

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	BORING NO. <u>9A-9</u>	DATE: BEGIN <u>3/16/94</u>	PAGE <u>1/2</u>
					JOB NO. <u>146727-B</u>	COMPLETE <u>3/16/94</u> Thin Walled Tube	
					PROJECT <u>Wallisville Lake, Trinity River & Tributaries</u>	☒ 3" ☐ 6"	
					LOCATION <u>near Wallisville, Texas</u>		
					ELEVATION OF HOLE _____		
					MANUFACTURER'S DESIGNATION OF DRILL RIG <u>FALING 36</u>		
					GROUNDWATER: DEPTH <u>0</u> ft., ELEV. _____ ft., at end of Drilling		
					WEATHER <u>OVERCAST, COOL</u>		
					DRILLER <u>RANDY BEARER</u>	LOGGER <u>PETER KOSMOSKI</u>	
		COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS	
0	1	1.0	Gray	clay	stiff		
	2	1.75	gray	clay	stiff		
5	3	1.75	gray	clay	stiff		
	4	3.0	yellowish	clay	v. stiff		calc neds
	5	3.25	Brown	clay	v. stiff		
10	6	2.0	Yellowish	clay	v. stiff		sls
	7	2.5	Yellowish	clay	v. stiff		sls
	8	3.0	Yellowish	clay	v. stiff		black structure
15	9	3.5	Yellowish	clay	v. stiff		
	10	3.5	Yellowish	clay	v. stiff		calc neds
20	11	2.75	Yellowish	clay	v. stiff	sand	* encounter water @ 20'
	12	1.5	Yellowish	clay	stiff	sand	
25	13	2.75	Yellowish	clay	v. stiff		calc neds
	14	2.5	Yellowish	clay	v. stiff		
	15	2.5	Yellowish	clay	v. stiff		
30	16	3.5	Yellowish	clay	v. stiff		ferri neds
	17	3.5	Yellowish	clay	v. stiff		ferri neds, calc neds
35	18	2.5	Yellowish	clay	v. stiff		

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT. - BLOW COUNT	BORING NO. <u>94-9</u> DATE: BEGIN <u>3/16/94</u> PAGE <u>2 / 2</u> JOB NO. <u>146727-6</u> COMPLETE <u>3/16/94</u> Thin Walled Tube PROJECT <u>Wallisville Lake, Trinity River & Tributaries</u> ☒ 3" ☐ 6" LOCATION _____ ELEVATION OF HOLE _____ MANUFACTURER'S DESIGNATION OF DRILL RIG <u>FANUC 36</u> GROUNDWATER: DEPTH <u>0*</u> ft., ELEV. _____ ft., at end of Drilling WEATHER <u>OVERCAST, COOL</u> DRILLER <u>RANDY GEAREN</u> LOGGER <u>PETER KOSMOSKI</u>				
				COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35		19 A 25		Reddish Brown	clay	Hard		sandy clay 36'-37'
40		20 3.75		Reddish Brown	clay	vis. stiff		
45								
50								
55								
60								
65								
70								

JOB NO. 14G727-12

DATE 4/7/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-9

SAMPLE NO. 3

DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION

Gray, Clay, Stiff, w/sand pockets & calcareous nodules

Tare No.	P-200	Height	5.595 in.
Tare plus Wet Specimen	761.68 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	632.87 gm	Initial Area	6.290 sq in.
Water Weight	128.81 gm	Volume	35.194 cu in.
Tare Weight	42.44 gm	Volume of Solids	cu in.
Wet Specimen	1178.30 gm	Void Ratio	
Dry Specimen	967.28 gm	Saturation	%
Water Content	21.82 %	Dry Density	104.7 lb/cu ft

Specific Gravity of Solids

LL = 58

PL =

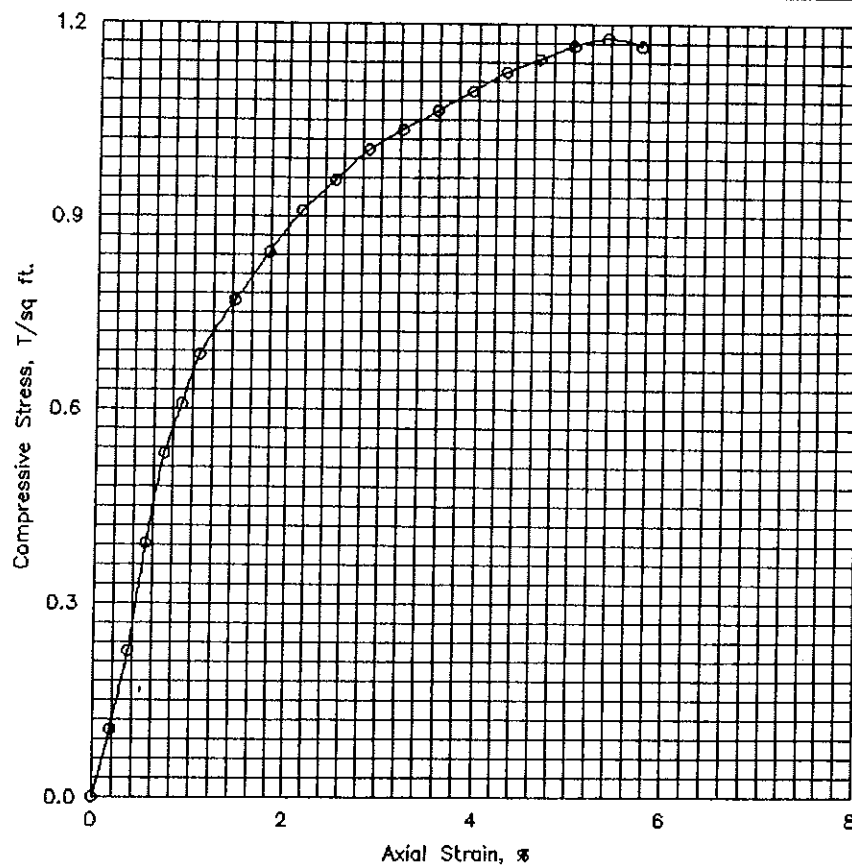
PI =

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	26.0	19.9	.004	6.31	.227
.5	30.	.030	45.0	34.5	.005	6.32	.392
.7	40.	.040	61.0	46.7	.007	6.34	.531
.9	50.	.050	70.0	53.6	.009	6.35	.608
1.0	60.	.060	79.0	60.5	.011	6.36	.685
1.4	80.	.080	89.0	68.2	.014	6.38	.769
1.7	100.	.100	98.0	75.1	.018	6.40	.844
2.0	120.	.120	106.0	81.2	.021	6.43	.909
2.3	140.	.140	112.0	85.8	.025	6.45	.957
2.7	160.	.160	118.0	90.4	.029	6.48	1.005
3.0	180.	.180	122.0	93.5	.032	6.50	1.035
3.3	200.	.200	126.0	96.5	.036	6.52	1.065
3.6	220.	.220	130.0	99.6	.039	6.55	1.095
3.9	240.	.240	134.0	102.6	.043	6.57	1.125
4.2	260.	.260	137.0	104.9	.046	6.60	1.145
4.6	280.	.280	140.0	107.2	.050	6.62	1.166
4.8	300.	.300	142.0	108.8	.054	6.65	1.178
5.2	320.	.320	141.0	108.0	.057	6.67	1.166

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	21.8 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	104.7		
Time to failure, min		t_f	4.85		
Unconfined compressive strength, T/sq ft		q_u	1.18		
Undrained shear strength, T/sq ft		S_u	.59		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		

Classification Gray, Clay, Stiff, w/sand pockets & calcareous nodules

LL	58	PL	PI	G_o
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Remarks	Project Lake Wallisville, Trinity River	
	and Tributaries,	
	Area near Wallisville, Texas	
	Boring No. 94-9	Sample No. 3
	Depth 4-6 ft EI	Date 4/7/94
	UNCONFINED COMPRESSION TEST REPORT	

JOB NO. 14G727-12

DATE 4/7/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-9

SAMPLE NO. 6

DEPTH 10-12 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Very stiff, w/calcareous nodules & ferrous stains

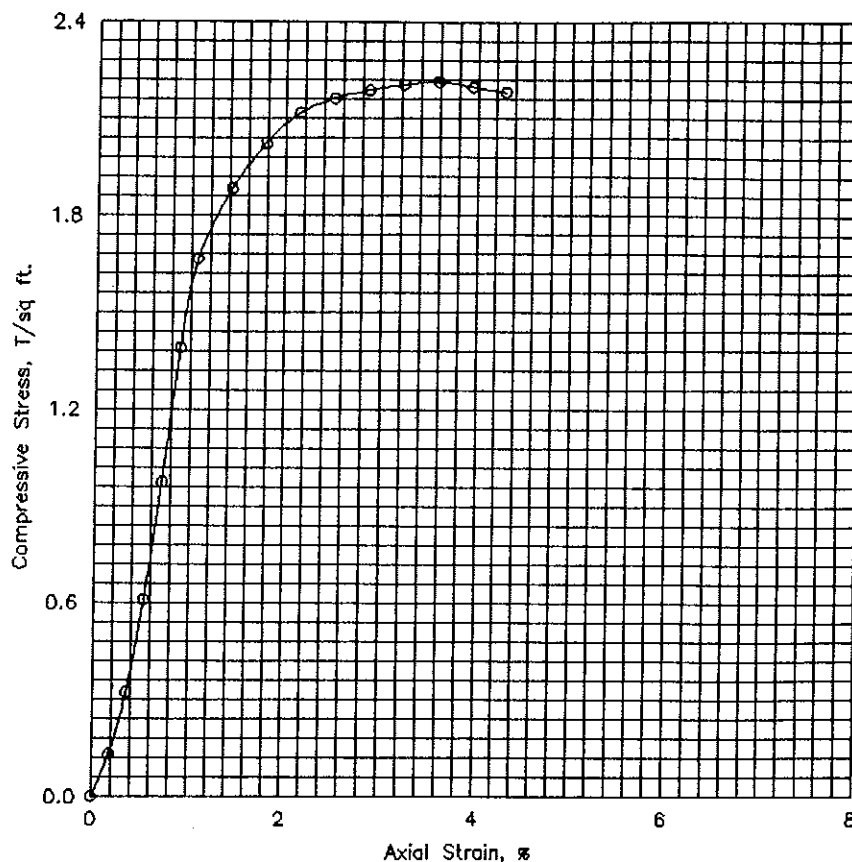
Tare No.	IM-1	Height	5.595 in.
Tare plus Wet Specimen	562.67 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	456.93 gm	Initial Area	6.290 sq in.
Water Weight	105.74 gm	Volume	35.194 cu in.
Tare Weight	42.46 gm	Volume of Solids	cu in.
Wet Specimen	1161.44 gm	Void Ratio	
Dry Specimen	925.36 gm	Saturation	%
Water Content	25.51 %	Dry Density	100.2 lb/cu ft
Specific Gravity of Solids			
LL = 84	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	15.0	11.5	.002	6.30	.131
.3	20.	.020	37.0	28.3	.004	6.31	.323
.5	30.	.030	70.0	53.6	.005	6.32	.610
.7	40.	.040	112.0	85.8	.007	6.34	.975
.9	50.	.050	160.0	122.6	.009	6.35	1.390
1.0	60.	.060	192.0	147.1	.011	6.36	1.665
1.3	80.	.080	218.0	167.0	.014	6.38	1.884
1.6	100.	.100	235.0	180.0	.018	6.40	2.024
2.0	120.	.120	247.0	189.2	.021	6.43	2.119
2.3	140.	.140	253.0	193.8	.025	6.45	2.163
2.6	160.	.160	257.0	196.9	.029	6.48	2.189
2.9	180.	.180	260.0	199.2	.032	6.50	2.206
3.3	200.	.200	262.0	200.7	.036	6.52	2.215
3.6	220.	.220	261.0	199.9	.039	6.55	2.198
3.9	240.	.240	260.0	199.2	.043	6.57	2.182

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	25.5 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	100.2		
Time to failure, min		t_f	3.25		
Unconfined compressive strength, T/sq ft		q_u	2.22		
Undrained shear strength, T/sq ft		S_u	1.11		
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 & ferrous stains					
LL	84	PL		PI	G_o
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No. 94-9		Sample No. 6	
		Depth 10-12 ft		Date 4/7/94	
		UNCONFINED COMPRESSION TEST REPORT			

JOB NO. 14G727-12

DATE 4/7/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-9

SAMPLE NO. 9

DEPTH 16-18 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Very stiff, w/calcareous nodules & organic material

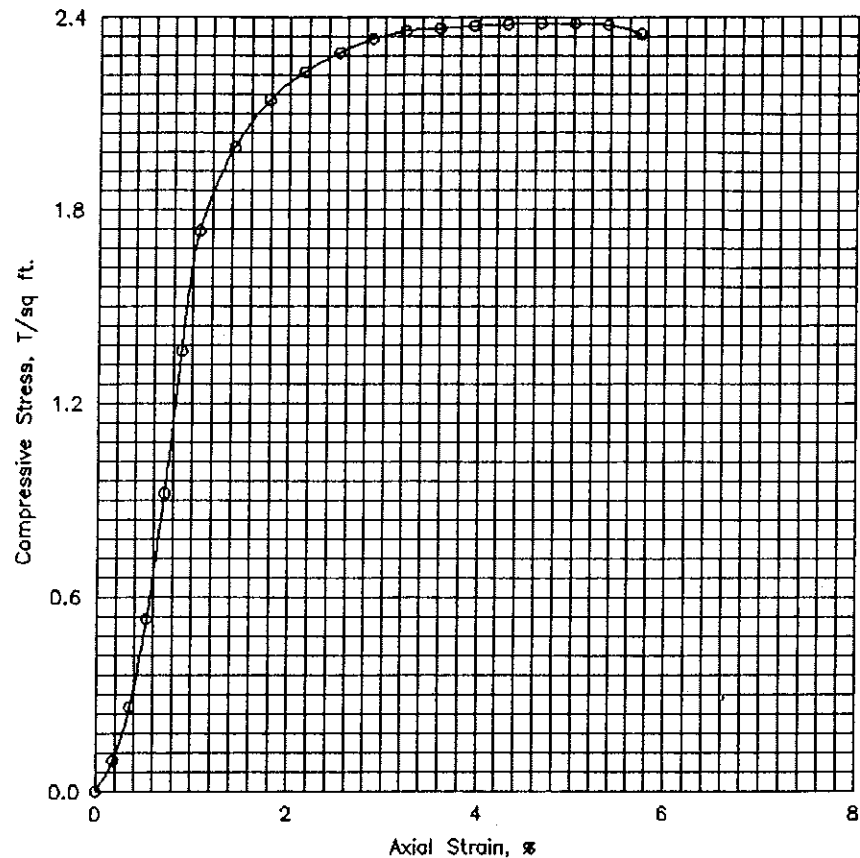
Tare No.	W-7	Height	5.595 in.
Tare plus Wet Specimen	678.54 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	546.58 gm	Initial Area	6.290 sq in.
Water Weight	131.96 gm	Volume	35.194 cu in.
Tare Weight	42.52 gm	Volume of Solids	cu in.
Wet Specimen	1156.28 gm	Void Ratio	
Dry Specimen	916.38 gm	Saturation	%
Water Content	26.18 %	Dry Density	99.2 lb/cu ft
Specific Gravity of Solids			
LL = 75	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	11.0	8.4	.002	6.30	.096
.3	20.	.020	30.0	23.0	.004	6.31	.262
.5	30.	.030	61.0	46.7	.005	6.32	.532
.7	40.	.040	106.0	81.2	.007	6.34	.923
.9	50.	.050	157.0	120.3	.009	6.35	1.364
1.0	60.	.060	200.0	153.2	.011	6.36	1.735
1.4	80.	.080	231.0	176.9	.014	6.38	1.996
1.7	100.	.100	249.0	190.7	.018	6.40	2.144
2.0	120.	.120	260.0	199.2	.021	6.43	2.231
2.3	140.	.140	268.0	205.3	.025	6.45	2.291
2.6	160.	.160	274.0	209.9	.029	6.48	2.334
3.0	180.	.180	278.0	212.9	.032	6.50	2.359
3.3	200.	.200	280.0	214.5	.036	6.52	2.367
3.4	220.	.220	282.0	216.0	.039	6.55	2.375
3.7	240.	.240	283.5	217.2	.043	6.57	2.379
4.1	260.	.260	285.0	218.3	.046	6.60	2.383
4.3	280.	.280	286.0	219.1	.050	6.62	2.382
4.7	300.	.300	286.5	219.5	.054	6.65	2.377
5.0	320.	.320	284.0	217.5	.057	6.67	2.348

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	26.2 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	99.2		
Time to failure, min		t_f	4.05		
Unconfined compressive strength, T/sq ft		q_u	2.38		
Undrained shear strength, T/sq ft		S_u	1.19		
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 & organic material					
LL	75	PL		PI	G_o
Remarks			Project Lake Wallisville, Trinity River		
			and Tributaries,		
			Area near Wallisville, Texas		
			Boring No. 94-9	Sample No. 9	
			Depth 16-18 ft	Date 4/7/94	
UNCONFINED COMPRESSION TEST REPORT					

JOB NO. 14G727-12

DATE 4/7/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-9

SAMPLE NO. 12

DEPTH 22-24 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Very stiff, w/calcareous nodules & organic material

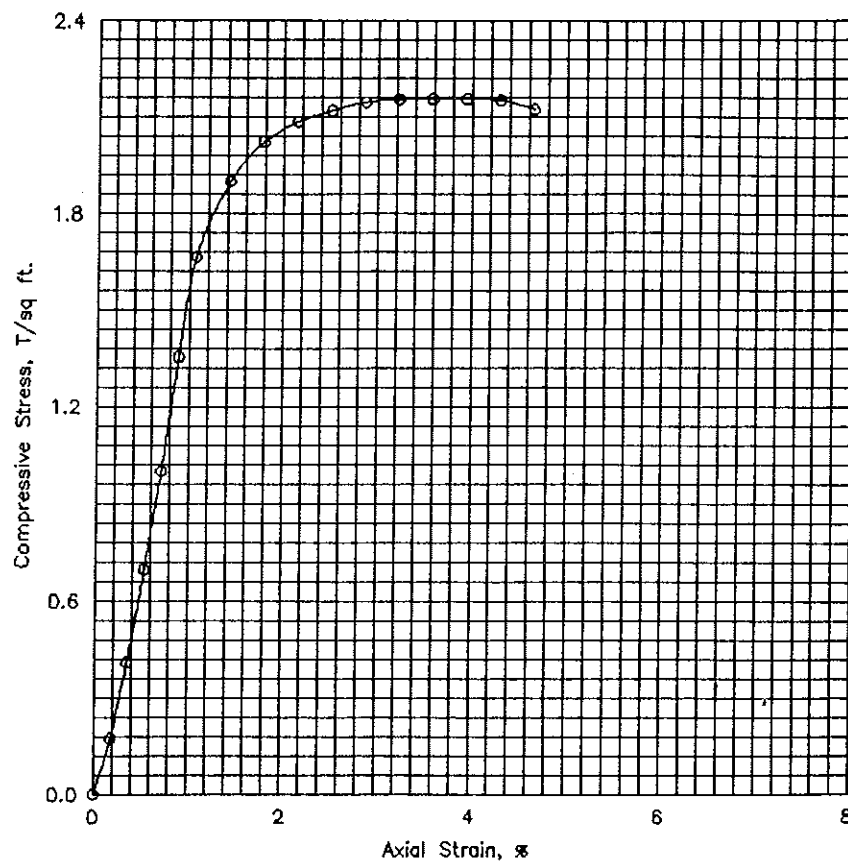
Tare No.	K1-18	Height	5.595 in.
Tare plus Wet Specimen	595.09 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	474.13 gm	Initial Area	6.290 sq in.
Water Weight	120.96 gm	Volume	35.194 cu in.
Tare Weight	42.49 gm	Volume of Solids	cu in.
Wet Specimen	1154.34 gm	Void Ratio	
Dry Specimen	901.66 gm	Saturation	%
Water Content	28.02 %	Dry Density	97.6 lb/cu ft
Specific Gravity of Solids			
LL = 81	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	20.0	15.3	.002	6.30	.175
.3	20.	.020	47.0	36.0	.004	6.31	.411
.5	30.	.030	80.0	61.3	.005	6.32	.698
.7	40.	.040	115.0	88.1	.007	6.34	1.001
.9	50.	.050	156.0	119.5	.009	6.35	1.356
1.0	60.	.060	192.0	147.1	.011	6.36	1.665
1.3	80.	.080	220.0	168.5	.014	6.38	1.901
1.6	100.	.100	235.0	180.0	.018	6.40	2.024
2.0	120.	.120	243.0	186.1	.021	6.43	2.085
2.3	140.	.140	248.0	190.0	.025	6.45	2.120
2.6	160.	.160	252.0	193.0	.029	6.48	2.146
2.9	180.	.180	254.0	194.6	.032	6.50	2.155
3.3	200.	.200	255.0	195.3	.036	6.52	2.156
3.6	220.	.220	256.0	196.1	.039	6.55	2.156
3.9	240.	.240	256.5	196.5	.043	6.57	2.153
4.2	260.	.260	254.0	194.6	.046	6.60	2.124

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen σ_1		Undisturbed			
Initial	Water content	w_0	28.0 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	97.6		
Time to failure, min		t_f	3.58		
Unconfined compressive strength, T/sq ft		q_u	2.16		
Undrained shear strength, T/sq ft		S_u	1.08		
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 stiff, w/calcareous nodules & organic material					
LL	81	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No. 94-9	Sample No. 12		
		Depth 22-24 ft	Date 4/7/94		
		UNCONFINED COMPRESSION TEST REPORT			

SUMMARY OF LABORATORY TEST RESULTS

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

Boring No. 94-9

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	0.50		Dark gray,Clay,Medium stiff,w/grass roots	C H	25.3											
2	2 - 4	1.25		Dark gray,Clay,Stiff,w/ferrous stain	C H	26.9											
3	4 - 6	1.25		Gray,Clay,Stiff,w/sand pockets and calcareous nodules	C H	21.8	104.7	127.5	58		100.0	100.0	99.6	99.0	98.7		1.18
4	6 - 8	2.00		Yellowish gray,Clay,Very stiff,w/calcareous nodules	C H	19.1											
5	8 - 10	2.25		Yellowish gray,Clay,Very stiff,w/calcareous nodules and blocky structure	C H	24.2											
6	10 - 12	2.25		Yellowish gray,Clay,Very stiff,w/calcareous nodules and ferrous stain	C H	25.5	100.2	125.7	84		100.0	100.0	99.8	98.9	98.5		2.22
7	12 - 14	2.75		Yellowish brown,Clay,Very stiff,w/organic material	C H	30.5											
8	14 - 16	2.25		Olive gray,Clay,Very stiff,w/calcareous nodules, slickensided	C H	29.9											
9	16 - 18	3.75		Yellowish gray,Clay,Very stiff,w/calcareous nodules and organic material	C H	26.2	99.2	125.2	75		100.0	100.0	100.0	99.6	98.8		2.38
10	18 - 20	3.50		Yellowish brown,Clay,Very stiff,w/calcareous nodules	C H	24.2											
11	20 - 22	2.00		Olive gray,Clay,Very stiff,w/calcareous nodules and ferrous stain	C H	21.0											
12	22 - 24	2.50		Yellowish gray,Clay,Hard, w/calcareous nodules and ferrous stain Very Stiff	C H	28.0	97.6	124.9	81		100.0	100.0	100.0	99.4	99.0		2.16
13	24 - 26	2.00		Yellowish brown,Clay,Very stiff,w/sand pockets and ferrous stain	C H	24.0											
14	26 - 28	2.50		Olive gray,Clay,Very stiff, slickensided	C H	28.5											
15	28 - 30	3.00		Olive gray,Clay,Very stiff,w/ferrous stain, slickensided	C H	22.4											
16	30 - 32	3.25		Olive gray,Clay,Very stiff,w/calcareous nodules and ferrous stain	C H	24.5											
17	32 - 34	3.25		Olive gray,Clay,Very stiff,w/calcareous nodules and ferrous stain	C H	22.6											
18	34 - 36	2.25		Gray and brown,Clay,Very stiff,w/ferrous stain, slickensided	C H	27.4											
19	36 - 38	2.00		Gray and brown,Clay,Very stiff,w/calcareous nodules and ferrous stain	C H	20.9											
20	38 - 40	4.50		Gray and brown,Clay,Hard,w/calcareous nodules and ferrous stain	C H	25.7											

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content

q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe