JOB NO. 94G783-4 DATE 9/6/94

PROJECT Houston-Galvaston Navigation Channel

AREA Houston, Texas

BORING NO. 93-104 SAMPLE NO. 2 DEPTH 2-4 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish gray,Clay,Stiff,Sandy,w/ shell fragments

Tare No.	W-7	Height	5.595 in.
Tare plus Wet Specimen	309.59 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	260.61 gm	Initial Area	6.290 sq in.
Water Weight	48.98 gm	Volume	35.194 cu in.
Tare Weight	42.58 gm	Volume of Solids	cu in.
Wet Specimen	1135.67 gm	Void Ratio	
Dry Specimen	927.34 gm	Saturation	%
Water Content	22.46 %	Dry Density	100.4 lb/cu ft
Specific Gravity of Solids			

LL = 47 PL = 17 PI = 30

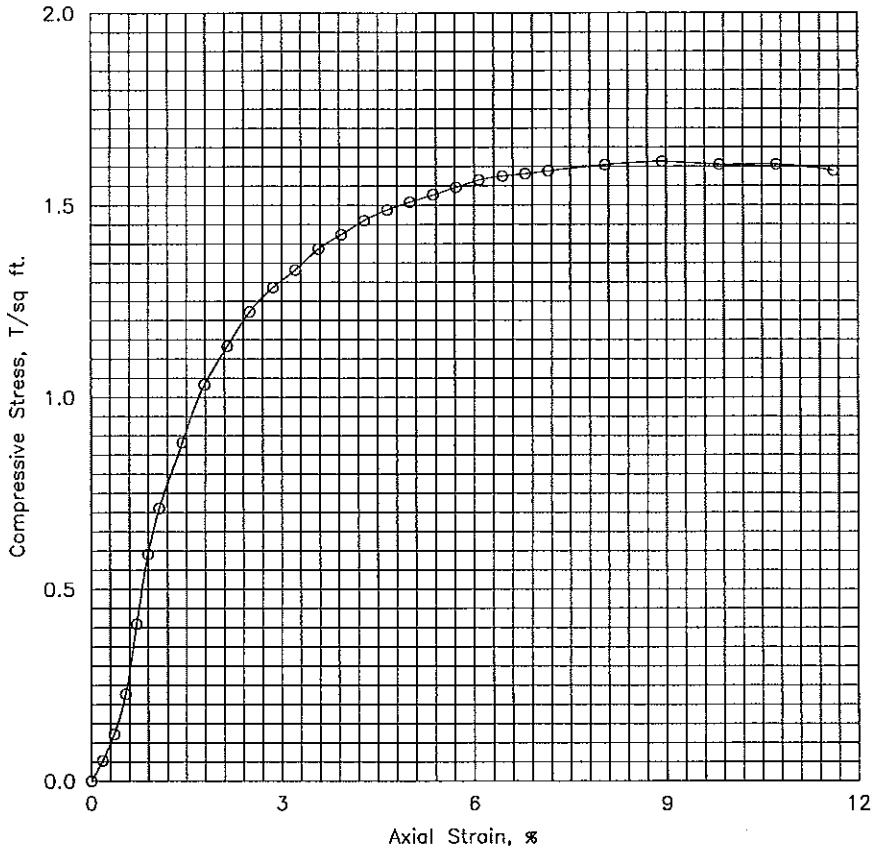
Proving Ring No. 10170
Proving Ring Constant, K = .766 lbs/div.

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	6.0	4.6	.002	6.30	.053
.3	20.	.020	14.0	10.7	.004	6.31	.122
.5	30.	.030	26.0	19.9	.005	6.32	.227
.8	40.	.040	47.0	36.0	.007	6.34	.409
.9	50.	.050	68.0	52.1	.009	6.35	.591
1.3	60.	.060	82.0	62.8	.011	6.36	.711
1.6	80.	.080	102.0	78.1	.014	6.38	.882
2.0	100.	.100	120.0	91.9	.018	6.40	1.033
2.3	120.	.120	132.0	101.1	.021	6.43	1.133
2.6	140.	.140	143.0	109.5	.025	6.45	1.222
2.9	160.	.160	151.0	115.7	.029	6.48	1.286
3.2	180.	.180	157.0	120.3	.032	6.50	1.332
3.6	200.	.200	164.0	125.6	.036	6.52	1.387
3.9	220.	.220	169.0	129.5	.039	6.55	1.424
4.2	240.	.240	174.0	133.3	.043	6.57	1.460
4.6	260.	.260	178.0	136.3	.046	6.60	1.488
4.9	280.	.280	181.0	138.6	.050	6.62	1.508
5.2	300.	.300	184.0	140.9	.054	6.65	1.527
5.5	320.	.320	187.0	143.2	.057	6.67	1.546
5.9	340.	.340	190.0	145.5	.061	6.70	1.565
6.2	360.	.360	192.0	147.1	.064	6.72	1.575
6.5	380.	.380	193.5	148.2	.068	6.75	1.581
6.8	400.	.400	195.0	149.4	.071	6.77	1.588
7.6	450.	.450	199.0	152.4	.080	6.84	1.604
8.4	500.	.500	202.0	154.7	.089	6.91	1.613

9.3	550.	.550	203.0	155.5	.098	6.98	1.605
10.1	600.	.600	205.0	157.0	.107	7.05	1.605
10.9	650.	.650	205.0	157.0	.116	7.12	1.589

Job No. 94G783-4

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	22.5 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	100.4			
Time to failure, min		t_f	8.43			
Unconfined compressive strength, T/sq ft		q_u	1.61			
Undrained shear strength, T/sq ft		S_u	.81			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Yellowish gray,Clay,Stiff,Sandy,w/ shell fragments

LL	47	PL	17	PI	30	G_s	

Remarks

Project Houston-Galvaston Navigation Channel

Area Houston, Texas

Boring No. 93-104 | Sample No. 2

Depth El 2-4 ft | Date 9/6/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

JOB NO. 94G783-4 DATE 9/6/94

PROJECT Houston-Galvaston Navigation Channel

AREA Houston, Texas

BORING NO. 93-104 SAMPLE NO. 5 DEPTH 12-14 ft

SPECIMEN NO. 1

CLASSIFICATION
Gray,Clay,Medium stiff,Sandy,w/sand pockets & shell fragments

Tare No.	IM-1	Height	5.595 in.
Tare plus Wet Specimen	364.29 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	293.93 gm	Initial Area	6.290 sq in.
Water Weight	70.36 gm	Volume	35.194 cu in.
Tare Weight	42.43 gm	Volume of Solids	cu in.
Wet Specimen	1141.38 gm	Void Ratio	
Dry Specimen	891.87 gm	Saturation	%
Water Content	27.98 %	Dry Density	96.5 lb/cu ft
Specific Gravity of Solids			

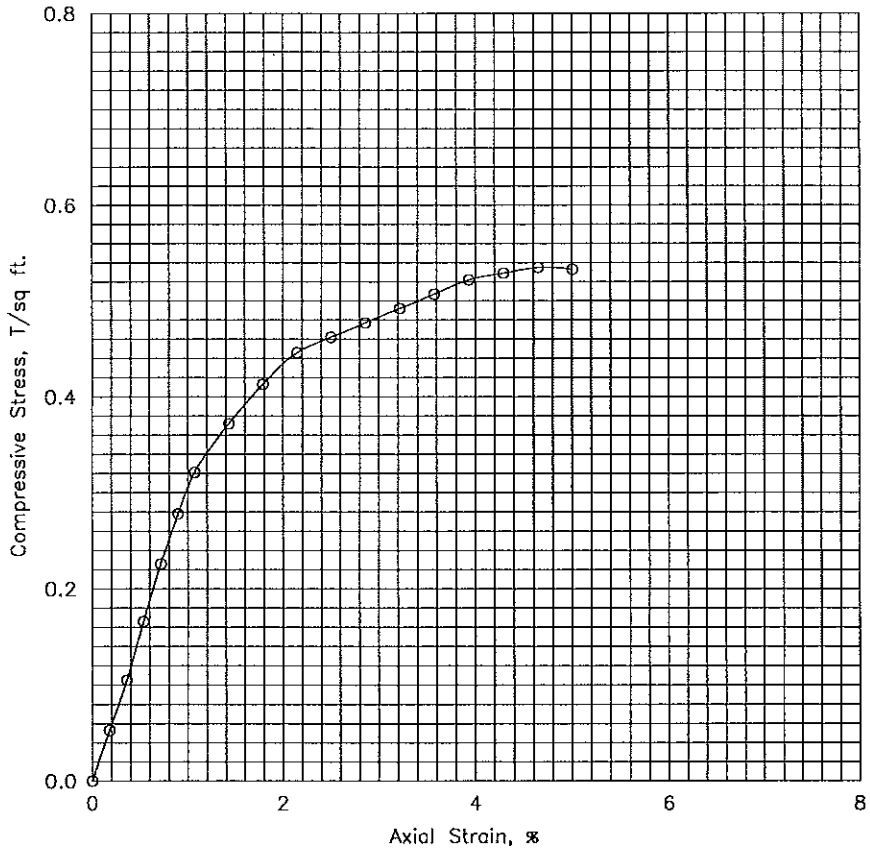
LL = 45 PL = 16 PI = 29

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	6.0	4.6	.002	6.30	.053
.3	20.	.020	12.0	9.2	.004	6.31	.105
.5	30.	.030	19.0	14.6	.005	6.32	.166
.7	40.	.040	26.0	19.9	.007	6.34	.226
.9	50.	.050	32.0	24.5	.009	6.35	.278
1.1	60.	.060	37.0	28.3	.011	6.36	.321
1.4	80.	.080	43.0	32.9	.014	6.38	.372
1.8	100.	.100	48.0	36.8	.018	6.40	.413
2.2	120.	.120	52.0	39.8	.021	6.43	.446
2.4	140.	.140	54.0	41.4	.025	6.45	.462
2.9	160.	.160	56.0	42.9	.029	6.48	.477
3.2	180.	.180	58.0	44.4	.032	6.50	.492
3.5	200.	.200	60.0	46.0	.036	6.52	.507
3.9	220.	.220	62.0	47.5	.039	6.55	.522
4.2	240.	.240	63.0	48.3	.043	6.57	.529
4.5	260.	.260	64.0	49.0	.046	6.60	.535
4.8	280.	.280	64.0	49.0	.050	6.62	.533

Job No. 94G783-4

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	28.0 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	96.5			
Time to failure, min		t_f	4.48			
Unconfined compressive strength, T/sq ft		q_u	.54			
Undrained shear strength, T/sq ft		S_u	.27			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Gray,Clay,Medium stiff,Sandy,w/sand pockets & shell fragments

LL	45	PL	16	PI	29	G_s	

Remarks

Project Houston-Galvaston Navigation Channel

Area Houston, Texas

Boring No. 93-104 | Sample No. 5

Depth El 12-14 ft | Date 9/6/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

JOB NO. 94G783-4 DATE 9/6/94

PROJECT Houston-Galvaston Navigation Channel

AREA Houston, Texas

BORING NO. 93-104 SAMPLE NO. 10 DEPTH 25-27 ft

SPECIMEN NO. 1

CLASSIFICATION
Gray,Clay,Very soft,w/ shell fragments

Tare No.	GB-8	Height	5.595 in.
Tare plus Wet Specimen	334.56 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	234.40 gm	Initial Area	6.290 sq in.
Water Weight	100.16 gm	Volume	35.194 cu in.
Tare Weight	42.47 gm	Volume of Solids	cu in.
Wet Specimen	1001.19 gm	Void Ratio	
Dry Specimen	657.87 gm	Saturation	%
Water Content	52.19 %	Dry Density	71.2 lb/cu ft
Specific Gravity of Solids			

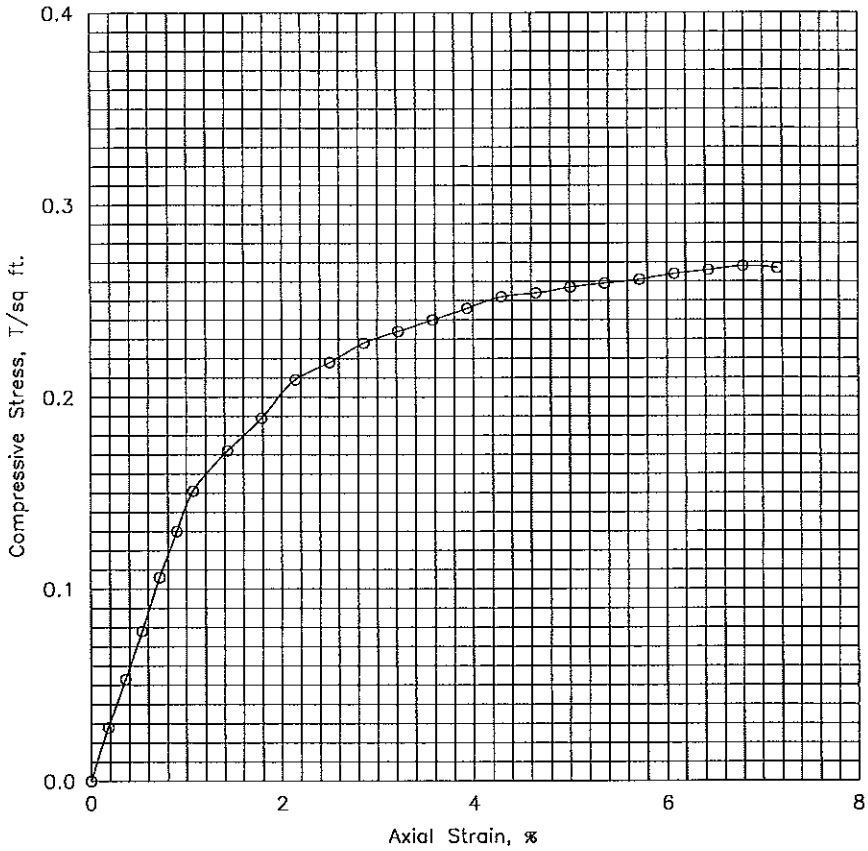
LL = 74 PL = 27 PI = 47

Proving Ring No. 17015
Proving Ring Constant, K = .311 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	8.0	2.5	.002	6.30	.028
.3	20.	.020	15.0	4.7	.004	6.31	.053
.6	30.	.030	22.0	6.8	.005	6.32	.078
.8	40.	.040	30.0	9.3	.007	6.34	.106
.9	50.	.050	37.0	11.5	.009	6.35	.130
1.1	60.	.060	43.0	13.4	.011	6.36	.151
1.4	80.	.080	49.0	15.2	.014	6.38	.172
1.8	100.	.100	54.0	16.8	.018	6.40	.189
2.2	120.	.120	60.0	18.6	.021	6.43	.209
2.5	140.	.140	63.0	19.6	.025	6.45	.218
2.8	160.	.160	66.0	20.5	.029	6.48	.228
3.2	180.	.180	68.0	21.1	.032	6.50	.234
3.5	200.	.200	70.0	21.7	.036	6.52	.240
3.9	220.	.220	72.0	22.4	.039	6.55	.246
4.2	240.	.240	74.0	23.0	.043	6.57	.252
4.5	260.	.260	75.0	23.3	.046	6.60	.254
4.8	280.	.280	76.0	23.6	.050	6.62	.257
5.2	300.	.300	77.0	23.9	.054	6.65	.259
5.5	320.	.320	78.0	24.2	.057	6.67	.261
5.8	340.	.340	79.0	24.5	.061	6.70	.264
6.1	360.	.360	80.0	24.8	.064	6.72	.266
6.4	380.	.380	81.0	25.2	.068	6.75	.268
6.8	400.	.400	81.0	25.2	.071	6.77	.267

Job No. 94G783-4

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	52.2 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	71.2			
Time to failure, min		t_f	6.43			
Unconfined compressive strength, T/sq ft		q_u	.27			
Undrained shear strength, T/sq ft		S_u	.13			
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,w/ shell fragments

LL	74	PL	27	PI	47	G_s	

Remarks

Project Houston-Galveston Navigation Channel	
Area Houston, Texas	
Boring No. 93-104	Sample No. 10
Depth El 25-27 ft	Date 9/6/94
UNCONFINED COMPRESSION TEST REPORT	

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-104" DATE: BEGIN 8/3/94 PAGE 1 / 2
JOB NO. 946783-1 COMPLETE 8/3/94 Thin Walled Tube
PROJECT HOUSTON-GALVESTON Navigation Channel ■ 3" ☐ 6"
LOCATION LEVEE @ DISPOSAL AREA #16
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Arco K4X4 K-1000 Marsh Buggy
GROUNDWATER: DEPTH ∅ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY/HOT
DRILLER DAVID GREGUTEK LOGGER Willie Baine/Rusty Teehan

Torvane Reading	DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
	0		1	3.5	BROWN	CLAY	VERY STIFF	SANDY	W/ROOTS AND SHELL FRAGMENTS
			2	1.5	BROWN	CLAY	STIFF	SANDY	W/SHELL FRAGMENTS
	5	X	3	3/4/7	GRAY	SAND	MEDIUM DENSE	SILTY	
	10	X	4	2/5/7	LIGHT GRAY	SAND	MEDIUM DENSE	SILTY	W/SHELL FRAGMENTS Clay AT 12'
			5	.75	LIGHT GRAY	CLAY	MEDIUM STIFF	SILTY	
	15		6	0.5	LIGHT GRAY	CLAY	MEDIUM STIFF	SILTY	Sand AT Bottom of Sample
		X	7	3/2/3	GRAY	SAND	LOOSE	SILTY	-W/Shell Fragments
	20								
		X	8	2/4/3	GRAY	SAND	LOOSE	SILTY	W/Shell Fragments clay AT 23'
0.50			9	0.00/0.10	GRAY	CLAY	Very Soft	SANDY	W/ SAND Pockets
0.35	25		10	0.00/0.04	GRAY	CLAY	Very soft	SANDY	W/ SAND Pockets
0.2			11	0.00/0.04	GRAY	CLAY	Very Soft	SANDY	-W/SAND Pockets
0.25	30		12	0.00/0.05	GRAY	CLAY	Very soft	SANDY	W/SHELL FRAGMENTS, Sand AT 31'
		X	13	3/4/3	GRAY	SAND	LOOSE	SILTY	W/ SHELL FRAGMENTS
	35								Clay at 36'

GEOTEST ENGINEERING, INC.

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-104 DATE: BEGIN 8/3/94 PAGE 2 / 2

JOB NO. 946783.1 COMPLETE 8/3/94 Thin Walled Tube

PROJECT Houston-Galveston Navigation channel ■ 3" □ 6"

LOCATION LEVEE @ DISPOSAL AREA #16

ELEVATION OF HOLE

MANUFACTURER'S DESIGNATION OF DRILL RIG Ardco K4X4, C-1000 Marsh Buggy

GROUNDWATER: DEPTH ∅ ft., ELEV. ____ ft., at end of Drilling

WEATHER SUNNY / HOT

DRILLER DAVID GREGURICK LOGGER Willie Barn / Rusty Tuchan

Torvane Reading	DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
	35				Gray	Sand	loose	SILTY	
0.30			14	0.00 / 0.06	GRAY	CLAY	VERY SOFT	SANDY.	W/SHELL FRAGMENTS
0.35			15	0.00 / 0.07	GRAY	CLAY	VERY SOFT	SANDY	W/SHELL FRAGMENTS
	40								Torvane Mutiplier 0.2
	45								
	50								
	55								
	60								
	65								
	70								

GEOTEST ENGINEERING, INC.

Project: on-Galveston Navigation Channel

SUM OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-104

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	3.25		Yellowish gray,Clay,Very stiff,Sandy,w/ shell fragments	C L	16.6											
2	2 - 4	1.75		Yellowish gray,Clay,Stiff,Sandy,w/shell fragments	C L	22.5	100.4	122.9	47.0	17.0	98.0*	97.0*	95.4*	92.0	72.3		1.61
3	4-5.5		11	Gray,Sand,Medium dense,Silty,w/shell fragments	S M												
4	9-10.5		12	Gray,Sand,Medium dense,Silty,w/shell fragments	S M						99.7*	98.6*	92.2*	45.8	24.6		
5	12-14	0.50		Gray,Clay,Medium stiff,Sandy,w/sand pockets and shell fragments	C L	28.0	96.5	123.6	45.0	16.0	96.8*	93.3*	88.1*	77.5	73.3		0.54
6	14-16	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets and shell fragments	C L	28.7											
7	16-17.5		5	Gray,Sand,Loose,Silty,w/shell fragments	S M												
8	21-22.5		7	Gray,Sand,Loose,Silty,w/shell fragments	S M												
9	23-25	0.25		Gray,Clay,Soft,w/shell fragments	C H	55.8											
10	25-27	0.25		Gray,Clay,Soft,w/shell fragments	C H	52.2	71.2	108.4	74.0	27.0	100.0	100.0	99.9	99.9	99.8		0.27
11	27-29	0.25		Gray,Clay,soft,Sandy,w/shell fragments	C L	26.2											
12	29-31	0.25		Gray,Clay,Soft,Sandy,w/shell fragments	C L	24.8											
13	31-32.5		7	Gray,Sand,Loose,Silty,w/shell fragments	S M												
14	36-38	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	23.2											
15	38-40	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	27.7											

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

* : Material retained are shell fragments

pc7,excel,original.xls

Geotest Engineering, Inc.