

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE	SAMPLE NO.	PEN./TORVANE	SPT.-BLOW COUNT	BORING NO. <u>9A-16</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, TX</u> ELEVATION OF HOLE _____ MANUFACTURER'S DESIGNATION OF DRILL RIG <u>FAIRBANKS 36</u> GROUNDWATER: DEPTH <u>0</u> ft., ELEV. _____ ft., at end of Drilling WEATHER <u>SUNNY, WARM</u> DRILLER <u>DAVID GEARDEN</u> LOGGER <u>PETER KOMOSKY</u>				
						COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0			1	2.0		Dark Gray	clay	V. stiff		
			2	1.5		" "	" "	" "		w/ calc nod 4'-8'
5			3	2.5		" "	" "	" "		
			4	4.5		Yellowish Brown	clay	Hard		
			5	4.5		Yellowish Brown	clay	Hard		
10			6	4.5		Yellowish Brown	clay	Hard	sand	w/ sand pockets, calc nod
			7	3.5		Yellowish Brown	clay	V. stiff		- w/ calc nod 12'-24'
15			8	2.25		Yellowish Brown	clay	V. stiff		
			9	2.25		Yellowish Brown	clay	V. stiff	sand	* encounter water @ 16'
			10	2.5		Yellowish Brown & Gray	clay	V. stiff		
20			11	3.5		Yellowish Brown	clay	V. stiff		
			12	4.25		Gray & Brown	clay	Hard		
25			13	3.5		Gray & Brown	clay	V. stiff		
			14	3.5		Gray & Brown	clay	V. stiff		w/ sand pockets
			15	3.5		Gray & Brown	clay	V. stiff		w/ sand pockets
30			16	4.5		Gray & Brown	clay	Hard		S/S 30-32'
			17	4.5		Gray & Brown	clay	Hard		S/S 32-34'
35			18	3.0		Reddish Brown	clay	V. stiff		

GEOTEST ENGINEERING, INC.

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	BORING NO. <u>9A-16</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 <u>near Wallisville, TX</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>SUNNY, WARM</u> DRILLER <u>PANDY GEARIN</u> LOGGER <u>PETER KOSMOS</u>			COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
				35							
		19	3.25	Reddish Brown	Clay	V. stiff			s/s		
		20	3.0	Reddish Brown	Clay	V. stiff			s/s		
40											
45											
50											
55											
60											
65											
70											

** water level at end of Drilling

JOB NO. 14G727-12

DATE 4/12/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-16

SAMPLE NO. 3

DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Stiff, w/calcareous nodules & ferrous stains

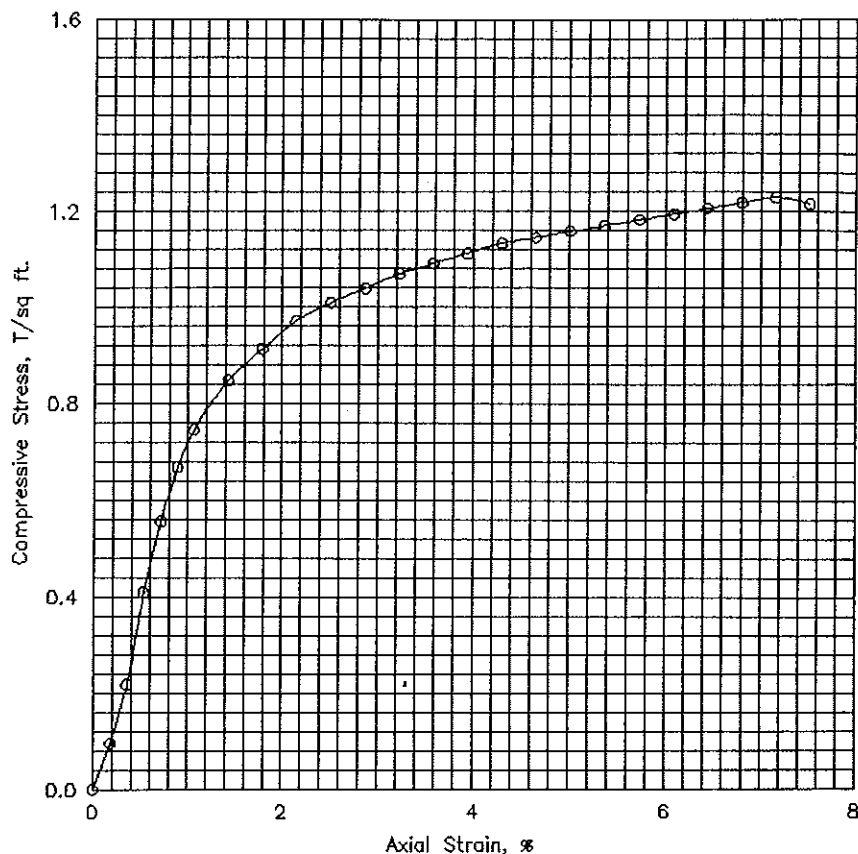
Tare No.	W-7	Height	5.595 in.
Tare plus Wet Specimen	427.10 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	350.26 gm	Initial Area	6.290 sq in.
Water Weight	76.84 gm	Volume	35.194 cu in.
Tare Weight	42.53 gm	Volume of Solids	cu in.
Wet Specimen	1148.97 gm	Void Ratio	
Dry Specimen	919.40 gm	Saturation	%
Water Content	24.97 %	Dry Density	99.5 lb/cu ft
Specific Gravity of Solids			
LL = 77	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	25.0	19.1	.004	6.31	.218
.5	30.	.030	47.0	36.0	.005	6.32	.410
.7	40.	.040	64.0	49.0	.007	6.34	.557
.9	50.	.050	77.0	59.0	.009	6.35	.669
1.0	60.	.060	86.0	65.9	.011	6.36	.746
1.4	80.	.080	98.0	75.1	.014	6.38	.847
1.7	100.	.100	106.0	81.2	.018	6.40	.913
2.0	120.	.120	113.0	86.6	.021	6.43	.970
2.4	140.	.140	118.0	90.4	.025	6.45	1.009
2.7	160.	.160	122.0	93.5	.029	6.48	1.039
3.0	180.	.180	126.0	96.5	.032	6.50	1.069
3.3	200.	.200	129.0	98.8	.036	6.52	1.091
3.5	220.	.220	132.0	101.1	.039	6.55	1.112
4.0	240.	.240	135.0	103.4	.043	6.57	1.133
4.3	260.	.260	137.0	104.9	.046	6.60	1.145
4.6	280.	.280	139.0	106.5	.050	6.62	1.158
4.9	300.	.300	141.0	108.0	.054	6.65	1.170
5.3	320.	.320	143.0	109.5	.057	6.67	1.182
5.6	340.	.340	145.0	111.1	.061	6.70	1.194
5.9	360.	.360	147.0	112.6	.064	6.72	1.206
6.2	380.	.380	149.0	114.1	.068	6.75	1.218
6.6	400.	.400	151.0	115.7	.071	6.77	1.229
6.9	420.	.420	150.0	114.9	.075	6.80	1.216

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	25.0 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	99.5		
Time to failure, min		t_f	6.55		
Unconfined compressive strength, T/sq ft		q_u	1.23		
Undrained shear strength, T/sq ft		S_u	.61		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		
Classification Yellowish gray, Clay, Stiff, w/calcareous nodules & ferrous stains					
LL	77	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No.	94-16	Sample No.	3
		Depth	4-6 ft	Date	4/12/94
		UNCONFINED COMPRESSION TEST REPORT			

JOB NO. 14G727-12

DATE 4/12/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-16

SAMPLE NO. 6

DEPTH 10-12 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish brown, Clay, Hard, w/calcareous nodules&sand pockets

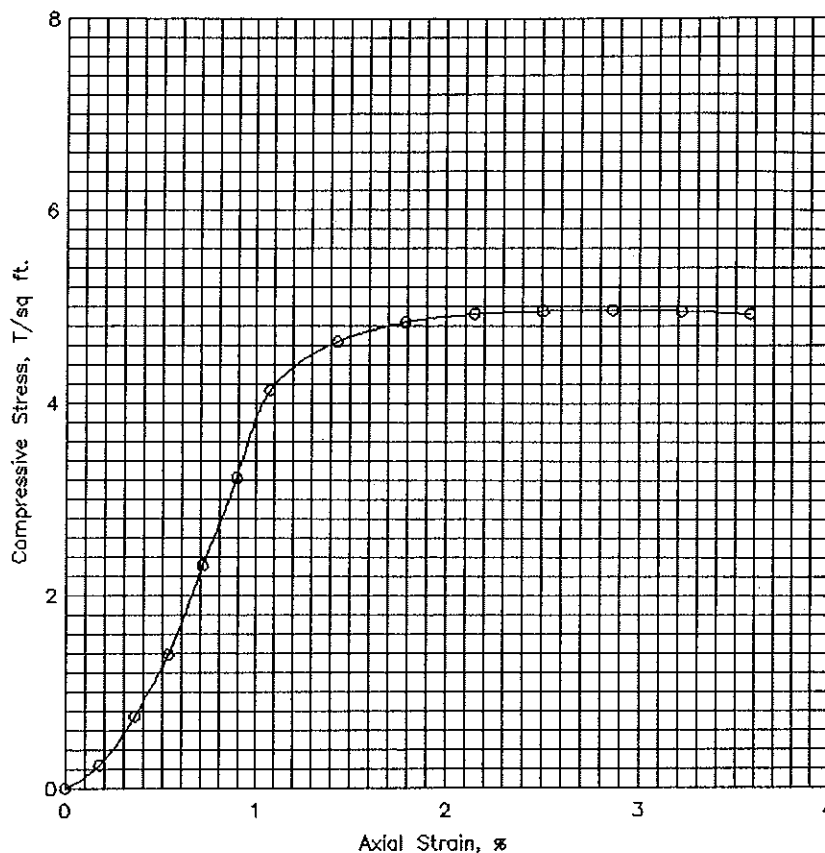
Tare No.	K1-14	Height	5.595 in.
Tare plus Wet Specimen	447.15 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	388.52 gm	Initial Area	6.290 sq in.
Water Weight	58.63 gm	Volume	35.194 cu in.
Tare Weight	42.61 gm	Volume of Solids	cu in.
Wet Specimen	1179.58 gm	Void Ratio	
Dry Specimen	1008.62 gm	Saturation	%
Water Content	16.95 %	Dry Density	109.2 lb/cu ft
Specific Gravity of Solids			
LL = 52	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	28.0	21.4	.002	6.30	.245
.4	20.	.020	86.0	65.9	.004	6.31	.751
.6	30.	.030	160.0	122.6	.005	6.32	1.395
.7	40.	.040	266.0	203.8	.007	6.34	2.316
.9	50.	.050	371.0	284.2	.009	6.35	3.224
1.1	60.	.060	477.0	365.4	.011	6.36	4.137
1.4	80.	.080	537.0	411.3	.014	6.38	4.641
1.8	100.	.100	562.0	430.5	.018	6.40	4.840
2.1	120.	.120	574.0	439.7	.021	6.43	4.925
2.4	140.	.140	580.0	444.3	.025	6.45	4.958
2.7	160.	.160	583.0	446.6	.029	6.48	4.966
3.0	180.	.180	584.0	447.3	.032	6.50	4.956
3.4	200.	.200	582.0	445.8	.036	6.52	4.921

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	16.9 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	109.2		
Time to failure, min		t_f	2.72		
Unconfined compressive strength, T/sq ft		q_u	4.97		
Undrained shear strength, T/sq ft		S_u	2.48		
Sensitivity ratio		S_t			
Initial specimen diameter, in.		D_0	2.830		
Initial specimen height, in.		H_0	5.595		
Classification Yellowish brown, Clay, Hard, w/ calcareous nodules & sand pockets					
LL	52	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No.	94-16	Sample No.	6
		Depth	10-12 ft	Date	4/12/94
		UNCONFINED COMPRESSION TEST REPORT			

JOB NO. 14G727-12

DATE 4/12/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-16

SAMPLE NO. 9

DEPTH 16-18 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Very stiff, w/calcareous nodules

Tare No.	K1-2	Height	5.595 in.
Tare plus Wet Specimen	465.26 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	384.20 gm	Initial Area	6.290 sq in.
Water Weight	81.06 gm	Volume	35.194 cu in.
Tare Weight	42.59 gm	Volume of Solids	cu in.
Wet Specimen	1183.94 gm	Void Ratio	
Dry Specimen	956.88 gm	Saturation	%
Water Content	23.73 %	Dry Density	103.6 lb/cu ft
Specific Gravity of Solids			
LL = 56	PL =	PI =	

Proving Ring No. 10170

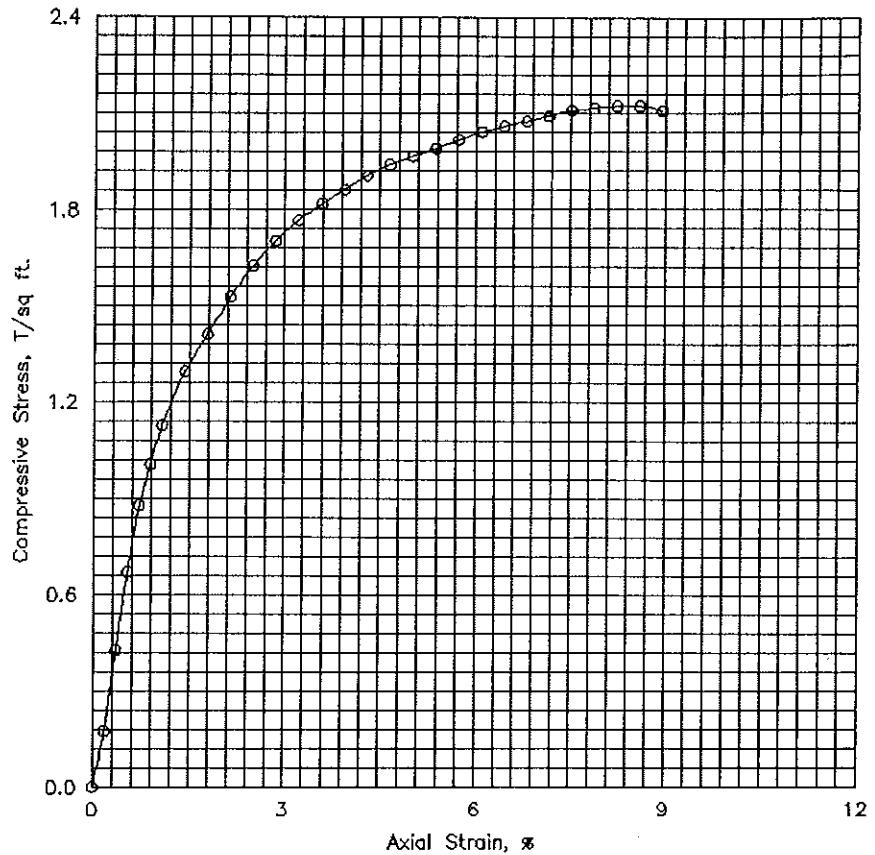
Proving Ring Constant, K = .766 lbs/div.

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	49.0	37.5	.004	6.31	.428
.5	30.	.030	77.0	59.0	.005	6.32	.672
.7	40.	.040	101.0	77.4	.007	6.34	.879
.9	50.	.050	116.0	88.9	.009	6.35	1.008
1.0	60.	.060	130.0	99.6	.011	6.36	1.128
1.4	80.	.080	150.0	114.9	.014	6.38	1.296
1.7	100.	.100	164.0	125.6	.018	6.40	1.412
2.0	120.	.120	178.0	136.3	.021	6.43	1.527
2.4	140.	.140	190.0	145.5	.025	6.45	1.624
2.7	160.	.160	200.0	153.2	.029	6.48	1.703
3.0	180.	.180	208.0	159.3	.032	6.50	1.765
3.4	200.	.200	215.0	164.7	.036	6.52	1.818
3.7	220.	.220	221.0	169.3	.039	6.55	1.862
4.0	240.	.240	227.0	173.9	.043	6.57	1.905
4.3	260.	.260	232.0	177.7	.046	6.60	1.940
4.7	280.	.280	236.0	180.8	.050	6.62	1.966
5.0	300.	.300	240.0	183.8	.054	6.65	1.991
5.3	320.	.320	244.0	186.9	.057	6.67	2.017
5.7	340.	.340	248.0	190.0	.061	6.70	2.042
6.0	360.	.360	251.0	192.3	.064	6.72	2.059
6.4	380.	.380	254.0	194.6	.068	6.75	2.076
6.7	400.	.400	257.0	196.9	.071	6.77	2.092
5.0	420.	.420	260.0	199.2	.075	6.80	2.109
5.3	440.	.440	262.0	200.7	.079	6.83	2.117

5.6	460.	.460	264.0	202.2	.082	6.85	2.124
6.0	480.	.480	265.0	203.0	.086	6.88	2.124
6.3	500.	.500	264.0	202.2	.089	6.91	2.108

Job No. 14G727-12

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	23.7 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	103.6		
Time to failure, min		t_f	5.63		
Unconfined compressive strength, T/sq ft		q_u	2.12		
Undrained shear strength, T/sq ft		S_u	1.06		
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					
LL	56	PL		PI	G_o
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No.	94-16	Sample No.	9
		Depth	16-18 ft	Date	4/12/94
		UNCONFINED COMPRESSION TEST REPORT			

JOB NO. 14G727-12

DATE 4/12/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-16

SAMPLE NO. 12

DEPTH 22-24 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Very stiff, w/calcareous nodules

Tare No.	K1-3	Height	5.595 in.
Tare plus Wet Specimen	335.18 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	276.58 gm	Initial Area	6.290 sq in.
Water Weight	58.60 gm	Volume	35.194 cu in.
Tare Weight	42.63 gm	Volume of Solids	cu in.
Wet Specimen	1178.50 gm	Void Ratio	
Dry Specimen	942.44 gm	Saturation	%
Water Content	25.05 %	Dry Density	102.0 lb/cu ft
Specific Gravity of Solids			
LL = 58	PL =	PI =	

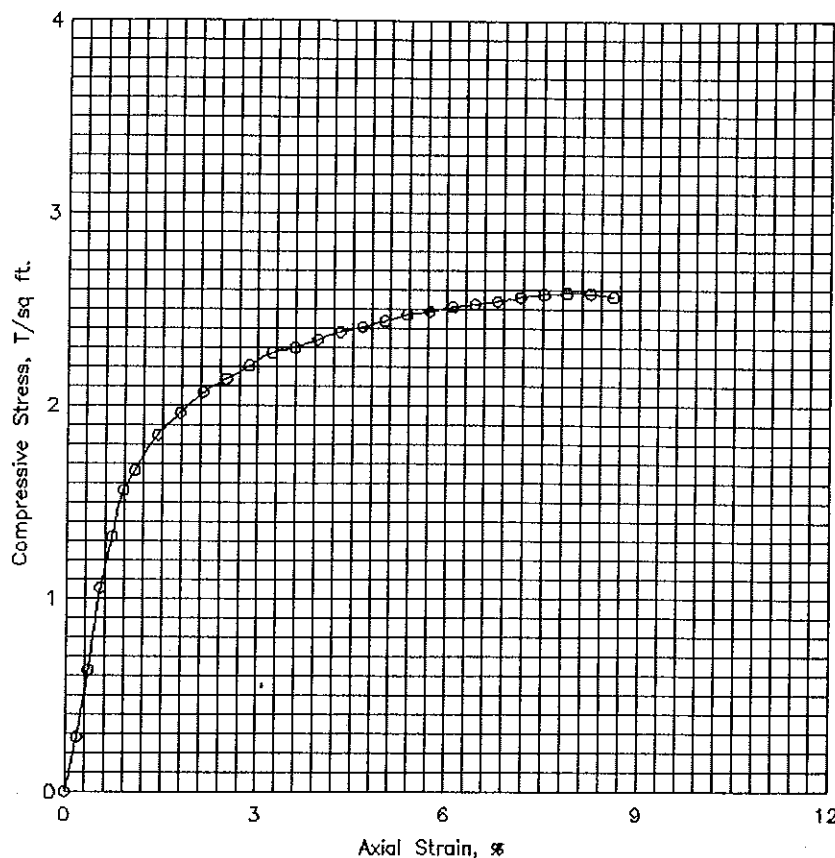
Proving Ring No. 10170

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	32.0	24.5	.002	6.30	.280
.3	20.	.020	72.0	55.2	.004	6.31	.629
.5	30.	.030	121.0	92.7	.005	6.32	1.055
.7	40.	.040	152.0	116.4	.007	6.34	1.323
.9	50.	.050	180.0	137.9	.009	6.35	1.564
1.0	60.	.060	192.0	147.1	.011	6.36	1.665
1.4	80.	.080	214.0	163.9	.014	6.38	1.850
1.7	100.	.100	228.0	174.6	.018	6.40	1.963
2.0	120.	.120	241.0	184.6	.021	6.43	2.068
2.4	140.	.140	250.0	191.5	.025	6.45	2.137
2.7	160.	.160	259.0	198.4	.029	6.48	2.206
3.0	180.	.180	268.0	205.3	.032	6.50	2.274
3.3	200.	.200	272.0	208.4	.036	6.52	2.300
3.7	220.	.220	278.0	212.9	.039	6.55	2.342
4.0	240.	.240	284.0	217.5	.043	6.57	2.383
4.4	260.	.260	288.0	220.6	.046	6.60	2.408
4.7	280.	.280	293.0	224.4	.050	6.62	2.440
5.0	300.	.300	298.0	228.3	.054	6.65	2.473
5.4	320.	.320	301.0	230.6	.057	6.67	2.488
5.7	340.	.340	305.0	233.6	.061	6.70	2.512
6.1	360.	.360	308.0	235.9	.064	6.72	2.527
6.4	380.	.380	311.0	238.2	.068	6.75	2.542
6.7	400.	.400	315.0	241.3	.071	6.77	2.564
5.1	420.	.420	318.0	243.6	.075	6.80	2.579
5.4	440.	.440	320.0	245.1	.079	6.83	2.585

5.7	460.	.460	321.0	245.9	.082	6.85	2.583
6.1	480.	.480	320.0	245.1	.086	6.88	2.565

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	25.0 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	102.0		
Time to failure, min		t_f	5.40		
Unconfined compressive strength, T/sq ft		q_u	2.59		
Undrained shear strength, T/sq ft		S_u	1.29		
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					
LL	58	PL		PI	G_c
Remarks		Project Lake Wallisville, Trinity River and Tributaries, Area near Wallisville, Texas			
		Boring No. 94-16		Sample No. 12	
		Depth 22-24 ft		Date 4/12/94	
		UNCONFINED COMPRESSION TEST REPORT			

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	29.4											
2	2 - 4	1.50		Dark gray,Clay,Stiff,w/ferrous stain	C H	26.7											
3	4 - 6	1.50		Yellowish gray,Clay,Stiff,w/calcareous nodules and ferrous stain	C H	25.0	99.5	124.4	77		100.0	99.9	99.5	98.9	98.6		1.23
4	6 - 8	3.75		Yellowish brown,Clay,Very stiff,w/calcareous nodules	C H	24.8											
5	8 - 10	4.50		Yellowish brown,Clay,Hard,w/silt parting	C H	17.2											
6	10 - 12	4.50		Yellowish brown,Clay,Hard,w/calcareous nodules and sand pockets	C H	17.0	109.2	127.7	52		100.0	99.9	99.6	99.0	98.8		4.97
7	12 - 14	4.25		Yellowish brown,Clay,Hard,w/calcareous nodules	C H	25.7											
8	14 - 16	2.50		Yellowish brown,Clay,Very stiff,w/calcareous nodules	C H	23.7											
9	16 - 18	2.25		Yellowish gray,Clay,Very stiff,w/calcareous nodules	C H	23.7	103.6	128.2	56		100.0	100.0	99.8	98.5	98.4		2.12
10	18 - 20	3.75		Yellowish brown, Clay,Very stiff,w/calcareous nodules	C H	21.2											
11	20 - 22	3.25		Yellowish brown,Clay,Very stiff,w/calcareous nodules	C H	22.7											
12	22 - 24	3.75		Yellowish brown,Clay,Very stiff,w/calcareous and ferrous nodules	C H	25.1	102.0	127.5	58		100.0	100.0	99.8	98.3	98.2		2.59
13	24 - 26	3.25		Yellowish brown,Clay,Very stiff,w/calcareous and ferrous nodules	C H	18.5											
14	26 - 28	2.50		Brown and gray,Clay,Very stiff,w/sand pocket and calcareous nodules	C H	25.2											
15	28 - 30	4.50		Reddish brown gray,Clay,Hard,w/calcareous nodules and sand pocket	C H	20.5											
16	30 - 32	4.00		Reddish brown,Clay,Hard,slickensided	C H	28.3											
17	32 - 34	4.50		Reddish brown,Clay,Hard,slickensided	C H	27.6											
18	34 - 36	3.25		Reddish brown,Clay,Very stiff,w/ferrous stain	C H	31.2											
19	36 - 38	3.25		Reddish brown,Clay,Very stiff,w/calcareous and ferrous nodules	C H	30.9											
20	38 - 40	3.25		Reddish brown,Clay,Very stiff,w/calcareous nodules	C H	34.0											

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