52	-0.1180	42.838	42.8	6.0	0.497	1.224	1.721	1.41	1.473	0.249
53	-0.1033	43.334	43.3	6.2	0.502	1.224	1.726	1.41	1.475	0.251
54	-0.0880	43.764	43.8	6.5	0.505	1.224	1.729	1.41	1.477	0.253
55	-0.0733	44.238	44.2	6.7	0.509	1.224	1.733	1.42	1.479	0.255
56	-0.0579	44.369	44.4	7.0	0.509	1.224	1.733	1.42	1.479	0.255
57	-0.0433	45.001	45.0	7.2	0.515	1.224	1.739	1.42	1.482	0.258
58	-0.0279	45.335	45.3	7.5	0.518	1.224	1.742	1.42	1.483	0.259
59	-0.0132	45.952	46.0	7.7	0.523	1.224	1.747	1.43	1.486	0.262
60	0.0021	46.102	46.1	8.0	0.524	1.224	1.748	1.43	1.486	0.262
61	0.0169	46.528	46.5	8.2	0.527	1.224	1.751	1.43	1.488	0.264
62	0.0316	46.295	46.3	8.5	0.523	1.224	1.747	1.43	1.486	0.262
63	0.0470	46.562	46.6	8.7	0.525	1.224	1.749	1.43	1.486	0.262
64	0.0617	46.175	46.2	9.0	0.519	1.224	1.743	1.42	1.483	0.259
65	0.0771	46.175	46.2	9.2	0.517	1.224	1.741	1.42	1.483	0.259
66	0.0918	45.952	46.0	9.5	0.513	1.224	1.737	1.42	1.481	0.257
67	0.1071	46.186	46.2	9.7	0.515	1.224	1.739	1.42	1.481	0.257
68	0.1218	45.865	45.9	10.0	0.510	1.224	1.734	1.42	1.479	0.255
69	0.1372	45.829	45.8	10.2	0.508	1.224	1.732	1.41	1.478	0.254
70	0.1519	45.312	45.3	10.5	0.475	1.224	1.699	1.39	1.462	0.238
71	0.1666	44.995	45.0	10.7	0.470	1.224	1.694	1.38	1.459	0.235
72	0.1821	44.386	44.4	11.0	0.461	1.224	1.685	1.38	1.454	0.230
73	0.1968	44.089	44.1	11.2	0.456	1.224	1.680	1.37	1.452	0.228
74	0.2122	43.952	44.0	11.5	0.452	1.224	1.676	1.37	1.450	0.226
75	0.2269	43.529	43.5	11.7	0.446	1.224	1.670	1.36	1.447	0.223
76	0.2422	43.347	43.3	12.0	0.442	1.224	1.666	1.36	1.445	0.221
77	0.2569	43.264	43.3	12.3	0.439	1.224	1.663	1.36	1.443	0.219
78	0.2723	42.795	42.8	12.5	0.432	1.224	1.656	1.35	1.440	0.216
79	0.2870	43.339	43.3	12.8	0.436	1.224	1.660	1.36	1.442	0.218
80	0.3023	42.780	42.8	13.0	0.428	1.224	1.652	1.35	1.438	0.214
81	0.3170	43.097	43.1	13.3	0.429	1.224	1.653	1.35	1.439	0.215
82	0.3285	42.992	43.0	13.4	0.427	1.224	1.651	1.35	1.437	0.213

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	Gray LEAN CLAY; sand seams	CL	27.6	89.2									
	2	2-4	Gray FAT CLAY	CH	37.6	81.3	67	23	44	98.7		1.16	2.8		Slickensided
	3	4-6	Gray and brown FAT CLAY; sand seams	CH	44.2	77.9									
	4	6-8	Brown and gray FAT CLAY	CH	29.7	89.4	59	20	39	94.3		0.79	4.7		Slickensided
	5	8-10	Brown and gray FAT CLAY; shell fragments	CH	33.4	93.4									
	6	10-12	Brown and tan LEAN CLAY with SAND	CL	17.2	107.3	40	20	20	79.9		2.32	15.1		Bulge
	7	12-14	Gray and tan SANDY LEAN CLAY	CL											
	8	14-16	Gray FAT CLAY with SAND	CH	61.3	63.6									
	9	16-18	Gray FAT CLAY	CH	64.0	60.5	123	34	89	99.8		0.38	11.7		Bulge
	10	18-20	Gray FAT CLAY	CH	40.0	75.2									
	11	20-22	Gray FAT CLAY	CH	65.0	57.5	97	27	70	90.2		0.38	9.1		Bulge
	12	22.5-24	Gray FAT CLAY; shell fragments	CH	43.3										
	13	24-25.5	Tan and gray CLAYEY SAND; shell fragments	SC						25.4					
	14	29-30.5	Gray LEAN CLAY; shell fragments	CL	30.0										
	15	31-32.5	Gray FAT CLAY; shell fragments	CH	45.0										
	16	32.5-34	Gray FAT CLAY; sand seams	CH	43.2	75.7	68	24	44	86.2		0.33	9.7		Bulge
	17	34-36	Gray CLAYEY SAND	SC	23.6	97.3									
	18	36-38	Gray FAT CLAY with SAND	CH	41.5	77.2									
	19	38-40	Gray FAT CLAY; sand seams	CH	48.6	74.0	66	23	43	86.8		0.38	10.1		Bulge
	20	40-42	Gray FAT CLAY; sand seams	CH	39.9	79.2									
	21	42-44	Gray FAT CLAY; sand seams	CH	41.2	74.6	72	24	48	86.9		0.40	8.0	26.0	Bulge
	22	44-46	Gray FAT CLAY; sand seams	CH	50.1	71.7									
	23	46-48	Gray FAT CLAY; sand seams	CH	49.0	70.6									
	24	48-50	Gray FAT CLAY with SAND	CH	37.3	75.7	56	20	36	76.2		0.49	7.7		Bulge
07-192															
	1	0-2	Gray FAT CLAY; grass roots	CH	30.9	82.8									
	2	2-4	Gray FAT CLAY	CH	66.0	60.2									
	3	4-6	Gray FAT CLAY	CH	65.6	57.2	95	28	67	98.0		0.22	8.2		60 degree
	4	6-8	Gray FAT CLAY	CH	52.3	66.9						0.32	6.2	6.0	60 degree
	5	8-10	Gray FAT CLAY	CH	74.7	57.0									
	6	10-12	Gray FAT CLAY	CH	48.7	69.8	101	29	72	99.4		0.37	4.5		45 degree
	7	12-14	Gray FAT CLAY	CH	67.8	60.6									
	8	14-16	Gray FAT CLAY; ferrous nodules	CH	71.4	56.0						0.37	5.8		60 degree
	9	16-18	Gray and tan FAT CLAY	CH	65.5	56.4	112	30	82	99.7		0.39	3.6		45 degree
	10	18-20	Gray and tan SANDY LEAN CLAY	CH	58.7	70.9									
	11	20-22	Gray SANDY LEAN CLAY	CL	24.0	100.1									
	12	22-24	Gray FAT CLAY	CH	40.6	79.8	63	24	39	92.7		0.53	8.2	17.0	60 degree

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															