U.S. ARMY CORPS OF ENGINEERS

BKM

BORING NO. 91-5 DATE: BEGIN 3-20-91 PAGE 1 / 1

JOB NO. 146446 COMPLETE _____ Thin Walled Tube

PROJECT Victoria to Channel ☑ 3" ☐ 6"

LOCATION Victoria Channel

ELEVATION OF HOLE _____

MANUFACTURER'S DESIGNATION OF DRILL RIG Failing 36

GROUNDWATER: DEPTH 7'-2" ft., ELEV. _____ ft., at end of Drilling

WEATHER Windy, Warm

DRILLER W. De Foor LOGGER J. Berg

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE / SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	4.0	TAN	clay	V/stiff		w/roots
		2	4.5+	GRAY	"	Hard		
5		3	4.5+	"	"	"		
		4	4.0	GRAY	clay	V/stiff		
		5	4.5	TAN	clay	hard		
10		6	4.5+	"	"	"		w/calc. nod
		7	4.5+	"	"	"		"
15		8	4.5+	TAN	clay	hard		w/calc. nod
		9	4.5+	TAN	clay	hard	w/sand seams	
		10	3.0	TAN	clay	very stiff		
20		11	4.5+	TAN	clay	hard		w calc nod SAND AT 22'
		12	3/5/9	TAN	Sand	Medium Dense		
25								clay at 26'
		13	4.0	TAN	clay	Very stiff		
		14	3.0	TAN	clay	very stiff	w/sand seams	Sand @ 30½'
30		15	3/2/10	TAN	Sand	Medium Dense		
		16	2/6/8	TAN	Sand	"		
35								

GEOTEST ENGINEERING, INC.

Project : Channel enlargement channel to Victoria, Victoria, Texas

SUMMARY OF LABORATORY TEST RESULTS

EL. 24.5' NGVD

Boring No. 91-5

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)	LL (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
1	0-2	2.50		Olive gray& yellowish brown, Clay, Very stiff,w/ calcareous nodules and roots	CH	18.1	110.4	130.3	52	21							
2	2-4	4.50		Dark gray, Clay, Hard, w/calcareous nodules	CH	25.9											
3	4-6	4.5+		Dark gray, Clay, Hard, w/calcareous nodules	CH	25.1											
4	6-8	4.5+		Dark gray and olive gray, Clay, Hard, w/calcareo-us nodules	CH	27.3	96.5	122.9	89	29	100.0	99.5	97.9		90.4		
5	8-10	3.25		Olive gray, Clay, Very stiff, w/calcaresous nodu-les ferrous stains Blocky structure and slickensided	CH	30.4											
6	10-12	3.50		Olive gray, Clay, Very stiff, w/calcareous and ferrous nodules	CH	19.3	110.4	131.6	62	22	99.7	98.5	96.2		94.5		4.44
7	12-14	4.25		Yellowish brown, Clay, Hard, w/calcareous nodul-es	CH	20.3											
8	14-16	4.5+		Yellowish brown and olive gray, Clay, Hard, Silty, w/calcareous nodules	CL	18.6											
9	16-18	4.5+		Brown and yellowish borwn, Clay, Hard, Sandy, w/sand seams	CL	17.3											
10	18-20	3.25		Gray and yellowish brown, Clay, Very stiff, w/calcareous noduless	CH	23.8	99.6	123.4	58	22	100.0	100.0	99.9		99.2		
11	20-22	3.50		Light yellowish brown, Clay, Very stiff,w/calcar-eous nodles	CH	23.4											
12	22.5-24		14	Gray, Sand, Medium dense, Clayey, w/gravel	SC						97.4	96.6	79.2		37.4		
13	26-28	2.75		Yellowish brown, Clay, Very stiff, w/sand seams and Blocky structures	CH	30.9	91.9	30.9	64	23	100.0	99.9	99.5		91.0		.96
14	28-30	2.00		Olive gray and yellowish brown, Clay, Very stiff, w/sand partting	CH	29.2											
15	30.5-32		17	Yellowish brown, Sand, Medium dense, Silty	SP-SM						100.0	100.0	99.9		4.9		
16	33.5-35		14	Yellowish brown, Sand, Medium dense, Silty	S M												
17	38.5-40		50	Gray and yellowish brown, Sand, Dense, Silty	SP-SM						100.0	99.5	58.6		5.1		

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. 91-5

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)	LL (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
18	43.5-45		46	Gray,Sand,Dense,Silty													
19	48.5-50		70	Gray,Sand,Very,Dense,Silty													

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 DATE 4/15/91

PROJECT CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA, TEXAS

BORING NO. 91-5 SAMPLE NO. 6 DEPTH 10-12 ft

SPECIMEN NO. 1

CLASSIFICATION
Olive gray,clay,verystiff,w/calcareous nodules & ferrous nodules

Tare No.	GE-3	Height	5.595 in.
Tare plus Wet Specimen	1258.69 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	1062.04 gm	Initial Area	6.290 sq in.
Water Weight	196.65 gm	Volume	35.194 cu in.
Tare Weight	42.62 gm	Volume of Solids	cu in.
Wet Specimen	1216.07 gm	Void Ratio	
Dry Specimen	1019.42 gm	Saturation	%
Water Content	19.29 %	Dry Density	110.3 lb/cu ft

Specific Gravity of Solids
LL = 62 PL = 22 PI = 40

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	95.0	72.8	.002	6.30	.831
.7	20.	.020	175.0	134.0	.004	6.31	1.529
.9	30.	.030	236.0	180.8	.005	6.32	2.058
1.2	40.	.040	283.0	216.8	.007	6.34	2.464
1.4	50.	.050	321.0	245.9	.009	6.35	2.789
1.6	60.	.060	350.0	268.1	.011	6.36	3.036
2.0	80.	.080	392.0	300.3	.014	6.38	3.388
2.4	100.	.100	422.0	323.3	.018	6.40	3.634
2.8	120.	.120	447.0	342.4	.021	6.43	3.835
3.1	140.	.140	467.0	357.7	.025	6.45	3.992
3.4	160.	.160	482.0	369.2	.029	6.48	4.105
3.8	180.	.180	496.0	379.9	.032	6.50	4.209
4.1	200.	.200	508.0	389.1	.036	6.52	4.295
4.9	250.	.250	528.0	404.4	.045	6.58	4.423
5.7	300.	.300	534.0	409.0	.054	6.65	4.431
5.9	315.	.315	532.0	407.5	.056	6.67	4.402

JOB NO. 14G459 DATE 4/15/91

PROJECT CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA, TEXAS

BORING NO. 91-5 SAMPLE NO. 13 DEPTH 26-28 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish brown,clay,very stiff,w/sand seams & blocky structure

Tare No.	P-10	Height	5.595 in.
Tare plus Wet Specimen	796.21 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	618.30 gm	Initial Area	6.290 sq in.
Water Weight	177.91 gm	Volume	35.194 cu in.
Tare Weight	42.42 gm	Volume of Solids	cu in.
Wet Specimen	1111.32 gm	Void Ratio	
Dry Specimen	849.03 gm	Saturation	%
Water Content	30.89 %	Dry Density	91.9 lb/cu ft
Specific Gravity of Solids			

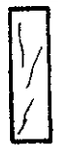
LL = 64 PL = 23 PI = 41

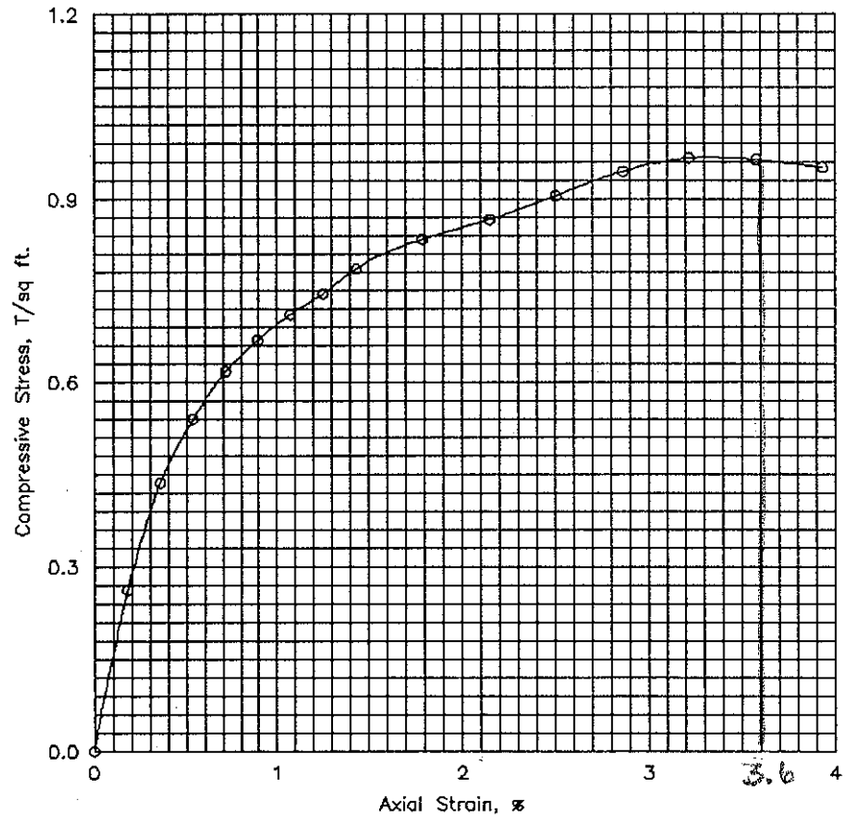
Proving Ring No. 10170
Proving Ring Constant, K = .766 lbs/div.

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	30.0	23.0	.002	6.30	.263
.6	20.	.020	50.0	38.3	.004	6.31	.437
.8	30.	.030	62.0	47.5	.005	6.32	.541
1.0	40.	.040	71.0	54.4	.007	6.34	.618
1.2	50.	.050	77.0	59.0	.009	6.35	.669
1.4	60.	.060	82.0	62.8	.011	6.36	.711
1.5	70.	.070	86.0	65.9	.013	6.37	.745
1.7	80.	.080	91.0	69.7	.014	6.38	.786
2.0	100.	.100	97.0	74.3	.018	6.40	.835
2.3	120.	.120	101.0	77.4	.021	6.43	.867
2.7	140.	.140	106.0	81.2	.025	6.45	.906
3.0	160.	.160	111.0	85.0	.029	6.48	.945
3.4	180.	.180	114.0	87.3	.032	6.50	.967
3.7	200.	.200	114.0	87.3	.036	6.52	.964
4.0	220.	.220	113.0	86.6	.039	6.55	.952

Job No. 14G459

Failure Sketches





☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	30.9 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	91.9			
Time to failure, min		t_f	3.37			
Unconfined compressive strength, T/sq ft		q_u	.97			
Undrained shear strength, T/sq ft		S_u	.48			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Yellowish brown,clay,very stiff,w/sand seams & blocky structure

LL	64	PL	23	PI	41	G_s	

Remarks

Project CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA

Area Victoria, Texas

Boring No. 91-5 | Sample No. 13

Depth El 26-28 ft | Date 4/15/91

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

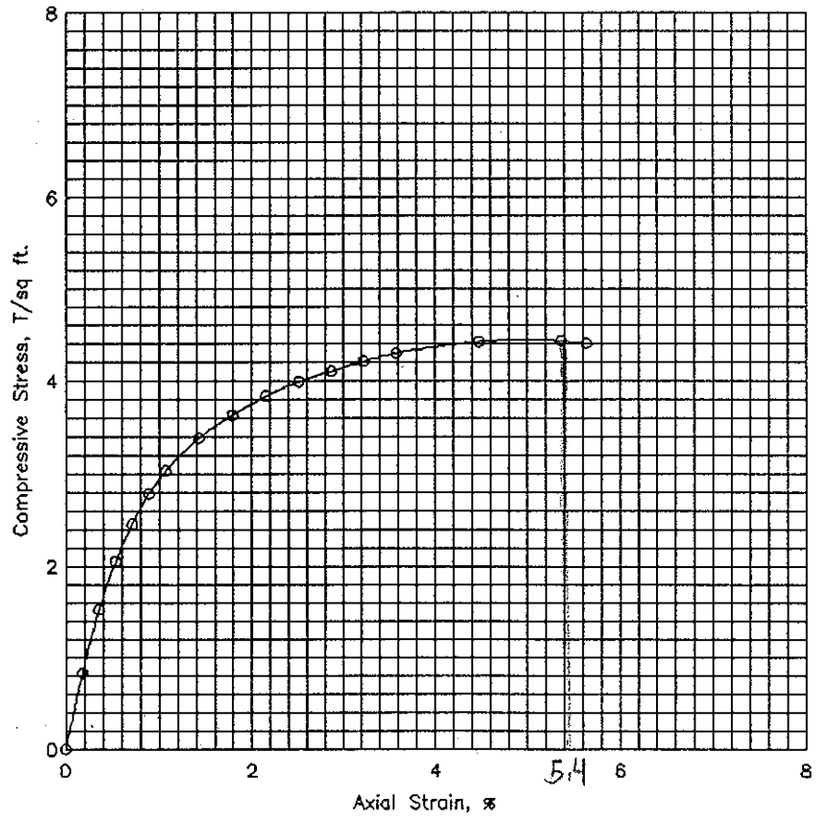
PLATE XI-2

Geotest Engineering, Inc.

PLATE

Job No. 14G459

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	19.3 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	110.3			
Time to failure, min		t_f	5.73			
Unconfined compressive strength, T/sq ft		q_u	4.43			
Undrained shear strength, T/sq ft		S_u	2.22			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Olive gray,clay,verystiff,w/calcareous nodules & ferrous nodules

LL	62	PL	22	PI	40	G_s	

Remarks

Project CHANNEL ENLARGEMENT, CHANNEL TO VICTORIA

Area Victoria, Texas

Boring No. 91-5 | Sample No. 6

Depth El 10-12 ft | Date 4/15/91

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

U.S. ARMY CORPS OF ENGINEERS

BKM

BORING NO. 91-5 DATE: BEGIN 3-20-91 PAGE 1 / 1

JOB NO. 146446 COMPLETE _____ Thin Walled Tube

PROJECT Victoria to Channel ☑ 3" ☐ 6"

LOCATION Victoria Channel

ELEVATION OF HOLE _____

MANUFACTURER'S DESIGNATION OF DRILL RIG Failing 36

GROUNDWATER: DEPTH 7'-2" ft., ELEV. _____ ft., at end of Drilling

WEATHER Windy, Warm

DRILLER W. De Foor LOGGER J. Berg

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE / SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	4.0	TAN	clay	V/stiff		w/roots
		2	4.5+	GRAY	"	Hard		
5		3	4.5+	"	"	"		
		4	4.0	GRAY	clay	V/stiff		
		5	4.5	TAN	clay	hard		
10		6	4.5+	"	"	"		w/calc. nod
		7	4.5+	"	"	"		"
15		8	4.5+	TAN	clay	hard		w/calc. nod
		9	4.5+	TAN	clay	hard	w/sand seams	
		10	3.0	TAN	clay	very stiff		
20		11	4.5+	TAN	clay	hard		w calc nod SAND AT 22'
		12	3/5/9	TAN	Sand	Medium Dense		
25								clay at 26'
		13	4.0	TAN	clay	Very stiff		
		14	3.0	TAN	clay	very stiff	w/sand seams	Sand @ 30½'
30		15	3/2/10	TAN	Sand	Medium Dense		
		16	2/6/8	TAN	Sand	"		
35								

GEOTEST ENGINEERING, INC.

U.S. ARMY CORPS OF ENGINEERS

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BORING NO. 91-5 DATE: BEGIN 3-20-91 PAGE 2 / 2

JOB NO. 146446 COMPLETE _____ Thin Walled Tube

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MANUFACTURER'S DESIGNATION OF DRILL RIG Failing 36

GROUNDWATER: DEPTH _____ ft., ELEV. _____ ft., at end of Drilling

WEATHER Windy, Warm

DRILLER W. De Fook 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	17	12/19/23	TAN	Sand	Dense		
45	X	18	14/20/26	TAN	Sand	Dense		
50	X	19	20/30/40	TAN	Sand	Very Dense		Bottom of 91-5 (50')
55								
60								
65								
70								

GEOTEST ENGINEERING, INC.