TOLUNAY-WONG ENGINEERS, INC.

Boring No.	Sample No.	Sample Depth (feet)	Elevation (feet)	Pocket Pen. (tsf)	Soil Description	USCS	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Finer than No. 200 (%)	Unit Dry Weight (pcf)	Dev./Compr. Stress (tsf)	Failure Strain (%)	Confining Pressure (psi)	Failure Type
	7	12-14		3.50	Gray, tan and brown LEAN CLAY; ferrous nodules	CL	23.2									
	8	14-16		4.25	Brown, tan and gray LEAN CLAY; ferrous nodules	CL	19.4									
	9	16-18		3.75	Gray and tan FAT CLAY; calcareous nodules	CH	24.0									
	10	18-20		4.00	Tan and gray FAT CLAY	CH	23.5									
	11	20-22		4.00	Dark gray and reddish-brown FAT CLAY	CH	22.4									
	12	22-24			Reddish-brown and dark gray FAT CLAY	CH	25.6					98.1	2.51	6.0		60 degree
	13	24-25		3.25	Dark gray, reddish-brown and tan FAT CLAY; traces of ferrous	CH	29.2	80	24	56		98.0	2.90	4.0	21	Multiple shear
07-26	N 13844815.61, E 3154025.56		55.40													
	1	0-2	53.40	3.00	Gray and reddish-brown FAT CLAY	CH	21.2									
	2	2-4	51.40	4.50	Gray and tan FAT CLAY	CH	20.9									
	3	4-6	49.40	3.50	Gray and tan FAT CLAY; calcareous nodules	CH	27.6									
	4	6-8	47.40	2.75	Reddish-brown and gray FAT CLAY	CH	36.7									
	5	8-10	45.40	3.50	Reddish-brown and gray FAT CLAY	CH	28.0									
	6	10-12	43.40	3.50	Reddish-brown and gray FAT CLAY	CH	29.4									
	7	12-14	41.40	3.25	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	24.5									
	8	14-16	39.40	4.50	Gray and tan FAT CLAY	CH	22.9									
	9	16-18	37.40	3.00	Gray and tan FAT CLAY; calcareous nodules	CH	25.3									
	10	18-20	35.40	4.50	Dark gray and tan FAT CLAY	CH	23.9	75	21	54		99.4	3.47	3.9	17	Bulge
	11	20-22	33.40	4.50	Dark gray FAT CLAY	CH	22.7					101.0	4.18	7.0		60 degree
	12	22-24	31.40	4.50	Gray and reddish-brown FAT CLAY	CH	21.2									
	13	24-25	30.40	2.50	Reddish-brown and gray FAT CLAY	CH	26.8									
07-27	N 13844844.19, E 3154558.51		55.34													
	1	0-2	53.34	1.50	Reddish-brown and gray FAT CLAY	CH	37.2									
	2	2-4	51.34	1.75	Reddish-brown and gray	CH	34.0									
	3	4-6	49.34	2.00	Reddish-brown and gray FAT CLAY	CH	31.5									
	4	6-8	47.34	2.00	Reddish-brown and gray FAT CLAY; silt seams	CH	35.5									
	5	8-10	45.34	2.50	Reddish-brown and gray FAT CLAY	CH	30.0									
	6	10-12	43.34	2.25	Reddish-brown and gray FAT CLAY	CH	33.6									
	7	12-14	41.34	2.75	Gray and tan FAT CLAY; rotten roots	CH	25.0	74	21	53		91.6	1.83	2.1	12	60 degree
	8	14-16	39.34	2.50	Reddish-brown and gray FAT CLAY	CH	36.6					84.8	1.54	1.2		60 degree
	9	16-18	37.34	3.50	Gray and tan FAT CLAY	CH	21.8									
	10	18-20	35.34	3.00	Tan and gray FAT CLAY; calcareous nodules	CH	24.7									
	11	20-22	33.34	2.75	Tan and gray FAT CLAY; calcareous nodules	CH	23.0									
	12	22-24	31.34	3.50	Reddish-brown and gray FAT CLAY	CH	31.4									
	13	24-26	29.34	3.00	Dark gray and reddish-brown FAT CLAY	CH	22.6									
	14	26-28	27.34	2.50	Gray and tan FAT CLAY	CH	32.6									
	15	28-30	25.34	2.50	Tan and gray FAT CLAY	CH	30.6									
	16	30-32	23.34	2.50	Tan and gray FAT CLAY; ferrous and calcareous nodules	CH	29.9					95.1	1.60	2.6		45 degree
	17	32-34	21.34	2.50	Tan and gray FAT CLAY; calcareous nodules	CH	28.4	76	21	55		95.5	1.83	3.4	28	Slickensided
	18	34-36	19.34	4.50	Reddish-brown and gray FAT CLAY	CH	25.5									
	19	36-38	17.34	4.50	Reddish-brown and gray FAT CLAY	CH	23.3									
	20	38-40	15.34	4.50	Reddish-brown and gray FAT CLAY; sand seams	CH	21.8									
07-28	N 13844870.34, E 3155085.93		56.21													
	1	0-2	54.21	2.25	Gray and reddish-brown FAT CLAY	CH	28.6									
	2	2-4	52.21	3.00	Reddish-brown and gray FAT CLAY	CH	30.0									
	3	4-6	50.21	3.50	Reddish-brown and gray FAT CLAY	CH	22.7					95.6	2.12	2.8		Slickensided
	4	6-8	48.21	3.00	Tan,light gray and gray FAT CLAY	CH	21.4	79	24	55		107.4	2.32	1.9	7	Slickensided
	5	8-10	46.21	3.50	Reddish-brown and gray FAT CLAY	CH	25.8									
	6	10-12	44.21	2.75	Gray and reddish-brown FAT CLAY	CH	21.6									
	7	12-14	42.21	3.00	Gray and tan FAT CLAY	CH	21.9									
	8	14-16	40.21	4.00	Gray and reddish-brown FAT CLAY	CH	21.6									
	9	16-18	38.21	2.75	Tan and gray FAT CLAY; calcareous nodules	CH	21.2									
	10	18-20	36.21	4.00	Tan and gray FAT CLAY	CH	24.7									
	11	20-22	34.21	3.00	Tan and gray FAT CLAY; calcareous nodules	CH	22.1									
	12	22-24	32.21	2.75	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	26.3									
	13	24-25	31.21	4.25	Reddish-brown and gray FAT CLAY	CH	26.9									

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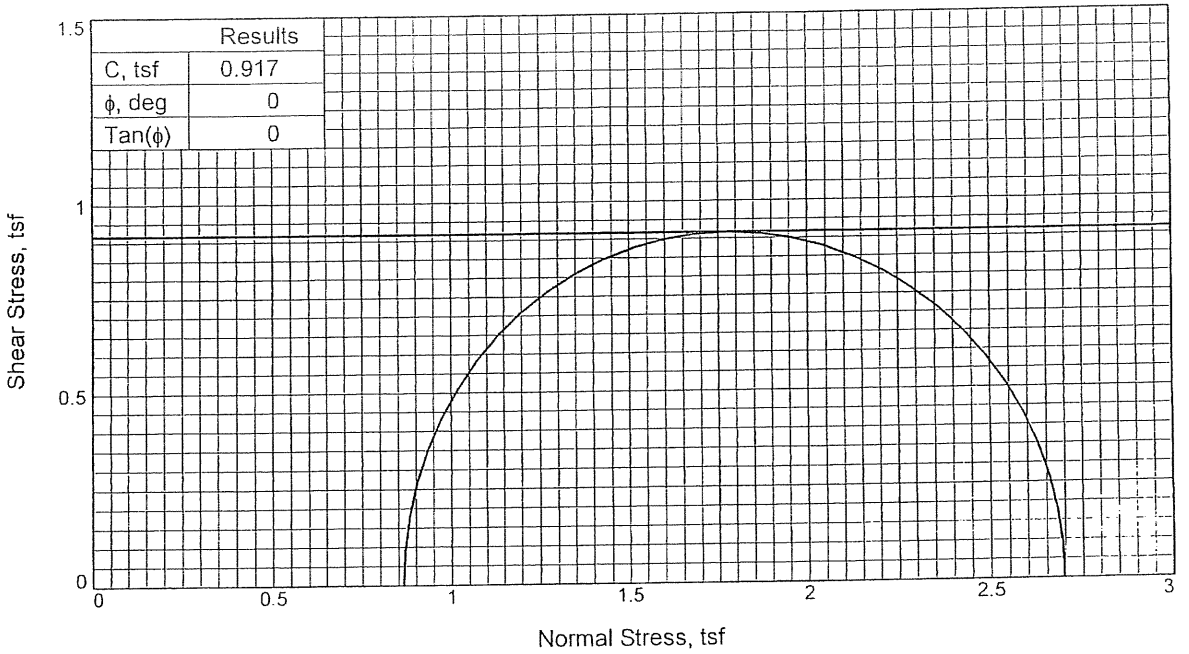
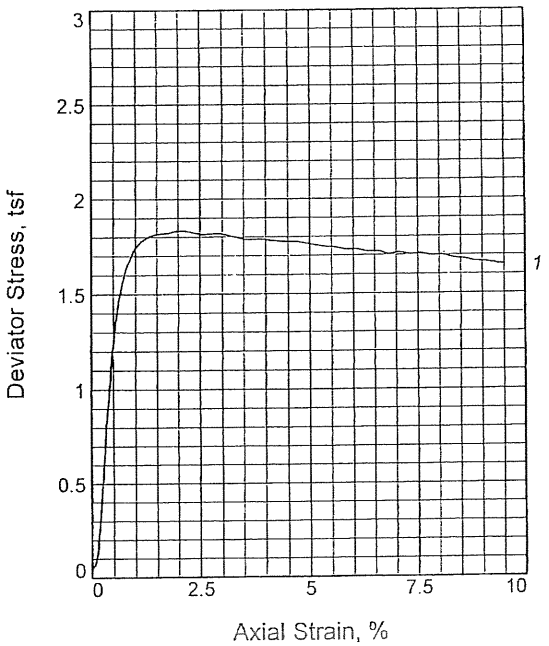




Sample No.		1
Initial	Water Content, %	25.0
	Dry Density, pcf	91.6
	Saturation, %	80.4
	Void Ratio	0.8391
	Diameter, in.	2.80
	Height, in.	6.00
At Test	Water Content, %	25.0
	Dry Density, pcf	91.6
	Saturation, %	80.4
	Void Ratio	0.8391
	Diameter, in.	2.80
	Height, in.	6.00
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.86
Fail. Stress, tsf		1.83
Strain, %		2.1
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		2.70
σ_3 Failure, tsf		0.86

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Gray and tan FAT CLAY; rotten roots

LL= 74 PL= 21 PI= 53

Assumed Specific Gravity= 2.70

Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 2.75
Failure type: 60 degree

Client: U. S. Army Corps of Engineers

Project: House Tract Placement Area
Contract No. DACW64-03-D-0008, Task Order 0067

Source of Sample: 07-27 **Depth:** 12-14

Sample Number: 7

Proj. No.: 07.18.922 **Date Sampled:** 11/6/07

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

11/13/2007
2:07 PM

Date:	11/6/07
Client:	U. S. Army Corps of Engineers
Project:	House Tract Placement Area
	Contract No. DACW64-03-D-0008, Task Order 0067
Project No.:	07.18.922
Location:	07-27
Depth:	12-14 **Sample Number:** 7
Description:	Gray and tan FAT CLAY; rotten roots
Remarks:	
	Test method: ASTM D 2850
	Pocket pen; tsf: 2.75
	Failure type: 60 degree
Type of Sample:	Undisturbed

Assumed Specific Gravity=2.70 **LL=**74 **PL=**21 **PI=**53

Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	130.910	130.910
Moisture content: Dry soil+tare, gms.	111.060	111.060
Moisture content: Tare, gms.	31.600	31.600
Moisture, %	25.0	25.0
Moist specimen weight, gms.	1110.8	
Diameter, in.	2.80	
Area, in.^{2}	6.16	
Height, in.	6.00	
Wet Density, pcf	114.5	
Dry density, pcf	91.6	
Void ratio	0.8391	
Saturation, %	80.4	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm^2

Membrane thickness = .031 cm

Cell pressure = 12.00 psi (0.864 tsf)

Back pressure = 0.00 psi (0.000 tsf)

Strain rate, %/min. = 1.00

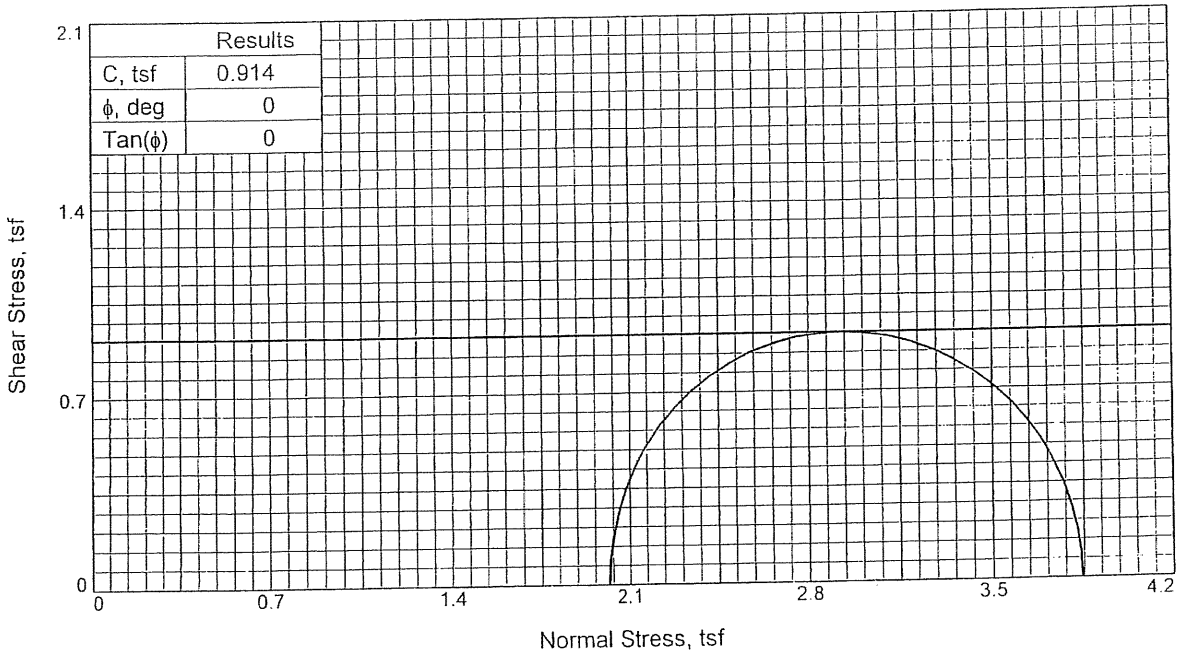
Fail. Stress = 1.834 tsf **at reading no.** 38

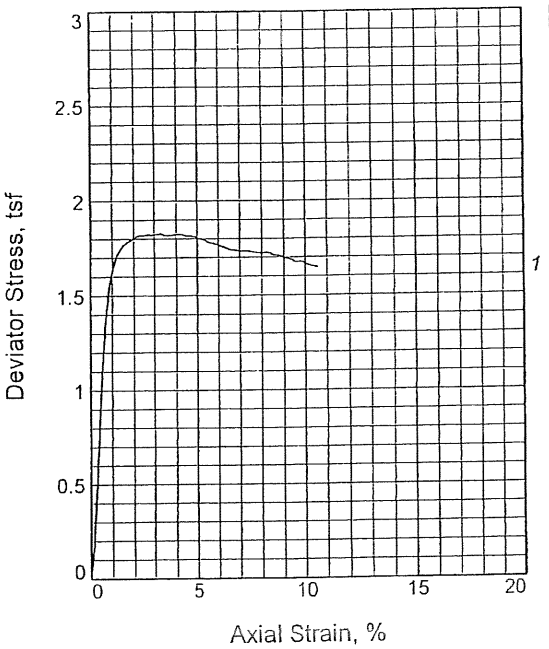
Test Readings for Specimen No. 1

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	0.8617	0.000	0.0	0.0	0.000	0.864	0.864	1.00	0.864	0.000
1	0.8618	3.315	3.3	0.0	0.039	0.864	0.903	1.04	0.883	0.019
2	0.8668	6.158	6.2	0.1	0.072	0.864	0.936	1.08	0.900	0.036
3	0.8681	7.789	7.8	0.1	0.091	0.864	0.955	1.11	0.909	0.045
4	0.8700	11.409	11.4	0.1	0.133	0.864	0.997	1.15	0.931	0.067
5	0.8713	18.376	18.4	0.2	0.215	0.864	1.079	1.25	0.971	0.107
6	0.8732	24.009	24.0	0.2	0.280	0.864	1.144	1.32	1.004	0.140
7	0.8745	31.099	31.1	0.2	0.363	0.864	1.227	1.42	1.045	0.181
8	0.8764	38.219	38.2	0.2	0.446	0.864	1.310	1.52	1.087	0.223
9	0.8777	46.351	46.4	0.3	0.541	0.864	1.405	1.63	1.134	0.270
10	0.8796	54.480	54.5	0.3	0.635	0.864	1.499	1.74	1.182	0.318
11	0.8809	62.130	62.1	0.3	0.724	0.864	1.588	1.84	1.226	0.362
12	0.8822	69.387	69.4	0.3	0.809	0.864	1.673	1.94	1.268	0.404
13	0.8843	76.609	76.6	0.4	0.892	0.864	1.756	2.03	1.310	0.446
14	0.8856	82.741	82.7	0.4	0.964	0.864	1.828	2.12	1.346	0.482
15	0.8875	89.981	90.0	0.4	1.048	0.864	1.912	2.21	1.388	0.524
16	0.8888	96.342	96.3	0.5	1.121	0.864	1.985	2.30	1.425	0.561
17	0.8900	102.000	102.0	0.5	1.187	0.864	2.051	2.37	1.458	0.594
18	0.8921	106.808	106.8	0.5	1.243	0.864	2.107	2.44	1.485	0.621
19	0.8934	110.859	110.9	0.5	1.289	0.864	2.153	2.49	1.509	0.645
20	0.8946	115.780	115.8	0.5	1.346	0.864	2.210	2.56	1.537	0.673
21	0.8967	119.839	119.8	0.6	1.393	0.864	2.257	2.61	1.561	0.697
22	0.8979	123.656	123.7	0.6	1.437	0.864	2.301	2.66	1.583	0.719
23	0.8992	126.573	126.6	0.6	1.471	0.864	2.335	2.70	1.599	0.735
24	0.9013	129.534	129.5	0.7	1.505	0.864	2.369	2.74	1.616	0.752
25	0.9025	132.228	132.2	0.7	1.536	0.864	2.400	2.78	1.632	0.768
26	0.9038	134.456	134.5	0.7	1.561	0.864	2.425	2.81	1.645	0.781
27	0.9059	136.720	136.7	0.7	1.587	0.864	2.451	2.84	1.657	0.793
28	0.9085	140.379	140.4	0.8	1.629	0.864	2.493	2.89	1.678	0.814
29	0.9105	142.650	142.7	0.8	1.654	0.864	2.518	2.91	1.691	0.827
30	0.9130	144.259	144.3	0.9	1.672	0.864	2.536	2.94	1.700	0.836
31	0.9164	146.809	146.8	0.9	1.701	0.864	2.565	2.97	1.715	0.851
32	0.9197	149.517	149.5	1.0	1.731	0.864	2.595	3.00	1.730	0.866
33	0.9300	153.864	153.9	1.1	1.779	0.864	2.643	3.06	1.753	0.889
34	0.9424	156.544	156.5	1.3	1.806	0.864	2.670	3.09	1.767	0.903
35	0.9539	157.869	157.9	1.5	1.818	0.864	2.682	3.10	1.773	0.909
36	0.9663	158.360	158.4	1.7	1.819	0.864	2.683	3.11	1.774	0.910
37	0.9786	159.623	159.6	1.9	1.830	0.864	2.694	3.12	1.779	0.915
38	0.9902	160.277	160.3	2.1	1.834	0.864	2.698	3.12	1.781	0.917
39	1.0024	159.660	159.7	2.3	1.823	0.864	2.687	3.11	1.776	0.912
40	1.0146	159.133	159.1	2.5	1.813	0.864	2.677	3.10	1.771	0.907
41	1.0268	159.708	159.7	2.8	1.816	0.864	2.680	3.10	1.772	0.908
42	1.0390	160.224	160.2	3.0	1.818	0.864	2.682	3.10	1.773	0.909
43	1.0512	159.615	159.6	3.2	1.807	0.864	2.671	3.09	1.768	0.904
44	1.0634	159.129	159.1	3.4	1.798	0.864	2.662	3.08	1.763	0.899
45	1.0756	158.338	158.3	3.6	1.785	0.864	2.649	3.07	1.757	0.893
46	1.0878	158.817	158.8	3.8	1.787	0.864	2.651	3.07	1.758	0.894

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	1.1000	159.268	159.3	4.0	1.788	0.864	2.652	3.07	1.758	0.894
48	1.1123	158.771	158.8	4.2	1.779	0.864	2.643	3.06	1.753	0.889
49	1.1239	158.886	158.9	4.4	1.777	0.864	2.641	3.06	1.752	0.888
50	1.1361	159.005	159.0	4.6	1.774	0.864	2.638	3.05	1.751	0.887
51	1.1483	159.230	159.2	4.8	1.773	0.864	2.637	3.05	1.750	0.886
52	1.1605	158.680	158.7	5.0	1.763	0.864	2.627	3.04	1.746	0.882
53	1.1818	157.934	157.9	5.3	1.748	0.864	2.612	3.02	1.738	0.874
54	1.1966	158.045	158.0	5.6	1.745	0.864	2.609	3.02	1.736	0.872
55	1.2120	157.360	157.4	5.8	1.733	0.864	2.597	3.01	1.730	0.866
56	1.2268	157.821	157.8	6.1	1.733	0.864	2.597	3.01	1.731	0.867
57	1.2422	157.115	157.1	6.3	1.721	0.864	2.585	2.99	1.724	0.860
58	1.2569	157.648	157.6	6.6	1.722	0.864	2.586	2.99	1.725	0.861
59	1.2723	156.610	156.6	6.8	1.706	0.864	2.570	2.97	1.717	0.853
60	1.2870	157.918	157.9	7.1	1.716	0.864	2.580	2.99	1.722	0.858
61	1.3024	157.361	157.4	7.3	1.705	0.864	2.569	2.97	1.716	0.852
62	1.3171	158.360	158.4	7.6	1.711	0.864	2.575	2.98	1.720	0.856
63	1.3325	157.671	157.7	7.8	1.699	0.864	2.563	2.97	1.713	0.849
64	1.3473	158.344	158.3	8.1	1.702	0.864	2.566	2.97	1.715	0.851
65	1.3627	157.254	157.3	8.3	1.685	0.864	2.549	2.95	1.707	0.843
66	1.3774	157.206	157.2	8.6	1.680	0.864	2.544	2.94	1.704	0.840
67	1.3929	156.523	156.5	8.9	1.668	0.864	2.532	2.93	1.698	0.834
68	1.4077	156.833	156.8	9.1	1.667	0.864	2.531	2.93	1.697	0.833
69	1.4231	156.181	156.2	9.4	1.655	0.864	2.519	2.92	1.692	0.828
70	1.4333	156.181	156.2	9.5	1.652	0.864	2.516	2.91	1.690	0.826





Sample No.		1
Initial	Water Content, %	28.4
	Dry Density, pcf	95.5
	Saturation, %	97.8
	Void Ratio	0.7978
	Diameter, in.	2.80
	Height, in.	6.00
At Test	Water Content, %	28.4
	Dry Density, pcf	95.5
	Saturation, %	97.8
	Void Ratio	0.7978
	Diameter, in.	2.80
	Height, in.	6.00
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		2.02
Fail. Stress, tsf		1.83
Strain, %		3.4
Ult. Stress, tsf		
Strain, %		
σ_1 Failure, tsf		3.84
σ_3 Failure, tsf		2.02

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Tan and gray FAT CLAY; calcareous nodules

LL= 76 PL= 21 PI= 55

Assumed Specific Gravity= 2.75

Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 2.50
Failure type: Slickensided

Client: U. S. Army Corps of Engineers

Project: House Tract Placement Area
Contract No. DACW64-03-D-0008, Task Order 0067

Source of Sample: 07-27 **Depth:** 32-34

Sample Number: 17

Proj. No.: 07.18.922 **Date Sampled:** 11/6/07

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST
Unconsolidated Undrained

11/13/2007
2:08 PM

Date:	11/6/07
Client:	U. S. Army Corps of Engineers
Project:	House Tract Placement Area
	Contract No. DACW64-03-D-0008, Task Order 0067
Project No.:	07.18.922
Location:	07-27
Depth:	32-34 **Sample Number:** 17
Description:	Tan and gray FAT CLAY; calcareous nodules
Remarks:	
	Test method: ASTM D 2850
	Pocket pen; tsf: 2.50
	Failure type: Slickensided
Type of Sample:	Undisturbed

Assumed Specific Gravity=2.75 **LL**=76 **PL**=21 **PI**=55

Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	135.800	135.800
Moisture content: Dry soil+tare, gms.	112.830	112.830
Moisture content: Tare, gms.	31.900	31.900
Moisture, %	28.4	28.4
Moist specimen weight, gms.	1188.9	
Diameter, in.	2.80	
Area, in.^{2}	6.16	
Height, in.	6.00	
Wet Density, pcf	122.6	
Dry density, pcf	95.5	
Void ratio	0.7978	
Saturation, %	97.8	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm^2

Membrane thickness = .031 cm

Cell pressure = 28.00 psi (2.016 tsf)

Back pressure = 0.00 psi (0.000 tsf)

Strain rate, %/min. = 1.00

Fail. Stress = 1.827 tsf at reading no. 50

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	0.8585	0.000	0.0	0.0	0.000	2.016	2.016	1.00	2.016	0.000
1	0.8586	2.984	3.0	0.0	0.035	2.016	2.051	1.02	2.033	0.017
2	0.8614	6.203	6.2	0.0	0.073	2.016	2.089	1.04	2.052	0.036
3	0.8633	8.034	8.0	0.1	0.094	2.016	2.110	1.05	2.063	0.047
4	0.8646	11.602	11.6	0.1	0.136	2.016	2.152	1.07	2.084	0.068
5	0.8666	14.962	15.0	0.1	0.175	2.016	2.191	1.09	2.103	0.087
6	0.8678	19.519	19.5	0.2	0.228	2.016	2.244	1.11	2.130	0.114
7	0.8691	24.025	24.0	0.2	0.280	2.016	2.296	1.14	2.156	0.140
8	0.8712	28.711	28.7	0.2	0.335	2.016	2.351	1.17	2.184	0.168
9	0.8725	33.492	33.5	0.2	0.391	2.016	2.407	1.19	2.211	0.195
10	0.8738	37.594	37.6	0.3	0.438	2.016	2.454	1.22	2.235	0.219
11	0.8758	42.512	42.5	0.3	0.496	2.016	2.512	1.25	2.264	0.248
12	0.8771	48.251	48.3	0.3	0.562	2.016	2.578	1.28	2.297	0.281
13	0.8784	54.036	54.0	0.3	0.630	2.016	2.646	1.31	2.331	0.315
14	0.8804	59.445	59.4	0.4	0.693	2.016	2.709	1.34	2.362	0.346
15	0.8817	64.649	64.6	0.4	0.753	2.016	2.769	1.37	2.393	0.377
16	0.8830	70.063	70.1	0.4	0.816	2.016	2.832	1.40	2.424	0.408
17	0.8850	75.371	75.4	0.4	0.877	2.016	2.893	1.44	2.455	0.439
18	0.8863	80.732	80.7	0.5	0.940	2.016	2.956	1.47	2.486	0.470
19	0.8882	86.110	86.1	0.5	1.002	2.016	3.018	1.50	2.517	0.501
20	0.8895	91.463	91.5	0.5	1.064	2.016	3.080	1.53	2.548	0.532
21	0.8908	95.722	95.7	0.5	1.113	2.016	3.129	1.55	2.573	0.557
22	0.8928	100.095	100.1	0.6	1.164	2.016	3.180	1.58	2.598	0.582
23	0.8941	103.128	103.1	0.6	1.199	2.016	3.215	1.59	2.615	0.599
24	0.8954	106.711	106.7	0.6	1.240	2.016	3.256	1.62	2.636	0.620
25	0.8974	110.848	110.8	0.6	1.288	2.016	3.304	1.64	2.660	0.644
26	0.8987	114.300	114.3	0.7	1.328	2.016	3.344	1.66	2.680	0.664
27	0.9000	117.595	117.6	0.7	1.366	2.016	3.382	1.68	2.699	0.683
28	0.9020	120.367	120.4	0.7	1.397	2.016	3.413	1.69	2.715	0.699
29	0.9033	122.478	122.5	0.7	1.421	2.016	3.437	1.71	2.727	0.711
30	0.9046	125.259	125.3	0.8	1.453	2.016	3.469	1.72	2.743	0.727
31	0.9066	127.440	127.4	0.8	1.478	2.016	3.494	1.73	2.755	0.739
32	0.9079	130.016	130.0	0.8	1.508	2.016	3.524	1.75	2.770	0.754
33	0.9092	132.090	132.1	0.8	1.531	2.016	3.547	1.76	2.782	0.766
34	0.9125	135.196	135.2	0.9	1.567	2.016	3.583	1.78	2.799	0.783
35	0.9158	138.073	138.1	1.0	1.599	2.016	3.615	1.79	2.816	0.800
36	0.9184	140.108	140.1	1.0	1.622	2.016	3.638	1.80	2.827	0.811
37	0.9204	142.168	142.2	1.0	1.645	2.016	3.661	1.82	2.839	0.823
38	0.9262	145.071	145.1	1.1	1.677	2.016	3.693	1.83	2.855	0.839
39	0.9320	148.182	148.2	1.2	1.711	2.016	3.727	1.85	2.872	0.856
40	0.9385	150.200	150.2	1.3	1.733	2.016	3.749	1.86	2.882	0.866
41	0.9507	153.464	153.5	1.5	1.767	2.016	3.783	1.88	2.899	0.883
42	0.9623	155.087	155.1	1.7	1.782	2.016	3.798	1.88	2.907	0.891
43	0.9746	156.737	156.7	1.9	1.797	2.016	3.813	1.89	2.915	0.899
44	0.9869	158.246	158.2	2.1	1.811	2.016	3.827	1.90	2.921	0.905
45	0.9991	159.242	159.2	2.3	1.818	2.016	3.834	1.90	2.925	0.909
46	1.0106	159.504	159.5	2.5	1.818	2.016	3.834	1.90	2.925	0.909

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	1.0230	160.193	160.2	2.7	1.822	2.016	3.838	1.90	2.927	0.911
48	1.0351	160.447	160.4	2.9	1.821	2.016	3.837	1.90	2.926	0.910
49	1.0473	161.106	161.1	3.1	1.825	2.016	3.841	1.91	2.928	0.912
50	1.0596	161.672	161.7	3.4	1.827	2.016	3.843	1.91	2.930	0.914
51	1.0711	161.083	161.1	3.5	1.817	2.016	3.833	1.90	2.924	0.908
52	1.0835	161.435	161.4	3.7	1.817	2.016	3.833	1.90	2.924	0.908
53	1.0958	162.219	162.2	4.0	1.822	2.016	3.838	1.90	2.927	0.911
54	1.1080	162.698	162.7	4.2	1.823	2.016	3.839	1.90	2.928	0.912
55	1.1201	162.725	162.7	4.4	1.820	2.016	3.836	1.90	2.926	0.910
56	1.1317	162.531	162.5	4.6	1.814	2.016	3.830	1.90	2.923	0.907
57	1.1382	162.899	162.9	4.7	1.816	2.016	3.832	1.90	2.924	0.908
58	1.1498	162.750	162.8	4.9	1.811	2.016	3.827	1.90	2.921	0.905
59	1.1621	162.341	162.3	5.1	1.802	2.016	3.818	1.89	2.917	0.901
60	1.1775	162.219	162.2	5.3	1.796	2.016	3.812	1.89	2.914	0.898
61	1.1922	161.171	161.2	5.6	1.780	2.016	3.796	1.88	2.906	0.890
62	1.2076	161.080	161.1	5.8	1.774	2.016	3.790	1.88	2.903	0.887
63	1.2224	160.697	160.7	6.1	1.765	2.016	3.781	1.88	2.899	0.883
64	1.2378	160.276	160.3	6.3	1.756	2.016	3.772	1.87	2.894	0.878
65	1.2525	159.387	159.4	6.6	1.741	2.016	3.757	1.86	2.887	0.871
66	1.2628	159.758	159.8	6.7	1.742	2.016	3.758	1.86	2.887	0.871
67	1.2827	159.570	159.6	7.1	1.734	2.016	3.750	1.86	2.883	0.867
68	1.2981	160.241	160.2	7.3	1.736	2.016	3.752	1.86	2.884	0.868
69	1.3128	160.040	160.0	7.6	1.730	2.016	3.746	1.86	2.881	0.865
70	1.3282	160.158	160.2	7.8	1.726	2.016	3.742	1.86	2.879	0.863
71	1.3430	160.461	160.5	8.1	1.725	2.016	3.741	1.86	2.878	0.862
72	1.3584	161.145	161.1	8.3	1.727	2.016	3.743	1.86	2.880	0.864
73	1.3731	160.102	160.1	8.6	1.711	2.016	3.727	1.85	2.872	0.856
74	1.3885	160.355	160.4	8.8	1.709	2.016	3.725	1.85	2.871	0.855
75	1.4033	159.724	159.7	9.1	1.698	2.016	3.714	1.84	2.865	0.849
76	1.4181	159.444	159.4	9.3	1.690	2.016	3.706	1.84	2.861	0.845
77	1.4336	158.360	158.4	9.6	1.674	2.016	3.690	1.83	2.853	0.837
78	1.4484	159.290	159.3	9.8	1.679	2.016	3.695	1.83	2.856	0.840
79	1.4638	158.307	158.3	10.1	1.664	2.016	3.680	1.83	2.848	0.832
80	1.4786	157.902	157.9	10.3	1.656	2.016	3.672	1.82	2.844	0.828
81	1.4934	157.635	157.6	10.6	1.648	2.016	3.664	1.82	2.840	0.824

Hole No. 07-27

BORING LOG	DISTRICT	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT House Tract Placement Area	7. ELEVATION OF HOLE 57.40 ft
2. LOCATION (Coordinates or Station) N=13840094.55 E=3154765.83	8. DATUM FOR ELEVATION
3. DRILLING AGENCY T.R.I.	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR: 23.2 ft
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, Inc.	10. DRILLING DATE and TIME STARTED: 2/22/07 COMPLETED: 2/22/07
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR: 34.2 ft	11. CLASSIFICATION REFERENCE
6. DEPTH OF HOLE 40 ft	12. ENGINEER

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PENETROMETER (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% <200)
			FAT CLAY"FILL", stiff, reddish brown & gray		1	58		1.25		37.2				
					2	42		2.00		34.0				
5					3	46		2.00		31.5				
			-w/ silt seams @ 6' - 8'		4	54		2.00		35.5				
					5	52		2.00		30.0				
10			-w/ ferrous nodules & sand pockets below 10'		6	71		2.25		33.6				
			-very stiff-hard, gray & tan w/ roots @ 12' - 14'		7	75		4.50	91.6	25.0	74	21	53	
15					8	75		2.50	84.8	36.6				
			-very stiff @ 16' - 24' -gray & tan @ 16' - 22'		9	58		3.50		21.8				
			-w/ calcareous nodules @ 18' - 22'		10	54		3.00		24.7				
20					11	63		2.75		23.0				
					12	71		3.75		31.4				
25					13	58		2.75		22.6				
			-gray & tan below 26'		14	67		2.50		32.6				
	29.4		FAT CLAY(CH), stiff, tan & gray, w/ ferrous nodules		15	75		2.50		30.6				
30					16	73		2.50	95.1	29.9				
			-slickensided w/ calcareous nodules below 32'		17	63		2.25	95.5	28.4	76	21	55	
			-very stiff to hard w/ reddish brown & gray											

SWG 1836 BOR 03.14.859-037.GPJ TOLUNAY-WONG ENGINEERS.GDT 3/4/08

ENG FORM: SWG 1836 BOR

Hole No. 07-27

BORING LOG	DISTRICT	INSTALLATION	SHEET 2 OF 2 SHEETS

1. PROJECT House Tract Placement Area	7. ELEVATION OF HOLE 57.40 ft
2. LOCATION (Coordinates or Station) N=13840094.55 E=3154765.83	8. DATUM FOR ELEVATION
3. DRILLING AGENCY T.R.I.	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR: 23.2 ft
4. LABORATORY TESTING AGENCY Tolunay-Wong Engineers, Inc.	10. DRILLING DATE and TIME STARTED: 2/22/07 COMPLETED: 2/22/07
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR: 34.2 ft	11. CLASSIFICATION REFERENCE
6. DEPTH OF HOLE 40 ft	12. ENGINEER

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PENETROMETER (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% <200)
			below 34'		18	71		4.50		25.5				
					19	60		4.00		23.3				
			-w/ sand seams below 38'		20	75		4.25		21.8				
40	17.4		Boring terminated at 40 ft.											
45														
50														
55														
60														
65														

SWG 1836 BOR 03.14.859-057.GPJ TOLUNAY-WONG ENGINEERS.GDT 3/4/08

ENG FORM: SWG 1836 BOR

07-27
N.=13,844,844.19, E.=3,154,558.51

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
1.25	37-	CH,S,R
2.00	34-	CH,VS,R
2.00	32-	CH,VS,R&Gy
2.00	36-	CH,W/SiSms,VS,R&Gy
2.00	30-	CH,VS,Gy&R
2.25	34-	CH,VS,Gy&R
4.50	25-92, 74-21,	CH,W/RtsVS,Gy&Bl
2.50	37-85,	CH,VS,R&Gy
3.50	22-	CH,VS,Gy
3.00	25-	CH,W/CalcNod,VS,GyTn&R
2.75	23-	CH,W/CalcNod,VS,Gy&Tn
3.75	31-	CH,VS,Gy&R
2.75	23-	CH,VS,Gy&R
2.50	33-	CH,VS,R&Gy
2.50	31-	CH,VS,Gy&Tn
2.50	30-95,	CH,W/Fer&CalcNod,VS,Tn&Gy
2.25	28-96, 76-21,	CH,Slks,W/CalcNod,VS,Tn&Gy
4.50	26-	CH,H,R&Gy
4.00	23-	CH,VS,R&Gy
4.25	22-	CH,W/SdSms,VS,R&Gy

07-28
N.=13,844,870.34, E.=3,155,085.93

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
3.75	29-	CH,VS,Gy&R
3.00	30-	CH,VS,Gy&Tn
2.75	23-96,	CH,VS,Gy&R
1.75	21-107, 79-24,	CH,Slks,S,Tn,Gy&R
2.25	26-	CH,VS,Gy&R
2.50	22-	CH,VS,Gy&R
3.00	22-	CH,VS,Gy&R
3.25	22-	CH,VS,Gy&R
2.00	21-	CH,W/CalcNod,VS,Gy&R
3.50	25-	CH,VS,Gy&R
2.50	22-	CH,W/CalcNod,VS,Gy
3.00	26-	CH,W/CalcNod,VS,Gy&RBn
4.00	27-	CH,VS,Gy&R

07-29
N.=13,844,820.73, E.=3,155,536.91

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
1.00		CH,S,R
3.50	25-	CH,VS,R
3.25	31-	CH,VS,R&Gy
4.50	24-	CH,H,R&Gy
2.50	30-	CH,VS,R&Gy
3.00	30-88,	CH,W/CalcNod,VS,Gy&R
2.75	33-83, 94-29,	CH,W/CalcNod,VS,Gy&R
3.25	22-	CH,VS,Gy&R
3.25	20-	CH,VS,Gy&R
4.50	30-	CH,H,Gy
4.50	23-	CH,H,Gy
4.50	24-	CH,W/CalcNod,H,Gy
4.25	24-	CH,H,Gy&R

07-30
N.=13,844,357.92, E.=3,155,690.69

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
1.75	21-	CH,S,R&Gy
4.50	18-	CI,W/Sd,H,Gy
3.50	19-	CH,W/CISms,VS,Gy
3.00	33-	CH,VS,Gy&R
4.50	20-	CH,H,Gy
2.75	23-	CH,VS,Gy
3.25	21-	CH,VS,Gy&R
2.50	22-	CH,VS,Gy&R
4.00	30-	CH,VS,Gy
3.25	20-	CH,VS,Gy
3.50	19-	CH,VS,Gy&R
3.00	21-	CH,VS,Gy
2.50	21-	CH,VS,Gy&Tn
1.75	28-	CH,W/Rts,VS,Gy
2.00	28-	CH,VS,Gy
1.50	28-95, 73-22,	CH,Slks,VS,Tn&Gy
2.00	27-	CH,W/CalcNod,S,Gy&Tn
4.50	26-	CH,Slks,H,Gy&RBn
3.25	26-	CH,W/SiPoc,VS,Gy&RBn
4.50	25-	CH,Slks,W/SiPoc,H,R&Gy

07-31
N.=13,843,832.85, E.=3,155,714.45

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
2.50	22-	CH,VS,Gy&R
3.75	18-	CI,VS,Gy&R
2.50	19-	CI,W/CalcNod,VS,Gy&R
4.50	34-	CH,VS,Gy
3.50	35-	CH,H,Gy&R
4.25	22-	CH,VS,Gy&R
3.50	20-	CH,VS,Gy&R
3.00	26-	CH,VS,Gy&RBn
3.00	26-	CH,VS,Gy&R
2.75	19-	CH,VS,Gy&Tn
2.75	40-	CH,VS,Gy&R
2.50	26-93, 91-27,	CH,W/CalcNod,VS,Gy&R
4.50	20-	CH,VS,Gy

07-32
N.=13,843,308.16, E.=3,155,741.26

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
4.50	21-	CH,H,R&Gy
3.50	20-	CH,VS,R&Gy
2.00	30-	CH,W/SdCISms,VS,Gy&R
3.00	21-	CH,VS,Gy&R
3.50	28-	CH,W/SdSms,VS,Gy&R
3.25	30-	CH,VS,R&Gy
1.75	24-98, 90-25,	CH,Slks,S,Gy&R
3.00	21-	CH,VS,Gy
4.50	20-	CH,H,Gy&R
2.25	23-	CH,VS,Gy&R
2.00	19-	CH,VS,R&Gy
3.75	20-	CH,VS,Gy
4.25	21-	CH,W/CalcNod,VS,Gy&R

07-33
N.=13,842,900.96, E.=3,155,618.63

W.T. NOT FOUND

P. P.	MC-UDW,LL-PL	
1.75	20-	CH,VS,R&Gy
4.50	21-	CH,H,R&Gy
3.75	27-	CH,VS,R&Gy
1.50	33-	CH,S,Gy&R
1.25	40-79, 96-29,	CH,Slks,S,R&Gy
3.00	25-	CH,VS,Gy&R
2.00	28-	CH,VS,Gy&R
3.00	20-	CH,VS,Gy
3.75	32-	CH,H,R&Gy
3.00	23-	CH,VS,R&Gy
2.50	23-	CH,S,Gy&R
3.50	20-	CH,VS,Gy&Tn
4.50	20-	CH,VS,Gy
2.75	29-	CH,VS,Gy&R
2.75	29-	CH,H,Gy&R
3.00	30-	CH,VS,Gy&R
1.50	25-98.2,80-23,	CH,VS,Gy&R
2.00	26-	CH,W/CalcDep,VS,Gy&Tn
2.00	28-	CH,W/CalcNod,VS,Gy&Tn
3.75	23-	CH,S,R&Gy

ELEVATIONS IN FEET, N.G.V.D. 88

NOTE:

FOR BORING LOG NOTES AND CLASSIFICATIONS, SEE DRAWING NO. F-46.

SOLICITATION NO. W912HY-08-B-0016

US Army Corps of Engineers
Galveston District

Rev.	Description	BY:$USER$	Date	By

TIME:$TIME$ DATE:$DATE$

Drawn by: | Date: APRIL, 2008 | Rev. --
Designed by: SK,SL,RB | Scale: AS SHOWN
Checked by: SL,RB | Approval Recommended: HARRISON T. SUTCLIFFE, P.E. Chief, Engineering Branch
Submitted by: LORI K. THOMAS, P.E. Det/Section & Structure Section
Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division

U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF DAVID C. WESTON, COL., C.E.
DISTRICT COMMANDER

HOUSTON SHIP CHANNEL, TEXAS
HOUSE TRACT PLACEMENT AREA
INTERIOR REHABILITATION, EXTERIOR LEVEE REHABILITATION, AND DRAINAGE DITCH REPAIR

LOGS OF BORINGS

Drawing No.: F-45
Sheet 48 of 49

File No. HSC 401-515

File:$FILE$