U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-367 DATE: BEGIN 8-23-93 PAGE 1 / 1
JOB NO. 146638 COMPLETE 8-23-93 Thin Walled Tube
PROJECT Core Drilling for enlargement of The retaining levee ■ 3" □ 6"
LOCATION for The Sabine Lake North Disposal Area, Port Arthur, Texas
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Ardco K4-4, C-1000
GROUNDWATER: DEPTH 1/2 ft., ELEV. ft., at end of Drilling
WEATHER Clear & Hot
DRILLER Scott Gregurek LOGGER Iraj Mostamand

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	2.75	Yellowish Brown	clay	Very stiff	silty	-w/ Sa pkts
		2	1.75	Yellowish Brown	clay	stiff	-silty	
5		3	0.25	Gray & Brown	clay	soft	silty	
		4	0.00	Gray & Brown	clay	Very soft	-silty	
		5	0.25	olive gray	clay	soft	-silty	-w/silt sms
10		6	0.00	olive gray	clay	Very soft	silty	-w/silt sms, sample Bulge on extrudsion 10-12'
		7	1.75	olive gray	clay	stiff	-silty	-w/ Fe Nod & Fe st
15		8	1.75	olive gray	clay	stiff	silty	-w/ Fe nod & Fe st
		9	1.50	Brown & gray	clay	stiff	silty	-w/silt sms
		10	1.75	Brown & gray	clay	stiff	-silty	-w/silt sms
20		11	1.00	" "	"	"	"	" " "
		12	1.50	Brown	clay	stiff	-silty	-w/silt sms & silt Parting
25		13	1.75	Yellowish Brown	clay	stiff		-w/silt Parting
30								
35								

SUMMARY OF LABORATORY TEST RESULTS

Project: Sabine lake North Disposal Area Sabine-Neches waterway Near Port Arthur, Texas

Contract No. DACW64-92-D-0005 Delivery Order No. 0025

Boring No.93-367

S#	Depth (ft.)	PP (tsf)	SPT Blows per foot	Visual Classification	U S C	M C (%)	Dry Unit Wt. (pcf)	Wet Unit Wt. (pcf)	LL (%)	PL (%)	Mechanical Analysis % passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	qu (tsf)
1	0-2	2.50		Yellowish Brown,Clay,Very stiff,Silty,w/sand seams	C L	30.9											
2	2-4	1.50		Yellowish Brown,Clay,Stiff,Silty,w/sand seams	C L	37.4											
3	4-6	0.25		Gray and Brown,Clay,Soft,Silty	C L	27.9										0.14	
4	6-8	0.00		Olive Gray,Clay,Very soft,Silty,w/sand seams	C L	30.5	90.0	117.5	49		100.0	100.0	99.6	98.5	96.4	0.09	0.18
5	8-10	0.25		Olive Gray,Clay,Soft,Silty,w/sand seams	C L	27.4										0.13	
6	10-12	0.00		Olive Gray,Clay,Very soft,Silty,w/sand seams	C L	28.9										0.08	
7	12-14	1.50		Olive Gray,Clay,Stiff,Silty,w/sand seams and ferrous nodules	C L	24.4	101.7	126.5	43	20	100.0	100.0	99.4	97.4	95.3		1.53
8	14-16	1.75		Olive Gray,Clay,Stiff,Silty,w/sand seams and ferrous nodules	C L	24.0											
9	16-18	1.50		Olive Gray,Clay,Stiff,Silty,w/sand seams and ferrous nodules	C L	30.5											
10	18-20	1.50		Olive Gray,Clay,Stiff,Silty,w/sand seams and ferrous nodules	C L	29.9											
11	20-22	1.25		Yellowish Brown,Clay,Stiff,Silty,w/silt seams	C L	29.9											
12	22-24	1.25		Yellowish Brown,Clay,Stiff,Silty,w/silt partings	C L	30.6											
13	24-26	1.75		Yellowish Brown,Clay,Stiff,Silty,w/ferrous stains and silt partings	C L	37.7											

S#: Sample Number, PP: Pocket Penetrometer Reading, USC: Unified Soil Classification, MC: Moisture Content
qu: Unconfined Compressive Strength, WOH: Weight of Hammer, WOP: Weight of Pipe

GEOTEST ENGINEERING, INC.

JOB NO. 14G719 DATE 10/09/93

PROJECT Sabine Lake North Disposal Area
Sabine-Neches Waterway

AREA Near Port Arthur, Texas

BORING NO. 93-367 SAMPLE NO. 4 DEPTH 6-8 ft

SPECIMEN NO. 1

CLASSIFICATION
Olive gray,Clay,Very soft,Silty,w/sand seams

Tare No.	P-9	Height	5.595 in.
Tare plus Wet Specimen	363.60 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	288.74 gm	Initial Area	6.290 sq in.
Water Weight	74.86 gm	Volume	35.194 cu in.
Tare Weight	43.02 gm	Volume of Solids	cu in.
Wet Specimen	1085.11 gm	Void Ratio	
Dry Specimen	831.72 gm	Saturation	%
Water Content	30.47 %	Dry Density	90.0 lb/cu ft
Specific Gravity of Solids			

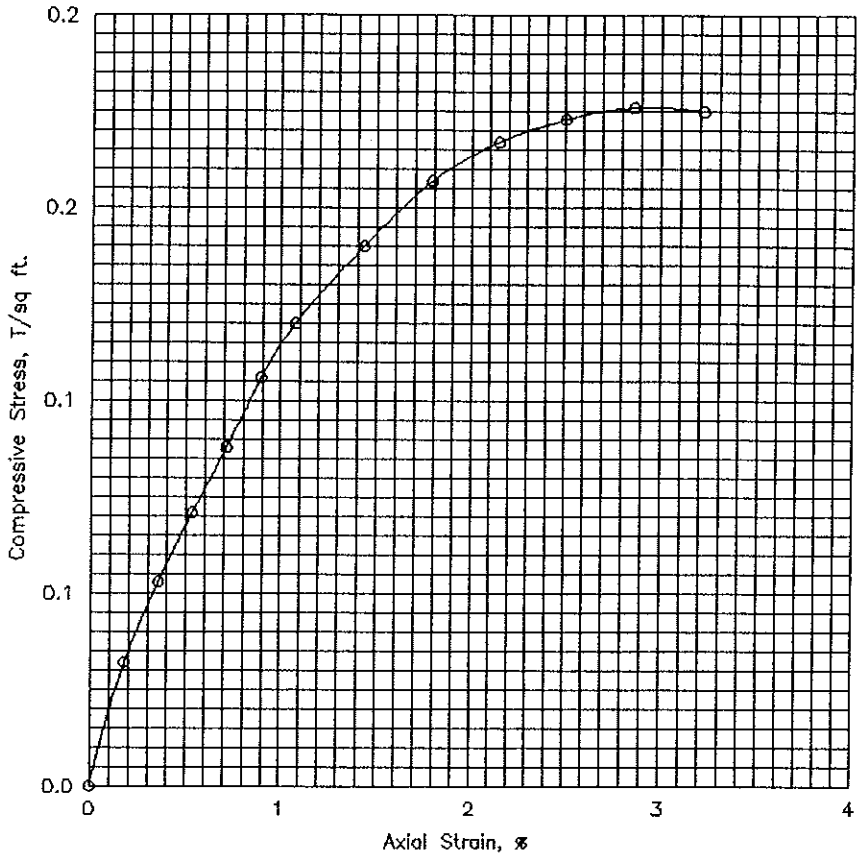
LL = 49 PL = PI =

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	9.0	2.8	.002	6.30	.032
.3	20.	.020	15.0	4.7	.004	6.31	.053
.5	30.	.030	20.0	6.2	.005	6.32	.071
.7	40.	.040	25.0	7.8	.007	6.34	.088
.9	50.	.050	30.0	9.3	.009	6.35	.106
1.0	60.	.060	34.0	10.6	.011	6.36	.120
1.4	80.	.080	40.0	12.4	.014	6.38	.140
1.7	100.	.100	45.0	14.0	.018	6.40	.157
2.0	120.	.120	48.0	14.9	.021	6.43	.167
2.3	140.	.140	50.0	15.5	.025	6.45	.173
2.6	160.	.160	51.0	15.8	.029	6.48	.176
3.0	180.	.180	51.0	15.8	.032	6.50	.175

Job No. 14G719

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	30.5 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	90.0			
Time to failure, min		t_f	2.63			
Unconfined compressive strength, T/sq ft		q_u	.18			
Undrained shear strength, T/sq ft		S_u	.09			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Olive gray,Clay,Very soft,Silty,w/sand seams

LL	49	PL		PI		G_s

Remarks

Project	Sabine Lake North Disposal Area
	Sabine-Neches Waterway
Area	Near Port Arthur, Texas
Boring No. 93-367	Sample No. 4
Depth El 6-8 ft	Date 10/09/93
UNCONFINED COMPRESSION TEST REPORT	

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 14G719 DATE 10/09/93

PROJECT Sabine Lake North Disposal Area
Sabine-Neches Waterway

AREA Near Port Arthur, Texas

BORING NO. 93-367 SAMPLE NO. 7 DEPTH 12-14 ft

SPECIMEN NO. 1

CLASSIFICATION
Olive gray,Clay,Stiff,Silty,w/sand seams & ferrous nodules

Tare No.	W-1	Height	5.595 in.
Tare plus Wet Specimen	507.64 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	416.45 gm	Initial Area	6.290 sq in.
Water Weight	91.19 gm	Volume	35.194 cu in.
Tare Weight	42.60 gm	Volume of Solids	cu in.
Wet Specimen	1168.46 gm	Void Ratio	
Dry Specimen	939.34 gm	Saturation	%
Water Content	24.39 %	Dry Density	101.7 lb/cu ft

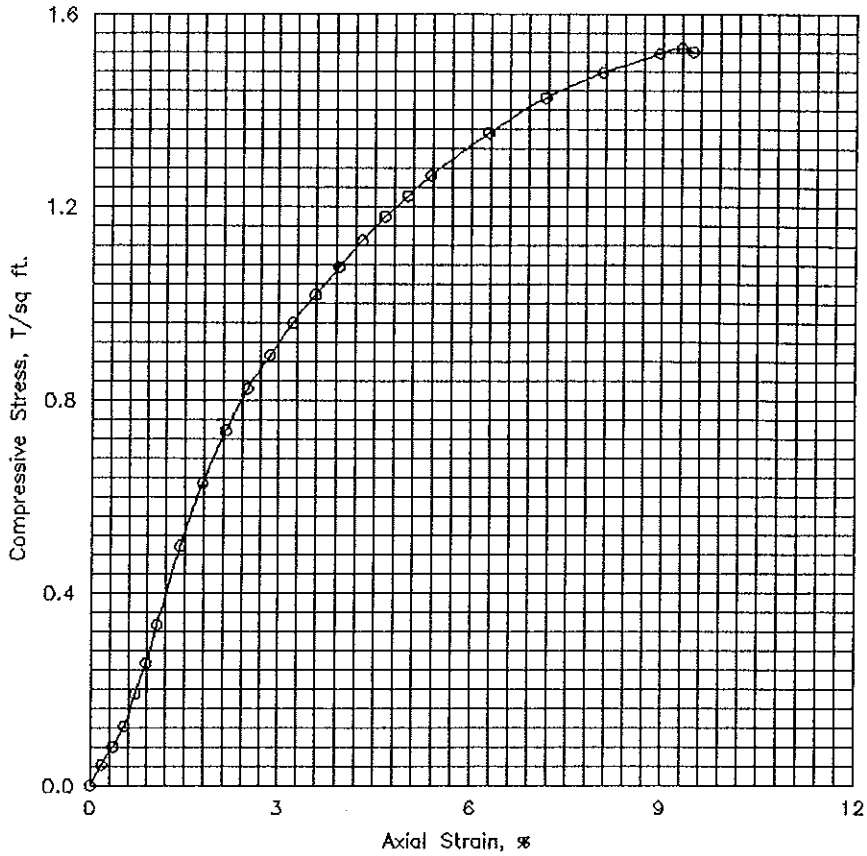
Specific Gravity of Solids
LL = 43 PL = 20 PI = 23

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	12.0	3.7	.002	6.30	.043
.4	20.	.020	23.0	7.1	.004	6.31	.081
.6	30.	.030	35.0	10.9	.005	6.32	.124
.7	40.	.040	54.0	16.8	.007	6.34	.191
.9	50.	.050	72.0	22.4	.009	6.35	.254
1.1	60.	.060	95.0	29.5	.011	6.36	.334
1.4	80.	.080	142.0	44.1	.014	6.38	.498
1.8	100.	.100	180.0	55.9	.018	6.40	.629
2.1	120.	.120	212.0	65.8	.021	6.43	.738
2.5	140.	.140	238.0	73.9	.025	6.45	.825
2.8	160.	.160	259.0	80.4	.029	6.48	.894
3.1	180.	.180	279.0	86.7	.032	6.50	.960
3.5	200.	.200	297.0	92.2	.036	6.52	1.018
3.8	220.	.220	315.0	97.8	.039	6.55	1.076
4.1	240.	.240	332.0	103.1	.043	6.57	1.130
4.4	260.	.260	348.0	108.1	.046	6.60	1.180
4.7	280.	.280	362.0	112.4	.050	6.62	1.223
5.1	300.	.300	376.0	116.8	.054	6.65	1.265
5.9	350.	.350	406.0	126.1	.063	6.71	1.353
6.7	400.	.400	432.0	134.2	.071	6.77	1.426
7.5	450.	.450	452.0	140.4	.080	6.84	1.478
8.3	500.	.500	469.0	145.7	.089	6.91	1.518
8.6	520.	.520	474.0	147.2	.093	6.93	1.529
8.8	530.	.530	473.0	146.9	.095	6.95	1.522

Job No. 14G719

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	24.4 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	101.7			
Time to failure, min		t_f	8.63			
Unconfined compressive strength, T/sq ft		q_u	1.53			
Undrained shear strength, T/sq ft		S_u	.76			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Olive gray,Clay,Stiff,Silty,w/sand seams & ferrous nodules

LL	43	PL	20	PI	23	G_s	

Remarks

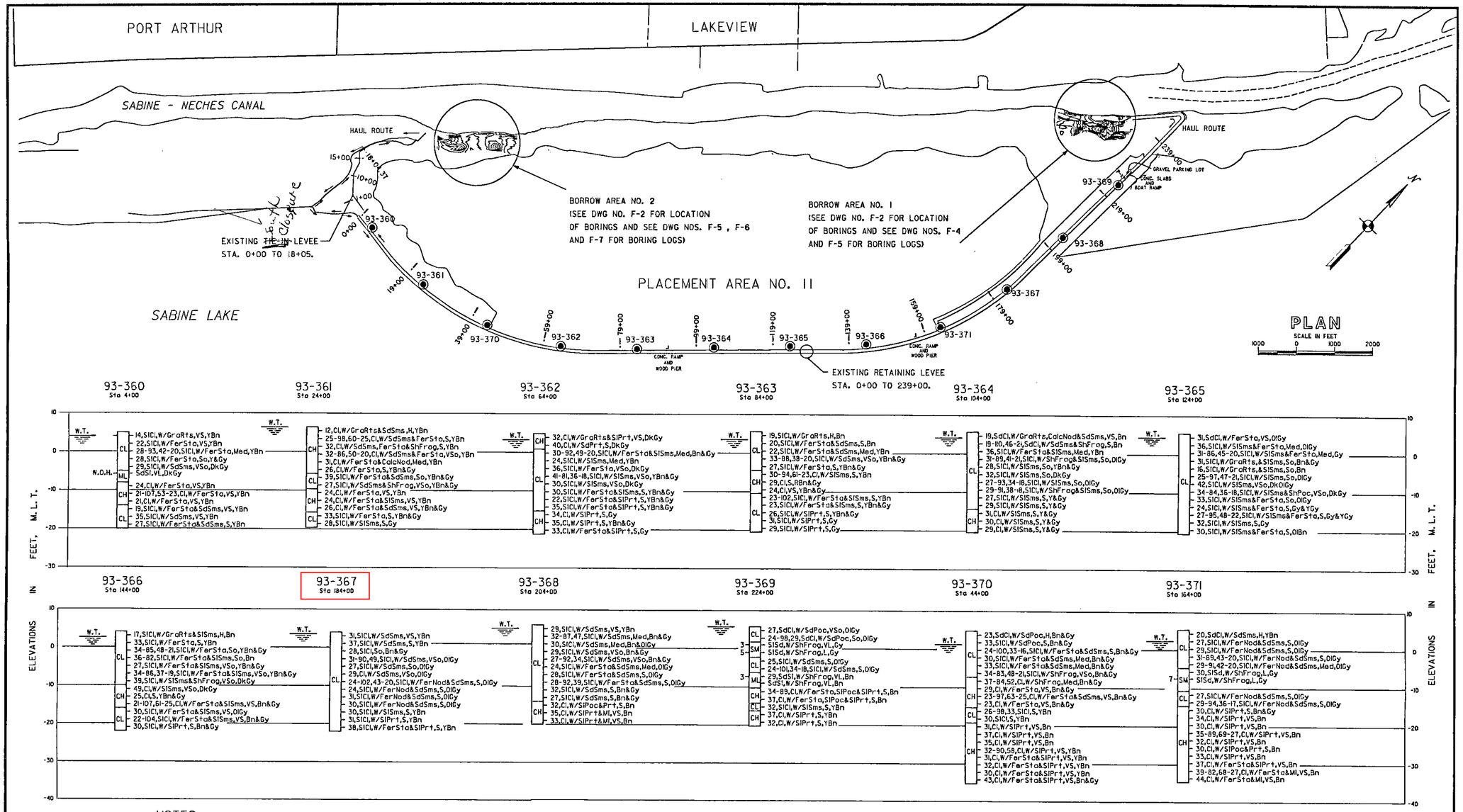
Project	Sabine Lake North Disposal Area
	Sabine-Neches Waterway
Area	Near Port Arthur, Texas
Boring No. 93-367	Sample No. 7
Depth 12-14 ft El	Date 10/09/93
UNCONFINED COMPRESSION TEST REPORT	

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE



NOTES;

1. SOILS HAVE BEEN CLASSIFIED IN ACCORDANCE WITH MILITARY STANDARD 619B "UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS, AND FOUNDATIONS." CONSISTENCY OF SOILS SUCH AS SOFT, MEDIUM, HARD, LOOSE, DENSE, ETC., ARE RELATIVE TERMS BASED ON ESTIMATED UNDISTURBED SHEAR STRENGTH OF THE MATERIAL AS DETERMINED BY VISUAL CLASSIFICATION POCKET PENETROMETER TESTS AND PENETRATION RESISTANCE DURING SAMPLING.
2. FIGURES TO THE RIGHT OF BORING LOGS ARE WATER CONTENTS IN PERCENT OF THE DRY WEIGHT, DRY DENSITY, LIQUID LIMIT, PLASTIC LIMIT, AND BAR LINEAR SHRINKAGE. (MC-LDW,LL-PL,I,BL.L.SJ) FIGURES TO THE LEFT OF BORING LOGS ARE BLOWS PER FOOT OF PENETRATION FROM STANDARD PENETRATION TESTING.
3. BORINGS WERE DRILLED USING WET ROTARY DRILLING TECHNIQUES AND UNDISTURBED SAMPLES WHERE RECOVERED WITH A 3-INCH DIAMETER THIN WALL SAMPLER WHERE COHESIVE MATERIALS WERE ENCOUNTERED. WHERE COHESIONLESS MATERIALS WERE ENCOUNTERED, DISTURBED SAMPLES WERE TAKEN WITH A SPLIT SPOON SAMPLER DURING PERFORMANCE OF STANDARD PENETRATION TESTING.
4. WATER TABLE LEVELS SHOWN ON BORING LOGS WERE DETERMINED AFTER DRILLING BORINGS BY MEASURING THE TOP OF FLUID LEVELS IN THE BORINGS. INASMUCH AS WET ROTARY DRILLING TECHNIQUES AND DRILLING MUD WERE USED TO DRILL THE HOLES, THE LEVEL OF DRILLING FLUIDS IN THE BORE HOLES MAY NOT HAVE STABILIZED TO THE LEVEL OF THE ACTUAL WATER TABLE. ADDITIONALLY, WATER TABLES IN THE FIELD ARE LIKELY TO FLUCTUATE DEPENDING ON WEATHER CONDITIONS. THEREFORE, SOME VARIATION SHOULD BE ANTICIPATED BETWEEN WATER TABLES INDICATED AND WATER TABLES ENCOUNTERED IN THE FIELD.

VISUAL CLASSIFICATIONS

Bn Brown(ish)	Nod Nodules	Sl Silt(y)
Calc Calcerous	Ol Olive	Sms Seams
Cl Clay	Poc Pocket(s)	So Soft
Dk Dark	Prt Parting	Sta Stain(s)
Fer Ferrous	R Red	V Very
Frag Fragment(s)	Rts Root(s)	W/ With
Gra Grass	S Stiff	W.T. Water Table
Gy Gray(ish)	Sd Sand(y)	W.O.H. Weight Of Hammer
H Hard	Sh Shell(y)	Y Yellow(ish)
L Loose		
Med Medium		
Mi Mica		

LABORATORY CLASSIFICATION

CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS.
ML INORGANIC SILTS AND VERY FINE SANDS, WITH SLIGHT PLASTICITY.
SM SILTY SANDS, SAND-SILT MIXTURES.

REVISION	DATE	DESCRIPTION	BY

OFFICE OF THE DISTRICT ENGINEER
U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

DRAWN BY: * J.G.
DESIGNED BY: * G.M.
CHECKED BY: * G.M./L.A.A.
SUBMITTED BY: *
CHIEF, GEOTECH & SURVEYS SECTION
APPROVED: *
CHIEF, DESIGN BRANCH
APPROVED: *
CHIEF, ENGINEERING DIVISION
DATE: JULY 1995

SABINE - NECHES WATERWAY, TEXAS
SABINE - NECHES CANAL
REHABILITATION OF PLACEMENT AREA NO. 11

PLAN AND BORING LOGS

* AS REQUIRED BY ENGINEER CIRCULAR NO. 1110-1-1932)

Prepared under the direction of
Robert B. Gatlin, Col., C.E.,
District Engineer

SCALE: AS SHOWN
EFFEC. DATE:
DRAWING NUMBER
F-1
SHEET 23 OF 32 FILE NO. SN 103-336