Project : Channel enlargement channel to Victoria, Victoria, Texas

SUMMARY OF LABORATORY TEST RESULTS

El. 14.4' NGVD

Boring No. 91-13

Contract No. DACW64-91-D-0001 Delivery Order No.0009

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)	L L (%)	P L (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0-2	2.50		Dark gray, Clay, Very stiff	CH	35.0											
2	2-4	4.25		Dark gray, Clay, Hard, w/calcareous nodule & Ferrous stains	CH	31.0											
3	4-6	4.50		Dark gray, Clay, Hard	CH	23.7	98.7	122.1	65	23	100.0	99.9	99.5		98.7		
4	6-8	4.25		Dark gray, Clay, Hard	CH	26.6											
5	8-10	2.25		Dark gray, Clay, Very stiff	CH	35.2											
6	10-12	2.00		Dark gray, Clay, Very stiff	CH	34.4											
7	12-14	1.75		Dark gray, Clay, Stiff	CH	36.3	84.4	115.6	72	24							
8	14-16	1.25		Dark gray, Clay, Stiff, w/ferrous nodules	CH	39.5											
9	16-18	1.50		Dark gray, Clay, Stiff, w/calcareous nodule	CH	37.7											
10	18-20	1.00		Dark gray, Clay, Stiff	CH	41.5											
11	20-22	1.50		Dark gray, Clay, Stiff, w/calcareous nodule	CH	39.0	80.6	112.1	83	30	99.4	98.1	96.1		94.0		
12	22-24	0.75		Gray, Clay, Medium ~~stiff~~	CH	35.8											
13	24-26	2.00		Gray, Clay, Very stiff, w/calcareous nodule and Slickensided	CH	33.3											
14	26-28	1.50		Gray, Clay, Sitff, w/calcareous nodule and Slickensided	CH	33.7											
15	28-30	2.00		Dark gray, Clay, Very stiff, w/calcareous nodule Slickensided	CH	28.7											
16	30-32	2.50		Dark gray, Clay, Very stiff,w/calcareous nodule & sand pockets	CH	28.6	93.3	119.9	62	23	100.0	99.6	97.5		77.4		.86
17	32-34	1.50		Gray & dark gray, Clay, Stiff, Sandy ,w/clay pockets	CL	20.5											

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 : Channel enlargement channel to Victoria, Victoria, Texas

SUMMARY OF LABORATORY TEST RESULTS

Boring No. 91-13

Contract No. DACW64-91-D-0001 Delivery Order No.0009

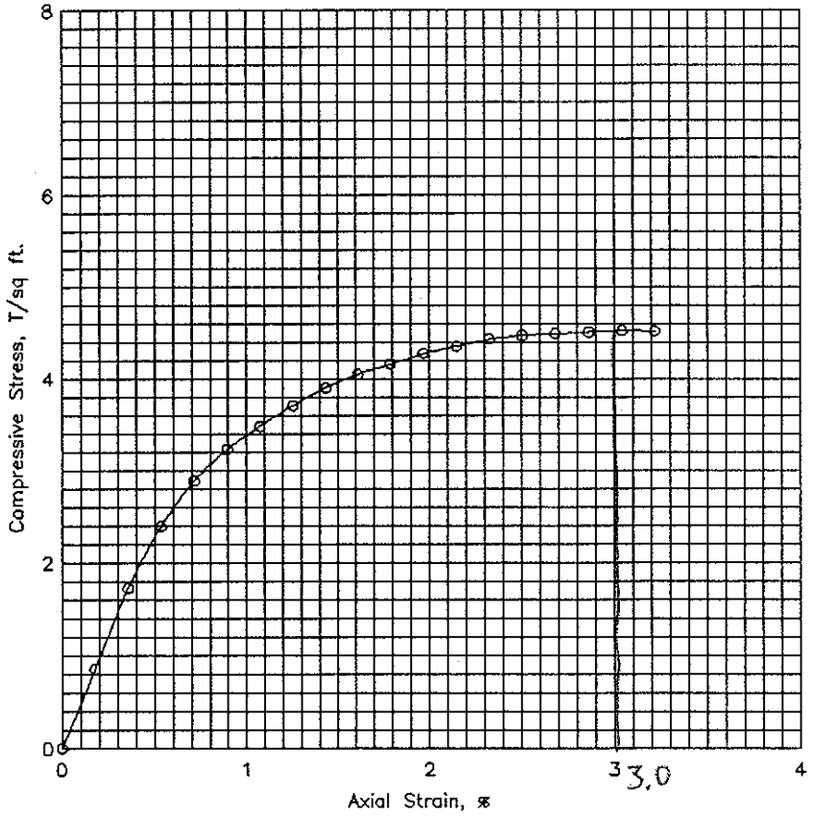
S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	M c (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	P L (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
18	34.5-36		16	Light olive gray,Sand,Medium dense,Silty	S M												
19	38.5-40		26	Light olive gray, Sand,Medium dense,Silty	S M												
20	43.5-45		33	Gray.Sand,Medium dense,Silty	S M												

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. 14G459

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_o	23.6 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	97.3			
Time to failure, min		t_f	3.75			
Unconfined compressive strength, T/sq ft		q_u	4.53			
Undrained shear strength, T/sq ft		S_u	2.27			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_o	2.830			
Initial specimen height, in.		H_o	5.595			

Classification Dark gray,clay,Hard

LL	65	PL	23	PI	42	G_s	

Remarks

Project CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA

Area Victoria, Texas

Boring No. 91-13 | Sample No. 3

Depth El 4-6 ft | Date 4/16/91

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

JOB NO. 14g459 DATE 4/16/91

PROJECT CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA, TEXAS

BORING NO. 91-13 SAMPLE NO. 16 DEPTH 30-32 ft

SPECIMEN NO. 1

CLASSIFICATION
Dark gray,clay,very stiff,w/calcareous nodules & sand pockets

Tare No.	P-30	Height	5.595 in.
Tare plus Wet Specimen	936.42 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	737.87 gm	Initial Area	6.290 sq in.
Water Weight	198.55 gm	Volume	35.194 cu in.
Tare Weight	42.71 gm	Volume of Solids	cu in.
Wet Specimen	1107.91 gm	Void Ratio	
Dry Specimen	861.77 gm	Saturation	%
Water Content	28.56 %	Dry Density	93.3 lb/cu ft

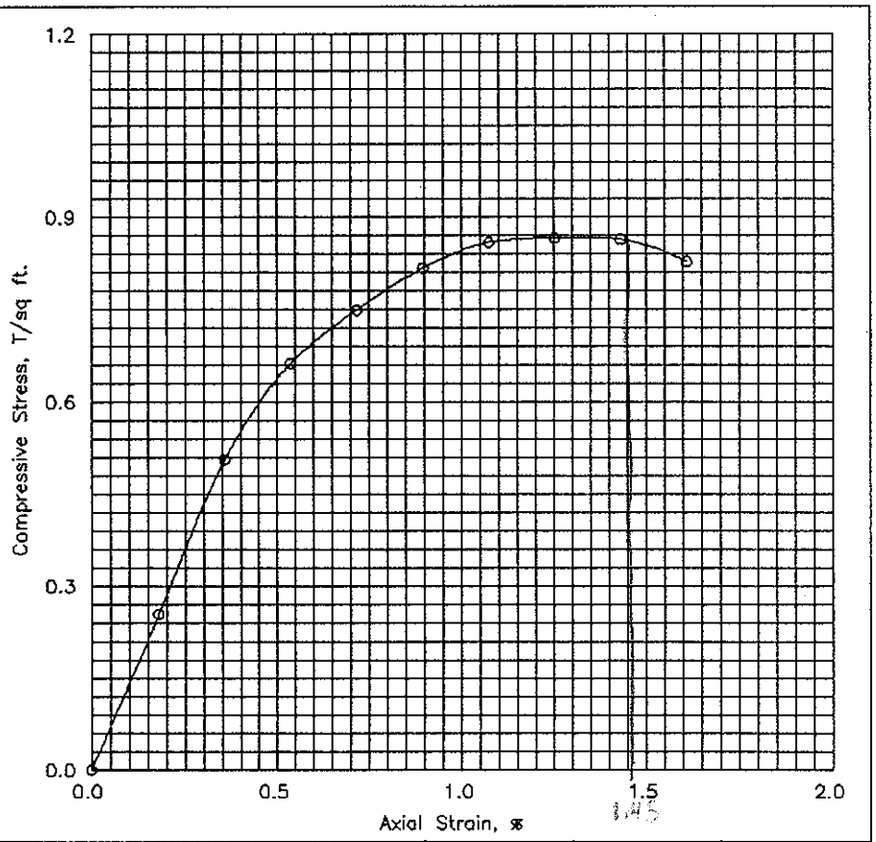
Specific Gravity of Solids
LL = 62 PL = 23 PI = 39

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
.4	10.	.010	29.0	22.2	.002	6.30	.254
.7	20.	.020	58.0	44.4	.004	6.31	.507
.9	30.	.030	76.0	58.2	.005	6.32	.663
1.1	40.	.040	86.0	65.9	.007	6.34	.749
1.2	50.	.050	94.0	72.0	.009	6.35	.817
1.4	60.	.060	99.0	75.8	.011	6.36	.859
1.6	70.	.070	100.0	76.6	.013	6.37	.866
1.7	80.	.080	100.0	76.6	.014	6.38	.864
1.9	90.	.090	96.0	73.5	.016	6.39	.828

Job No. 14G459

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_o	28.6 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	93.3			
Time to failure, min		t_f	1.57			
Unconfined compressive strength, T/sq ft		q_u	.87			
Undrained shear strength, T/sq ft		S_u	.43			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_o	2.830			
Initial specimen height, in.		H_o	5.595			

Classification Dark gray,clay,very stiff,w/calcareous nodules & sand pockets

LL	62	PL	23	PI	39	G_s	

Remarks

Project CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA

Area Victoria, Texas

Boring No. 91-13 | Sample No. 16

Depth El 30-32 ft | Date 4/16/91

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

JOB NO. 14g459 DATE 4/16/91

PROJECT CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA, TEXAS

BORING NO. 91-13 SAMPLE NO. 3 DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION
Dark gray, clay, hard

Tare No.	GE-10	Height	5.595 in.
Tare plus Wet Specimen	823.39 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	674.11 gm	Initial Area	6.290 sq in.
Water Weight	149.28 gm	Volume	35.194 cu in.
Tare Weight	42.40 gm	Volume of Solids	cu in.
Wet Specimen	1111.67 gm	Void Ratio	
Dry Specimen	899.18 gm	Saturation	%
Water Content	23.63 %	Dry Density	97.3 lb/cu ft

Specific Gravity of Solids
LL = 65 PL = 23 PI = 42

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

Elapsed Time n.	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
.4	10.	.010	98.0	75.1	.002	6.30	.858
.7	20.	.020	198.0	151.7	.004	6.31	1.730
.9	30.	.030	275.0	210.6	.005	6.32	2.398
1.1	40.	.040	332.0	254.3	.007	6.34	2.890
1.2	50.	.050	372.0	285.0	.009	6.35	3.233
1.4	60.	.060	402.0	307.9	.011	6.36	3.487
1.6	70.	.070	429.0	328.6	.013	6.37	3.714
1.7	80.	.080	452.0	346.2	.014	6.38	3.906
1.9	90.	.090	470.0	360.0	.016	6.39	4.055
2.5	100.	.100	484.0	370.7	.018	6.40	4.168
2.7	110.	.110	498.0	381.5	.020	6.42	4.281
2.9	120.	.120	508.0	389.1	.021	6.43	4.359
3.0	130.	.130	518.0	396.8	.023	6.44	4.436
3.2	140.	.140	524.0	401.4	.025	6.45	4.479
3.2	150.	.150	527.0	403.7	.027	6.46	4.497
3.6	160.	.160	530.0	406.0	.029	6.48	4.514
3.8	170.	.170	533.0	408.3	.030	6.49	4.531
3.9	180.	.180	533.0	408.3	.032	6.50	4.523

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 91-13 DATE: BEGIN 3-19-91 PAGE 1 / 1
JOB NO. 146446 COMPLETE 3-19-9 Thin Walled Tube
PROJECT Victoria Channel ☑ 3" ☐ 6"
LOCATION Victoria Channel
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Failing - 36
GROUNDWATER: DEPTH 8'7" ft., ELEV. ____ ft., at end of Drilling
WEATHER Clear, Warm
DRILLER W. De Foor LOGGER T. Berg

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	2.0	BROWN	Clay	Very Stiff		
		2	4.5+	"	Clay	Hard		
5		3	4.5+	BROWN	clay	Hard		
		4	4.5+	"	"	"		
		5	3.0	BROWN	Clay	very Stiff		
10		6	1.75	BROWN	Clay	Stiff		
		7	2.0	GRAY	Clay	very Stiff		
15		8	1.5	GRAY	clay	Stiff		
		9	2.0	GRAY	Clay	very Stiff		
		10	1.25	GRAY	clay	Stiff		
20		11	1.0	GRAY	Clay	~~Medium~~ Stiff		
		12	1.5	GRAY	Clay	Stiff		
25		13	2.0	GRAY	clay	very stiff		
		14	2.0	GRAY	clay	"		
		15	2.0	GRAY	Clay	"		
30		16	2.5	GRAY	Clay	very Stiff		
		17	2.5	GRAY	Clay	very Stiff	Sandy	Sand @ 34'
35		18	7/8/8	GRAY	Sand	Medium dense		

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 91-13 DATE: BEGIN 3-19-91 PAGE 2 of 2
JOB NO. 14644C COMPLETE 3-19-91 Thin Walled Tube
PROJECT Victoria Channel ☑ 3" ☐ 6"
LOCATION Victoria Channel
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Failing-36
GROUNDWATER: DEPTH 8'0" ft., ELEV. ____ ft., at end of Drilling
WEATHER Clear, Warm
DRILLER W. DeFaoe LOGGER J. Berg

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								
40	X	19	7/11/15	GRAY	SAND	MEDIUM DENSE		
45	X	20	9/14/19	GRAY	SAND	DENSE		Bottom of 91-13 (45')
50								
55								
60								
65								
70								

GEOTEST ENGINEERING INC.