JOB NO. 114008614 DATE 3/10/98

PROJECT Greens Bayou

AREA Houston, Texas

BORING NO. 97-73 SAMPLE NO. 4 DEPTH 6-8 ft

SPECIMEN NO. 1

CLASSIFICATION
Sandy Clay,w/sand seams,Stiff,Gray & Brown

Tare No.	KL33	Height	5.595 in.
Tare plus Wet Specimen	270.21 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	238.58 gm	Initial Area	6.290 sq in.
Water Weight	31.63 gm	Volume	35.194 cu in.
Tare Weight	42.88 gm	Volume of Solids	cu in.
Wet Specimen	1159.24 gm	Void Ratio	
Dry Specimen	997.95 gm	Saturation	%
Water Content	16.16 %	Dry Density	108.0 lb/cu ft
Specific Gravity of Solids			

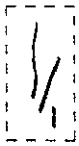
LL = 23 PL = 14 PI = 9

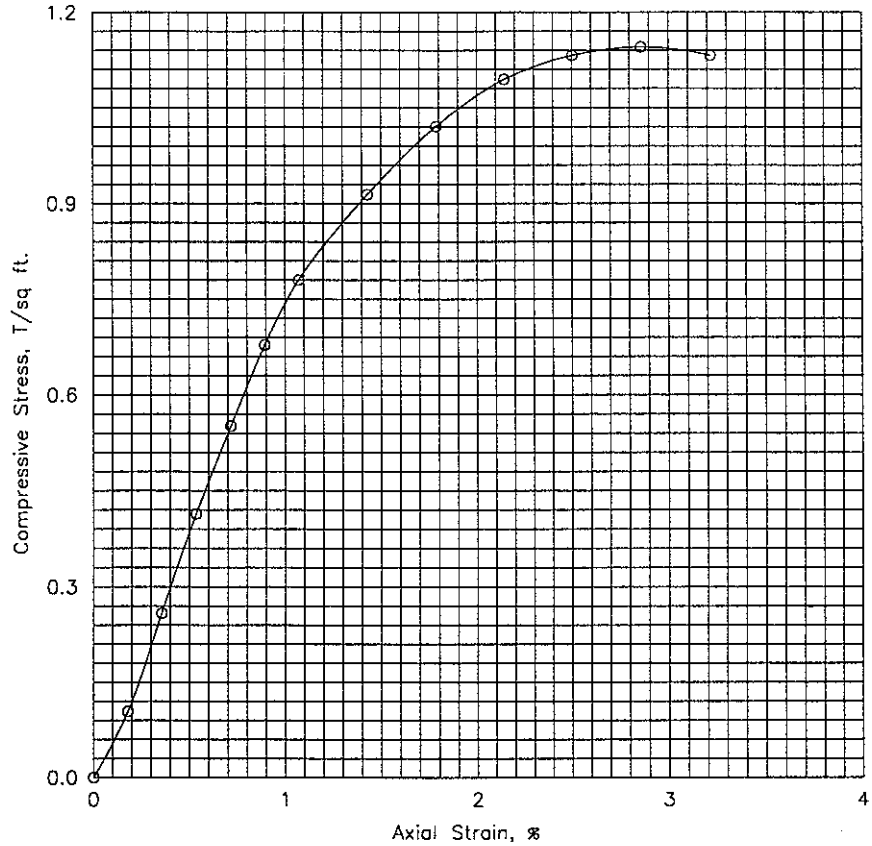
Proving Ring No. 10170
Proving Ring Constant, K = .757 lbs/div.

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	30.0	22.7	.004	6.31	.259
.5	30.	.030	48.0	36.3	.005	6.32	.414
.7	40.	.040	64.0	48.4	.007	6.34	.551
.9	50.	.050	79.0	59.8	.009	6.35	.678
1.1	60.	.060	91.0	68.9	.011	6.36	.780
1.4	80.	.080	107.0	81.0	.014	6.38	.914
1.7	100.	.100	120.0	90.8	.018	6.40	1.021
2.0	120.	.120	129.0	97.7	.021	6.43	1.094
2.3	140.	.140	134.0	101.4	.025	6.45	1.132
2.6	160.	.160	136.0	103.0	.029	6.48	1.145
2.9	180.	.180	135.0	102.2	.032	6.50	1.132

Job No. 114008614

Failure Sketches





☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	16.2 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	108.0			
Time to failure, min		t_f	2.62			
Unconfined compressive strength, T/sq ft		q_u	1.14			
Undrained shear strength, T/sq ft		S_u	.57			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Sandy Clay,w/sand seams,Stiff,Gray & Brown

LL	23	PL	14	PI	9	G_s	

Remarks

Project Greens Bayou

Area Houston, Texas

Boring No. 97-73 | Sample No. 4

Depth El 6-8 ft | Date 3/10/98

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 114008614 DATE 3/10/98

PROJECT Greens Bayou

AREA Houston, Texas

BORING NO. 97-73 SAMPLE NO. 9 DEPTH 16-18 ft

SPECIMEN NO. 1

CLASSIFICATION
Clay,w/calc nod,Hard,Red

Tare No.	HP19	Height	5.595 in.
Tare plus Wet Specimen	231.59 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	191.17 gm	Initial Area	6.290 sq in.
Water Weight	40.42 gm	Volume	35.194 cu in.
Tare Weight	43.16 gm	Volume of Solids	cu in.
Wet Specimen	1129.82 gm	Void Ratio	
Dry Specimen	887.46 gm	Saturation	%
Water Content	27.31 %	Dry Density	96.1 lb/cu ft
Specific Gravity of Solids			

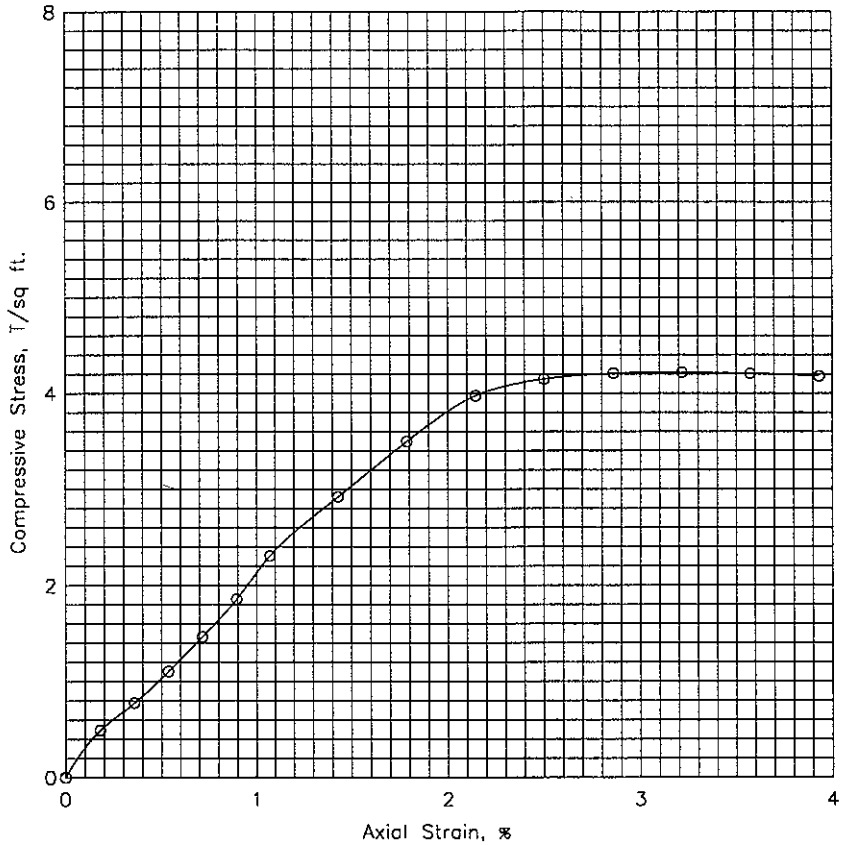
LL = 61 PL = 21 PI = 40

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	57.0	43.1	.002	6.30	.493
.3	20.	.020	90.0	68.1	.004	6.31	.777
.5	30.	.030	128.0	96.9	.005	6.32	1.103
.7	40.	.040	170.0	128.7	.007	6.34	1.463
.9	50.	.050	216.0	163.5	.009	6.35	1.855
1.0	60.	.060	269.0	203.6	.011	6.36	2.306
1.4	80.	.080	342.0	258.9	.014	6.38	2.921
1.6	100.	.100	411.0	311.1	.018	6.40	3.498
2.0	120.	.120	469.0	355.0	.021	6.43	3.977
2.3	140.	.140	491.0	371.7	.025	6.45	4.148
2.6	160.	.160	500.0	378.5	.029	6.48	4.209
2.9	180.	.180	503.0	380.8	.032	6.50	4.218
3.3	200.	.200	503.5	381.1	.036	6.52	4.207
3.6	220.	.220	502.0	380.0	.039	6.55	4.179

Job No. 114008614

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	27.3 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	96.1			
Time to failure, min		t_f	2.93			
Unconfined compressive strength, T/sq ft		q_u	4.22			
Undrained shear strength, T/sq ft		S_u	2.11			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Clay,w/calc nod,Hard,Red

LL	61	PL	21	PI	40	G_s	

Remarks

Project Greens Bayou

Area Houston, Texas

Boring No. 97-73 | Sample No. 9

Depth El 16-18 ft | Date 3/10/98

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 114008614 DATE 3/10/98

PROJECT Greens Bayou

AREA Houston, Texas

BORING NO. 97-73 SAMPLE NO. 18 DEPTH 34-36 ft

SPECIMEN NO. 1

CLASSIFICATION
Clay,w/calc nod,Hard,Red & Gray

Tare No.	KL24	Height	5.595 in.
Tare plus Wet Specimen	253.07 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	209.23 gm	Initial Area	6.290 sq in.
Water Weight	43.84 gm	Volume	35.194 cu in.
Tare Weight	44.30 gm	Volume of Solids	cu in.
Wet Specimen	1140.86 gm	Void Ratio	
Dry Specimen	901.29 gm	Saturation	%
Water Content	26.58 %	Dry Density	97.6 lb/cu ft
Specific Gravity of Solids			

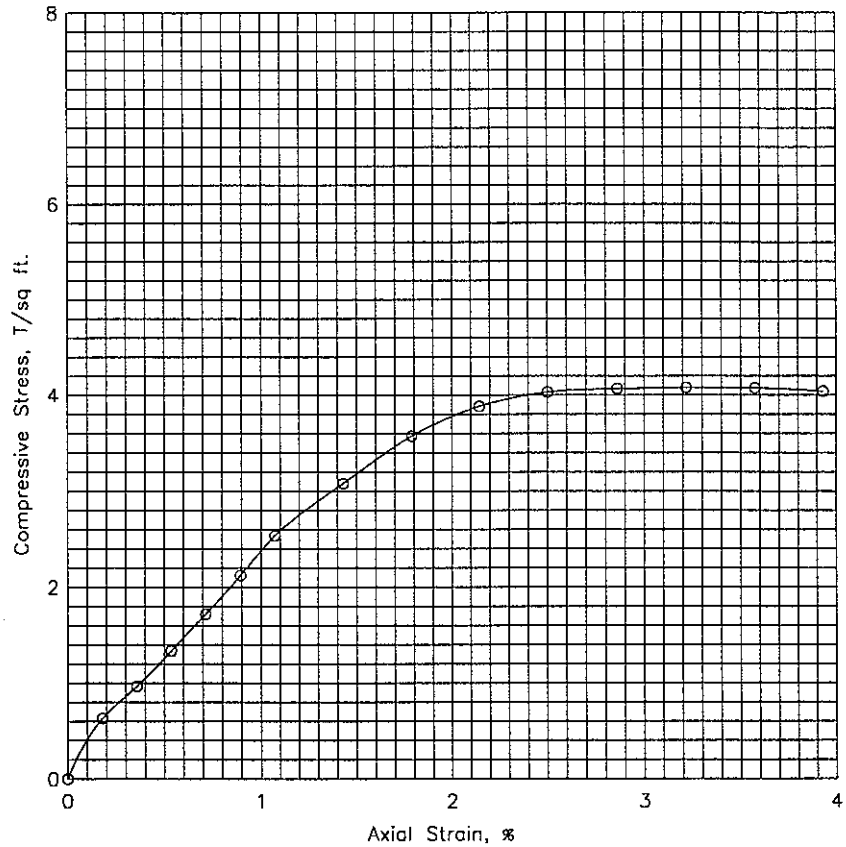
LL = 64 PL = 22 PI = 42

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	73.0	55.3	.002	6.30	.631
.4	20.	.020	112.0	84.8	.004	6.31	.967
.5	30.	.030	155.0	117.3	.005	6.32	1.336
.7	40.	.040	200.0	151.4	.007	6.34	1.721
.9	50.	.050	247.0	187.0	.009	6.35	2.121
1.0	60.	.060	296.0	224.1	.011	6.36	2.537
1.4	80.	.080	361.0	273.3	.014	6.38	3.083
1.7	100.	.100	420.0	317.9	.018	6.40	3.574
2.0	120.	.120	458.0	346.7	.021	6.43	3.883
2.3	140.	.140	477.0	361.1	.025	6.45	4.030
2.6	160.	.160	483.0	365.6	.029	6.48	4.065
2.9	180.	.180	486.0	367.9	.032	6.50	4.076
3.3	200.	.200	487.5	369.0	.036	6.52	4.073
3.6	220.	.220	485.0	367.1	.039	6.55	4.037

Job No. 114008614

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	26.6 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	97.6			
Time to failure, min		t_f	2.93			
Unconfined compressive strength, T/sq ft		q_u	4.08			
Undrained shear strength, T/sq ft		S_u	2.04			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Clay,w/calc nod,Hard,Red & Gray

LL	64	PL	22	PI	42	G_s	

Remarks

Project Greens Bayou

Area Houston, Texas

Boring No. 97-73 | Sample No. 18

Depth El 34-36 ft | Date 3/10/98

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

Project: Greens Bayou

SU[illegible] OF LABORATORY TEST RESULTS

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

Boring No. 97-73

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)
21	40-42	4.5+		Clay,w/silt poc,Hard,Red & Gray	C H	18.8											
22	42-44	3.00		Sandy Clay,Very stiff,Yellowish gray	C L	16.8											
23	44-46	4.00		Sandy Clay,w/calc nod,Very stiff,Yellowish gray	C L	16.4											
24	46-48	4.5+		Sandy Clay,w/calc nod,Hard,Yellowish gray	C L	16.0											
25	48-50	4.5+		Clay,w/fer nod,Hard,Gray & Brown	C H	17.0											

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

SHEAR STRENGTH PARAMETERS

MAXIMUM

ϕ = _____

TAN ϕ = _____

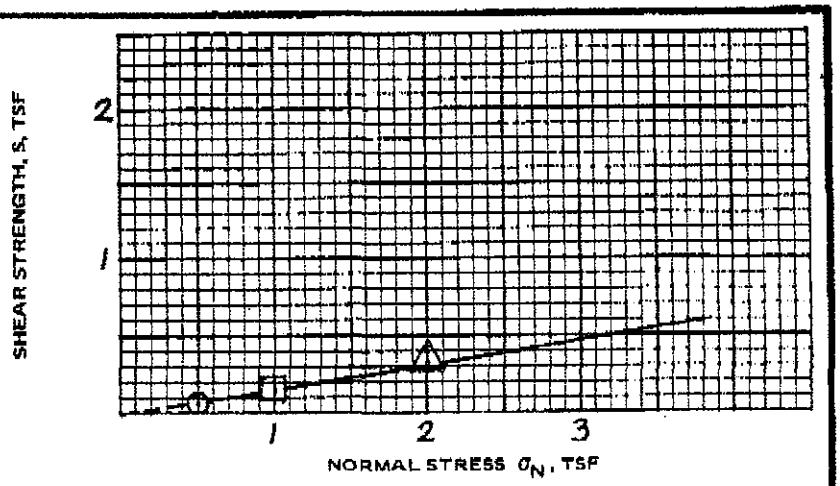
C = _____ TSF

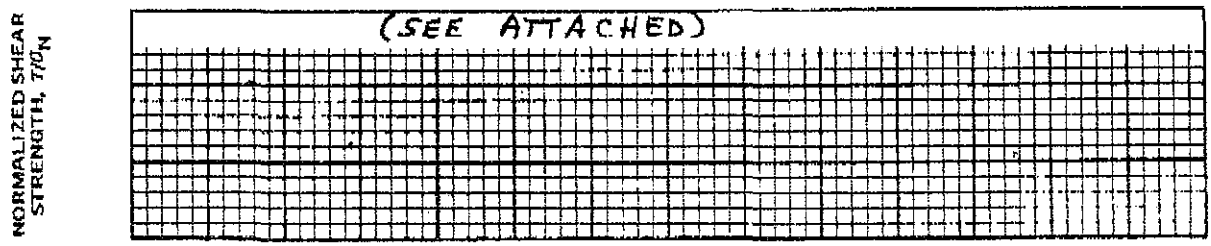
RESIDUAL

ϕ = 9.0 DEG.

TAN ϕ = 0.16

C = 0.0 TSF





RUN NUMBER	INITIAL CONDITION OF SPECIMEN(S)				FINAL WATER CONTENT %	NORMAL STRESS TSF	MAXIMUM SHEAR STRESS TSF	RESIDUAL SHEAR STRESS TSF	
	WATER CONTENT %	DRY DENSITY PCF	VOID RATIO	SAT-URATION %					
1	20.7	106.4	0.58	95.8	24.2	0.5 ⊙		0.07	
2						1.0 ⊡		0.14	
3						2.0 △		0.32	

LL	PL	PI	GS	SPECIMEN	SHEAR PLANE
30	16	14	2.7 (EST.)	UNDISTURBED	

DESCRIPTION OF SPECIMEN(S) BEFORE TEST CLAY (CL), REDDISH BROWN; WITH SAND

DESCRIPTION OF SPECIMEN(S) AFTER TEST _____

REMARKS _____

PROJECT GREENS BAYOU

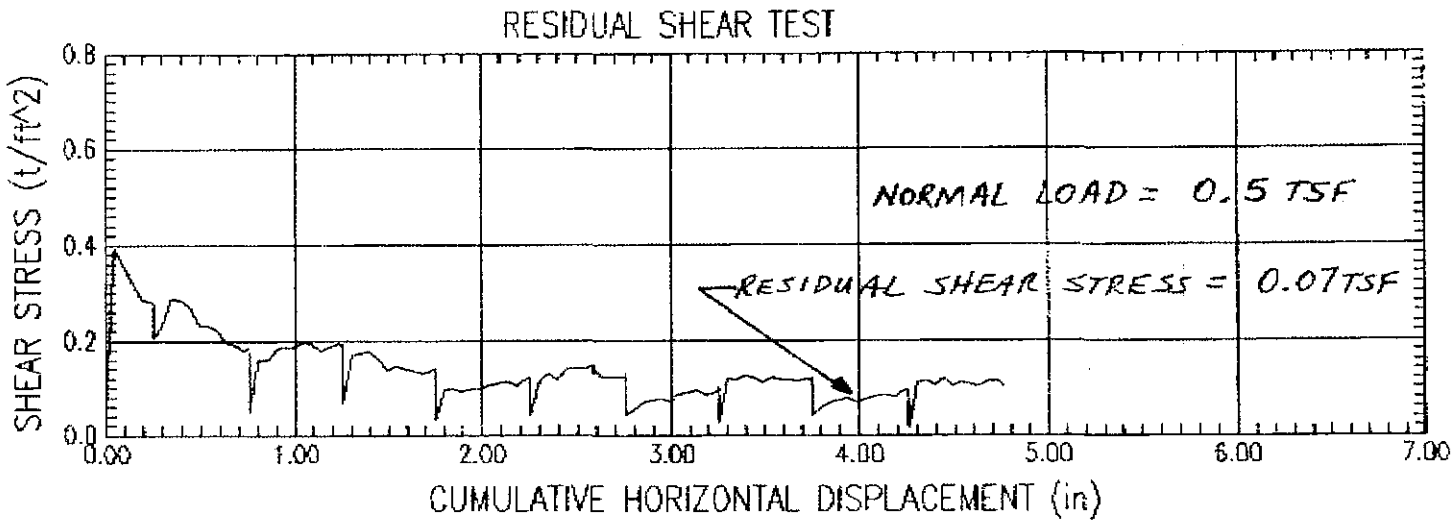
AREA

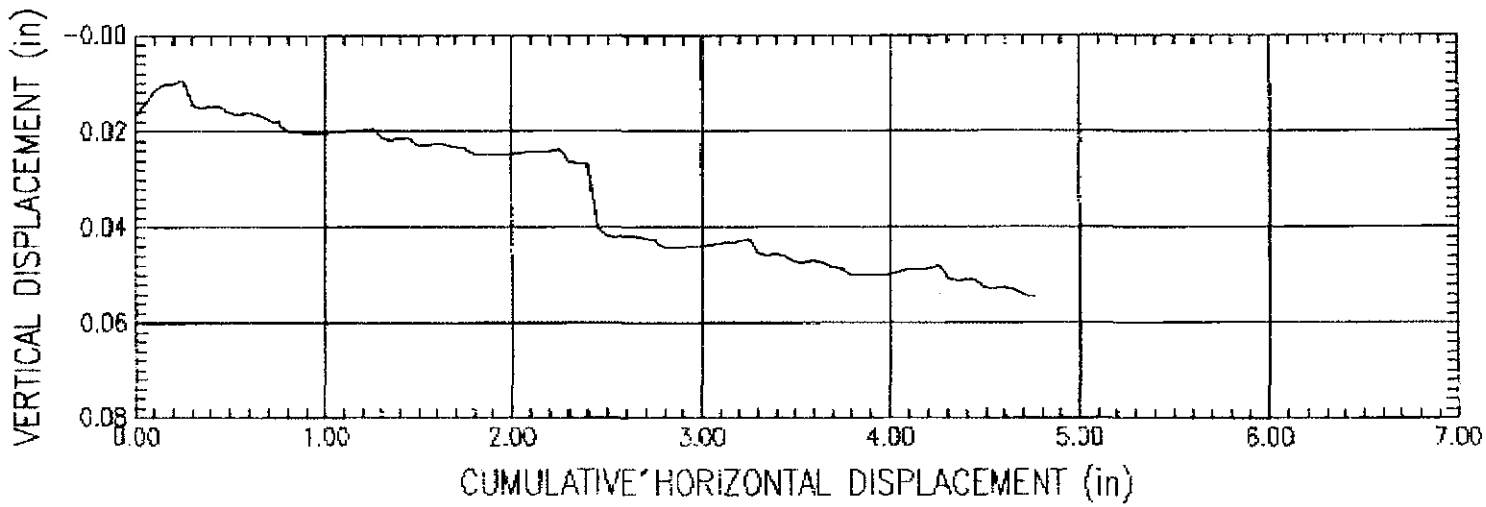
BORING NO. 97-73 SAMPLE NO. 13

DEPTH EL 24-26 DATE 02 APR 98

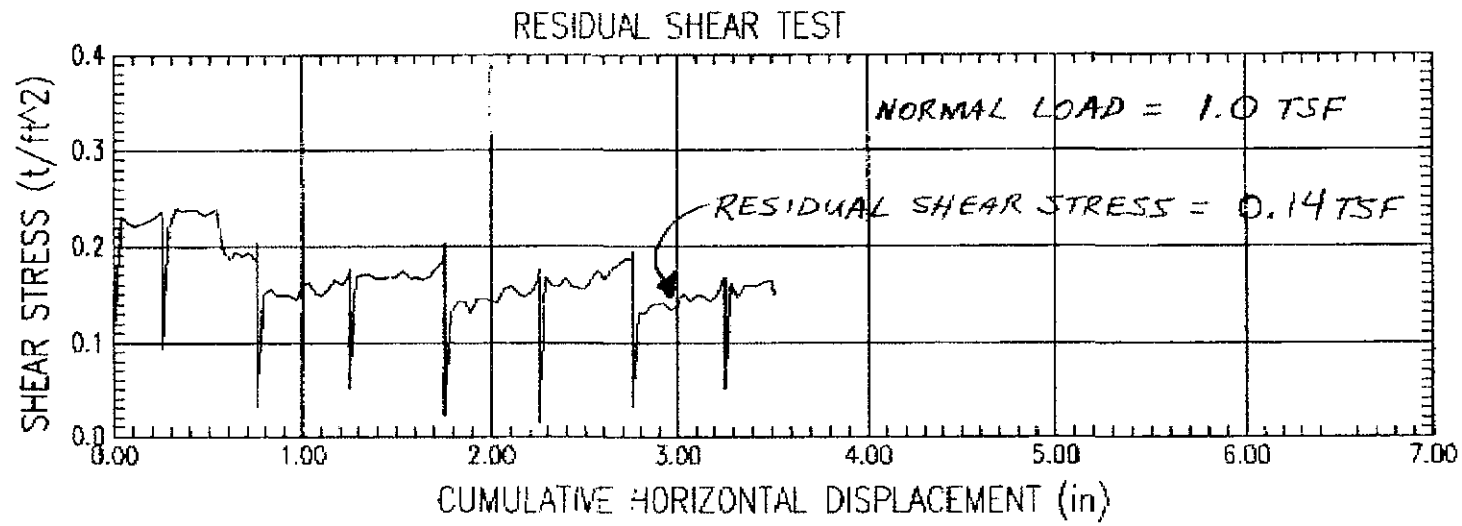
REPEATED DIRECT SHEAR TEST REPORT

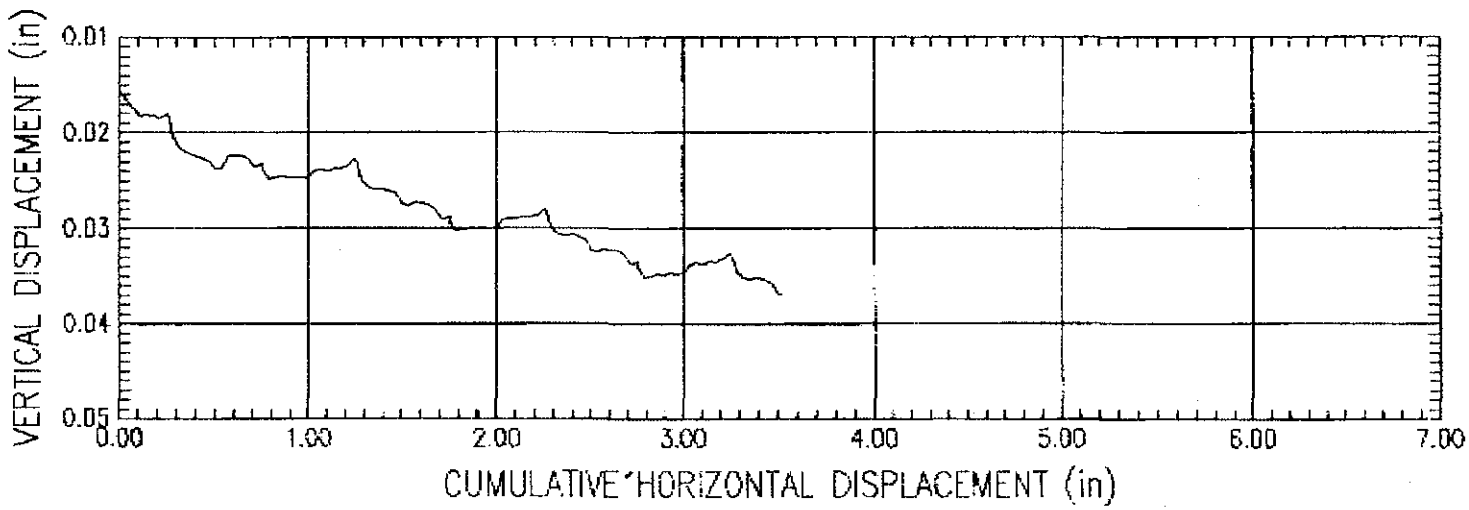
WES FORM 1 APR 75 2133



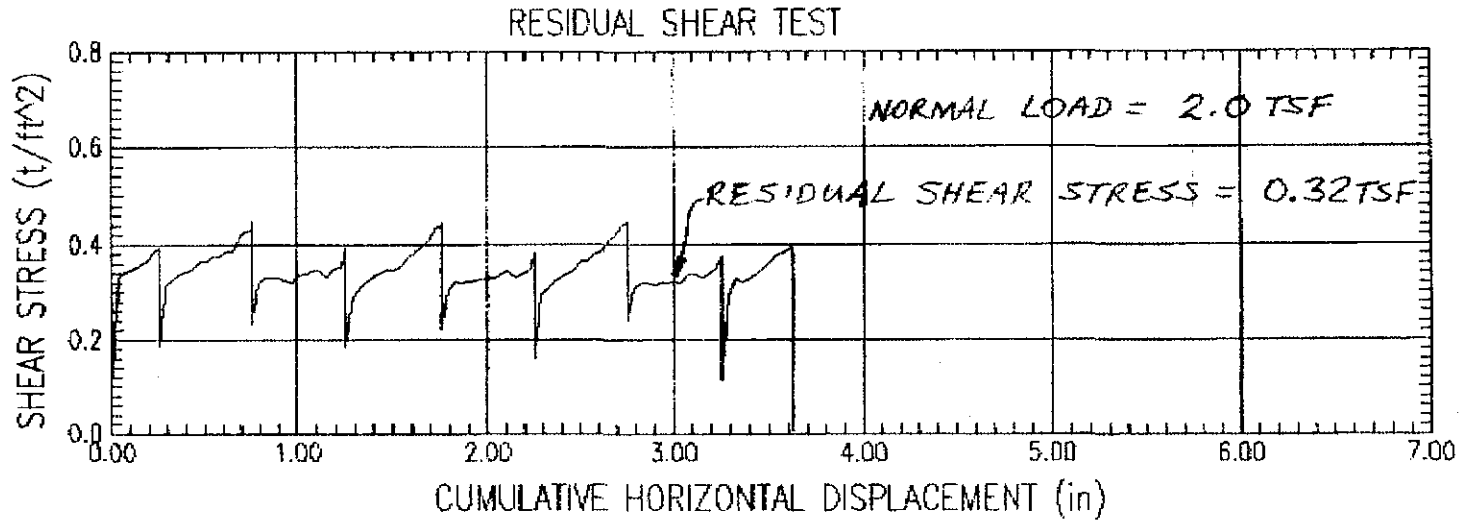


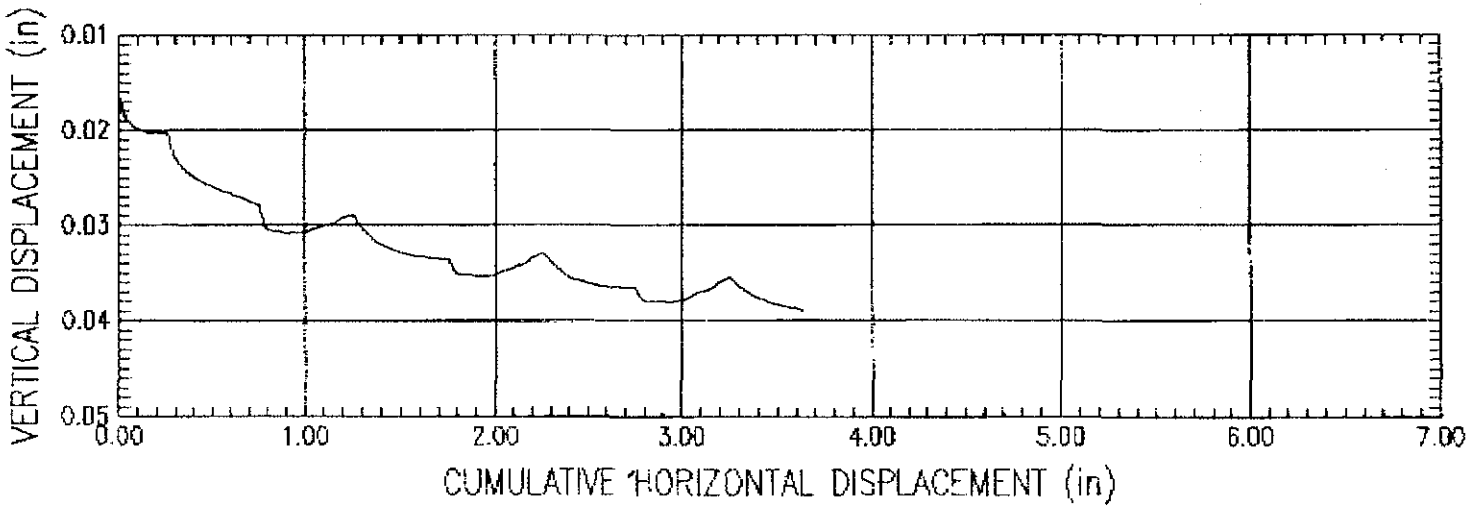
Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND



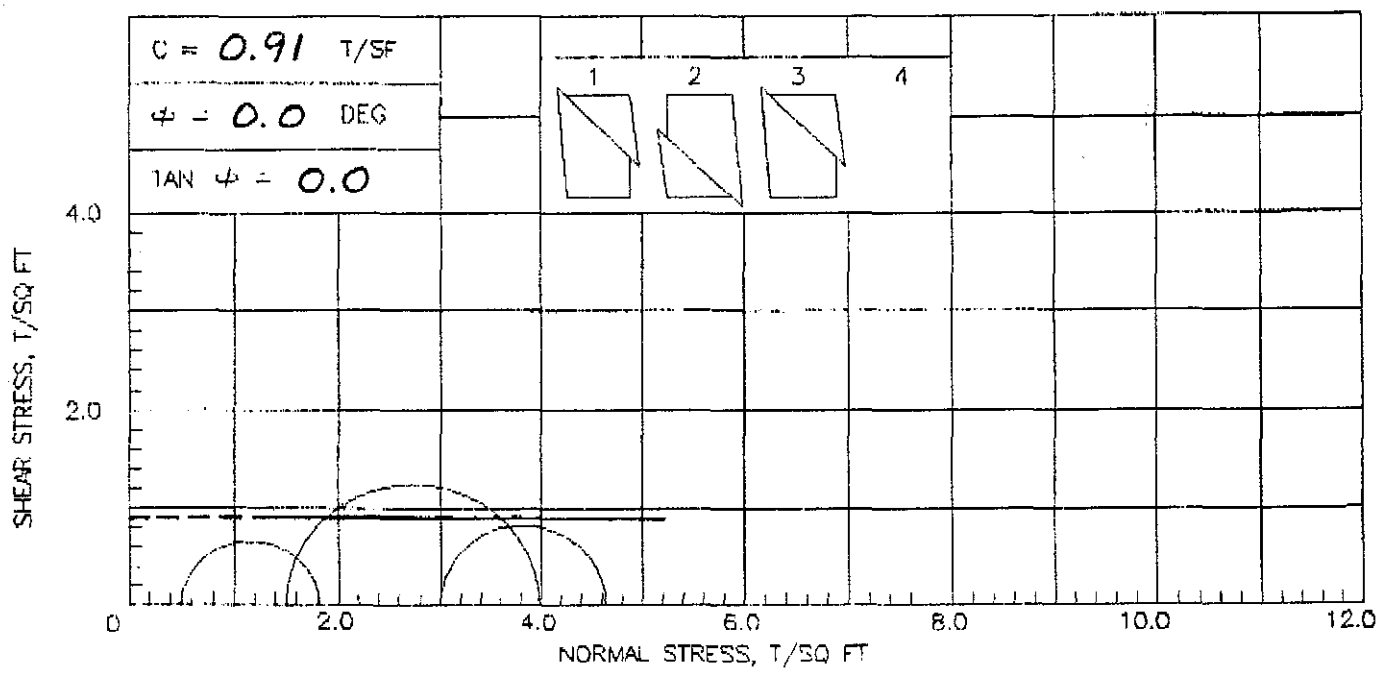


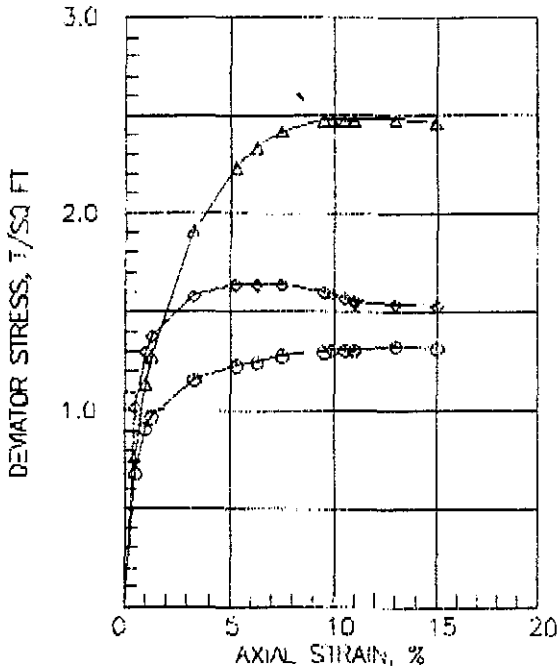
Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND





Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND





SPECIMEN NO.		○ 1	△ 2	◇ 3	4
INITIAL	WATER CONTENT, %	25.5	20.0	26.0	
	DRY DENSITY, PCF	100.4	109.1	100.1	
	SATURATION, %	100+	99.2	100+	
	VOID RATIO	.678	.544	.684	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESSURE, TSF				
CHAMBER PRESSURE, TSF		.50	1.50	3.00	
MAX. DEV. STRESS, TSF		1.31	2.48	1.64	
TIME TO FAILURE, MIN.		20	23	13	
STRAIN RATE INCR., %					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CH), BROWN

LL	PL	PI	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:

VERY ST
3.5 ft

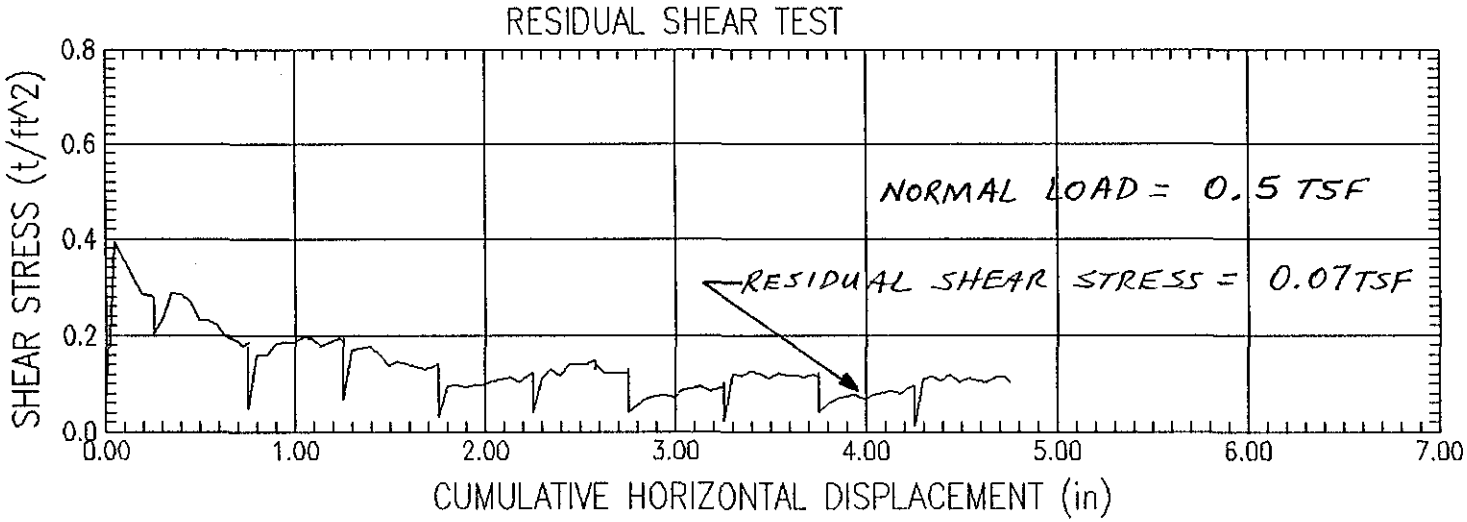
PROJECT GREENS BAYOU

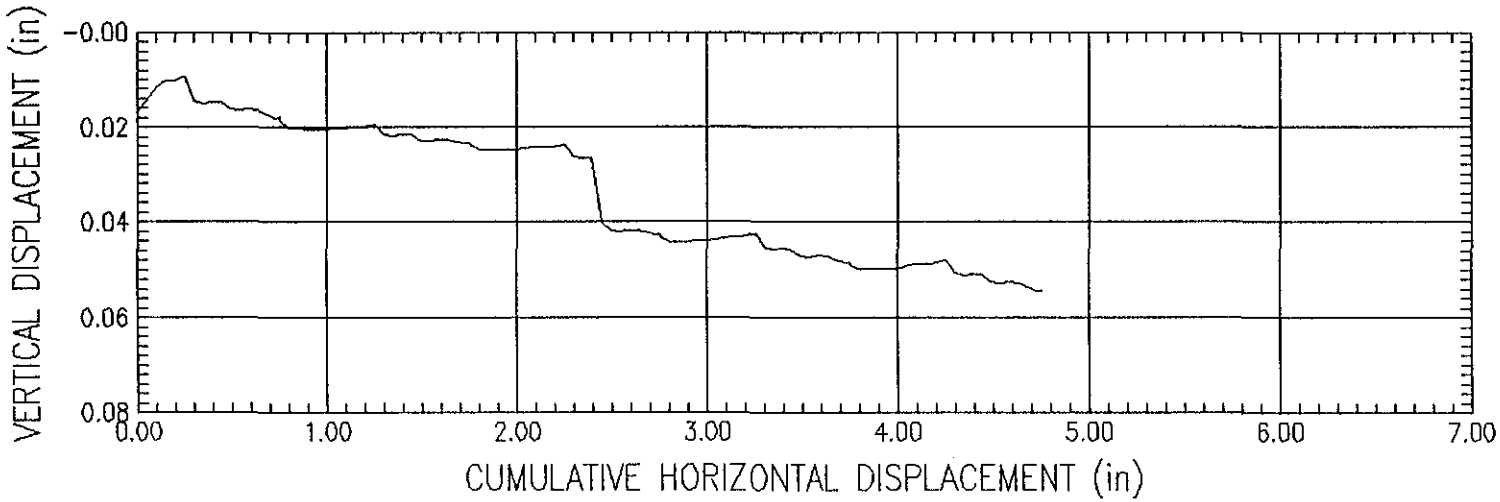
BORING NO. 97-73 SAMPLE NO. 7

DEPTH/ELEV 12-14 TECH. US

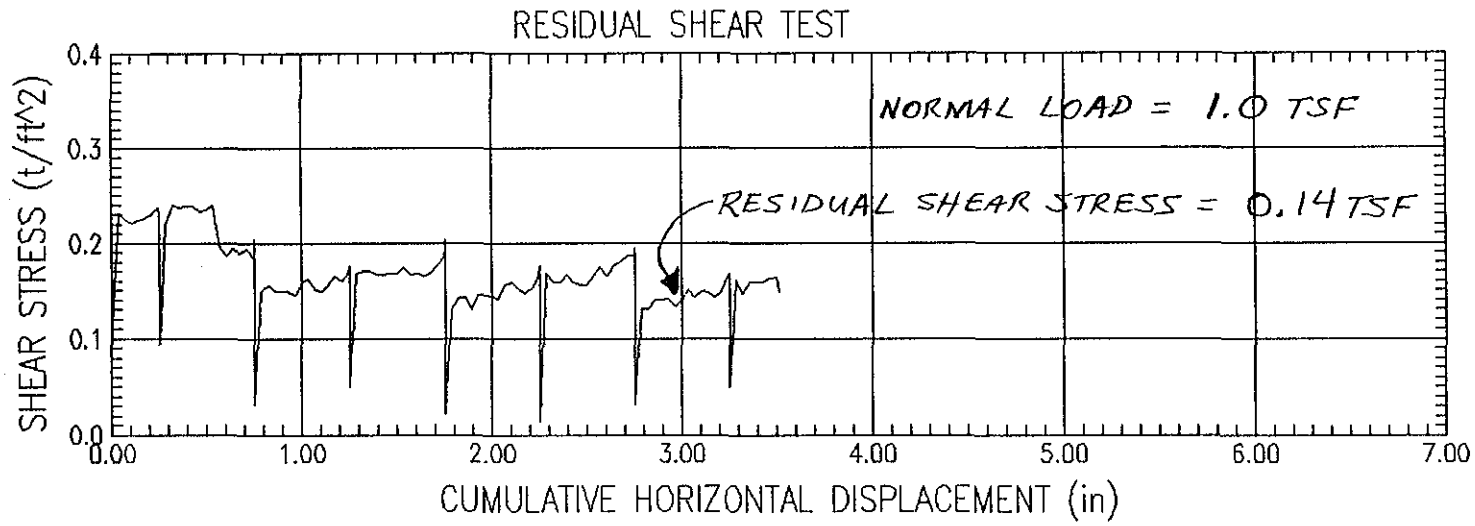
LABORATORY USAE WES - STF/GL DATE 03 APR 98

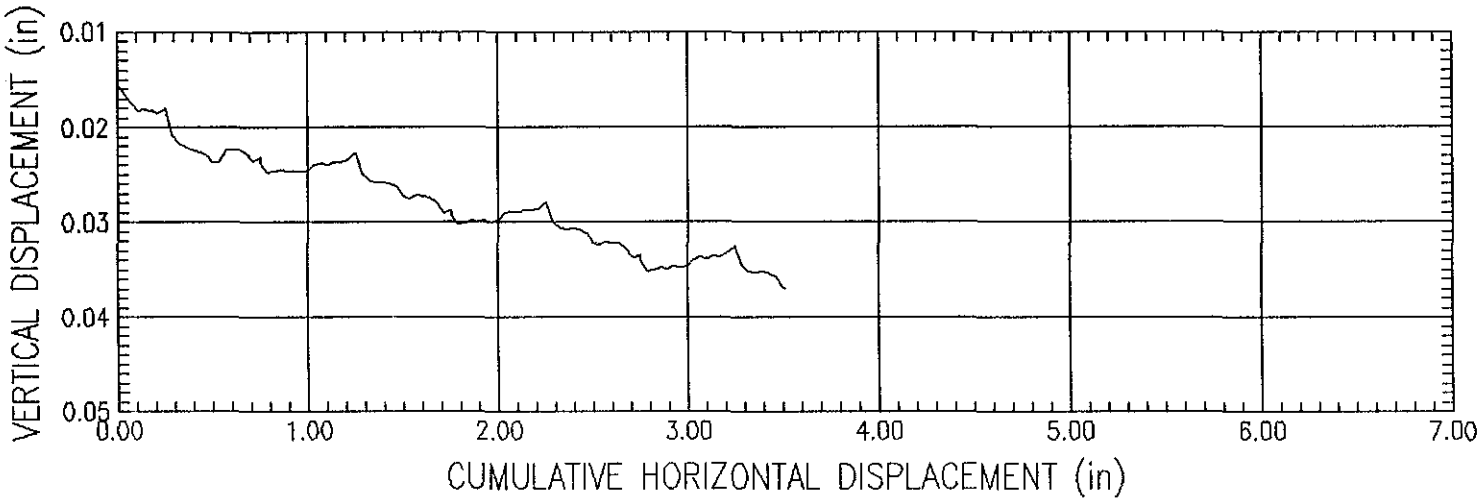
TRIAXIAL COMPRESSION TEST REPORT



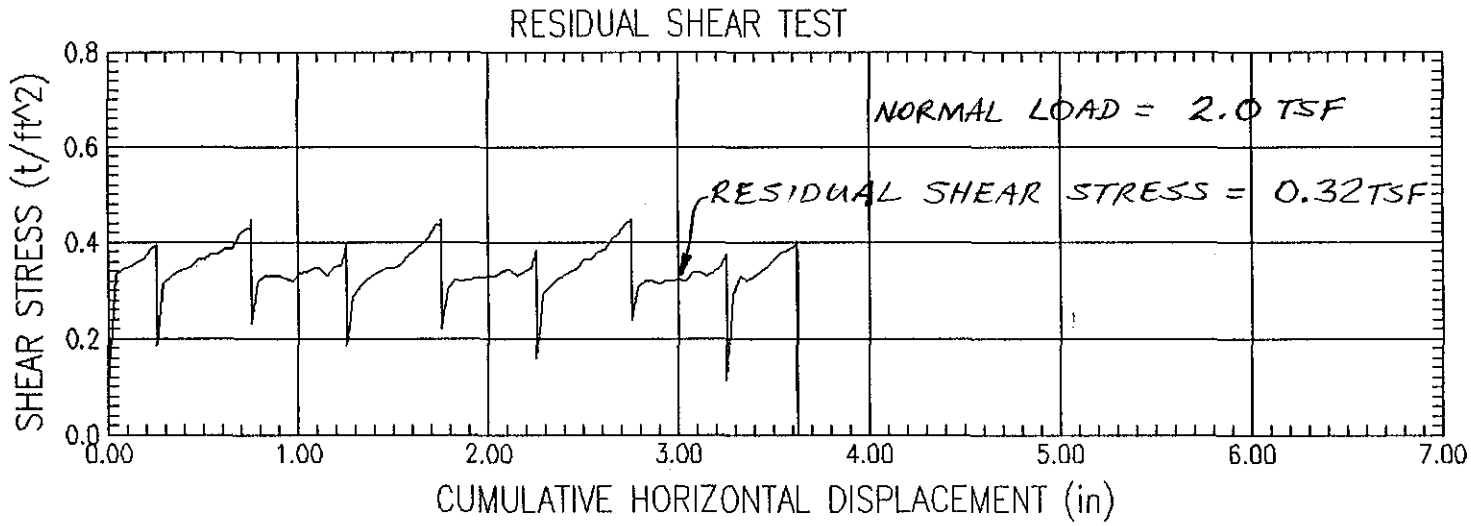


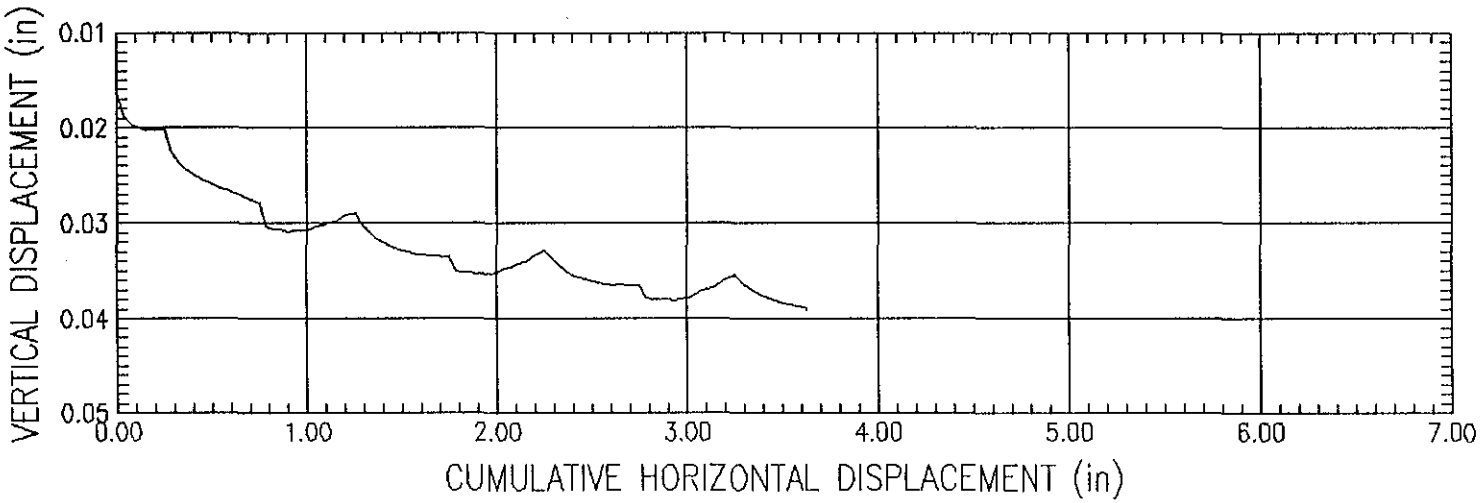
Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND





Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND





Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND

SHEAR STRENGTH PARAMETERS

MAXIMUM

ϕ = _____

TAN ϕ = _____

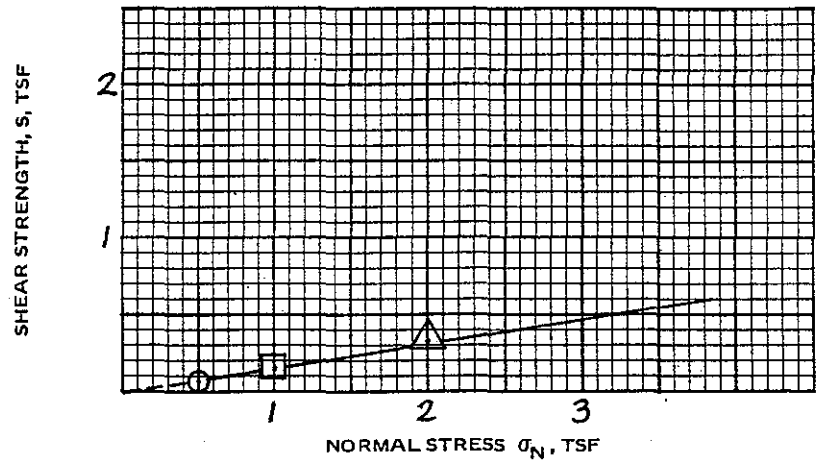
C = _____ TSF

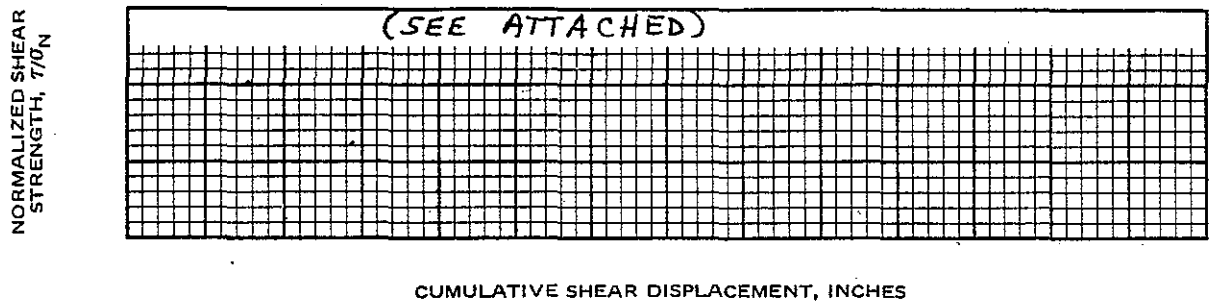
RESIDUAL

ϕ = 9.0 DEG.

TAN ϕ = 0.16

C = 0.0 TSF





RUN NUMBER	INITIAL CONDITION OF SPECIMEN(S)				FINAL WATER CONTENT %	NORMAL STRESS TSF	MAXIMUM SHEAR STRESS TSF	RESIDUAL SHEAR STRESS TSF	
	WATER CONTENT %	DRY DENSITY PCF	VOID RATIO	SAT-URATION %					
1	20.7	106.4	0.58	95.8	24.2	0.5 ⊙		0.07	
2						1.0 ⊡		0.14	
3						2.0 △		0.32	

LL	PL	PI	GS	SPECIMEN	SHEAR PLANE
30	16	14	2.7 (EST.)	UNDISTURBED	

DESCRIPTION OF SPECIMEN(S) BEFORE TEST CLAY (CL), REDDISH BROWN; WITH SAND

DESCRIPTION OF SPECIMEN(S) AFTER TEST _____

REMARKS _____

PROJECT GREENS BAYOU

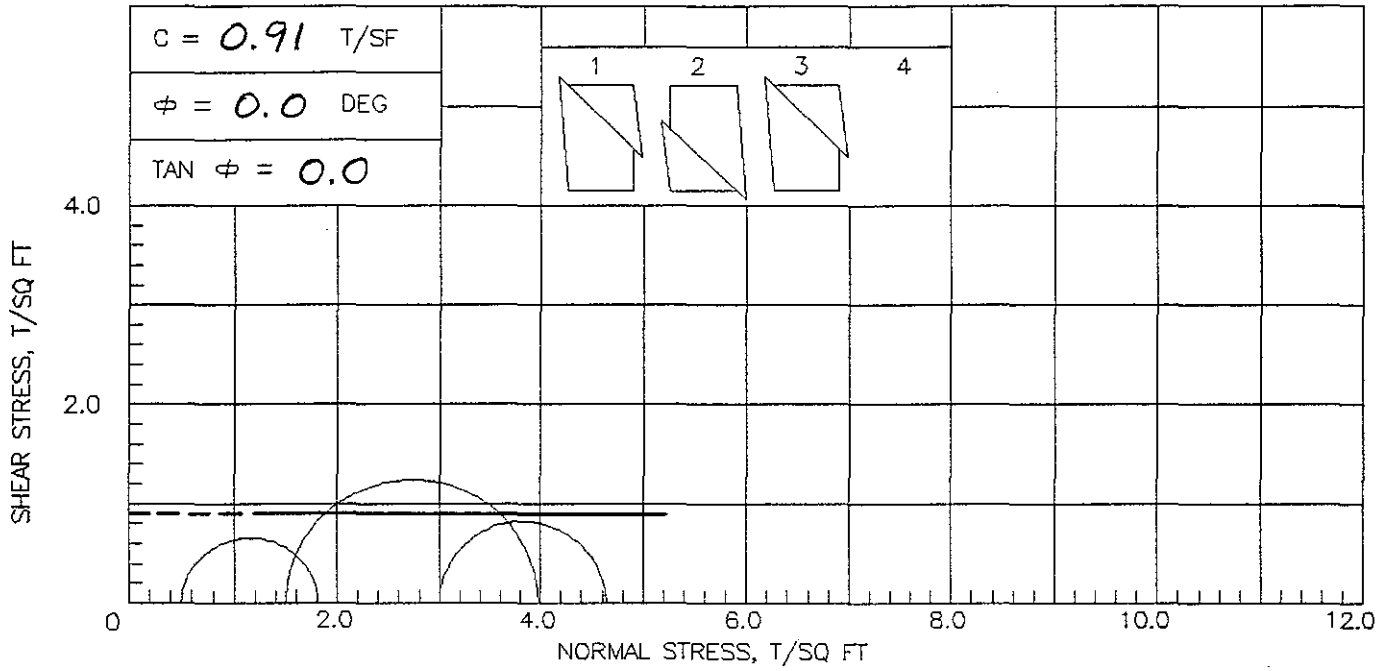
AREA

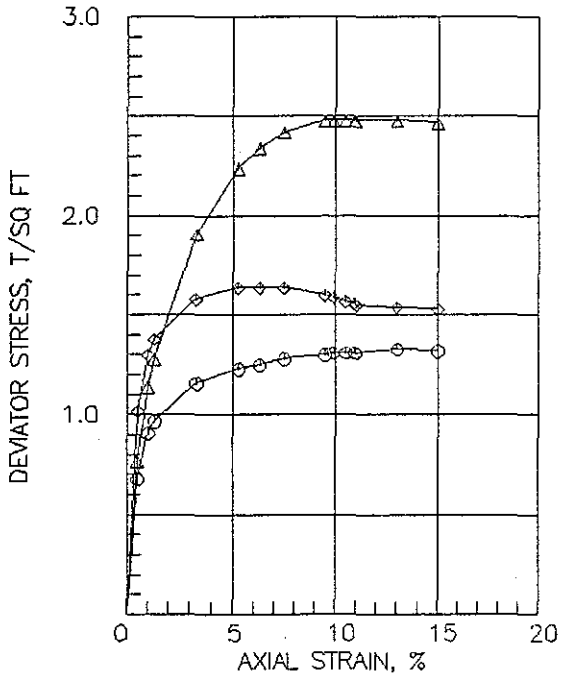
BORING NO. 97-73 SAMPLE NO. 13

DEPTH EL 24-26 DATE 02 APR 98

REPEATED DIRECT SHEAR TEST REPORT

WES FORM 1 APR 78 2133





SPECIMEN NO.		⊙ 1	△ 2	◇ 3	4
INITIAL	WATER CONTENT, %	25.5	20.0	26.0	
	DRY DENSITY, PCF	100.4	109.1	100.1	
	SATURATION, %	100+	99.2	100+	
	VOID RATIO	.678	.544	.684	
BEFORE SHEAR	WATER CONTENT, %				
	DRY DENSITY, PCF				
	SATURATION, %				
	VOID RATIO				
	BACK PRESSURE, TSF				
CHAMBER PRESSURE, TSF		.50	1.50	3.00	
MAX. DEV. STRESS, TSF		1.31	2.48	1.64	
TIME TO FAILURE, MIN.		20	23	13	
STRAIN RATE INCR., %					
INITIAL DIAMETER, IN.		1.40	1.40	1.40	
INITIAL HEIGHT, IN.		3.00	3.00	3.00	

CONTROLLED-STRAIN TEST

DESCRIPTION OF SPECIMENS: CLAY (CH), BROWN; WITH SAND

LL 56	PL 19	PI 37	GS 2.70 (ESTIMATED)	UNDISTURBED SPECIMEN	Q TEST

REMARKS:	PROJECT GREENS BAYOU	
	BORING NO. 97-73	SAMPLE NO. 7
	DEPTH/ELEV 12-14	TECH. US
	LABORATORY USAE WES - STF/GL	DATE 03 APR 98
	TRIAXIAL COMPRESSION TEST REPORT	

SHEAR STRENGTH PARAMETERS

MAXIMUM

ϕ = _____

TAN ϕ = _____

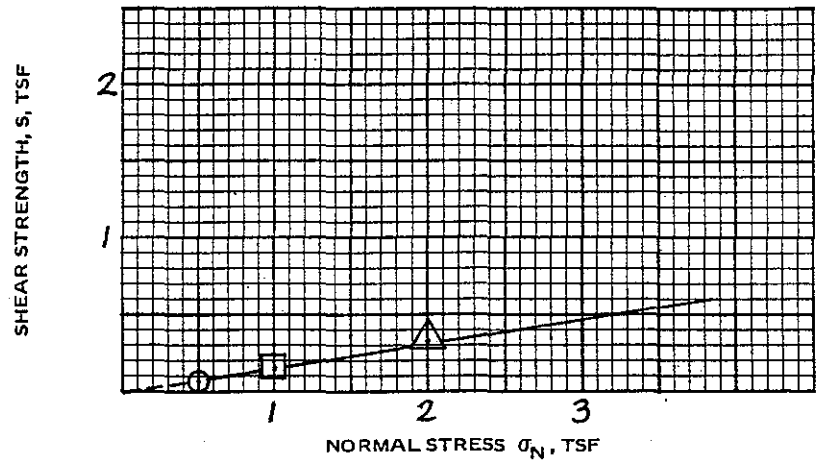
C = _____ TSF

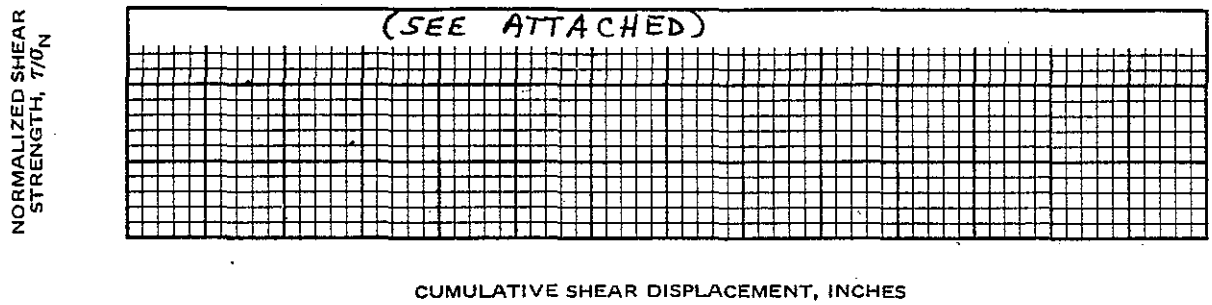
RESIDUAL

ϕ = 9.0 DEG.

TAN ϕ = 0.16

C = 0.0 TSF





RUN NUMBER	INITIAL CONDITION OF SPECIMEN(S)				FINAL WATER CONTENT %	NORMAL STRESS TSF	MAXIMUM SHEAR STRESS TSF	RESIDUAL SHEAR STRESS TSF	
	WATER CONTENT %	DRY DENSITY PCF	VOID RATIO	SAT-URATION %					
1	20.7	106.4	0.58	95.8	24.2	0.5 ⊙		0.07	
2						1.0 ⊡		0.14	
3						2.0 △		0.32	

LL	PL	PI	GS	SPECIMEN	SHEAR PLANE
30	16	14	2.7 (EST.)	UNDISTURBED	

DESCRIPTION OF SPECIMEN(S) BEFORE TEST CLAY (CL), REDDISH BROWN; WITH SAND

DESCRIPTION OF SPECIMEN(S) AFTER TEST _____

REMARKS _____

PROJECT GREENS BAYOU

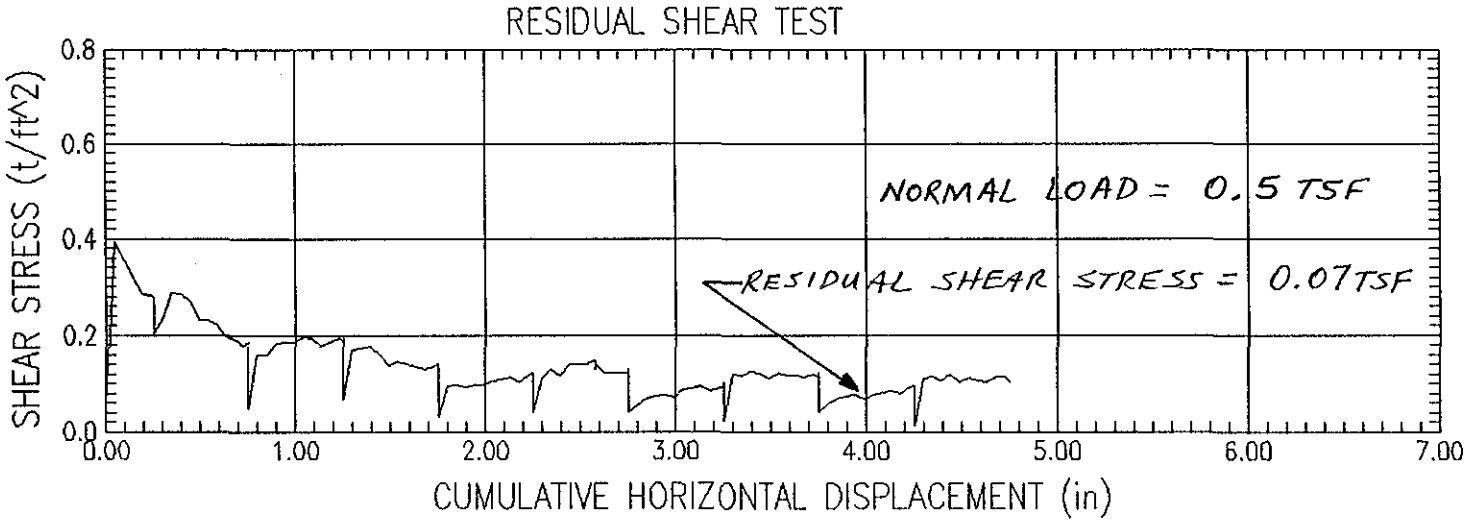
AREA

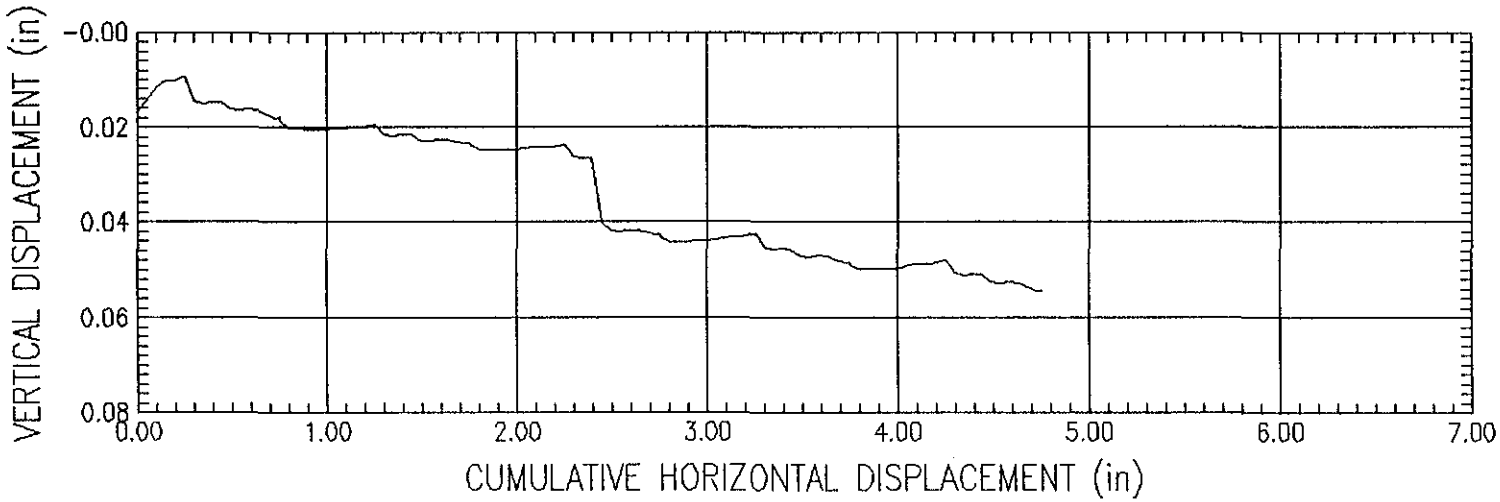
BORING NO. 97-73 SAMPLE NO. 13

DEPTH EL 24-26 DATE 02 APR 98

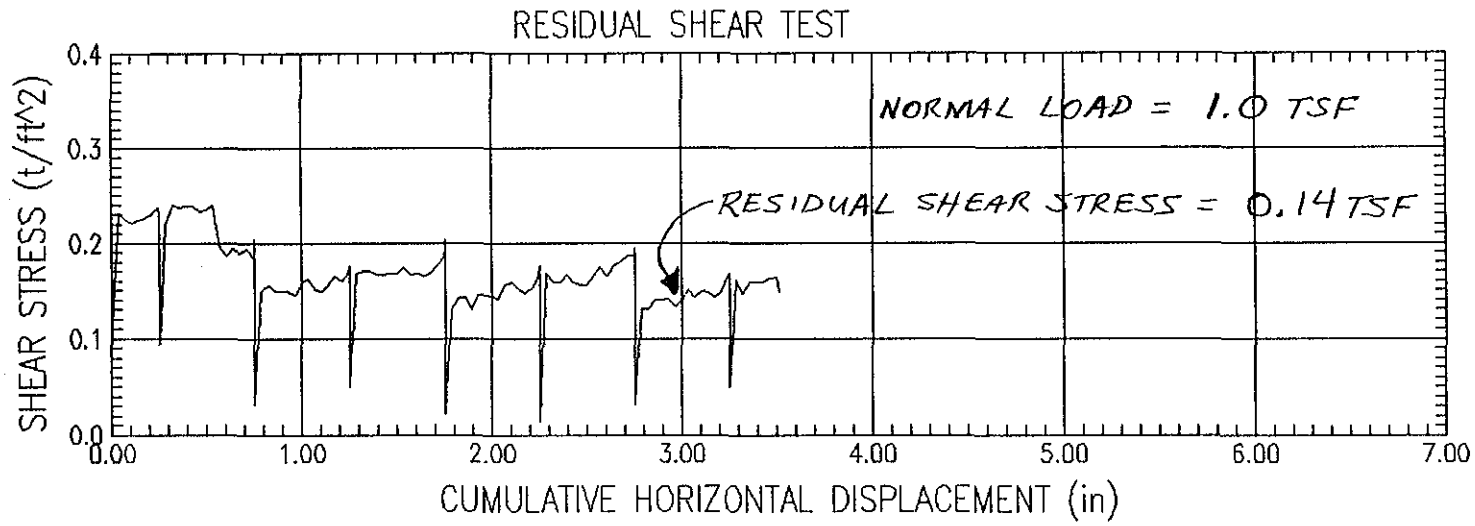
REPEATED DIRECT SHEAR TEST REPORT

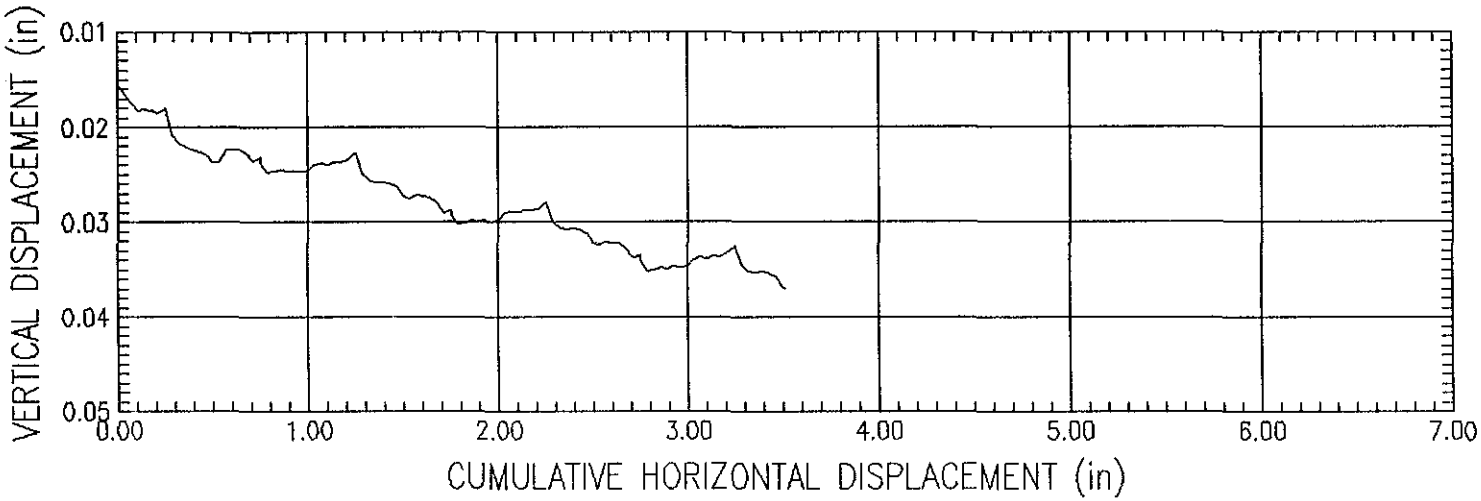
WES FORM 1 APR 78 2133



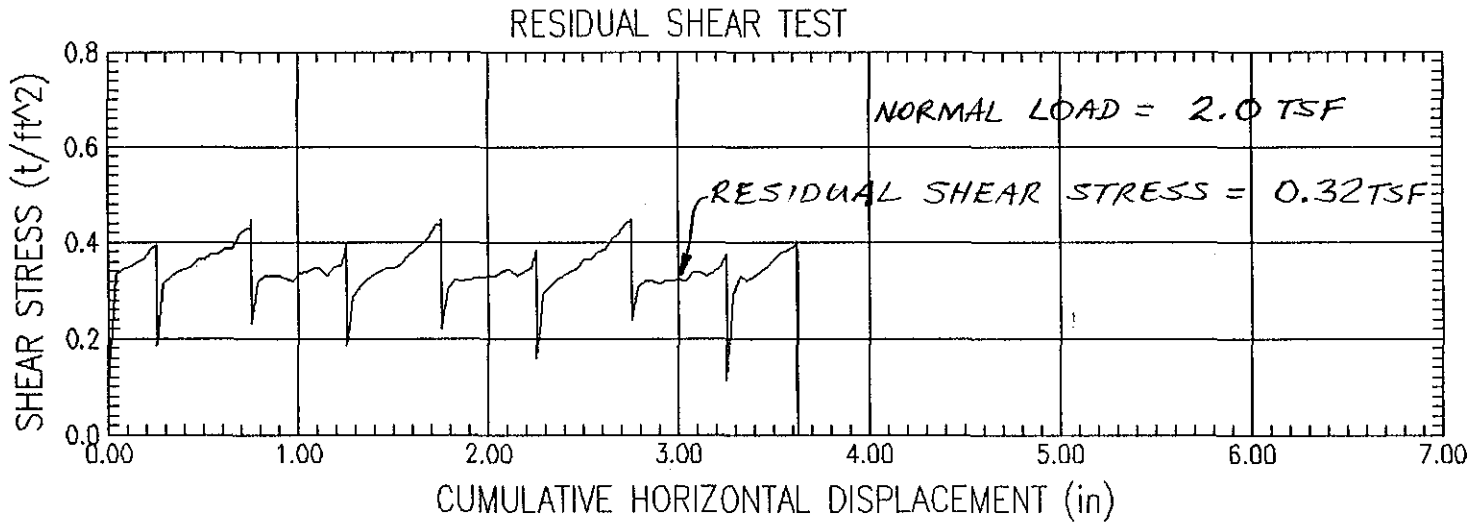


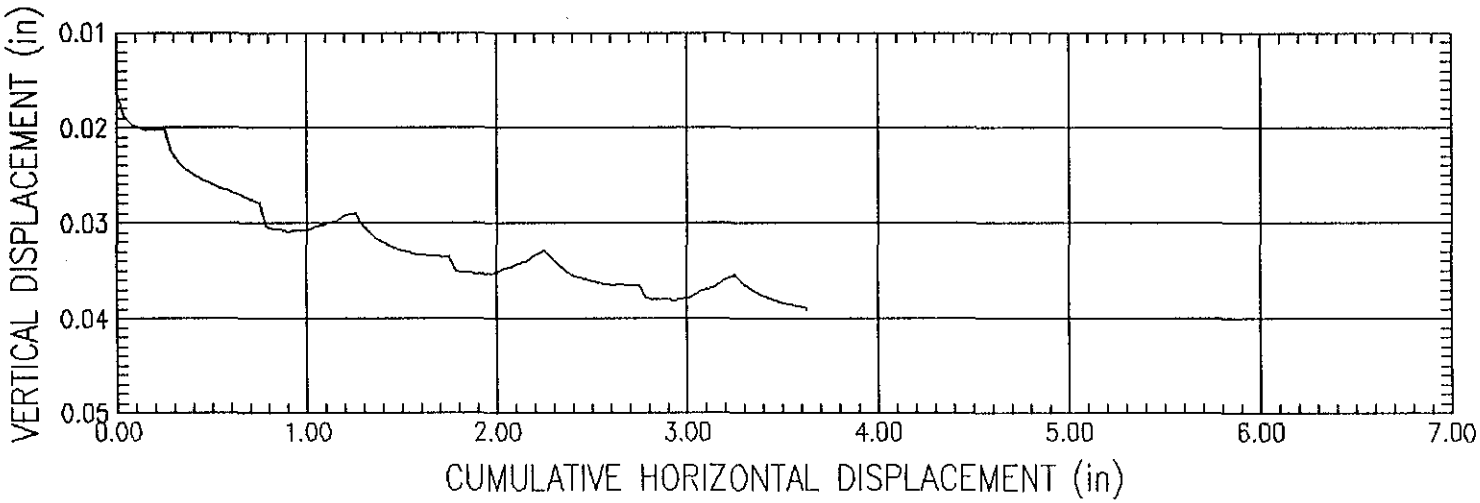
Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND



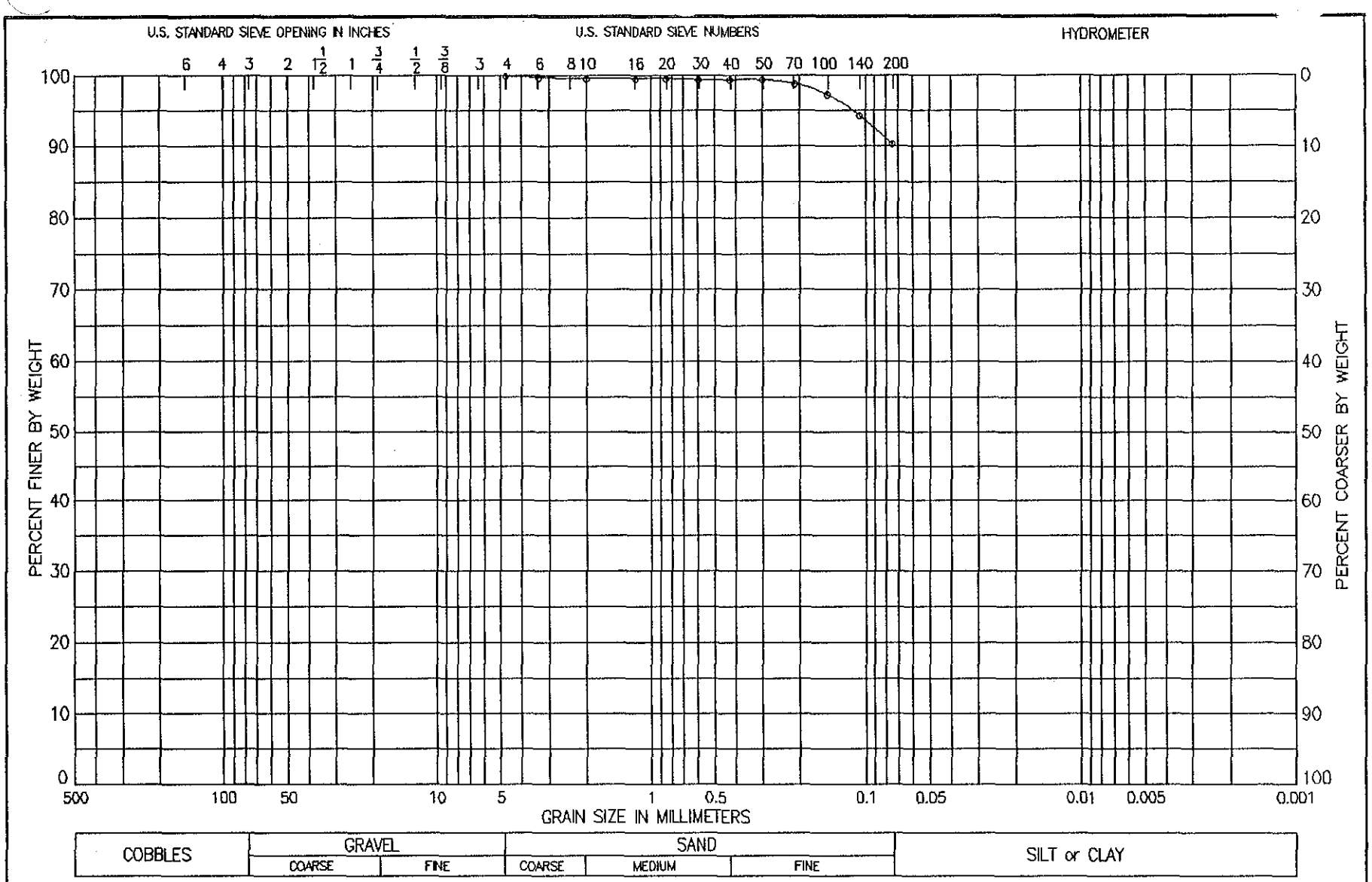


Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND





Project Name : Greens Bayou
Project No : 0998
Test Date : 4/2/98
Boring No : 97-73
Sample No : 13
Test No : 0998a
Depth : 24-26
Description : CLAY (CL), REDDISH BROWN; WITH SAND



LL	PL	PI	GS	NAT W,%	ORG,%
56	19	37			

CLASSIFICATION
CLAY (CH), BROWN; WITH SAND

PROJECT GREENS BAYOU

BORING NO. 97-73 SAMPLE NO. 7

DEPTH/ELEV 12-14 DATE 28 APR 98

GRADATION CURVE

LABORATORY USAE WES - STF/GL

SIEVE ANALYSIS

PROJECT: GREENS BAYOU

BORING: 97-73 SAMPLE: 7 DF: PR0998 .DAT
DEPTH: 12-14 DATE: 28 APR 98

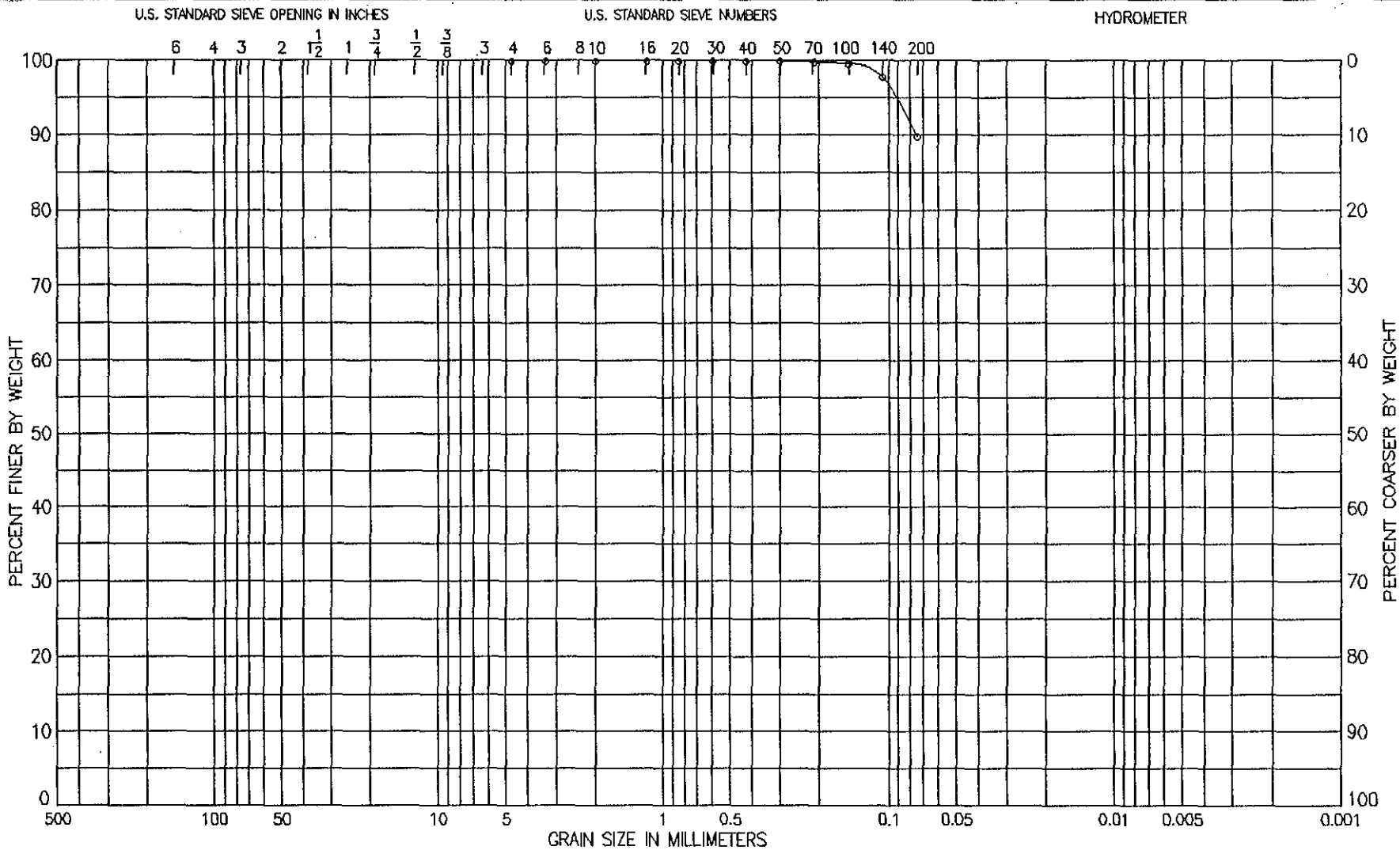
LL: 56 PL: 19 PI: 37 GS: .00 WC: .00
CLASSIFICATION: 128
CLAY (CH), BROWN; WITH SAND

TOTAL WEIGHT OF SAMPLE: .0 gms.
PARTIAL WEIGHT AFTER SPLIT: 52.9 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 4	4.750	100.0	.0
.1	No 6	3.350	99.8	.2
.2	No 10	2.000	99.6	.4
.2	No 16	1.180	99.6	.4
.2	No 20	.850	99.6	.4
.3	No 30	.600	99.4	.6
.3	No 40	.425	99.4	.6
.3	No 50	.300	99.4	.6
.6	No 70	.212	98.9	1.1
1.4	No 100	.150	97.4	2.6
3.0	No 140	.106	94.3	5.7
5.1	No 200	.075	90.4	9.6

PERCENT GRAVEL = .0
PERCENT SAND = 9.6
PERCENT FINES = 90.4

EDE



LL	PL	PI	GS	NAT W,%	ORG,%
30	16	14			

CLASSIFICATION

CLAY (CL), REDDISH BROWN; WITH SAND

PROJECT GREENS BAYOU

BORING NO. 97-73 SAMPLE NO. 13

DEPTH/ELEV 24-26 DATE 30 APR 98

GRADATION CURVE

LABORATORY USAE WES – STF/GL

SIEVE ANALYSIS

PROJECT: GREENS BAYOU

BORING: 97-73 SAMPLE: 13 DF: PR0998 .DAT
DEPTH: 24-26 DATE: 30 APR 98

LL: 30 PL: 16 PI: 14 GS: .00 WC: .00
CLASSIFICATION: 140
CLAY (CL), REDDISH BROWN; WITH SAND

TOTAL WEIGHT OF SAMPLE: .0 gms.
PARTIAL WEIGHT AFTER SPLIT: 60.1 gms.

WEIGHTS gm.	SIEVE SIZE or NUMBER	OPENING mm	PERCENT FINER	PERCENT COARSER
.0	No 4	4.750	100.0	.0
.0	No 6	3.350	100.0	.0
.0	No 10	2.000	100.0	.0
.0	No 16	1.180	100.0	.0
.0	No 20	.850	100.0	.0
.0	No 30	.600	100.0	.0
.0	No 40	.425	100.0	.0
.0	No 50	.300	100.0	.0
.1	No 70	.212	99.8	.2
.2	No 100	.150	99.7	.3
1.3	No 140	.106	97.8	2.2
6.1	No 200	.075	89.9	10.1

PERCENT GRAVEL = .0
PERCENT SAND = 10.1
PERCENT FINES = 89.9

EDE