Project: Greens Bayou

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-95-D-0007 Delivery Order No. 0047

Boring No. 97-88

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
1	0 - 2			Clayey Sand,w/grass roots,Gray	S C	14.3											
2	2 - 4	0.50		Sandy Clay,Medium stiff,Dark gray	C L	14.8											
3	4 - 6	4.5+		Sandy Clay,w/fer nod & sand seams,Hard, Gray & Yellowish gray	C L	11.8											
4	6 - 8	4.5+		Sandy Clay,w/fer nod & sand seams,Hard, Gray & Yellowish gray	C L	8.0											
5	8 - 10	1.50		Sandy Clay,w/fer nod & sand seams,Stiff, Gray & Yellowish gray	C L	17.7	105.6	124.3	27.0	17.0	99.8	99.6	99.5	96.6	77.1		1.23
6	10 - 12	1.25		Sandy Clay,w/fer nod & sand seams,Stiff, Gray & Yellowish gray	C L	19.6											
7	12 - 14	3.50		Sandy Clay,w/calc nod & sand seams,Very stiff,Gray & Yellowish gray	C L	21.8											
8	14 - 16	3.75		Sandy Clay,w/calc nod & sand seams,Very stiff,Gray & Yellowish gray	C L	19.8											
9	16 - 18	3.50		Clay,w/fer stains,slks,Very stiff,Red & Gray	C H	22.3											
10	18 - 20	3.50		Clay,w/fer stains,slks,Very stiff,Red & Gray	C H	21.5	98.8	120.1	52.0	23.0							
11	20-21		n	Silty Sand,Red ? Medium Dense	S M	—	—	—									
11A	21-22	3.50		Clay,w/fer stains,slks,Very stiff,Red	C H	32.2											
12	22-24	4.5+		Clay,w/fer stains,slks,Hard,Red	C H	29.5	92.5	119.7	74.0	30.0	99.9	99.4	99.2	94.1	92.3		4.15
13	24-26	4.5+		Clay,w/fer stains,slks,Hard,Red	C H	21.8											
14A	26-27			Sandy Silt,w/silt stone,Red Medium Dense	M L												
14	27-28	3.50		Clay,w/silt stone & fer stains,slks,Very stiff, Red	C H	25.3											
15	28-30			Sandy Silt,Medium dense,Red	M L												
16	30-31.5		23	Sandy Silt,Medium dense,Red	M L												
17	32-34	3.75		Clay,w/calc nod & fer stains,slks,Very stiff, Red	C H	25.6											
18	34-36	4.25		Clay,w/calc nod & fer stains,slks,Hard,Red	C H	26.1											

10

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

Project: Greens Bayou

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-95-D-0007 Delivery Order No. 0047

Boring No. 97-88

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
19	36-38	3.50		Clay,w/calc nod & fer stains,slks,Very stiff, Red	C H	30.4	93.4	121.8	52.0	23.0							
20	38-40	4.25		Clay,w/calc nod & fer stains,slks,Hard,Red	C H	30.2											
21	40-42	1.00		Sandy Clay,Stiff,Yellowish gray	C L	17.7	111.3	131.0	27.0	16.0	100.0	100.0	99.9	94.4	63.8		1.16
22	42-44	3.50		Sandy Clay,w/fer stains & sand seams,Very stiff,Red & Gray	C L	19.2											
23	44-46	1.75		Sandy Clay,w/fer stains & sand seams,Stiff, Red & Gray	C L	18.0											
24	46-48			Sandy Silt,Medium dense,Red	M L	18.6											
25	48-49.5		24	Sandy Silt,Medium dense,Red	M L												
26	49.5-51		30	Sandy Silt,Medium dense,Red	M L												

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

JOB NO. 114008614 DATE 2/28/98

OJECT Greens Bayou

AREA Houston, Texas

BORING NO. 97-88 SAMPLE NO. 5 DEPTH 8-10 ft

SPECIMEN NO. 1

CLASSIFICATION
Sandy Clay,w/fer nod & sand seams,Stiff,Gray&Yellowish gray

Tare No.	IB-17	Height	5.595 in.
Tare plus Wet Specimen	452.14 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	390.69 gm	Initial Area	6.290 sq in.
Water Weight	61.45 gm	Volume	35.194 cu in.
Tare Weight	43.86 gm	Volume of Solids	cu in.
Wet Specimen	1148.50 gm	Void Ratio	
Dry Specimen	975.64 gm	Saturation	%
Water Content	17.72 %	Dry Density	105.6 lb/cu ft

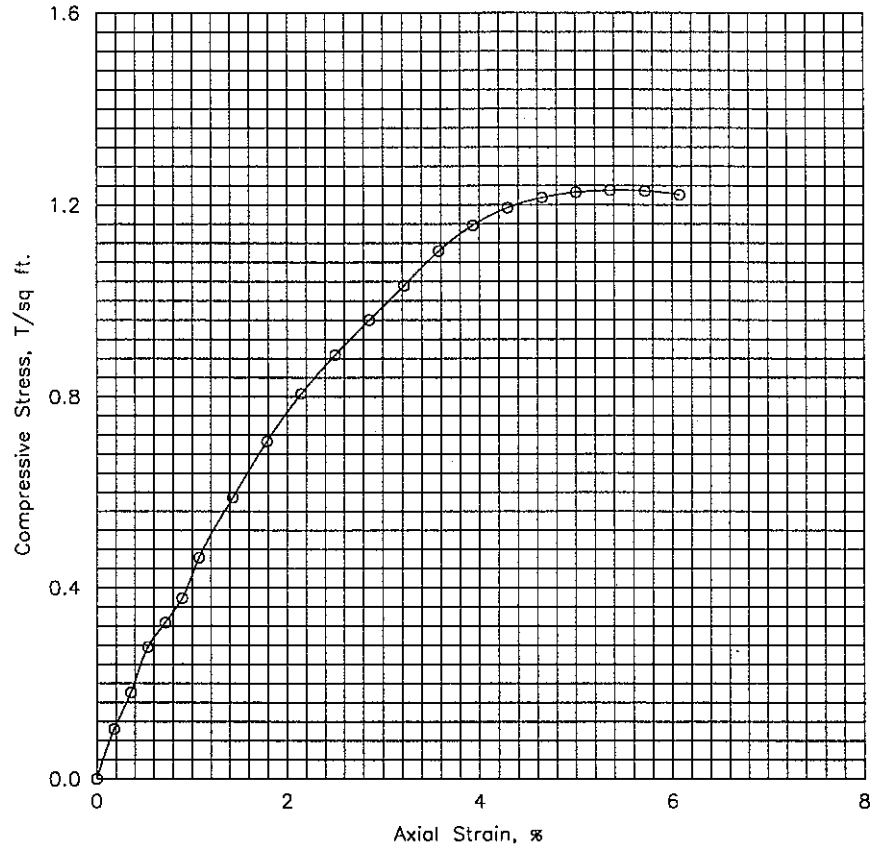
Specific Gravity of Solids
LL = 27 PL = 17 PI = 10

Proving Ring No. 10170
Proving Ring Constant, K = .757 lbs/div.

Elapsed Time min.	Dial Reading 0.001"	Cumulative Change in.	Proving Ring Dial Reading	Axial Load lb	Axial Strain	Area Corr. sq in.	Compr. Stress tsf
.0	0.	.000	.0	.0	.000	6.29	.000
.2	10.	.010	12.0	9.1	.002	6.30	.104
.4	20.	.020	21.0	15.9	.004	6.31	.181
.5	30.	.030	32.0	24.2	.005	6.32	.276
.7	40.	.040	38.0	28.8	.007	6.34	.327
.9	50.	.050	44.0	33.3	.009	6.35	.378
1.1	60.	.060	54.0	40.9	.011	6.36	.463
1.4	80.	.080	69.0	52.2	.014	6.38	.589
1.7	100.	.100	83.0	62.8	.018	6.40	.706
2.0	120.	.120	95.0	71.9	.021	6.43	.806
2.3	140.	.140	105.0	79.5	.025	6.45	.887
2.7	160.	.160	114.0	86.3	.029	6.48	.960
3.0	180.	.180	123.0	93.1	.032	6.50	1.031
3.3	200.	.200	132.0	99.9	.036	6.52	1.103
3.7	220.	.220	139.0	105.2	.039	6.55	1.157
4.0	240.	.240	144.0	109.0	.043	6.57	1.194
4.3	260.	.260	147.0	111.3	.046	6.60	1.215
4.6	280.	.280	149.0	112.8	.050	6.62	1.226
4.9	300.	.300	150.0	113.6	.054	6.65	1.230
5.3	320.	.320	150.5	113.9	.057	6.67	1.229
5.6	340.	.340	150.0	113.6	.061	6.70	1.221

Job No. 114008614

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	17.7 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	105.6			
Time to failure, min		t_f	4.95			
Unconfined compressive strength, T/sq ft		q_u	1.23			
Undrained shear strength, T/sq ft		S_u	.62			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Sandy Clay,w/fer nod & sand seams,Stiff,Gray&Yellowish gray

LL	27	PL	17	PI	10	G_s

Remarks

Project Greens Bayou

Area Houston, Texas

Boring No. 97-88 | Sample No. 5

Depth El 8-10 ft | Date 2/28/98

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

JOB NO. 114008614 DATE 2/28/98

OJECT Greens Bayou

AREA Houston, Texas

BORING NO. 97-88 SAMPLE NO. 12 DEPTH 22-24 ft

SPECIMEN NO. 1

CLASSIFICATION
Clay,w/fer stains,slks,Hard,Red

Tare No.	WB1	Height	5.595 in.
Tare plus Wet Specimen	468.84 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	372.05 gm	Initial Area	6.290 sq in.
Water Weight	96.79 gm	Volume	35.194 cu in.
Tare Weight	43.63 gm	Volume of Solids	cu in.
Wet Specimen	1106.30 gm	Void Ratio	
Dry Specimen	854.47 gm	Saturation	%
Water Content	29.47 %	Dry Density	92.5 lb/cu ft

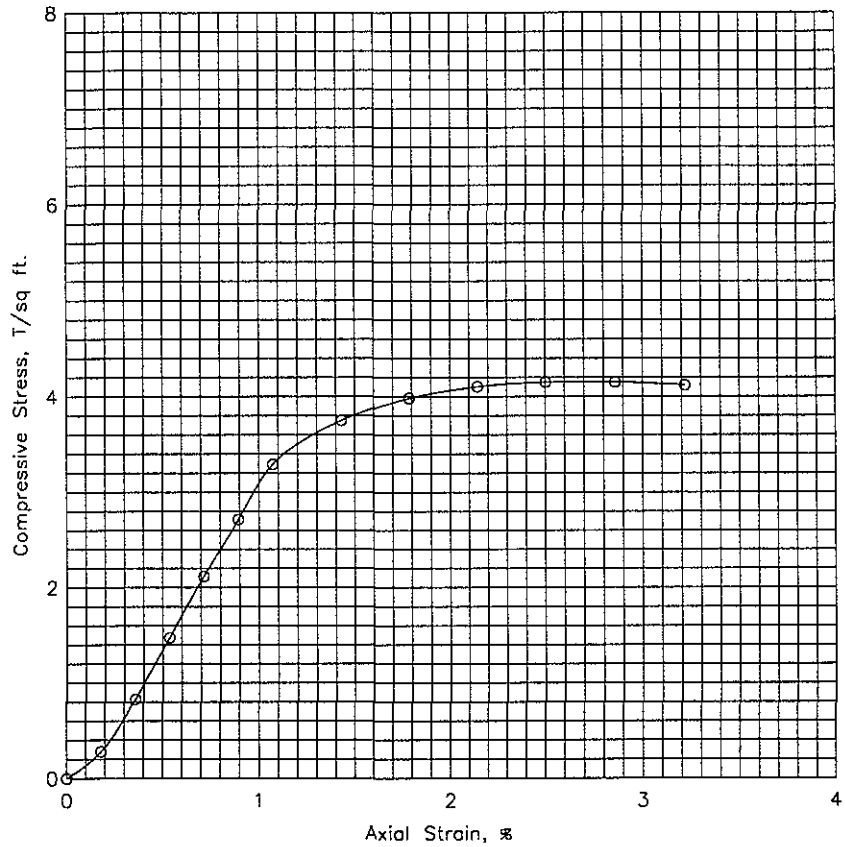
Specific Gravity of Solids
LL = 74 PL = 30 PI = 44

Proving Ring No. 10170
Proving Ring Constant, K = .757 lbs/div.

Elapsed Time min.	Dial Reading 0.001"	Cumulative Change in.	Proving Ring Dial Reading	Axial Load lb	Axial Strain	Area Corr. sq in.	Compr. Stress tsf
.0	0.	.000	.0	.0	.000	6.29	.000
.2	10.	.010	32.0	24.2	.002	6.30	.277
.3	20.	.020	96.0	72.7	.004	6.31	.829
.5	30.	.030	171.0	129.4	.005	6.32	1.474
.7	40.	.040	246.0	186.2	.007	6.34	2.116
.9	50.	.050	316.0	239.2	.009	6.35	2.714
1.0	60.	.060	384.0	290.7	.011	6.36	3.292
1.4	80.	.080	439.0	332.3	.014	6.38	3.750
1.7	100.	.100	468.0	354.3	.018	6.40	3.983
2.0	120.	.120	484.0	366.4	.021	6.43	4.104
2.3	140.	.140	491.0	371.7	.025	6.45	4.148
2.6	160.	.160	493.0	373.2	.029	6.48	4.150
3.0	180.	.180	491.0	371.7	.032	6.50	4.118

Job No. 11400614

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	29.5 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	92.5			
Time to failure, min		t_f	2.63			
Unconfined compressive strength, T/sq ft		q_u	4.15			
Undrained shear strength, T/sq ft		S_u	2.07			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Clay,w/fer stains,slks,Hard,Red

LL	74	PL	30	PI	44	G_s

Remarks

Project Greens Bayou

Area Houston, Texas

Boring No. 97-88 | Sample No. 12

Depth El 22-24 ft | Date 2/28/98

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 114008614 DATE 2/28/98

OJECT Greens Bayou

AREA Houston, Texas

BORING NO. 97-88 SAMPLE NO. 21 DEPTH 40-42 ft

SPECIMEN NO. 1

CLASSIFICATION
Sandy Clay,Stiff,Yellowish gray

Tare No.	PZ16	Height	5.595 in.
Tare plus Wet Specimen	489.36 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	422.14 gm	Initial Area	6.290 sq in.
Water Weight	67.22 gm	Volume	35.194 cu in.
Tare Weight	42.73 gm	Volume of Solids	cu in.
Wet Specimen	1210.45 gm	Void Ratio	
Dry Specimen	1028.27 gm	Saturation	%
Water Content	17.72 %	Dry Density	111.3 lb/cu ft

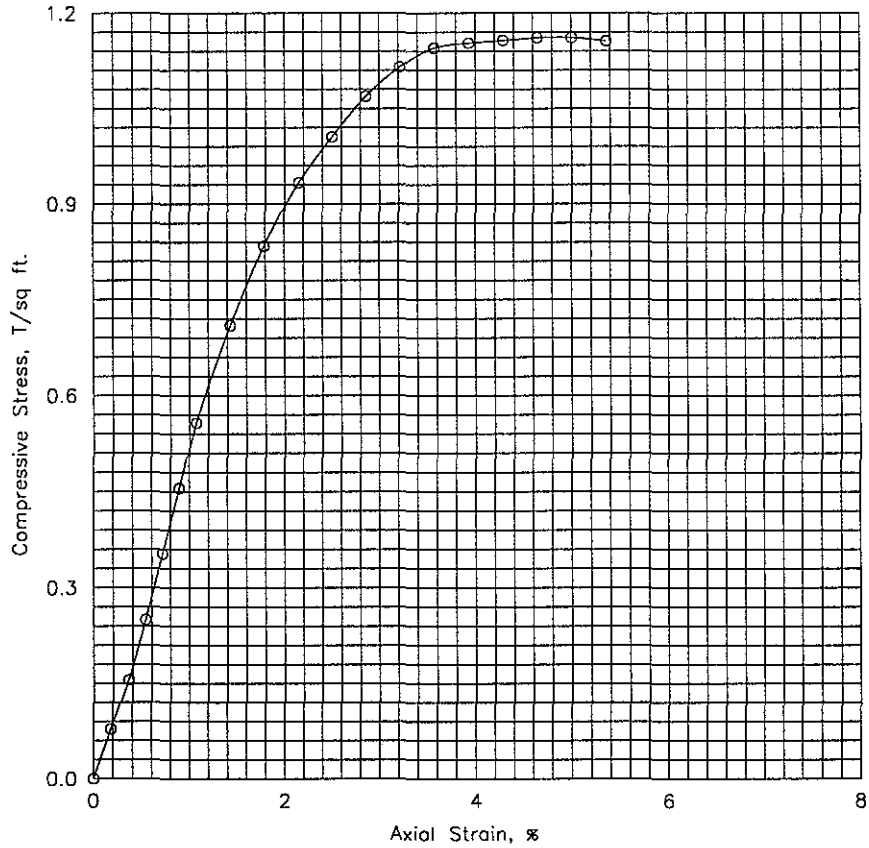
Specific Gravity of Solids
LL = 27 PL = 16 PI = 11

Proving Ring No. 10170
Proving Ring Constant, K = .757 lbs/div.

Elapsed Time min.	Dial Reading 0.001"	Cumulative Change in.	Proving Ring Dial Reading	Axial Load lb	Axial Strain	Area Corr. sq in.	Compr. Stress tsf
.0	0.	.000	.0	.0	.000	6.29	.000
.2	10.	.010	9.0	6.8	.002	6.30	.078
.4	20.	.020	18.0	13.6	.004	6.31	.155
.5	30.	.030	29.0	22.0	.005	6.32	.250
.7	40.	.040	41.0	31.0	.007	6.34	.353
.9	50.	.050	53.0	40.1	.009	6.35	.455
1.0	60.	.060	65.0	49.2	.011	6.36	.557
1.4	80.	.080	83.0	62.8	.014	6.38	.709
1.7	100.	.100	98.0	74.2	.018	6.40	.834
2.0	120.	.120	110.0	83.3	.021	6.43	.933
2.3	140.	.140	119.0	90.1	.025	6.45	1.005
2.6	160.	.160	127.0	96.1	.029	6.48	1.069
3.0	180.	.180	133.0	100.7	.032	6.50	1.115
3.3	200.	.200	137.0	103.7	.036	6.52	1.145
3.6	220.	.220	138.5	104.8	.039	6.55	1.153
4.0	240.	.240	139.5	105.6	.043	6.57	1.157
4.3	260.	.260	140.5	106.4	.046	6.60	1.161
4.6	280.	.280	141.0	106.7	.050	6.62	1.161
4.9	300.	.300	141.0	106.7	.054	6.65	1.156

Job No. 114008614

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	17.7 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	111.3			
Time to failure, min		t_f	4.27			
Unconfined compressive strength, T/sq ft		q_u	1.16			
Undrained shear strength, T/sq ft		S_u	.58			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Sandy Clay,Stiff,Yellowish gray

LL	27	PL	16	PI	11	G_s	

Remarks

Project Greens Bayou

Area Houston, Texas

Boring No. 97-88 | Sample No. 21

Depth El 40-42 ft | Date 2/28/98

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

Project: Greens Bayou

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-95-D-0007 Delivery Order No. 0047

Boring No. 97-88

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
1	0 - 2			Clayey Sand,w/grass roots,Gray	S C	14.3											
2	2 - 4	0.50		Sandy Clay,Medium stiff,Dark gray	C L	14.8											
3	4 - 6	4.5+		Sandy Clay,w/fer nod & sand seams,Hard, Gray & Yellowish gray	C L	11.8											
4	6 - 8	4.5+		Sandy Clay,w/fer nod & sand seams,Hard, Gray & Yellowish gray	C L	8.0											
5	8 - 10	1.50		Sandy Clay,w/fer nod & sand seams,Stiff, Gray & Yellowish gray	C L	17.7	105.6	124.3	27.0	17.0	99.8	99.6	99.5	96.6	77.1		1.23
6	10 - 12	1.25		Sandy Clay,w/fer nod & sand seams,Stiff, Gray & Yellowish gray	C L	19.6											
7	12 - 14	3.50		Sandy Clay,w/calc nod & sand seams,Very stiff,Gray & Yellowish gray	C L	21.8											
8	14 - 16	3.75		Sandy Clay,w/calc nod & sand seams,Very stiff,Gray & Yellowish gray	C L	19.8											
9	16 - 18	3.50		Clay,w/fer stains,slks,Very stiff,Red & Gray	C H	22.3											
10	18 - 20	3.50		Clay,w/fer stains,slks,Very stiff,Red & Gray	C H	21.5	98.8	120.1	52.0	23.0							
11	20-21		n	Silty Sand,Red ? Medium Dense	S M	—	—	—									
11A	21-22	3.50		Clay,w/fer stains,slks,Very stiff,Red	C H	32.2											
12	22-24	4.5+		Clay,w/fer stains,slks,Hard,Red	C H	29.5	92.5	119.7	74.0	30.0	99.9	99.4	99.2	94.1	92.3		4.15
13	24-26	4.5+		Clay,w/fer stains,slks,Hard,Red	C H	21.8											
14A	26-27			Sandy Silt,w/silt stone,Red Medium Dense	M L												
14	27-28	3.50		Clay,w/silt stone & fer stains,slks,Very stiff, Red	C H	25.3											
15	28-30			Sandy Silt,Medium dense,Red	M L												
16	30-31.5		23	Sandy Silt,Medium dense,Red	M L												
17	32-34	3.75		Clay,w/calc nod & fer stains,slks,Very stiff, Red	C H	25.6											
18	34-36	4.25		Clay,w/calc nod & fer stains,slks,Hard,Red	C H	26.1											

10

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

Project: Greens Bayou

SUMMARY OF LABORATORY TEST RESULTS

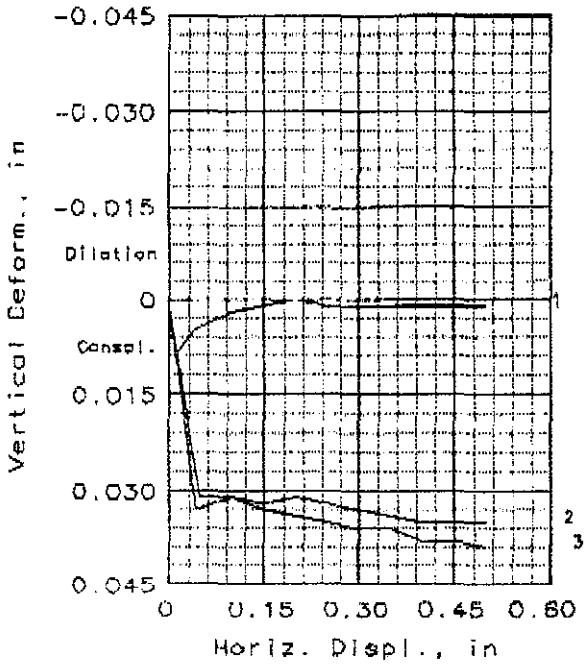
Contract No. DACW64-95-D-0007 Delivery Order No. 0047

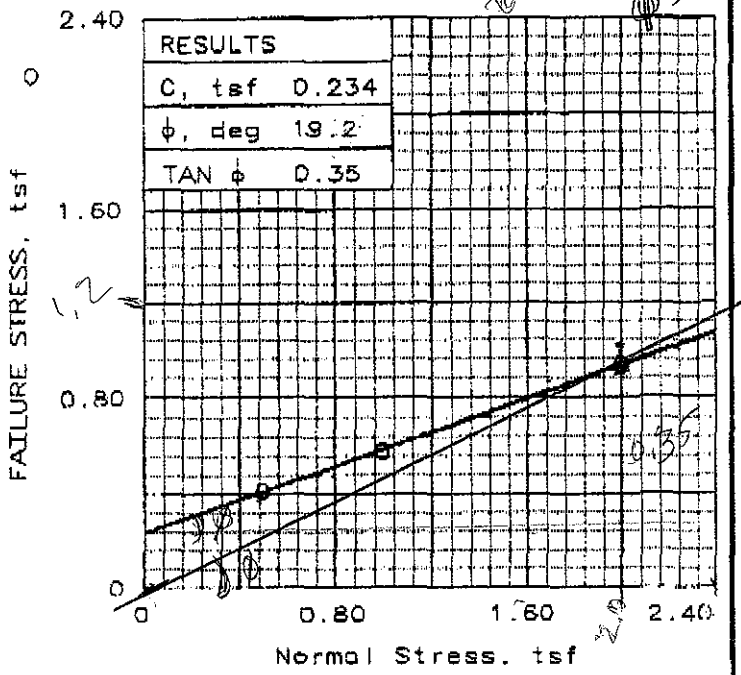
Boring No. 97-88

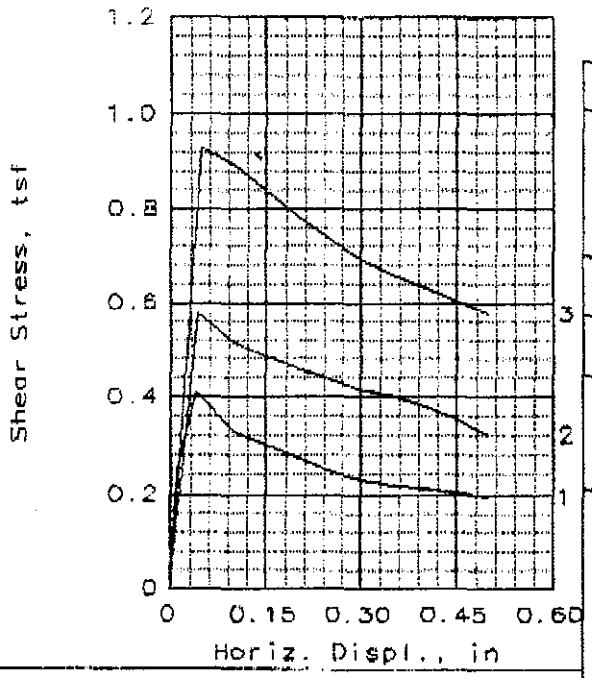
S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
19	36-38	3.50		Clay,w/calc nod & fer stains,slks,Very stiff, Red	C H	30.4	93.4	121.8	52.0	23.0							
20	38-40	4.25		Clay,w/calc nod & fer stains,slks,Hard,Red	C H	30.2											
21	40-42	1.00		Sandy Clay,Stiff,Yellowish gray	C L	17.7	111.3	131.0	27.0	16.0	100.0	100.0	99.9	94.4	63.8		1.16
22	42-44	3.50		Sandy Clay,w/fer stains & sand seams,Very stiff,Red & Gray	C L	19.2											
23	44-46	1.75		Sandy Clay,w/fer stains & sand seams,Stiff, Red & Gray	C L	18.0											
24	46-48			Sandy Silt,Medium dense,Red	M L	18.6											
25	48-49.5		24	Sandy Silt,Medium dense,Red	M L												
26	49.5-51		30	Sandy Silt,Medium dense,Red	M L												

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

adjusted tan = sin/cos







SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	21.2	21.3	22.0
	VOID RATIO	0.568	0.573	0.576
	SATURATION, %	100.7	100.3	103.0
	DRY DENSITY, pcf	107.5	107.2	106.9
VOID RATIO AFTER CONSOLIDATION		0.5536	0.5312	0.5330
TIME FOR 50% CONSOLIDATION		0	0	0
FINAL	WATER CONTENT, %	23.2	23.7	23.6
	VOID RATIO	0.552	0.481	0.477
	SATURATION, %	113.5	133.2	133.8
NORMAL STRESS, tsf		0.500	1.000	2.000
FAILURE STRESS, tsf		0.411	0.577	0.931
ACTUAL TIME TO FAILURE, MIN		235	247	282
RATE OF STRAIN, in/MIN		0.000	0.000	0.000
ULTIMATE STRESS, tsf				

CONTROLLED STRAIN

TYPE OF SPECIMEN UNDISTURBED | 2.500 in DIA. | 1.097 in THICK

DESCRIPTION CLAY (CL), REDDISH BROWN; WITH SAND

LL= 46 | PL= 18 | PI= 28 | Gs= 2.7

REMARKS

PROJECT GREENS BAYOU

AREA

BORING NO. 97-86 SAMPLE NO. 8

DEPTH/ELEV 14-16 DATE: 27 APR 98

DIRECT SHEAR TEST REPORT

DEPARTMENT OF THE ARMY, WATERWAYS EXPERIMENT STATION - VICKSBURG, MISSISSIPPI
Work O No. 0998
Requisition No.