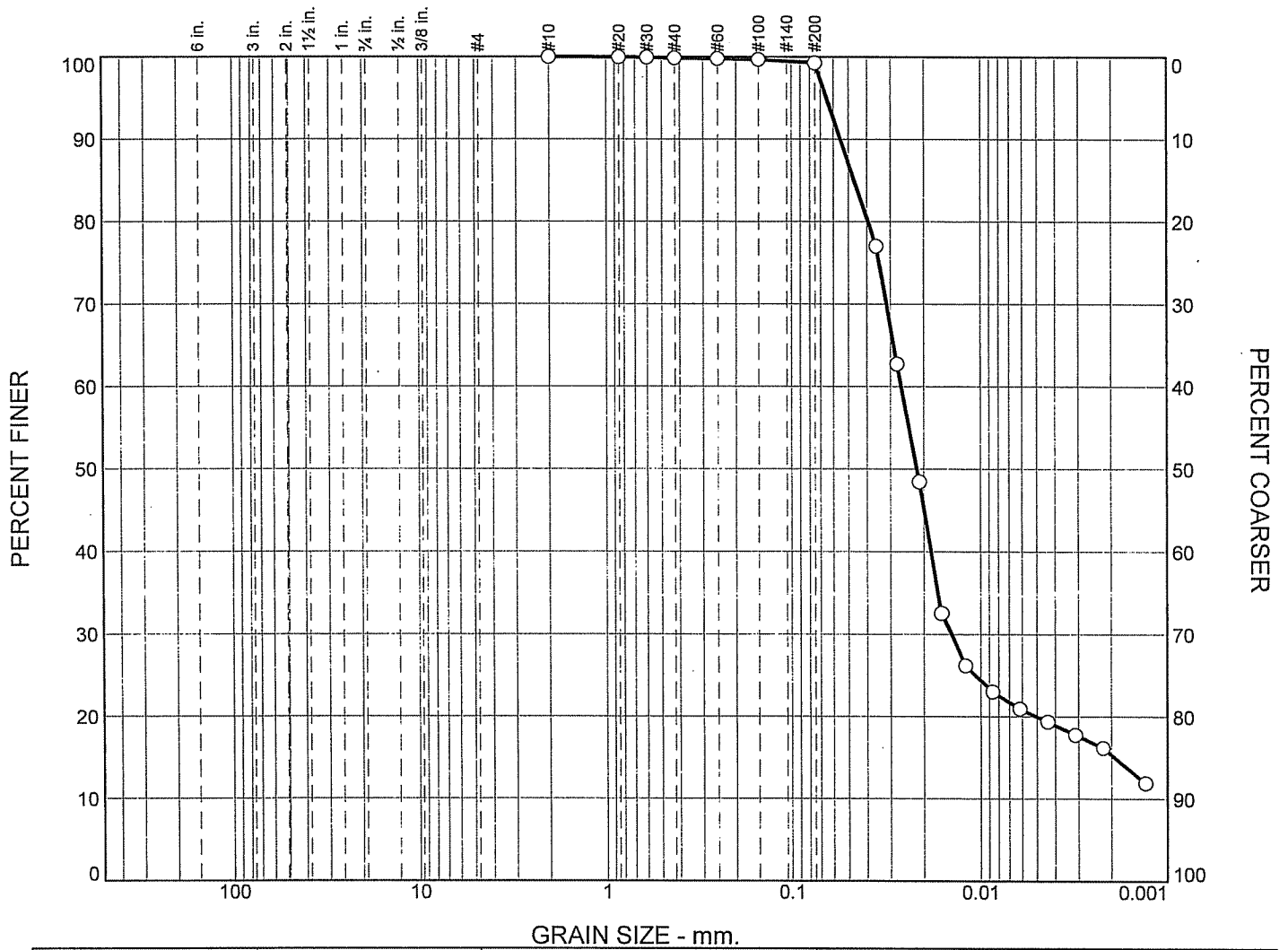


Particle Size Analysis - ASTM D 422



GRAIN SIZE - mm.

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	0.5	83.9	15.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	07-241	6	10-12	Tan and brown 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: 07-241

Depth: 10-12

Sample Number: 6

Material Description: Tan and brown 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., %
269.77	207.52	207.52	3"					
			3/4"					
			#4					
			#10	207.52	100.0			
			#20	207.54	100.0			
			#30	207.57	99.9			
			#40	207.62	99.8			
			#60	207.66	99.8			
			#100	207.72	99.7			
			#200	207.98	99.3			

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample = 79.56

Hygroscopic moisture correction:

Moist weight and tare = 154.05

Dry weight and tare = 127.31

Tare weight = 31.02

Hygroscopic moisture = 27.8%

Table of composite correction values:

Temp., deg. C: 21.8 20.8

Comp. corr.: -5.5 -6.5

Meniscus correction only = 0.5

Specific gravity of solids = 2.70

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

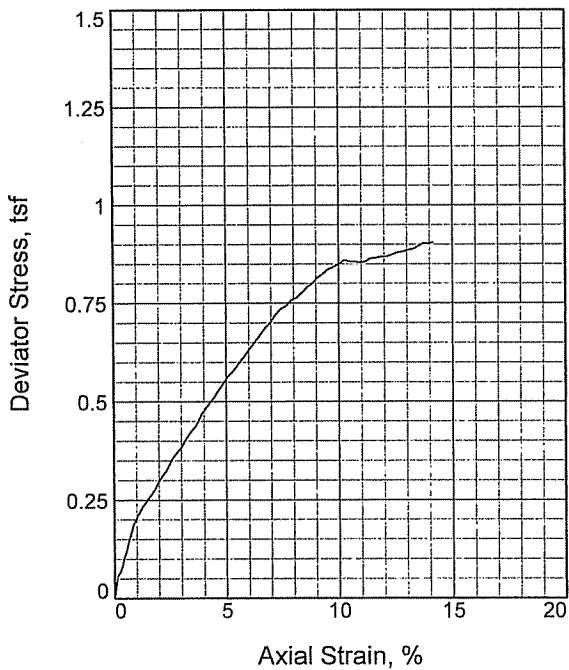
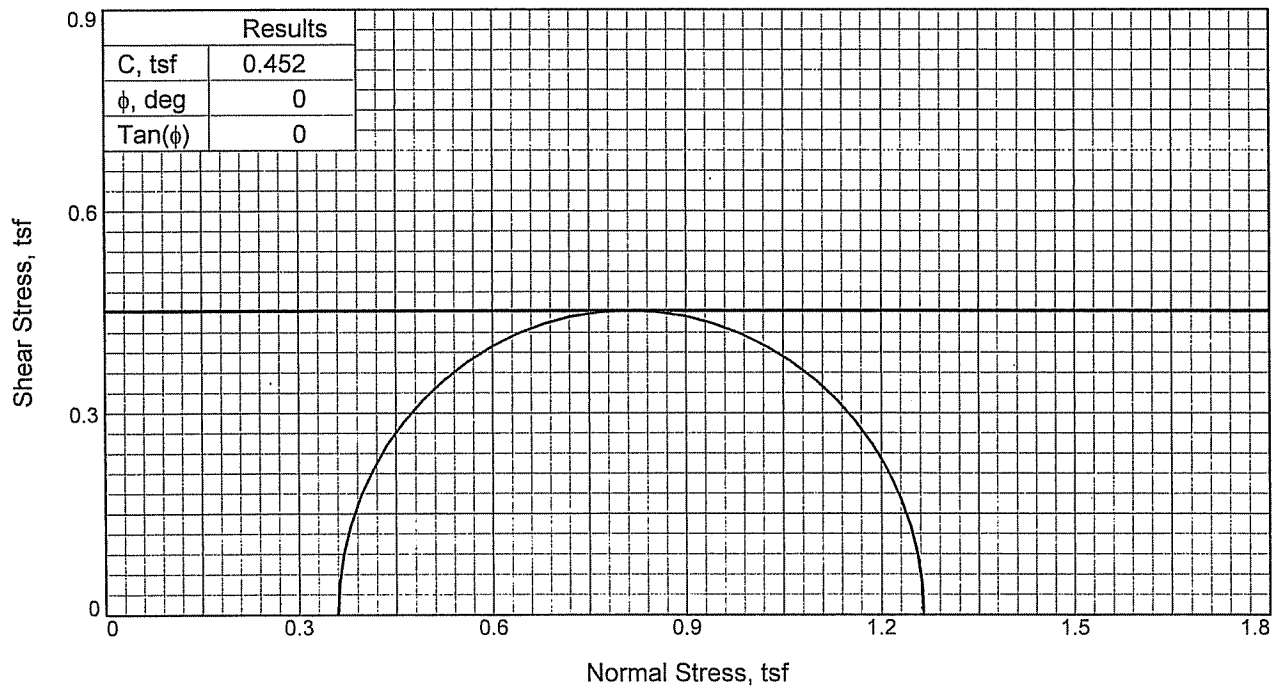
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.8	54.0	48.5	0.0131	54.5	7.4	0.0357	77.0
2.00	21.8	45.0	39.5	0.0131	45.5	8.8	0.0276	62.7
4.00	21.8	36.0	30.5	0.0131	36.5	10.3	0.0211	48.4
8.00	21.8	26.0	20.5	0.0131	26.5	11.9	0.0161	32.6
15.00	21.8	22.0	16.5	0.0131	22.5	12.6	0.0121	26.2
30.00	21.8	20.0	14.5	0.0131	20.5	12.9	0.0086	23.0
60.00	21.5	19.0	13.2	0.0132	19.5	13.1	0.0062	21.0
120.00	21.5	18.0	12.2	0.0132	18.5	13.3	0.0044	19.4
240.00	21.5	17.0	11.2	0.0132	17.5	13.4	0.0031	17.8
480.00	21.5	16.0	10.2	0.0132	16.5	13.6	0.0022	16.2
1440.00	20.8	14.0	7.5	0.0133	14.5	13.9	0.0013	11.9

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	0.2	0.5	0.7	83.9	15.4	99.3

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0019	0.0050	0.0143	0.0217	0.0262	0.0394	0.0466	0.0550	0.0650

Fineness Modulus
0.01



Sample No.		1
Initial	Water Content, %	30.1
	Dry Density, pcf	94.1
	Saturation, %	99.8
	Void Ratio	0.8319
	Diameter, in.	2.83
At Test	Height, in.	5.99
	Water Content, %	27.6
	Dry Density, pcf	94.1
	Saturation, %	91.6
	Void Ratio	0.8319
Diameter, in.		2.83
Height, in.		5.99
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.36
Fail. Stress, tsf		0.90
Ult. Stress, tsf		
σ_1 Failure, tsf		1.26
σ_3 Failure, tsf		0.36

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown and gray SILTY CLAY with SAND

Assumed Specific Gravity= 2.76

Remarks:

Test method: ASTM D 2850

Torvane; tsf: 0.10

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: 07-241

Depth: 12-14

Sample Number: 7

Proj. No.: 08.18.918

Date Sampled: 7/18/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

7/24/2008

3:00 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:** 07-241**Depth:** 12-14**Sample Number:** 7**Description:** Brown and gray SILTY CLAY with SAND**Remarks:**

Test method: ASTM D 2850

Torvane; tsf: 0.10

Failure type: Bulge

Type of Sample: Undisturbed**Assumed Specific Gravity**=2.76**LL**=**PL**=**PI**=**Test Method:** ASTM D 2850**Parameters for Specimen No. 1**

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	137.820	102.560
Moisture content: Dry soil+tare, gms.	113.360	86.940
Moisture content: Tare, gms.	32.020	30.380
Moisture, %	30.1	27.6
Moist specimen weight, gms.	1205.1	
Diameter, in.	2.83	
Area, in. ²	6.27	
Height, in.	5.99	
Wet Density, pcf	122.3	
Dry density, pcf	94.1	
Void ratio	0.8319	
Saturation, %	99.8	

Test Readings for Specimen No. 1Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Cell pressure = 5.00 psi (0.360 tsf)

Back pressure = 0.00 psi (0.000 tsf)

Strain rate, %/min. = 1.00

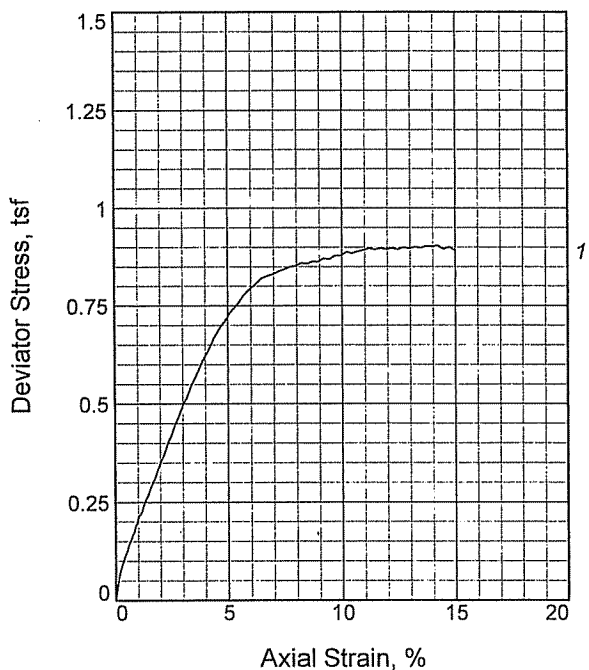
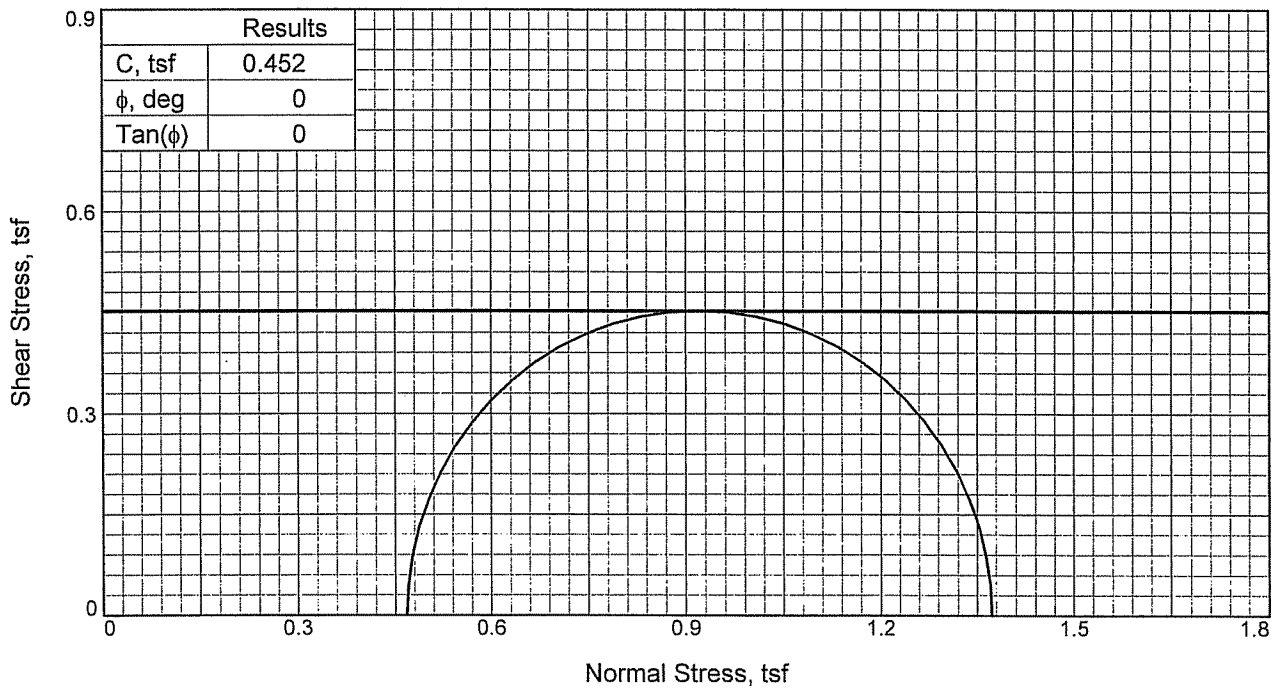
Fail. Stress = 0.904 tsf at reading no. 76

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	0.0690	0.000	0.0	0.0	0.000	0.360	0.360	1.00	0.360	0.000
1	0.0777	4.908	4.9	0.1	0.056	0.360	0.416	1.16	0.388	0.028
2	0.0849	5.868	5.9	0.3	0.067	0.360	0.427	1.19	0.394	0.034
3	0.0904	7.272	7.3	0.4	0.083	0.360	0.443	1.23	0.402	0.042
4	0.0947	8.590	8.6	0.4	0.098	0.360	0.458	1.27	0.409	0.049
5	0.0978	9.510	9.5	0.5	0.109	0.360	0.469	1.30	0.414	0.054
6	0.1020	10.634	10.6	0.6	0.121	0.360	0.481	1.34	0.421	0.061
7	0.1044	11.623	11.6	0.6	0.133	0.360	0.493	1.37	0.426	0.066
8	0.1087	12.898	12.9	0.7	0.147	0.360	0.507	1.41	0.434	0.074
9	0.1130	14.041	14.0	0.7	0.160	0.360	0.520	1.44	0.440	0.080
10	0.1173	15.407	15.4	0.8	0.176	0.360	0.536	1.49	0.448	0.088
11	0.1216	16.491	16.5	0.9	0.188	0.360	0.548	1.52	0.454	0.094
12	0.1277	17.548	17.5	1.0	0.200	0.360	0.560	1.55	0.460	0.100
13	0.1332	18.653	18.7	1.1	0.212	0.360	0.572	1.59	0.466	0.106
14	0.1458	20.584	20.6	1.3	0.233	0.360	0.593	1.65	0.477	0.117
15	0.1572	21.957	22.0	1.5	0.249	0.360	0.609	1.69	0.484	0.124
16	0.1685	23.334	23.3	1.7	0.264	0.360	0.624	1.73	0.492	0.132
17	0.1800	24.829	24.8	1.9	0.280	0.360	0.640	1.78	0.500	0.140
18	0.1854	25.799	25.8	1.9	0.291	0.360	0.651	1.81	0.505	0.145
19	0.1968	27.514	27.5	2.1	0.309	0.360	0.669	1.86	0.515	0.155
20	0.2076	28.805	28.8	2.3	0.323	0.360	0.683	1.90	0.522	0.162
21	0.2137	29.817	29.8	2.4	0.334	0.360	0.694	1.93	0.527	0.167
22	0.2245	31.611	31.6	2.6	0.354	0.360	0.714	1.98	0.537	0.177
23	0.2359	33.003	33.0	2.8	0.369	0.360	0.729	2.02	0.544	0.184
24	0.2474	34.235	34.2	3.0	0.382	0.360	0.742	2.06	0.551	0.191
25	0.2582	35.785	35.8	3.2	0.398	0.360	0.758	2.11	0.559	0.199
26	0.2642	36.745	36.7	3.3	0.408	0.360	0.768	2.13	0.564	0.204
27	0.2756	38.281	38.3	3.5	0.425	0.360	0.785	2.18	0.572	0.212
28	0.2869	39.509	39.5	3.6	0.437	0.360	0.797	2.21	0.579	0.219
29	0.2923	40.479	40.5	3.7	0.448	0.360	0.808	2.24	0.584	0.224
30	0.2983	41.561	41.6	3.8	0.459	0.360	0.819	2.28	0.590	0.230
31	0.3037	42.531	42.5	3.9	0.469	0.360	0.829	2.30	0.595	0.235
32	0.3150	43.956	44.0	4.1	0.484	0.360	0.844	2.34	0.602	0.242
33	0.3264	45.366	45.4	4.3	0.499	0.360	0.859	2.39	0.609	0.249
34	0.3379	46.650	46.7	4.5	0.512	0.360	0.872	2.42	0.616	0.256
35	0.3433	47.581	47.6	4.6	0.522	0.360	0.882	2.45	0.621	0.261
36	0.3547	49.029	49.0	4.8	0.536	0.360	0.896	2.49	0.628	0.268
37	0.3739	51.780	51.8	5.1	0.564	0.360	0.924	2.57	0.642	0.282
38	0.3884	53.166	53.2	5.3	0.578	0.360	0.938	2.61	0.649	0.289
39	0.4021	55.020	55.0	5.6	0.597	0.360	0.957	2.66	0.658	0.298
40	0.4164	56.750	56.8	5.8	0.614	0.360	0.974	2.71	0.667	0.307
41	0.4302	58.618	58.6	6.0	0.633	0.360	0.993	2.76	0.676	0.316
42	0.4445	60.409	60.4	6.3	0.650	0.360	1.010	2.81	0.685	0.325
43	0.4582	62.212	62.2	6.5	0.668	0.360	1.028	2.86	0.694	0.334
44	0.4726	64.110	64.1	6.7	0.687	0.360	1.047	2.91	0.703	0.343
45	0.4863	65.502	65.5	7.0	0.700	0.360	1.060	2.94	0.710	0.350
46	0.5001	67.577	67.6	7.2	0.720	0.360	1.080	3.00	0.720	0.360

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	0.5145	69.173	69.2	7.4	0.735	0.360	1.095	3.04	0.728	0.368
48	0.5283	70.025	70.0	7.7	0.743	0.360	1.103	3.06	0.731	0.371
49	0.5426	71.631	71.6	7.9	0.758	0.360	1.118	3.10	0.739	0.379
50	0.5563	72.332	72.3	8.1	0.763	0.360	1.123	3.12	0.742	0.382
51	0.5707	73.842	73.8	8.4	0.777	0.360	1.137	3.16	0.749	0.389
52	0.5845	75.366	75.4	8.6	0.791	0.360	1.151	3.20	0.756	0.396
53	0.5988	76.417	76.4	8.8	0.800	0.360	1.160	3.22	0.760	0.400
54	0.6126	77.957	78.0	9.1	0.814	0.360	1.174	3.26	0.767	0.407
55	0.6269	79.106	79.1	9.3	0.824	0.360	1.184	3.29	0.772	0.412
56	0.6407	80.417	80.4	9.5	0.836	0.360	1.196	3.32	0.778	0.418
57	0.6550	81.272	81.3	9.8	0.842	0.360	1.202	3.34	0.781	0.421
58	0.6688	82.181	82.2	10.0	0.849	0.360	1.209	3.36	0.785	0.425
59	0.6832	83.431	83.4	10.3	0.860	0.360	1.220	3.39	0.790	0.430
60	0.6969	83.264	83.3	10.5	0.856	0.360	1.216	3.38	0.788	0.428
61	0.7113	83.506	83.5	10.7	0.856	0.360	1.216	3.38	0.788	0.428
62	0.7250	83.453	83.5	11.0	0.854	0.360	1.214	3.37	0.787	0.427
63	0.7388	83.809	83.8	11.2	0.855	0.360	1.215	3.38	0.788	0.428
64	0.7532	84.963	85.0	11.4	0.864	0.360	1.224	3.40	0.792	0.432
65	0.7669	85.229	85.2	11.7	0.865	0.360	1.225	3.40	0.792	0.432
66	0.7812	85.839	85.8	11.9	0.869	0.360	1.229	3.41	0.794	0.434
67	0.7950	86.051	86.1	12.1	0.869	0.360	1.229	3.41	0.794	0.434
68	0.8088	86.766	86.8	12.4	0.874	0.360	1.234	3.43	0.797	0.437
69	0.8232	87.586	87.6	12.6	0.879	0.360	1.239	3.44	0.800	0.440
70	0.8370	87.990	88.0	12.8	0.881	0.360	1.241	3.45	0.801	0.441
71	0.8513	88.736	88.7	13.1	0.886	0.360	1.246	3.46	0.803	0.443
72	0.8651	89.205	89.2	13.3	0.888	0.360	1.248	3.47	0.804	0.444
73	0.8794	90.143	90.1	13.5	0.895	0.360	1.255	3.49	0.808	0.448
74	0.8931	91.143	91.1	13.8	0.903	0.360	1.263	3.51	0.811	0.451
75	0.9075	91.377	91.4	14.0	0.903	0.360	1.263	3.51	0.811	0.451
76	0.9165	91.723	91.7	14.2	0.904	0.360	1.264	3.51	0.812	0.452



Sample No.	1	
Initial	Water Content, %	27.7
	Dry Density, pcf	94.6
	Saturation, %	95.8
	Void Ratio	0.7816
	Diameter, in.	2.77
	Height, in.	5.98
At Test	Water Content, %	29.1
	Dry Density, pcf	94.6
	Saturation, %	100.6
	Void Ratio	0.7816
	Diameter, in.	2.77
	Height, in.	5.98
Strain rate, %/min.	1.00	
Back Pressure, tsf	0.00	
Cell Pressure, tsf	0.47	
Fail. Stress, tsf	0.90	
Ult. Stress, tsf		
σ_1 Failure, tsf	1.37	
σ_3 Failure, tsf	0.47	

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Brown and gray SILTY CLAY

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 2850

Pocket pen; tsf: 0.50

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: 07-241

Depth: 16-18

Sample Number: 9

Proj. No.: 08.18.918

Date Sampled: 7/18/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

7/24/2008

3:03 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:** 07-241**Depth:** 16-18**Sample Number:** 9**Description:** Brown and gray SILTY CLAY**Remarks:**

Test method: ASTM D 2850

Pocket pen; tsf: 0.50

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.	144.290	107.600
Moisture content: Dry soil+tare, gms.	119.820	90.400
Moisture content: Tare, gms.	31.600	31.340
Moisture, %	27.7	29.1
Moist specimen weight, gms.	1147.7	
Diameter, in.	2.77	
Area, in. ²	6.05	
Height, in.	5.98	
Wet Density, pcf	120.9	
Dry density, pcf	94.6	
Void ratio	0.7816	
Saturation, %	95.8	

Test Readings for Specimen No. 1Membrane modulus = .130 kN/cm²

Membrane thickness = .031 cm

Cell pressure = 6.50 psi (0.468 tsf)

Back pressure = 0.00 psi (0.000 tsf)

Strain rate, %/min. = 1.00

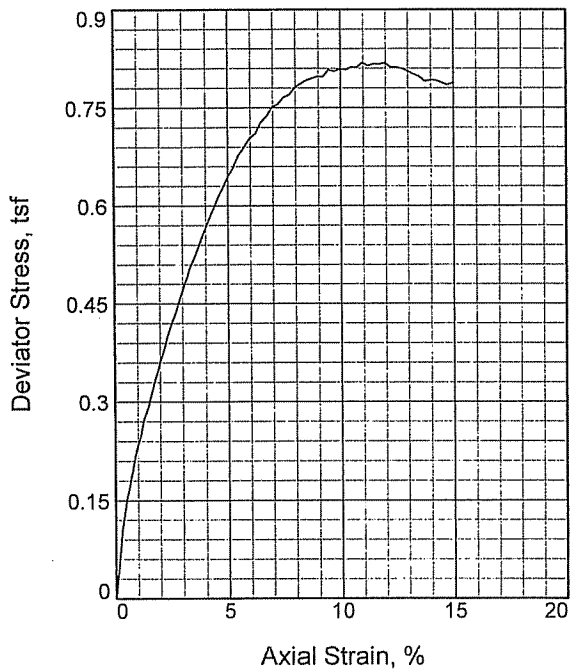
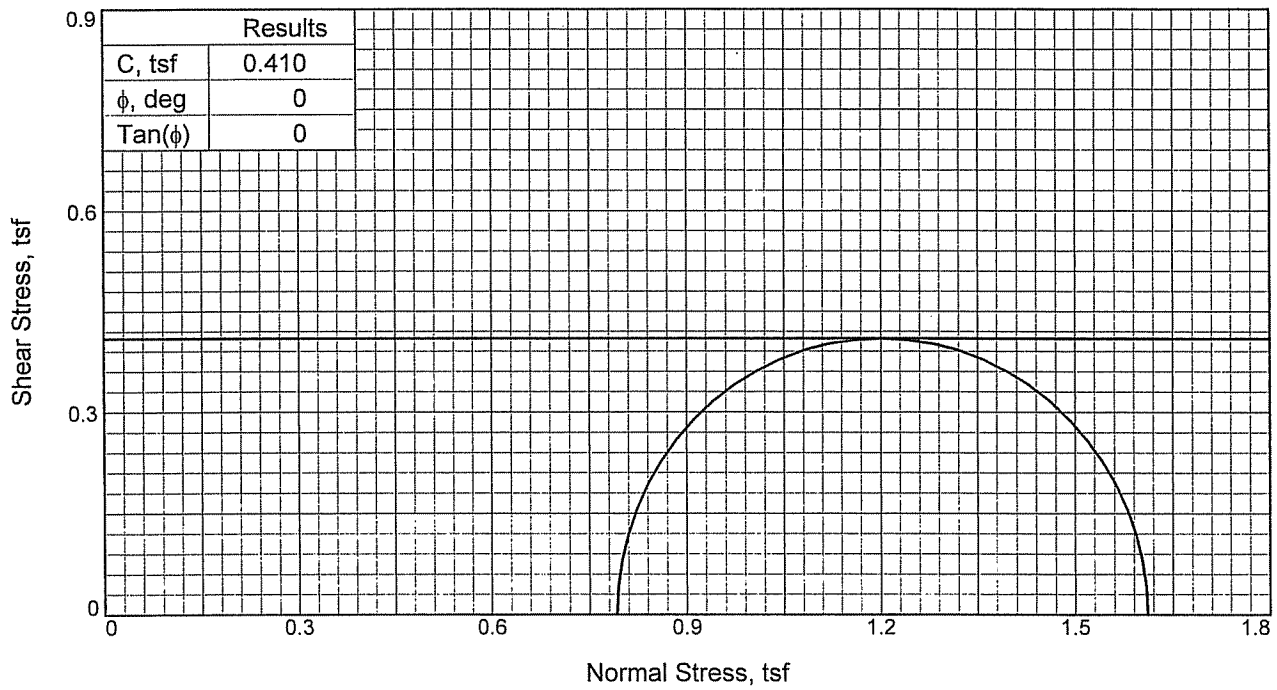
Fail. Stress = 0.905 tsf at reading no. 83

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	0.0500	0.000	0.0	0.0	0.000	0.468	0.468	1.00	0.468	0.000
1	0.0580	4.757	4.8	0.1	0.057	0.468	0.525	1.12	0.496	0.028
2	0.0610	5.767	5.8	0.2	0.069	0.468	0.537	1.15	0.502	0.034
3	0.0655	6.969	7.0	0.3	0.083	0.468	0.551	1.18	0.509	0.041
4	0.0701	8.223	8.2	0.3	0.098	0.468	0.566	1.21	0.517	0.049
5	0.0746	9.449	9.4	0.4	0.112	0.468	0.580	1.24	0.524	0.056
6	0.0812	10.720	10.7	0.5	0.127	0.468	0.595	1.27	0.531	0.063
7	0.0837	11.664	11.7	0.6	0.138	0.468	0.606	1.30	0.537	0.069
8	0.0904	12.919	12.9	0.7	0.153	0.468	0.621	1.33	0.544	0.076
9	0.0949	13.871	13.9	0.8	0.164	0.468	0.632	1.35	0.550	0.082
10	0.0995	14.805	14.8	0.8	0.175	0.468	0.643	1.37	0.555	0.087
11	0.1021	15.840	15.8	0.9	0.187	0.468	0.655	1.40	0.561	0.093
12	0.1087	16.880	16.9	1.0	0.199	0.468	0.667	1.43	0.567	0.099
13	0.1113	17.945	17.9	1.0	0.211	0.468	0.679	1.45	0.574	0.106
14	0.1191	18.998	19.0	1.2	0.224	0.468	0.692	1.48	0.580	0.112
15	0.1249	20.842	20.8	1.3	0.245	0.468	0.713	1.52	0.591	0.123
16	0.1314	21.920	21.9	1.4	0.257	0.468	0.725	1.55	0.597	0.129
17	0.1372	22.921	22.9	1.5	0.269	0.468	0.737	1.57	0.602	0.134
18	0.1436	24.609	24.6	1.6	0.288	0.468	0.756	1.62	0.612	0.144
19	0.1557	26.685	26.7	1.8	0.312	0.468	0.780	1.67	0.624	0.156
20	0.1615	28.240	28.2	1.9	0.330	0.468	0.798	1.70	0.633	0.165
21	0.1679	29.439	29.4	2.0	0.344	0.468	0.812	1.73	0.640	0.172
22	0.1737	30.743	30.7	2.1	0.358	0.468	0.826	1.77	0.647	0.179
23	0.1800	31.954	32.0	2.2	0.372	0.468	0.840	1.80	0.654	0.186
24	0.1858	33.305	33.3	2.3	0.387	0.468	0.855	1.83	0.662	0.194
25	0.1922	34.905	34.9	2.4	0.406	0.468	0.874	1.87	0.671	0.203
26	0.1980	35.964	36.0	2.5	0.418	0.468	0.886	1.89	0.677	0.209
27	0.2038	37.393	37.4	2.6	0.434	0.468	0.902	1.93	0.685	0.217
28	0.2102	38.783	38.8	2.7	0.449	0.468	0.917	1.96	0.693	0.225
29	0.2159	39.788	39.8	2.8	0.461	0.468	0.929	1.98	0.698	0.230
30	0.2223	41.283	41.3	2.9	0.477	0.468	0.945	2.02	0.707	0.239
31	0.2281	42.495	42.5	3.0	0.491	0.468	0.959	2.05	0.713	0.245
32	0.2338	43.724	43.7	3.1	0.505	0.468	0.973	2.08	0.720	0.252
33	0.2403	44.706	44.7	3.2	0.515	0.468	0.983	2.10	0.726	0.258
34	0.2461	46.088	46.1	3.3	0.531	0.468	0.999	2.13	0.733	0.265
35	0.2524	47.510	47.5	3.4	0.546	0.468	1.014	2.17	0.741	0.273
36	0.2646	49.632	49.6	3.6	0.570	0.468	1.038	2.22	0.753	0.285
37	0.2767	52.098	52.1	3.8	0.597	0.468	1.065	2.27	0.766	0.298
38	0.2825	53.256	53.3	3.9	0.609	0.468	1.077	2.30	0.773	0.305
39	0.2947	55.135	55.1	4.1	0.630	0.468	1.098	2.35	0.783	0.315
40	0.3005	56.085	56.1	4.2	0.640	0.468	1.108	2.37	0.788	0.320
41	0.3069	57.235	57.2	4.3	0.652	0.468	1.120	2.39	0.794	0.326
42	0.3126	58.561	58.6	4.4	0.667	0.468	1.135	2.42	0.801	0.333
43	0.3248	60.544	60.5	4.6	0.688	0.468	1.156	2.47	0.812	0.344
44	0.3312	61.500	61.5	4.7	0.698	0.468	1.166	2.49	0.817	0.349
45	0.3433	62.847	62.8	4.9	0.711	0.468	1.179	2.52	0.824	0.356
46	0.3491	63.825	63.8	5.0	0.722	0.468	1.190	2.54	0.829	0.361

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	0.3549	64.807	64.8	5.1	0.732	0.468	1.200	2.56	0.834	0.366
48	0.3761	67.120	67.1	5.5	0.755	0.468	1.223	2.61	0.846	0.378
49	0.3915	69.199	69.2	5.7	0.777	0.468	1.245	2.66	0.856	0.388
50	0.4062	70.770	70.8	6.0	0.792	0.468	1.260	2.69	0.864	0.396
51	0.4209	72.072	72.1	6.2	0.805	0.468	1.273	2.72	0.870	0.402
52	0.4364	73.585	73.6	6.5	0.819	0.468	1.287	2.75	0.878	0.410
53	0.4511	74.319	74.3	6.7	0.825	0.468	1.293	2.76	0.881	0.413
54	0.4665	75.039	75.0	7.0	0.831	0.468	1.299	2.78	0.884	0.416
55	0.4812	75.833	75.8	7.2	0.838	0.468	1.306	2.79	0.887	0.419
56	0.4965	76.542	76.5	7.5	0.843	0.468	1.311	2.80	0.890	0.422
57	0.5113	77.341	77.3	7.7	0.850	0.468	1.318	2.82	0.893	0.425
58	0.5260	77.671	77.7	8.0	0.851	0.468	1.319	2.82	0.894	0.426
59	0.5415	78.662	78.7	8.2	0.859	0.468	1.327	2.84	0.898	0.430
60	0.5563	78.754	78.8	8.5	0.858	0.468	1.326	2.83	0.897	0.429
61	0.5710	79.468	79.5	8.7	0.864	0.468	1.332	2.85	0.900	0.432
62	0.5865	79.601	79.6	9.0	0.863	0.468	1.331	2.84	0.899	0.431
63	0.6013	80.635	80.6	9.2	0.871	0.468	1.339	2.86	0.904	0.436
64	0.6160	80.670	80.7	9.5	0.869	0.468	1.337	2.86	0.903	0.435
65	0.6314	81.729	81.7	9.7	0.878	0.468	1.346	2.88	0.907	0.439
66	0.6461	81.969	82.0	10.0	0.879	0.468	1.347	2.88	0.907	0.439
67	0.6615	83.097	83.1	10.2	0.888	0.468	1.356	2.90	0.912	0.444
68	0.6762	82.922	82.9	10.5	0.884	0.468	1.352	2.89	0.910	0.442
69	0.6916	83.694	83.7	10.7	0.889	0.468	1.357	2.90	0.913	0.445
70	0.7062	84.300	84.3	11.0	0.893	0.468	1.361	2.91	0.915	0.447
71	0.7216	84.913	84.9	11.2	0.897	0.468	1.365	2.92	0.917	0.449
72	0.7363	84.838	84.8	11.5	0.894	0.468	1.362	2.91	0.915	0.447
73	0.7517	85.429	85.4	11.7	0.898	0.468	1.366	2.92	0.917	0.449
74	0.7664	85.356	85.4	12.0	0.894	0.468	1.362	2.91	0.915	0.447
75	0.7817	85.851	85.9	12.2	0.897	0.468	1.365	2.92	0.917	0.449
76	0.7965	85.772	85.8	12.5	0.894	0.468	1.362	2.91	0.915	0.447
77	0.8112	86.632	86.6	12.7	0.900	0.468	1.368	2.92	0.918	0.450
78	0.8267	86.519	86.5	13.0	0.896	0.468	1.364	2.92	0.916	0.448
79	0.8414	87.203	87.2	13.2	0.901	0.468	1.369	2.92	0.918	0.450
80	0.8568	87.230	87.2	13.5	0.898	0.468	1.366	2.92	0.917	0.449
81	0.8715	87.896	87.9	13.7	0.903	0.468	1.371	2.93	0.919	0.451
82	0.8868	88.134	88.1	14.0	0.902	0.468	1.370	2.93	0.919	0.451
83	0.9016	88.633	88.6	14.2	0.905	0.468	1.373	2.93	0.920	0.452
84	0.9169	87.944	87.9	14.5	0.895	0.468	1.363	2.91	0.916	0.448
85	0.9316	88.748	88.7	14.7	0.901	0.468	1.369	2.92	0.918	0.450
86	0.9470	88.090	88.1	15.0	0.891	0.468	1.359	2.90	0.914	0.446



Sample No.	1	
Initial	Water Content, %	41.7
	Dry Density, pcf	80.4
	Saturation, %	99.4
	Void Ratio	1.1736
	Diameter, in.	2.80
At Test	Height, in.	5.99
	Water Content, %	39.1
	Dry Density, pcf	80.4
	Saturation, %	93.3
	Void Ratio	1.1736
Diameter, in.	2.80	
Height, in.	5.99	
Strain rate, %/min.	1.00	
Back Pressure, tsf	0.00	
Cell Pressure, tsf	0.79	
Fail. Stress, tsf	0.82	
Ult. Stress, tsf		
σ_1 Failure, tsf	1.61	
σ_3 Failure, tsf	0.79	

Type of Test:

Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray FAT CLAY

Assumed Specific Gravity= 2.80

Remarks:

Test method: ASTM D 2850

Pocket pen; tsf: 0.50

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: 07-241

Depth: 28-30

Sample Number: 15

Proj. No.: 08.18.918

Date Sampled: 7/18/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

7/24/2008
3:17 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: 07-241
Depth: 28-30 **Sample Number:** 15
Description: Gray FAT CLAY
Remarks:

Test method: ASTM D 2850
Pocket pen; tsf: 0.50
Failure type: 60 degree

Type of Sample: Undisturbed
Assumed Specific Gravity=2.80 **LL=** **PL=** **PI=**
Test Method: ASTM D 2850

Parameters for Specimen No. 1		
Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	129.900	113.880
Moisture content: Dry soil+tare, gms.	100.820	90.780
Moisture content: Tare, gms.	31.020	31.730
Moisture, %	41.7	39.1
Moist specimen weight, gms.	1103.3	
Diameter, in.	2.80	
Area, in. ²	6.16	
Height, in.	5.99	
Wet Density, pcf	113.9	
Dry density, pcf	80.4	
Void ratio	1.1736	
Saturation, %	99.4	

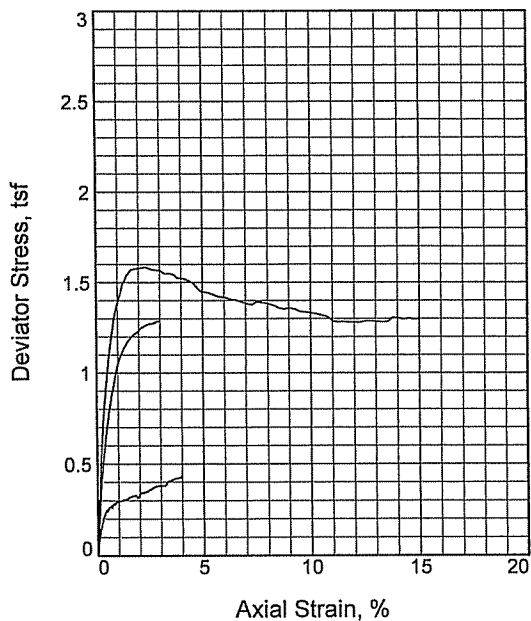
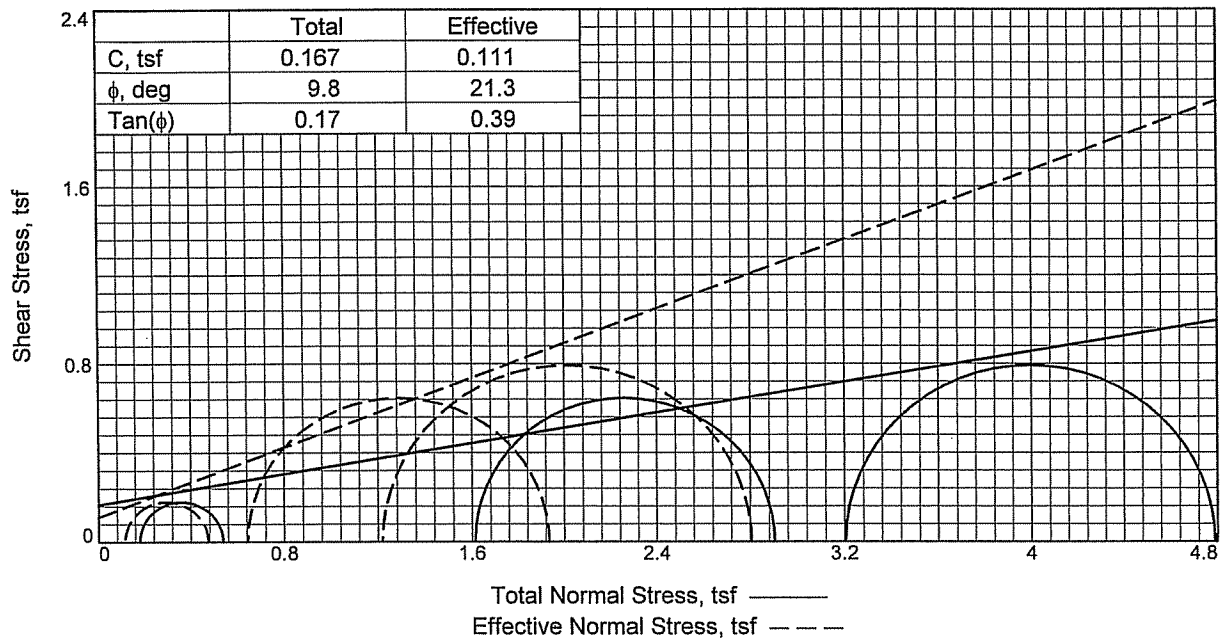
Test Readings for Specimen No. 1	
Membrane modulus =	.130 kN/cm ²
Membrane thickness =	.031 cm
Cell pressure =	11.00 psi (0.792 tsf)
Back pressure =	0.00 psi (0.000 tsf)
Strain rate, %/min. =	1.00
Fail. Stress =	0.819 tsf at reading no. 68

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	0.0241	0.000	0.0	0.0	0.000	0.792	0.792	1.00	0.792	0.000
1	0.0337	4.466	4.5	0.2	0.052	0.792	0.844	1.07	0.818	0.026
2	0.0353	5.572	5.6	0.2	0.065	0.792	0.857	1.08	0.825	0.033
3	0.0386	7.071	7.1	0.2	0.082	0.792	0.874	1.10	0.833	0.041
4	0.0411	8.866	8.9	0.3	0.103	0.792	0.895	1.13	0.844	0.052
5	0.0444	9.796	9.8	0.3	0.114	0.792	0.906	1.14	0.849	0.057
6	0.0490	11.240	11.2	0.4	0.131	0.792	0.923	1.17	0.857	0.065
7	0.0523	12.270	12.3	0.5	0.143	0.792	0.935	1.18	0.863	0.071
8	0.0549	13.222	13.2	0.5	0.154	0.792	0.946	1.19	0.869	0.077
9	0.0595	14.099	14.1	0.6	0.164	0.792	0.956	1.21	0.874	0.082
10	0.0628	15.078	15.1	0.6	0.175	0.792	0.967	1.22	0.880	0.088
11	0.0661	15.941	15.9	0.7	0.185	0.792	0.977	1.23	0.885	0.093
12	0.0707	16.880	16.9	0.8	0.196	0.792	0.988	1.25	0.890	0.098
13	0.0733	17.746	17.7	0.8	0.206	0.792	0.998	1.26	0.895	0.103
14	0.0766	18.601	18.6	0.9	0.216	0.792	1.008	1.27	0.900	0.108
15	0.0825	19.938	19.9	1.0	0.231	0.792	1.023	1.29	0.907	0.115
16	0.0891	21.014	21.0	1.1	0.243	0.792	1.035	1.31	0.914	0.122
17	0.0937	21.877	21.9	1.2	0.253	0.792	1.045	1.32	0.918	0.126
18	0.1007	23.641	23.6	1.3	0.273	0.792	1.065	1.34	0.928	0.136
19	0.1072	24.629	24.6	1.4	0.284	0.792	1.076	1.36	0.934	0.142
20	0.1130	25.514	25.5	1.5	0.294	0.792	1.086	1.37	0.939	0.147
21	0.1194	26.782	26.8	1.6	0.308	0.792	1.100	1.39	0.946	0.154
22	0.1251	28.020	28.0	1.7	0.322	0.792	1.114	1.41	0.953	0.161
23	0.1315	29.344	29.3	1.8	0.337	0.792	1.129	1.43	0.960	0.168
24	0.1373	30.174	30.2	1.9	0.346	0.792	1.138	1.44	0.965	0.173
25	0.1437	31.433	31.4	2.0	0.360	0.792	1.152	1.45	0.972	0.180
26	0.1558	33.298	33.3	2.2	0.381	0.792	1.173	1.48	0.982	0.190
27	0.1616	34.626	34.6	2.3	0.396	0.792	1.188	1.50	0.990	0.198
28	0.1737	36.577	36.6	2.5	0.417	0.792	1.209	1.53	1.001	0.209
29	0.1859	38.312	38.3	2.7	0.436	0.792	1.228	1.55	1.010	0.218
30	0.1918	39.448	39.4	2.8	0.448	0.792	1.240	1.57	1.016	0.224
31	0.2044	41.522	41.5	3.0	0.471	0.792	1.263	1.59	1.027	0.235
32	0.2102	42.430	42.4	3.1	0.481	0.792	1.273	1.61	1.032	0.240
33	0.2160	43.237	43.2	3.2	0.489	0.792	1.281	1.62	1.037	0.245
34	0.2222	44.555	44.6	3.3	0.504	0.792	1.296	1.64	1.044	0.252
35	0.2340	45.985	46.0	3.5	0.519	0.792	1.311	1.66	1.051	0.259
36	0.2402	46.932	46.9	3.6	0.529	0.792	1.321	1.67	1.056	0.264
37	0.2522	48.747	48.7	3.8	0.548	0.792	1.340	1.69	1.066	0.274
38	0.2645	50.419	50.4	4.0	0.566	0.792	1.358	1.71	1.075	0.283
39	0.2703	51.227	51.2	4.1	0.574	0.792	1.366	1.73	1.079	0.287
40	0.2822	52.820	52.8	4.3	0.591	0.792	1.383	1.75	1.088	0.296
41	0.2883	53.688	53.7	4.4	0.600	0.792	1.392	1.76	1.092	0.300
42	0.3001	55.144	55.1	4.6	0.615	0.792	1.407	1.78	1.100	0.308
43	0.3128	56.566	56.6	4.8	0.630	0.792	1.422	1.79	1.107	0.315
44	0.3243	58.083	58.1	5.0	0.645	0.792	1.437	1.81	1.115	0.323
45	0.3366	59.251	59.3	5.2	0.657	0.792	1.449	1.83	1.120	0.328
46	0.3514	61.228	61.2	5.5	0.677	0.792	1.469	1.85	1.130	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	0.3666	62.483	62.5	5.7	0.689	0.792	1.481	1.87	1.136	0.344
48	0.3820	63.886	63.9	6.0	0.702	0.792	1.494	1.89	1.143	0.351
49	0.3969	64.796	64.8	6.2	0.711	0.792	1.503	1.90	1.147	0.355
50	0.4116	66.493	66.5	6.5	0.727	0.792	1.519	1.92	1.156	0.364
51	0.4266	67.551	67.6	6.7	0.737	0.792	1.529	1.93	1.160	0.368
52	0.4421	69.029	69.0	7.0	0.751	0.792	1.543	1.95	1.167	0.375
53	0.4568	69.574	69.6	7.2	0.755	0.792	1.547	1.95	1.169	0.377
54	0.4722	70.710	70.7	7.5	0.765	0.792	1.557	1.97	1.174	0.382
55	0.4870	71.311	71.3	7.7	0.769	0.792	1.561	1.97	1.177	0.385
56	0.5023	72.547	72.5	8.0	0.781	0.792	1.573	1.99	1.182	0.390
57	0.5170	73.293	73.3	8.2	0.787	0.792	1.579	1.99	1.185	0.393
58	0.5324	73.995	74.0	8.5	0.792	0.792	1.584	2.00	1.188	0.396
59	0.5472	74.461	74.5	8.7	0.795	0.792	1.587	2.00	1.189	0.397
60	0.5625	74.977	75.0	9.0	0.798	0.792	1.590	2.01	1.191	0.399
61	0.5772	75.100	75.1	9.2	0.797	0.792	1.589	2.01	1.191	0.399
62	0.5926	76.360	76.4	9.5	0.808	0.792	1.600	2.02	1.196	0.404
63	0.6073	76.267	76.3	9.7	0.805	0.792	1.597	2.02	1.194	0.402
64	0.6221	76.882	76.9	10.0	0.809	0.792	1.601	2.02	1.197	0.405
65	0.6375	76.934	76.9	10.2	0.807	0.792	1.599	2.02	1.196	0.404
66	0.6522	77.579	77.6	10.5	0.812	0.792	1.604	2.03	1.198	0.406
67	0.6670	77.759	77.8	10.7	0.812	0.792	1.604	2.02	1.198	0.406
68	0.6825	78.693	78.7	11.0	0.819	0.792	1.611	2.03	1.202	0.410
69	0.6973	78.431	78.4	11.2	0.814	0.792	1.606	2.03	1.199	0.407
70	0.7126	78.962	79.0	11.5	0.817	0.792	1.609	2.03	1.201	0.409
71	0.7274	79.098	79.1	11.7	0.816	0.792	1.608	2.03	1.200	0.408
72	0.7428	79.534	79.5	12.0	0.818	0.792	1.610	2.03	1.201	0.409
73	0.7575	79.154	79.2	12.2	0.812	0.792	1.604	2.03	1.198	0.406
74	0.7729	79.370	79.4	12.5	0.812	0.792	1.604	2.03	1.198	0.406
75	0.7876	79.361	79.4	12.7	0.810	0.792	1.602	2.02	1.197	0.405
76	0.8030	79.259	79.3	13.0	0.806	0.792	1.598	2.02	1.195	0.403
77	0.8177	78.993	79.0	13.2	0.801	0.792	1.593	2.01	1.193	0.401
78	0.8330	78.891	78.9	13.5	0.798	0.792	1.590	2.01	1.191	0.399
79	0.8478	78.374	78.4	13.7	0.790	0.792	1.582	2.00	1.187	0.395
80	0.8631	78.777	78.8	14.0	0.792	0.792	1.584	2.00	1.188	0.396
81	0.8778	78.991	79.0	14.2	0.792	0.792	1.584	2.00	1.188	0.396
82	0.8932	78.870	78.9	14.5	0.788	0.792	1.580	2.00	1.186	0.394
83	0.9080	78.755	78.8	14.8	0.785	0.792	1.577	1.99	1.185	0.393
84	0.9233	79.351	79.4	15.0	0.789	0.792	1.581	2.00	1.186	0.394



Sample No.	1	2	3
Initial			
Water Content, %	31.4	31.4	31.4
Dry Density, pcf	88.8	88.8	88.8
Saturation, %	94.3	94.3	94.3
Void Ratio	0.8991	0.8991	0.8991
Diameter, in.	2.81	2.81	2.81
Height, in.	5.73	5.73	5.73
At Test			
Water Content, %	32.2	32.2	32.2
Dry Density, pcf	90.1	90.1	90.1
Saturation, %	100.0	100.0	100.0
Void Ratio	0.8707	0.8707	0.8707
Diameter, in.	2.78	2.84	2.93
Height, in.	5.73	5.50	5.19
Strain rate, %/min.	0.05	0.0051	0.0043
Back Pressure, tsf	2.17	2.19	2.16
Cell Pressure, tsf	2.35	3.80	5.36
Fail. Stress, tsf	0.36	1.29	1.59
Excess Pore Pr., tsf	0.06	0.97	1.98
Ult. Stress, tsf	0.43	1.29	1.30
Excess Pore Pr., tsf	-0.01	0.97	1.81
$\bar{\sigma}_1$ Failure, tsf	0.47	1.93	2.80
$\bar{\sigma}_3$ Failure, tsf	0.12	0.64	1.22

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Tan and gray FAT CLAY

LL= 70

PL= 22

PI= 48

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 4767

Pocket pen; tsf: 2.25

Failure type: 45 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: 07-241

Depth: 6-8

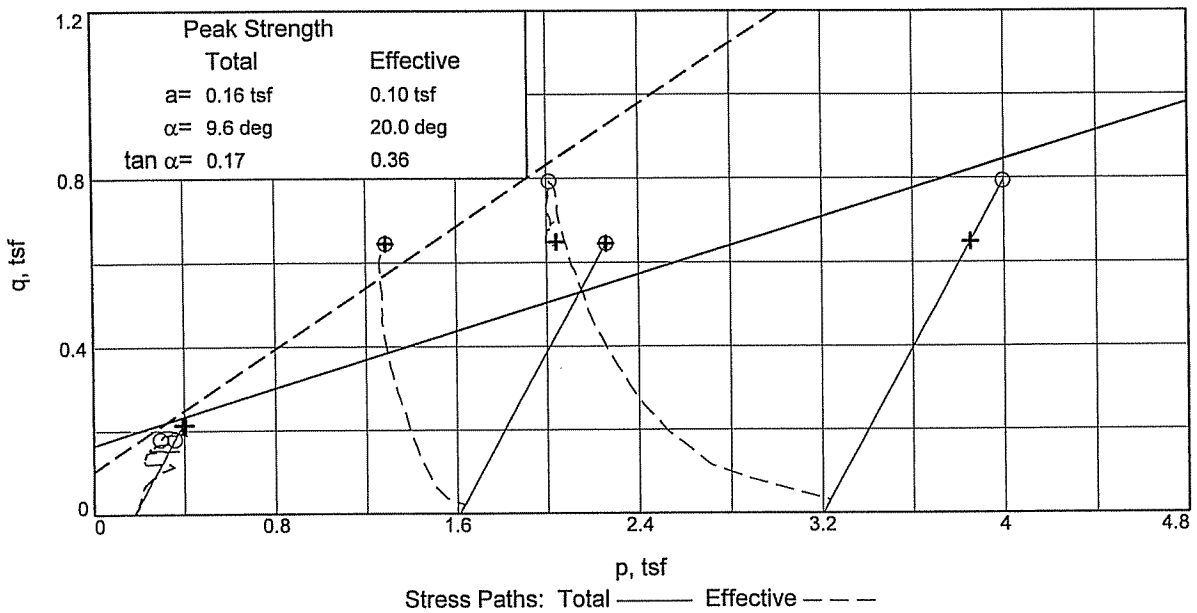
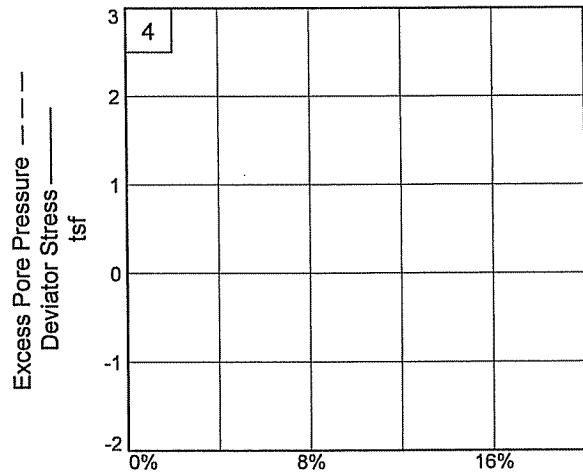
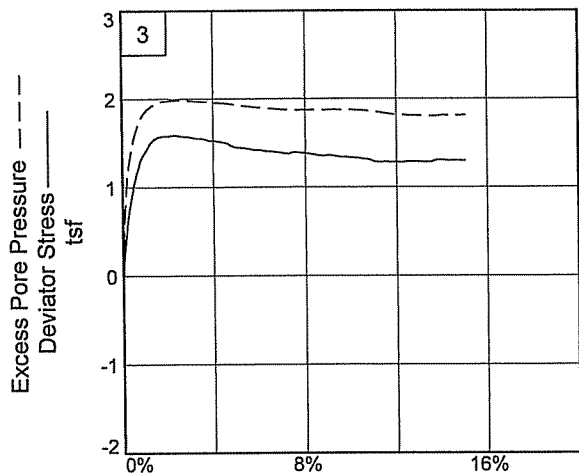
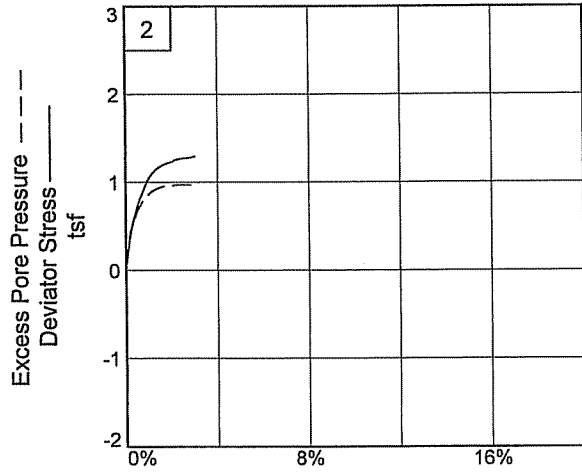
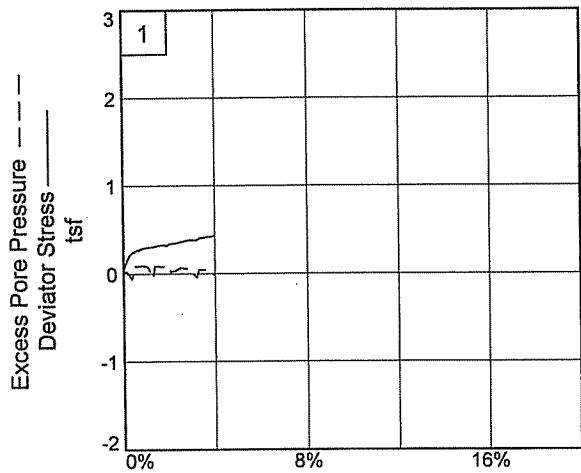
Sample Number: 4

Proj. No.: 08.18.918

Date Sampled: 8/1/08

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: 07-241 Depth: 6-8
 Project No.: 08.18.918

Sample Number: 4

TOLUNAY-WONG ENGINEERS, INC.

TRIAxIAL COMPRESSION TEST
CU with Pore Pressures

8/11/2008
5:05 PM

Date: 8/1/08
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: 07-241
Depth: 6-8 **Sample Number:** 4
Description: Tan and gray FAT CLAY
Remarks:
 Test method: ASTM D 4767
 Pocket pen; tsf: 2.25
 Failure type: 45 degree
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL**=70 **PL**=22 **PI**=48
Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	94.470			82.640
Moisture content: Dry soil+tare, gms.	79.180			69.950
Moisture content: Tare, gms.	30.470			30.600
Moisture, %	31.4	32.7	32.2	32.2
Moist specimen weight, gms.	1084.6			
Diameter, in.	2.81	2.79	2.78	
Area, in. ²	6.18	6.12	6.09	
Height, in.	5.73	5.74	5.73	
Net decrease in height, in.		-0.01	0.01	
Net decrease in water volume, cc.			3.90	
Wet Density, pcf	116.6	118.8	119.2	
Dry density, pcf	88.8	89.5	90.1	
Void ratio	0.8991	0.8835	0.8707	
Saturation, %	94.3	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 32.70 psi (2.354 tsf)
 Consolidation back pressure = 30.20 psi (2.174 tsf)
 Consolidation effective confining stress = 0.180 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 0.359 tsf at reading no. 42
 Ult. Stress = 0.428 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	0.1855	0.000	0.0	0.0	0.000	0.182	0.182	1.00	30.17	0.182	0.000
1	0.1859	0.000	0.0	0.0	0.000	0.182	0.182	1.00	30.17	0.182	0.000
2	0.1860	3.169	3.2	0.0	0.037	0.182	0.220	1.21	30.17	0.201	0.019
3	0.1874	3.932	3.9	0.0	0.046	0.176	0.222	1.26	30.26	0.199	0.023
4	0.1889	6.626	6.6	0.1	0.078	0.170	0.248	1.46	30.34	0.209	0.039
5	0.1903	7.832	7.8	0.1	0.093	0.165	0.257	1.56	30.41	0.211	0.046
6	0.1917	9.542	9.5	0.1	0.113	0.159	0.272	1.71	30.49	0.215	0.056
7	0.1932	11.695	11.7	0.1	0.138	0.158	0.296	1.87	30.50	0.227	0.069
8	0.1946	12.154	12.2	0.2	0.144	0.163	0.307	1.88	30.43	0.235	0.072
9	0.1960	13.706	13.7	0.2	0.162	0.170	0.332	1.95	30.33	0.251	0.081
10	0.1975	14.879	14.9	0.2	0.176	0.178	0.353	1.99	30.23	0.265	0.088
11	0.1989	15.352	15.4	0.2	0.181	0.186	0.367	1.97	30.11	0.277	0.091
12	0.2004	16.991	17.0	0.3	0.200	0.195	0.395	2.03	30.00	0.295	0.100
13	0.2018	17.643	17.6	0.3	0.208	0.204	0.412	2.02	29.86	0.308	0.104
14	0.2032	18.089	18.1	0.3	0.213	0.216	0.429	1.99	29.70	0.322	0.107
15	0.2047	18.633	18.6	0.3	0.220	0.226	0.446	1.97	29.56	0.336	0.110
16	0.2061	19.375	19.4	0.4	0.228	0.240	0.469	1.95	29.36	0.355	0.114
17	0.2090	20.825	20.8	0.4	0.245	0.209	0.454	2.17	29.80	0.332	0.123
18	0.2118	21.478	21.5	0.5	0.240	0.115	0.355	3.09	31.11	0.235	0.120
19	0.2133	22.234	22.2	0.5	0.248	0.102	0.350	3.44	31.29	0.226	0.124
20	0.2147	22.722	22.7	0.5	0.253	0.099	0.352	3.55	31.32	0.226	0.126
21	0.2176	23.554	23.6	0.6	0.261	0.096	0.358	3.71	31.36	0.227	0.131
22	0.2233	24.676	24.7	0.7	0.271	0.093	0.364	3.92	31.41	0.229	0.136
23	0.2248	23.772	23.8	0.7	0.260	0.092	0.352	3.82	31.42	0.222	0.130
24	0.2262	24.865	24.9	0.7	0.272	0.092	0.364	3.94	31.42	0.228	0.136
25	0.2305	26.148	26.1	0.8	0.285	0.091	0.375	4.13	31.44	0.233	0.142
26	0.2334	25.647	25.6	0.8	0.277	0.091	0.368	4.04	31.43	0.230	0.139
27	0.2348	26.209	26.2	0.9	0.283	0.091	0.374	4.10	31.43	0.233	0.141
28	0.2363	26.929	26.9	0.9	0.291	0.090	0.381	4.23	31.45	0.235	0.145
29	0.2420	27.397	27.4	1.0	0.293	0.092	0.385	4.20	31.43	0.238	0.146
30	0.2492	28.178	28.2	1.1	0.298	0.107	0.405	3.79	31.22	0.256	0.149
31	0.2549	28.686	28.7	1.2	0.301	0.162	0.463	2.86	30.45	0.312	0.150
32	0.2607	29.304	29.3	1.3	0.305	0.223	0.528	2.37	29.61	0.375	0.152
33	0.2664	29.735	29.7	1.4	0.307	0.095	0.402	4.23	31.38	0.248	0.153
34	0.2721	30.833	30.8	1.5	0.316	0.096	0.412	4.31	31.37	0.254	0.158
35	0.2779	31.426	31.4	1.6	0.320	0.097	0.417	4.29	31.35	0.257	0.160
36	0.2836	32.059	32.1	1.7	0.324	0.100	0.424	4.25	31.31	0.262	0.162
37	0.2893	32.614	32.6	1.8	0.328	0.102	0.429	4.22	31.29	0.265	0.164
38	0.2951	31.652	31.7	1.9	0.313	0.105	0.418	3.97	31.24	0.262	0.157
39	0.3008	33.622	33.6	2.0	0.333	0.110	0.443	4.04	31.18	0.276	0.167
40	0.3065	34.241	34.2	2.1	0.340	0.163	0.502	3.09	30.44	0.332	0.170
41	0.3180	34.752	34.8	2.3	0.345	0.147	0.492	3.35	30.66	0.319	0.172
42	0.3295	36.050	36.0	2.5	0.359	0.116	0.475	4.10	31.09	0.295	0.180
43	0.3352	36.536	36.5	2.6	0.364	0.118	0.482	4.09	31.07	0.300	0.182
44	0.3467	37.828	37.8	2.8	0.378	0.123	0.501	4.07	30.99	0.312	0.189
45	0.3582	38.094	38.1	3.0	0.380	0.169	0.549	3.25	30.36	0.359	0.190
46	0.3697	38.056	38.1	3.2	0.379	0.221	0.600	2.72	29.63	0.410	0.190

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	0.3754	40.073	40.1	3.3	0.402	0.133	0.535	4.02	30.85	0.334	0.201
48	0.3869	40.863	40.9	3.5	0.410	0.137	0.547	3.98	30.79	0.342	0.205
49	0.3926	41.294	41.3	3.6	0.414	0.139	0.554	3.97	30.76	0.347	0.207
50	0.3983	41.852	41.9	3.7	0.420	0.143	0.563	3.93	30.71	0.353	0.210
51	0.4098	42.164	42.2	3.9	0.423	0.182	0.605	3.32	30.17	0.394	0.211
52	0.4109	42.612	42.6	3.9	0.428	0.192	0.619	3.23	30.04	0.405	0.214

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	94.470			82.640
Moisture content: Dry soil+tare, gms.	79.180			69.950
Moisture content: Tare, gms.	30.470			30.600
Moisture, %	31.4	34.7	32.2	32.2
Moist specimen weight, gms.	1084.6			
Diameter, in.	2.81	2.83	2.84	
Area, in. ²	6.18	6.29	6.35	
Height, in.	5.73	5.74	5.50	
Net decrease in height, in.		-0.01	0.25	
Net decrease in water volume, cc.			19.90	
Wet Density, pcf	116.6	117.3	119.2	
Dry density, pcf	88.8	87.1	90.1	
Void ratio	0.8991	0.9358	0.8707	
Saturation, %	94.3	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 = 52.80 psi (3.802 tsf)
 Consolidation back pressure = 30.40 psi (2.189 tsf)
 Consolidation effective confining stress = 1.613 tsf
 Strain rate, %/min. = 0.0051
 Fail. Stress = 1.291 tsf at reading no. 54
 Ult. Stress = 1.291 tsf at reading no. 54

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0878	0.000	0.0	0.0	0.000	1.611	1.611	1.00	30.43	1.611	0.000
1	0.0881	0.000	0.0	0.0	0.000	1.611	1.611	1.00	30.43	1.611	0.000
2	0.0882	3.829	3.8	0.0	0.043	1.611	1.654	1.03	30.43	1.632	0.022
3	0.0896	6.542	6.5	0.0	0.074	1.518	1.592	1.05	31.71	1.555	0.037
4	0.0909	11.153	11.2	0.1	0.126	1.441	1.568	1.09	32.78	1.505	0.063
5	0.0923	16.595	16.6	0.1	0.188	1.382	1.570	1.14	33.60	1.476	0.094
6	0.0937	21.080	21.1	0.1	0.239	1.333	1.572	1.18	34.28	1.453	0.119
7	0.0951	25.104	25.1	0.1	0.284	1.293	1.577	1.22	34.85	1.435	0.142
8	0.0964	28.820	28.8	0.2	0.326	1.257	1.583	1.26	35.34	1.420	0.163
9	0.0978	32.326	32.3	0.2	0.366	1.222	1.588	1.30	35.83	1.405	0.183
10	0.0992	35.663	35.7	0.2	0.404	1.191	1.594	1.34	36.26	1.392	0.202

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	0.1006	39.042	39.0	0.2	0.442	1.162	1.604	1.38	36.66	1.383	0.221
12	0.1019	41.963	42.0	0.3	0.475	1.138	1.613	1.42	36.99	1.376	0.237
13	0.1033	44.467	44.5	0.3	0.503	1.112	1.614	1.45	37.36	1.363	0.251
14	0.1047	47.135	47.1	0.3	0.533	1.088	1.620	1.49	37.69	1.354	0.266
15	0.1061	49.747	49.7	0.3	0.562	1.065	1.627	1.53	38.01	1.346	0.281
16	0.1074	51.683	51.7	0.4	0.584	1.046	1.630	1.56	38.28	1.338	0.292
17	0.1088	54.210	54.2	0.4	0.612	1.026	1.638	1.60	38.56	1.332	0.306
18	0.1102	56.322	56.3	0.4	0.636	1.005	1.641	1.63	38.84	1.323	0.318
19	0.1116	58.689	58.7	0.4	0.663	0.988	1.651	1.67	39.08	1.319	0.331
20	0.1129	60.695	60.7	0.5	0.685	0.971	1.656	1.71	39.32	1.313	0.343
21	0.1143	62.256	62.3	0.5	0.703	0.957	1.659	1.73	39.51	1.308	0.351
22	0.1157	64.480	64.5	0.5	0.727	0.940	1.667	1.77	39.75	1.303	0.364
23	0.1171	66.583	66.6	0.5	0.751	0.924	1.675	1.81	39.96	1.300	0.375
24	0.1184	68.187	68.2	0.6	0.769	0.911	1.680	1.84	40.15	1.295	0.384
25	0.1198	70.246	70.2	0.6	0.792	0.897	1.689	1.88	40.35	1.293	0.396
26	0.1212	71.570	71.6	0.6	0.807	0.887	1.693	1.91	40.49	1.290	0.403
27	0.1226	73.398	73.4	0.6	0.827	0.872	1.699	1.95	40.68	1.286	0.414
28	0.1239	75.033	75.0	0.7	0.845	0.860	1.705	1.98	40.86	1.283	0.423
29	0.1253	76.361	76.4	0.7	0.860	0.850	1.710	2.01	41.00	1.280	0.430
30	0.1267	77.869	77.9	0.7	0.877	0.840	1.716	2.04	41.14	1.278	0.438
31	0.1281	79.322	79.3	0.7	0.893	0.831	1.724	2.07	41.26	1.277	0.446
32	0.1308	81.718	81.7	0.8	0.919	0.812	1.731	2.13	41.53	1.271	0.460
33	0.1322	83.121	83.1	0.8	0.935	0.804	1.739	2.16	41.63	1.271	0.467
34	0.1336	84.737	84.7	0.8	0.953	0.798	1.751	2.19	41.72	1.274	0.476
35	0.1350	86.095	86.1	0.9	0.968	0.789	1.757	2.23	41.84	1.273	0.484
36	0.1363	87.497	87.5	0.9	0.983	0.781	1.764	2.26	41.95	1.273	0.492
37	0.1377	88.688	88.7	0.9	0.997	0.775	1.772	2.29	42.03	1.274	0.498
38	0.1391	90.192	90.2	0.9	1.013	0.768	1.782	2.32	42.13	1.275	0.507
39	0.1418	92.219	92.2	1.0	1.035	0.755	1.790	2.37	42.32	1.272	0.518
40	0.1432	93.545	93.5	1.0	1.050	0.748	1.798	2.40	42.41	1.273	0.525
41	0.1487	96.607	96.6	1.1	1.083	0.726	1.810	2.49	42.71	1.268	0.542
42	0.1542	99.280	99.3	1.2	1.112	0.709	1.821	2.57	42.95	1.265	0.556
43	0.1597	102.010	102.0	1.3	1.142	0.696	1.838	2.64	43.13	1.267	0.571
44	0.1652	103.814	103.8	1.4	1.161	0.684	1.844	2.70	43.31	1.264	0.580
45	0.1707	105.524	105.5	1.5	1.179	0.673	1.851	2.75	43.46	1.262	0.589
46	0.1762	107.028	107.0	1.6	1.194	0.665	1.859	2.80	43.57	1.262	0.597
47	0.1872	109.054	109.1	1.8	1.214	0.655	1.869	2.85	43.71	1.262	0.607
48	0.1982	110.896	110.9	2.0	1.232	0.652	1.884	2.89	43.75	1.268	0.616
49	0.2037	112.409	112.4	2.1	1.248	0.648	1.896	2.92	43.80	1.272	0.624
50	0.2147	113.771	113.8	2.3	1.260	0.642	1.903	2.96	43.88	1.272	0.630
51	0.2257	114.985	115.0	2.5	1.271	0.641	1.912	2.98	43.90	1.276	0.636
52	0.2367	115.472	115.5	2.7	1.274	0.644	1.918	2.98	43.85	1.281	0.637
53	0.2477	116.716	116.7	2.9	1.285	0.644	1.929	3.00	43.86	1.286	0.642
54	0.2533	117.340	117.3	3.0	1.291	0.643	1.934	3.01	43.86	1.289	0.645

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	94.470			82.640
Moisture content: Dry soil+tare, gms.	79.180			69.950
Moisture content: Tare, gms.	30.470			30.600
Moisture, %	31.4	35.6	32.2	32.2
Moist specimen weight, gms.	1084.6			
Diameter, in.	2.81	2.85	2.93	
Area, in. ²	6.18	6.37	6.73	
Height, in.	5.73	5.74	5.19	
Net decrease in height, in.		-0.01	0.55	
Net decrease in water volume, cc.			27.70	
Wet Density, pcf	116.6	116.5	119.2	
Dry density, pcf	88.8	85.9	90.1	
Void ratio	0.8991	0.9613	0.8707	
Saturation, %	94.3	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 = 74.50 psi (5.364 tsf)

Consolidation back pressure = 30.00 psi (2.160 tsf)

Consolidation effective confining stress = 3.204 tsf

Strain rate, %/min. = 0.0043

Fail. Stress = 1.585 tsf at reading no. 46

Ult. Stress = 1.298 tsf at reading no. 100

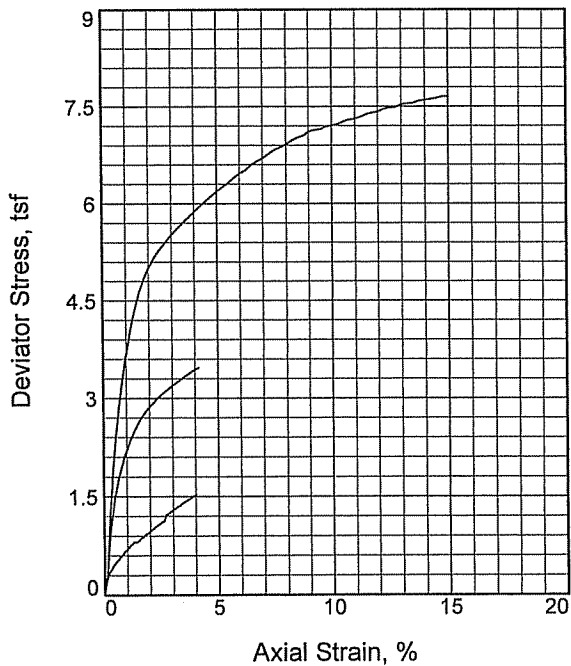
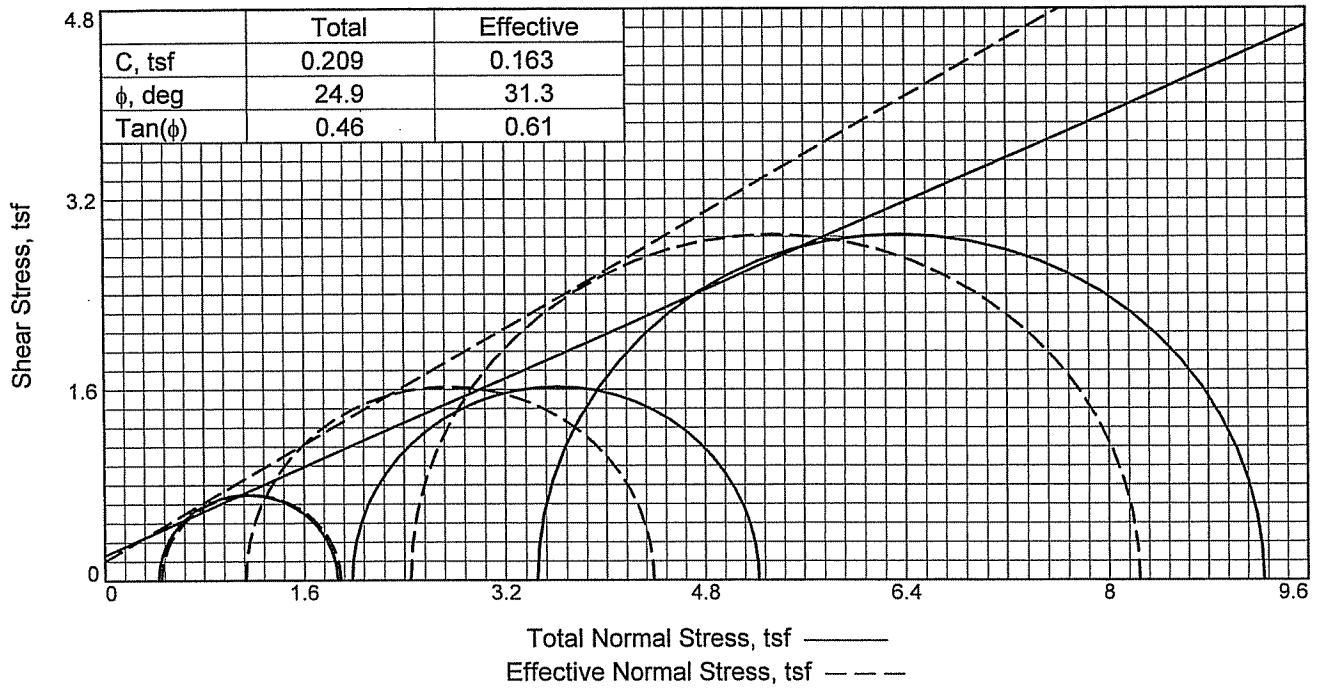
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0860	0.000	0.0	0.0	0.000	3.204	3.204	1.00	30.00	3.204	0.000
1	0.0876	0.000	0.0	0.0	0.000	3.204	3.204	1.00	30.00	3.204	0.000
2	0.0877	5.874	5.9	0.0	0.063	3.204	3.267	1.02	30.00	3.235	0.031
3	0.0890	15.340	15.3	0.1	0.164	2.810	2.974	1.06	35.47	2.892	0.082
4	0.0903	21.709	21.7	0.1	0.232	2.596	2.829	1.09	38.44	2.712	0.116
5	0.0916	30.630	30.6	0.1	0.328	2.444	2.771	1.13	40.56	2.608	0.164
6	0.0929	36.760	36.8	0.1	0.393	2.330	2.723	1.17	42.14	2.527	0.197
7	0.0942	43.135	43.1	0.2	0.461	2.243	2.704	1.21	43.35	2.474	0.231
8	0.0955	47.904	47.9	0.2	0.512	2.169	2.681	1.24	44.37	2.425	0.256
9	0.0968	53.083	53.1	0.2	0.567	2.104	2.671	1.27	45.27	2.388	0.284
10	0.0981	57.901	57.9	0.2	0.618	2.047	2.666	1.30	46.07	2.356	0.309
11	0.0994	62.615	62.6	0.3	0.669	1.998	2.666	1.33	46.75	2.332	0.334
12	0.1007	66.267	66.3	0.3	0.707	1.954	2.661	1.36	47.37	2.307	0.354
13	0.1020	70.254	70.3	0.3	0.750	1.908	2.658	1.39	48.00	2.283	0.375
14	0.1033	73.570	73.6	0.3	0.785	1.872	2.657	1.42	48.50	2.264	0.393
15	0.1046	77.078	77.1	0.4	0.822	1.837	2.659	1.45	48.99	2.248	0.411
16	0.1059	80.306	80.3	0.4	0.856	1.803	2.660	1.47	49.45	2.232	0.428
17	0.1072	83.263	83.3	0.4	0.888	1.771	2.658	1.50	49.91	2.215	0.444
18	0.1085	86.150	86.1	0.4	0.918	1.741	2.659	1.53	50.32	2.200	0.459
19	0.1098	88.749	88.7	0.5	0.946	1.716	2.662	1.55	50.66	2.189	0.473
20	0.1111	91.905	91.9	0.5	0.979	1.687	2.666	1.58	51.07	2.176	0.490

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	0.1124	95.156	95.2	0.5	1.014	1.661	2.675	1.61	51.43	2.168	0.507
22	0.1136	97.633	97.6	0.5	1.040	1.641	2.681	1.63	51.71	2.161	0.520
23	0.1149	100.272	100.3	0.6	1.068	1.619	2.687	1.66	52.01	2.153	0.534
24	0.1162	102.763	102.8	0.6	1.094	1.593	2.687	1.69	52.37	2.140	0.547
25	0.1175	105.175	105.2	0.6	1.119	1.574	2.693	1.71	52.64	2.133	0.560
26	0.1188	107.471	107.5	0.6	1.143	1.556	2.699	1.73	52.89	2.127	0.572
27	0.1201	109.516	109.5	0.7	1.165	1.536	2.701	1.76	53.17	2.118	0.582
28	0.1214	111.168	111.2	0.7	1.182	1.517	2.699	1.78	53.44	2.108	0.591
29	0.1227	113.027	113.0	0.7	1.202	1.501	2.703	1.80	53.65	2.102	0.601
30	0.1240	115.242	115.2	0.7	1.225	1.486	2.711	1.82	53.86	2.098	0.612
31	0.1253	117.094	117.1	0.8	1.244	1.471	2.715	1.85	54.08	2.093	0.622
32	0.1266	119.440	119.4	0.8	1.269	1.454	2.723	1.87	54.30	2.089	0.634
33	0.1279	121.197	121.2	0.8	1.287	1.440	2.727	1.89	54.49	2.084	0.644
34	0.1305	124.183	124.2	0.9	1.318	1.416	2.734	1.93	54.84	2.075	0.659
35	0.1331	126.884	126.9	0.9	1.346	1.394	2.740	1.97	55.15	2.067	0.673
36	0.1357	128.994	129.0	1.0	1.368	1.374	2.742	2.00	55.41	2.058	0.684
37	0.1383	131.130	131.1	1.0	1.390	1.359	2.749	2.02	55.62	2.054	0.695
38	0.1448	136.099	136.1	1.1	1.441	1.326	2.766	2.09	56.09	2.046	0.720
39	0.1500	140.691	140.7	1.2	1.488	1.303	2.791	2.14	56.40	2.047	0.744
40	0.1552	143.190	143.2	1.3	1.513	1.286	2.798	2.18	56.65	2.042	0.756
41	0.1604	145.807	145.8	1.4	1.539	1.269	2.808	2.21	56.87	2.039	0.769
42	0.1708	148.873	148.9	1.6	1.568	1.244	2.812	2.26	57.22	2.028	0.784
43	0.1812	149.952	150.0	1.8	1.576	1.231	2.807	2.28	57.40	2.019	0.788
44	0.1916	150.450	150.4	2.0	1.578	1.227	2.805	2.29	57.46	2.016	0.789
45	0.2020	151.215	151.2	2.2	1.583	1.224	2.806	2.29	57.51	2.015	0.791
46	0.2072	151.624	151.6	2.3	1.585	1.219	2.805	2.30	57.56	2.012	0.793
47	0.2124	151.443	151.4	2.4	1.582	1.219	2.801	2.30	57.57	2.010	0.791
48	0.2228	150.788	150.8	2.6	1.572	1.225	2.797	2.28	57.49	2.011	0.786
49	0.2331	150.875	150.9	2.8	1.569	1.226	2.795	2.28	57.47	2.011	0.785
50	0.2435	150.775	150.8	3.0	1.565	1.226	2.791	2.28	57.47	2.008	0.783
51	0.2539	149.469	149.5	3.2	1.548	1.231	2.779	2.26	57.41	2.005	0.774
52	0.2643	149.901	149.9	3.4	1.550	1.234	2.784	2.26	57.36	2.009	0.775
53	0.2747	149.706	149.7	3.6	1.544	1.238	2.782	2.25	57.31	2.010	0.772
54	0.2851	148.082	148.1	3.8	1.525	1.241	2.766	2.23	57.26	2.004	0.762
55	0.2955	148.224	148.2	4.0	1.523	1.248	2.771	2.22	57.16	2.010	0.761
56	0.3059	147.994	148.0	4.2	1.517	1.249	2.766	2.22	57.16	2.007	0.759
57	0.3163	147.213	147.2	4.4	1.506	1.253	2.759	2.20	57.10	2.006	0.753
58	0.3267	146.067	146.1	4.6	1.491	1.258	2.750	2.19	57.02	2.004	0.746
59	0.3319	144.361	144.4	4.7	1.472	1.264	2.736	2.17	56.95	2.000	0.736
60	0.3422	142.417	142.4	4.9	1.449	1.271	2.721	2.14	56.84	1.996	0.725
61	0.3604	142.276	142.3	5.3	1.443	1.284	2.727	2.12	56.66	2.006	0.721
62	0.3734	141.495	141.5	5.5	1.431	1.290	2.721	2.11	56.58	2.006	0.715
63	0.3864	140.800	140.8	5.8	1.420	1.299	2.720	2.09	56.45	2.010	0.710
64	0.3994	141.013	141.0	6.0	1.419	1.305	2.724	2.09	56.38	2.014	0.709
65	0.4124	140.188	140.2	6.3	1.406	1.313	2.719	2.07	56.27	2.016	0.703
66	0.4254	140.213	140.2	6.5	1.403	1.316	2.719	2.07	56.22	2.018	0.701
67	0.4384	139.738	139.7	6.8	1.394	1.321	2.715	2.06	56.15	2.018	0.697

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	0.4513	139.139	139.1	7.0	1.385	1.327	2.712	2.04	56.07	2.020	0.692
69	0.4643	138.694	138.7	7.3	1.377	1.330	2.706	2.04	56.03	2.018	0.688
70	0.4773	140.857	140.9	7.5	1.394	1.336	2.730	2.04	55.95	2.033	0.697
71	0.4903	140.775	140.8	7.8	1.390	1.330	2.720	2.04	56.03	2.025	0.695
72	0.5033	140.401	140.4	8.0	1.382	1.332	2.714	2.04	56.00	2.023	0.691
73	0.5163	139.772	139.8	8.3	1.372	1.332	2.704	2.03	56.00	2.018	0.686
74	0.5293	138.901	138.9	8.5	1.360	1.332	2.692	2.02	56.00	2.012	0.680
75	0.5423	138.571	138.6	8.8	1.353	1.336	2.689	2.01	55.94	2.013	0.677
76	0.5552	139.626	139.6	9.0	1.360	1.333	2.693	2.02	55.98	2.013	0.680
77	0.5682	139.330	139.3	9.3	1.353	1.327	2.680	2.02	56.07	2.004	0.677
78	0.5812	138.159	138.2	9.5	1.338	1.333	2.671	2.00	55.99	2.002	0.669
79	0.5942	138.423	138.4	9.8	1.337	1.334	2.670	2.00	55.98	2.002	0.668
80	0.6072	138.291	138.3	10.0	1.332	1.333	2.665	2.00	55.98	1.999	0.666
81	0.6202	138.126	138.1	10.3	1.327	1.336	2.662	1.99	55.95	1.999	0.663
82	0.6332	137.647	137.6	10.5	1.318	1.338	2.657	1.98	55.91	1.998	0.659
83	0.6462	137.216	137.2	10.8	1.310	1.344	2.654	1.98	55.83	1.999	0.655
84	0.6591	135.026	135.0	11.0	1.286	1.352	2.638	1.95	55.72	1.995	0.643
85	0.6721	135.010	135.0	11.3	1.282	1.362	2.644	1.94	55.59	2.003	0.641
86	0.6851	135.608	135.6	11.5	1.284	1.371	2.655	1.94	55.46	2.013	0.642
87	0.6981	135.615	135.6	11.8	1.281	1.382	2.663	1.93	55.30	2.023	0.640
88	0.7111	136.047	136.0	12.0	1.281	1.385	2.666	1.92	55.26	2.026	0.641
89	0.7241	136.261	136.3	12.3	1.279	1.388	2.667	1.92	55.22	2.028	0.640
90	0.7371	137.421	137.4	12.5	1.287	1.395	2.681	1.92	55.13	2.038	0.643
91	0.7501	137.949	137.9	12.8	1.288	1.395	2.683	1.92	55.12	2.039	0.644
92	0.7630	137.941	137.9	13.0	1.284	1.398	2.682	1.92	55.09	2.040	0.642
93	0.7760	138.164	138.2	13.3	1.283	1.401	2.683	1.92	55.05	2.042	0.641
94	0.7890	138.547	138.5	13.5	1.282	1.401	2.683	1.92	55.04	2.042	0.641
95	0.8020	141.381	141.4	13.8	1.305	1.401	2.706	1.93	55.05	2.053	0.652
96	0.8150	141.716	141.7	14.0	1.304	1.393	2.697	1.94	55.15	2.045	0.652
97	0.8280	141.346	141.3	14.3	1.297	1.394	2.691	1.93	55.14	2.042	0.648
98	0.8410	142.229	142.2	14.5	1.301	1.391	2.692	1.94	55.18	2.041	0.651
99	0.8540	142.130	142.1	14.8	1.296	1.394	2.690	1.93	55.14	2.042	0.648
100	0.8662	142.702	142.7	15.0	1.298	1.392	2.690	1.93	55.17	2.041	0.649



Sample No.	1	2	3	
Initial	Water Content, %	28.0	28.0	28.0
	Dry Density, pcf	94.4	94.4	94.4
	Saturation, %	96.2	96.2	96.2
	Void Ratio	0.7847	0.7847	0.7847
	Diameter, in.	2.78	2.78	2.78
	Height, in.	5.57	5.57	5.57
At Test	Water Content, %	24.8	24.8	24.8
	Dry Density, pcf	100.9	100.9	100.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6699	0.6699	0.6699
	Diameter, in.	2.69	2.73	2.77
	Height, in.	5.55	5.38	5.22
Strain rate, %/min.	0.05	0.05	0.05	
Back Pressure, tsf	2.18	2.17	2.18	
Cell Pressure, tsf	2.61	4.16	5.63	
Fail. Stress, tsf	1.44	3.25	5.80	
Excess Pore Pr., tsf	-0.02	0.85	1.00	
Ult. Stress, tsf	1.52	3.47	7.66	
Excess Pore Pr., tsf	-0.06	0.77	-0.14	
$\bar{\sigma}_1$ Failure, tsf	1.89	4.38	8.24	
$\bar{\sigma}_3$ Failure, tsf	0.46	1.13	2.45	

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Brown and gray LEAN CLAY

LL= 28 PL= 15 PI= 13

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 4767

Pocket pen; tsf: 1.75

Failure type: Bulge

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

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

Source of Sample: 07-241 **Depth:** 14-16

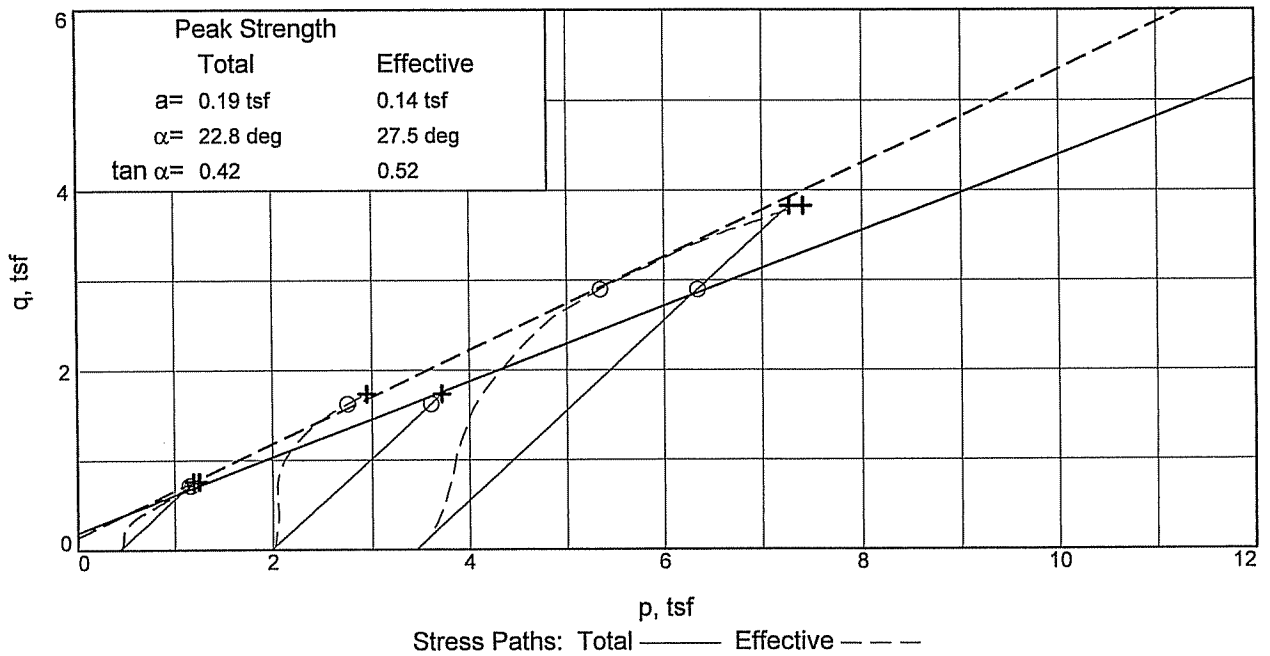
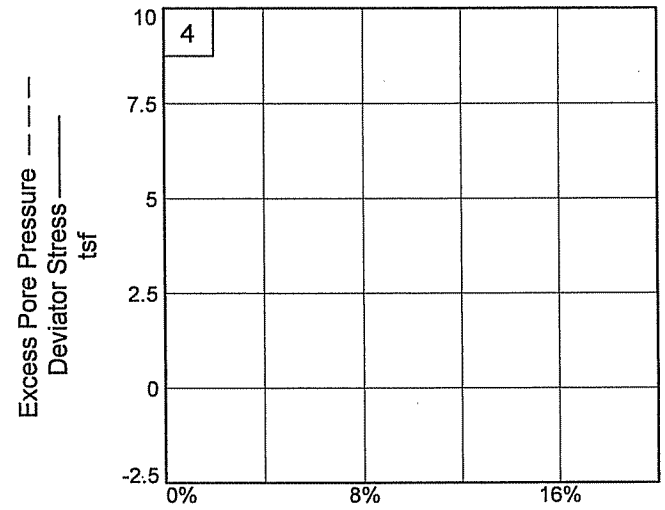
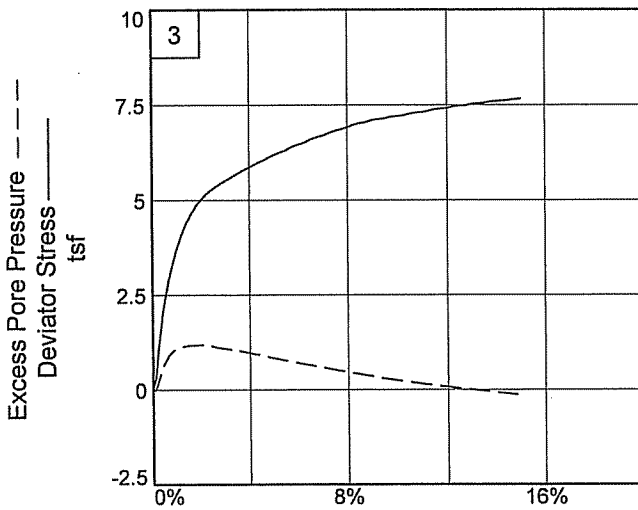
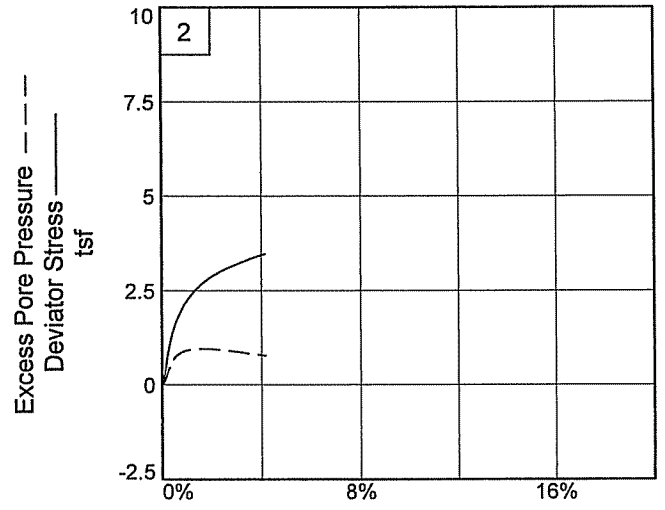
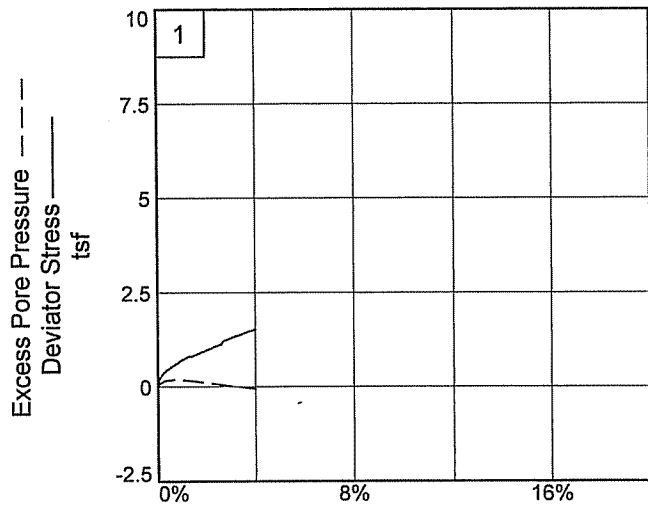
Sample Number: 8

Proj. No.: 08.18.918

Date Sampled: 8/4/08

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: 07-241

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
4:49 PM

Date: 8/4/08
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: 07-241
Depth: 14-16 **Sample Number:** 8
Description: Brown and gray LEAN CLAY
Remarks:
 Test method: ASTM D 4767
 Pocket pen; tsf: 1.75
 Failure type: Bulge
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL**=28 **PL**=15 **PI**=13
Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1				
Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	121.490			118.660
Moisture content: Dry soil+tare, gms.	101.690			101.180
Moisture content: Tare, gms.	30.850			30.730
Moisture, %	28.0	25.3	24.8	24.8
Moist specimen weight, gms.	1069.4			
Diameter, in.	2.78	2.70	2.69	
Area, in. ²	6.05	5.72	5.68	
Height, in.	5.57	5.56	5.55	
Net decrease in height, in.		0.02	0.01	
Net decrease in water volume, cc.			4.00	
Wet Density, pcf	120.8	125.5	126.0	
Dry density, pcf	94.4	100.2	100.9	
Void ratio	0.7847	0.6828	0.6699	
Saturation, %	96.2	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 36.30 psi (2.614 tsf)
 Consolidation back pressure = 30.30 psi (2.182 tsf)
 Consolidation effective confining stress = 0.432 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 1.435 tsf at reading no. 53
 Ult. Stress = 1.524 tsf at reading no. 58

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	0.0040	0.000	0.0	0.0	0.000	0.430	0.430	1.00	30.33	0.430	0.000
1	0.0046	0.000	0.0	0.0	0.000	0.430	0.430	1.00	30.33	0.430	0.000
2	0.0047	3.215	3.2	0.0	0.041	0.429	0.470	1.09	30.33	0.450	0.020
3	0.0061	8.342	8.3	0.0	0.106	0.413	0.518	1.26	30.57	0.466	0.053
4	0.0075	13.002	13.0	0.1	0.165	0.383	0.548	1.43	30.98	0.466	0.082
5	0.0089	16.863	16.9	0.1	0.213	0.366	0.579	1.58	31.22	0.472	0.107
6	0.0103	19.235	19.2	0.1	0.243	0.347	0.591	1.70	31.48	0.469	0.122
7	0.0117	21.271	21.3	0.1	0.269	0.333	0.602	1.81	31.67	0.468	0.135
8	0.0131	23.366	23.4	0.2	0.295	0.322	0.618	1.92	31.82	0.470	0.148
9	0.0145	25.180	25.2	0.2	0.318	0.312	0.630	2.02	31.97	0.471	0.159
10	0.0159	26.660	26.7	0.2	0.337	0.303	0.640	2.11	32.09	0.471	0.168
11	0.0172	27.939	27.9	0.2	0.353	0.296	0.649	2.19	32.19	0.473	0.177
12	0.0186	29.297	29.3	0.3	0.370	0.291	0.661	2.27	32.26	0.476	0.185
13	0.0214	31.373	31.4	0.3	0.396	0.278	0.674	2.43	32.44	0.476	0.198
14	0.0228	32.732	32.7	0.3	0.413	0.274	0.687	2.51	32.50	0.480	0.207
15	0.0256	34.941	34.9	0.4	0.441	0.266	0.707	2.66	32.61	0.486	0.220
16	0.0283	36.699	36.7	0.4	0.463	0.262	0.724	2.77	32.67	0.493	0.231
17	0.0311	38.257	38.3	0.5	0.482	0.256	0.738	2.89	32.75	0.497	0.241
18	0.0325	39.552	39.6	0.5	0.498	0.253	0.751	2.97	32.79	0.502	0.249
19	0.0367	42.090	42.1	0.6	0.530	0.250	0.780	3.12	32.83	0.515	0.265
20	0.0394	43.636	43.6	0.6	0.549	0.249	0.798	3.21	32.84	0.523	0.275
21	0.0422	45.426	45.4	0.7	0.571	0.245	0.816	3.34	32.90	0.530	0.286
22	0.0450	46.863	46.9	0.7	0.589	0.247	0.836	3.39	32.87	0.542	0.295
23	0.0478	48.681	48.7	0.8	0.612	0.246	0.857	3.49	32.89	0.552	0.306
24	0.0505	50.453	50.5	0.8	0.634	0.248	0.882	3.55	32.85	0.565	0.317
25	0.0533	52.348	52.3	0.9	0.657	0.245	0.902	3.68	32.90	0.574	0.329
26	0.0561	54.014	54.0	0.9	0.678	0.246	0.924	3.75	32.88	0.585	0.339
27	0.0589	55.442	55.4	1.0	0.695	0.250	0.945	3.78	32.83	0.598	0.348
28	0.0658	59.338	59.3	1.1	0.743	0.254	0.997	3.93	32.77	0.626	0.372
29	0.0714	61.825	61.8	1.2	0.774	0.259	1.032	3.99	32.71	0.646	0.387
30	0.0769	64.798	64.8	1.3	0.810	0.268	1.078	4.03	32.58	0.673	0.405
31	0.0825	67.602	67.6	1.4	0.802	0.275	1.077	3.91	32.48	0.676	0.401
32	0.0880	70.188	70.2	1.5	0.830	0.282	1.112	3.94	32.38	0.697	0.415
33	0.0936	72.981	73.0	1.6	0.861	0.292	1.154	3.94	32.24	0.723	0.431
34	0.0991	75.134	75.1	1.7	0.884	0.305	1.189	3.90	32.07	0.747	0.442
35	0.1047	78.029	78.0	1.8	0.916	0.313	1.229	3.92	31.95	0.771	0.458
36	0.1102	79.981	80.0	1.9	0.936	0.320	1.256	3.93	31.86	0.788	0.468
37	0.1158	82.787	82.8	2.0	0.968	0.324	1.292	3.98	31.79	0.808	0.484
38	0.1214	85.069	85.1	2.1	0.995	0.335	1.330	3.97	31.64	0.833	0.497
39	0.1269	87.203	87.2	2.2	1.020	0.342	1.362	3.98	31.55	0.852	0.510
40	0.1325	89.731	89.7	2.3	1.050	0.352	1.402	3.98	31.41	0.877	0.525
41	0.1380	91.693	91.7	2.4	1.073	0.363	1.436	3.96	31.26	0.900	0.537
42	0.1436	94.373	94.4	2.5	1.105	0.371	1.477	3.98	31.14	0.924	0.553
43	0.1491	96.149	96.1	2.6	1.126	0.381	1.507	3.95	31.00	0.944	0.563
44	0.1547	98.655	98.7	2.7	1.216	0.389	1.604	4.13	30.90	0.997	0.608
45	0.1602	100.521	100.5	2.8	1.237	0.398	1.635	4.11	30.78	1.016	0.619
46	0.1658	102.925	102.9	2.9	1.266	0.405	1.671	4.12	30.67	1.038	0.633

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	0.1713	105.126	105.1	3.0	1.291	0.412	1.704	4.13	30.57	1.058	0.646
48	0.1769	107.311	107.3	3.1	1.317	0.422	1.739	4.12	30.44	1.080	0.658
49	0.1824	109.462	109.5	3.2	1.342	0.428	1.770	4.13	30.35	1.099	0.671
50	0.1880	111.250	111.3	3.3	1.362	0.437	1.799	4.12	30.24	1.118	0.681
51	0.1935	113.586	113.6	3.4	1.389	0.444	1.833	4.13	30.14	1.138	0.695
52	0.1991	115.359	115.4	3.5	1.410	0.450	1.859	4.14	30.06	1.154	0.705
53	0.2046	117.556	117.6	3.6	1.435	0.456	1.891	4.15	29.97	1.174	0.718
54	0.2102	119.187	119.2	3.7	1.453	0.463	1.916	4.14	29.88	1.189	0.727
55	0.2157	121.430	121.4	3.8	1.479	0.470	1.949	4.15	29.78	1.209	0.740
56	0.2213	123.102	123.1	3.9	1.498	0.477	1.975	4.14	29.68	1.226	0.749
57	0.2268	125.287	125.3	4.0	1.523	0.487	2.010	4.13	29.54	1.248	0.762
58	0.2274	125.371	125.4	4.0	1.524	0.488	2.011	4.13	29.53	1.250	0.762

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	121.490			118.660
Moisture content: Dry soil+tare, gms.	101.690			101.180
Moisture content: Tare, gms.	30.850			30.730
Moisture, %	28.0	26.4	24.8	24.8
Moist specimen weight, gms.	1069.4			
Diameter, in.	2.78	2.72	2.73	
Area, in. ²	6.05	5.82	5.86	
Height, in.	5.57	5.56	5.38	
Net decrease in height, in.		0.02	0.18	
Net decrease in water volume, cc.			13.40	
Wet Density, pcf	120.8	124.4	126.0	
Dry density, pcf	94.4	98.4	100.9	
Void ratio	0.7847	0.7132	0.6699	
Saturation, %	96.2	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 57.80 psi (4.162 tsf)
 Consolidation back pressure = 30.20 psi (2.174 tsf)
 Consolidation effective confining stress = 1.987 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 3.246 tsf at reading no. 51
 Ult. Stress = 3.468 tsf at reading no. 56

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	-0.1958	0.000	0.0	0.0	0.000	1.990	1.990	1.00	30.16	1.990	0.000
1	-0.1956	0.000	0.0	0.0	0.000	1.990	1.990	1.00	30.16	1.990	0.000
2	-0.1955	3.142	3.1	0.0	0.039	1.990	2.029	1.02	30.16	2.010	0.019
3	-0.1941	6.825	6.8	0.0	0.084	1.981	2.065	1.04	30.29	2.023	0.042
4	-0.1927	10.819	10.8	0.1	0.133	1.961	2.094	1.07	30.56	2.027	0.066

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
5	-0.1913	15.898	15.9	0.1	0.195	1.934	2.129	1.10	30.94	2.031	0.098
6	-0.1899	22.734	22.7	0.1	0.279	1.898	2.177	1.15	31.44	2.037	0.139
7	-0.1885	30.467	30.5	0.1	0.374	1.856	2.230	1.20	32.02	2.043	0.187
8	-0.1871	39.894	39.9	0.2	0.489	1.808	2.297	1.27	32.69	2.053	0.245
9	-0.1857	49.661	49.7	0.2	0.609	1.753	2.362	1.35	33.46	2.057	0.304
10	-0.1843	59.053	59.1	0.2	0.724	1.700	2.423	1.43	34.20	2.061	0.362
11	-0.1829	67.073	67.1	0.2	0.822	1.650	2.472	1.50	34.88	2.061	0.411
12	-0.1815	74.799	74.8	0.3	0.916	1.600	2.516	1.57	35.57	2.058	0.458
13	-0.1801	81.653	81.7	0.3	1.000	1.554	2.554	1.64	36.22	2.054	0.500
14	-0.1787	87.629	87.6	0.3	1.073	1.515	2.588	1.71	36.76	2.051	0.536
15	-0.1773	93.778	93.8	0.3	1.148	1.477	2.625	1.78	37.29	2.051	0.574
16	-0.1759	99.933	99.9	0.4	1.223	1.441	2.663	1.85	37.79	2.052	0.611
17	-0.1745	105.421	105.4	0.4	1.290	1.406	2.696	1.92	38.27	2.051	0.645
18	-0.1731	110.730	110.7	0.4	1.354	1.373	2.728	1.99	38.73	2.050	0.677
19	-0.1717	115.192	115.2	0.4	1.408	1.345	2.754	2.05	39.11	2.050	0.704
20	-0.1703	119.189	119.2	0.5	1.457	1.321	2.778	2.10	39.45	2.050	0.728
21	-0.1689	123.032	123.0	0.5	1.504	1.300	2.804	2.16	39.74	2.052	0.752
22	-0.1675	127.164	127.2	0.5	1.554	1.278	2.832	2.22	40.05	2.055	0.777
23	-0.1661	131.403	131.4	0.6	1.605	1.258	2.863	2.28	40.33	2.060	0.803
24	-0.1647	135.611	135.6	0.6	1.656	1.238	2.894	2.34	40.60	2.066	0.828
25	-0.1634	139.075	139.1	0.6	1.698	1.222	2.919	2.39	40.83	2.071	0.849
26	-0.1620	142.420	142.4	0.6	1.738	1.207	2.945	2.44	41.04	2.076	0.869
27	-0.1605	145.380	145.4	0.7	1.774	1.193	2.967	2.49	41.23	2.080	0.887
28	-0.1578	151.092	151.1	0.7	1.843	1.168	3.011	2.58	41.57	2.090	0.921
29	-0.1564	154.365	154.4	0.7	1.882	1.159	3.041	2.62	41.71	2.100	0.941
30	-0.1550	157.563	157.6	0.8	1.921	1.148	3.068	2.67	41.86	2.108	0.960
31	-0.1521	162.783	162.8	0.8	1.983	1.131	3.114	2.75	42.10	2.122	0.992
32	-0.1493	167.554	167.6	0.9	2.040	1.116	3.156	2.83	42.30	2.136	1.020
33	-0.1465	173.062	173.1	0.9	2.106	1.103	3.209	2.91	42.48	2.156	1.053
34	-0.1438	177.840	177.8	1.0	2.163	1.090	3.253	2.98	42.66	2.172	1.082
35	-0.1409	182.046	182.0	1.0	2.213	1.082	3.295	3.05	42.78	2.188	1.107
36	-0.1340	192.765	192.8	1.1	2.340	1.063	3.403	3.20	43.04	2.233	1.170
37	-0.1284	199.344	199.3	1.3	2.418	1.052	3.470	3.30	43.19	2.261	1.209
38	-0.1228	206.571	206.6	1.4	2.503	1.045	3.548	3.40	43.29	2.296	1.251
39	-0.1173	212.774	212.8	1.5	2.575	1.040	3.616	3.48	43.35	2.328	1.288
40	-0.1117	218.316	218.3	1.6	2.639	1.038	3.678	3.54	43.38	2.358	1.320
41	-0.1061	223.923	223.9	1.7	2.704	1.035	3.739	3.61	43.43	2.387	1.352
42	-0.1006	227.908	227.9	1.8	2.750	1.038	3.788	3.65	43.38	2.413	1.375
43	-0.0950	233.098	233.1	1.9	2.809	1.040	3.849	3.70	43.36	2.445	1.405
44	-0.0838	240.553	240.6	2.1	2.893	1.049	3.942	3.76	43.23	2.495	1.447
45	-0.0783	243.660	243.7	2.2	2.927	1.055	3.982	3.77	43.15	2.519	1.464
46	-0.0727	247.405	247.4	2.3	2.969	1.061	4.030	3.80	43.07	2.545	1.485
47	-0.0671	250.690	250.7	2.4	3.005	1.065	4.071	3.82	43.00	2.568	1.503
48	-0.0559	257.038	257.0	2.6	3.075	1.079	4.154	3.85	42.81	2.617	1.537
49	-0.0448	262.524	262.5	2.8	3.134	1.096	4.230	3.86	42.57	2.663	1.567
50	-0.0336	267.902	267.9	3.0	3.191	1.114	4.306	3.86	42.32	2.710	1.596
51	-0.0225	273.042	273.0	3.2	3.246	1.132	4.378	3.87	42.07	2.755	1.623

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
52	-0.0113	277.991	278.0	3.4	3.297	1.151	4.448	3.87	41.82	2.799	1.649
53	-0.0058	280.945	280.9	3.5	3.329	1.160	4.489	3.87	41.69	2.824	1.664
54	0.0054	285.570	285.6	3.7	3.376	1.179	4.555	3.86	41.43	2.867	1.688
55	0.0166	290.105	290.1	3.9	3.422	1.198	4.620	3.86	41.16	2.909	1.711
56	0.0277	294.609	294.6	4.2	3.468	1.217	4.685	3.85	40.90	2.951	1.734

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	121.490			118.660
Moisture content: Dry soil+tare, gms.	101.690			101.180
Moisture content: Tare, gms.	30.850			30.730
Moisture, %	28.0	27.0	24.8	24.8
Moist specimen weight, gms.	1069.4			
Diameter, in.	2.78	2.74	2.77	
Area, in. ²	6.05	5.88	6.04	
Height, in.	5.57	5.56	5.22	
Net decrease in height, in.		0.02	0.34	
Net decrease in water volume, cc.			18.00	
Wet Density, pcf	120.8	123.8	126.0	
Dry density, pcf	94.4	97.5	100.9	
Void ratio	0.7847	0.7281	0.6699	
Saturation, %	96.2	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 78.20 psi (5.630 tsf)
 Consolidation back pressure = 30.30 psi (2.182 tsf)
 Consolidation effective confining stress = 3.449 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 5.798 tsf at reading no. 47
 Ult. Stress = 7.656 tsf at reading no. 93

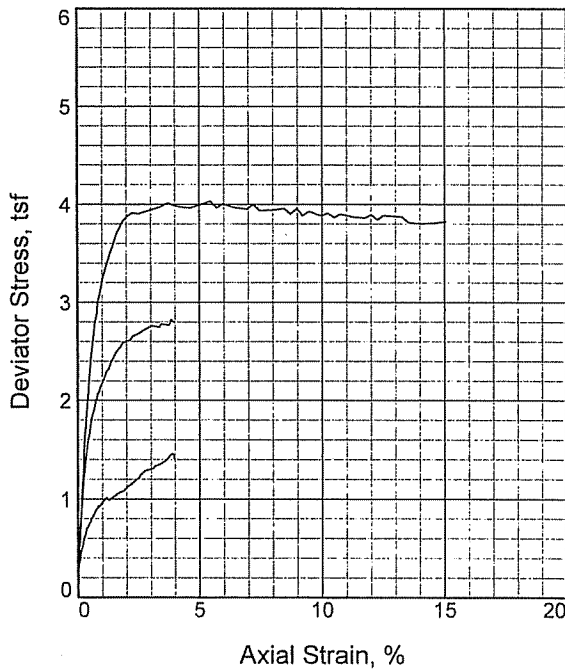
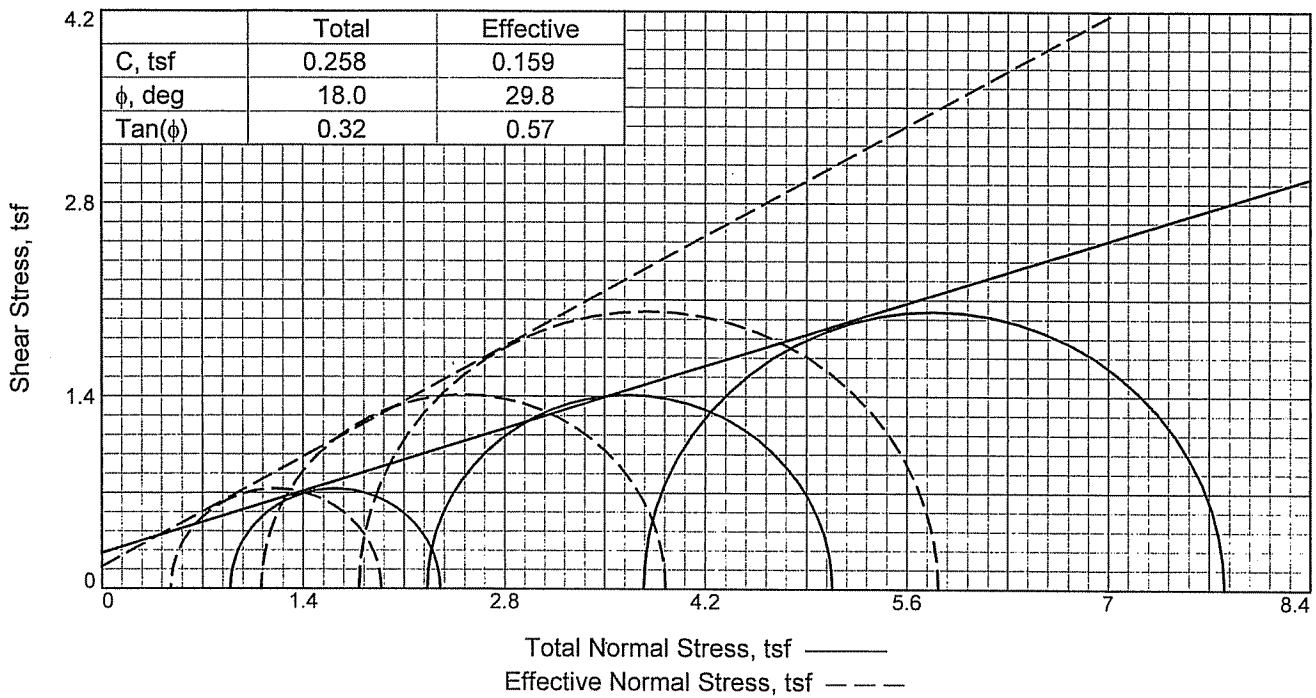
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	-0.0372	0.000	0.0	0.0	0.000	3.452	3.452	1.00	30.25	3.452	0.000
1	-0.0371	0.000	0.0	0.0	0.000	3.452	3.452	1.00	30.25	3.452	0.000
2	-0.0370	3.528	3.5	0.0	0.042	3.452	3.494	1.01	30.25	3.473	0.021
3	-0.0344	12.924	12.9	0.1	0.154	3.454	3.608	1.04	30.22	3.531	0.077
4	-0.0318	21.903	21.9	0.1	0.261	3.453	3.714	1.08	30.24	3.584	0.130
5	-0.0292	39.197	39.2	0.2	0.466	3.403	3.870	1.14	30.93	3.636	0.233
6	-0.0279	52.442	52.4	0.2	0.624	3.364	3.988	1.19	31.48	3.676	0.312
7	-0.0266	66.791	66.8	0.2	0.794	3.310	4.105	1.24	32.22	3.708	0.397
8	-0.0252	81.213	81.2	0.2	0.966	3.252	4.218	1.30	33.03	3.735	0.483
9	-0.0239	94.870	94.9	0.3	1.128	3.194	4.322	1.35	33.83	3.758	0.564
10	-0.0226	107.062	107.1	0.3	1.272	3.140	4.412	1.41	34.59	3.776	0.636
11	-0.0213	118.284	118.3	0.3	1.405	3.093	4.498	1.45	35.25	3.795	0.703

Test Readings for Specimen No. 5

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	-0.0200	128.551	128.6	0.3	1.527	3.048	4.575	1.50	35.87	3.811	0.763
13	-0.0187	138.191	138.2	0.4	1.641	3.007	4.648	1.55	36.44	3.827	0.820
14	-0.0174	149.104	149.1	0.4	1.770	2.955	4.725	1.60	37.16	3.840	0.885
15	-0.0161	159.375	159.4	0.4	1.892	2.906	4.798	1.65	37.84	3.852	0.946
16	-0.0148	168.945	168.9	0.4	2.005	2.859	4.863	1.70	38.49	3.861	1.002
17	-0.0135	177.651	177.7	0.5	2.107	2.818	4.926	1.75	39.06	3.872	1.054
18	-0.0122	185.872	185.9	0.5	2.204	2.782	4.986	1.79	39.56	3.884	1.102
19	-0.0109	193.521	193.5	0.5	2.295	2.750	5.044	1.83	40.01	3.897	1.147
20	-0.0083	207.746	207.7	0.6	2.462	2.693	5.155	1.91	40.80	3.924	1.231
21	-0.0070	215.724	215.7	0.6	2.556	2.661	5.217	1.96	41.24	3.939	1.278
22	-0.0044	230.156	230.2	0.6	2.725	2.608	5.333	2.05	41.98	3.971	1.363
23	-0.0017	243.002	243.0	0.7	2.876	2.553	5.429	2.13	42.74	3.991	1.438
24	0.0009	254.037	254.0	0.7	3.005	2.512	5.517	2.20	43.31	4.015	1.503
25	0.0035	266.378	266.4	0.8	3.150	2.474	5.623	2.27	43.85	4.048	1.575
26	0.0061	277.533	277.5	0.8	3.280	2.443	5.723	2.34	44.27	4.083	1.640
27	0.0087	287.859	287.9	0.9	3.400	2.417	5.817	2.41	44.63	4.117	1.700
28	0.0113	297.019	297.0	0.9	3.507	2.393	5.899	2.47	44.97	4.146	1.753
29	0.0139	307.864	307.9	1.0	3.633	2.374	6.007	2.53	45.23	4.190	1.816
30	0.0205	329.000	329.0	1.1	3.877	2.337	6.214	2.66	45.75	4.275	1.939
31	0.0257	345.967	346.0	1.2	4.073	2.318	6.391	2.76	46.00	4.355	2.037
32	0.0309	359.214	359.2	1.3	4.225	2.308	6.533	2.83	46.15	4.420	2.112
33	0.0361	373.689	373.7	1.4	4.391	2.288	6.679	2.92	46.42	4.484	2.195
34	0.0414	384.127	384.1	1.5	4.509	2.279	6.787	2.98	46.55	4.533	2.254
35	0.0466	395.516	395.5	1.6	4.638	2.272	6.910	3.04	46.65	4.591	2.319
36	0.0518	403.798	403.8	1.7	4.730	2.272	7.002	3.08	46.65	4.637	2.365
37	0.0570	413.613	413.6	1.8	4.840	2.265	7.105	3.14	46.74	4.685	2.420
38	0.0675	428.245	428.2	2.0	5.001	2.266	7.267	3.21	46.73	4.766	2.501
39	0.0779	440.845	440.8	2.2	5.138	2.270	7.408	3.26	46.67	4.839	2.569
40	0.0884	451.093	451.1	2.4	5.246	2.279	7.525	3.30	46.55	4.902	2.623
41	0.0988	460.155	460.2	2.6	5.341	2.319	7.660	3.30	45.99	4.990	2.670
42	0.1093	468.800	468.8	2.8	5.430	2.345	7.775	3.32	45.63	5.060	2.715
43	0.1198	476.719	476.7	3.0	5.510	2.366	7.876	3.33	45.34	5.121	2.755
44	0.1302	484.428	484.4	3.2	5.588	2.380	7.968	3.35	45.14	5.174	2.794
45	0.1406	491.625	491.6	3.4	5.659	2.404	8.063	3.35	44.81	5.234	2.830
46	0.1511	498.942	498.9	3.6	5.731	2.427	8.159	3.36	44.49	5.293	2.866
47	0.1616	505.760	505.8	3.8	5.798	2.447	8.244	3.37	44.22	5.346	2.899
48	0.1720	512.816	512.8	4.0	5.866	2.476	8.343	3.37	43.81	5.410	2.933
49	0.1825	519.717	519.7	4.2	5.933	2.507	8.440	3.37	43.38	5.474	2.966
50	0.1929	526.543	526.5	4.4	5.998	2.528	8.526	3.37	43.09	5.527	2.999
51	0.2034	532.968	533.0	4.6	6.059	2.558	8.617	3.37	42.67	5.587	3.029
52	0.2138	539.581	539.6	4.8	6.121	2.588	8.709	3.37	42.26	5.648	3.060
53	0.2243	545.839	545.8	5.0	6.179	2.617	8.796	3.36	41.85	5.706	3.089
54	0.2373	553.479	553.5	5.3	6.249	2.650	8.899	3.36	41.39	5.775	3.124
55	0.2504	560.055	560.1	5.5	6.306	2.685	8.992	3.35	40.90	5.839	3.153
56	0.2635	569.714	569.7	5.8	6.398	2.717	9.116	3.35	40.46	5.917	3.199
57	0.2765	576.666	576.7	6.0	6.459	2.741	9.200	3.36	40.13	5.971	3.230
58	0.2896	582.981	583.0	6.3	6.513	2.774	9.287	3.35	39.67	6.031	3.256

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	0.3026	591.709	591.7	6.5	6.592	2.803	9.396	3.35	39.26	6.100	3.296
60	0.3157	598.443	598.4	6.8	6.650	2.833	9.482	3.35	38.86	6.157	3.325
61	0.3287	604.253	604.3	7.0	6.696	2.864	9.560	3.34	38.42	6.212	3.348
62	0.3418	611.798	611.8	7.3	6.761	2.894	9.655	3.34	38.01	6.275	3.381
63	0.3549	618.674	618.7	7.5	6.819	2.924	9.743	3.33	37.59	6.333	3.410
64	0.3679	624.421	624.4	7.8	6.864	2.955	9.819	3.32	37.16	6.387	3.432
65	0.3810	630.455	630.5	8.0	6.911	2.984	9.895	3.32	36.76	6.439	3.456
66	0.3940	638.037	638.0	8.3	6.975	3.011	9.986	3.32	36.38	6.499	3.488
67	0.4071	643.656	643.7	8.5	7.018	3.037	10.054	3.31	36.03	6.545	3.509
68	0.4201	647.871	647.9	8.8	7.044	3.070	10.115	3.29	35.55	6.593	3.522
69	0.4332	655.506	655.5	9.0	7.108	3.097	10.205	3.30	35.19	6.651	3.554
70	0.4463	659.781	659.8	9.3	7.134	3.128	10.262	3.28	34.76	6.695	3.567
71	0.4593	662.586	662.6	9.5	7.145	3.156	10.301	3.26	34.36	6.729	3.573
72	0.4724	668.659	668.7	9.8	7.191	3.179	10.369	3.26	34.05	6.774	3.595
73	0.4854	672.058	672.1	10.0	7.207	3.203	10.410	3.25	33.72	6.806	3.604
74	0.4985	675.377	675.4	10.3	7.223	3.224	10.447	3.24	33.42	6.835	3.611
75	0.5116	681.242	681.2	10.5	7.265	3.248	10.513	3.24	33.09	6.881	3.633
76	0.5246	686.036	686.0	10.8	7.296	3.273	10.568	3.23	32.75	6.921	3.648
77	0.5377	689.245	689.2	11.0	7.309	3.295	10.604	3.22	32.44	6.949	3.655
78	0.5507	694.084	694.1	11.3	7.340	3.315	10.655	3.21	32.16	6.985	3.670
79	0.5638	699.694	699.7	11.5	7.378	3.336	10.714	3.21	31.87	7.025	3.689
80	0.5768	703.729	703.7	11.8	7.400	3.357	10.757	3.20	31.57	7.057	3.700
81	0.5899	707.278	707.3	12.0	7.416	3.376	10.793	3.20	31.31	7.085	3.708
82	0.6029	713.685	713.7	12.3	7.462	3.395	10.857	3.20	31.04	7.126	3.731
83	0.6160	717.386	717.4	12.5	7.479	3.417	10.896	3.19	30.75	7.156	3.740
84	0.6291	719.986	720.0	12.8	7.485	3.434	10.919	3.18	30.50	7.177	3.743
85	0.6421	726.322	726.3	13.0	7.529	3.449	10.979	3.18	30.29	7.214	3.765
86	0.6552	729.764	729.8	13.3	7.543	3.464	11.007	3.18	30.09	7.236	3.772
87	0.6682	732.431	732.4	13.5	7.549	3.482	11.031	3.17	29.84	7.257	3.774
88	0.6813	738.158	738.2	13.8	7.586	3.498	11.084	3.17	29.61	7.291	3.793
89	0.6944	741.749	741.7	14.0	7.601	3.523	11.124	3.16	29.27	7.324	3.800
90	0.7074	745.128	745.1	14.3	7.613	3.542	11.155	3.15	29.01	7.349	3.807
91	0.7205	748.799	748.8	14.5	7.628	3.557	11.186	3.14	28.79	7.372	3.814
92	0.7335	753.318	753.3	14.8	7.652	3.577	11.229	3.14	28.52	7.403	3.826
93	0.7466	755.950	755.9	15.0	7.656	3.588	11.244	3.13	28.36	7.416	3.828



Sample No.		1	2	3
Initial	Water Content, %	33.0	33.0	33.0
	Dry Density, pcf	88.2	88.2	88.2
	Saturation, %	97.7	97.7	97.7
	Void Ratio	0.9113	0.9113	0.9113
	Diameter, in.	2.03	2.03	2.03
	Height, in.	3.97	3.97	3.97
At Test	Water Content, %	25.9	25.9	25.9
	Dry Density, pcf	99.2	99.2	99.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6995	0.6995	0.6995
	Diameter, in.	1.93	1.98	1.99
	Height, in.	3.94	3.75	3.70
Strain rate, %/min.		0.05	0.05	0.05
Back Pressure, tsf		2.16	2.16	2.19
Cell Pressure, tsf		3.05	4.42	5.96
Fail. Stress, tsf		1.46	2.82	4.03
Excess Pore Pr., tsf		0.41	1.15	1.99
Ult. Stress, tsf		1.41	2.80	3.82
Excess Pore Pr., tsf		0.39	1.13	2.03
$\bar{\sigma}_1$ Failure, tsf		1.94	3.93	5.82
$\bar{\sigma}_3$ Failure, tsf		0.48	1.11	1.79

Type of Test:

CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray LEAN CLAY

LL= 36

PL= 16

PI= 20

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 4767

Pocket pen; tsf: 0.75

Failure type: Bulge

Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

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

Source of Sample: 07-241

Depth: 26-28

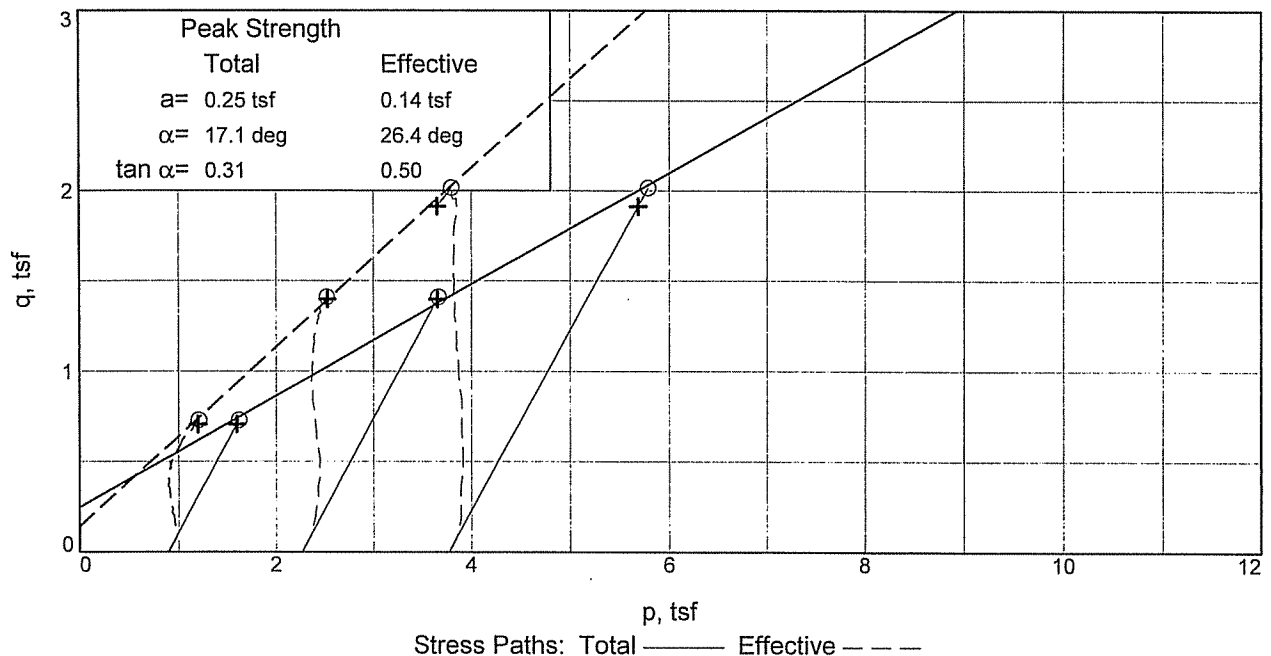
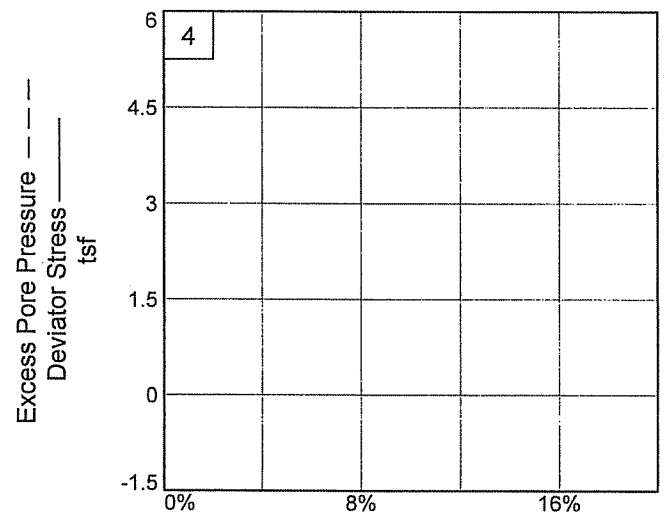
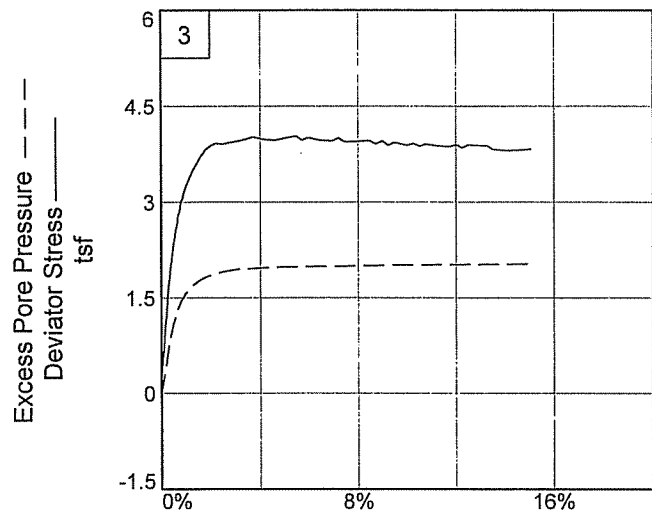
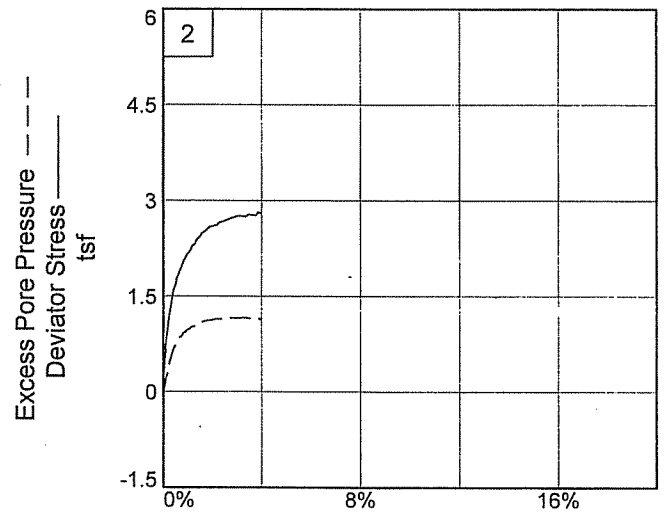
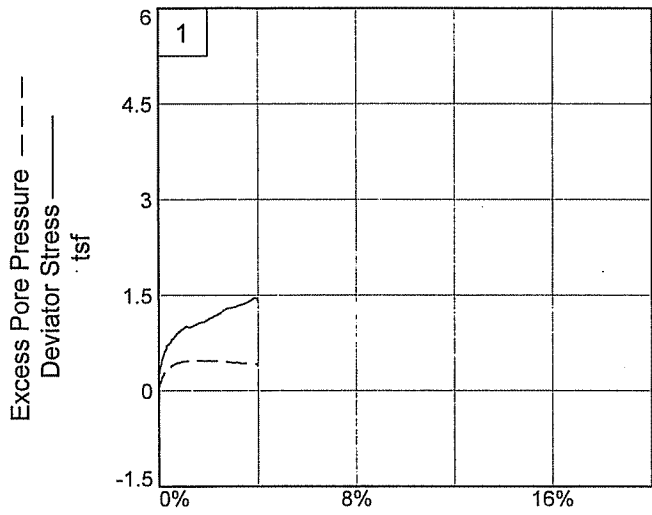
Sample Number: 14

Proj. No.: 08.18.918

Date Sampled: 7/27/08

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: 07-241 Depth: 26-28
 Project No.: 08.18.918

Sample Number: 14

TOLUNAY-WONG ENGINEERS, INC.

TRIAxIAL COMPRESSION TEST
CU with Pore Pressures

8/4/2008
1:24 PM

Date: 7/27/08
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: 07-241
Depth: 26-28 **Sample Number:** 14
Description: Gray LEAN CLAY
Remarks:

Test method: ASTM D 4767
 Pocket pen; tsf: 0.75
 Failure type: Bulge

Type of Sample: Undisturbed

Assumed Specific Gravity=2.70 **LL**=36 **PL**=16 **PI**=20

Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1				
Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	112.130			117.260
Moisture content: Dry soil+tare, gms.	92.090			99.460
Moisture content: Tare, gms.	31.290			30.750
Moisture, %	33.0	27.3	25.9	25.9
Moist specimen weight, gms.	397.4			
Diameter, in.	2.03	1.95	1.93	
Area, in. ²	3.25	2.97	2.91	
Height, in.	3.97	3.95	3.94	
Net decrease in height, in.		0.02	0.01	
Net decrease in water volume, cc.			4.30	
Wet Density, pcf	117.3	123.5	124.9	
Dry density, pcf	88.2	97.0	99.2	
Void ratio	0.9113	0.7383	0.6995	
Saturation, %	97.7	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 = 42.40 psi (3.053 tsf)
Consolidation back pressure = 30.00 psi (2.160 tsf)
Consolidation effective confining stress = 0.893 tsf
Strain rate, %/min. = 0.05
Fail. Stress = 1.459 tsf at reading no. 46
Ult. Stress = 1.411 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	0.0002	0.000	0.0	0.0	0.000	0.896	0.896	1.00	29.96	0.896	0.000
1	0.0004	7.189	7.2	0.0	0.178	0.896	1.073	1.20	29.96	0.985	0.089
2	0.0006	9.819	9.8	0.0	0.243	0.843	1.086	1.29	30.69	0.964	0.121
3	0.0012	12.086	12.1	0.0	0.299	0.815	1.114	1.37	31.08	0.964	0.149
4	0.0020	14.207	14.2	0.0	0.351	0.783	1.134	1.45	31.52	0.959	0.175
5	0.0036	15.858	15.9	0.1	0.392	0.758	1.150	1.52	31.87	0.954	0.196
6	0.0041	17.740	17.7	0.1	0.438	0.715	1.153	1.61	32.47	0.934	0.219
7	0.0050	19.265	19.3	0.1	0.476	0.703	1.179	1.68	32.63	0.941	0.238
8	0.0065	20.439	20.4	0.2	0.504	0.677	1.181	1.75	33.00	0.929	0.252
9	0.0072	21.210	21.2	0.2	0.523	0.662	1.185	1.79	33.20	0.924	0.262
10	0.0082	22.622	22.6	0.2	0.558	0.646	1.204	1.86	33.43	0.925	0.279
11	0.0087	23.428	23.4	0.2	0.578	0.627	1.204	1.92	33.70	0.916	0.289
12	0.0098	24.338	24.3	0.2	0.600	0.615	1.215	1.98	33.86	0.915	0.300
13	0.0111	25.267	25.3	0.3	0.623	0.604	1.227	2.03	34.01	0.915	0.311
14	0.0124	25.932	25.9	0.3	0.639	0.592	1.231	2.08	34.17	0.912	0.319
15	0.0130	28.069	28.1	0.3	0.691	0.568	1.259	2.22	34.51	0.913	0.346
16	0.0167	29.296	29.3	0.4	0.721	0.539	1.260	2.34	34.91	0.899	0.360
17	0.0184	30.285	30.3	0.5	0.745	0.526	1.271	2.42	35.09	0.899	0.373
18	0.0207	31.270	31.3	0.5	0.769	0.518	1.287	2.48	35.20	0.903	0.384
19	0.0212	32.199	32.2	0.5	0.792	0.510	1.301	2.55	35.32	0.905	0.396
20	0.0240	33.101	33.1	0.6	0.813	0.493	1.307	2.65	35.55	0.900	0.407
21	0.0267	34.569	34.6	0.7	0.849	0.478	1.327	2.78	35.76	0.902	0.424
22	0.0293	36.033	36.0	0.7	0.884	0.463	1.347	2.91	35.97	0.905	0.442
23	0.0326	37.200	37.2	0.8	0.912	0.451	1.363	3.02	36.14	0.907	0.456
24	0.0334	37.974	38.0	0.8	0.931	0.460	1.391	3.02	36.01	0.926	0.465
25	0.0340	37.275	37.3	0.9	0.913	0.458	1.371	3.00	36.05	0.914	0.457
26	0.0362	38.286	38.3	0.9	0.938	0.454	1.392	3.06	36.09	0.923	0.469
27	0.0382	39.100	39.1	1.0	0.957	0.439	1.396	3.18	36.30	0.918	0.478
28	0.0462	41.486	41.5	1.2	1.013	0.434	1.447	3.33	36.37	0.941	0.507
29	0.0500	42.612	42.6	1.3	0.986	0.420	1.406	3.34	36.56	0.913	0.493
30	0.0577	44.395	44.4	1.5	1.019	0.428	1.447	3.38	36.46	0.937	0.509
31	0.0657	46.505	46.5	1.7	1.059	0.421	1.480	3.52	36.55	0.950	0.529
32	0.0742	47.949	47.9	1.9	1.082	0.429	1.512	3.52	36.44	0.970	0.541
33	0.0783	49.279	49.3	2.0	1.109	0.426	1.535	3.60	36.48	0.980	0.554
34	0.0821	50.293	50.3	2.1	1.131	0.422	1.554	3.68	36.53	0.988	0.566
35	0.0860	51.026	51.0	2.2	1.148	0.432	1.580	3.65	36.39	1.006	0.574
36	0.0897	51.791	51.8	2.3	1.165	0.427	1.592	3.73	36.47	1.010	0.583
37	0.0942	52.978	53.0	2.4	1.192	0.426	1.619	3.80	36.48	1.023	0.596
38	0.0977	53.651	53.7	2.5	1.207	0.425	1.633	3.84	36.49	1.029	0.604
39	0.1015	55.071	55.1	2.6	1.240	0.420	1.661	3.95	36.56	1.041	0.620
40	0.1090	57.069	57.1	2.8	1.286	0.436	1.721	3.95	36.35	1.078	0.643
41	0.1215	58.206	58.2	3.1	1.309	0.456	1.765	3.87	36.06	1.111	0.654
42	0.1256	59.170	59.2	3.2	1.330	0.449	1.779	3.96	36.17	1.114	0.665
43	0.1335	60.314	60.3	3.4	1.354	0.466	1.821	3.91	35.92	1.144	0.677
44	0.1409	61.549	61.5	3.6	1.381	0.464	1.845	3.97	35.95	1.155	0.691
45	0.1451	62.508	62.5	3.7	1.402	0.469	1.871	3.99	35.89	1.170	0.701
46	0.1531	65.023	65.0	3.9	1.459	0.482	1.941	4.03	35.71	1.211	0.729

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	0.1564	64.683	64.7	4.0	1.450	0.475	1.925	4.05	35.80	1.200	0.725
48	0.1570	63.057	63.1	4.0	1.411	0.499	1.909	3.83	35.48	1.204	0.705

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	112.130			117.260
Moisture content: Dry soil+tare, gms.	92.090			99.460
Moisture content: Tare, gms.	31.290			30.750
Moisture, %	33.0	28.2	25.9	25.9
Moist specimen weight, gms.	397.4			
Diameter, in.	2.03	1.96	1.98	
Area, in. ²	3.25	3.01	3.06	
Height, in.	3.97	3.95	3.75	
Net decrease in height, in.		0.02	0.20	
Net decrease in water volume, cc.			6.80	
Wet Density, pcf	117.3	122.7	124.9	
Dry density, pcf	88.2	95.7	99.2	
Void ratio	0.9113	0.7609	0.6995	
Saturation, %	97.7	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 = 61.40 psi (4.421 tsf)
 Consolidation back pressure = 30.00 psi (2.160 tsf)
 Consolidation effective confining stress = 2.261 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 2.819 tsf at reading no. 49
 Ult. Stress = 2.796 tsf at reading no. 50

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	0.0002	0.000	0.0	0.0	0.000	2.264	2.264	1.00	29.96	2.264	0.000
1	0.0005	7.936	7.9	0.0	0.186	2.264	2.450	1.08	29.96	2.357	0.093
2	0.0007	12.281	12.3	0.0	0.289	2.231	2.520	1.13	30.41	2.376	0.144
3	0.0015	16.032	16.0	0.0	0.377	2.207	2.584	1.17	30.74	2.396	0.188
4	0.0023	21.003	21.0	0.1	0.493	2.163	2.656	1.23	31.36	2.409	0.247
5	0.0034	26.078	26.1	0.1	0.612	2.120	2.733	1.29	31.95	2.427	0.306
6	0.0035	30.846	30.8	0.1	0.724	2.062	2.786	1.35	32.76	2.424	0.362
7	0.0043	36.080	36.1	0.1	0.847	2.026	2.873	1.42	33.26	2.449	0.423
8	0.0059	39.575	39.6	0.2	0.928	1.977	2.905	1.47	33.95	2.441	0.464
9	0.0069	43.848	43.8	0.2	1.028	1.931	2.960	1.53	34.58	2.445	0.514
10	0.0076	46.444	46.4	0.2	1.089	1.893	2.982	1.58	35.11	2.437	0.545
11	0.0086	49.166	49.2	0.2	1.153	1.849	3.002	1.62	35.72	2.425	0.576
12	0.0092	52.085	52.1	0.2	1.221	1.805	3.026	1.68	36.33	2.416	0.610
13	0.0105	54.661	54.7	0.3	1.281	1.768	3.049	1.72	36.84	2.409	0.640
14	0.0111	57.015	57.0	0.3	1.336	1.739	3.075	1.77	37.25	2.407	0.668

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	0.0121	59.486	59.5	0.3	1.393	1.705	3.098	1.82	37.72	2.401	0.697
16	0.0128	61.754	61.8	0.3	1.446	1.677	3.123	1.86	38.11	2.400	0.723
17	0.0136	63.131	63.1	0.4	1.478	1.649	3.127	1.90	38.50	2.388	0.739
18	0.0144	65.320	65.3	0.4	1.529	1.623	3.152	1.94	38.86	2.387	0.765
19	0.0154	67.458	67.5	0.4	1.579	1.599	3.177	1.99	39.20	2.388	0.789
20	0.0163	68.775	68.8	0.4	1.609	1.575	3.184	2.02	39.53	2.379	0.805
21	0.0179	70.426	70.4	0.5	1.647	1.552	3.199	2.06	39.84	2.376	0.824
22	0.0185	71.791	71.8	0.5	1.679	1.530	3.208	2.10	40.15	2.369	0.839
23	0.0192	73.527	73.5	0.5	1.719	1.513	3.232	2.14	40.39	2.372	0.859
24	0.0208	76.601	76.6	0.5	1.790	1.479	3.269	2.21	40.86	2.374	0.895
25	0.0229	78.891	78.9	0.6	1.843	1.446	3.289	2.27	41.32	2.367	0.921
26	0.0248	80.885	80.9	0.7	1.888	1.413	3.302	2.34	41.77	2.358	0.944
27	0.0269	83.253	83.3	0.7	1.942	1.395	3.337	2.39	42.03	2.366	0.971
28	0.0278	84.806	84.8	0.7	1.978	1.381	3.359	2.43	42.22	2.370	0.989
29	0.0296	86.506	86.5	0.8	2.017	1.358	3.374	2.49	42.54	2.366	1.008
30	0.0309	88.627	88.6	0.8	2.065	1.335	3.400	2.55	42.86	2.367	1.033
31	0.0333	89.953	90.0	0.9	2.095	1.324	3.419	2.58	43.01	2.372	1.047
32	0.0345	91.502	91.5	0.9	2.130	1.308	3.438	2.63	43.24	2.373	1.065
33	0.0407	95.397	95.4	1.1	2.217	1.266	3.483	2.75	43.82	2.374	1.109
34	0.0436	98.292	98.3	1.2	2.283	1.239	3.522	2.84	44.19	2.380	1.141
35	0.0477	99.958	100.0	1.3	2.319	1.233	3.552	2.88	44.28	2.392	1.159
36	0.0507	102.838	102.8	1.3	2.384	1.190	3.574	3.00	44.88	2.382	1.192
37	0.0549	104.931	104.9	1.5	2.430	1.190	3.619	3.04	44.88	2.404	1.215
38	0.0585	107.439	107.4	1.6	2.485	1.171	3.657	3.12	45.13	2.414	1.243
39	0.0663	110.140	110.1	1.8	2.542	1.146	3.688	3.22	45.49	2.417	1.271
40	0.0700	112.130	112.1	1.9	2.586	1.143	3.729	3.26	45.52	2.436	1.293
41	0.0812	113.802	113.8	2.2	2.616	1.119	3.735	3.34	45.86	2.427	1.308
42	0.0847	115.517	115.5	2.3	2.653	1.127	3.780	3.36	45.75	2.453	1.327
43	0.0963	117.500	117.5	2.6	2.690	1.102	3.792	3.44	46.09	2.447	1.345
44	0.1036	119.133	119.1	2.8	2.722	1.102	3.824	3.47	46.09	2.463	1.361
45	0.1148	121.228	121.2	3.1	2.761	1.105	3.867	3.50	46.05	2.486	1.381
46	0.1262	121.017	121.0	3.4	2.748	1.101	3.849	3.50	46.10	2.475	1.374
47	0.1296	122.589	122.6	3.5	2.781	1.108	3.889	3.51	46.01	2.499	1.391
48	0.1411	122.408	122.4	3.8	2.768	1.104	3.872	3.51	46.06	2.488	1.384
49	0.1449	124.771	124.8	3.9	2.819	1.109	3.928	3.54	45.99	2.519	1.409
50	0.1493	123.942	123.9	4.0	2.796	1.128	3.924	3.48	45.74	2.526	1.398

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	112.130			117.260
Moisture content: Dry soil+tare, gms.	92.090			99.460
Moisture content: Tare, gms.	31.290			30.750
Moisture, %	33.0	28.9	25.9	25.9
Moist specimen weight, gms.	397.4			
Diameter, in.	2.03	1.97	1.99	
Area, in. ²	3.25	3.05	3.10	
Height, in.	3.97	3.95	3.70	
Net decrease in height, in.		0.02	0.25	
Net decrease in water volume, cc.			9.00	
Wet Density, pcf	117.3	122.0	124.9	
Dry density, pcf	88.2	94.7	99.2	
Void ratio	0.9113	0.7808	0.6995	
Saturation, %	97.7	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 = 82.80 psi (5.962 tsf)
 Consolidation back pressure = 30.40 psi (2.189 tsf)
 Consolidation effective confining stress = 3.773 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 4.031 tsf at reading no. 58
 Ult. Stress = 3.824 tsf at reading no. 85

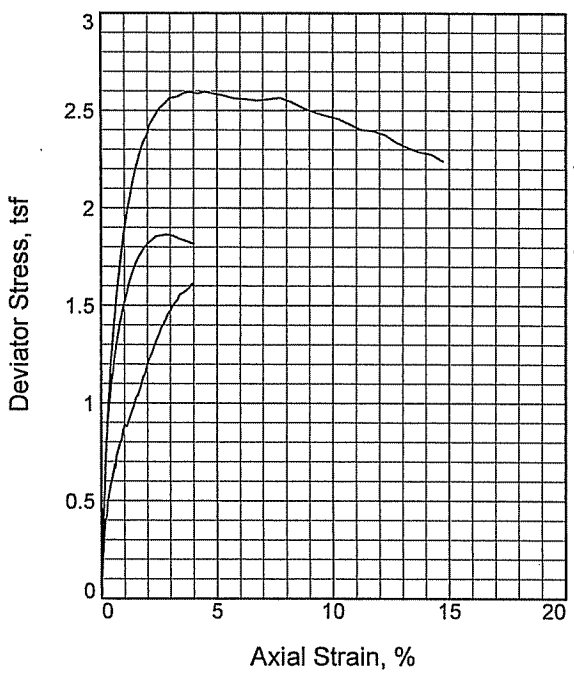
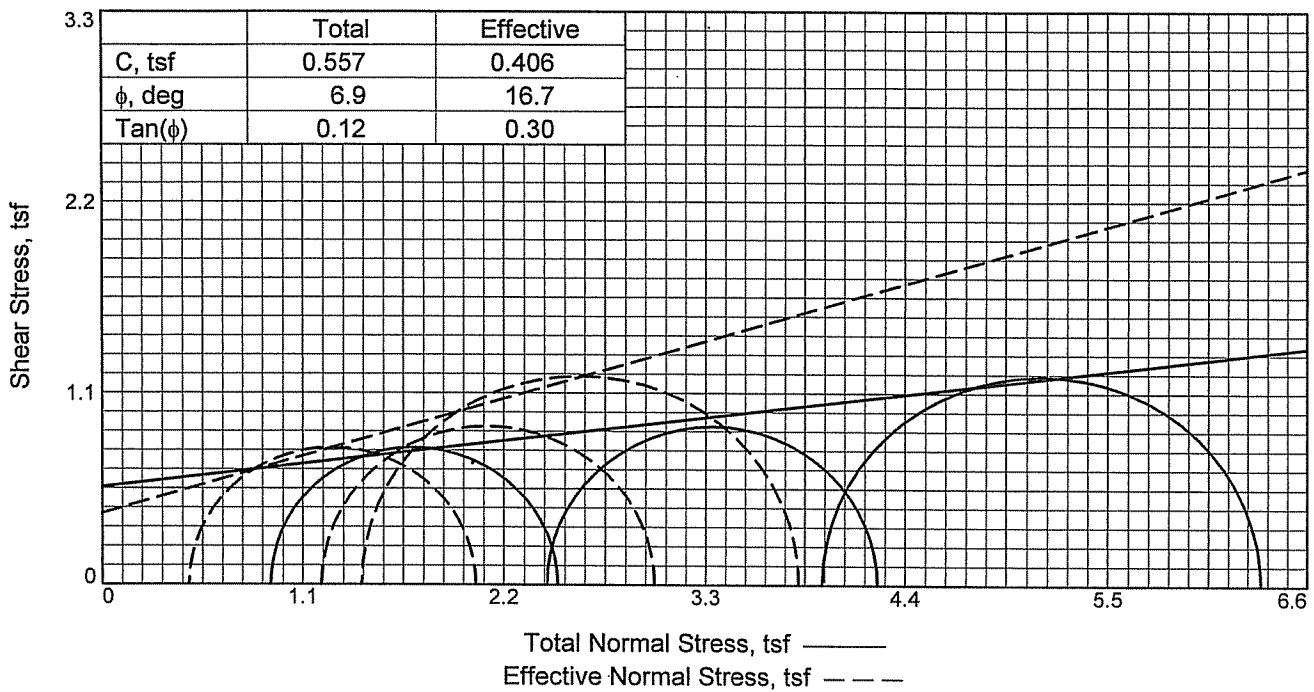
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0001	0.000	0.0	0.0	0.000	3.775	3.775	1.00	30.37	3.775	0.000
1	0.0003	6.638	6.6	0.0	0.154	3.775	3.929	1.04	30.37	3.852	0.077
2	0.0005	10.933	10.9	0.0	0.254	3.747	4.001	1.07	30.75	3.874	0.127
3	0.0009	16.097	16.1	0.0	0.373	3.710	4.083	1.10	31.27	3.897	0.187
4	0.0017	19.823	19.8	0.0	0.460	3.669	4.128	1.13	31.85	3.898	0.230
5	0.0023	23.592	23.6	0.1	0.547	3.622	4.169	1.15	32.49	3.896	0.273
6	0.0032	27.335	27.3	0.1	0.634	3.578	4.211	1.18	33.11	3.894	0.317
7	0.0042	31.875	31.9	0.1	0.739	3.526	4.265	1.21	33.82	3.896	0.369
8	0.0049	37.662	37.7	0.1	0.872	3.476	4.348	1.25	34.53	3.912	0.436
9	0.0058	43.209	43.2	0.2	1.001	3.415	4.416	1.29	35.36	3.916	0.500
10	0.0066	47.739	47.7	0.2	1.105	3.364	4.469	1.33	36.08	3.916	0.553
11	0.0079	52.334	52.3	0.2	1.211	3.304	4.515	1.37	36.91	3.910	0.606
12	0.0089	56.980	57.0	0.2	1.319	3.246	4.565	1.41	37.72	3.905	0.659
13	0.0095	62.034	62.0	0.3	1.435	3.186	4.621	1.45	38.56	3.903	0.718
14	0.0099	67.147	67.1	0.3	1.553	3.130	4.683	1.50	39.33	3.907	0.777
15	0.0109	72.124	72.1	0.3	1.668	3.072	4.740	1.54	40.13	3.906	0.834
16	0.0120	75.491	75.5	0.3	1.745	3.024	4.769	1.58	40.81	3.896	0.873
17	0.0128	78.536	78.5	0.3	1.815	2.975	4.790	1.61	41.49	3.882	0.908
18	0.0134	82.264	82.3	0.4	1.901	2.926	4.827	1.65	42.16	3.877	0.951
19	0.0146	85.957	86.0	0.4	1.986	2.877	4.863	1.69	42.84	3.870	0.993
20	0.0159	90.008	90.0	0.4	2.079	2.832	4.911	1.73	43.47	3.871	1.039

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	0.0164	92.946	92.9	0.4	2.147	2.791	4.938	1.77	44.03	3.865	1.073
22	0.0173	95.745	95.7	0.5	2.211	2.757	4.967	1.80	44.51	3.862	1.105
23	0.0179	97.928	97.9	0.5	2.261	2.718	4.979	1.83	45.05	3.849	1.130
24	0.0188	101.320	101.3	0.5	2.338	2.681	5.019	1.87	45.57	3.850	1.169
25	0.0201	104.581	104.6	0.5	2.413	2.642	5.055	1.91	46.10	3.849	1.206
26	0.0210	107.720	107.7	0.6	2.485	2.608	5.092	1.95	46.58	3.850	1.242
27	0.0217	109.848	109.8	0.6	2.533	2.577	5.111	1.98	47.00	3.844	1.267
28	0.0235	113.276	113.3	0.6	2.611	2.523	5.134	2.04	47.76	3.828	1.305
29	0.0244	115.951	116.0	0.7	2.672	2.495	5.167	2.07	48.15	3.831	1.336
30	0.0252	118.608	118.6	0.7	2.733	2.467	5.200	2.11	48.53	3.834	1.366
31	0.0262	121.279	121.3	0.7	2.793	2.441	5.234	2.14	48.90	3.838	1.397
32	0.0280	123.438	123.4	0.8	2.842	2.399	5.241	2.18	49.47	3.820	1.421
33	0.0291	125.658	125.7	0.8	2.892	2.378	5.270	2.22	49.77	3.824	1.446
34	0.0296	127.895	127.9	0.8	2.943	2.354	5.297	2.25	50.10	3.826	1.472
35	0.0306	130.522	130.5	0.8	3.003	2.329	5.332	2.29	50.45	3.831	1.501
36	0.0328	132.727	132.7	0.9	3.052	2.294	5.345	2.33	50.94	3.820	1.526
37	0.0344	135.844	135.8	0.9	3.122	2.265	5.387	2.38	51.34	3.826	1.561
38	0.0376	140.785	140.8	1.0	3.233	2.207	5.440	2.46	52.15	3.823	1.616
39	0.0418	145.656	145.7	1.1	3.341	2.154	5.494	2.55	52.89	3.824	1.670
40	0.0455	149.409	149.4	1.2	3.423	2.114	5.537	2.62	53.45	3.825	1.712
41	0.0489	152.856	152.9	1.3	3.499	2.074	5.573	2.69	54.00	3.823	1.749
42	0.0533	156.302	156.3	1.4	3.574	2.038	5.611	2.75	54.50	3.825	1.787
43	0.0570	159.817	159.8	1.5	3.650	2.010	5.661	2.82	54.88	3.836	1.825
44	0.0603	162.734	162.7	1.6	3.713	1.990	5.704	2.87	55.16	3.847	1.857
45	0.0637	164.735	164.7	1.7	3.756	1.970	5.725	2.91	55.44	3.847	1.878
46	0.0674	167.463	167.5	1.8	3.814	1.948	5.761	2.96	55.75	3.854	1.907
47	0.0748	170.293	170.3	2.0	3.870	1.917	5.787	3.02	56.18	3.852	1.935
48	0.0827	172.455	172.5	2.2	3.911	1.891	5.802	3.07	56.53	3.847	1.956
49	0.0936	172.696	172.7	2.5	3.905	1.863	5.768	3.10	56.93	3.815	1.952
50	0.1049	174.325	174.3	2.8	3.929	1.843	5.772	3.13	57.20	3.808	1.965
51	0.1161	175.837	175.8	3.1	3.951	1.823	5.774	3.17	57.47	3.799	1.975
52	0.1274	177.611	177.6	3.4	3.978	1.816	5.795	3.19	57.57	3.806	1.989
53	0.1381	179.682	179.7	3.7	4.013	1.810	5.823	3.22	57.66	3.816	2.006
54	0.1497	178.943	178.9	4.0	3.983	1.804	5.787	3.21	57.75	3.795	1.991
55	0.1612	178.919	178.9	4.4	3.970	1.795	5.765	3.21	57.87	3.780	1.985
56	0.1721	179.235	179.2	4.7	3.964	1.792	5.756	3.21	57.91	3.774	1.982
57	0.1831	180.856	180.9	4.9	3.988	1.786	5.773	3.23	58.00	3.779	1.994
58	0.2020	183.788	183.8	5.5	4.031	1.786	5.817	3.26	57.99	3.802	2.015
59	0.2116	181.254	181.3	5.7	3.964	1.785	5.749	3.22	58.01	3.767	1.982
60	0.2207	183.553	183.6	6.0	4.004	1.783	5.787	3.25	58.04	3.785	2.002
61	0.2389	182.781	182.8	6.5	3.966	1.778	5.744	3.23	58.10	3.761	1.983
62	0.2577	183.087	183.1	7.0	3.951	1.776	5.727	3.22	58.14	3.751	1.976
63	0.2667	185.841	185.8	7.2	4.000	1.777	5.777	3.25	58.12	3.777	2.000
64	0.2758	183.487	183.5	7.5	3.939	1.775	5.714	3.22	58.15	3.744	1.969
65	0.2951	184.668	184.7	8.0	3.942	1.769	5.711	3.23	58.23	3.740	1.971
66	0.3138	186.366	186.4	8.5	3.956	1.768	5.724	3.24	58.25	3.746	1.978
67	0.3230	184.280	184.3	8.7	3.901	1.767	5.668	3.21	58.26	3.718	1.951

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	0.3327	187.397	187.4	9.0	3.956	1.765	5.721	3.24	58.29	3.743	1.978
69	0.3414	184.489	184.5	9.2	3.885	1.759	5.644	3.21	58.37	3.702	1.942
70	0.3510	187.122	187.1	9.5	3.929	1.759	5.688	3.23	58.37	3.723	1.964
71	0.3697	185.867	185.9	10.0	3.881	1.758	5.639	3.21	58.38	3.698	1.940
72	0.3794	187.901	187.9	10.3	3.912	1.757	5.668	3.23	58.40	3.712	1.956
73	0.3894	186.281	186.3	10.5	3.866	1.756	5.623	3.20	58.40	3.690	1.933
74	0.3984	188.483	188.5	10.8	3.901	1.757	5.658	3.22	58.40	3.707	1.951
75	0.4166	188.054	188.1	11.3	3.871	1.753	5.624	3.21	58.45	3.689	1.936
76	0.4354	188.758	188.8	11.8	3.863	1.752	5.615	3.21	58.47	3.683	1.932
77	0.4446	190.855	190.9	12.0	3.895	1.753	5.648	3.22	58.45	3.701	1.948
78	0.4539	188.751	188.8	12.3	3.841	1.750	5.591	3.19	58.49	3.671	1.921
79	0.4627	191.502	191.5	12.5	3.887	1.749	5.636	3.22	58.51	3.692	1.943
80	0.4730	191.886	191.9	12.8	3.882	1.750	5.632	3.22	58.50	3.691	1.941
81	0.4917	192.506	192.5	13.3	3.872	1.748	5.620	3.22	58.52	3.684	1.936
82	0.5003	190.277	190.3	13.5	3.817	1.745	5.562	3.19	58.56	3.654	1.908
83	0.5201	190.757	190.8	14.1	3.803	1.747	5.550	3.18	58.54	3.648	1.901
84	0.5385	192.187	192.2	14.6	3.809	1.743	5.552	3.19	58.60	3.647	1.905
85	0.5569	194.058	194.1	15.1	3.824	1.743	5.566	3.19	58.60	3.655	1.912



Sample No.		1	2	3
Initial	Water Content, %	42.4	42.4	42.4
	Dry Density, pcf	78.8	78.8	78.8
	Saturation, %	98.8	98.8	98.8
	Void Ratio	1.1798	1.1798	1.1798
	Diameter, in.	2.01	2.01	2.01
At Test	Height, in.	4.06	4.06	4.06
	Water Content, %	33.4	33.4	33.4
	Dry Density, pcf	89.4	89.4	89.4
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.9193	0.9193	0.9193
	Diameter, in.	1.89	1.92	1.95
	Height, in.	4.03	3.91	3.78
	Strain rate, %/min.	0.05	0.03	0.02
	Back Pressure, tsf	2.18	2.19	2.19
	Cell Pressure, tsf	3.10	4.62	6.13
	Fail. Stress, tsf	1.57	1.82	2.40
	Excess Pore Pr., tsf	0.45	1.23	2.53
	Ult. Stress, tsf	1.61	1.82	2.24
	Excess Pore Pr., tsf	0.42	1.23	2.59
	$\bar{\sigma}_1$ Failure, tsf	2.05	3.02	3.82
	$\bar{\sigma}_3$ Failure, tsf	0.48	1.20	1.42

Type of Test:
CU with Pore Pressures

Sample Type: Undisturbed

Description: Gray FAT CLAY

LL= 67 PL= 21 PI= 46

Assumed Specific Gravity= 2.75

Remarks:
Test method: ASTM D 4767
Pocket pen; tsf: 1.25
Failure type: Bulge

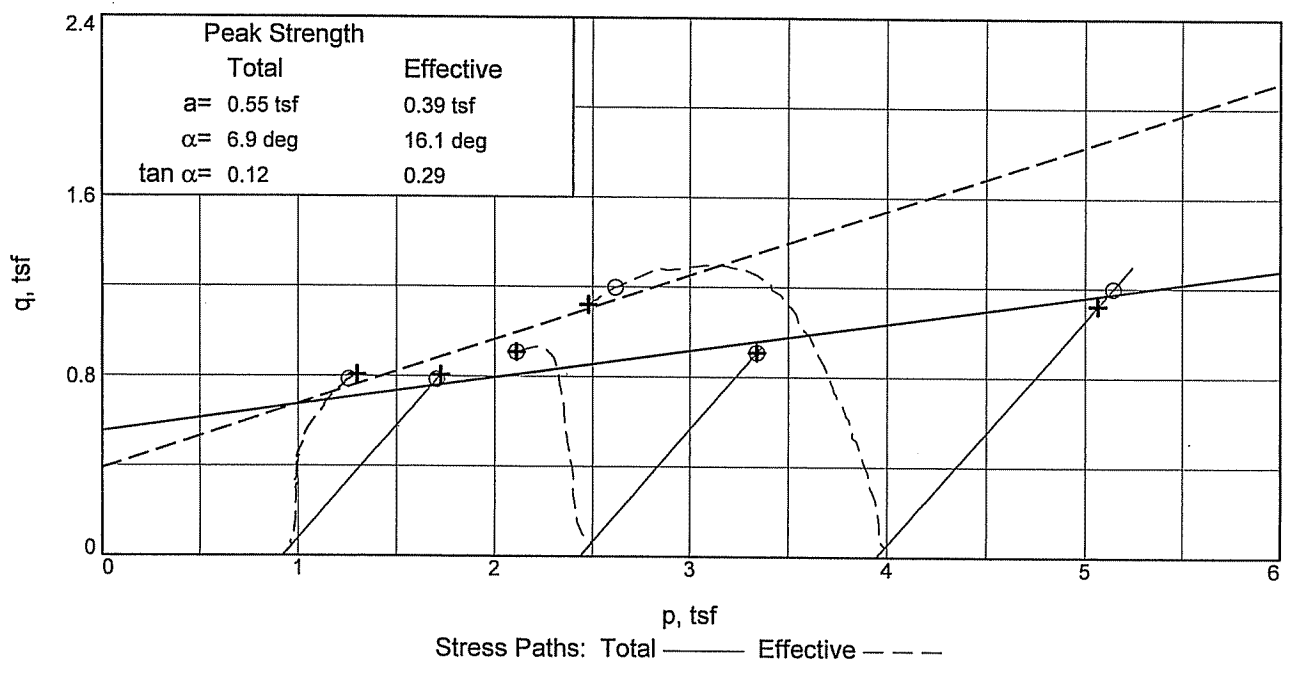
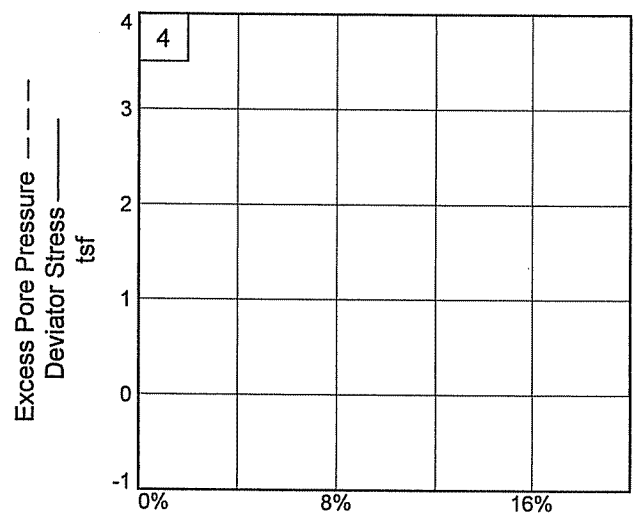
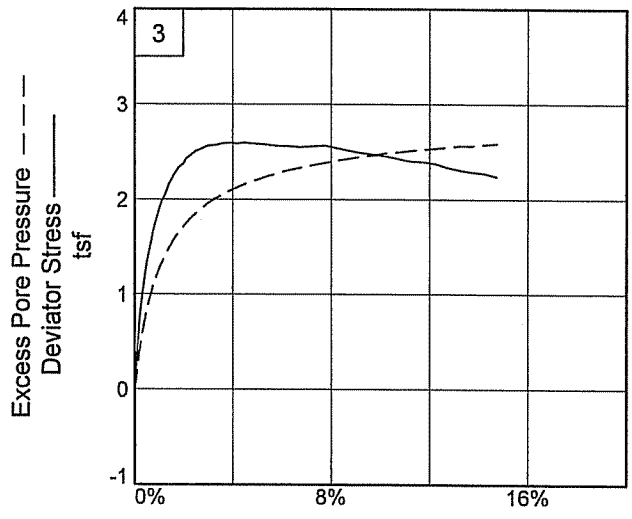
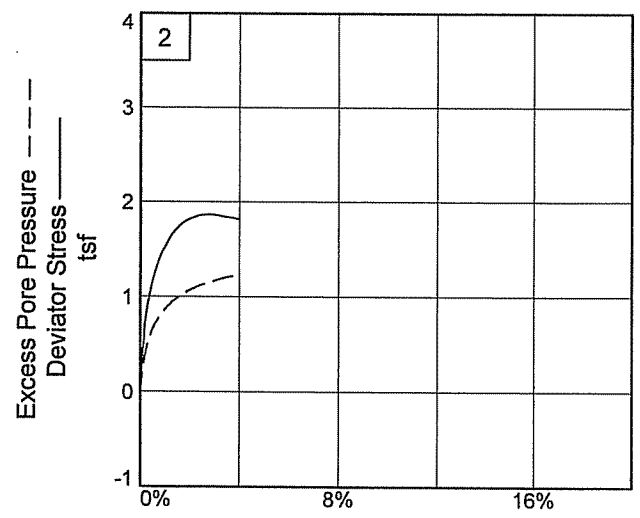
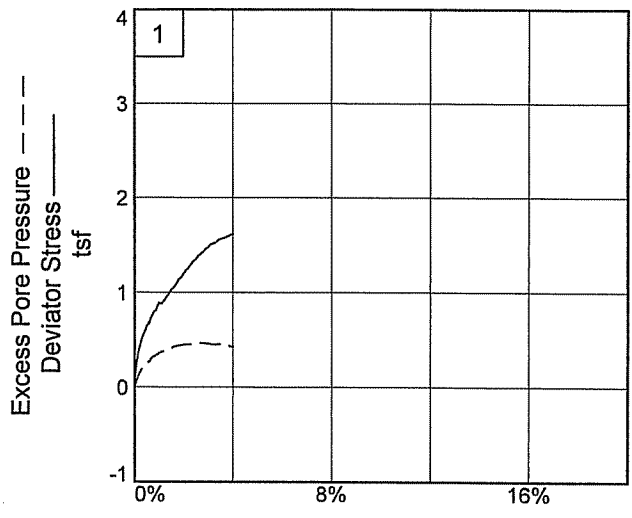
Client: United States Army Corps of Engineers

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

Source of Sample: 07-241 **Depth:** 32-34

Sample Number: 17

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



Client: United States Army Corps of Engineers

Project: Galveston Channel and Pelican Island PA

Source of Sample: 07-241

Depth: 32-34

Sample Number: 17

Project No.: 08.18.918

TOLUNAY-WONG ENGINEERS, INC.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

7/28/2008

2:44 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: 07-241
Depth: 32-34 **Sample Number:** 17
Description: Gray FAT CLAY
Remarks:

Test method: ASTM D 4767
 Pocket pen; tsf: 1.25
 Failure type: Bulge

Type of Sample: Undisturbed

Assumed Specific Gravity=2.75 **LL**=67 **PL**=21 **PI**=46

Test Method: ASTM D 4767 Method B

Parameters for Specimen No. 1				
Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	130.630			90.320
Moisture content: Dry soil+tare, gms.	100.840			75.270
Moisture content: Tare, gms.	30.540			30.250
Moisture, %	42.4	35.8	33.4	33.4
Moist specimen weight, gms.	377.4			
Diameter, in.	2.01	1.91	1.89	
Area, in. ²	3.16	2.87	2.80	
Height, in.	4.06	4.06	4.03	
Net decrease in height, in.		0.00	0.03	
Net decrease in water volume, cc.			6.20	
Wet Density, pcf	112.1	117.5	119.3	
Dry density, pcf	78.8	86.5	89.4	
Void ratio	1.1798	0.9836	0.9193	
Saturation, %	98.8	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 43.10 psi (3.103 tsf)
 Consolidation back pressure = 30.30 psi (2.182 tsf)
 Consolidation effective confining stress = 0.922 tsf
 Strain rate, %/min. = 0.05
 Fail. Stress = 1.570 tsf at reading no. 55
 Ult. Stress = 1.612 tsf at reading no. 58

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	-0.3808	0.000	0.0	0.0	0.000	0.922	0.922	1.00	30.30	0.922	0.000
1	-0.3807	0.000	0.0	0.0	0.000	0.922	0.922	1.00	30.30	0.922	0.000
2	-0.3806	3.728	3.7	0.0	0.096	0.922	1.018	1.10	30.30	0.970	0.048
3	-0.3796	4.727	4.7	0.0	0.122	0.901	1.022	1.13	30.59	0.961	0.061
4	-0.3786	7.817	7.8	0.1	0.201	0.876	1.077	1.23	30.93	0.977	0.100
5	-0.3776	9.762	9.8	0.1	0.251	0.856	1.106	1.29	31.22	0.981	0.125
6	-0.3766	11.266	11.3	0.1	0.289	0.838	1.128	1.35	31.46	0.983	0.145
7	-0.3756	13.054	13.1	0.1	0.335	0.821	1.156	1.41	31.70	0.988	0.168
8	-0.3746	14.126	14.1	0.2	0.363	0.806	1.168	1.45	31.91	0.987	0.181
9	-0.3735	15.275	15.3	0.2	0.392	0.793	1.185	1.49	32.09	0.989	0.196
10	-0.3725	16.004	16.0	0.2	0.411	0.779	1.190	1.53	32.28	0.985	0.205
11	-0.3715	16.743	16.7	0.2	0.430	0.767	1.197	1.56	32.44	0.982	0.215
12	-0.3705	18.030	18.0	0.3	0.462	0.755	1.218	1.61	32.61	0.986	0.231
13	-0.3695	19.122	19.1	0.3	0.490	0.744	1.234	1.66	32.77	0.989	0.245
14	-0.3675	20.727	20.7	0.3	0.531	0.724	1.255	1.73	33.04	0.990	0.266
15	-0.3665	21.424	21.4	0.4	0.549	0.716	1.265	1.77	33.16	0.990	0.274
16	-0.3645	22.631	22.6	0.4	0.580	0.700	1.280	1.83	33.38	0.990	0.290
17	-0.3624	23.532	23.5	0.5	0.602	0.686	1.288	1.88	33.57	0.987	0.301
18	-0.3604	24.948	24.9	0.5	0.638	0.673	1.311	1.95	33.76	0.992	0.319
19	-0.3584	25.743	25.7	0.6	0.658	0.661	1.320	2.00	33.92	0.990	0.329
20	-0.3574	26.767	26.8	0.6	0.684	0.654	1.339	2.05	34.01	0.996	0.342
21	-0.3564	26.038	26.0	0.6	0.665	0.649	1.314	2.03	34.09	0.981	0.333
22	-0.3554	27.354	27.4	0.6	0.699	0.644	1.343	2.09	34.16	0.993	0.349
23	-0.3544	28.309	28.3	0.7	0.723	0.628	1.351	2.15	34.38	0.989	0.362
24	-0.3523	29.413	29.4	0.7	0.751	0.616	1.367	2.22	34.54	0.992	0.375
25	-0.3503	30.221	30.2	0.8	0.771	0.606	1.377	2.27	34.68	0.992	0.386
26	-0.3483	31.112	31.1	0.8	0.794	0.597	1.391	2.33	34.80	0.994	0.397
27	-0.3453	31.833	31.8	0.9	0.811	0.585	1.397	2.39	34.97	0.991	0.406
28	-0.3433	33.377	33.4	0.9	0.850	0.577	1.427	2.47	35.09	1.002	0.425
29	-0.3422	34.068	34.1	1.0	0.868	0.573	1.441	2.51	35.14	1.007	0.434
30	-0.3412	34.027	34.0	1.0	0.866	0.569	1.435	2.52	35.20	1.002	0.433
31	-0.3402	34.992	35.0	1.0	0.891	0.564	1.455	2.58	35.26	1.010	0.445
32	-0.3362	36.460	36.5	1.1	0.879	0.552	1.431	2.59	35.43	0.992	0.439
33	-0.3322	37.960	38.0	1.2	0.911	0.541	1.452	2.69	35.59	0.996	0.456
34	-0.3281	39.785	39.8	1.3	0.952	0.532	1.484	2.79	35.71	1.008	0.476
35	-0.3241	41.188	41.2	1.4	0.982	0.524	1.507	2.87	35.82	1.016	0.491
36	-0.3201	43.123	43.1	1.5	1.026	0.516	1.542	2.99	35.94	1.029	0.513
37	-0.3160	44.079	44.1	1.6	1.045	0.499	1.543	3.09	36.17	1.021	0.522
38	-0.3120	45.777	45.8	1.7	1.082	0.491	1.573	3.20	36.28	1.032	0.541
39	-0.3080	47.949	47.9	1.8	1.131	0.484	1.615	3.34	36.38	1.049	0.566
40	-0.3039	48.992	49.0	1.9	1.152	0.479	1.631	3.40	36.44	1.055	0.576
41	-0.2999	51.030	51.0	2.0	1.198	0.474	1.672	3.53	36.52	1.073	0.599
42	-0.2959	52.384	52.4	2.1	1.231	0.471	1.702	3.61	36.56	1.086	0.615
43	-0.2918	53.450	53.5	2.2	1.256	0.471	1.727	3.67	36.56	1.099	0.628
44	-0.2878	54.974	55.0	2.3	1.293	0.470	1.763	3.75	36.57	1.117	0.647
45	-0.2838	56.209	56.2	2.4	1.323	0.470	1.793	3.81	36.57	1.131	0.661
46	-0.2797	57.248	57.2	2.5	1.347	0.460	1.807	3.93	36.72	1.133	0.674

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	-0.2757	58.854	58.9	2.6	1.386	0.458	1.844	4.03	36.74	1.151	0.693
48	-0.2717	59.645	59.6	2.7	1.404	0.457	1.861	4.07	36.75	1.159	0.702
49	-0.2676	60.644	60.6	2.8	1.428	0.458	1.886	4.12	36.74	1.172	0.714
50	-0.2636	61.840	61.8	2.9	1.456	0.459	1.915	4.17	36.72	1.187	0.728
51	-0.2596	62.603	62.6	3.0	1.473	0.462	1.936	4.19	36.68	1.199	0.737
52	-0.2555	63.771	63.8	3.1	1.501	0.467	1.968	4.22	36.62	1.217	0.750
53	-0.2474	64.917	64.9	3.3	1.526	0.474	2.000	4.22	36.52	1.237	0.763
54	-0.2434	66.077	66.1	3.4	1.553	0.467	2.021	4.32	36.61	1.244	0.777
55	-0.2354	66.890	66.9	3.6	1.570	0.476	2.046	4.30	36.49	1.261	0.785
56	-0.2273	67.813	67.8	3.8	1.589	0.483	2.073	4.29	36.39	1.278	0.795
57	-0.2232	68.575	68.6	3.9	1.607	0.490	2.096	4.28	36.30	1.293	0.803
58	-0.2190	68.872	68.9	4.0	1.612	0.497	2.109	4.25	36.20	1.303	0.806

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	130.630			90.320
Moisture content: Dry soil+tare, gms.	100.840			75.270
Moisture content: Tare, gms.	30.540			30.250
Moisture, %	42.4	38.0	33.4	33.4
Moist specimen weight, gms.	377.4			
Diameter, in.	2.01	1.94	1.92	
Area, in. ²	3.16	2.96	2.88	
Height, in.	4.06	4.06	3.91	
Net decrease in height, in.		0.00	0.15	
Net decrease in water volume, cc.			12.20	
Wet Density, pcf	112.1	115.8	119.3	
Dry density, pcf	78.8	83.9	89.4	
Void ratio	1.1798	1.0459	0.9193	
Saturation, %	98.8	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .130 kN/cm²
 Membrane thickness = .031 cm
 Filter paper coefficient = 0.0019 kN/cm
 Filter paper coverage = 50%
 Consolidation cell pressure = 64.20 psi (4.622 tsf)
 Consolidation back pressure = 30.40 psi (2.189 tsf)
 Consolidation effective confining stress = 2.434 tsf
 Strain rate, %/min. = 0.03
 Fail. Stress = 1.816 tsf at reading no. 48
 Ult. Stress = 1.816 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	0.0032	0.000	0.0	0.0	0.000	2.437	2.437	1.00	30.35	2.437	0.000
1	0.0033	0.000	0.0	0.0	0.000	2.437	2.437	1.00	30.35	2.437	0.000
2	0.0034	4.691	4.7	0.0	0.117	2.437	2.554	1.05	30.35	2.496	0.059
3	0.0044	8.071	8.1	0.0	0.201	2.345	2.547	1.09	31.63	2.446	0.101
4	0.0054	11.932	11.9	0.1	0.298	2.272	2.569	1.13	32.65	2.421	0.149

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
5	0.0063	15.980	16.0	0.1	0.399	2.214	2.612	1.18	33.45	2.413	0.199
6	0.0073	19.334	19.3	0.1	0.482	2.166	2.648	1.22	34.12	2.407	0.241
7	0.0083	22.156	22.2	0.1	0.552	2.122	2.675	1.26	34.72	2.399	0.276
8	0.0093	25.109	25.1	0.2	0.626	2.085	2.711	1.30	35.24	2.398	0.313
9	0.0103	28.184	28.2	0.2	0.702	2.050	2.752	1.34	35.73	2.401	0.351
10	0.0112	30.427	30.4	0.2	0.758	2.018	2.776	1.38	36.17	2.397	0.379
11	0.0122	32.502	32.5	0.2	0.809	1.989	2.798	1.41	36.58	2.394	0.405
12	0.0132	34.375	34.4	0.3	0.856	1.957	2.813	1.44	37.02	2.385	0.428
13	0.0142	36.263	36.3	0.3	0.903	1.933	2.836	1.47	37.35	2.384	0.451
14	0.0152	37.626	37.6	0.3	0.936	1.911	2.847	1.49	37.66	2.379	0.468
15	0.0162	39.139	39.1	0.3	0.974	1.888	2.862	1.52	37.97	2.375	0.487
16	0.0171	40.339	40.3	0.4	1.003	1.868	2.872	1.54	38.25	2.370	0.502
17	0.0181	41.724	41.7	0.4	1.038	1.850	2.887	1.56	38.51	2.368	0.519
18	0.0191	42.955	43.0	0.4	1.068	1.832	2.900	1.58	38.75	2.366	0.534
19	0.0211	45.085	45.1	0.5	1.120	1.800	2.920	1.62	39.20	2.360	0.560
20	0.0220	45.881	45.9	0.5	1.140	1.786	2.925	1.64	39.40	2.356	0.570
21	0.0230	47.087	47.1	0.5	1.169	1.772	2.941	1.66	39.59	2.356	0.585
22	0.0250	49.154	49.2	0.6	1.220	1.745	2.965	1.70	39.96	2.355	0.610
23	0.0269	50.811	50.8	0.6	1.261	1.722	2.983	1.73	40.28	2.352	0.630
24	0.0289	52.658	52.7	0.7	1.306	1.699	3.005	1.77	40.60	2.352	0.653
25	0.0309	54.159	54.2	0.7	1.342	1.679	3.021	1.80	40.88	2.350	0.671
26	0.0328	55.465	55.5	0.8	1.374	1.660	3.034	1.83	41.15	2.347	0.687
27	0.0348	56.879	56.9	0.8	1.408	1.635	3.044	1.86	41.49	2.339	0.704
28	0.0367	58.205	58.2	0.9	1.440	1.619	3.059	1.89	41.72	2.339	0.720
29	0.0387	59.463	59.5	0.9	1.471	1.601	3.072	1.92	41.96	2.337	0.735
30	0.0407	60.599	60.6	1.0	1.498	1.585	3.083	1.95	42.19	2.334	0.749
31	0.0426	61.384	61.4	1.0	1.517	1.570	3.087	1.97	42.39	2.329	0.758
32	0.0465	63.339	63.3	1.1	1.563	1.544	3.108	2.01	42.76	2.326	0.782
33	0.0505	65.374	65.4	1.2	1.612	1.519	3.131	2.06	43.10	2.325	0.806
34	0.0544	67.150	67.1	1.3	1.654	1.492	3.146	2.11	43.48	2.319	0.827
35	0.0583	68.611	68.6	1.4	1.689	1.470	3.158	2.15	43.79	2.314	0.844
36	0.0622	69.880	69.9	1.5	1.718	1.449	3.167	2.19	44.08	2.308	0.859
37	0.0661	71.054	71.1	1.6	1.745	1.431	3.176	2.22	44.32	2.304	0.873
38	0.0700	72.015	72.0	1.7	1.767	1.417	3.183	2.25	44.53	2.300	0.883
39	0.0739	72.895	72.9	1.8	1.787	1.397	3.184	2.28	44.80	2.290	0.893
40	0.0818	74.202	74.2	2.0	1.815	1.368	3.183	2.33	45.20	2.275	0.907
41	0.0896	75.194	75.2	2.2	1.836	1.345	3.181	2.36	45.52	2.263	0.918
42	0.0974	76.155	76.2	2.4	1.855	1.321	3.176	2.40	45.86	2.248	0.928
43	0.1091	76.611	76.6	2.7	1.861	1.293	3.153	2.44	46.24	2.223	0.930
44	0.1131	76.841	76.8	2.8	1.864	1.288	3.152	2.45	46.32	2.220	0.932
45	0.1248	76.819	76.8	3.1	1.858	1.259	3.117	2.48	46.71	2.188	0.929
46	0.1365	76.387	76.4	3.4	1.842	1.238	3.079	2.49	47.01	2.159	0.921
47	0.1483	76.155	76.2	3.7	1.830	1.220	3.050	2.50	47.26	2.135	0.915
48	0.1599	75.782	75.8	4.0	1.816	1.202	3.018	2.51	47.50	2.110	0.908

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	130.630			90.320
Moisture content: Dry soil+tare, gms.	100.840			75.270
Moisture content: Tare, gms.	30.540			30.250
Moisture, %	42.4	40.8	33.4	33.4
Moist specimen weight, gms.	377.4			
Diameter, in.	2.01	1.98	1.95	
Area, in. ²	3.16	3.07	2.98	
Height, in.	4.06	4.06	3.78	
Net decrease in height, in.		0.00	0.28	
Net decrease in water volume, cc.			19.60	
Wet Density, pcf	112.1	113.9	119.3	
Dry density, pcf	78.8	80.9	89.4	
Void ratio	1.1798	1.1226	0.9193	
Saturation, %	98.8	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 = 85.20 psi (6.134 tsf)
 Consolidation back pressure = 30.40 psi (2.189 tsf)
 Consolidation effective confining stress = 3.946 tsf
 Strain rate, %/min. = 0.02
 Fail. Stress = 2.396 tsf at reading no. 70
 Ult. Stress = 2.240 tsf at reading no. 76

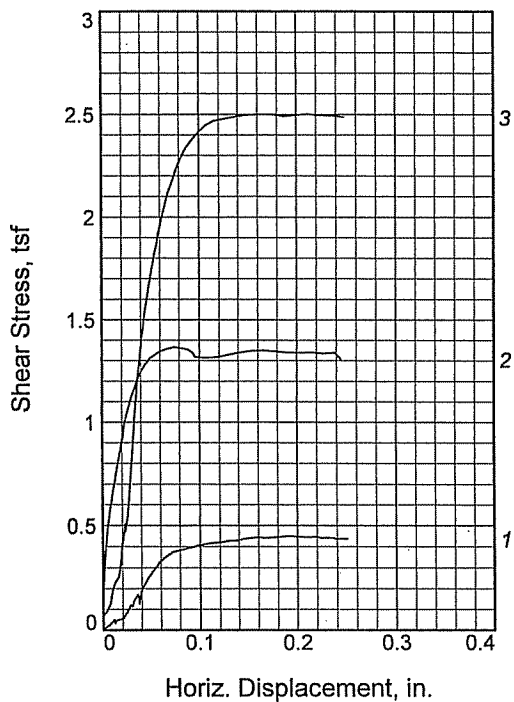
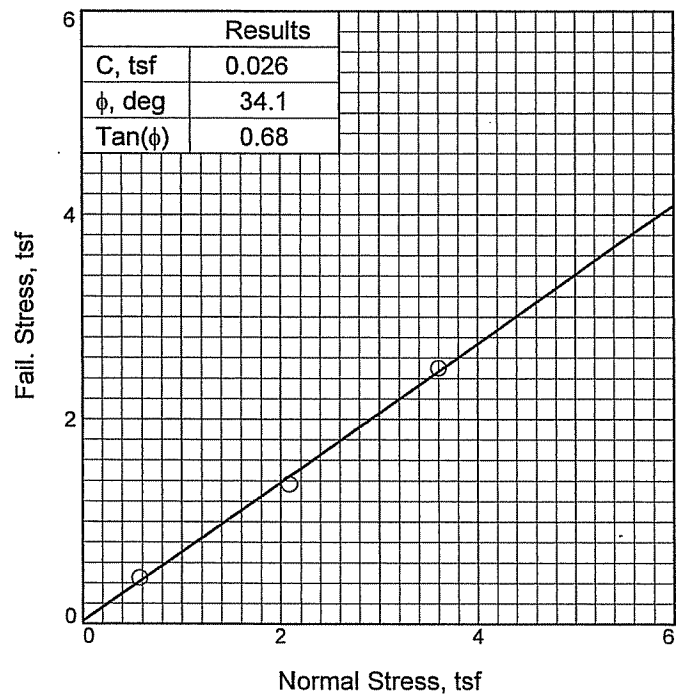
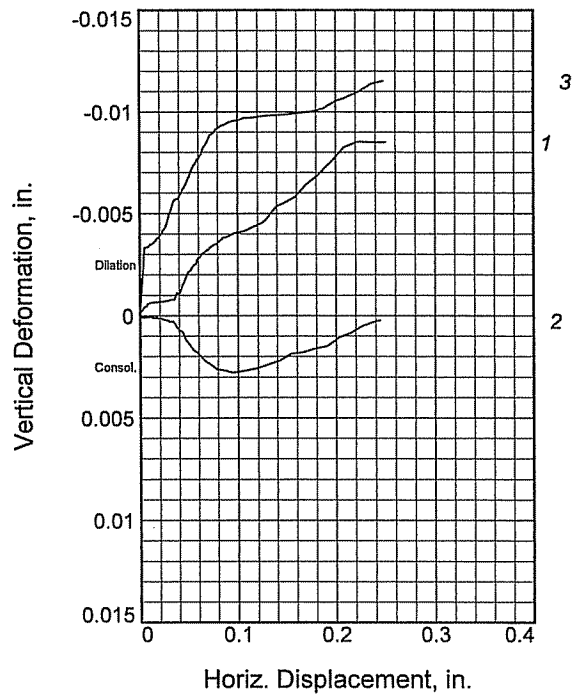
No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress tsf	Minor Eff. Stress tsf	Major Eff. Stress tsf	1:3 Ratio	Pore Press. psi	P tsf	Q tsf
0	0.0075	0.000	0.0	0.0	0.000	3.947	3.947	1.00	30.38	3.947	0.000
1	0.0076	0.000	0.0	0.0	0.000	3.947	3.947	1.00	30.38	3.947	0.000
2	0.0077	3.664	3.7	0.0	0.088	3.947	4.036	1.02	30.38	3.991	0.044
3	0.0087	5.880	5.9	0.0	0.142	3.893	4.035	1.04	31.13	3.964	0.071
4	0.0096	9.244	9.2	0.1	0.223	3.850	4.073	1.06	31.72	3.962	0.111
5	0.0106	13.376	13.4	0.1	0.323	3.799	4.122	1.08	32.43	3.961	0.161
6	0.0115	17.105	17.1	0.1	0.412	3.744	4.156	1.11	33.20	3.950	0.206
7	0.0124	21.015	21.0	0.1	0.506	3.689	4.195	1.14	33.96	3.942	0.253
8	0.0134	24.020	24.0	0.2	0.579	3.636	4.215	1.16	34.70	3.925	0.289
9	0.0143	26.850	26.8	0.2	0.647	3.586	4.233	1.18	35.39	3.910	0.323
10	0.0153	30.614	30.6	0.2	0.737	3.537	4.274	1.21	36.08	3.906	0.369
11	0.0162	33.307	33.3	0.2	0.802	3.491	4.292	1.23	36.72	3.892	0.401
12	0.0172	35.653	35.7	0.3	0.858	3.448	4.306	1.25	37.31	3.877	0.429
13	0.0181	38.214	38.2	0.3	0.920	3.408	4.327	1.27	37.87	3.868	0.460
14	0.0191	40.590	40.6	0.3	0.977	3.368	4.344	1.29	38.42	3.856	0.488
15	0.0200	43.120	43.1	0.3	1.037	3.329	4.366	1.31	38.97	3.847	0.519
16	0.0210	44.282	44.3	0.4	1.065	3.294	4.359	1.32	39.45	3.826	0.532
17	0.0219	47.395	47.4	0.4	1.139	3.259	4.399	1.35	39.93	3.829	0.570
18	0.0229	49.033	49.0	0.4	1.178	3.226	4.405	1.37	40.39	3.816	0.589
19	0.0238	51.021	51.0	0.4	1.226	3.195	4.421	1.38	40.83	3.808	0.613
20	0.0247	52.303	52.3	0.5	1.256	3.166	4.423	1.40	41.22	3.794	0.628

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	0.0257	54.419	54.4	0.5	1.307	3.132	4.439	1.42	41.70	3.786	0.653
22	0.0266	56.123	56.1	0.5	1.348	3.102	4.450	1.43	42.11	3.776	0.674
23	0.0285	58.507	58.5	0.6	1.404	3.049	4.453	1.46	42.85	3.751	0.702
24	0.0295	60.065	60.1	0.6	1.441	3.023	4.464	1.48	43.22	3.743	0.721
25	0.0304	61.300	61.3	0.6	1.470	2.998	4.468	1.49	43.57	3.733	0.735
26	0.0314	62.934	62.9	0.6	1.509	2.974	4.483	1.51	43.89	3.729	0.755
27	0.0323	64.249	64.2	0.7	1.540	2.950	4.491	1.52	44.22	3.720	0.770
28	0.0342	66.793	66.8	0.7	1.600	2.906	4.507	1.55	44.83	3.707	0.800
29	0.0351	68.054	68.1	0.7	1.630	2.885	4.516	1.57	45.13	3.700	0.815
30	0.0361	69.426	69.4	0.8	1.663	2.864	4.526	1.58	45.43	3.695	0.831
31	0.0380	71.434	71.4	0.8	1.710	2.828	4.537	1.60	45.93	3.682	0.855
32	0.0389	72.744	72.7	0.8	1.741	2.803	4.544	1.62	46.27	3.673	0.870
33	0.0408	74.649	74.6	0.9	1.786	2.765	4.550	1.65	46.80	3.657	0.893
34	0.0418	75.815	75.8	0.9	1.813	2.746	4.559	1.66	47.07	3.652	0.906
35	0.0437	77.577	77.6	1.0	1.854	2.711	4.565	1.68	47.55	3.638	0.927
36	0.0456	79.526	79.5	1.0	1.900	2.677	4.577	1.71	48.01	3.627	0.950
37	0.0493	82.712	82.7	1.1	1.974	2.619	4.593	1.75	48.83	3.606	0.987
38	0.0531	85.078	85.1	1.2	2.028	2.560	4.588	1.79	49.65	3.574	1.014
39	0.0569	87.709	87.7	1.3	2.089	2.507	4.596	1.83	50.38	3.552	1.044
40	0.0607	90.800	90.8	1.4	2.160	2.459	4.619	1.88	51.05	3.539	1.080
41	0.0645	92.896	92.9	1.5	2.208	2.416	4.624	1.91	51.64	3.520	1.104
42	0.0682	94.883	94.9	1.6	2.253	2.370	4.623	1.95	52.28	3.497	1.126
43	0.0720	96.658	96.7	1.7	2.293	2.332	4.624	1.98	52.82	3.478	1.146
44	0.0758	98.453	98.5	1.8	2.333	2.298	4.631	2.02	53.28	3.465	1.166
45	0.0834	100.545	100.5	2.0	2.378	2.230	4.608	2.07	54.23	3.419	1.189
46	0.0871	102.673	102.7	2.1	2.426	2.199	4.624	2.10	54.66	3.411	1.213
47	0.0947	104.595	104.6	2.3	2.466	2.142	4.608	2.15	55.45	3.375	1.233
48	0.1023	106.502	106.5	2.5	2.506	2.094	4.600	2.20	56.12	3.347	1.253
49	0.1136	108.337	108.3	2.8	2.541	2.029	4.570	2.25	57.02	3.299	1.271
50	0.1212	109.523	109.5	3.0	2.564	1.986	4.550	2.29	57.62	3.268	1.282
51	0.1325	110.161	110.2	3.3	2.571	1.935	4.506	2.33	58.32	3.220	1.285
52	0.1439	111.339	111.3	3.6	2.590	1.889	4.479	2.37	58.96	3.184	1.295
53	0.1552	111.903	111.9	3.9	2.595	1.851	4.446	2.40	59.49	3.149	1.298
54	0.1665	111.875	111.9	4.2	2.586	1.819	4.405	2.42	59.94	3.112	1.293
55	0.1779	112.689	112.7	4.5	2.597	1.785	4.382	2.45	60.40	3.084	1.298
56	0.1892	112.669	112.7	4.8	2.588	1.757	4.345	2.47	60.80	3.051	1.294
57	0.2062	112.807	112.8	5.3	2.579	1.715	4.294	2.50	61.38	3.005	1.290
58	0.2251	112.660	112.7	5.8	2.562	1.677	4.240	2.53	61.90	2.958	1.281
59	0.2440	113.123	113.1	6.3	2.559	1.642	4.201	2.56	62.40	2.921	1.280
60	0.2629	113.380	113.4	6.8	2.551	1.613	4.164	2.58	62.80	2.889	1.276
61	0.2818	114.274	114.3	7.2	2.558	1.587	4.145	2.61	63.16	2.866	1.279
62	0.3007	115.254	115.3	7.7	2.566	1.563	4.129	2.64	63.49	2.846	1.283
63	0.3196	114.747	114.7	8.2	2.541	1.536	4.076	2.65	63.87	2.806	1.270
64	0.3385	114.070	114.1	8.7	2.512	1.516	4.028	2.66	64.15	2.772	1.256
65	0.3574	113.699	113.7	9.2	2.490	1.496	3.986	2.66	64.42	2.741	1.245
66	0.3763	113.521	113.5	9.7	2.472	1.483	3.955	2.67	64.60	2.719	1.236
67	0.3952	113.455	113.5	10.2	2.457	1.461	3.918	2.68	64.91	2.690	1.229

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	0.4141	112.815	112.8	10.7	2.430	1.449	3.879	2.68	65.07	2.664	1.215
69	0.4330	112.082	112.1	11.2	2.401	1.432	3.833	2.68	65.31	2.632	1.200
70	0.4519	112.484	112.5	11.7	2.396	1.420	3.815	2.69	65.48	2.618	1.198
71	0.4708	112.116	112.1	12.2	2.374	1.409	3.784	2.68	65.63	2.596	1.187
72	0.4897	110.938	110.9	12.7	2.336	1.394	3.730	2.68	65.83	2.562	1.168
73	0.5086	110.250	110.3	13.2	2.308	1.384	3.692	2.67	65.98	2.538	1.154
74	0.5275	109.853	109.9	13.7	2.287	1.381	3.668	2.66	66.02	2.524	1.143
75	0.5464	109.934	109.9	14.2	2.275	1.368	3.644	2.66	66.19	2.506	1.138
76	0.5653	108.877	108.9	14.7	2.240	1.357	3.598	2.65	66.35	2.478	1.120



Sample No.	1	2	3
Initial			
Water Content, %	12.4	22.1	25.8
Dry Density, pcf	103.9	102.1	99.3
Saturation, %	53.8	91.5	99.8
Void Ratio	0.6228	0.6516	0.6981
Diameter, in.	2.50	2.50	2.50
Height, in.	1.00	1.00	1.00
At Test			
Water Content, %	13.9	22.8	25.1
Dry Density, pcf	104.2	102.3	99.7
Saturation, %	60.7	94.9	97.9
Void Ratio	0.6176	0.6476	0.6910
Diameter, in.	2.50	2.50	2.50
Height, in.	1.00	1.00	1.00
Normal Stress, tsf	0.576	2.088	3.600
Fail. Stress, tsf	0.453	1.367	2.502
Displacement, in.	0.19	0.08	0.21
Ult. Stress, tsf			
Displacement, in.			
Strain rate, %/min.	0.02	0.03	0.02

Sample Type: Undisturbed
Description: Tan and gray LEAN CLAY
 LL= 32 PL= 16 PI= 16
 Assumed Specific Gravity= 2.70
 Remarks: Test method: ASTM D 3080

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: 07-241 **Depth:** 20-22
Sample Number: 11
Proj. No.: 08.18.918 **Date Sampled:** 8/6/08

DIRECT SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

DIRECT SHEAR TEST

8/14/2008

Date: 8/6/08
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: 07-241
Depth: 20-22 **Sample Number:** 11
Description: Tan and gray LEAN CLAY
Remarks: Test method: ASTM D 3080
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=**32 **PL=**16 **PI=**16

Parameters for Specimen No. 1

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	362.470		364.430
Moisture content: Dry soil+tare, gms.	345.820		345.820
Moisture content: Tare, gms.	211.740		211.740
Moisture, %	12.4	13.9	13.9
Moist specimen weight, gms.	150.7		
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	116.8	118.7	
Dry density, pcf	103.9	104.2	
Void ratio	0.6228	0.6176	
Saturation, %	53.8	60.7	

Test Readings for Specimen No. 1

Normal stress = 0.576 tsf

Strain rate, %/min. = 0.02

Fail. Stress = 0.453 tsf at reading no. 64

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.0801	0.000	0.0	0.000	0.6404
1	0.0802	0.179	0.2	0.003	0.6405
2	0.0807	-0.012	0.0	0.000	0.6406
3	0.0817	0.637	0.6	0.009	0.6406
4	0.0842	1.072	1.1	0.016	0.6408
5	0.0857	1.408	1.4	0.021	0.6408
6	0.0872	1.730	1.7	0.025	0.6408
7	0.0877	2.067	2.1	0.030	0.6410
8	0.0892	2.570	2.6	0.038	0.6410
9	0.0907	3.051	3.1	0.045	0.6410
10	0.0917	3.464	3.5	0.051	0.6410
11	0.0922	2.250	2.3	0.033	0.6410
12	0.0927	2.637	2.6	0.039	0.6410
13	0.0947	3.277	3.3	0.048	0.6411

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
14	0.1007	3.880	3.9	0.057	0.6411
15	0.1017	4.328	4.3	0.063	0.6411
16	0.1022	4.646	4.6	0.068	0.6411
17	0.1032	5.083	5.1	0.074	0.6411
18	0.1037	5.458	5.5	0.080	0.6411
19	0.1047	5.787	5.8	0.085	0.6411
20	0.1052	6.133	6.1	0.090	0.6411
21	0.1072	7.231	7.2	0.106	0.6411
22	0.1087	8.227	8.2	0.121	0.6411
23	0.1102	7.758	7.8	0.114	0.6412
24	0.1117	9.484	9.5	0.139	0.6412
25	0.1132	10.284	10.3	0.151	0.6412
26	0.1147	11.005	11.0	0.161	0.6412
27	0.1162	11.730	11.7	0.172	0.6413
28	0.1177	8.656	8.7	0.127	0.6415
29	0.1192	11.996	12.0	0.176	0.6415
30	0.1207	13.341	13.3	0.196	0.6415
31	0.1222	14.480	14.5	0.212	0.6417
32	0.1237	15.258	15.3	0.224	0.6419
33	0.1252	16.123	16.1	0.236	0.6420
34	0.1267	17.081	17.1	0.250	0.6422
35	0.1282	17.627	17.6	0.258	0.6424
36	0.1297	18.344	18.3	0.269	0.6425
37	0.1312	19.088	19.1	0.280	0.6426
38	0.1327	19.730	19.7	0.289	0.6427
39	0.1342	20.273	20.3	0.297	0.6428
40	0.1357	20.765	20.8	0.304	0.6429
41	0.1372	21.497	21.5	0.315	0.6429
42	0.1387	22.222	22.2	0.326	0.6431
43	0.1417	23.014	23.0	0.337	0.6433
44	0.1432	23.499	23.5	0.344	0.6434
45	0.1462	24.128	24.1	0.354	0.6435
46	0.1477	24.598	24.6	0.361	0.6435
47	0.1507	25.088	25.1	0.368	0.6437
48	0.1522	25.498	25.5	0.374	0.6437
49	0.1568	25.865	25.9	0.379	0.6439
50	0.1598	26.216	26.2	0.384	0.6439
51	0.1658	26.572	26.6	0.389	0.6442
52	0.1688	26.902	26.9	0.394	0.6442
53	0.1748	27.239	27.2	0.399	0.6444
54	0.1778	27.639	27.6	0.405	0.6444
55	0.1868	28.140	28.1	0.412	0.6445
56	0.1928	28.494	28.5	0.418	0.6447
57	0.2048	28.807	28.8	0.422	0.6450
58	0.2078	29.117	29.1	0.427	0.6450
59	0.2198	29.396	29.4	0.431	0.6457
60	0.2258	29.935	29.9	0.439	0.6459

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
61	0.2378	30.275	30.3	0.444	0.6462
62	0.2498	30.257	30.3	0.443	0.6468
63	0.2618	30.501	30.5	0.447	0.6473
64	0.2738	30.896	30.9	0.453	0.6478
65	0.2768	30.616	30.6	0.449	0.6480
66	0.2888	30.427	30.4	0.446	0.6486
67	0.3008	30.501	30.5	0.447	0.6489
68	0.3038	30.174	30.2	0.442	0.6489
69	0.3158	30.186	30.2	0.442	0.6489
70	0.3188	29.861	29.9	0.438	0.6489
71	0.3304	29.937	29.9	0.439	0.6489

Parameters for Specimen No. 2

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	378.010		378.900
Moisture content: Dry soil+tare, gms.	348.920		348.920
Moisture content: Tare, gms.	217.180		217.180
Moisture, %	22.1	22.8	22.8
Moist specimen weight, gms.	160.8		
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	124.6	125.6	
Dry density, pcf	102.1	102.3	
Void ratio	0.6516	0.6476	
Saturation, %	91.5	94.9	

Test Readings for Specimen No. 2

Normal stress = 2.088 tsf

Strain rate, %/min. = 0.03

Fail. Stress = 1.367 tsf at reading no. 55

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.3213	0.000	0.0	0.000	0.6519
1	0.3214	10.064	10.1	0.148	0.6519
2	0.3219	13.588	13.6	0.199	0.6519
3	0.3224	17.001	17.0	0.249	0.6519
4	0.3229	20.234	20.2	0.297	0.6518
5	0.3234	22.724	22.7	0.333	0.6518
6	0.3239	25.014	25.0	0.367	0.6518
7	0.3244	27.032	27.0	0.396	0.6518
8	0.3249	28.622	28.6	0.419	0.6518
9	0.3254	30.209	30.2	0.443	0.6518
10	0.3259	31.612	31.6	0.463	0.6518
11	0.3264	32.814	32.8	0.481	0.6519
12	0.3269	34.094	34.1	0.500	0.6519
13	0.3274	35.285	35.3	0.517	0.6519

Test Readings for Specimen No. 2

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
14	0.3279	36.333	36.3	0.532	0.6519
15	0.3284	37.660	37.7	0.552	0.6518
16	0.3294	39.612	39.6	0.581	0.6518
17	0.3299	40.766	40.8	0.597	0.6518
18	0.3304	41.792	41.8	0.612	0.6518
19	0.3309	42.913	42.9	0.629	0.6518
20	0.3319	44.929	44.9	0.658	0.6518
21	0.3329	46.621	46.6	0.683	0.6518
22	0.3334	47.757	47.8	0.700	0.6518
23	0.3344	49.446	49.4	0.725	0.6518
24	0.3349	50.578	50.6	0.741	0.6518
25	0.3354	51.615	51.6	0.756	0.6518
26	0.3364	53.428	53.4	0.783	0.6518
27	0.3374	55.041	55.0	0.807	0.6518
28	0.3384	56.757	56.8	0.832	0.6518
29	0.3388	57.856	57.9	0.848	0.6518
30	0.3398	59.099	59.1	0.866	0.6518
31	0.3403	60.261	60.3	0.883	0.6518
32	0.3413	61.835	61.8	0.906	0.6518
33	0.3423	63.185	63.2	0.926	0.6518
34	0.3431	66.042	66.0	0.968	0.6518
35	0.3436	67.143	67.1	0.984	0.6517
36	0.3446	68.617	68.6	1.006	0.6517
37	0.3456	69.784	69.8	1.023	0.6517
38	0.3466	71.114	71.1	1.042	0.6517
39	0.3486	73.273	73.3	1.074	0.6517
40	0.3501	75.096	75.1	1.101	0.6517
41	0.3516	76.694	76.7	1.124	0.6516
42	0.3531	78.152	78.2	1.145	0.6516
43	0.3546	79.400	79.4	1.164	0.6516
44	0.3561	80.889	80.9	1.186	0.6515
45	0.3576	82.167	82.2	1.204	0.6514
46	0.3591	83.280	83.3	1.221	0.6513
47	0.3606	84.360	84.4	1.236	0.6513
48	0.3621	85.421	85.4	1.252	0.6512
49	0.3651	87.050	87.0	1.276	0.6511
50	0.3681	88.288	88.3	1.294	0.6507
51	0.3711	89.459	89.5	1.311	0.6506
52	0.3756	90.582	90.6	1.328	0.6502
53	0.3801	91.559	91.6	1.342	0.6501
54	0.3891	92.629	92.6	1.358	0.6497
55	0.3966	93.285	93.3	1.367	0.6494
56	0.3996	93.059	93.1	1.364	0.6493
57	0.4101	92.403	92.4	1.354	0.6492
58	0.4146	91.460	91.5	1.340	0.6491
59	0.4176	89.964	90.0	1.319	0.6491
60	0.4281	89.651	89.7	1.314	0.6492

Test Readings for Specimen No. 2

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
61	0.4401	89.954	90.0	1.318	0.6493
62	0.4521	90.718	90.7	1.330	0.6495
63	0.4641	91.517	91.5	1.341	0.6497
64	0.4761	91.998	92.0	1.348	0.6500
65	0.4881	92.170	92.2	1.351	0.6501
66	0.5001	91.851	91.9	1.346	0.6503
67	0.5121	91.448	91.4	1.340	0.6504
68	0.5241	91.411	91.4	1.340	0.6508
69	0.5361	91.487	91.5	1.341	0.6511
70	0.5481	91.133	91.1	1.336	0.6514
71	0.5601	91.392	91.4	1.339	0.6516
72	0.5656	89.303	89.3	1.309	0.6517

Parameters for Specimen No. 3

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	379.020		378.070
Moisture content: Dry soil+tare, gms.	345.970		345.970
Moisture content: Tare, gms.	217.840		217.840
Moisture, %	25.8	25.1	25.1
Moist specimen weight, gms.	161.2		
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	124.9	124.7	
Dry density, pcf	99.3	99.7	
Void ratio	0.6981	0.6910	
Saturation, %	99.8	97.9	

Test Readings for Specimen No. 3

Normal stress = 3.60 tsf

Strain rate, %/min. = 0.02

Fail. Stress = 2.502 tsf at reading no. 65

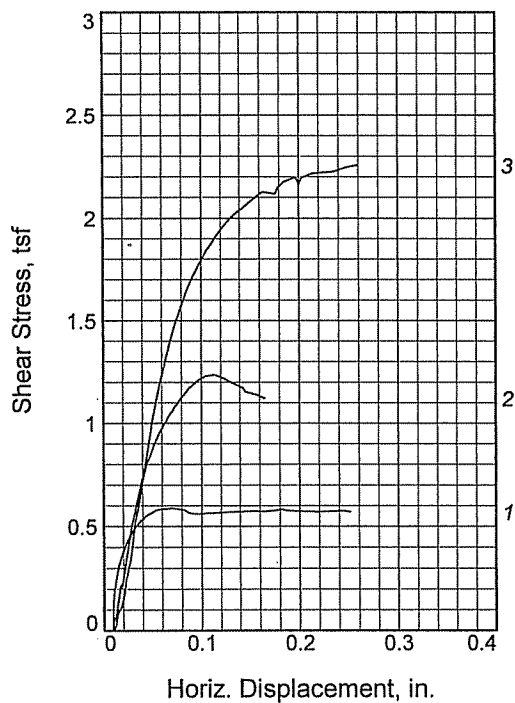
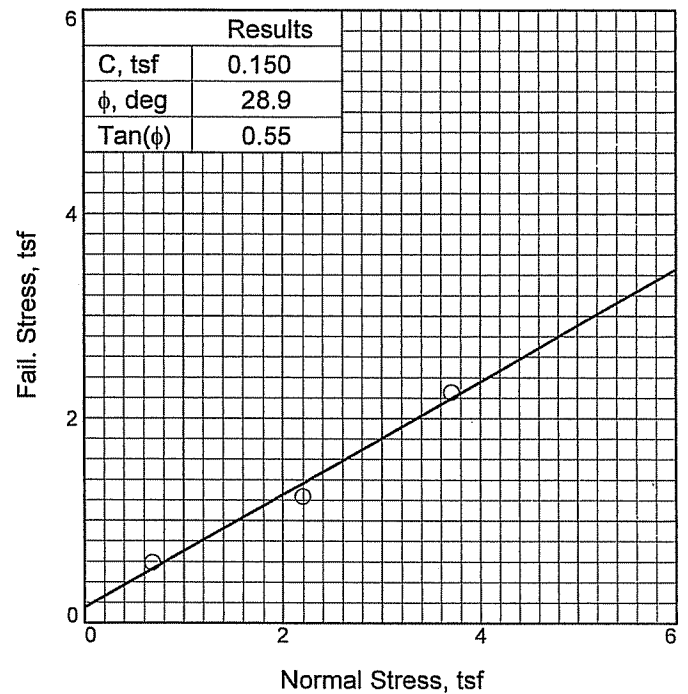
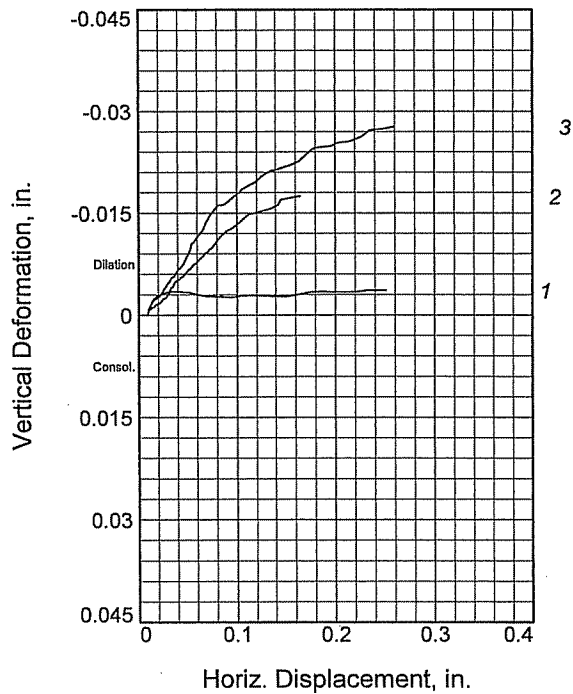
No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.1051	0.000	0.0	0.000	0.6518
1	0.1052	4.529	4.5	0.066	0.6519
2	0.1097	6.469	6.5	0.095	0.6551
3	0.1127	8.672	8.7	0.127	0.6551
4	0.1137	10.916	10.9	0.160	0.6552
5	0.1152	13.341	13.3	0.196	0.6552
6	0.1177	15.542	15.5	0.228	0.6553
7	0.1212	17.380	17.4	0.255	0.6555
8	0.1222	19.210	19.2	0.282	0.6556
9	0.1237	22.430	22.4	0.329	0.6556
10	0.1242	24.688	24.7	0.362	0.6556
11	0.1247	27.262	27.3	0.400	0.6557
12	0.1257	29.439	29.4	0.431	0.6557

Test Readings for Specimen No. 3

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
13	0.1272	32.538	32.5	0.477	0.6559
14	0.1278	34.535	34.5	0.506	0.6559
15	0.1283	32.029	32.0	0.469	0.6560
16	0.1298	34.981	35.0	0.513	0.6560
17	0.1308	36.980	37.0	0.542	0.6561
18	0.1323	42.607	42.6	0.624	0.6563
19	0.1338	48.763	48.8	0.715	0.6565
20	0.1353	55.497	55.5	0.813	0.6568
21	0.1368	62.774	62.8	0.920	0.6570
22	0.1383	69.338	69.3	1.016	0.6572
23	0.1398	75.529	75.5	1.107	0.6574
24	0.1413	81.093	81.1	1.189	0.6575
25	0.1428	86.194	86.2	1.263	0.6575
26	0.1443	90.801	90.8	1.331	0.6575
27	0.1458	95.294	95.3	1.397	0.6577
28	0.1473	99.162	99.2	1.453	0.6578
29	0.1488	103.176	103.2	1.512	0.6579
30	0.1503	106.578	106.6	1.562	0.6580
31	0.1518	109.685	109.7	1.608	0.6582
32	0.1533	113.018	113.0	1.656	0.6583
33	0.1548	115.855	115.9	1.698	0.6585
34	0.1563	118.586	118.6	1.738	0.6587
35	0.1578	121.383	121.4	1.779	0.6589
36	0.1593	124.025	124.0	1.818	0.6590
37	0.1608	126.113	126.1	1.848	0.6592
38	0.1623	128.723	128.7	1.887	0.6593
39	0.1638	131.283	131.3	1.924	0.6594
40	0.1653	133.464	133.5	1.956	0.6595
41	0.1668	135.535	135.5	1.986	0.6596
42	0.1683	137.643	137.6	2.017	0.6597
43	0.1698	139.571	139.6	2.046	0.6600
44	0.1713	141.556	141.6	2.075	0.6601
45	0.1743	144.905	144.9	2.124	0.6603
46	0.1773	147.741	147.7	2.165	0.6606
47	0.1803	150.669	150.7	2.208	0.6607
48	0.1833	153.224	153.2	2.246	0.6609
49	0.1863	155.580	155.6	2.280	0.6610
50	0.1893	157.422	157.4	2.307	0.6611
51	0.1923	159.296	159.3	2.335	0.6611
52	0.1968	161.311	161.3	2.364	0.6613
53	0.2013	163.230	163.2	2.392	0.6613
54	0.2058	164.954	165.0	2.418	0.6614
55	0.2118	166.671	166.7	2.443	0.6615
56	0.2208	168.434	168.4	2.469	0.6615
57	0.2328	169.157	169.2	2.479	0.6616
58	0.2449	169.910	169.9	2.490	0.6616
59	0.2569	170.383	170.4	2.497	0.6617

Test Readings for Specimen No. 3

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
60	0.2689	170.499	170.5	2.499	0.6617
61	0.2809	170.492	170.5	2.499	0.6618
62	0.2929	169.939	169.9	2.491	0.6620
63	0.3049	170.289	170.3	2.496	0.6623
64	0.3139	170.542	170.5	2.499	0.6625
65	0.3169	170.685	170.7	2.502	0.6625
66	0.3289	170.227	170.2	2.495	0.6628
67	0.3409	170.116	170.1	2.493	0.6632
68	0.3529	169.693	169.7	2.487	0.6633



Sample No.		1	2	3
Initial	Water Content, %	30.8	32.4	29.4
	Dry Density, pcf	92.7	86.1	88.9
	Saturation, %	99.7	89.7	86.8
	Void Ratio	0.8511	0.9931	0.9312
	Diameter, in.	2.50	2.50	2.50
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	29.5	32.3	32.0
	Dry Density, pcf	93.9	88.4	90.6
	Saturation, %	98.0	94.2	98.4
	Void Ratio	0.8279	0.9421	0.8948
	Diameter, in.	2.50	2.50	2.50
	Height, in.	0.99	0.98	0.98
Normal Stress, tsf		0.684	2.196	3.708
Fail. Stress, tsf		0.589	1.237	2.256
Displacement, in.		0.07	0.11	0.26
Ult. Stress, tsf				
Displacement, in.				
Strain rate, %/min.		0.02	0.04	0.02

Sample Type: Undisturbed
Description: Gray LEAN CLAY

Assumed Specific Gravity= 2.75

Remarks:

Test method: ASTM D 3080

Pocket pen; tsf: 2.00

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: 07-241 **Depth:** 24-26

Sample Number: 13

Proj. No.: 08.18.918

Date Sampled: 7/20/08

DIRECT SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

DIRECT SHEAR TEST

7/28/2008

Date: 7/20/08
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: 07-241
Depth: 24-26 **Sample Number:** 13
Description: Gray LEAN CLAY
Remarks:
 Test method: ASTM D 3080
 Pocket pen; tsf: 2.00
Type of Sample: Undisturbed
Assumed Specific Gravity=2.75 **LL=** **PL=** **PI=**

Parameters for Specimen No. 1

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	373.840		372.250
Moisture content: Dry soil+tare, gms.	336.910		336.910
Moisture content: Tare, gms.	217.190		217.190
Moisture, %	30.8	29.5	29.5
Moist specimen weight, gms.	156.7		
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	121.4	121.6	
Dry density, pcf	92.7	93.9	
Void ratio	0.8511	0.8279	
Saturation, %	99.7	98.0	

Test Readings for Specimen No. 1

Normal stress = 0.684 tsf
 Strain rate, %/min. = 0.02
 Fail. Stress = 0.589 tsf at reading no. 47

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.4123	0.000	0.0	0.000	0.6521
1	0.4219	0.000	0.0	0.000	0.6521
2	0.4220	9.466	9.5	0.139	0.6521
3	0.4225	10.817	10.8	0.159	0.6527
4	0.4230	12.520	12.5	0.183	0.6529
5	0.4235	13.856	13.9	0.203	0.6532
6	0.4240	14.745	14.7	0.216	0.6533
7	0.4245	15.965	16.0	0.234	0.6534
8	0.4250	16.808	16.8	0.246	0.6536
9	0.4255	17.770	17.8	0.260	0.6538
10	0.4260	18.575	18.6	0.272	0.6540
11	0.4265	19.436	19.4	0.285	0.6541

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
12	0.4270	20.050	20.1	0.294	0.6542
13	0.4275	20.817	20.8	0.305	0.6544
14	0.4285	21.764	21.8	0.319	0.6544
15	0.4290	22.469	22.5	0.329	0.6546
16	0.4295	22.993	23.0	0.337	0.6546
17	0.4300	23.440	23.4	0.344	0.6547
18	0.4305	23.977	24.0	0.351	0.6547
19	0.4310	24.469	24.5	0.359	0.6548
20	0.4315	24.963	25.0	0.366	0.6549
21	0.4320	25.581	25.6	0.375	0.6549
22	0.4325	26.054	26.1	0.382	0.6549
23	0.4335	26.715	26.7	0.392	0.6550
24	0.4340	27.215	27.2	0.399	0.6550
25	0.4350	27.942	27.9	0.410	0.6551
26	0.4360	28.655	28.7	0.420	0.6551
27	0.4365	29.067	29.1	0.426	0.6551
28	0.4375	29.788	29.8	0.437	0.6552
29	0.4385	30.249	30.2	0.443	0.6553
30	0.4395	30.850	30.9	0.452	0.6553
31	0.4405	31.360	31.4	0.460	0.6553
32	0.4415	31.861	31.9	0.467	0.6555
33	0.4420	32.308	32.3	0.474	0.6554
34	0.4430	32.837	32.8	0.481	0.6554
35	0.4445	33.415	33.4	0.490	0.6554
36	0.4455	33.994	34.0	0.498	0.6555
37	0.4470	34.590	34.6	0.507	0.6555
38	0.4490	35.268	35.3	0.517	0.6555
39	0.4505	35.980	36.0	0.527	0.6556
40	0.4535	36.606	36.6	0.537	0.6555
41	0.4550	37.256	37.3	0.546	0.6555
42	0.4580	37.843	37.8	0.555	0.6554
43	0.4610	38.418	38.4	0.563	0.6555
44	0.4655	39.278	39.3	0.576	0.6554
45	0.4700	39.721	39.7	0.582	0.6552
46	0.4805	39.930	39.9	0.585	0.6549
47	0.4820	40.165	40.2	0.589	0.6548
48	0.4835	40.043	40.0	0.587	0.6548
49	0.4940	39.603	39.6	0.580	0.6548
50	0.4970	38.998	39.0	0.572	0.6548
51	0.5000	38.540	38.5	0.565	0.6548
52	0.5075	38.129	38.1	0.559	0.6547
53	0.5180	38.423	38.4	0.563	0.6549
54	0.5285	38.618	38.6	0.566	0.6550
55	0.5405	38.860	38.9	0.570	0.6549
56	0.5525	38.887	38.9	0.570	0.6548
57	0.5645	39.083	39.1	0.573	0.6549
58	0.5765	39.004	39.0	0.572	0.6551

Test Readings for Specimen No. 1

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
59	0.5885	39.306	39.3	0.576	0.6555
60	0.5945	39.811	39.8	0.583	0.6555
61	0.5975	39.341	39.3	0.577	0.6555
62	0.6094	39.095	39.1	0.573	0.6555
63	0.6214	39.014	39.0	0.572	0.6555
64	0.6334	38.864	38.9	0.570	0.6555
65	0.6454	39.079	39.1	0.573	0.6557
66	0.6574	39.288	39.3	0.576	0.6557
67	0.6634	38.876	38.9	0.570	0.6557

Parameters for Specimen No. 2

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	365.060		364.910
Moisture content: Dry soil+tare, gms.	328.870		328.870
Moisture content: Tare, gms.	217.190		217.190
Moisture, %	32.4	32.3	32.3
Moist specimen weight, gms.	147.2		
Diameter, in.	2.50	2.50	
Area, in. ²	4.91	4.91	
Height, in.	1.00	0.98	
Net decrease in height, in.		0.03	
Wet Density, pcf	114.0	116.9	
Dry density, pcf	86.1	88.4	
Void ratio	0.9931	0.9421	
Saturation, %	89.7	94.2	

Test Readings for Specimen No. 2

Normal stress = 2.196 tsf

Strain rate, %/min. = 0.04

Fail. Stress = 1.237 tsf at reading no. 72

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.3144	0.000	0.0	0.000	0.6864
1	0.3238	0.000	0.0	0.000	0.6864
2	0.3237	1.693	1.7	0.025	0.6864
3	0.3247	2.927	2.9	0.043	0.6869
4	0.3257	3.831	3.8	0.056	0.6871
5	0.3267	5.141	5.1	0.075	0.6872
6	0.3277	6.204	6.2	0.091	0.6874
7	0.3282	7.639	7.6	0.112	0.6875
8	0.3287	9.015	9.0	0.132	0.6875
9	0.3292	9.866	9.9	0.145	0.6875
10	0.3297	10.939	10.9	0.160	0.6876
11	0.3302	11.840	11.8	0.174	0.6876
12	0.3307	12.950	13.0	0.190	0.6877
13	0.3313	13.977	14.0	0.205	0.6877
14	0.3317	14.934	14.9	0.219	0.6878
15	0.3328	13.827	13.8	0.203	0.6879

Test Readings for Specimen No. 2

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
16	0.3333	15.207	15.2	0.223	0.6879
17	0.3343	16.371	16.4	0.240	0.6880
18	0.3348	17.408	17.4	0.255	0.6881
19	0.3358	19.345	19.3	0.284	0.6881
20	0.3363	20.598	20.6	0.302	0.6882
21	0.3368	21.746	21.7	0.319	0.6882
22	0.3373	22.819	22.8	0.334	0.6883
23	0.3378	23.720	23.7	0.348	0.6884
24	0.3383	24.584	24.6	0.360	0.6884
25	0.3388	25.482	25.5	0.373	0.6885
26	0.3393	26.485	26.5	0.388	0.6887
27	0.3398	27.495	27.5	0.403	0.6887
28	0.3403	28.485	28.5	0.417	0.6888
29	0.3408	29.332	29.3	0.430	0.6888
30	0.3413	30.365	30.4	0.445	0.6888
31	0.3423	32.264	32.3	0.473	0.6889
32	0.3433	34.031	34.0	0.499	0.6891
33	0.3443	35.436	35.4	0.519	0.6893
34	0.3448	36.310	36.3	0.532	0.6894
35	0.3458	37.670	37.7	0.552	0.6896
36	0.3468	38.869	38.9	0.570	0.6901
37	0.3473	39.926	39.9	0.585	0.6902
38	0.3483	41.389	41.4	0.607	0.6904
39	0.3493	42.825	42.8	0.628	0.6905
40	0.3508	44.903	44.9	0.658	0.6909
41	0.3523	47.087	47.1	0.690	0.6913
42	0.3538	48.993	49.0	0.718	0.6914
43	0.3553	50.845	50.8	0.745	0.6916
44	0.3568	52.515	52.5	0.770	0.6918
45	0.3583	54.192	54.2	0.794	0.6920
46	0.3598	55.746	55.7	0.817	0.6920
47	0.3628	57.713	57.7	0.846	0.6926
48	0.3643	58.926	58.9	0.864	0.6928
49	0.3658	60.344	60.3	0.884	0.6930
50	0.3673	61.555	61.6	0.902	0.6932
51	0.3688	62.611	62.6	0.918	0.6934
52	0.3703	63.897	63.9	0.936	0.6937
53	0.3718	64.848	64.8	0.950	0.6939
54	0.3733	65.789	65.8	0.964	0.6940
55	0.3748	66.703	66.7	0.978	0.6943
56	0.3763	67.572	67.6	0.990	0.6945
57	0.3793	69.123	69.1	1.013	0.6949
58	0.3808	70.211	70.2	1.029	0.6951
59	0.3824	71.092	71.1	1.042	0.6954
60	0.3854	72.293	72.3	1.060	0.6957
61	0.3869	73.190	73.2	1.073	0.6960
62	0.3899	74.649	74.6	1.094	0.6963

Test Readings for Specimen No. 2

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
63	0.3929	76.107	76.1	1.115	0.6969
64	0.3959	77.218	77.2	1.132	0.6975
65	0.3989	78.426	78.4	1.149	0.6980
66	0.4019	79.678	79.7	1.168	0.6984
67	0.4049	80.590	80.6	1.181	0.6988
68	0.4094	81.888	81.9	1.200	0.6991
69	0.4139	82.979	83.0	1.216	0.6996
70	0.4199	83.940	83.9	1.230	0.7003
71	0.4244	84.076	84.1	1.232	0.7009
72	0.4274	84.431	84.4	1.237	0.7012
73	0.4364	83.462	83.5	1.223	0.7015
74	0.4454	81.841	81.8	1.199	0.7019
75	0.4514	80.953	81.0	1.186	0.7021
76	0.4574	80.010	80.0	1.173	0.7026
77	0.4604	78.689	78.7	1.153	0.7033
78	0.4724	77.563	77.6	1.137	0.7037
79	0.4792	76.563	76.6	1.122	0.7039

Parameters for Specimen No. 3

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	360.200		363.220
Moisture content: Dry soil+tare, gms.	326.470		326.470
Moisture content: Tare, gms.	211.720		211.720
Moisture, %	29.4	32.0	32.0
Moist specimen weight, gms.	148.5		
Diameter, in.	2.50	2.50	
Area, in. ²	4.91	4.91	
Height, in.	1.00	0.98	
Net decrease in height, in.		0.02	
Wet Density, pcf	115.0	119.6	
Dry density, pcf	88.9	90.6	
Void ratio	0.9312	0.8948	
Saturation, %	86.8	98.4	

Test Readings for Specimen No. 3

Normal stress = 3.708 tsf

Strain rate, %/min. = 0.02

Fail. Stress = 2.256 tsf at reading no. 79

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
0	0.3622	0.000	0.0	0.000	0.7132
1	0.3715	0.000	0.0	0.000	0.7132
2	0.3716	1.173	1.2	0.017	0.7132
3	0.3726	0.140	0.1	0.002	0.7141
4	0.3746	2.129	2.1	0.031	0.7146
5	0.3756	4.644	4.6	0.068	0.7149
6	0.3776	6.381	6.4	0.094	0.7153
7	0.3806	7.949	7.9	0.116	0.7156
8	0.3821	10.423	10.4	0.153	0.7158
9	0.3836	12.363	12.4	0.181	0.7159
10	0.3841	14.246	14.2	0.209	0.7160
11	0.3846	16.122	16.1	0.236	0.7162
12	0.3861	18.108	18.1	0.265	0.7164
13	0.3876	20.278	20.3	0.297	0.7167
14	0.3891	22.027	22.0	0.323	0.7172
15	0.3901	23.979	24.0	0.351	0.7173
16	0.3911	26.051	26.1	0.382	0.7175
17	0.3921	28.585	28.6	0.419	0.7178
18	0.3931	31.380	31.4	0.460	0.7180
19	0.3941	33.700	33.7	0.494	0.7181
20	0.3951	36.153	36.2	0.530	0.7184
21	0.3961	37.836	37.8	0.555	0.7187
22	0.3986	41.732	41.7	0.612	0.7189
23	0.4001	44.176	44.2	0.647	0.7192
24	0.4016	47.366	47.4	0.694	0.7195
25	0.4031	50.340	50.3	0.738	0.7199
26	0.4046	53.290	53.3	0.781	0.7200
27	0.4061	56.376	56.4	0.826	0.7203
28	0.4076	59.417	59.4	0.871	0.7206

Test Readings for Specimen No. 3

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
29	0.4091	62.111	62.1	0.910	0.7210
30	0.4106	64.928	64.9	0.952	0.7215
31	0.4121	67.999	68.0	0.997	0.7218
32	0.4136	70.647	70.6	1.035	0.7223
33	0.4151	73.287	73.3	1.074	0.7228
34	0.4166	75.653	75.7	1.109	0.7237
35	0.4181	78.077	78.1	1.144	0.7238
36	0.4196	80.205	80.2	1.175	0.7240
37	0.4211	82.438	82.4	1.208	0.7244
38	0.4226	84.705	84.7	1.241	0.7246
39	0.4241	86.638	86.6	1.270	0.7249
40	0.4256	88.670	88.7	1.300	0.7252
41	0.4271	90.735	90.7	1.330	0.7255
42	0.4286	92.330	92.3	1.353	0.7258
43	0.4301	94.361	94.4	1.383	0.7264
44	0.4316	96.396	96.4	1.413	0.7269
45	0.4331	98.048	98.0	1.437	0.7273
46	0.4346	99.796	99.8	1.463	0.7277
47	0.4361	101.450	101.5	1.487	0.7280
48	0.4391	104.185	104.2	1.527	0.7285
49	0.4406	105.952	106.0	1.553	0.7288
50	0.4436	108.687	108.7	1.593	0.7293
51	0.4466	111.496	111.5	1.634	0.7293
52	0.4496	113.754	113.8	1.667	0.7295
53	0.4526	116.004	116.0	1.700	0.7297
54	0.4556	118.027	118.0	1.730	0.7301
55	0.4586	120.148	120.1	1.761	0.7305
56	0.4616	121.940	121.9	1.787	0.7309
57	0.4646	123.730	123.7	1.813	0.7312
58	0.4676	125.466	125.5	1.839	0.7316
59	0.4721	127.611	127.6	1.870	0.7320
60	0.4751	129.264	129.3	1.894	0.7323
61	0.4811	132.014	132.0	1.935	0.7327
62	0.4871	134.345	134.3	1.969	0.7335
63	0.4931	136.451	136.5	2.000	0.7341
64	0.4991	138.087	138.1	2.024	0.7344
65	0.5051	139.668	139.7	2.047	0.7347
66	0.5111	141.424	141.4	2.073	0.7349
67	0.5171	142.973	143.0	2.095	0.7352
68	0.5261	145.095	145.1	2.127	0.7358
69	0.5381	144.474	144.5	2.117	0.7374
70	0.5411	146.575	146.6	2.148	0.7377
71	0.5471	148.399	148.4	2.175	0.7379
72	0.5591	150.055	150.1	2.199	0.7381
73	0.5621	147.735	147.7	2.165	0.7384
74	0.5651	149.767	149.8	2.195	0.7385
75	0.5771	151.316	151.3	2.218	0.7388

Test Readings for Specimen No. 3

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Shear Stress tsf	Vertical Def. Dial in.
76	0.5891	151.599	151.6	2.222	0.7394
77	0.5981	151.868	151.9	2.226	0.7404
78	0.6101	153.207	153.2	2.245	0.7406
79	0.6218	153.935	153.9	2.256	0.7409

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
07-239															
	2	2.5-4	Reddish-brown and gray FAT CLAY	CH	35.6		67	21	46	98.4					
	3	4-6	Reddish-brown and gray FAT CLAY; sand seams	CH	31.0	90.2									
	4	6-8	Tan and brown LEAN CLAY	CL	29.4	94.4	35	16	19	99.7		1.21	7.2	2.5	Vertical shear
	5	8-10	Brown SILTY CLAY	CL-ML	28.3	95.1						0.86	5.7	3.5	Bulge
	6	10-12	Gray LEAN CLAY	CL	24.9	101.1	36	16	20	99.5					
	7	12-14	Light gray and tan FAT CLAY with SAND	CH	31.2	91.8						0.32	4.0		
	8	14-16	Gray LEAN CLAY	CL	54.1										
	9	16-18	Gray LEAN CLAY with SAND	CL	28.4	93.5									
	10	18-20	Gray LEAN CLAY	CL	29.2	96.1	33	16	17	99.8					
	11	20-22	Gray LEAN CLAY; sand seams	CL	33.2	88.9									
	12	22-24	Gray LEAN CLAY with SAND	CL	29.8	91.5									
	13	24-26	Brown and gray FAT CLAY	CH	31.2	91.7	50	20	30	99.9		0.77	6.4	9.5	60 degree
	14	26-28	Gray FAT CLAY	CH	39.1	82.1									
	15	28-30	Gray FAT CLAY	CH	35.7	81.9						1.26	7.2		60 degree
07-240															
	2	2.5-4	Tan and gray SANDY SILTY CLAY	CL-ML	22.2										
	3	4-6	Tan and brown LEAN CLAY	CL	23.1	104.2	31	16	15	98.2		1.69	6.5	2.0	Vertical shear
	4	6-8	Tan and brown LEAN CLAY	CL	61.6										
	5	8-10	Tan and gray SANDY SILTY CLAY; ferrous nodules	CL-ML	25.3	92.1						0.43	5.5	3.5	Vertical shear
	6	10-12	Tan and gray SANDY SILTY CLAY	CL-ML	27.3	92.4									
	7	12-14	Tan and brown LEAN CLAY	CL	27.6	92.5	32	16	16	99.4		0.36	5.6	5.0	Vertical shear
	8	14-16	Tan and gray SANDY LEAN CLAY; calcareous nodules	CL	27.3	94.7									
	9	16-18	Brown SILTY CLAY with SAND	CL-ML	27.3	93.3						0.36	5.8	6.5	Bulge
	10	18-20	Tan and brown SILTY CLAY	CL-ML	29.3	94.0						0.75	5.2		Vertical shear
	11	20-22	Gray and tan SILTY CLAY with SAND	CL-ML	30.3	90.7									
	12	22-24	Tan and brown SANDY SILTY CLAY	CL-ML	33.6	91.7									
	13	24-26	Gray and brown FAT CLAY	CH	30.6	90.7	53	20	33	99.8		0.23	5.0	9.5	Bulge
	14	26-28	Gray LEAN CLAY with SAND	CL	32.3	87.2									
	15	28-30	Gray FAT CLAY	CH	47.3	77.5									
07-241															
	1	0-2	Gray FAT CLAY	CH	172.6										
	2	2-4	Gray FAT CLAY	CH	158.9		126	30	96	95.6					
	3	4-6	Reddish-brown and gray FAT CLAY	CH	30.6	87.0									
	4	6-8	Tan and gray FAT CLAY	CH	31.4	88.7	70	22	48	99.9					
	5	8-10	Tan and gray SANDY SILTY CLAY; shell fragments	CL-ML	24.7	100.6									
	6	10-12	Tan and brown LEAN CLAY	CL	27.8	93.9	42	17	25	99.3		0.83	7.2		60 degree

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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
	7	12-14	Brown and gray SILTY CLAY with SAND	CL-ML	30.1	94.0						0.90	14.2	5.0	Bulge
	8	14-16	Brown and gray LEAN CLAY	CL	28.0	94.4	28	15	13	98.6					
	9	16-18	Brown and gray SILTY CLAY	CL-ML	27.7	94.6						0.91	14.2	6.5	60 degree
	10	18-20	Gray SANDY SILTY CLAY	CL-ML	29.8	93.5									
	11	20-22	Tan and gray LEAN CLAY	CL	12.4	103.9	32	16	16	98.8		0.45	7.7		
	12	22-24	Gray SILTY CLAY with SAND	CL-ML	33.1	92.2									
	13	24-26	Gray LEAN CLAY	CL	34.3	90.4						0.59	2.8		
	14	26-28	Gray LEAN CLAY	CL	33.0	88.2	36	16	20	99.7					
	15	28-30	Gray FAT CLAY	CH	41.7	80.4						0.82	11.0	11.0	60 degree
	16	30-32	Gray FAT CLAY	CH	43.6	76.9						1.39	8.5		60 degree
	17	32-34	Gray FAT CLAY	CH	42.4	78.7	67	21	46	99.9					
	18	34-35	Gray FAT CLAY	CH	46.7	74.1									

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