

U.S. ARMY CORPS OF ENGINEERS

E. + 4.1 mwt

DEPTH, FEET	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	BORING NO. <u>92-141</u> DATE: BEGIN <u>8-1-92</u> PAGE <u>1 12</u> JOB NO. <u>146548</u> COMPLETE <u>8-1-92</u> Thin Walled Tube ☒ 3" ☐ 6" PROJECT <u>DISPOSAL AREA #5</u> LOCATION <u>BROWNSVILLE SHIP CHANNEL</u> ELEVATION OF HOLE _____ MANUFACTURER'S DESIGNATION OF DRILL RIG <u>C-1000 Marsh Buggy</u> GROUNDWATER: DEPTH <u>2.00</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
0	1	0.75	BROWN	CLAY	MEDIUM STIFF		
0.0	2	0	GRAY	"	VERY SOFT		
5	3	0.5	GRAY	"	MEDIUM STIFF	+ GRAY 6'-18'	
	4	1.0	BROWN	"	STIFF		
	5	1.25	"	"	"		
-10	6	0.5	"	"	MEDIUM STIFF	- w/ SILT LAYER 11'-12'	
	7	3.0	"	"	VERY STIFF		
-15	8	3.5	"	"	"		
	9	2.5	"	"	"		
-20	10	3.75	LIGHT GRAY	CLAY	VERY STIFF	+ LIGHT BROWN 18'-20'	
	11	4.0	"	"	"	- w/ SAND PKTS 18'-22'	
✓	12	2.0	LIGHT GRAY	CLAY	VERY STIFF	+ LIGHT BROWN 22'-24'	
-25	13	3.25	"	"	"		
	14	4.25	LIGHT GRAY	CLAY	HARD	+ LIGHT BROWN 26'-30'	
✓	15	4.5+	"	"	"		
-30	16	4.5	"	"	"	+ BROWN 30'-36'	
	17	4.5	"	"	"		
✓	18	4.5	"	"	"		

DEPTH, FEET	SAMPLE NO.	SAMPLE NO.	PEN./TORVANE	SPT.-BLOW COUNT	BORING NO. <u>92-141</u> DATE: BEGIN <u>8-1-92</u> PAGE <u>2 12</u>				
					JOB NO. <u>146548</u> COMPLETE <u>8-1-92</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>2.00</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
35	19	4.5			BROWN	CLAY	HARD		✓ LIGHT GRAY 36-40 w/ Calc Nod 36-38
38	20	4.5			"	"	"		
40	21	4.5			"	"	"		
42	22	4.5			"	"	"		
44	23	4.5			"	"	"		
46	24	4.5			BROWN	CLAY	HARD	SILTY	46 - 48 1/2
48	25	4.5			BROWN	CLAY	HARD		
50	26	4.5			"	"	"		-w/ SILT PKTS. 50'-54'
52	27	4.5			"	"	"		
54	28	2.75			BROWN	CLAY	VERY STIFF	SILTY	✓ GRAY Below 54'
56	29	2.25			"	"	"	"	
58	30	2.25			"	"	"	"	
60									
62									
64									
66									
68									
70									

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. 92-141

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		
1	0-2	0.50		Gray,Clay,Medium stiff	CH	33.8	86.0	115.1								0.25	0.54
2	2-4	0.50		Gray,Clay,Medium stiff	CH	34.7	84.7	114.1	54	21	100.0	100.0	99.9	97.4	94.2	0.25	0.51
3	4-6	0.75		Gray,Clay,Medium stiff	CH	35.8										0.30	
4	6-8	1.25		Brown,Clay,Stiff,Sandy,w/ferrous noduels	CL	25.3											
5	8-10	1.25		Dark brown,Clay,Stiff,Sandy,w/ferrous stains	CL	26.3	96.9	122.4	41	18	100.0	100.0	99.3	96.9	81.1	0.50	0.99
6	10 - 12	1.00		Brown&yellowish brown,Clay,Stiff,w/ferrous nodules	CH	29.9											
7	12-14	2.25		Brown,Clay,Very stiff,w/ferrous nodules&mica	CH	35.2											
8	14-16	3.75		Brown,Clay,Very stiff,w/ferrous nodules&blocky structure	CH	26.4	99.8	126.1	57	23	100.0	99.9	99.7	99.3	98.4		2.01
9	16-18	1.50		Brown,Clay,Stiff,w/ferrous nodules	CH	35.2											
10	18-20	1.50		Yellowish gray&gray,Clay,Stiff,Sandy,w/sand seams&mica	CL	20.6	106.7	128.7	37	17	100.0	99.2	99.0	78.9	75.7		1.03
11	20-22	3.00		Yellowish gray&gray,Clay,Very stiff,Sandy,w/ferrous nodules	CL	18.1											
12	22-24	2.00		Light gray,Clay,Very stiff,Sandy	CL												
13	24-26	1.75		Gray,Clay,Stiff,Sandy	CL	16.0	114.9	133.3	33	16	100.0	99.9	99.9	84.7	72.8		1.39
14	26-28	4.5+		Olive gray,Clay,Hard,Sandy,w/mica	CL	16.0											
15	28-30	4.5+		Light gray,Clay,Hard	CH												
16	30 - 32	3.25		Yellowish gray,Clay,Very stiff,Sandy,w/calcareous nodules	CL	18.4	112.4	133.1	45	21	100.0	99.9	99.8	97.2	89.7		2.30
17	32 - 34	4.5+		Light 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. 92-141

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	4.5+		Reddish brown,Clay,Hard,w/calcareous nodules& silt parting	CH	20.1											
19	36 - 38	4.5+		Brown,Clay,Hard,w/calcareous nodules	CH	22.3											
20	38 - 40	4.5+		Brown,Clay,Hard	CH												
21	40 - 42	4.5+		Yellowish brown,Clay,Hard,w/mica&blocky structure	CH	19.0											
22	42 - 44	4.5+		Yellowish brown,Clay,Hard,w/mica&blocky structure	CH	20.9	108.0	130.6	55	24	100.0	99.7	99.5	99.4	99.1		4.68
23	44 - 46	4.5+		Brown,Clay,Hard	CH												
24	46 - 48	4.5+		Reddish brown,Clay,Hard	CH	23.8											
25	48 - 50	4.5+		Reddish brown,Clay,Hard	CH	20.6											
26	50 - 52	4.5+		Yellowish brown,Clay,Hard,Silty	CL	21.7											
27	52 - 54	4.5+		Yellowish brown,Clay,Hard,Silty	CL	22.2											
28	54 - 56	2.00		Yellowish brown,Clay,Very stiff,Silty	CL	17.8											
29	56 - 58	1.75		Yellowish brown,Clay,Stiff,Silty	CL	18.1	110.9	131.0	33	18	100.0	100.0	100.0	99.7	99.3		1.74
30	58 - 60	1.50		Yellowish brown,Clay,Stiff,Silty	CL	20.0											

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

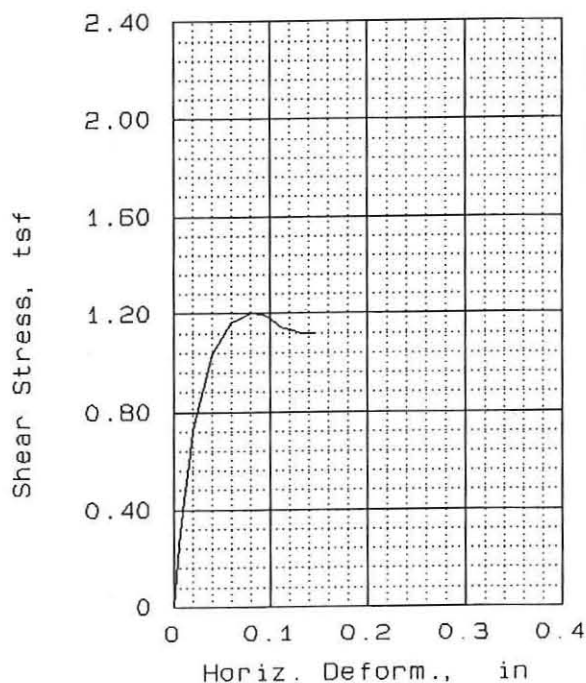
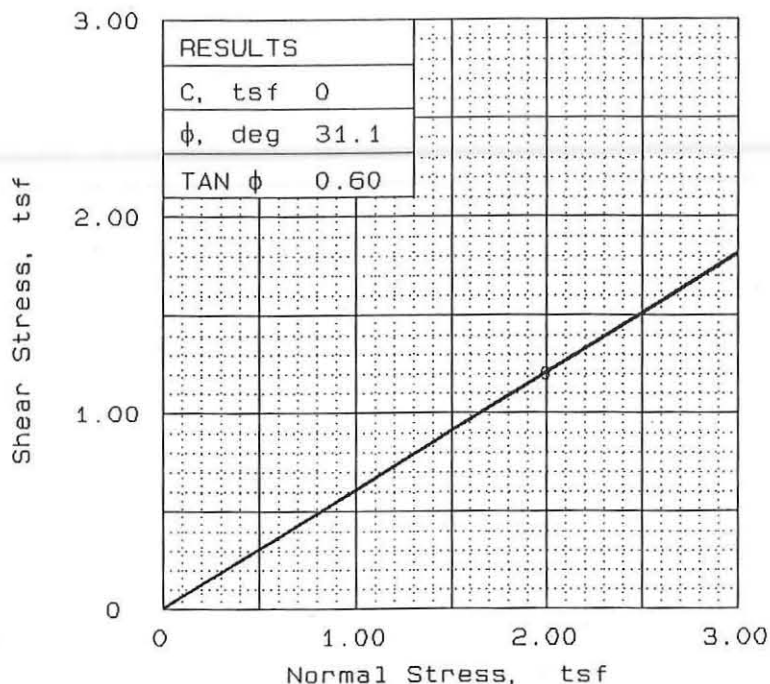
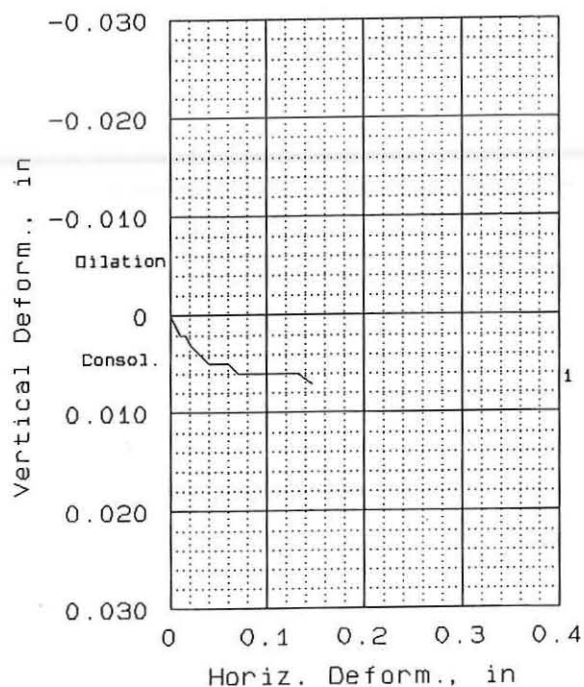
RESULTS OF TESTS OF DISTURBED AND UNDISTURBED SOIL SAMPLES

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



SAMPLE NO.		1
INITIAL	WATER CONTENT, %	17.4
	DRY DENSITY, pcf	113.4
	SATURATION, %	97.9
	VOID RATIO	0.475
	DIAMETER, in	2.50
	HEIGHT, in	1.00
AT TEST	WATER CONTENT, %	16.0
	DRY DENSITY, pcf	117.9
	SATURATION, %	102.5
	VOID RATIO	0.419
	DIAMETER, in	2.50
	HEIGHT, in	0.96
NORMAL STRESS, tsf		2.00
MAX. SHEAR, tsf		1.21
STRAIN RATE, %/min.		0.002
ULT. SHEAR, tsf		

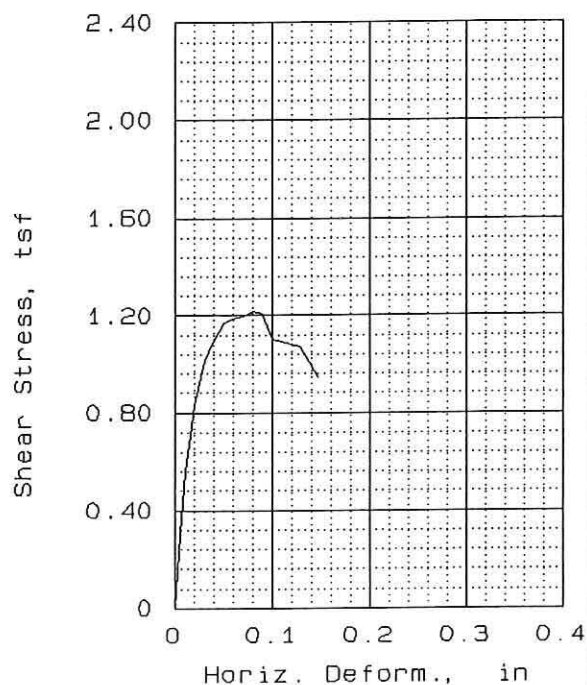
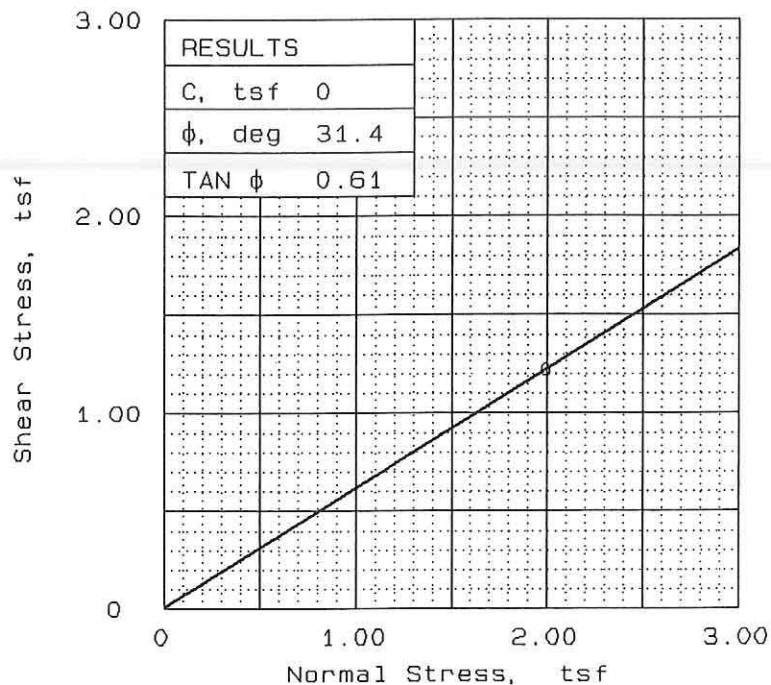
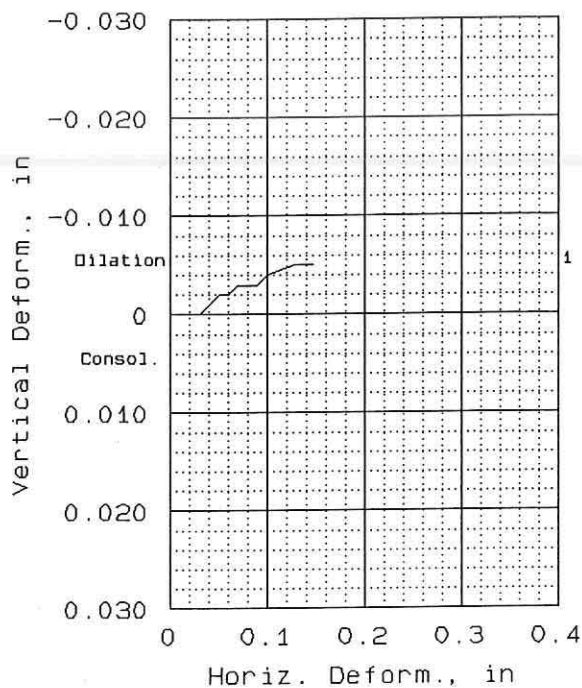
SAMPLE DATA
 SAMPLE TYPE: UNDISTURBED
 DESCRIPTION: CLAYEY SAND (SC)
 LL= 27 PL= 14 PI= 13.0
 SPECIFIC GRAVITY= 2.68
 REMARKS: SPECIFIC GRAVITY
 ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS
 GALVESTON DISTRICT
 PROJECT: BRAZOS ISLAND HARBOR
 BROWNSVILLE, TX.
 SAMPLE LOCATION: BORING: 92-141. ST-12
 22.0'-24.0', SWD LAB NO. 92/3575
 PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1
INITIAL	WATER CONTENT, %	15.1
	DRY DENSITY, pcf	116.6
	SATURATION, %	93.4
	VOID RATIO	0.435
	DIAMETER, in	2.50
	HEIGHT, in	1.00
AT TEST	WATER CONTENT, %	15.6
	DRY DENSITY, pcf	119.1
	SATURATION, %	103.2
	VOID RATIO	0.405
	DIAMETER, in	2.50
	HEIGHT, in	0.98
NORMAL STRESS, tsf		2.00
MAX. SHEAR, tsf		1.22
STRAIN RATE, %/min.		0.002
ULT. SHEAR, tsf		

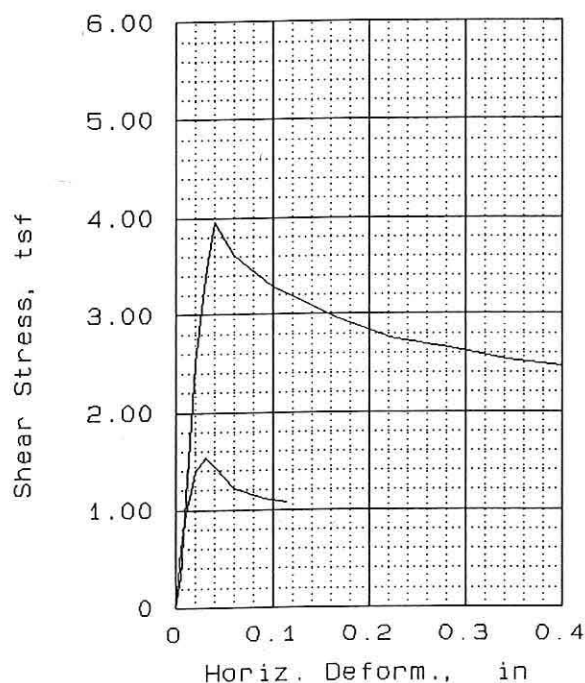
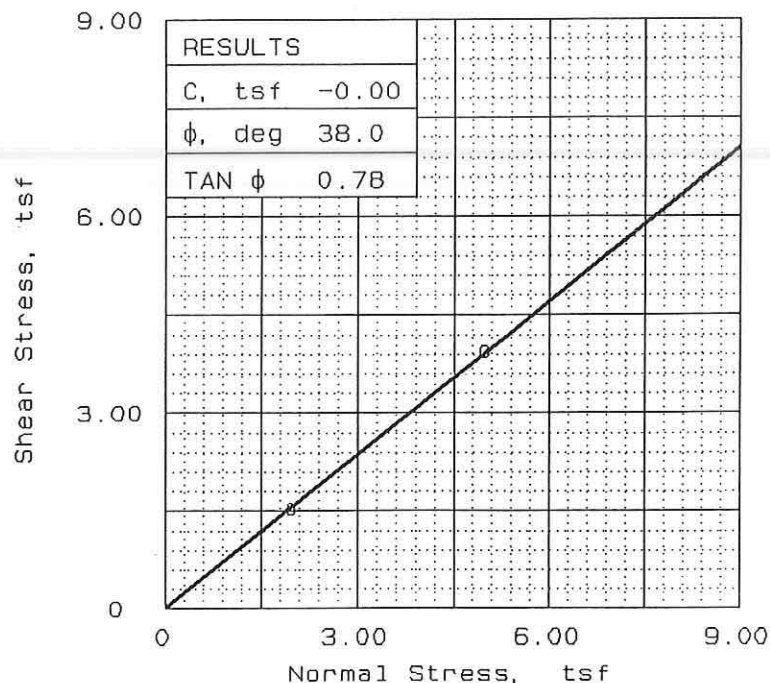
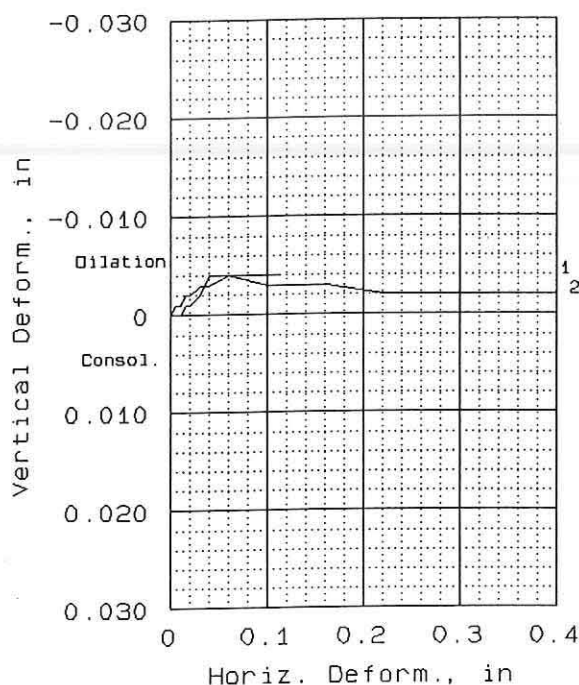
SAMPLE DATA
 SAMPLE TYPE: UNDISTURBED
 DESCRIPTION: SANDY LEAN CLAY (CL)
 LL= 28 PL= 12 PI= 16.0
 SPECIFIC GRAVITY= 2.68
 REMARKS: SPECIFIC GRAVITY ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS
 GALVESTON DISTRICT
 PROJECT: BRAZOS ISLAND HARBOR
 BROWNSVILLE, TX.
 SAMPLE LOCATION: BORING: 92-141, ST-15
 28.0'-30.0', SWD LAB NO. 92/3576
 PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	17.7	17.7
	DRY DENSITY, pcf	113.4	111.0
	SATURATION, %	99.6	93.7
	VOID RATIO	0.476	0.507
	DIAMETER, in	2.50	2.50
	HEIGHT, in	1.00	1.00
AT TEST	WATER CONTENT, %	16.7	16.5
	DRY DENSITY, pcf	115.6	113.9
	SATURATION, %	100.2	94.2
	VOID RATIO	0.448	0.469
	DIAMETER, in	2.50	2.50
	HEIGHT, in	0.98	0.98
NORMAL STRESS, tsf		2.00	5.00
MAX. SHEAR, tsf		1.53	3.95
STRAIN RATE, %/min.		0.002	0.002
ULT. SHEAR, tsf			

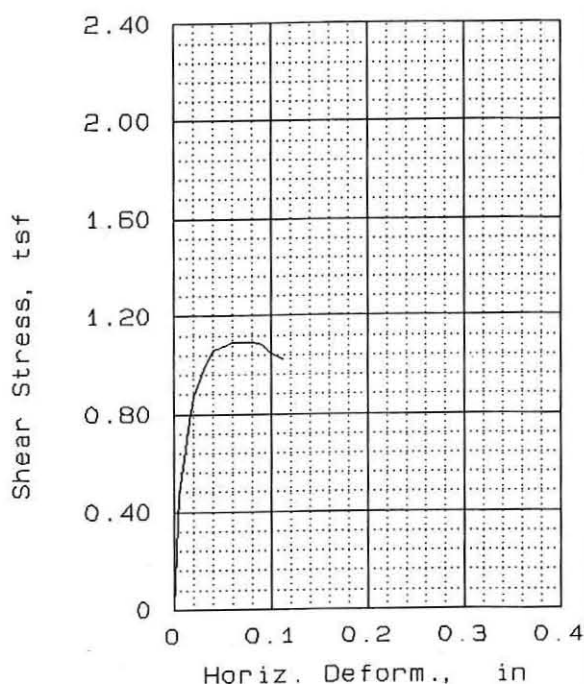
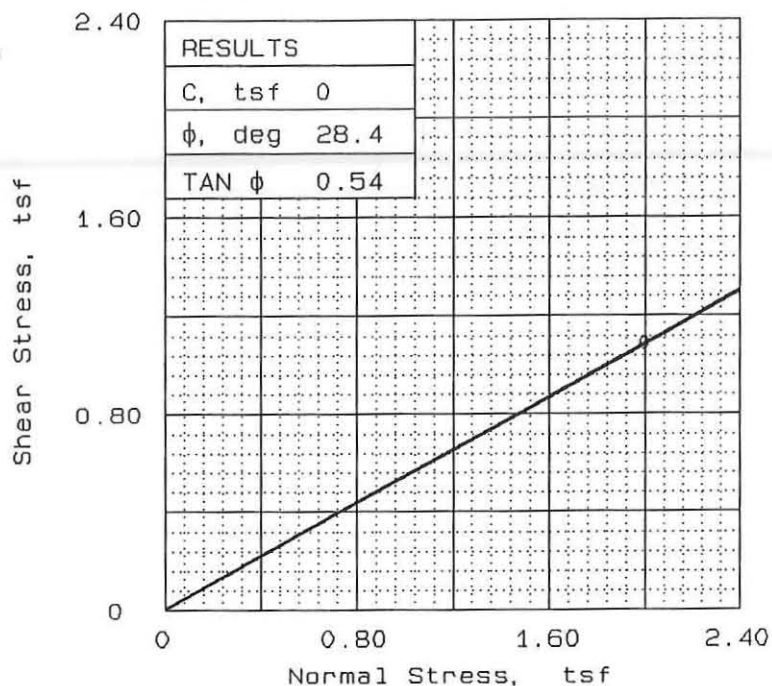
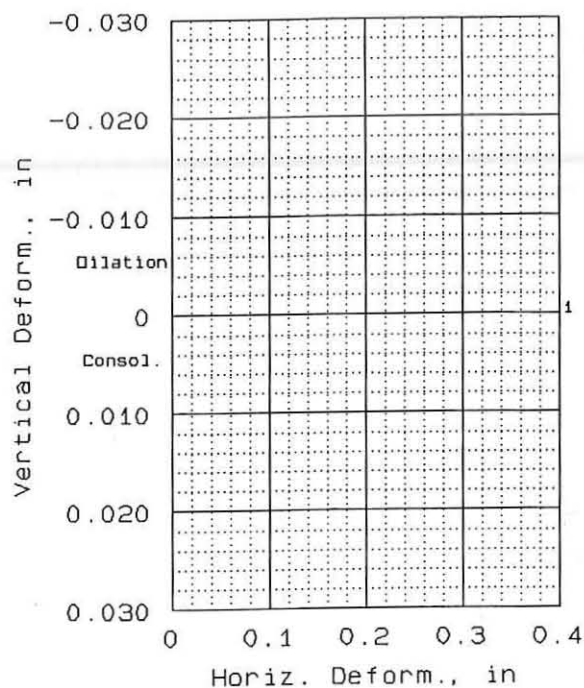
SAMPLE DATA
 SAMPLE TYPE: UNDISTURBED
 DESCRIPTION: LEAN CLAY (CL)
 LL= 46 PL= 18 PI= 28.0
 SPECIFIC GRAVITY= 2.68
 REMARKS: SPECIFIC GRAVITY
 ESTIMATED

CLIENT: US ARMY CORPS OF ENGINEERS
 GALVESTON DISTRICT
 PROJECT: BRAZOS ISLAND HARBOR
 BROWNSVILLE, TX.
 SAMPLE LOCATION: BORING: 92-141, ST-17
 32.0-34.0, SWD LAB NO. 92/3577
 PROJ. NO.: 15653 DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1
INITIAL	WATER CONTENT, %	21.5
	DRY DENSITY, pcf	105.0
	SATURATION, %	96.9
	VOID RATIO	0.594
	DIAMETER, in	2.50
	HEIGHT, in	1.00
AT TEST	WATER CONTENT, %	21.2
	DRY DENSITY, pcf	107.7
	SATURATION, %	102.6
	VOID RATIO	0.554
	DIAMETER, in	2.50
	HEIGHT, in	0.98
NORMAL STRESS, tsf		2.00
MAX. SHEAR, tsf		1.09
STRAIN RATE, %/min.		0.002
ULT. SHEAR, tsf		

SAMPLE DATA

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

LL= 45 PL= 19 PI= 26.0

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: 92-141. ST-20
38.0-40.0, SWD LAB NO. 92/3578

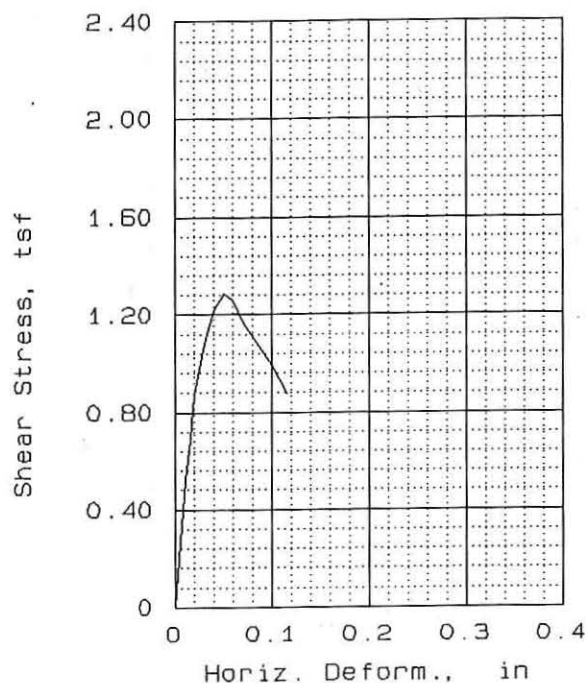
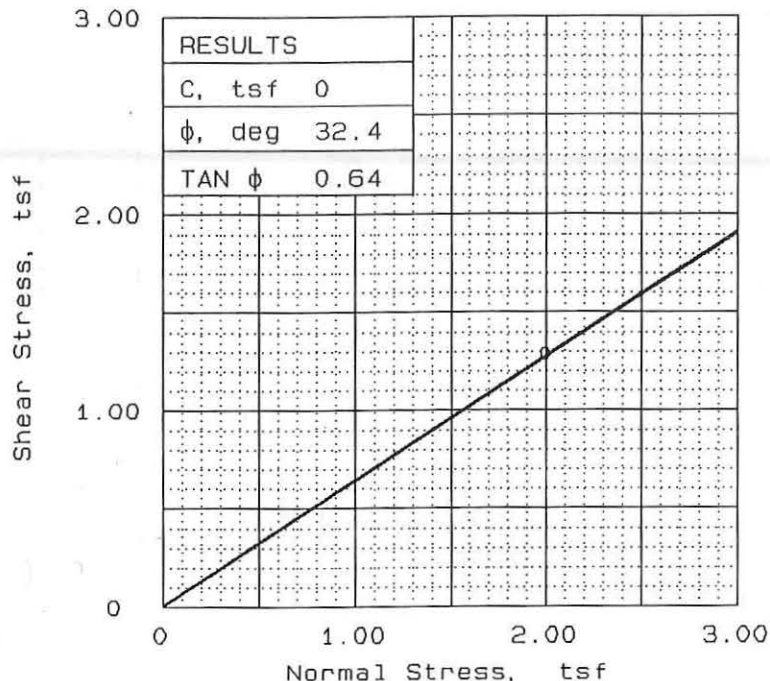
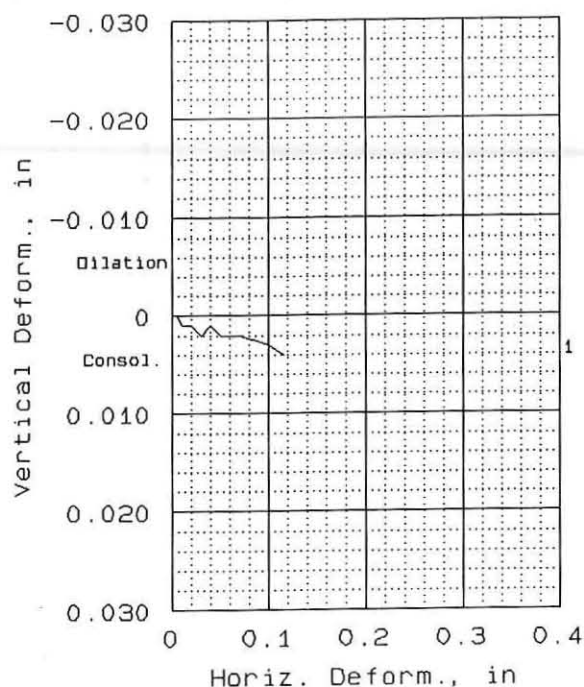
PROJ. NO.: 15653

DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN

FIG. NO.



SAMPLE NO.		1
INITIAL	WATER CONTENT, %	23.1
	DRY DENSITY, pcf	105.1
	SATURATION, %	104.3
	VOID RATIO	0.592
	DIAMETER, in	2.50
	HEIGHT, in	1.00
AT TEST	WATER CONTENT, %	22.3
	DRY DENSITY, pcf	107.4
	SATURATION, %	107.3
	VOID RATIO	0.557
	DIAMETER, in	2.50
	HEIGHT, in	0.98
NORMAL STRESS, tsf		2.00
MAX. SHEAR, tsf		1.29
STRAIN RATE, %/min.		0.002
ULT. SHEAR, tsf		

SAMPLE DATA

SAMPLE TYPE: UNDISTURBED
DESCRIPTION: LEAN CLAY (CL)

LL= 38 PL= 16 PI= 22.0

SPECIFIC GRAVITY= 2.68

REMARKS: SPECIFIC GRAVITY
ESTIMATED, FEW GYPSUM
STRINGERS IN SAMPLE

FIG. NO.

CLIENT: US ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT

PROJECT: BRAZOS ISLAND HARBOR
BROWNSVILLE, TX.

SAMPLE LOCATION: BORING: 92-141, ST-23
44.0'-46.0', SWD LAB NO. 92/3579

PROJ. NO.: 15653

DATE: AUGUST 1992

DIRECT SHEAR TEST

CORPS OF ENGINEERS - SOUTHWESTERN