U.S. ARMY CORPS OF ENGINEERS

BORING NO. 94-15 DATE: BEGIN 3/16/94 PAGE 1 / 2
JOB NO. 146727-5 COMPLETE 3/16/94 Thin Walled Tube
PROJECT Wallisville Lake, Trinity River & Tributaries ■ 3" □ 6"
LOCATION Near Wallisville, Tx
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG FAIRLAKE 36
GROUNDWATER: DEPTH 0** ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY, WARM
DRILLER RANDY GEARIN LOGGER PETER KOSMOSKI

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	0.75	Dark gray	clay	m. stiff		
		2	2.0	Dark gray	clay	V. stiff		w/fe nods
5		3	2.0	Yellowish Brown	clay	V. stiff		
		4	2.5	Yellowish Brown	clay	V. stiff		w/calc nods, trace sand
		5	4.5	Yellowish Brown	clay	Hard		calc nods, fe stains
10		6	4.5	Yellowish Brown	clay	Hard		blocky structure, SLS 10'-12'
		7	4.5	Yellowish Brown	clay	Hard		w/calc nods
15		8	4.5	Yellowish Brown	clay	Hard		SLS 14'-16'
		9	4.5	Yellowish Brown	clay	Hard		SLS 16'-18'
		16	2.5	Yellowish Brown	clay	V. stiff		*encounter water @ 20'
20		11	4.5	Yellowish Brown	clay	Hard		SLS 20'-22'
		12	4.5	Yellowish Brown	clay	Hard		w/calc nods
25		13	2.75	Yellowish Brown	clay	V. stiff		w/calc nods
		14	2.25	Yellowish Brown	clay	V. stiff		w/calc nods
		15	3.0	Yellowish Brown	clay	V. stiff		w/calc nods
30		16	4.0	Yellowish Brown	clay	Very stiff		w/calc nods
		17	3.0	Yellowish Brown	clay	V. stiff	sand	w/fe. nods
35		18	2.25	Reddish Brown	clay	V. stiff	sand	

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 94-15 DATE: BEGIN 3/16/94 PAGE 2 12
JOB NO. 146727-6 COMPLETE 3/16/94 Thin Walled Tube
PROJECT Wallisville Lake, Trinity River & Tributaries ■ 3" □ 6"
LOCATION near Wallisville, TX
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG FALNG 36
GROUNDWATER: DEPTH 0** ft., ELEV. ft., at end of Drilling
WEATHER CLOUDY, WARM
DRILLER RANDY GEARING LOGGER PETER KOSMOSKI

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								
		19	4.0	Reddish Brown	clay	V. stiff		s\s
		20	3.75	Reddish Brown	clay	V. stiff		s\s
40								
								** water level at end of Drilling
45								
50								
55								
60								
65								
70								

JOB NO. 14G727-12 DATE 4/12/94

PROJECT Lake Wallisville,Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-15 SAMPLE NO. 3 DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION
Gray,Clay,Very stiff

Tare No.	KL-24	Height	5.595 in.
Tare plus Wet Specimen	308.84 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	261.05 gm	Initial Area	6.290 sq in.
Water Weight	47.79 gm	Volume	35.194 cu in.
Tare Weight	42.59 gm	Volume of Solids	cu in.
Wet Specimen	1144.88 gm	Void Ratio	
Dry Specimen	939.38 gm	Saturation	%
Water Content	21.88 %	Dry Density	101.7 lb/cu ft

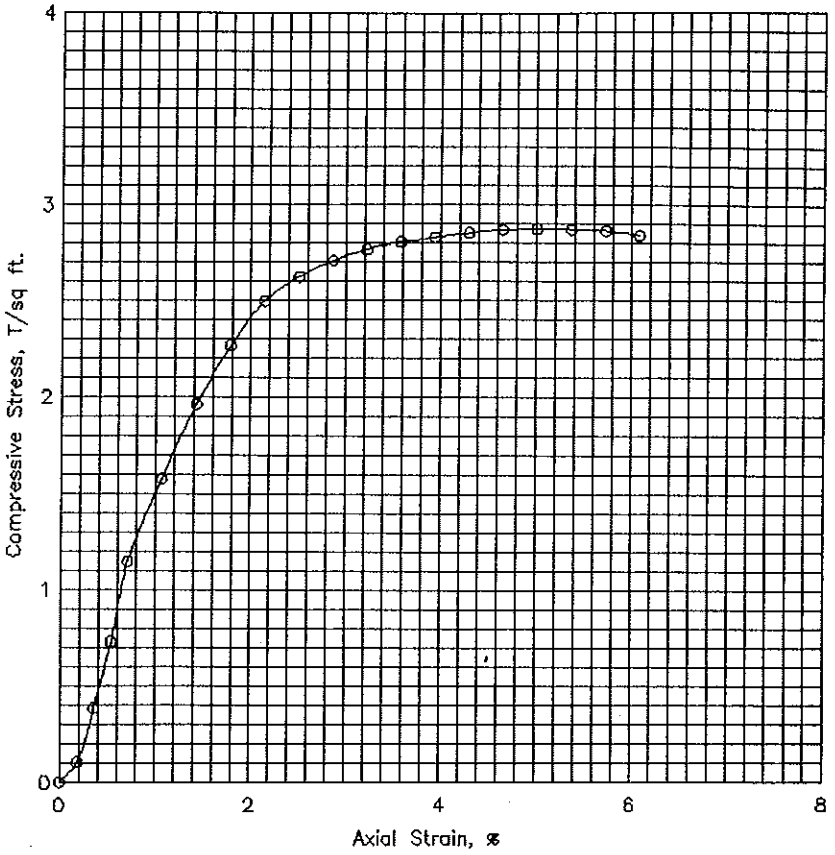
Specific Gravity of Solids
LL = 58 PL = PI =

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	12.0	9.2	.002	6.30	.105
.3	20.	.020	44.0	33.7	.004	6.31	.384
.5	30.	.030	84.0	64.3	.005	6.32	.733
.7	40.	.040	132.0	101.1	.007	6.34	1.149
1.0	60.	.060	182.0	139.4	.011	6.36	1.579
1.4	80.	.080	227.0	173.9	.014	6.38	1.962
1.7	100.	.100	263.0	201.5	.018	6.40	2.265
2.0	120.	.120	291.0	222.9	.021	6.43	2.497
2.3	140.	.140	307.0	235.2	.025	6.45	2.624
2.7	160.	.160	318.0	243.6	.029	6.48	2.708
3.0	180.	.180	326.0	249.7	.032	6.50	2.766
3.3	200.	.200	332.0	254.3	.036	6.52	2.807
3.7	220.	.220	336.0	257.4	.039	6.55	2.830
4.0	240.	.240	340.0	260.4	.043	6.57	2.853
4.3	260.	.260	343.0	262.7	.046	6.60	2.868
4.7	280.	.280	345.0	264.3	.050	6.62	2.874
5.0	300.	.300	346.0	265.0	.054	6.65	2.871
5.3	320.	.320	346.5	265.4	.057	6.67	2.864
5.7	340.	.340	345.0	264.3	.061	6.70	2.841

Job No. 14727-12

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	21.9 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	101.7			
Time to failure, min		t_f	4.67			
Unconfined compressive strength, T/sq ft		q_u	2.87			
Undrained shear strength, T/sq ft		S_u	1.44			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Gray,Clay,Very stiff

LL	58	PL		PI		G_s	

Remarks

Project Lake Wallisville,Trinity River and Tributaries,

Area near Wallisville, Texas

Boring No. 94-15 | Sample No. 3

Depth El 4-6 ft | Date 4/12/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

JOB NO. 14G727-12 DATE 4/12/94

PROJECT Lake Wallisville,Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-15 SAMPLE NO. 7 DEPTH 12-14 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish gray,Clay,Very stiff,w/calcareous nodules&blocky structure

Tare No.	P-219	Height	5.595 in.
Tare plus Wet Specimen	379.80 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	304.33 gm	Initial Area	6.290 sq in.
Water Weight	75.47 gm	Volume	35.194 cu in.
Tare Weight	42.64 gm	Volume of Solids	cu in.
Wet Specimen	1145.05 gm	Void Ratio	
Dry Specimen	888.74 gm	Saturation	%
Water Content	28.84 %	Dry Density	96.2 lb/cu ft

Specific Gravity of Solids
LL = 79 PL = PI =

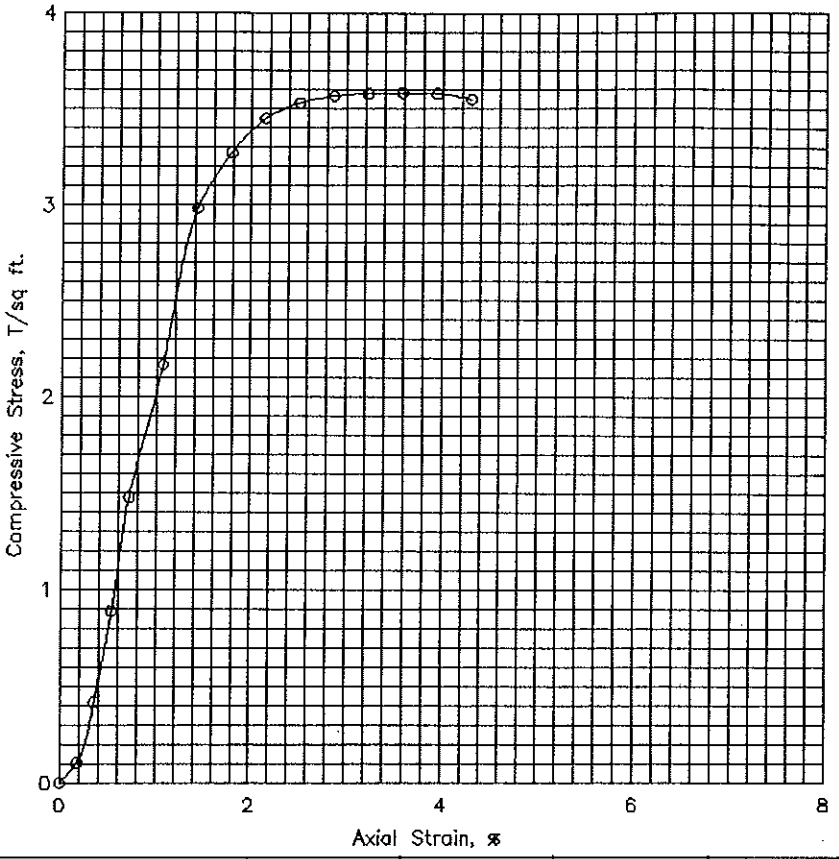
Proving Ring No. 10170
Proving Ring Constant, K = .766 lbs/div.

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	12.0	9.2	.002	6.30	.105
.4	20.	.020	48.0	36.8	.004	6.31	.419
.5	30.	.030	102.0	78.1	.005	6.32	.890
.7	40.	.040	170.0	130.2	.007	6.34	1.480
1.0	60.	.060	250.0	191.5	.011	6.36	2.168
1.4	80.	.080	345.0	264.3	.014	6.38	2.982
1.7	100.	.100	380.0	291.1	.018	6.40	3.272
2.1	120.	.120	402.0	307.9	.021	6.43	3.449
2.4	140.	.140	413.0	316.4	.025	6.45	3.531
2.7	160.	.160	419.0	321.0	.029	6.48	3.569
3.0	180.	.180	422.0	323.3	.032	6.50	3.581
3.4	200.	.200	424.0	324.8	.036	6.52	3.585
3.7	220.	.220	425.0	325.5	.039	6.55	3.580
4.1	240.	.240	423.0	324.0	.043	6.57	3.550

Job No. 14G727-12

Failure Sketches

☐ Controlled stress
☒ Controlled strain



Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	28.8 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	96.2			
Time to failure, min		t_f	3.37			
Unconfined compressive strength, T/sq ft		q_u	3.58			
Undrained shear strength, T/sq ft		S_u	1.79			
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 stiff,w/calcareous nodules&blocky structure

LL	PL	PI	G_s
79			

Remarks

Project Lake Wallisville,Trinity River and Tributaries,
Area near Wallisville, Texas
Boring No. 94-15 | Sample No. 7
Depth El 12-14 ft | Date 4/12/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 14G727-12 DATE 4/12/94

PROJECT Lake Wallisville, Trinity River and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-15 SAMPLE NO. 10 DEPTH 18-20 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish gray, Clay, Hard, w/calcareous nodules&blocky structure

Tare No.	K1-32	Height	5.595 in.
Tare plus Wet Specimen	396.78 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	328.13 gm	Initial Area	6.290 sq in.
Water Weight	68.65 gm	Volume	35.194 cu in.
Tare Weight	42.59 gm	Volume of Solids	cu in.
Wet Specimen	1185.76 gm	Void Ratio	
Dry Specimen	955.93 gm	Saturation	%
Water Content	24.04 %	Dry Density	103.5 lb/cu ft

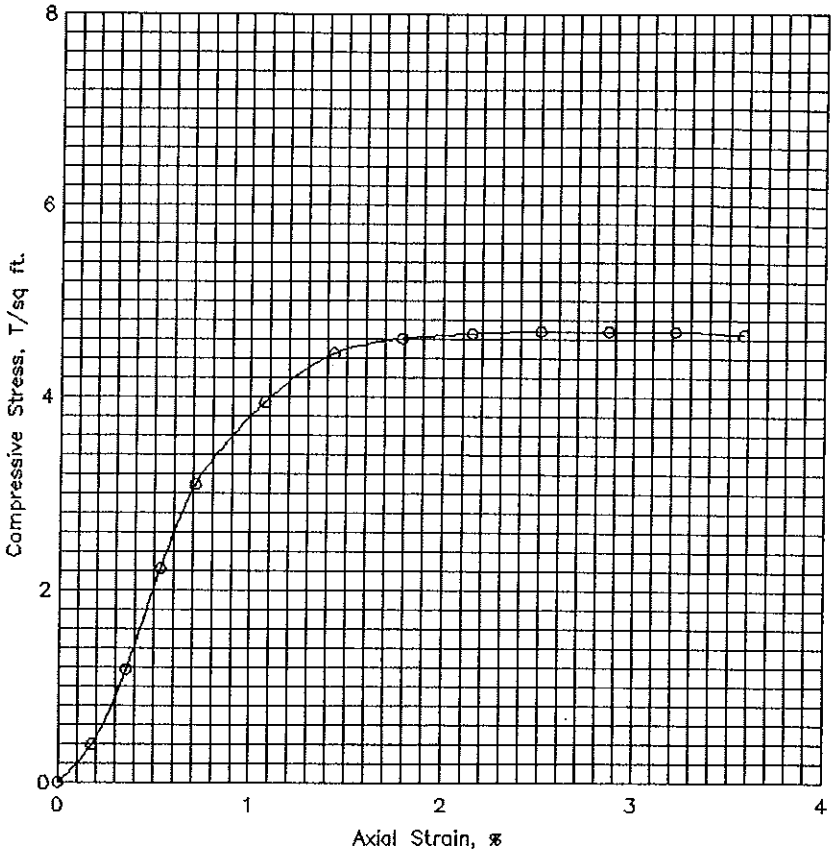
Specific Gravity of Solids
LL = 74 PL = PI =

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	45.0	34.5	.002	6.30	.394
.3	20.	.020	135.0	103.4	.004	6.31	1.179
.5	30.	.030	255.0	195.3	.005	6.32	2.224
.7	40.	.040	355.0	271.9	.007	6.34	3.090
1.1	60.	.060	455.0	348.5	.011	6.36	3.947
1.4	80.	.080	515.0	394.5	.014	6.38	4.451
1.7	100.	.100	535.0	409.8	.018	6.40	4.607
2.0	120.	.120	543.0	415.9	.021	6.43	4.659
2.4	140.	.140	548.0	419.8	.025	6.45	4.685
2.7	160.	.160	550.0	421.3	.029	6.48	4.684
3.0	180.	.180	552.0	422.8	.032	6.50	4.684
3.3	200.	.200	550.0	421.3	.036	6.52	4.650

Job No. 14G727-12

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_o	24.0 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	103.5			
Time to failure, min		t_f	2.37			
Unconfined compressive strength, T/sq ft		q_u	4.68			
Undrained shear strength, T/sq ft		S_u	2.34			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_o	2.830			
Initial specimen height, in.		H_o	5.595			

Classification Yellowish gray,Clay,Hard,w/calcareous nodules&blocky structure

LL	PL	PI	G_s
74			

Remarks

Project Lake Wallisville,Trinity River and Tributaries,
Area near Wallisville, Texas
Boring No. 94-15 Sample No. 10
Depth El 18-20 ft Date 4/12/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 14G727-12 DATE 4/12/94

PROJECT Lake Wallisville,Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-15 SAMPLE NO. 13 DEPTH 24-26 ft

SPECIMEN NO. 1

CLASSIFICATION
Yellowish gray,Clay,Very stiff,w/calcareous nodules&sand parting

Tare No.	W-19	Height	5.595 in.
Tare plus Wet Specimen	453.16 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	377.20 gm	Initial Area	6.290 sq in.
Water Weight	75.96 gm	Volume	35.194 cu in.
Tare Weight	42.66 gm	Volume of Solids	cu in.
Wet Specimen	1182.40 gm	Void Ratio	
Dry Specimen	963.61 gm	Saturation	%
Water Content	22.71 %	Dry Density	104.3 lb/cu ft

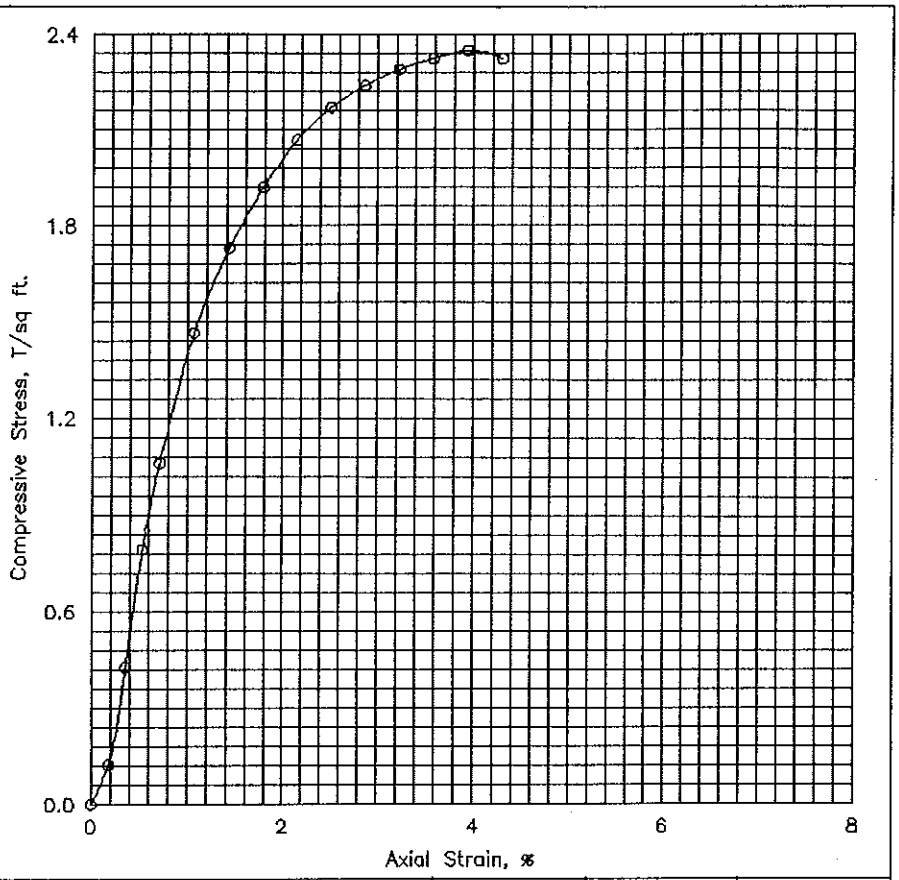
Specific Gravity of Solids
LL = 57 PL = PI =

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	14.0	10.7	.002	6.30	.123
.4	20.	.020	49.0	37.5	.004	6.31	.428
.6	30.	.030	91.0	69.7	.005	6.32	.794
.8	40.	.040	122.0	93.5	.007	6.34	1.062
1.2	60.	.060	169.0	129.5	.011	6.36	1.466
1.5	80.	.080	200.0	153.2	.014	6.38	1.729
1.9	100.	.100	223.0	170.8	.018	6.40	1.920
2.3	120.	.120	241.0	184.6	.021	6.43	2.068
2.6	140.	.140	254.0	194.6	.025	6.45	2.171
2.9	160.	.160	263.0	201.5	.029	6.48	2.240
3.2	180.	.180	270.0	206.8	.032	6.50	2.291
3.6	200.	.200	275.0	210.6	.036	6.52	2.325
3.9	220.	.220	279.0	213.7	.039	6.55	2.350
4.2	240.	.240	277.0	212.2	.043	6.57	2.325

Job No. 146727-12

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_o	22.7 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	104.3			
Time to failure, min		t_f	3.90			
Unconfined compressive strength, T/sq ft		q_u	2.35			
Undrained shear strength, T/sq ft		S_u	1.18			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_o	2.830			
Initial specimen height, in.		H_o	5.595			

Classification Yellowish gray,Clay,Very stiff,w/calcareous nodules&sand parting

LL	PL	PI	G_s
57			

Remarks

Project Lake Wallisville,Trinity River and Tributaries,
Area near Wallisville, Texas
Boring No. 94-15 | Sample No. 13
Depth El 24-26 ft | Date 4/12/94

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

Geotest Engineering, Inc.

PLATE

Project: Lake Wallisville, Trinity River and Tributaries , Texas

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-93-D-0005 Delivery Order No. 0012

Boring No. 94-15

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	1.00		Dark gray,Clay,Stiff,w/grass roots	C H	24.6											
2	2 - 4	1.50		Gray,Clay,Very stiff	C H	23.7											
3	4 - 6	2.25		Gray,Clay,Very stiff	C H	21.9	101.7	123.9	58		100.0	100.0	100.0	99.0	98.7		2.87
4	6 - 8	2.50		Yellowish gray,Clay,Very stiff,w/sand parting	C H	20.5											
5	8 - 10	4.00		Yellowish gray,Clay,Very stiff,w/calcareous nosules&sand parting	C H	23.0											
6	10 - 12	2.50		Yellowish gray,Clay,Very stiff,w/calcareous nodules&blocky structure	C H	26.5											
7	12 - 14	4.00		Yellowish gray,Clay,Very Stiff,w/calcareous nodules and blocky structure	C H	28.8	96.2	123.9	79		100.0	100.0	99.7	98.6	98.4		3.58
8	14 - 16	4.50		Yellowish gray,Clay,Hard,w/ferrous stains and blocky structure	C H	26.5											
9	16 - 18	4.50		Yellowish gray,Clay,Hard,w/blocky structure	C H	26.8											
10	18 - 20	4.50		Yellowish gray,Clay,Hard,w/calcareous nodules and blocky structure	C H	24.0	103.5	128.4	74		100.0	100.0	99.0	98.6	98.0		4.68
11	20 - 22	4.50		Yellowish gray,Clay,Hard,w/blocky structure	C H	23.7											
12	22 - 24	4.00		Yellowish gray,Clay,Very stiff,w/blocky structure	C H	22.8											
13	24 - 26	3.50		Yellowish gray,Clay,Very stiff,w/calcareous nodules and sand parting	C H	22.7	104.3	127.9	57		100.0	100.0	99.7	99.1	98.0		2.35
14	26 - 28	3.50		Yellowish gray,Clay,Very stiff,w/calcareous nodules and sand parting	C H	24.3											
15	28 - 30	4.50		Yellowish gray,Clay,Hard,w/sand parting and calcareous nodules	C H	24.1											
16	30 - 32	4.50		Yellowish gray,Clay,Hard,w/sand parting	C H	24.4											
17	32 - 34	2.00		Reddish brown&gray,Clay,Very stiff,Sandy, w/calcareous nodules	C L	25.8											
18	34 - 36	3.50		Reddish brown,Clay,Very stiff,Sandy,w/sand parting and ferrous stain	C L	23.4											
19	36 - 38	3.50		Reddish brown,Clay,Very stiff,w/silt parting	C H	26.9											
20	38 - 40	4.50		Reddish brown,Clay,Hard,w/blocky structure	C H	26.0											

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