

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE NO.		PEN./TORVANE		SPT.-BLOW COUNT		BORING NO. <u>91-303</u> DATE: BEGIN <u>11-27-91</u> PAGE <u>1 / 1</u>		JOB NO. <u>14G 531</u> COMPLETE <u>11-27-91</u> Thin Walled Tube		PROJECT <u>GIWW</u> ☒ 3" ☐ 6"		LOCATION <u>SARGENT BEACH STA 333+0.0</u>		ELEVATION OF HOLE		MANUFACTURER'S DESIGNATION OF DRILL RIG <u>ARDCO</u>		GROUNDWATER: DEPTH <u>0</u> ft., ELEV. <u>6.1</u> ft., at end of Drilling		WEATHER <u>MOSTLY CLOUDY + RAIN</u>		DRILLER <u>Douglas Mitchell</u> LOGGER <u>John A. Hentley</u>	
								COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS													
0		1	0.25	GRAY	CLAY	SOFT						-w/ROOTS - 0'-2													
		2	0.25	GRAY	CLAY	SOFT			SANDY			-w/SAND SEAMS													
5		3	0.25	GRAY	CLAY	SOFT			SANDY																
		4	0.5	GRAY	CLAY	MEDIUM STIFF						* + BROWN													
		5	1.0	GRAY	CLAY	STIFF																			
10		6	1.0	BROWN	CLAY	STIFF																			
		7	0.75	BROWN	CLAY	MEDIUM STIFF																			
15		8	0.5	GRAY	CLAY	MEDIUM STIFF																			
		9	0.75	GRAY	CLAY	MEDIUM STIFF																			
20		10	1.0	GRAY	CLAY	STIFF						* + LIGHT BROWN 20'-32'													
		11	2.0	LIGHT GRAY	CLAY	VERY STIFF						-w/ Calcareous Fossils 20'-36'													
		12	2.0	LIGHT GRAY	CLAY	VERY STIFF																			
25		13	2.0	LIGHT GRAY	CLAY	VERY STIFF																			
		14	2.0	LIGHT GRAY	CLAY	VERY STIFF																			
30		15	2.25	LIGHT GRAY	CLAY	VERY STIFF						* + BROWN 30'-32'													
		16	3.0	LIGHT GRAY	CLAY	VERY STIFF						* + LIGHT GRAY 32'-36'													
		17	4.0	REDISH BROWN	CLAY	HARD																			
35		18	2.75	REDISH BROWN	CLAY	VERY STIFF						-w/SILT POCKETS 34'-36'													

U.S. ARMY CORPS OF ENGINEERS

BORING NO. <u>91-303</u>		DATE: BEGIN <u>11-27-91</u>		PAGE <u>2</u> of <u>2</u>			
JOB NO. <u>146531</u>		COMPLETE <u>11-27-91</u> Thin Walled Tube					
PROJECT <u>GIWW</u>		☒ 3" ☐ 6"					
LOCATION <u>SARGENT BEACH STA. 333+60</u>							
ELEVATION OF HOLE _____							
MANUFACTURER'S DESIGNATION OF DRILL RIG <u>ARDCO</u>							
GROUNDWATER: DEPTH <u>0</u> ft., ELEV. _____ ft., at end of Drilling							
WEATHER <u>MOSTLY CLOUDY WITH</u>							
DRILLER <u>DOUGLAS MITCHELL</u> LOGGER <u>JOHN A. GENTRY</u>							
DEPTH, FEET	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSIS- TENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	19	4.0	REDISH BROWN	CLAY	HARD		+ LIGHT GRAY BELOW 36' -w/ Calcareous + Ferrous 36'-40'
40	20	4.0	REDISH BROWN	CLAY	HARD		
	21	3.0	REDISH BROWN	CLAY	VERY STIFF		
	22	2.75	REDISH BROWN	CLAY	VERY STIFF		
45	23	3.0	REDISH BROWN	CLAY	VERY STIFF		-w/ SILT POCKET BELOW 44'
	24	3.25	REDISH BROWN	CLAY	VERY STIFF		
50	25	3.25	REDISH BROWN	CLAY	VERY STIFF		

Project : Gulf Intracoastal Waterway, near Sargent Beach, Texas
Contract No. DACW64-92-D-0001

SUMMARY OF LABORATORY TEST RESULTS

Boring No. 91-303

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	USC	M c (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	LL (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0-2	0.00		Brownish gray, Clay, Very soft, Sandy, w/grass roots	CL	44.7										0.04	
2	2-4	0.00		Gray, Clay, Very soft, Sandy, w/grass roots	CL	40.2	80.3	112.6	48	21	100.0	100.0	100.0	99.8	84.1	0.04	0.10
3	4-6	0.25 0.25		Gray, Clay, Soft, Sandy 5.2'-5.55' $q_u = 140$ psf SWD 5.55'-6' $S_u = 140$ pcf	CL	33.4	85		43	15					77		
4	6-8	0.50 0.25		Gray, clay, Medium stiff 7.3-8 Soft SWD (DS)	CH	35.8	85		51	18					95		
5	8-10	0.50		Gray & tan, Clay, Medium stiff	CH	34.5	86.2	115.9	71	24	100.0	100.0	99.9	98.3	95.0	0.30	0.29 $C = 290$
6	10-12	1.00 25-75		Brown, Clay, Stiff 11.25-11.55' $C_u = 370$ 11.5-12 SWD $C_u = 570$	CH	13.5	98		61	23					100		
7	12-14	0.75 125-75		Brown, Clay, Medium Stiff DS SWD	CH CL	43.9	77	110	66	21					98		
8	14-16	0.50		Gray, Clay, Medium stiff 15.1-15.5' $C_u = 320$ SWD 15.5-16' $C_u = 400$	CH	44	77	10	55	16					86		
9	16-18	1.00		Gray & tan, Clay, Stiff	CH	53.0	68.5	104.8	97	33	100.0	99.9	99.8	99.1	97.6	0.35	0.37 $C = 370$
10	18-20	1.00 1-1.25		Gray, Clay, Stiff 19.55-20' $C_u = 700$ SWD	CH	48.3	74	109.7	107	29					99		$C = 700$
11	20-22	1.50		Gray & tan, Clay, Stiff, w/ferrous nodules	CH	47.0											
12	22-24	2.00		Gray & tan, Clay, Very stiff, w/calcareous nodules	CH	43.5											
13	24-26	2.00		Gray & tan, Clay, Very stiff, w/calcareous & ferrous nodules	CH	43.4											
14	26-28	2.00		Brown & gray, Clay, Very stiff	CH	40.6	78.0	109.7	111		100.0	99.8	99.8	99.6	99.5		
15	28-30	2.50		Gray & tan, Clay, Very stiff, w/mica	CH	32.7											
16	30-32	3.00		Gray & brown, Clay, Very stiff, w/calcareous nodules	CH	28.6											
17	32-34	4.00		Brown & gray, Clay, Very stiff, w/calcareous nodules	CH	23.9											

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content

q u : Unconfined Compressive Strength, W O H : Weight of hammer, W O P : Weight of pipe

Project : Gulf Intracoastal Waterway, near Sargent Beach, Texas
Contract No. DACW64-92-D-0001

SUMMARY OF LABORATORY TEST RESULTS

Boring No. 91-303

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	M c (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	LL (%)	P L (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
18	34-36	2-75 2.5-4		Reddish brown, Clay, Very stiff <i>SWD</i>	CH CL	22.1	106		42	14					96		
19	36-38	4.00		Reddish brown, Clay, Very stiff	CH	26.2											
20	38-40	4.25		Reddish brown, Clay, Hard, w/calcareous & ferrous nodules, slickensided	CH	24.9											
21	40-42	4.5+		Reddish brown, Clay, Hard, slickensided	CH	26.1											
22	42-44	4.5+		Reddish brown, Clay, Hard, slickensided	CH	24.1											
23	44-46	4.00		Reddish brown, Clay, Very stiff, w/sand parting, slickensided	CH	26.5											
24	46-48	3.50		Reddish brown, Clay, Very stiff, w/sand parting, slickensided	CH	28.5			64								
25	48-50	3.50		Reddish brown, Clay, Very stiff, w/sand parting	CH	28.4											

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content

q u : Unconfined Compressive Strength, W O H : Weight of hammer, W O P : Weight of pipe

JOB NO. 14G533

DATE 1/6/92

PROJECT Gulf Intracoastal Waterway near Sargent Beach, Texas

BORING NO. 91-303

SAMPLE NO. 2

DEPTH 2-4 ft

SPECIMEN NO. 1

CLASSIFICATION

Gray, Clay, Very soft, Sandy, w/Grass roots

Tare No.	P-207	Height	5.595 in.
Tare plus Wet Specimen	493.44 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	364.19 gm	Initial Area	6.290 sq in.
Water Weight	129.25 gm	Volume	35.194 cu in.
Tare Weight	42.75 gm	Volume of Solids	cu in.
Wet Specimen	1039.87 gm	Void Ratio	
Dry Specimen	741.65 gm	Saturation	%
Water Content	40.21 %	Dry Density	80.3 lb/cu ft
Specific Gravity of Solids			
LL = 48	PL = 21	PI = 27	

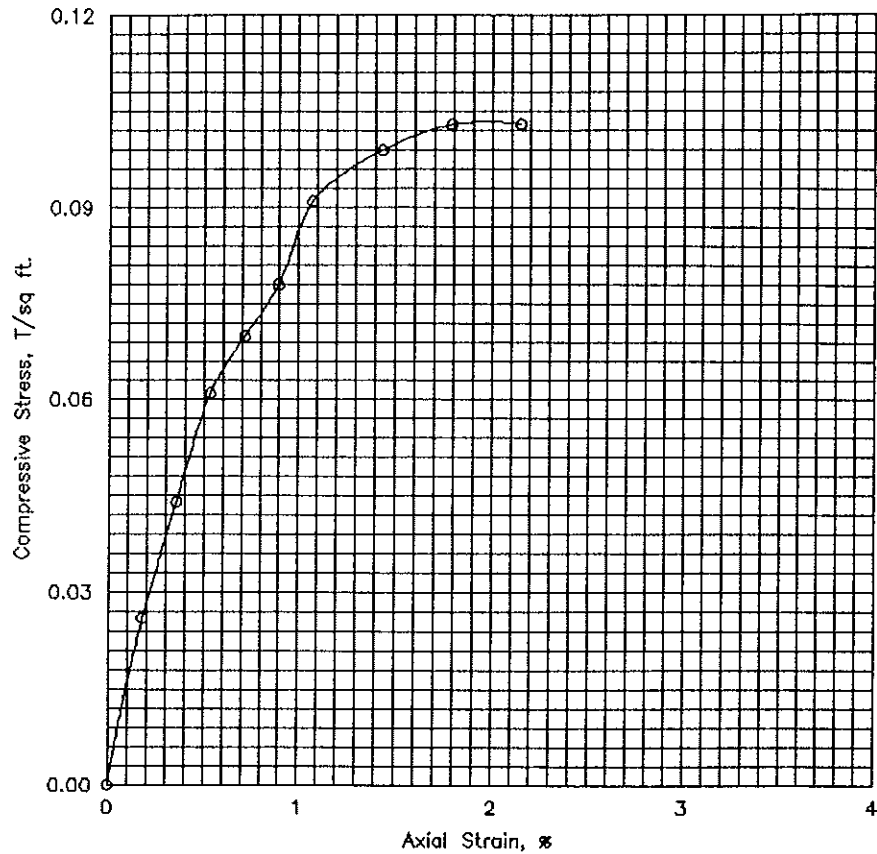
Proving Ring No. 10170

Proving Ring Constant, K = .766 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	3.0	2.3	.002	6.30	.026
.3	20.	.020	5.0	3.8	.004	6.31	.044
.5	30.	.030	7.0	5.4	.005	6.32	.061
.7	40.	.040	8.0	6.1	.007	6.34	.070
.9	50.	.050	9.0	6.9	.009	6.35	.078
1.0	60.	.060	10.5	8.0	.011	6.36	.091
1.4	80.	.080	11.5	8.8	.014	6.38	.099
1.8	100.	.100	12.0	9.2	.018	6.40	.103
2.1	120.	.120	12.0	9.2	.021	6.43	.103

Job No. 146533

Failure Sketches



- ☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	40.2 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	80.3		
Time to failure, min		t_f	1.75		
Unconfined compressive strength, T/sq ft		q_u	.10		
Undrained shear strength, T/sq ft		S_u	.05		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		

Classification Gray, Clay, Very soft, Sandy, w/Grass roots

LL	48	PL	21	PI	27	G_s
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Remarks	Project Gulf Intracoastal Waterway	
	Area Near Sargent Beach, Texas	
	Boring No. 91-303	Sample No. 2
	Depth 2-4 ft El	Date 1/6/92
	UNCONFINED COMPRESSION TEST REPORT	

JOB NO. 14G533

DATE 1/6/92

PROJECT Gulf Intracoastal Waterway near Sargent Beach, Texas

BORING NO. 91-303

SAMPLE NO. 5

DEPTH 8 - 10 ft

SPECIMEN NO. 1

CLASSIFICATION

Gray & Tan, Clay, Medium stiff

Tare No.	P-216	Height	5.595 in.
Tare plus Wet Specimen	572.46 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	436.60 gm	Initial Area	6.290 sq in.
Water Weight	135.86 gm	Volume	35.194 cu in.
Tare Weight	42.59 gm	Volume of Solids	cu in.
Wet Specimen	1070.82 gm	Void Ratio	
Dry Specimen	796.26 gm	Saturation	%
Water Content	34.48 %	Dry Density	86.2 lb/cu ft
Specific Gravity of Solids			
LL = 71	PL = 24	PI = 47	

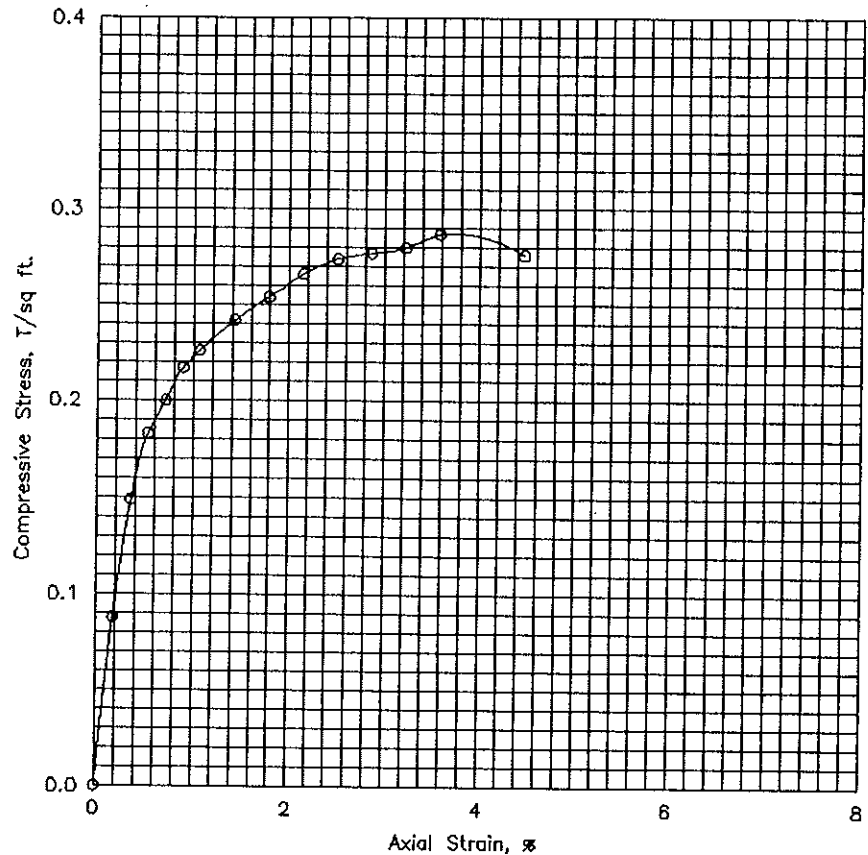
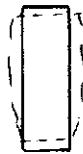
Proving Ring No. 10170

Proving Ring Constant, K = .766 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	10.0	7.7	.002	6.30	.088
.4	20.	.020	17.0	13.0	.004	6.31	.149
.6	30.	.030	21.0	16.1	.005	6.32	.183
.7	40.	.040	23.0	17.6	.007	6.34	.200
.9	50.	.050	25.0	19.1	.009	6.35	.217
1.0	60.	.060	26.0	19.9	.011	6.36	.226
1.4	80.	.080	28.0	21.4	.014	6.38	.242
1.7	100.	.100	29.5	22.6	.018	6.40	.254
2.0	120.	.120	31.0	23.7	.021	6.43	.266
2.3	140.	.140	32.0	24.5	.025	6.45	.274
2.7	160.	.160	32.5	24.9	.029	6.48	.277
3.0	180.	.180	33.0	25.3	.032	6.50	.280
3.3	200.	.200	34.0	26.0	.036	6.52	.287
4.0	250.	.250	33.0	25.3	.045	6.58	.276

Job No. 140533

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	34.5 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	86.2		
Time to failure, min		t_f	3.27		
Unconfined compressive strength, T/sq ft		q_u	.29		
Undrained shear strength, T/sq ft		S_u	.14		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		
Classification Gray & Tan, Clay, Medium stiff					
LL	71	PL	24	PI	47
		G_s			
Remarks		Project Gulf Intracoastal Waterway			
		Area Near Sargent Beach, Texas			
		Boring No. 91-303		Sample No. 5	
		Depth 8 - 10 ft		Date 1/6/92	
		UNCONFINED COMPRESSION TEST REPORT			

JOB NO. 14G533

DATE 1/6/92

PROJECT Gulf Intracoastal Waterway near Sargent Beach, Texas

BORING NO. 91-303

SAMPLE NO. 9

DEPTH 16 - 18 ft

SPECIMEN NO. 1

CLASSIFICATION

Gray & Tan, Clay, Stiff

Tare No.	P-26	Height	5.595 in.
Tare plus Wet Specimen	456.74 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	313.37 gm	Initial Area	6.290 sq in.
Water Weight	143.37 gm	Volume	35.194 cu in.
Tare Weight	42.61 gm	Volume of Solids	cu in.
Wet Specimen	967.82 gm	Void Ratio	
Dry Specimen	632.76 gm	Saturation	%
Water Content	52.95 %	Dry Density	68.5 lb/cu ft
Specific Gravity of Solids			
LL = 97	PL = 33	PI = 64	

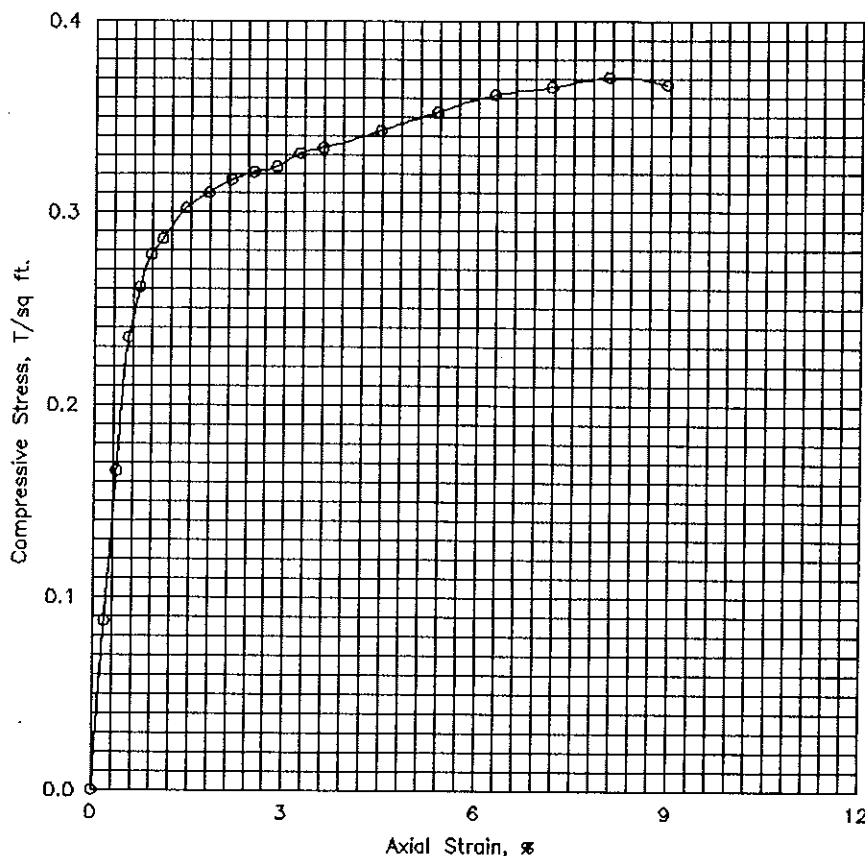
Proving Ring No. 10170

Proving Ring Constant, K = .766 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
.3	10.	.010	10.0	7.7	.002	6.30	.088
.5	20.	.020	19.0	14.6	.004	6.31	.166
.7	30.	.030	27.0	20.7	.005	6.32	.235
.8	40.	.040	30.0	23.0	.007	6.34	.261
1.0	50.	.050	32.0	24.5	.009	6.35	.278
1.2	60.	.060	33.0	25.3	.011	6.36	.286
1.5	80.	.080	35.0	26.8	.014	6.38	.302
1.8	100.	.100	36.0	27.6	.018	6.40	.310
2.1	120.	.120	37.0	28.3	.021	6.43	.317
2.5	140.	.140	37.5	28.7	.025	6.45	.321
2.8	160.	.160	38.0	29.1	.029	6.48	.324
3.1	180.	.180	39.0	29.9	.032	6.50	.331
3.4	200.	.200	39.5	30.3	.036	6.52	.334
4.3	250.	.250	41.0	31.4	.045	6.58	.343
5.1	300.	.300	42.5	32.6	.054	6.65	.353
5.9	350.	.350	44.0	33.7	.063	6.71	.362
6.7	400.	.400	45.0	34.5	.071	6.77	.366
7.5	450.	.450	46.0	35.2	.080	6.84	.371
8.3	500.	.500	46.0	35.2	.089	6.91	.367

Job No. 14G533

Failure Sketches



- ☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	53.0 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	68.5		
Time to failure, min		t_f	7.48		
Unconfined compressive strength, T/sq ft		q_u	.37		
Undrained shear strength, T/sq ft		S_u	.19		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		
Classification Gray & Tan, Clay, Stiff					
LL	97	PL	33	PI	64
		G_s			
Remarks		Project Gulf Intracoastal Waterway			
		Area Near Sargent Beach, Texas			
		Boring No. 91-303		Sample No. 9	
		Depth 16 - 18 ft		Date 1/6/92	
		UNCONFINED COMPRESSION TEST REPORT			