U.S. ARMY CORPS OF ENGINEERS

BORING NO. 97-22 DATE: BEGIN 6-27-97 PAGE 1 / 1
JOB NO. 1140086134 COMPLETE 6-27-9 Thin Walled Tube
PROJECT Upper Basin Detention Area B ■ 3" □ 6"
LOCATION along Brays Bayou
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Marsh Buggy K4X4, F.36
GROUNDWATER: DEPTH 0 ft., ELEV. ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY & HOT
DRILLER Dempsey Geamon LOGGER John Gentry

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	1.5	GRAY	CLAY	STIFF		+BR. W/ROOTS 0-2
		2	1.25	GRAY	CLAY	STIFF		
5		3	2.0	GRAY	CLAY	VERY STIFF	SANDY	-W/ Calc Nods 4-10 -W/FeNods 4-10
		4	1.75	LT GRAY	CLAY	STIFF	SANDY	+YELLOW 6-11
		5	2.75	LT GRAY	CLAY	VERY STIFF	SANDY	
10		6	1.75	LT GRAY	CLAY	STIFF	SANDY	
FAR SAMPLE →		6A		LT GRAY	SAND	MEDIUM DENSE	SILTY	+YELLOW 11-12
	X	7	5 10 16	BROWN	SAND	MEDIUM DENSE	SILTY	+GRAY 12-31
15								
	X	8	6 15 18	BROWN	SAND	DENSE	SILTY	
20								
	X	9	12 32 46	BROWN	SAND	VERY DENSE	SILTY	
25								
	X	10	13 39 50/3"	BROWN	SAND	VERY DENSE	SILTY	
30								
		11	4.0	REDDISH BROWN	CLAY	VERY STIFF		+GRAY 31-35 -W/SAND POCKETS 31-35 -W/Calc Nods 31-35
		12	3.75	REDDISH BROWN	CLAY	VERY STIFF		
35								

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 97-22 DATE: BEGIN 6-27-97 PAGE 1 / 1
JOB NO. 114008634 COMPLETE 6-27-9 Thin Walled Tube
PROJECT Upper Basin Detention Area B ■ 3" □ 6"
LOCATION along Brays Bayou
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG Marsh Buggy K4X4, F-36
GROUNDWATER: DEPTH 0 ft., ELEV. ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY 1407
DRILLER Dempsey Gearon LOGGER Jobn Gentry

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	1.5	GRAY	CLAY	STIFF		+BROWN 0-2 -W/ROOTS 0-2
		2	1.25	GRAY	CLAY	STIFF		
5		3	2.0	GRAY	CLAY	VERY STIFF	SANDY	-W/ Calc Nods 4'-10' -W/FeNods 4'-10'
		4	1.75	LT GRAY	CLAY	STIFF	SANDY	+YELLOW 6'-11'
		5	2.75	LT GRAY	CLAY	VERY STIFF	SANDY	
10		6	1.75	LT GRAY	CLAY	STIFF	SANDY	
→ ARSAMPLE		6A		LT GRAY	SAND	MEDIUM DENSE	SILTY	+YELLOW 11'-12'
	X	7	5 10 16	BROWN	SAND	MEDIUM DENSE	SILTY	+GRAY 12'-31'
15								
	X	8	6 15 18	BROWN	SAND	DENSE	SILTY	
20								
	X	9	12 32 46	BROWN	SAND	VERY DENSE	SILTY	
25								
	X	10	13 30 50/3"	BROWN	SAND	VERY DENSE	SILTY	
30								
		11	4.0	REDDISH BROWN	CLAY	VERY STIFF		+GRAY 31'-35' -W/SAND POCKETS 31'-35' -w/Calc Nods 31'-35'
		12	3.75	REDDISH BROWN	CLAY	VERY STIFF		
35								

GEOTEST ENGINEERING, INC.

Project: Brays Bayou PDM

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-95-D-0007 Delivery Order No. 0035

Boring No. 97-22

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	1.50		Clay,w/grass roots,Stiff,Gray	C H	27.8											
2	2 - 4	1.25		Clay,Stiff,Gray	C H	21.8											
3	4 - 6	1.75		Sandy Clay,w/calcareous & ferrous nodules, Stiff,Gray	C L	25.9											
4	6 - 8	1.75		Sandy Clay,w/calcareous & ferrous nodules, Stiff,Gray	C L	19.7											
5	8 - 10	1.75		Sandy Clay,w/calcareous & ferrous nodules, Stiff,Gray	C L	19.7	102.4	122.6	44.0	19.0	99.7	99.5	99.3	89.8	58.8		1.70
6	10-11	1.75		Sandy Clay,w/calcareous & ferrous nodules, Stiff,Gray	C L	20.3											
6A	11-12			Silty Sand,Medium dense,Gray	S M	21.1											
7	12-13.5		26	Silty Sand,Medium dense,Brown	S M	23.1											
8	17-18.5		33	Silty Sand,Dense,Brown	SP-SM						99.9	99.8	99.7	69.1	11.3		
9	22-23.5		78	Silty Sand,Very dense,Brown	S M												
10	27-28.5		80/9"	Silty Sand,Very dense,Brown	S M												
11	31-33	4.00		Clay,w/calcareous nodules & ferrous stains, slickensided,Very stiff,Reddish brown	C H	19.7											
12	33-35	3.75		Clay,w/calcareous nodules & ferrous stains, slickensided,Very stiff,Reddish brown	C H	22.3	100.9	123.4	68.0	25.0	100.0	100.0	99.9	99.3	98.4		2.88

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

JOB NO. 114008613 DATE 7/2/97

PROJECT Brays Bayou PDM

AREA Houston, Texas

BORING NO. 97-22 SAMPLE NO. 5 DEPTH 8-10 ft

SPECIMEN NO. 1

CLASSIFICATION
Sandy Clay,w/calc & fer nod,Stiff,Gray

Tare No.	KL-28	Height	5.595 in.
Tare plus Wet Specimen	445.43 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	379.18 gm	Initial Area	6.290 sq in.
Water Weight	66.25 gm	Volume	35.194 cu in.
Tare Weight	42.81 gm	Volume of Solids	cu in.
Wet Specimen	1132.38 gm	Void Ratio	
Dry Specimen	946.05 gm	Saturation	%
Water Content	19.70 %	Dry Density	102.4 lb/cu ft

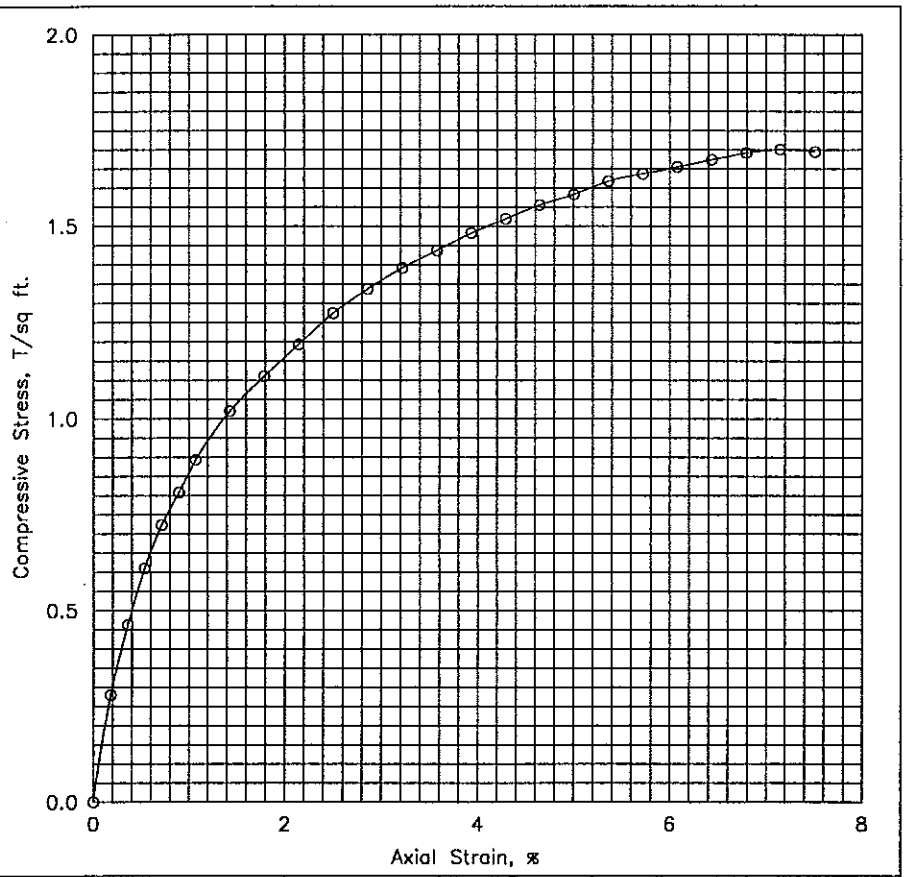
Specific Gravity of Solids
LL = 44 PL = 19 PI = 25

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
.4	20.	.020	53.0	40.6	.004	6.31	.463
.5	30.	.030	70.0	53.6	.005	6.32	.610
.7	40.	.040	83.0	63.6	.007	6.34	.723
.9	50.	.050	93.0	71.2	.009	6.35	.808
1.1	60.	.060	103.0	78.9	.011	6.36	.893
1.4	80.	.080	118.0	90.4	.014	6.38	1.020
1.7	100.	.100	129.0	98.8	.018	6.40	1.111
2.1	120.	.120	139.0	106.5	.021	6.43	1.193
2.4	140.	.140	149.0	114.1	.025	6.45	1.274
2.8	160.	.160	157.0	120.3	.029	6.48	1.337
3.1	180.	.180	164.0	125.6	.032	6.50	1.392
3.4	200.	.200	170.0	130.2	.036	6.52	1.437
3.8	220.	.220	176.0	134.8	.039	6.55	1.482
4.1	240.	.240	181.0	138.6	.043	6.57	1.519
4.4	260.	.260	186.0	142.5	.046	6.60	1.555
4.7	280.	.280	190.0	145.5	.050	6.62	1.583
5.1	300.	.300	195.0	149.4	.054	6.65	1.618
5.4	320.	.320	198.0	151.7	.057	6.67	1.637
5.8	340.	.340	201.0	154.0	.061	6.70	1.655
6.1	360.	.360	204.0	156.3	.064	6.72	1.674
6.4	380.	.380	207.0	158.6	.068	6.75	1.692
6.7	400.	.400	209.0	160.1	.071	6.77	1.701
7.1	420.	.420	209.0	160.1	.075	6.80	1.695

Job No. 114008613

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	19.7 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	102.4			
Time to failure, min		t_f	6.73			
Unconfined compressive strength, T/sq ft		q_u	1.70			
Undrained shear strength, T/sq ft		S_u	.85			
Sensitivity ratio		S_t				
Initial specimen diameter, in.		D_0	2.830			
Initial specimen height, in.		H_0	5.595			

Classification Sandy Clay,w/calc & fer nod,Stiff,Gray

LL	44	PL	19	PI	25	G_s	

Remarks

Project Brays Bayou PDM

Area Houston, Texas

Boring No. 97-22 | Sample No. 5

Depth El 8-10 ft | Date 7/2/97

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659
1 JUN 65

PLATE XI-2

Geotest Engineering, Inc.

PLATE

JOB NO. 114008613 DATE 7/2/97

PROJECT Brays Bayou PDM

AREA Houston, Texas

BORING NO. 97-22 SAMPLE NO. 12 DEPTH 33-35 ft

SPECIMEN NO. 1

CLASSIFICATION
Clay,w/calc nod&ferrous stains,slickensided,Very stiff,Red&gray

Tare No.	IM112	Height	5.595 in.
Tare plus Wet Specimen	680.61 gm	Average Diameter	2.830 in.
Tare plus Dry Specimen	564.35 gm	Initial Area	6.290 sq in.
Water Weight	116.26 gm	Volume	35.194 cu in.
Tare Weight	43.02 gm	Volume of Solids	cu in.
Wet Specimen	1140.39 gm	Void Ratio	
Dry Specimen	932.45 gm	Saturation	%
Water Content	22.30 %	Dry Density	100.9 lb/cu ft

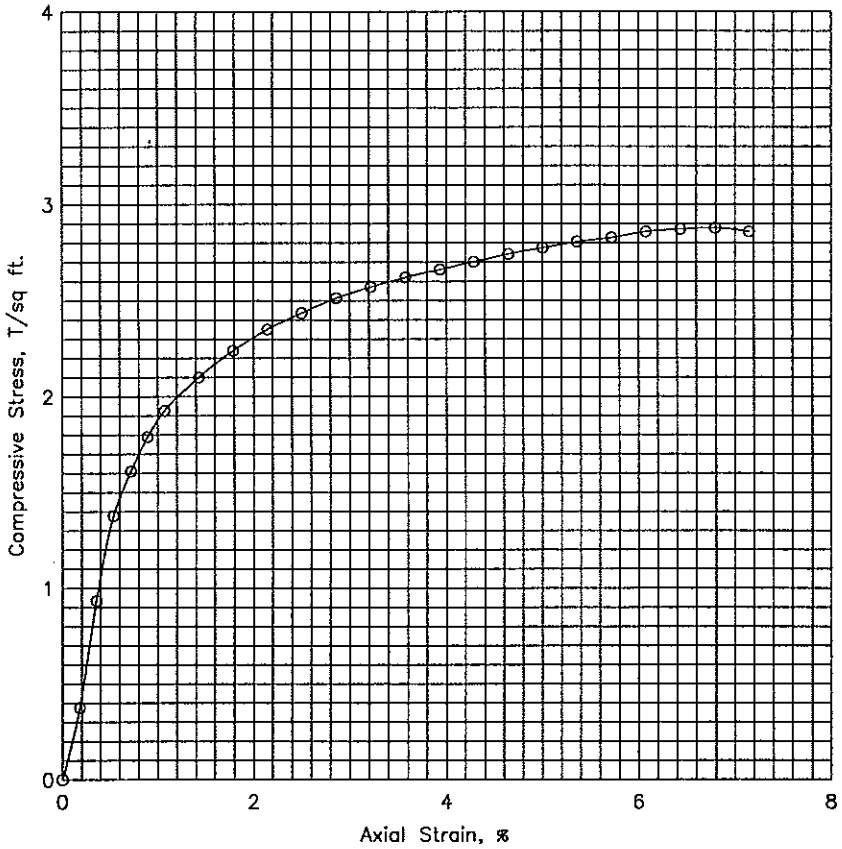
Specific Gravity of Solids
LL = 68 PL = 25 PI = 43

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	43.0	32.9	.002	6.30	.376
.4	20.	.020	107.0	82.0	.004	6.31	.935
.6	30.	.030	158.0	121.0	.005	6.32	1.378
.8	40.	.040	185.0	141.7	.007	6.34	1.610
.9	50.	.050	206.0	157.8	.009	6.35	1.790
1.1	60.	.060	222.0	170.1	.011	6.36	1.926
1.5	80.	.080	243.0	186.1	.014	6.38	2.100
1.8	100.	.100	260.0	199.2	.018	6.40	2.239
2.1	120.	.120	274.0	209.9	.021	6.43	2.351
2.4	140.	.140	285.0	218.3	.025	6.45	2.436
2.8	160.	.160	295.0	226.0	.029	6.48	2.513
3.1	180.	.180	303.0	232.1	.032	6.50	2.571
3.5	200.	.200	310.0	237.5	.036	6.52	2.621
3.8	220.	.220	316.0	242.1	.039	6.55	2.662
4.1	240.	.240	322.0	246.7	.043	6.57	2.702
4.5	260.	.260	328.0	251.2	.046	6.60	2.742
4.8	280.	.280	333.0	255.1	.050	6.62	2.774
5.2	300.	.300	338.0	258.9	.054	6.65	2.805
5.5	320.	.320	342.0	262.0	.057	6.67	2.827
5.8	340.	.340	347.0	265.8	.061	6.70	2.858
6.2	360.	.360	350.0	268.1	.064	6.72	2.871
6.5	380.	.380	352.0	269.6	.068	6.75	2.877
6.8	400.	.400	351.0	268.9	.071	6.77	2.858

Job No. 114008613

Failure Sketches



☐ Controlled stress
☒ Controlled strain

Test No.			1			
Type of Specimen			Undisturbed			
Initial	Water content	w_0	22.3 %	%	%	%
	Void ratio	e_0				
	Saturation	S_0	%	%	%	%
	Dry density, lb/cu ft	γ_d	100.9			
Time to failure, min		t_f	6.48			
Unconfined compressive strength, T/sq ft		q_u	2.88			
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 Clay,w/calc nod&ferrous stains,slickensided,Very stiff,Red&gray

LL	68	PL	25	PI	43	G_s	

Remarks

Project Brays Bayou PDM

Area Houston, Texas

Boring No. 97-22 | Sample No. 12

Depth El 33-35 ft | Date 7/2/97

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 3659

PLATE XI-2

Geotest Engineering, Inc.

PLATE