U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-361 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 0 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	4.5+	Gray & Brown	Clay	Hard		-w/ Sa pkts
		2	1.25	Gray & Brown	Clay	Stiff		-w/ Sa pkts & Sa sms
5		3	0.00	Gray & Brown	Clay	Very soft	Torvane shear Defines the cotton ft. w/ the layer and	-w/ Sa sms
		4	0.00	Gray & Brown	Clay	Very Soft		" " "
		5	0.00	olive gray	Clay	Very Soft		-w/ Sa sms & shell Fragments
10		6	1.75	olive gray	Clay	Stiff		-w/ Fest
		7	0.00	Gray	Clay	Very Soft	Silty	-w/ shell Fragments
15		8	0.00	Gray	Clay	Very Soft	Silty	-w/ Shell Fragments
		9	2.00	olive gray	Clay	Very Stiff		w/ Fest & Sa sms
		10	2.25	" "	"	" "		-w/ Fest & silt sms
20		11	2.50	" "	"	" "		-w/ Sand Seams
		12	0.75	Yellowish Brown	Clay	M. stiff	Silty	
25		13	1.25	" "	"	Stiff	Silty	-w/ silt sms
30								30 to 40% unconfined on VS.
35								

GEOTEST ENGINEERING, INC.

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.93-361

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					Torvane Shear Strength (tsf)	qu (tsf)
											#4	#10	#40	#100	#200		
1	0-2	4.25		Yellowish brown,Clay,Hard,w/sand seams and grass roots	C H	11.5											
2	2-4	1.00		Yellowish brown,Clay,Stiff,w/sand seams and ferrous stains	C H	25.2	97.8	122.4	60	25	100.0	100.0	100.0	98.9	97.9		1.06
3	4-6	0.25		Yellowish brown and Gray,Clay,Soft,w/sand seams, ferrous stains and shell fragments	C H	32.1										0.12	
4	6-8	0.00		Yellowish Gray,Clay,Very soft,w/sand seams and ferrous stains	C H	32.3	86.2	114.0	50	20	100.0	100.0	99.4	98.4	98.1	0.08	0.15
5	8-10	0.50		Yellowish brown,Clay,Medium stiff,w/ferrous stains and calcareous nodules	C H	31.0										0.30	
6	10-12	1.00		Yellowish brown and Gray,Clay,Stiff,w/ferrous stains	C H	26.3										0.50	
7	12-14	0.25		Gray and Yellowish brown,Clay,Soft,Silty,w/ferrous Stains .and sand seams	C L	39.4										0.12	
8	14-16	0.00		Gray and brown,Clay,Very soft,Silty,w/shell fragments and sand seams	C L	27.0										0.10	
9	16-18	2.50		Yellowish brown,Clay,Very stiff,w/ferrous stains	C H	24.3											
10	18-20	2.50		Yellowish brown,Clay,Very stiff,w/silt seams and ferrous stains	C H	24.2											
11	20-22	2.25		Gray and Yellowish brown,Clay,Very stiff,w/sand seams and ferrous stains	C H	25.7											
12	22-24	1.25		Gray and Yellowish brown,Clay,Stiff,Silty,w/ferrous stains	C L	32.5											
13	24-26	1.25		Gray,Clay,Stiff,Silty,w/silt seams	C L	27.5											

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 9/29/93

PROJECT Sabine Lake North Disposal Area
Sabine-Neches Waterway

AREA Near Port Arthur, Texas

BORING NO. 93-361 SAMPLE NO. 2 DEPTH 2-4 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish brown,Clay,Stiff,w/sand seams & ferrous stains

Tare No.	W-4	Height	5.595 in.
Tare plus Wet Specimen	318.71 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	263.18 gm	Initial Area	6.290 sq in.
Water Weight	55.53 gm	Volume	35.194 cu in.
Tare Weight	42.36 gm	Volume of Solids	cu in.
Wet Specimen	1130.96 gm	Void Ratio	
Dry Specimen	903.70 gm	Saturation	%
Water Content	25.15 %	Dry Density	97.8 lb/cu ft
Specific Gravity of Solids			

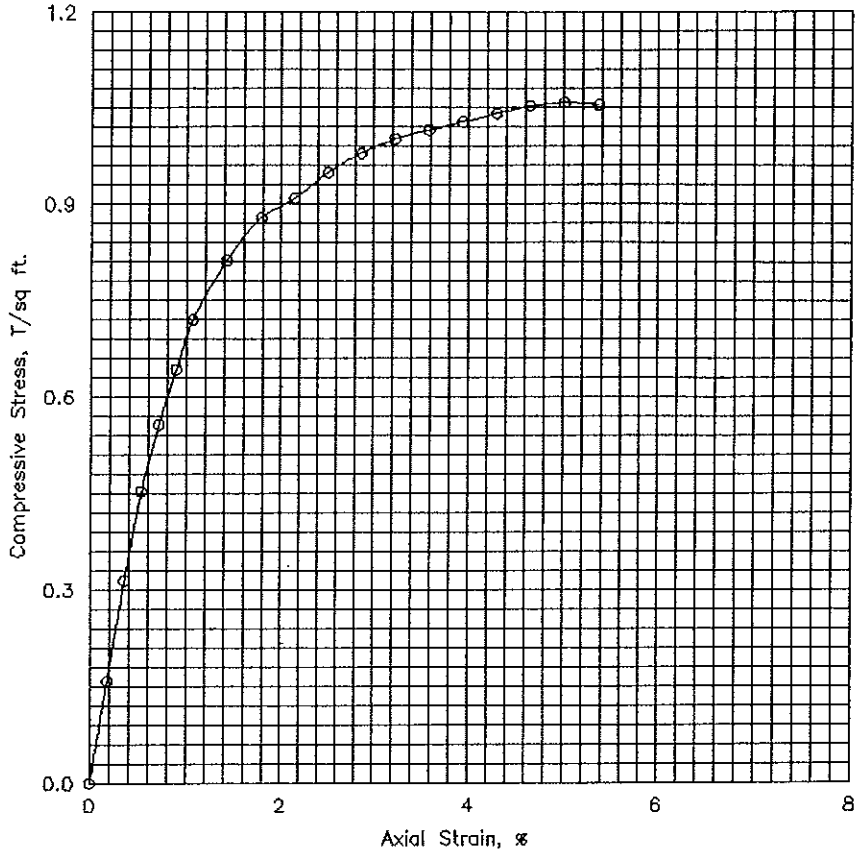
LL = 60 PL = 25 PI = 35

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	18.0	13.8	.002	6.30	.158
.5	20.	.020	36.0	27.6	.004	6.31	.315
.6	30.	.030	52.0	39.8	.005	6.32	.453
.8	40.	.040	64.0	49.0	.007	6.34	.557
1.0	50.	.050	74.0	56.7	.009	6.35	.643
1.2	60.	.060	83.0	63.6	.011	6.36	.720
1.5	80.	.080	94.0	72.0	.014	6.38	.812
1.9	100.	.100	102.0	78.1	.018	6.40	.878
2.2	120.	.120	106.0	81.2	.021	6.43	.909
2.5	140.	.140	111.0	85.0	.025	6.45	.949
2.9	160.	.160	115.0	88.1	.029	6.48	.979
3.2	180.	.180	118.0	90.4	.032	6.50	1.001
3.5	200.	.200	120.0	91.9	.036	6.52	1.015
3.8	220.	.220	122.0	93.5	.039	6.55	1.028
4.1	240.	.240	124.0	95.0	.043	6.57	1.041
4.5	260.	.260	126.0	96.5	.046	6.60	1.053
4.8	280.	.280	127.0	97.3	.050	6.62	1.058
5.2	300.	.300	127.0	97.3	.054	6.65	1.054

Job No. 14G719

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	25.1 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	97.8			
Time to failure, min		t_f	4.80			
Unconfined compressive strength, T/sq ft		q_u	1.06			
Undrained shear strength, T/sq ft		S_u	.53			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Yellowish brown,Clay,Stiff,w/sand seams & ferrous stains

LL	60	PL	25	PI	35	G_s	

Remarks

Project Sabine Lake North Disposal Area
Sabine-Neches Waterway
Area Near Port Arthur, Texas
Boring No. 93-361 Sample No. 2
Depth, El 2-4 ft Date 9/29/93

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 14G719 DATE 9/29/93

PROJECT Sabine Lake North Disposal Area
Sabine-Neches Waterway

AREA Near Port Arthur, Texas

BORING NO. 93-361 SAMPLE NO. 4 DEPTH 6-8 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish gray,Clay,Very soft,w/sand seams & ferrous stains

Tare No.	P-4	Height	5.595 in.
Tare plus Wet Specimen	445.43 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	347.20 gm	Initial Area	6.290 sq in.
Water Weight	98.23 gm	Volume	35.194 cu in.
Tare Weight	42.97 gm	Volume of Solids	cu in.
Wet Specimen	1053.14 gm	Void Ratio	
Dry Specimen	796.10 gm	Saturation	%
Water Content	32.29 %	Dry Density	86.2 lb/cu ft
Specific Gravity of Solids			

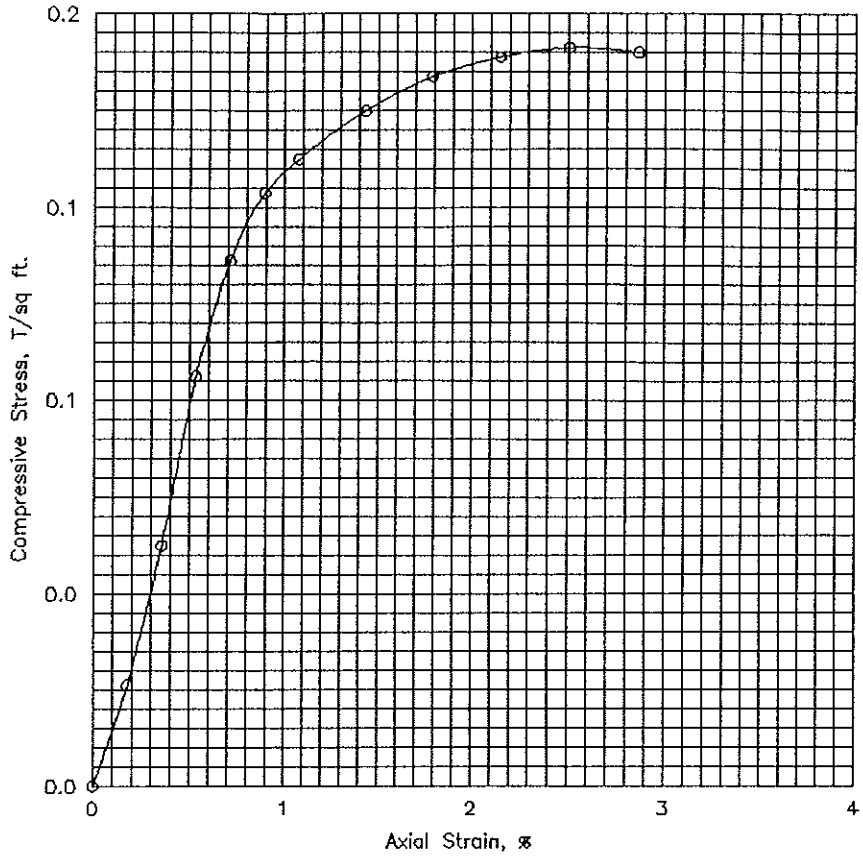
LL = 50 PL = 20 PI = 30

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
.3	10.	.010	6.0	1.9	.002	6.30	.021
.4	20.	.020	14.0	4.3	.004	6.31	.050
.6	30.	.030	24.0	7.5	.005	6.32	.085
.8	40.	.040	31.0	9.6	.007	6.34	.109
1.0	50.	.050	35.0	10.9	.009	6.35	.123
1.2	60.	.060	37.0	11.5	.011	6.36	.130
1.6	80.	.080	40.0	12.4	.014	6.38	.140
1.9	100.	.100	42.0	13.0	.018	6.40	.147
2.2	120.	.120	43.5	13.5	.021	6.43	.151
2.5	140.	.140	44.0	13.7	.025	6.45	.153
2.8	160.	.160	44.0	13.7	.029	6.48	.152

Job No. 14G719

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	32.3 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	86.2			
Time to failure, min		t_f	2.52			
Unconfined compressive strength, T/sq ft		q_u	.15			
Undrained shear strength, T/sq ft		S_u	.08			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Yellowish gray,Clay,Very soft,w/sand seams & ferrous stains

LL	50	PL	20	PI	30	G_s	

Remarks

Project Sabine Lake North Disposal Area
Sabine-Neches Waterway
Area Near Port Arthur, Texas
Boring No. 93-361 Sample No. 4
Depth El 6-8 ft Date 9/29/93

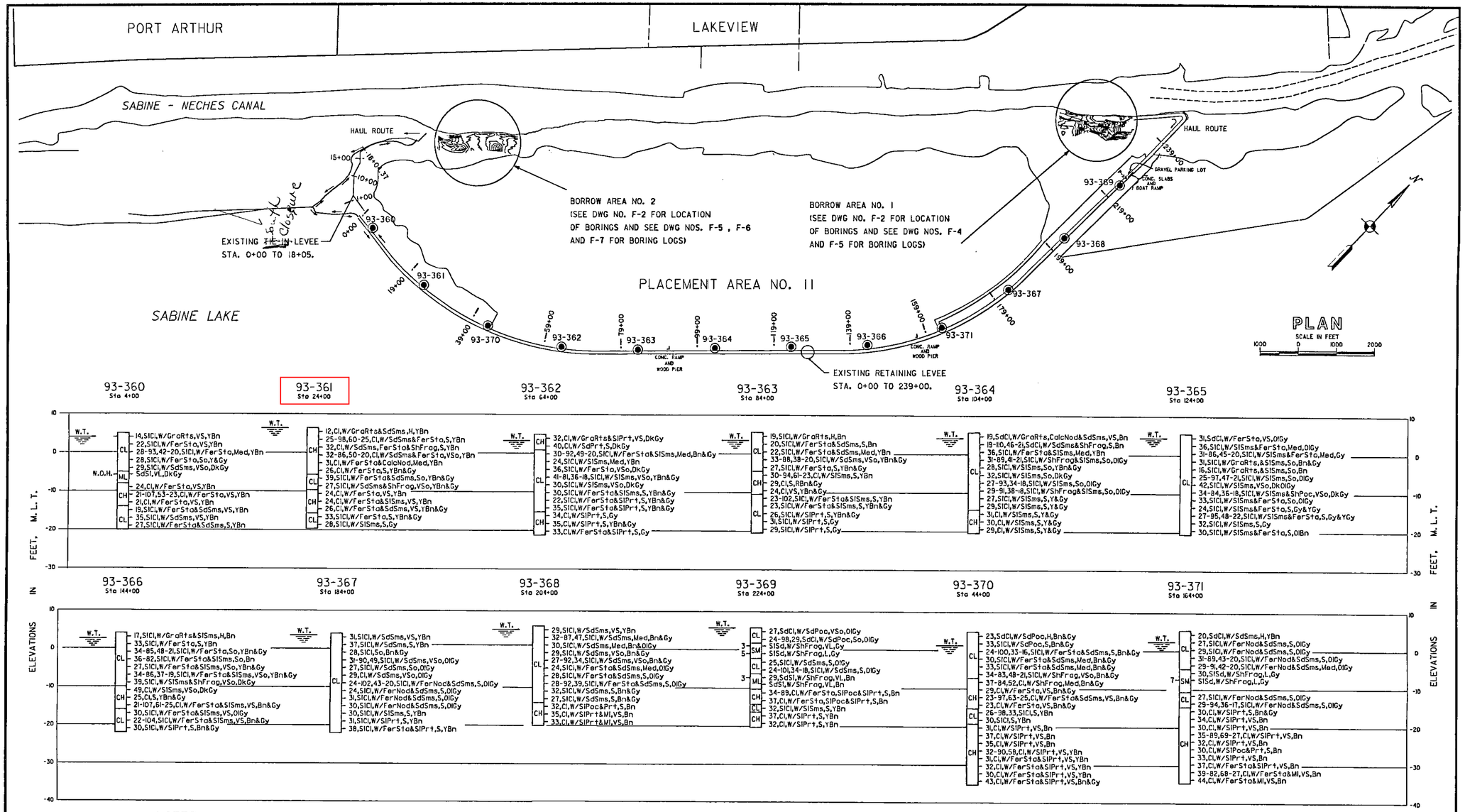
UNCONFINED COMPRESSION TEST REPORT

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

CADD

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. 1110-1-8152)

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

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