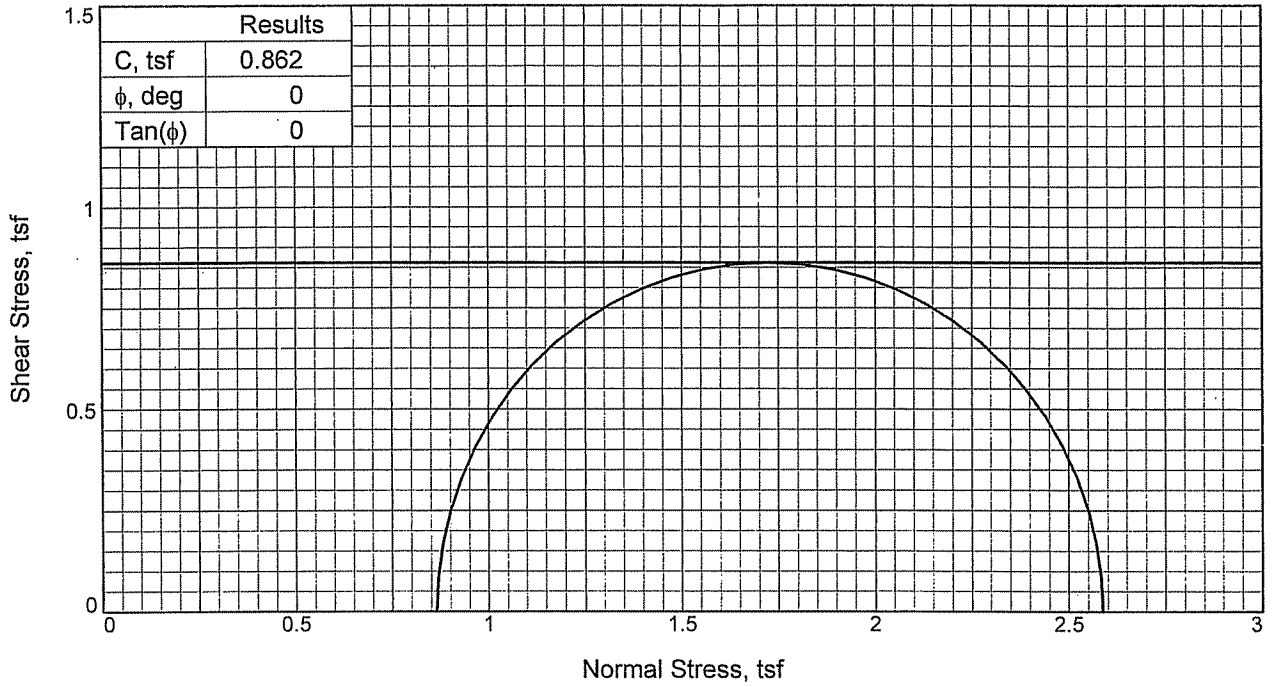
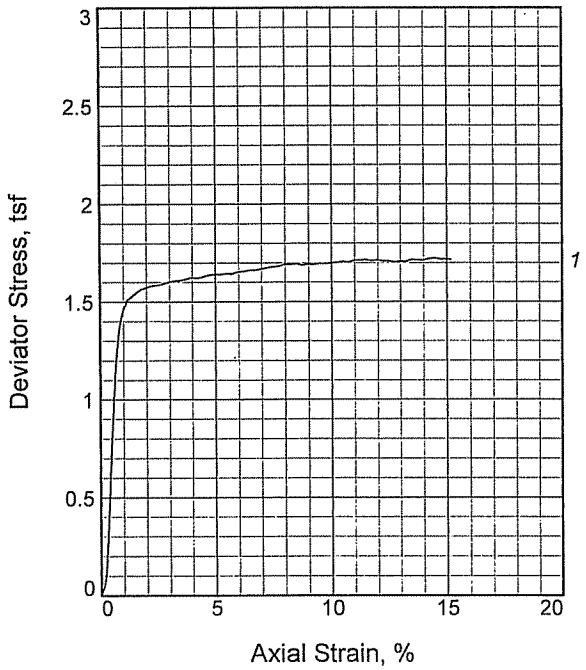
	2	2-4	Gray FAT CLAY	CH	27.1	94.5								
	3	4-6	Tan and gray FAT CLAY	OH	31.5	89.5								
	4	6-8	Tan and gray FAT CLAY; calcareous nodules	CH	27.7	95.9								
	5	8-10	Reddish-brown and gray FAT CLAY	CH	40.2	83.0								
	6	10-12	Reddish-brown and gray FAT CLAY	CH	30.5	91.4	75	23	52	99.4	0.50	0.6	11	Slickensided
	7	12-14	Reddish-brown and gray FAT CLAY	CH	30.3	89.2								
	8	14-16	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	29.3	91.5								
	9	16-18	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	30.7	93.0								
	10	18-20	Tan and gray FAT CLAY; ferrous nodules	CH	19.5	107.1								
08-89			**El. 9.75, E=3183894 N=13645807**											
	2	2-4	Gray and tan FAT CLAY	CH	30.9	88.3								
	3	4-6	Tan and gray FAT CLAY; ferrous nodules	CH	27.0	95.0								
	4	6-8	Tan and reddish-brown FAT CLAY; calcareous nodules	CH	23.4	102.0								
	5	8-10	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	25.4	98.4								
	6	10-12	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	27.5	97.1								
	7	12-14	Reddish-brown and gray FAT CLAY	CH	28.4	93.7	67	21	46	99.8	1.72	14.5	12	Slickensided
	8	14-16	Reddish-brown and gray FAT CLAY	CH	28.8	93.9								
	9	16-18	Reddish-brown and gray FAT CLAY	CH	28.5	97.2								
	10	18-20	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	29.3	94.6								
08-90			**El. 9.75, E=3184808 N=13645601**											
	2	2-4	Gray and tan FAT CLAY; calcareous nodules	CH	24.1	100.0								
	3	4-6	Tan and reddish-brown FAT CLAY; calcareous nodules	CH	21.2	108.7								
	4	6-8	Reddish-brown and gray FAT CLAY	CH	21.2	107.1								
	5	8-10	Reddish-brown and gray FAT CLAY	CH	25.4	98.9								
	6	10-12	Reddish-brown and gray FAT CLAY	CH	26.5	96.2								
	7	12-14	Reddish-brown and gray FAT CLAY	CH	28.1	96.1	70	22	48	99.4	2.00	4.4	12	45 degree
	8	14-16	Reddish-brown and gray FAT CLAY; calcareous nodules	CH	26.8	97.0								
	9	16-18	Reddish-brown and gray FAT CLAY	CH	24.8	98.2	69	22	47	97.5	1.75	2.3		Slickensided
08-91			**El. 8.75, E=3185612 N=13645555**											
	2	2-4	Gray FAT CLAY	CH	19.9	107.5	55	20	35	93.4	3.49	6	5	60 degree
	3	4-6	Tan and gray FAT CLAY	CH	27.0		61	20	41	95.0				
	4	6-8	Tan and gray FAT CLAY	CH	26.9	98.0	60	20	40	97.1	1.55	9.7		60 degree
	5	8-10	Reddish-brown and gray FAT CLAY	CH	25.8	100.1	65	21	44	99.6	1.02	6.7	9	60 degree
	6	10-12	Reddish-brown and gray FAT CLAY	CH	27.4	97.0	68	21	47	99.3	1.51	2.2		Slickensided
	7	12-14	Reddish-brown and gray FAT CLAY	CH	28.8	95.0	67	21	46	98.7	1.44	1.9	12	Slickensided
	8	14-16	Reddish-brown and gray FAT CLAY	CH	25.9	97.4	66	21	45	99.5	1.47	1.9		Slickensided
	9	16-18	Reddish-brown and gray FAT CLAY	CH	28.7	96.8	72	22	50	98.6	1.42	5.1	15	Slickensided
	10	18-20	Reddish-brown and gray FAT CLAY	CH	23.7	101.2	67	21	46	97.5	2.43	14.6		45 degree
	11	20-22	Reddish-brown FAT CLAY	CH	22.1	105.6	60	21	39	89.7	2.41	14.5	18	45 degree
	12	22-24	Reddish-brown and gray FAT CLAY with SAND	CH	22.4					82.0				
	13	24-26	Reddish-brown FAT CLAY	CH	26.0	97.9	69	21	48	98.3	1.97	8	21	45 degree
	14	26-28	Reddish-brown and gray FAT CLAY	CH	25.2	97.2	65	21	44	97.5	1.09	1.2		Slickensided
	15	28-30	Reddish-brown FAT CLAY	CH	23.0	102.4	70	22	48	99.7	2.32	6.2	24	60 degree
	16	30-32	Gray and tan CLAYEY SAND	SC	19.0	106.8	37	17	20	46.4	1.16	5.2		Vertical shear
	17	32-34	Brown FAT CLAY	CH	24.8	100.3	66	21	45	90.5	2.30	8.5	28	60 degree
	18	34-36	Gray and tan LEAN CLAY with SAND; calcareous deposits	CL	18.5	112.9	43	17	26	84.1	1.52	5.7		Vertical shear
	19	36-38	Brown CLAYEY SAND	SC	18.2	111.7	23	15	8	46.7	1.43	11	31	Bulge
	20	38-40	Tan POORLY GRADED SAND	SP	18.5					4.9				
08-92			**El. 8.25, E=3186327 N=13646253**											
	2	2-4	Tan and gray SANDY LEAN CLAY	CL	18.2	108.7								
	3	4-6	Reddish-brown and gray FAT CLAY	CH	25.2	101.3								
	4	6-8	Tan and gray FAT CLAY	CH	21.2	109.3								
	5	8-10	Reddish-brown and gray FAT CLAY	CH	25.5	97.6								
	6	10-12	Reddish-brown FAT CLAY	CH	28.7	95.4	68	21	47	98.3	1.64	14.2	11	Slickensided
	8	14-16	Tan and gray LEAN CLAY with SAND	CL	20.9	107.0	33	16	17	80.8	0.85	14.7	14	Bulge
	9	16-18	Reddish-brown and gray FAT CLAY	CH	21.8	102.7								
	10	18-20	Reddish-brown and tan CLAYEY SAND; calcareous nodules	SC	19.1	110.5								
08-93			**El. 10.25, E=3185920 N=13646861**											
	1	0-2	Gray SANDY LEAN CLAY	CL	11.2	107.3								
	2	2-4	Tan and gray SANDY LEAN CLAY	CL	17.3	112.0								
	3	4-6	Tan and gray LEAN CLAY with SAND	CL	21.2	104.0								
	4	6-8	Reddish-brown and gray FAT CLAY	CH	28.9	91.4					1.33	8.2		45 degree





Sample No.		1
Initial	Water Content, %	28.4
	Dry Density, pcf	93.7
	Saturation, %	96.1
	Void Ratio	0.7988
	Diameter, in.	2.85
	Height, in.	6.00
At Test	Water Content, %	30.1
	Dry Density, pcf	93.7
	Saturation, %	101.7
	Void Ratio	0.7988
	Diameter, in.	2.85
	Height, in.	6.00
Strain rate, %/min.		1.00
Back Pressure, tsf		0.00
Cell Pressure, tsf		0.86
Fail. Stress, tsf		1.72
Ult. Stress, tsf		
σ_1 Failure, tsf		2.59
σ_3 Failure, tsf		0.86

Type of Test:
Unconsolidated Undrained

Sample Type: Undisturbed

Description: Reddish-brown and gray FAT CLAY

LL= 67 **PL=** 21 **PI=** 46

Assumed Specific Gravity= 2.70

Remarks:

Test method: ASTM D 2850

Pocket pen; tsf: 2.75

Failure type: Slickensided

Client: United States Army Corps of Engineers

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

Source of Sample: 08-89 **Depth:** 12-14

Sample Number: 7

Proj. No.: 08.18.921 **Date Sampled:** 8/14/08

TRIAXIAL SHEAR TEST REPORT

Tolunay-Wong Engineers, Inc.

TRIAXIAL COMPRESSION TEST

Unconsolidated Undrained

8/19/2008
1:23 PM

Date: 8/14/08
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: 08-89
Depth: 12-14 **Sample Number:** 7
Description: Reddish-brown and gray FAT CLAY
Remarks:
Test method: ASTM D 2850
Pocket pen; tsf: 2.75
Failure type: Slickensided
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=**67 **PL=**21 **PI=**46
Test Method: ASTM D 2850

Parameters for Specimen No. 1

Specimen Parameter	Initial	Final
Moisture content: Moist soil+tare, gms.	153.130	119.740
Moisture content: Dry soil+tare, gms.	126.090	99.240
Moisture content: Tare, gms.	31.000	31.100
Moisture, %	28.4	30.1
Moist specimen weight, gms.	1208.6	
Diameter, in.	2.85	
Area, in.^{2}	6.38	
Height, in.	6.00	
Wet Density, pcf	120.3	
Dry density, pcf	93.7	
Void ratio	0.7988	
Saturation, %	96.1	

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 = 1.724 tsf **at reading no.** 89

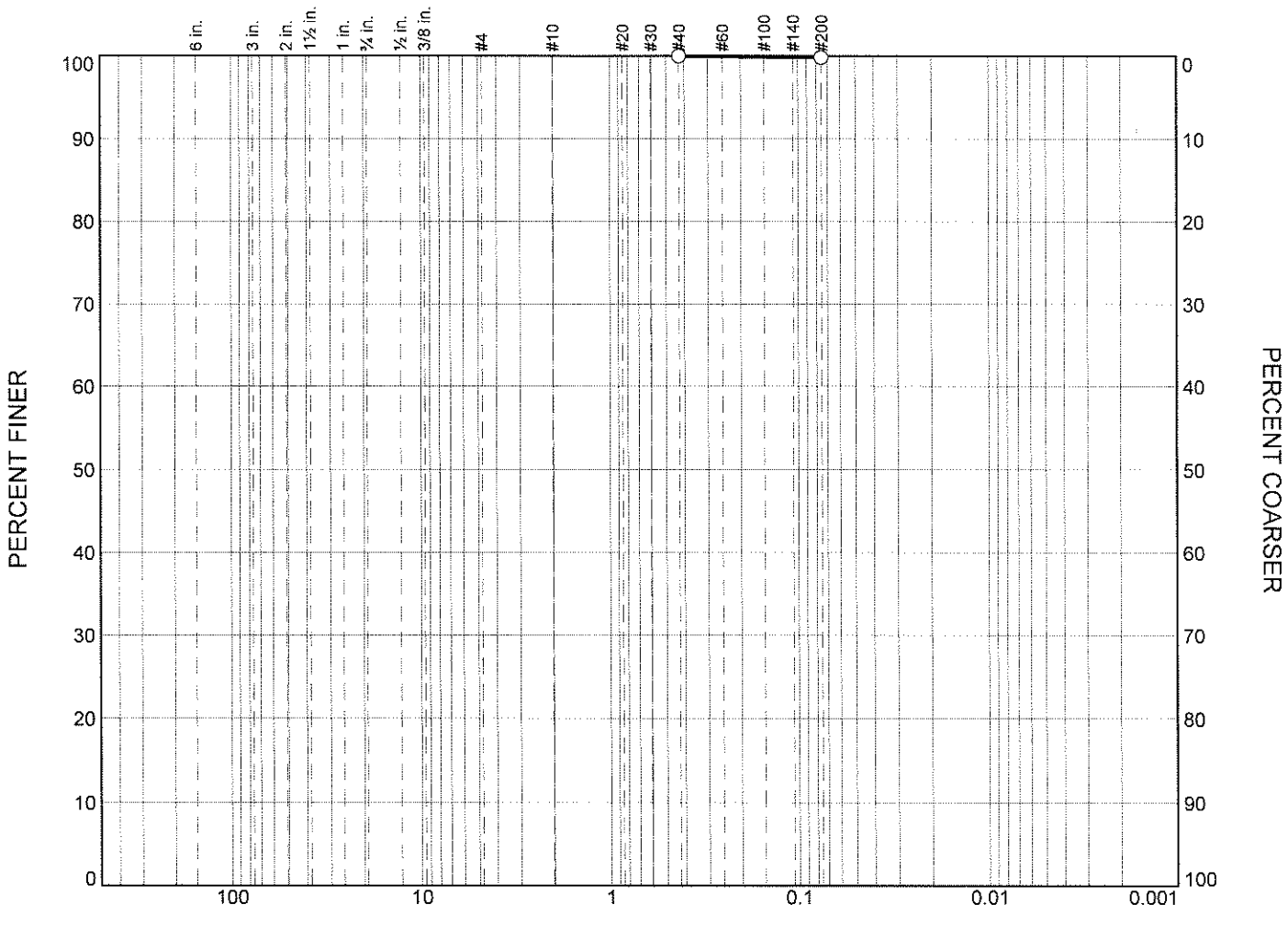
Test Readings for Specimen No. 1

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	0.0219	0.000	0.0	0.0	0.000	0.864	0.864	1.00	0.864	0.000
1	0.0311	4.778	4.8	0.2	0.054	0.864	0.918	1.06	0.891	0.027
2	0.0339	8.598	8.6	0.2	0.097	0.864	0.961	1.11	0.912	0.048
3	0.0358	11.436	11.4	0.2	0.129	0.864	0.993	1.15	0.928	0.064
4	0.0371	15.977	16.0	0.3	0.180	0.864	1.044	1.21	0.954	0.090
5	0.0384	20.785	20.8	0.3	0.234	0.864	1.098	1.27	0.981	0.117
6	0.0405	26.624	26.6	0.3	0.300	0.864	1.164	1.35	1.014	0.150
7	0.0418	31.819	31.8	0.3	0.358	0.864	1.222	1.41	1.043	0.179
8	0.0431	37.210	37.2	0.4	0.418	0.864	1.282	1.48	1.073	0.209
9	0.0451	43.276	43.3	0.4	0.487	0.864	1.351	1.56	1.107	0.243
10	0.0464	48.840	48.8	0.4	0.549	0.864	1.413	1.64	1.138	0.274
11	0.0477	54.806	54.8	0.4	0.616	0.864	1.480	1.71	1.172	0.308
12	0.0497	60.851	60.9	0.5	0.684	0.864	1.548	1.79	1.206	0.342
13	0.0510	67.414	67.4	0.5	0.757	0.864	1.621	1.88	1.243	0.379
14	0.0523	73.461	73.5	0.5	0.825	0.864	1.689	1.95	1.276	0.412
15	0.0543	78.917	78.9	0.5	0.886	0.864	1.750	2.03	1.307	0.443
16	0.0555	84.199	84.2	0.6	0.945	0.864	1.809	2.09	1.336	0.472
17	0.0568	88.875	88.9	0.6	0.997	0.864	1.861	2.15	1.363	0.499
18	0.0589	93.920	93.9	0.6	1.053	0.864	1.917	2.22	1.391	0.527
19	0.0601	98.532	98.5	0.6	1.105	0.864	1.969	2.28	1.416	0.552
20	0.0614	102.968	103.0	0.7	1.154	0.864	2.018	2.34	1.441	0.577
21	0.0635	106.669	106.7	0.7	1.196	0.864	2.060	2.38	1.462	0.598
22	0.0648	109.705	109.7	0.7	1.229	0.864	2.093	2.42	1.479	0.615
23	0.0660	112.473	112.5	0.7	1.260	0.864	2.124	2.46	1.494	0.630
24	0.0681	115.232	115.2	0.8	1.291	0.864	2.155	2.49	1.509	0.645
25	0.0694	117.940	117.9	0.8	1.321	0.864	2.185	2.53	1.524	0.660
26	0.0706	120.336	120.3	0.8	1.347	0.864	2.211	2.56	1.538	0.674
27	0.0727	122.580	122.6	0.8	1.372	0.864	2.236	2.59	1.550	0.686
28	0.0752	125.346	125.3	0.9	1.402	0.864	2.266	2.62	1.565	0.701
29	0.0785	128.139	128.1	0.9	1.433	0.864	2.297	2.66	1.580	0.716
30	0.0819	130.619	130.6	1.0	1.459	0.864	2.323	2.69	1.594	0.730
31	0.0878	132.995	133.0	1.1	1.485	0.864	2.349	2.72	1.606	0.742
32	0.0924	135.089	135.1	1.2	1.507	0.864	2.371	2.74	1.617	0.753
33	0.1046	137.375	137.4	1.4	1.529	0.864	2.393	2.77	1.629	0.765
34	0.1168	139.431	139.4	1.6	1.549	0.864	2.413	2.79	1.638	0.774
35	0.1290	141.182	141.2	1.8	1.565	0.864	2.429	2.81	1.646	0.782
36	0.1405	141.976	142.0	2.0	1.571	0.864	2.435	2.82	1.649	0.785
37	0.1528	143.138	143.1	2.2	1.580	0.864	2.444	2.83	1.654	0.790
38	0.1651	143.801	143.8	2.4	1.584	0.864	2.448	2.83	1.656	0.792
39	0.1773	144.384	144.4	2.6	1.587	0.864	2.451	2.84	1.658	0.794
40	0.1895	145.327	145.3	2.8	1.594	0.864	2.458	2.85	1.661	0.797
41	0.2017	146.424	146.4	3.0	1.603	0.864	2.467	2.86	1.666	0.802
42	0.2138	147.167	147.2	3.2	1.608	0.864	2.472	2.86	1.668	0.804
43	0.2254	147.504	147.5	3.4	1.608	0.864	2.472	2.86	1.668	0.804
44	0.2377	148.158	148.2	3.6	1.612	0.864	2.476	2.87	1.670	0.806
45	0.2498	149.087	149.1	3.8	1.619	0.864	2.483	2.87	1.673	0.809
46	0.2620	149.995	150.0	4.0	1.625	0.864	2.489	2.88	1.677	0.813

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	0.2743	150.070	150.1	4.2	1.622	0.864	2.486	2.88	1.675	0.811
48	0.2858	150.627	150.6	4.4	1.625	0.864	2.489	2.88	1.677	0.813
49	0.2982	151.667	151.7	4.6	1.633	0.864	2.497	2.89	1.680	0.816
50	0.3104	152.549	152.5	4.8	1.639	0.864	2.503	2.90	1.683	0.819
51	0.3225	153.124	153.1	5.0	1.642	0.864	2.506	2.90	1.685	0.821
52	0.3348	153.320	153.3	5.2	1.640	0.864	2.504	2.90	1.684	0.820
53	0.3496	154.216	154.2	5.5	1.645	0.864	2.509	2.90	1.687	0.823
54	0.3650	154.522	154.5	5.7	1.644	0.864	2.508	2.90	1.686	0.822
55	0.3797	155.761	155.8	6.0	1.653	0.864	2.517	2.91	1.691	0.827
56	0.3951	156.286	156.3	6.2	1.654	0.864	2.518	2.91	1.691	0.827
57	0.4098	157.463	157.5	6.5	1.662	0.864	2.526	2.92	1.695	0.831
58	0.4252	157.835	157.8	6.7	1.662	0.864	2.526	2.92	1.695	0.831
59	0.4400	158.913	158.9	7.0	1.669	0.864	2.533	2.93	1.698	0.834
60	0.4554	159.765	159.8	7.2	1.673	0.864	2.537	2.94	1.700	0.836
61	0.4701	160.813	160.8	7.5	1.679	0.864	2.543	2.94	1.704	0.840
62	0.4855	161.451	161.5	7.7	1.681	0.864	2.545	2.95	1.705	0.841
63	0.5003	162.875	162.9	8.0	1.692	0.864	2.556	2.96	1.710	0.846
64	0.5157	163.227	163.2	8.2	1.691	0.864	2.555	2.96	1.709	0.845
65	0.5304	164.074	164.1	8.5	1.695	0.864	2.559	2.96	1.711	0.847
66	0.5458	163.899	163.9	8.7	1.688	0.864	2.552	2.95	1.708	0.844
67	0.5606	164.775	164.8	9.0	1.693	0.864	2.557	2.96	1.710	0.846
68	0.5754	165.070	165.1	9.2	1.691	0.864	2.555	2.96	1.710	0.846
69	0.5909	165.956	166.0	9.5	1.695	0.864	2.559	2.96	1.712	0.848
70	0.6056	166.473	166.5	9.7	1.696	0.864	2.560	2.96	1.712	0.848
71	0.6210	167.167	167.2	10.0	1.698	0.864	2.562	2.97	1.713	0.849
72	0.6358	167.838	167.8	10.2	1.700	0.864	2.564	2.97	1.714	0.850
73	0.6512	169.026	169.0	10.5	1.708	0.864	2.572	2.98	1.718	0.854
74	0.6659	168.916	168.9	10.7	1.702	0.864	2.566	2.97	1.715	0.851
75	0.6812	170.444	170.4	11.0	1.712	0.864	2.576	2.98	1.720	0.856
76	0.6959	170.873	170.9	11.2	1.712	0.864	2.576	2.98	1.720	0.856
77	0.7113	171.778	171.8	11.5	1.716	0.864	2.580	2.99	1.722	0.858
78	0.7261	171.592	171.6	11.7	1.709	0.864	2.573	2.98	1.719	0.855
79	0.7409	172.628	172.6	12.0	1.715	0.864	2.579	2.98	1.721	0.857
80	0.7563	172.651	172.7	12.2	1.710	0.864	2.574	2.98	1.719	0.855
81	0.7711	172.993	173.0	12.5	1.709	0.864	2.573	2.98	1.718	0.854
82	0.7865	172.904	172.9	12.7	1.703	0.864	2.567	2.97	1.715	0.851
83	0.8012	173.852	173.9	13.0	1.707	0.864	2.571	2.98	1.718	0.854
84	0.8167	174.242	174.2	13.3	1.706	0.864	2.570	2.97	1.717	0.853
85	0.8314	175.663	175.7	13.5	1.715	0.864	2.579	2.98	1.721	0.857
86	0.8468	176.071	176.1	13.8	1.714	0.864	2.578	2.98	1.721	0.857
87	0.8616	176.516	176.5	14.0	1.713	0.864	2.577	2.98	1.721	0.857
88	0.8764	177.805	177.8	14.2	1.721	0.864	2.585	2.99	1.724	0.860
89	0.8920	178.655	178.7	14.5	1.724	0.864	2.588	3.00	1.726	0.862
90	0.9067	178.437	178.4	14.8	1.717	0.864	2.581	2.99	1.722	0.858
91	0.9221	179.290	179.3	15.0	1.720	0.864	2.584	2.99	1.724	0.860
92	0.9311	179.112	179.1	15.2	1.715	0.864	2.579	2.98	1.722	0.858

Particle Size Analysis - ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	0.2	99.8	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	08-89	7	12-14	Reddish-brown and gray FAT CLAY	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