

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE	SPT.-BLOW COUNT	BORING NO. <u>92-143</u> DATE: BEGIN <u>7-30-92</u> PAGE <u>1 12</u>				
					JOB NO. <u>146548</u> COMPLETE <u>7-30-92</u> Thin Walled Tube				
PROJECT <u>DISPOSAL AREA #5</u> ☒ 3" ☐ 6"					LOCATION <u>BROWNSVILLE SHIP CHANNEL</u>				
ELEVATION OF HOLE					MANUFACTURER'S DESIGNATION OF DRILL RIG <u>C-1000 Marsh Buggy</u>				
GROUNDWATER: DEPTH <u>6.00</u> ft., ELEV. <u> </u> ft., at end of Drilling					WEATHER <u>PARTLY CLOUDY + VERY WINDY</u>				
DRILLER <u>SCOTT GREGUREK</u> LOGGER <u>JOHN A. GENTRY</u>									
					COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
+5.5	0	1			BROWN	CLAY	VERY COF7	SILTY	
		2	0.5		BROWN	CLAY	MEDIUM STIFF		
0	5	3	0.0		GRAY	CLAY	VERY SOFT		
		4	0.0		"	"	"		
		5	0.25		"	"	SOFT		
	10	6	0.5		"	"	MEDIUM STIFF		
		7	0.5		"	"	"		
-10	15	8	1.0		"	"	STIFF		+ GRAY 14'-24'
		9	1.25		BROWN	"	"		
		10	1.75		"	"	"		
✓	20	11	2.25		BROWN	CLAY	STIFF		
		12	2.25		"	"	"		
	25	13	0.5		GRAY	CLAY	MEDIUM STIFF		-w/ Silty Sa LAYER 24'-27'
✓		14	1.5		"	"	STIFF		+ DARK 26'-27'
		15	1.75		GRAY	"	"		+ BROWN 28'-36'
	30	16	4.5		GRAY	CLAY	HARD		-w/ Calc 30'-32'
✓		17	4.5		"	"	"		
	35	18	4.5		"	"	"		-w/ Sa PKTS 34'-36'

DEPTH, FEET	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	BORING NO. <u>92-143</u> DATE: BEGIN <u>7-30-92</u> PAGE <u>2</u> <u>12</u>				
			JOB NO. <u>146548</u> COMPLETE <u>7-30-92</u> Thin Walled Tube				
			PROJECT <u>DISPOSAL AREA #5</u> ☒ 3" ☐ 6"				
			LOCATION <u>BROWNSVILLE SHIP CHANNEL</u>				
			ELEVATION OF HOLE _____				
			MANUFACTURER'S DESIGNATION OF DRILL RIG <u>C-1000 Marsh Buggy</u>				
			GROUNDWATER: DEPTH <u>6.00</u> ft., ELEV. _____ ft., at end of Drilling				
			WEATHER <u>PARTLY CLOUDY & VERY WINDY</u>				
			DRILLER <u>SCOTT GREGUREK</u> LOGGER <u>JOHN A. GENTRY</u>				
			COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
-35	✓ 19	4.5+	GRAY	CLAY	HARD		+ BROWN - w/ silt pkts 34' - 40'
	20	4.5+	"	"	"		
-40	21	4.5+	GRAY	CLAY	HARD		
	22	4.5+	GRAY	CLAY	HARD		- w/ silt pkts 44' - 47'
-45	23	3.5	GRAY	CLAY	VERY STIFF		+ GRAY 46' - 48'
	24	4.5+	BROWN	"	HARD		
	25	4.5+	"	"	"		
-50	26	4.5+	"	"	"		
	27	4.5+	BROWN	CLAY	HARD		
-55	28	4.5+	BROWN	CLAY	HARD		- w/ silt layer & silt pkts below 56'
	29	4.5+	BROWN	CLAY	HARD		
	30	4.5+	BROWN	CLAY	HARD		
-60							
-65							
-70							

El. -46

Project : Disposal area site adjacent to the Brownsville Ship channel for the
Brazos Island Harbor project near Brownsville, Texas
Contract No. DACW64-92-D-0001 Delivery order No. 0025

SUMMARY OF LABORATORY TEST RESULTS

Boring No. 92-143

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	M c (%)	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	0.00		Brown,Clay,Very Soft,w/sand seams	CH	26.9										0.08	
2	2-4	0.50		Brown,Clay,Medium stiff,w/ferrous stains&mica	CH	38.5										0.25	
3	4-6	0.25		Olive gray,Clay,Soft	CH	51.0	69.8	105.4	63	26	100.0	100.0	100.0	100.0	99.8	0.18	0.41
4	6-8	0.00		Gray,Clay,Very soft	CH	61.8										0.06	
5	8-10	0.00		Olive gray,Clay,Very soft	CH	47.3	73.2	107.8	57	24	100.0	100.0	100.0	99.9	99.7	0.09	0.17
6	10-12	0.00		Gray,Clay,Very soft	CH	57.3										0.05	
7	12 - 14	0.25		Gray,Clay,Soft	CH	42.0	77.7	110.4	70	25	100.0	100.0	100.0	100.0	99.8	0.16	0.35
8	14 - 16	1.25		Brown&gray,Clay,Stiff,w/ferrous stains	CH	31.7											
9	16 - 18	0.75		Brown&gray,Clay,Medium stiff	CH	34.8	87.0	117.3	76	28	100.0	100.0	99.9	99.5	99.4	0.30	0.69
10	18 - 20	2.00		Brown&gray,Clay,Very stiff	CH	35.6											
11	20 - 22	2.25		Brown,Clay,Very stiff	CH												
12	22 - 24	2.50		Yellowish gray&brown,Clay,Very stiff,w/mica	CH	34.7	86.4	116.4	64	25	100.0	100.0	99.8	99.3	99.3		2.01
13	24 - 26			Gray,Sand,Loose,Silty	S M	23.6											
14	26 - 28	1.50		Gray,Clay,Stiff	CH												
15	28 - 30	3.25		Olive gray,Clay,Very stiff,Sandy,w/calcareous nodules&ferrous nodules	CL	19.4											
16	30 - 32	3.75		Olive gray,Clay,Very stiff,Sandy,w/calcareous nodules&ferrous nodules	CL	16.3											
17	32 - 34	4.5+		Gray,Clay,Hard	CH												

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content
q u : Unconfined Compressive Strength, W O H : Weight of hammer, W O P : Weight of pipe

Geotest Engineering, Inc.

Project : Disposal area site adjacent to the Brownsville Ship channel for the
Brazos Island Harbor project near Brownsville, Texas
Contract No. DACW64-92-D-0001 Delivery order No. 0025

SUMMARY OF LABORATORY TEST RESULTS

Boring No. 92-143

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	M c (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	LL (%)	P L (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
18	34 - 36	3.75		Brown&gray,Clay,Very stiff,w/calcareous nodules &vertical sand seams	CH	17.9	112.4	132.5	57	24	100.0	99.4	98.3	94.3	91.0		1.70
19	36 - 38	4.5+		Gray,Clay,Hard	CH												
20	38 - 40	4.5+		Olive gray,Clay,Hard,Sandy,w/calcareous nodules &sand seams	CL	20.7											
21	40 - 42	4.5+		Brown&gray,Clay,Hard,w/calcareous nodules and mica,slickensided	CH	21.0											
22	42 - 44	4.5+		Gray,Clay,Hard	CH												
23	44 - 46	3.00		Yellowish brown,Clay,Very stiff,Silty	CL	21.4											
24	46 - 48	4.00		Yellowish brown,Clay,Very stiff,Silty	CL	21.2											
25	48 - 50	4.5+		Brown,Clay,Hard	CH												
26	50 - 52	4.5+		Brown&gray,Clay,Hard,w/calcareous nodules	CH	23.2											
27	52 - 54	4.00		Yellowish brown,Clay,Very stiff,w/mica	CH	23.1	103.4	127.3	71	26	100.0	100.0	99.5	99.4	98.9		3.71
28	54 - 56	4.5+		Brown&gray,Clay,Hard,w/mica	CH	20.1											
29	56 - 58	4.5+		Yellowish brown,Clay,Hard,Silty,w/calcareous nodules	CL	21.9											
30	58 - 60	4.5+		Yellowish brown,Clay,Hard,Silty,w/calcareous nodules	CL	20.8											

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classification, M c : Moisture Content
q u : Unconfined Compressive Strength, W O H : Weight of hammer, W O P : Weight of pipe

Geotest Engineering, Inc.

TABLE 1

RESULTS OF TESTS OF DISTURBED AND UNDISTURBED SOIL SAMPLES

NOTE: * ALL SOIL SAMPLES THAT DO NOT HAVE COMPLETE LABORATORY TEST DATA

WERE VISUALLY CLASSIFIED ONLY.

SWDED-GL REPORT NO. 15653 BRAZOS ISLAND-HOUSTON-GALVESTON NAVIGATION STUDY PROJECT

BORING NO.	SWD NO.	FLD NO.	DEPTH, FT	GR	SA	FI	LL	PL	PI	LS	WC, %	PCF	MAJOR TESTS	DESCRIPTION OF MATERIAL
92 141	92/3575	ST-12	22.0 - 24.0	0	66	34	27	14	13		17.1	112	DIRECT SHEAR	SC - CLAYEY SAND, GRAYISH BROWN, MOIST, CALCAREOUS NODULES, IRON OXIDE STAINS, VERY STIFF, PENE = 2.75-3.5, SAND POCKETS THROUGHOUT.
92 141	92/3576	ST-15	28.0 - 30.0	0	32	68	28	12	16		16.2	114	DIRECT SHEAR	CL - SANDY LEAN CLAY, GRAYISH BROWN, MOIST, WHITE CHALK LIKE MATERIAL, IRON OXIDE STAINS, SAND POCKETS THROUGHOUT, HARD, PENE > 4.0.
92 141	92/3577	ST-17	32.0 - 34.0	0	10	90	46	18	28		17.1	113	DIRECT SHEAR	CL - LEAN CLAY, BROWN WITH LIGHT GRAY, MOIST, CALCAREOUS WITH WHITE CHALK LIKE MATERIAL, IRON OXIDE STAINS, FEW SAND POCKETS, HARD, PENE > 4.0.
92 141	92/3578	ST-20	38.0 - 40.0	0	18	82	45	19	26		20.8	107	DIRECT SHEAR	CL - LEAN CLAY WITH SAND, OLIVE, MOIST, CALCAREOUS, IRON OXIDE STAINS, SAND POCKETS AND SEAMS THROUGHOUT, WHITE CHALK LIKE MATERIAL, VERY STIFF TO HARD, PENE = 3.5- > 4.5.
92 141	92/3579	ST-23	44.0 - 46.0	0	1	99	38	16	22		21.9	104	DIRECT SHEAR	CL - LEAN CLAY, BROWN WITH LIGHT GRAY, MOIST, CALCAREOUS, SAND POCKETS THROUGHOUT, VERY STIFF TO HARD, PENE = 2.0-4.5, SOME GYPSUM.
92 143	92/3580	ST-11	20.0 - 22.0	0	1	99	71	24	47		33.1	90	DIRECT SHEAR	CH - FAT CLAY, GRAY WITH BROWN, MOIST, CALCAREOUS, SAND POCKETS, WHITE CHALK LIKE STRINGERS THROUGHOUT, VERY STIFF, PENE = 2.25-3.0.
92 143	92/3581	ST-14	26.0 - 28.0	0	52	48	34	17	17		23.9	103	DIRECT SHEAR	SC - CLAYEY SAND, GRAY, MOIST, CALCAREOUS, IRON OXIDE STAINS, SAND POCKETS THROUGHOUT, MEDIUM TO STIFF, PENE = 0.5-1.25.
92 143	92/3582	ST-17	32.0 - 34.0	0	34	66	38	15	23		16.0	114	DIRECT	CL - SANDY LEAN CLAY, GRAY WITH DARK GRAY, MOIST, CALCAREOUS WITH

TABLE 1

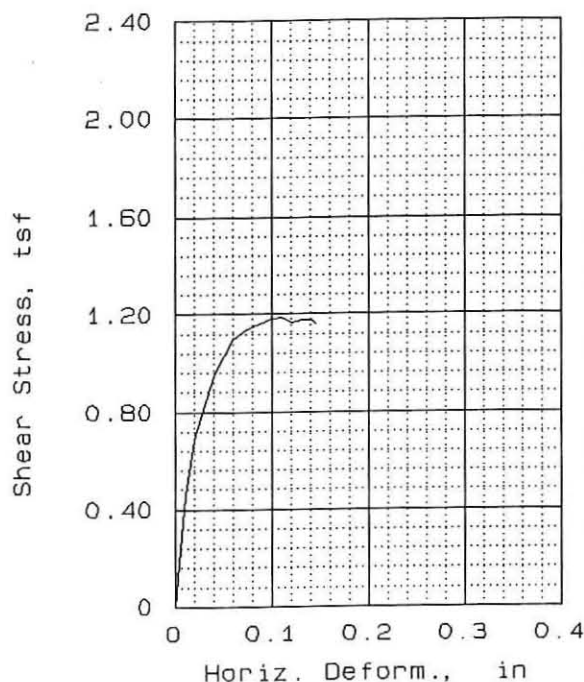
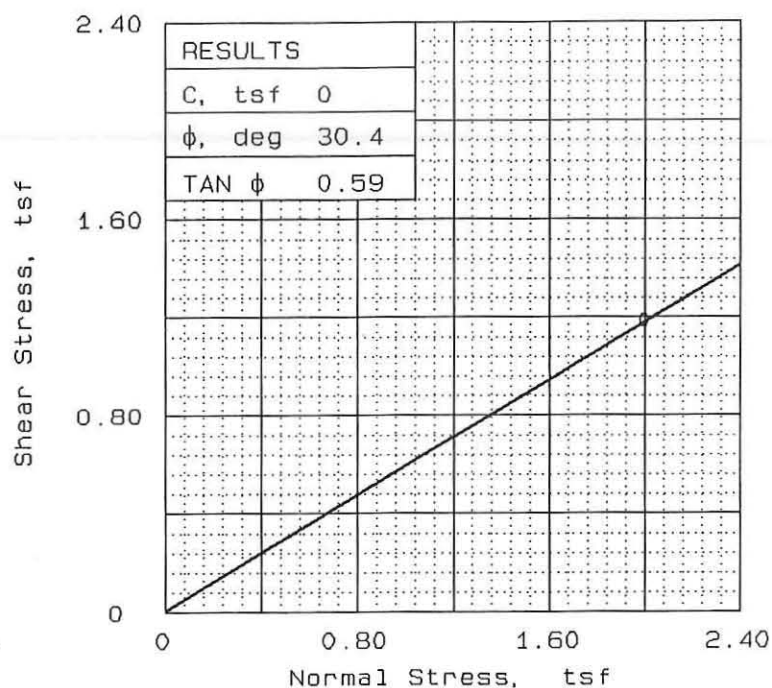
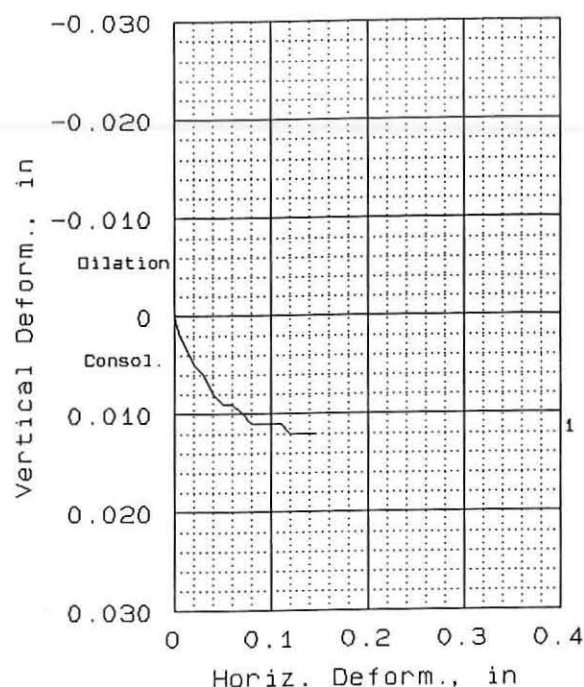
RESULTS OF TESTS OF DISTURBED AND UNDISTURBED SOIL SAMPLES

NOTE: * ALL SOIL SAMPLES THAT DO NOT HAVE COMPLETE LABORATORY TEST DATA

WERE VISUALLY CLASSIFIED ONLY.

SWDED-GL REPORT NO. 15653 BRAZOS ISLAND-HOUSTON-GALVESTON NAVIGATION STUDY PROJECT

BORING NO.	SWD NO.	FLD NO.	DEPTH, FT	GR	SA	FI	LL	PL	PI	LS	WC, %	PCF	MAJOR TESTS	DESCRIPTION OF MATERIAL
													SHEAR	WHITE CHALK LIKE MATERIAL, IRON OXIDE STAINS, SAND POCKETS THROUGHOUT, STIFF TO HARD, PENE = 1.5-4.5.
92	143	92/3583	ST-19	36.0 - 38.0	0	39	61	33	15	18	19.8	108	DIRECT SHEAR	CL - SANDY LEAN CLAY, LIGHT GRAYISH BROWN WITH BROWN,MOIST,CALCAREOUS WITH CALCAREOUS NODULES, WHITE CHALK LIKE MATERIAL, IRON OXIDE STAINS, SAND POCKETS AND SEAMS THROUGHOUT, VERY STIFF TO HARD, PENE = VERY STIFF TO HARD, PENE = 3.0-4.5.
92	143	92/3584	ST-22	42.0 - 44.0	0	1	99	47	18	29	23.5	109	DIRECT SHEAR	CL - LEAN CLAY, LIGHT GRAY WITH BROWN, MOIST, CALCAREOUS, FEW SAND POCKETS, IRON OXIDE STAINS, WHITE CHALK LIKE MATERIAL, HARD, PENE > 4.0, SHALY.
92	143	92/3585	ST-25	48.0 - 50.0	0	4	96	58	19	39	19.9	108	DIRECT SHEAR	CH - FAT CLAY, BROWN WITH LIGHT GRAY, MOIST, CALCAREOUS WITH CALCAREOUS NODULES, FEW SAND POCKETS, VERTICAL FRACTURES IN TOP 0.3', GYPSUM, IRON OXIDE STAINS, HARD, PENE > 4.0.
92	152	92/3586	ST-11	20.0 - 22.0	0	7	93	30	19	11	25.6	99	DIRECT SHEAR	CL - LEAN CLAY, GRAYISH BROWN, MOIST, CALCAREOUS, SAND POCKETS AND SEAMS THROUGHOUT,HORIZONTAL FRACTURES,SOFT TO STIFF, PENE = 0.25-1.75.
92	152	92/3587	ST-16	30.0 - 32.0	2	67	31	24	15	9	18.4	111	DIRECT SHEAR	SC - CLAYEY SAND, GRAYISH BROWN, MOIST, CALCAREOUS WITH CALCAREOUS NODULES, HORIZONTAL FRACTURES, STIFF, PENE = 1.5-1.75.



SAMPLE NO.		1
INITIAL	WATER CONTENT, %	24.5
	DRY DENSITY, pcf	103.6
	SATURATION, %	106.5
	VOID RATIO	0.615
	DIAMETER, in	2.50
	HEIGHT, in	1.00
AT TEST	WATER CONTENT, %	18.6
	DRY DENSITY, pcf	112.7
	SATURATION, %	103.0
	VOID RATIO	0.484
	DIAMETER, in	2.50
	HEIGHT, in	0.92
NORMAL STRESS, tsf		2.00
MAX. SHEAR, tsf		1.19
STRAIN RATE, %/min.		0.002
ULT. SHEAR, tsf		

SAMPLE DATA

SAMPLE TYPE: UNDISTURBED
DESCRIPTION: CLAYEY SAND (SC)

LL= 34 PL= 17 PI= 17.0

SPECIFIC GRAVITY= 2.68

REMARKS: SPECIFIC GRAVITY
ESTIMATED

FIG. NO.

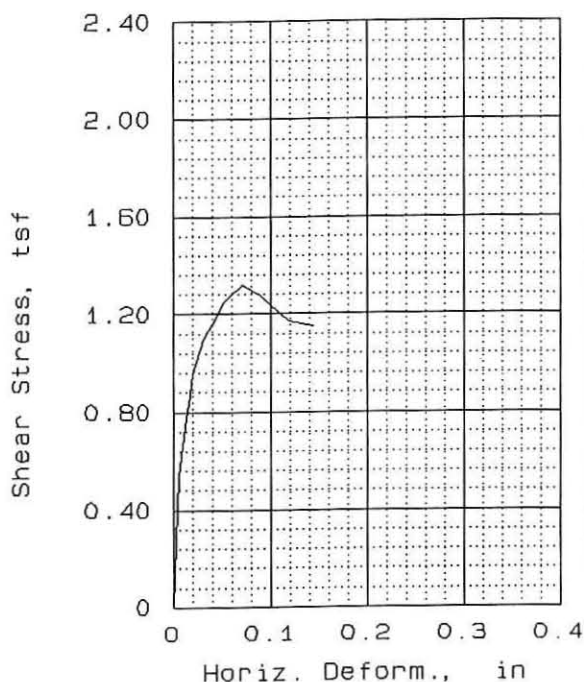
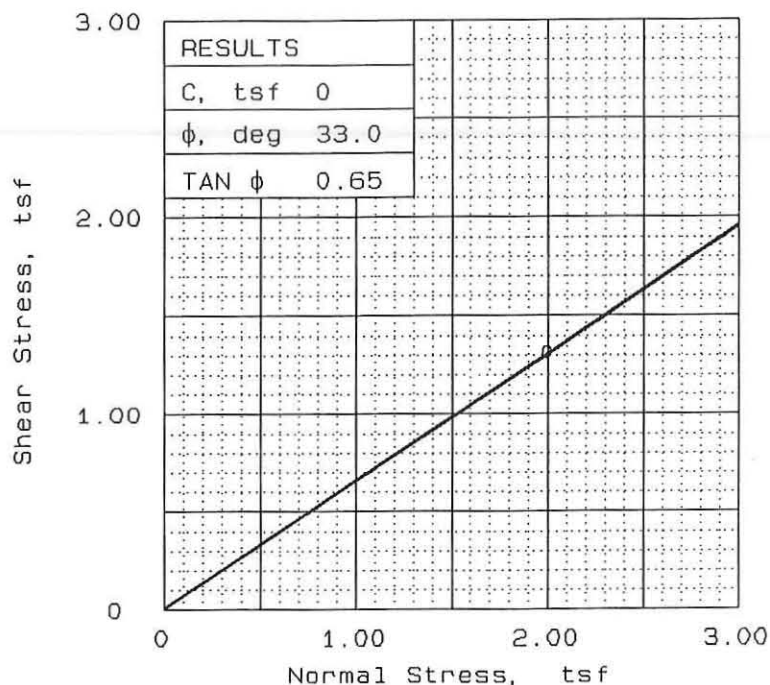
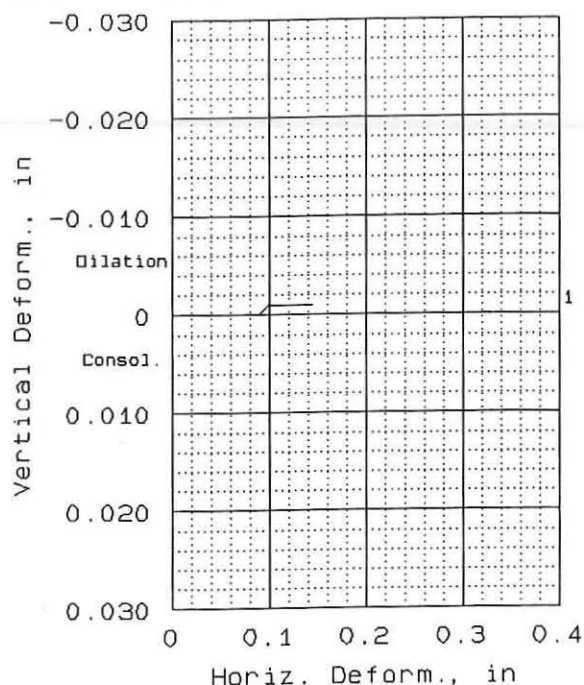
CLIENT: US ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT
PROJECT: BRAZOS ISLAND HARBOR
BROWNSVILLE, TX.

SAMPLE LOCATION: BORING: 92-143, ST-14
26.0-28.0, SWD LAB NO. 92/3581

PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN



SAMPLE NO.		1
INITIAL	WATER CONTENT, %	15.5
	DRY DENSITY, pcf	118.2
	SATURATION, %	100.1
	VOID RATIO	0.416
	DIAMETER, in	2.50
	HEIGHT, in	1.00
AT TEST	WATER CONTENT, %	15.3
	DRY DENSITY, pcf	120.6
	SATURATION, %	105.8
	VOID RATIO	0.388
	DIAMETER, in	2.50
	HEIGHT, in	0.98
NORMAL STRESS, tsf		2.00
MAX. SHEAR, tsf		1.32
STRAIN RATE, %/min.		0.002
ULT. SHEAR, tsf		

SAMPLE DATA

SAMPLE TYPE: UNDISTURBED
 DESCRIPTION: SANDY LEAN CLAY
 (CL)
 LL= 38 PL= 15 PI= 23.0
 SPECIFIC GRAVITY= 2.68
 REMARKS: SPECIFIC GRAVITY
 ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS
 GALVESTON DISTRICT
 PROJECT: BRAZOS ISLAND HARBOR
 BROWNSVILLE, TX.

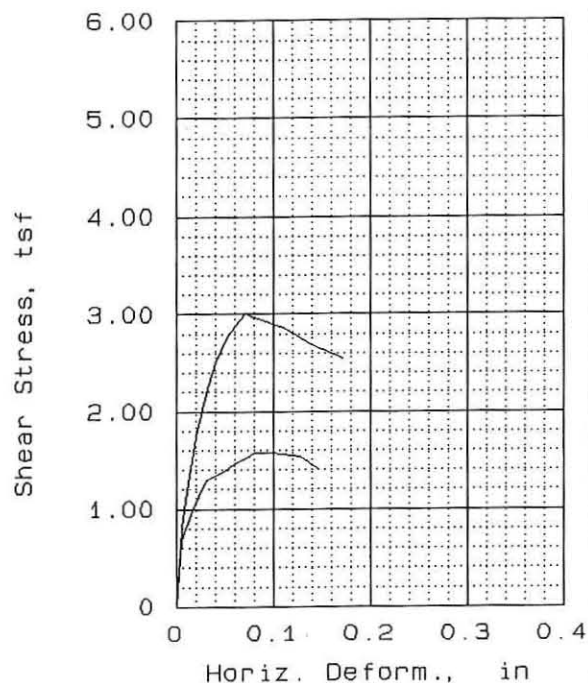
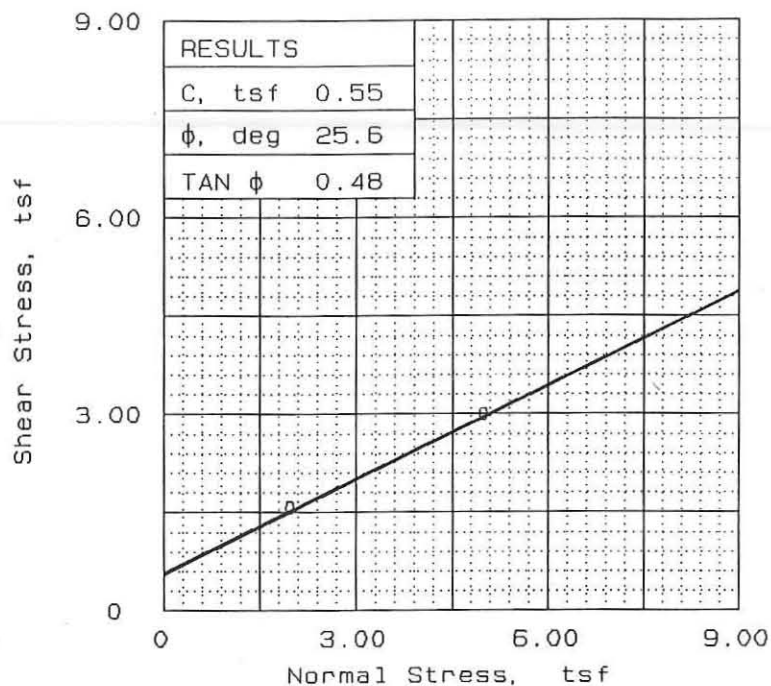
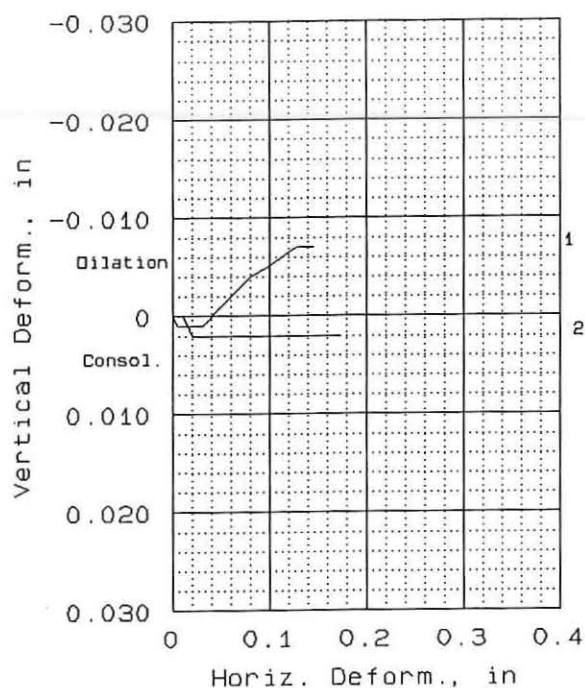
SAMPLE LOCATION: BORING: 92-143, ST-17
 32.0-34.0, SWD LAB NO. 92/3582

PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	16.4	16.2
	DRY DENSITY, pcf	114.6	113.1
	SATURATION, %	95.7	90.4
	VOID RATIO	0.460	0.479
	DIAMETER, in	2.50	2.50
	HEIGHT, in	1.00	1.00
AT TEST	WATER CONTENT, %	17.1	16.3
	DRY DENSITY, pcf	116.8	118.0
	SATURATION, %	106.1	104.1
	VOID RATIO	0.432	0.418
	DIAMETER, in	2.50	2.50
	HEIGHT, in	0.98	0.96
NORMAL STRESS, tsf		2.00	5.01
MAX. SHEAR, tsf		1.58	3.01
STRAIN RATE, %/min.		0.002	0.002
ULT. SHEAR, tsf			

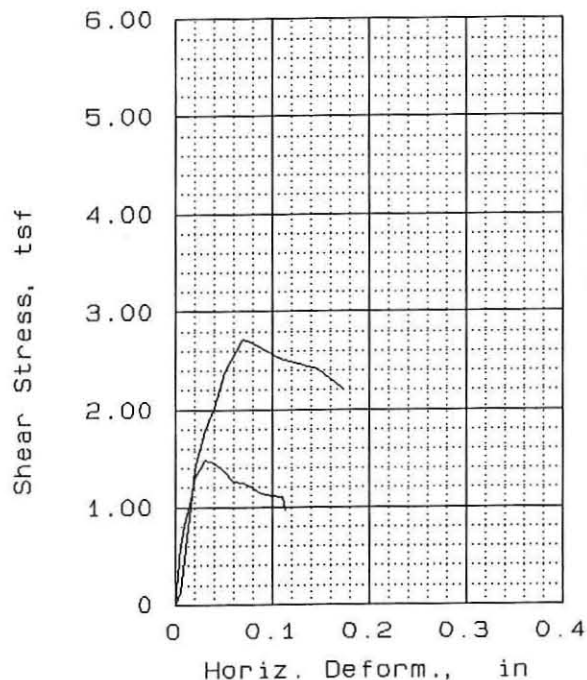
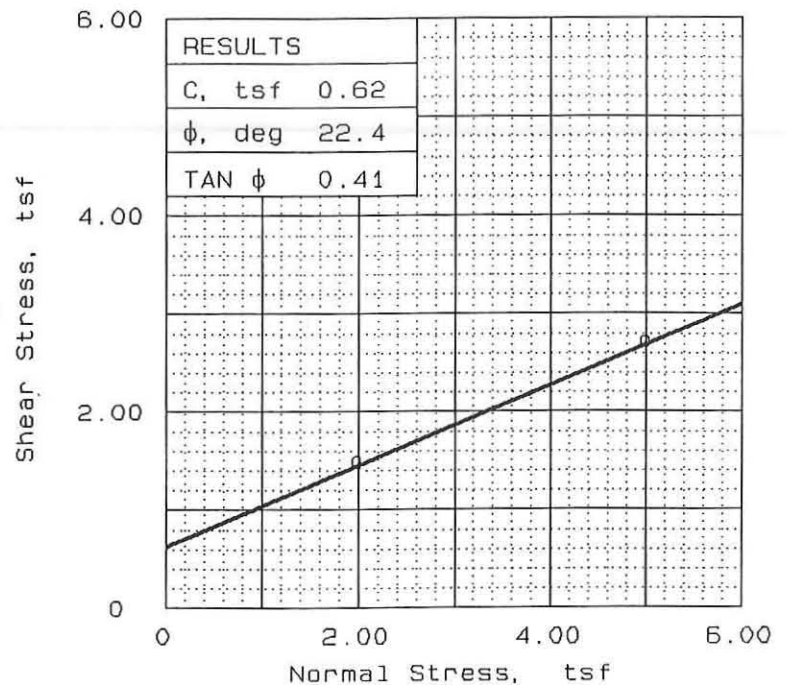
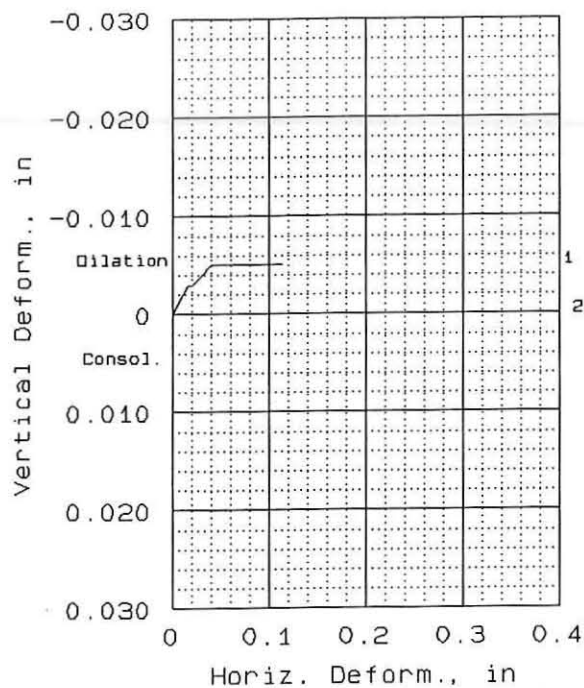
SAMPLE DATA
SAMPLE TYPE: UNDISTURBED
DESCRIPTION: SANDY LEAN CLAY (CL)
LL= 33 PL= 15 PI= 18.0
SPECIFIC GRAVITY= 2.68
REMARKS: SPECIFIC GRAVITY ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT
PROJECT: BRAZOS ISLAND HARBOR
BROWNSVILLE, TX.
SAMPLE LOCATION: BORING: 92-143, ST-19
36.0-38.0, SWD LAB NO. 92/3583
PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	17.7	17.4
	DRY DENSITY, pcf	113.4	114.4
	SATURATION, %	99.8	100.8
	VOID RATIO	0.475	0.463
	DIAMETER, in	2.50	2.50
	HEIGHT, in	1.00	1.00
AT TEST	WATER CONTENT, %	17.7	16.6
	DRY DENSITY, pcf	115.1	117.6
	SATURATION, %	105.0	105.5
	VOID RATIO	0.453	0.422
	DIAMETER, in	2.50	2.50
	HEIGHT, in	0.99	0.97
NORMAL STRESS, tsf		2.00	5.00
MAX. SHEAR, tsf		1.48	2.72
STRAIN RATE, %/min.		0.002	0.002
ULT. SHEAR, tsf			

SAMPLE DATA
 SAMPLE TYPE: UNDISTURBED
 DESCRIPTION: LEAN CLAY (CL)

LL= 47 PL= 18 PI= 29.0
 SPECIFIC GRAVITY= 2.68
 REMARKS: SPECIFIC GRAVITY
 ESTIMATED

FIG. NO.

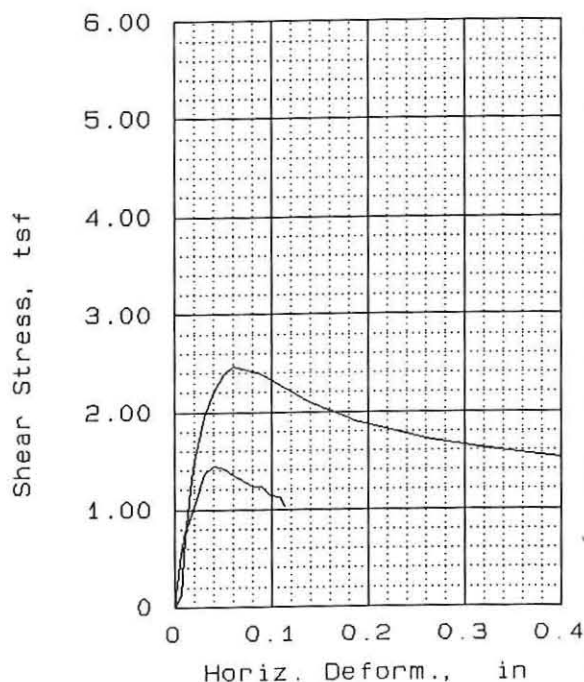
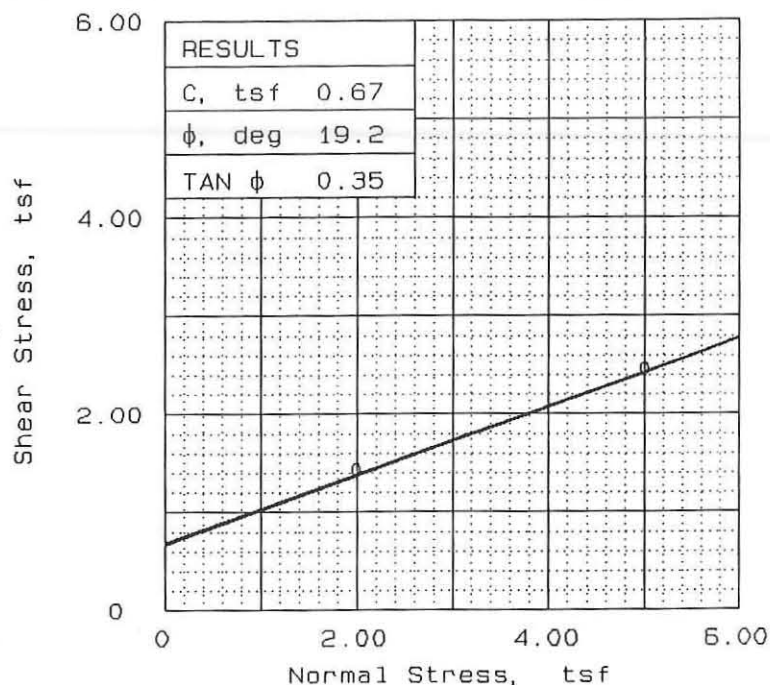
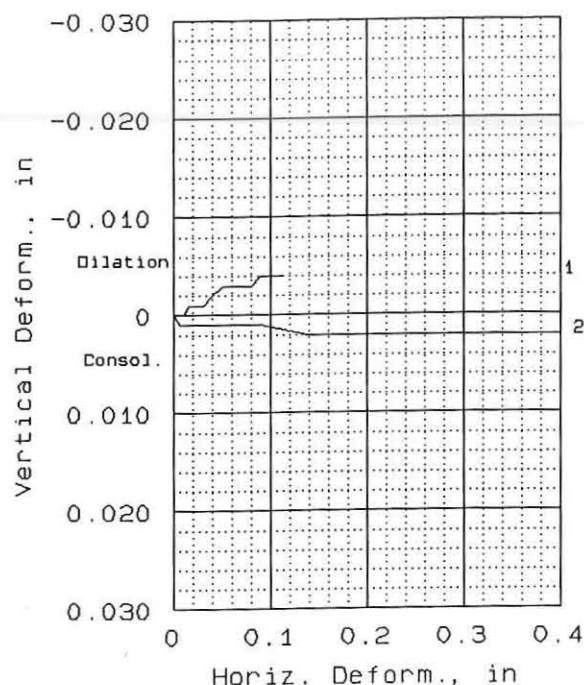
CLIENT: US ARMY CORPS OF ENGINEERS
 GALVESTON DISTRICT
 PROJECT: BRAZOS ISLAND HARBOR
 BROWNSVILLE, TX.

SAMPLE LOCATION: BORING: 92-143. ST-22
 42.0-44.0, SWD LAB NO. 92/3584

PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN



SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	20.1	22.0
	DRY DENSITY, pcf	108.9	106.1
	SATURATION, %	99.6	101.7
	VOID RATIO	0.542	0.583
	DIAMETER, in	2.50	2.50
	HEIGHT, in	1.00	1.00
AT TEST	WATER CONTENT, %	20.9	20.5
	DRY DENSITY, pcf	110.0	109.3
	SATURATION, %	106.6	103.1
	VOID RATIO	0.526	0.536
	DIAMETER, in	2.50	2.50
	HEIGHT, in	0.99	0.97
NORMAL STRESS, tsf		2.01	5.01
MAX. SHEAR, tsf		1.44	2.46
STRAIN RATE, %/min.		0.002	0.002
ULT. SHEAR, tsf			

SAMPLE DATA

SAMPLE TYPE: UNDISTURBED
DESCRIPTION: FAT CLAY (CH)

LL= 58 PL= 19 PI= 39.0

SPECIFIC GRAVITY= 2.69

REMARKS: SPECIFIC GRAVITY
ESTIMATED

FIG. NO.

CLIENT: US ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT
PROJECT: BRAZOS ISLAND HARBOR
BROWNSVILLE, TX.

SAMPLE LOCATION: BORING: 92-143, ST-25
48.0-50.0, SWD LAB NO. 92/3585

PROJ. NO.: 15653

DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN