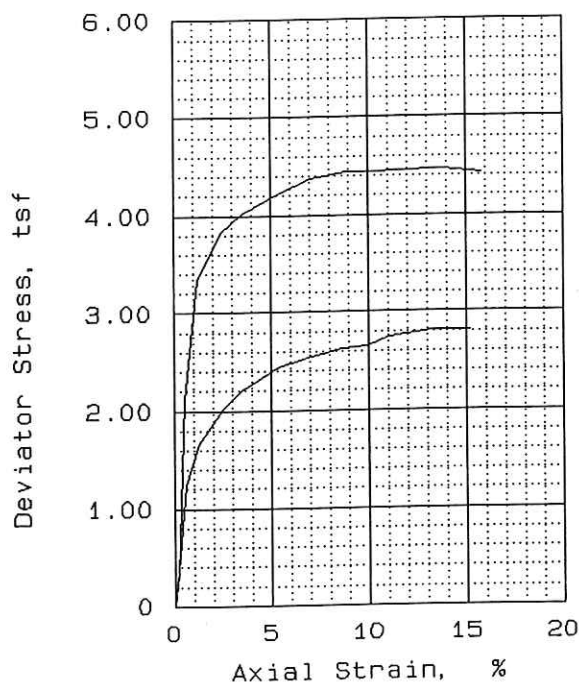
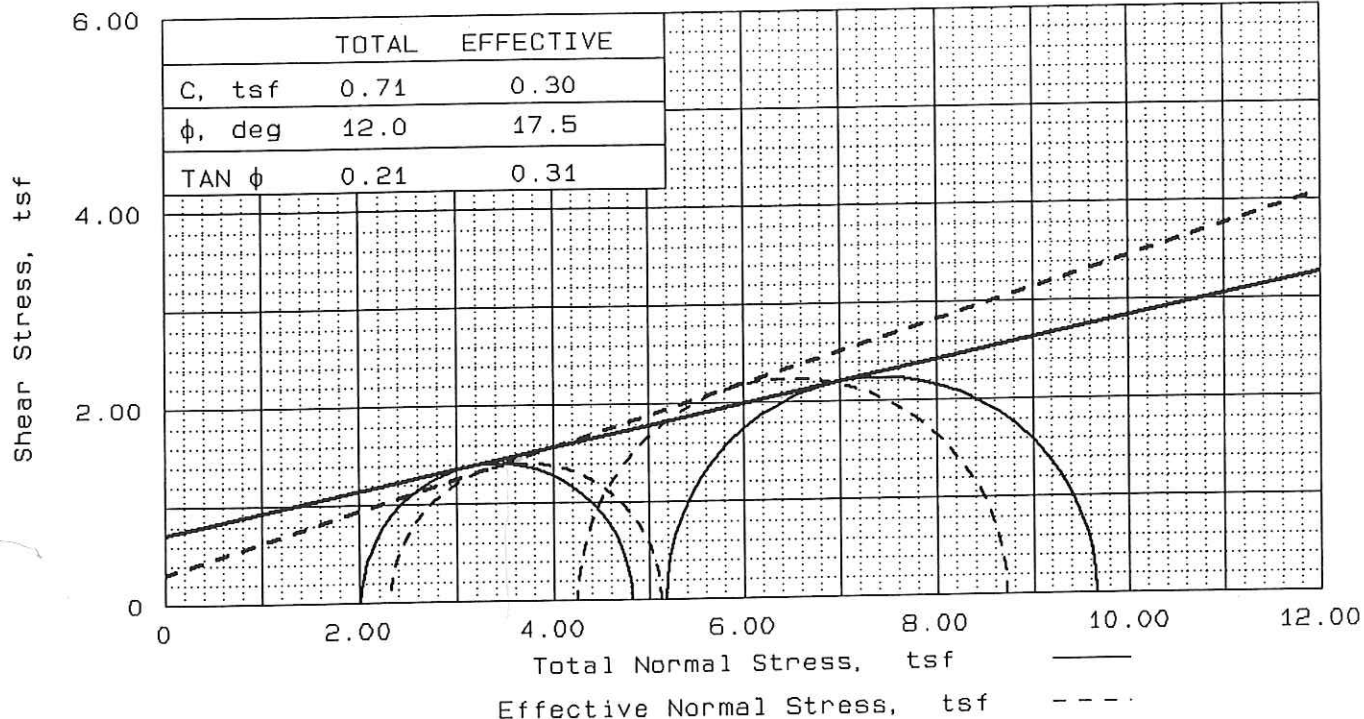


U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE NO.	PEN./TORVANE	SPT.-BLOW COUNT	BORING NO. <u>92-139</u> DATE: BEGIN <u>6-29-92</u> PAGE <u>1 / 2</u>				
					JOB NO. <u>14G547</u> COMPLETE <u>6-29-92</u> Thin Walled Tube				
					PROJECT <u>Brays Bayou</u> ☒ 3" ☐ 6"				
					LOCATION <u>Bank of Brays Bayou</u>				
					ELEVATION OF HOLE _____				
					MANUFACTURER'S DESIGNATION OF DRILL RIG <u>K-1000 Marsh Buggy</u>				
					GROUNDWATER: DEPTH <u>22</u> ft., ELEV. _____ ft., at end of Drilling				
					WEATHER <u>Partly Cloudy, Warm</u>				
					DRILLER <u>Scott Gregurek</u> LOGGER <u>Harry Patel</u>				
					COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	4.5		Dk. Gray	clay	Hard		w/ grass roots (Fill)
		2	3.0		Y. Gray	clay	v-stiff		
5		3	2.5		Y-Gray	clay	v-stiff		
		4	3.5		Y-Gray	clay	v-stiff		w/ calcareous nodules
		5	4.0		Y. Gray	clay	v-stiff		w/ calcareous nodules
10		6	4.5		R. Br. & Gr.	clay	Hard		w/ calcareous nodules
		7	4.25		R. Br. & Gr.	clay	Hard		w/ calcareous nodules
15		8	4.5		R. Br. & Gr.	clay	Hard		w/ Cal. Nodol.
		9	4.25		Y. Gray	clay	Hard		
		10	4.25		Y. Gray	clay	Hard		w/ cal. nodol.
20		11	3.75		Y. Gray	clay	v-stiff		w/ sand partings
		12	4.0		Y-Gray	clay	v-stiff		w/ calcareous nodules, & sand partings
25		13	3.5		Y-Gray	clay	v-stiff	Sandy	w/ stain of Fe. Nodol.
		14	3.5		Y. Gray	clay	v-stiff	Sandy	
30		15	4.0		R. Br. & Gr.	clay	v-stiff		w/ sand partings
		16	4.5		R. Br. & Gr.	clay	Hard		w/ sand partings
		17	4.5		R. Br.	clay	Hard		w/ sa layer @ bottom
35		18	3.0		Lt. Gray	clay	v-stiff	Sandy	

U.S. ARMY CORPS OF ENGINEERS

DEPTH, FEET		SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	BORING NO. <u>92-139</u> DATE: BEGIN <u>6-29-92</u> PAGE <u> </u>			JOB NO. <u>14G547</u> COMPLETE <u>6-29-92</u> Thin Wa. <u> </u>		PROJECT <u>Brays Bayou</u> ☒ 3" L		
					LOCATION <u>Bank of Brays Bayou</u>			ELEVATION OF HOLE <u> </u>				
					MANUFACTURER'S DESIGNATION OF DRILL RIG <u>K-1000 Marsh Buggy</u>							
					GROUNDWATER: DEPTH <u>22</u> ft., ELEV. <u> </u> ft., at end of Drilling							
					WEATHER <u>Partly Cloudy & Warm</u>							
					DRILLER <u>Scott Gregurek</u> LOGGER <u>Harry Patel</u>							
					COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS			
-35-			19	2.5	Lt. Gr.	clay	v-stiff	Sandy	w/sand seam			
			20	4.0	Lt-Gr.	clay	v-stiff	Sandy	w/sa partings			
-40-			21	3.0	y. Lt-Gr.	clay	v-stiff	Sandy	w/sa seam			
			22	4.5	y. Gr.	clay	Hard	Sandy	w/cl seam			
-45-			23	4.5	R. Br. 1/2 Gr.	clay	Hard		w/sand partings			
			24	4.5 ⁺	R. Br.	clay	Hard		w/si partings			
			25	4.5 ⁺	R. Br.	clay	Hard		w/si sa layer bottom			
-50-												
-55-												
-60-												
-65-												
-70-												



SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	15.9	18.7
	DRY DENSITY, pcf	114.0	111.3
	SATURATION, %	90.6	98.7
	VOID RATIO	0.472	0.509
	DIAMETER, in	1.40	1.38
	HEIGHT, in	3.07	2.97
AT TEST	WATER CONTENT, %	18.6	18.7
	DRY DENSITY, pcf	111.9	111.6
	SATURATION, %	100.0	100.0
	VOID RATIO	0.501	0.504
	DIAMETER, in	1.41	1.39
	HEIGHT, in	3.07	2.95
BACK PRESSURE, tsf		5.33	7.63
CELL PRESSURE, tsf		7.34	12.82
FAILURE STRESS, tsf		2.81	4.47
PORE PRESSURE, tsf		5.03	8.56
STRAIN RATE, %/min.		0.050	0.050
ULTIMATE STRESS, tsf			
PORE PRESSURE, tsf			
$\bar{\sigma}_1$ FAILURE, tsf		5.13	8.72
$\bar{\sigma}_3$ FAILURE, tsf		2.32	4.26

TYPE OF TEST:

CU with pore pressures

SAMPLE TYPE: UNDISTURBED

DESCRIPTION: FAT CLAY WITH SAND (CH)

LL= PL= PI=

SPECIFIC GRAVITY= 2.69

REMARKS: SPECIFIC GRAVITY ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS

GALVESTON DISTRICT

PROJECT: BRAYS BAYOU - FLOOD PROTECTION

SAMPLE LOCATION: BORING: 92-139, ST-6

10.0'-12.0', SWD LAB NO. 92/3299

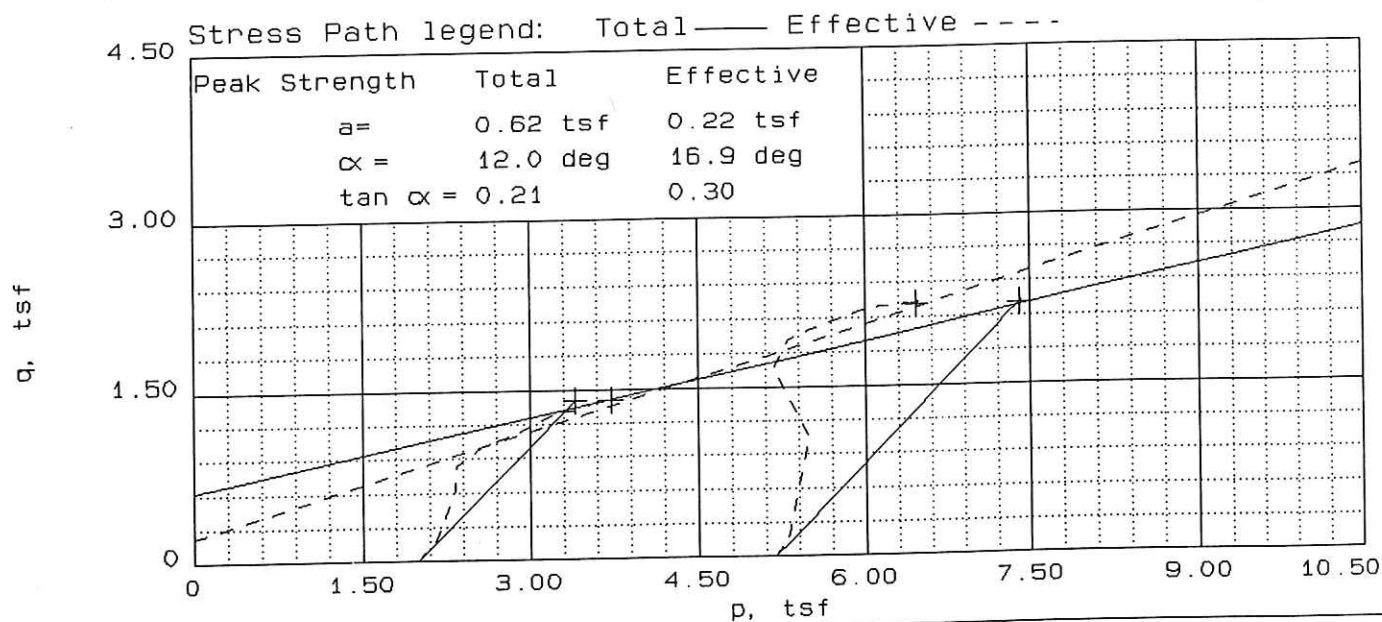
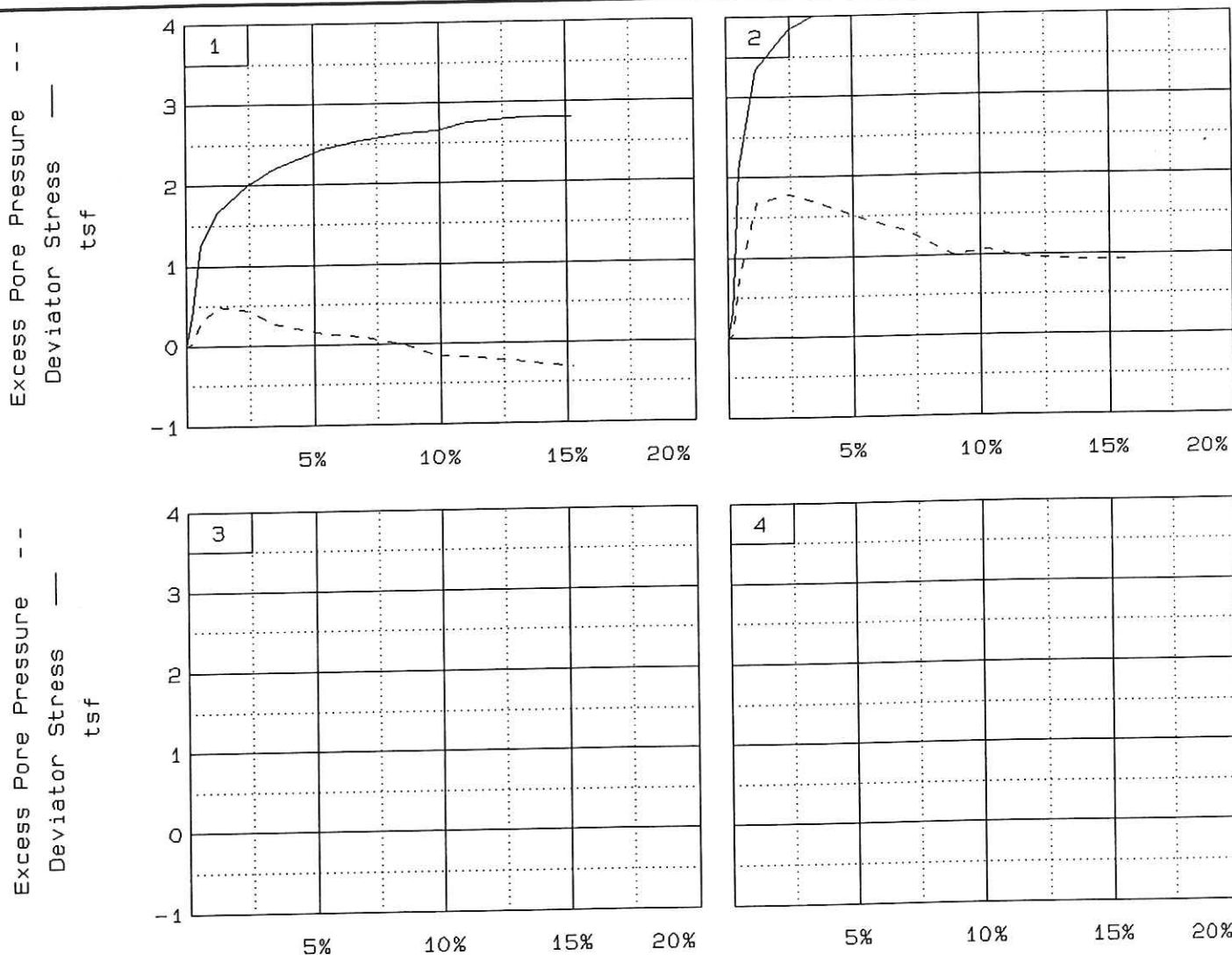
PROJ. NO.: 15625

DATE: SEPT 1992

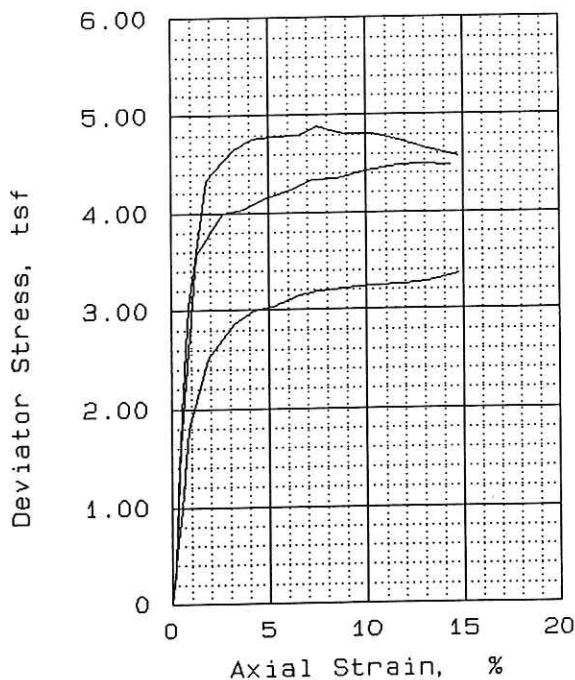
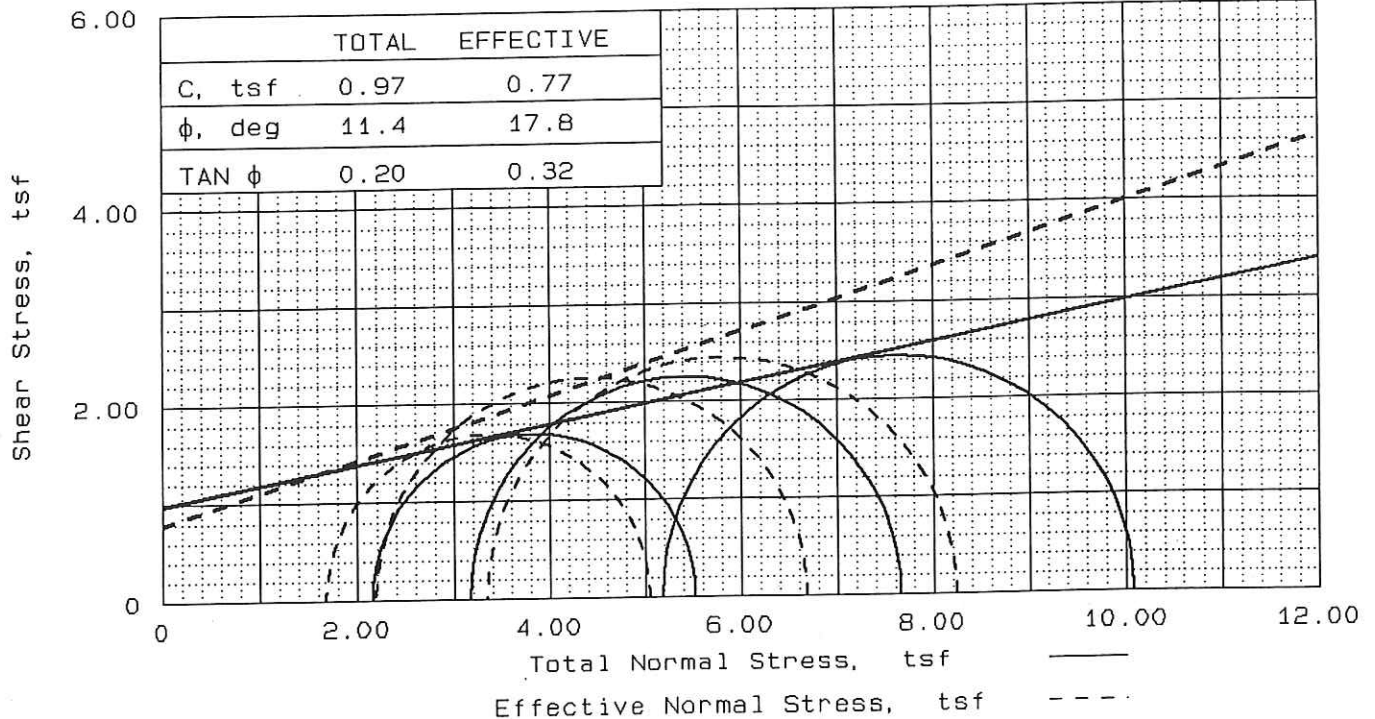
TRIAxIAL COMPRESSION TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



Client: US ARMY CORPS OF ENGINEERS GALVESTON DISTRICT
 Project: BRAYS BAYOU - FLOOD PROTECTION
 Location: BORING: 92-139, ST-6 10.0'-12.0', SWD LAB NO. 92/3299
 File: 3299RBAR Project No.: 15625



SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	17.6	17.3	20.1
	DRY DENSITY, pcf	107.4	108.4	106.2
	SATURATION, %	84.9	85.6	93.5
	VOID RATIO	0.557	0.543	0.576
	DIAMETER, in	1.38	1.37	1.37
	HEIGHT, in	2.99	2.95	2.99
AT TEST	WATER CONTENT, %	18.7	18.0	19.6
	DRY DENSITY, pcf	111.4	112.9	109.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.502	0.482	0.527
	DIAMETER, in	1.36	1.35	1.36
	HEIGHT, in	2.98	2.93	2.95
BACK PRESSURE, tsf		9.00	6.48	6.98
CELL PRESSURE, tsf		11.16	9.65	12.17
FAILURE STRESS, tsf		3.37	4.50	4.89
PORE PRESSURE, tsf		9.48	7.46	8.82
STRAIN RATE, %/min.		0.050	0.050	0.050
ULTIMATE STRESS, tsf				
PORE PRESSURE, tsf				
$\bar{\sigma}_1$ FAILURE, tsf		5.05	6.68	8.24
$\bar{\sigma}_3$ FAILURE, tsf		1.68	2.19	3.35

TYPE OF TEST:

CU with pore pressures

SAMPLE TYPE: UNDISTURBED

DESCRIPTION: LEAN CLAY WITH SAND (CL)

LL= 31 PL= 14 PI= 17.0

SPECIFIC GRAVITY= 2.68

REMARKS: SPECIFIC GRAVITY

ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS

GALVESTON DISTRICT

PROJECT: BRAYS BAYOU - FLOOD PROTECTION

SAMPLE LOCATION: BORING: 92-139, ST-13
24.0'-26.0', SWD LAB NO. 92/3301

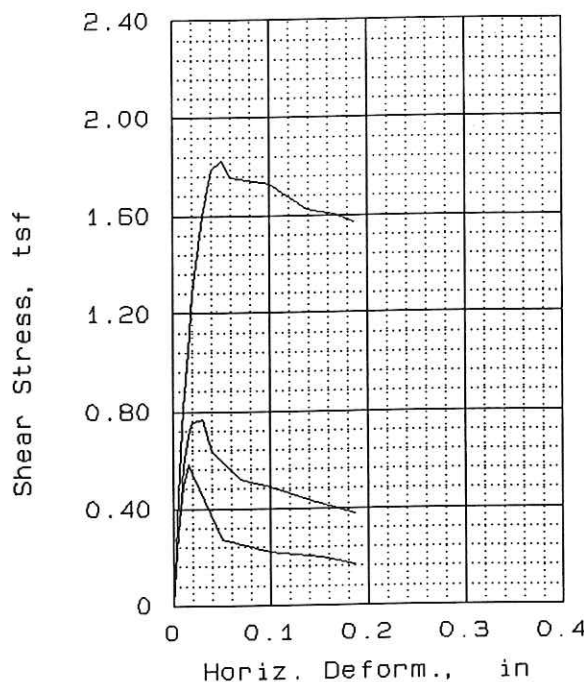
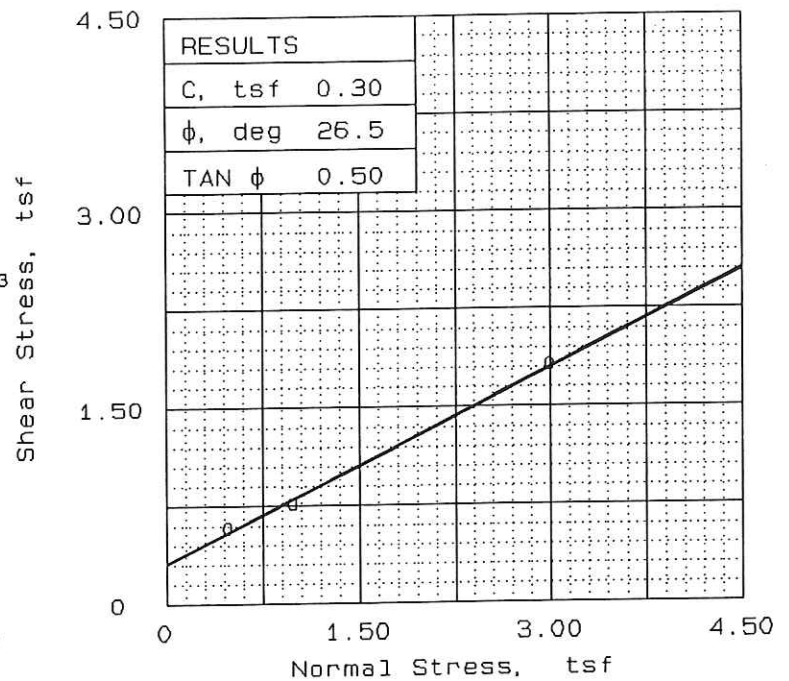
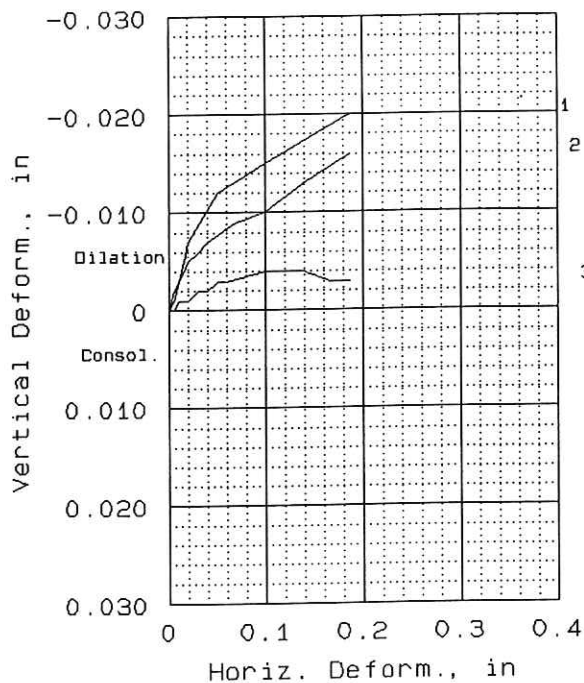
PROJ. NO.: 15625

DATE: SEPT 1992

TRIAxIAL COMPRESSION TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	20.3	21.6	20.5
	DRY DENSITY, pcf	108.1	105.7	108.2
	SATURATION, %	98.8	98.5	100.0
	VOID RATIO	0.553	0.589	0.552
	DIAMETER, in	2.51	2.51	2.51
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	21.9	23.2	20.4
	DRY DENSITY, pcf	107.2	105.1	109.7
	SATURATION, %	104.1	104.5	103.6
	VOID RATIO	0.567	0.597	0.530
	DIAMETER, in	2.51	2.51	2.51
	HEIGHT, in	1.01	1.01	0.99
NORMAL STRESS, tsf		0.49	1.00	3.00
MAX. SHEAR, tsf		0.58	0.77	1.82
STRAIN RATE, %/min.		0.004	0.004	0.004
ULT. SHEAR, tsf				

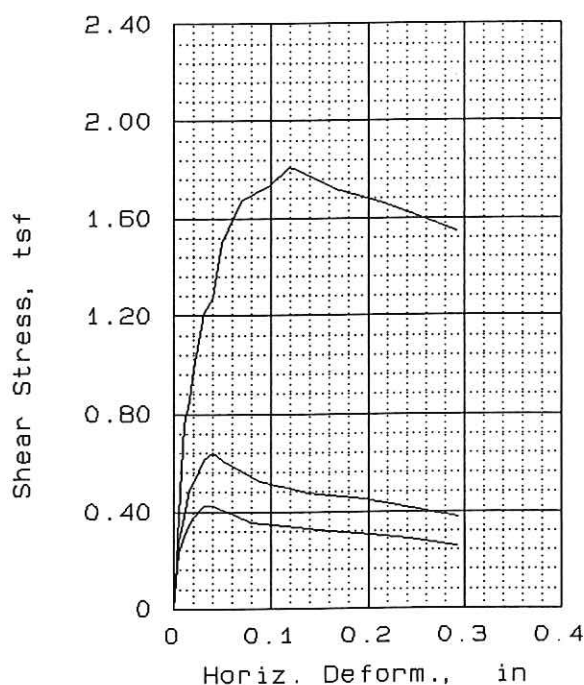
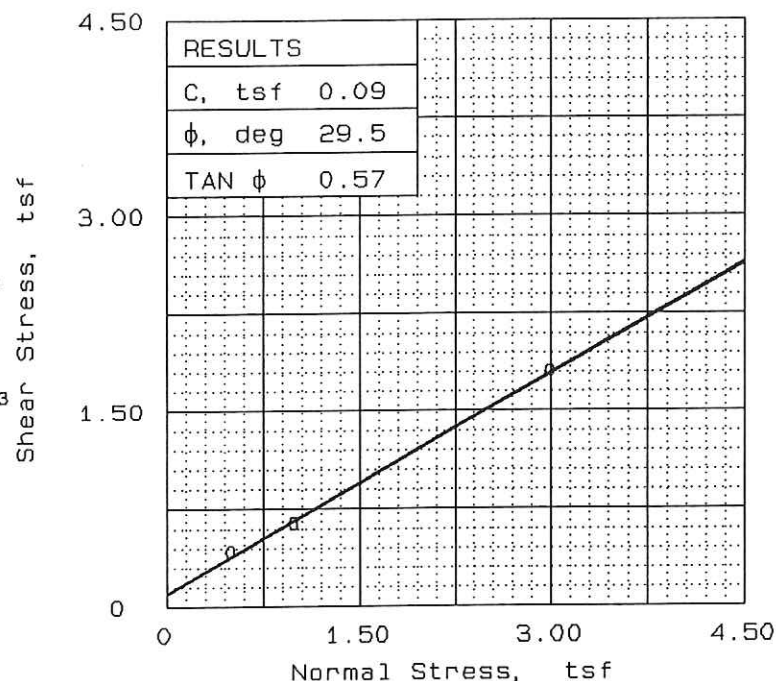
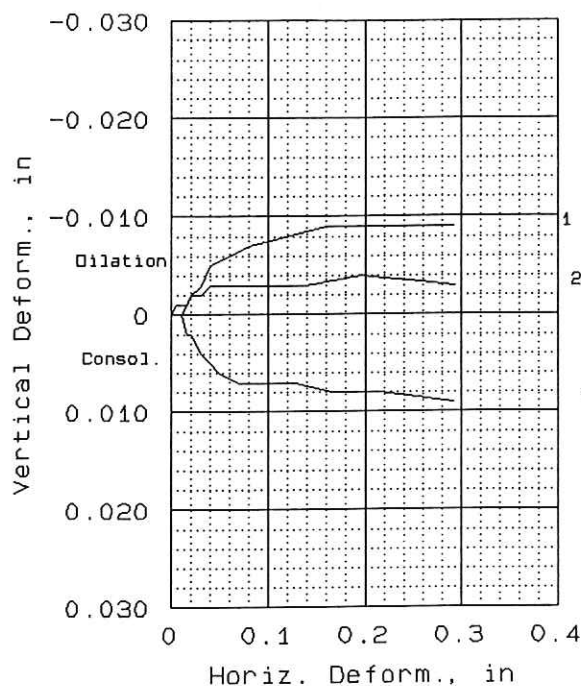
SAMPLE DATA
 SAMPLE TYPE: UNDISTURBED
 DESCRIPTION: FAT CLAY (CH)
 LL= 60 PL= 18 PI= 42.0
 SPECIFIC GRAVITY= 2.69
 REMARKS: SPECIFIC GRAVITY
 ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS
 GALVESTON DISTRICT
 PROJECT: BRAYS BAYOU - FLOOD PROTECTION
 SAMPLE LOCATION: BORING: 92-139, ST-8
 14.0-16.0, SWD LAB NO. 92/3300
 PROJ. NO.: 15625 DATE: SEPT 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	21.7	22.4	17.7
	DRY DENSITY, pcf	103.6	104.0	111.6
	SATURATION, %	94.7	98.5	95.3
	VOID RATIO	0.616	0.609	0.499
	DIAMETER, in	2.51	2.51	2.51
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	22.5	17.6	17.7
	DRY DENSITY, pcf	105.1	115.6	115.5
	SATURATION, %	102.1	105.8	105.8
	VOID RATIO	0.591	0.447	0.448
	DIAMETER, in	2.51	2.51	2.51
	HEIGHT, in	0.99	0.90	0.97
NORMAL STRESS, tsf		0.51	1.00	3.00
MAX. SHEAR, tsf		0.43	0.64	1.81
STRAIN RATE, %/min.		0.004	0.004	0.004
ULT. SHEAR, tsf				

SAMPLE DATA

SAMPLE TYPE: UNDISTURBED
DESCRIPTION: LEAN CLAY WITH
SAND (CL)

LL= 40 PL= 13 PI= 27.0

SPECIFIC GRAVITY= 2.68

REMARKS: SPECIFIC GRAVITY
ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS

GALVESTON DISTRICT

PROJECT: BRAYS BAYOU - FLOOD PROTECTION

SAMPLE LOCATION: BORING: 92-139, ST-14
26.0'-28.0', SWD LAB NO. 92/3302

PROJ. NO.: 15625

DATE: SEPT 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.

SUMMARY OF LABORATORY TEST RESULTS

Project: Brays Bayou, Sims Bayou and Fondren Ditch Project, Houston, Texas
Contract No. DACW64-92-D-0001 Delivery Order No. 0021

Boring No. 92-139

S#	Depth (ft.)	PP (tsf)	SPT Blows per foot	Visual Classification	U S C	M C (%)	Dry Unit Wt. (pcf)	Wet Unit Wt. (pcf)	LL (%)	PL (%)	Mechanical Analysis % passing					Torvane Shear Strength (tsf)	qu (tsf)
											#4	#10	#40	#100	#200		
1	0-2	4.50		Dark Gray, Clay, Hard, w/grass roots & calcareous nodules	C H	23.6											
2	2-4	2.50		Dark Gray, Clay, Very stiff, w/calcareous nodules	C H	25.2											
3	4-6	2.25		Dark Gray, Clay, Very stiff w/ferrous nodules	C H	22.0			68								
4	6-8	3.00		Yellowish gray, Clay, Very stiff, w/calcareous and ferrous nodules	C H	21.9											
5	8-10	4.25		Yellowish gray, Clay, Hard, w/calcareous & ferrous nodules	C H	22.6											
6	10-12	4.5+		Reddish Brown & Gray, Clay, Hard, w/calcareous nodules	C H												
7	12-14	3.25		Brown Gray, Clay, Very Stiff, w/calcareous nodules and sand seams	C H	23.3	103.8	127.9	60	23	100.0	100.0	99.9	99.3	98.8		3.07
8	14-16	4.5+		Reddish Brown & Gray, Clay, Hard, w/calcareous nodules	C H												
9	16-18	4.25		Yellowish Gray, Clay, Hard, w/calcareous nodules	C H	18.7			53								
10	18-20	3.75		Yellowish gray, Clay, Very stiff, w/calcareous nodules	C H	20.0											
11	20-22	3.75		Yellowish gray, Clay, Very stiff, w/calcareous and ferrous nodules	C H	21.1											
12	22-24	3.25		Yellowish gray, Clay, Very stiff, w/calcareous and ferrous nodules	C H	22.9											
13	24-26	3.50		Yellowish Gray, Clay, Very stiff, Sandy, w/ferrous stains	C L												
14	26-28	3.50		Yellowish Gray, Clay, Very stiff, Sandy, w/ferrous stains	C L												
15	28-30	3.00		Gray & Brown, Clay, Very stiff, w/calcareous nodules and Silt pockets	C H	19.4											

S#: Sample Number, PP: Pocket Penetrometer Reading, USC: Unified Soil Classification, MC: Moisture Content
qu: Unconfined Compressive Strength, WOH: Weight of Hammer, WOP: Weight of Pipe

GEOTEST ENGINEERING, INC.

SUMMARY OF LABORATORY TEST RESULTS

Project: Brays Bayou, Sims Bayou and Fondren Ditch Project, Houston, Texas
Contract No. DACW64-92-D-0001 Delivery Order No. 0021

Boring No. 92-139

S#	Depth (ft.)	PP (tsf)	SPT Blows per foot	Visual Classification	U S C	M C (%)	Dry Unit Wt. (pcf)	Wet Unit Wt. (pcf)	LL (%)	PL (%)	Mechanical Analysis % passing					Torvane Shear Strength (tsf)	qu (tsf)
											#4	#10	#40	#100	#200		
16	30-32	4.25		Yellowish gray, Clay, Hard w/calcareous nodules	C H	22.2			65								
17	32-34	3.75		Brown&Gray, Clay, Very stiff, w/calcareous nodules and silt layer	C H	20.1											
18	34-36	2.75		Light Gray, Clay, Very stiff, Sandy	C L	14.3	119.4	136.5	34	16	100.0	100.0	98.2	87.5	67.7		2.00
19	36-38	2.25		Light Gray&Yellowish gray, Clay, Very stiff, Sandy	C L	16.3											
20	38-40	4.00		Light Gray&Yellowish gray, Clay, Very stiff, Sandy	C L	15.1											
21	40-42	4.25		Light Gray&Yellowish gray, Clay, Hard, Sandy, w/sand seams	C L	15.1											
22	42-44	4.50		Light Gray&Brown, Clay, Hard, Sandy, w/sand pockets	C L	17.9											
23	44-46	2.75		Light Gray&Brown, Clay, Very stiff, w/silt pockets	C H	28.1											
24	46-48	3.75		Reddish Brown, Clay, Very stiff w/silt pockets, slickensided	C H	28.0			66								
25	48-50	3.50		Reddish Brown, Clay, Very stiff, w/calcareous nodules	C H	27.6											

S#: Sample Number, PP: Pocket Penetrometer Reading, USC: Unified Soil Classification, MC: Moisture Content
qu: Unconfined Compressive Strength, WOH: Weight of Hammer, WOP: Weight of Pipe

GEOTEST ENGINEERING, INC.