

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE NO.		PEN./TORVANE SPT.-BLOW COUNT		BORING NO. <u>9A-13</u> DATE: BEGIN <u>3/17/94</u> PAGE <u>1/2</u> JOB NO. <u>146727-B</u> COMPLETE <u>3/17/94</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>F411-36</u> GROUNDWATER: DEPTH _____ ft., ELEV. _____ ft., at end of Drilling WEATHER <u>Sunny, warm</u> DRILLER <u>Randy Gorden</u> LOGGER <u>Peter L. Lusk</u>				
						COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	0.75			Gray	clay	medium stiff		water marks
		2	1.5			Gray/Brown	clay	stiff		scale nodes, trace sand
							clay	hard		
5		3	4.5			" "	clay	hard		scale nodes
		4	4.5			" "	clay	hard		scale nodes
		5	4.5			" "	clay	hard		scale nodes
10		6	4.0			Yellowish Brown/gray	clay	v. stiff		sls 10'-12'
		7	2.75			Yellowish Brown/gray	clay	v. stiff		scale nodes
							clay	v. stiff		scale nodes
15		8	2.75			Yellowish Brown/gray	clay	v. stiff		scale nodes
							silt	-	sand	sample broke upon extrusion encounter water at 18'
		9	-			Yellowish Brown				
							clay	v. stiff		w/ scale nod
20		10	3.75			Yellowish Brown	clay	v. stiff		sls 20'-22'
		11	2.75			Yellowish Brown	clay	v. stiff		
		12	3.5			Yellowish Brown	clay	v. stiff		scale nodes
							clay	v. stiff		
25		13	2.75			Yellowish Brown	clay	v. stiff		scale nodes
							clay	v. stiff		scale nodes
		14	3.75			Yellowish Brown	clay	v. stiff		terr nodes, scale nodes
		15	2.75			Yellowish Brown	clay	v. stiff		scale nodes
30							clay	v. stiff	sand	
		16	2.75			Reddish Brown	clay	v. stiff	sand	
		17	3.75			Reddish Brown	clay	v. stiff		
35		18	-			Reddish Brown	sand	-	clay	

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET	SAMPLE NO.	PEN./TORVANE	SPT.-BLOW COUNT	BORING NO. <u>94-13</u> DATE: BEGIN <u>3/17/94</u> PAGE <u>2 / 2</u>				
				JOB NO. <u>146727-6</u> COMPLETE <u>3/17/94</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>Framco 3b</u>				
				GROUNDWATER: DEPTH <u>0</u> ft., ELEV. _____ ft., at end of Drilling				
				WEATHER <u>SUNNY, WARM</u>				
				DRILLER <u>RANDY GARDEN</u> LOGGER <u>PETER KOSMOSKI</u>				
				COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	11	4.5		Reddish Brown	clay	Hard		uphole rods, blocking structure 36' - 40'
40	20	4.5		Reddish Brown	clay	Hard		
45								** water here at end of Drilling
50								
55								
60								
65								
70								

GEOTEST ENGINEERING, INC.

JOB NO. 14G727-12

DATE 4/11/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-13

SAMPLE NO. 3

DEPTH 4-6 ft

SPECIMEN NO. 1

CLASSIFICATION

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

Tare No.	P201	Height	5.595 in.
Tare plus Wet Specimen	486.84 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	407.72 gm	Initial Area	6.290 sq in.
Water Weight	79.12 gm	Volume	35.194 cu in.
Tare Weight	42.43 gm	Volume of Solids	cu in.
Wet Specimen	1173.60 gm	Void Ratio	
Dry Specimen	964.66 gm	Saturation	%
Water Content	21.66 %	Dry Density	104.4 lb/cu ft
Specific Gravity of Solids			
LL = 72	PL =	PI =	

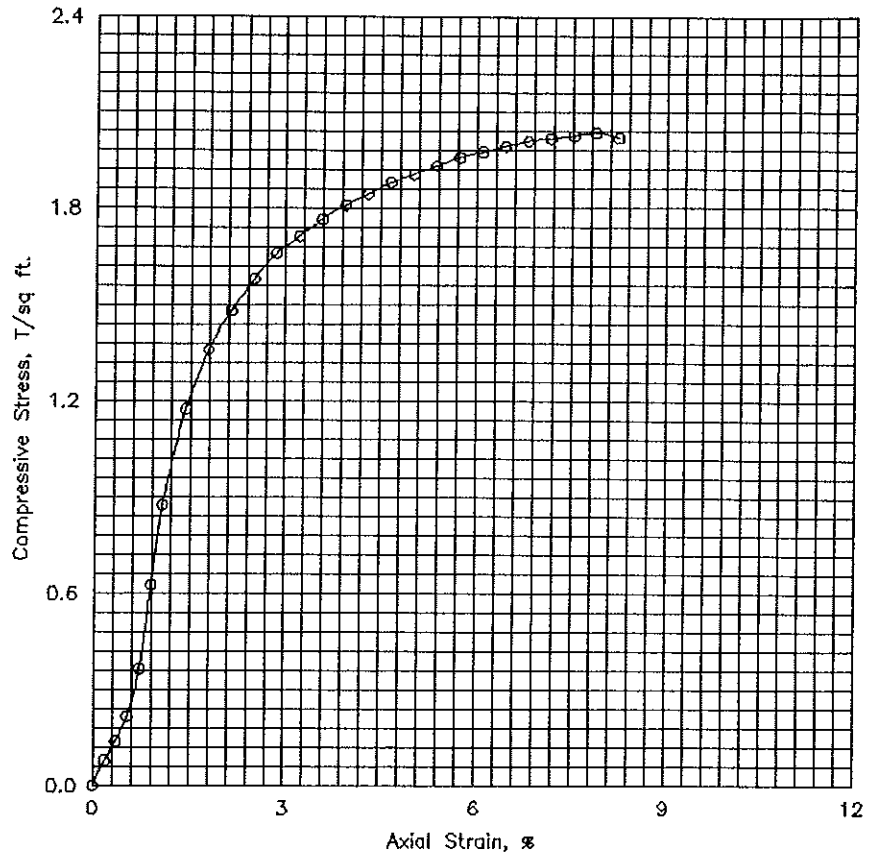
Proving Ring No. 10170

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	9.0	6.9	.002	6.30	.079
.4	20.	.020	16.0	12.3	.004	6.31	.140
.6	30.	.030	25.0	19.1	.005	6.32	.218
.7	40.	.040	42.0	32.2	.007	6.34	.366
.9	50.	.050	72.0	55.2	.009	6.35	.626
1.1	60.	.060	101.0	77.4	.011	6.36	.876
1.4	80.	.080	136.0	104.2	.014	6.38	1.175
1.7	100.	.100	158.0	121.0	.018	6.40	1.361
2.1	120.	.120	173.0	132.5	.021	6.43	1.484
2.4	140.	.140	185.0	141.7	.025	6.45	1.581
2.7	160.	.160	195.0	149.4	.029	6.48	1.661
3.0	180.	.180	202.0	154.7	.032	6.50	1.714
3.3	200.	.200	209.0	160.1	.036	6.52	1.767
3.7	220.	.220	215.0	164.7	.039	6.55	1.811
4.0	240.	.240	220.0	168.5	.043	6.57	1.846
4.3	260.	.260	225.0	172.3	.046	6.60	1.881
4.6	280.	.280	229.0	175.4	.050	6.62	1.907
4.9	300.	.300	233.0	178.5	.054	6.65	1.933
5.3	320.	.320	237.0	181.5	.057	6.67	1.959
5.4	340.	.340	240.0	183.8	.061	6.70	1.976
5.8	360.	.360	243.0	186.1	.064	6.72	1.994
6.1	380.	.380	246.0	188.4	.068	6.75	2.010
6.4	400.	.400	248.0	190.0	.071	6.77	2.019
6.7	420.	.420	250.0	191.5	.075	6.80	2.027
7.1	440.	.440	252.0	193.0	.079	6.83	2.036

7.4	460.	.460	251.0	192.3	.082	6.85	2.020
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Failure Sketches



□ Controlled stress
 ⊗ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	21.7 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	104.4		
Time to failure, min		t_f	7.05		
Unconfined compressive strength, T/sq ft		q_u	2.04		
Undrained shear strength, T/sq ft		S_u	1.02		
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 & sand pockets					
LL	72	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No.	94-13	Sample No.	3
		Depth	4-6 ft	Date	4/11/94
		UNCONFINED COMPRESSION TEST REPORT			

JOB NO. 14G727-12

DATE 4/11/94

PROJECT Lake Wallisville, Trinity River
and Tributaries,

AREA near Wallisville, Texas

BORING NO. 94-13

SAMPLE NO. 6

DEPTH 10-12 ft

SPECIMEN NO. 1

CLASSIFICATION

Yellowish gray, Clay, Very stiff, w/blocky structure

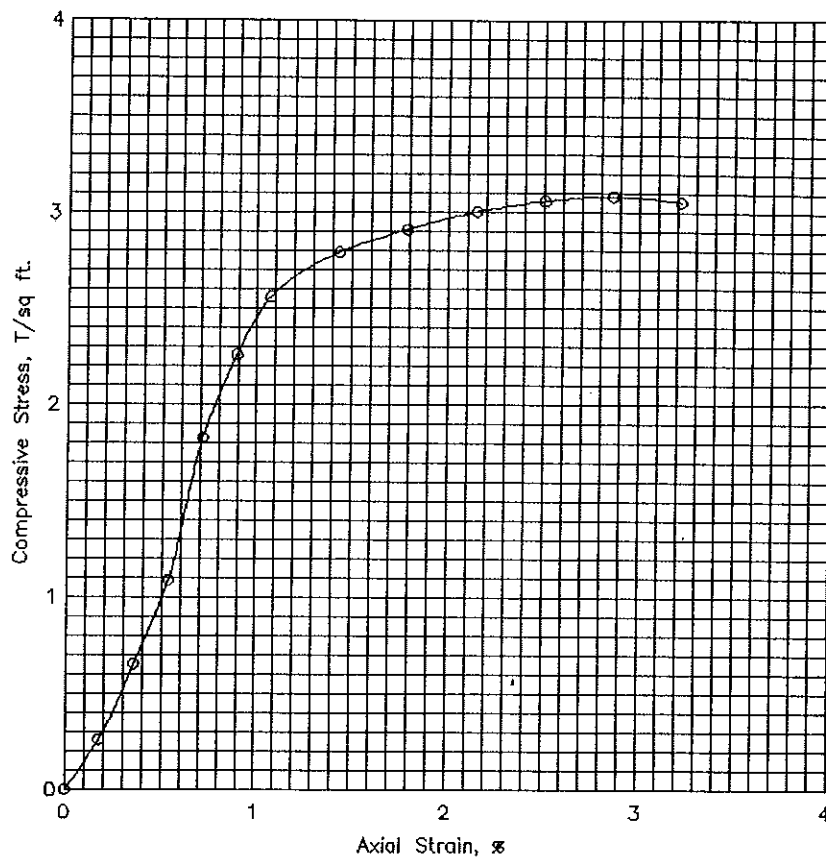
Tare No.	W-6	Height	5.595 in.
Tare plus Wet Specimen	389.87 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	313.36 gm	Initial Area	6.290 sq in.
Water Weight	76.51 gm	Volume	35.194 cu in.
Tare Weight	42.56 gm	Volume of Solids	cu in.
Wet Specimen	1144.54 gm	Void Ratio	
Dry Specimen	892.41 gm	Saturation	%
Water Content	28.25 %	Dry Density	96.6 lb/cu ft
Specific Gravity of Solids			
LL = 82	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	30.0	23.0	.002	6.30	.263
.4	20.	.020	75.0	57.4	.004	6.31	.655
.5	30.	.030	125.0	95.8	.005	6.32	1.090
.7	40.	.040	210.0	160.9	.007	6.34	1.828
.9	50.	.050	260.0	199.2	.009	6.35	2.259
1.0	60.	.060	295.0	226.0	.011	6.36	2.559
1.4	80.	.080	323.0	247.4	.014	6.38	2.792
1.7	100.	.100	338.0	258.9	.018	6.40	2.911
2.0	120.	.120	350.0	268.1	.021	6.43	3.003
2.3	140.	.140	358.0	274.2	.025	6.45	3.060
2.6	160.	.160	362.0	277.3	.029	6.48	3.083
3.0	180.	.180	360.0	275.8	.032	6.50	3.055

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	28.3 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	96.6		
Time to failure, min		t_f	2.63		
Unconfined compressive strength, T/sq ft		q_u	3.08		
Undrained shear strength, T/sq ft		S_u	1.54		
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/blocky structure					
LL	82	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No.	94-13	Sample No.	6
		Depth	10-12 ft	Date	4/11/94
		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. 94-13

SAMPLE NO. 10

DEPTH 18-20 ft

SPECIMEN NO. 1

CLASSIFICATION

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

Tare No.	IM-1	Height	5.595 in.
Tare plus Wet Specimen	482.16 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	400.33 gm	Initial Area	6.290 sq in.
Water Weight	81.83 gm	Volume	35.194 cu in.
Tare Weight	42.48 gm	Volume of Solids	cu in.
Wet Specimen	1186.64 gm	Void Ratio	
Dry Specimen	965.79 gm	Saturation	%
Water Content	22.87 %	Dry Density	104.5 lb/cu ft
Specific Gravity of Solids			
LL = 65	PL =	PI =	

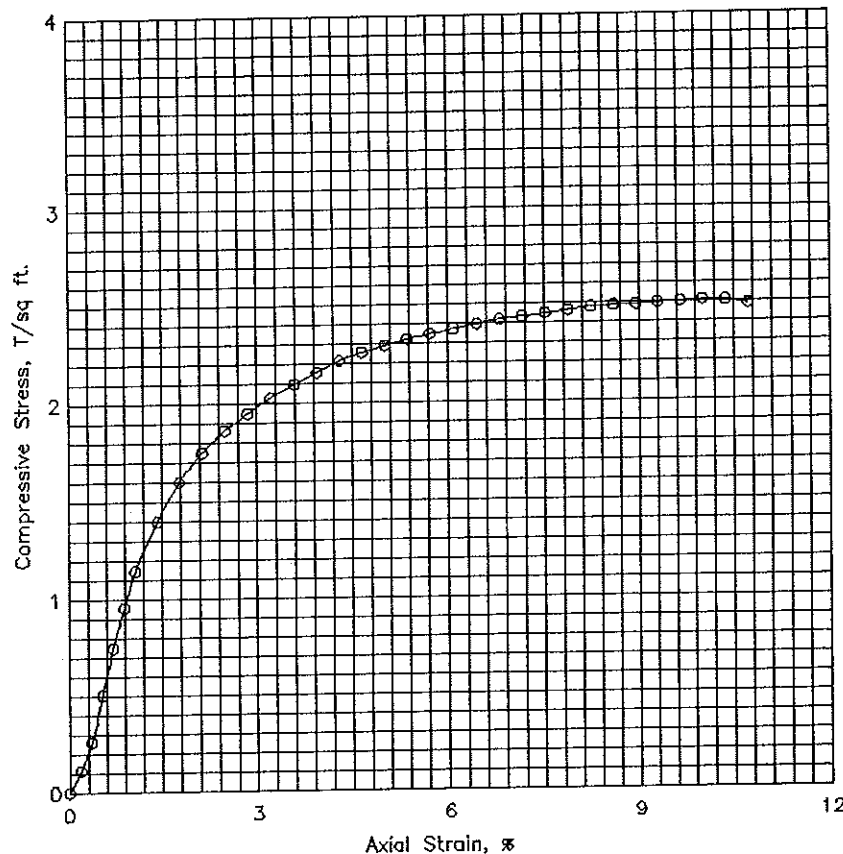
Proving Ring No. 10170

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	13.0	10.0	.002	6.30	.114
.4	20.	.020	30.0	23.0	.004	6.31	.262
.5	30.	.030	58.0	44.4	.005	6.32	.506
.7	40.	.040	86.0	65.9	.007	6.34	.749
.9	50.	.050	110.0	84.3	.009	6.35	.956
1.0	60.	.060	132.0	101.1	.011	6.36	1.145
1.4	80.	.080	162.0	124.1	.014	6.38	1.400
1.7	100.	.100	186.0	142.5	.018	6.40	1.602
2.0	120.	.120	204.0	156.3	.021	6.43	1.750
2.3	140.	.140	218.0	167.0	.025	6.45	1.864
2.6	160.	.160	229.0	175.4	.029	6.48	1.950
3.0	180.	.180	239.0	183.1	.032	6.50	2.028
3.3	200.	.200	248.0	190.0	.036	6.52	2.097
3.6	220.	.220	256.0	196.1	.039	6.55	2.156
3.9	240.	.240	264.0	202.2	.043	6.57	2.215
4.2	260.	.260	270.0	206.8	.046	6.60	2.257
4.4	280.	.280	275.0	210.6	.050	6.62	2.291
4.7	300.	.300	280.0	214.5	.054	6.65	2.323
5.0	320.	.320	284.0	217.5	.057	6.67	2.348
5.3	340.	.340	288.0	220.6	.061	6.70	2.372
5.7	360.	.360	292.0	223.7	.064	6.72	2.396
6.0	380.	.380	296.0	226.7	.068	6.75	2.419
6.3	400.	.400	299.0	229.0	.071	6.77	2.434
6.7	420.	.420	302.0	231.3	.075	6.80	2.449
7.0	440.	.440	305.0	233.6	.079	6.83	2.464

7.3	460.	.460	308.0	235.9	.082	6.85	2.479
7.6	480.	.480	310.0	237.5	.086	6.88	2.485
7.9	500.	.500	312.0	239.0	.089	6.91	2.491
8.3	520.	.520	314.0	240.5	.093	6.93	2.497
8.4	540.	.540	316.0	242.1	.097	6.96	2.503
8.7	560.	.560	318.0	243.6	.100	6.99	2.509
9.1	580.	.580	319.0	244.4	.104	7.02	2.507
9.4	600.	.600	318.0	243.6	.107	7.05	2.489

Failure Sketches


☐ Controlled stress

☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	22.9 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	104.5		
Time to failure, min		t_f	8.73		
Unconfined compressive strength, T/sq ft		q_u	2.51		
Undrained shear strength, T/sq ft		S_u	1.25		
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/sand pockets & calcareous nodules					
LL	65	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No. 94-13	Sample No. 10		
		Depth 18-20 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. 94-13

SAMPLE NO. 13

DEPTH 24-26 ft

SPECIMEN NO. 1

CLASSIFICATION

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

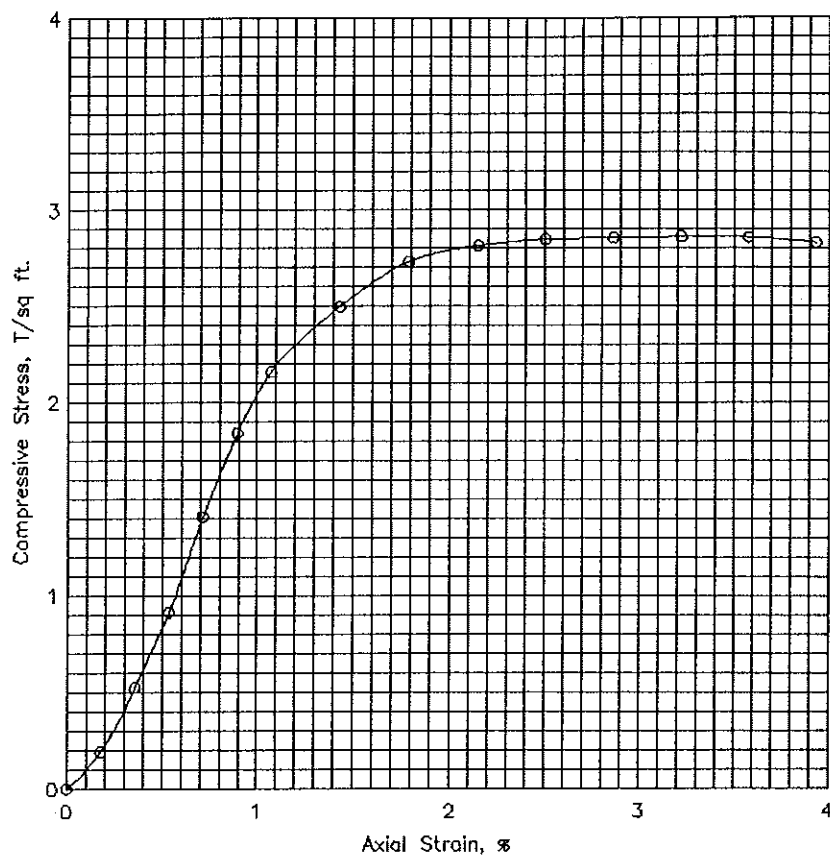
Tare No.	K1-18	Height	5.595 in.
Tare plus Wet Specimen	455.44 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	368.35 gm	Initial Area	6.290 sq in.
Water Weight	87.09 gm	Volume	35.194 cu in.
Tare Weight	42.51 gm	Volume of Solids	cu in.
Wet Specimen	1160.98 gm	Void Ratio	
Dry Specimen	916.12 gm	Saturation	%
Water Content	26.73 %	Dry Density	99.2 lb/cu ft
Specific Gravity of Solids			
LL = 67	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	22.0	16.9	.002	6.30	.193
.4	20.	.020	60.0	46.0	.004	6.31	.524
.5	30.	.030	105.0	80.4	.005	6.32	.916
.7	40.	.040	162.0	124.1	.007	6.34	1.410
.9	50.	.050	212.0	162.4	.009	6.35	1.842
1.0	60.	.060	249.0	190.7	.011	6.36	2.160
1.4	80.	.080	289.0	221.4	.014	6.38	2.498
1.7	100.	.100	317.0	242.8	.018	6.40	2.730
2.0	120.	.120	328.0	251.2	.021	6.43	2.814
2.3	140.	.140	333.0	255.1	.025	6.45	2.847
2.6	160.	.160	335.0	256.6	.029	6.48	2.853
3.0	180.	.180	337.0	258.1	.032	6.50	2.860
3.3	200.	.200	338.0	258.9	.036	6.52	2.858
3.6	220.	.220	336.0	257.4	.039	6.55	2.830

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.		1			
Type of Specimen		Undisturbed			
Initial	Water content	w_0	26.7 %	%	%
	Void ratio	e_0			
	Saturation	S_0	%	%	%
	Dry density, lb/cu ft	γ_d	99.2		
Time to failure, min		t_f	2.95		
Unconfined compressive strength, T/sq ft		q_u	2.86		
Undrained shear strength, T/sq ft		S_u	1.43		
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	67	PL		PI	G_s
Remarks		Project Lake Wallisville, Trinity River			
		and Tributaries,			
		Area near Wallisville, Texas			
		Boring No. 94-13		Sample No. 13	
		Depth 24-26 ft		Date 4/12/94	
		UNCONFINED COMPRESSION TEST REPORT			

SUMMARY OF LABORATORY TEST RESULTS

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

Boring No. 94-13

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 (%)	P L (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	1.25		Dark gray, Clay, Stiff, w/roots material	C H	26.1											
2	2 - 4	1.25		Brown, Clay, Stiff, w/silt pocket	C H	32.4											
3	4 - 6	2.75		Yellowish gray, Clay, Very stiff, w/calcareous nodules and sand pocket	C H	21.7	104.4	127.0	72		100.0	100.0	99.8	98.7	98.1		2.04
4	6 - 8	3.75		Yellowish gray, Clay, Very stiff, w/calcareous nodules and sand pocket	C H	23.1											
5	8 - 10	4.50		Yellowish gray, Clay, Hard, w/calcareous nodules	C H	23.5											
6	10 - 12	3.75		Yellowish gray, Clay, Very stiff, w/blocky structure	C H	28.3	96.6	123.9	82		100.0	100.0	99.6	98.7	98.4		3.08
7	12 - 14	3.25		Yellowish gray, Clay, Very stiff, w/calcareous nodules and blocky structure	C H	28.4											
8	14 - 16	3.75		Yellowish gray, Clay, Very stiff, w/calcareous nodules	C H	27.6											
9	16 - 18			Yellowish gray, Silt, Sandy	M L	21.5											
10	18 - 20	2.75		Yellowish gray, Clay, Very stiff, w/sand pocket and calcareous nodules	C H	22.8	104.5	128.5	65		100.0	100.0	99.8	98.7	97.8		2.51
11	20 - 22	3.50		Yellowish brown, Clay, Very stiff, w/ferrous stain	C H	29.2											
12	22 - 24	3.25		Yellowish brown, Clay, Very stiff, w/ferrous stain and blocky structure	C H	25.9											
13	24 - 26	3.00		Yellowish gray, Clay, Very stiff, w/calcareous nodules and blocky structure	C H	26.7	99.2	125.7	67		100.0	100.0	99.7	98.6	97.6		2.86
14	26 - 28	4.50		Light gray, Clay, Hard, w/calcareous nodules & sand pocket	C H	22.0											
15	28 - 30	3.75		Light gray, Clay, very stiff, w/calcareous nodules & sand pocket	C H	23.4											
16	30 - 32	3.50		Light gray, Clay, Very stiff, w/calcareous nodules	C H	25.5											
17	32 - 34	3.50		Brown, Clay, Very stiff, Sandy, w/calcareous nodules	C L	19.3											
18	34 - 36			Brown, Sand, Clayey	S C	21.4											
19	36 - 38	4.50		Reddish brown, Clay, Hard, w/calcareous nodules & silt pocket	C H	20.5											
20	38 - 40	4.25		Reddish brown, Clay, Hard, w/silt pocket	C H	26.4											

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