JOB NO. 14G783-4 DATE 8/30/94

PROJECT Houston-Galvaston Navigation Channel

AREA Houston, Texas

BORING NO. 93-95 SAMPLE NO. 3 DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION
Brown,Clay,Medium stiff,w/ sand pockets

Tare No.	GE-4	Height	5.595 in.
Tare plus Wet Specimen	352.53 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	274.60 gm	Initial Area	6.290 sq in.
Water Weight	77.93 gm	Volume	35.194 cu in.
Tare Weight	42.42 gm	Volume of Solids	cu in.
Wet Specimen	1058.58 gm	Void Ratio	
Dry Specimen	792.56 gm	Saturation	%
Water Content	33.56 %	Dry Density	85.8 lb/cu ft

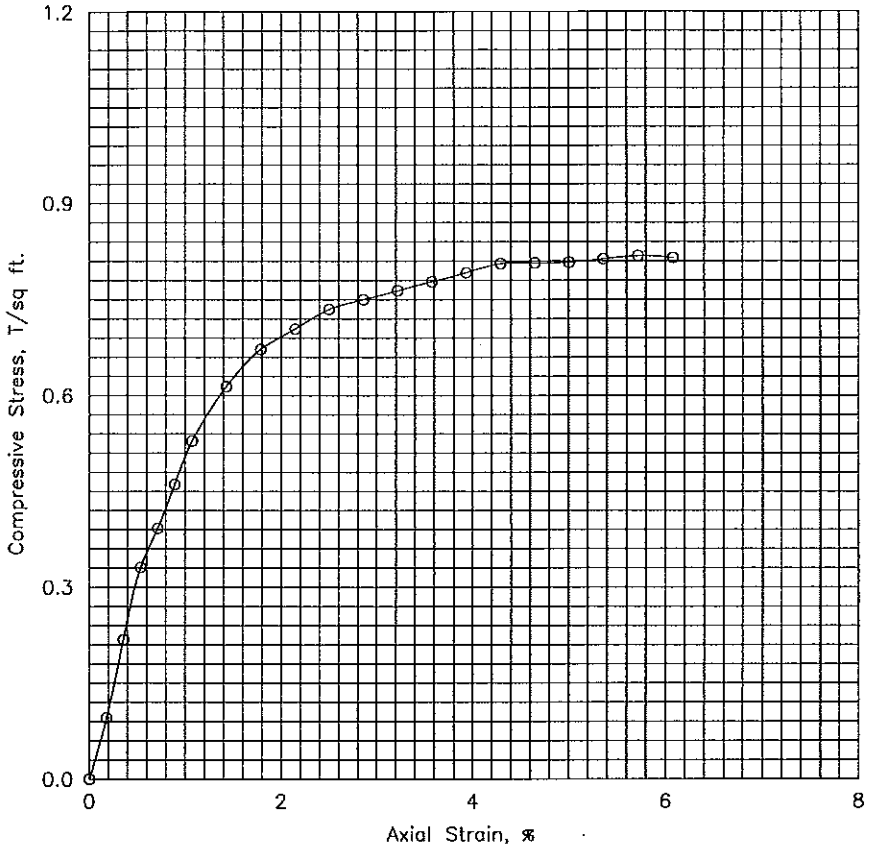
Specific Gravity of Solids
LL = 52 PL = 21 PI = 31

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	11.0	8.4	.002	6.30	.096
.6	20.	.020	25.0	19.1	.004	6.31	.218
.8	30.	.030	38.0	29.1	.005	6.32	.331
.9	40.	.040	45.0	34.5	.007	6.34	.392
1.1	50.	.050	53.0	40.6	.009	6.35	.461
1.3	60.	.060	61.0	46.7	.011	6.36	.529
1.6	80.	.080	71.0	54.4	.014	6.38	.614
1.9	100.	.100	78.0	59.7	.018	6.40	.672
2.3	120.	.120	82.0	62.8	.021	6.43	.704
2.6	140.	.140	86.0	65.9	.025	6.45	.735
2.9	160.	.160	88.0	67.4	.029	6.48	.750
3.2	180.	.180	90.0	68.9	.032	6.50	.764
3.5	200.	.200	92.0	70.5	.036	6.52	.778
3.8	220.	.220	94.0	72.0	.039	6.55	.792
4.2	240.	.240	96.0	73.5	.043	6.57	.806
4.5	260.	.260	96.5	73.9	.046	6.60	.807
4.8	280.	.280	97.0	74.3	.050	6.62	.808
5.3	300.	.300	98.0	75.1	.054	6.65	.813
5.5	320.	.320	99.0	75.8	.057	6.67	.818
5.8	340.	.340	99.0	75.8	.061	6.70	.815

Job No. 14G783-4

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	33.6 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	85.8			
Time to failure, min		t_f	5.48			
Unconfined compressive strength, T/sq ft		q_u	.82			
Undrained shear strength, T/sq ft		S_u	.41			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Brown,Clay,Medium stiff,w/ sand pockets

LL	52	PL	21	PI	31	G_s	

Remarks

Project Houston-Galvaston Navigation Channel

Area Houston, Texas

Boring No. 93-95 | Sample No. 3

Depth 4-6 ft | Date 8/30/94

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UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 14G783-4 DATE 8/30/94

PROJECT Houston-Galvaston Navigation Channel

AREA Houston, Texas

BORING NO. 93-95 SAMPLE NO. 7 DEPTH 12-14 ft

SPECIMEN NO. 1

CLASSIFICATION
Brown,Clay,Medium stiff

Tare No.	14F	Height	5.595 in.
Tare plus Wet Specimen	113.85 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	89.77 gm	Initial Area	6.290 sq in.
Water Weight	24.08 gm	Volume	35.194 cu in.
Tare Weight	32.01 gm	Volume of Solids	cu in.
Wet Specimen	1045.41 gm	Void Ratio	
Dry Specimen	737.82 gm	Saturation	%
Water Content	41.69 %	Dry Density	79.9 lb/cu ft

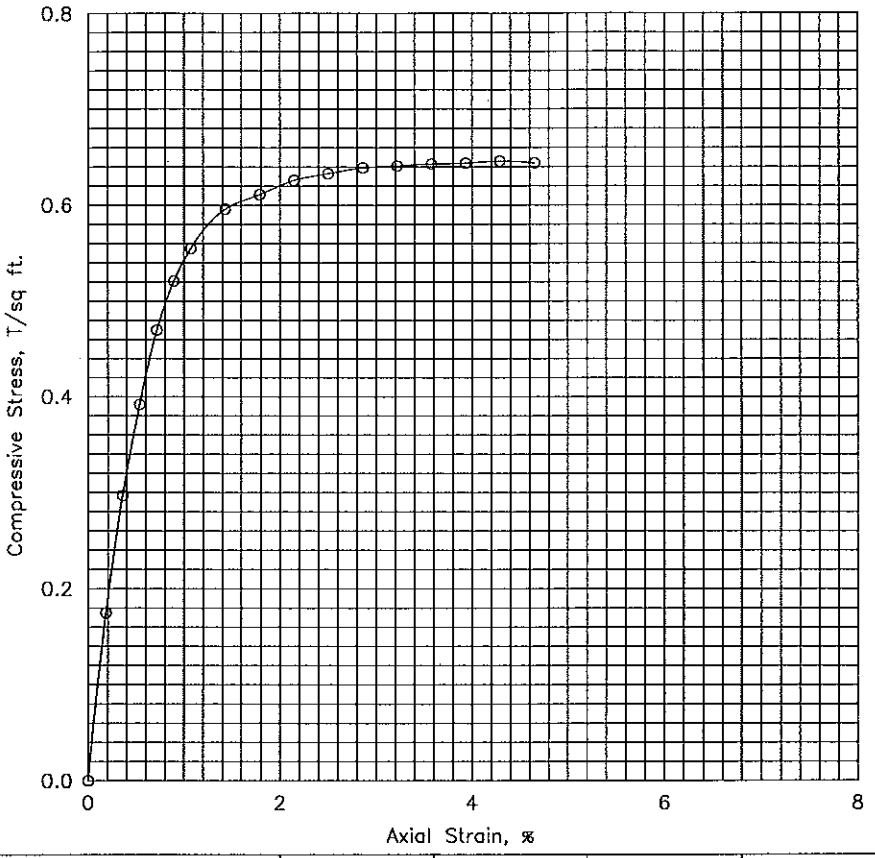
Specific Gravity of Solids
LL = 70 PL = 31 PI = 39

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	20.0	15.3	.002	6.30	.175
.5	20.	.020	34.0	26.0	.004	6.31	.297
.7	30.	.030	45.0	34.5	.005	6.32	.392
.8	40.	.040	54.0	41.4	.007	6.34	.470
1.0	50.	.050	60.0	46.0	.009	6.35	.521
1.2	60.	.060	64.0	49.0	.011	6.36	.555
1.5	80.	.080	69.0	52.9	.014	6.38	.596
1.8	100.	.100	71.0	54.4	.018	6.40	.611
2.2	120.	.120	73.0	55.9	.021	6.43	.626
2.5	140.	.140	74.0	56.7	.025	6.45	.633
2.8	160.	.160	75.0	57.4	.029	6.48	.639
3.2	180.	.180	75.5	57.8	.032	6.50	.641
3.4	200.	.200	76.0	58.2	.036	6.52	.643
3.8	220.	.220	76.5	58.6	.039	6.55	.644
4.1	240.	.240	77.0	59.0	.043	6.57	.646
4.5	260.	.260	77.0	59.0	.046	6.60	.644

Job No. 14G783-4

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	41.7 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	79.9			
Time to failure, min		t_f	4.10			
Unconfined compressive strength, T/sq ft		q_u	.65			
Undrained shear strength, T/sq ft		S_u	.32			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Brown,Clay,Medium stiff

LL	70	PL	31	PI	39	G_s

Remarks

Project Houston-Galvaston Navigation Channel

Area Houston, Texas

Boring No. 93-95 | Sample No. 7

Depth El 12-14 ft | Date 8/30/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

Geotest Engineering, Inc.

PLATE

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-95 DATE: BEGIN 7-20-94 PAGE 1 / 2
JOB NO. 946783-1 COMPLETE 7-20-94 Thin Walled Tube
PROJECT HOUSTON-GALVESTON Navigation Channel ■ 3" □ 6"
LOCATION Disposal Area # 15
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Hydro K4X4, C-1000 Marsh Buggy
GROUNDWATER: DEPTH 0 ft., ELEV. ____ ft., at end of Drilling
WEATHER Sunny & Hot 83
DRILLER David Oregruk LOGGER Willie Barnes

Torvane Reading

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0								
		1	1.0	Brown	Clay	Stiff		
		2	1.0	Brown	Clay	Stiff		
5		3	1.0	Brown	Clay	Stiff	Silty	W- Sand Pockets
		4	.75	Brown	Clay	M Stiff	Silty	W- Sand Layers
		5	1.25	Brown	Clay	Stiff		W- Shell Fragments
10		6	1.25	Brown	Clay	Stiff		
		7	0.75	Brown	Clay	M. Stiff		
15		8	1.25	Brown	Clay	Stiff		
		9	1.25	Brown	Clay	Stiff		Sand at 18'
20		10	5/6/5	Gray	Sand	M. Dense	Silty	
25		11	4/3/3	Gray	Sand	Loose	Silty	
30		12	2/2/3	Gray	Sand	Loose	Silty	
35		13	1/2/3	Gray	Sand	Loose	Silty	

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-95 DATE: BEGIN 7-28-94 PAGE 2 / 2
JOB NO. 946783.1 COMPLETE 7-28-94 Thin Walled Tube
PROJECT Houston-Galveston Navigation channel ■ 3" □ 6"
LOCATION Disposal Area #15
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Ardco K4X4, C-1000 Marsh Buggy
GROUNDWATER: DEPTH 0 ft., ELEV. ft., at end of Drilling
WEATHER Sunny and Hot 95°
DRILLER David Dargenk LOGGER Willis Barnes

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								
40	X	14	3/3/2	Gray	Sand	Loose Dense	Clayey	
45								
50								
55								
60								
65								
70								

Project: ...on-Galveston Navigation Channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-95

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					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	1.25		Brown,Clay,Stiff,w/roots and sand pockts	C H	33.4											
2	2 - 4	1.50		Brown,Clay,Stiff,w/sand pockets	C H	32.2											
3	4 - 6	0.75		Brown,Clay,Medium stiff,w/sand pockets	C H	33.6	85.8	114.6	52	21	100.0	99.6	98.7	95.9	94.1		0.82
4	6 - 8	0.75		Brown,Clay,Medium stiff,Silty,w/sand pockets See SWD report 16162 Q-Test	eL CH	36.6	84		66	23							Q=3.0
5	8 - 10	1.00		Brown,Clay,Stiff,w/shell fragments	C H	40.1											
6	10 - 12	0.75		Brown,Clay,Stiff	C H	33.9											
7	12 - 14	0.75		Brown,Clay,Medium stiff	C H	41.7	79.9	113.2	70	31	99.3	99.0	97.9	96.6	95.2		0.65
8	14 - 16	1.50		Brown,Clay,Stiff	C H	38.5											
9	16 - 18	1.00		Brown,Clay,Stiff	C H	40.8											
10	18-19.5		11	Gray,Sand,Medium dense,Silty,w/shell fragment	S M												
11	23-24.5		6	Gray,Sand,Loose,Silty,w/shell fragments	SP-SM						96.9*	96.2*	92.8*	63.7	11.4		
12	28-29.5		5	Gray,Sand,Loose,Silty,w/shell fragments	S M												
13	33-34.5		5	Gray,Sand,Loose,Silty,w/shell fragments	S M												
14	38.5-40		5	Gray,Sand,Loose,Silty,w/shell fragments	S M												

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