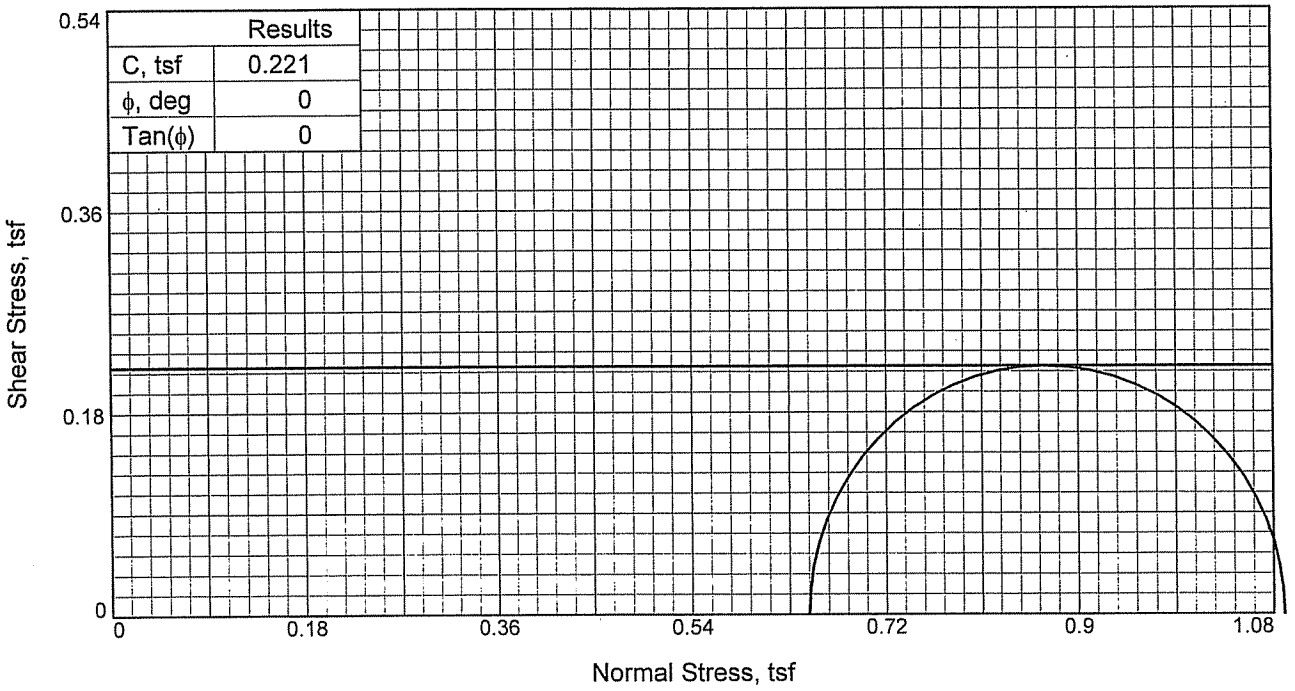
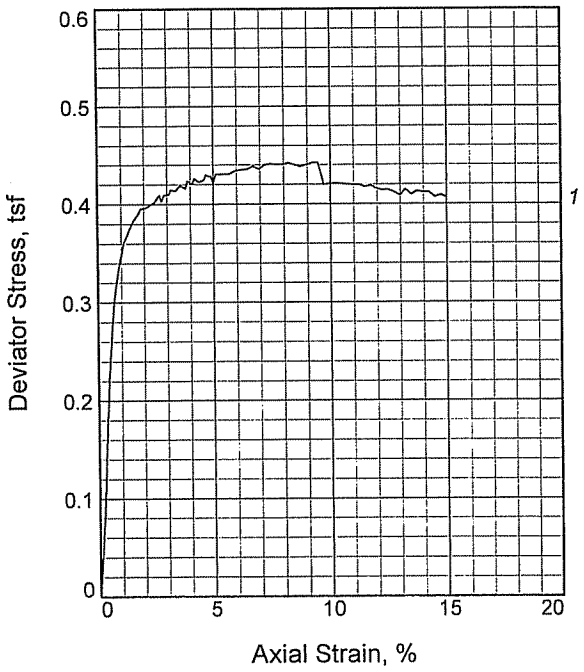
	5	8-10	Reddish-brown LEAN CLAY	CL	31.9	95.8	45	18	27	99.8	1.01	12	9	Bulge
	6	10-12	Reddish-brown SANDY SILTY CLAY	CL-ML	25.4	97.5								
	7	12-14	Reddish-brown and gray FAT CLAY	CH	27.8	97.9								
	8	14-16	Reddish-brown and gray FAT CLAY	CH	21.0	105.9								
	9	16-18	Reddish-brown and gray LEAN CLAY with SAND	CL	15.8	113.2								
	10	18-20	Reddish-brown and gray LEAN CLAY with SAND	CL	26.5	97.4								
08-94			**El. 9.25, E=3185568 N=13646170**											
	1	0-2	Gray and tan SANDY LEAN CLAY	CL	11.3	106.3								
	2	2-4	Gray and tan FAT CLAY	CH	24.9	100.1								
	3	4-6	Tan and gray FAT CLAY	CH	24.5	99.7	60	21	39	90.7	1.20	11.4	6	60 degree
	4	6-8	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	29.6	96.0								
	5	8-10	Reddish-brown and gray FAT CLAY	CH	28.9	95.4								
	6	10-12	Reddish-brown and gray FAT CLAY	CH	22.0	107.1	50	20	30	97.8	1.13	11.2	11	60 degree
	7	12-14	Reddish-brown and gray SANDY SILTY CLAY	CL-ML	23.8	99.5					0.84	3.4		Vertical shear
	8	14-16	Reddish-brown gray FAT CLAY; calcareous nodules	CH	27.5	97.5								
	9	16-18	Reddish-brown and gray FAT CLAY	CH	25.4	98.4	67	21	46	98.0	2.28	6.7	15	Slickensided
	10	18-20	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	27.0	98.0								
08-95			**El. 11.00, E=3184767 N=13646549**											
	1	0-2	Gray and tan SANDY LEAN CLAY	CL	9.9	108.8								
	2	2-4	Tan and gray SANDY LEAN CLAY	CL	20.9	105.1								
	3	4-6	Tan and gray FAT CLAY; ferrous nodules	CH	23.5	103.0	61	21	40		2.01	11.2	6	Bulge
	4	6-8	Reddish-brown and gray FAT CLAY; calcareous	CH	24.2	101.6					1.72	11.2		60 degree
	5	8-10	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	28.1	95.9								
	6	10-12	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	27.5	94.7								
	7	12-14	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	30.1	95.6								
	8	14-16	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	27.6	97.3								
	9	16-18	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	26.2	99.2								
	10	18-20	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	24.1	100.5								
08-96			**El. 11.50, E=3184441 N=13647279**											
	1	0-2	Gray SANDY LEAN CLAY	CL	17.8	106.6								
	2	2-4	Gray and tan FAT CLAY	CH	20.1	103.5								
	3	4-6	Reddish-brown and gray FAT CLAY	CH	32.9	89.8	64	21	43	93.1	0.85	6.2	6	60 degree
	4	6-8	Reddish-brown and gray FAT CLAY	CH	27.6	94.3								
	5	8-10	Reddish-brown and gray FAT CLAY	CH	30.6	90.8								
	6	10-12	Reddish-brown and gray FAT CLAY	CH	25.7	95.8	66	21	45	98.8	1.54	2.6		Slickensided
	7	12-14	Reddish-brown and gray FAT CLAY	CH	24.9	102.6								
	8	14-16	Reddish-brown LEAN CLAY with SAND	CL	24.1	97.7								
	9	16-18	Reddish-brown and gray FAT CLAY	CH	26.0	97.9								
	10	18-20	Reddish-brown and gray FAT CLAY	CH	26.3	98.0								
08-97			**El. 11.25, E=3185190 N=13647332**											
	1	0-2	Gray SANDY LEAN CLAY	CL	15.8	109.4								
	2	2-4	Gray FAT CLAY with SAND	CH	21.1	105.3								
	3	4-6	Tan and gray FAT CLAY; ferrous and calcareous nodules	CH	21.2	108.2								
	4	6-8	Reddish-brown and gray FAT CLAY; ferrous nodules	CH	30.4	89.6								
	5	8-10	Reddish-brown and gray FAT CLAY	CH	40.9	86.4	66	21	45	98.0	0.44	9.5	9	60 degree
	6	10-12	Reddish-brown and gray SILTY CLAY with SAND	CL-ML	35.6									
	7	12-14	Reddish-brown and gray SILTY CLAY with SAND	CL-ML	27.0	95.8					0.58	5.8		Vertical shear
	8	14-16	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	25.4	99.0								
	9	16-18	Reddish-brown and gray FAT CLAY	CH	25.1	98.8								
	10	18-20	Reddish-brown and gray FAT CLAY	CH	28.9	98.7								
08-98			**El. 11.00, E=3184452 N=13647824**											
	1	0-2	Gray SANDY LEAN CLAY	CL	13.2	105.9								
	2	2-4	Tan and gray FAT CLAY	CH	19.8	98.9								
	3	4-6	Tan and gray FAT CLAY	CH	17.1	109.6								
	4	6-8	Reddish-brown and gray FAT CLAY	CH	29.1	93.3	67	21	46	98.3	1.22	6.1		Slickensided
	5	8-10	Reddish-brown and gray FAT CLAY	CH	32.4	88.6								
	6	10-12	Reddish-brown and gray FAT CLAY	CH	24.5	99.6	62	20	42	95.2	1.75	5.1	11	Slickensided
	7	12-14	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	37.8	87.0								
	8	14-16	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	26.0	98.0								
	9	16-18	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	24.4	102.5								
	10	18-20	Reddish-brown and gray FAT CLAY	CH	27.6	96.5								
08-99														





Sample No.		1
Initial	Water Content, %	40.9
	Dry Density, pcf	79.5
	Saturation, %	98.6
	Void Ratio	1.1193
	Diameter, in.	2.89
	Height, in.	5.97
At Test	Water Content, %	39.3
	Dry Density, pcf	79.5
	Saturation, %	94.9
	Void Ratio	1.1193
	Diameter, in.	2.89
	Height, in.	5.97
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.65
Fail. Stress, tsf		0.44
Ult. Stress, tsf		
σ_1 Failure, tsf		1.09
σ_3 Failure, tsf		0.65

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish-brown and gray FAT CLAY; calcareous

LL= 66 **PL=** 21 **PI=** 45

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: Chocolate Bayou Placement Area
Contract DACW64-03-D-0008; Task Order 0079

Source of Sample: 08-97 **Depth:** 8-10

Sample Number: 5

Proj. No.: 08.18.921 **Date Sampled:** 8/16/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

8/19/2008
2:09 PM

Date: 8/16/08
Client: United States Army Corps of Engineers
Project: Chocolate Bayou Placement Area
Contract DACW64-03-D-0008; Task Order 0079
Project No.: 08.18.921
Location: 08-97
Depth: 8-10 **Sample Number:** 5
Description: Reddish-brown and gray FAT CLAY; calcareous
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=**66 **PL=**21 **PI=**45
Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	152.010	118.560
Moisture content: Dry soil+tare, gms.	117.080	94.000
Moisture content: Tare, gms.	31.600	31.550
Moisture, %	40.9	39.3
Moist specimen weight, gms.	1151.5	
Diameter, in.	2.89	
Area, in.^{2}	6.56	
Height, in.	5.97	
Wet Density, pcf	112.0	
Dry density, pcf	79.5	
Void ratio	1.1193	
Saturation, %	98.6	

Test Readings for Specimen No. 1

Membrane modulus = .130 kN/cm^2
Membrane thickness = .031 cm
Cell pressure = 9.00 psi (0.648 tsf)
Back pressure = 0.00 psi (0.000 tsf)
Strain rate, %/min. = 1.00
Fail. Stress = 0.442 tsf **at reading no.** 70

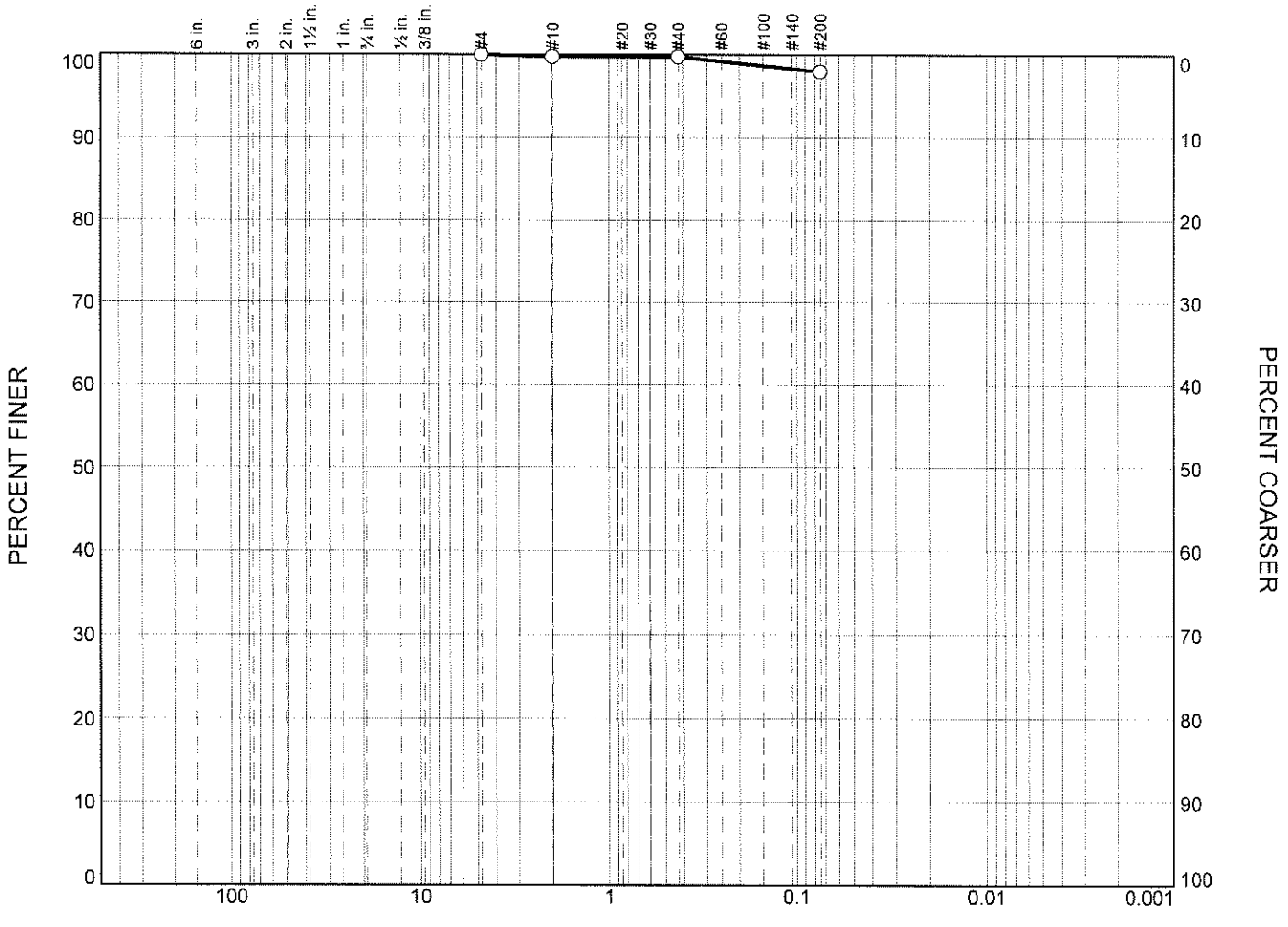
Test Readings for Specimen No. 1

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	0.0599	0.000	0.0	0.0	0.000	0.648	0.648	1.00	0.648	0.000
1	0.0682	4.748	4.7	0.1	0.052	0.648	0.700	1.08	0.674	0.026
2	0.0693	6.174	6.2	0.2	0.068	0.648	0.716	1.10	0.682	0.034
3	0.0713	6.846	6.8	0.2	0.075	0.648	0.723	1.12	0.686	0.038
4	0.0726	7.535	7.5	0.2	0.083	0.648	0.731	1.13	0.689	0.041
5	0.0739	9.372	9.4	0.2	0.103	0.648	0.751	1.16	0.699	0.051
6	0.0759	10.198	10.2	0.3	0.112	0.648	0.760	1.17	0.704	0.056
7	0.0772	11.962	12.0	0.3	0.131	0.648	0.779	1.20	0.713	0.065
8	0.0791	13.449	13.4	0.3	0.147	0.648	0.795	1.23	0.722	0.074
9	0.0804	14.598	14.6	0.3	0.160	0.648	0.808	1.25	0.728	0.080
10	0.0817	16.567	16.6	0.4	0.181	0.648	0.829	1.28	0.739	0.091
11	0.0837	17.506	17.5	0.4	0.191	0.648	0.839	1.30	0.744	0.096
12	0.0850	18.685	18.7	0.4	0.204	0.648	0.852	1.32	0.750	0.102
13	0.0862	20.283	20.3	0.4	0.222	0.648	0.870	1.34	0.759	0.111
14	0.0895	21.542	21.5	0.5	0.235	0.648	0.883	1.36	0.766	0.118
15	0.0908	22.823	22.8	0.5	0.249	0.648	0.897	1.38	0.773	0.125
16	0.0928	23.381	23.4	0.6	0.255	0.648	0.903	1.39	0.776	0.128
17	0.0941	24.490	24.5	0.6	0.267	0.648	0.915	1.41	0.782	0.134
18	0.0954	25.169	25.2	0.6	0.275	0.648	0.923	1.42	0.785	0.137
19	0.0974	25.705	25.7	0.6	0.280	0.648	0.928	1.43	0.788	0.140
20	0.0987	26.596	26.6	0.6	0.290	0.648	0.938	1.45	0.793	0.145
21	0.1032	28.359	28.4	0.7	0.309	0.648	0.957	1.48	0.803	0.155
22	0.1066	29.154	29.2	0.8	0.317	0.648	0.965	1.49	0.807	0.159
23	0.1111	30.172	30.2	0.9	0.328	0.648	0.976	1.51	0.812	0.164
24	0.1137	30.833	30.8	0.9	0.335	0.648	0.983	1.52	0.816	0.168
25	0.1183	31.707	31.7	1.0	0.345	0.648	0.993	1.53	0.820	0.172
26	0.1216	32.212	32.2	1.0	0.350	0.648	0.998	1.54	0.823	0.175
27	0.1228	32.717	32.7	1.1	0.355	0.648	1.003	1.55	0.826	0.178
28	0.1274	33.313	33.3	1.1	0.362	0.648	1.010	1.56	0.829	0.181
29	0.1352	33.966	34.0	1.3	0.368	0.648	1.016	1.57	0.832	0.184
30	0.1409	34.552	34.6	1.4	0.374	0.648	1.022	1.58	0.835	0.187
31	0.1532	35.467	35.5	1.6	0.383	0.648	1.031	1.59	0.840	0.192
32	0.1655	36.173	36.2	1.8	0.390	0.648	1.038	1.60	0.843	0.195
33	0.1712	36.678	36.7	1.9	0.395	0.648	1.043	1.61	0.846	0.198
34	0.1833	36.840	36.8	2.1	0.396	0.648	1.044	1.61	0.846	0.198
35	0.1954	37.169	37.2	2.3	0.399	0.648	1.047	1.62	0.847	0.199
36	0.2076	37.566	37.6	2.5	0.402	0.648	1.050	1.62	0.849	0.201
37	0.2197	38.288	38.3	2.7	0.409	0.648	1.057	1.63	0.853	0.205
38	0.2255	37.788	37.8	2.8	0.403	0.648	1.051	1.62	0.850	0.202
39	0.2319	38.367	38.4	2.9	0.409	0.648	1.057	1.63	0.852	0.204
40	0.2440	38.533	38.5	3.1	0.410	0.648	1.058	1.63	0.853	0.205
41	0.2498	39.006	39.0	3.2	0.415	0.648	1.063	1.64	0.855	0.207
42	0.2619	38.984	39.0	3.4	0.413	0.648	1.061	1.64	0.855	0.207
43	0.2742	39.595	39.6	3.6	0.419	0.648	1.067	1.65	0.857	0.209
44	0.2863	39.370	39.4	3.8	0.416	0.648	1.064	1.64	0.856	0.208
45	0.2921	40.135	40.1	3.9	0.423	0.648	1.071	1.65	0.860	0.212
46	0.3044	39.923	39.9	4.1	0.420	0.648	1.068	1.65	0.858	0.210

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	0.3101	40.499	40.5	4.2	0.426	0.648	1.074	1.66	0.861	0.213
48	0.3223	40.257	40.3	4.4	0.422	0.648	1.070	1.65	0.859	0.211
49	0.3344	40.559	40.6	4.6	0.425	0.648	1.073	1.66	0.860	0.212
50	0.3402	41.083	41.1	4.7	0.430	0.648	1.078	1.66	0.863	0.215
51	0.3523	41.012	41.0	4.9	0.428	0.648	1.076	1.66	0.862	0.214
52	0.3587	40.429	40.4	5.0	0.422	0.648	1.070	1.65	0.859	0.211
53	0.3644	41.313	41.3	5.1	0.430	0.648	1.078	1.66	0.863	0.215
54	0.3856	41.508	41.5	5.5	0.431	0.648	1.079	1.66	0.863	0.215
55	0.4003	41.595	41.6	5.7	0.431	0.648	1.079	1.66	0.863	0.215
56	0.4156	42.039	42.0	6.0	0.434	0.648	1.082	1.67	0.865	0.217
57	0.4304	42.280	42.3	6.2	0.435	0.648	1.083	1.67	0.866	0.218
58	0.4456	42.416	42.4	6.5	0.435	0.648	1.083	1.67	0.866	0.218
59	0.4603	42.854	42.9	6.7	0.439	0.648	1.087	1.68	0.867	0.219
60	0.4750	42.661	42.7	7.0	0.436	0.648	1.084	1.67	0.866	0.218
61	0.4905	43.219	43.2	7.2	0.440	0.648	1.088	1.68	0.868	0.220
62	0.5051	43.433	43.4	7.5	0.441	0.648	1.089	1.68	0.869	0.221
63	0.5204	43.478	43.5	7.7	0.440	0.648	1.088	1.68	0.868	0.220
64	0.5351	43.608	43.6	8.0	0.441	0.648	1.089	1.68	0.868	0.220
65	0.5505	43.873	43.9	8.2	0.442	0.648	1.090	1.68	0.869	0.221
66	0.5651	43.798	43.8	8.5	0.440	0.648	1.088	1.68	0.868	0.220
67	0.5805	43.727	43.7	8.7	0.438	0.648	1.086	1.68	0.867	0.219
68	0.5952	44.061	44.1	9.0	0.440	0.648	1.088	1.68	0.868	0.220
69	0.6105	44.360	44.4	9.2	0.442	0.648	1.090	1.68	0.869	0.221
70	0.6252	44.482	44.5	9.5	0.442	0.648	1.090	1.68	0.869	0.221
71	0.6405	44.604	44.6	9.7	0.420	0.648	1.068	1.65	0.858	0.210
72	0.6551	44.882	44.9	10.0	0.421	0.648	1.069	1.65	0.858	0.210
73	0.6705	45.119	45.1	10.2	0.421	0.648	1.069	1.65	0.859	0.211
74	0.6852	45.255	45.3	10.5	0.421	0.648	1.069	1.65	0.858	0.210
75	0.7005	45.399	45.4	10.7	0.420	0.648	1.068	1.65	0.858	0.210
76	0.7151	45.548	45.5	11.0	0.420	0.648	1.068	1.65	0.858	0.210
77	0.7304	45.720	45.7	11.2	0.420	0.648	1.068	1.65	0.858	0.210
78	0.7451	45.657	45.7	11.5	0.417	0.648	1.065	1.64	0.857	0.209
79	0.7604	45.999	46.0	11.7	0.419	0.648	1.067	1.65	0.857	0.209
80	0.7751	45.885	45.9	12.0	0.416	0.648	1.064	1.64	0.856	0.208
81	0.7899	45.908	45.9	12.2	0.414	0.648	1.062	1.64	0.855	0.207
82	0.8053	46.148	46.1	12.5	0.415	0.648	1.063	1.64	0.855	0.207
83	0.8200	46.096	46.1	12.7	0.412	0.648	1.060	1.64	0.854	0.206
84	0.8353	45.886	45.9	13.0	0.408	0.648	1.056	1.63	0.852	0.204
85	0.8500	46.755	46.8	13.2	0.415	0.648	1.063	1.64	0.855	0.207
86	0.8653	46.386	46.4	13.5	0.409	0.648	1.057	1.63	0.853	0.205
87	0.8800	46.961	47.0	13.7	0.413	0.648	1.061	1.64	0.855	0.207
88	0.8953	47.027	47.0	14.0	0.412	0.648	1.060	1.64	0.854	0.206
89	0.9100	47.268	47.3	14.2	0.412	0.648	1.060	1.64	0.854	0.206
90	0.9253	46.916	46.9	14.5	0.407	0.648	1.055	1.63	0.852	0.204
91	0.9401	47.346	47.3	14.7	0.409	0.648	1.057	1.63	0.853	0.205
92	0.9554	47.271	47.3	15.0	0.407	0.648	1.055	1.63	0.851	0.203

Particle Size Analysis - ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	0.0	1.8	98.0	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	08-97	5	8-10	Reddish-brown and gray FAT CLAY; calcareous	CH

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client: United States Army Corps of Engineers
Project: Chocolate Bayou Placement Area
Contract DACW64-03-D-0008; Task Order 0079
Project No.: 08.18.921