WEST BANK OF THE MISSISSIPPI RIVER
IN THE VICINITY OF NEW ORLEANS, LA

EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT

DESIGN MEMORANDUM NO. 2
EAST AND WEST OF ALGIERS CANAL

IN TWO VOLUMES

VOLUME 2

DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

NEW ORLEANS, LOUISISANA

JANUARY 1999

WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS, LOUISIANA
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
DESIGN MEMORANDUM NO. 2
EAST AND WEST OF ALGIERS CANAL

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WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS, LA
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
DESIGN MEMORANDUM NO. 2
EAST AND WEST OF ALGIERS CANAL

APPENDIX F-I

GEOTECHNICAL BORING LOGS AND LABORATORY DATA

APPENDIX F-I

BORING LOGS AND LABORATORY TEST DATA

LEGEND AND NOTES FOR LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot
TV	Torvane shear strength in tons per square foot
SPT	Standard Penetration Test. Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in O.D., 1.4-in. I.D. sampler a distance of one foot into the soil, after first seating it 6 inches
SPLR	Type of Sampling: Shelby; SPT; Auger; No Sample
SYMBOL	Clay; Silt; Sand; Humus — Predominant type shown heavy; Modifying type shown light
DENSITY	Unit weight in pounds per cubic foot
USC	Unified Soil Classification

TYPE

UC	Unconfined compression shear
OB	Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
UU	Unconsolidated undrained triaxial compression shear
CU	Consolidated undrained triaxial compression shear
DS	Direct shear
CON	Consolidation
PD	Particle size distribution
k	Coefficient of permeability in centimeters per second
SP	Swelling pressure in pounds per square foot

ϕ Angle of internal friction in degrees

c Cohesion in pounds per square foot

Other laboratory test results reported on separate figure

Ground Water Measurements ▼ Initial ▽ Final

GENERAL NOTES

(1) At the time the borings were made, ground water levels were measured below existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction, immediately prior to beginning work.

(2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.69 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/15/96 **Boring:** ALGE1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff brown silty clay w/roots, shells, & organic matter	CL	1	0	30										
	1.25				Stiff gray & tan clay w/organic matter & clayey silt lenses	CH	2	1.5	44										
	1.00				w/silty sand lenses & layers		3	4	50										
	0.60				Medium dense tan & gray clayey sand	SC	4	6.5	28										
10	0.50				Soft gray clay w/sandy silt lenses & layers, organic matter, & small roots	CH	5	9	49										
	0.50				Soft gray silty clay w/roots	CL	6	11.5	36										
	0.50				w/small roots & silty sand lenses		7	14	34										
	0.50				Soft gray clay w/sandy silt lenses & few roots	CH	8	16.5	36										
20	0.50						9	19	120										
	0.60				Medium stiff gray clay w/clayey silt lenses & layers, & trace of wood	CH	10	21.5	96										
	0.50				Soft gray clay w/trace of small roots, clayey silt lenses, & few shell fragments	CH	11	24	74										
	0.50				w/shells, clayey silt lenses & layers, & organic matter		12	26.5	79										
30	0.50				w/organic matter & clayey silt pockets & lenses		13	29	57										
	0.50				w/clayey silt lenses, layers, & pockets		14	31.5	46										
					Loose gray sandy silt w/silty sand layers	ML	15	34	25										
		4	☒		Loose gray fine sand w/sandy silt & clayey silt layers	SP	16	37	27										
40					Loose gray silty sand w/few small clay lenses	SM	17	39	26										
	0.50				w/clay lenses & pockets		18	41.5	33										
					Medium dense gray silty sand w/clay layers	SM	19	44	29										
	0.50				Soft gray silty clay w/silt lenses & trace of wood	CL	20	46.5	31										
50	0.50				w/few silt lenses & wood		21	49	40										

Comments: Coordinates: North 484688.370, East 3685189.805

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.69 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/15/96 **Boring:** ALGE1 **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50	0.50				Soft gray clay w/silty sand lenses & layers	CH	22	51.5-52.5	57										
	0.50						23	54-55	44										
	0.50						24	56.5-57.5	45										
60	0.50				w/silt lenses		25	59-60	55										
	0.50						26	61.5-62.5	61										
	0.50						27	64-65	55										
	0.50						28	66.5-67.5	56										
70	0.50						29	69-70	63										
	0.50						30	71.5-72.5	57										
	0.60				Medium stiff gray clay w/clayey silt lenses	CH	31	74-75	55										
	0.50				Soft gray clay w/shell fragments, & clayey sand pockets & lenses	CH	32	76.5-77.5	37										
80	0.50						33	79-80	36										
90																			
100																			

Comments: Coordinates: North 484688.370, East 3685189.805

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -0.73 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/14/96 **Boring:** ALGE2 **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff brown & tan clay w/organic matter & roots	CH	1	0-1	31										
	1.50				Stiff gray & tan clay w/silt lenses, pockets, & organic matter	CH	2	1.5-2.5	58										
	1.00				Medium stiff gray clay w/clayey silt pockets & roots	CH	3	4-5	114										
	0.40				Soft gray clay w/clayey silt & silty sand layers	CH	4	6.5-7.5	29										
10	0.40				w/shells & alternating silty sand layers		5	9-10	38										
	0.50				w/shells		6	11.5-12.5	96										
	0.50						7	14-15	97										
	0.50						8	16.5-17.5	102										
20	0.40				w/silty sand layers & lenses		9	19-20	44										
	0.40						10	21.5-22.5	68										
	0.50				w/silty sand layers		11	24-25	63										
	0.50						12	26.5-27.5	49										
30	0.50						13	29-30	41										
	0.50						14	31.5-32.5	60										
	0.50				w/few silt lenses		15	34-35	64										
	0.50						16	36.5-37.5	65										
40	0.40				Loose gray sandy silt w/silty clay layers	ML	17	39-40	33										
	0.50				Soft gray clay	CH	18	41.5-42.5	65										
	0.50						19	44-45	61										
	0.50						20	46.5-47.5	60										
50	0.50				w/clayey silt lenses		21	49-50	57										

Comments: Coordinates: North 488130.438, East 3689961.091

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -0.73 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/14/96 **Boring:** ALGE2 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray clay	CH													
	0.50						22	51.5-52.5	53										
	0.50						23	54-55	56										
	0.50						24	56.5-57.5	63										
60	0.50				w/few silt lenses		25	59-60	58										
	0.50						26	61.5-62.5	59										
	0.50						27	64-65	58										
	0.50						28	66.5-67.5	54										
70	0.50				w/sandy clay layers, sand pockets, & shell fragments		29	69-70	33										
	0.60				Medium stiff gray clay w/sandy clay pockets & layers, shell fragments, & sand layers & pockets	CH	30	71.5-72.5	49										
	2.00				Very stiff greenish-gray & gray sandy clay w/clayey sand lenses & pockets	CH	31	74-75	20										
	2.25				Very stiff greenish-gray & tan clay w/clayey sand lenses & layers	CH	32	76.5-77.5	20										
80					Dense greenish-gray & tan silty sand w/clay pockets	SM	33	79-80	27										
90																			
100																			

Comments: Coordinates: North 488130.438, East 3689961.091

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.07 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/08/96 **Boring:** ALGE3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Stiff gray & tan silty clay w/roots & sand pockets	CL	1	0	24										
	1.25				Loose gray silty sand w/clay layers	SM	2	1.5	25										
	1.00				w/clay layers & lenses		3	4	26										
	1.00						4	6.5	26										
	0.75				Medium stiff gray clay w/sandy silt lenses & layers, & organic matter	CH	5	9	66										
10	0.50				Loose gray silty sand w/clay layers & pockets, & few roots	SM	6	11.5	27										
	0.50				Soft gray & tan clay w/clayey silt pockets, organic matter, & much wood	CH	7	14	48										
	0.50				w/wood		8	16.5	41										
	0.50				Loose brown & black humus w/clay layers & much wood	PT	9	19	245										
20	0.50				Loose gray silty sand w/clay lenses & pockets, & roots	SM	10	21.5	33										
					Loose gray silty sand w/wood, sandy silt layers, clay pockets, & roots	SM	11	24	28										
	0.50				Medium stiff gray clay w/many shell fragments, organic matter, & small silty clay layers	CH	12	26.5	69										
30	0.50						13	29	98										
	0.50				w/shells, clayey silt lenses, & silty sand pockets		14	31.5	54										
	0.50				w/clayey silt lenses, few silty sand lenses, & pockets		15	34	56										
	0.50				w/clayey silt lenses & silt lenses		16	36.5	54										
40	0.50				w/many sandy silt lenses		17	39	50										
	0.50				Soft gray clay w/silt lenses	CH	18	41.5	67										
	0.50						19	44	61										
	0.50						20	46.5	67										
50	0.50						21	49	60										

Comments: Coordinates: North 491737.652, East 3694801.079

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.07 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/08/96 **Boring:** ALGE3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50	0.50				Soft gray clay w/clayey silt lenses & silt lenses	CH	22	51.5	65										
	0.50						23	54	61										
	0.50						24	56.5	54										
60	0.50						25	59	56										
	0.50						26	61.5	58										
	0.50						27	64	63										
	0.50						28	66.5	59										
70	0.50						29	69	58										
	0.50						30	71.5	58										
	0.50						31	74	58										
	0.50						32	76.5	56										
80	0.50				Soft gray sandy clay w/clay layers & shells	CL	33	79	24										
90																			
100																			

Comments: Coordinates: North 491737.652, East 3694801.079

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 0.17 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/12/96 **Boring:** ALGE4 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Very stiff tan & gray silty clay w/roots	CL	1	0-1	45										
	2.25				w/roots & sand pockets		2	1.5-2.5	25										
	0.50				Soft to medium stiff black & gray organic clay w/organic matter & wood	OH	3	4-5	57										
	0.05				Very soft gray silty clay w/silt lenses & roots	CL	4	6.5-7.5	37										
10	0.05				Loose gray clayey silt w/sandy silt layers	ML	5	9-10	32										
	0.05				Loose gray sandy silt w/small clay lenses & silty clay layers	ML	6	11.5-12.5	32										
	0.05				Very soft gray clay w/silt lenses, organic matter & few roots	CH	7	14-15	85										
	0.05				w/few sand pockets, organic matter & shell fragments		8	16.5-17.5	93										
20	0.05				w/shells & organic matter		9	19-20	58										
	0.05				w/organic matter		10	21.5-22.5	73										
	0.05				w/organic matter & few shell fragments		11	24-25	62										
	0.05				w/silty sand lenses & layers		12	26.5-27.5	40										
30	0.05						13	29-30	61										
	0.05				w/silty sand lenses		14	31.5-32.5	76										
	0.05				w/few silty sand lenses		15	34-35	67										
	0.05						16	36.5-37.5	72										
40	0.05						17	39-40	64										
	0.05						18	41.5-42.5	69										
	0.05						19	44-45	69										
	0.05				Soft gray clay	CH	20	46.5-47.5	58										
50	0.05						21	49-50	58										

Comments: Coordinates: North 493957.230, East 3697224.019

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 0.17 Datum: NGVD Gr. Water Depth: See Text Job No.: 14638 Date Drilled: 3/12/96 Boring: ALGE4 Refer to "Legends & Notes"

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay	CH													
	0.10						22	51.5-52.5	55										
	0.10						23	54-55	58										
	0.10						24	56.5-57.5	62										
60	0.10						25	59-60	63										
	0.20						26	61.5-62.5	60										
	0.20						27	64-65	70										
	0.20				w/sand layers & lenses		28	66.5-67.5	64										
70	0.10				Loose gray clayey sand w/shell fragments	SC	29	69-70	29										
	0.10						30	71.5-72.5	30										
	0.30				Medium stiff gray clay w/sand lenses	CH	31	74-75	41										
	1.25				Stiff greenish-gray & light gray sandy clay w/clayey sand layers	CL	32	76.5-77.5	24										
80	1.75						33	79-80	22										
90																			
100																			

Comments: Coordinates: North 493957.230, East 3697224.019

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 8.71 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/07/96 **Boring:** ALGE5 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff gray & tan silty clay w/roots & organic matter	CL	1	0-1	33										
	1.25				Stiff gray clay w/clayey silt lenses, organic matter, & roots	CH	2	1.5-2.5	54										
	1.50						3	4-5	31										
	0.60				Medium stiff dark gray clay w/organic matter & clayey silt layers	CH	4	6.5-7.5	76										
	0.50				Soft dark gray clay w/organic matter & small roots	CH	5	9-10	97										
10	0.50				Soft gray clay w/organic matter & wood	CH	6	11.5-12.5	67										
	0.60				Medium stiff gray clay w/wood, organic matter, & clayey silt lenses	CH	7	14-15	50										
	0.60				w/clayey silt lenses & sandy silt lenses		8	16.5-17.5	64										
	0.50				Soft brown humus w/wood & organic clay layers	PT	9	19-20	224										
20	0.50				Soft gray clay w/wood & organic matter	CH	10	21.5-22.5	142										
	0.40						11	24-25	66										
	0.30				w/sandy silt lenses & layers		12	26.5-27.5	33										
	0.50				Loose gray sandy silt	ML	13	29-30	49										
30					Loose gray silty sand w/sand layers	SM	14	31.5-32.5											
		31			Dense gray fine sand	SP	15	34-35											
		30					16	37-38											
		10			Soft gray clay w/sand lenses & layers	CH	17	39-40	42										
40	0.50				Soft gray silty clay w/silty sand layers	CL	18	41.5-42.5											
	0.50				Soft gray silty clay w/clay layers	CL	19	44-45	65										
	0.50				Soft gray clay	CH	20	46.5-47.5	38										
50	0.50				w/few silt lenses		21	49-50	51										

Comments: Coordinates: North 497996.807, East 3699266.828

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 8.71 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/07/96 **Boring:** ALGE5 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50	0.50				Soft gray clay w/clayey silt lenses & pockets	CH	22	51.5-52.5	53										
	0.50						23	54-55	49										
	0.50						24	56.5-57.5	58										
60	0.50						25	59-60	61										
	0.50						26	61.5-62.5	64										
	0.50						27	64-65	63										
	0.50						28	66.5-67.5	65										
	0.60				Medium stiff gray clay	CH	29	69-70	60										
70	0.50				Soft gray clay w/few sandy silt lenses	CH	30	71.5-72.5	59										
	0.50						31	74-75	57										
	0.50						32	76.5-77.5	61										
	0.50						33	79-80	56										
80																			
90																			
100																			

Comments: Coordinates: North 497996.807, East 3699266.828

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.12 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/12/96 **Boring:** ALGE6 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Medium compact gray & tan clayey silt w/roots & shell fragments	ML	1	0-0.3	39										
	1.50				Stiff brown clay w/sand pockets, roots, & shell fragments	CH	2	1.5-2.5	63										
					Stiff dark gray organic clay w/clayey silt lenses & pockets	OH													
	0.40				Medium stiff dark gray & brown organic clay w/clayey silt pockets & clay layers	OH	3	4-5	81										
					Soft gray silty clay w/clay layers & lenses	CL	4	6.5-7.5	37										
10	0.25				Soft gray clay w/sandy silt pockets	CH	5	9-10	74										
	0.25						6	11.5-12.5	100										
	0.25				w/organic clay layers & pockets, & wood		7	14-15	74										
	0.25				w/trace of organic matter & sandy silt pockets		8	16.5-17.5	76										
20					w/clayey silt pockets, lenses, trace of organic matter, & trace of wood		9	19-20	31										
					Medium compact gray clayey silt w/clay pockets	ML	10	21.5-22.5	30										
		11	X		Medium dense gray silty sand	SM	11	24-25	33										
		7	X		Loose gray fine sand w/clay pockets	SP	12	26.5-27.5	40										
30					Losoe gray silty sand	SM	13	29-30	31										
	0.30				Loose gray clayey silt w/clay lenses	ML	14	31.5-32.5	34										
					Very soft gray silty clay w/clay layers	CL	15	34-35	31										
	0.30				Soft gray clay w/clayey silt layers	CH	16	36.5-37.5	39										
40	0.30				Loose gray silty sand w/clay layers	SM	17	39-40	29										
	0.30				Soft gray clay w/clayey silt pockets	CH	18	41.5-42.5	38										
	0.30				Soft gray clay		19	44-45	48										
	0.30						20	46.5-47.5	55										
50	0.30						21	49-50	62										

Comments: Coordinates: North 501517.478, East 3701098.846

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.12 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/12/96 **Boring:** ALGE6 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray clay	CH													
	0.40						22	51.5-52.5	59										
	0.40						23	54-55	62										
	0.40						24	56.5-57.5	63										
60	0.40						25	59-60	64										
	0.40				w/fine sand lenses		26	61.5-62.5	64										
	0.40				w/silty sand layers		27	64-65	53										
	0.40				w/sand pockets & shell fragments		28	66.5-67.5	33										
70	0.40				w/clay pockets & shell fragments		29	69-70	33										
	0.40				Loose gray fine sand w/clay pockets	SP	30	71.5-72.5	28										
		50=5"			Very dense gray fine sand	SP	31	74-75	28										
		22			Very stiff gray clay w/sand pockets & shell fragments	CH	32	76.5-77.5	28										
80	1.00				Medium stiff gray sandy clay w/shell fragments & trace of wood	CL	33	79-80											
90																			
100																			

Comments: Coordinates: North 501517.478, East 3701098.846

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.79 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/06/96 **Boring:** ALGE7 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff gray & brown silty clay w/limestone & roots	CL	1	0											
	1.25				Stiff gray & tan clay w/clayey silt lenses & organic matter	CH	2	1.5	56										
	1.00				w/clayey silt lenses		3	4	69										
	0.80				Medium stiff gray & tan clay w/clayey silt pockets, organic matter, & wood	CH	4	6.5	44										
10	0.75				Medium stiff gray clay w/wood, clayey silt lenses, & roots	CH	5	9	33										
	0.50				Soft gray clay w/sandy silt lenses, wood, & organic matter	CH	6	11.5	54										
	0.50				w/sandy silt lenses, roots, & clayey silt lenses		7	14	64										
	0.20				Very soft gray clay w/wood, humus layers, & pockets	CH	8	16.5	104										
20	0.40				Soft brown humus w/wood	PT	9	19	293										
	0.60				Medium stiff gray clay w/wood	CH	10	21.5	67										
	0.50				Soft gray clay w/roots & organic matter	CH	11	24	33										
	0.50				w/roots		12	26.5	75										
30	0.50				w/clayey silt lenses & trace of roots		13	29	46										
	0.50				w/clayey silt lenses & layers		14	31.5	53										
	0.50				w/clayey silt lenses		15	34	53										
	0.50				Loose gray sandy silt w/clay lenses	ML	16	36.5											
40	0.30				w/clayey silt layers		17	39											
	0.50				Soft gray clay w/clayey silt lenses	CH	18	41.5	39										
	0.50						19	44	48										
	0.50				w/clayey silt lenses & layers		20	46.5	51										
50	0.40						21	49	41										

Comments: Coordinates: North 506135.743, East 3703397.032

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.79 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/06/96 **Boring:** ALGE7 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay	CH													
	0.40						22	51.5	39										
	0.50						23	54	45										
	0.50				w/clayey silt lenses		24	56.5	60										
60	0.50						25	59	63										
	0.50						26	61.5	62										
	0.50						27	64	58										
	0.50						28	66.5	59										
70	0.50						29	69	66										
	0.50				w/silty sand lenses & layers		30	71.5	63										
	0.50				w/silty sand layers		31	74	51										
	0.50				w/clayey sand pockets & shell fragments		32	76.5	45										
80	0.50				w/sand pockets & shell fragments		33	79	32										
90																			
100																			

Comments: Coordinates: North 506135.743, East 3703397.032

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 5.50 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/05/96 **Boring:** ALGE8 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Loose gray clayey silt w/roots & glass	ML	1	0											
		10			Loose brown clayey silt w/roots, gravel, & glass	ML	2	1											
		5			Medium stiff gray clay w/clayey silt, gravel, glass, & shells	CH	3	4	43										
	1.00				Medium stiff dark gray & tan clay w/organic matter & clayey silt pockets	CH	4	7	40										
10	0.30				Soft gray clay w/clayey silt pockets & lenses & organic matter	CH	5	9	50										
	0.05				Soft gray organic clay w/humus layers & decayed wood	OH	6	12	141										
	0.30				w/clay & humus layers		7	14	186										
	0.70				Medium stiff gray clay w/organic matter & clayey silt lenses	CH	8	17	86										
20	1.00				w/organic matter & wood		9	19	54										
	0.60				Medium stiff gray organic clay w/humus layers & wood	OH	10	22	180										
	0.60				w/humus & clay layers		11	24	163										
	0.25				Soft gray clay w/clayey silt lenses & organic matter	CH	12	27	60										
30	0.50				Medium stiff gray clay w/trace of wood & silt layers	CH	13	29	83										
					Loose gray silty sand w/clay lenses	SM	14	32											
	0.50				Medium stiff gray & tan clay w/sandy silt layers & lenses	CH	15	34	57										
	0.60				Medium stiff gray clay w/clayey silt layers & lenses	CH	16	37	66										
40	0.60						17	39	68										
	0.75				w/clayey silt pockets		18	42	67										
	0.50						19	44	67										
	0.60						20	47	67										
50	0.60				w/sandy silt lenses		21	49	55										

Comments: Coordinates: North 511863.1, East 3706454.431

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 5.50 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/05/96 **Boring:** ALGE8 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Medium stiff gray clay w/silt lenses	CH													
	0.75						22	52	70										
	0.75				w/silt layers		23	54	66										
	0.75						24	57	58										
60	0.75						25	59	57										
	0.60				w/silt pockets		26	62	60										
	0.75						27	64	60										
	0.75				w/sand lenses		28	67	65										
70	0.80				w/clayey sand layers		29	69	59										
	0.80						30	72	58										
	1.00				Stiff gray clay w/shell fragments	CH	31	74	56										
	1.00						32	77	53										
80	1.20				Medium dense gray clayey sand w/shell fragments & clay layers	SC	33	79											
90																			
100																			

Comments: Coordinates: North 511863.1, East 3706454.431

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.25 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/06/96 **Boring:** ALGE9 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff dark gray clay w/roots & grass	CH	1	0	32										
	1.40				Stiff gray & tan clay w/clayey silt lenses & layers, & organic matter	CH	2	2	57										
	1.40				Loose gray clayey silt w/silty sand pockets & lenses	ML	3	4	24										
	1.20				Medium stiff gray & tan clay w/many silty sand pockets & lenses	CH	4	7	59										
10	0.80				Medium stiff gray & dark gray clay w/organic matter	CH	5	9	71										
	0.80						6	12	73										
	0.60				Soft brown & gray organic clay w/clay layers	OH	7	14	174										
	1.00				Stiff gray & dark gray clay w/organic clay & wood	CH	8	17	118										
20					Loose black humus w/clay layers & wood	PT	9	19	270										
	0.60				Medium stiff gray organic clay w/humus, wood, & decayed roots	OH	10	22	155										
	0.60				Medium stiff dark brown & gray organic clay w/clayey silt lenses, wood, roots, & organic matter	OH	11	24	229										
	0.50				Soft gray & tan clay w/sandy silt layers	CH	12	27	50										
30	0.50				w/sandy silt layers & lenses		13	29	56										
	0.60				Medium stiff gray clay w/silty sand layers & lenses	CH	14	32	56										
					Medium compact gray clayey silt w/silty sand layers	ML	15	34											
	0.25				Soft gray & tan clay w/silty sand layers & lenses	CH	16	37	48										
40					Soft gray clay w/silty sand layers & pockets	SM	17	39	51										
	0.50				Medium stiff gray clay	CH	18	42	66										
	0.75				w/silty sand pockets		19	44	64										
	0.75				w/clayey silt layers		20	47	68										
50	0.75						21	49	54										

Comments: Coordinates: North 514667.790, East 3709519.893

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.25 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/06/96 **Boring:** ALGE9 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Medium stiff gray clay	CH													
	0.75						22	52	72										
	0.75						23	54	62										
	0.80						24	57	68										
60	0.75						25	59	62										
	1.00						26	62	75										
	1.00						27	64	62										
	1.20				w/few silty sand layers		28	67	67										
70					Medium dense gray clayey sand w/clay layers & shell fragments	SC	29	69	27										
	1.20				Stiff gray clay w/clayey sand layers & pockets, & shells	CH	30	72	44										
	1.25				w/sand pockets & shell fragments		31	74	61										
	1.00				Medium stiff gray clay w/clayey sand pockets & shells	CH	32	77	47										
	0.30				w/clayey sand layers & pockets, & shells		33	79	39										
80																			
90																			
100																			

Comments: Coordinates: North 514667.790, East 3709519.893

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.69 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 2/29/96 **Boring:** ALGW1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Loose gray limestone & shells	GP	1	0											
		8			Medium stiff gray clay w/shells	CH	2	2	31										
	0.50				Medium stiff gray & tan clay w/silty sand pockets & shell fragments	CH	3	4	55										
	0.40				Soft gray clay w/clayey silt lenses & organic matter	CH	4	7	68										
10	0.40				w/clayey silt pockets, organic matter, wood, & roots		5	9	59										
	0.30				w/wood		6	12	92										
	0.30				w/sandy silt lenses, pockets, & wood		7	14	46										
					Very loose gray sandy silt w/clay lenses	ML	8	17											
20					Medium stiff black organic clay w/humus layers	OH	9	19	197										
					Medium stiff gray clay w/organic clay & humus layers	CH	10	22	83										
	0.25				Loose gray sandy silt w/clay pockets	ML	11	24	39										
					Medium dense gray silty sand	SM	12	27											
30		6			Medium stiff gray clay w/silty sand layers	CH	13	29	61										
					Loose gray fine sand w/clay layers	SP	14	32											
		28			Medium dense gray silty sand w/clay layers	SM	15	34											
		27					16	36											
40		5			Medium stiff gray clay w/sandy silt	CH	17	39	37										
	0.20				Loose gray silty sand	SM	18	42											
	0.20						19	44											
	0.25				Soft gray clay	CH	20	47	66										
50	0.25				w/silty sand layers & silt lenses		21	49	46										

Comments: Coordinates: North 485906.337, East 3682390.777

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.69 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 2/29/96 **Boring:** ALGW1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay	CH													
	0.30				w/clayey silt layers & silt lenses		22	52	51										
	0.40				w/few silt lenses		23	54	69										
	0.30						24	57	58										
60	0.30				w/silt layers		25	59	59										
					Medium stiff gray clay	CH													
	0.50						26	62	54										
	0.50						27	64	54										
	0.50						28	67	67										
70	0.60						29	69	65										
	0.60						30	72	60										
	0.60				w/sand layers & pockets, clayey sand layers, & shell fragments		31	74	45										
					Medium dense gray clayey sand w/clay layers & shell fragments	SC	32	77											
							33	79											
80																			
90																			
100																			

Comments: Coordinates: North 485906.337, East 3682390.777

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 3.58 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 2/29 & 3/01/96 **Boring:** ALGW2

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Loose tan & gray clayey silt w/trace of fine sand	ML	1	0.0											
	2.40				Very stiff dark gray & tan clay w/thin clayey silt & sandy silt layers & pockets, & trace of wood	CH	2	1.5	25										
							3	4	37										
	1.20				Stiff dark gray clay w/clayey silt layers & decayed wood	CH	4	6.5	53										
10	0.70				Loose gray clayey silt w/thin clay layers & few roots	ML	5	9											
	0.25				Soft gray clay w/clayey silt pockets & trace of organic matter	CH	6	11.5	46										
	0.25				w/clayey silt lenses, roots, trace of organic matter, & shell fragments		7	14	80										
	0.50				Loose gray clayey silt w/organic matter & organic clay layers	ML	8	16.5											
20	0.40						9	19											
	0.90				Medium stiff dark gray clay w/organic matter & organic clay layers	CH	10	21.5	119										
	0.75				w/trace of organic matter		11	24	118										
	0.50				Medium stiff gray clay w/fine sand & silt lenses	CH	12	26.5	40										
					Loose gray fine sand w/trace of organic matter & few clay lenses	SP	13	29											
30		50=11"			Very dense gray fine sand	SP	14	31											
		4			Very loose gray clayey silt w/clay layers	ML	15	33											
	0.50				Medium stiff gray clay w/clayey silt lenses & thin layers, & pockets	CH	16	36.5	38										
40	0.50				w/clayey silt layers		17	39	37										
	0.60				w/few fine sand lenses		18	41.5	42										
	0.75						19	44	55										
	0.70				w/few clayey silt lenses		20	46.5	43										
50	0.70				w/trace of organic matter		21	49	48										

Comments: Coordinates: North 485135.505, East 3684681.569

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 3.58 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 2/29 & 3/01/96 **Boring:** ALGW2 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Medium stiff gray clay	CH													
	0.75						22	51.5	45										
	0.90				w/clayey silt layers		23	54	42										
	0.90						24	56.5	61										
	0.90						25	59	50										
60																			
	0.90						26	61.5	60										
	0.90						27	64	60										
	0.90				w/few clayey silt lenses		28	66.5	58										
	0.90						29	69	58										
70																			
	0.75				w/sand layers, pockets, & shell fragments		30	71.5	38										
					Loose gray clayey sand w/clay pockets	SC	31	74											
		33			Dense gray fine sand w/shell fragments & few clay lenses	SP	32	76.5											
					Very stiff green & tan sandy clay	CL	33	79	19										
80																			
90																			
100																			

Comments: Coordinates: North 485135.505, East 3684681.569

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 8.495 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/01/96 **Boring:** ALGW3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium stiff gray clay w/roots, shells & grass	CH	1	0	27										
					Loose tan silt w/roots	ML	2	2											
	1.75				Stiff gray, tan, & brown clay w/silt layers & pockets	CH	3	4	29										
	0.75				Medium stiff gray & dark gray clay w/silty sand layers & pockets	CH	4	7	76										
10	0.30				Soft gray clay w/silty sand pockets & shell fragments	CH	5	9	69										
	0.30				w/clayey silt layers, silty sand lenses, & shells		6	12	52										
					Medium stiff gray clay w/organic clay & clayey silt lenses	CH	7	14	55										
					Loose black humus w/clay layers	Pt	8	17	133										
20	0.30				Loose gray clayey silt w/silty sand layers & lenses	ML	9	19											
	0.25				Loose gray silty sand	SM	10	22											
	0.25				Soft gray clay w/shell fragments	CH	11	24	80										
	0.30				w/organic matter & shell fragments		12	27	71										
30	0.40				w/silty sand layers & lenses		13	29	52										
	0.40				w/silty sand layers & pockets		14	32	45										
					Medium compact gray sandy silt w/clay layers	ML	15	34											
	0.30				Soft gray clay w/silty sand layers	CH	16	37	43										
40		16			Medium dense gray silty sand w/clay layers	SM	17	39											
		18					18	42											
		14					19	44											
					Medium stiff gray clay w/silty sand layers	CH													
	0.50						20	47	45										
50	0.50						21	49	57										

Comments: Coordinates: North 489031.072, East 3690060.058

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 8.495 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/01/96 **Boring:** ALGW3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Medium stiff gray clay	CH													
	0.50						22	52	63										
	0.60						23	54	63										
	0.60						24	57	63										
60	0.75						25	59	58										
	0.60						26	62	55										
	0.60						27	64	58										
	0.75						28	67	59										
70	0.75						29	69	57										
	1.00				Stiff gray clay	CH	30	72	59										
	1.00				w/silty sand pockets		31	74	57										
	0.80				Medium stiff gray sandy clay w/clay layers & shells	CL	32	77	32										
80	0.80				Medium stiff gray clay w/clay layers, shells, sand pockets, & lenses	CH	33	79	43										
90																			
100																			

Comments: Coordinates: North 489031.072, East 3690060.058

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 0.438 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/01/96 **Boring:** ALGW4 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Loose brown medium to fine sand w/trace of medium sand & grass roots	SP	1	0											
	2.20				Compact gray & tan clayey silt w/silty clay pockets & layers, & clay layers	ML	2	1.5											
	1.20				Loose gray clayey silt w/clay layers	ML	3	4											
	1.20				Stiff dark gray & brown clay w/organic matter & organic clay layers	CH	4	6.5	168										
10	0.50				Loose gray clayey silt	ML	5	9											
	0.25				Soft dark gray clay w/organic matter, shells, & shell fragments	CH	6	11.5	86										
	0.25						7	14	55										
	0.40				Soft gray clay w/organic matter & shell fragments	CH	8	16.5	76										
20	0.30				Loose gray clayey silt w/sandy silt layers	ML	9	19											
	0.70				w/silty sand layers & trace of wood		10	21.5											
					Very loose to loose gray silty sand w/sandy silt layers	SM	11	24											
	0.90				Loose gray clayey silt w/clay layers	ML	12	26.5											
30	0.40				Soft gray clay w/clayey silt layers	CH	13	29	63										
	0.40				w/clayey silt lenses		14	31.5	67										
	0.40				w/few clayey silt lenses		15	34	59										
	0.40						16	36.5	58										
40	0.40						17	39	60										
	0.40				Medium stiff gray clay	CH	18	41.5	47										
	0.40						19	44	53										
	0.50						20	46.5	69										
50	0.50						21	49	60										

Comments: Coordinates: North 491181.668, East 3692925.745

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 0.438 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/01/96 **Boring:** ALGW4 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50	0.60				Medium stiff gray clay	CH	22	51.5	58										
	0.60						23	54	59										
	0.70				w/few clayey silt lenses		24	56.5	67										
60	0.70						25	59	59										
	0.70						26	61.5	61										
	0.70						27	64	59										
	0.50				Loose gray clayey sand w/clay pockets & shell fragments	SC	28	66.5											
70	0.60				Medium stiff gray clay w/sand lenses & layers, & shells	CH	29	69	37										
	0.60				Loose gray clayey sand w/small clay layers & shell fragments	SC	30	71.5											
	2.25				Very stiff greenish-gray & tan sandy clay w/sandy silt lenses	CL	31	74	21										
	2.25						32	76.5	21										
80	1.75				Stiff greenish-gray & tan sandy clay	CL	33	79	28										
90																			
100																			

Comments: Coordinates: North 491181.668, East 3692925.745

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.816 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/04/96 **Boring:** ALGW5 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium compact dark gray & tan clayey silt w/shells & roots	ML	1	0-0.5											
	2.40					ML	2	1.5-2.5											
	1.90				Very compact tan & gray clayey silt w/fine sand pockets	ML	3	4-5											
	0.60				Dense brown & dark gray silty sand w/clay lenses & pockets	CH	4	6.5-7.5	45										
10	0.30				Medium stiff gray & tan clay w/clayey silt lenses & pockets	CH	5	9-10	77										
	0.25				Soft gray & tan clay w/clayey silt pockets	CH	6	11.5-12.5	77										
					Soft gray clay w/clayey silt lenses, pockets, shell fragments, & organic matter	CH	7	14-15	59										
	0.60				Soft gray clay w/clayey silt lenses & organic matter	CH	8	16.5-17.5	47										
20	0.30				Medium stiff gray clay w/clayey silt, humus layers, wood, & organic clay layers	SC	9	19-20	31										
					Loose gray clayey sand	ML	10	21.5-22.5											
					Loose gray clayey silt w/clay lenses Loose gray clayey silt		11	24-25											
	0.40				Soft gray clay w/organic matter & shell fragments	CH	12	26.5-27.5	74										
30	0.30				Soft gray & tan clay w/silty clay layers, shell fragments, & organic matter	CH	13	29-30	107										
	0.30				w/organic matter		14	31.5-32.5	90										
	0.30						15	34-35	74										
	0.30				Soft gray clay w/clayey silt layers & lenses & silt lenses	CH	16	36.5-37.5	50										
40	0.30				w/sandy silt layers & lenses		17	39-40	57										
	0.40				w/clayey sand lenses & sandy silt lenses		18	41.5-42.5	63										
	0.40						19	44-45	64										
	0.40				w/clayey silt lenses		20	46.5-47.5	67										
50	0.40				w/few clayey silt lenses		21	49-50	67										

Comments: Coordinates: North 493544.923, East 3696054.745

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.816 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/04/96 **Boring:** ALGW5 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50	0.40				Soft gray clay	CH	22	51.5-52.5	69										
	0.40						23	54-55	67										
	0.40						24	56.5-57.5	61										
60	0.40						25	59-60	57										
	0.40						26	61.5-62.5	51										
	0.40						27	64-65	62										
	0.40						28	66.5-67.5	68										
70	0.40						29	69-70	63										
	0.40						30	71.5-72.5	60										
	0.40						31	74-75	66										
					w/clayey sand layers & pockets, & shell fragments		32	76.5-77.5	35										
80							33	79-80	34										
90																			
100																			

Comments: Coordinates: North 493544.923, East 3696054.745

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 1.58 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/11/96 **Boring:** ALGW6 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium compact gray & tan clayey silt w/roots & gravel	ML	1	0-0.3	27										
	0.70				Loose tan fine sand w/gravel	SP	2	0.3-1	5										
						CH	3	1.5-2.5	46										
	0.30				Medium stiff gray, tan & black clay w/clayey silt lenses, pockets, organic matter, organic layers, & brick fragments	CH	4	4-5	46										
	0.25						5	6.5-7.5	66										
10					Soft gray & tan clay w/clayey silt layers, lenses, pockets, & organic matter	ML	6	9-10	32										
					w/sandy silt layers & trace of organic matter	OH	7	12-12.5	89										
	0.25				Loose gray clayey silt w/clay layers		8	14-15	210										
					Medium stiff dark gray & black organic clay w/clay layers w/decayed wood	CH	9	16.5-17.5	92										
20	0.25				Soft gray clay w/trace of organic matter	CH	10	19-20	109										
					Soft gray clay w/trace of organic matter & decayed wood		11	21.5-22.5	75										
					w/trace of organic matter w/clayey silt layers & clayey silt pockets		12	24-25	49										
					Loose gray clayey silt w/clay lenses	ML	13	26.5-27.5	33										
30					Loose gray silty sand w/clay layers & lenses	SM	14	29-30	32										
					Loose gray clayey silt w/clay lenses	ML	15	31.5-32.5	34										
					Medium compact gray sandy silt	ML	16	34-35	35										
	0.30				Soft gray clay w/silty sand lenses	CH	17	36.5-37.5	47										
40	0.30				Soft gray clay w/clayey silt lenses	CH	18	39-40	40										
	0.30				Medium stiff gray clay w/clayey silt layers	CH	19	41.5-42.5	55										
	0.30						20	44-45	55										
	0.30						21	46.5-47.5	64										
50	0.30						22	49-50	57										

Comments: Coordinates: North 500281.942, East 3699699.114

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 1.58 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/11/96 **Boring:** ALGW6 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50	0.30				Medium stiff gray clay	CH	23	51.5-52.5	58										
	0.30						24	54-55	49										
	0.30						25	56.5-57.5	56										
60	0.30						26	59-60	54										
	0.30						27	61.5-62.5	66										
	0.30						28	64-65	62										
	0.40				Medium stiff gray clay w/silty sand lenses	CH	29	66.5-67.5	62										
70	0.40				w/silty sand lenses & pockets		30	69-70	60										
					Loose gray clayey sand w/shells & clay layers	SC	31	71.5-72.5	26										
					Medium dense gray fine sand w/clay layers	SP	32	74-75	25										
	0.40				Medium stiff gray clay w/fine sand pockets & shell fragments	CH	33	76.5-77.5											
80	0.40						34	79-80											
90																			
100																			

Comments: Coordinates: North 500281.942, East 3699699.114

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 8.78 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/04/96 **Boring:** ALGW7 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Loose tan & gray clayey silt w/trace of fine sand	ML	1	0-1	32										
	3.25				Very stiff dark gray & tan clay w/thin clayey silt & sandy silty clay & pockets, & trace of wood	CH	2	1.5-2.5	23										
	2.25				w/organic matter & silt lenses	CH	3	4-5	29										
	2.10				Very stiff dark gray & tan clay w/silt pockets, thin sandy silt layer & lenses, few pockets, & trace of organic matter	CH	4	6.5-7.5	32										
10	0.60					ML	5	9-10	43										
	0.80				Stiff dark gray clay w/clayey silt layers & decayed wood	CH	6	11.5-12.5	56										
	0.70				Loose gray clayey silt w/thin clay layers & few roots	CH	7	14-15	53										
	0.50				Soft gray clay w/clayey silt pockets & trace of organic matter	ML	8	16.5-17.5	40										
20	0.95				Medium stiff gray clay w/clayey silt lenses, roots, trace of organic matter, & shell fragments		9	19-20	45										
	0.55				Loose gray clayey silt w/clay layers	CH	10	21.5-22.5	39										
	0.05				Medium stiff dark gray clay w/organic clay layers & organic matter	CH	11	24-25	43										
	0.05				Very soft dark gray clay w/trace of organic matter w/fine sand & silt lenses		12	26.5-27.5	44										
30	0.05				Loose gray fine sand w/few clay lenses & trace of organic matter	SP	13	29-30											
	0.05						14	31.5-32.5	70										
	0.05				Very loose gray clayey silt w/clay layers	ML	15	34-35	34										
	0.05				Medium stiff gray clay w/clayey silt lenses, pockets, & thin clay layers	CH	16	36.5-37.5											
40	0.05				Loose gray sandy silt w/clayey silt lenses & organic matter	ML	17	39-40											
	0.05				w/clayey silt lenses, organic matter, & fine sand lenses		18	41.5-42.5	33										
		6	X		Medium stiff gray clay w/silt lenses	CH	19	44-45	43										
	0.05				Soft gray clay w/silty sand layers & trace of organic matter	CH	20	46.5-47.5	34										
50	0.05						21	49-50	39										

Comments: Coordinates: North 485135.505, East 3684681.569

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 8.78 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/04/96 **Boring:** ALGW7 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay	CH													
	0.05				Very soft gray clay w/silty sand layers	CH	22	51.2-52.2	41										
	0.05				Soft gray clay w/clayey silt layers	CH	23	54-55	28										
	0.30						24	56.5-57.5	52										
60	0.30						25	59-60	46										
	0.40						26	61.5-62.5	52										
	0.40						27	64-65	53										
	0.35				w/few clayey silt lenses & layers		28	66.5-67.5	55										
70	0.35						29	69-70	55										
	0.30				w/fine sand lenses, layers & pockets, & shell fragments		30	71.5-72.5	51										
	0.55				Loose gray clayey sand w/clay pockets	SC	31	74-75	52										
	0.60				Medium dense gray fine sand w/few clay lenses & shell fragments	SP	32	76.5-77.5	34										
80	0.60				Stiff green & tan sandy clay w/sand pockets & shell fragments	CL	33	79-80	32										
90																			
100																			

Comments: Coordinates: North 485135.505, East 3684681.569

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 3.951 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/04/96 **Boring:** ALGW8 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium stiff gray & tan clay w/roots & organic matter	CH	1	0-1	58										
	0.75				w/roots & organic matter		2	1.5-2.5	88										
	0.50				Soft dark gray clay w/humus layers, organic matter, organic clay layers	CH	3	4-5	140										
	0.20				Extremely soft gray clay w/wood & organic matter	CH	4	7.5-8.5	196										
10	0.20				w/wood, organic matter & humus layers		5	9-10	224										
	0.20				Very soft gray clay w/clayey silt pockets	CH	6	11.5-12.5	78										
	0.20				w/wood		7	14-15	71										
	0.25				w/trace of wood & organic matter		8	16.5-17.5	82										
20	0.20				w/clayey silt layers		9	19-20	85										
	0.20				w/sandy silt lenses & layers		10	21.5-22.5	40										
	0.30				Soft gray clay w/clayey silt & sandy silt lenses	CH	11	24-25	41										
	0.40				w/clayey silt lenses		12	26.5-27.5	70										
30	0.30						13	29-30	78										
	0.30						14	31.5-32.5	76										
	0.30						15	34-35	67										
	0.30						16	36.5-37.5	61										
40	0.40						17	39-40	78										
	0.40						18	41.5-42.5	69										
	0.40						19	44-45	69										
	0.40						20	46.5-47.5	68										
50	0.50						21	49-50	61										

Comments: Coordinates: North 509148.427, East 3704175.151

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 3.951 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/04/96 **Boring:** ALGW8 **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay w/clayey silt lenses	CH													
	0.50						22	51.5-52.5	60										
	0.50						23	54-55	63										
	0.50				w/sandy silt lenses		24	56.5-57.5	65										
60	0.50				w/sandy silt lenses & layers		25	59-60	69										
	0.20				Loose gray clayey sand w/shell fragments	SC	26	61.5-62.5											
	0.40				Soft gray clay w/clayey sand layers & shell fragments	CH	27	64-65	51										
	0.50				Soft gray clay w/sand lenses & shells	CH	28	66.5-67.5	61										
70	0.50				w/sand lenses & pockets, & shell fragments		29	69-70	35										
	0.50						30	71.5-72.5	48										
	0.50						31	74-75	32										
	0.50						32	76.5-77.5	60										
80	0.70						33	79-80	67										
90																			
100																			

Comments: Coordinates: North 509148.427, East 3704175.151

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.009 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/05/96 **Boring:** ALGW9 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff gray & brown silty clay w/roots & organic matter	CL	1	0	25										
	1.90					CL	2	1.5	41										
	1.50				Very stiff gray & brown silty clay w/roots, organic matter, & trace of wood	CH	3	4	42										
	0.50				Stiff gray & tan clay w/clayey silt lenses & organic matter	CH	4	6.5	74										
10	0.60				Soft gray clay w/sandy silt lenses	CH	5	9	153										
	0.50				Medium stiff gray & brown clay w/organic matter & organic clay layers	CH	6	11.5	129										
	0.50				Soft gray & brown clay w/humus layers, wood & roots	PT	7	14	388										
	0.50				Soft brown humus w/roots	OH	8	16.5	194										
20	0.50				Soft gray & brown organic clay w/roots & humus layers		9	19	126										
	0.60				Soft black & dark gray clay w/humus layers & many roots	CH	10	21.5	193										
	0.50				Soft gray & brown organic clay w/clayey silt layers & organic matter	OH	11	24	190										
	0.30				Soft gray clay w/clayey silt lenses	CH	12	26.5	75										
30	0.30						13	29	80										
	0.30				Loose gray clayey silt w/small clay layers & sandy silt lenses & layers	ML	14	31.5											
	0.30				Soft gray clay w/clayey silt lenses	CH	15	34	64										
	0.30						16	36.5	75										
40	0.30						17	39	64										
	0.30						18	41.5	70										
	0.40						19	44	67										
	0.30						20	46.5	66										
50	0.40						21	49	71										

Comments: Coordinates: North 513359.703, East 3707077.608

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.009 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/05/96 **Boring:** ALGW9 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50	0.50				Soft gray clay w/clayey silt lenses	CH	22	51.5	66										
	0.50						23	54	63										
	0.50						24	56.5	61										
60	0.50						25	59	58										
	0.50						26	61.5	62										
	0.50						27	64	61										
	0.50						28	66.5	55										
70	0.50				w/sand layers		29	69	68										
	0.30				Loose gray clayey sand	SC	30	71.5											
	0.50				Soft gray clay w/shells & clayey sand lenses & layers	CH	31	74	58										
	0.50				w/sandy silt lenses & layers		32	76.5	58										
80	0.50				w/sandy silt lenses		33	79	39										
90																			
100																			

Comments: Coordinates: North 513359.703, East 3707077.608

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 2.70 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/05/96 **Boring:** ALGW10 **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium compact tan clayey silt w/roots	ML	1	0	31										
	0.60				Medium compact tan & gray clayey silt w/silty clay layers & shell fragments	ML	2	1.5	20										
	1.80				Stiff dark gray & tan clay w/clayey silt layers	CH	3	4	27										
	2.50				Very stiff gray & tan clay w/clayey silt layers & pockets	CH	4	6.5	32										
10					Medium stiff gray & tan clay w/gravel	CH	5	9	52										
	0.30				Soft gray & tan clay w/organic clay layers & organic matter	CH	6	11.5	89										
	0.30				Loose dark brown humus w/organic layers	PT	7	14	267										
	0.30				Soft gray clay	CH	8	16.5	69										
20					Soft dark brown & gray organic clay w/humus pockets	OH	9	19	178										
					Soft gray & tan clay w/silty sand layers	CH	10	21.5	54										
					Soft gray clay	CH	11	24	81										
30					Loose gray silty sand	SM	12	29.5	51										
	0.30				Soft gray clay w/clayey silt lenses	CH	13	31.5	40										
	0.30						14	34	69										
	0.30				w/few silt lenses		15	36.5	69										
40	0.30						16	39	65										
	0.30						17	41.5	66										
	0.30						18	44	68										
	0.30				w/few clayey silt lenses		19	46.5	59										
50	0.30						20	49	56										

Comments: Coordinates: North 517774.112, East 3712102.544

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 2.70 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/05/96 **Boring:** ALGW10 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50	0.30				Soft gray clay	CH	21	51.5	62										
	0.30						22	54	62										
	0.50				w/few clayey silt lenses		23	56.5	61										
60	0.50						24	59	64										
		19			Medium dense gray fine sand	SP	25	60											
		8			w/clay layers		26	63											
	0.30				Soft gray clay w/sand pockets	CH	27	64	40										
	0.30				w/shell fragments & sand pockets		28	66.5	37										
70	0.30				Loose gray clayey sand w/shell fragments	SC	29	69	25										
					Loose gray silty sand	SM	30	71.5	28										
							31	74	26										
		11			Medium dense gray fine sand w/clay layers	SP	32	76											
80		22					33	79											
90																			
100																			

Comments: Coordinates: North 517774.112, East 3712102.544

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.75 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/19/96 **Boring:** ALGE-1U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Medium stiff tan silty clay w/roots	CL													
					Medium stiff gray & tan clay w/wood, organic matter, & shells	CH													
					Soft gray clay w/silt lenses & organic matter	CH	3C	6.0	32	88	117	UU	4	377	33	19	14		
					w/humus pockets														
10					w/wood & sandy silt lenses														
					Medium stiff gray clay w/silt layers & lenses, & organic matter	CH	5C	14.1	47	72	107	UU	0	446	70	19	51		
					Wood	WD													
20		8			Loose gray fine silty sand w/clay layers & wood layers	SM													
		10			w/thin clay layers														
		3			Soft gray silty clay w/clayey silt & silty clay layers, & organic matter	CL													
					Soft gray clay	CH	9C	27.2	35	85	114	UU	0	373	39	19	20		
30					Medium stiff gray clay w/sand layers, & silt layers & lenses	CH	10C	31.4	70	60	101	UC	0	297	92	30	62		
							10D	31.7	66	61	101	UU		359					
					Soft gray clay w/clayey silt layers	CH													
		5			Loose gray clayey silt w/silty clay layers	ML													
40		3			Soft gray clay w/clayey silt lenses	CH													
					Medium stiff gray clay w/clayey silt lenses	CH	13D	43.8	38	83	115	UU	0	524	51	19	32		
					Soft gray clay w/silt lenses & pockets	CH	14C	47.5	54	69	106	UC		414					
50																			

Comments: Coordinates: North 483259.046, East 3683305.925
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.75 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/19/96 **Boring:** ALGE-1U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI	
50					Soft gray clay w/silt lenses & pockets	CH												
					Medium stiff gray clay w/silt lenses & pockets	CH	15C	51.4	36	84	115	UC	0	545	66	23	43	
							15D	51.7	43	77	110	UU		552				
							16C	55.5	58	66	105	UC		538				
60							17C	59.5	50	70	108	UC	0	603	81	25	56	
							17D	59.8	51	70	105	UU		670				
					w/silt layers & layers													
							18C	63.5	58	65	103	UC		606	88	27	61	CONS
							18D	63.8	56	67	105							
							19C	67.5	51	71	107	UC		606				
					w/silt lenses & pockets													
70							20B	70.5	57	64	101	UU	0	488	94	27	67	
							20C	71.5	55	69	107	UC		570				
					w/sandy silt lenses, layers, & pockets													
							21C	75.5	58	65	103	UC		835				
					w/fine sand layers & lenses, & shell fragments		22B	78.5	37	84	115	UU	0	825	50	19	31	
80																		
90																		
100																		

Comments: Coordinates: North 483259.046, East 3683305.925
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.65 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/20/96 **Boring:** ALGE-2U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Stiff gray & tan silty clay w/roots & organic matter	CL													
					Medium stiff gray & brown clay w/organic matter & roots	CH													
					Soft gray clay w/clayey silt lenses & layers	CH													
					w/shells, & sandy silt lenses & layers														
10							4C		98	46	91	UU	0	341	131	35	96		
					Very soft gray clay w/silt lenses	CH													
							5D		59	65	104	UU	0	213	66	21	45		
					Soft gray clay w/clayey silt lenses & layers	CH													
20					Loose gray sandy silt w/silty sand layers	ML													
		8			Loose gray silty sand	SM													
		3			Soft gray clay w/sandy silt lenses	CH													
					w/clayey silt lenses & layers														
30							10C		59	63	101	UU	0	450	74	23	51		
							12D		52	70	106	UU	0	278	79	23	56		
40					w/silt lenses & pockets														
							13D		58	66	104				77	19	58		CONS
					Medium stiff gray clay w/silt pockets	CH	14B		55	67	104	UU	0	656	88	21	67		
					w/silt lenses & pockets														
50																			

Comments: Coordinates: North 486362.907, East 3687549.870
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.65 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/20/96 **Boring:** ALGE-2U

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Medium stiff gray clay	CH													
					w/silt lenses & pockets														
					w/fine sand lenses & pockets		16D	53.8	61	64	102	UU	0	636	89	27	62		
60							18B	60.5	59	63	101	UU	0	739	91	26	65		
					w/shells & clayey sand lenses & layers														
					Stiff reddish-gray sandy clay w/shells & clayey sand layers	CL	19D	65.8	28	93	118	UU	0	983	23	16	7		
70		29			Medium dense gray clayey sand w/shells & sandy clay layers	SC													
		26			Medium dense greenish-gray clayey sand w/sandy clay layers	SC													
		24																	
		36			Dense greenish-gray & tan fine sand	SP													
80		31																	
90																			
100																			

Comments: Coordinates: North 486362.907, East 3687549.870
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.469 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/18/96 **Boring:** ALGE-3U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff gray & tan clay w/roots & clayey silt lenses	CH													
					Medium stiff gray silty clay w/silt lenses & clay pockets	CL	3D	6.1	31	89	117	UU	0	739	45	15	30		
10					Medium compact gray sandy silt w/clay layers	ML													
					Soft gray clay w/silty clay layers & lenses, large organic matter pockets, & shell fragments	CH	5B	13.4	67	58	98	UU	0	384	101	31	70		
					Medium stiff dark gray & black organic clay w/peat layers & lenses, & clay pockets	OH	6B	17.1	131	35	79				177	52	125		CONS
20					Soft gray silty clay w/clay layers & pockets	CL	7B	20.9	39						41	19	22		
					Soft gray clay w/organic matter pockets & shell fragments	CH	7C	22.5	79	54	97	UC		475					
					Medium stiff gray clay w/silt layers & lenses, organic matter pockets, & shell fragments	CH	8D	26.6	57	66	104	UU	0	578	78	27	51		
30					Soft gray silty clay w/clay layers & lenses	CL	9B	29.6	34						34	18	16		
					Soft gray clay w/sandy silt layers	CH													
		5 7			Loose gray sandy silt w/clay layers	ML													
40		7			Soft gray clay w/sandy silt lenses	CH													
		7 6 4			Loose gray silty sand	SM													
					Soft gray clay w/clayey silt lenses & lenses	CH													
50						CH	17B	48.7	49	72	108	UU	0	638	72	26	46		

Comments: Coordinates: North 489889.329, East 3692280.732
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.469 Datum: NGVD Gr. Water Depth: See Text Job No.: 14638 Date Drilled: 4/18/96 Boring: ALGE-3U Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Medium stiff gray clay w/clayey silt layers & lenses	CH	17C		56	68	106	UC		529					
							18C		51	72	109	UC		503					
					w/clayey silt layers & lenses														
							19C		57	66	104	UC	0	549	83	24	59		
							19D		54	68	105	UU		544					
60					Soft gray clay w/silt pockets	CH													
					Very soft gray clay w/silt pockets	CH	20C		54	70	107	UC	0	315	83	23	60		
							20D		51	70	106	UU		179					
					Medium stiff gray clay w/silt lenses & pockets	CH	21C		61	65	105	UC		656					
					w/silt pockets														
70							22C		56	66	104	UC	0	613	88	27	61		
					w/silt lenses & silty sand lenses & pockets		22D		54	67	103	UU		584					
							23C		54	69	107	UC		650					
					w/fine sand layers		24B		56	66	103	UU	0	737	88	26	62		
		4			Loose gray fine clayey sand	SC													
80		4			w/sandy clay layers & shells														
90																			
100																			

Comments: Coordinates: North 489889.329, East 3692280.732
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -1.90 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/17/96 **Boring:** ALGE-4U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium stiff gray & tan silty clay w/small roots	CL													
					Medium stiff gray clay w/shells	CH													
					Soft black peat w/roots	PT	3C		271	20	72	UU	0	330	307	109	198		
					Medium stiff gray clay w/shells	CH													
10					Very soft gray clay w/silt layers & lenses, & shell fragments	CH	4D		74	56	97	UC		144					
					w/silt layers & lenses, organic matter pockets, & shell fragments	CH	6C		77	55	97	UC	0	156	110	34	76		
							6D		87	50	94	UU		340					
20					Soft gray clay w/silt layers & lenses, & shell fragments														
					w/silt layers & lenses		8B		68	60	100	UU	0	292	82	24	58		
							8C		72	56	96	UC		268					
30							9C		60	66	105	UC		259					
							10C		63	64	103	UC	0	242	90	26	64		
							10D		68	59	100	UU		332					
							11C		63	64	103	UC		276					
40																			
							12C		67	61	102	UC	0	304	95	26	69		
							12D		69	59	100	UU		383					
							13C		70	59	101	UC		357					
50																			

Comments: Coordinates: North 492367.653, East 3695724.177
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -1.90 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/17/96 **Boring:** ALGE-4U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray clay w/silt layers & lenses	CH	14C	50.5	67	61	102	UC	0	294	79	25	54		
							14D	50.8	57	66	104	UU		440					
					Very soft gray clay w/silt layers & lenses	CH	15C	54.5	63	64	104	UC		223					
60					Soft gray clay w/silt layers & lenses	CH	16C	58.5	64	61	101	UC	0	346	94	27	67		
							16D	58.8	63	62	100	UU		416					
					Medium stiff gray clay w/silt layers & lenses	CH	17B	61.5	66	61	102				89	33	56		CONS
					Very soft gray clay w/silt layers & lenses	CH	17C	62.5	53	71	108	UC		224					
70					Medium stiff light gray & tan clay w/shell fragments	CH	19B	69.2	22	96	119	UU	0	864	23	14	9		
		29			Medium dense gray & tan clayey sand	SC													
		34			Dense gray & tan clayey sand w/sandy clay pockets	SC													
		40																	
		41																	
		24			Medium dense gray clayey silt w/silty clay layers	ML													
80																			
90																			
100																			

Comments: Coordinates: North 492367.653, East 3695724.177
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.61 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/18/96 **Boring:** ALGE-5U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium stiff gray & tan clay w/roots & clayey silt lenses	CH													
					Stiff gray & tan clay w/clayey silt layers & lenses, large organic matter pockets, & roots	CH	2C	3.0	32						56	22	34		
10					Soft dark gray & brown organic clay w/clay layers & pockets, & decayed wood pockets	OH	4C	10.1	86	48	90	UU	0	402	130	43	87		
					w/clay pockets, decayed wood, & roots		5B	13.6	55	66	102	UC		476					
					Soft gray clay w/silt layers & lenses, & organic pockets	CH	6C	18.5	61	64	103	UC		250					
20					Medium stiff dark gray organic clay w/clay layers & pockets, roots, decayed wood, & peat layers	OH	7C	22.5	60	59	94	UC		756	137	51	86		
							7D	22.9	91	43	82	UU	0	833					
		3			Loose gray sandy silt w/clay layers	ML													
30					Soft gray clay w/clayey silt layers & lenses	CH													
					Soft gray sandy clay w/clay layers	CL	10C	31.9	36	83	113	UU	0	430	35	22	13		
					Soft gray clay w/clay layers & lenses	CH	11C	36.5	35						32	18	14		
40							12B	39.6	45	75	109	UC		348	50	19	31		CONS
							12C	39.9	47	73	108								
							13C	43.9	40	80	112	UU	0	483	50	23	27		
							13D	44.4	61	64	103	UC		327					
50							14C	48.5	57	66	103	UC		281					

Comments: Coordinates: North 496725.774, East 3698623.889
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.61 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/18/96 **Boring:** ALGE-5U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray clay w/clayey silt layers & lenses	CH													
						CH	15B	51.5	67	61	101	UU	0	617	99	27	72		
					Medium stiff gray clay w/clayey silt layers & lenses	CH	15C	52.5	57	65	103	UC		404					
					Soft gray clay w/silt layers & lenses		16C	56.5	53	68	104	UC		278					
60					Medium stiff gray clay w/silt layers & lenses	CH	17C	60.5	58	64	102	UC		365	93	27	66		
							17D	60.8	59	65	104	UU	0	652					
					Soft gray clay w/silt layers & lenses	CH	18C	64.5	53	68	104	UC		369					
70					Medium stiff gray clay w/silt layers & lenses	CH	19C	68.5	58	65	102	UC		372	100	28	72		
							19D	68.8	60	64	103	UU	0	535					
							20C	72.5	54	69	106	UC		608					
					Soft gray clay	CH	21B	74.7	65	62	102	UU	0	422	89	30	59		
80					Soft gray sandy clay w/shell fragments	CL	22C	80.2	29						40	16	24		
90																			
100																			

Comments: Coordinates: North 496725.774, East 3698623.889
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.08 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/15/96 **Boring:** ALGE-6U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium stiff brown silty clay w/grass roots	CL													
10					Soft dark gray & brown organic clay w/shell fragments, roots, & decayed wood	OH	3C	9.1	119	39	85	UU	0	274	155	41	114		
					Very soft gray clay w/silt layers & lenses	CH	4C	13.4	70	56	96	UU	0	194	85	25	60		
					Soft gray silty clay w/silt layers & lenses, & clay	CL	5B	16.7	35	85	115				36	23	13		CONS
20		12 11			Medium dense gray fine sand w/clayey sand layers	SP													
		8			Loose gray sandy silt w/clayey silt layers	ML													
30		5 4			Loose gray clayey silt w/clay layers & sandy silt layers	ML													
					Soft gray clay w/silty sand layers	CH													
					Medium stiff green silty clay w/silt layers & lenses	CL	13C	37.0	39	83	115	UC	0	427	48	17	31		
							13D	37.3	37	83	114	UU		540					
40					Soft gray sandy clay w/silt layers & lenses	CL	14C	41.2	45	75	109	UC		317					
							15B	44.5	49	70	105	UU	0	412	76	23	53		
50							15C	45.5	55	65	101	UC		467					

Comments: Coordinates: North 500124.973, East 3700396.794
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.08 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/15/96 **Boring:** ALGE-6U Refer to "Legends & Notes"

Scale In Feet	PP	SPT	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50			Soft gray sandy clay w/silt layers & lenses	CL													
			Medium stiff gray sandy clay w/silt layers & lenses	CL	17C	53.5	58	67	105	UC	0	551	86	26	60		
					17D	53.8	54	67	104	UU		557					
			Medium stiff gray clay w/silt layers & lenses	CH	18C	57.5	66	61	102	UC		579					
60					19C	61.4	54	67	104	UU	0	756	90	29	61		
		14	Loose gray clayey sand w/shell fragments	SC													
70		40	Medium dense gray clayey sand w/sandy clay, sand layers, & shell fragments	SC													
		48	Dense gray fine sand	SP													
		47															
		6	Medium stiff gray clay w/sand pockets	CH													
			Stiff gray clay w/sandy clay layers, silt pockets, & decayed wood	CH	26B	78.2	53	70	105	UU	0	1156	70	20	50		
80																	
90																	
100																	

Comments: Coordinates: North 500124.973, East 3700396.794
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.230 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/12/96 **Boring:** ALGE-7U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Very stiff brown silty clay w/roots	CL													
					Medium stiff tan & gray silty clay w/silt lenses	CL	2B	4.9	60	64	102	UU	0	374	82	29	53		
10					Soft gray clay w/silt layers & lenses	CH													
20					Medium stiff gray & tan silty clay w/silt layers & lenses, large organic matter layers & pockets	CL	4C 4D	14.1 14.7	29 30	91 92	118 120	UU UC	0	590 519	42	17	25		
					Soft gray silty clay w/silt layers & lenses	CL	6D	22.8	40	79	111	UU	0	414	45	21	24		
		4 8			Loose gray sandy silt	ML													
30		4			Soft gray clay w/sandy silt layers	CH													
		6			Medium stiff gray clay w/wood	CH													
		20 29			Medium dense gray fine sand w/clay layers	SP													
40		34			Dene gray fine sand	SP													
		29 25			Medium dense gray fine sand	SP													
		40 47			Dense gray fine sand	SP													
50		53			Very dense gray fine sand	SP													

Comments: Coordinates: North 504278.169, East 3702451.616

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.230 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/12/96 **Boring:** ALGE-7U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50		50=11"			Very dense gray fine sand	SP													
		51																	
		12			Medium dense gray sandy silt w/clayey silt layers	ML													
		9			Loose gray clayey silt w/clay layers	ML													
		8			Medium stiff gray clay w/clayey silt layers & pockets	CH													
60							25B	61.5	45	74	109	UU	0	654	72	24	48		
							25C	62.5	53	71	108	UC		705					
							26C	66.5	57	67	105	UC		615	94	28	66		CONS
							26D	66.8	58	66	104								
70					Stiff gray clay w/silt lenses & pockets	CH	27D	70.5	58	67	105	UC		1029	94	30	64		
							27C	71.1	58	66	103	UU	0	1169					
					Loose gray clayey sand w/shell fragments & clay layers	SC													
					Medium stiff gray sandy clay w/fine sand layers & shell fragments	CL	29C	78.1	33						41	17	24		
80																			
90																			
100																			

Comments: Coordinates: North 504278.169, East 3702451.616

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.75 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/22/96 **Boring:** ALGE-8U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff gray & brown clay w/roots & wood	CH													
					Medium stiff gray & brown clay w/organic matter & wood	CH													
					Soft gray organic clay w/decayed wood & roots	OH	3C	5.6	150	31	77	UU	0	391	206	54	152		
10																			
					Loose gray clayey silt w/roots	ML													
					Very soft gray clay w/silt layers & lenses, & few concretions	CH	5C	14.2	61	63	101	UU	0	175	90	23	67		
					Loose gray clayey silt	ML													
20																			
					Soft gray clay w/silt layers, lenses & pockets	CH													
							8C	26.1	52	68	104	UU	0	312	60	21	39		
30							9C	30.5	70	59	100	UC		277					
							10C	34.1	66	60	100	UU	0	388	85	27	58		
					Very soft gray clay w/silt layers & lenses	CH	11C	38.5	60	69	109	UC		209	88	32	56		CONS
					Medium stiff gray clay w/silt layers & lenses	CH	11D	38.8	70	59	100								
40																			
					Soft gray clay w/silt pockets	CH	13D	46.2	61	63	101	UU	0	415	81	25	56		
50																			

Comments: Coordinates: North 508246.628, East 3704510.434
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -2.75 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/22/96 **Boring:** ALGE-8U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay w/silt pockets	CH													
					Medium stiff gray clay w/silt pockets	CH	15C	54.1	65	60	100	UU	0	585	93	29	64		
60																			
					Medium stiff gray sandy clay w/fine sand layers	CL	17C	61.8	62	62	101	UU	0	553	88	28	60		
		10			Medium dense gray fine sand w/clayey sand pockets	SP													
		11																	
		4			Medium stiff gray clay w/shells	CH													
70																			
					Medium compact gray sandy silt w/shells & sandy silt pockets	ML													
					Stiff gray clay w/shell fragments & clay pockets	CH	22D	76.8	30	91	118	UU	0	577	28	15	13		
		6			Loose gray silty sand w/shells & sandy silt pockets	SM													
80																			
90																			
100																			

Comments: Coordinates: North 508246.628, East 3704510.434
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.06 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/20/96 **Boring:** ALGE-9U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff dark gray clay w/roots & grass	CH													
					w/roots, humus, & grass roots		2B	4.6	38	74	103	UU	0	1690	82	33	49		
					Stiff dark gray & tan clay w/humus	CH													
					Loose black humus w/wood	Pt													
10																			
					Soft gray clay w/wood	CH	5C	17.7	64	55	91	UU	0	300	118	28	90		
20					Loose black humus w/wood	Pt													
					w/clay layers & wood														
					Very soft gray clay w/silt layers & lenses	CH	7D	26.2	62	62	100	UU	0	212	72	23	49		
					Soft gray clay w/clayey silt layers & pockets	CH													
30																			
							9D	34.8	58	64	102	UU	0	310	92	30	62		
40																			
					Very soft gray clay w/clayey silt layers, lenses, & pockets	CH	11C	42.1	59	62	98				81	26	55		CONS
50																			

Comments: Coordinates: North 512862.124, East 3707443.123
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.06 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/20/96 **Boring:** ALGE-9U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Very soft gray clay w/clayey silt layers, lenses, & pockets	CH	13D	50.8	61	63	102	UU	0	381	84	25	59		
					Soft gray clay w/clayey silt layers & lenses	CH													
60					Medium stiff gray clay w/clayey silt layers & lenses	CH	15D	58.5	66	58	98	UU	0	489	93	27	66		
					Soft gray clay w/clayey silt layers & lenses	CH	17D	66.8	64	60	98	UU	0	478	91	23	68		
70		17 14			Medium dense gray silty sand w/shell fragments	SM													
		17			Medium dense gray clayey sand w/clay layers & shell fragments	SC													
		7			Medium stiff gray clay w/shell fragments w/silty sand layers	CH	22B	77.1	44	75	109	UU	0	736	64	18	46		
80		11			Medium dense gray silty sand w/clay layers & shells	SM													
90																			
100																			

Comments: Coordinates: North 512862.124, East 3707443.123
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 1.95 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/19/96 **Boring:** ALGE-10U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff dark gray clay w/roots, shells & grass	CH													
					Stiff gray & tan clay w/roots	CH													
					Medium stiff gray clay w/humus & wood	CH													
10					w/organic matter layers & lenses, & decayed wood		3C	10.5	54	67	103	UC	0	271	103	32	71		
							3D	10.8	61	62	98	UU		506					
					Soft gray clay w/humus & wood	CH													
20							6B	21.5	66	62	101	UU	0	542	76	25	51		
					Very soft gray clay w/sandy silt layers & lenses, & organic matter pockets	CH	6C	22.5	51	72	109	UC		221					
30					Soft gray clay w/clayey silt lenses	CH	8C	30.5	70	58	98	UC	0	332	96	27	69		
							8D	30.8	70	58	98	UU		422					
					Very soft gray clay w/silt layers & lenses	CH	9C	34.4	66	61	101	UC		207					
40					Soft gray clay w/silt layers & lenses	CH	10C	38.5	72	57	99	UC	0	259	86	27	59		
							10D	38.8	68	58	97	UU		542					
							11C	42.4	63	63	102	UC		380	81	26	55		
					Medium stiff gray clay w/silt layers & lenses	CH	12C	46.5	55	67	103	UC	0	263	72	25	47		
50							12D	46.8	53	67	103	UU		646					

Comments: Coordinates: North 515847.833, East 3710935.137
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 1.95 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/19/96 **Boring:** ALGE-10U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50			Medium stiff gray clay w/silt layers & lenses	CH	13C	50.5	54	67	103	UC		265					
			Soft gray clay w/silt pockets	CH													
			Medium stiff gray clay w/silt pockets	CH	14C 14D	54.4 54.7	57 56	67 65	105 101	UC UU	0	399 660	80	28	52		
					15C	57.6	63	63	102				87	28	59		CONS
		19	Medium dense gray silty sand	SM													
60		12	Medium dense gray clayey sand w/shell fragments	SC													
		8 9	Loose gray clayey sand w/shell fragments & clay layers	SC													
		5	Loose gray sandy clay w/shell fragments & clayey sand layers	CL													
		12	Medium dense gray silty sand w/clay layers	SM													
70		9 5 6	Loose gray silty sand w/clay layers & shell fragments	SM													
		8	Medium stiff gray silty clay w/many shell fragments & clayey silt layers	CL													
		18	Very stiff greenish-gray clay	CH													
80																	
90																	
100																	

Comments: Coordinates: North 515847.833, East 3710935.137
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.03 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/06/96 **Boring:** ALGW-1U Refer to "Legends & Notes"

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff tan & gray silty clay w/roots & sandy silt pockets	CL													
10					Soft gray clay w/oxidation, silt lenses, & pockets	CH	3C	6.1	71	56	96	UU	0	381	98	32	66		
					Soft gray silty clay w/sandy silt layers & roots	CL													
					Wood	WD													
20					Soft gray silty clay w/silt lenses, roots, & wood	CL	6B	18.9	42	79	113	UU	0	335	47	18	29		
					Soft gray clay w/silt lenses	CH	8B	24.1	63	62	102	UU	0	309	93	27	66		
30		6			Loose gray sandy silt w/silty clay layers	ML													
		14			Medium dense gray fine sand w/clay layers	SP													
		5			Soft gray silty clay w/silty sand layers	CL													
40		15 13 13			Medium dense gray fine sand w/clayey sand layers	SP													
		9			Loose gray fine sand	SP													
		8			Loose gray clayey silt w/sandy silt layers & clay layers	ML													
50		5			Soft to medium stiff gray clay w/silty sand lenses	CH													

Comments: Coordinates: North 484210.581, East 3683302.379
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.03 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/06/96 **Boring:** ALGW-1U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50		11			Medium compact gray sandy silt	ML													
		5			Soft to medium stiff gray clay w/silt lenses	CH													
					Medium stiff gray clay w/silty sand pockets	CH	22C	55.1	49	70	105	UU	0	754	73	25	48		
60																			
							24B	62.4	42	77	110	UU	0	804	65	25	40		
							24C	63.5	50	71	106	UC		919					
							25C	67.5	51	71	107	UC		689					
70																			
							26C	71.5	55	68	105	UC	0	964	88	26	62		
							26D	71.8	52	69	107	UU		990					
					Stiff gray clay	CH	27C	75.5	59	65	103	UC		1169	83	25	58		CONS
					Medium stiff gray clay w/silt lenses & pockets, & silty sand pockets	CH	27D	75.8	59	65	104								
					Soft gray clay w/shell fragments	CH	28C	79.3	27						32	18	14		
80																			
90																			
100																			

Comments: Coordinates: North 484210.581, East 3683302.379
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 3.47 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/12/96 **Boring:** ALGW-2U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff gray & dark gray clay w/shells, concrete fragments, & roots	CH													
					Medium stiff gray, dark gray, & tan clay w/clayey silt pockets & shells	CH													
					Stiff gray & brown silty clay w/silt layers & lenses, fine sand layers, organic matter, & oxidized pockets	CL	2B	5.3	28	90	116	UU	0	492	47	22	25		
						CH													
10					Soft gray clay w/oxidized pockets, silt lenses & pockets, large organic matter pockets, & decayed wood	CL													
					Soft gray silty clay w/silty sand lenses & wood														
					Medium dense gray silty sand w/clay layers & wood	SM													
					Soft gray clay w/silt layers & lenses, & trace of organic matter	CH	5C	18.4	58	66	104	UU	0	475	97	21	76		
20					Medium stiff gray clay w/silt lenses & layers, & fine sand laeyrs	CH	6C	22.0	48	73	108				71	22	49		CONS
					Soft gray clay w/silt lenses	CH													
30					Stiff gray clay w/silty sand & clayey silt pockets	CH													
					Medium stiff gray clay w/silt layers & lenses	CH	9C	34.4	45	77	112	UU	0	538	67	25	42		
					Medium stiff gray clay w/clayey silt pockets	CH													
40							11B	41.5	55	67	105	UU	0	646	84	27	57		
							11C	42.5	52	69	106	UC		512					
							12C	46.5	52	69	105	UC		470					
50																			

Comments: Coordinates: North 484210.581, East 3683302.379
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 3.47 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/12/96 **Boring:** ALGW-2U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Medium stiff gray clay	CH	13C	49.9	49	72	108	UU	0	679	75	24	51		
							13C	50.5	57	66	103	UC		499					
							14C	54.5	52	69	104	UC		491					
					w/silty sand pockets														
							15C	58.5	54	66	102	UC	0	551	86	29	57		
60					w/silty lenses & pockets, & trace of organic matter		15D	58.8	53	69	107	UU		725					
							16C	62.5	52	69	105	UC		756					
							17C	66.1	55	67	105	UU	0	753	89	30	59		
70					Soft gray silty clay w/silt layers & lenses, & shell fragments	CL	18C	70.5	27						25	17	8		
							19B	73.5	31						36	17	19		
					Stiff tan & gray silty clay w/shell fragments	CL	20B	78.0	21						26	12	14		
80																			
90																			
100																			

Comments: Coordinates: North 484210.581, East 3683302.379
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.58 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/08 & 3/11/96 **Boring:** ALGW-3U

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		8			Loose gray & tan clayey silt w/roots w/silty sand pockets	ML													
		8			Medium stiff gray clay w/clayey silt lenses & pockets, & shell fragments	CH													
10					Soft gray clay w/silt lenses & shell fragments	CH	4B	9.1	66	59	98	UU	0	314	100	32	68		
					Stiff gray clay w/clayey silt pockets & wood	CH													
20					Medium stiff gray clay w/clayey silt lenses & shell fragments	CH	7B	21.5	67	61	102	UU	0	553	95	26	69		
							7C	21.8	73	57	98	UC		511					
							8C	26.4	57	65	100	UU	0	613	92	28	64		
30					Soft gray sandy clay w/clayey sand layers & pockets	CL													
40					Medium stiff gray clay w/silt lenses	CH	12C	42.0	53	68	106	UU	0	603	81	25	56		
							13C	46.1	68	60	101				93	26	67		CONS
50																			

Comments: Coordinates: North 490347.872, East 3691858.068
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 9.58 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/08 & 3/11/96 **Boring:** ALGW-3U

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Medium stiff gray clay	CH	14C	50.5	56	67	105	UC		500					
					w/silt layers & lenses		15C	54.5	61	64	103	UC	0	548	73	28	45		
					w/silt pockets		15D	54.8	52	69	106	UU		554					
							16B	57.6	57	67	105	UC		712					
60					w/silt layers & lenses														
							17B	61.6	56	67	104	UC	0	677	96	27	69		
							17C	62.1	60	64	104	UU		746					
70							19C	70.1	58	64	102	UU	0	758	97	30	67		
					Medium stiff gray sandy clay w/clayey sand & clay layers, & shells	CL													
					Medium stiff gray clay w/clayey sand layers & pockets, & shells	CH													
80																			
90																			
100																			

Comments: Coordinates: North 490347.872, East 3691858.068
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -1.91 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/18/96 **Boring:** ALGW-4U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium stiff gray silty clay w/shells & roots	CL													
					Very soft gray clay w/silt layers & pockets, & roots	CH	2B	4.4	55	67	106	UU	0	81	58	20	38		
10																			
		4			Very loose gray clayey silt w/silty sand layers & pockets	ML													
		5			Loose gray clayey silt w/silty sand & clay layers	ML													
		7																	
		3			Soft gray silty clay w/silty sand pockets & shell fragments	CL													
20																			
					Soft gray organic clay w/trace of organic matter	OH	8C	22.1	85	50	93	UU	0	430	128	35	93		
					Very soft gray clay w/shell fragments & silt lenses, & pockets	CH	9D	26.7	76	57	100	UC		213					
30					Soft gray clay w/silt layers & lenses	CH	10B	29.5	57	65	104	UU	0	319	72	24	48		
					Very soft gray clay w/silt layers & lenses	CH	10C	30.5	70	60	101	UC		211					
					Soft gray clay w/silt layers & lenses	CH	11C	34.5	58	68	107	UC		323					
					Very soft gray clay w/silt lenses & pockets	CH	12C	38.5	69	59	100	UC	0	210	101	31	70		
40					Soft gray clay w/silt lenses & pockets	CH	12D	38.8	63	63	103	UU		411					
							3C	42.5	70	59	99	UC		396					
					Medium stiff gray clay w/silt layers & lenses	CH	14C	46.1	71	63	107	UC	0	396	83	26	57		
							14D	46.4	68	60	101	UU		497					
50																			

Comments: Coordinates: North 492391.906, East 3694557.800
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -1.91 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/18/96 **Boring:** ALGW-4U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray clay w/silt pockets	CH	15C	50.3	56	72	113	UC		314					
					Medium stiff gray clay w/silt layers & lenses	CH	16C	54.1	64	63	103	UC	0	452	89	30	59		
							16D	54.4	61	63	103	UU		562					
							17C	57.5	64	62	102	UC		543	86	33	53		CONS
							17C	58.0	60	65	105								
60																			
					Soft gray clay w/silt layers & lenses	CH	18C	61.6	65	62	102	UU	0	548	92	28	64		
							18C	62.2	61	64	102	UC		420					
		11			Medium dense gray clayey sand w/shell fragments	SC													
		7			Loose gray clayey sand w/clay layers & shell fragments	SC													
		7																	
70																			
		27			Medium dense greenish-gray & tan clayey sand	SC													
		37			Dense greenish-gray & tan fine sand	SP													
		50=11"			Very dense gray fine sand	SP													
		26			Medium compact gray clayey silt w/silty sand pockets, shell fragments, & clay layers	ML													
		32			Compact gray clayey silt w/silty sand pockets, shell fragments, & clay layers	ML													
80																			
90																			
100																			

Comments: Coordinates: North 492391.906, East 3694557.800
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.06 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/16/96 **Boring:** ALGW-5U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	ϕ	C	LL	PL	PI		
0					Stiff dark gray & tan clay w/shells & roots	CH													
					Medium stiff brown & gray clay w/clay layers & lenses	CH	1C	2.4	44						66	22	44		
					Loose black humus w/clay layers	Pt													
10					Soft gray clay w/organic matter, peat pockets, & silt	CH	3B	9.4	63	62	103	UU	0	383	98	27	71		
							3C	9.7	75	56	99	UC		343					
					Very soft gray clay w/silt, organic matter & shell fragments	CH	4D	14.4	79	55	95	UU	0	224	89	29	60		
20					Loose black humus w/wood & clay layers	Pt	6C	21.3	70	58	98				88	26	62		CONS
					Soft gray clay w/silt lenses & pockets, & trace of decayed wood	CH													
					Soft gray organic clay w/organic matter, lenses, & pockets	OH	7D	27.2	121	38	84	UU	0	392	188	63	125		
30					Soft gray clay w/silt pockets & decayed wood	CH	8C	30.5	118	39	85	UC		411					
							9C	33.6	43	76	109	UU	0	325	90	19	71		
40																			
							11C	42.5	66	60	100	UC	0	341	92	31	61		
							11D	42.8	65	62	102	UU		415					
					Very soft gray clay w/silt layers & lenses	CH	12C	46.1	68	59	99	UC		217					
50																			

Comments: Coordinates: North 495298.753, East 3697204.168
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 7.06 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/16/96 **Boring:** ALGW-5U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay w/silt lenses & layers	CH	13C 13D	49.9 50.2	63 66	63 61	102 101	UC UU	0	368 447	98	31	67		
							14C	54.4	61	63	102	UC		342					
							15C 15D	57.8 58.1	67 59	60 64	100 102	UC UU	0	310 488	90	27	63		
60																			
					Medium stiff gray clay w/silt layers & lenses	CH	16C	62.2	55	66	103	UC		437					
70							18C 18C	69.9 70.5	65 67	59 60	99 100	UU UC	0	678 590	94	33	61		
							19C 19D	74.5 74.8	51 55	69 66	104 103	UC UU	0	352 576	86	31	55		
		9 7			Loose gray clayey silt w/silty sand pockets & clay layers	ML													
80																			
90																			
100																			

Comments: Coordinates: North 495298.753, East 3697204.168
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -1.18 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/11/96 **Boring:** ALGW-6U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0 10					Medium stiff gray clay w/clayey silt lenses, roots, grass, & organic matter	CH	2D	6.2	39	77	108	UU	0	503	69	23	46		
					Soft gray clay w/clay layers & lenses	CH	4C 4D	13.9 14.2	36 37	86 83	117 115	UC UU	0	327 264	40	18	22		
20					Loose gray clayey silt w/silty sand pockets w/clay layers	ML													
30		14 16 13			Medium dense gray silty sand	SM													
40		8 10 9 9 8			Loose gray silty sand w/clay layers	SM													
		8			Medium stiff gray silty clay w/silty sand layers & pockets	CL													
50		8			Medium stiff gray clay	CH	17B 17C 17D	45.9 46.5 46.8	58 51 54	66 70 68	104 105 106	 UC UU	0	 509 695	92 82	27 26	65 56		CONS

Comments: Coordinates: North 502723.351, East 3700920.051
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -1.18 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/11/96 **Boring:** ALGW-6U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other Tests
50			Medium stiff gray clay	CH	18C	50.5	54	67	103	UC		581				
			Medium stiff dark gray clay	CH												
			Medium stiff gray clay w/silt pockets	CH	19C	54.5	53	68	105	UC		717	102	32	70	
					19D	54.8	60	64	103	UU	0	747				
60					20C	58.2	53	69	106	UC		794				
					21D	62.6	52	66	101	UU	0	683	85	27	58	
		9	Loose gray silty sand w/clay layers & shell fragments	SM												
		10	Loose gray clayey sand w/shell fragments	SC												
		12	Medium dense gray clayey sand w/shell fragments	SC												
70		9														
		8	Loose gray clayey sand w/shell fragments & clay layers	SC												
		11	Medium dense gray clayey sand w/shell fragments	SC												
		14														
		11														
80		13														
90																
100																

Comments: Coordinates: North 502723.351, East 3700920.051
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.37 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/12-15/96 **Boring:** ALGW-7U

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Stiff gray & tan silty clay w/silty sand pockets & roots	CL													
					Medium stiff gray & tan clay w/clayey silt pockets, organic matter, & wood	CH													
10					Soft gray clay w/silt lenses & pockets, organic matter, & few concretions	CH	3C	9.7	56	67	105	UU	0	292	70	26	44		
20					Medium stiff gray & brown clay w/trace of organic matter lenses, & silt pockets	CH	5C	18.1	67	57	95	UU	0	706	104	36	68		
					Soft gray clay w/clayey silt pockets	CH													
30					Medium stiff gray clay w/silt layers & lenses	CH	8B	29.7	71	58	100	UU	0	493	97	32	65		
					Soft gray clay w/silt layers & lenses	CH	8C	30.3	85	52	96	UC		411					
		17			Medium compact gray clayey silt w/clay layers	ML													
40		13																	
		8			Loose gray clayey silt w/clay layers	ML													
		4			Soft gray clay	CH													
							14C	46.2	48	73	108	UC	0	289	67	23	44		
50							14D	46.5	49	73	109	UU		378					

Comments: Coordinates: North 507430.878, East 3703361.531
5-in diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.37 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/12-15/96 **Boring:** ALGW-7U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay	CH	15C	50.5	58	65	103	UC		321					
							16C	54.5	58	67	106	UC	0	421	92	27	65		
							16D	54.8	62	64	102	UU		460					
							17C	57.2	64	62	102				91	31	60		CONS
							17C	57.8	51	71	107	UC		285					
60																			
					Medium stiff gray clay w/silt lenses & pockets	CH	18C	62.4	60	65	104	UC	0	526	91	27	64		
							18D	62.7	61	63	102	UU		515					
							19C	65.8	56	67	104	UC		555					
		4			Very loose gray clayey silt w/clay layers & silty sand pockets	ML													
70		6			Loose gray clayey silt w/clay layers & silty sand pockets	ML													
		7																	
		3			Soft gray sandy clay w/many shell fragments	CL													
		7			Medium stiff gray silty clay w/many shells & shell fragments	CL													
		8																	
80																			
90																			
100																			

Comments: Coordinates: North 507430.878, East 3703361.531
5-in diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -3.21 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/10/96 **Boring:** ALGW-8U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Stiff dark gray clay w/roots & organic matter	CH													
					Medium stiff gray & tan clay w/organic matter, roots, & humus	CH													
10																			
					Soft gray clay w/silt layers & lenses	CH													
							4C	14.4	49	73	108	UU	0	296	56	20	36		
					Medium stiff gray clay w/silt pockets, trace of concretions, & trace of decayed wood	CH	5B	17.5	89	49	93				118	26	92		CONS
20					Loose gray silty sand	SM													
					Medium stiff gray clay w/clayey silt pockets	CH													
					Soft gray clay w/silt layers & lenses	CH	7C	26.5	55	68	106	UC	0	233	97	28	69		
							7D	26.8	75	56	98	UU		271					
30							8C	30.5	68	59	100	UC		270					
							9C	34.5	70	58	99	UC	0	323	76	23	53		
							9D	34.8	58	65	103	UU		327					
40							10D	38.7	65	62	102	UC		258					
							11C	42.0	66	60	100	UU	0	492	96	32	64		
							11D	42.7	58	66	104	UC		335					
					Very soft gray clay w/silt pockets	CH	12C	46.5	64	61	100	UC		158					
50																			

Comments: Coordinates: North 511549.059, East 3705397.981
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: -3.21 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 4/10/96 **Boring:** ALGW-8U **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Very soft gray clay w/silt pockets	CH	13C	50.5	58	65	103	UC		252	85	27	58		
					Soft dark gray clay	CH	13D	50.8	57	66	104	UU	0	550					
							14C	54.5	56	66	103	UC		441					
					Medium stiff gray clay w/silty sand layers & lenses	CH	15B	57.4	58	65	103	UU	0	655	84	27	57		
60		13			Medium dense gray clayey sand	SC													
		8																	
					Loose gray clayey sand w/clay layers & shell fragments	SC													
					Medium stiff gray clay w/silt layers & pockets, & shell fragments	CH	18C	66.1	59	64	103	UU	0	798	94	29	65		
70																			
					Loose gray sandy silt w/shell fragments	ML													
					Medium stiff gray sandy clay w/clay layers & lenses, & shell fragments	CL	20C	73.8	37	82	112	UU	0	604	38	17	21		
		9			Loose gray sandy silt w/shell fragments & clay layers	ML													
		7																	
		3			Soft gray clay w/clayey sand layers & shell fragments	CH													
80																			
90																			
100																			

Comments: Coordinates: North 511549.059, East 3705397.981
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.36 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/25/96 **Boring:** ALGW-9U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Very stiff gray clay w/roots & grass	CH													
					Stiff gray & tan clay w/roots & organic matter	CH													
					Medium sitff gray & tan clay w/roots & organic matter	CH													
					Soft brown organic clay w/silt layers & lenses, & roots	OH	2C	5.8	91	45	87	UU	0	465	104	34	70		
10					Compact gray clayey silt w/clay layers & silty sand pockets	ML													
					Medium stiff gray & dark gray clay w/silty sand pockets	CH													
					Medium stiff gray clay w/organic matter & humus	CH	5B	17.2	55	65	101	UU	0	590	110	36	74		
20																			
					Soft gray clay w/silt layers & lenses, & trace of organic matter	CH	7B	25.5	63	62	103	UU	0	318	86	24	62		
							7C	26.5	65	61	101	UC		337					
30																			
							9C	34.1	62	62	101	UU	0	419	88	25	63		
							10C	37.9	65	61	101	UC		273	83	25	58		CONS
40							10C	38.5	72	58	99								
							11C	42.5	59	65	103	UC	0	298	94	27	67		
							11D	42.8	66	60	101	UU		416					
							12C	46.5	76	55	97	UC		295					
50																			

Comments: Coordinates: North 515626.413, East 3709614.241
5-in. diameter samples

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

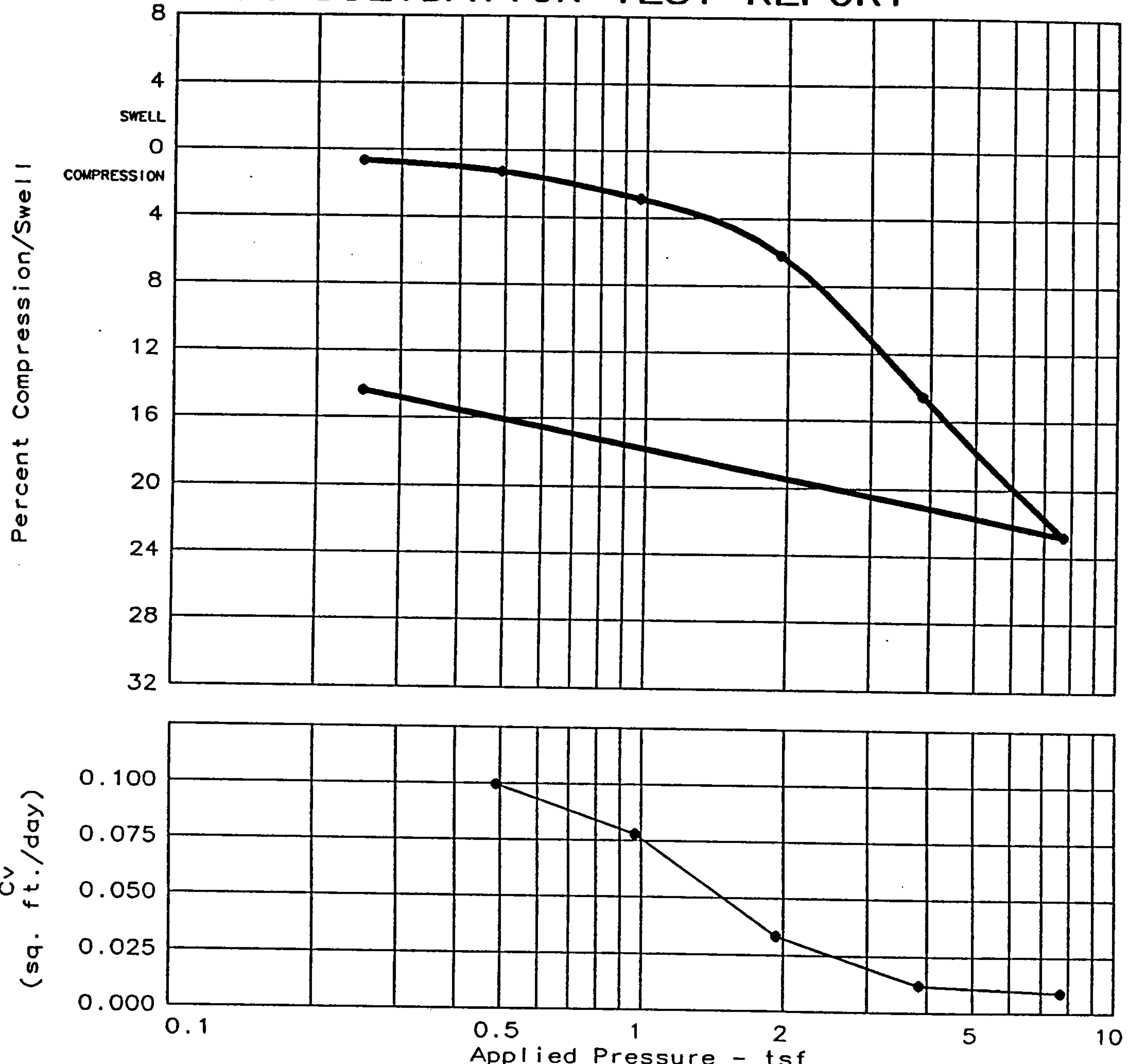
U.S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

Ground Elev.: 6.36 **Datum:** NGVD **Gr. Water Depth:** See Text **Job No.:** 14638 **Date Drilled:** 3/25/96 **Boring:** ALGW-9U **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Soft gray clay w/silt layers & lenses, & trace of organic matter	CH	13C	50.5	63	63	102	UC	0	341	89	23	66		
							13D	50.8	62	62	102	UU		379					
							14C	54.5	65	61	101	UC		435					
60					Medium stiff gray clay	CH	15C	58.5	66	61	100	UC	0	576	82	23	59		
							15D	58.8	62	62	103	UU		562					
		18			Medium dense gray silty sand w/clay layers & shell fragments	SM													
		7			Loose gray silty sand w/clay layers	SM													
70		8			Medium stiff gray sandy clay w/clay layers & shell fragments	CL													
					Soft gray clay w/shell fragments	CH	21C	74.5	31						29	23	6		
					Medium stiff gray clay w/shell fragments	CH	22C	77.9	29	94	121	UU	0	856	32	20	12		
80					Soft gray clay w/shell fragments	CH	22C	78.5	30						56	22	34		
					Stiff gray clay w/clayey sand & clayey sand pockets, & shell fragments	CH													
90																			
100																			

Comments: Coordinates: North 515626.413, East 3709614.241
5-in. diameter samples

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.8 %	58.8	65.4	83	58	2.740	1.92	0.78	1.6144

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.78	M Gr CH4 w/ lns, ars ML & ars SM
	Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-1U, Sample 27-D
Depth 75.8'
Date: 7-18-96

Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

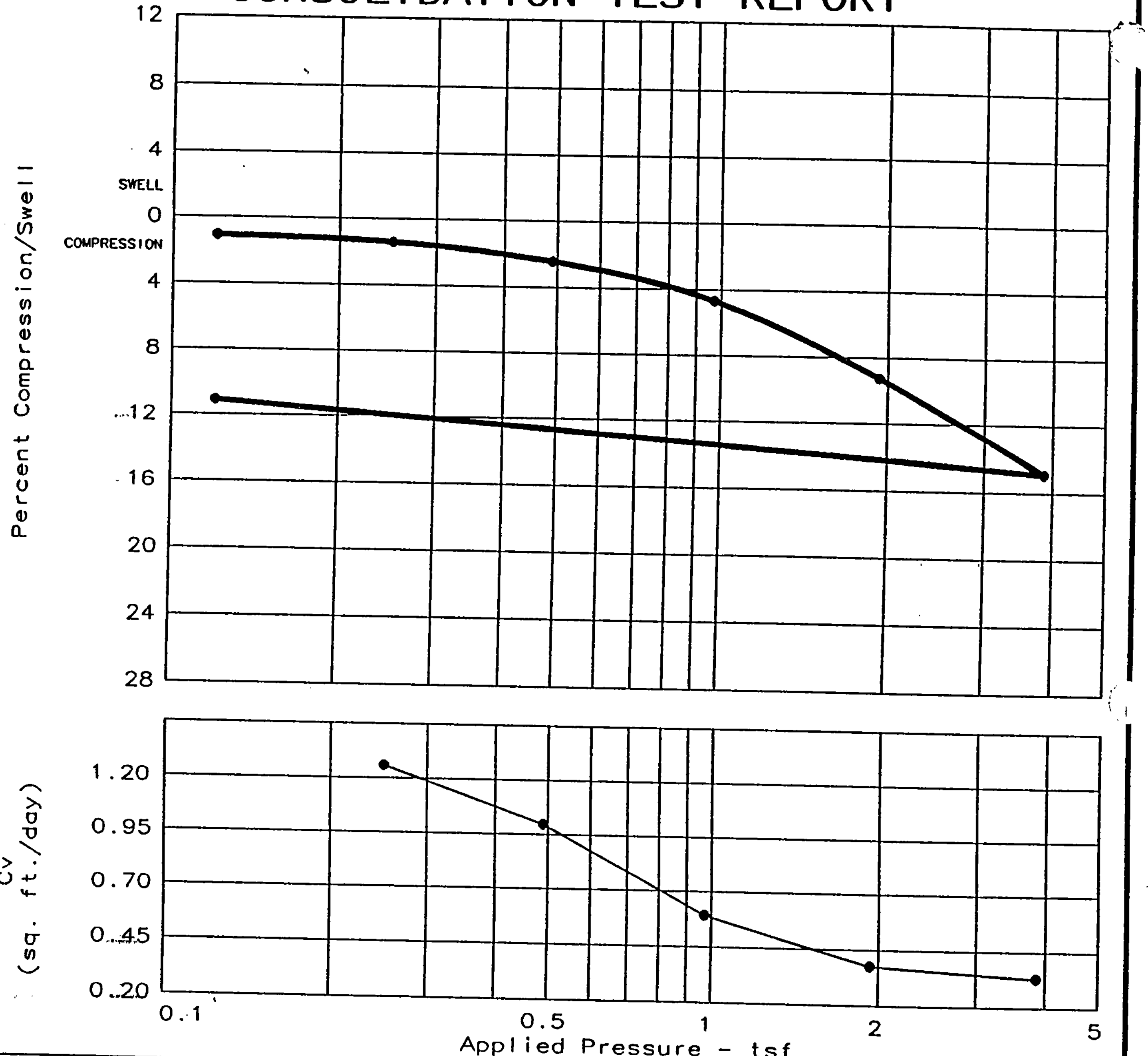
CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE

Fig. No. ______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
98.1 %	48.0	72.9	71	49	2.720	1.11	0.43	1.3308

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.43	M Gr CH3 w/ lns, lyr ML & lns, lyr SP Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-2U, Sample 6-C
Depth 22.0'
Date: 7-18-96

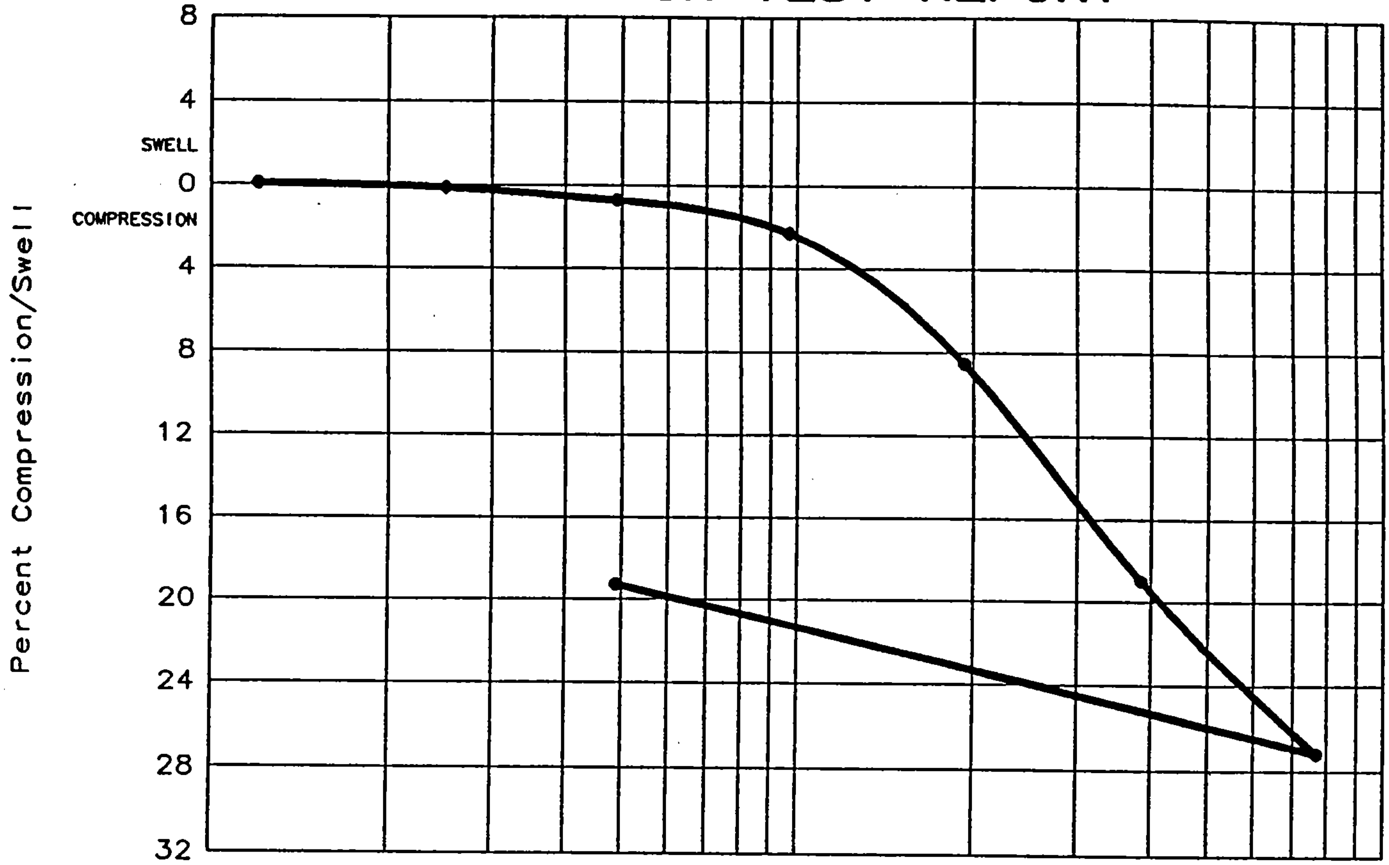
CONSOLIDATION TEST REPORT

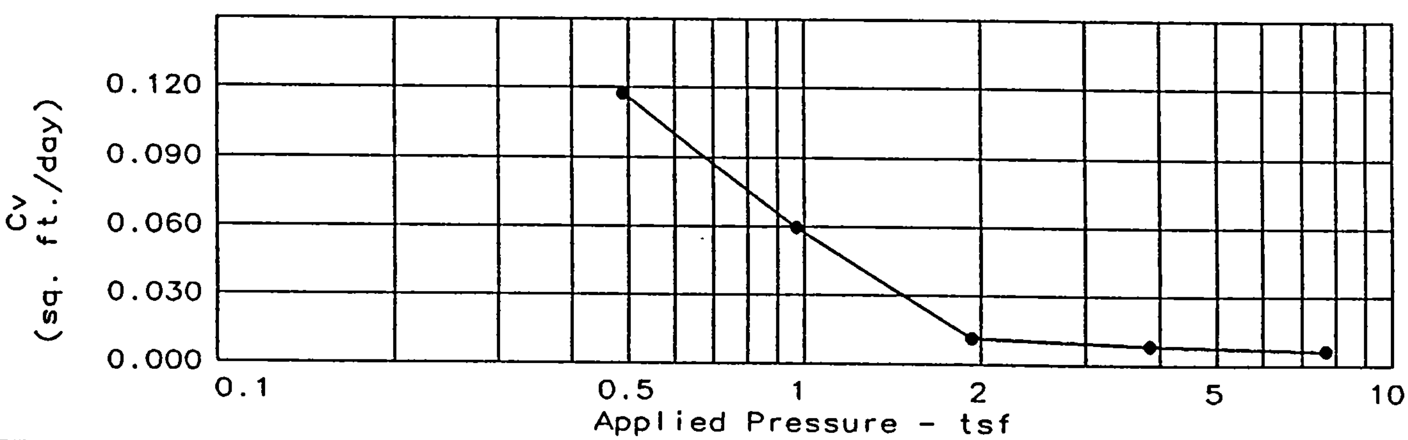
EUSTIS ENGINEERING COMPANY, INC.

Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

Tested by RNE
Fig. No. ______

CONSOLIDATION TEST REPORT





Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
100.8 %	67.5	60.5	93	67	2.750	1.45	1.01	1.8398

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 1.01	M Gr CH4 w/ Ins ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-3U, Sample 13-C
Depth 46.1'
Date: 7-30-96

Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

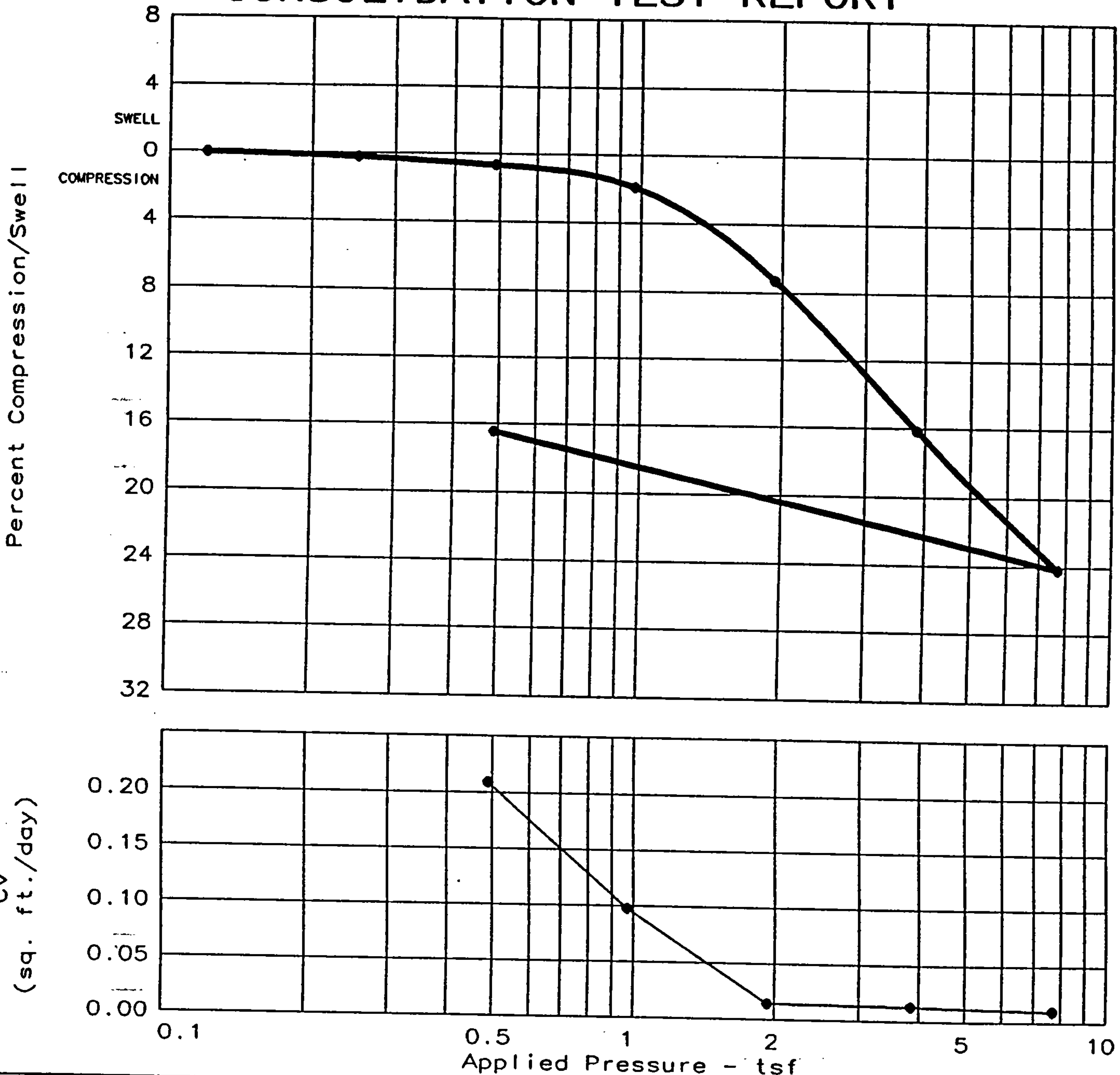
CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE

Fig. No.______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
100.6 %	64.0	62.4	86	53	2.750	1.40	0.80	1.7509

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.80	M Gr CH4 w/ Ins, lyr ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-4U, Sample 17-C
Depth 57.5'
Date: 7-30-96

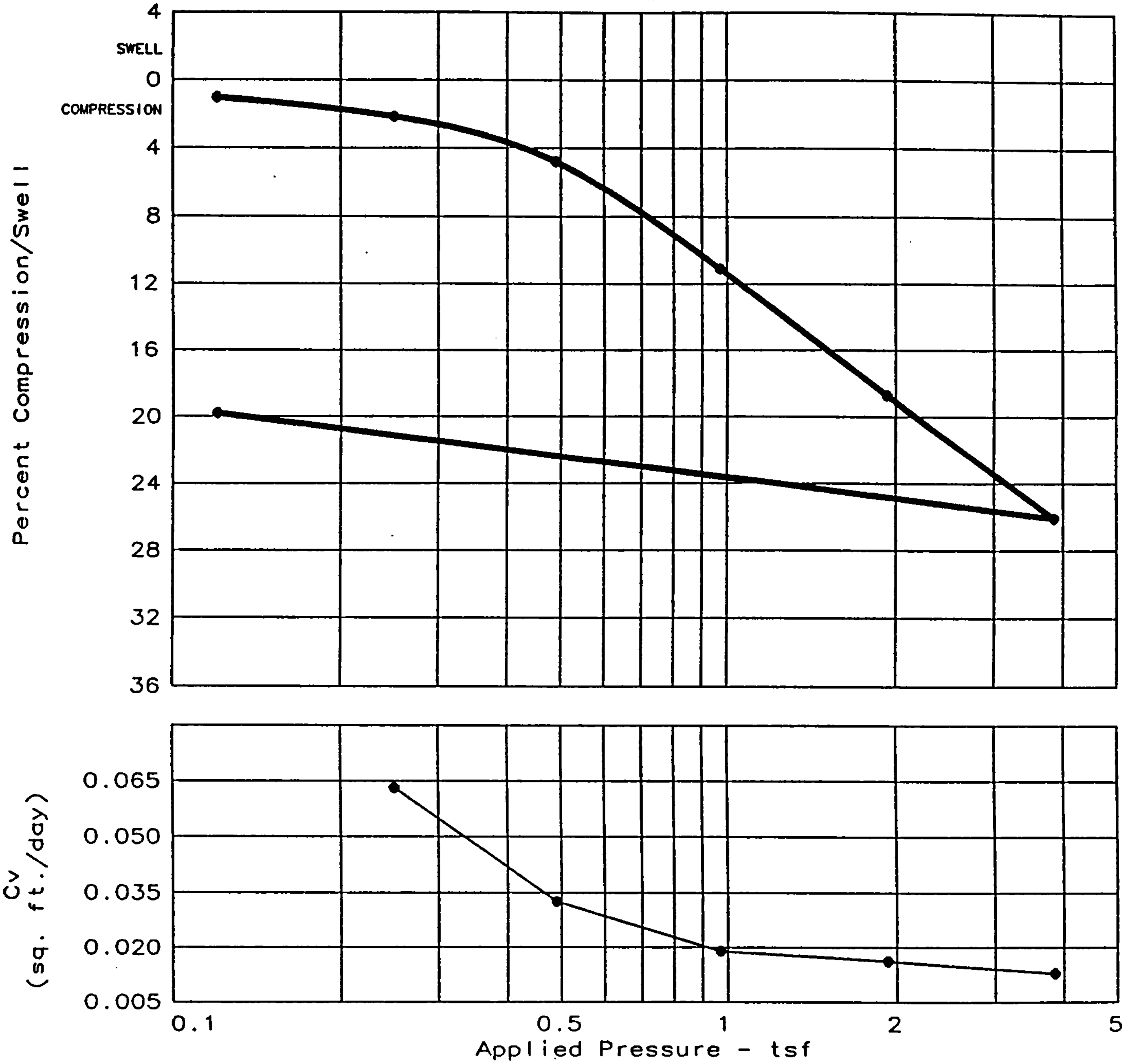
Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE
Fig. No. ______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
97.1 %	69.8	57.7	88	62	2.750	0.55	0.76	1.9749

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.76	So Gr CH4 w/ Ins, ars ML & tr dec wd Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-5U, Sample 6-C
Depth 21.3'
Date: 7-30-96

CONSOLIDATION TEST REPORT

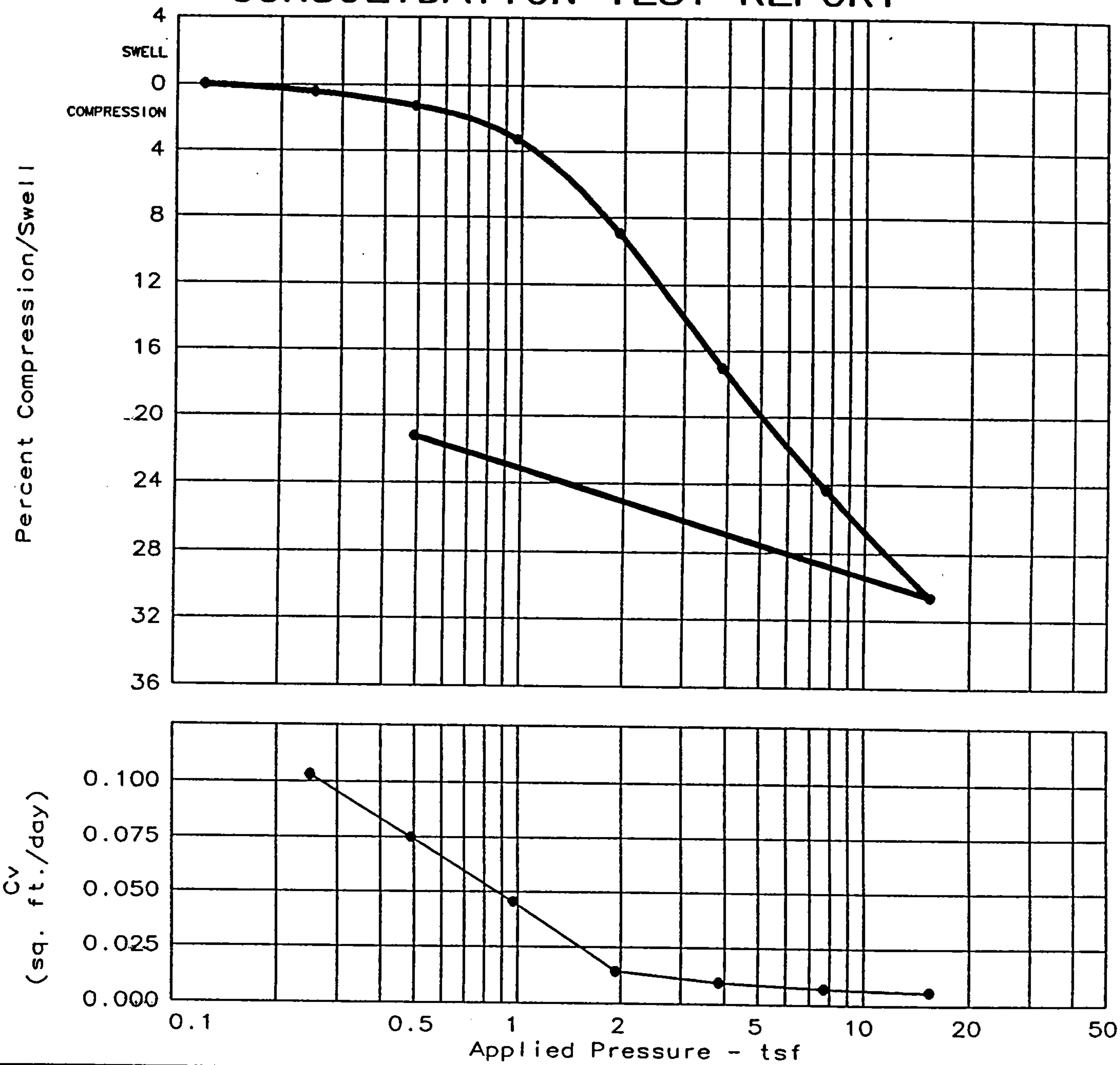
EUSTIS ENGINEERING COMPANY, INC.

Remarks:

Water table = N/A
Contract No.
DACW29-95-D-0012

Tested by RNE
Fig. No.______

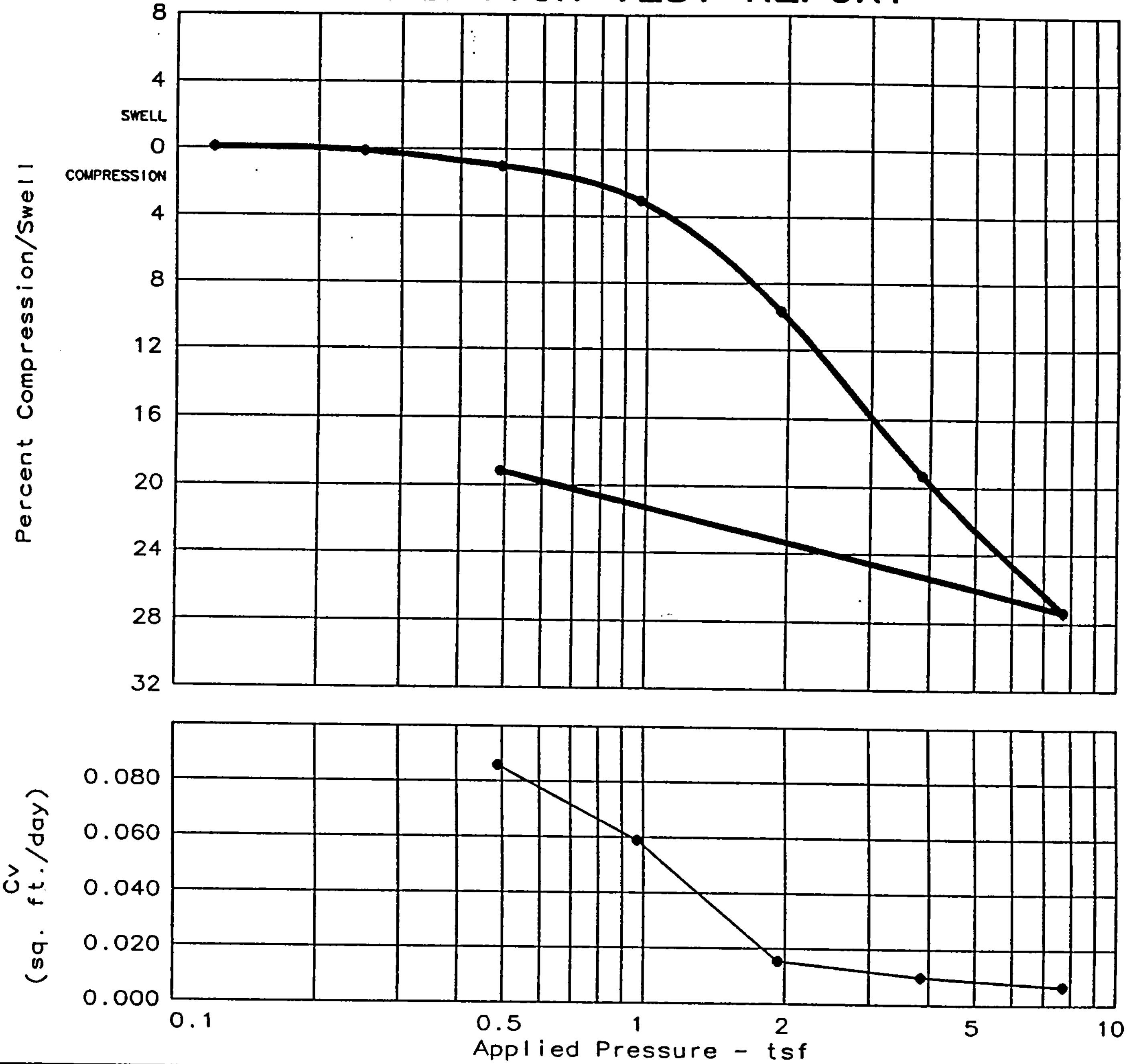
CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.4 %	58.3	65.7	92	65	2.750	1.19	0.69	1.6130

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.69	M Gr CH4 w/ lns, ars ML Class: CH
Project No.: 13622 Project: Algiers Levees Location: Boring ALGW-6U, Sample 17-C Depth 45.9' Date: 7-30-96	Remarks: Water table = N/A Contract No. DACW29-95-D-0012
CONSOLIDATION TEST REPORT EUSTIS ENGINEERING COMPANY, INC.	Tested by RNE Fig. No._____

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
100.6 %	64.2	62.3	91	60	2.750	1.29	0.88	1.7538

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.88	So Gr CH4 w/ lns, ars ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-7U, Sample 17-C
Depth 57.2'
Date: 7-30-96

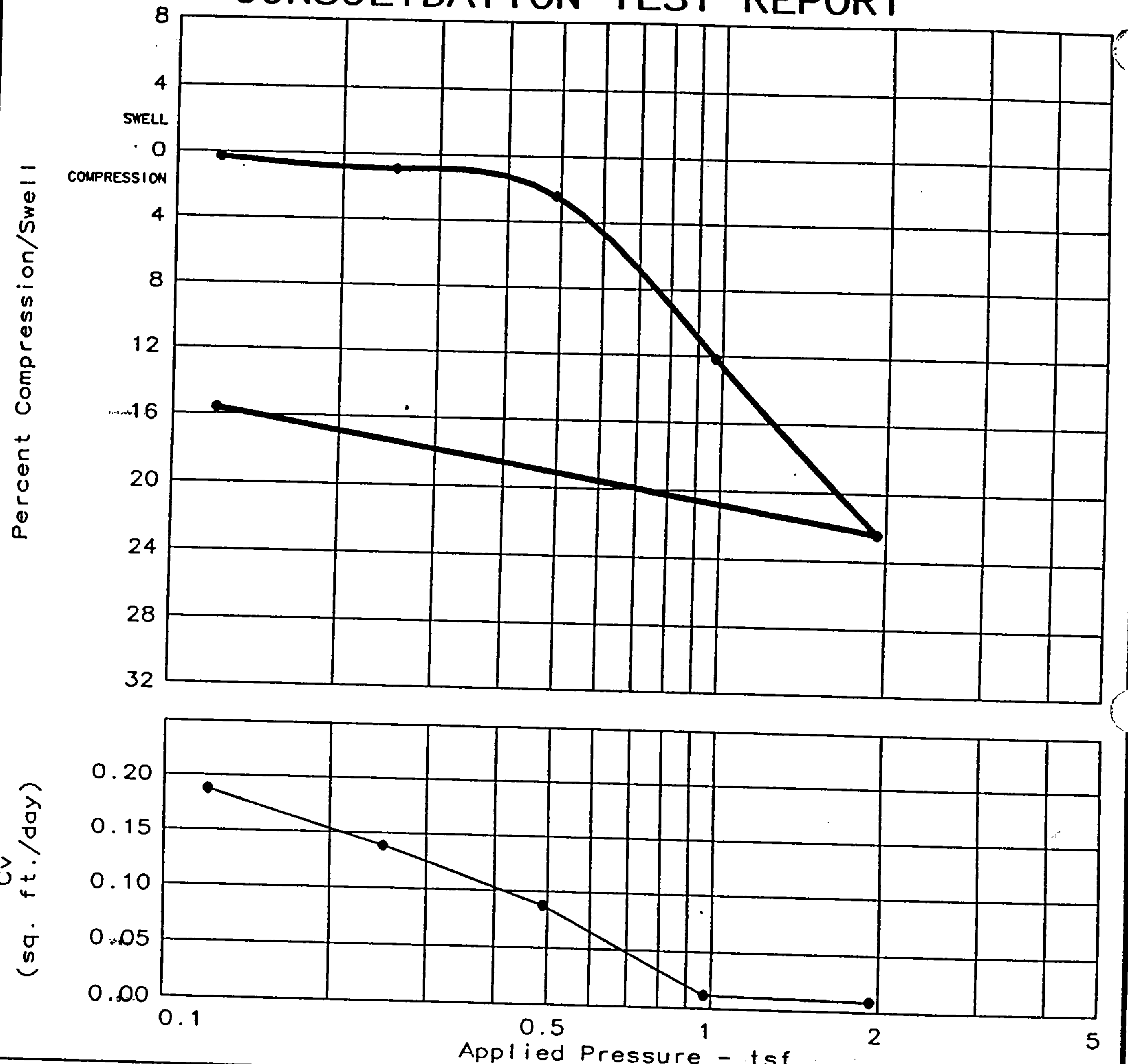
Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE
Fig. No._____

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
100.4 %	89.1	49.3	118	92	2.650	0.54	1.25	2.3530

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 1.25	M Gr CH4 w/ ars ML & tr conc & tr dec wd Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-8U, Sample 5-B
Depth 17.5'
Date: 7-30-96

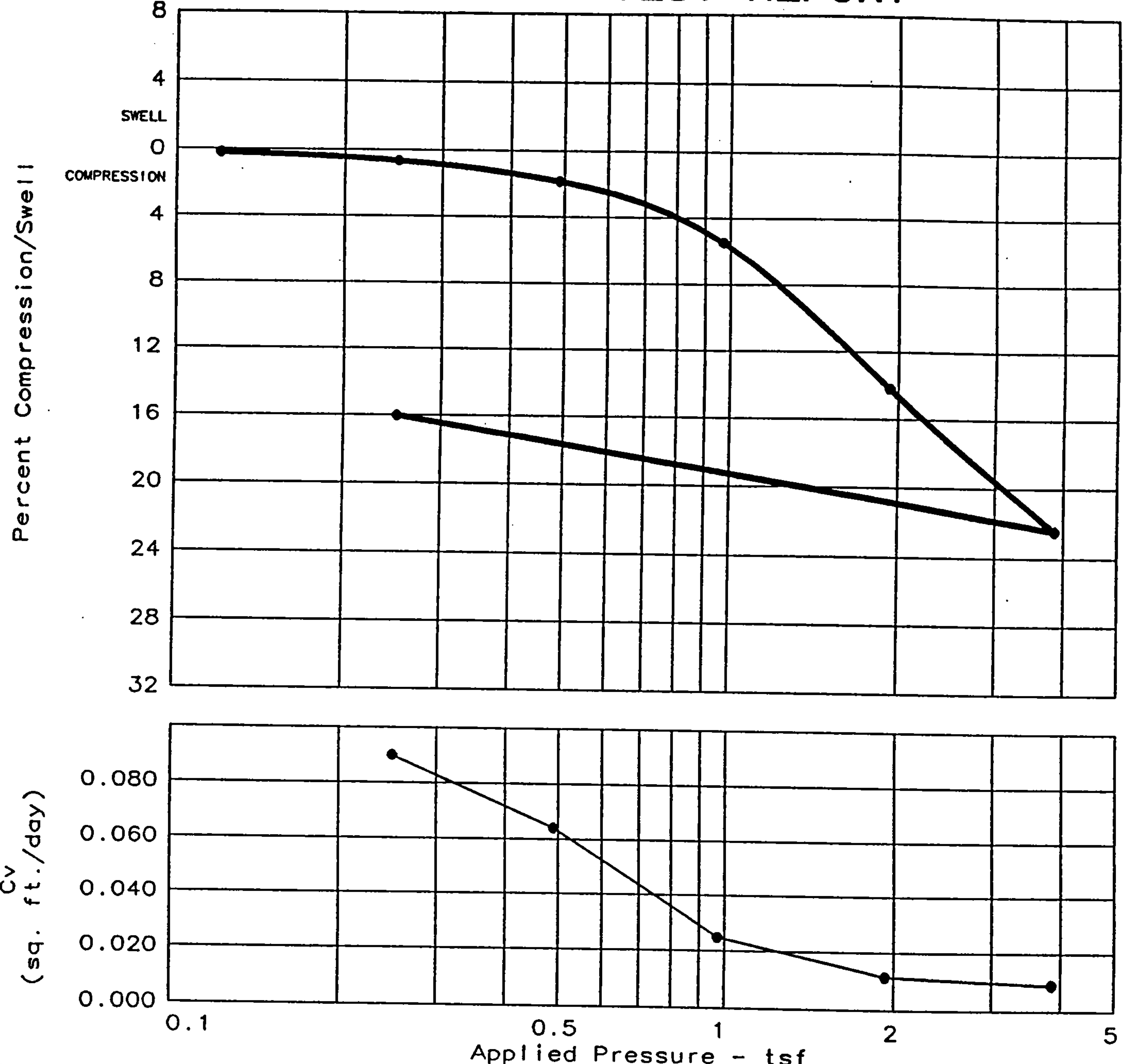
Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE
Fig. No. ______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.8 %	64.9	61.5	83	58	2.740	1.00	0.86	1.7834

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.86	So Gr CH3 w/ lyr, lns ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGW-9U, Sample 10-C
Depth 37.9'
Date: 7-30-96

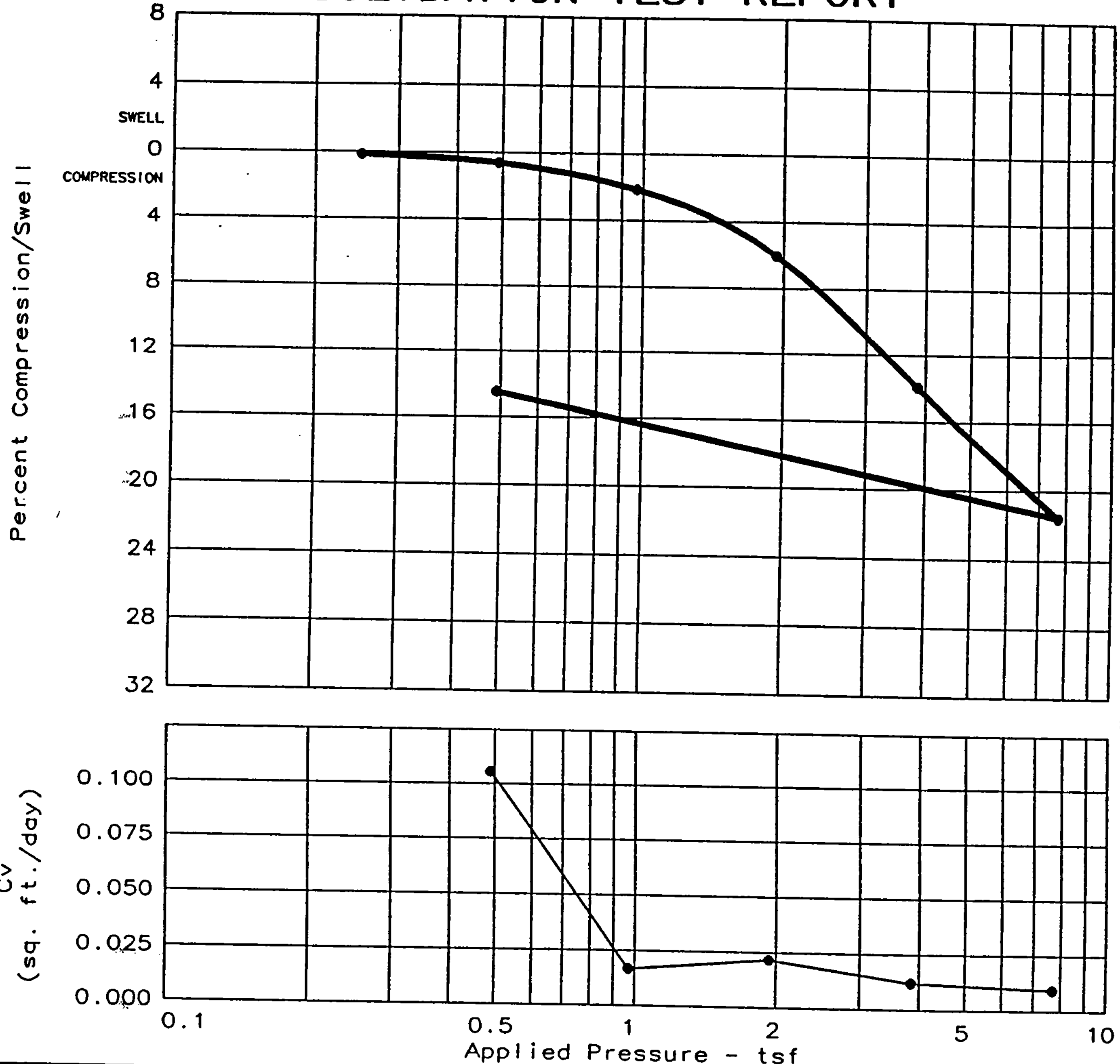
Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

Tested by RNE
Fig. No. ______

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.4 %	56.2	67.1	88	61	2.740	1.73	0.70	1.5496

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.70	M Gr CH4 w/ ars & lyr ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-1U, Sample 18-D
Depth 63.8'
Date: 8-23-96

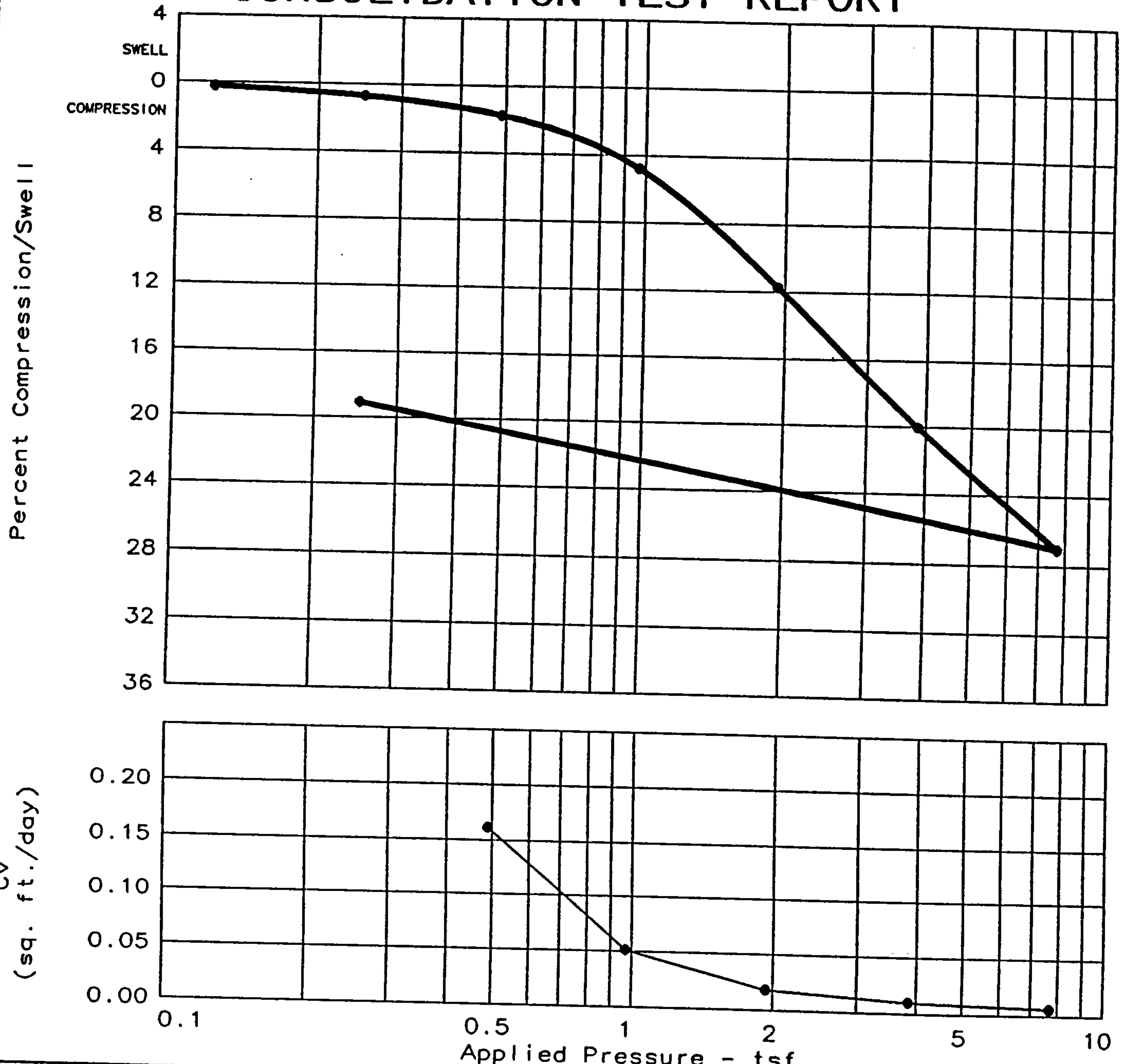
Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE & RET
Fig. No. ______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.2 %	58.1	65.7	77	58	2.740	1.05	0.72	1.6044

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.72	So Gr CH4 w/ lns & ars ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-2U, Sample 13-D
Depth 41.8'
Date: 8-23-96

Remarks:
Water table = N A
Contract No.
DACW29-95-D-0012

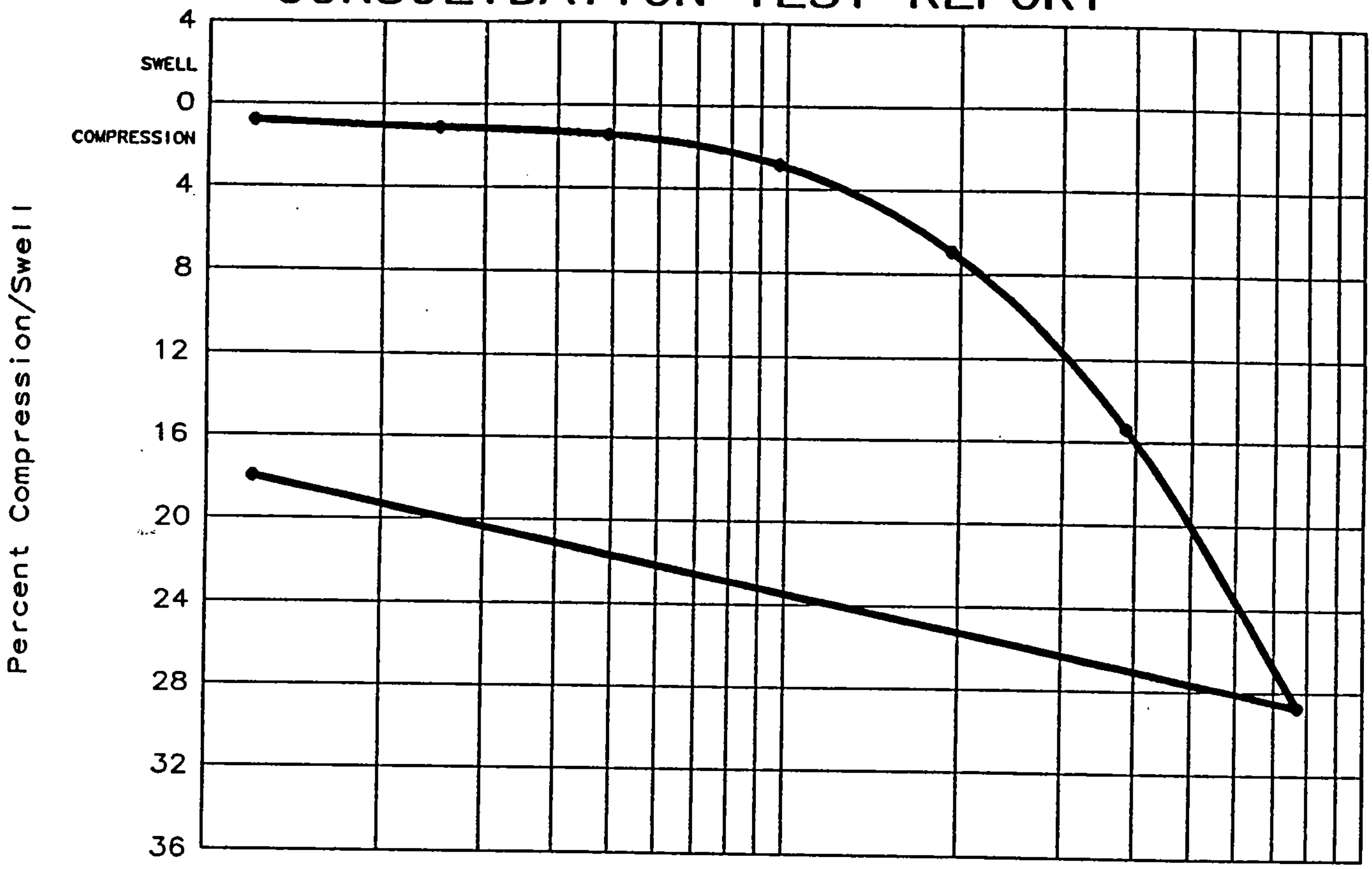
Tested by RNE & RET

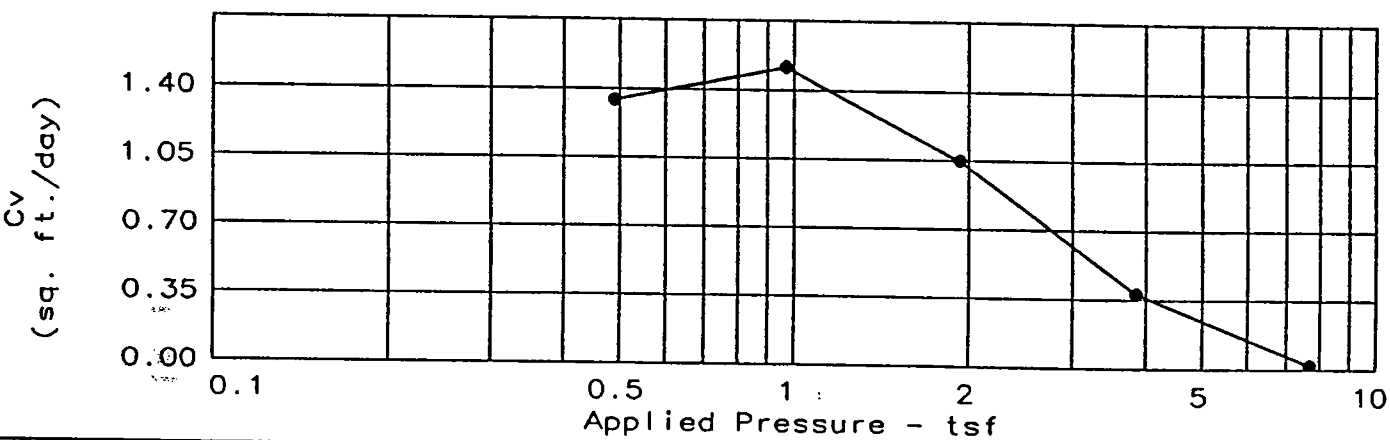
Fig. No.______

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

CONSOLIDATION TEST REPORT





Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
89.4 %	123.4	35.2	177	125	2.550	2.28	1.98	3.5209

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 1.98	M DGr & Bk CHOC w/ lyr & lns PT, ars CH Class: OH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-3U, Sample 6-B
Depth 17.1'
Date: 8-23-96

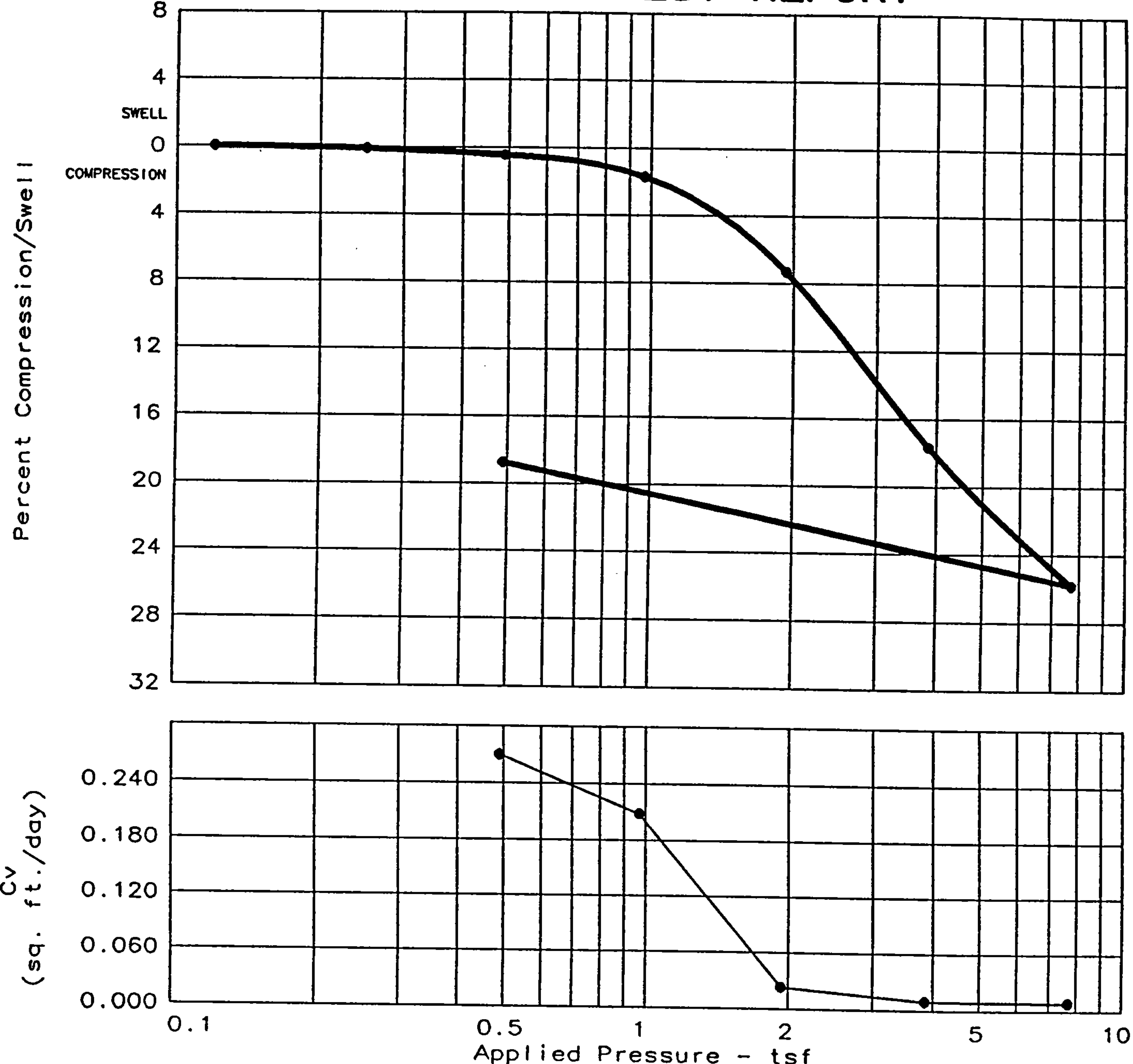
Remarks:
Water table = N A
Contract No.
DACW29-95-D-0012

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE & RET
Fig. No. ______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
100.6 %	65.5	61.4	89	56	2.740	1.52	0.95	1.7855

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.95	M Gr CH4 w/ Ins & lyr ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-4U, Sample 17-B
Depth 61.5'
Date: 8-23-96

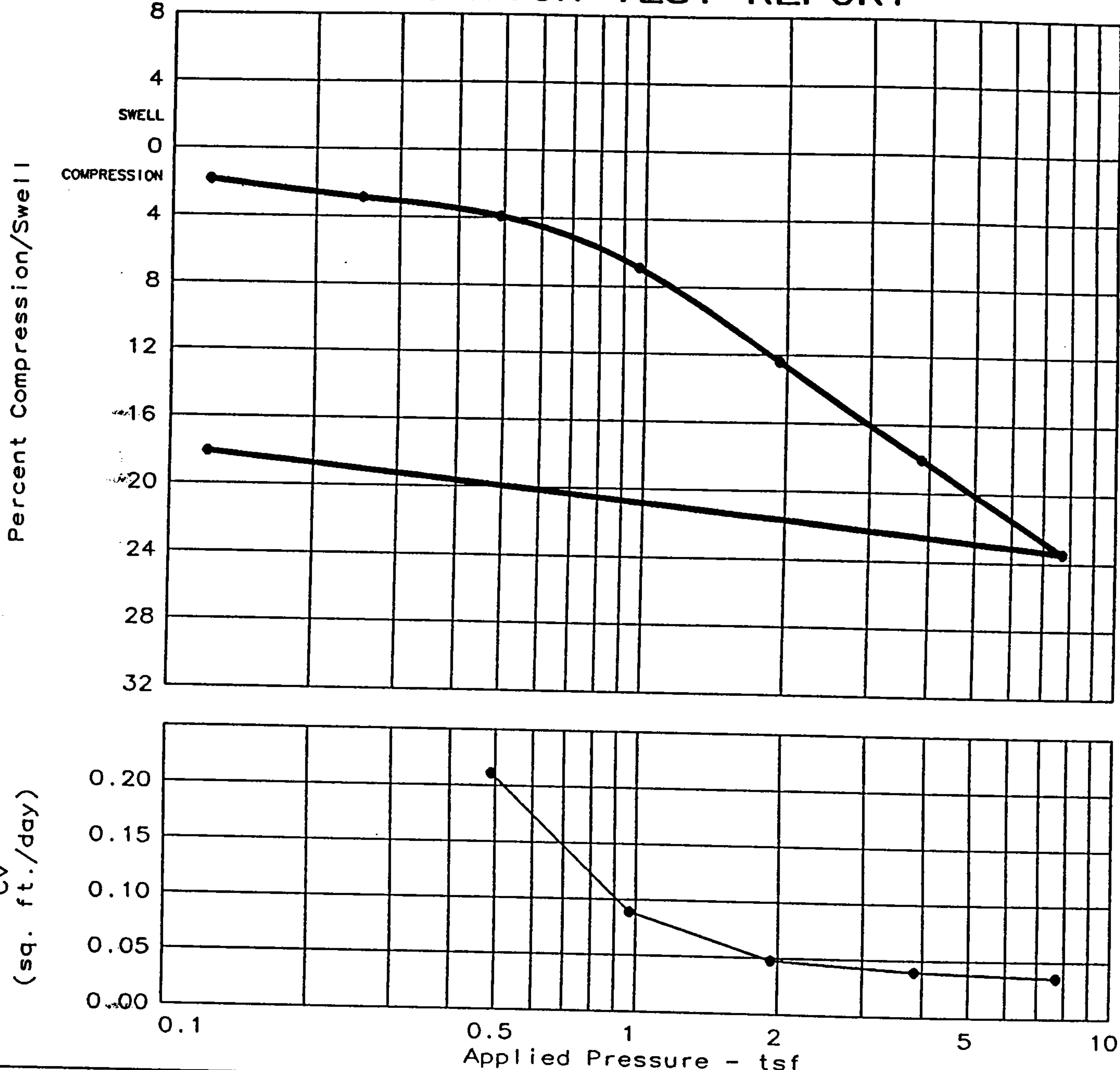
Remarks:
Water table = N A
Contract No.
DACW29-95-D-0012

Tested by RNE & RET
Fig. No. ______

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
98.2 %	47.4	73.2	50	31	2.700	0.94	0.43	1.3036

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.43	So Gr CH2 w/ lns & lyr ML Class: CL

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-5U, Sample 12-C
Depth 39.9'
Date: 8-23-96

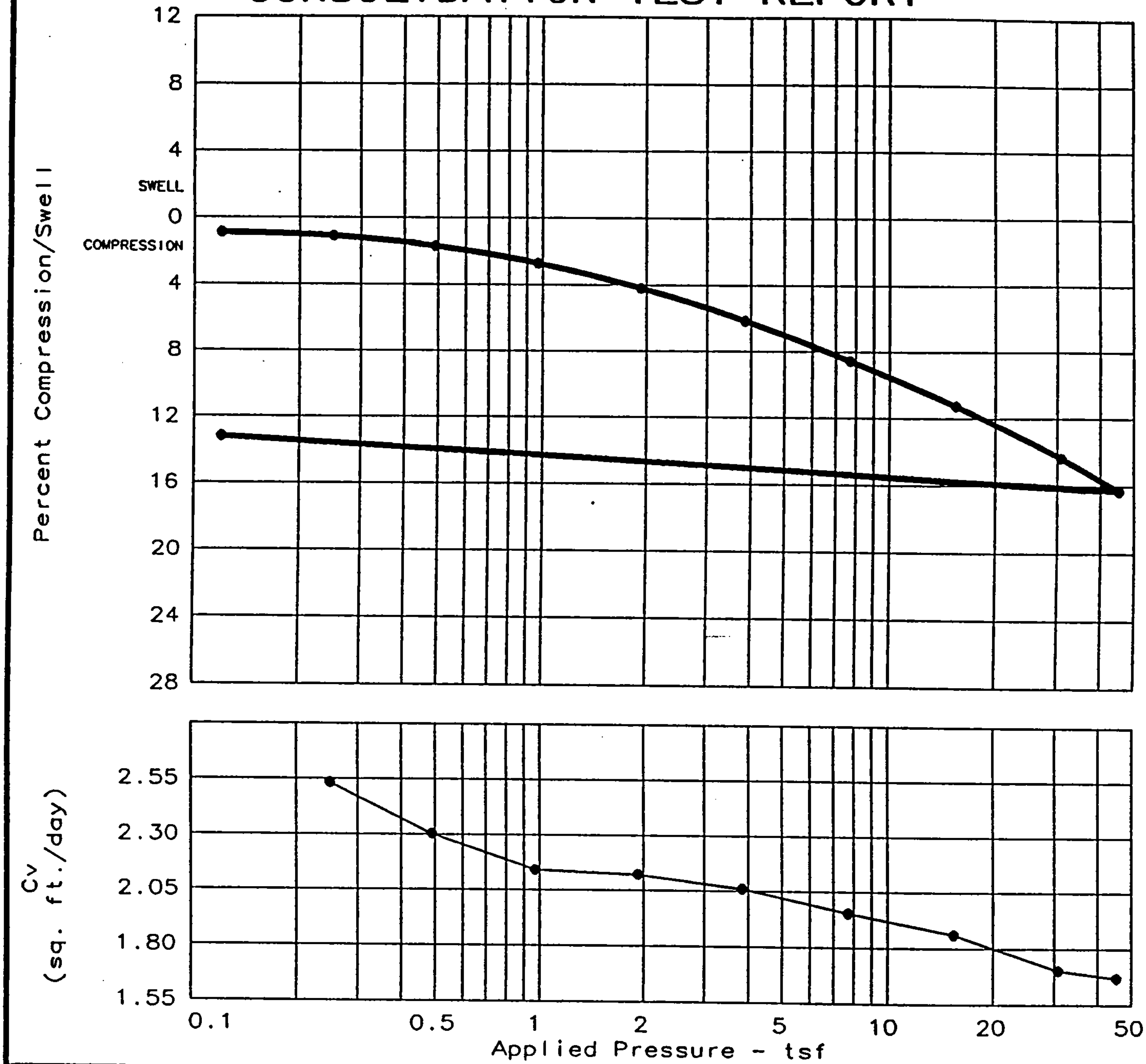
Remarks:
Water table = N A
Contract No.
DACW29-95-D-0012

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE & RET
Fig. No. ______

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
95.6 %	34.7	85.1	36	13	2.700	2.85	0.20	0.9799

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.20	So Gr CL4 w/ Ins, lyr ML & CH3 Class: CL

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-6U, Sample 5-B
Depth 16.7'
Date: 8-23-96

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

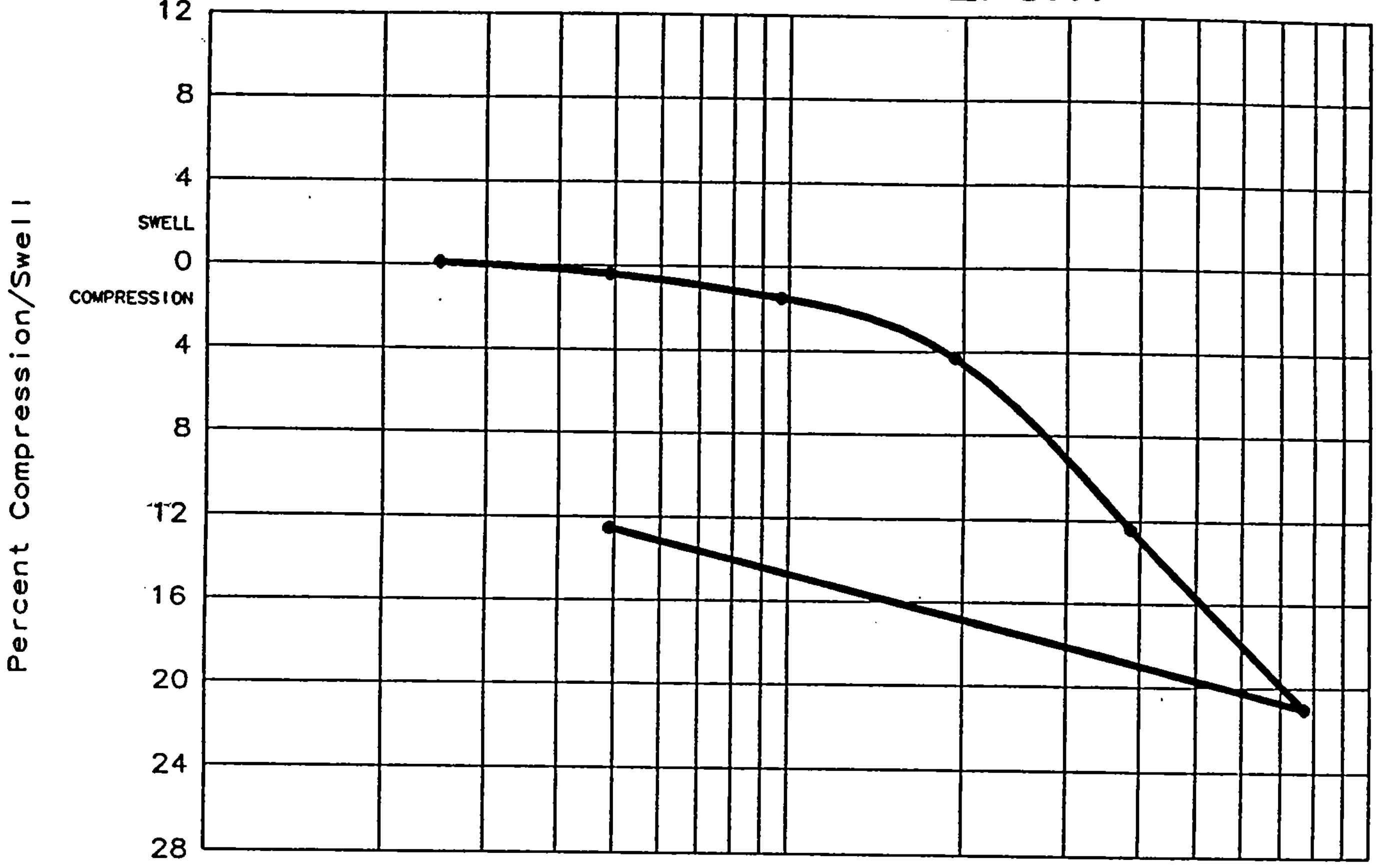
Remarks:

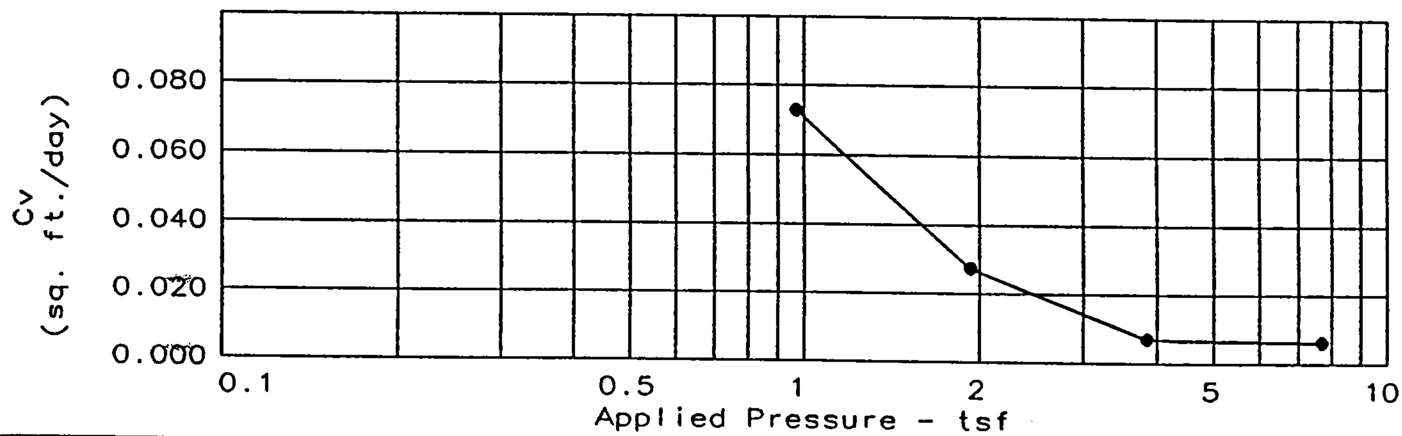
Water table = N A
Contract No.
DACW29-95-D-0012

Tested by RNE & RET

Fig. No. ______

CONSOLIDATION TEST REPORT





Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.2 %	57.7	66.0	94	66	2.750	1.97	0.77	1.6006

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.77	M Gr CH4 w/ ars & lns ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-7U, Sample 26-D
Depth 66.8'
Date: 8-23-96

Remarks:
Water table = N A
Contract No.
DACW29-95-D-0012

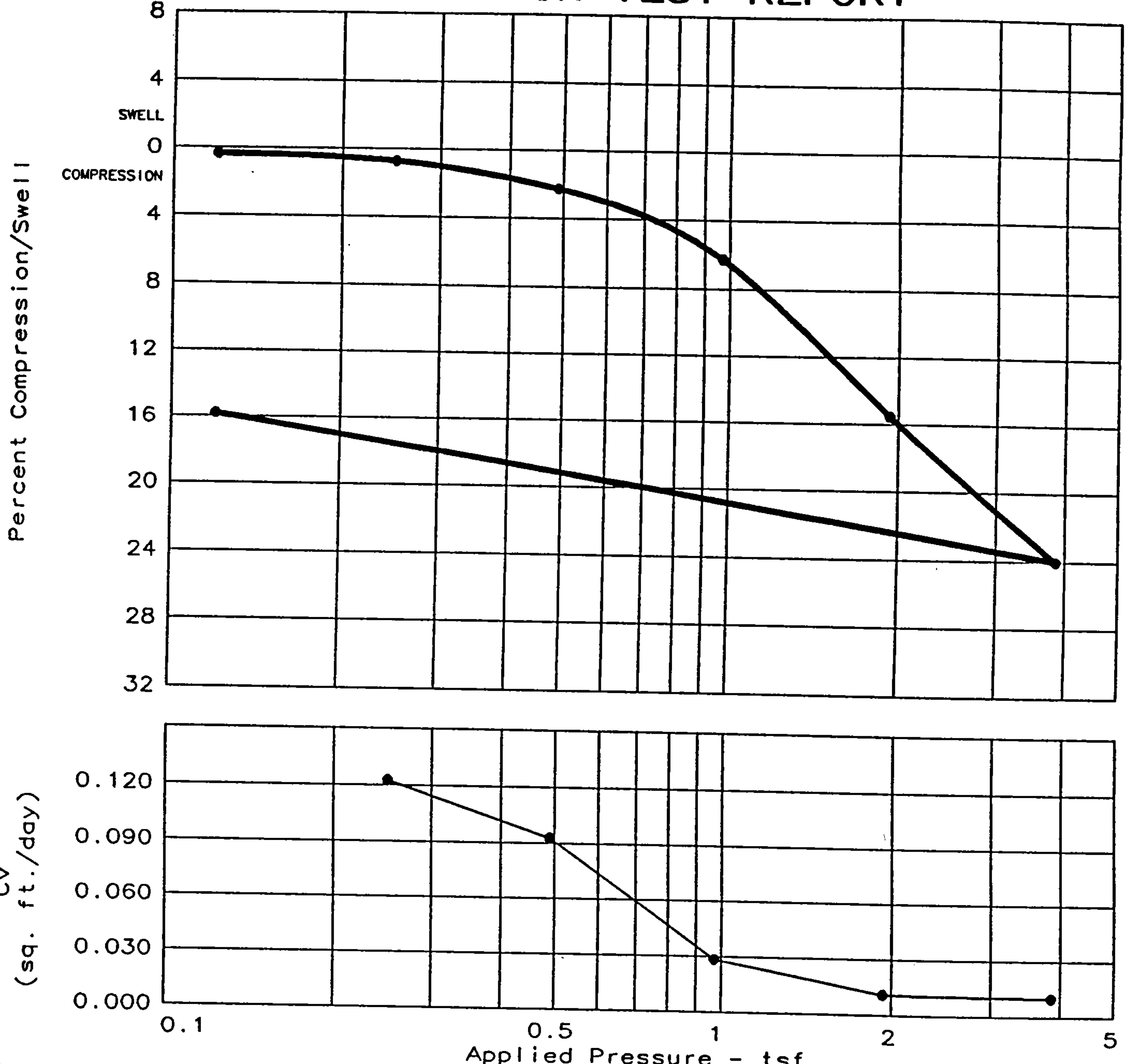
Tested by RNE & RET

CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Fig. No. ______

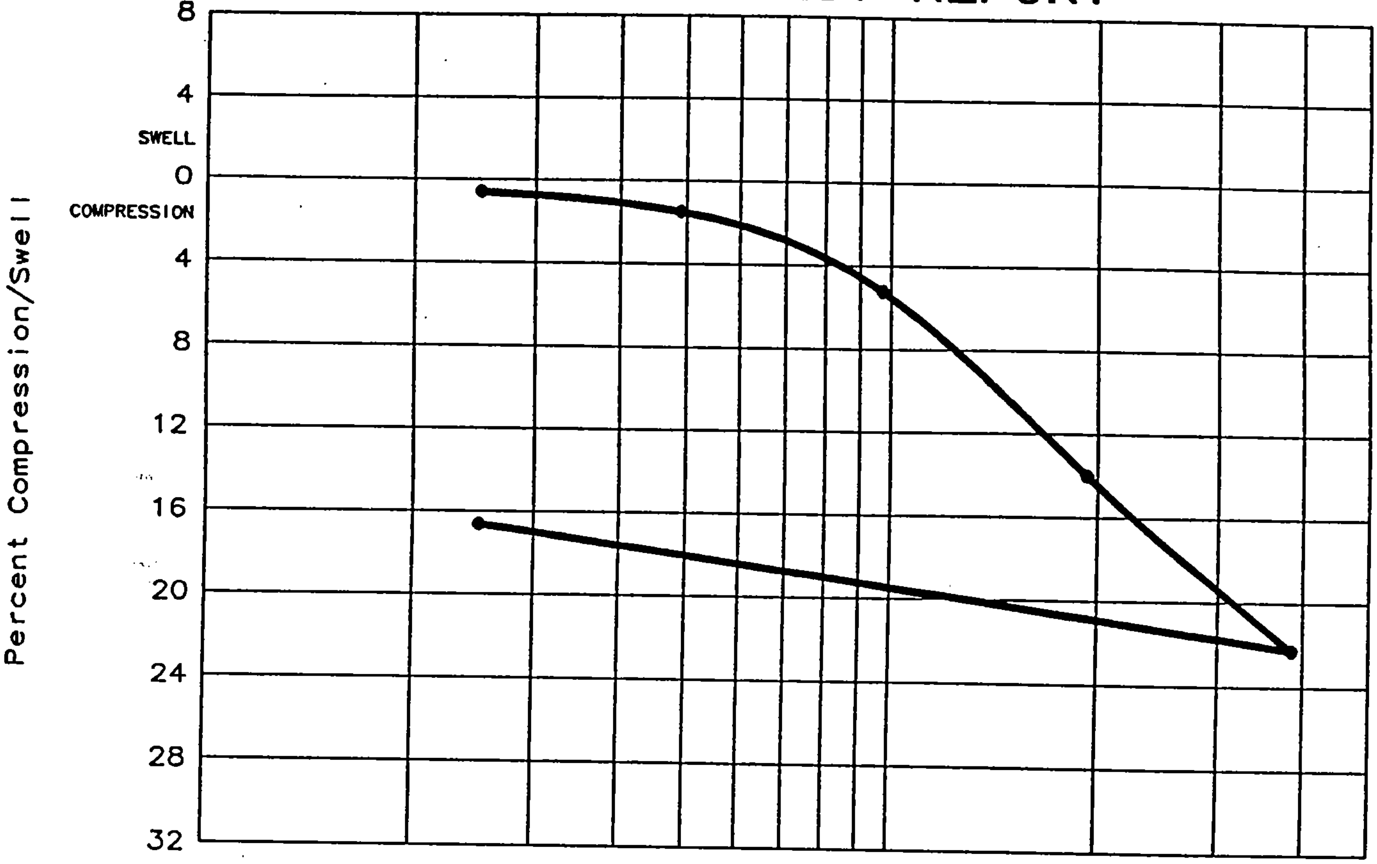
CONSOLIDATION TEST REPORT

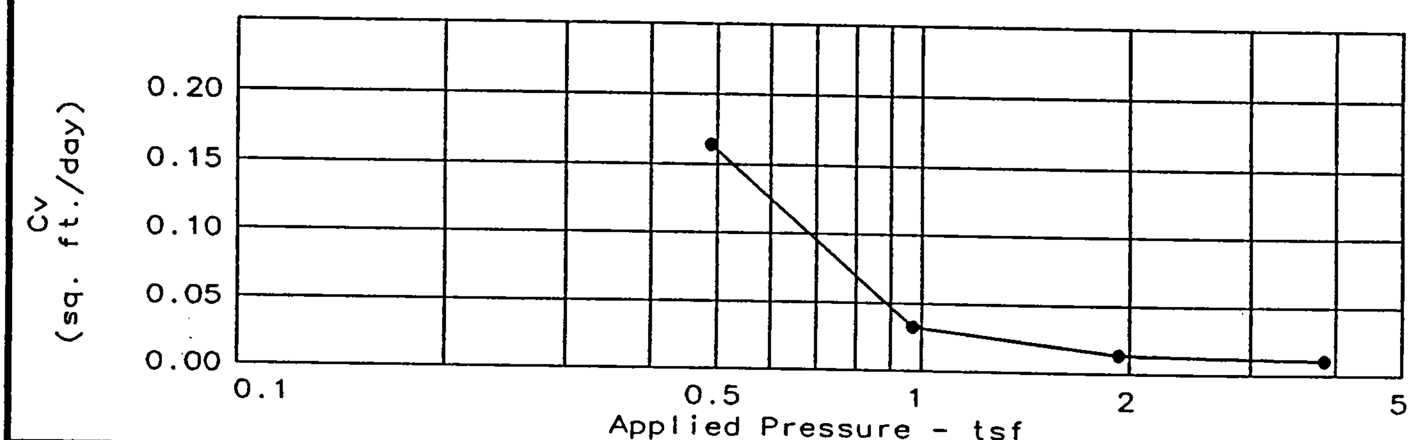


Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	Cc	eo
100.0 %	69.5	59.0	88	56	2.750	0.94	0.94	1.9117

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.94	M Gr CH4 w/ lns & lyr ML Class: CH
Project No.: 13622 Project: Algiers Levees Location: Boring ALGE-8U, Sample 11-D Depth 38.8' Date: 8-23-96	Remarks: Water table = N A Contract No. DACW29-95-D-0012
CONSOLIDATION TEST REPORT EUSTIS ENGINEERING COMPANY, INC.	Tested by RNE & RET Fig. No.______

CONSOLIDATION TEST REPORT





Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
91.8 %	59.4	61.8	81	55	2.750	0.93	0.85	1.7778

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.85	VSo Gr CH3 w/ lns & ars ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-9U, Sample 11-C
Depth 42.1'
Date: 8-23-96

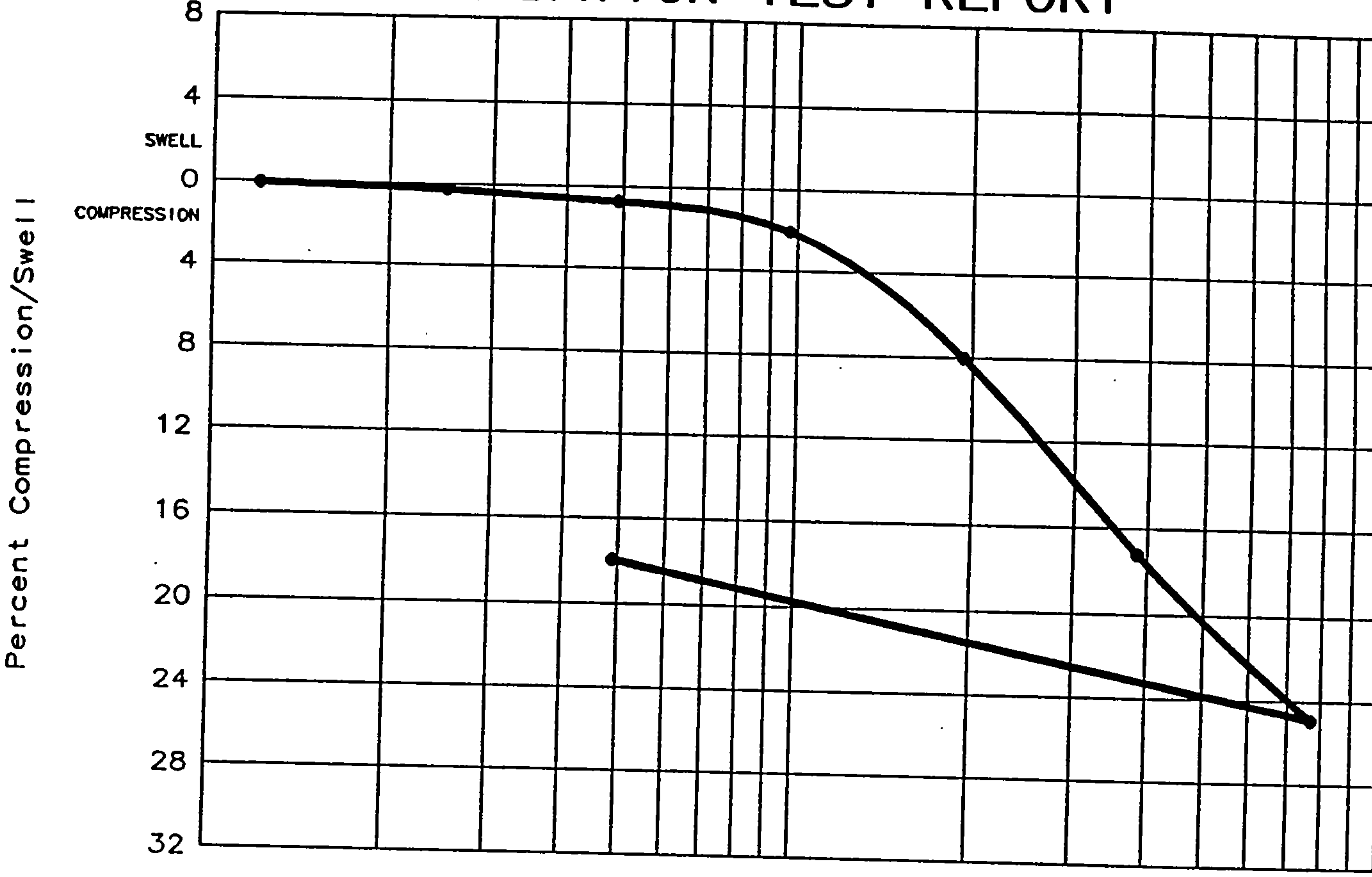
Remarks:
Water table = N/A
Contract No.
DACW29-95-D-0012

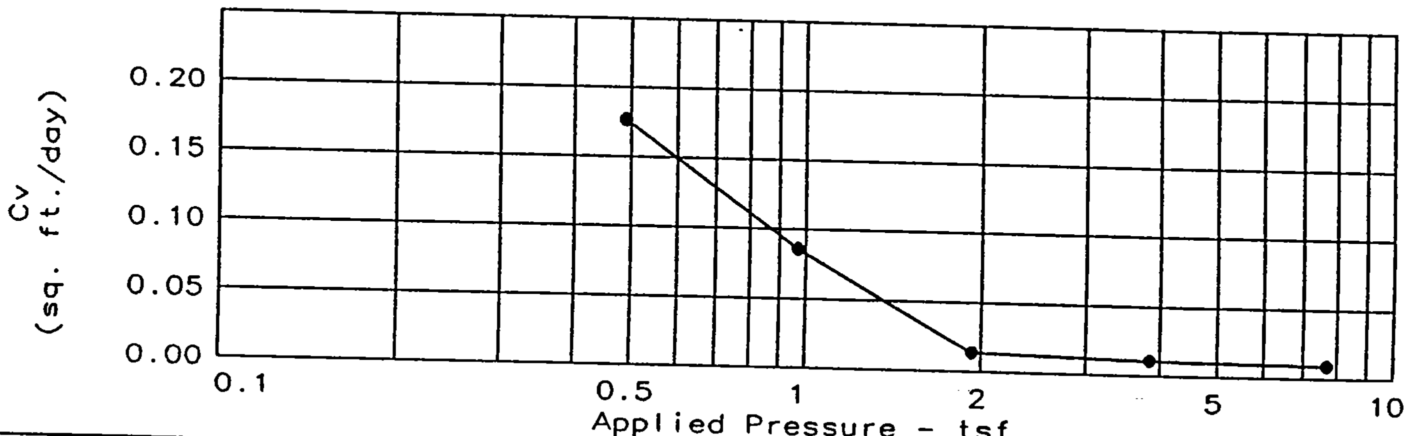
CONSOLIDATION TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Tested by RNE
Fig. No.______

CONSOLIDATION TEST REPORT





Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Precons. press.	C_c	e_o
99.8 %	62.9	62.8	87	59	2.750	1.31	0.82	1.7325

TEST RESULTS	MATERIAL DESCRIPTION
Compression Index = 0.82	So Gr CH4 w/ ars ML Class: CH

Project No.: 13622
Project: Algiers Levees
Location: Boring ALGE-10U, Sample 15-C
Depth 57.6'
Date: 8-23-96

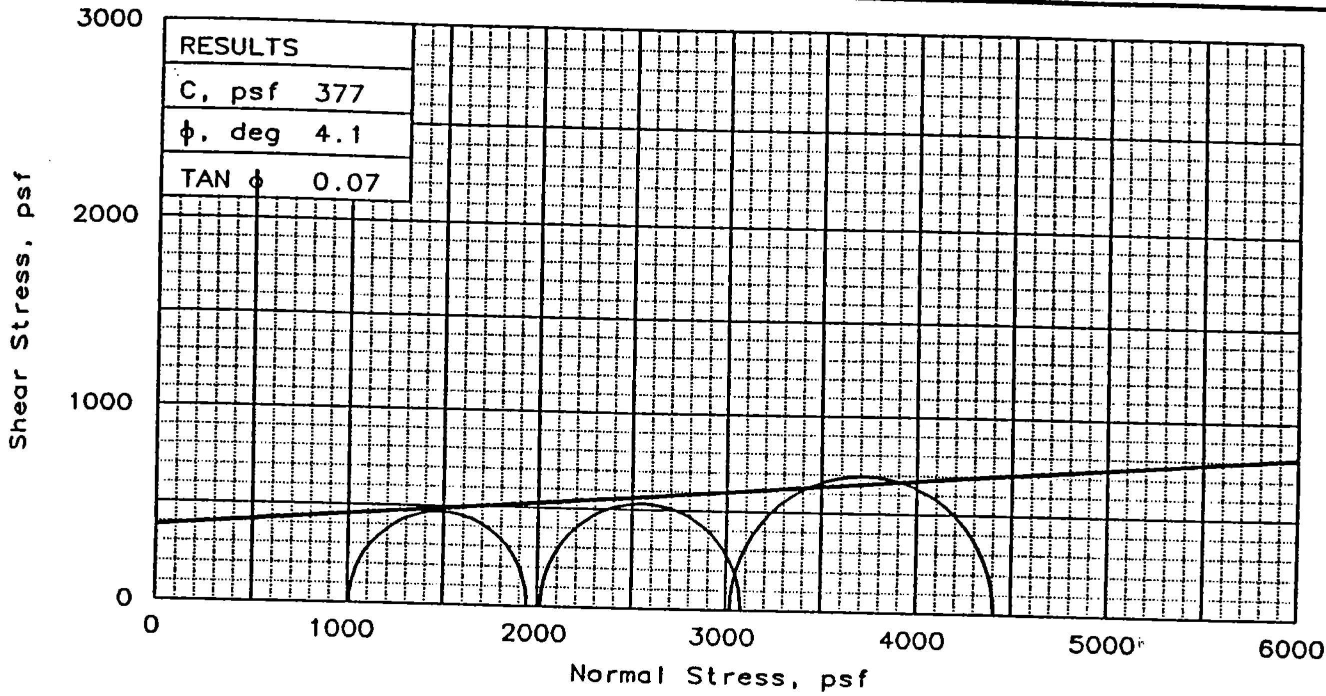
CONSOLIDATION TEST REPORT

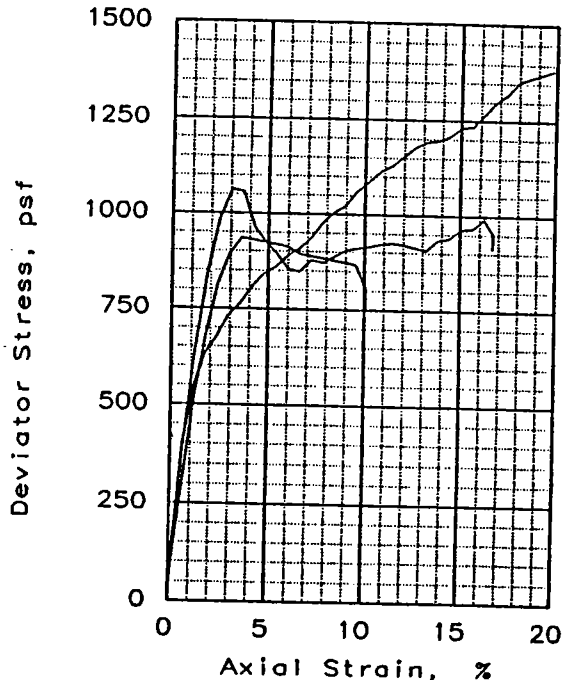
EUSTIS ENGINEERING COMPANY, INC.

Remarks:

Water table = N/A
Contract No.
DACW29-95-D-0012

Tested by RNE
Fig. No. ______





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	33.9	29.6	33.5
	DRY DENSITY, pcf	83.5	90.7	85.5
	SATURATION, %	90.8	94.1	94.2
	VOID RATIO	0.997	0.838	0.950
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	3.00	2.99	2.99
AT TEST	WATER CONTENT, %	37.7	31.4	35.5
	DRY DENSITY, pcf	83.0	90.7	85.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.007	0.838	0.948
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.99	2.99	2.99
Strain rate, in/min		0.0954	0.0996	0.0988
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		936	1063	1385
ULTIMATE STRESS, psf		749	914	1385
σ_1 FAILURE, psf		1944	3079	4409
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CL4
w/ lns & ors ML
LL= 33 PL= 19 PI= 14
SPECIFIC GRAVITY= 2.67
REMARKS:

FIG. NO.: ______

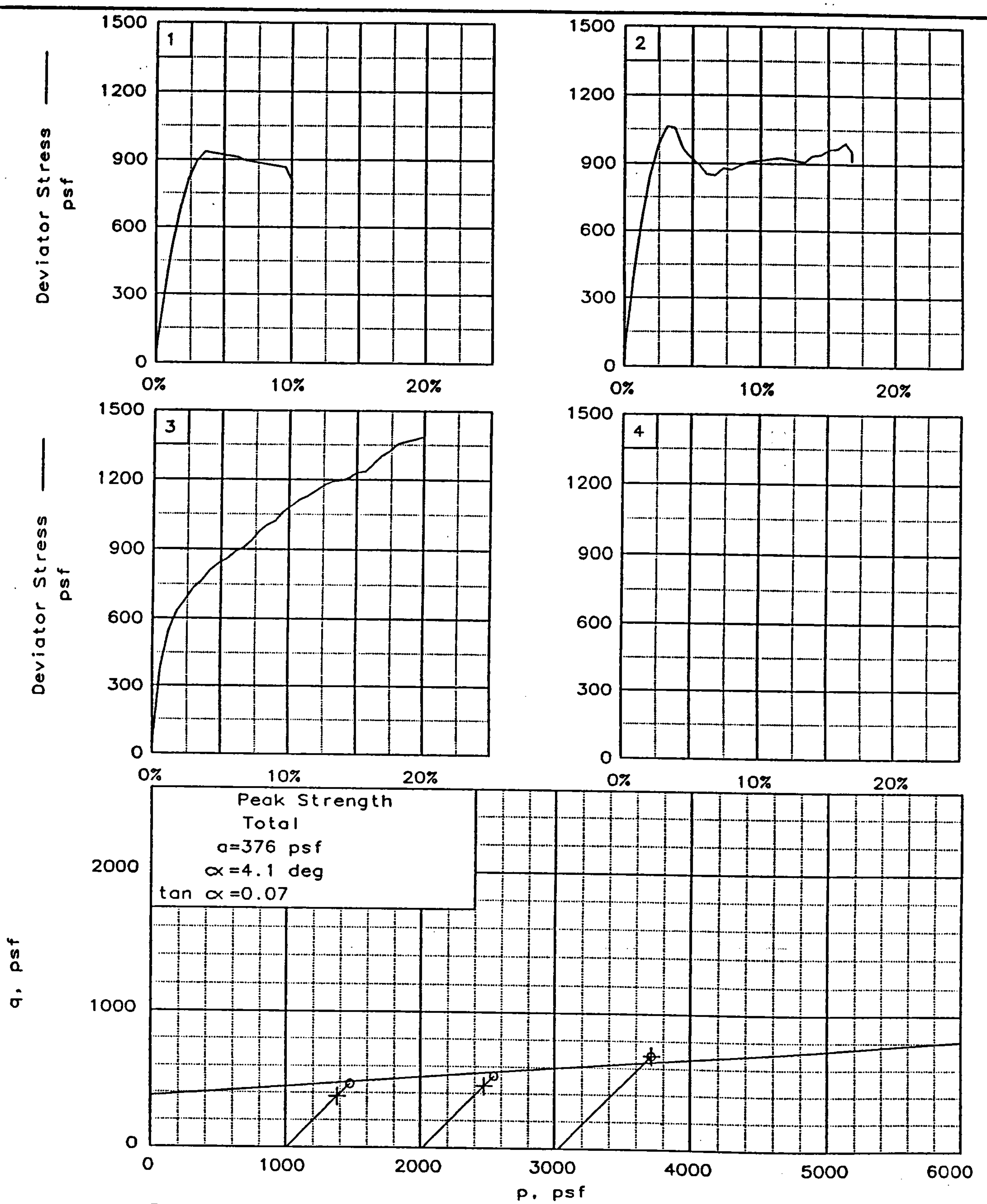
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-1U,
Sample 3-C, Depth 6.0'

PROJ. NO.: 13622 DATE: 6-25-96

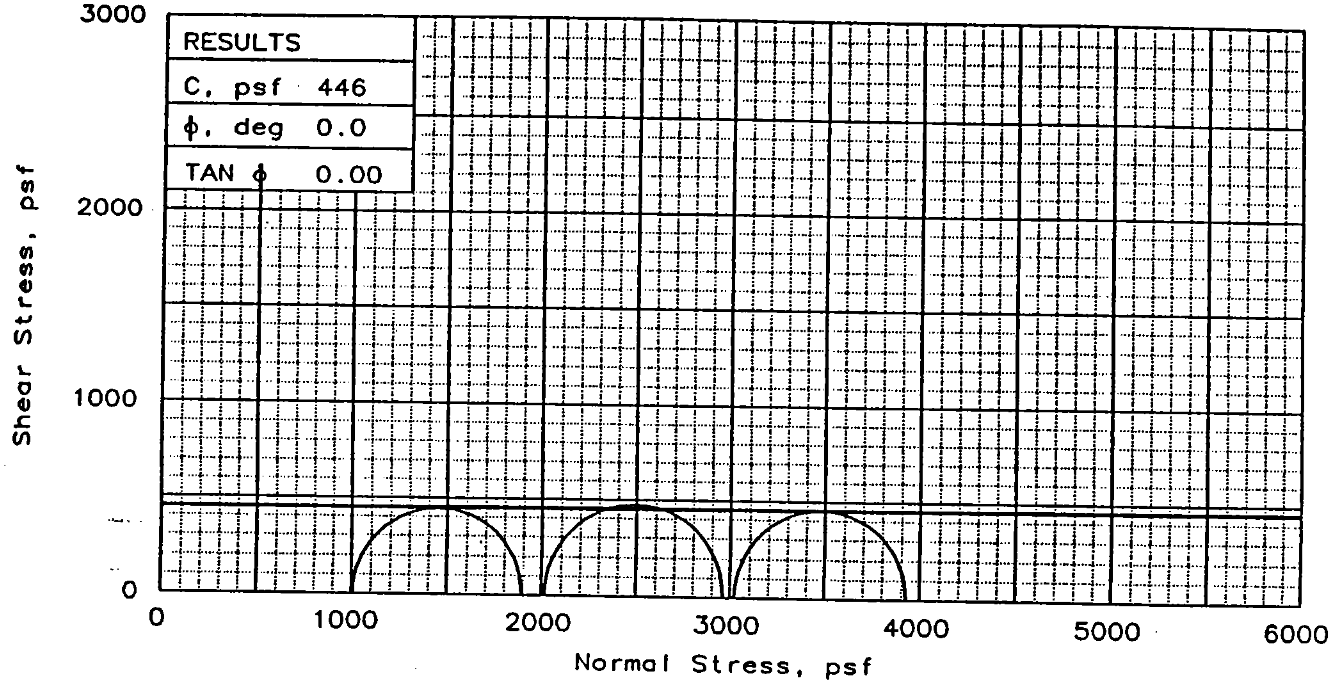
TRIAXIAL SHEAR TEST REPORT

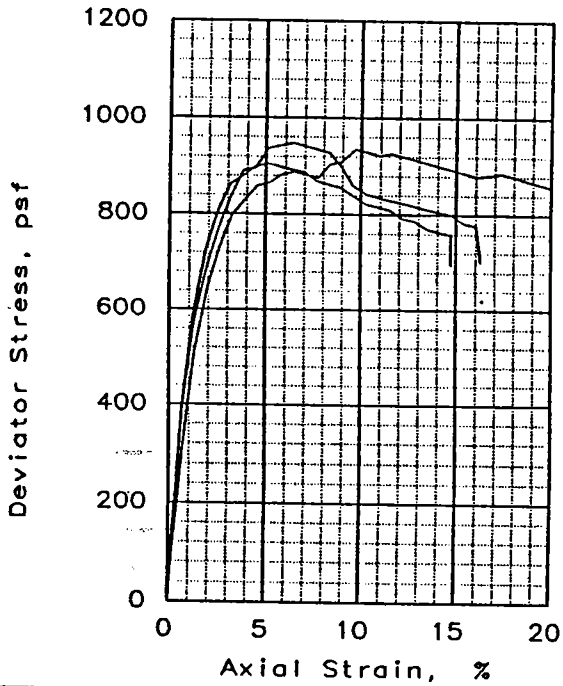
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-1U, Sample 3-C, Depth 6.0'
File: UU-6797 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	45.2	47.8	50.6
	DRY DENSITY, pcf	74.5	72.5	71.5
	SATURATION, %	95.6	96.5	99.5
	VOID RATIO	1.296	1.359	1.393
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	47.3	49.4	50.6
	DRY DENSITY, pcf	74.5	72.7	71.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.295	1.353	1.387
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1014	0.1006	0.0990
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		888	947	904
ULTIMATE STRESS, psf		858	702	695
σ_1 FAILURE, psf		1896	2963	3928
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ lyr & lns ML, ars org
LL= 70 PL= 19 PI= 51
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

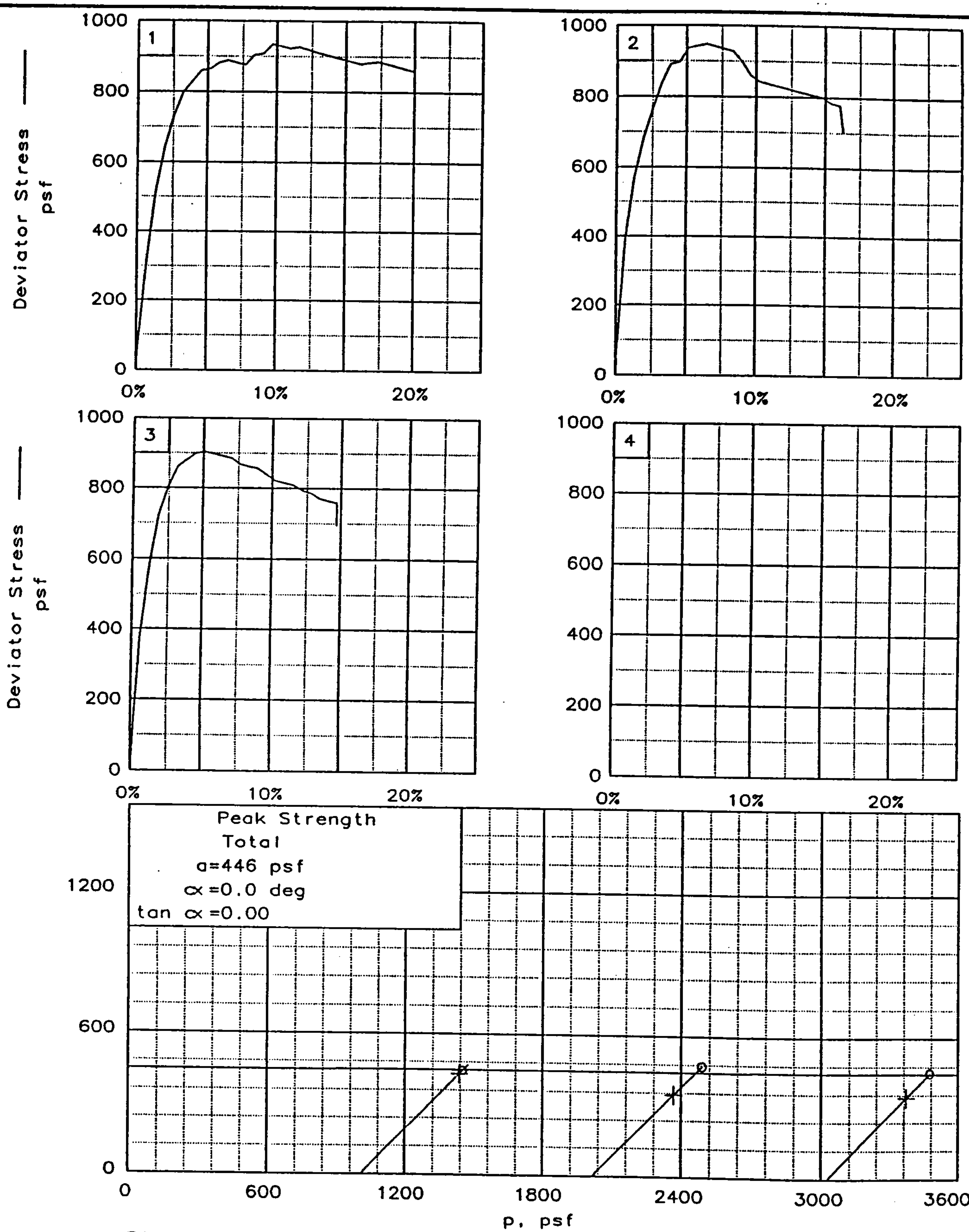
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-1U,
Sample 5-C, Depth 14.1'

PROJ. NO.: 13622 DATE: 6-25-96

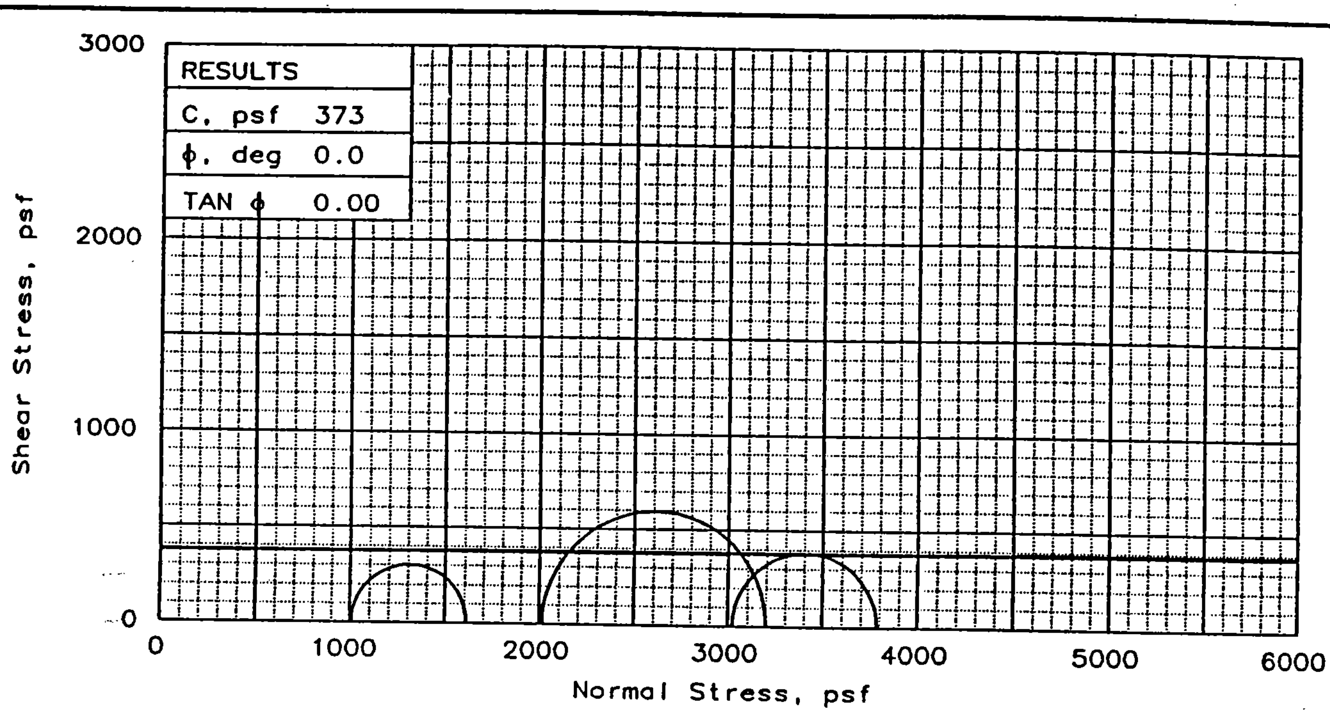
TRIAXIAL SHEAR TEST REPORT

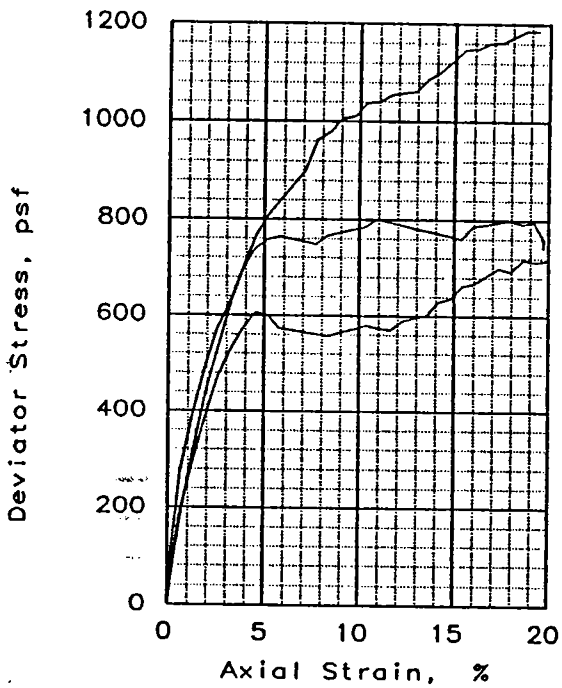
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-1U, Sample 5-C, Depth 14.1'
File: UU-6798 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	34.3	33.7	38.9
	DRY DENSITY, pcf	85.2	87.8	81.1
	SATURATION, %	94.9	99.0	97.3
	VOID RATIO	0.978	0.920	1.079
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.78	2.81
AT TEST	WATER CONTENT, %	36.1	33.7	41.0
	DRY DENSITY, pcf	85.3	88.3	80.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.975	0.910	1.108
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.79	2.80
Strain rate, in/min		0.1028	0.1013	0.1025
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		605	1186	764
ULTIMATE STRESS, psf		717	1186	742
σ_1 FAILURE, psf		1613	3202	3788
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CL4 w/ lyr & ors CH

LL= 39 PL= 19 PI= 20

SPECIFIC GRAVITY= 2.7

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

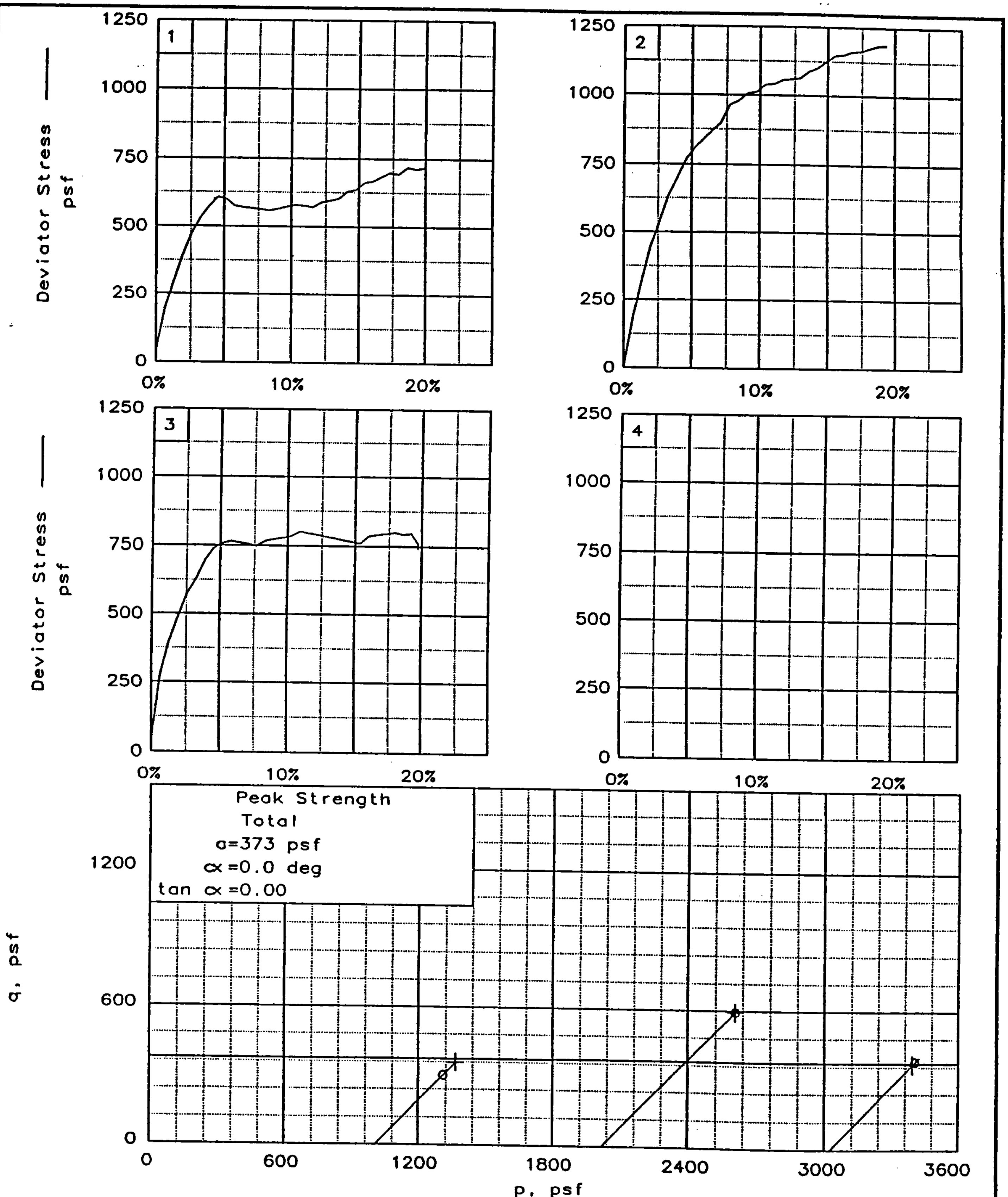
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-1U,
Sample 9-C, Depth 27.2'

PROJ. NO.: 13622 DATE: 6-25-96

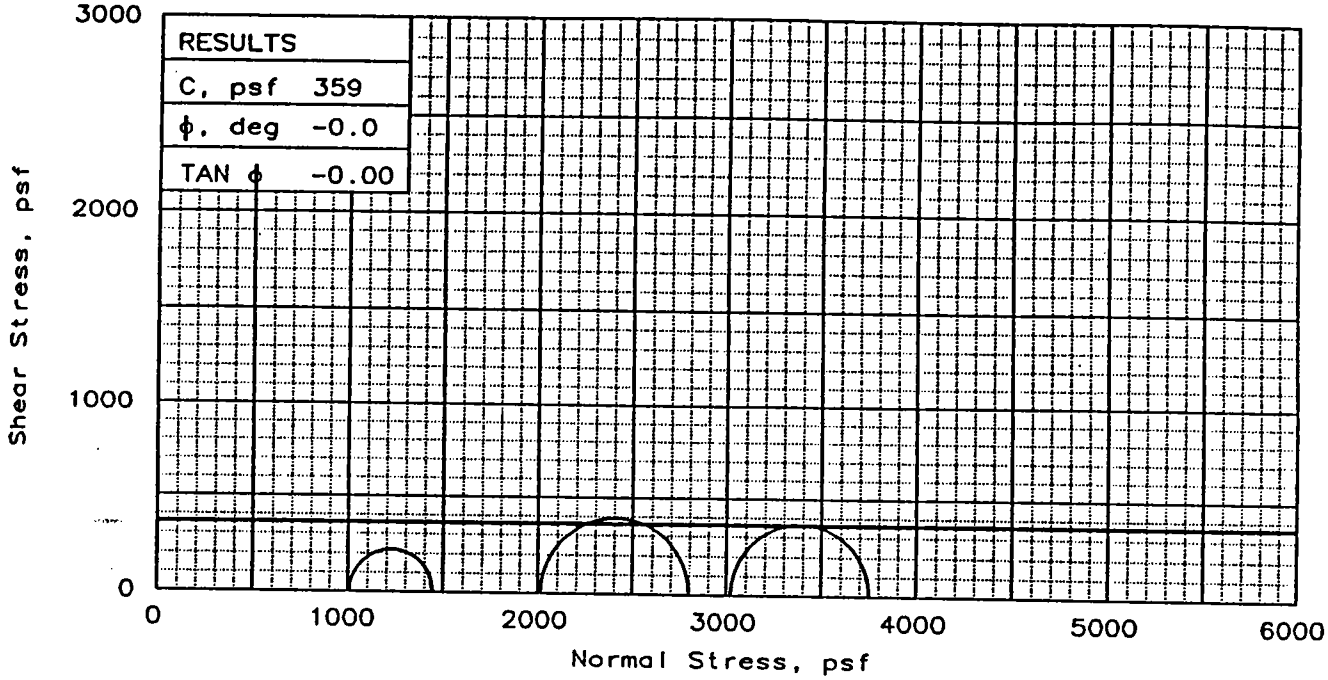
TRIAXIAL SHEAR TEST REPORT

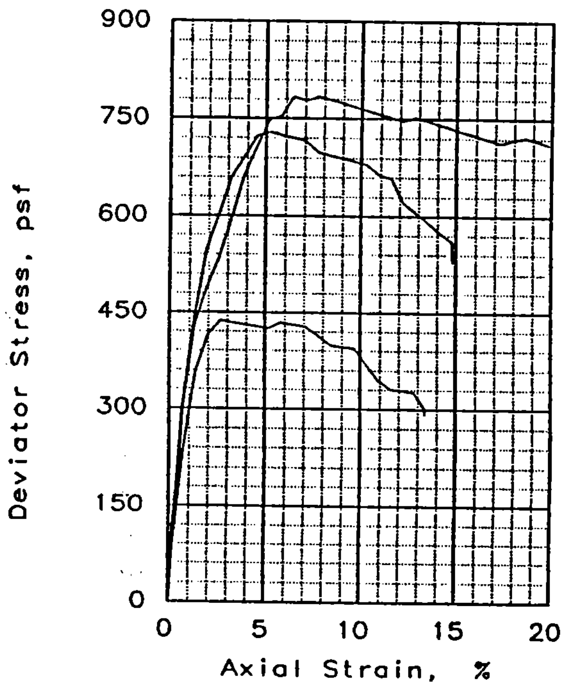
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-1U, Sample 9-C, Depth 27.2'
File: UU-6799 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.4	67.4	65.2
	DRY DENSITY, pcf	60.4	60.4	61.3
	SATURATION, %	100.7	100.7	99.7
	VOID RATIO	1.833	1.834	1.791
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.82	2.80	2.80
AT TEST	WATER CONTENT, %	68.9	66.9	65.2
	DRY DENSITY, pcf	59.2	60.4	61.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.888	1.832	1.785
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1004	0.1004	0.1011
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		437	784	730
ULTIMATE STRESS, psf		292	711	529
σ_1 FAILURE, psf		1445	2800	3754
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lns ML, ars org

LL= 92 PL= 30 PI= 62

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

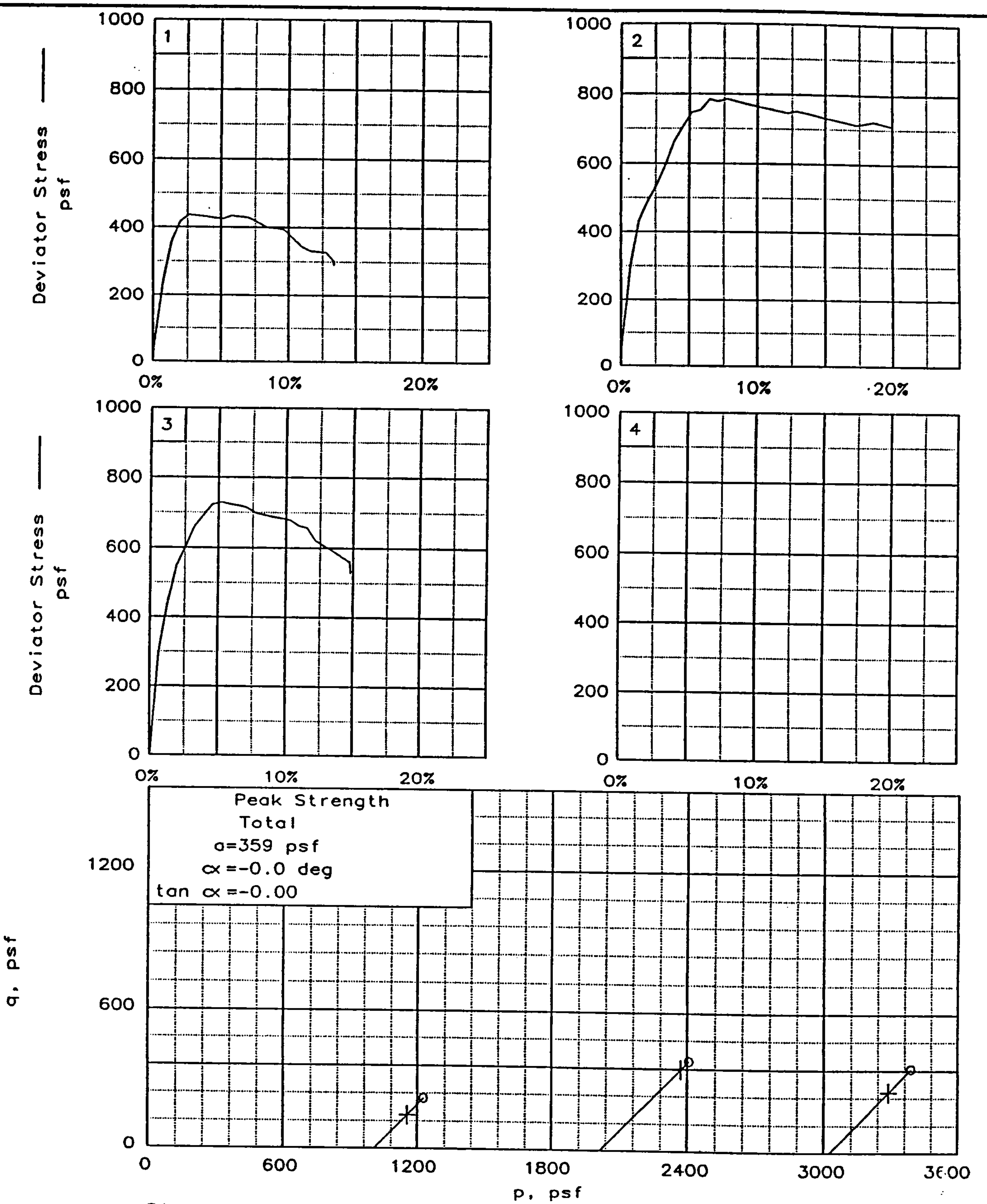
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-1U,
Sample 10-D, Depth 31.7'

PROJ. NO.: 13622 DATE: 6-25-96

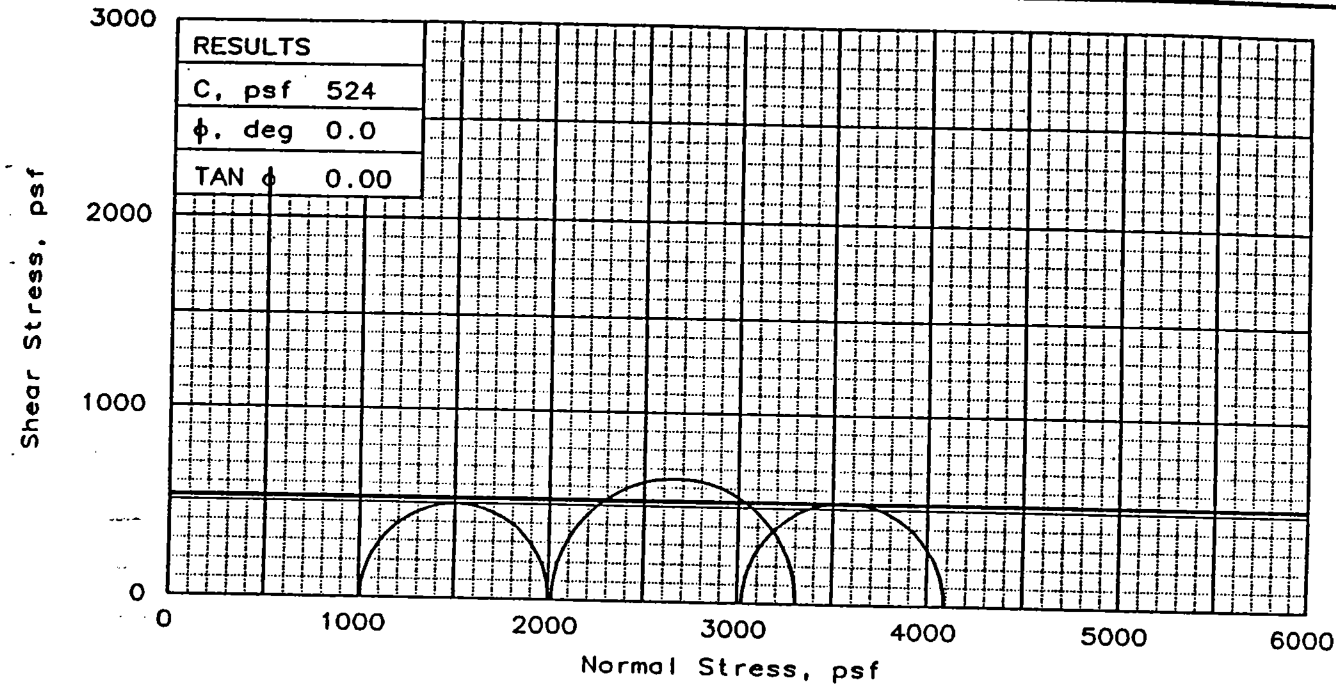
TRIAXIAL SHEAR TEST REPORT

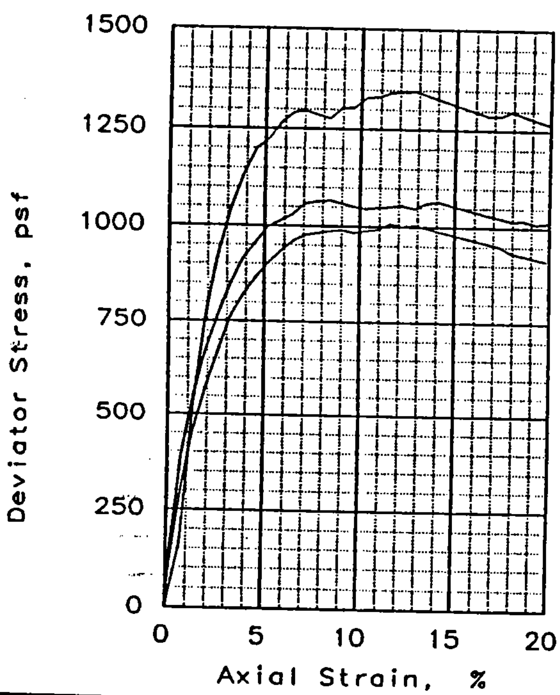
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-1U, Sample 10-D, Depth 31.7'
File: UU-6800 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	37.1	37.1	38.0
	DRY DENSITY, pcf	83.6	84.0	83.6
	SATURATION, %	97.2	98.1	99.3
	VOID RATIO	1.045	1.036	1.047
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.79
AT TEST	WATER CONTENT, %	38.2	37.7	37.6
	DRY DENSITY, pcf	83.6	84.1	84.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.047	1.033	1.030
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0970	0.1002	0.1020
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		991	1294	1067
ULTIMATE STRESS, psf		913	1267	1013
σ_1 FAILURE, psf		1999	3310	4091
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH3 w/ Ins ML

LL= 51 PL= 19 PI= 32

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ____

CLIENT: U.S. Army Corps of Engineers

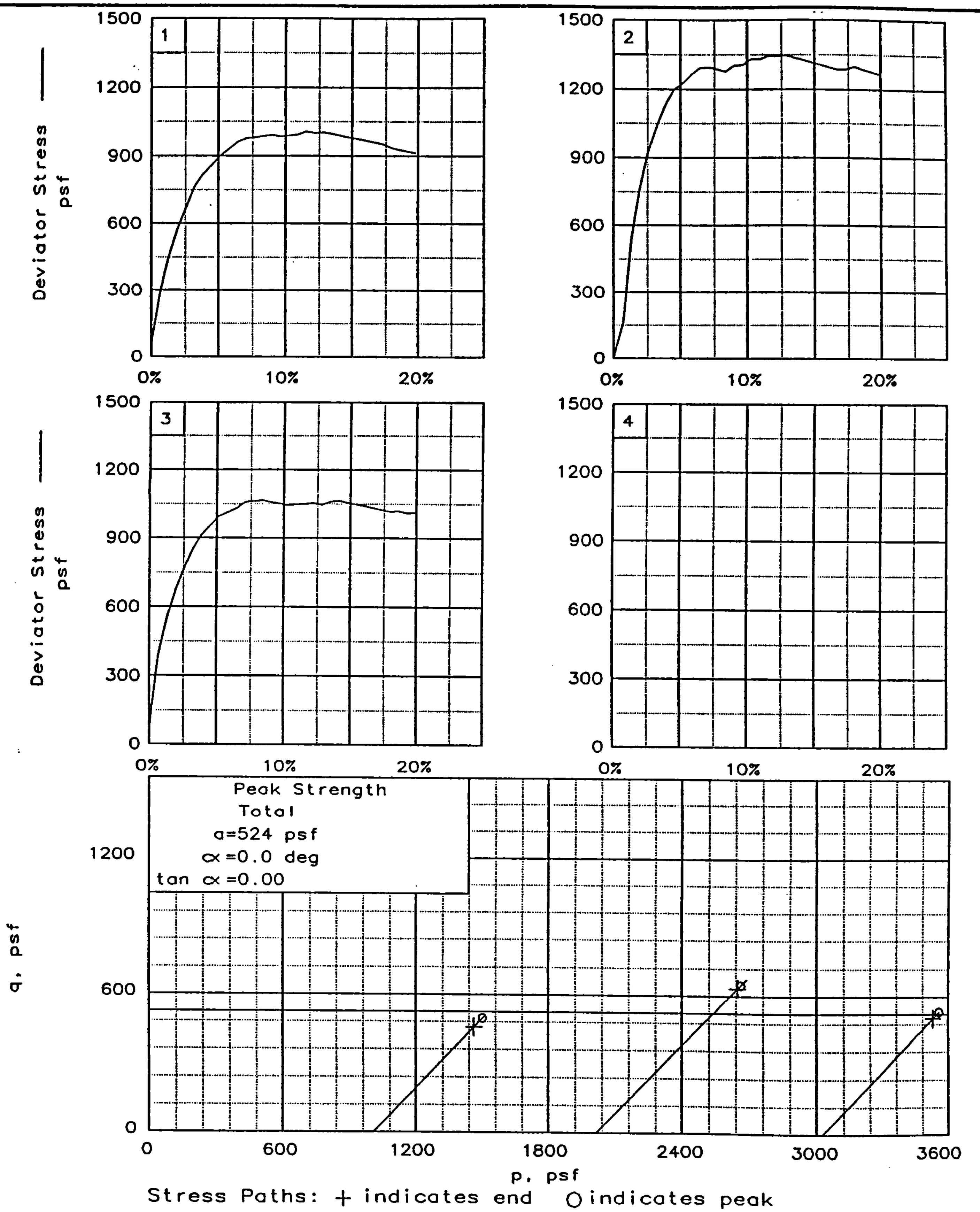
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-1U,
Sample 13-D, Depth 43.8'

PROJ. NO.: 13622 DATE: 6-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

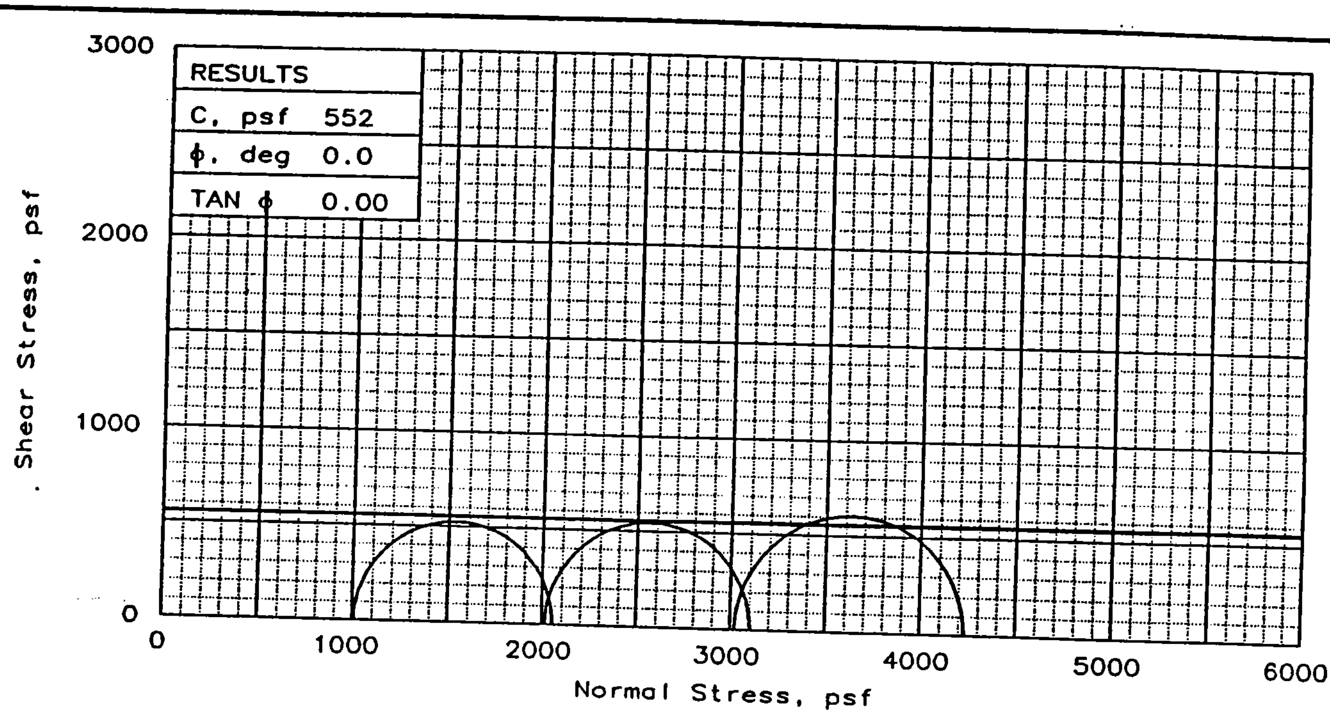


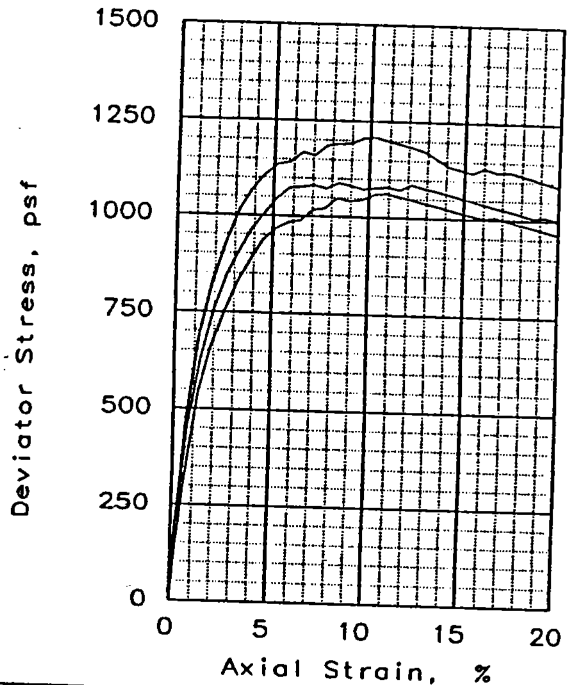
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-1U, Sample 13-D, Depth 43.8'

File: UU-6801 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	45.1	42.6	42.5
	DRY DENSITY, pcf	75.1	77.5	78.5
	SATURATION, %	97.1	97.2	99.3
	VOID RATIO	1.262	1.192	1.163
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	46.3	43.8	42.5
	DRY DENSITY, pcf	75.1	77.5	78.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.260	1.191	1.157
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1007	0.1011	0.1019
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1048	1089	1209
ULTIMATE STRESS, psf		966	1001	1090
σ_1 FAILURE, psf		2056	3105	4233
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ lns & grs ML
LL= 66 PL= 23 PI= 43
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

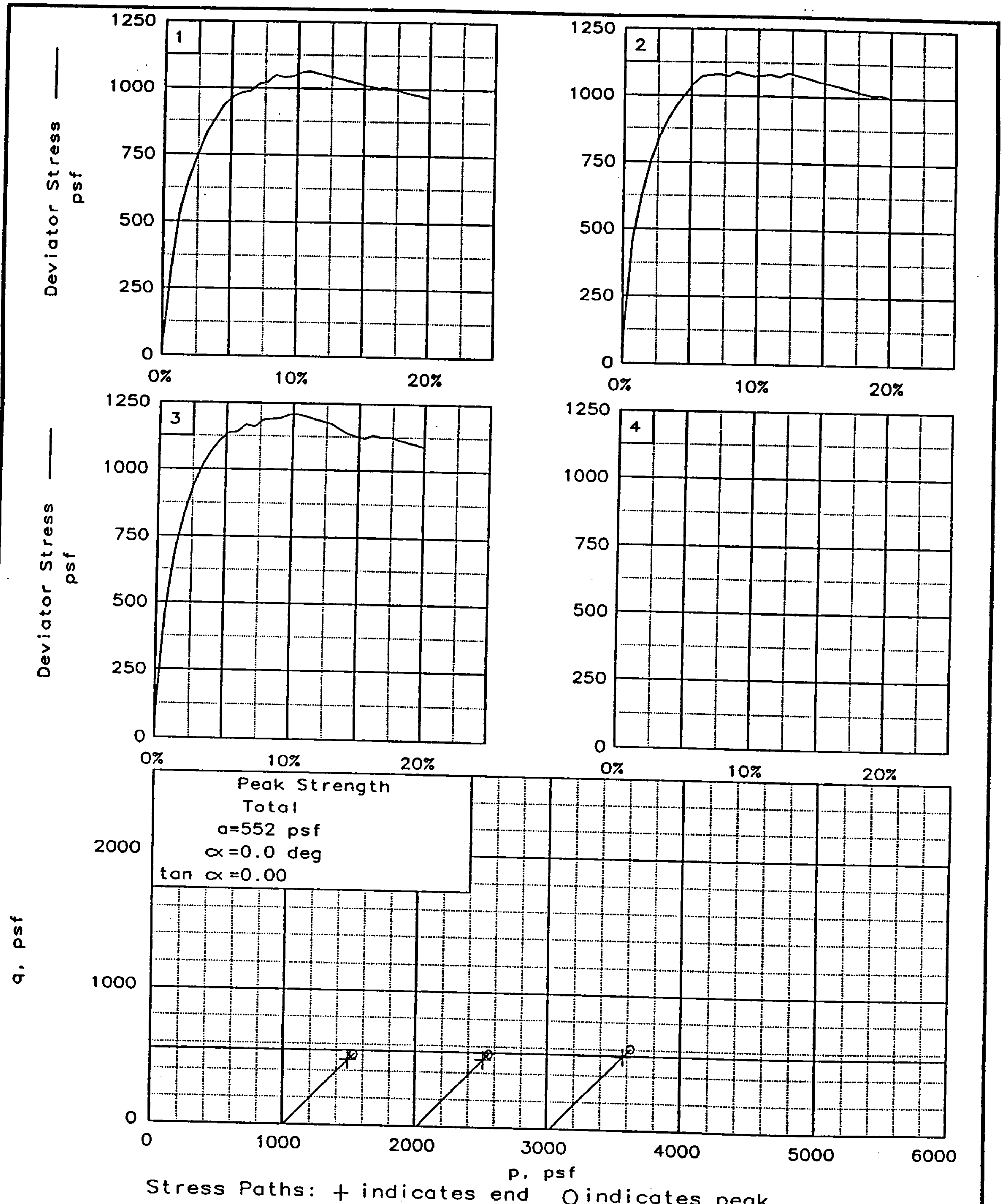
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-1U,
Sample 15-D, Depth 51.7'

PROJ. NO.: 13622 DATE: 6-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

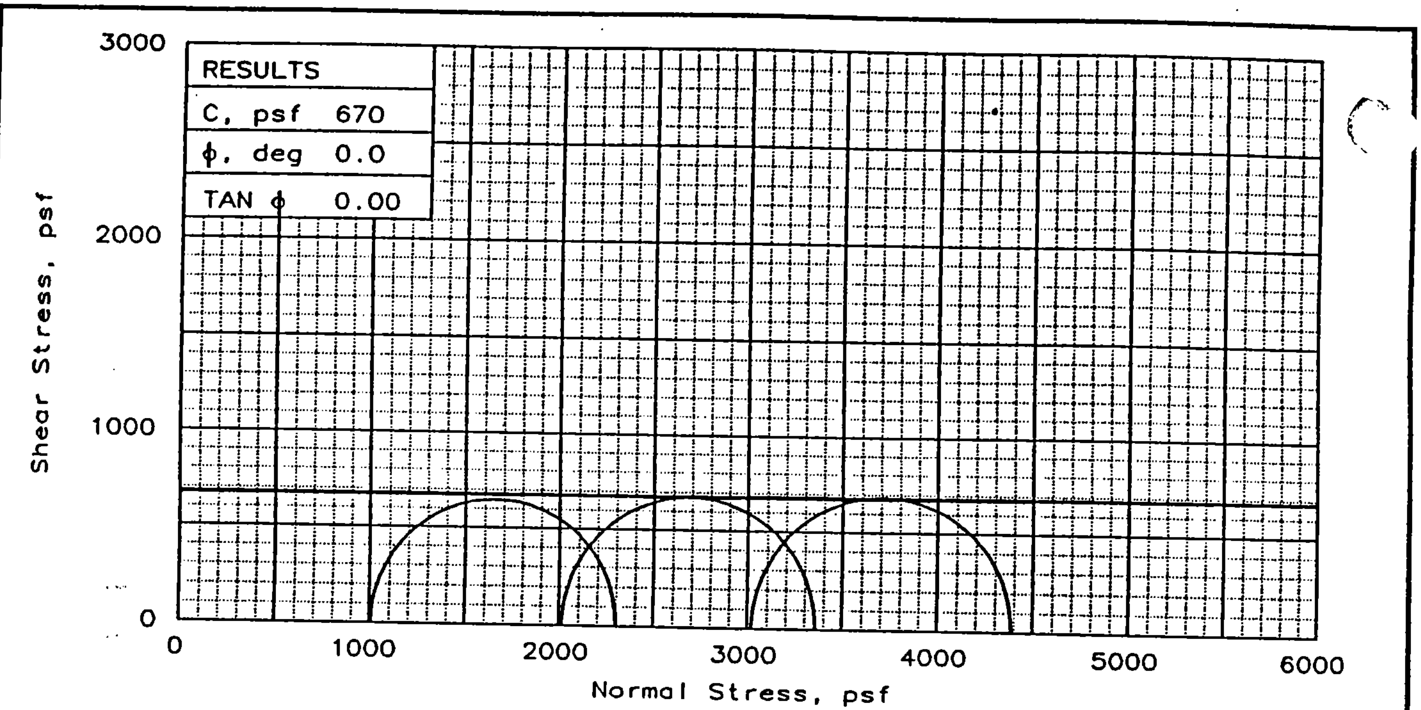


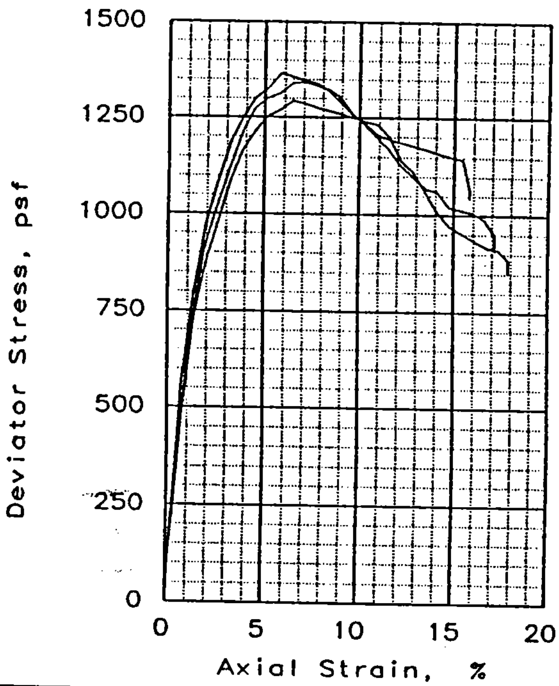
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-1U, Sample 15-D, Depth 51.7'

File: UU-6802 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	52.8	50.4	50.9
	DRY DENSITY, pcf	68.3	70.9	70.5
	SATURATION, %	96.5	98.2	98.1
	VOID RATIO	1.486	1.396	1.410
	DIAMETER, in	1.42	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	54.7	51.2	51.3
	DRY DENSITY, pcf	68.3	71.0	70.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.487	1.393	1.396
	DIAMETER, in	1.42	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0989	0.0965	0.0981
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1294	1342	1366
ULTIMATE STRESS, psf		854	910	1043
σ_1 FAILURE, psf		2302	3358	4390
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ ors ML
LL= 81 PL= 25 PI= 56
SPECIFIC GRAVITY= 2.72
REMARKS:

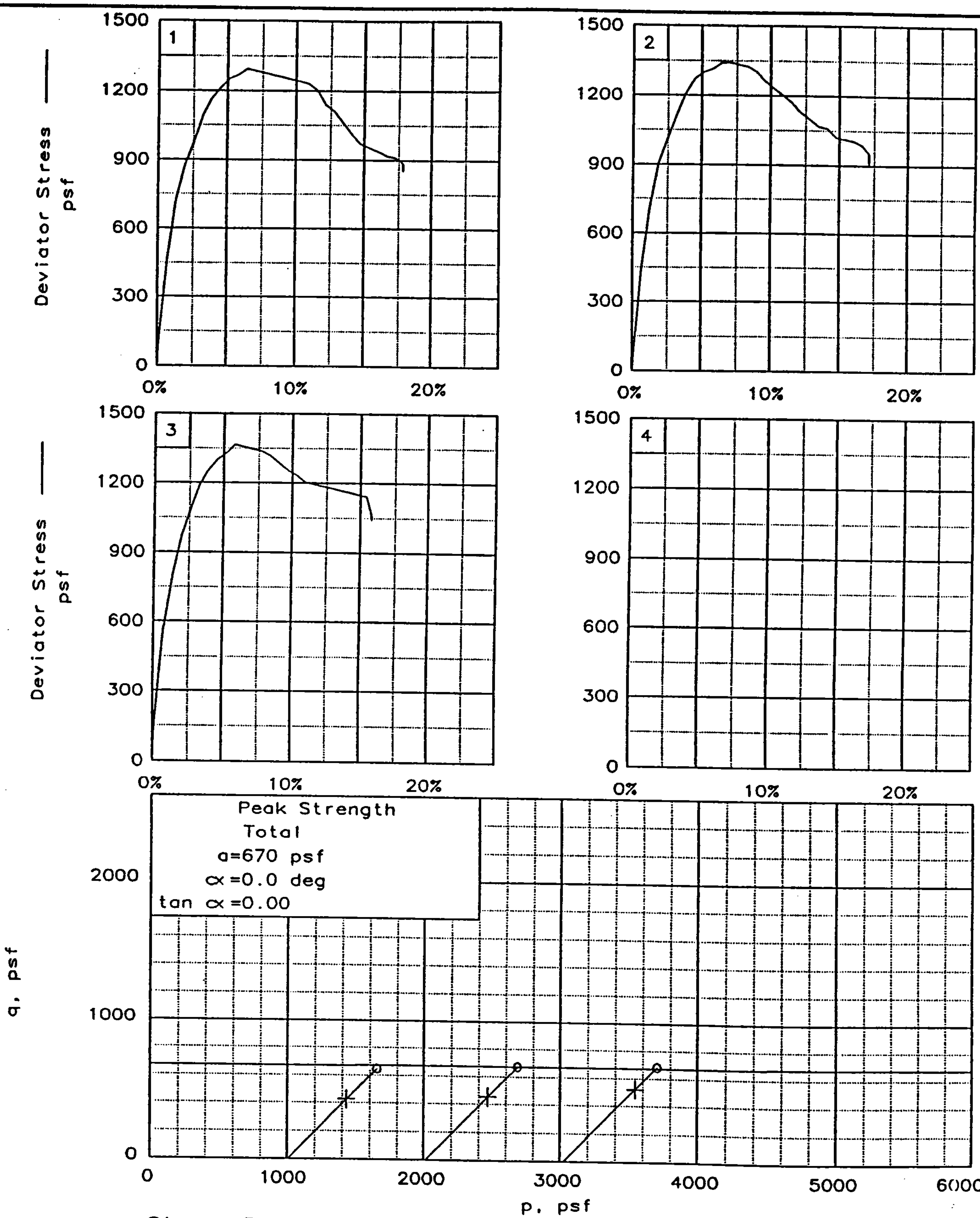
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-1U,
Sample 17-D, Depth 59.8'
PROJ. NO.: 13622 DATE: 6-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



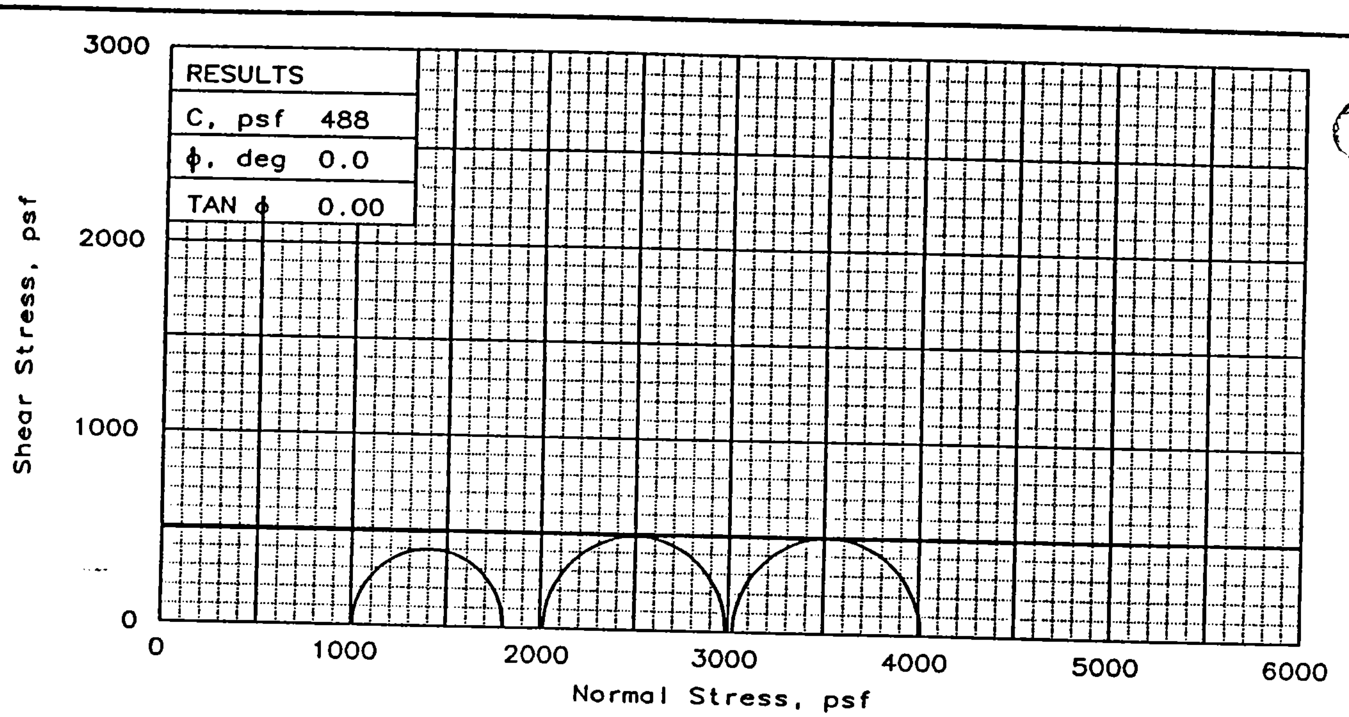
Stress Paths: + indicates end O indicates peak

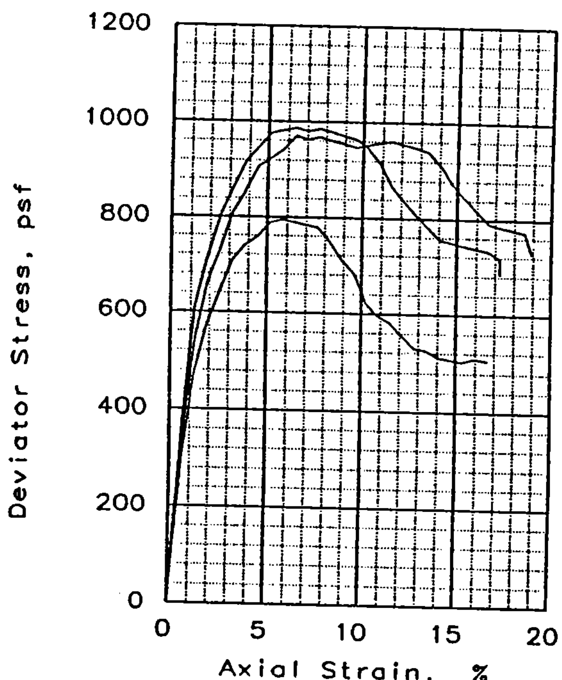
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-1U, Sample 17-D, Depth 59.8'

File: UU-6803 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	56.6	56.5	57.4
	DRY DENSITY, pcf	64.3	64.5	64.8
	SATURATION, %	93.7	94.1	96.4
	VOID RATIO	1.642	1.634	1.620
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.79	2.79	2.79
AT TEST	WATER CONTENT, %	59.2	59.1	58.0
	DRY DENSITY, pcf	65.1	65.1	65.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.610	1.608	1.577
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1005	0.1014	0.1005
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		794	970	987
ULTIMATE STRESS, psf		506	728	685
σ_1 FAILURE, psf		1802	2986	4011
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lns & ors ML

LL= 94 PL= 27 PI= 67

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

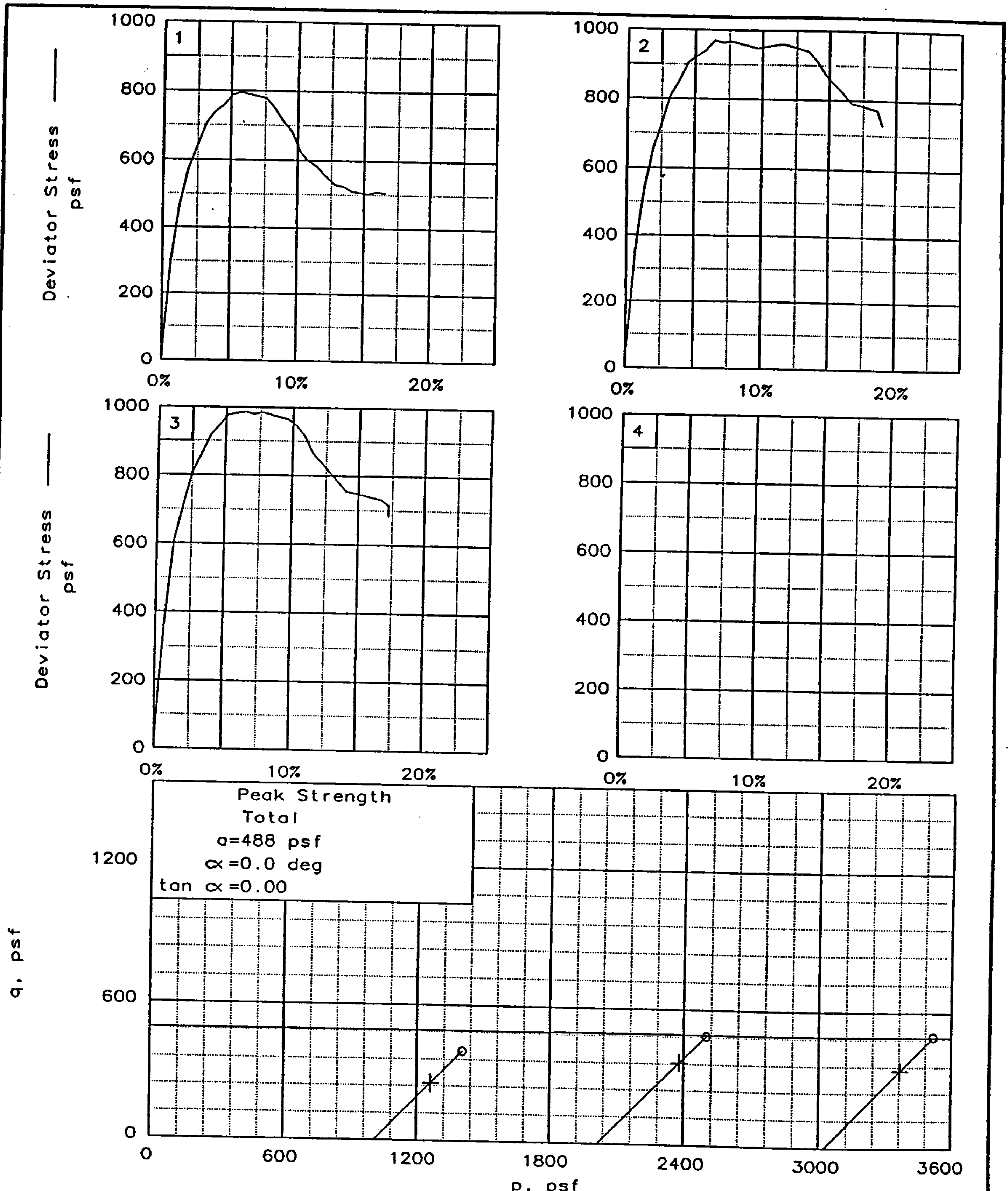
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-1U,
Sample 20-B, Depth 70.5'

PROJ. NO.: 13622 DATE: 6-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



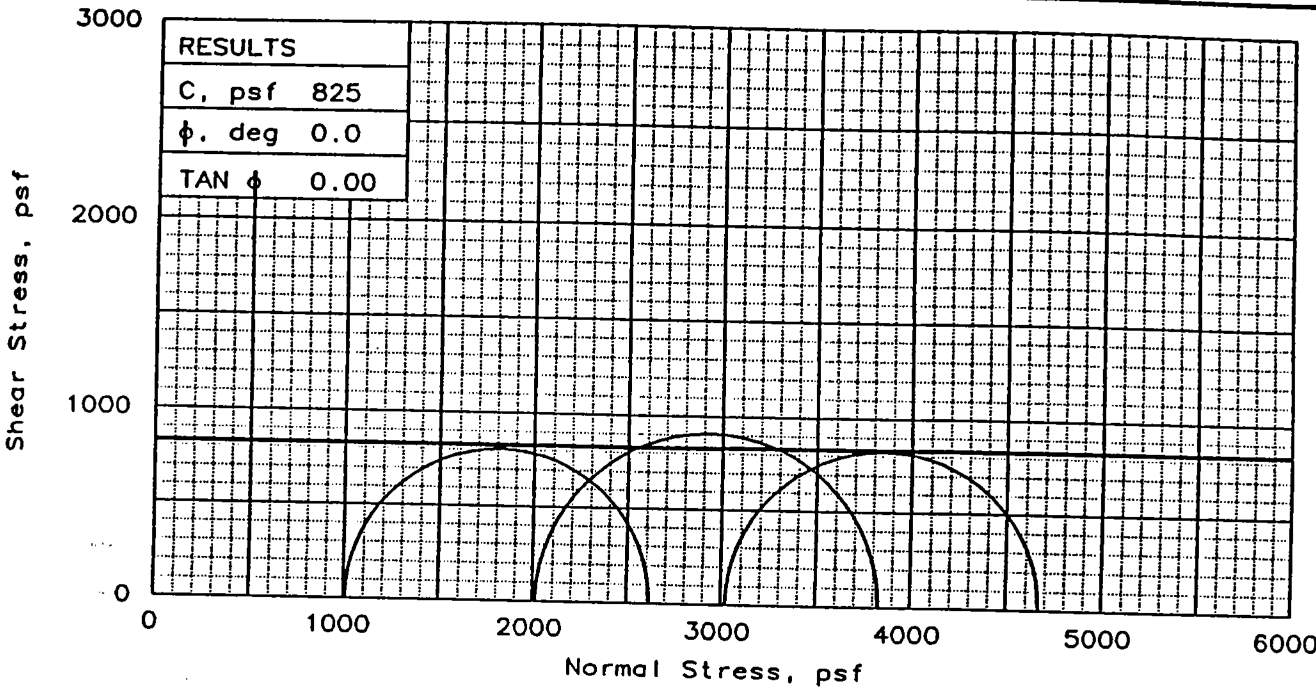
Stress Paths: + indicates end O indicates peak

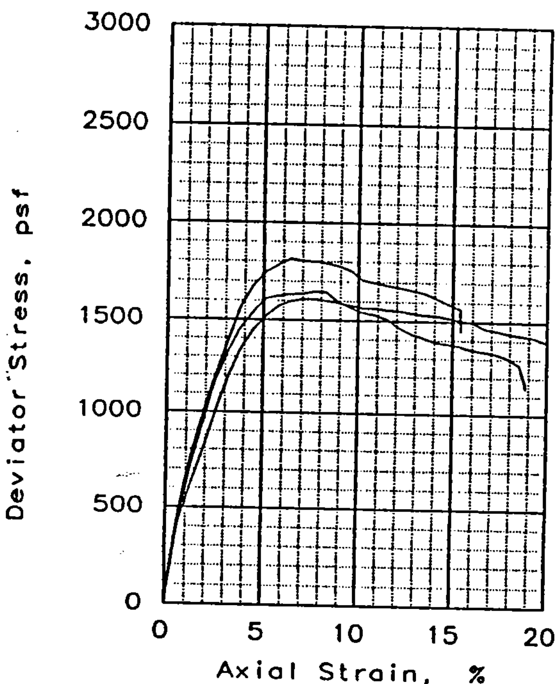
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-1U, Sample 20-B, Depth 70.5'

File: UU-6804 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	37.7	37.7	35.2
	DRY DENSITY, pcf	84.0	83.7	85.8
	SATURATION, %	99.6	98.8	97.1
	VOID RATIO	1.036	1.045	0.993
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.79	2.79	2.80
AT TEST	WATER CONTENT, %	37.3	37.5	35.9
	DRY DENSITY, pcf	84.6	84.4	86.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.022	1.027	0.983
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0985	0.0997	0.1011
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1611	1816	1647
ULTIMATE STRESS, psf		1398	1450	1141
σ_1 FAILURE, psf		2619	3832	4671
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH2
w/ lyr & lns SM, slf
LL= 50 PL= 19 PI= 31
SPECIFIC GRAVITY= 2.74
REMARKS:

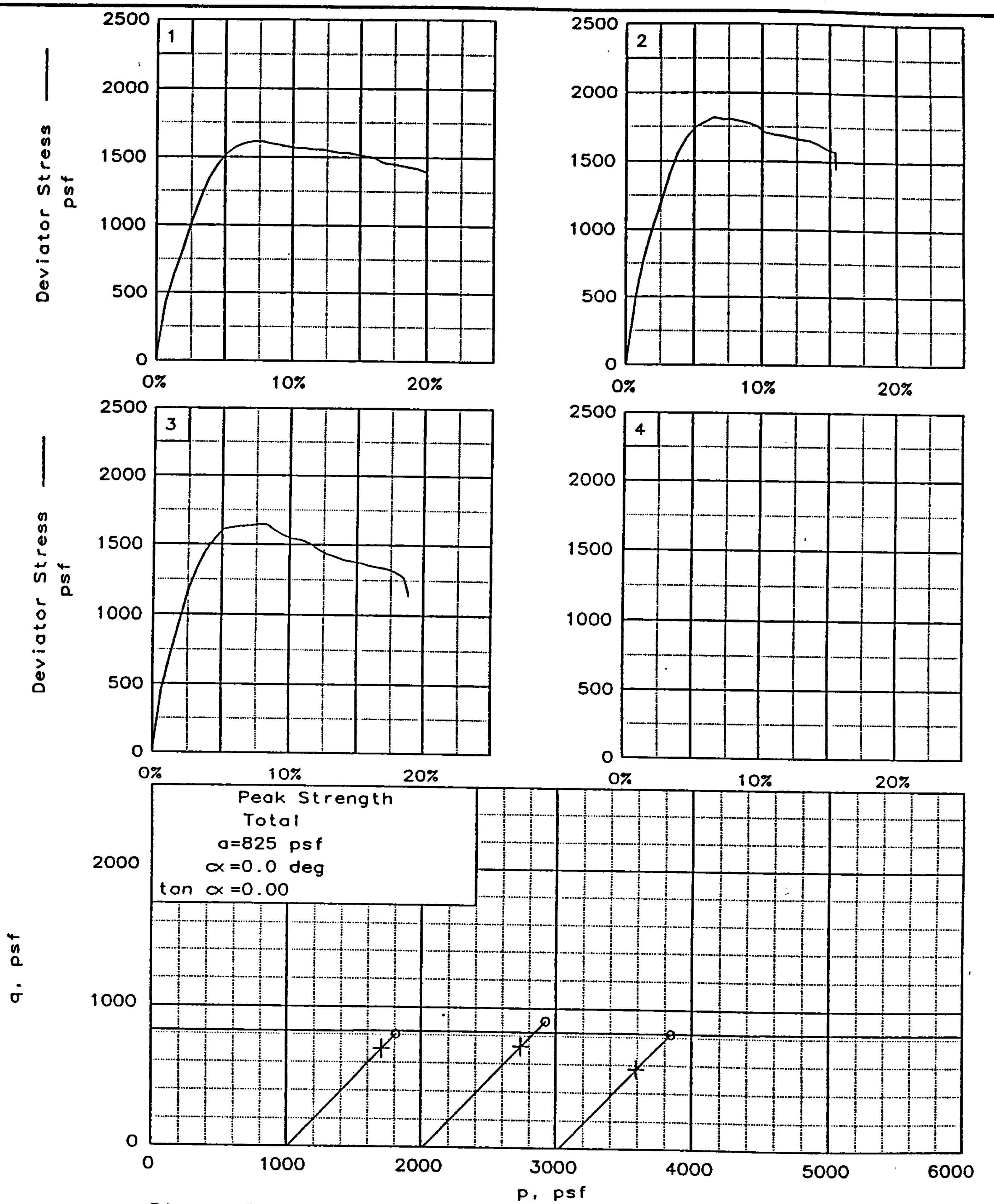
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-1U,
Sample 22-B, Depth 78.5'
PROJ. NO.: 13622 DATE: 6-25-96

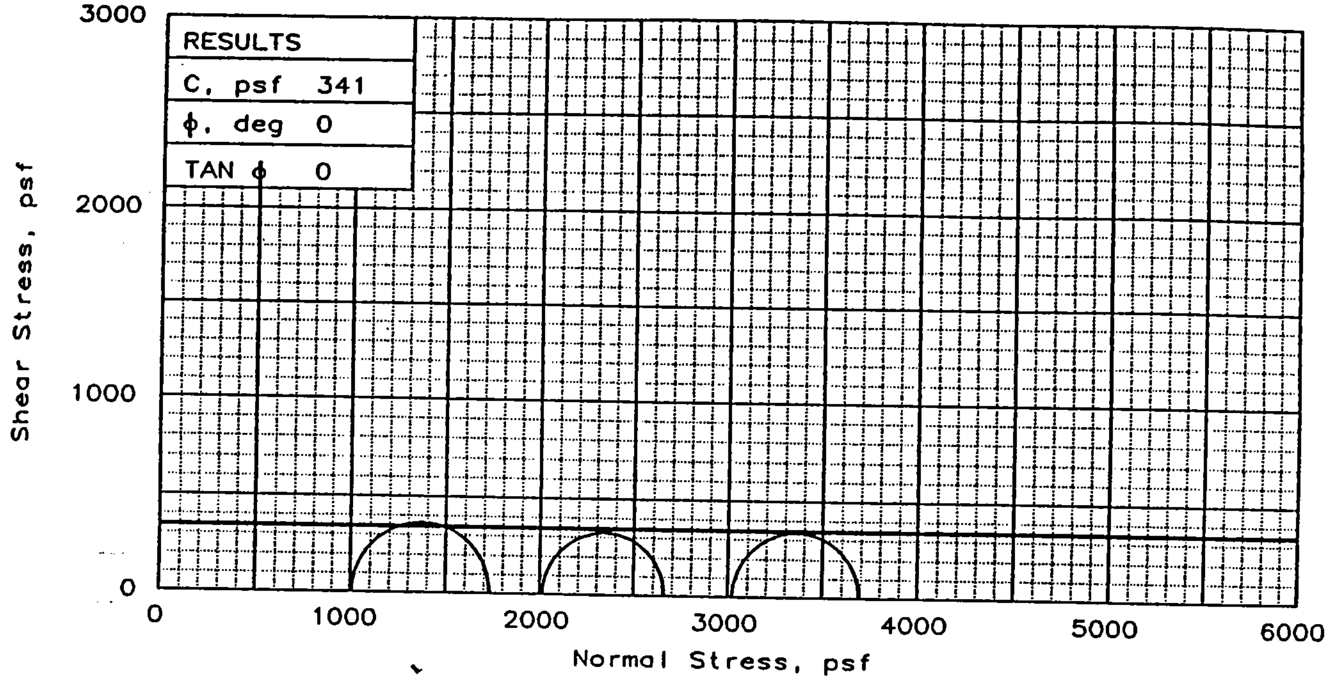
TRIAXIAL SHEAR TEST REPORT

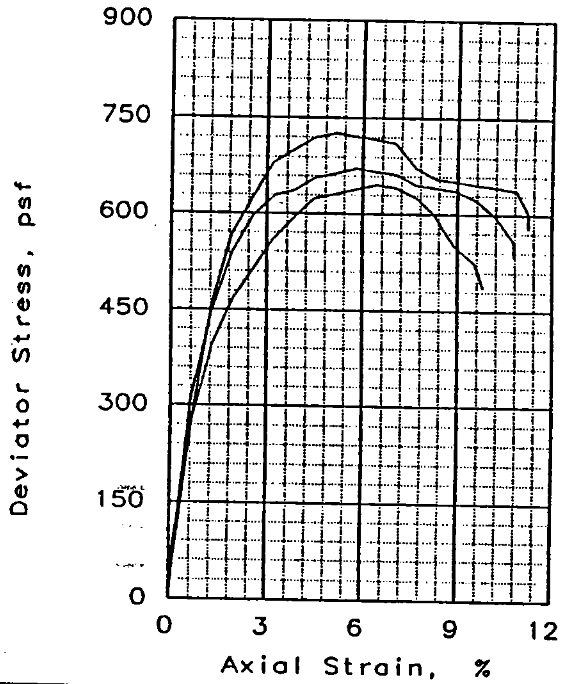
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-1U, Sample 22-B, Depth 78.5'
File: UU-6805 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	96.0	96.8	101.0
	DRY DENSITY, pcf	46.8	46.3	45.0
	SATURATION, %	99.0	98.3	98.8
	VOID RATIO	2.657	2.697	2.801
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.81
AT TEST	WATER CONTENT, %	97.1	98.6	103.8
	DRY DENSITY, pcf	46.7	46.2	44.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.661	2.702	2.843
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0974	0.0976	0.0985
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		727	646	671
ULTIMATE STRESS, psf		579	487	535
σ_1 FAILURE, psf		1735	2662	3695
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ slf
LL= 131 PL= 35 PI= 96
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

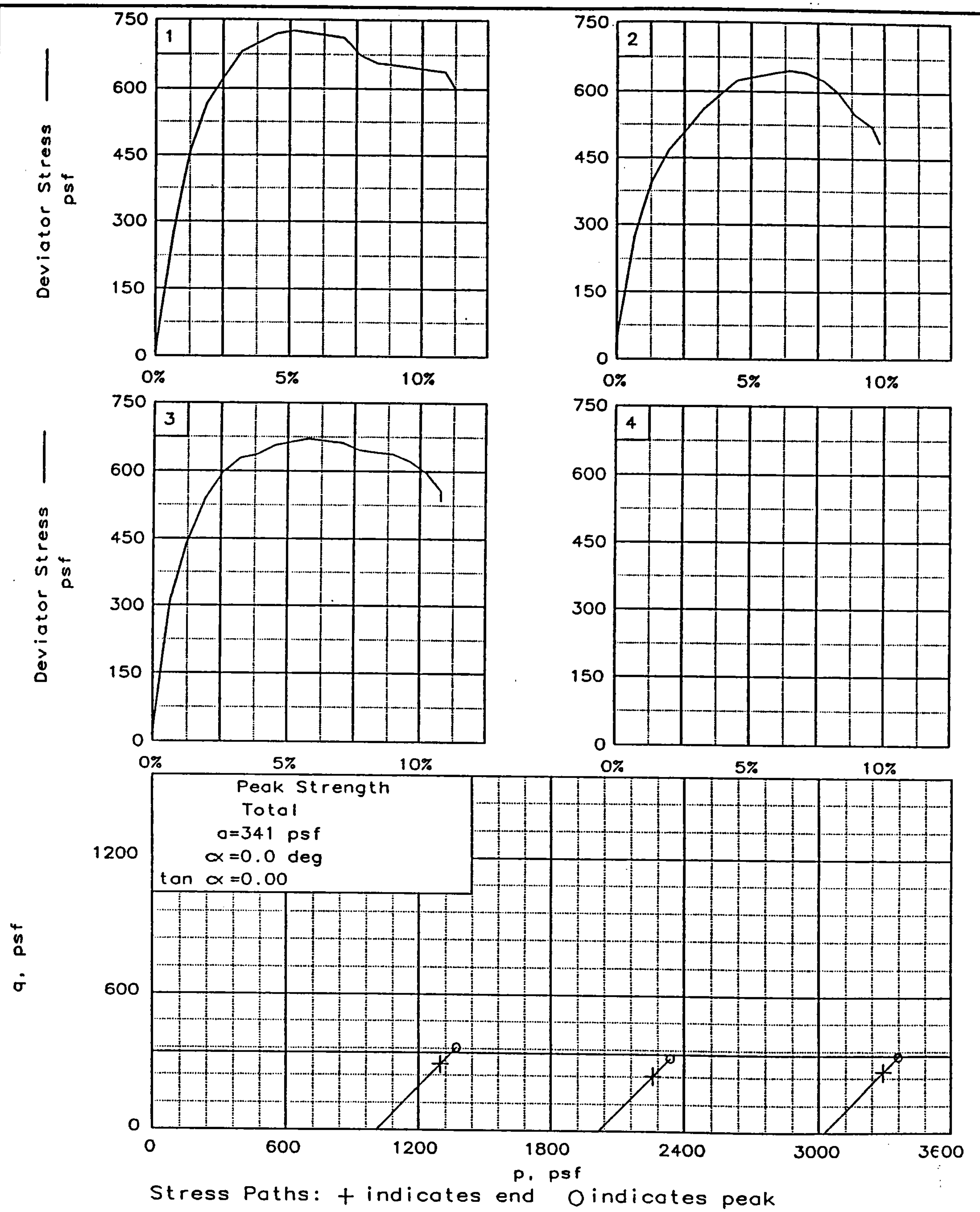
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-2U,
Sample 4-C, Depth 9.9'

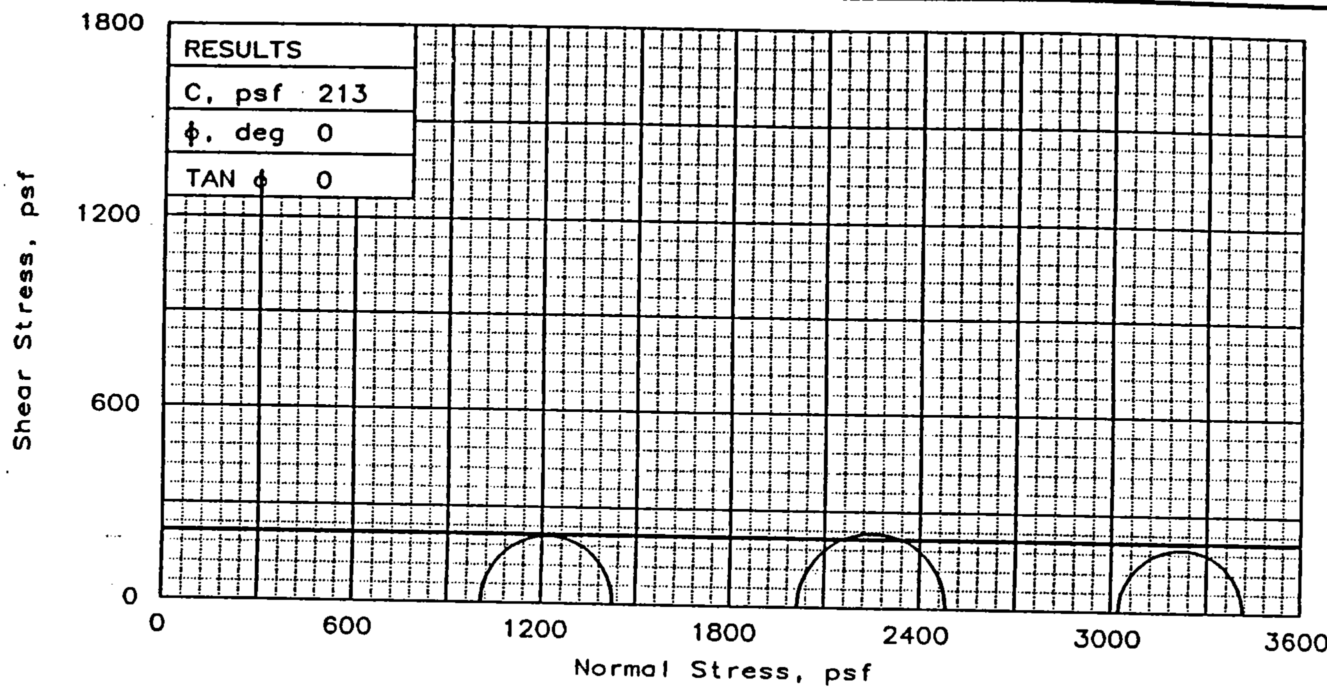
PROJ. NO.: 13622 DATE: 6-25-96

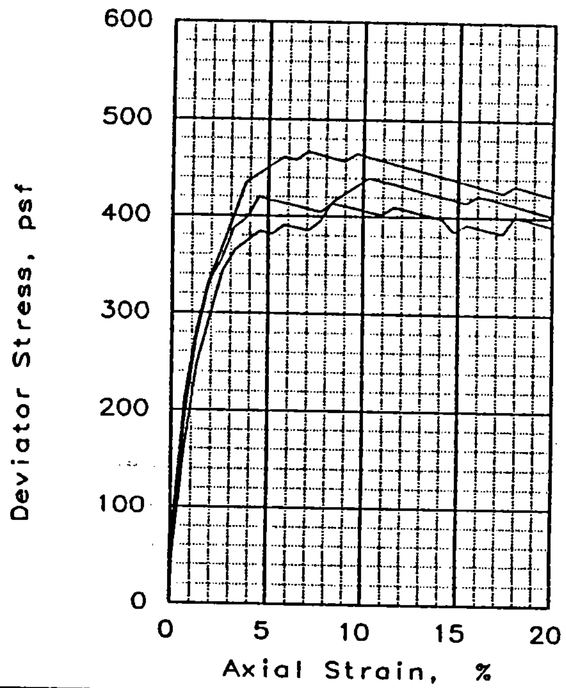
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-2U, Sample 4-C, Depth 9.9'
File: UU-6806 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.0	58.8	58.8
	DRY DENSITY, pcf	63.5	65.6	65.9
	SATURATION, %	100.3	100.2	100.9
	VOID RATIO	1.694	1.606	1.597
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	61.9	58.8	58.0
	DRY DENSITY, pcf	63.5	65.5	66.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.695	1.612	1.590
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0953	0.0976	0.1009
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		419	467	391
ULTIMATE STRESS, psf		392	422	403
σ_1 FAILURE, psf		1427	2483	3415
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: VSo Gr CH3
w/ Ins ML

LL= 66 PL= 21 PI= 45

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ____

CLIENT: U.S. Army Corps of Engineers

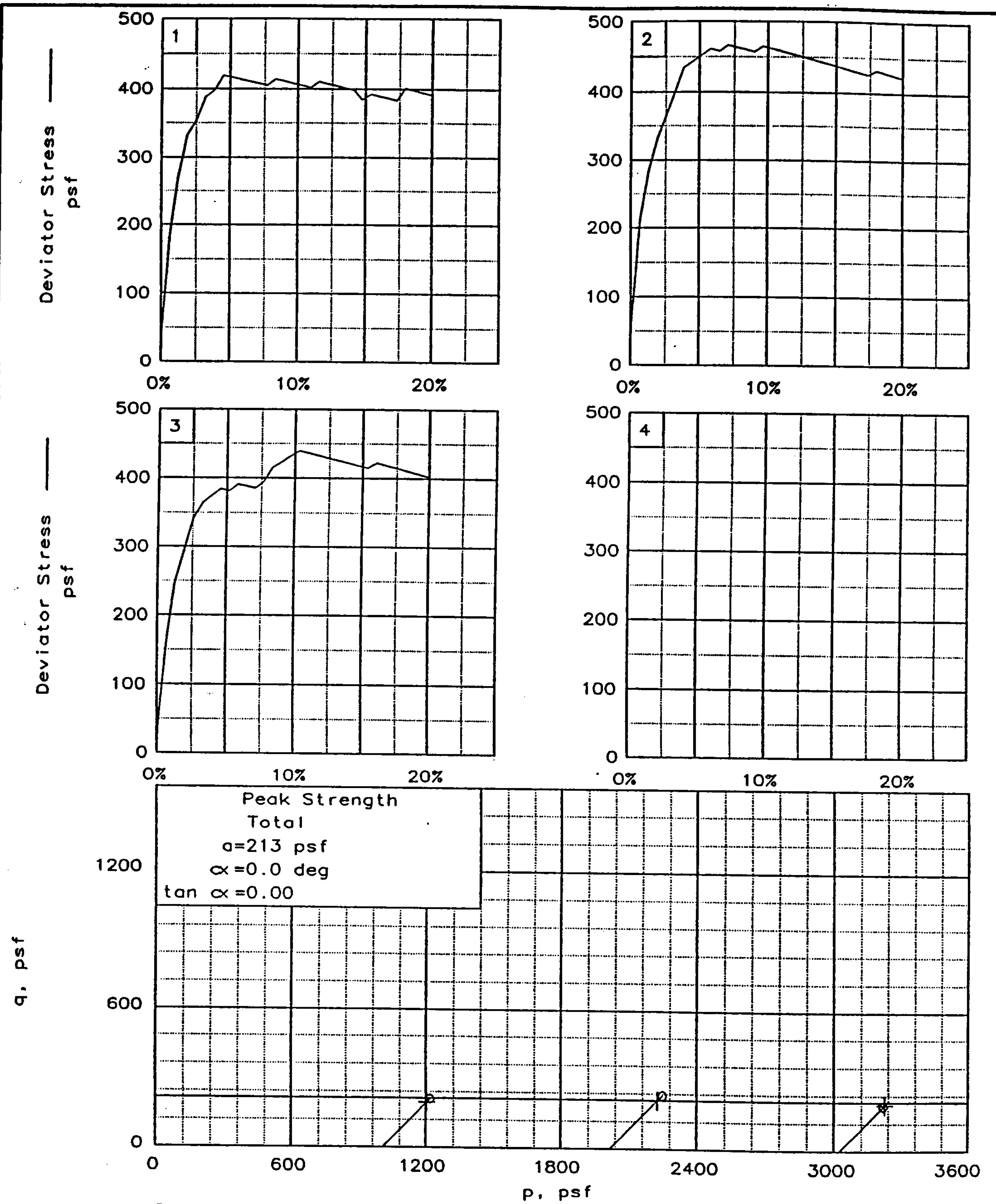
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-2U,
Sample 5-D, Depth 14.8'

PROJ. NO.: 13622 DATE: 6-26-96

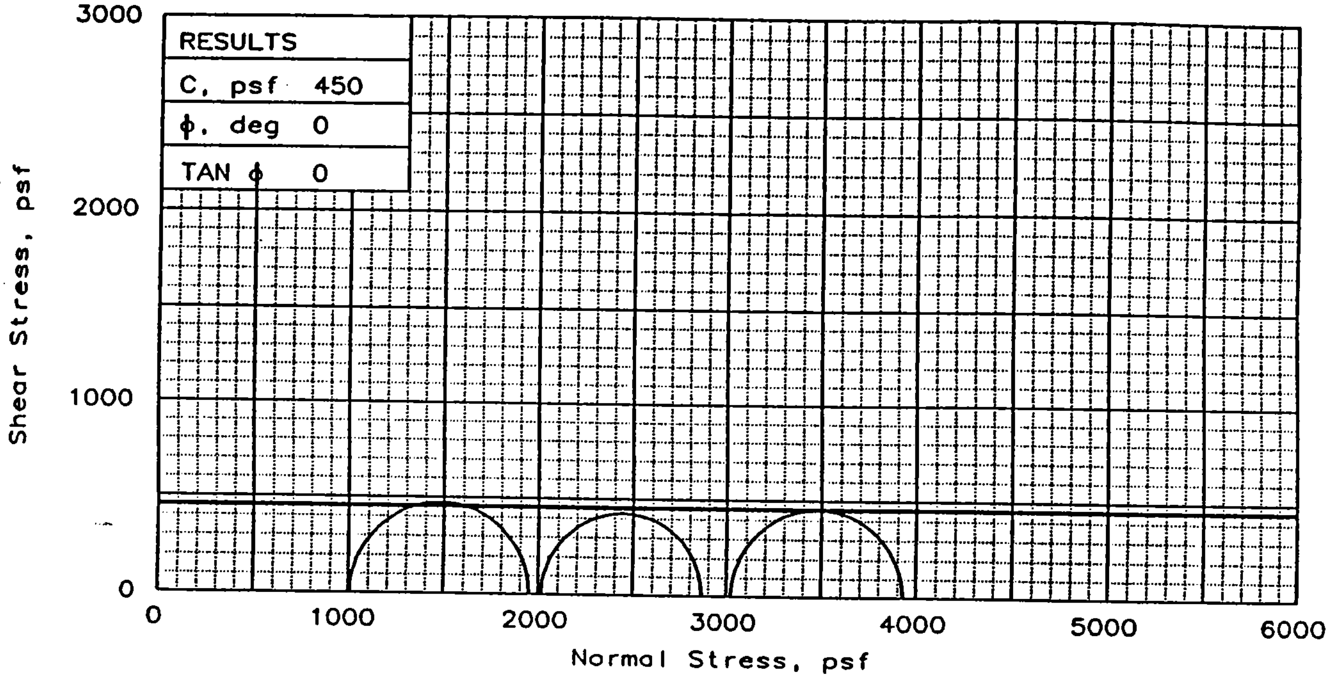
TRIAXIAL SHEAR TEST REPORT

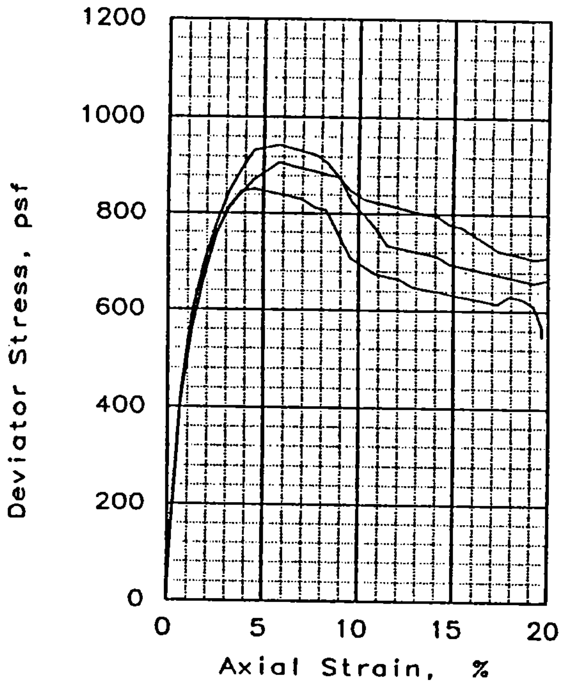
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-2U, Sample 5-D, Depth 14.8'
File: UU-6807 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	59.7	60.5	59.8
	DRY DENSITY, pcf	63.6	63.0	64.3
	SATURATION, %	96.8	96.7	98.6
	VOID RATIO	1.689	1.715	1.661
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	61.8	62.6	60.1
	DRY DENSITY, pcf	63.5	63.0	64.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.692	1.717	1.648
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0995	0.0981	0.1010
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		943	852	907
ULTIMATE STRESS, psf		664	548	711
σ_1 FAILURE, psf		1951	2868	3931
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4 w/ lyr & lns ML

LL= 74 PL= 23 PI= 51

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

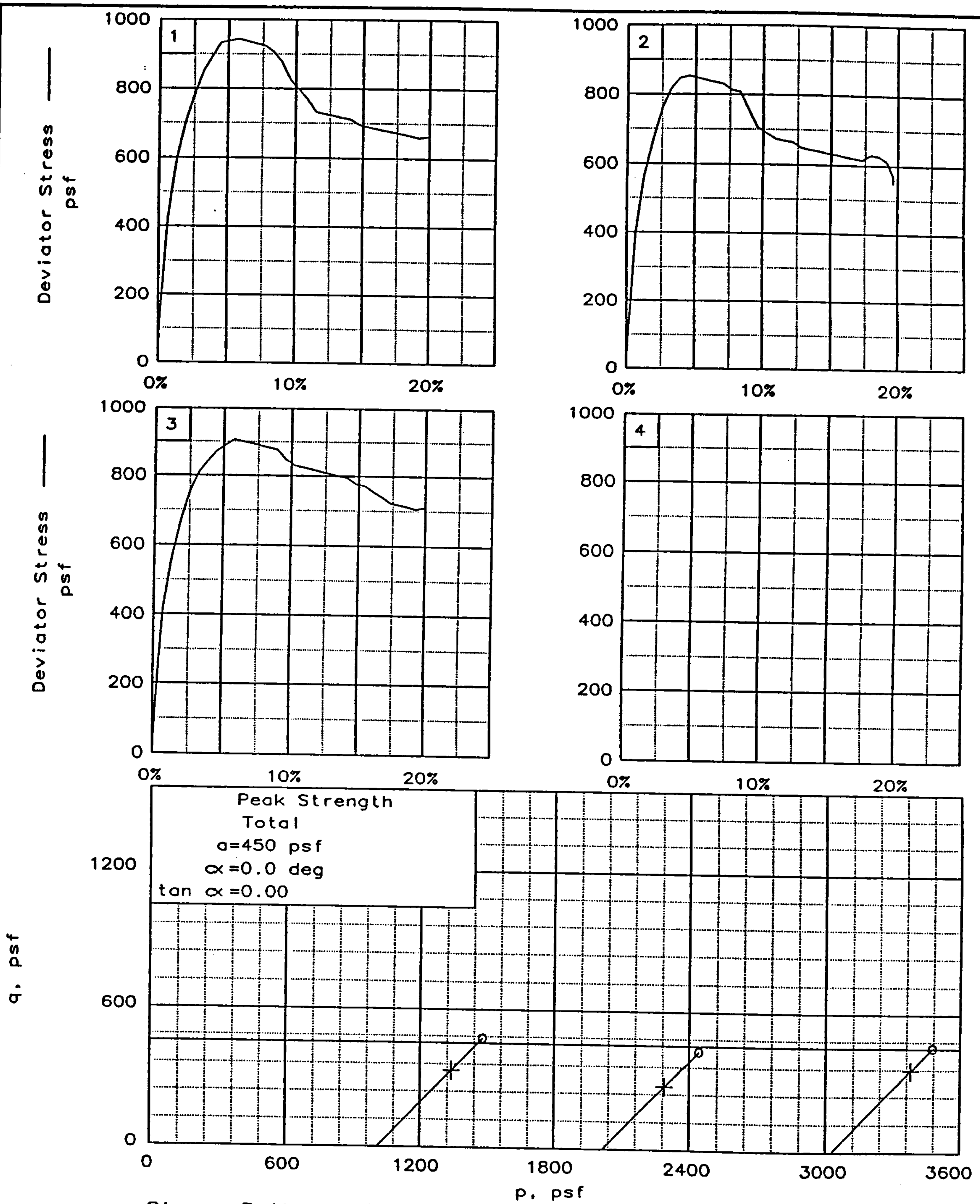
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-2U, Sample 10-C, Depth 29.4'

PROJ. NO.: 13622 DATE: 6-26-96

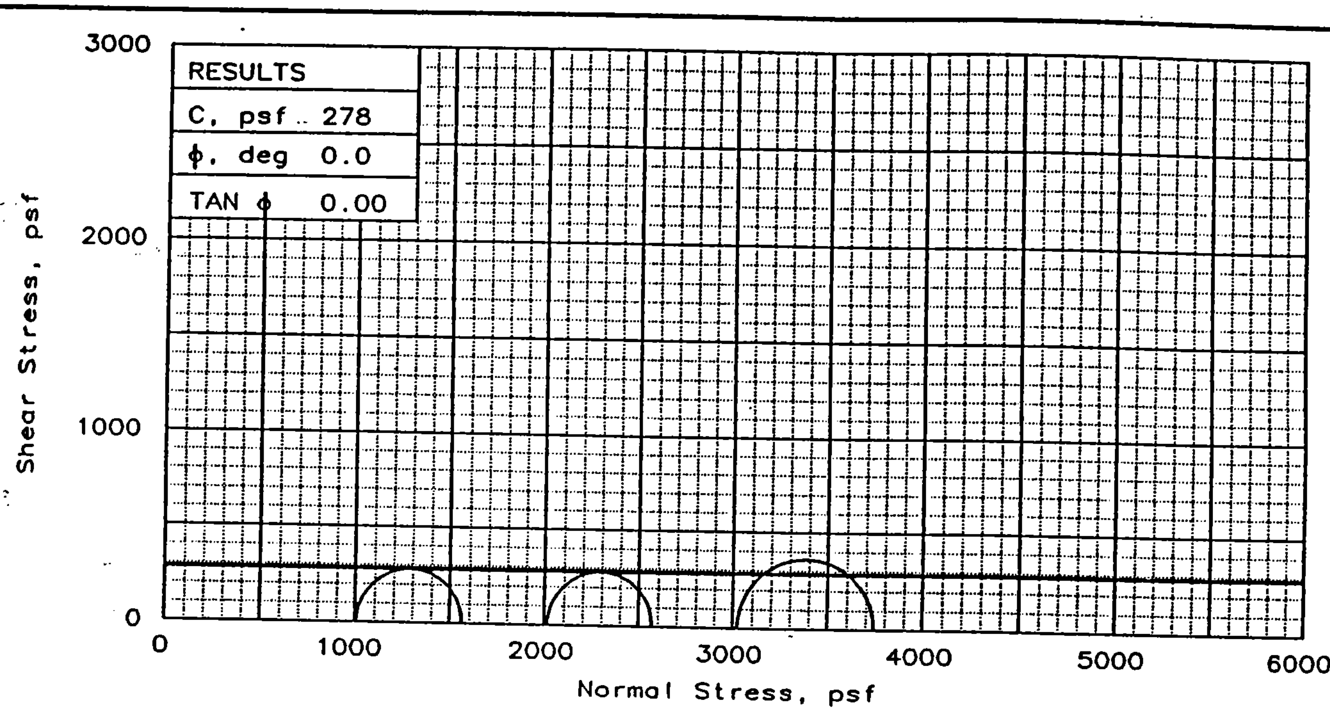
TRIAXIAL SHEAR TEST REPORT

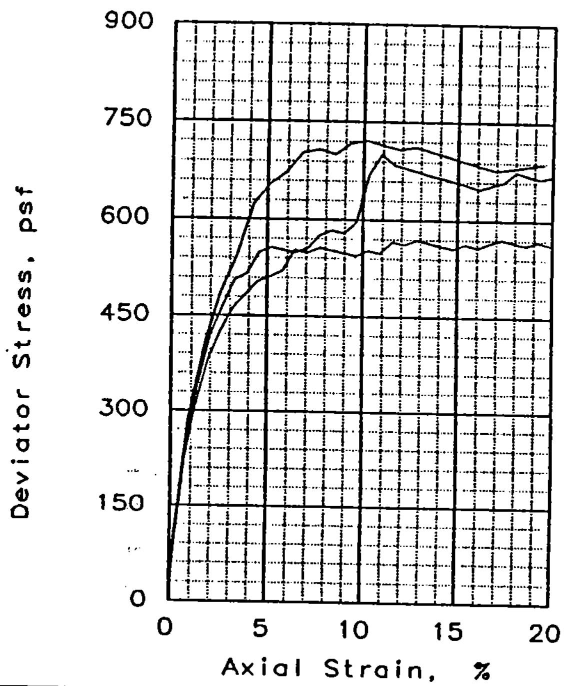
Eustis Engineering Company, Inc.



Stress Paths: + indicates end   ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-2U, Sample 10-C, Depth 29.4'
File: UU-6808   Project No.: 13622   FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	50.5	52.5	51.9
	DRY DENSITY, pcf	71.2	69.5	69.6
	SATURATION, %	99.2	98.9	98.1
	VOID RATIO	1.384	1.444	1.439
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.12
AT TEST	WATER CONTENT, %	50.8	53.0	52.3
	DRY DENSITY, pcf	71.3	69.5	70.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.383	1.442	1.424
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.12
Strain rate, in/min		0.0947	0.1015	0.0998
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		556	556	722
ULTIMATE STRESS, psf		669	563	687
σ_1 FAILURE, psf		1564	2572	3746
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lns & ars ML
LL= 79 PL= 23 PI= 56
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

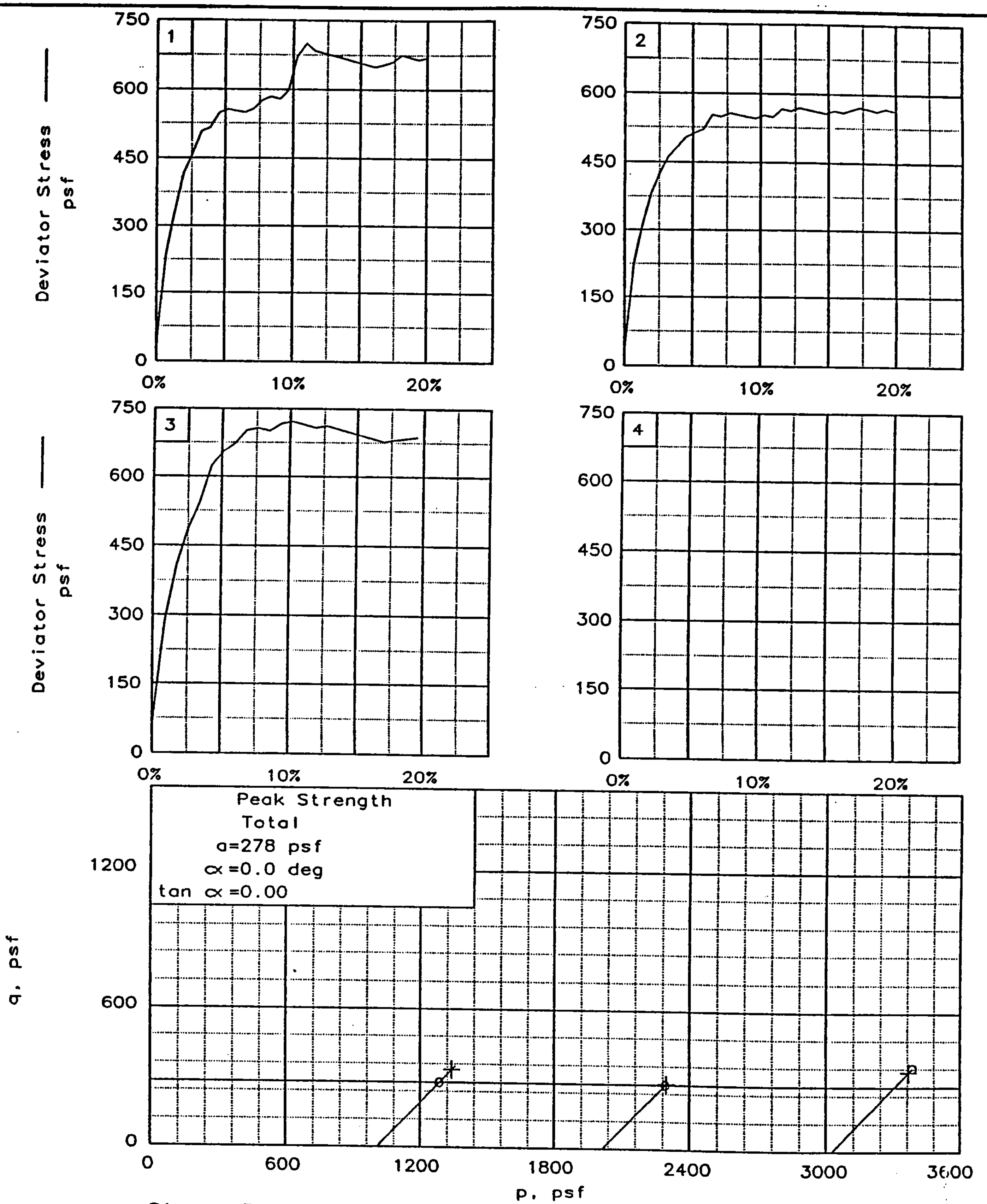
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-2U,
Sample 12-D, Depth 37.8'

PROJ. NO.: 13622 DATE: 6-26-96

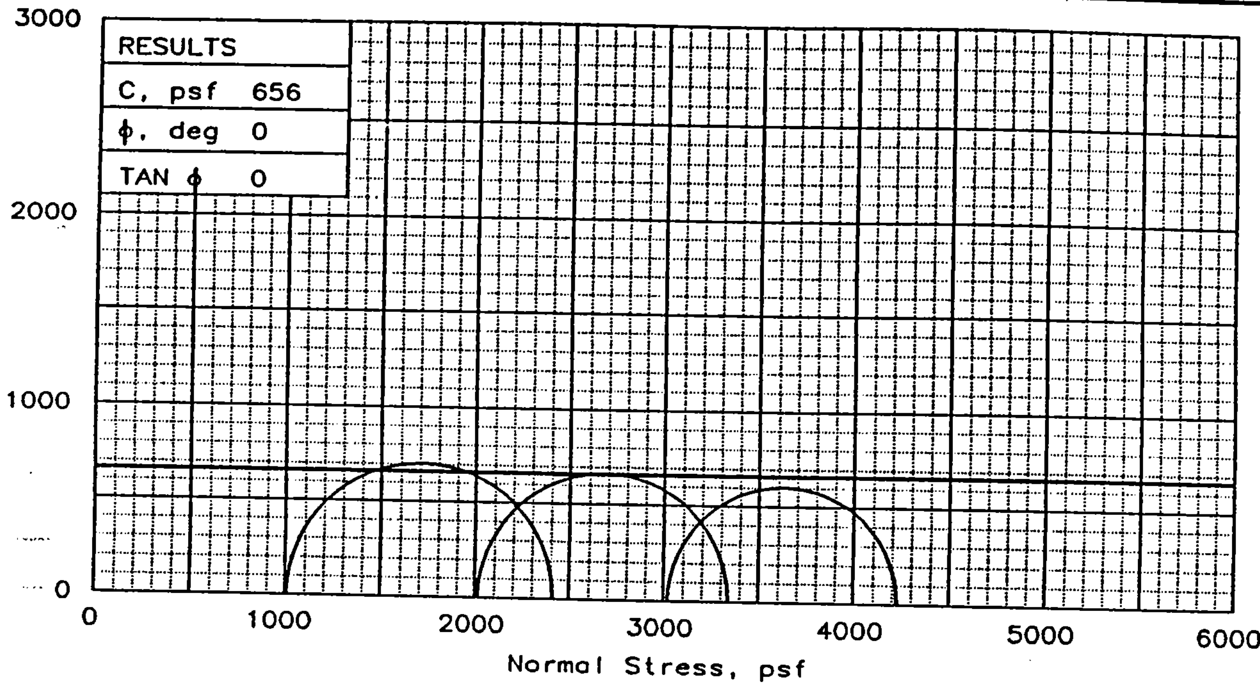
TRIAXIAL SHEAR TEST REPORT

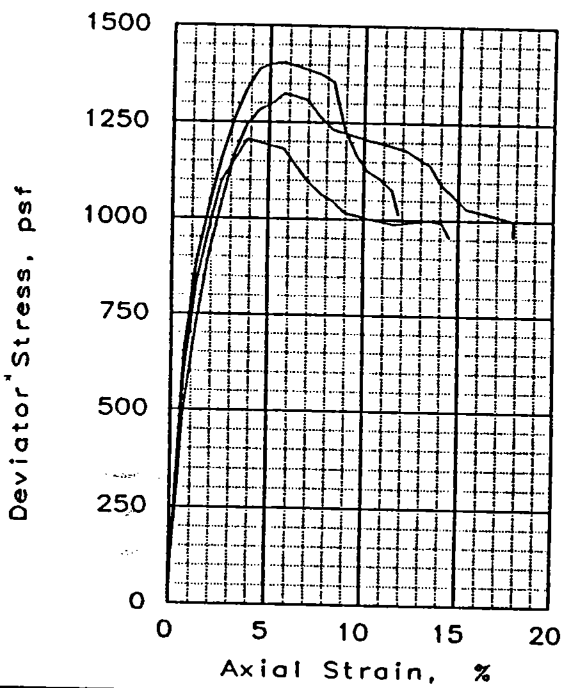
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-2U, Sample 12-D, Depth 37.8'
File: UU-6809 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	56.9	54.8	55.9
	DRY DENSITY, pcf	66.6	67.9	66.0
	SATURATION, %	99.9	99.2	96.8
	VOID RATIO	1.548	1.502	1.572
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	56.9	55.0	57.7
	DRY DENSITY, pcf	66.7	68.0	66.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.548	1.497	1.570
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0953	0.0989	0.0987
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1404	1325	1205
ULTIMATE STRESS, psf		1016	959	955
σ_1 FAILURE, psf		2412	3341	4229
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ ors ML
LL= 88 PL= 21 PI= 67
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

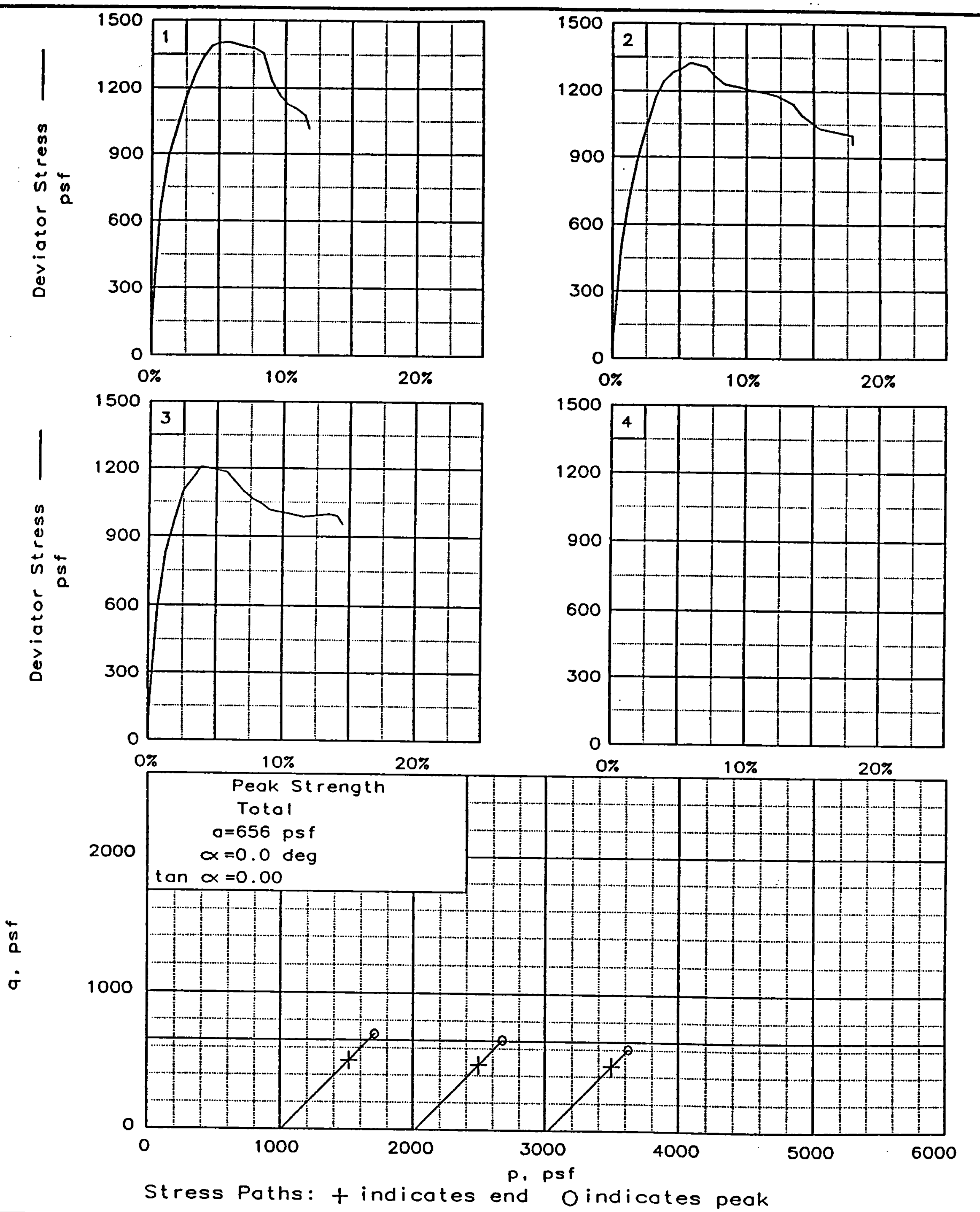
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-2U,
Sample 14-B, Depth 44.5'

PROJ. NO.: 13622 DATE: 6-26-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

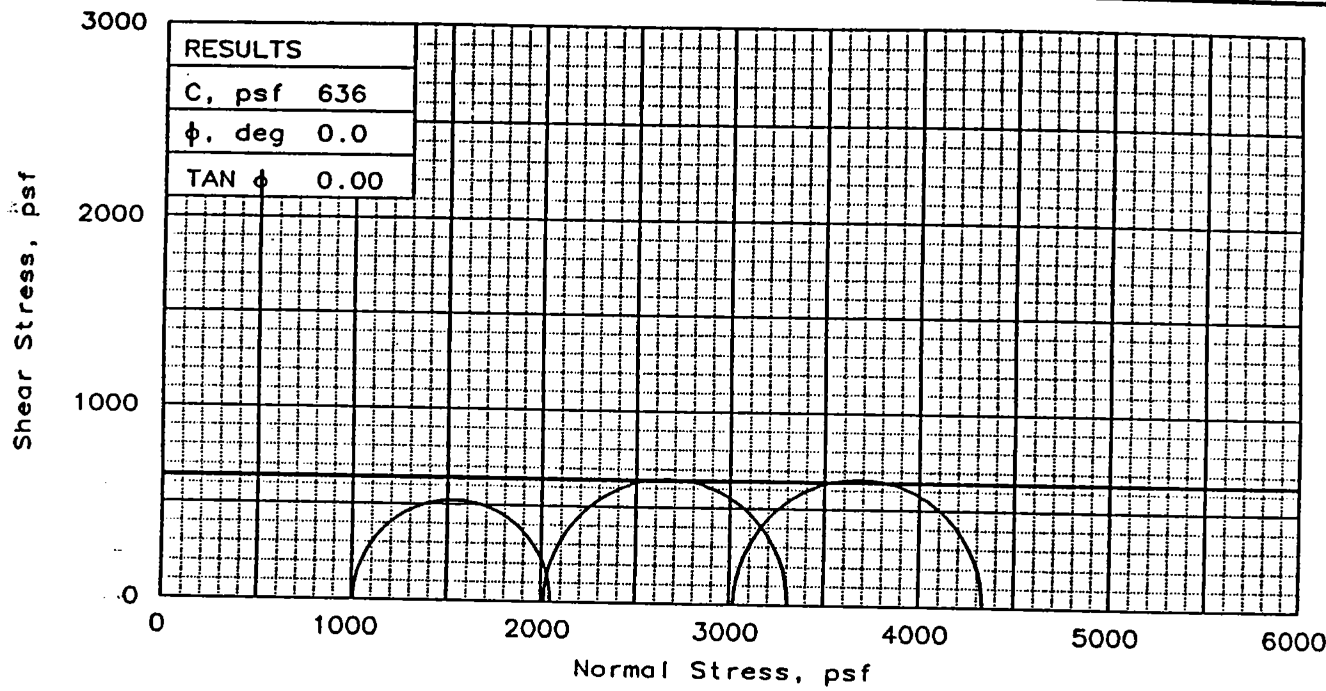


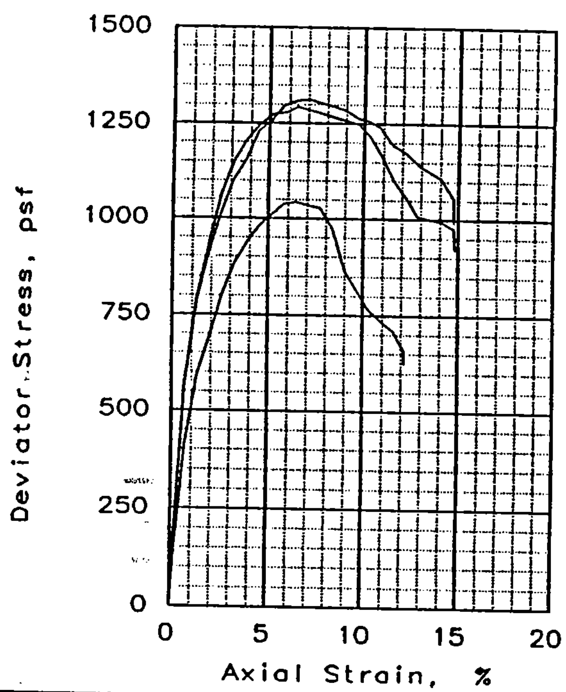
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-2U, Sample 14-B, Depth 44.5'

File: UU-6810 Project No.: 13622 FIG. NO.: _____





	SPECIMEN NO.:	1	2	3
INITIAL	WATER CONTENT, %	61.4	61.0	59.5
	DRY DENSITY, pcf	63.2	64.1	64.3
	SATURATION, %	99.0	100.7	98.6
	VOID RATIO	1.688	1.648	1.642
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	62.2	60.5	60.3
	DRY DENSITY, pcf	63.1	64.2	64.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.693	1.644	1.641
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
	Strain rate, in/min	0.0995	0.1007	0.0995
	BACK PRESSURE, psf	0	0	0
	CELL PRESSURE, psf	1008	2016	3024
	FAILURE STRESS, psf	1043	1294	1313
	ULTIMATE STRESS, psf	627	921	991
	σ_1 FAILURE, psf	2051	3310	4337
	σ_3 FAILURE, psf	1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lns & ors ML
LL= 89 PL= 27 PI= 62
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

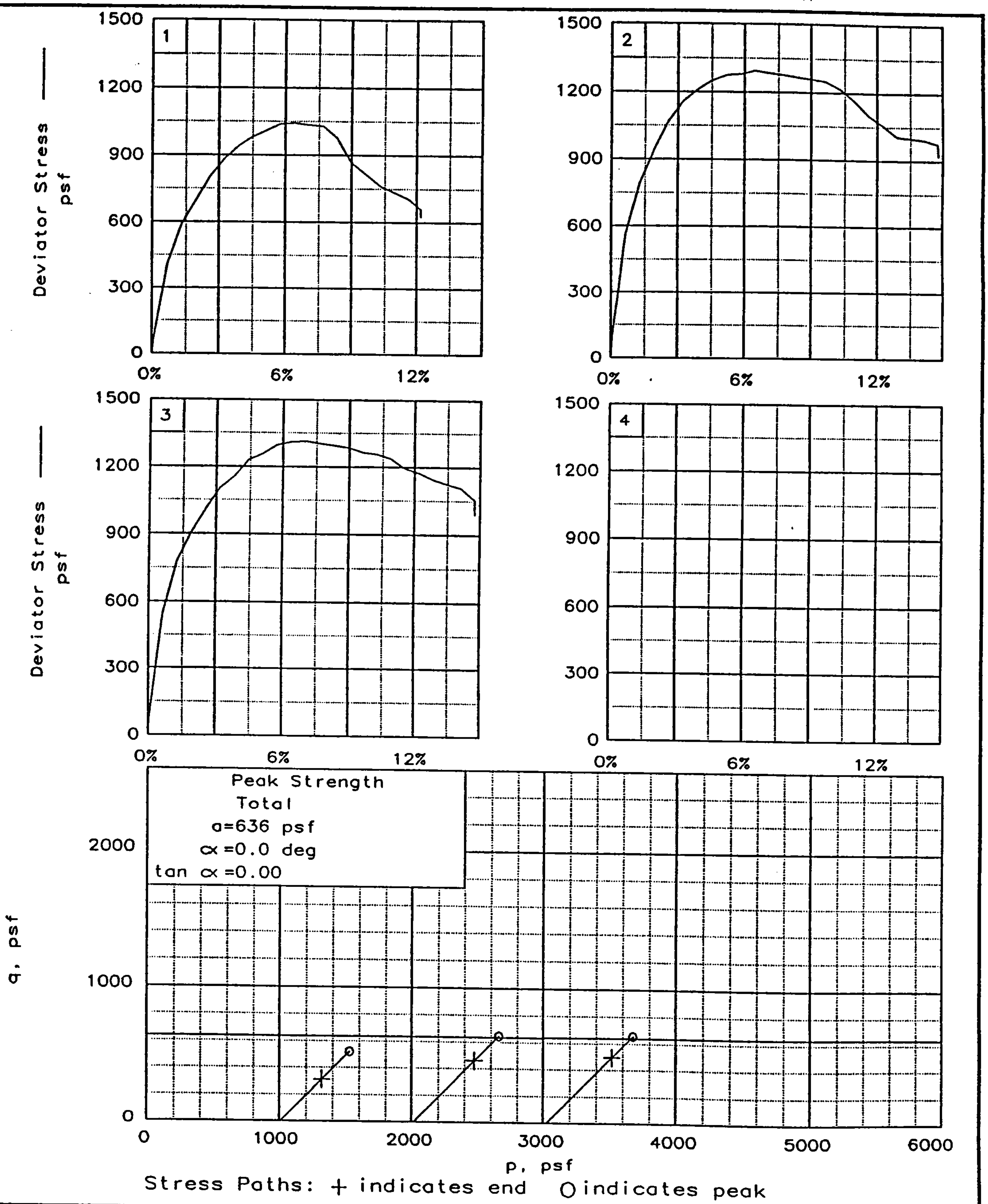
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-2U,
Sample 16-D, Depth 53.8'

PROJ. NO.: 13622 DATE: 6-26-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

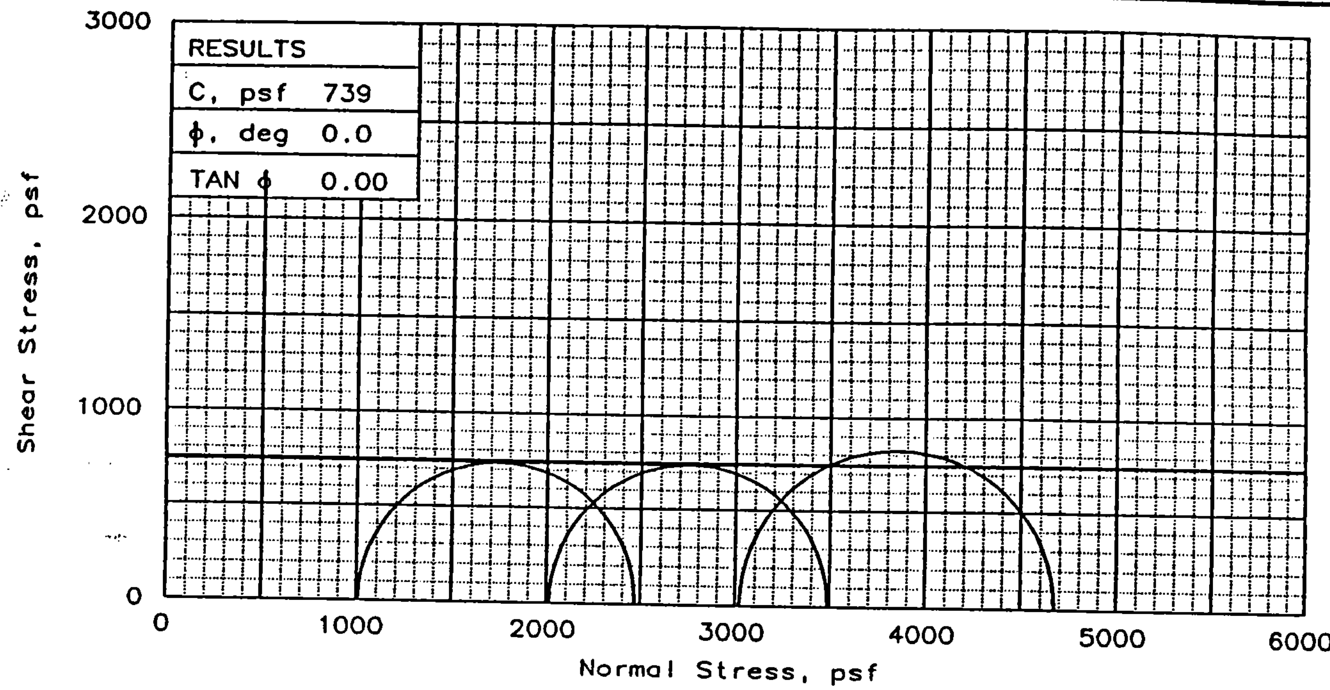


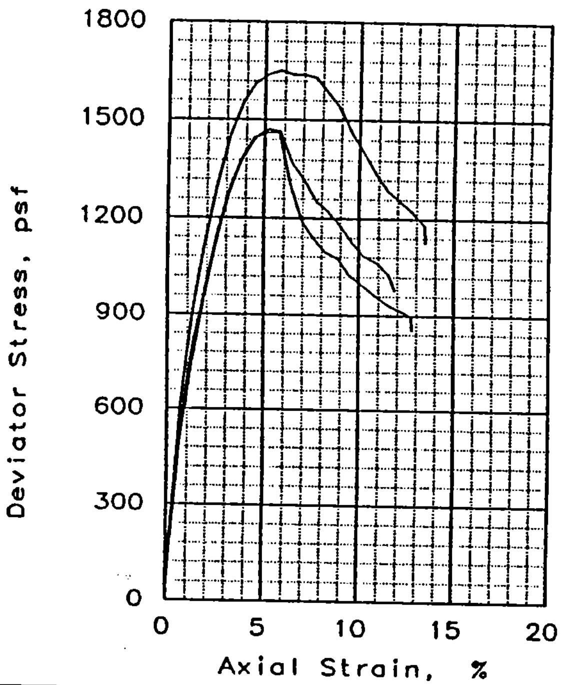
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-2U, Sample 16-D, Depth 53.8'

File: UU-6811 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	60.5	59.6	59.2
	DRY DENSITY, pcf	63.1	63.8	64.4
	SATURATION, %	97.4	97.6	98.5
	VOID RATIO	1.689	1.661	1.635
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	62.1	60.8	59.9
	DRY DENSITY, pcf	63.2	64.0	64.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.688	1.655	1.630
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0945	0.0947	0.0965
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1462	1472	1651
ULTIMATE STRESS, psf		855	977	1126
σ_1 FAILURE, psf		2470	3488	4675
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ lns & ars SP
LL= 91 PL= 26 PI= 65
SPECIFIC GRAVITY= 2.72
REMARKS:

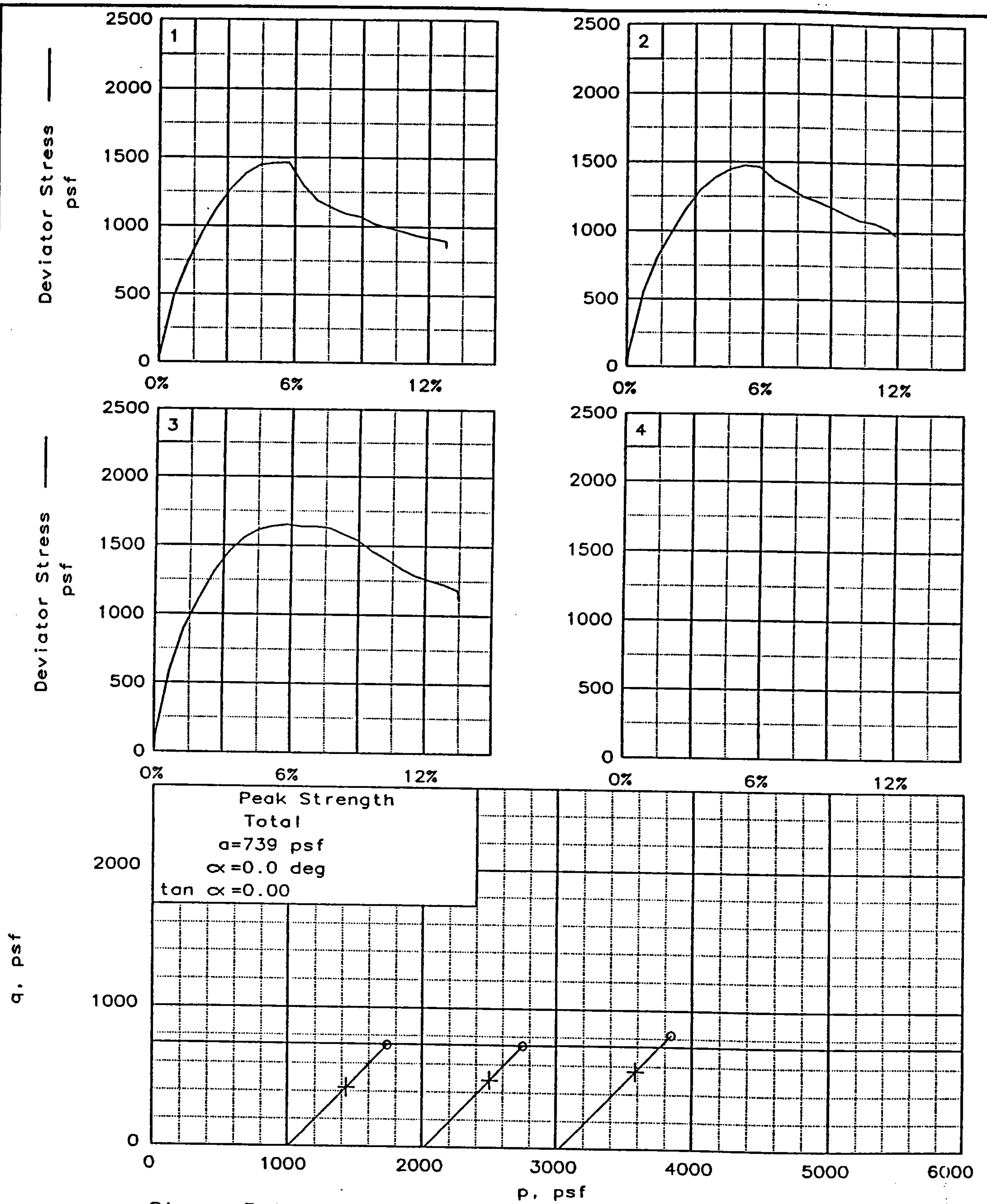
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-2U,
Sample 18-B, Depth 60.5'
PROJ. NO.: 13622 DATE: 6-26-96

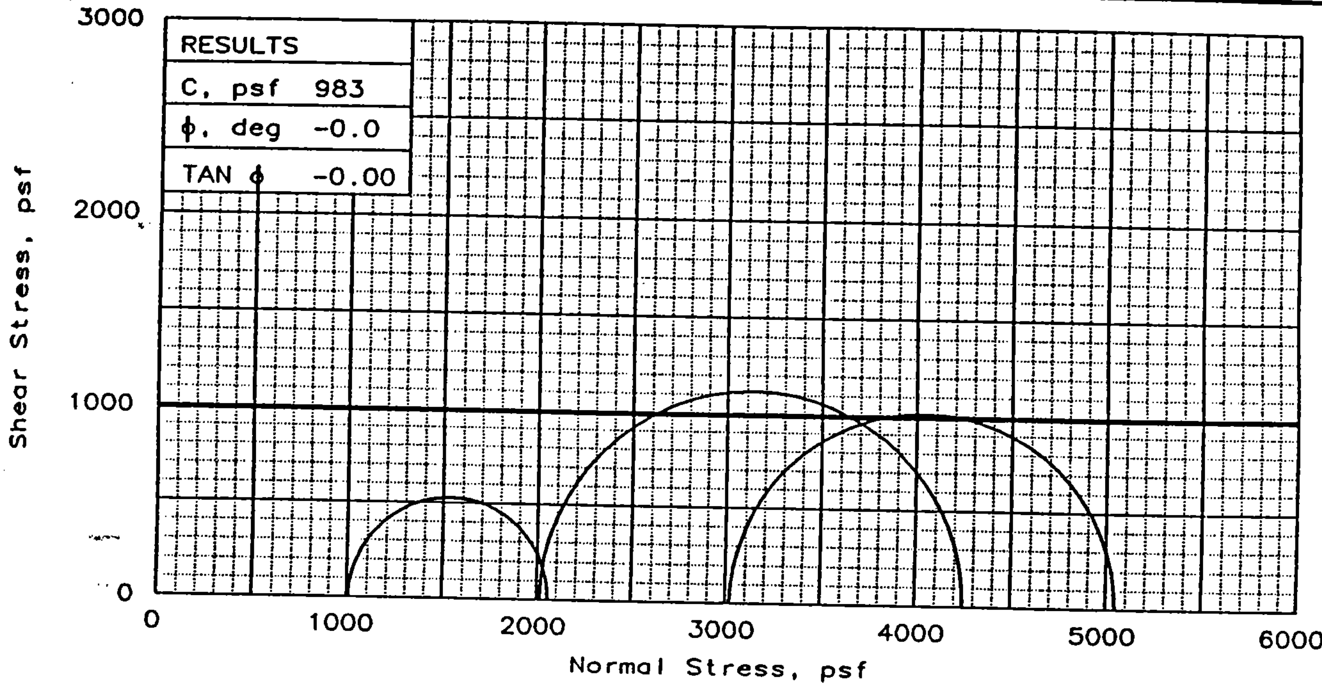
TRIAXIAL SHEAR TEST REPORT

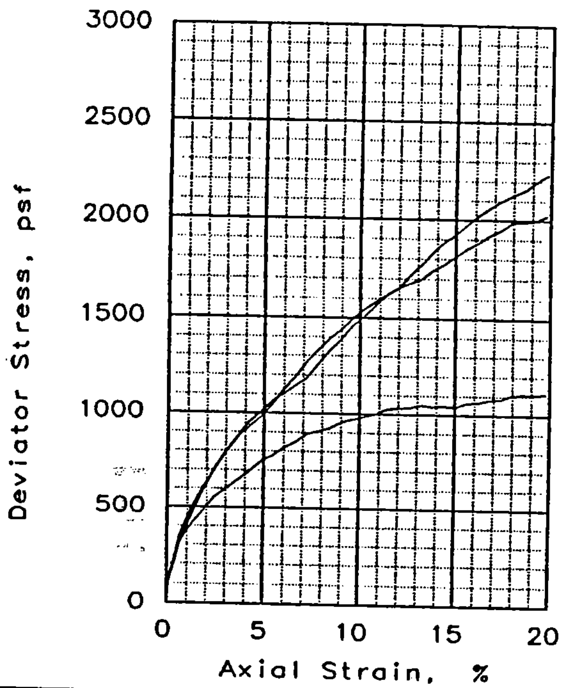
Eustis Engineering Company, Inc.



Stress Paths: + indicates end   O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-2U, Sample 18-B, Depth 60.5'
File: UU-6812   Project No.: 13622   FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	28.4	27.9	27.5
	DRY DENSITY, pcf	93.4	92.3	92.4
	SATURATION, %	95.2	91.1	90.1
	VOID RATIO	0.805	0.827	0.825
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.99	2.99	2.99
AT TEST	WATER CONTENT, %	29.9	30.7	30.7
	DRY DENSITY, pcf	93.2	92.2	92.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.808	0.828	0.829
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.99	2.99	2.99
Strain rate, in/min		0.1017	0.1022	0.1013
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1050	2234	2024
ULTIMATE STRESS, psf		1112	2234	2024
σ_1 FAILURE, psf		2058	4250	5048
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CL3
w/ slf
LL= 23 PL= 16 PI= 7
SPECIFIC GRAVITY= 2.7
REMARKS:

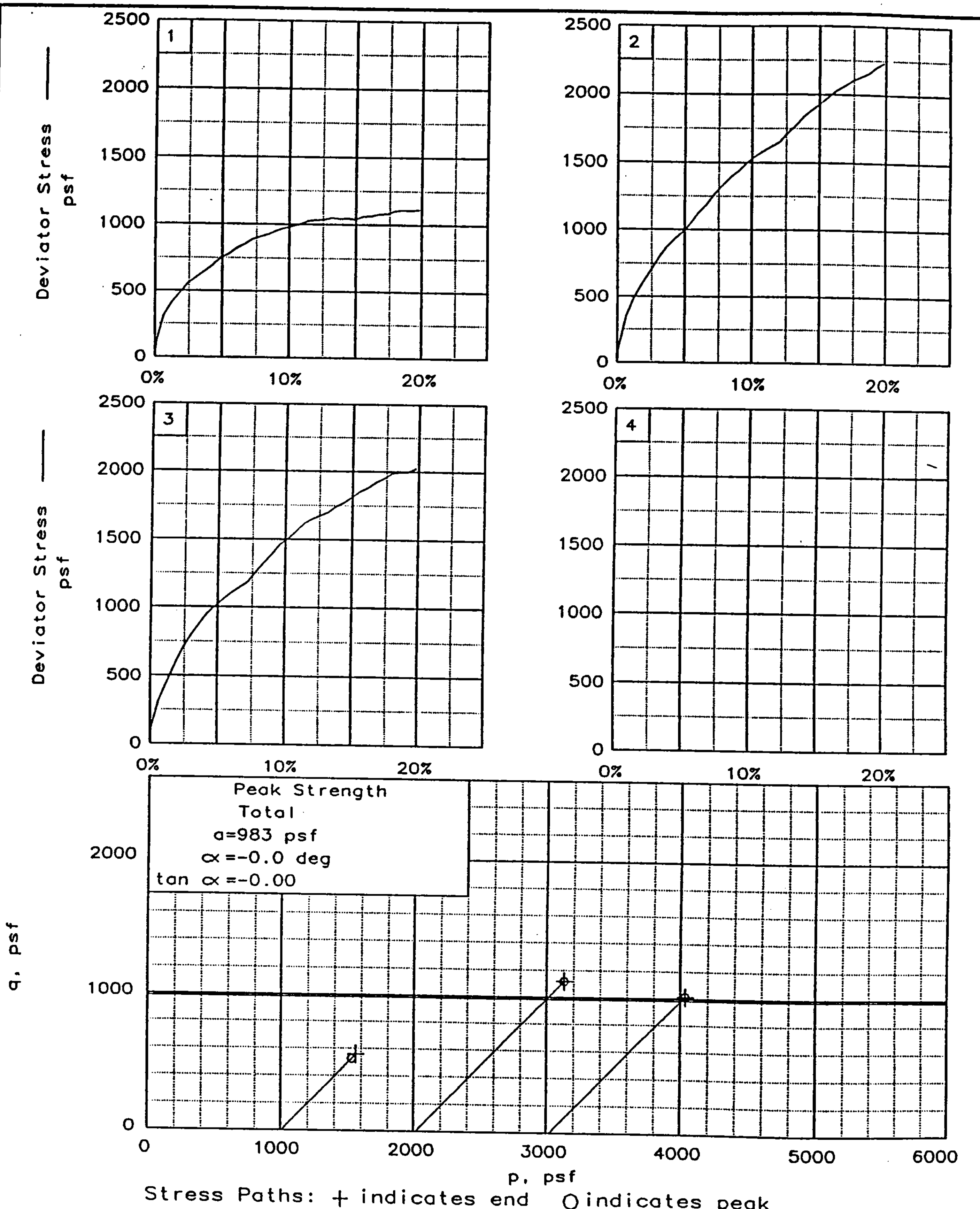
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-2U,
Sample 19-D, Depth 65.8'
PROJ. NO.: 13622 DATE: 6-26-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

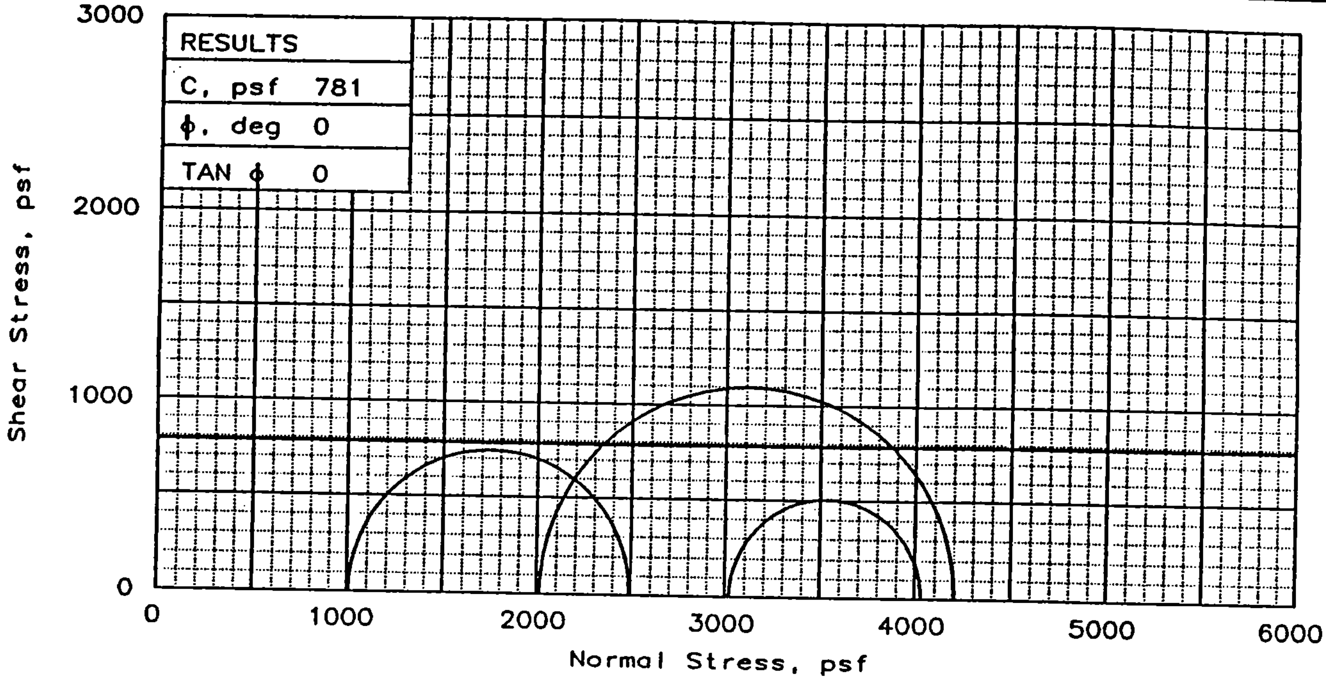


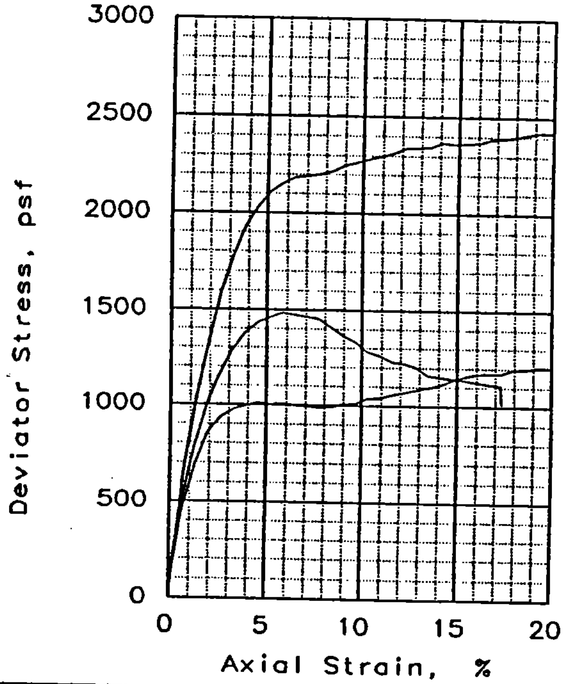
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-2U, Sample 19-D, Depth 65.8'

File: UU-6813 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	32.4	26.5	31.2
	DRY DENSITY, pcf	87.3	92.9	89.2
	SATURATION, %	93.8	87.8	94.5
	VOID RATIO	0.932	0.815	0.890
	DIAMETER, in	1.41	1.42	1.41
	HEIGHT, in	2.80	2.80	2.79
AT TEST	WATER CONTENT, %	34.4	29.9	32.5
	DRY DENSITY, pcf	87.4	93.2	89.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.929	0.808	0.878
	DIAMETER, in	1.41	1.42	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0976	0.1025	0.0969
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1485	2191	1009
ULTIMATE STRESS, psf		1015	2424	1205
σ_1 FAILURE, psf		2493	4207	4033
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CL6
w/ lns ML, ars CH
LL= 45 PL= 15 PI= 30
SPECIFIC GRAVITY= 2.7
REMARKS:

FIG. NO.: ______

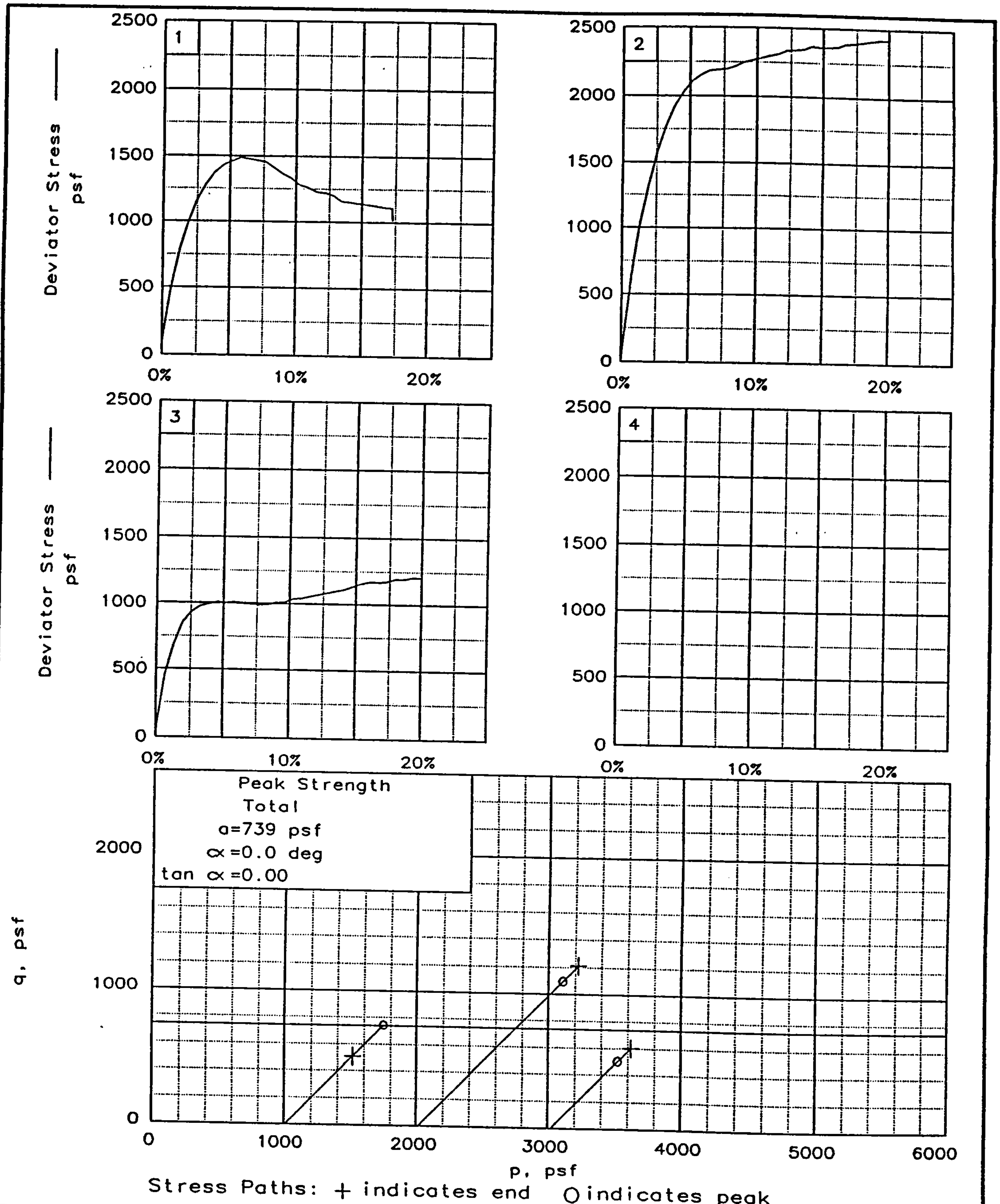
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-3U,
Sample 3-D, Depth 6.1'

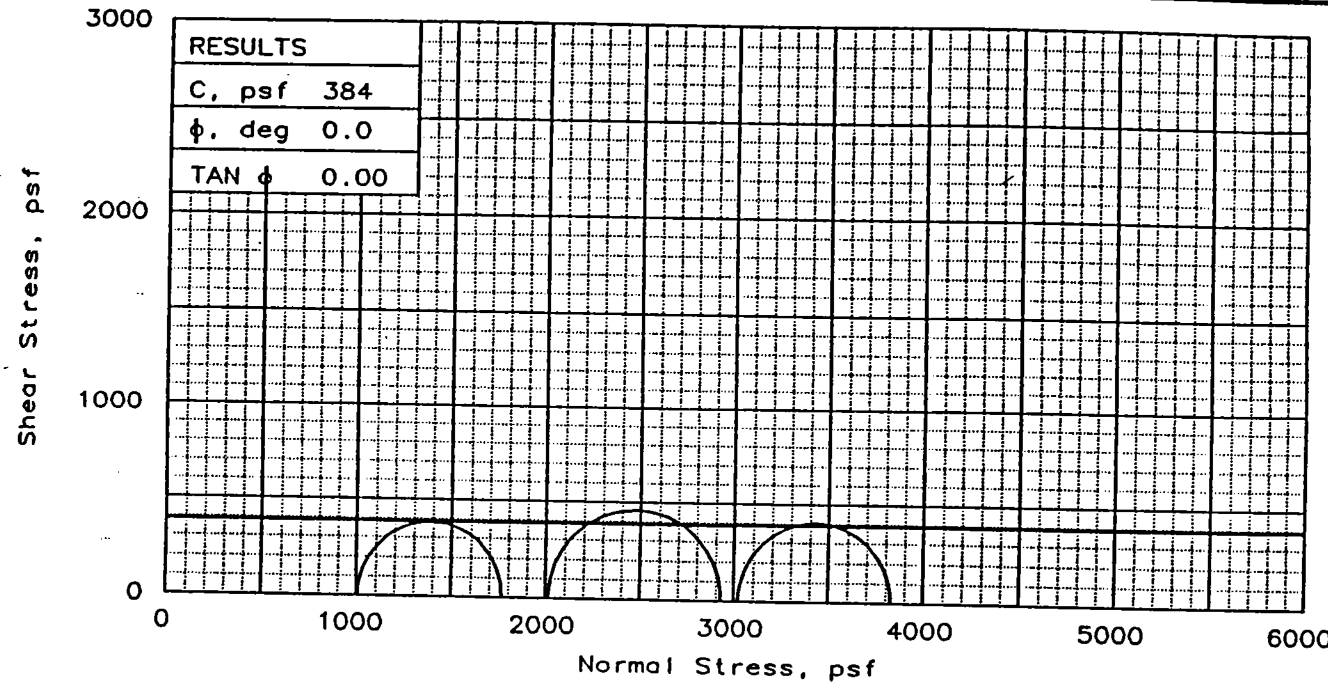
PROJ. NO.: 13622 DATE: 6-26-96

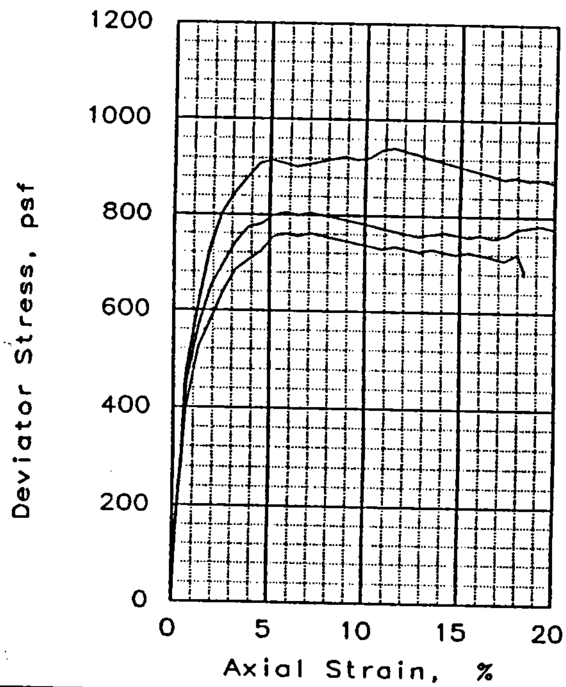
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-3U, Sample 3-D, Depth 6.1'
File: UU-6814 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.6	77.8	56.4
	DRY DENSITY, pcf	58.3	53.7	66.5
	SATURATION, %	95.8	97.5	98.3
	VOID RATIO	1.935	2.187	1.572
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	70.5	79.6	57.6
	DRY DENSITY, pcf	58.3	53.8	66.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.932	2.180	1.578
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1005	0.1012	0.1027
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		761	915	806
ULTIMATE STRESS, psf		679	873	775
σ_1 FAILURE, psf		1769	2931	3830
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH2 w/ lyr & lns CL, lg ars org, & slf
LL= 101 PL= 31 PI= 70
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

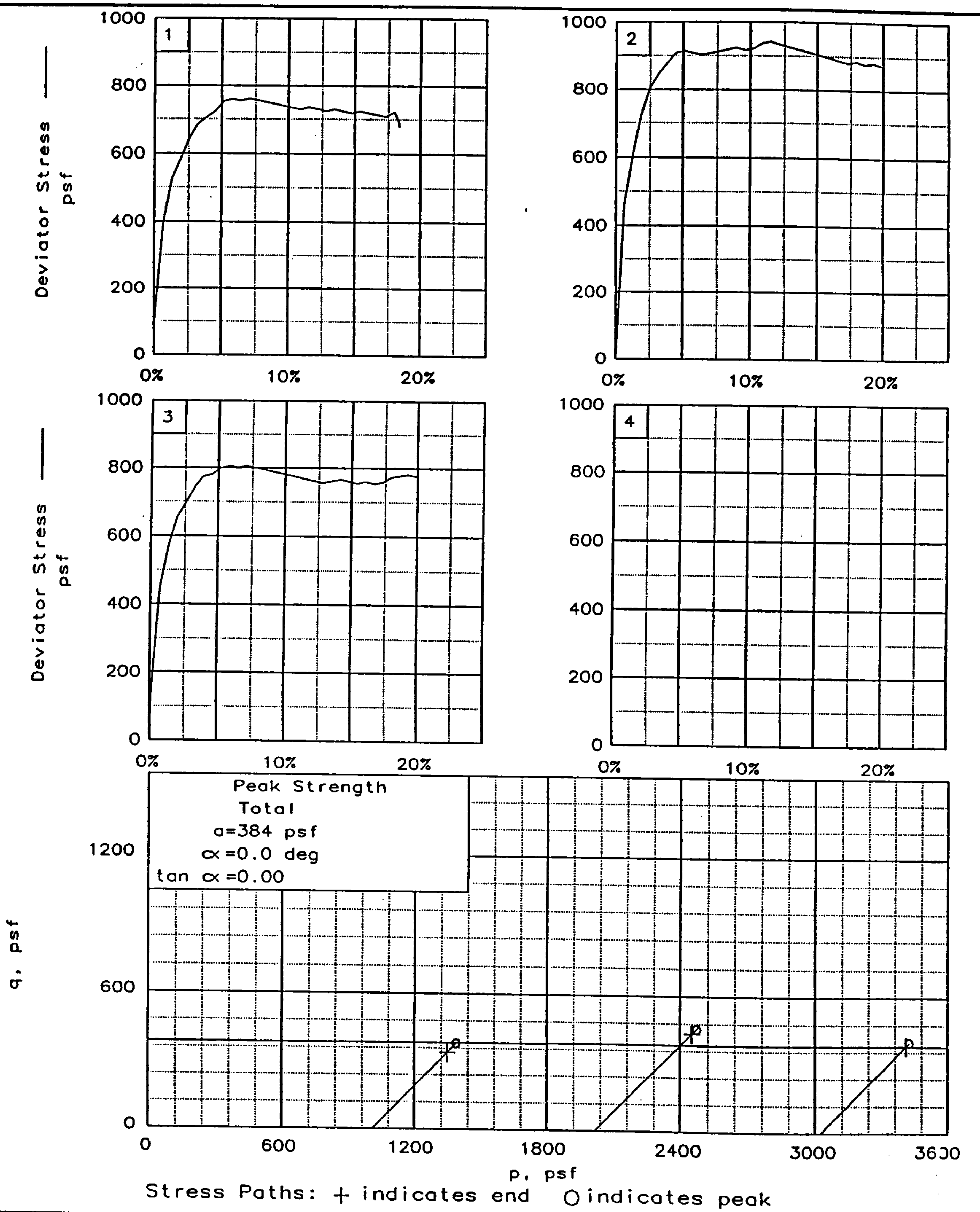
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-3U,
Sample 5-B, Depth 13.4'

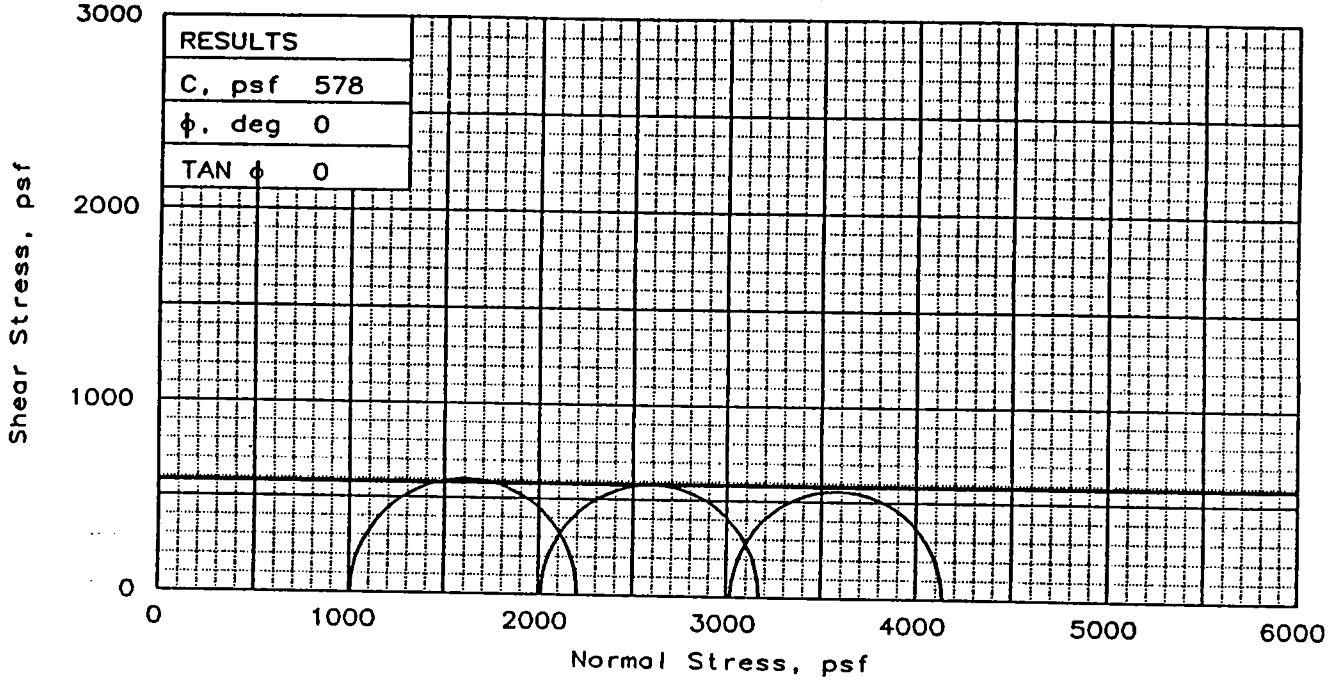
PROJ. NO.: 13622 DATE: 6-26-96

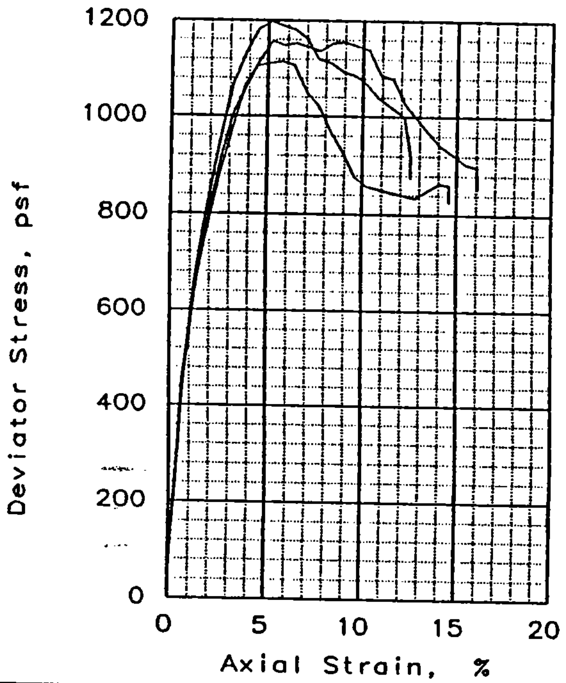
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-3U, Sample 5-B, Depth 13.4'
File: UU-6815 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	57.8	56.4	56.4
	DRY DENSITY, pcf	66.1	66.6	66.7
	SATURATION, %	99.6	98.6	98.9
	VOID RATIO	1.588	1.568	1.564
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	58.2	57.3	56.9
	DRY DENSITY, pcf	65.9	66.5	66.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.595	1.571	1.559
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0925	0.1005	0.0991
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1198	1156	1114
ULTIMATE STRESS, psf		874	855	827
σ_1 FAILURE, psf		2206	3172	4138
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH3 w/ lyr & lns ML, ors org & slf

LL= 78 PL= 27 PI= 51

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

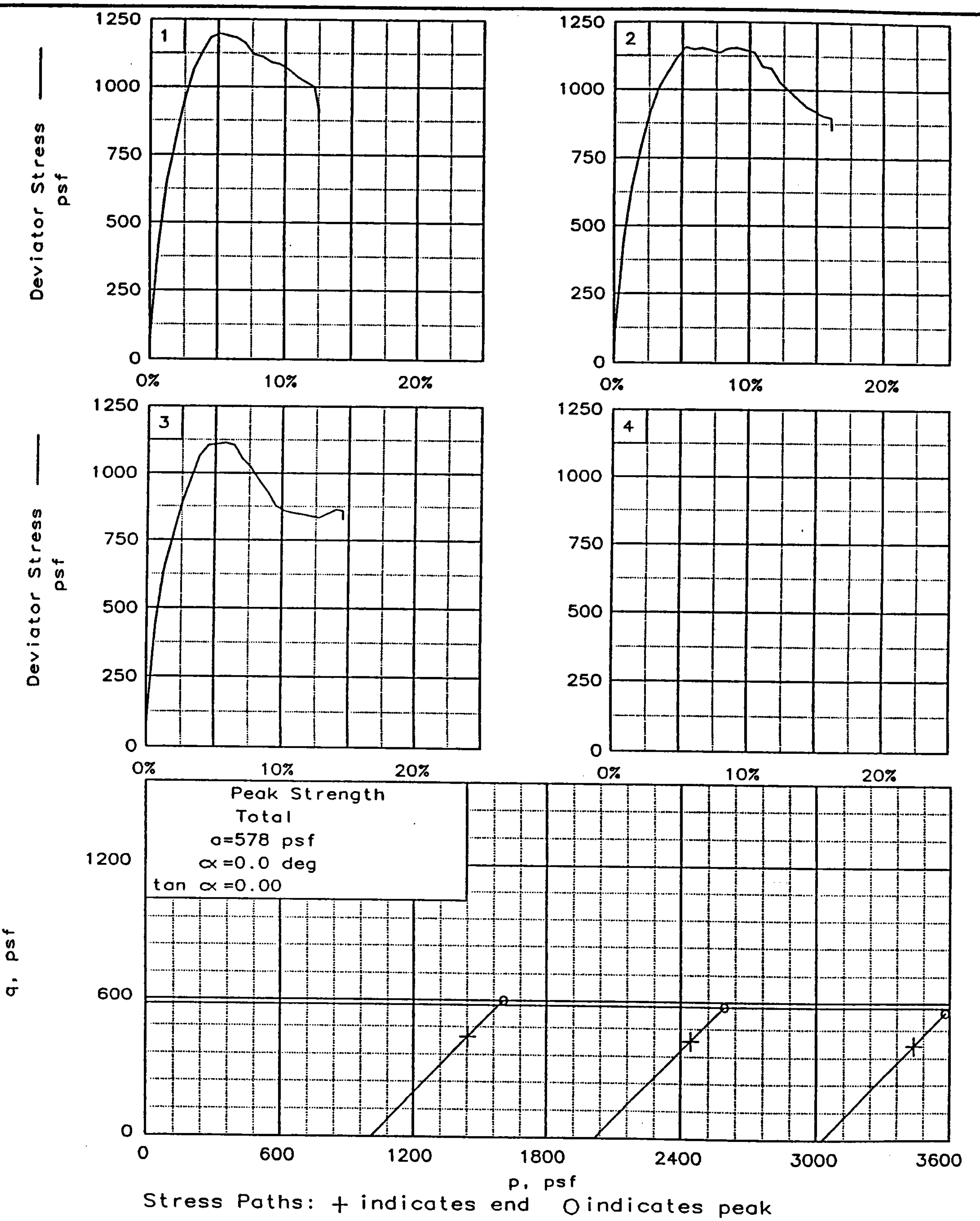
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-3U,
Sample 8-D, Depth 26.6'

PROJ. NO.: 13622 DATE: 6-27-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

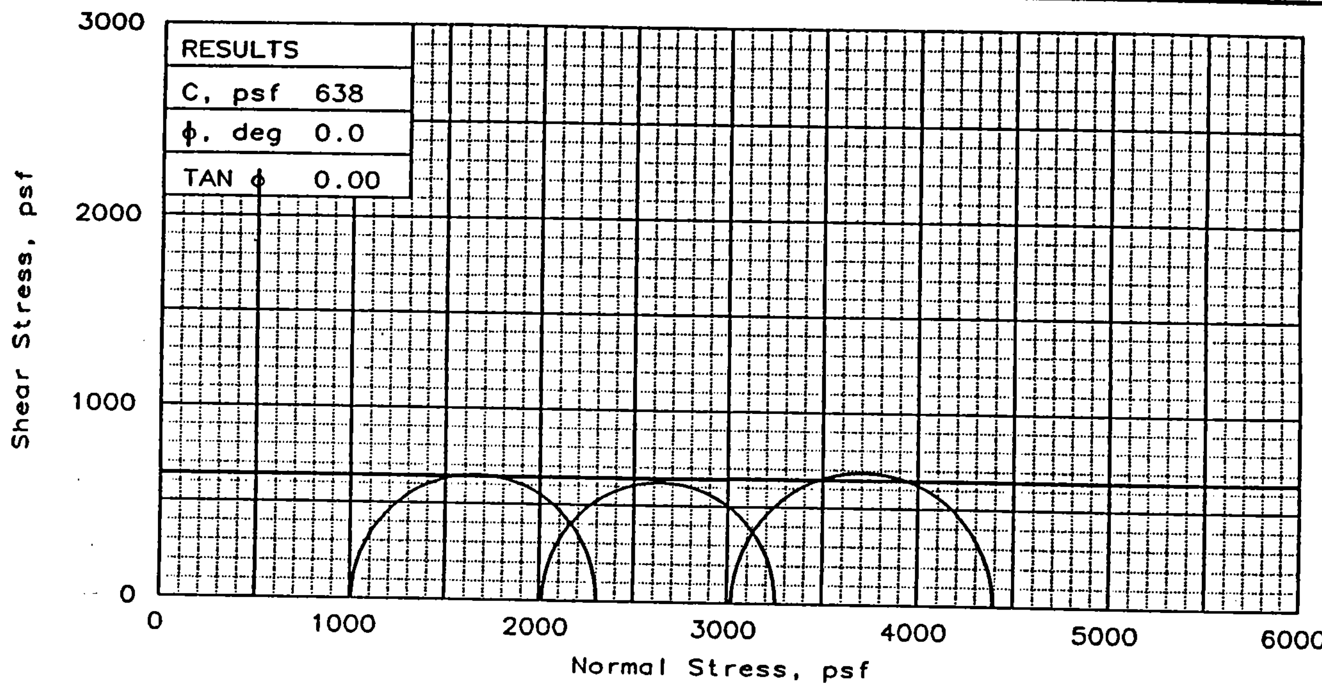


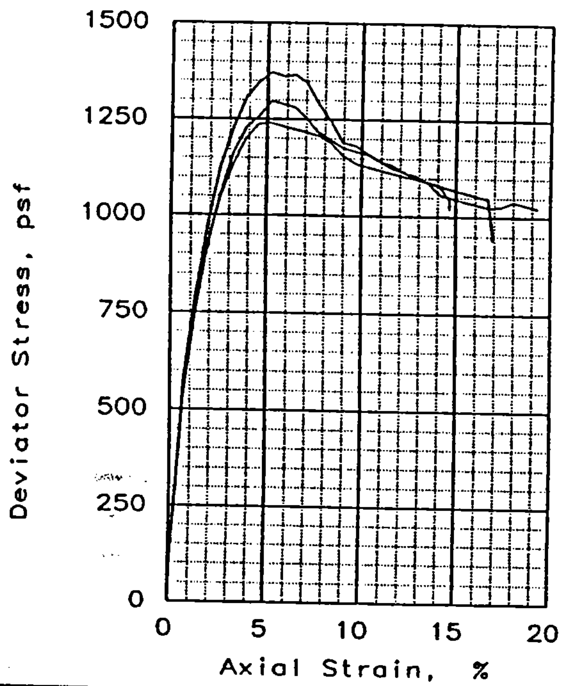
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-3U, Sample 8-D, Depth 26.6'

File: UU-6816 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	49.1	50.0	48.3
	DRY DENSITY, pcf	72.6	72.2	73.6
	SATURATION, %	99.1	100.2	99.9
	VOID RATIO	1.357	1.368	1.325
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.81	2.80	2.80
AT TEST	WATER CONTENT, %	49.9	49.9	48.1
	DRY DENSITY, pcf	72.3	72.2	73.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.367	1.368	1.318
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1026	0.0952	0.0994
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1297	1240	1371
ULTIMATE STRESS, psf		1023	940	1021
σ_1 FAILURE, psf		2305	3256	4395
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ lyr & lns ML
LL= 72 PL= 26 PI= 46
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

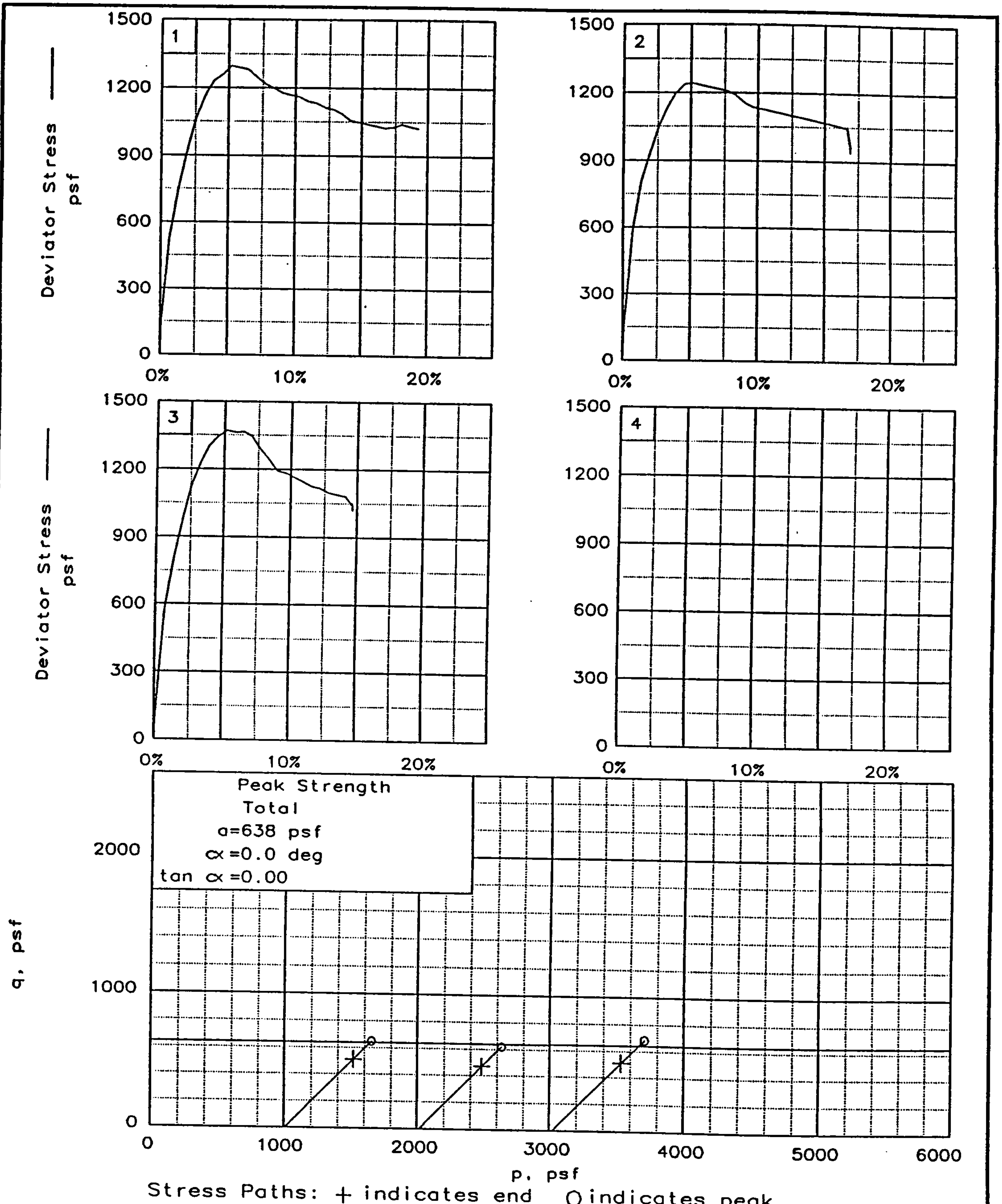
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-3U,
Sample 17-B, Depth 48.7'

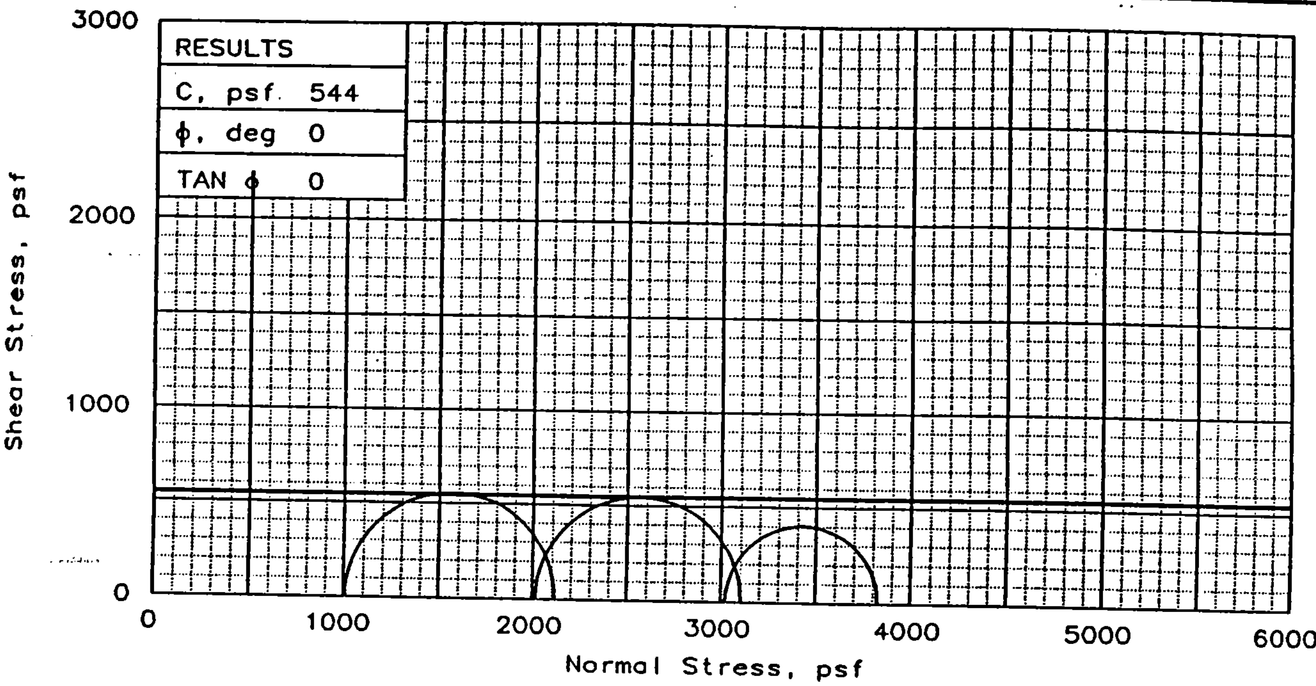
PROJ. NO.: 13622 DATE: 6-27-96

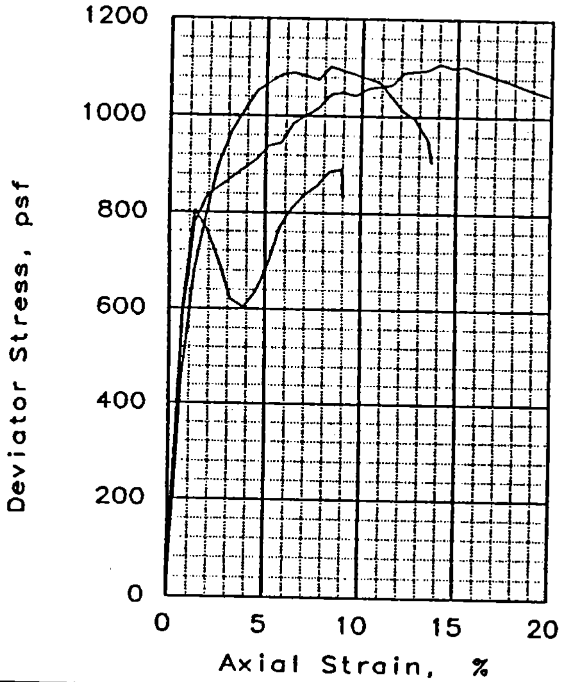
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-3U, Sample 17-B, Depth 48.7'
File: UU-6817 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.2	53.1	54.7
	DRY DENSITY, pcf	68.2	68.6	67.5
	SATURATION, %	98.5	97.5	97.8
	VOID RATIO	1.507	1.493	1.533
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	55.0	54.1	55.8
	DRY DENSITY, pcf	68.2	68.9	67.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.507	1.484	1.528
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1020	0.0971	0.0934
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1109	1089	805
ULTIMATE STRESS, psf		1045	908	833
σ_1 FAILURE, psf		2117	3105	3829
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 83 PL= 24 PI= 59
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

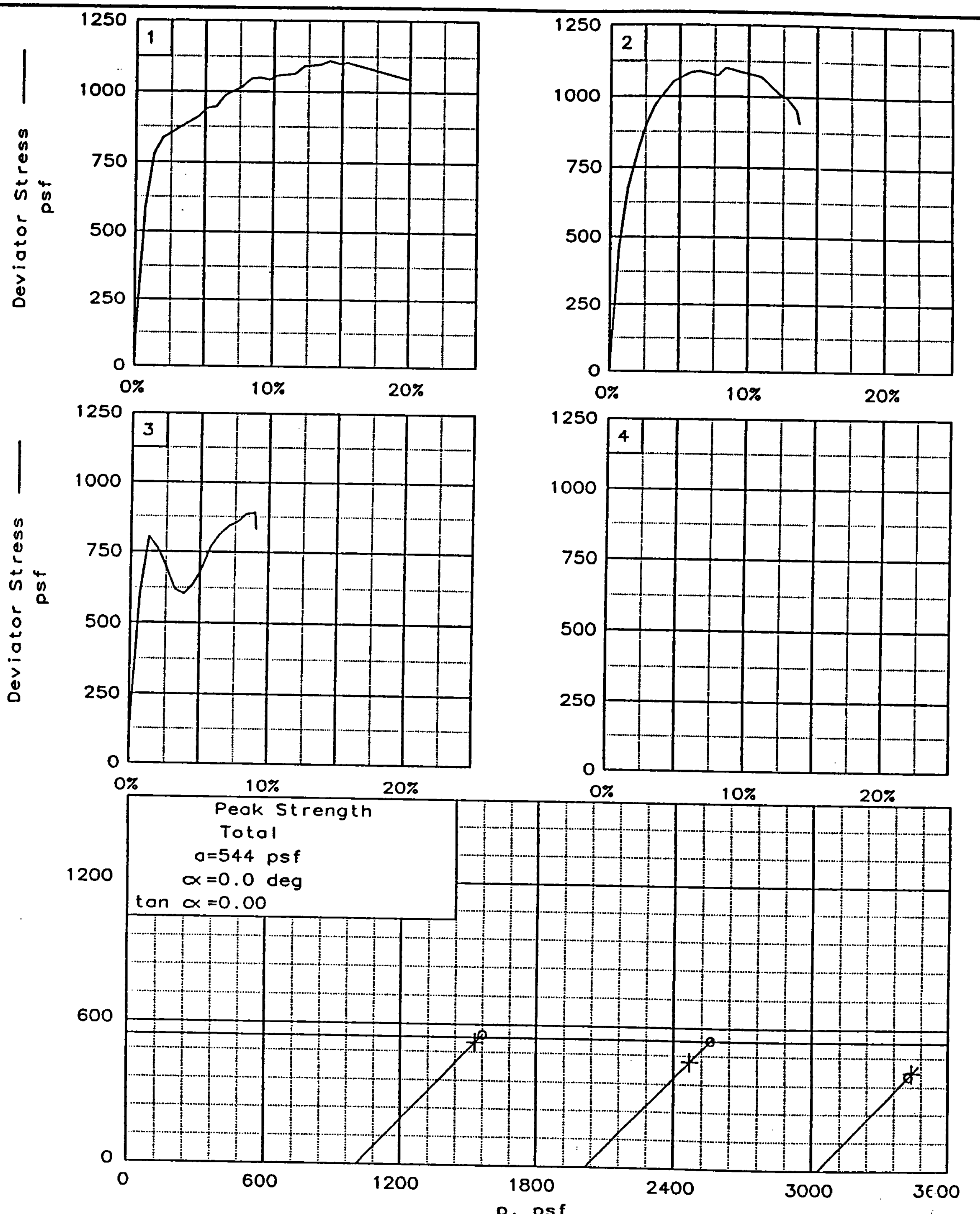
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-3U,
Sample 19-D, Depth 57.1'

PROJ. NO.: 13622 DATE: 6-27-96

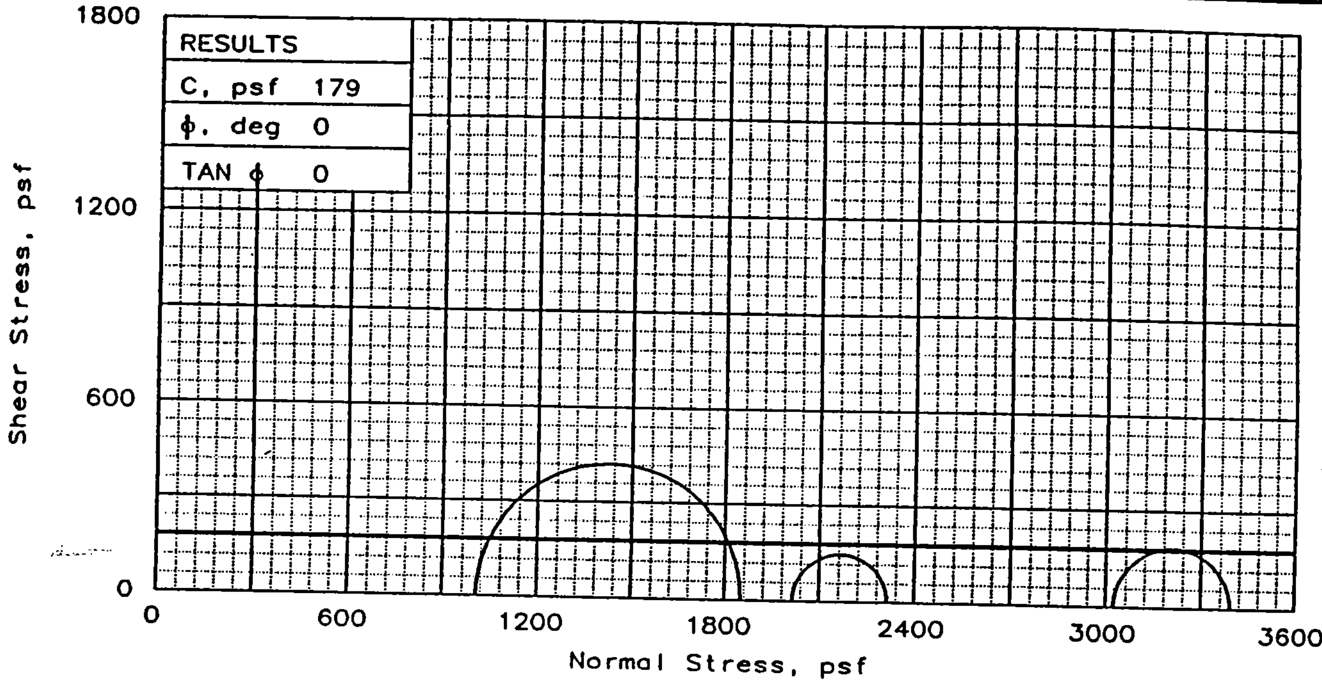
TRIAXIAL SHEAR TEST REPORT

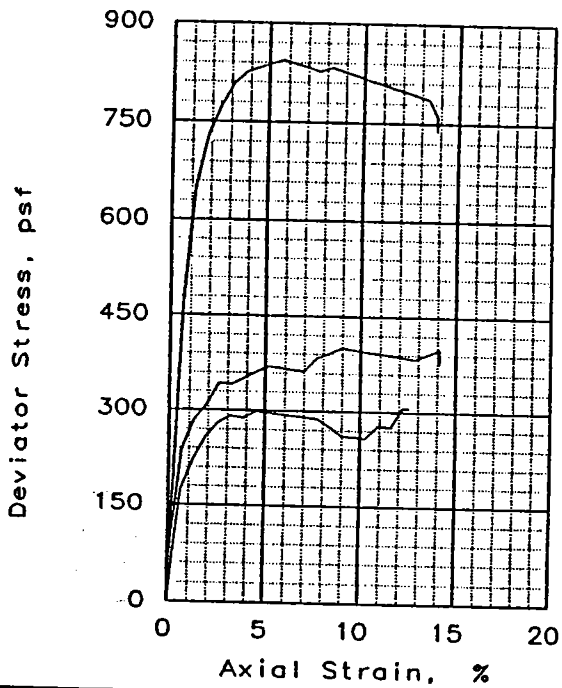
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-3U, Sample 19-D, Depth 57.1'
File: UU-6818 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	51.3	51.4	50.5
	DRY DENSITY, pcf	70.0	69.9	70.7
	SATURATION, %	97.8	97.7	98.1
	VOID RATIO	1.426	1.430	1.401
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	52.4	52.3	51.5
	DRY DENSITY, pcf	70.0	70.1	70.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.426	1.422	1.401
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0961	0.0994	0.0988
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		844	298	370
ULTIMATE STRESS, psf		739	306	378
σ_1 FAILURE, psf		1852	2314	3394
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: VSo Gr CH4 w/ ors ML

LL= 83 PL= 23 PI= 60

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ____

CLIENT: U.S. Army Corps of Engineers

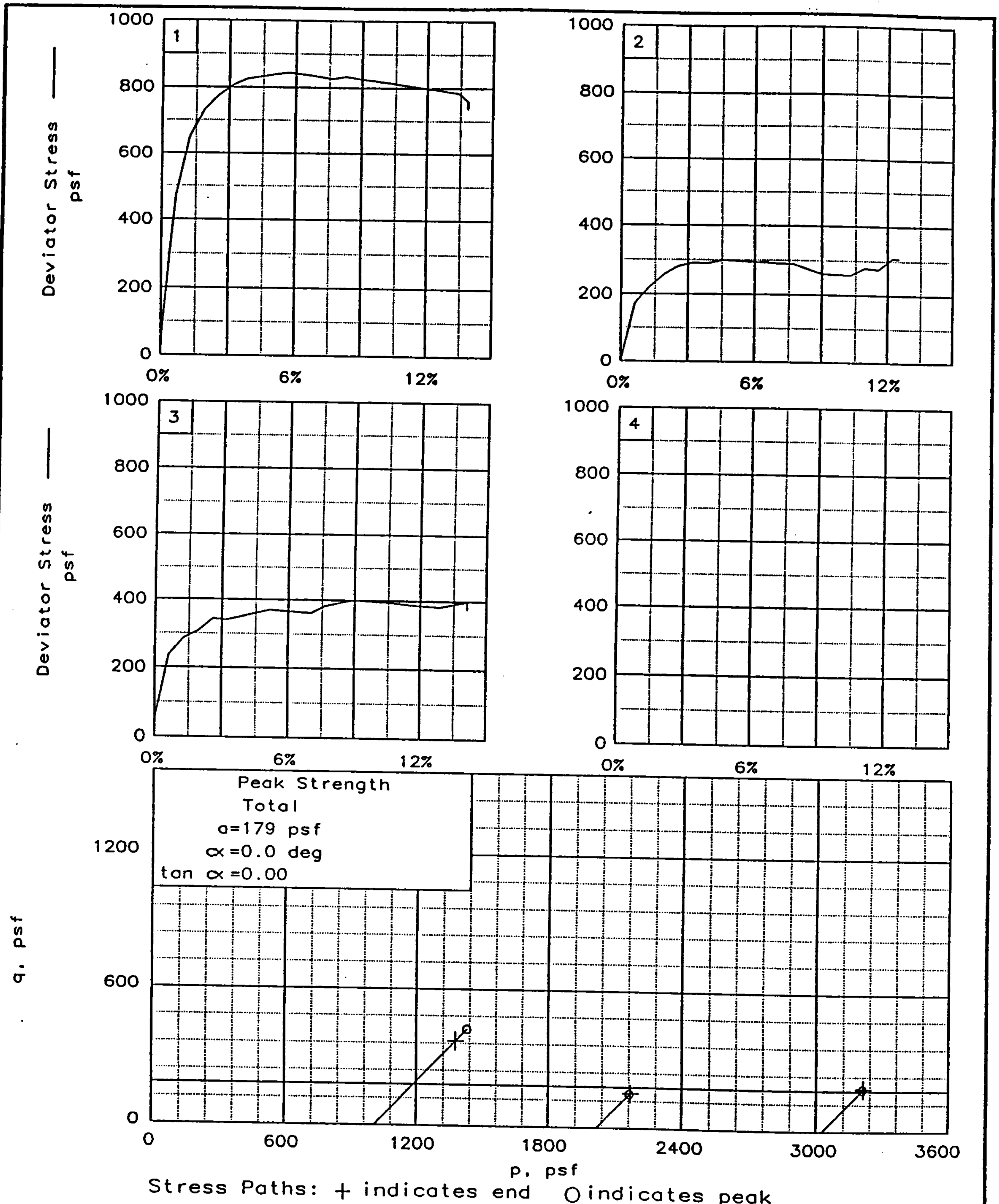
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-3U,
Sample 20-D, Depth 61.7'

PROJ. NO.: 13622 DATE: 6-27-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

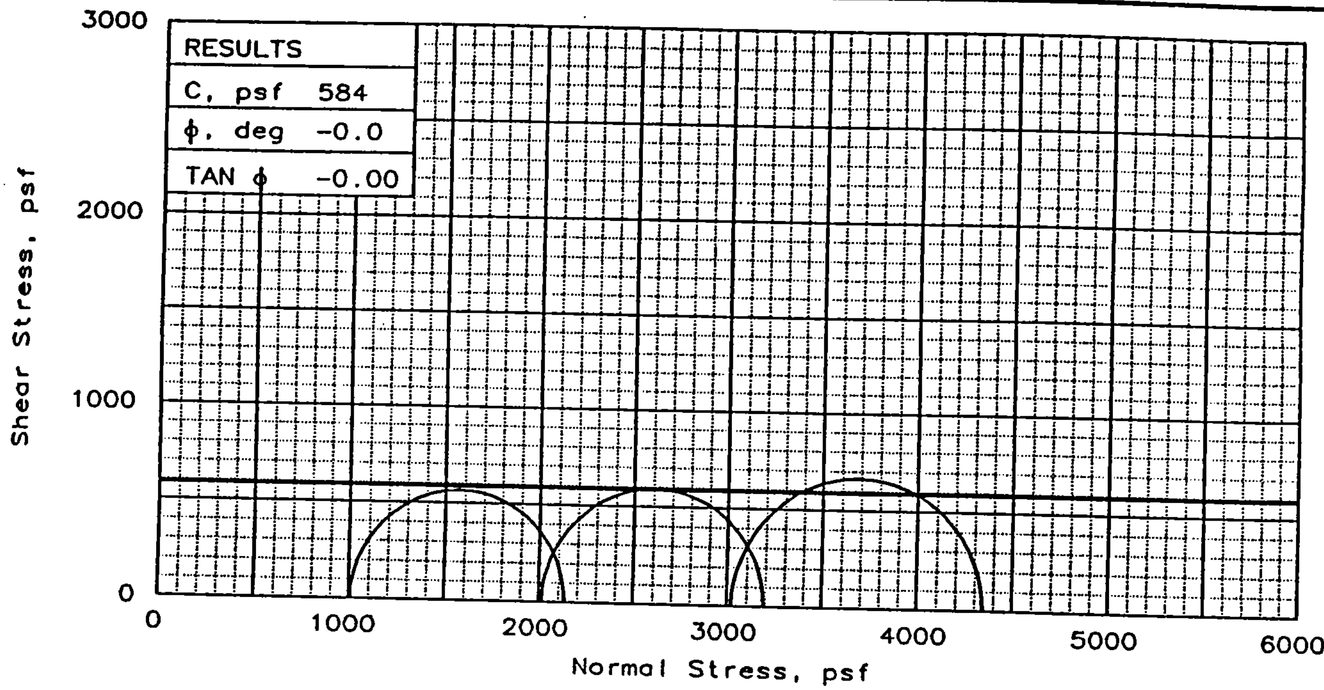


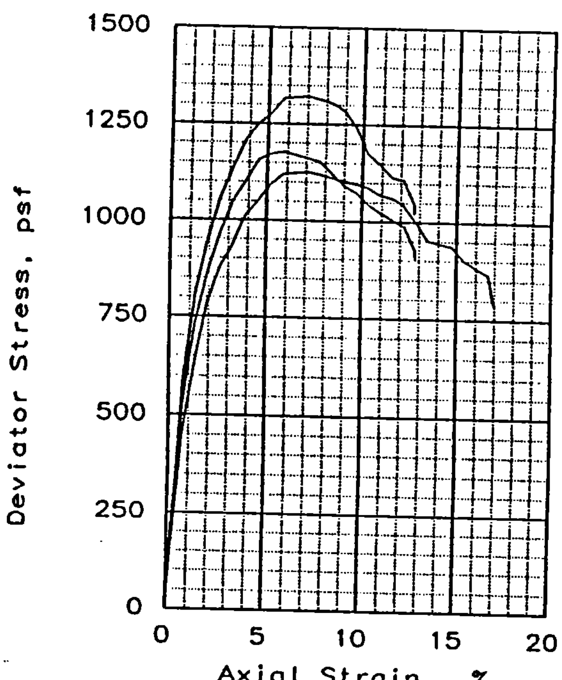
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-3U, Sample 20-D, Depth 61.7'

File: UU-6819 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.6	54.1	54.0
	DRY DENSITY, pcf	66.8	67.1	67.0
	SATURATION, %	95.9	95.7	95.2
	VOID RATIO	1.560	1.550	1.552
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.81
AT TEST	WATER CONTENT, %	57.0	56.8	57.5
	DRY DENSITY, pcf	66.7	66.9	66.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.563	1.556	1.574
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1015	0.0998	0.0997
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1127	1177	1322
ULTIMATE STRESS, psf		789	904	1024
σ_1 FAILURE, psf		2135	3193	4346
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ Ins ML
LL= 88 PL= 27 PI= 61
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

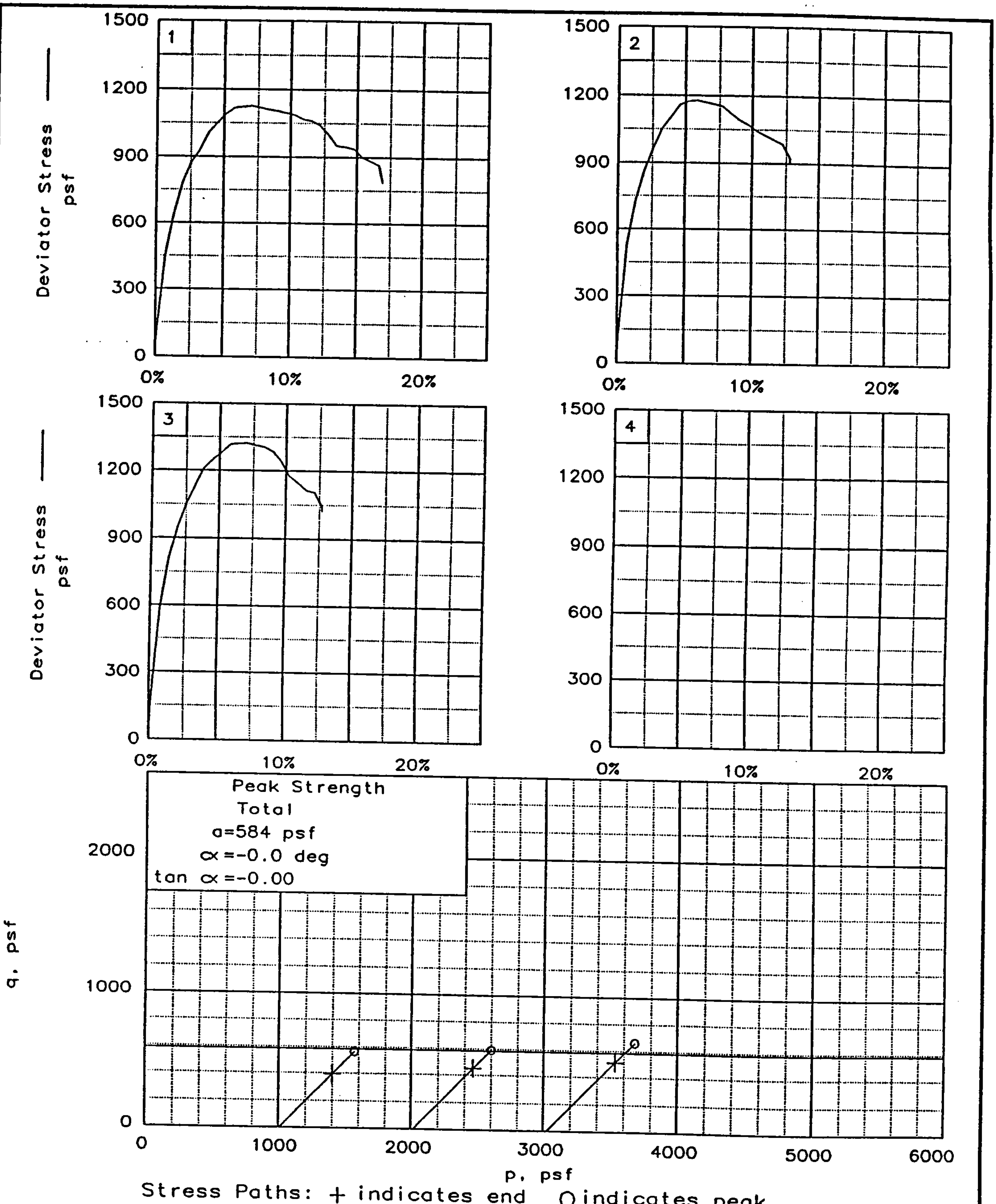
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-3U,
Sample 22-D, Depth 69.8'

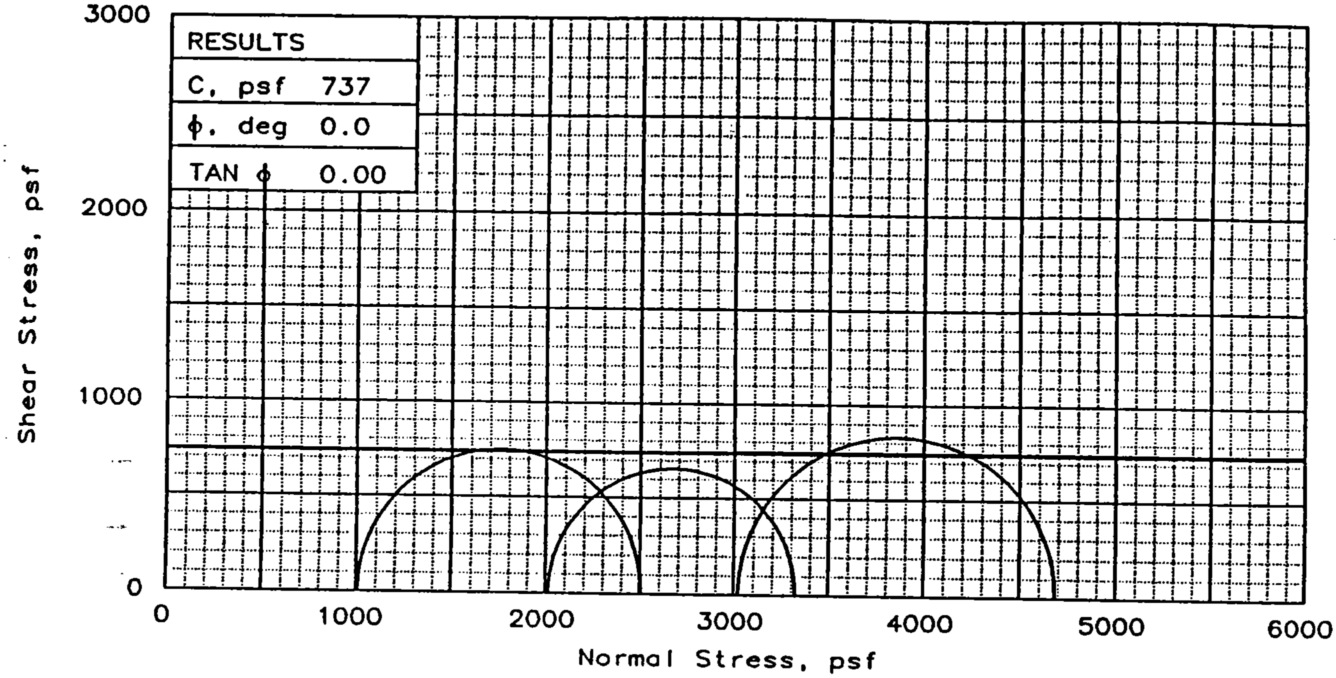
PROJ. NO.: 13622 DATE: 6-27-96

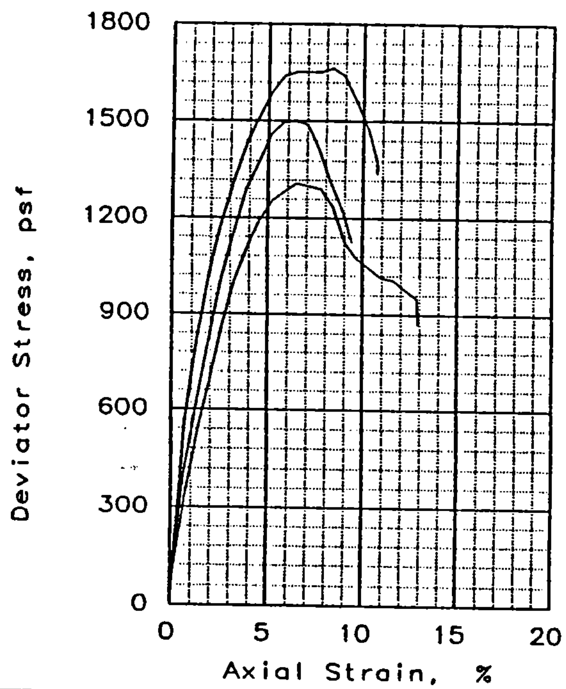
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-3U, Sample 22-D, Depth 69.8'
File: UU-6820 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	55.7	57.1	55.9
	DRY DENSITY, pcf	66.3	65.3	66.0
	SATURATION, %	96.5	96.6	96.2
	VOID RATIO	1.581	1.619	1.591
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.79	2.79
AT TEST	WATER CONTENT, %	57.3	58.3	57.4
	DRY DENSITY, pcf	66.6	65.9	66.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.570	1.596	1.574
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0971	0.1001	0.0937
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1498	1309	1663
ULTIMATE STRESS, psf		1124	871	1342
σ_1 FAILURE, psf		2506	3325	4687
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lyr SP

LL= 88 PL= 26 PI= 62

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

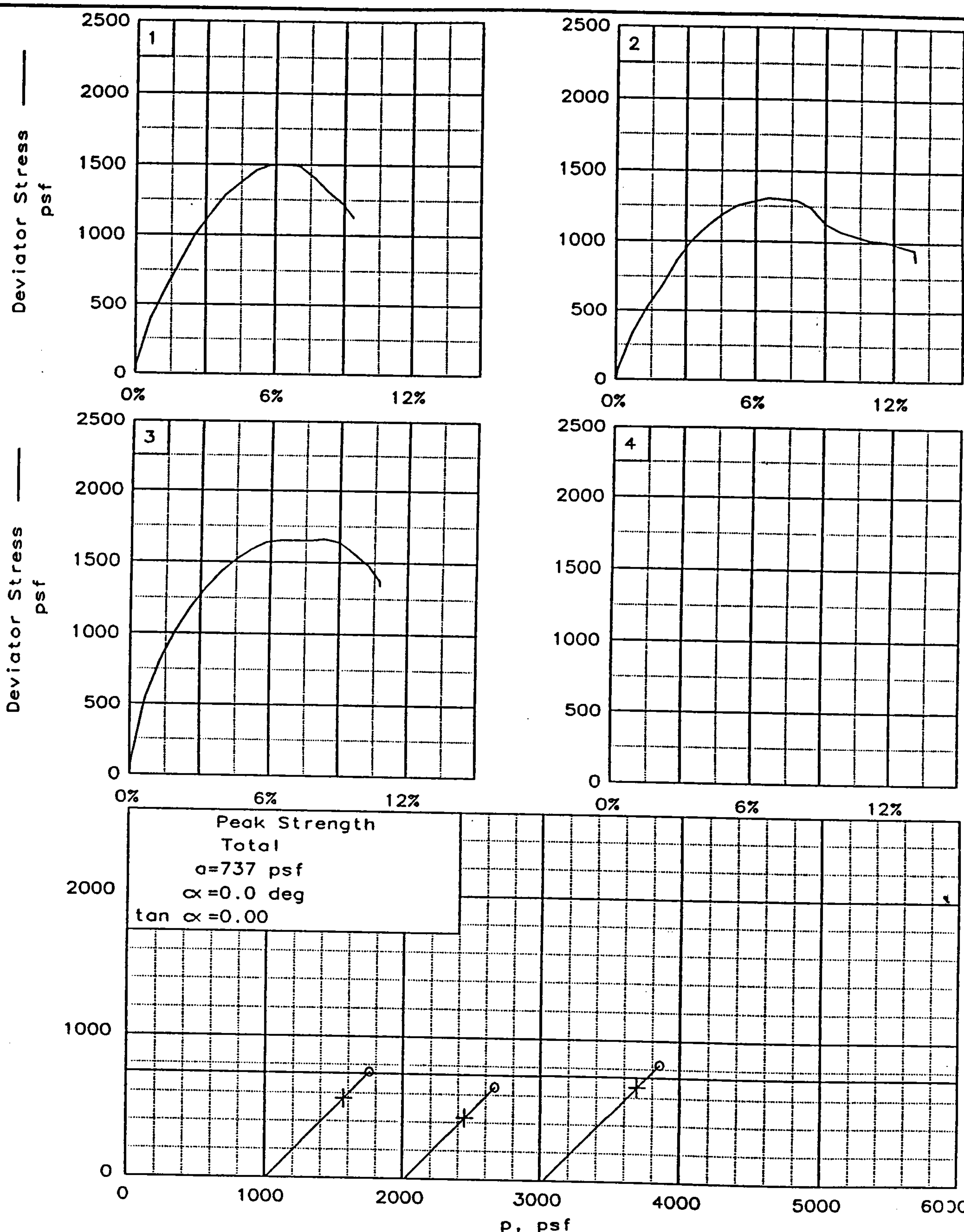
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-3U,
Sample 24-B, Depth 75.8'

PROJ. NO.: 13622 DATE: 6-27-96

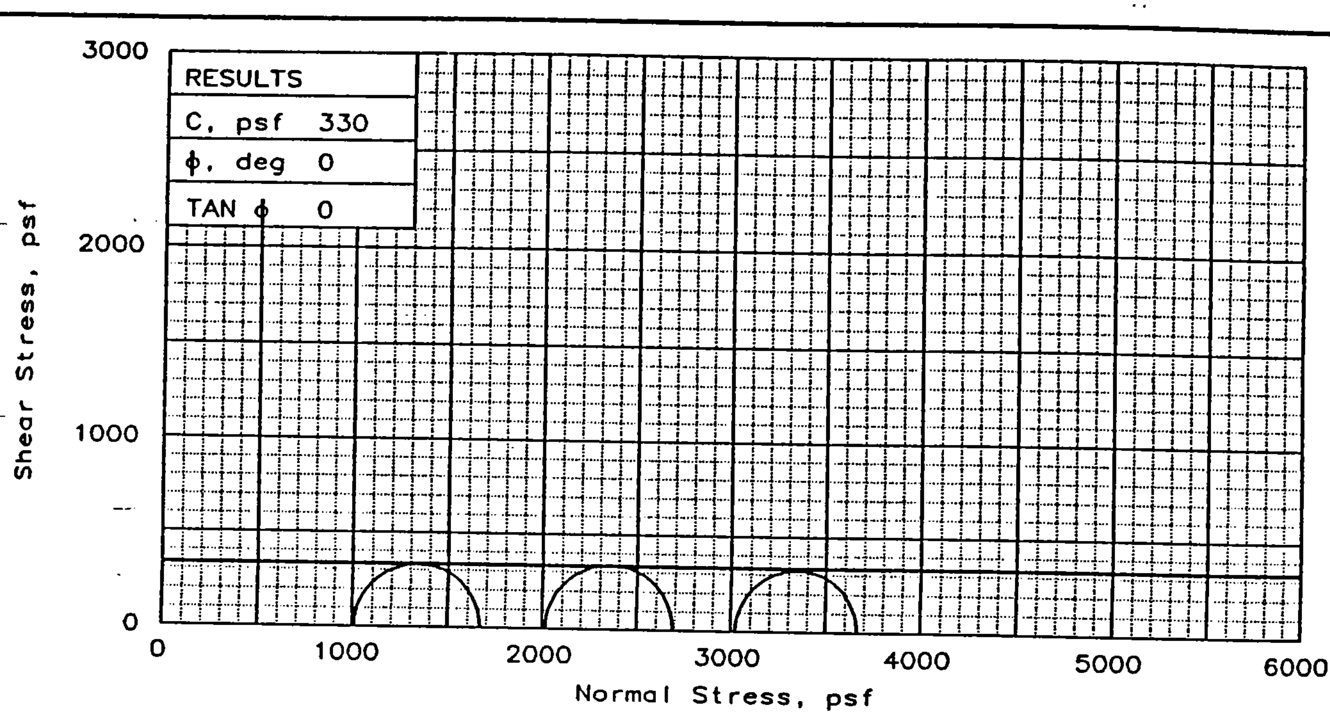
TRIAXIAL SHEAR TEST REPORT

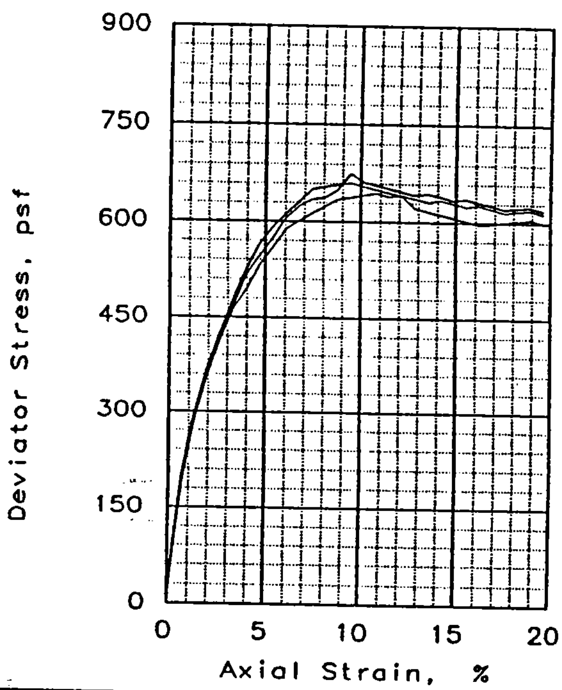
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-3U, Sample 24-B, Depth 75.8'
File: UU-6821   Project No.: 13622   FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	271.4	271.6	248.5
	DRY DENSITY, pcf	19.2	19.3	21.1
	SATURATION, %	94.4	95.4	96.5
	VOID RATIO	7.473	7.405	6.691
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	288.3	283.9	256.7
	DRY DENSITY, pcf	19.1	19.4	21.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	7.497	7.381	6.673
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1062	0.1056	0.1093
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		661	675	644
ULTIMATE STRESS, psf		600	620	615
σ_1 FAILURE, psf		1669	2691	3668
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So BK PEAT
w/ rts

LL= 307 PL= 109 PI= 198

SPECIFIC GRAVITY= 2.6

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

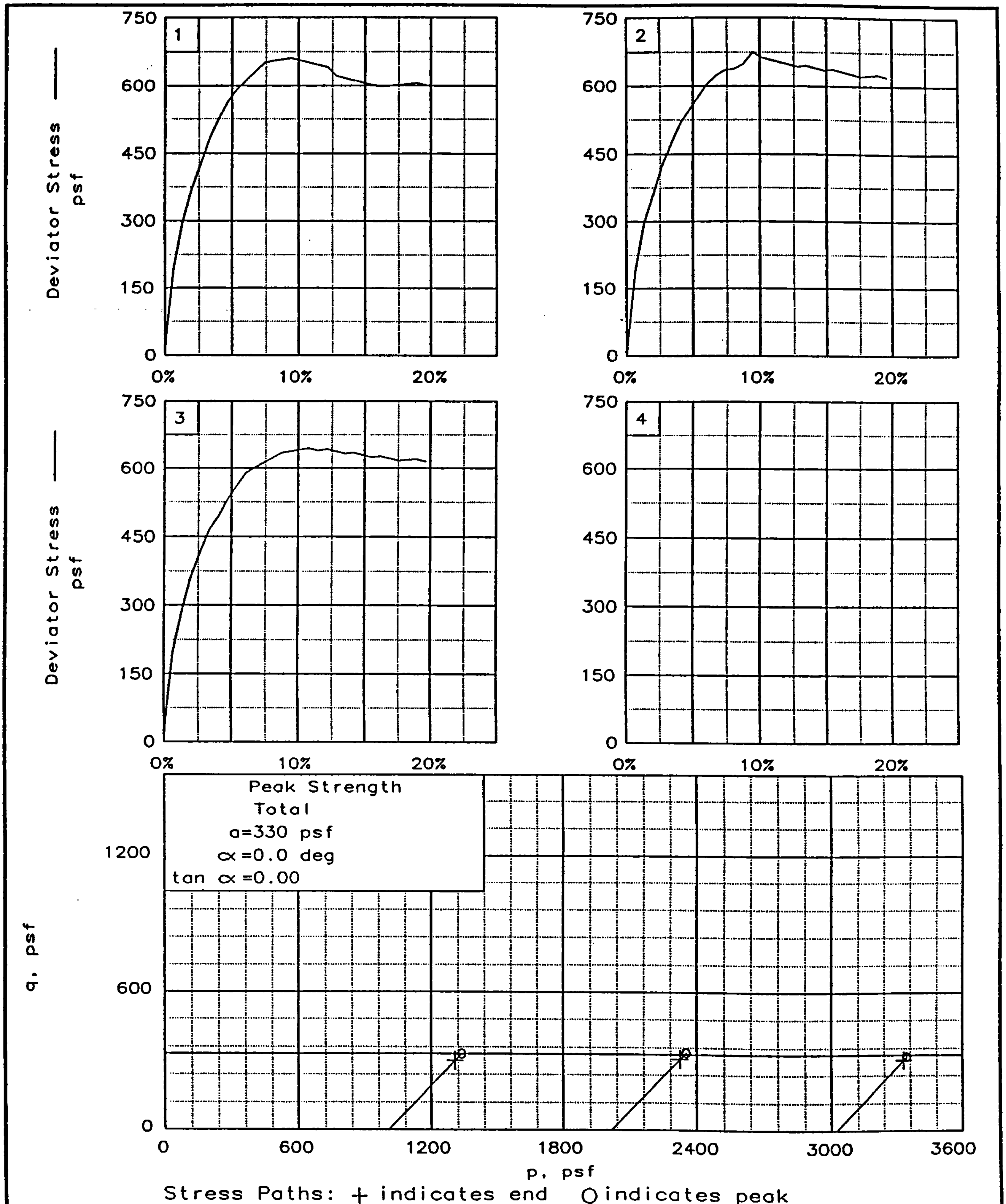
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-4U,
Sample 3-C, Depth 5.8'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

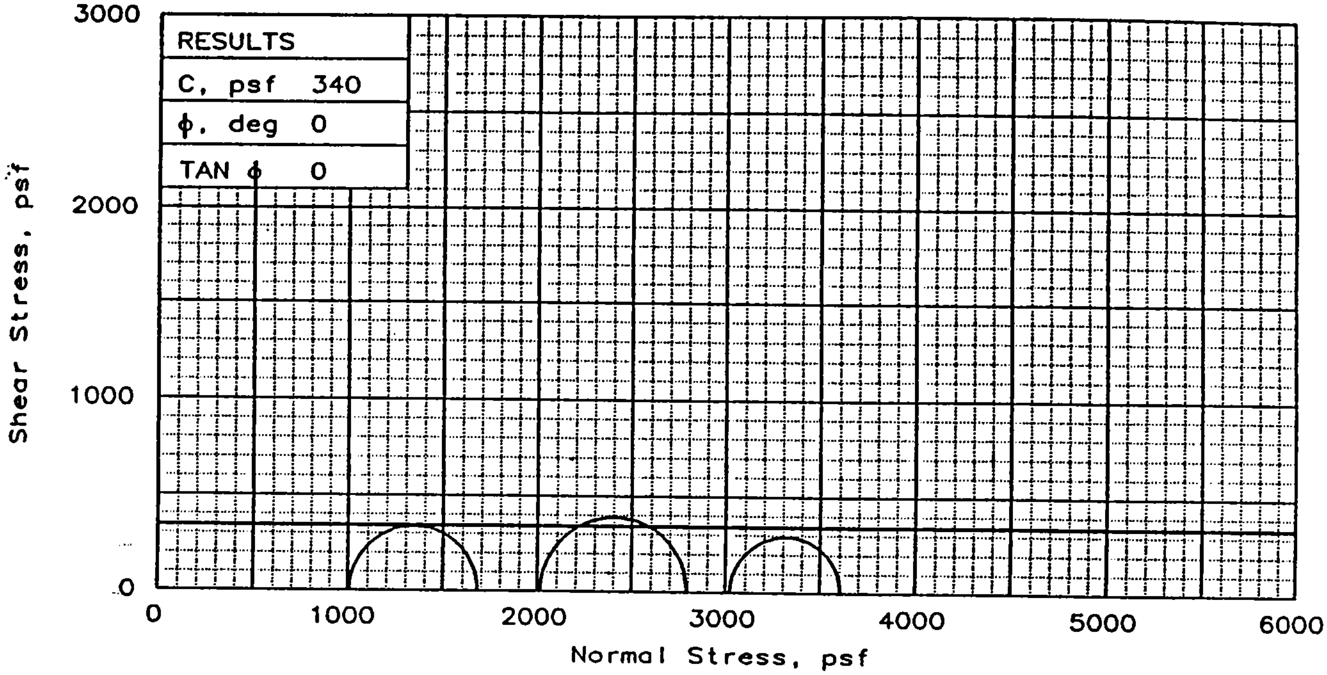


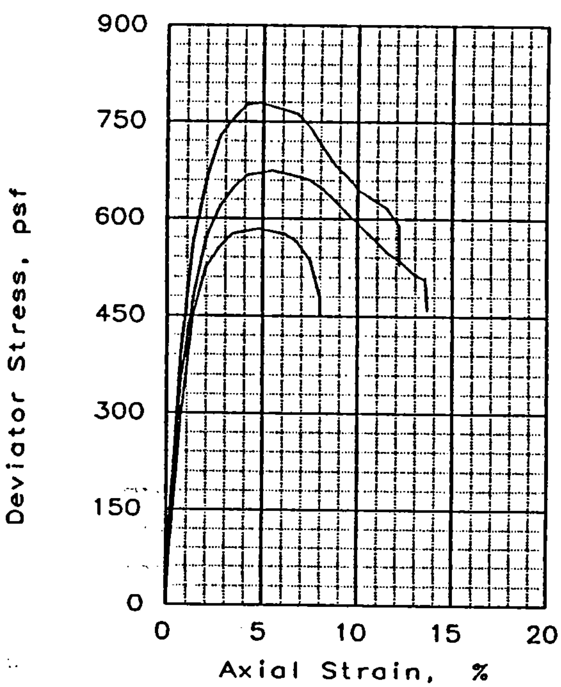
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-4U, Sample 3-C, Depth 5.8'

File: UU-6822 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	88.5	87.0	86.8
	DRY DENSITY, pcf	49.5	50.6	50.5
	SATURATION, %	98.7	100.2	99.6
	VOID RATIO	2.456	2.380	2.389
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.81
AT TEST	WATER CONTENT, %	89.6	86.7	88.3
	DRY DENSITY, pcf	49.5	50.7	50.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.455	2.374	2.418
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1058	0.0953	0.1028
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		675	779	584
ULTIMATE STRESS, psf		460	529	453
σ_1 FAILURE, psf		1683	2795	3608
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4
w/ lyr & lns ML, slf

LL= 110 PL= 34 PI= 76

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

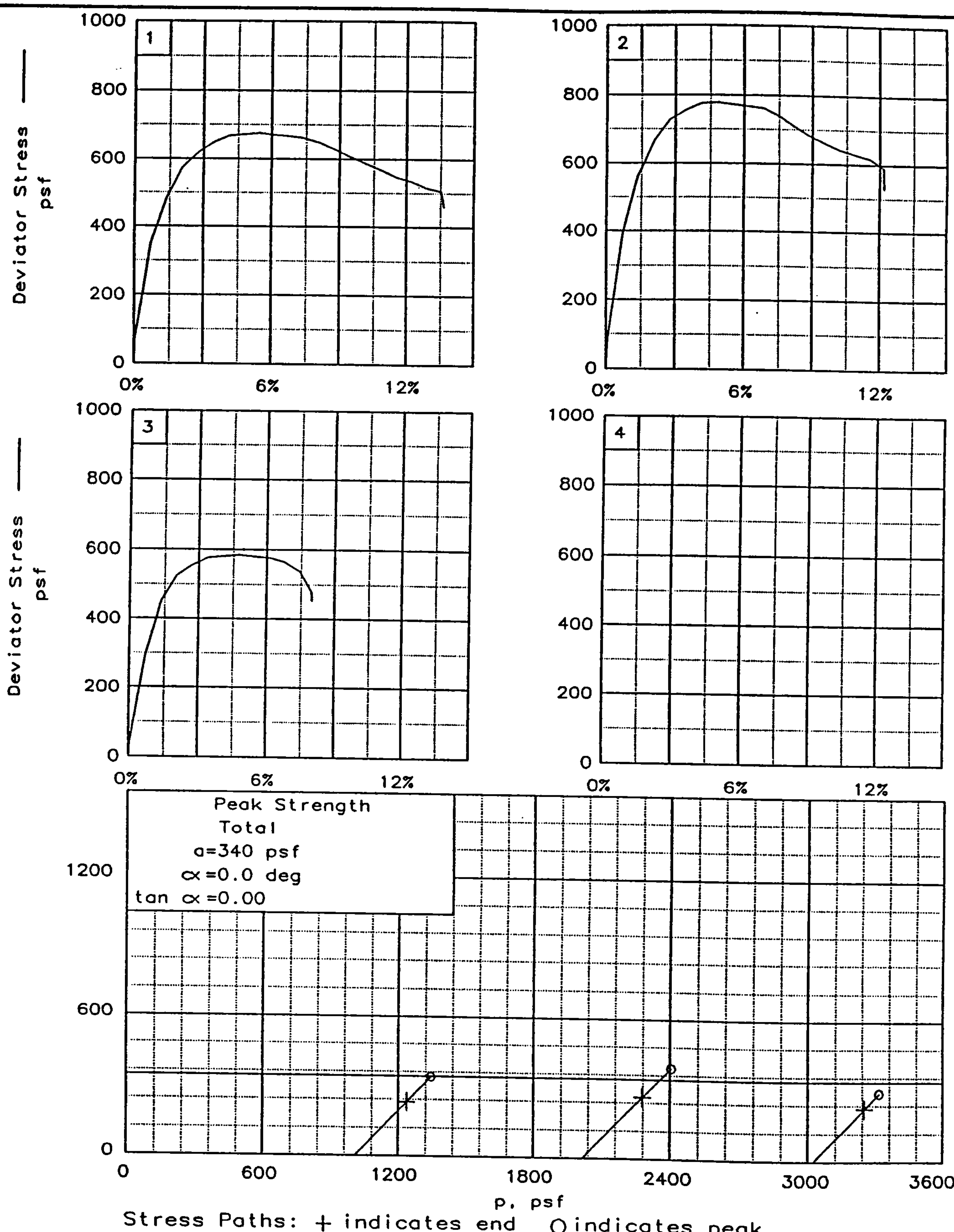
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-4U,
Sample 6-D, Depth 18.8'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

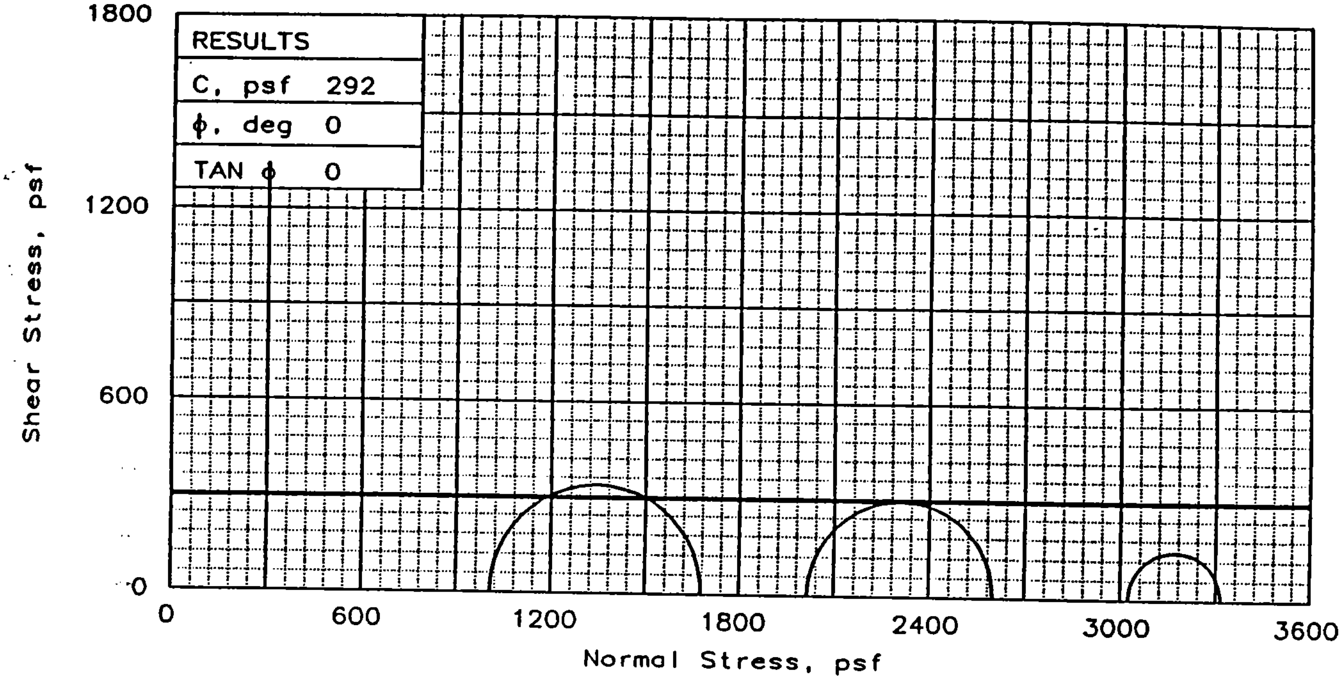


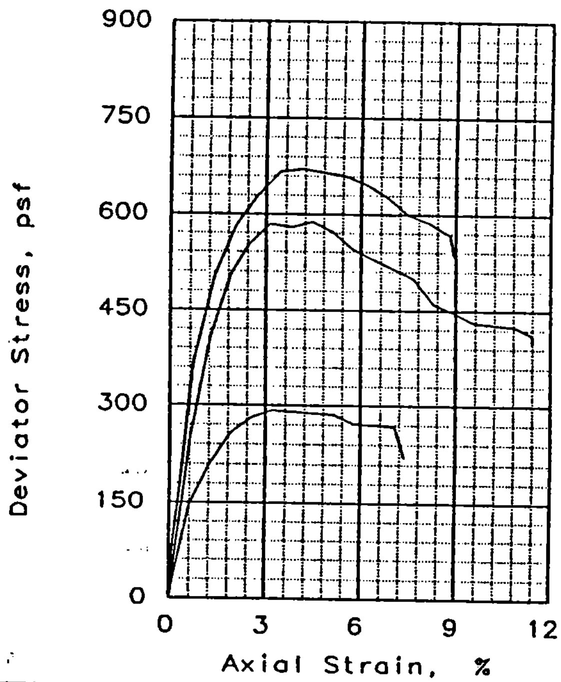
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-4U, Sample 6-D, Depth 18.8'

File: UU-6823 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	68.4	68.3	67.0
	DRY DENSITY, pcf	59.8	60.0	60.4
	SATURATION, %	100.8	101.1	100.1
	VOID RATIO	1.859	1.852	1.834
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.83	2.81
AT TEST	WATER CONTENT, %	67.9	70.4	67.4
	DRY DENSITY, pcf	59.8	58.4	60.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.861	1.929	1.846
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1028	0.0985	0.0914
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		670	584	292
ULTIMATE STRESS, psf		535	400	221
σ_1 FAILURE, psf		1678	2600	3316
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 82 PL= 24 PI= 58
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

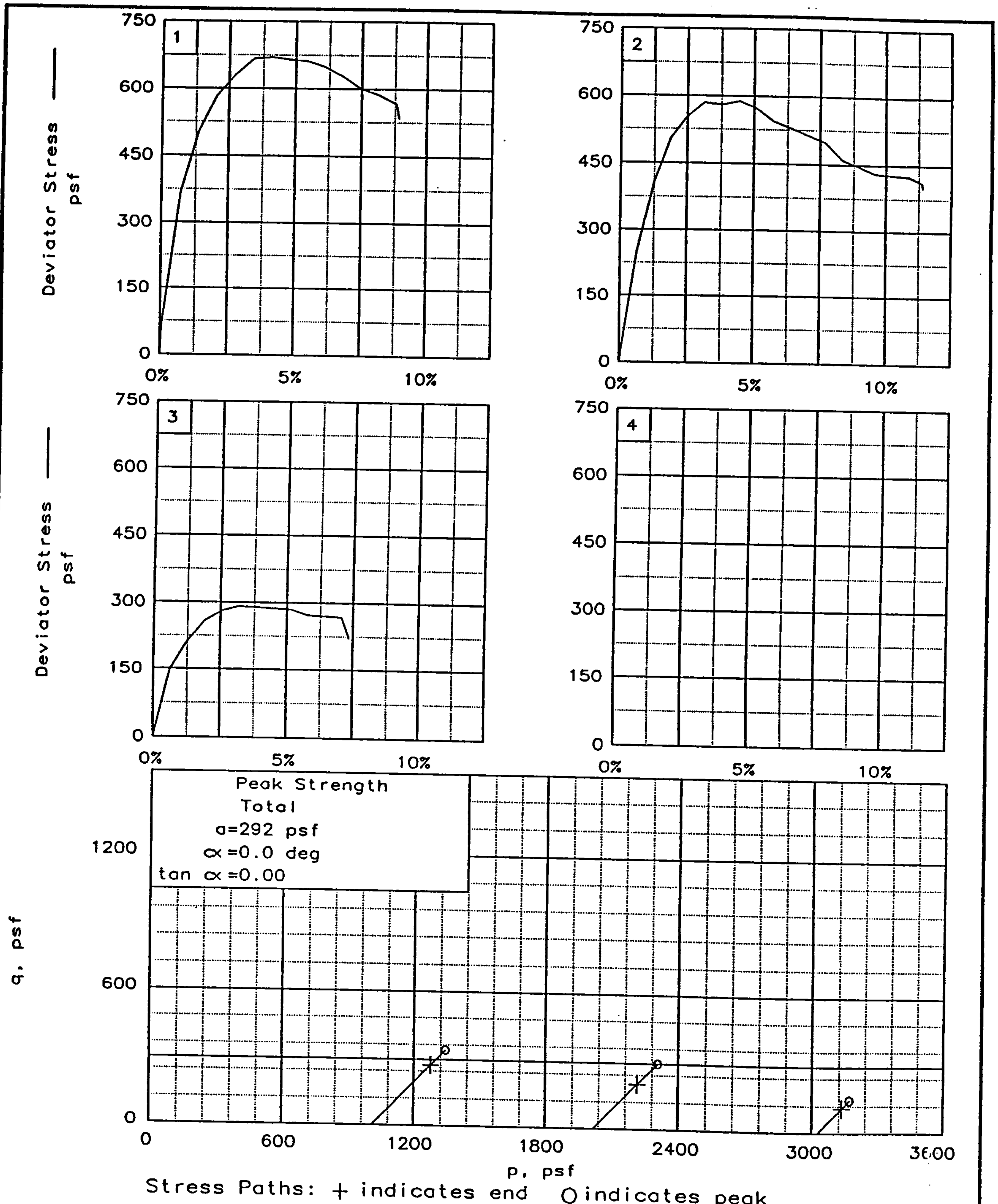
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-4U,
Sample 8-B, Depth 25.5'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

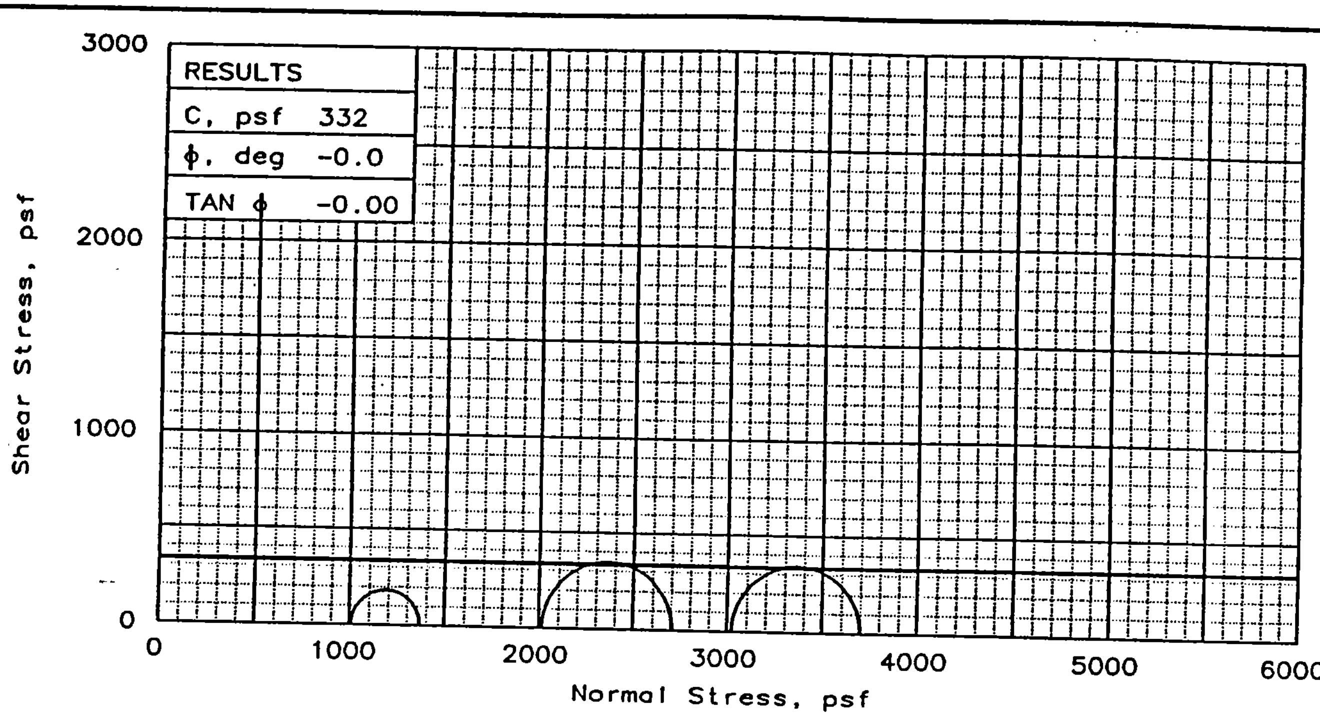


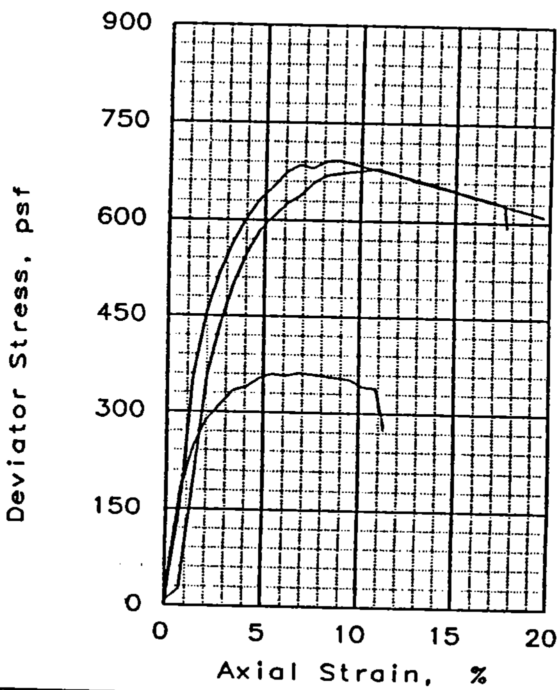
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-4U, Sample 8-B, Depth 25.5'

File: UU-6824 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.9	68.3	68.0
	DRY DENSITY, pcf	59.7	59.6	59.6
	SATURATION, %	99.7	100.0	99.7
	VOID RATIO	1.867	1.871	1.870
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	68.4	67.9	68.1
	DRY DENSITY, pcf	59.5	59.8	59.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.873	1.859	1.867
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1066	0.1074	0.1098
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		362	693	680
ULTIMATE STRESS, psf		276	610	592
σ_1 FAILURE, psf		1370	2709	3704
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4 w/ lyr & lns ML

LL= 90 PL= 26 PI= 64

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

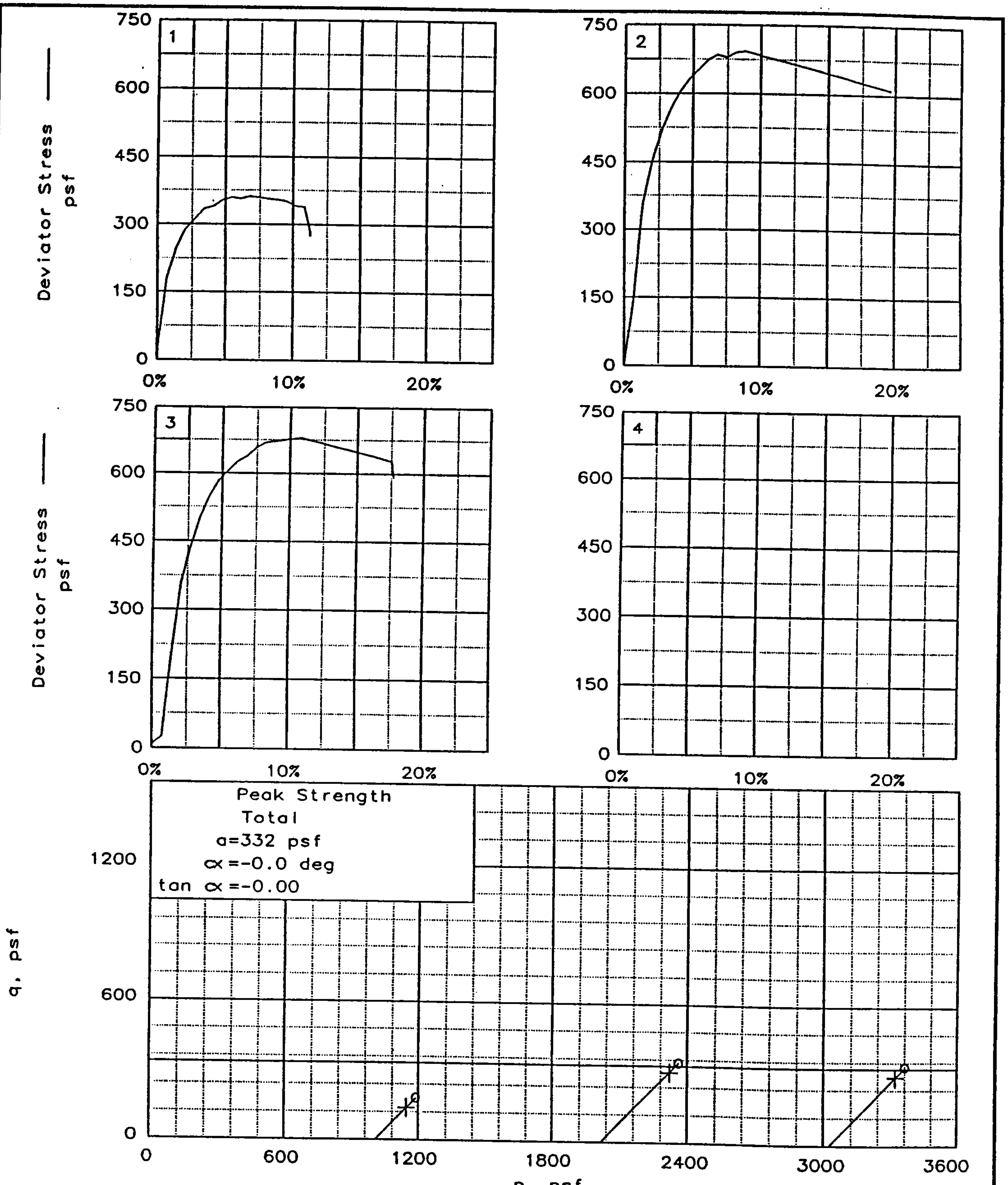
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-4U, Sample 10-D, Depth 34.8'

PROJ. NO.: 13622 DATE: 6-28-96

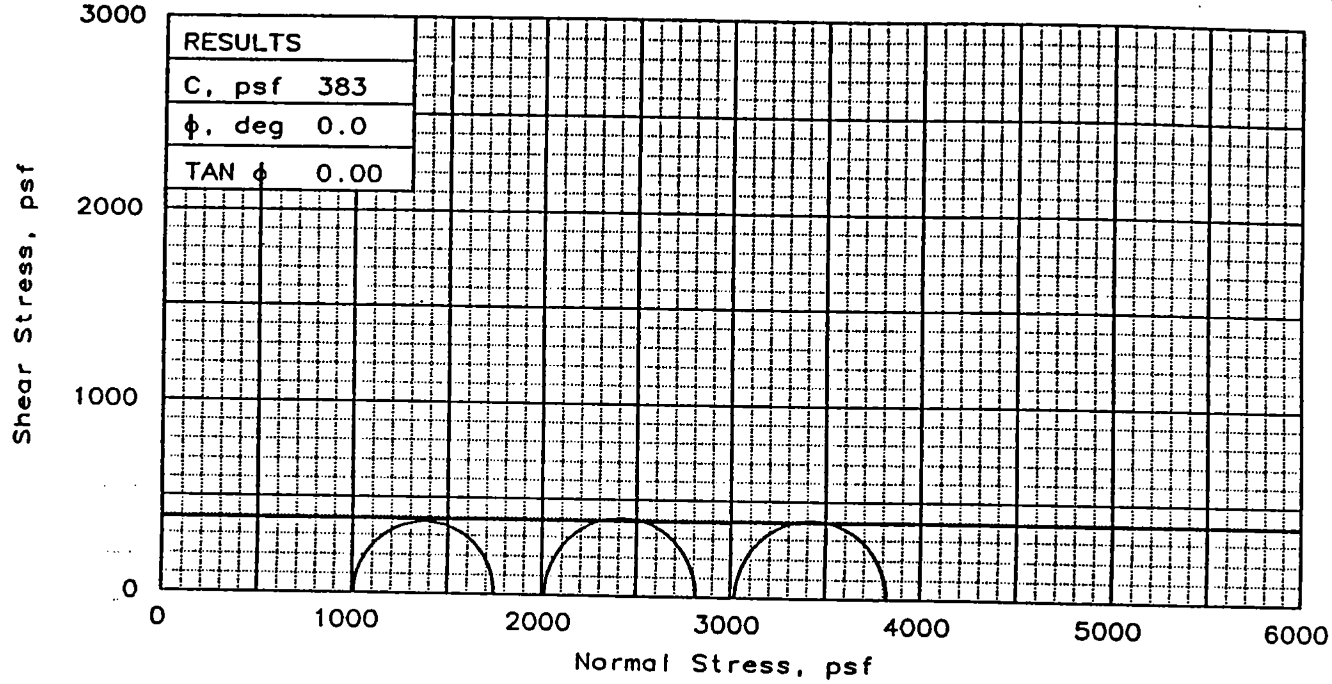
TRIAXIAL SHEAR TEST REPORT

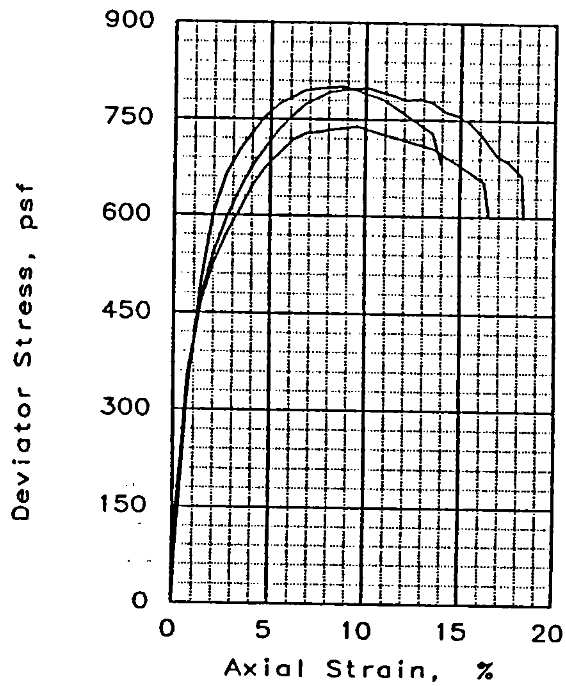
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-4U, Sample 10-D, Depth 34.8'
File: UU-6825 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	69.9	69.6	68.9
	DRY DENSITY, pcf	59.1	58.6	59.2
	SATURATION, %	101.5	99.9	100.4
	VOID RATIO	1.873	1.896	1.867
	DIAMETER, in	1.40	1.41	1.40
	HEIGHT, in	2.80	2.81	2.81
AT TEST	WATER CONTENT, %	68.9	70.4	69.5
	DRY DENSITY, pcf	59.1	58.3	58.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.875	1.915	1.890
	DIAMETER, in	1.40	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1074	0.1071	0.1038
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		739	801	799
ULTIMATE STRESS, psf		602	682	599
σ_1 FAILURE, psf		1747	2817	3823
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lns & ars ML
LL= 95 PL= 26 PI= 69
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

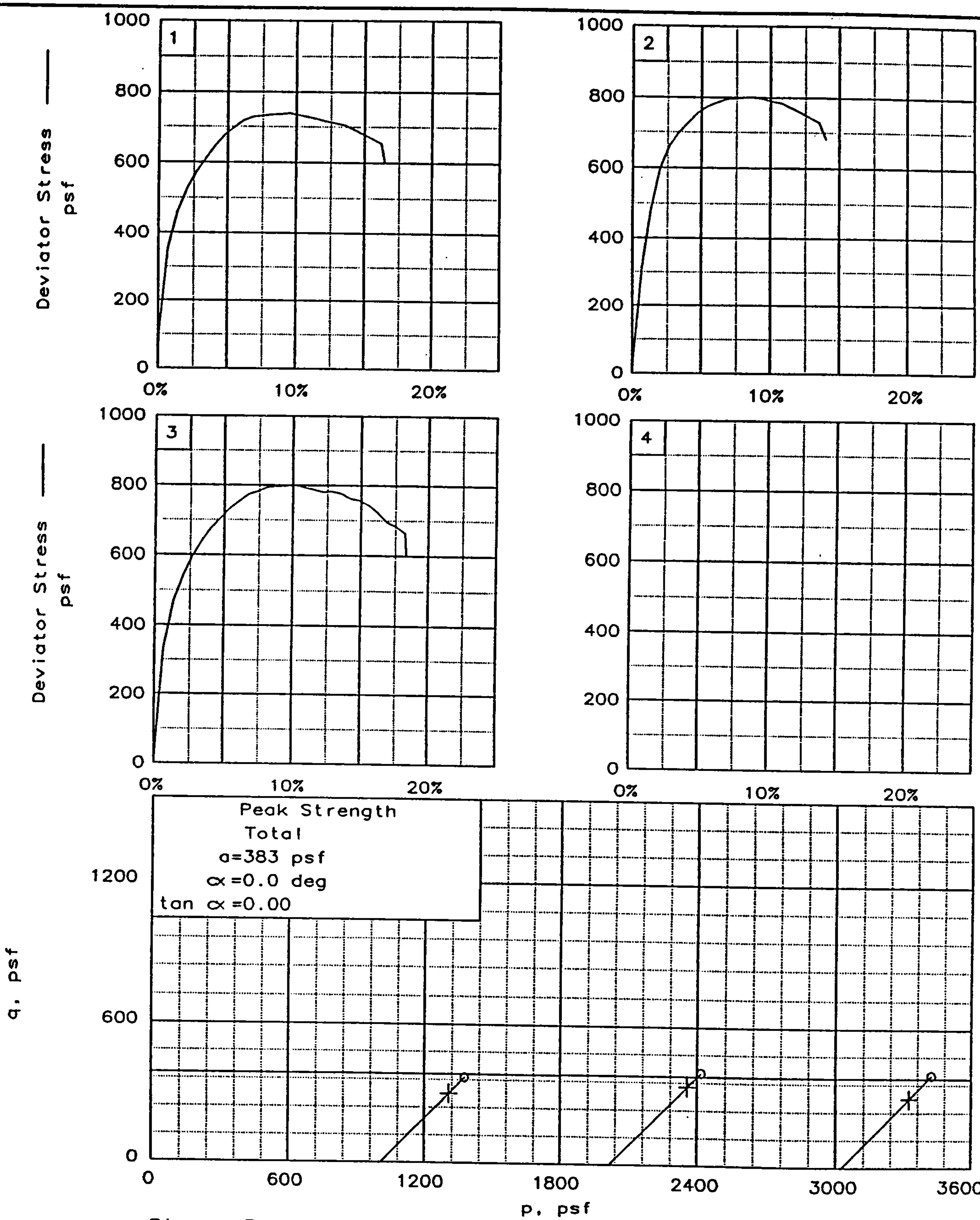
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-4U,
Sample 12-D, Depth 42.8'

PROJ. NO.: 13622 DATE: 6-28-96

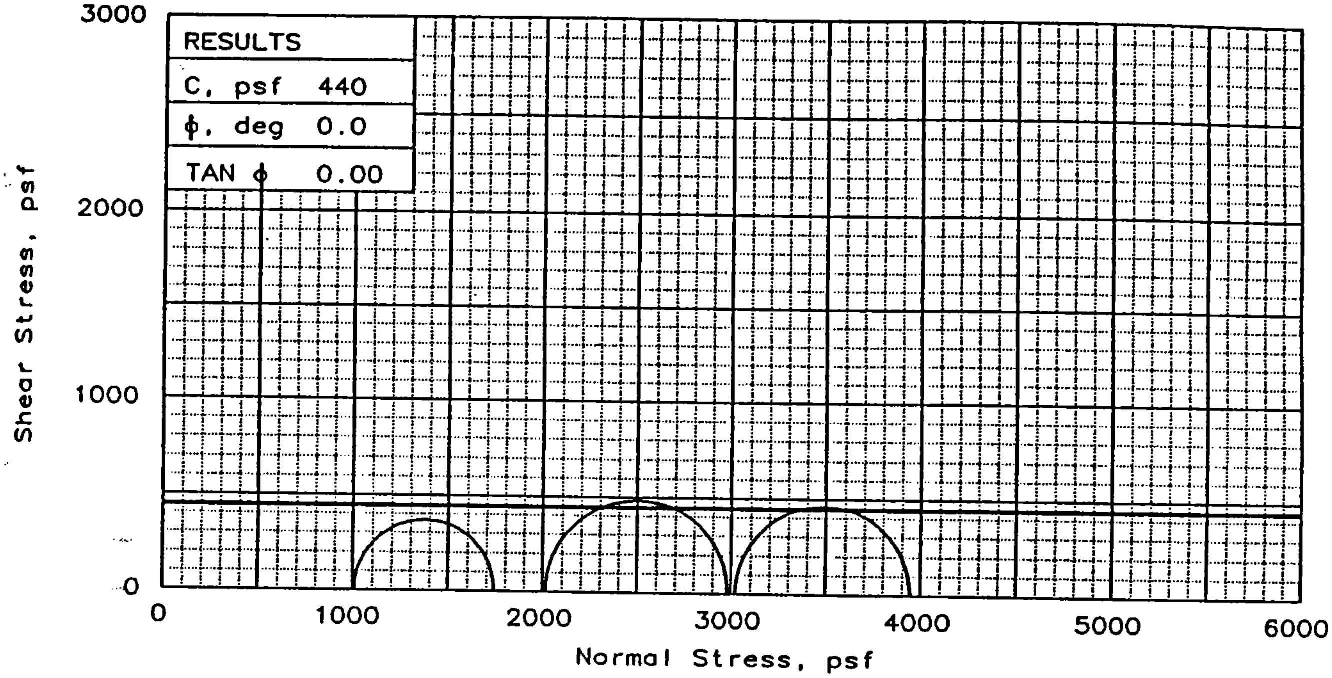
TRIAXIAL SHEAR TEST REPORT

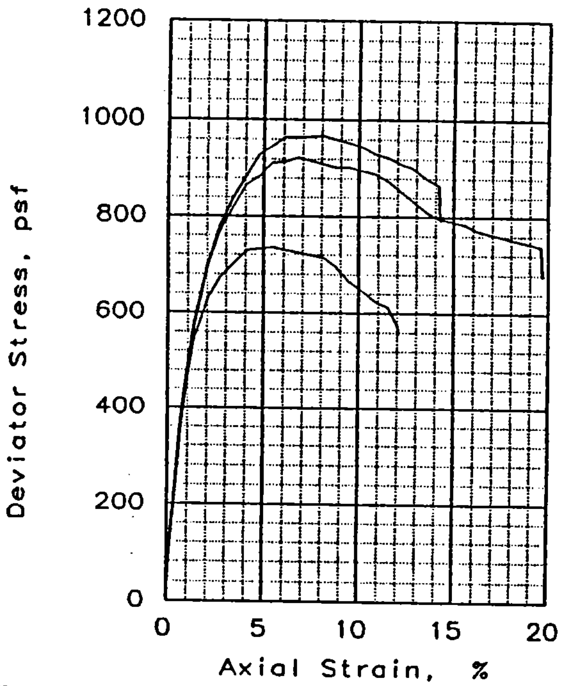
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-4U, Sample 12-D, Depth 42.8'
File: UU-6826 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	57.4	56.7	57.5
	DRY DENSITY, pcf	65.5	66.4	66.0
	SATURATION, %	97.6	98.7	99.1
	VOID RATIO	1.611	1.575	1.591
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.81	2.80	2.81
AT TEST	WATER CONTENT, %	59.9	57.1	59.2
	DRY DENSITY, pcf	64.8	66.7	65.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.641	1.566	1.622
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1065	0.1058	0.1070
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		735	967	922
ULTIMATE STRESS, psf		556	791	677
σ_1 FAILURE, psf		1743	2983	3946
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns ML
LL= 79 PL= 25 PI= 54
SPECIFIC GRAVITY= 2.74
REMARKS:

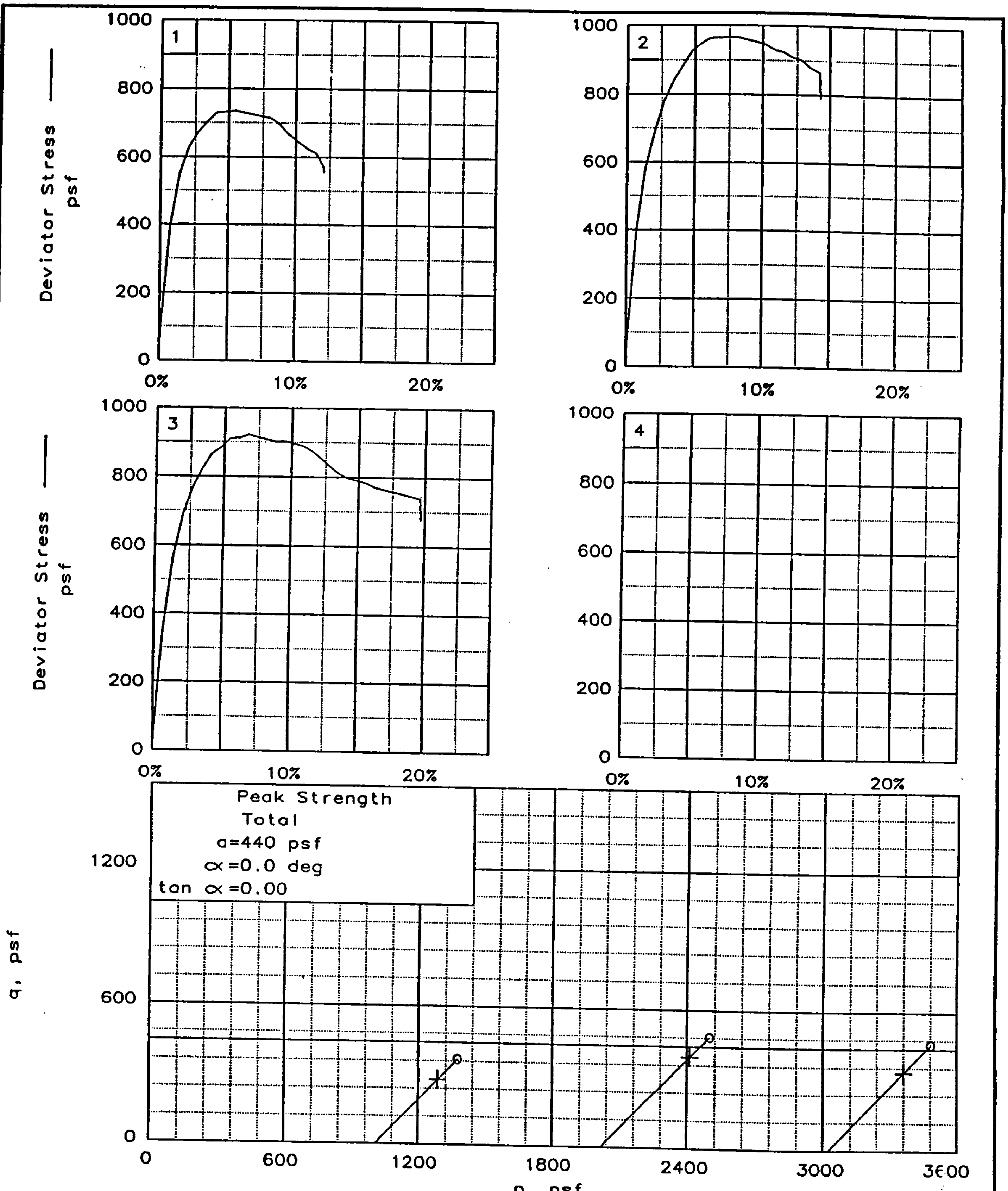
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-4U,
Sample 14-D, Depth 50.8'
PROJ. NO.: 13622 DATE: 6-28-96

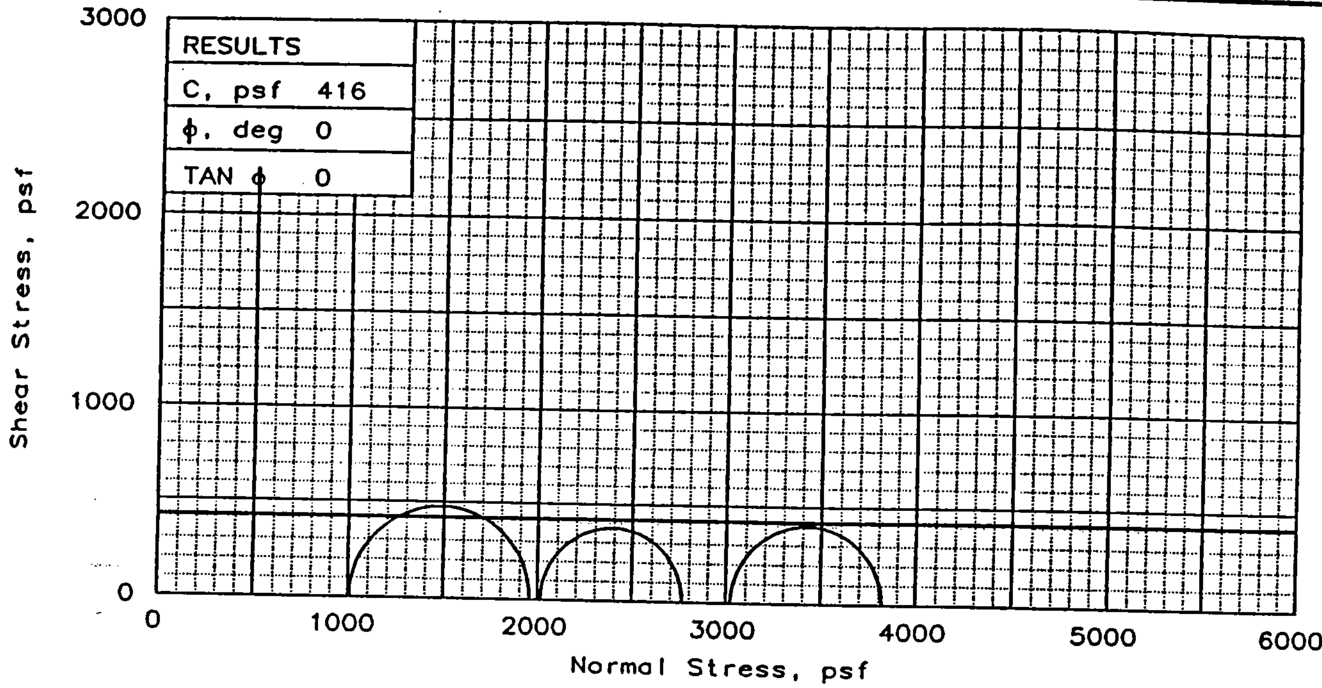
TRIAXIAL SHEAR TEST REPORT

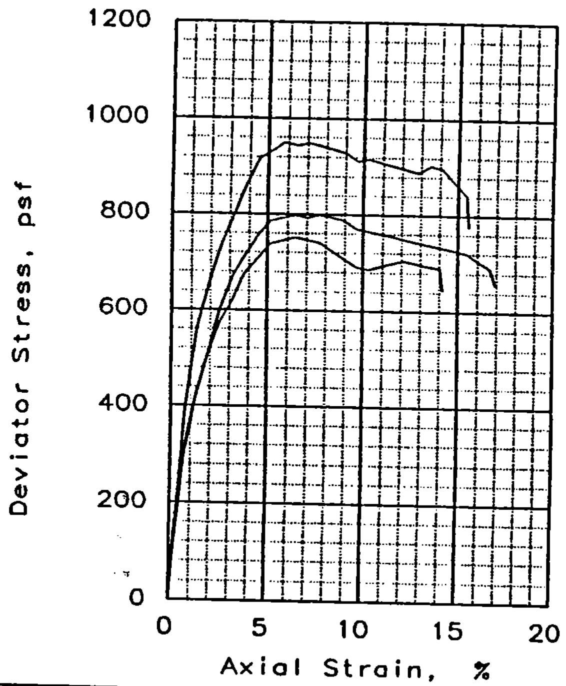
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-4U, Sample 14-D, Depth 50.8'
File: UU-6827 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.8	63.4	63.6
	DRY DENSITY, pcf	61.8	62.4	61.1
	SATURATION, %	97.3	99.7	96.9
	VOID RATIO	1.768	1.743	1.798
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.82	2.81	2.81
AT TEST	WATER CONTENT, %	66.7	64.9	66.4
	DRY DENSITY, pcf	60.5	61.6	60.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.827	1.778	1.819
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1002	0.0997	0.1011
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		949	751	798
ULTIMATE STRESS, psf		778	646	657
σ_1 FAILURE, psf		1957	2767	3822
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns ML
LL= 94 PL= 27 PI= 67
SPECIFIC GRAVITY= 2.74
REMARKS:

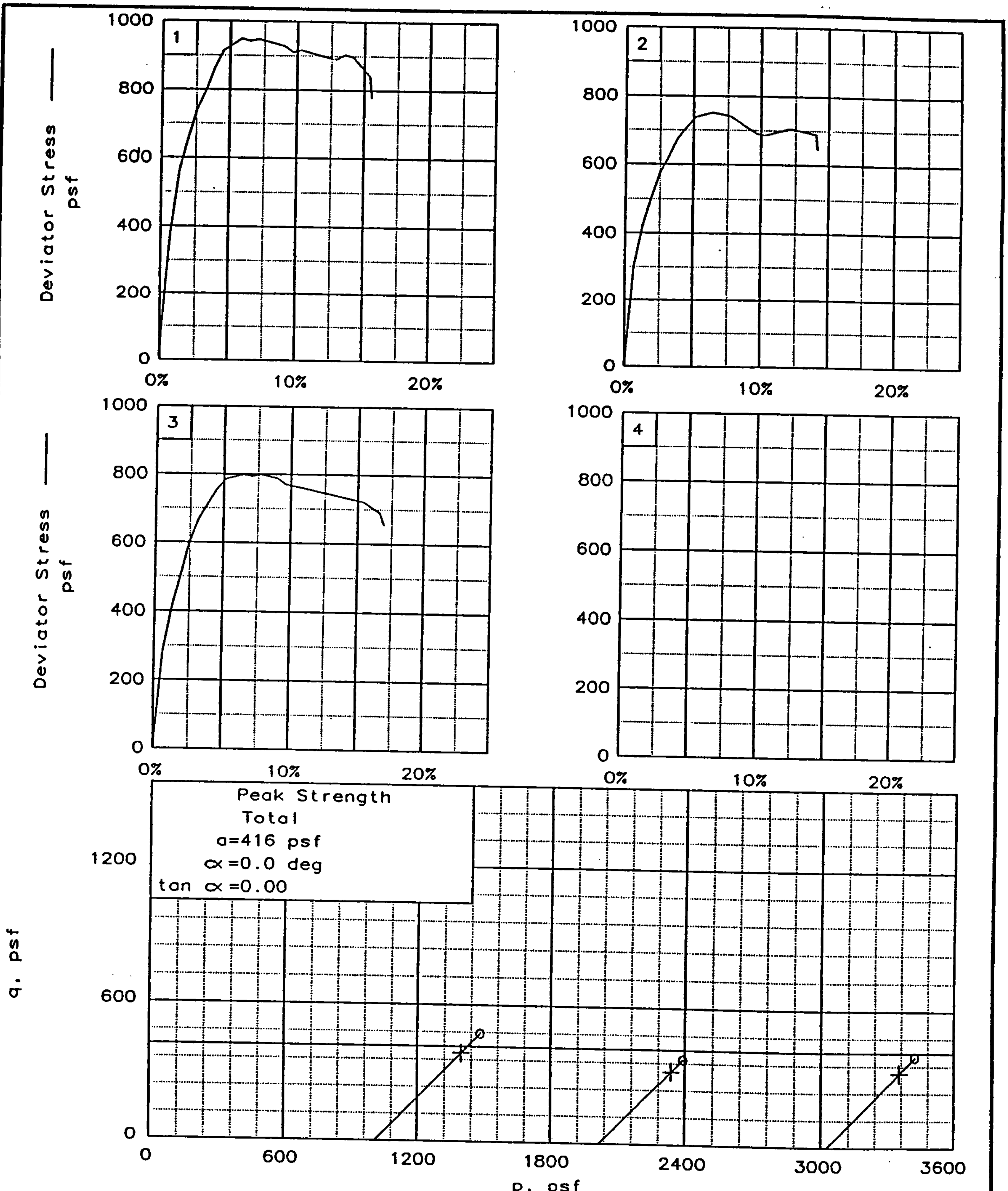
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-4U,
Sample 16-D, Depth 58.8'
PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



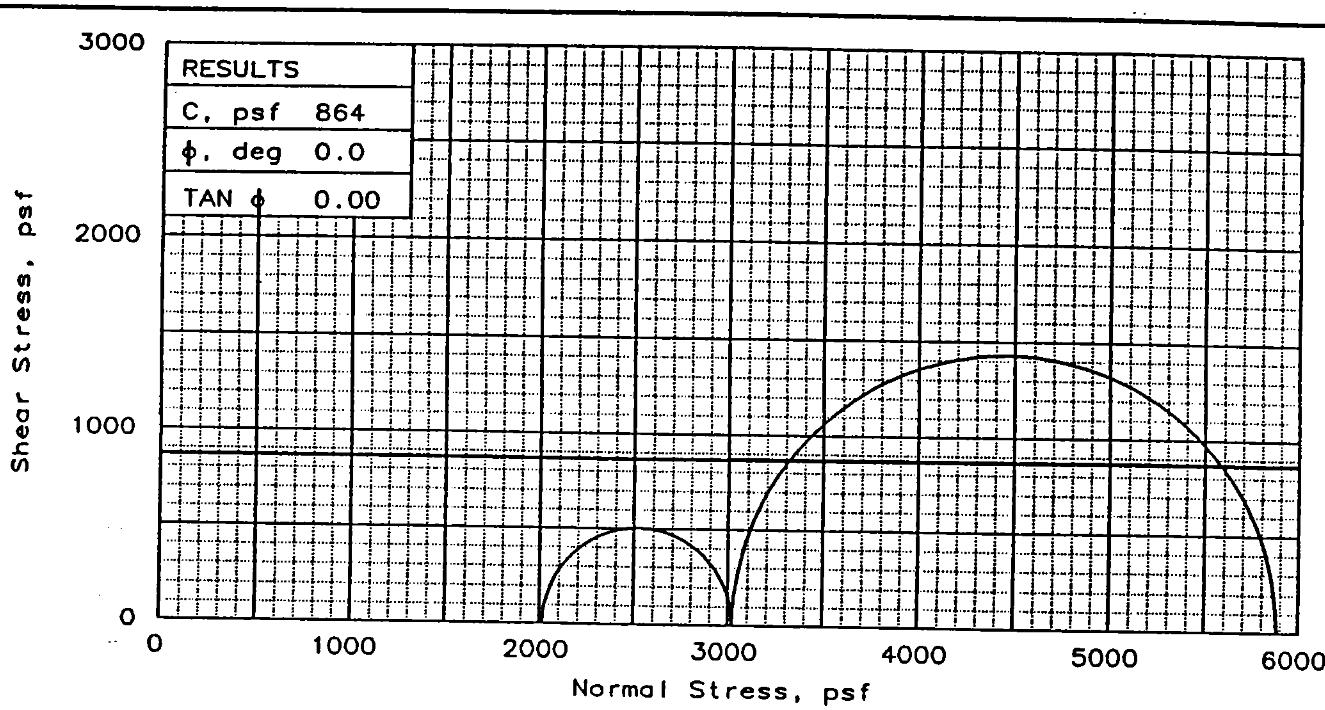
Stress Paths: + indicates end ○ indicates peak

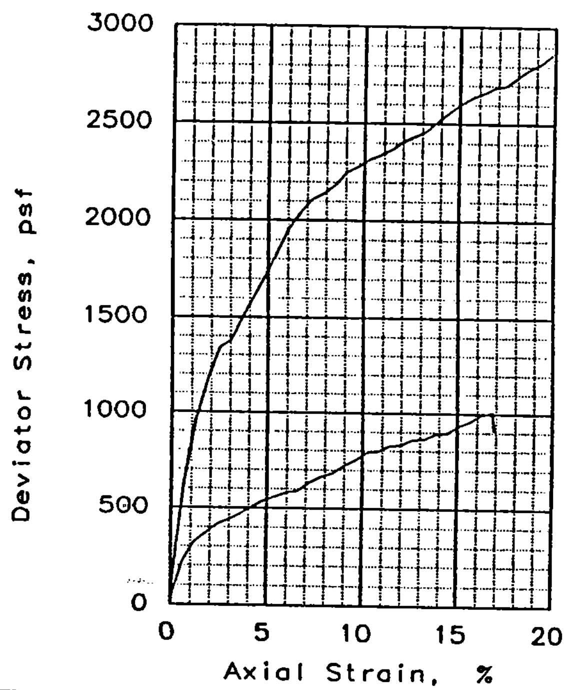
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-4U, Sample 16-D, Depth 58.8'

File: UU-6828 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2
INITIAL	WATER CONTENT, %	23.9	21.4
	DRY DENSITY, pcf	94.3	99.9
	SATURATION, %	81.9	84.2
	VOID RATIO	0.787	0.687
	DIAMETER, in	1.40	1.40
	HEIGHT, in	2.99	2.99
AT TEST	WATER CONTENT, %	29.1	25.3
	DRY DENSITY, pcf	94.4	100.2
	SATURATION, %	100.0	100.0
	VOID RATIO	0.785	0.682
	DIAMETER, in	1.40	1.40
	HEIGHT, in	2.99	2.99
Strain rate, in/min		0.1023	0.1031
BACK PRESSURE, psf		0	0
CELL PRESSURE, psf		2016	3024
FAILURE STRESS, psf		1007	2860
ULTIMATE STRESS, psf		911	2860
σ_1 FAILURE, psf		3023	5884
σ_3 FAILURE, psf		2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M LGr & T CL3 w/ slf

LL= 23 PL= 14 PI= 9

SPECIFIC GRAVITY= 2.7

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

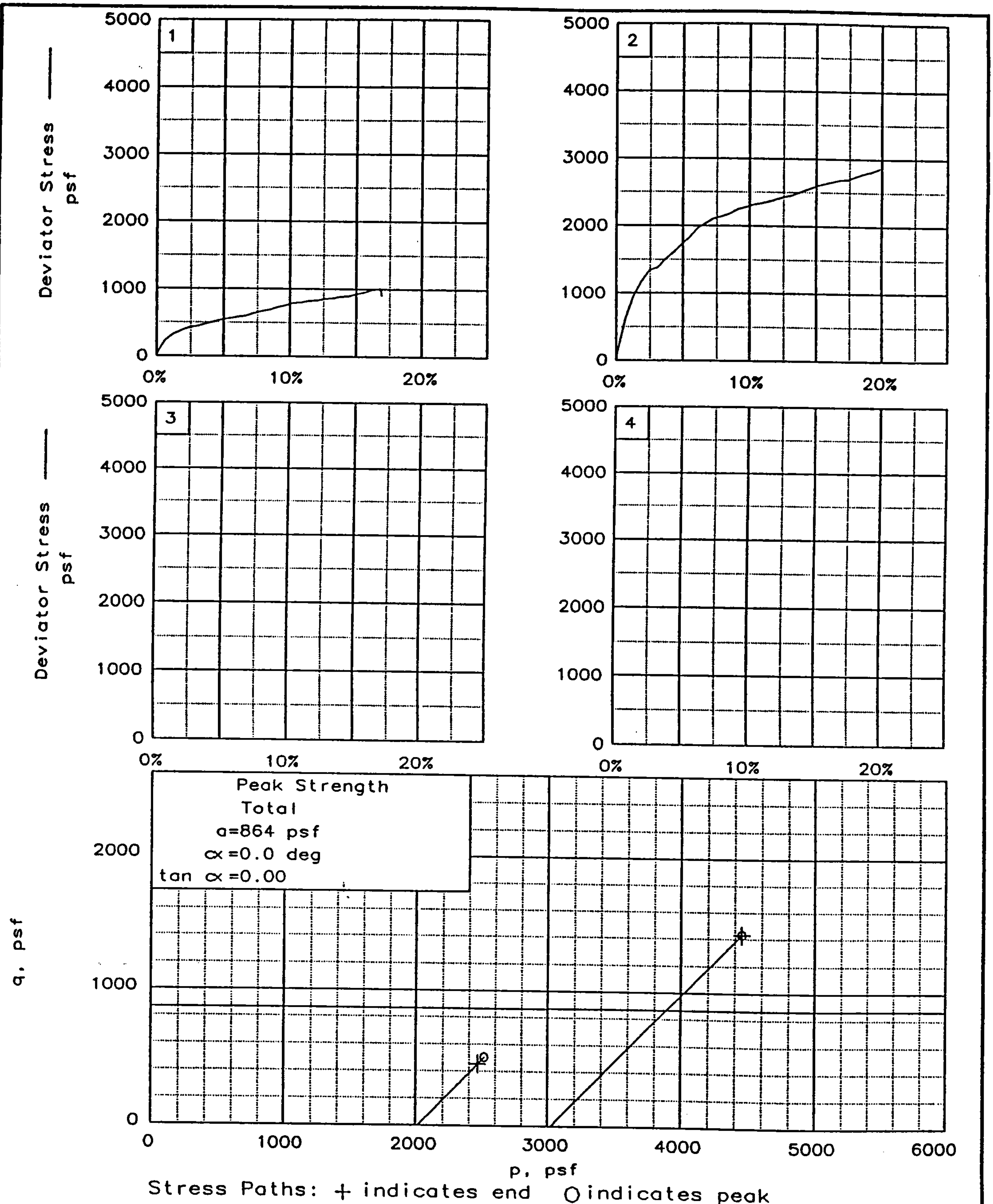
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-4U, Sample 19-B, Depth 69.2'

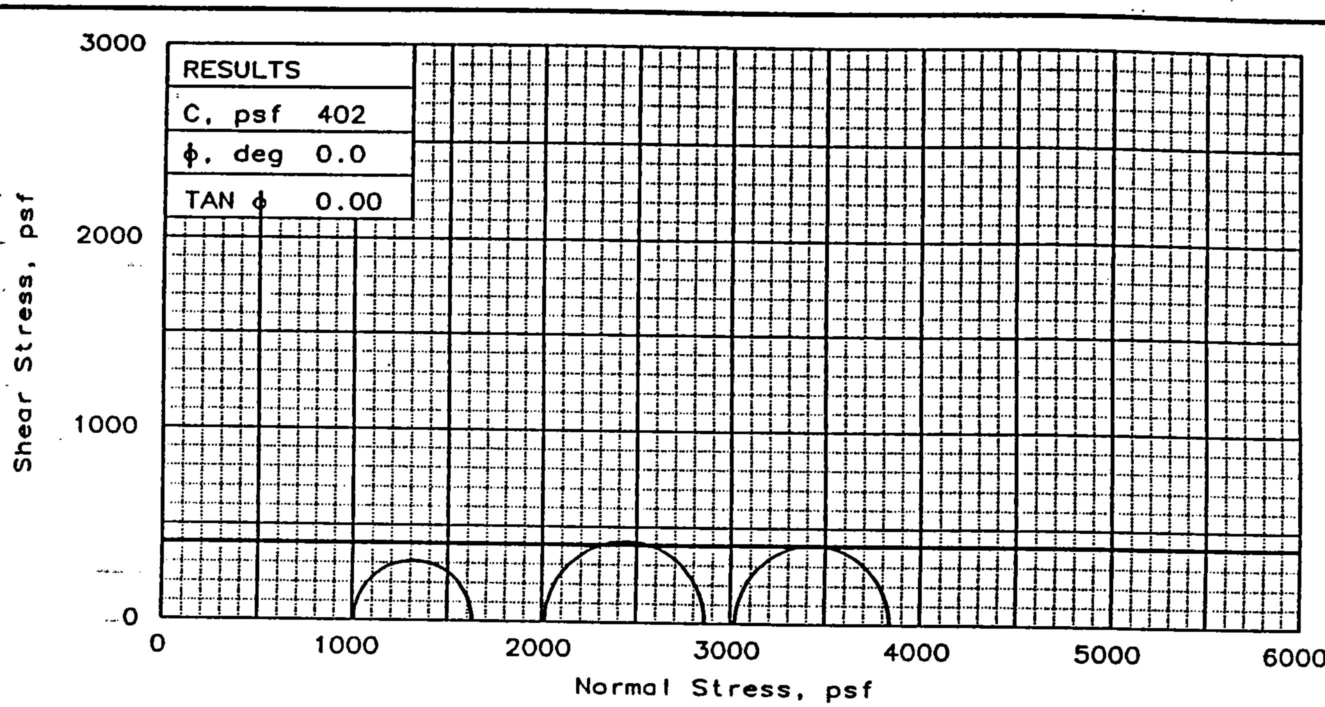
PROJ. NO.: 13622 DATE: 6-28-96

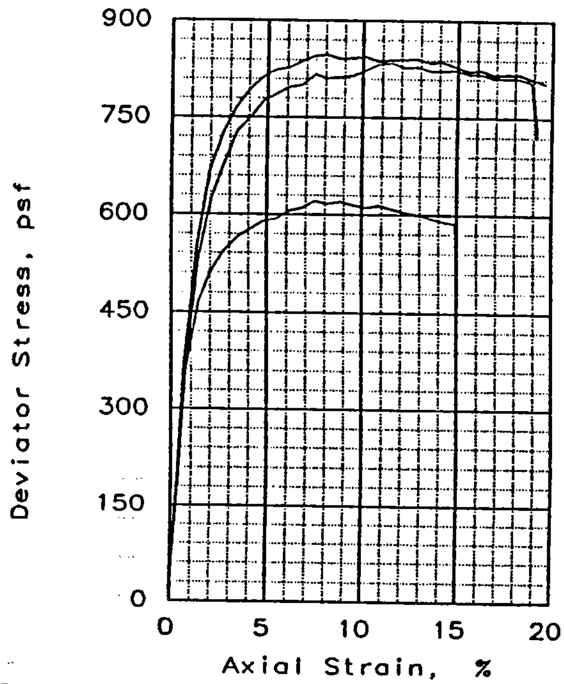
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-4U, Sample 19-B, Depth 69.2'
File: UU-6829 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	84.7	87.6	96.2
	DRY DENSITY, pcf	49.4	48.6	44.6
	SATURATION, %	94.9	95.9	93.5
	VOID RATIO	2.410	2.468	2.778
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.81	2.79	2.80
AT TEST	WATER CONTENT, %	90.4	90.1	102.3
	DRY DENSITY, pcf	49.0	49.1	44.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.440	2.433	2.762
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1074	0.1094	0.1089
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		621	848	817
ULTIMATE STRESS, psf		512	804	720
σ_1 FAILURE, psf		1629	2864	3841
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So DGr & Br CHOC w/ lyr & ars CH, ars dec wd
LL= 130 PL= 43 PI= 87
SPECIFIC GRAVITY= 2.7
REMARKS:

FIG. NO.: ______

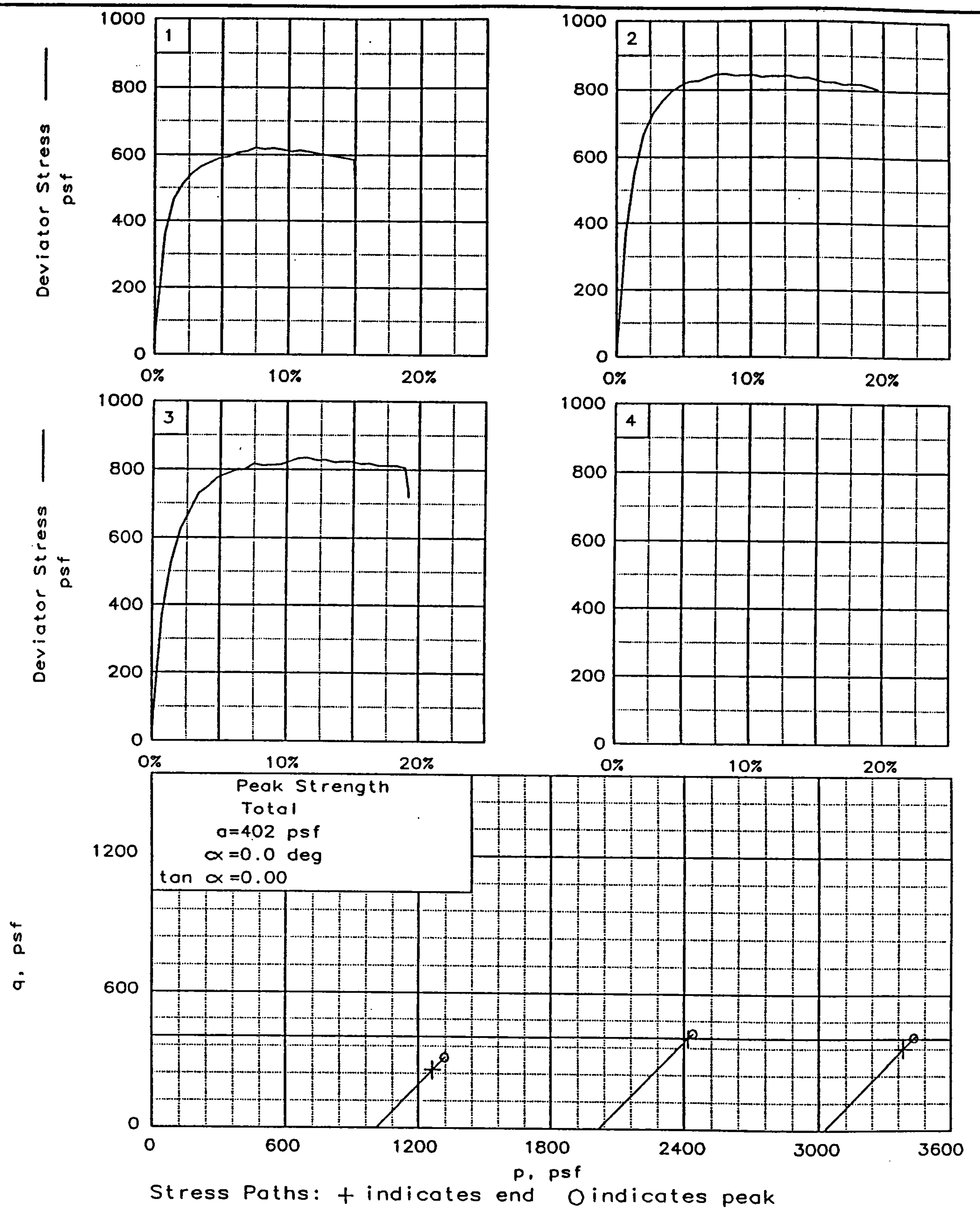
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U, Sample 4-C, Depth 10.1'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

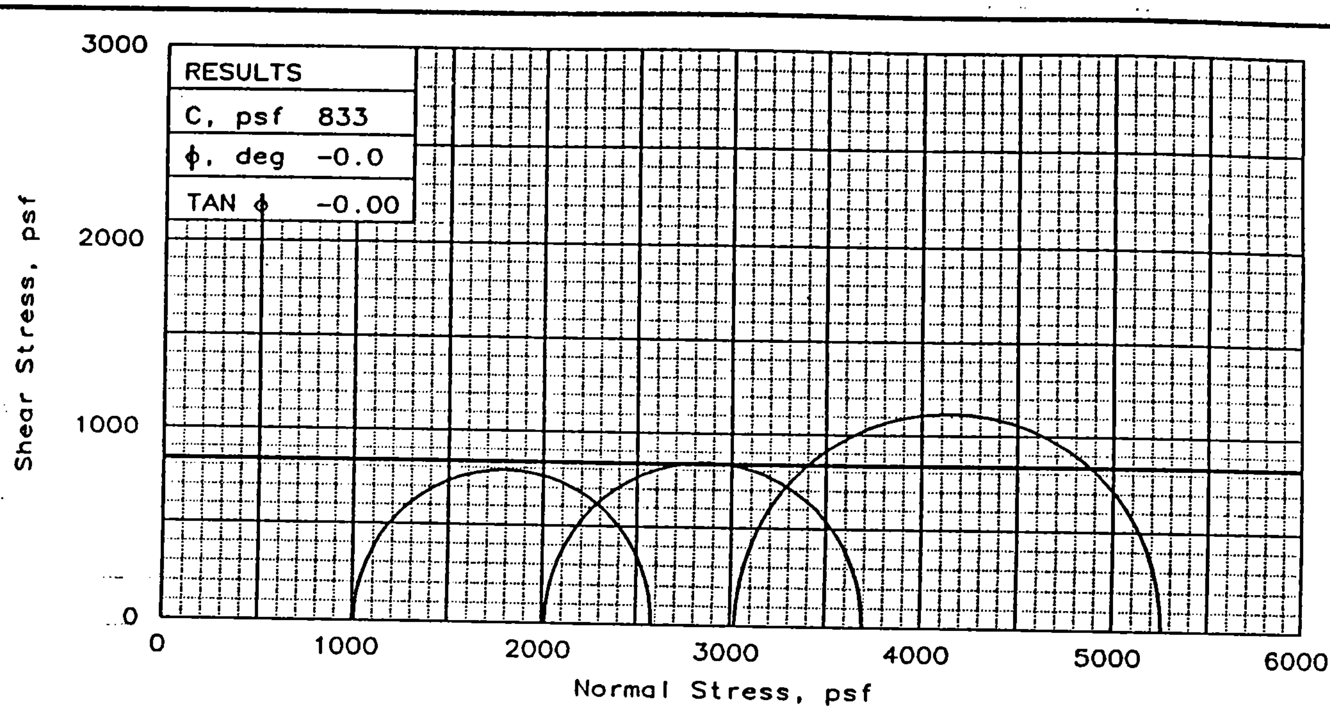


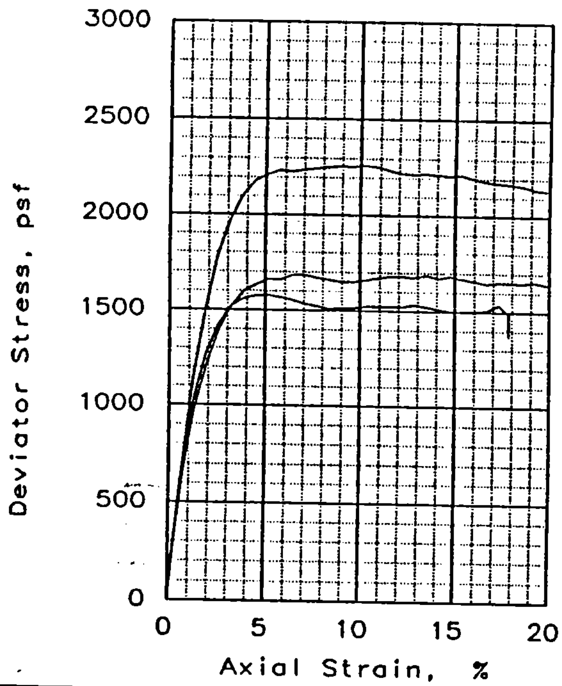
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-5U, Sample 4-C, Depth 10.1'

File: UU-6830 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	86.8	90.2	97.6
	DRY DENSITY, pcf	46.3	43.6	41.1
	SATURATION, %	90.2	86.1	86.1
	VOID RATIO	2.504	2.722	2.946
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.79	2.79
AT TEST	WATER CONTENT, %	96.1	103.2	111.4
	DRY DENSITY, pcf	46.4	44.1	41.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.498	2.682	2.896
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0997	0.1023	0.1020
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1576	1682	2234
ULTIMATE STRESS, psf		1374	1643	2137
σ_1 FAILURE, psf		2584	3698	5258
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M DGr & BK CHOC w/ ors, lyr CH, rts, dec wd & PT
LL= 137 PL= 51 PI= 86
SPECIFIC GRAVITY= 2.6
REMARKS:

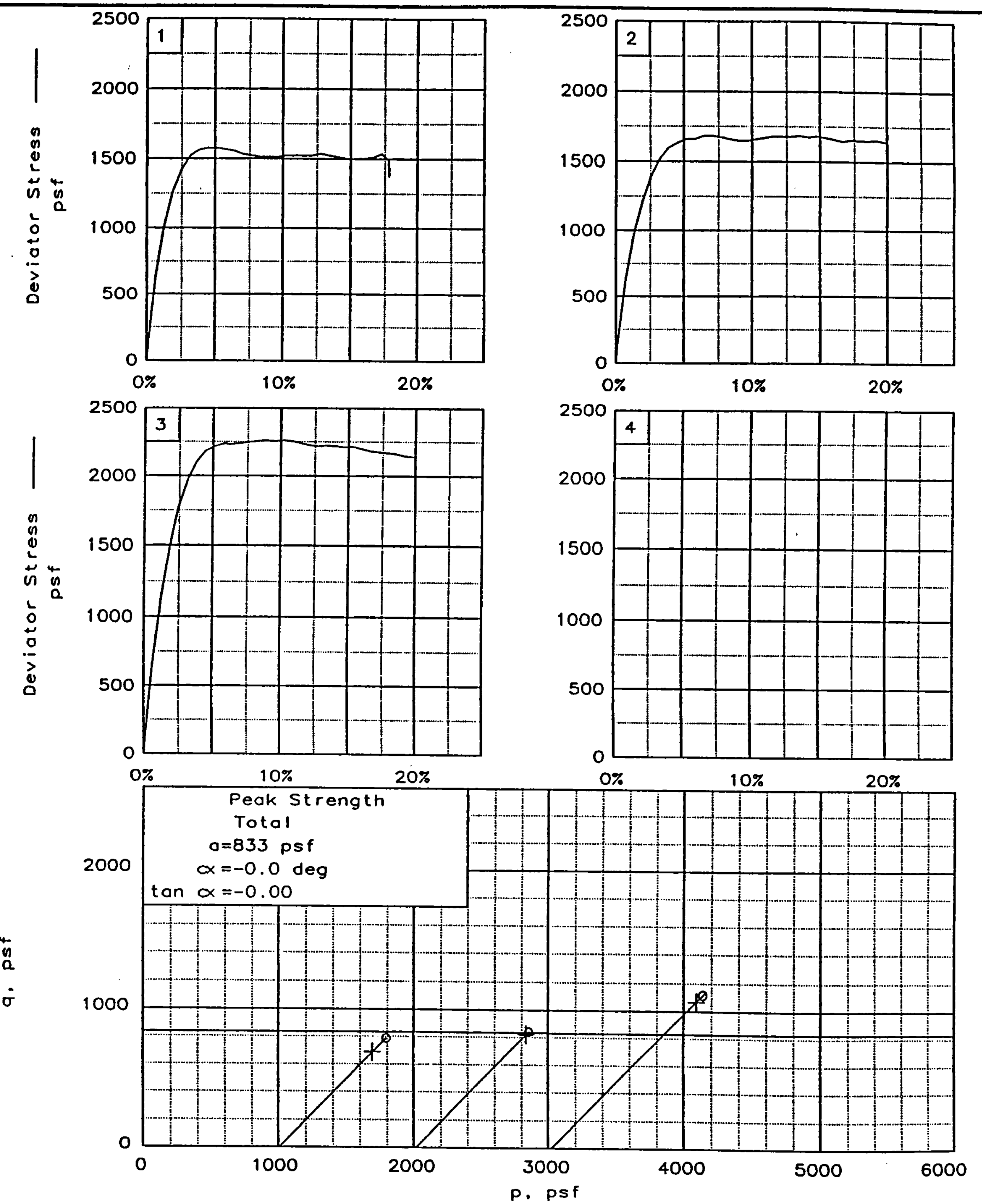
FIG. NO.:

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U,
Sample 7-D, Depth 22.9'
PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



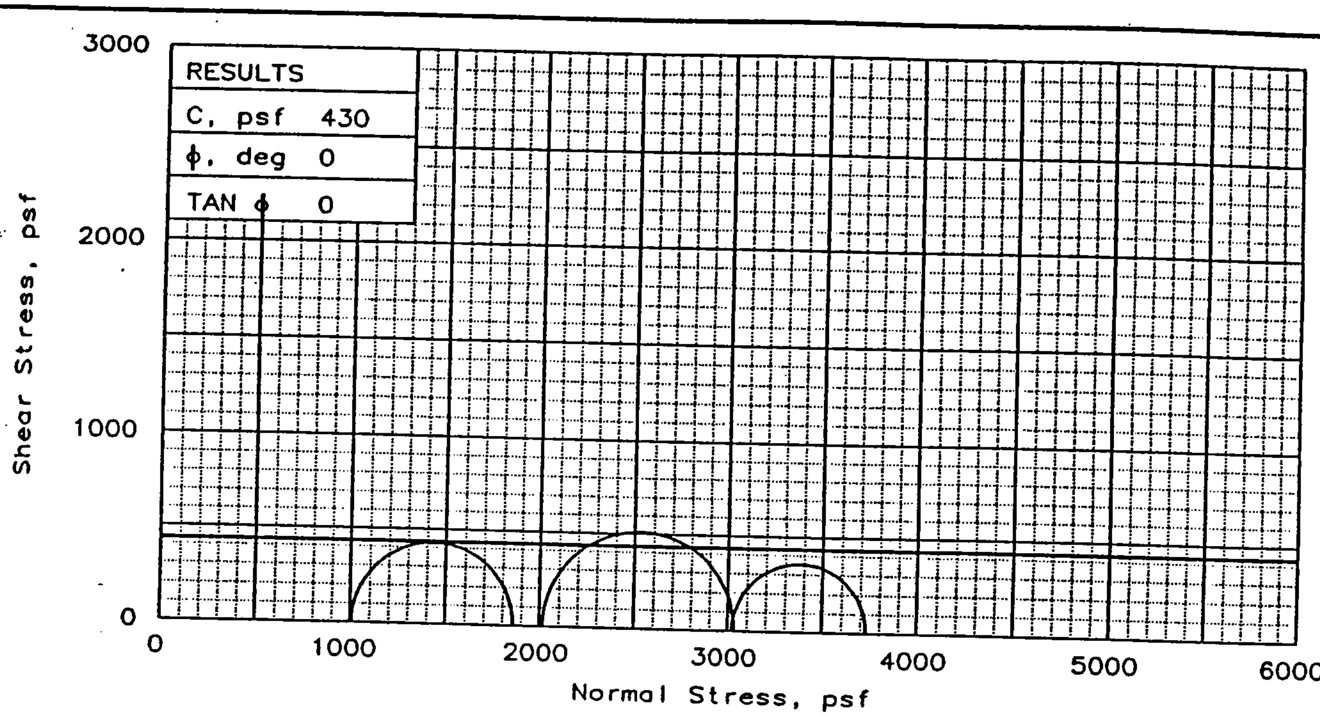
Stress Paths: + indicates end O indicates peak

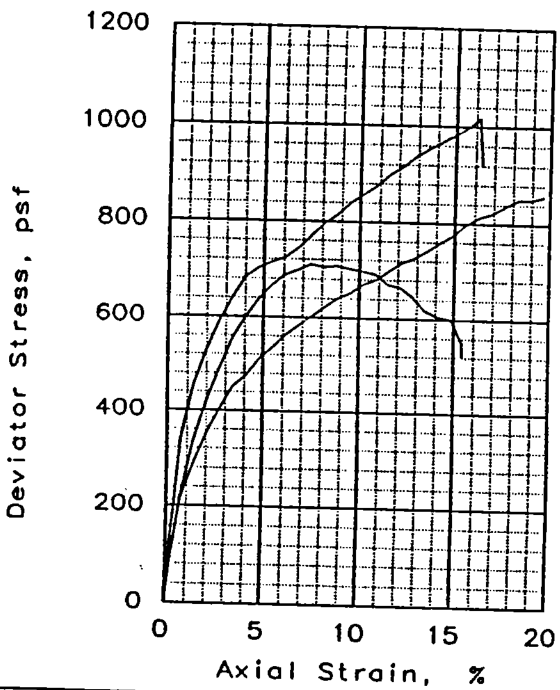
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-5U, Sample 7-D, Depth 22.9'

File: UU-6831 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	36.7	35.5	36.3
	DRY DENSITY, pcf	82.5	84.0	83.5
	SATURATION, %	94.9	95.1	96.0
	VOID RATIO	1.044	1.007	1.019
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	38.4	37.0	37.9
	DRY DENSITY, pcf	82.7	84.4	83.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.037	0.998	1.024
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1086	0.1076	0.1075
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		851	1017	709
ULTIMATE STRESS, psf		857	921	523
σ_1 FAILURE, psf		1859	3033	3733
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CL5
w/ Ins CH

LL= 35 PL= 22 PI= 13

SPECIFIC GRAVITY= 2.7

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

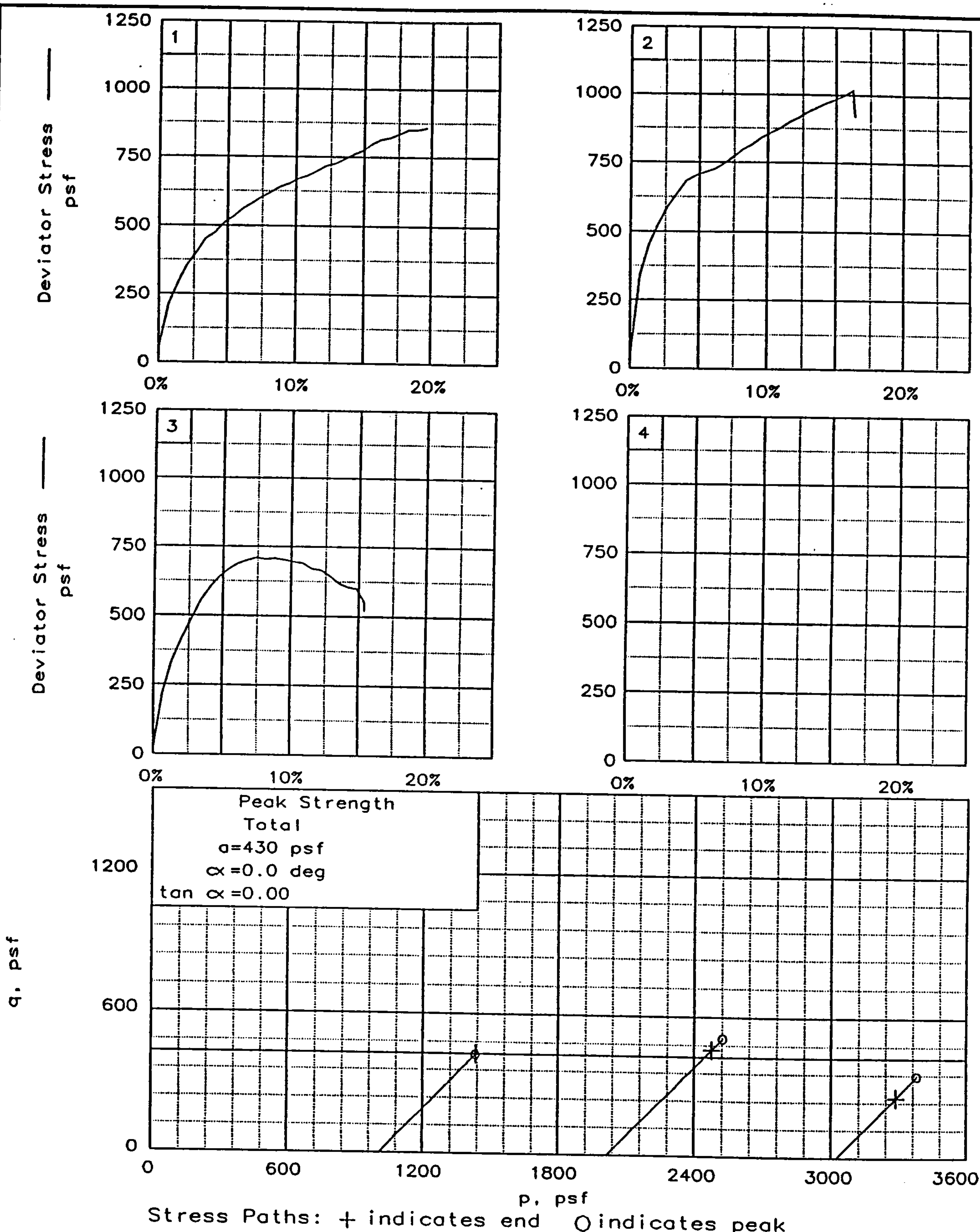
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-5U,
Sample 10-C, Depth 31.9'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

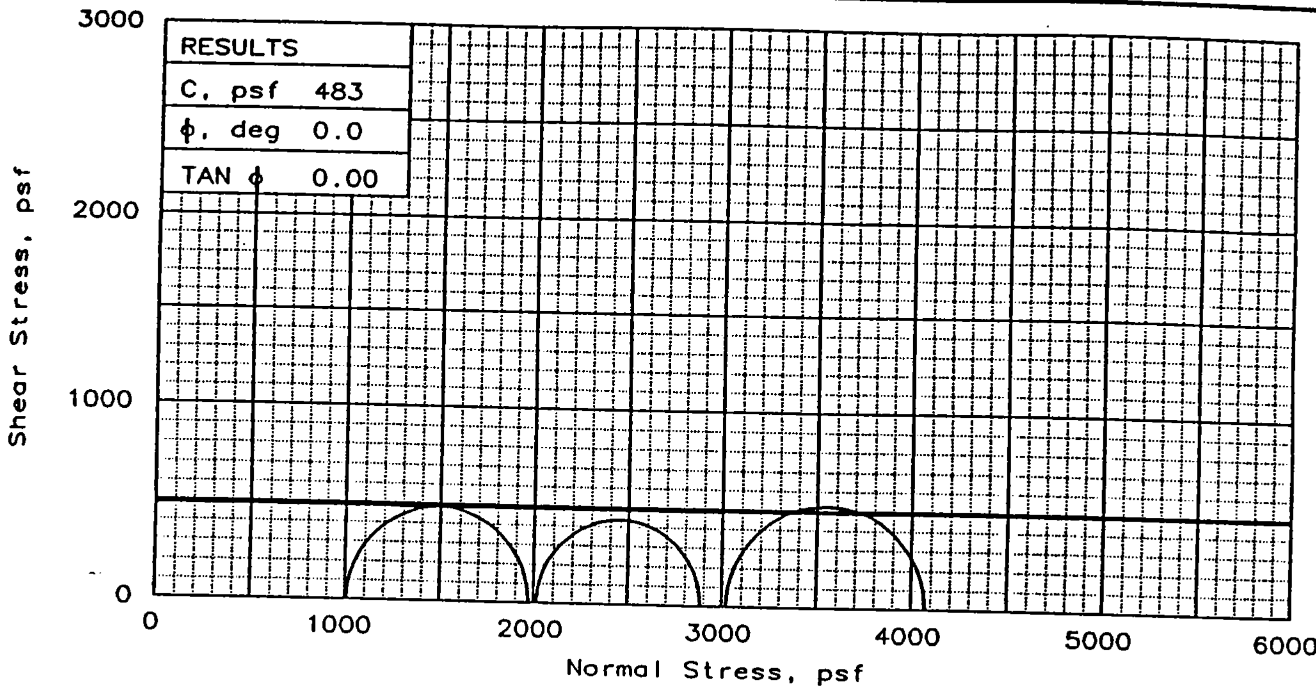


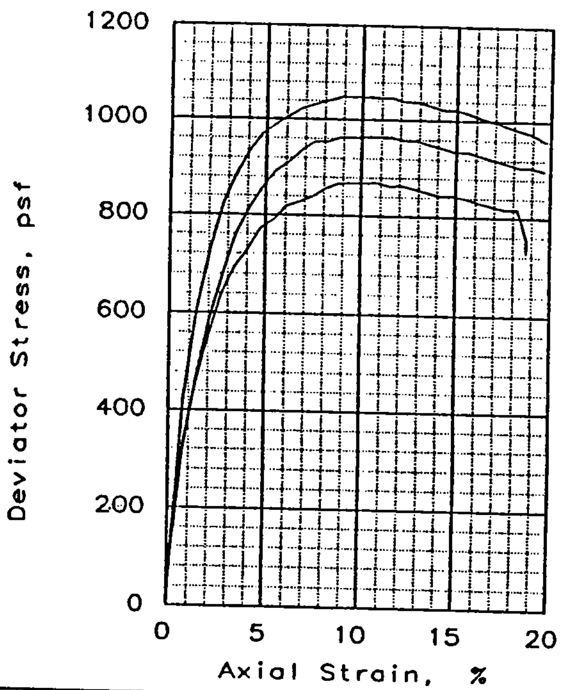
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-5U, Sample 10-C, Depth 31.9'

File: UU-6832 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	38.1	40.3	40.8
	DRY DENSITY, pcf	81.4	79.4	79.5
	SATURATION, %	94.7	95.7	97.1
	VOID RATIO	1.101	1.154	1.152
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	40.2	42.4	42.0
	DRY DENSITY, pcf	81.4	79.2	79.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.101	1.161	1.151
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1050	0.1099	0.1084
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		964	869	1048
ULTIMATE STRESS, psf		898	729	958
σ_1 FAILURE, psf		1972	2885	4072
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH2
w/ lyr & lns ML
LL= 50 PL= 23 PI= 27
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ____

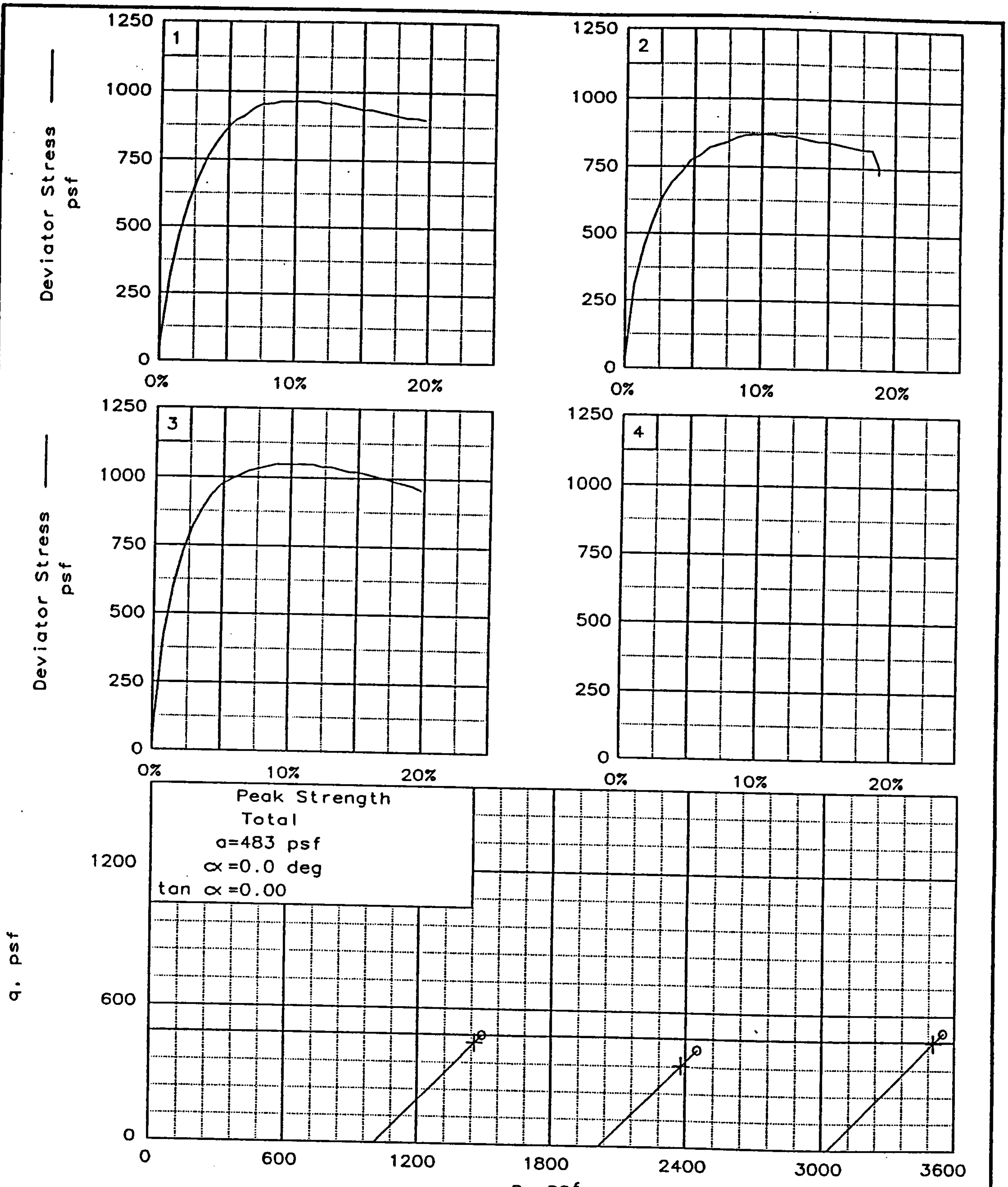
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U,
Sample 13-C, Depth 43.9'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



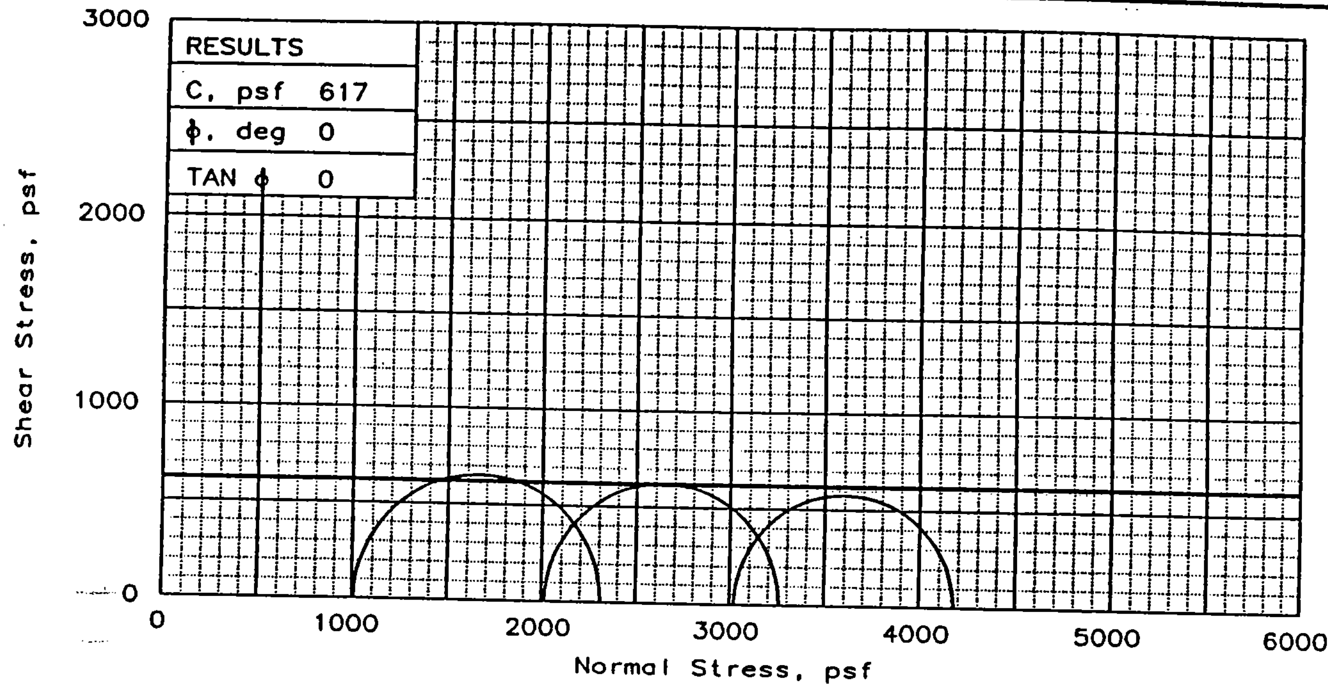
Stress Paths: + indicates end ○ indicates peak

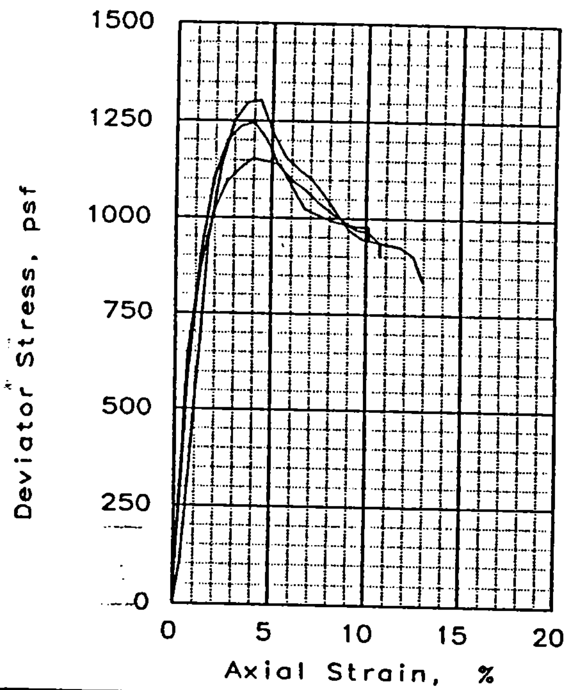
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-5U, Sample 13-C, Depth 43.9'

File: UU-6833 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.4	67.1	66.4
	DRY DENSITY, pcf	59.5	61.0	61.2
	SATURATION, %	98.6	101.8	101.4
	VOID RATIO	1.874	1.805	1.793
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.81	2.80	2.80
AT TEST	WATER CONTENT, %	70.0	65.7	65.4
	DRY DENSITY, pcf	58.6	61.1	61.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.917	1.800	1.793
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1076	0.0996	0.1052
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1305	1245	1154
ULTIMATE STRESS, psf		838	903	940
σ_1 FAILURE, psf		2313	3261	4178
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 99 PL= 27 PI= 72
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

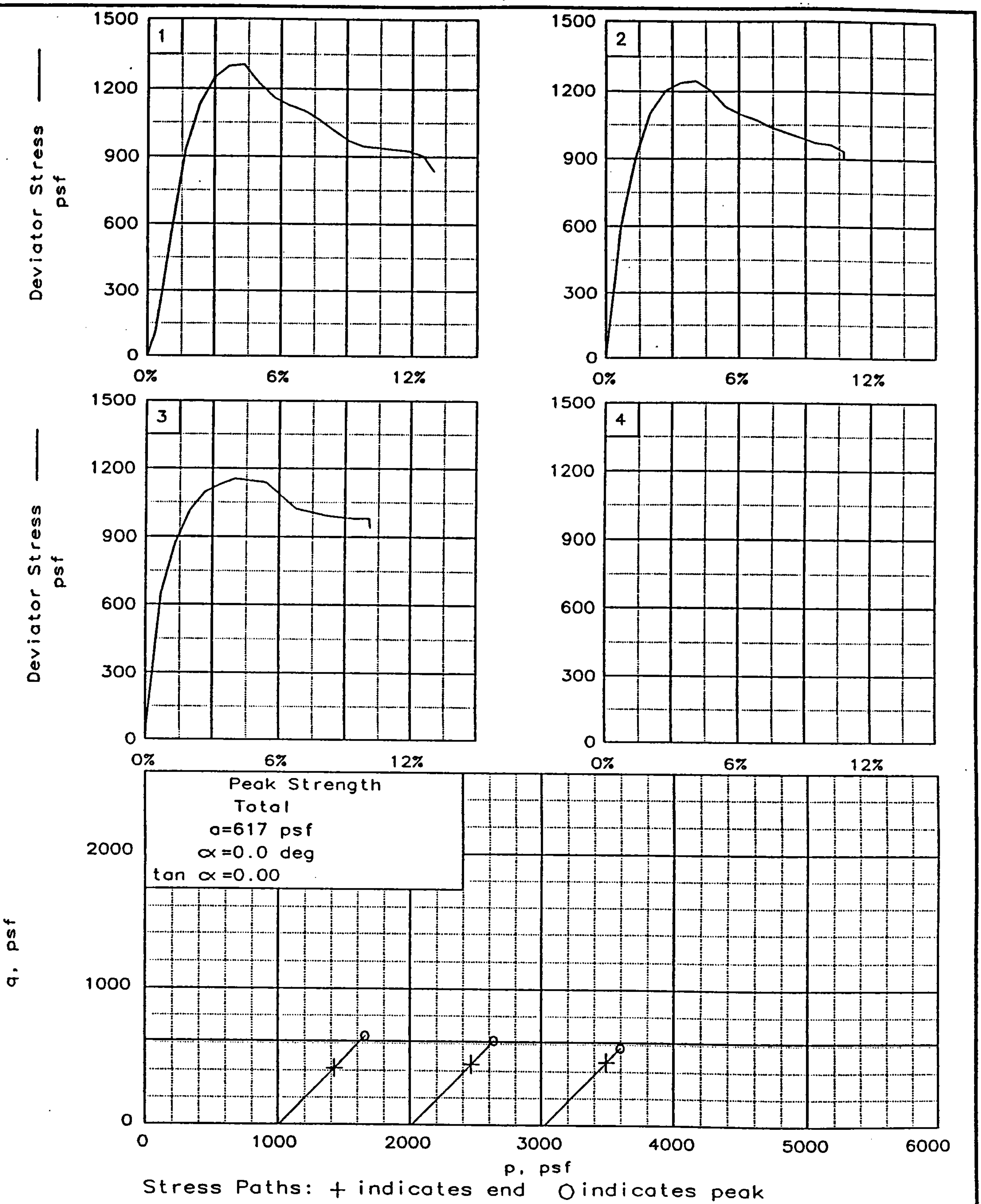
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U,
Sample 15-B, Depth 51.5'

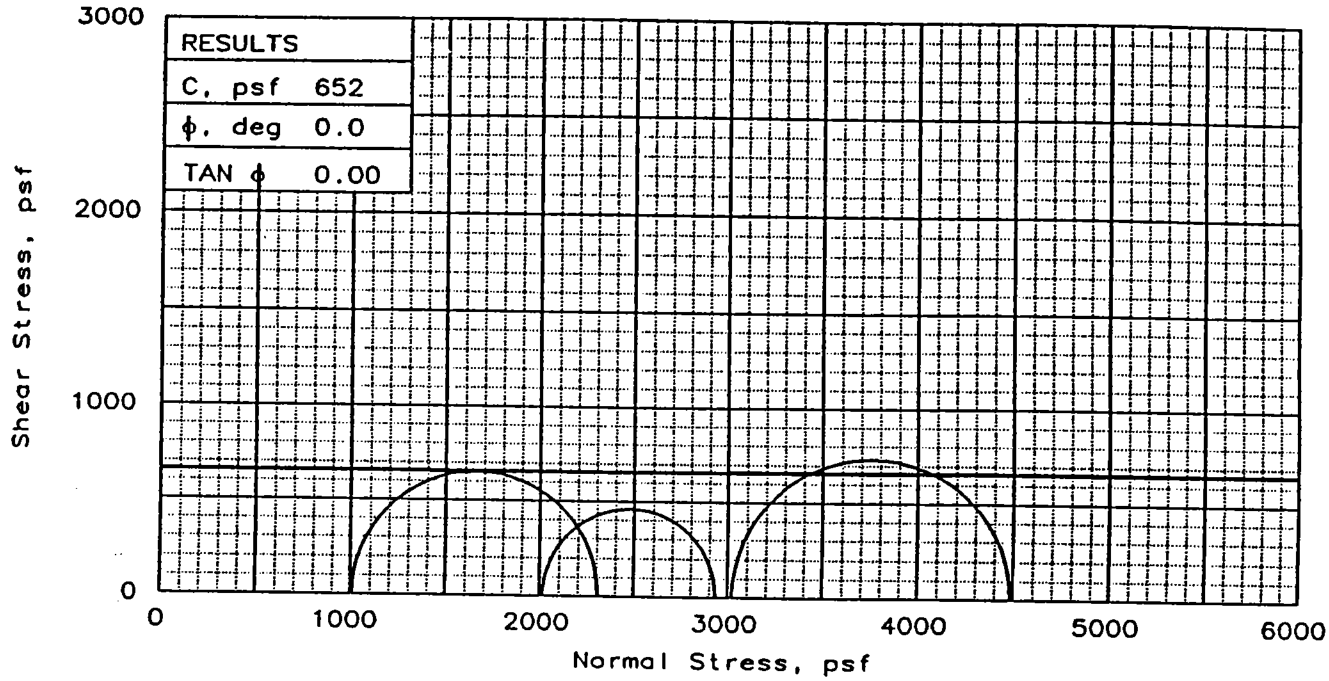
PROJ. NO.: 13622 DATE: 6-28-96

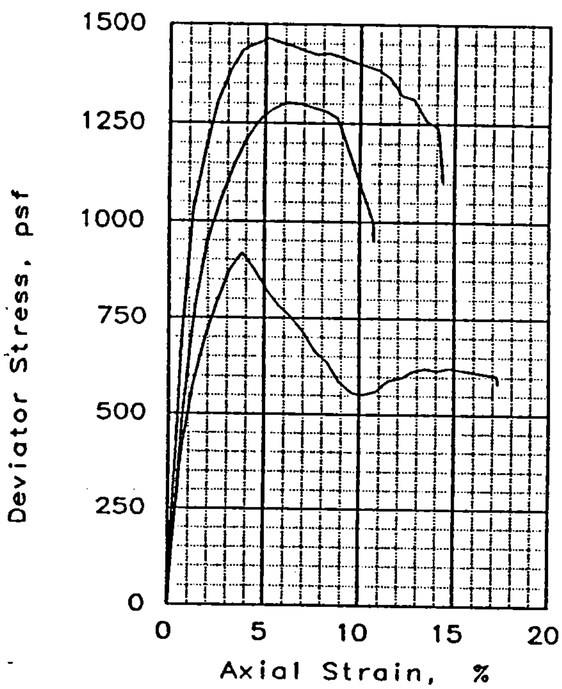
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-5U, Sample 15-B, Depth 51.5'
File: UU-6834 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	59.2	59.5	58.6
	DRY DENSITY, pcf	65.4	65.5	66.2
	SATURATION, %	100.4	101.2	101.3
	VOID RATIO	1.617	1.610	1.584
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	59.2	58.2	57.5
	DRY DENSITY, pcf	65.2	65.9	66.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.622	1.596	1.576
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0897	0.0992	0.0984
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1301	919	1463
ULTIMATE STRESS, psf		951	582	1106
σ_1 FAILURE, psf		2309	2935	4487
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 93 PL= 27 PI= 66
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

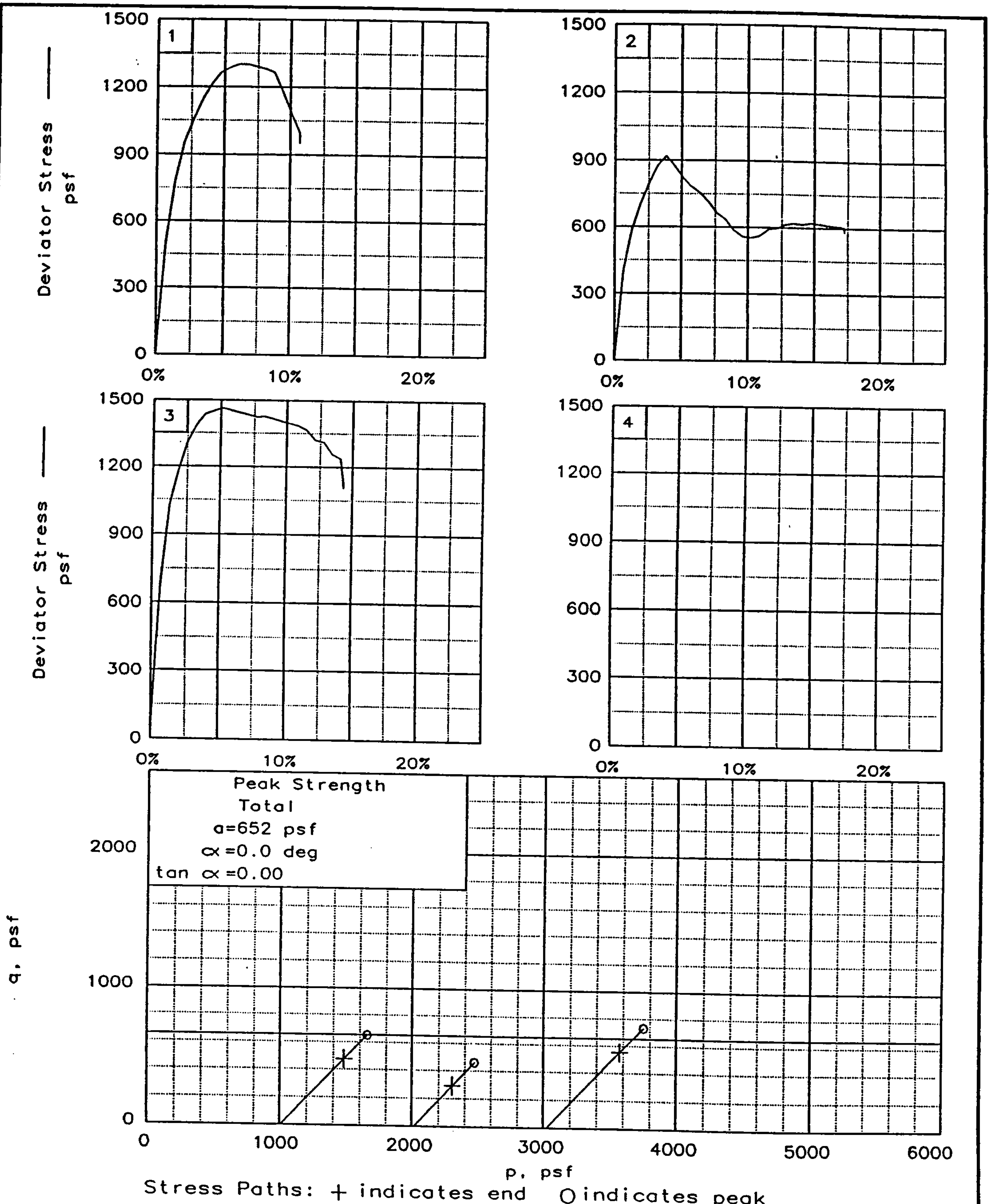
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U,
Sample 17-D, Depth 60.8'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

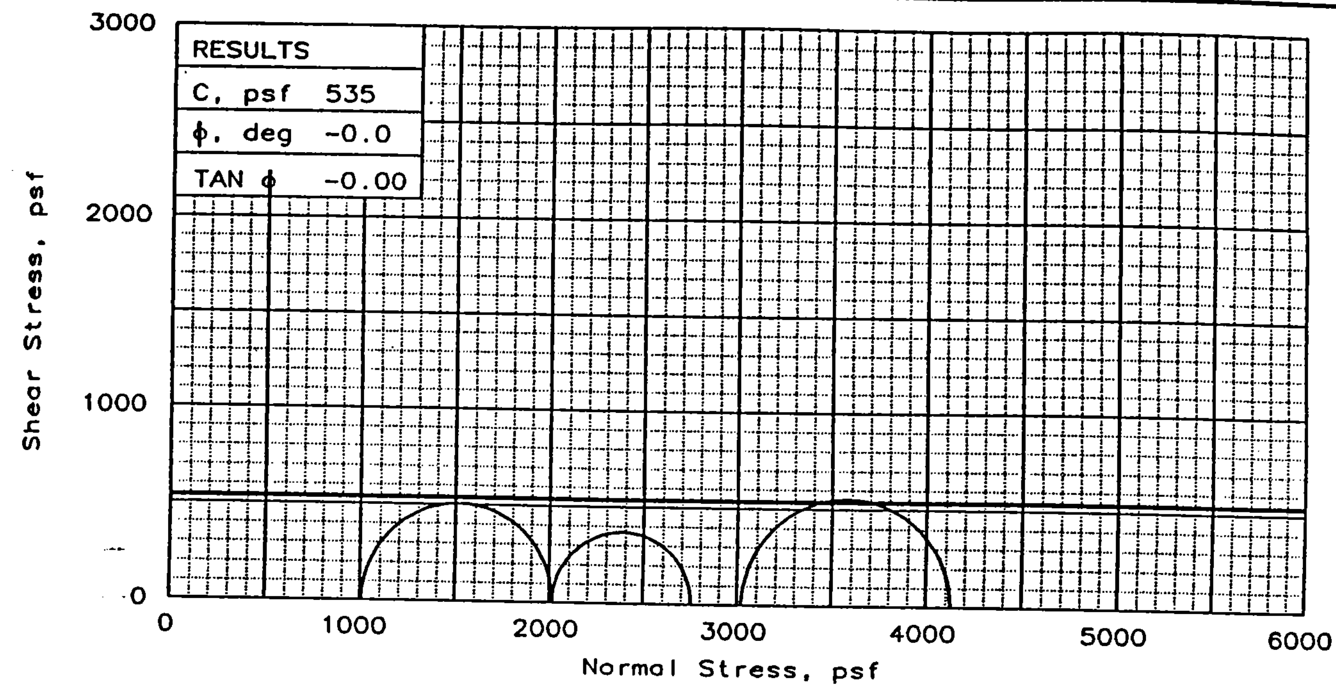


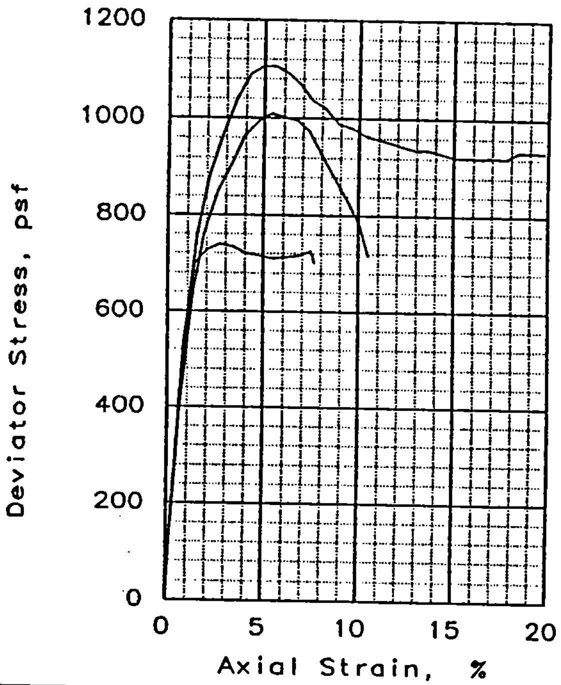
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-5U, Sample 17-D, Depth 60.8'

File: UU-6835 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	59.8	60.1	60.2
	DRY DENSITY, pcf	64.1	64.4	64.2
	SATURATION, %	98.1	99.5	99.1
	VOID RATIO	1.669	1.656	1.666
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.79
AT TEST	WATER CONTENT, %	61.2	60.7	59.8
	DRY DENSITY, pcf	63.9	64.3	64.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.678	1.662	1.638
	DIAMETER, in	1.41	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0975	0.1018	0.1021
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1009	739	1106
ULTIMATE STRESS, psf		716	701	932
σ_1 FAILURE, psf		2017	2755	4130
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 100 PL= 28 PI= 72
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

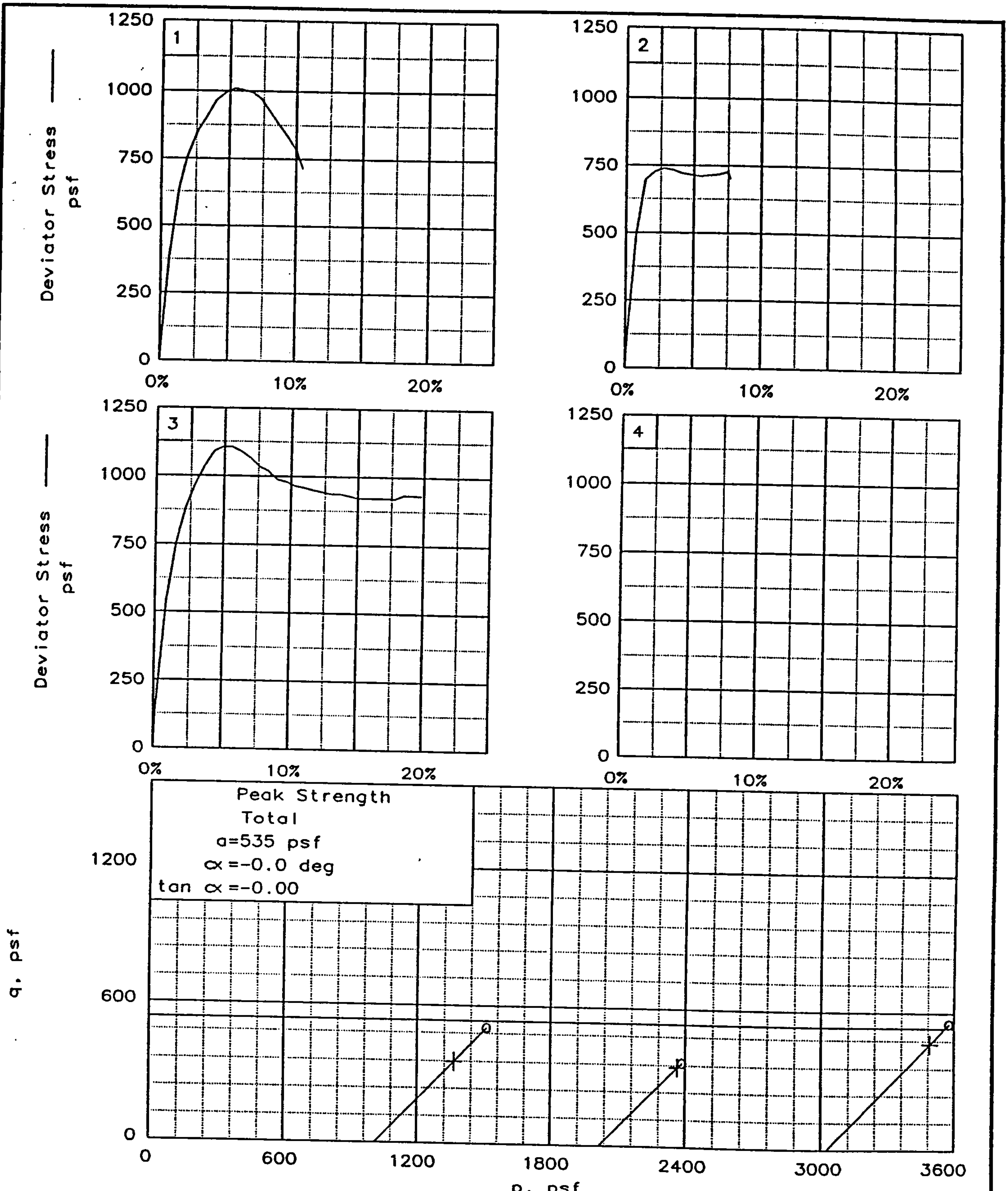
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U,
Sample 19-D, Depth 68.8'

PROJ. NO.: 13622 DATE: 6-28-96

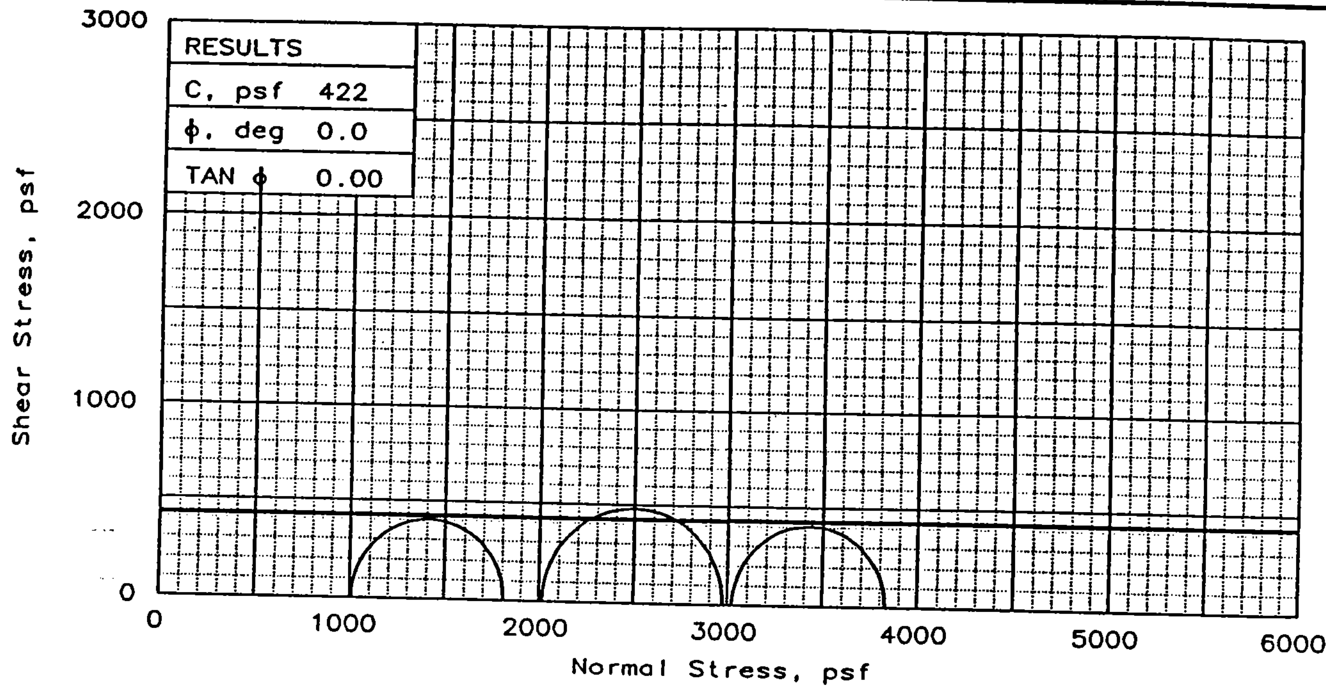
TRIAXIAL SHEAR TEST REPORT

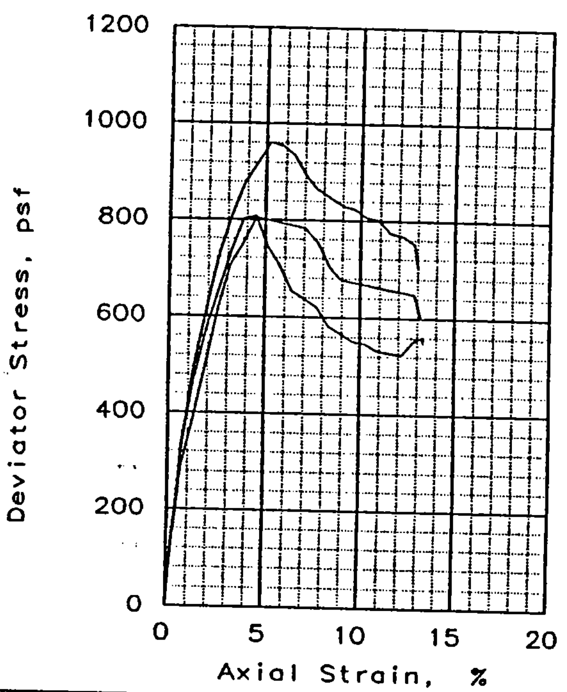
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-5U, Sample 19-D, Depth 68.8'
File: UU-6836 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	63.7	63.7	66.5
	DRY DENSITY, pcf	62.3	62.7	61.0
	SATURATION, %	100.0	100.9	100.9
	VOID RATIO	1.746	1.730	1.806
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.81	2.80	2.79
AT TEST	WATER CONTENT, %	65.1	62.8	65.2
	DRY DENSITY, pcf	61.4	62.9	61.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.785	1.721	1.785
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0993	0.1012	0.0995
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		805	960	808
ULTIMATE STRESS, psf		603	707	550
σ_1 FAILURE, psf		1813	2976	3832
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4

LL= 89 PL= 30 PI= 59
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

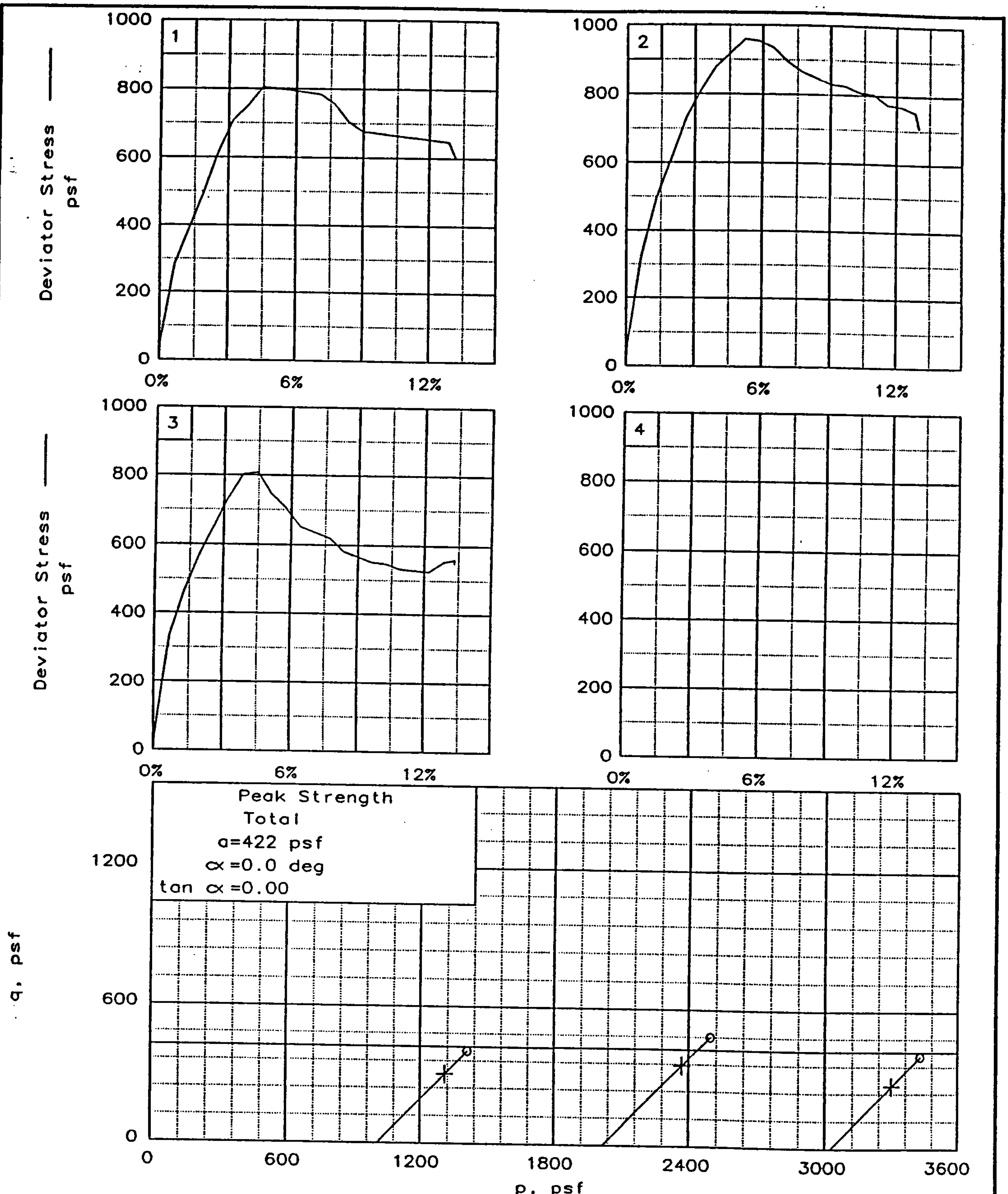
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-5U,
Sample 21-B, Depth 74.7'

PROJ. NO.: 13622 DATE: 6-28-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



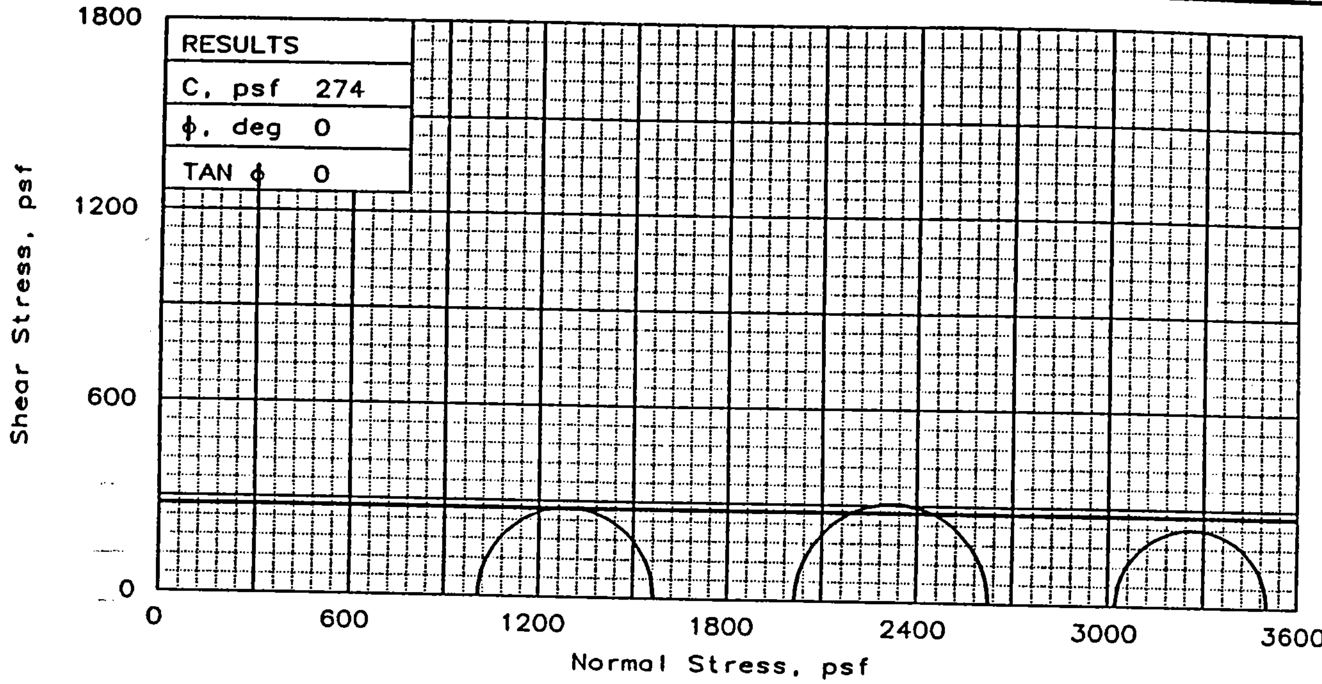
Stress Paths: + indicates end ○ indicates peak

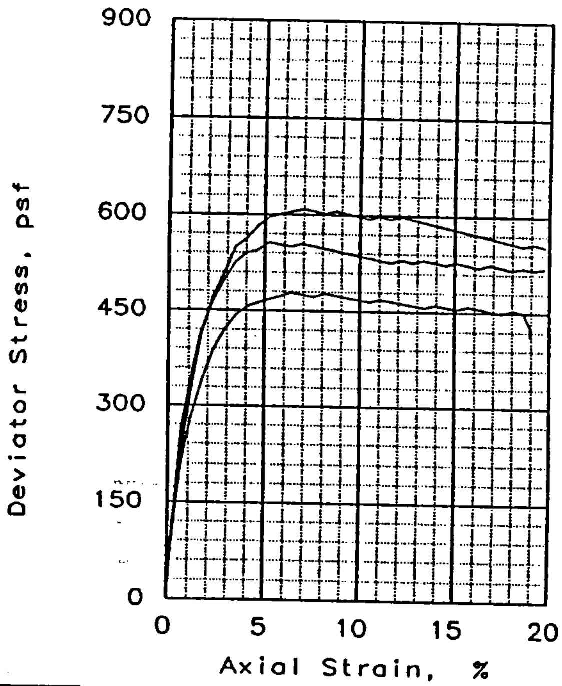
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-5U, Sample 21-B, Depth 74.7'

File: UU-6837 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	115.2	113.0	126.2
	DRY DENSITY, pcf	40.3	40.7	36.8
	SATURATION, %	98.3	97.8	95.7
	VOID RATIO	3.108	3.063	3.494
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.81	2.80	2.80
AT TEST	WATER CONTENT, %	118.8	115.9	131.4
	DRY DENSITY, pcf	39.9	40.6	36.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	3.149	3.071	3.482
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0893	0.0895	0.0927
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		557	609	478
ULTIMATE STRESS, psf		519	553	414
σ_1 FAILURE, psf		1565	2625	3502
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So DGr & Br CHOB w/ slf, rts, dec wd
LL= 155 PL= 41 PI= 114
SPECIFIC GRAVITY= 2.65
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 3-C, Depth 9.1'

PROJ. NO.: 13622 DATE: 7-1-96

TRIAXIAL SHEAR TEST REPORT

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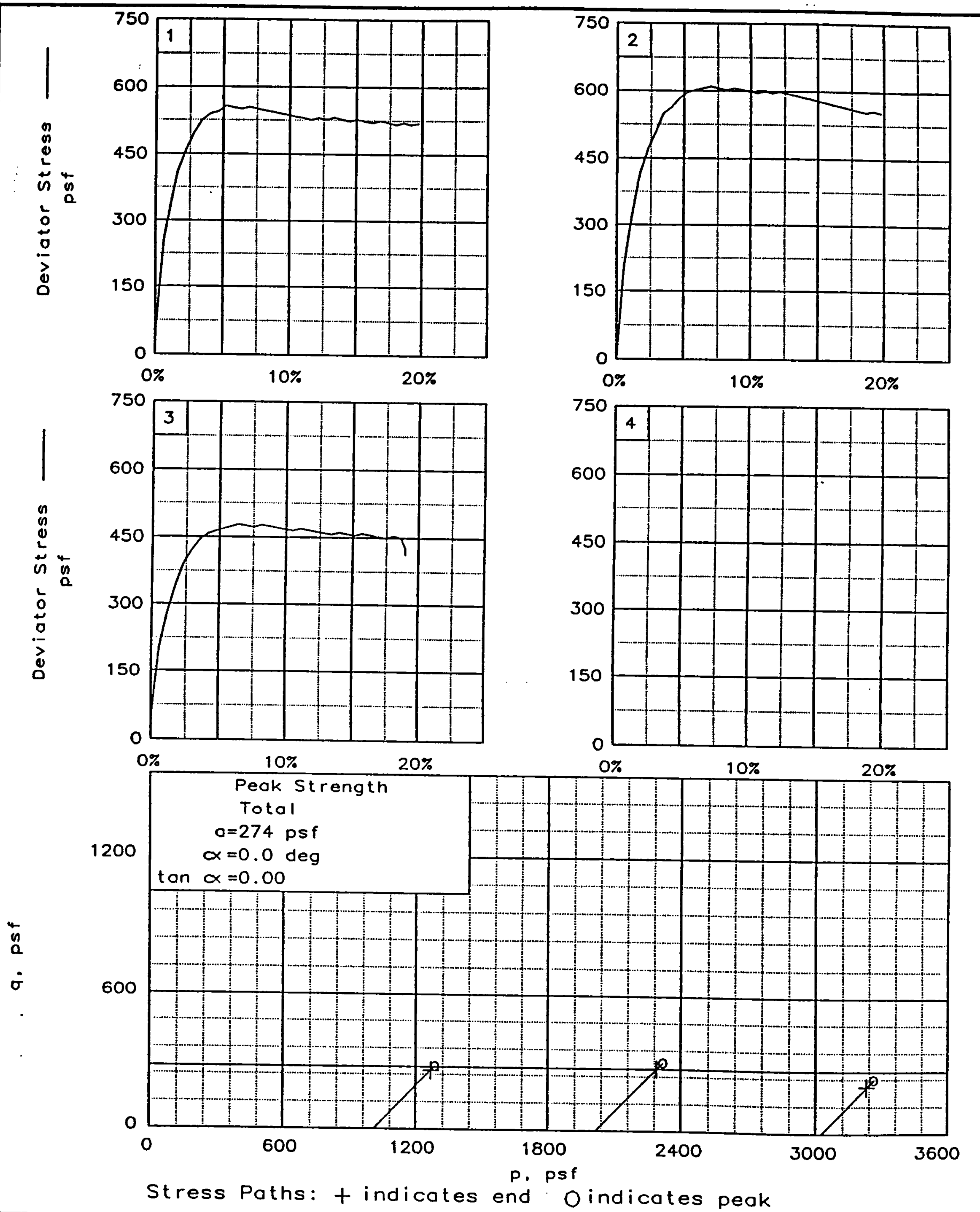
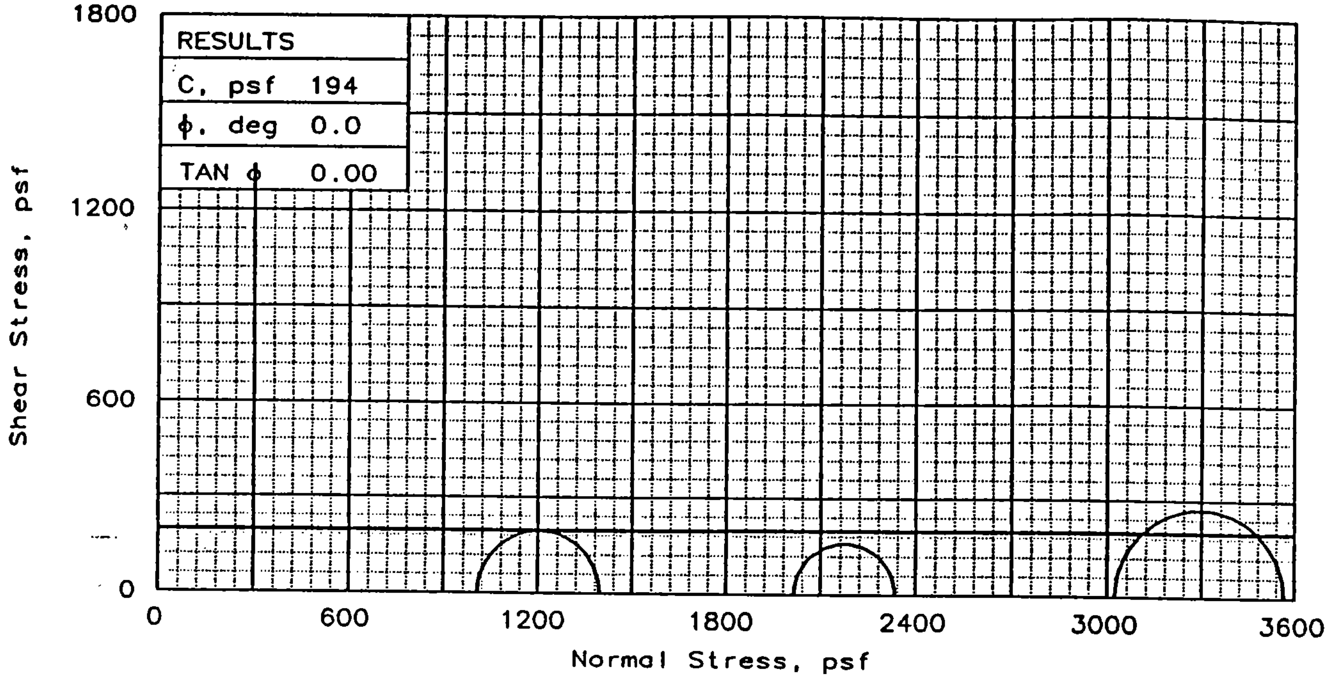
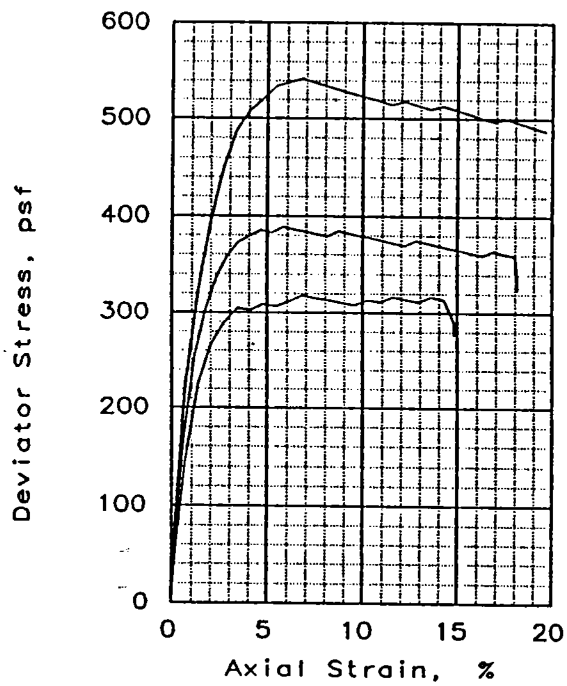


Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-6U, Sample 3-C, Depth 9.1'
File: UU-6851 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	74.9	70.7	67.9
	DRY DENSITY, pcf	54.1	56.2	58.9
	SATURATION, %	94.9	94.8	97.7
	VOID RATIO	2.161	2.043	1.903
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	78.4	74.8	69.3
	DRY DENSITY, pcf	54.4	56.1	59.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.147	2.049	1.899
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0897	0.1055	0.0996
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		389	318	542
ULTIMATE STRESS, psf		324	276	488
σ_1 FAILURE, psf		1397	2334	3566
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH4
w/ lyr & lns ML
LL= 85 PL= 25 PI= 60
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 4-C, Depth 13.4'

PROJ. NO.: 13622 DATE: 7-1-96

TRIAXIAL SHEAR TEST REPORT

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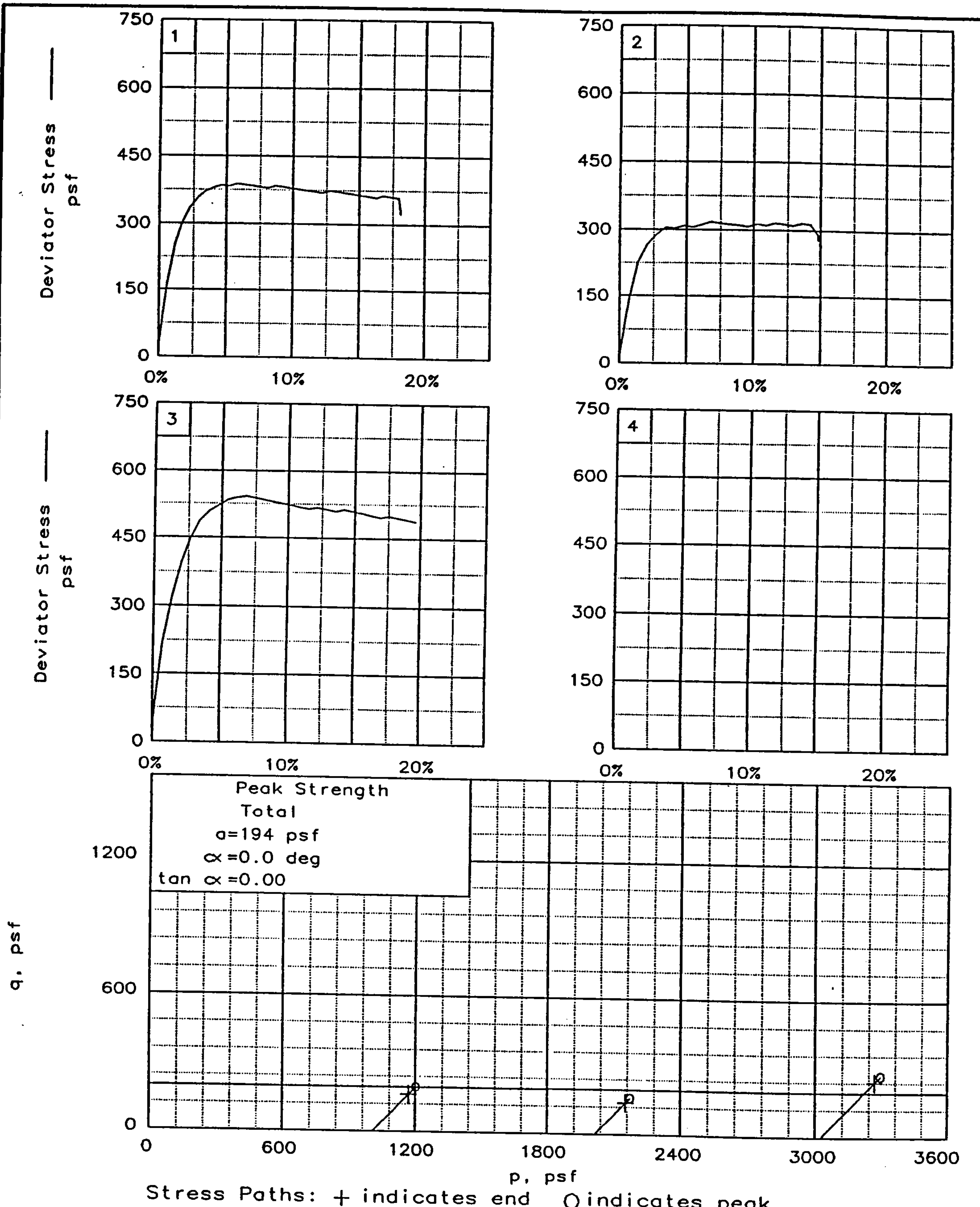
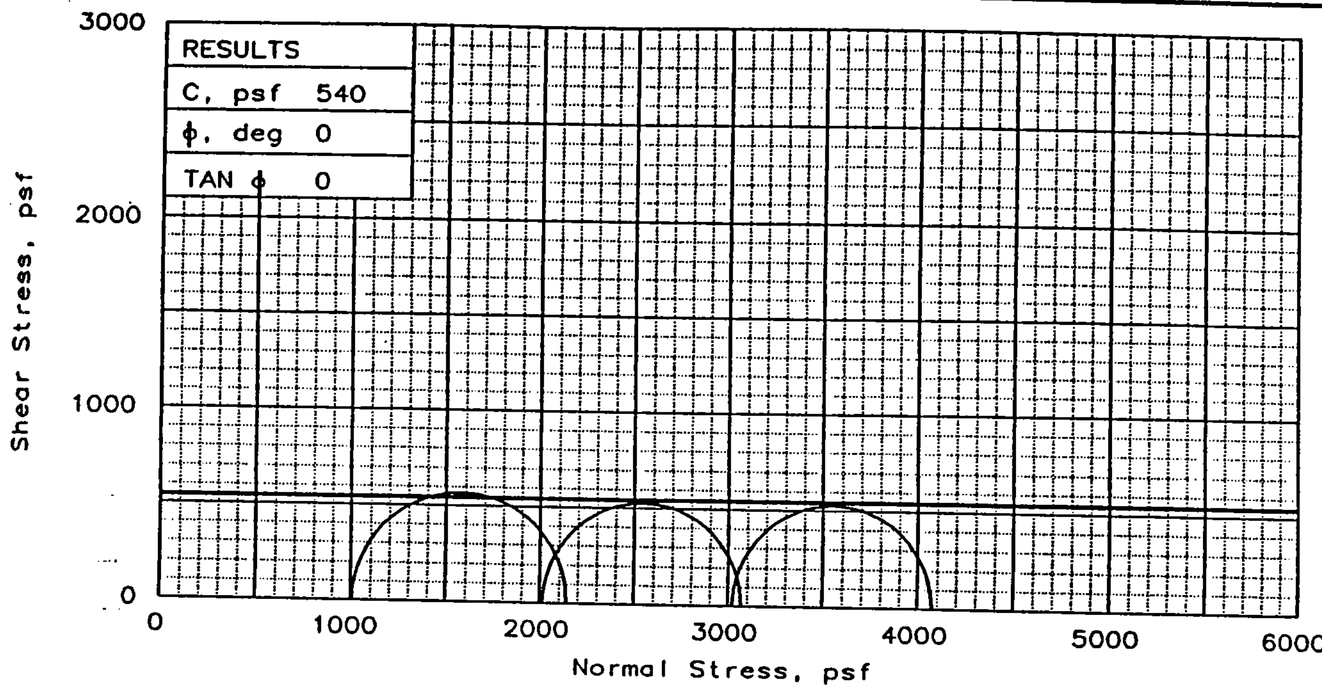
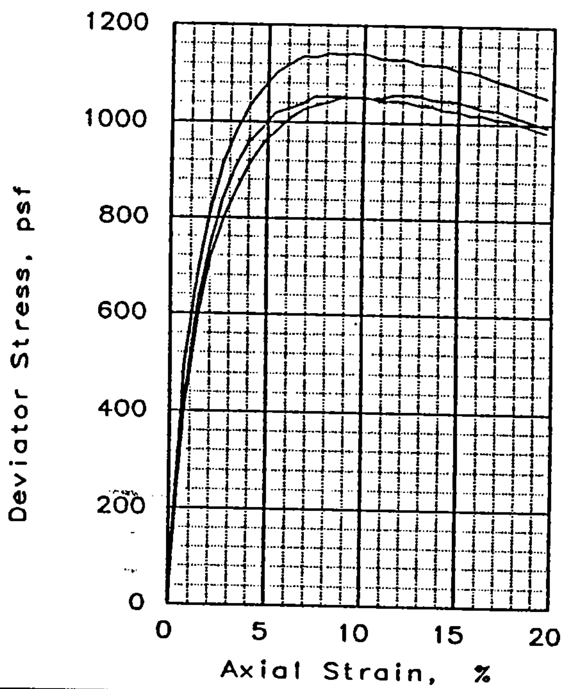


Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-6U, Sample 4-C, Depth 13.4'
File: UU-6852 Project No.: 13622 FIG. NO.: ____





	SPECIMEN NO.:	1	2	3
INITIAL	WATER CONTENT, %	37.0	37.1	36.8
	DRY DENSITY, pcf	83.6	83.7	83.4
	SATURATION, %	97.6	98.3	96.6
	VOID RATIO	1.030	1.028	1.035
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	38.0	37.6	38.0
	DRY DENSITY, pcf	83.5	83.9	83.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.034	1.023	1.033
	DIAMETER, in	1.41	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
	Strain rate, in/min	0.1069	0.1082	0.1058
	BACK PRESSURE, psf	0	0	0
	CELL PRESSURE, psf	1008	2016	3024
	FAILURE STRESS, psf	1135	1053	1050
	ULTIMATE STRESS, psf	1054	983	994
	σ_1 FAILURE, psf	2143	3069	4074
	σ_3 FAILURE, psf	1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CL6
w/ lns & ars ML
LL= 48 PL= 17 PI= 31
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 13-D, Depth 37.3'

PROJ. NO.: 13622 DATE: 7-1-96

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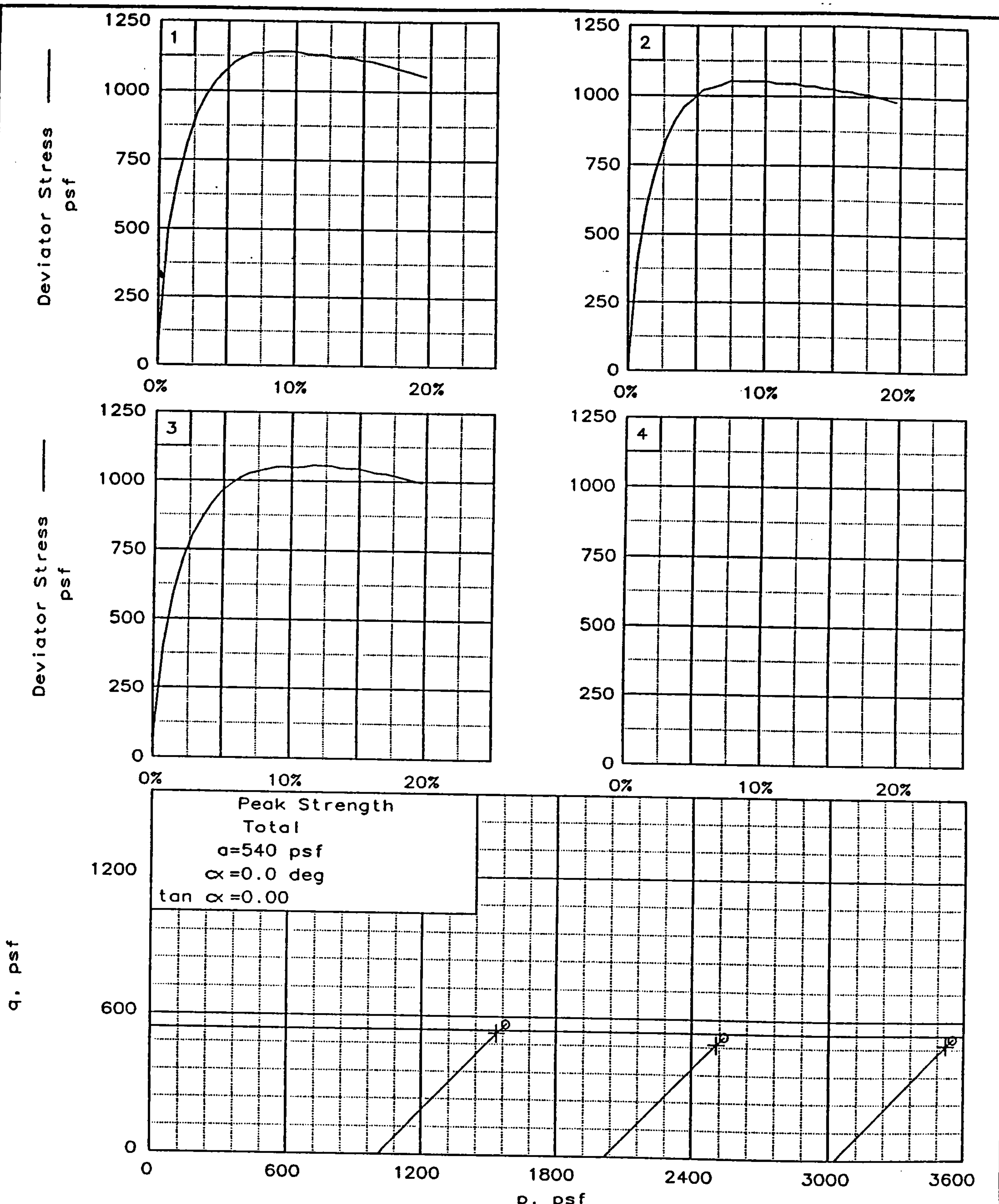
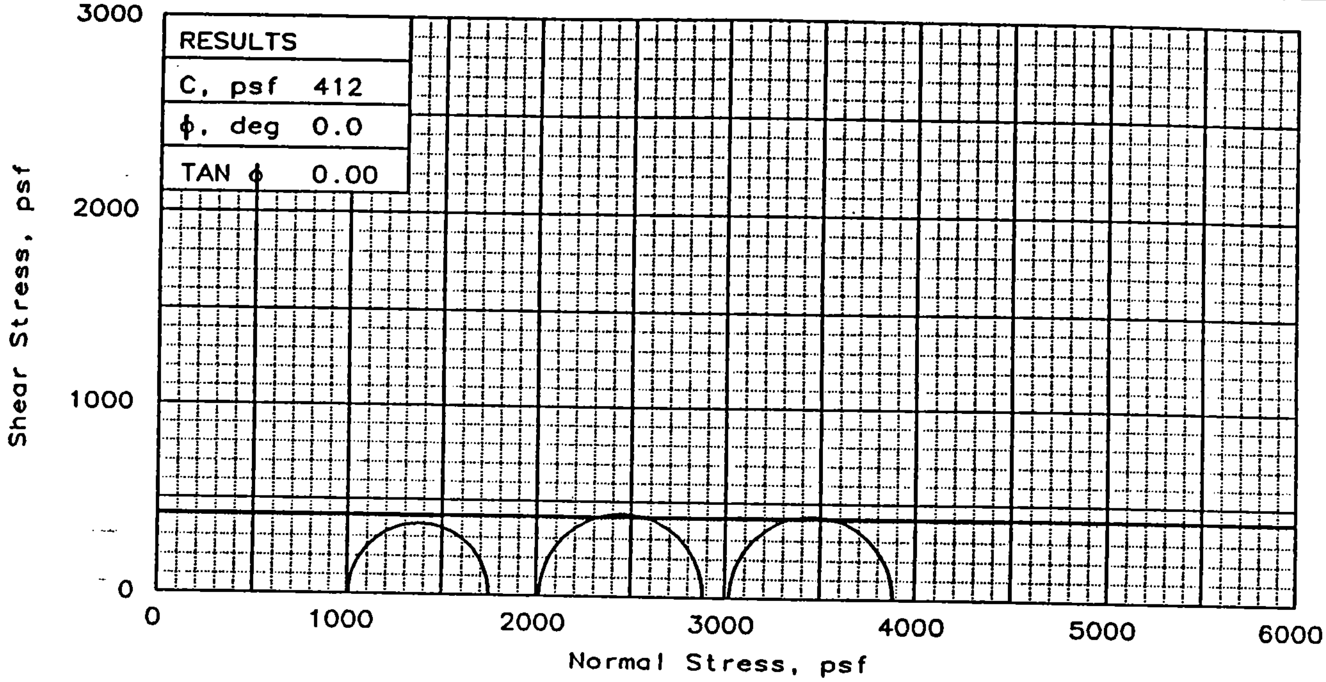
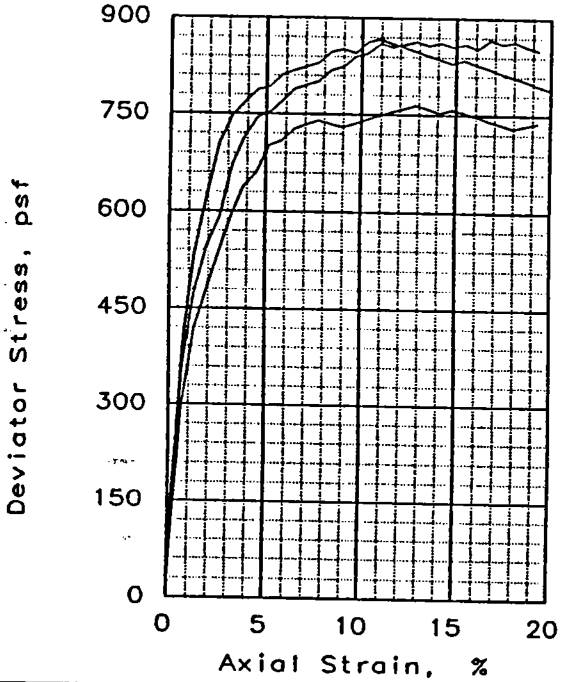


Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-6U, Sample 13-D, Depth 37.3'
File: UU-6853 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	49.9	49.7	49.1
	DRY DENSITY, pcf	70.5	70.4	70.1
	SATURATION, %	96.0	95.1	93.5
	VOID RATIO	1.425	1.431	1.440
	DIAMETER, in	1.40	1.41	1.41
	HEIGHT, in	2.80	2.80	2.79
AT TEST	WATER CONTENT, %	51.5	51.7	52.0
	DRY DENSITY, pcf	70.9	70.8	70.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.411	1.417	1.425
	DIAMETER, in	1.40	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0937	0.0997	0.1014
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		740	867	861
ULTIMATE STRESS, psf		738	790	850
σ_1 FAILURE, psf		1748	2883	3885
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns ML
LL= 76 PL= 23 PI= 53
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 15-B, Depth 44.5'
PROJ. NO.: 13622 DATE: 7-1-96

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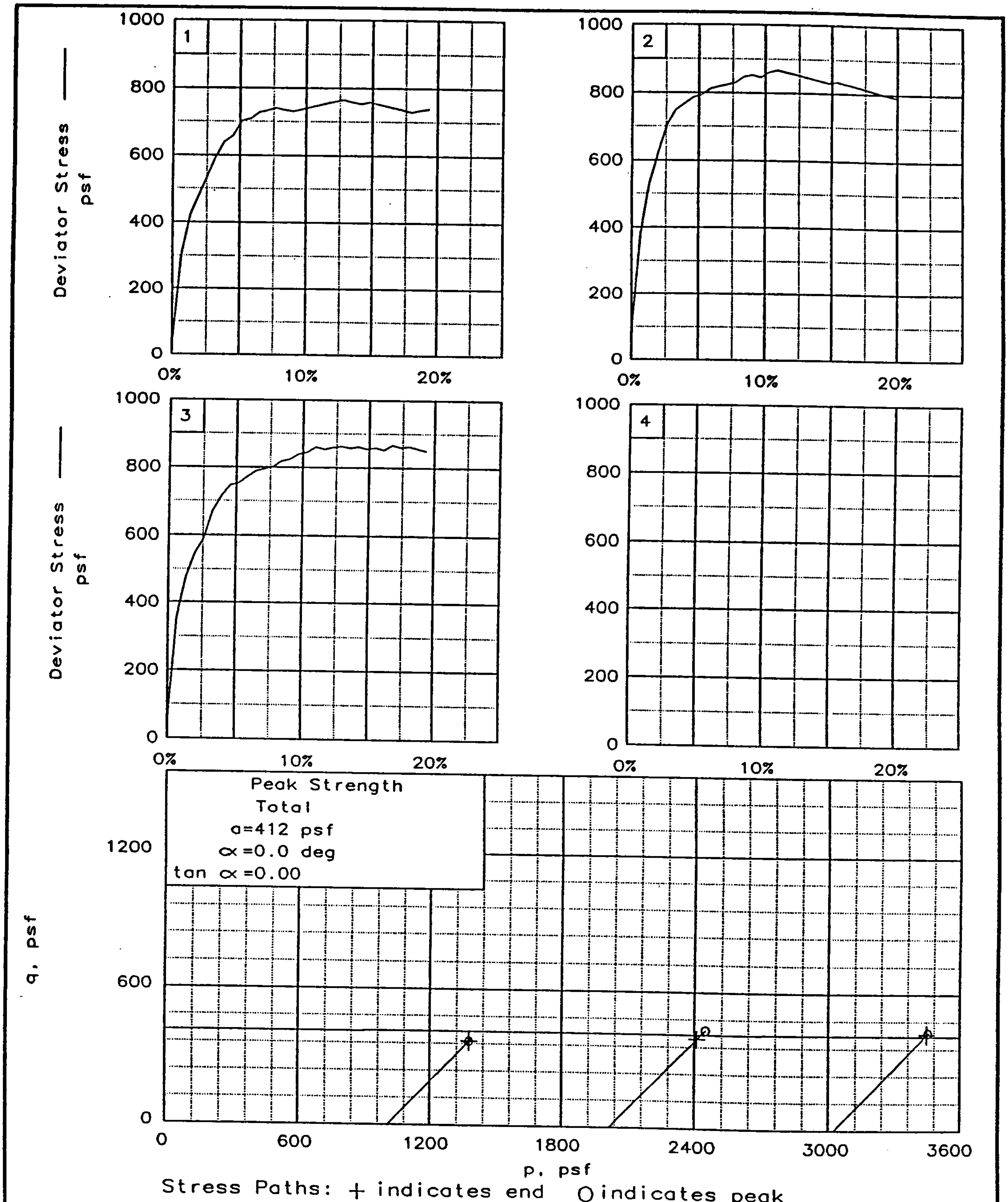
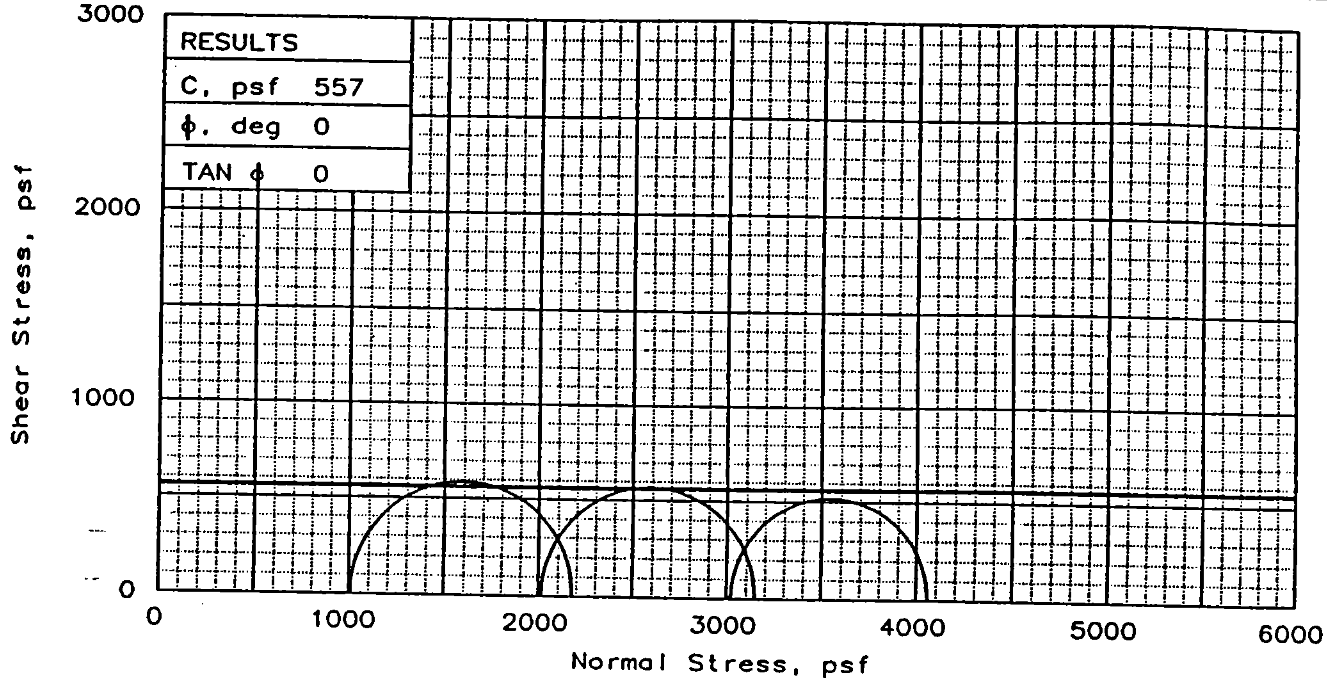


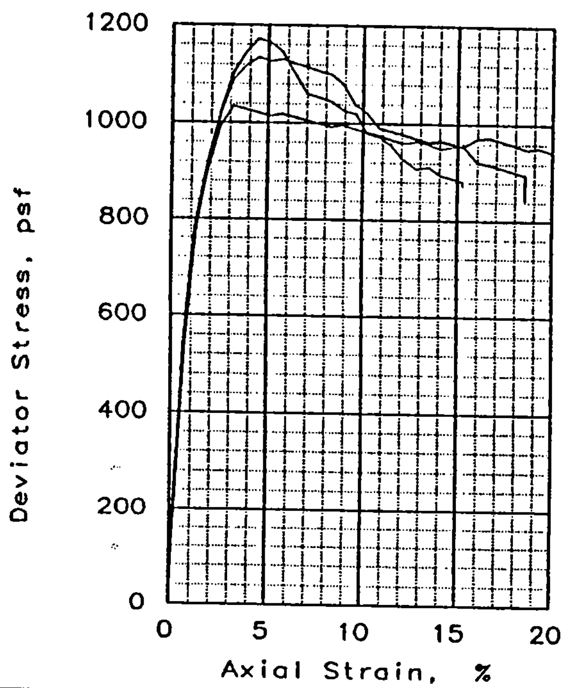
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-6U, Sample 15-B, Depth 44.5'

File: UU-6854 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	55.0	54.6	53.8
	DRY DENSITY, pcf	67.4	67.3	67.3
	SATURATION, %	97.8	97.1	95.5
	VOID RATIO	1.540	1.540	1.542
	DIAMETER, in	1.41	1.41	1.42
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	56.2	55.9	56.0
	DRY DENSITY, pcf	67.4	67.6	67.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.540	1.531	1.533
	DIAMETER, in	1.41	1.41	1.42
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0985	0.0974	0.0985
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1172	1133	1035
ULTIMATE STRESS, psf		872	846	945
σ_1 FAILURE, psf		2180	3149	4059
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 86 PL= 26 PI= 60
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 17-D, Depth 53.8'

PROJ. NO.: 13622 DATE: 7-1-96

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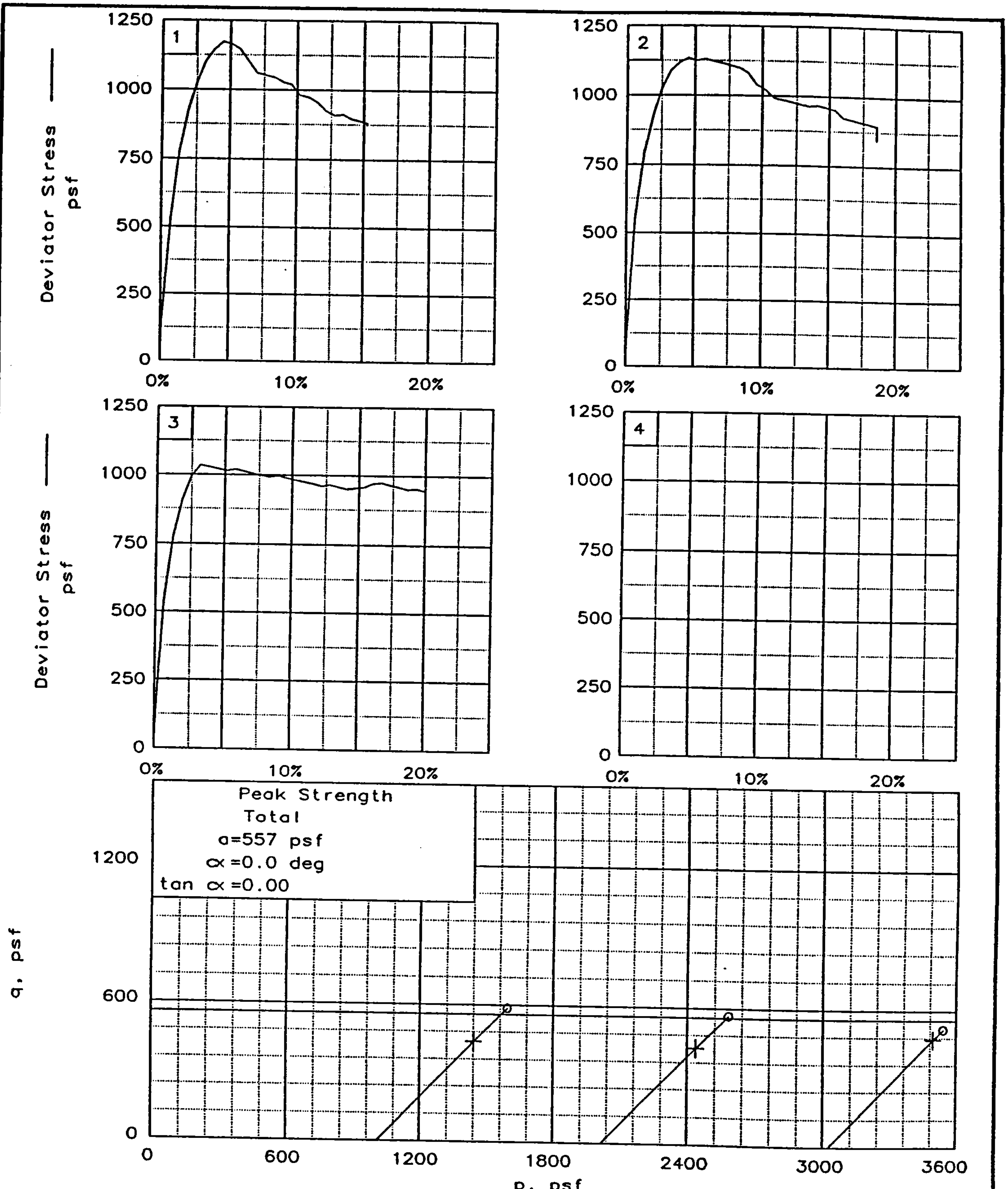
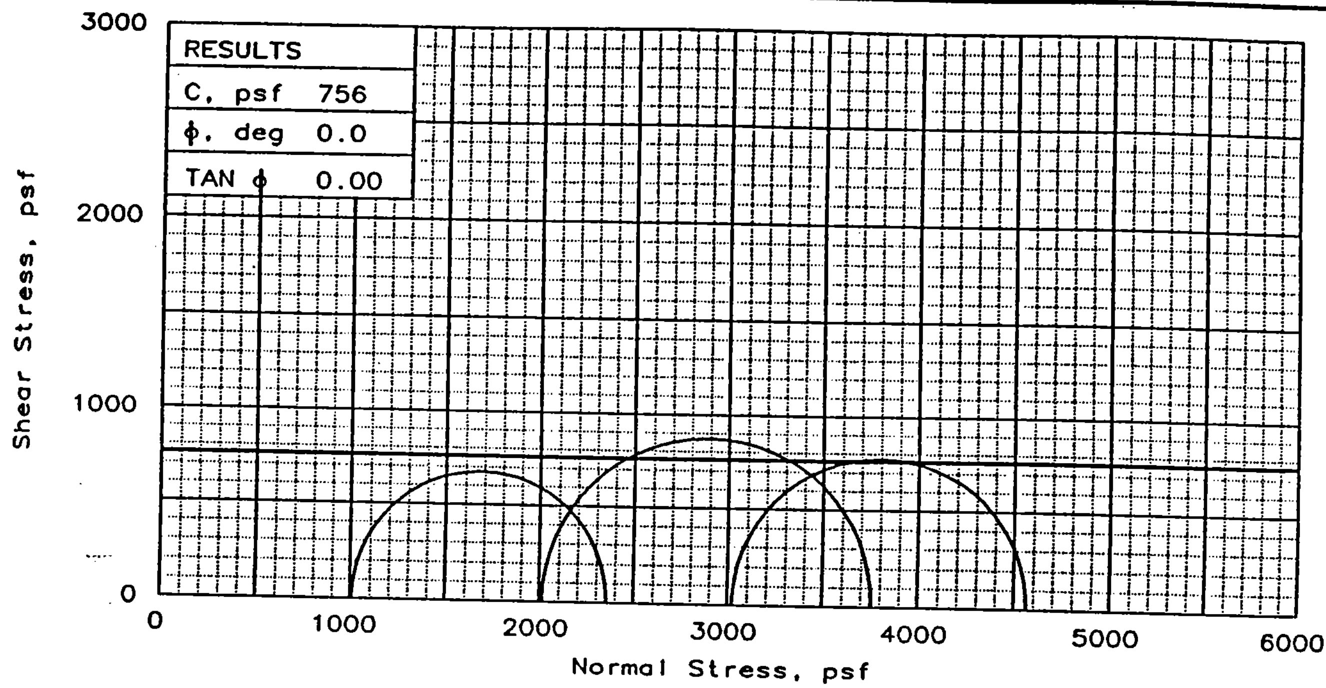
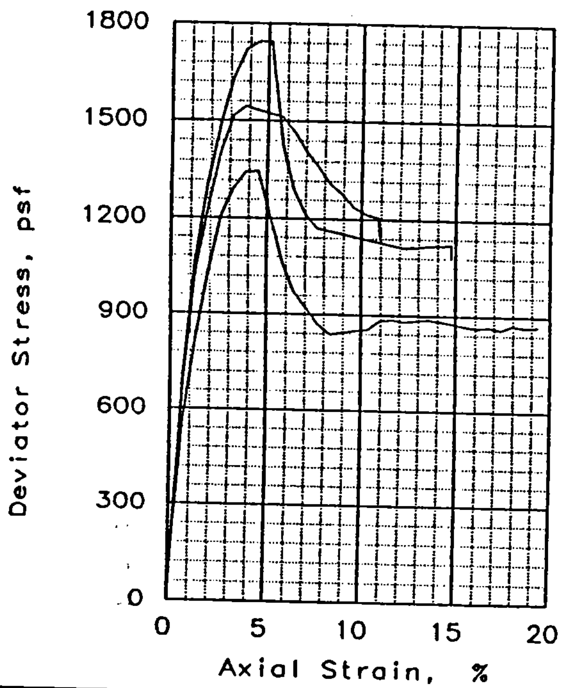


Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-6U, Sample 17-D, Depth 53.8'
File: UU-6855 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	52.5	54.7	54.1
	DRY DENSITY, pcf	68.3	66.6	68.2
	SATURATION, %	95.6	95.6	98.4
	VOID RATIO	1.503	1.568	1.506
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	55.1	57.1	54.6
	DRY DENSITY, pcf	68.2	66.7	68.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.509	1.564	1.495
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1003	0.0995	0.0972
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1347	1745	1543
ULTIMATE STRESS, psf		869	1081	1149
σ_1 FAILURE, psf		2355	3761	4567
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 90 PL= 29 PI= 61
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 19-C, Depth 61.4'

PROJ. NO.: 13622 DATE: 7-1-96

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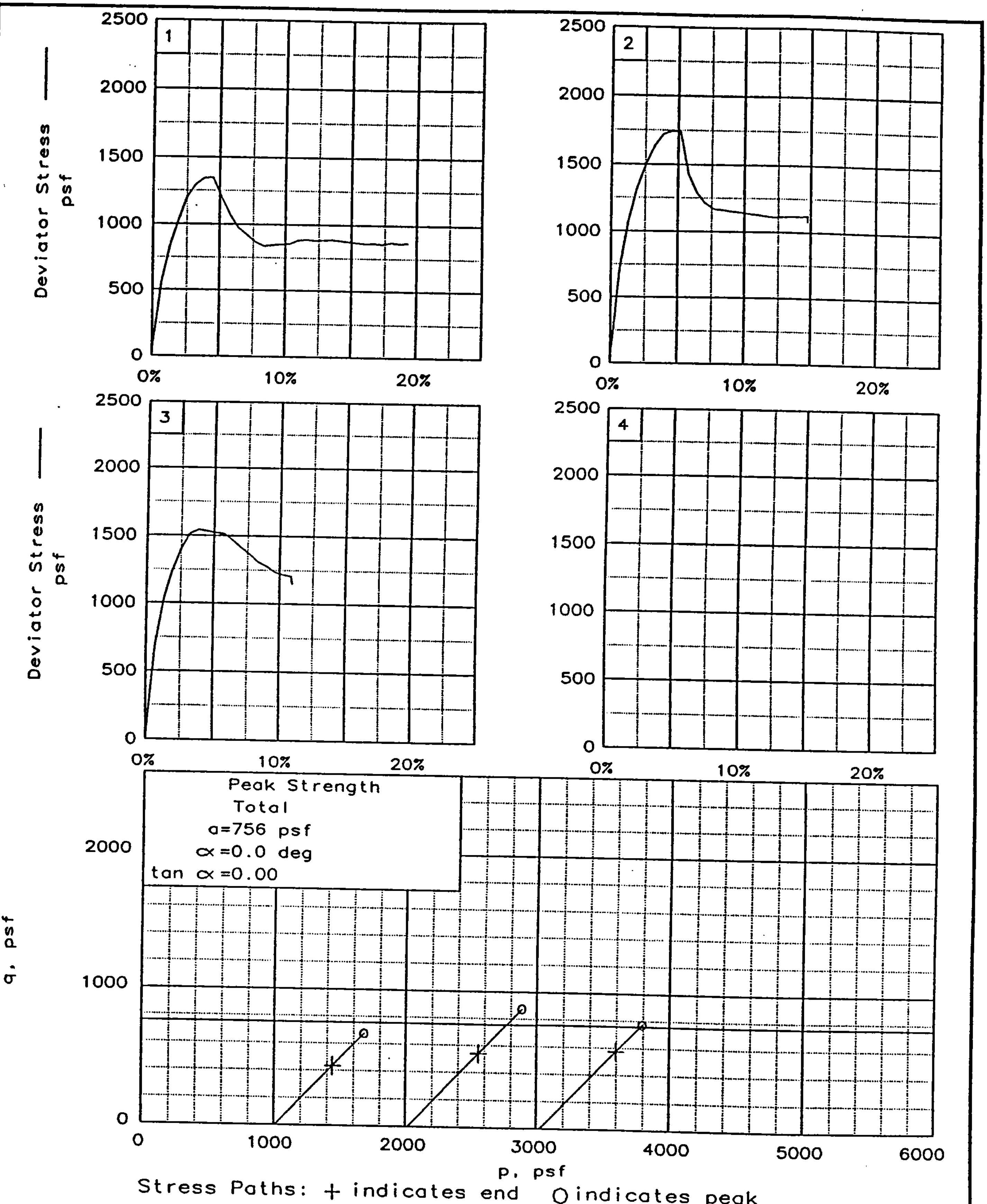
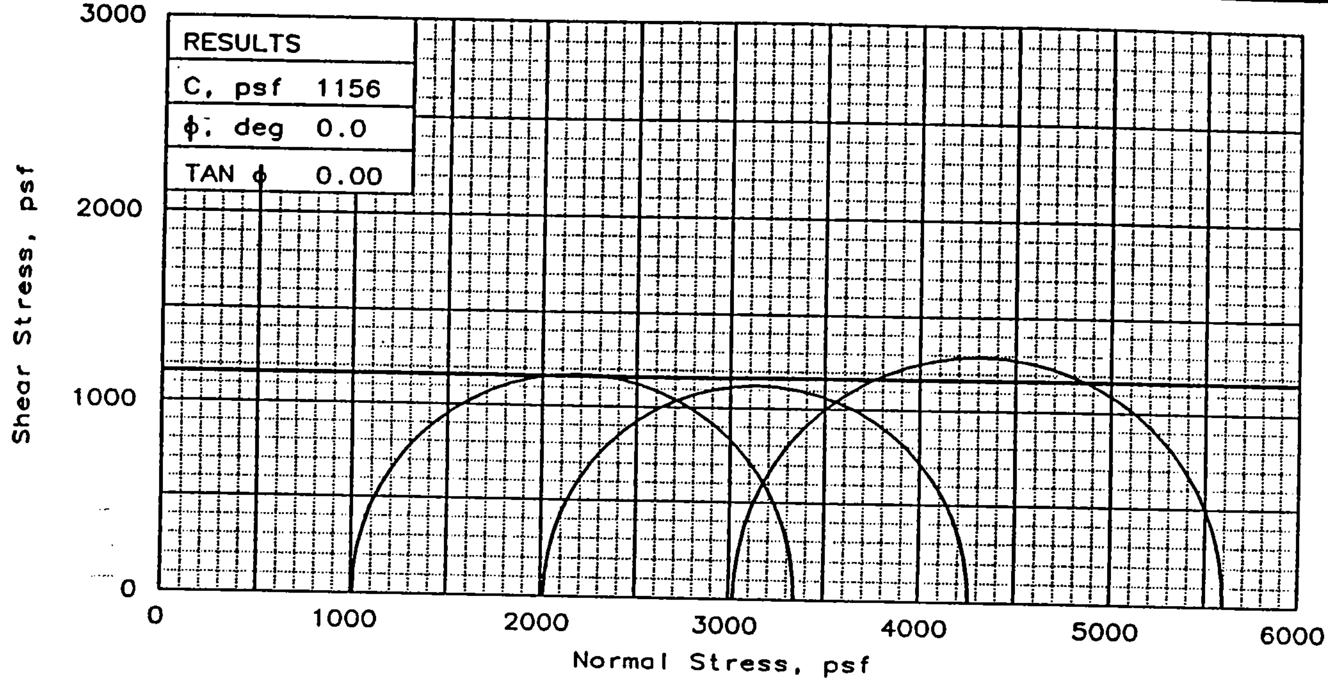
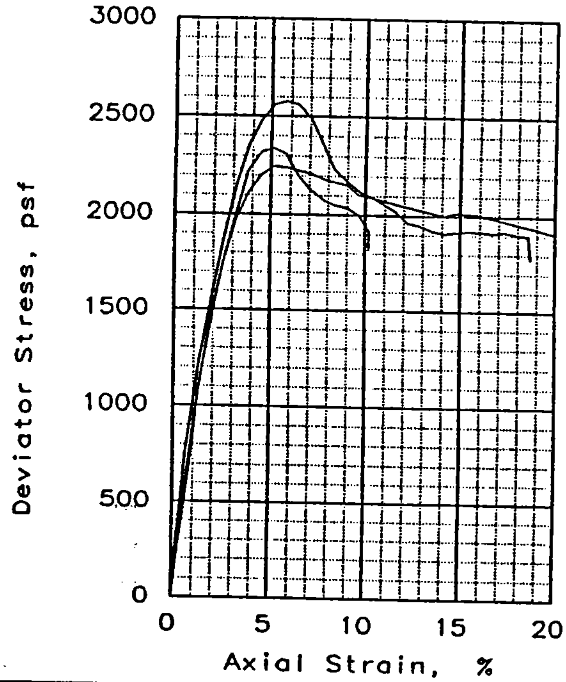


Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-6U, Sample 19-C, Depth 61.4'
File: UU-6856 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	46.6	56.6	55.8
	DRY DENSITY, pcf	73.1	65.1	66.2
	SATURATION, %	95.3	95.2	96.6
	VOID RATIO	1.340	1.629	1.582
	DIAMETER, in	1.40	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	48.9	58.9	57.4
	DRY DENSITY, pcf	73.1	65.4	66.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.339	1.614	1.573
	DIAMETER, in	1.40	1.41	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0924	0.0996	0.1020
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		2338	2245	2577
ULTIMATE STRESS, psf		1818	1916	1779
σ_1 FAILURE, psf		3346	4261	5601
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: St Gr CH3 w/
lyr CL5, ars ML & dec wd
LL= 70 PL= 20 PI= 50
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-6U,
Sample 26-B, Depth 78.2'

PROJ. NO.: 13622 DATE: 7-1-96

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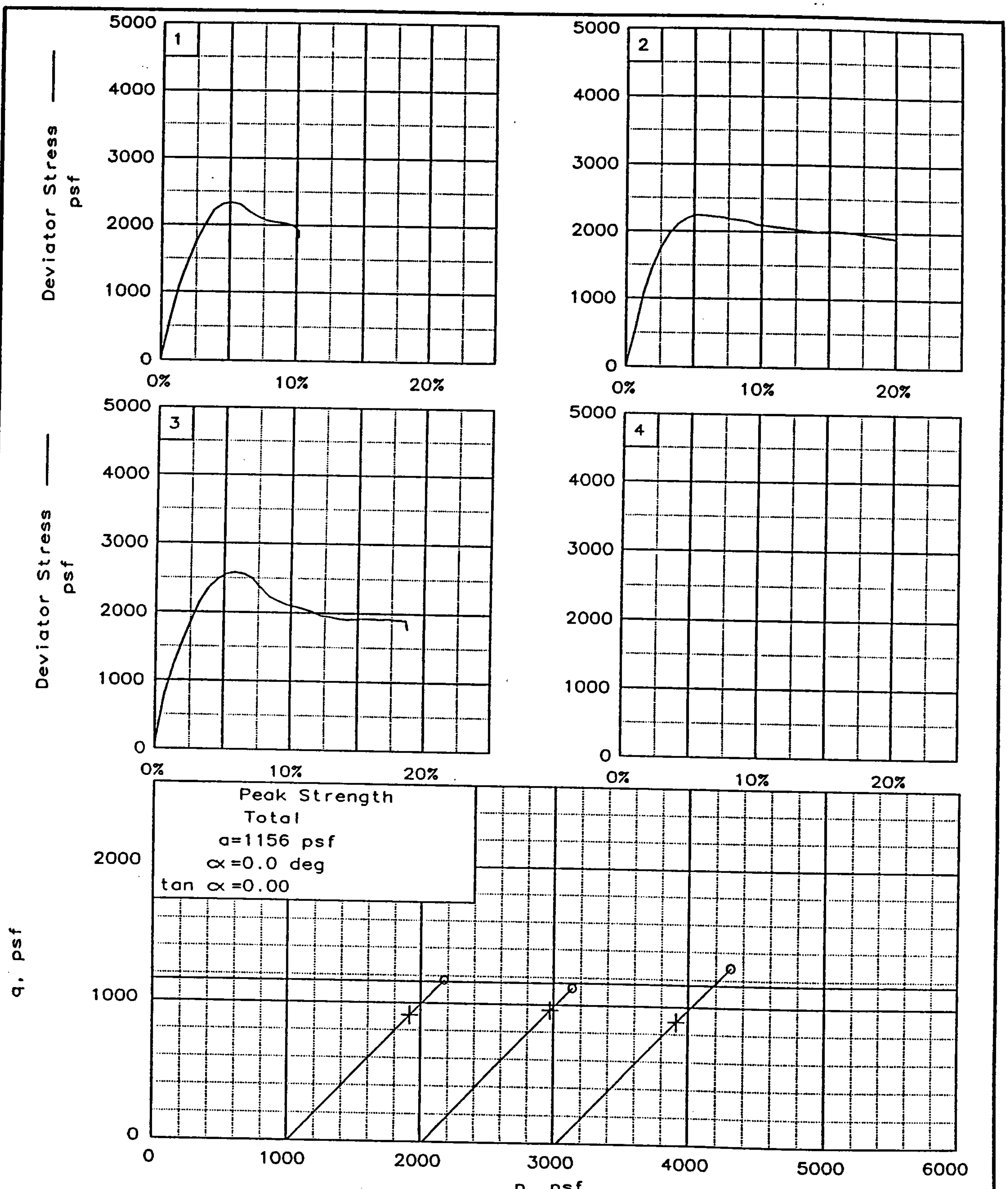
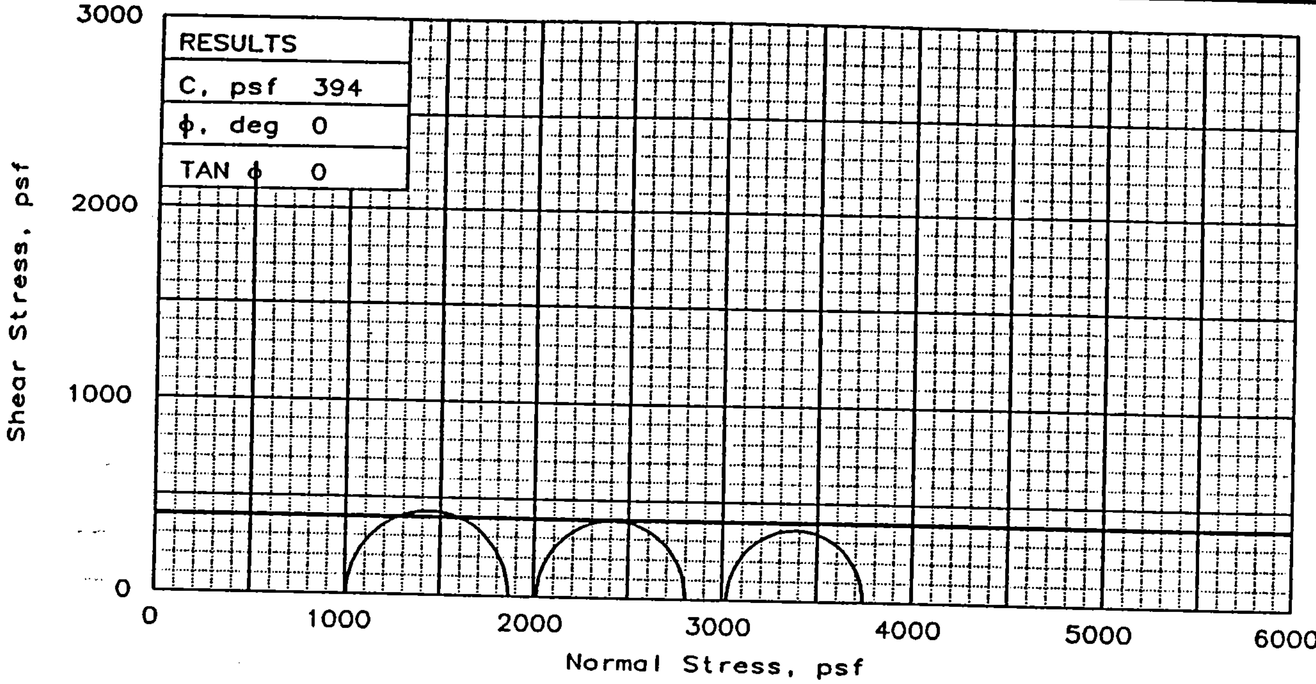
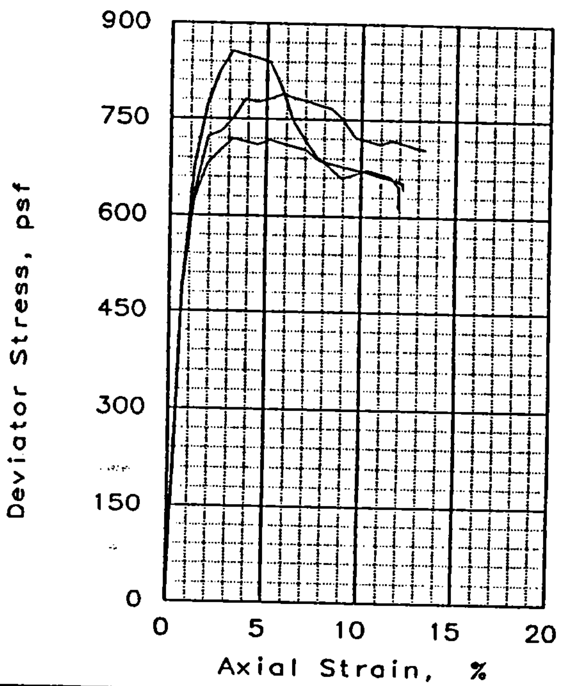


Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-6U, Sample 26-B, Depth 78.2'
File: UU-6857 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	58.0	61.4	58.6
	DRY DENSITY, pcf	64.9	63.2	64.7
	SATURATION, %	97.1	98.7	97.6
	VOID RATIO	1.636	1.705	1.646
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	59.9	62.1	60.2
	DRY DENSITY, pcf	64.7	63.3	64.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.642	1.702	1.649
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0969	0.0985	0.0973
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		857	789	720
ULTIMATE STRESS, psf		614	704	642
σ_1 FAILURE, psf		1865	2805	3744
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 82 PL= 29 PI= 53
SPECIFIC GRAVITY= 2.74
REMARKS:

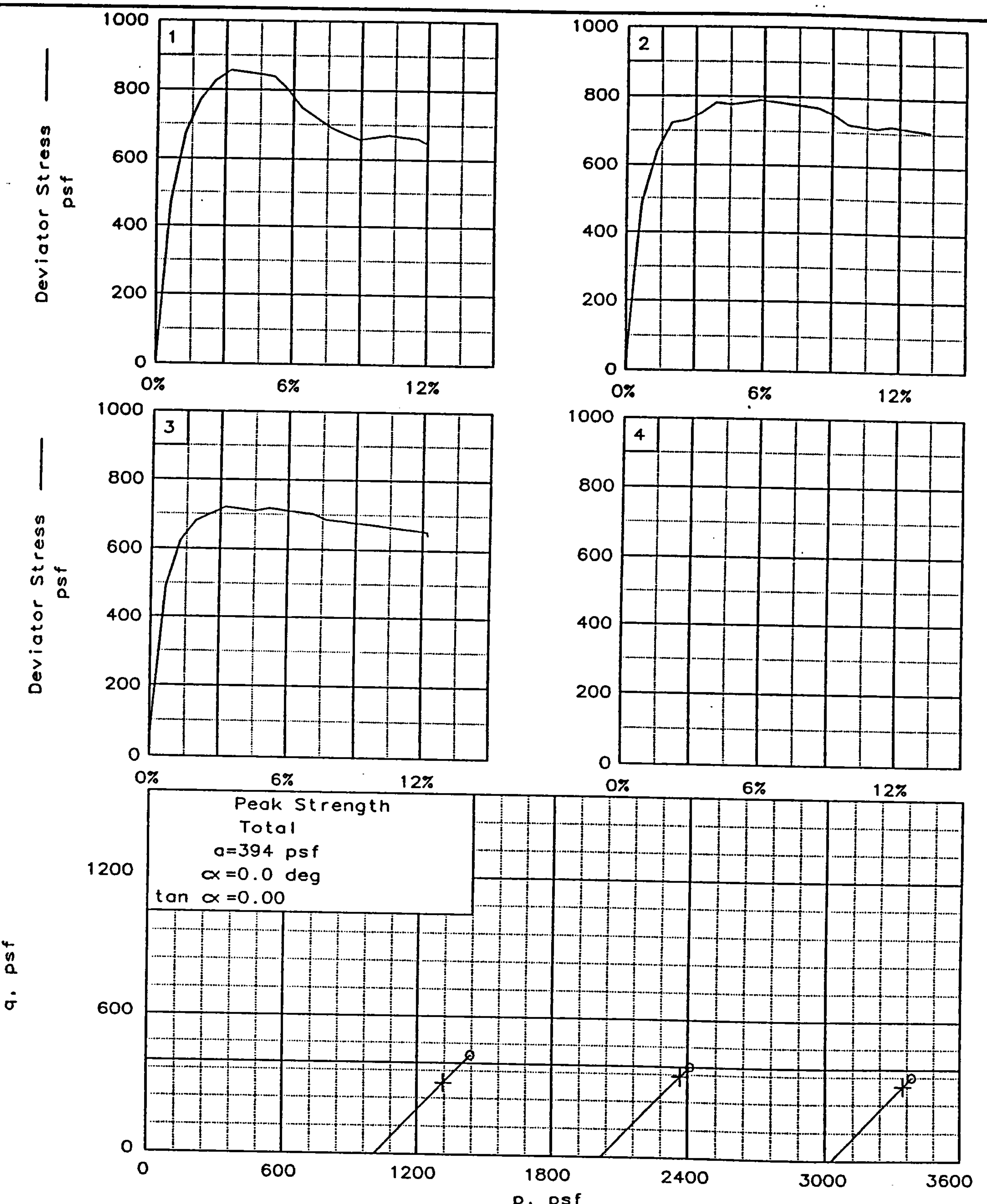
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-7U,
Sample 2-B, Depth 2.0'
PROJ. NO.: 13622 DATE: 7-11-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



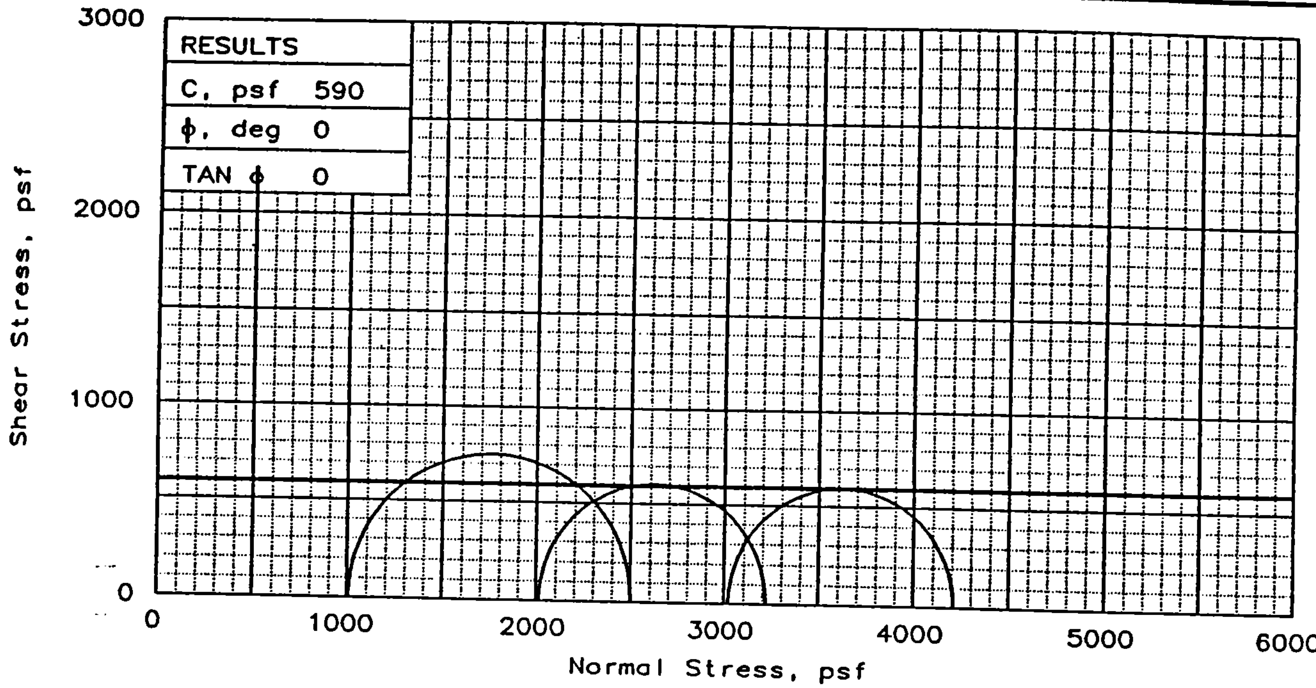
Stress Paths: + indicates end O indicates peak

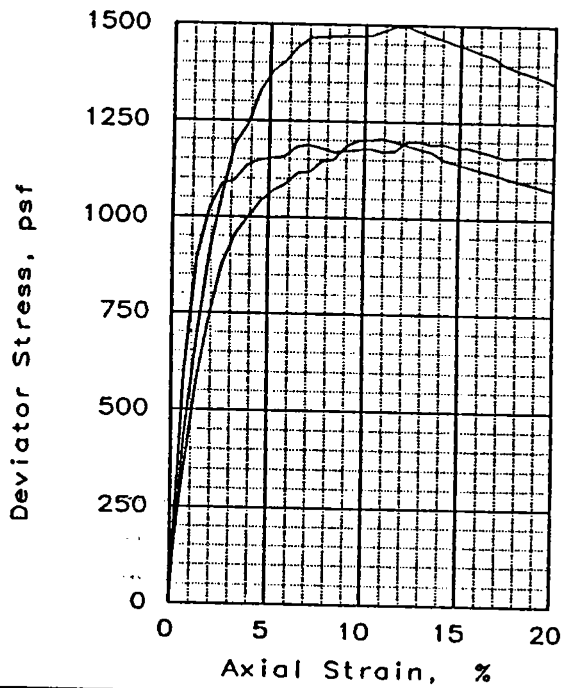
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-7U, Sample 2-B, Depth 2.0'

File: UU-6942 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	28.8	29.6	31.0
	DRY DENSITY, pcf	92.0	91.3	88.8
	SATURATION, %	91.9	92.9	91.6
	VOID RATIO	0.860	0.873	0.926
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.79
AT TEST	WATER CONTENT, %	31.5	31.6	33.2
	DRY DENSITY, pcf	91.8	91.6	89.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.864	0.867	0.908
	DIAMETER, in	1.40	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0984	0.1018	0.1023
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1495	1205	1187
ULTIMATE STRESS, psf		1354	1074	1161
σ_1 FAILURE, psf		2503	3221	4211
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr & T CL6 w/lyr & lns ML, lyr & lg ors org
LL= 42 PL= 17 PI= 25
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

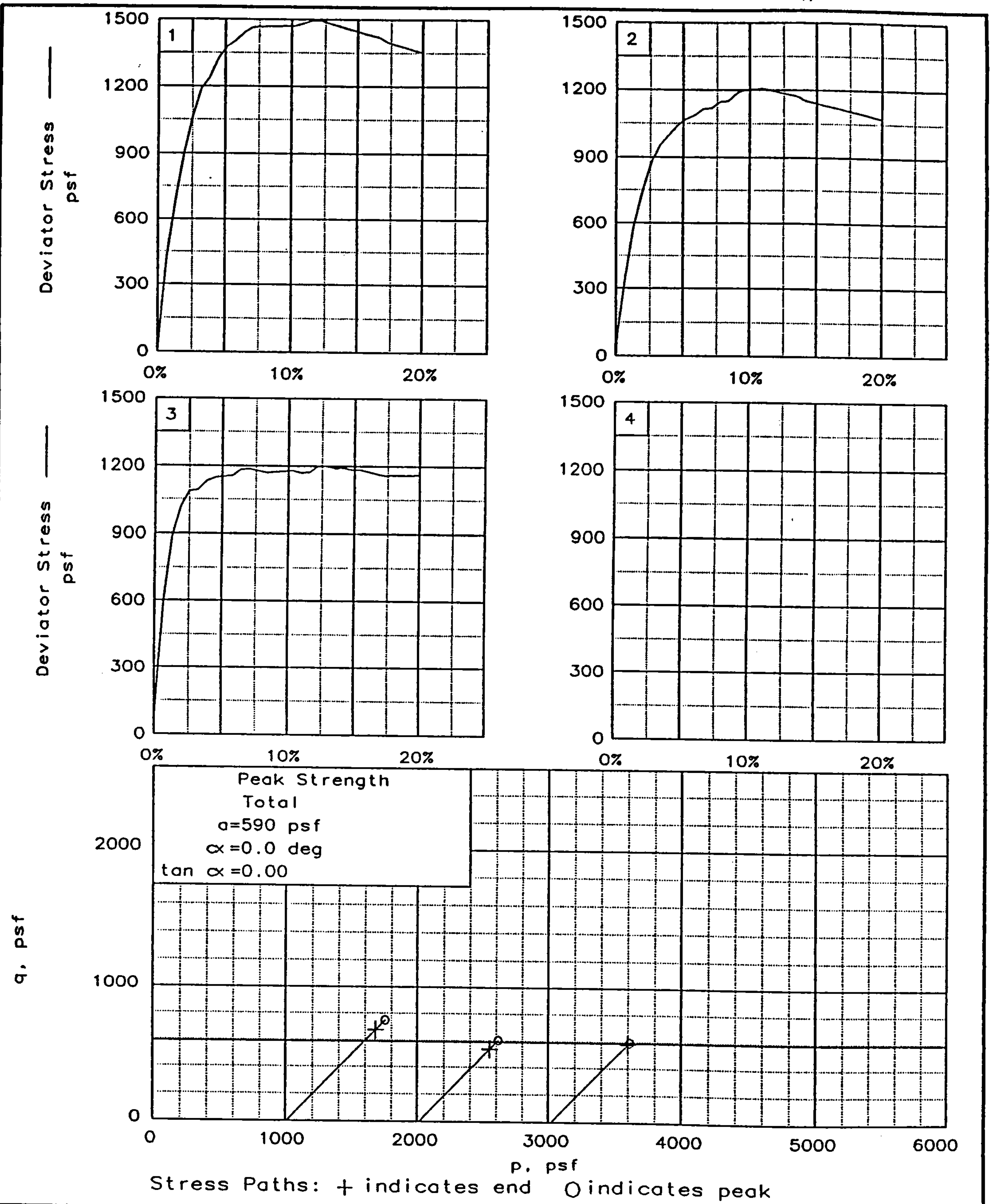
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-7U,
Sample 4-C, Depth 14.1'

PROJ. NO.: 13622 DATE: 7-11-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

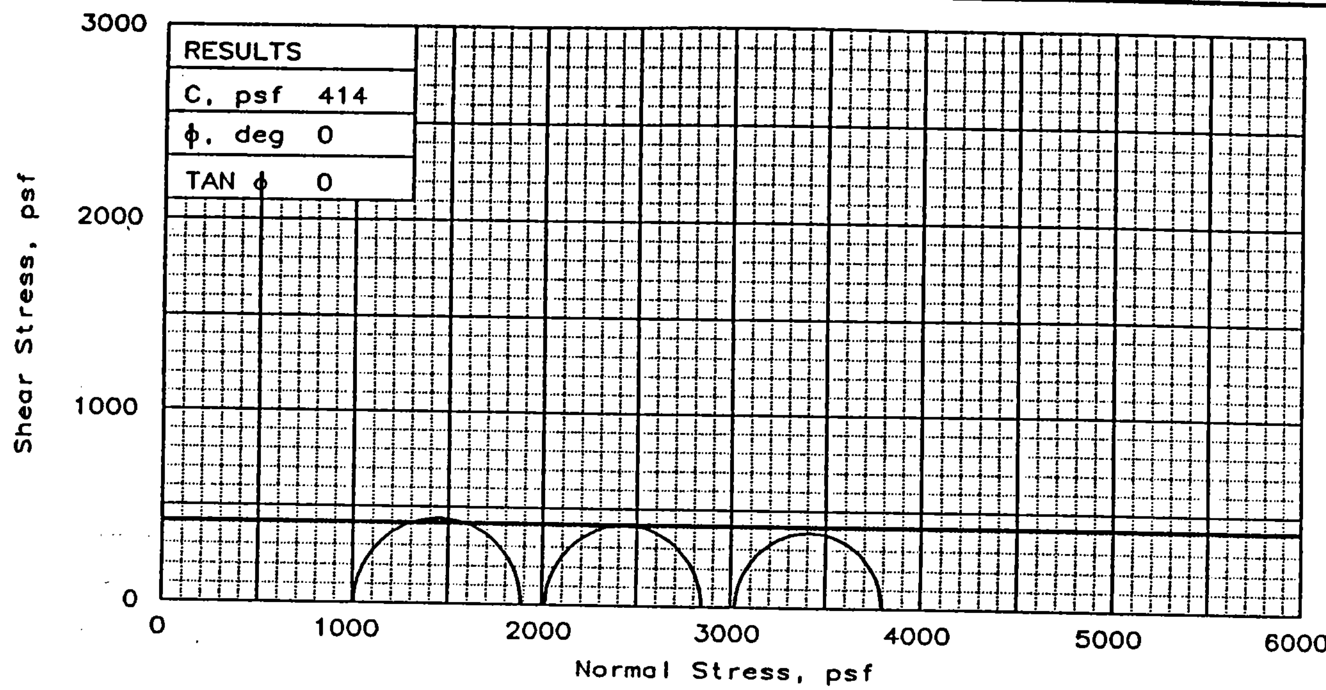


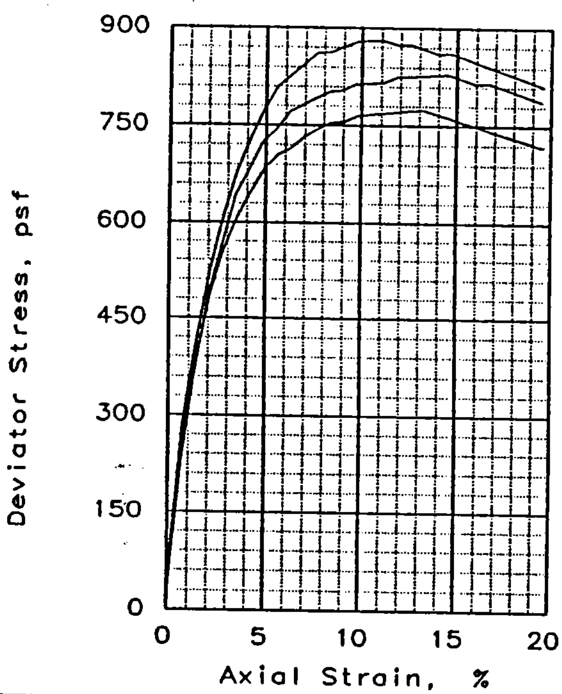
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-7U, Sample 4-C, Depth 14.1'

File: UU-6943 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	40.6	40.0	40.9
	DRY DENSITY, pcf	78.8	80.8	79.4
	SATURATION, %	95.1	98.2	96.9
	VOID RATIO	1.170	1.118	1.155
	DIAMETER, in	1.42	1.40	1.40
	HEIGHT, in	2.81	2.81	2.81
AT TEST	WATER CONTENT, %	43.3	41.3	42.5
	DRY DENSITY, pcf	78.2	80.2	79.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.187	1.132	1.164
	DIAMETER, in	1.42	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1101	0.1114	0.1060
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		881	829	774
ULTIMATE STRESS, psf		812	788	718
σ_1 FAILURE, psf		1889	2845	3798
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CL6
w/ lyr & lns ML

LL= 45 PL= 21 PI= 24

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

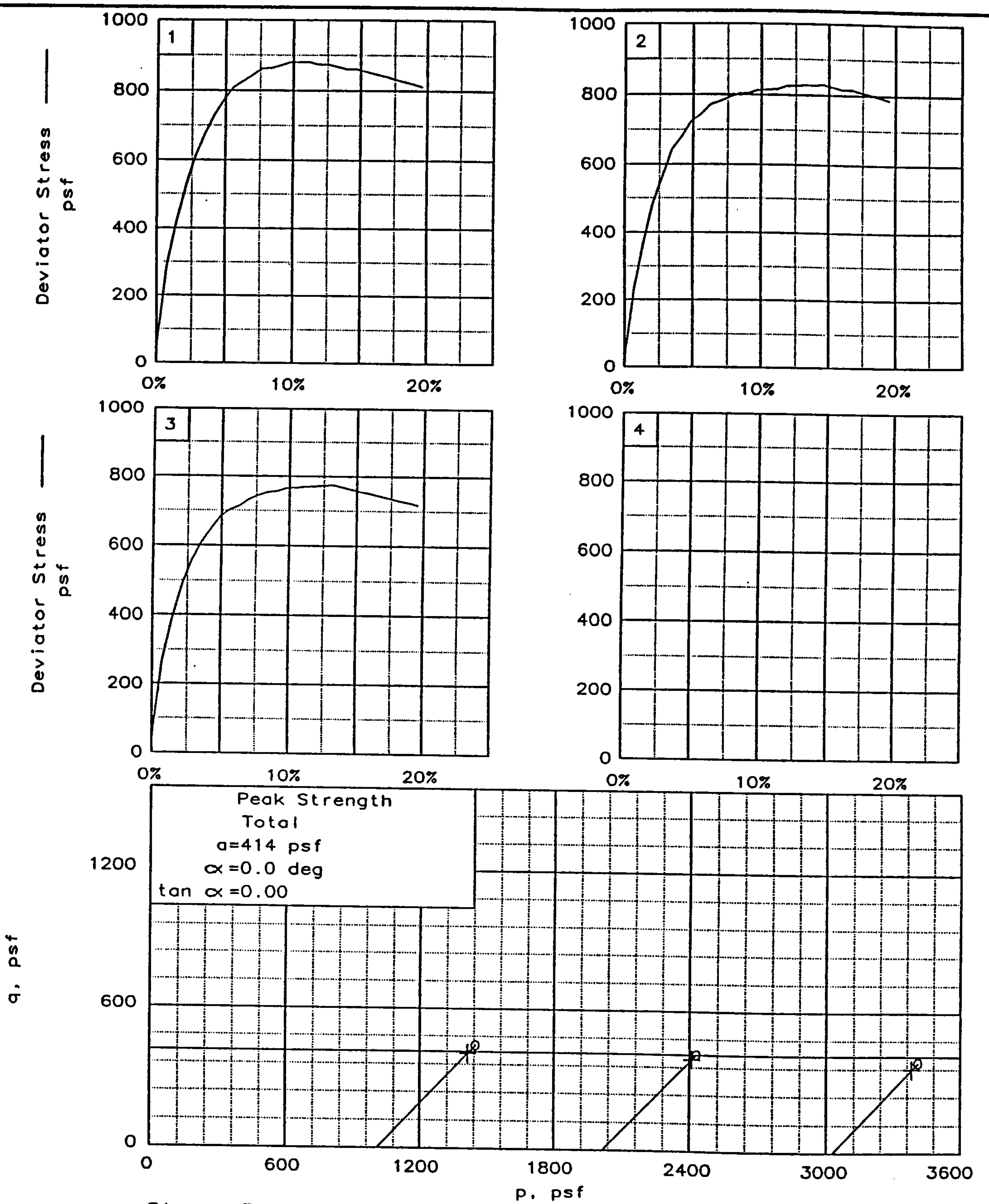
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-7U,
Sample 6-D, Depth 22.8'

PROJ. NO.: 13622 DATE: 7-11-96

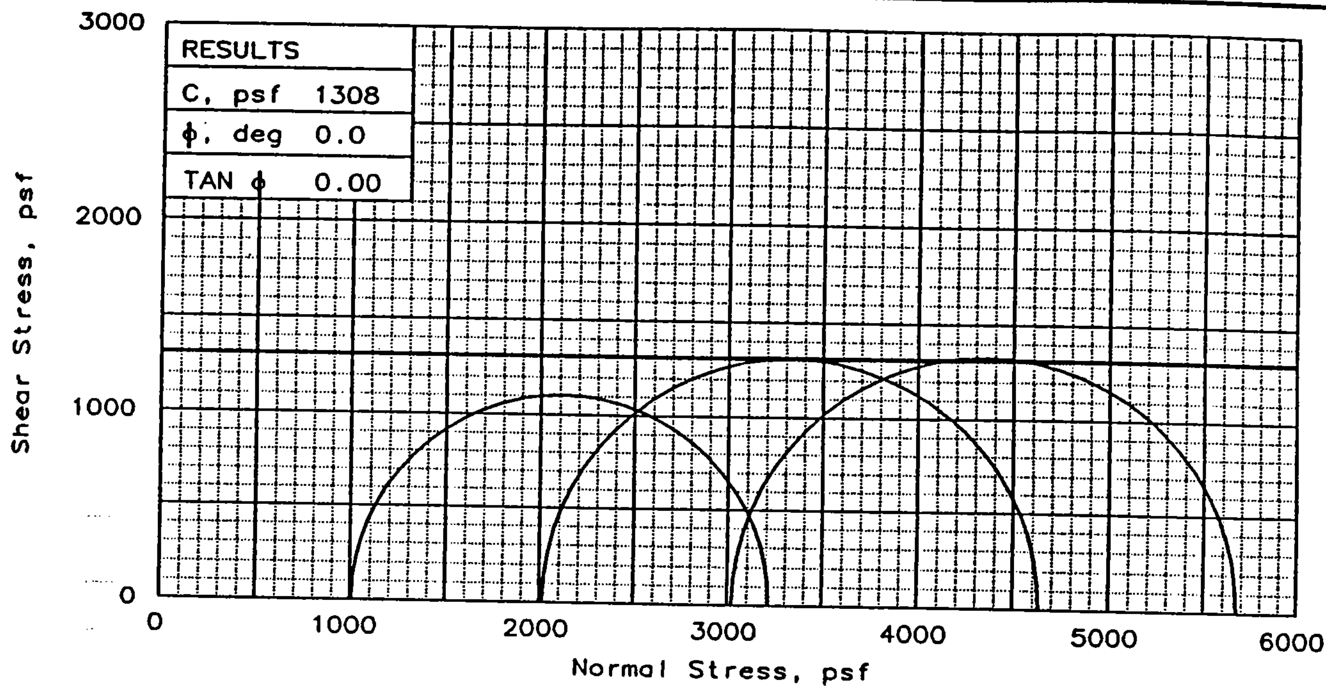
TRIAXIAL SHEAR TEST REPORT

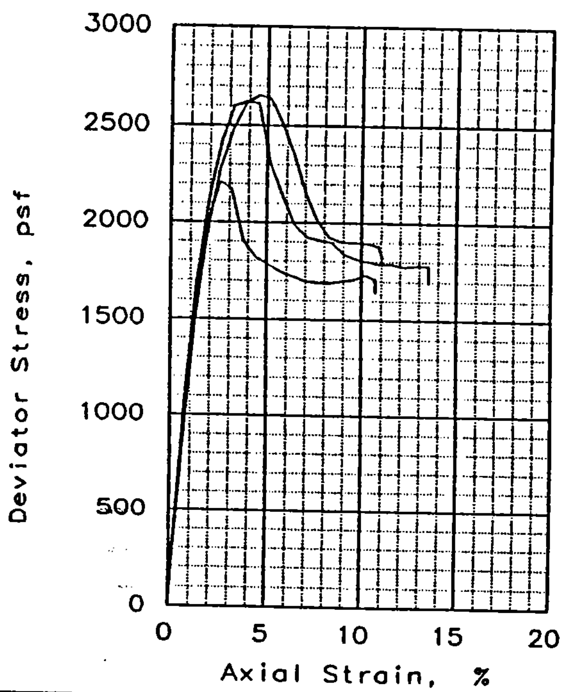
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No.. DACW29-95-D-0012
Location: Boring ALGE-7U, Sample 6-D, Depth 22.8'
File: UU-6944 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	45.6	46.5	45.7
	DRY DENSITY, pcf	74.6	74.7	75.0
	SATURATION, %	97.3	99.3	98.4
	VOID RATIO	1.275	1.273	1.264
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	46.9	46.6	46.2
	DRY DENSITY, pcf	74.6	74.9	75.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.275	1.267	1.257
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0959	0.0976	0.0954
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		2208	2619	2653
ULTIMATE STRESS, psf		1643	1693	1822
σ_1 FAILURE, psf		3216	4635	5677
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: St Gr CH4
w/ lns & ars ML

LL= 72 PL= 24 PI= 48

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

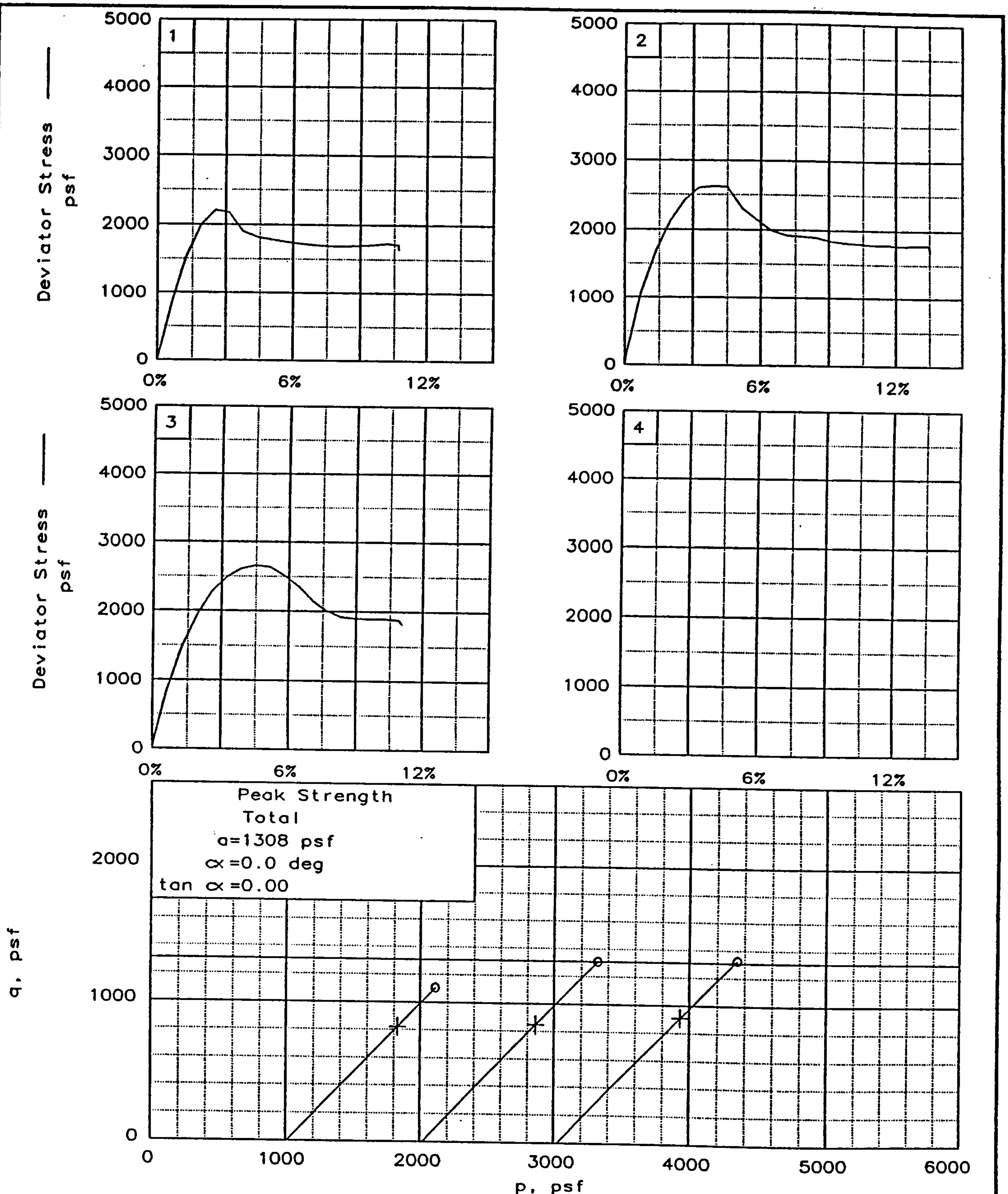
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-7U,
Sample 25-B, Depth 61.5'

PROJ. NO.: 13622 DATE: 7-11-96

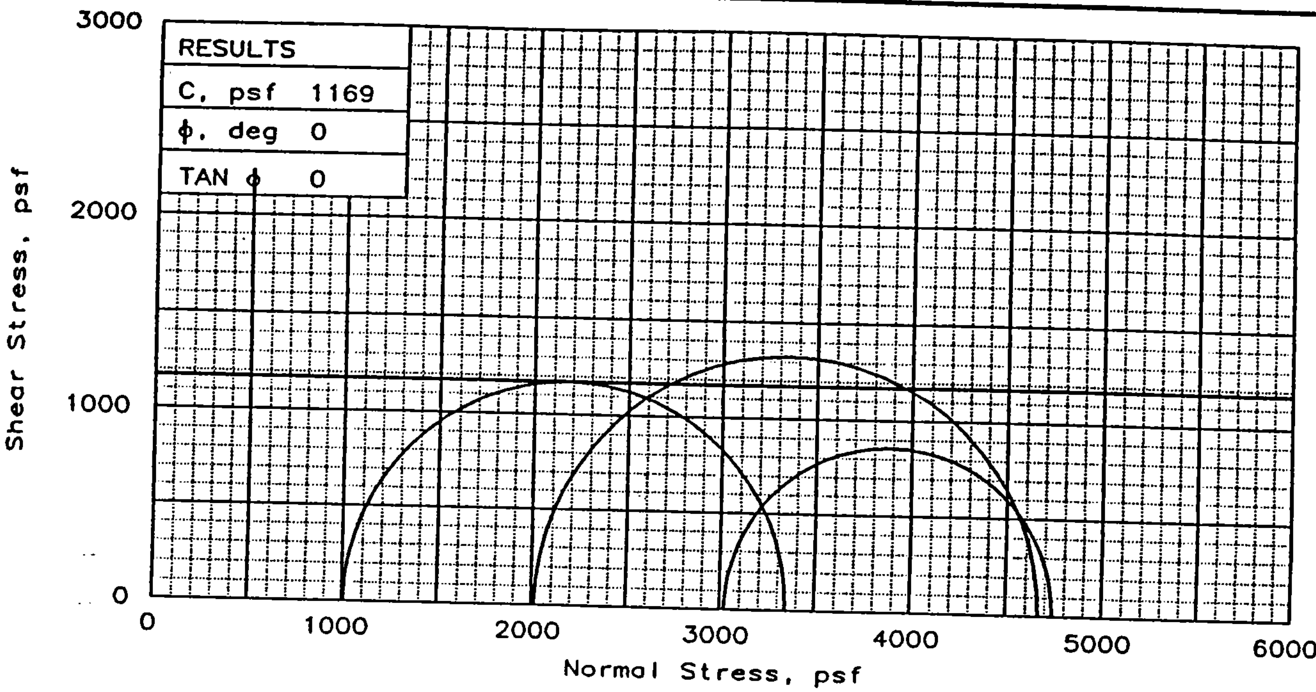
TRIAXIAL SHEAR TEST REPORT

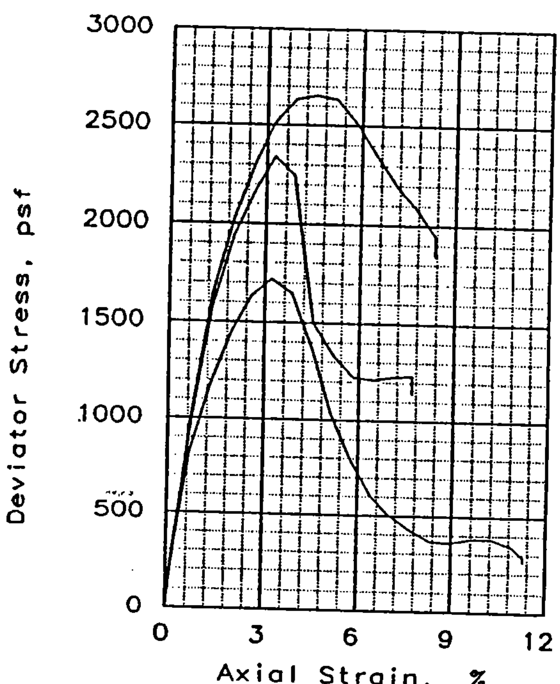
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-7U, Sample 25-B, Depth 61.5'
File: UU-6945 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	59.3	56.3	58.2
	DRY DENSITY, pcf	64.9	67.0	64.9
	SATURATION, %	100.0	99.8	97.8
	VOID RATIO	1.614	1.533	1.617
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.79
AT TEST	WATER CONTENT, %	59.3	56.2	58.6
	DRY DENSITY, pcf	65.0	67.1	65.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.614	1.529	1.595
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0829	0.0901	0.0965
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		2339	2652	1718
ULTIMATE STRESS, psf		1139	1843	264
σ_1 FAILURE, psf		3347	4668	4742
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: St Gr CH4
w/ lns & ars ML
LL= 94 PL= 30 PI= 64
SPECIFIC GRAVITY= 2.72
REMARKS:

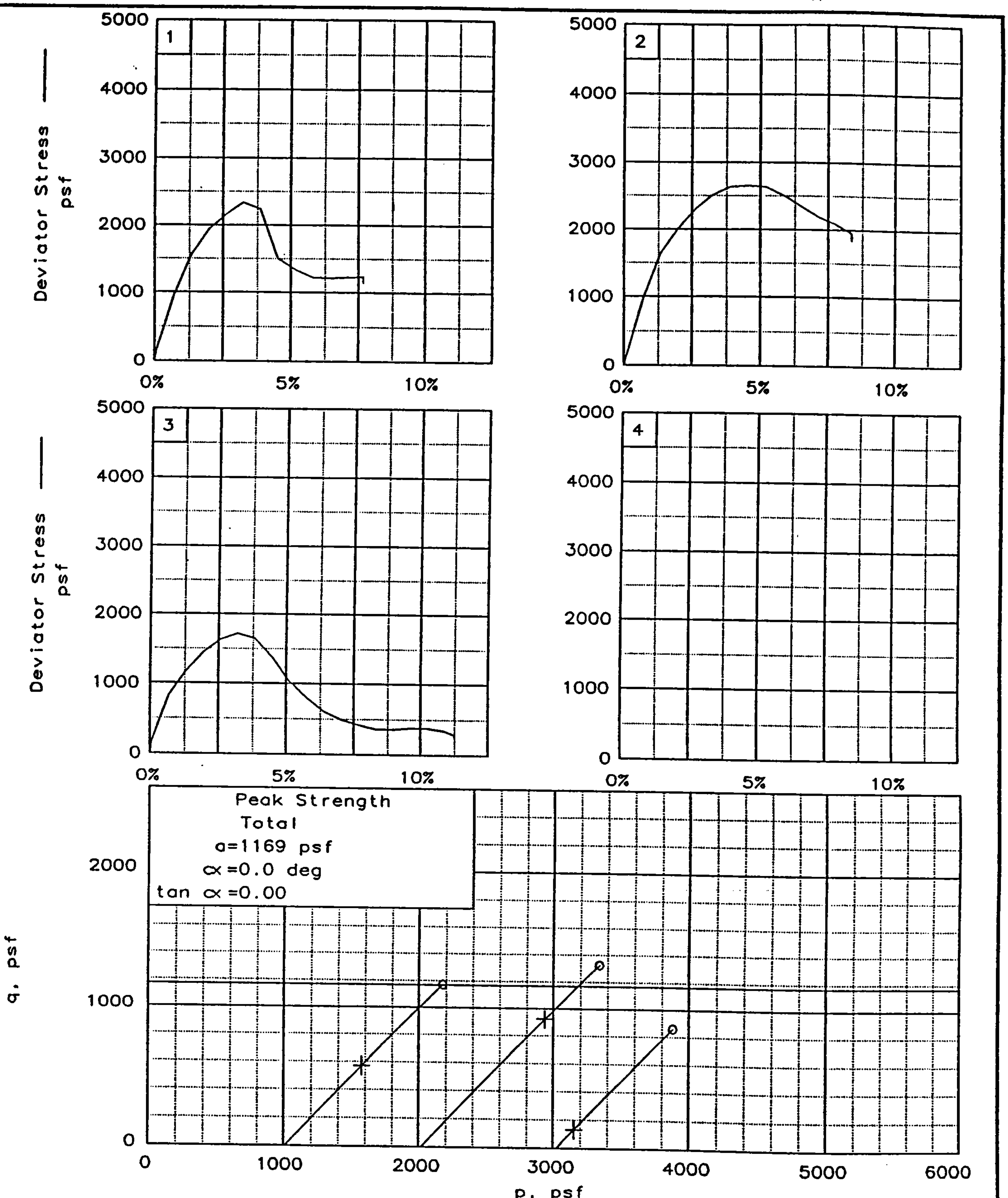
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-7U,
Sample 27-C, Depth 71.1'
PROJ. NO.: 13622 DATE: 7-11-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



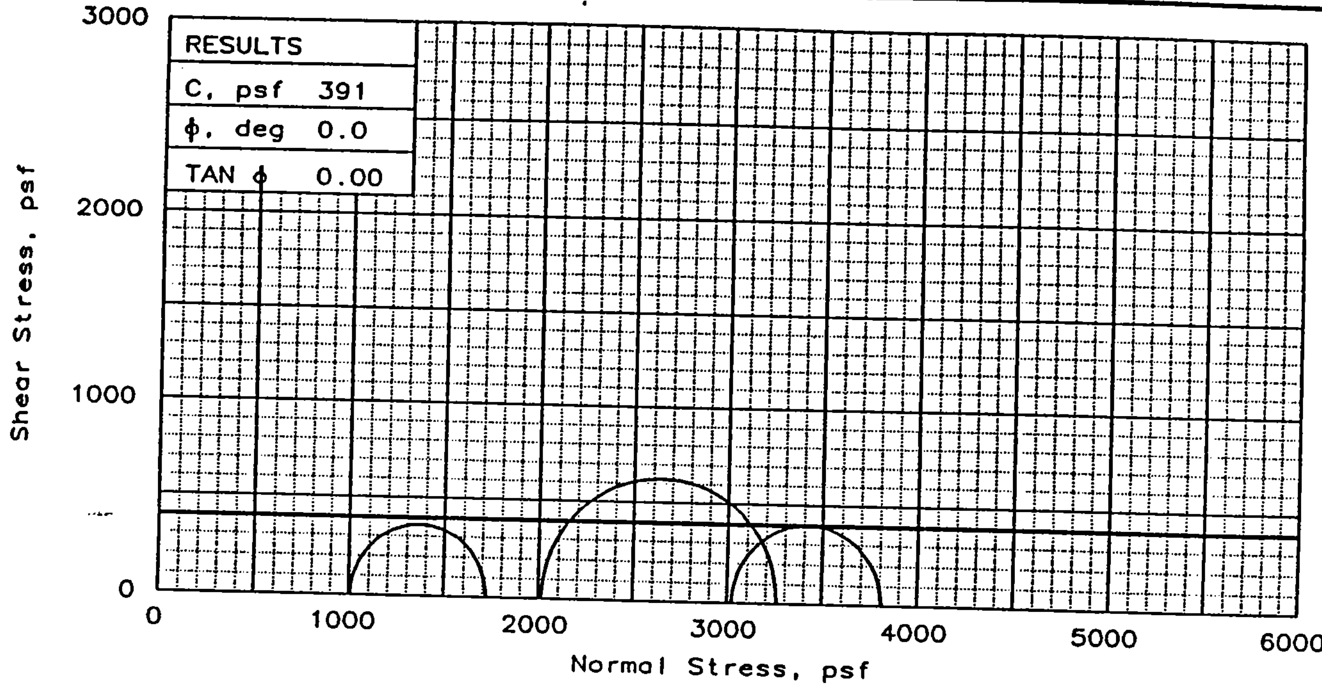
Stress Paths: + indicates end O indicates peak

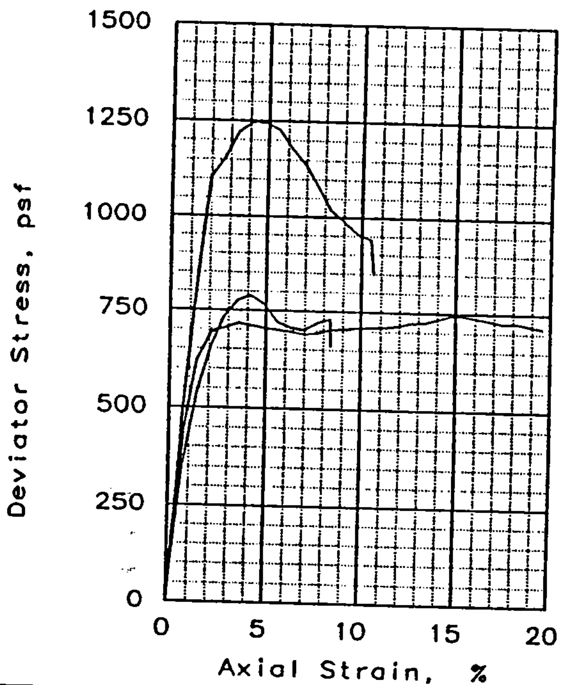
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-7U, Sample 27-C, Depth 71.1'

File: UU-6946 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	149.5	143.5	152.0
	DRY DENSITY, pcf	30.5	32.1	29.7
	SATURATION, %	89.7	91.5	87.9
	VOID RATIO	4.416	4.156	4.579
	DIAMETER, in	1.41	1.40	1.42
	HEIGHT, in	2.81	2.79	2.78
AT TEST	WATER CONTENT, %	167.5	154.6	168.7
	DRY DENSITY, pcf	30.4	32.5	30.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	4.439	4.098	4.470
	DIAMETER, in	1.41	1.40	1.42
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1117	0.1056	0.1034
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		716	1246	788
ULTIMATE STRESS, psf		714	847	660
σ_1 FAILURE, psf		1724	3262	3812
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CHOB w/ dec wd & rts
LL= 206 PL= 54 PI= 152
SPECIFIC GRAVITY= 2.65
REMARKS:

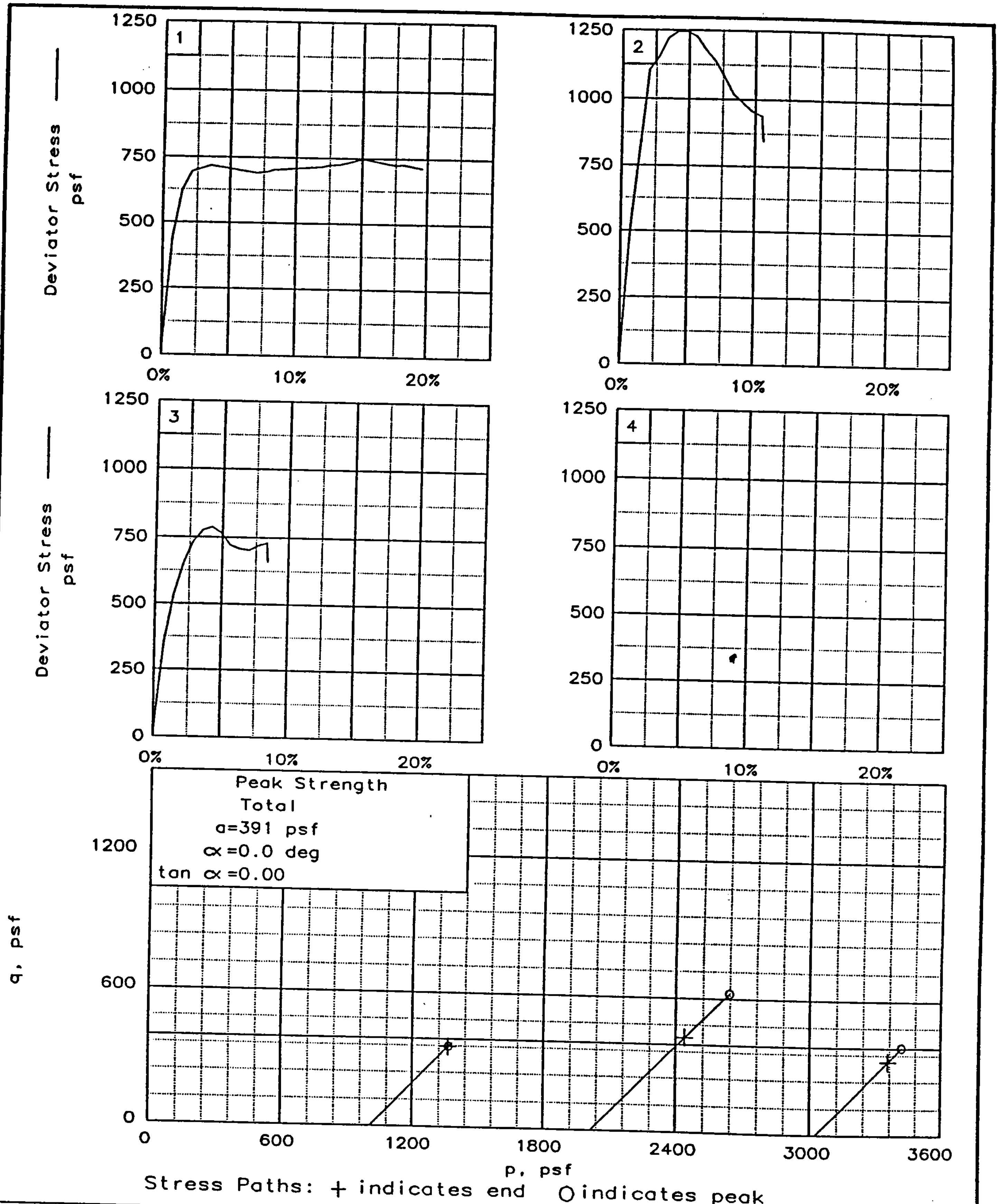
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

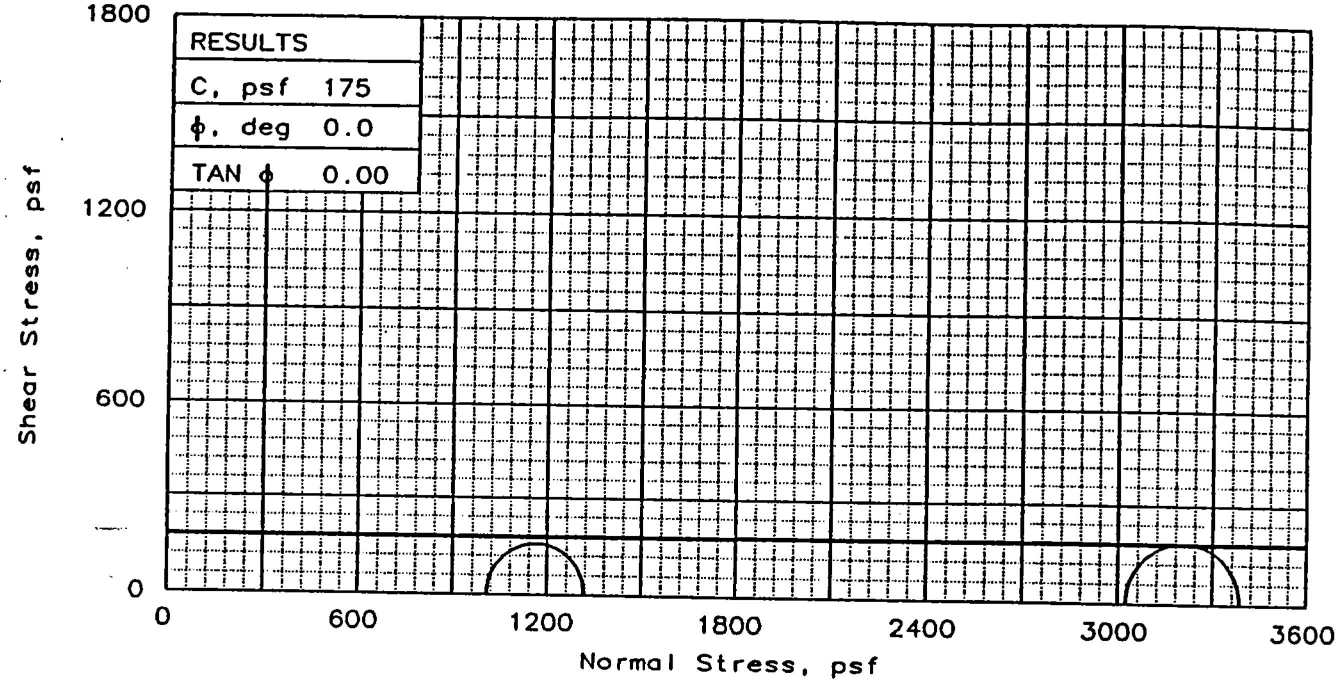
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U, Sample 3-C, Depth 5.6'
PROJ. NO.: 13622 DATE: 7-11-96

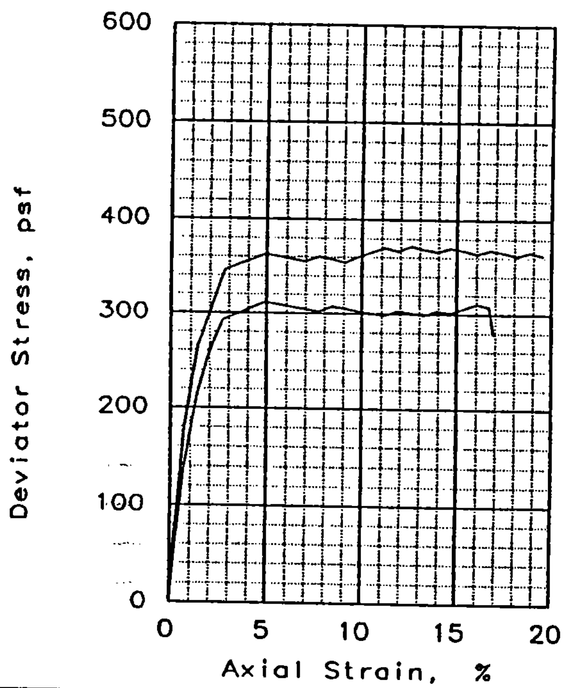
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-8U, Sample 3-C, Depth 5.6'
File: UU-6947 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2
INITIAL	WATER CONTENT, %	62.5	59.1
	DRY DENSITY, pcf	62.2	64.4
	SATURATION, %	97.9	97.7
	VOID RATIO	1.750	1.657
	DIAMETER, in	1.40	1.40
	HEIGHT, in	2.81	2.80
AT TEST	WATER CONTENT, %	64.7	60.5
	DRY DENSITY, pcf	61.7	64.4
	SATURATION, %	100.0	100.0
	VOID RATIO	1.772	1.657
	DIAMETER, in	1.40	1.40
	HEIGHT, in	2.80	2.80
Strain rate, in/min		0.1070	0.1106
BACK PRESSURE, psf		0	0
CELL PRESSURE, psf		1008	3024
FAILURE STRESS, psf		311	363
ULTIMATE STRESS, psf		279	363
σ_1 FAILURE, psf		1319	3387
σ_3 FAILURE, psf		1008	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH4 w/ lyr & lns ML & few conc
LL= 90 PL= 23 PI= 67
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

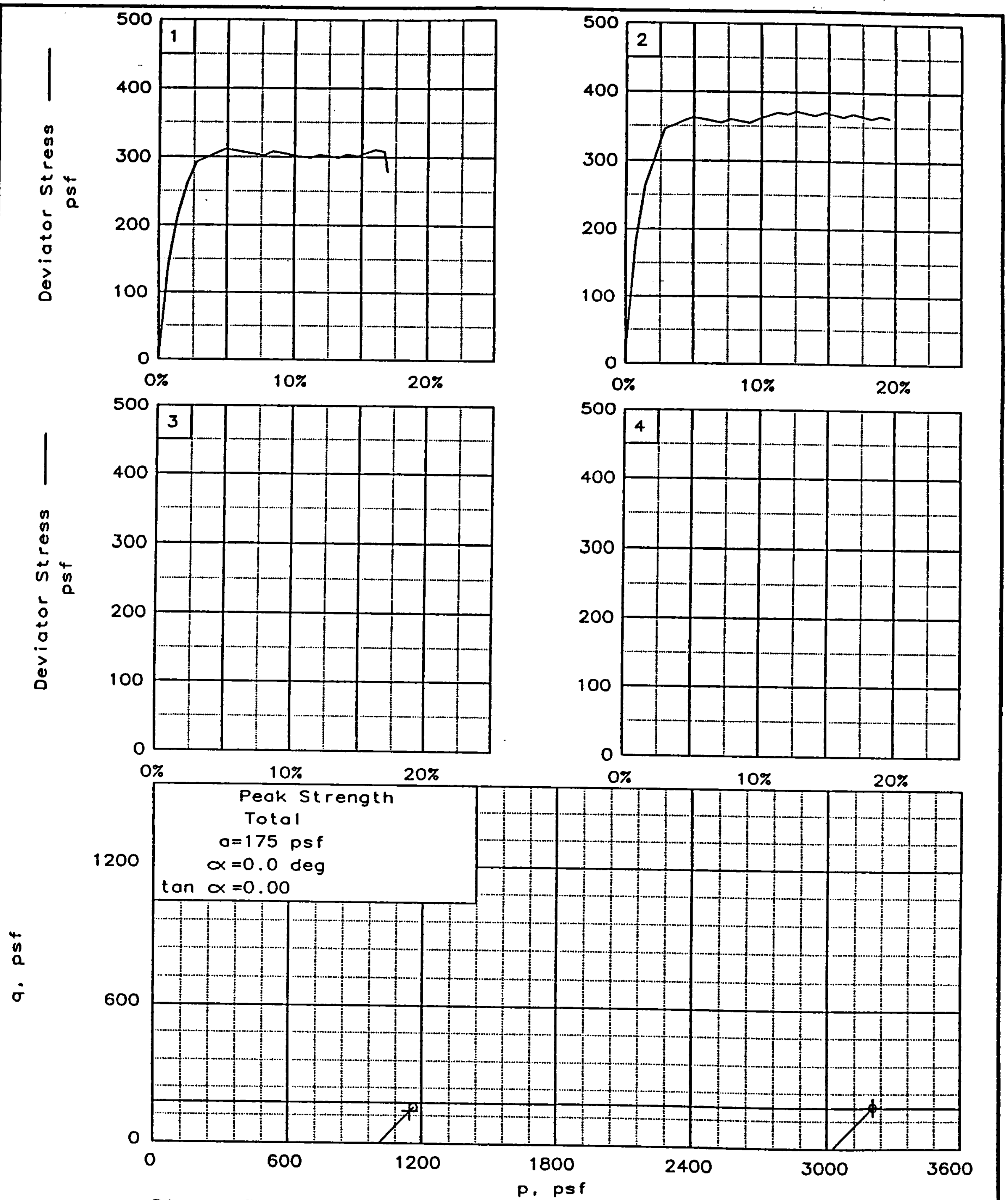
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U, Sample 5-C, Depth 14.2'

PROJ. NO.: 13622 DATE: 7-11-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



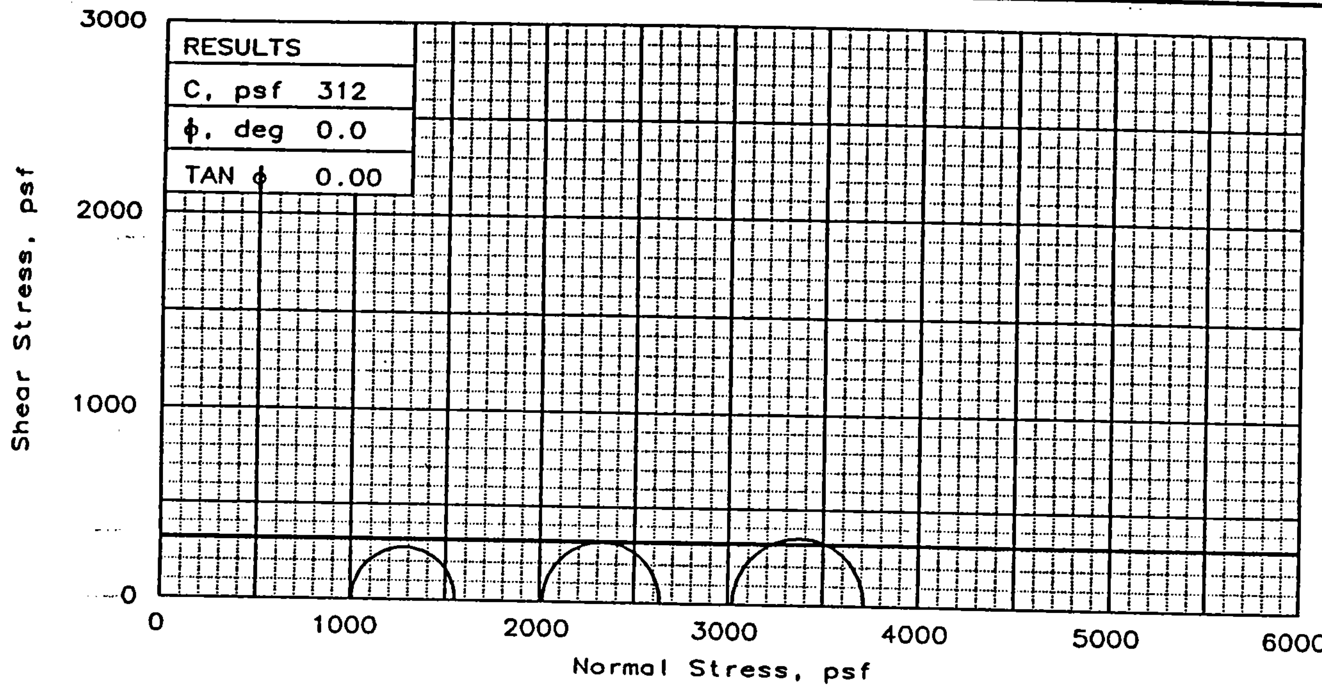
Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers

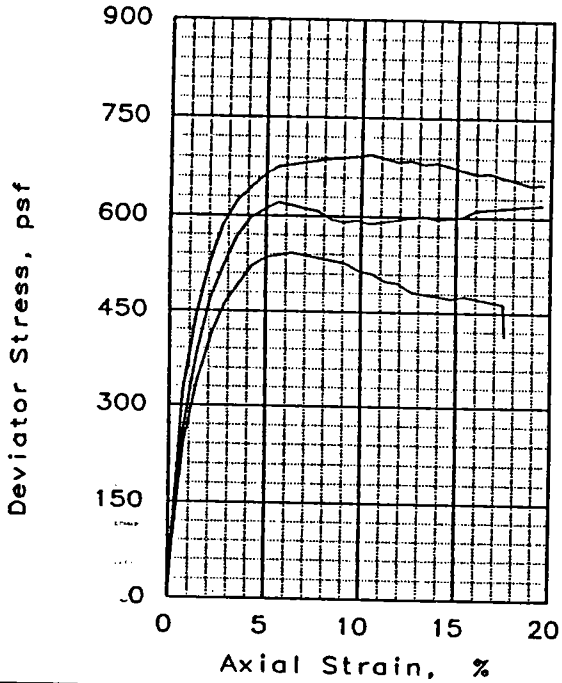
Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-8U, Sample 5-C, Depth 14.2'

File: UU-6948 Project No.: 13622 FIG. NO.: ____



RESULTS	
C, psf	312
ϕ, deg	0.0
TAN ϕ	0.00



SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	52.5	50.8	53.4
	DRY DENSITY, pcf	68.4	69.6	68.1
	SATURATION, %	96.2	96.0	97.2
	VOID RATIO	1.483	1.439	1.494
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.81	2.80	2.80
AT TEST	WATER CONTENT, %	54.9	53.2	54.7
	DRY DENSITY, pcf	68.1	69.4	68.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.493	1.448	1.489
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1077	0.1063	0.1057
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		543	621	694
ULTIMATE STRESS, psf		413	620	652
σ_1 FAILURE, psf		1551	2637	3718
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lns, lyr & ars ML
LL= 60 PL= 21 PI= 39
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

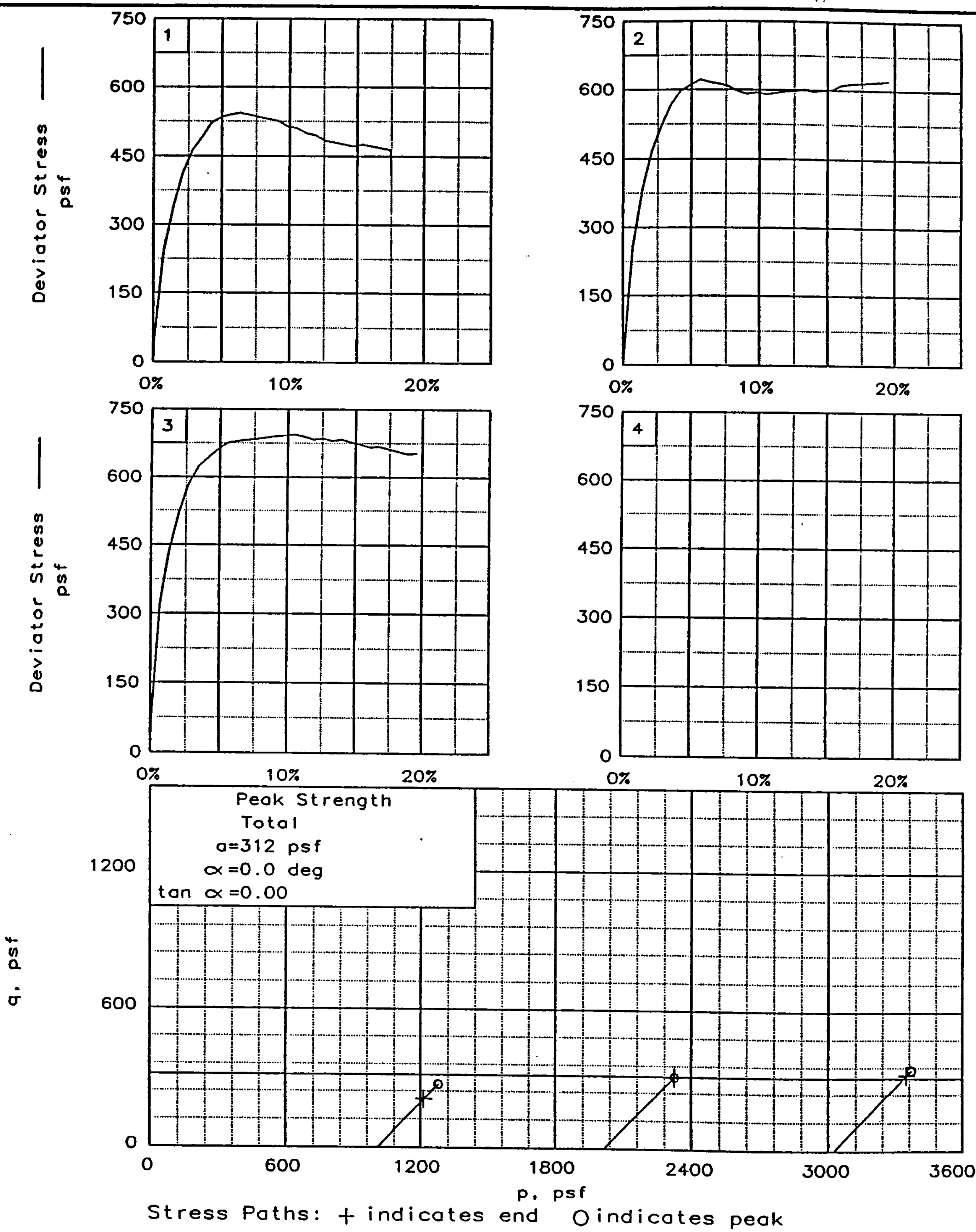
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U,
Sample 8-C, Depth 26.1'

PROJ. NO.: 13622 DATE: 7-12-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

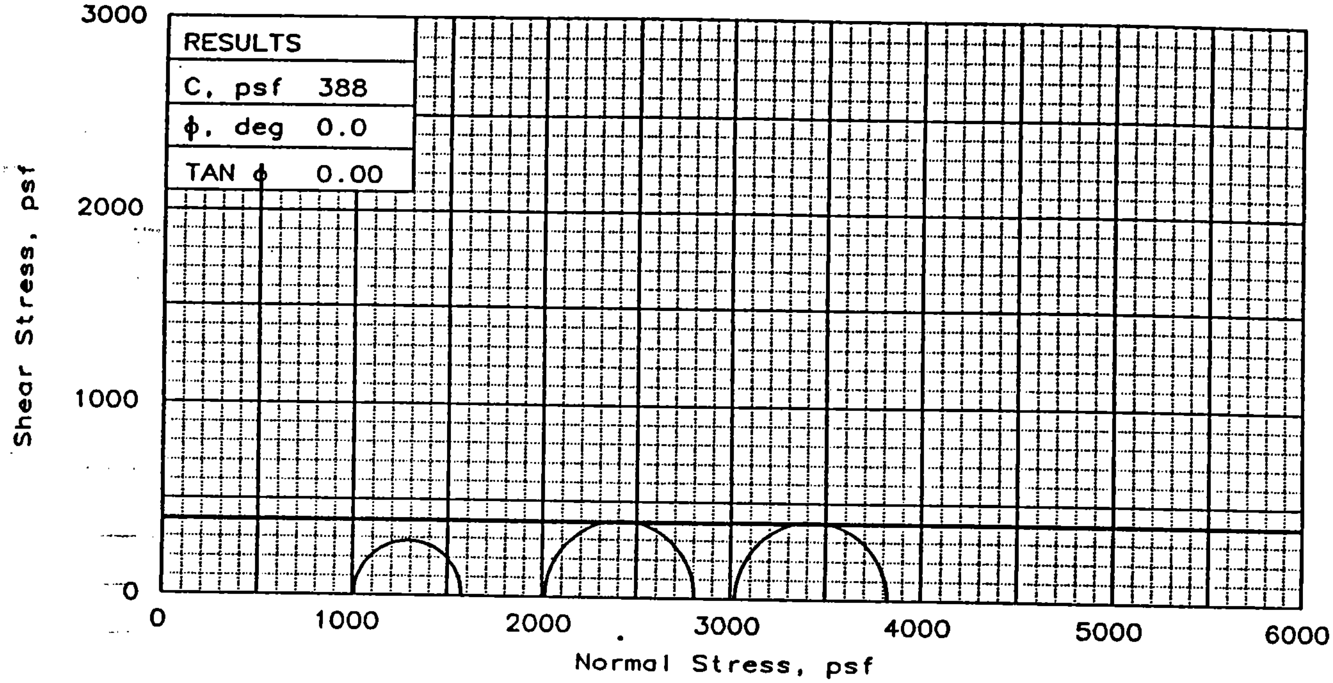


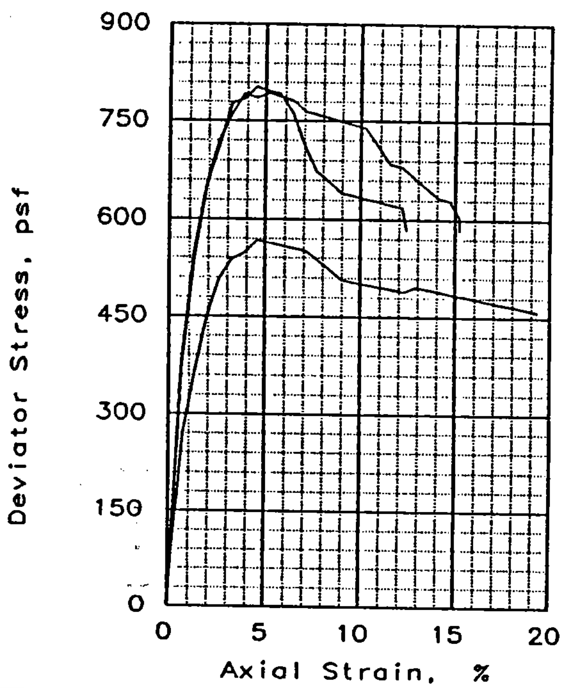
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-8U, Sample 8-C, Depth 26.1'

File: UU-6950 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	66.4	66.8	66.0
	DRY DENSITY, pcf	60.2	59.2	60.3
	SATURATION, %	99.2	97.1	98.9
	VOID RATIO	1.819	1.870	1.816
	DIAMETER, in	1.41	1.42	1.41
	HEIGHT, in	2.81	2.80	2.80
AT TEST	WATER CONTENT, %	67.4	68.8	66.7
	DRY DENSITY, pcf	59.9	59.2	60.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.833	1.870	1.815
	DIAMETER, in	1.41	1.42	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1014	0.0983	0.0961
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		567	793	803
ULTIMATE STRESS, psf		459	584	585
σ_1 FAILURE, psf		1575	2809	3827
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lns & ors ML
LL= 85 PL= 27 PI= 58
SPECIFIC GRAVITY= 2.72
REMARKS:

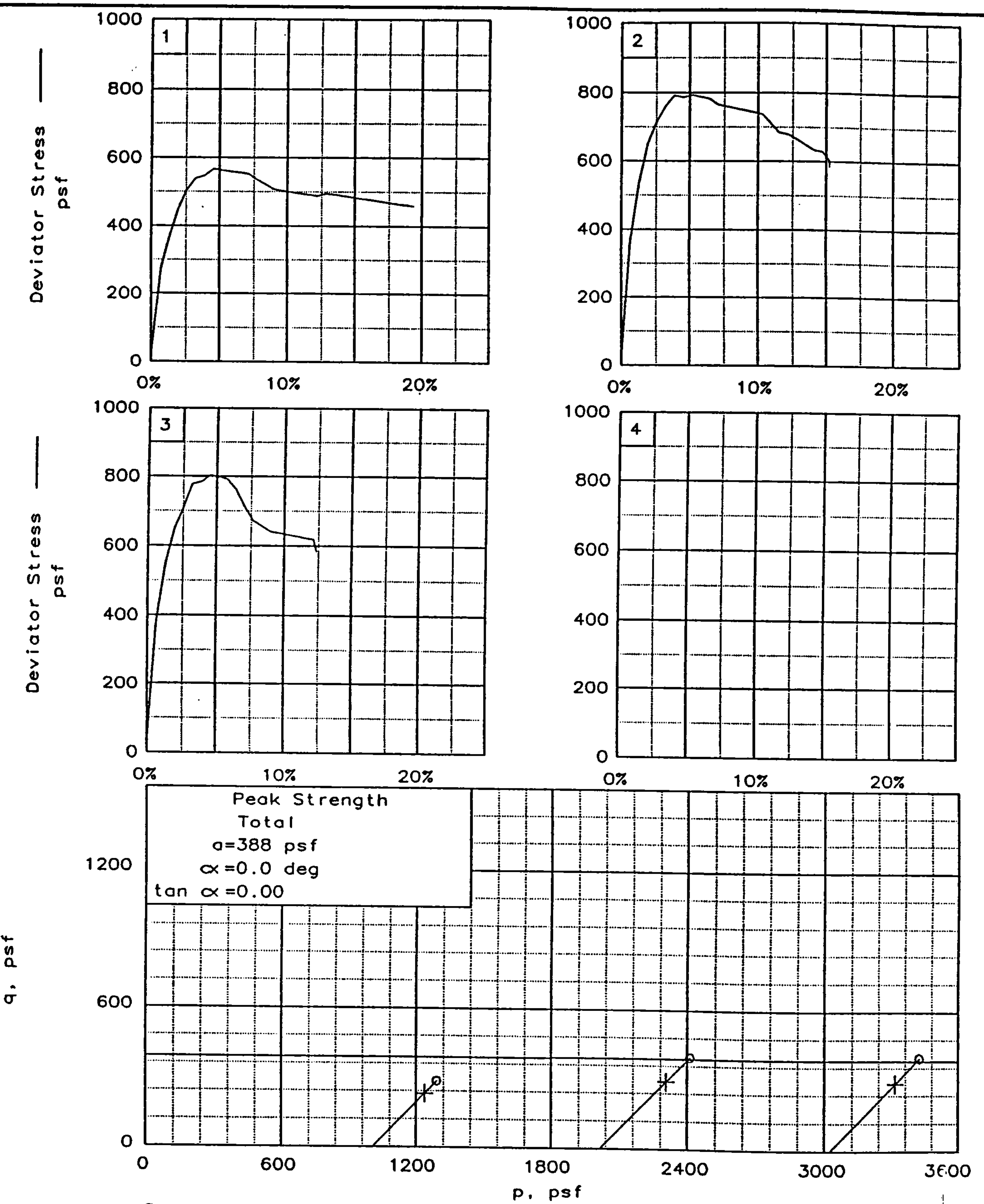
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U,
Sample 10-C, Depth 34.1'
PROJ. NO.: 13622 DATE: 7-12-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



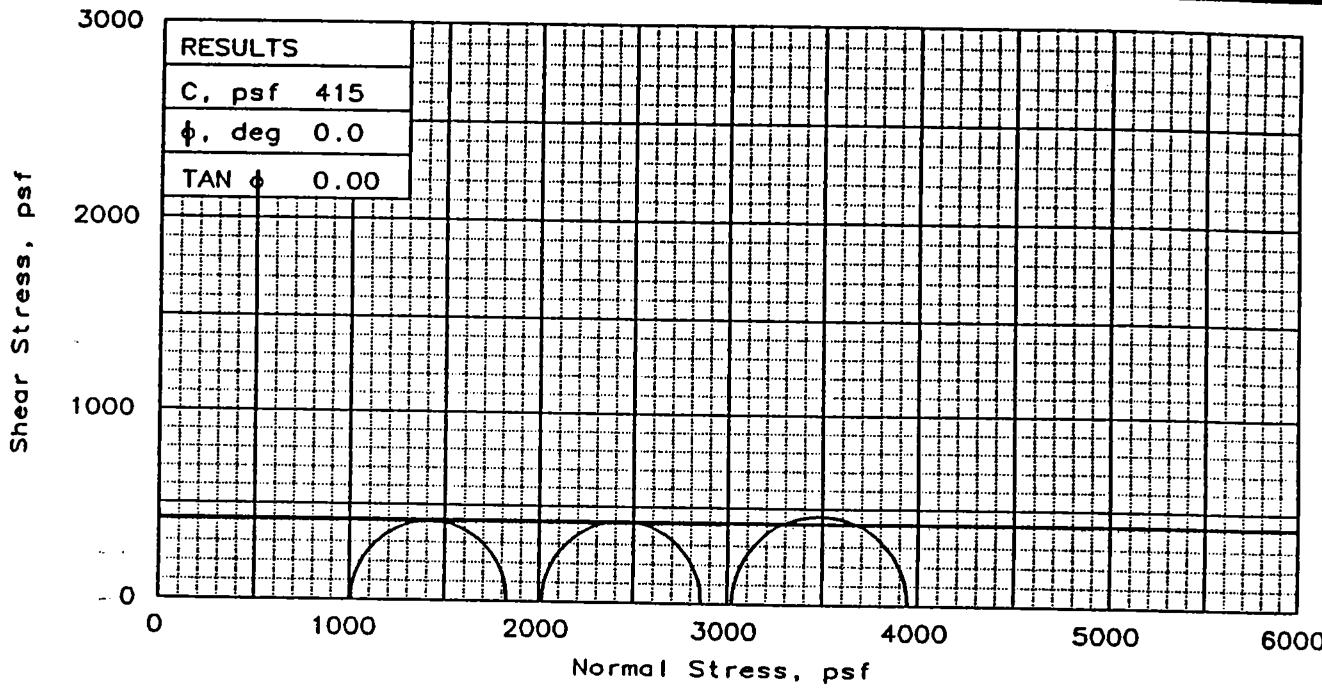
Stress Paths: + indicates end ○ indicates peak

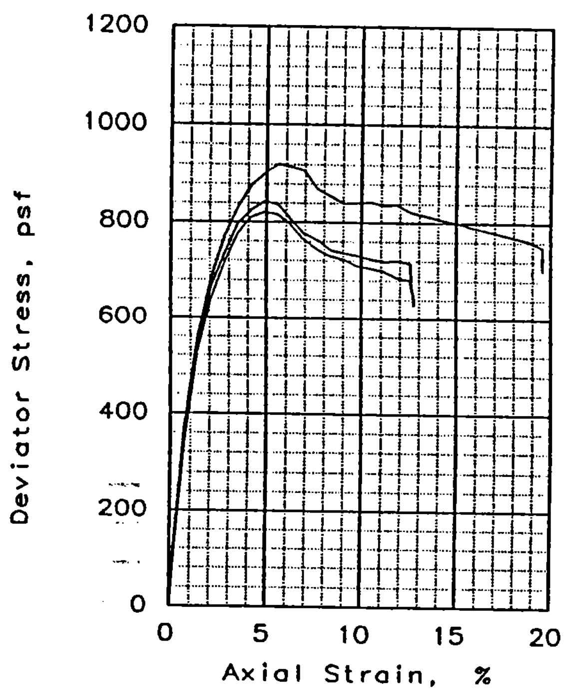
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-8U, Sample 10-C, Depth 34.1'

File: UU-6951 Project No.: 13622 FIG. NO.: _____





	SPECIMEN NO.:	1	2	3
INITIAL	WATER CONTENT, %	60.4	60.9	61.2
	DRY DENSITY, pcf	63.3	62.8	63.0
	SATURATION, %	97.6	97.3	98.3
	VOID RATIO	1.683	1.704	1.694
	DIAMETER, in	1.42	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	62.2	62.4	62.5
	DRY DENSITY, pcf	63.1	63.0	62.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.691	1.697	1.701
	DIAMETER, in	1.42	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
	Strain rate, in/min	0.0998	0.1071	0.1109
	BACK PRESSURE, psf	0	0	0
	CELL PRESSURE, psf	1008	2016	3024
	FAILURE STRESS, psf	821	843	921
	ULTIMATE STRESS, psf	628	670	702
	σ_1 FAILURE, psf	1829	2859	3945
	σ_3 FAILURE, psf	1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ ors ML
LL= 81 PL= 25 PI= 56
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

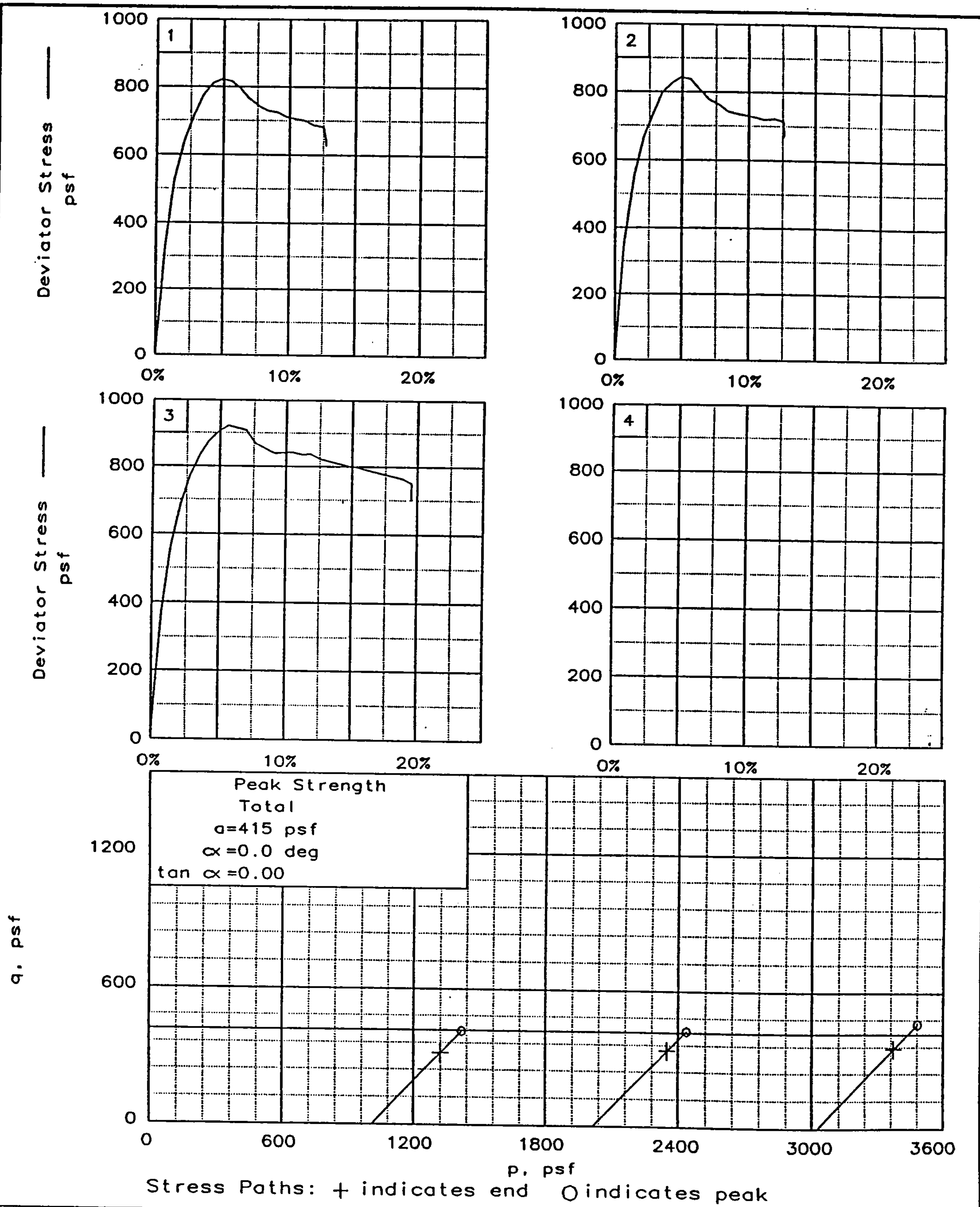
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U,
Sample 13-D, Depth 46.2'

PROJ. NO.: 13622 DATE: 7-12-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



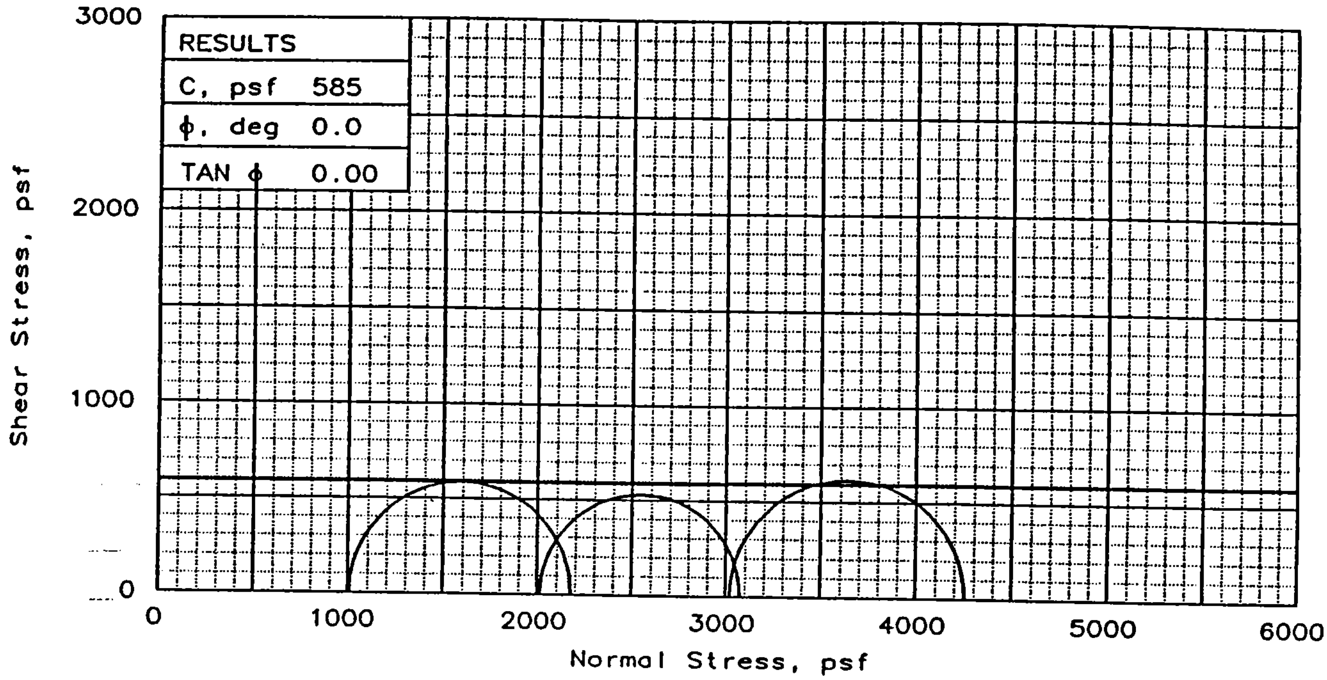
Client: U.S. Army Corps of Engineers

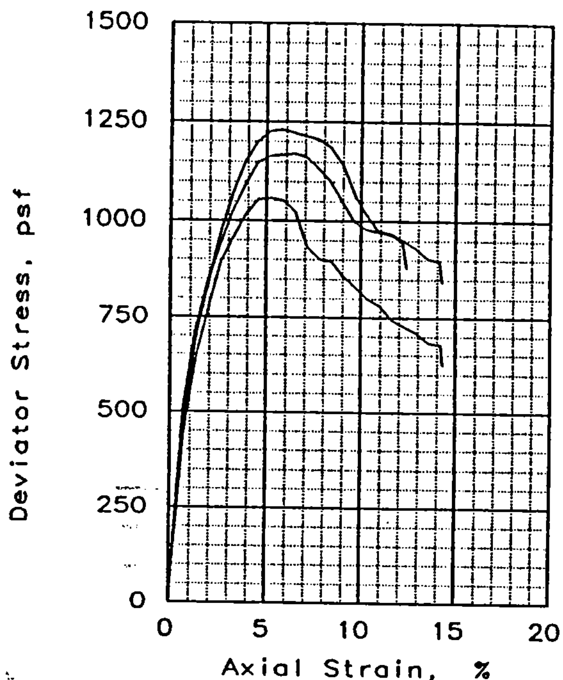
Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-8U, Sample 13-D, Depth 46.2'

File: UU-6952 Project No.: 13622 FIG. NO.: ____

RESULTS	
C, psf	585
ϕ, deg	0.0
TAN ϕ	0.00





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	65.5	65.6	65.2
	DRY DENSITY, pcf	60.4	60.5	60.8
	SATURATION, %	98.4	98.7	99.0
	VOID RATIO	1.809	1.808	1.791
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	66.3	66.6	65.8
	DRY DENSITY, pcf	60.6	60.4	60.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.804	1.811	1.789
	DIAMETER, in	1.41	1.40	1.41
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0954	0.0986	0.0980
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1171	1059	1231
ULTIMATE STRESS, psf		879	624	843
σ_1 FAILURE, psf		2179	3075	4255
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ ars ML

LL= 93 PL= 29 PI= 64

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

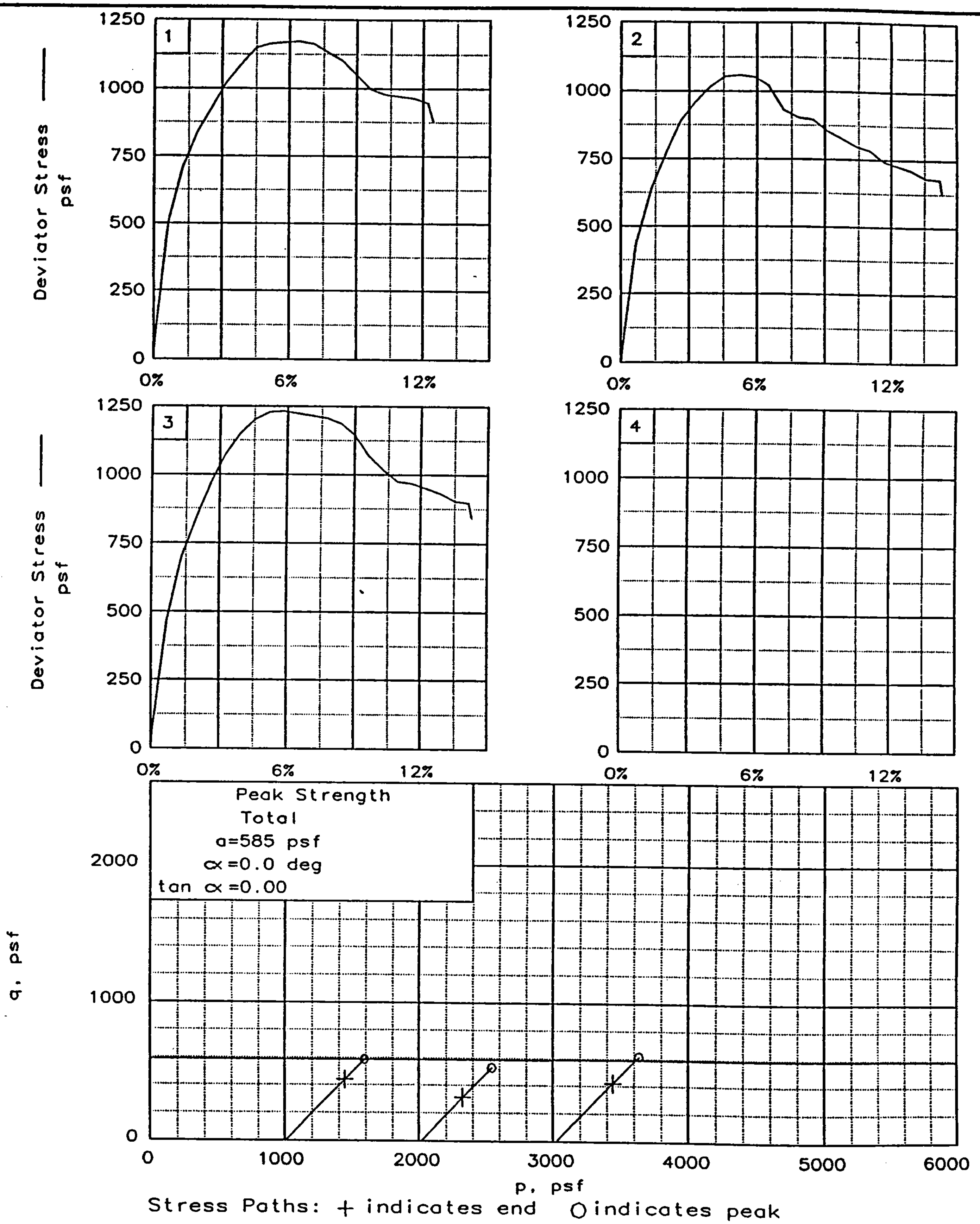
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-8U,
Sample 15-C, Depth 54.1'

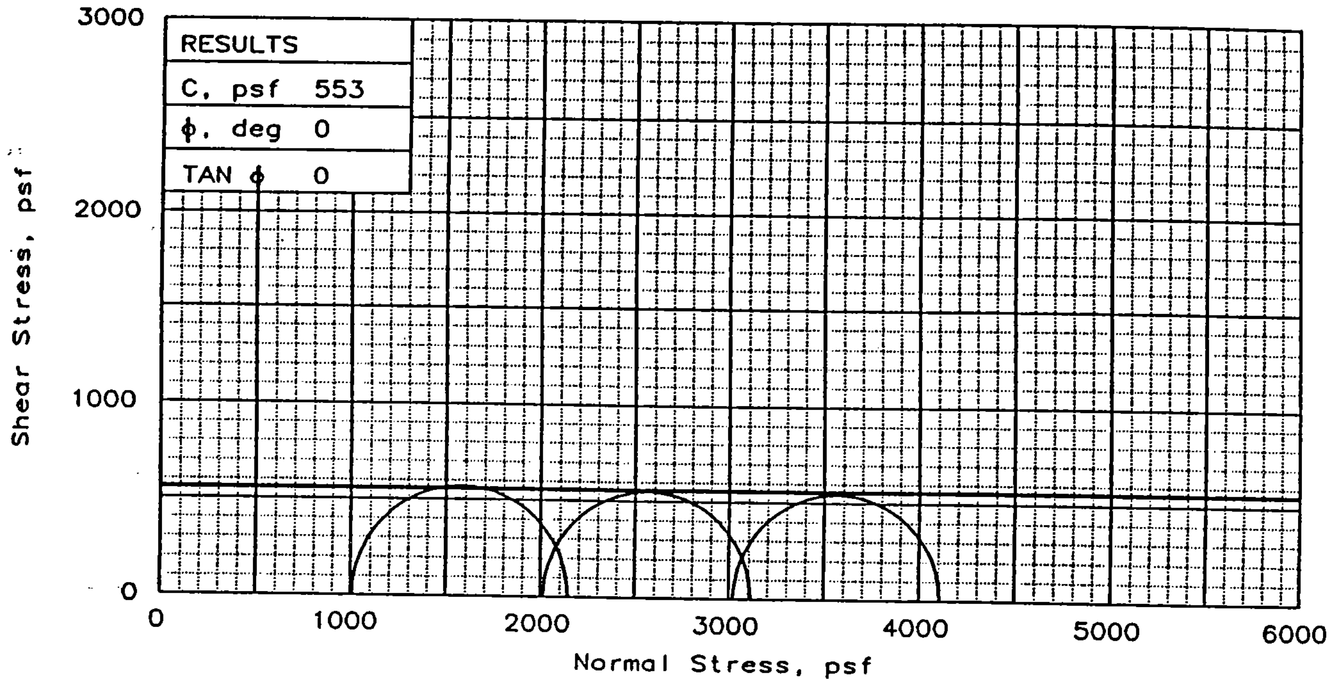
PROJ. NO.: 13622 DATE: 7-12-96

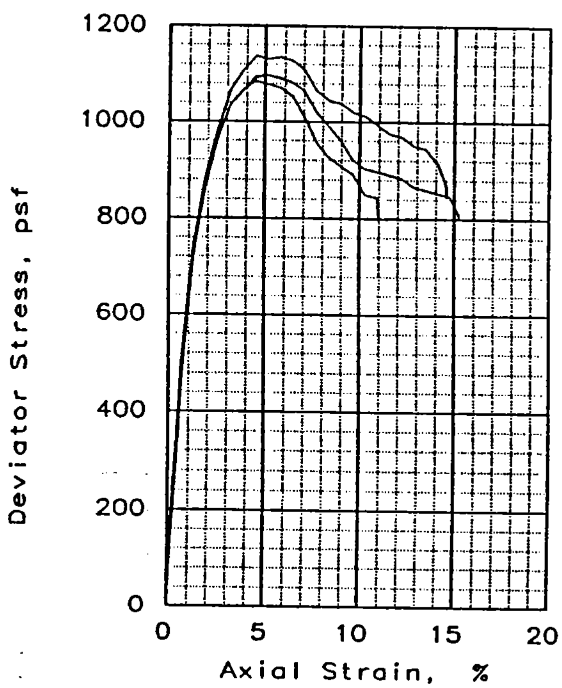
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-8U, Sample 15-C, Depth 54.1'
File: UU-6953 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.6	62.9	62.9
	DRY DENSITY, pcf	62.1	62.5	62.2
	SATURATION, %	97.8	99.2	98.5
	VOID RATIO	1.754	1.738	1.749
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
AT TEST	WATER CONTENT, %	64.0	63.3	63.6
	DRY DENSITY, pcf	62.1	62.6	62.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.754	1.734	1.741
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0989	0.0994	0.0959
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1137	1097	1085
ULTIMATE STRESS, psf		846	799	798
σ_1 FAILURE, psf		2145	3113	4109
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ lyr SP
LL= 88 PL= 28 PI= 60
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

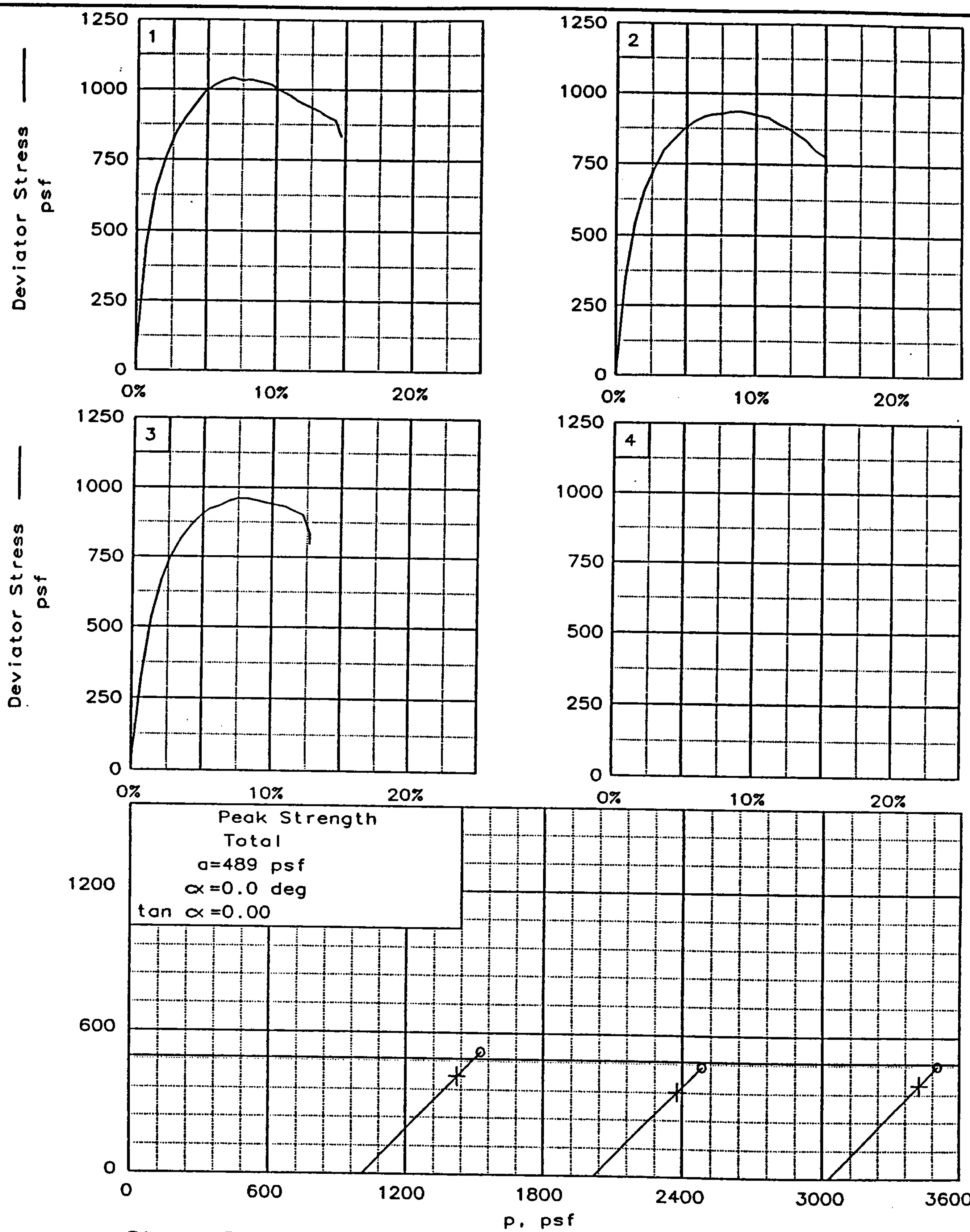
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U,
Sample 17-C, Depth 61.8'

PROJ. NO.: 13622 DATE: 7-12-96

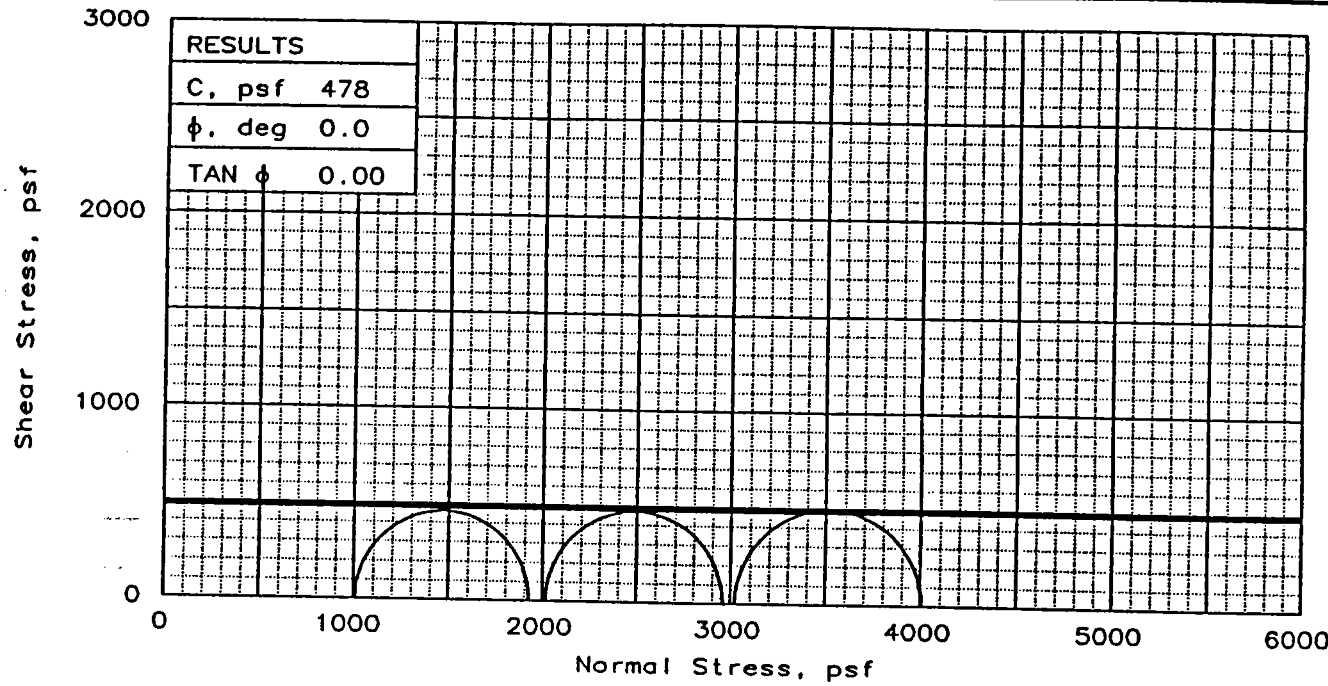
TRIAXIAL SHEAR TEST REPORT

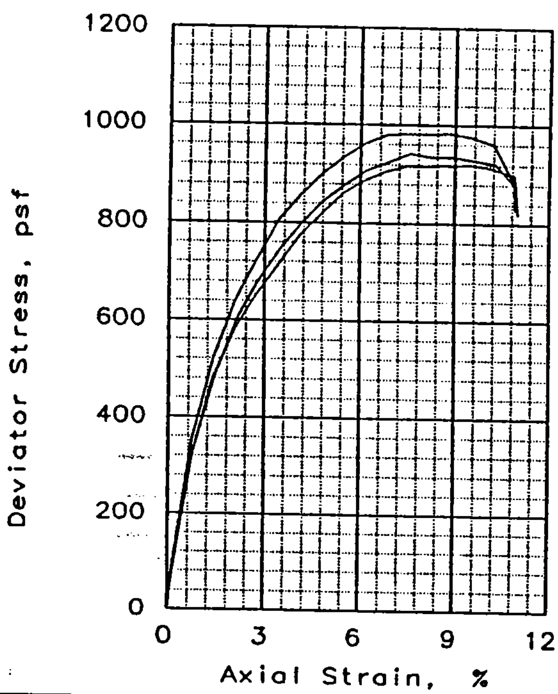
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-9U, Sample 15-D, Depth 58.8'
File: UU-7111 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	65.8	64.4	63.2
	DRY DENSITY, pcf	60.0	60.2	60.4
	SATURATION, %	97.4	95.7	94.6
	VOID RATIO	1.852	1.843	1.831
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	67.5	67.1	66.2
	DRY DENSITY, pcf	60.0	60.3	60.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.849	1.838	1.814
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1121	0.1122	0.1009
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		919	942	983
ULTIMATE STRESS, psf		819	830	829
σ_1 FAILURE, psf		1927	2958	4007
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4
w/ lyr & lns ML

LL= 91 PL= 23 PI= 68

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

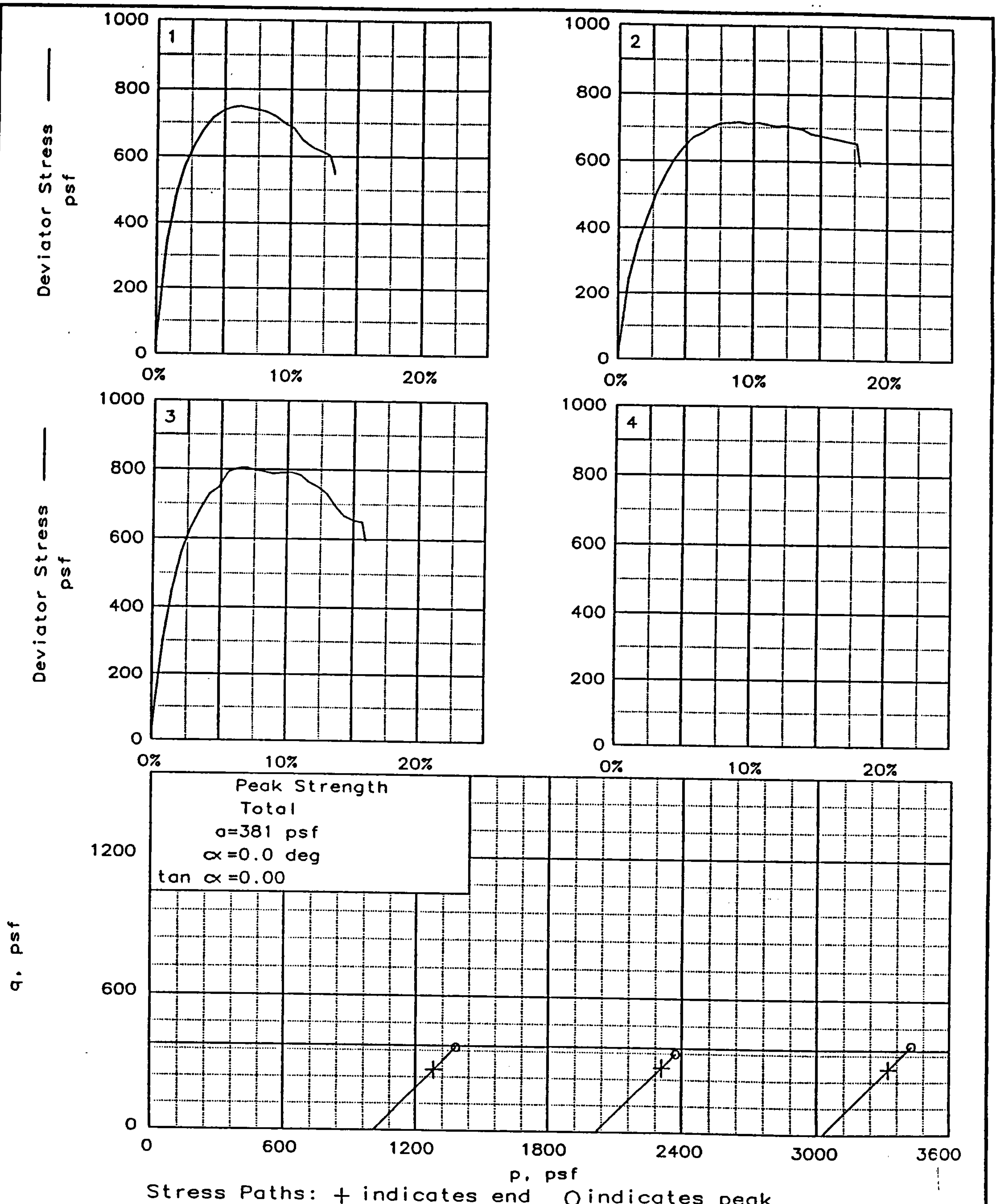
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-9U,
Sample 17-D, Depth 66.8'

PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

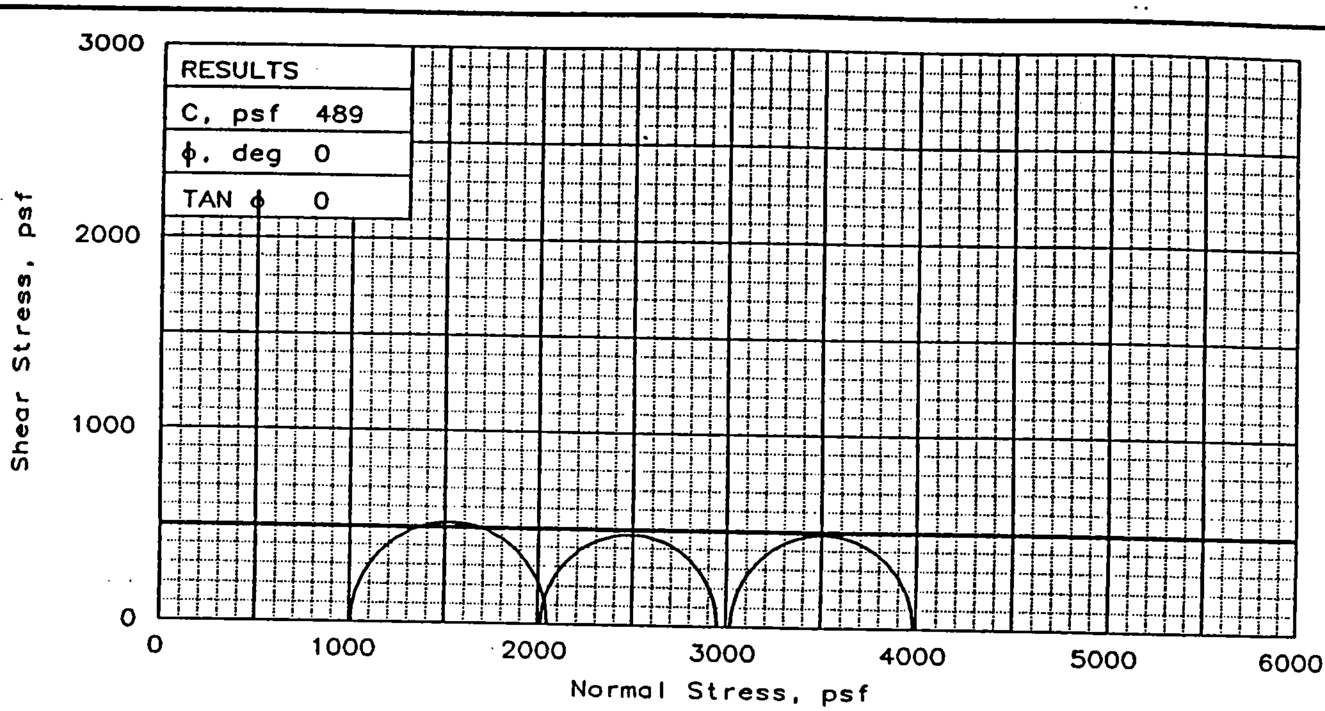


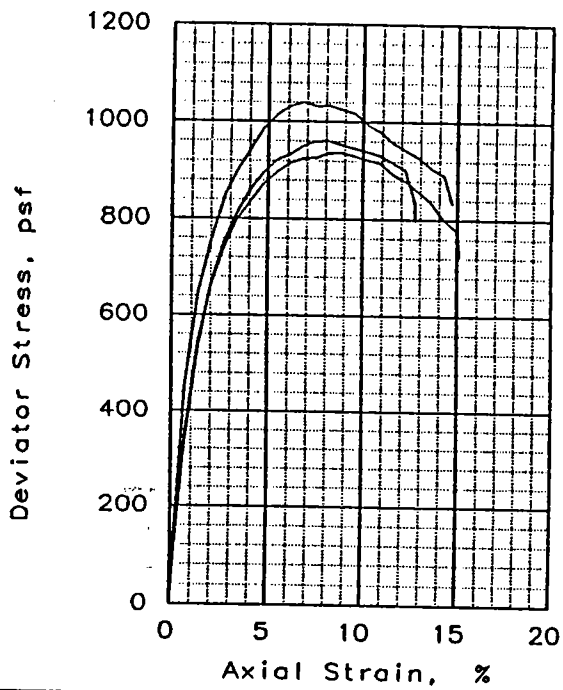
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-9U, Sample 13-D, Depth 50.8'

File: UU-7110 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	66.2	64.2	67.4
	DRY DENSITY, pcf	58.9	59.8	58.4
	SATURATION, %	95.3	94.4	95.7
	VOID RATIO	1.904	1.862	1.930
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	69.8	67.8	70.2
	DRY DENSITY, pcf	58.7	59.8	58.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.913	1.859	1.924
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1147	0.1144	0.1065
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1040	937	960
ULTIMATE STRESS, psf		833	724	798
σ_1 FAILURE, psf		2048	2953	3984
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 93 PL= 27 PI= 66
SPECIFIC GRAVITY= 2.74
REMARKS:

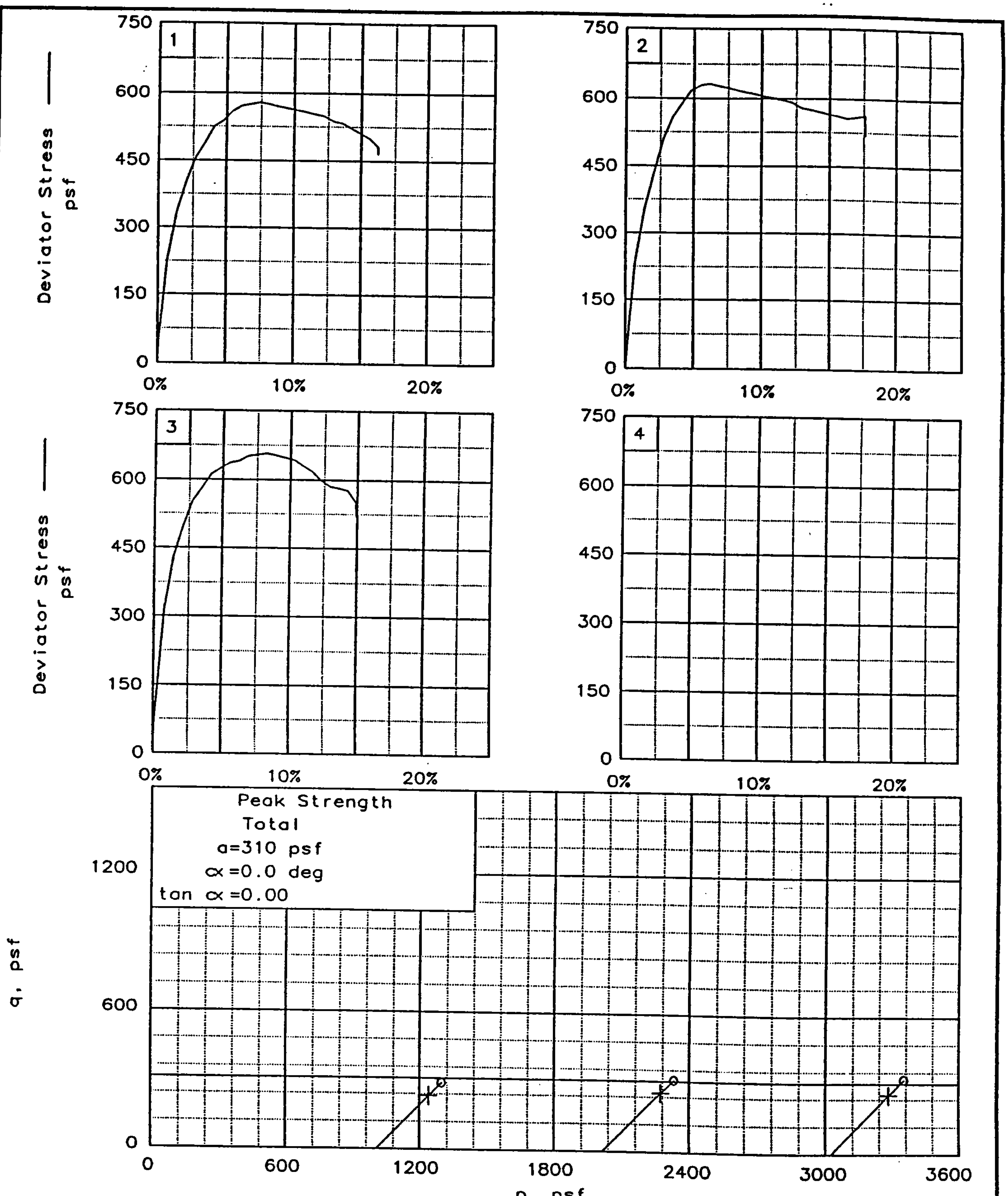
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-9U,
Sample 15-D, Depth 58.8'
PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



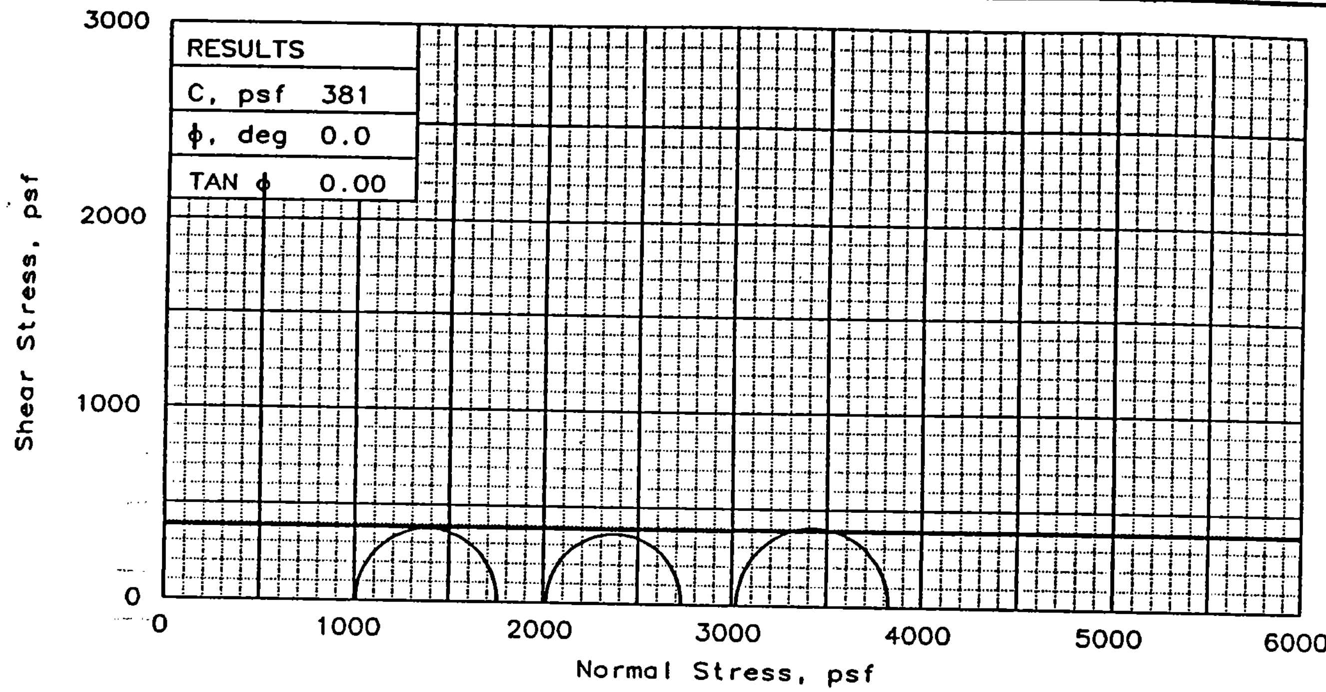
Stress Paths: + indicates end O indicates peak

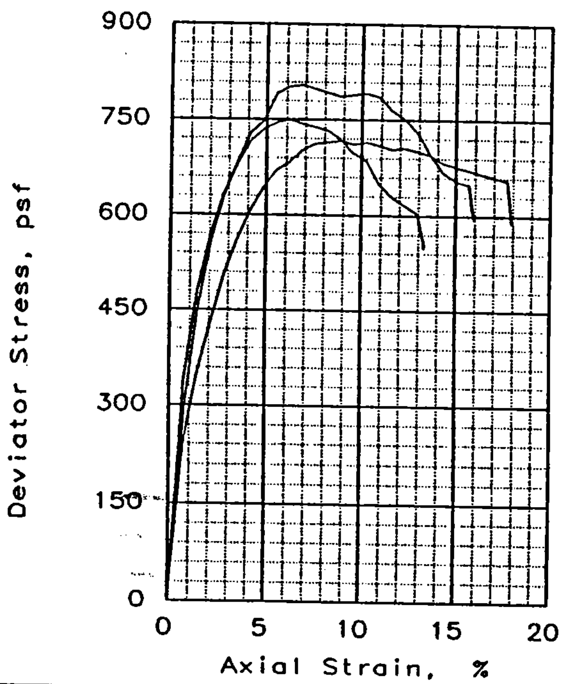
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-9U, Sample 9-D, Depth 34.8'

File: UU-7109 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.5	61.0	59.2
	DRY DENSITY, pcf	61.9	65.9	63.5
	SATURATION, %	97.0	104.6	95.8
	VOID RATIO	1.764	1.597	1.694
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	64.7	58.2	61.8
	DRY DENSITY, pcf	61.7	65.9	63.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.773	1.594	1.692
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1128	0.1161	0.1117
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		749	717	805
ULTIMATE STRESS, psf		548	589	595
σ_1 FAILURE, psf		1757	2733	3829
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4 w/ lyr & lns ML

LL= 84 PL= 25 PI= 59

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

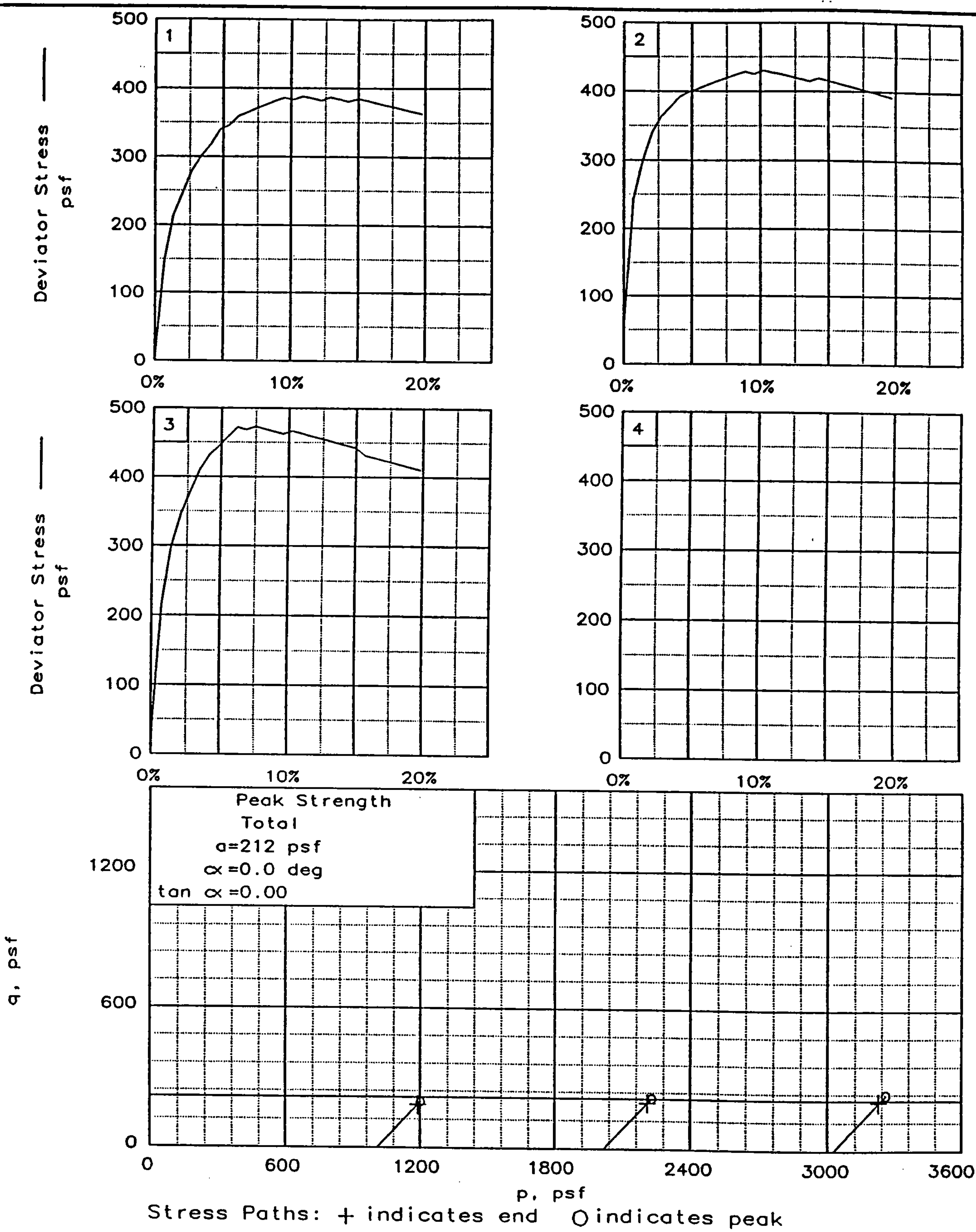
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-9U, Sample 13-D, Depth 50.8'

PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

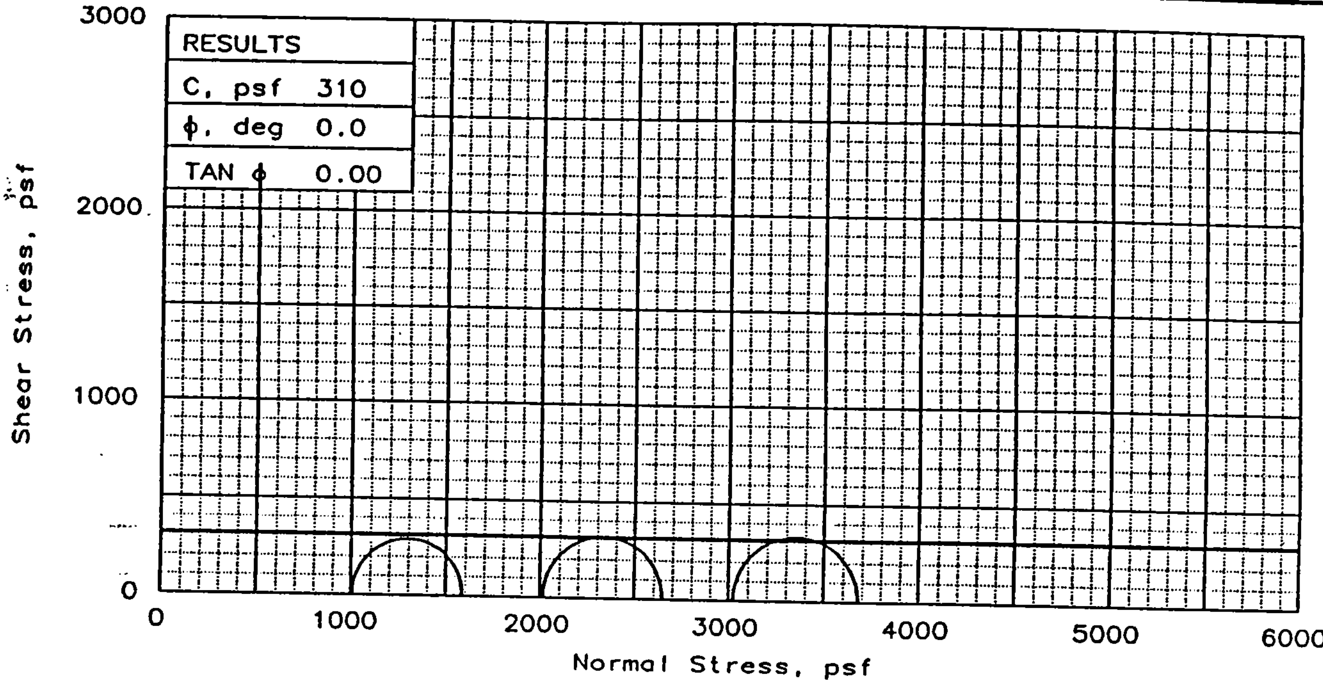


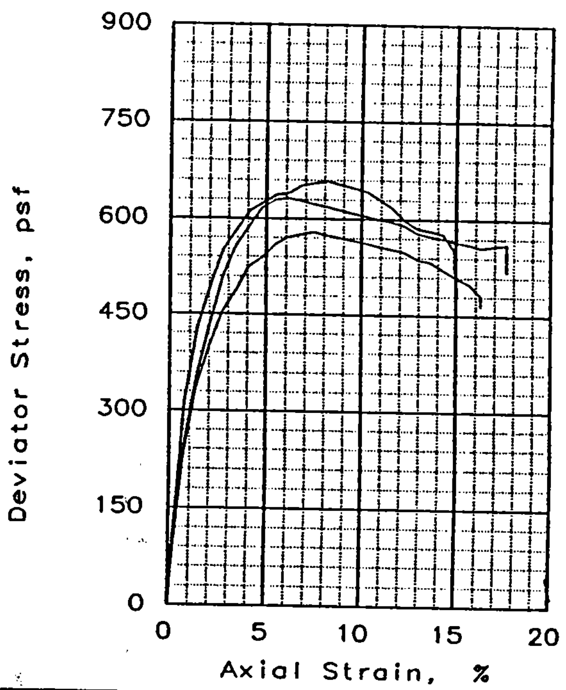
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-9U, Sample 7-D, Depth 26.2'

File: UU-7108 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	59.4	56.2	60.7
	DRY DENSITY, pcf	64.2	64.6	63.6
	SATURATION, %	97.8	93.6	98.5
	VOID RATIO	1.666	1.647	1.688
	DIAMETER, in	1.40	1.39	1.39
	HEIGHT, in	2.99	2.99	2.98
AT TEST	WATER CONTENT, %	61.5	60.3	61.8
	DRY DENSITY, pcf	63.7	64.5	63.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.686	1.653	1.693
	DIAMETER, in	1.40	1.39	1.39
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1151	0.1149	0.1126
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		579	632	658
ULTIMATE STRESS, psf		465	518	521
σ_1 FAILURE, psf		1587	2648	3682
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4
w/ lyr & lns ML

LL= 92 PL= 30 PI= 62

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ____

CLIENT: U.S. Army Corps of Engineers

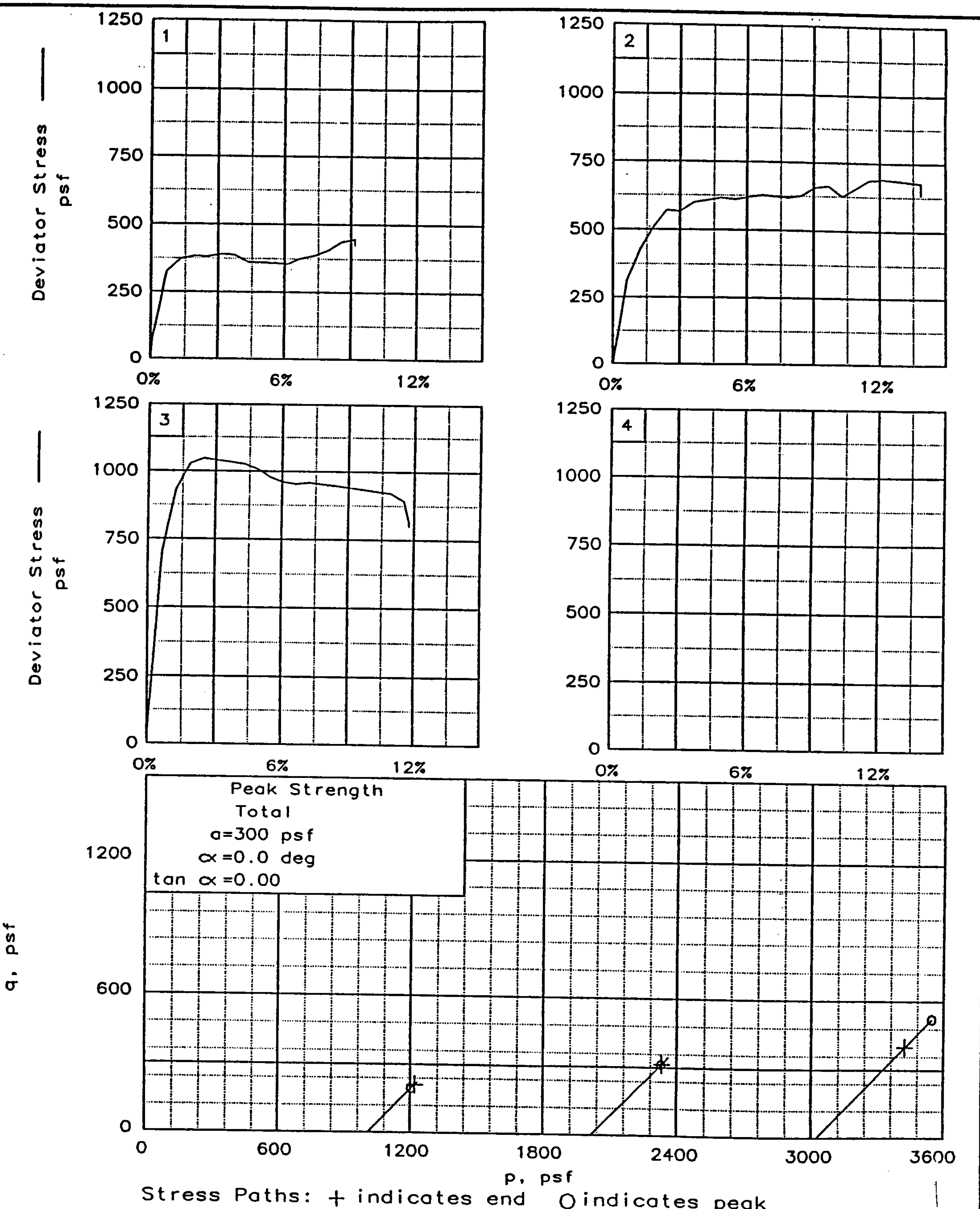
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-9U,
Sample 9-D, Depth 34.8'

PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

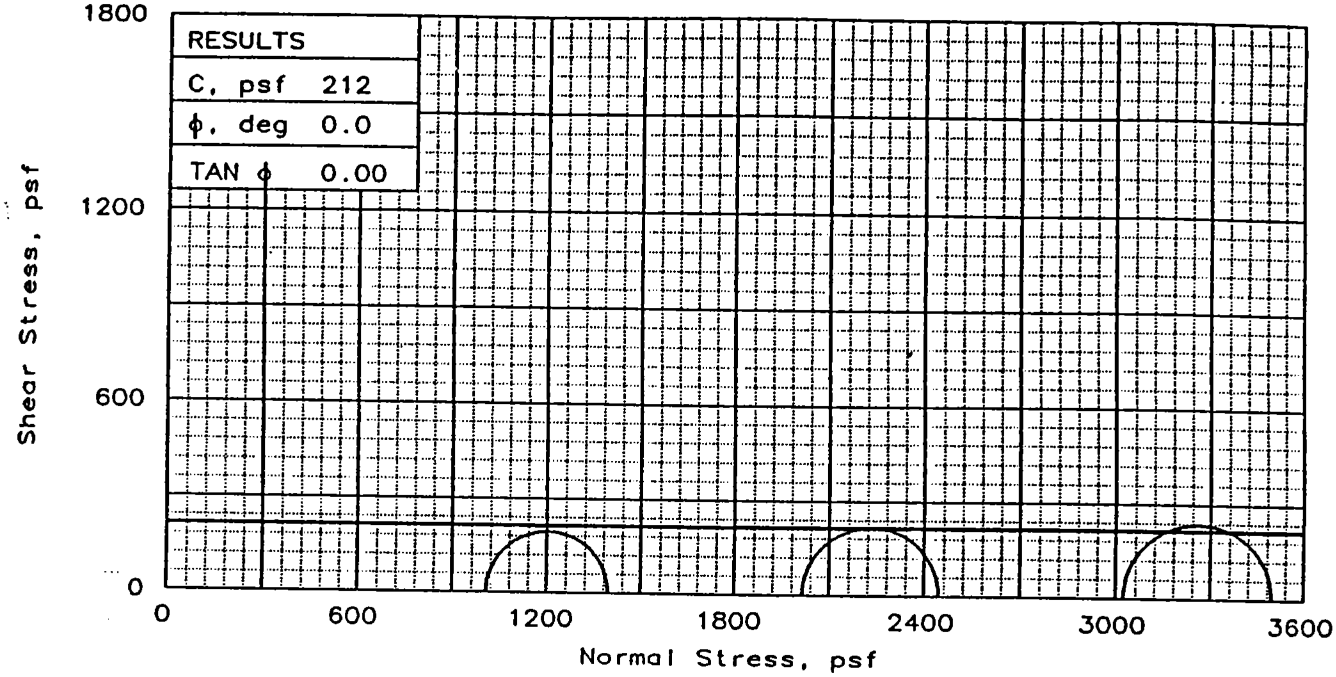


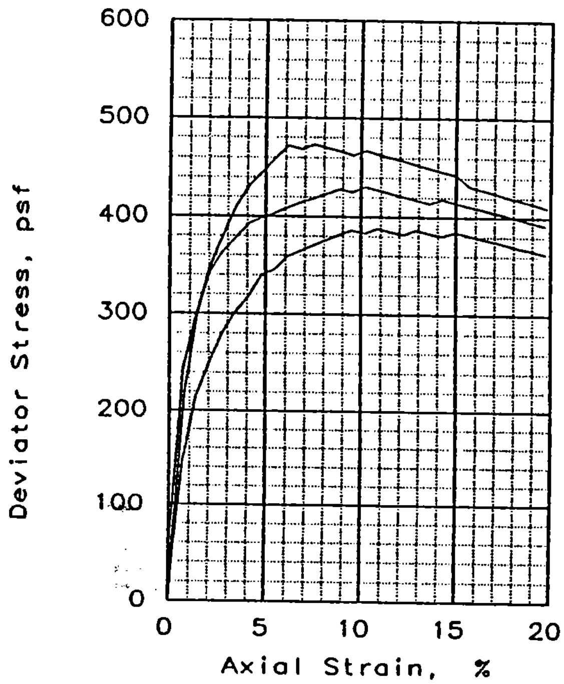
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-9U, Sample 5-C, Depth 17.7'

File: UU-7107 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.5	60.7	63.0
	DRY DENSITY, pcf	62.5	62.4	61.4
	SATURATION, %	98.5	95.6	96.7
	VOID RATIO	1.738	1.740	1.785
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.99	2.98
AT TEST	WATER CONTENT, %	64.0	64.0	65.6
	DRY DENSITY, pcf	62.1	62.1	61.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.753	1.755	1.799
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1157	0.1164	0.1161
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		388	430	473
ULTIMATE STRESS, psf		363	392	410
σ_1 FAILURE, psf		1396	2446	3497
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH3
w/ lyr & lns ML
LL= 72 PL= 23 PI= 49
SPECIFIC GRAVITY= 2.74
REMARKS:

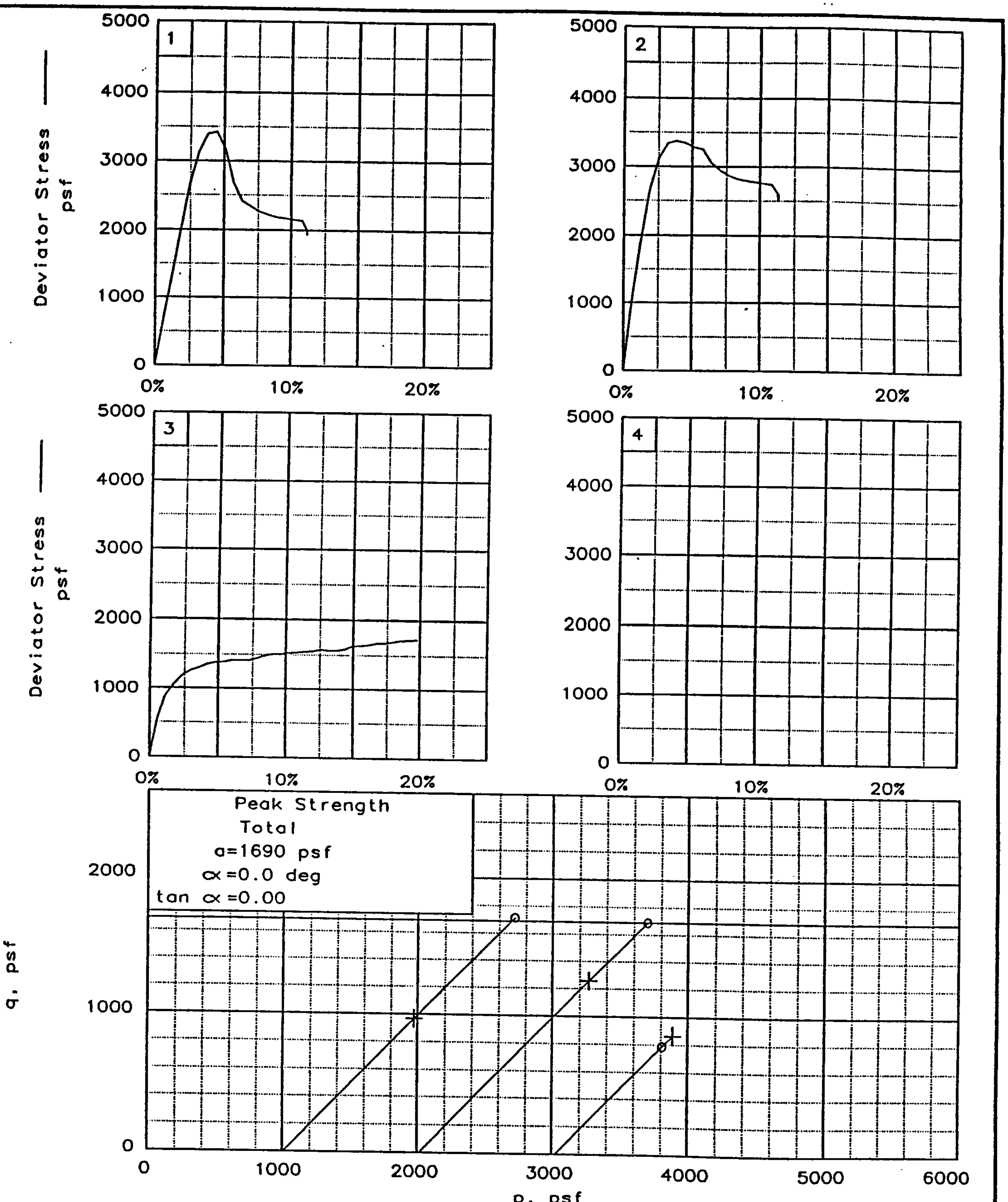
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-9U,
Sample 7-D, Depth 26.2'
PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



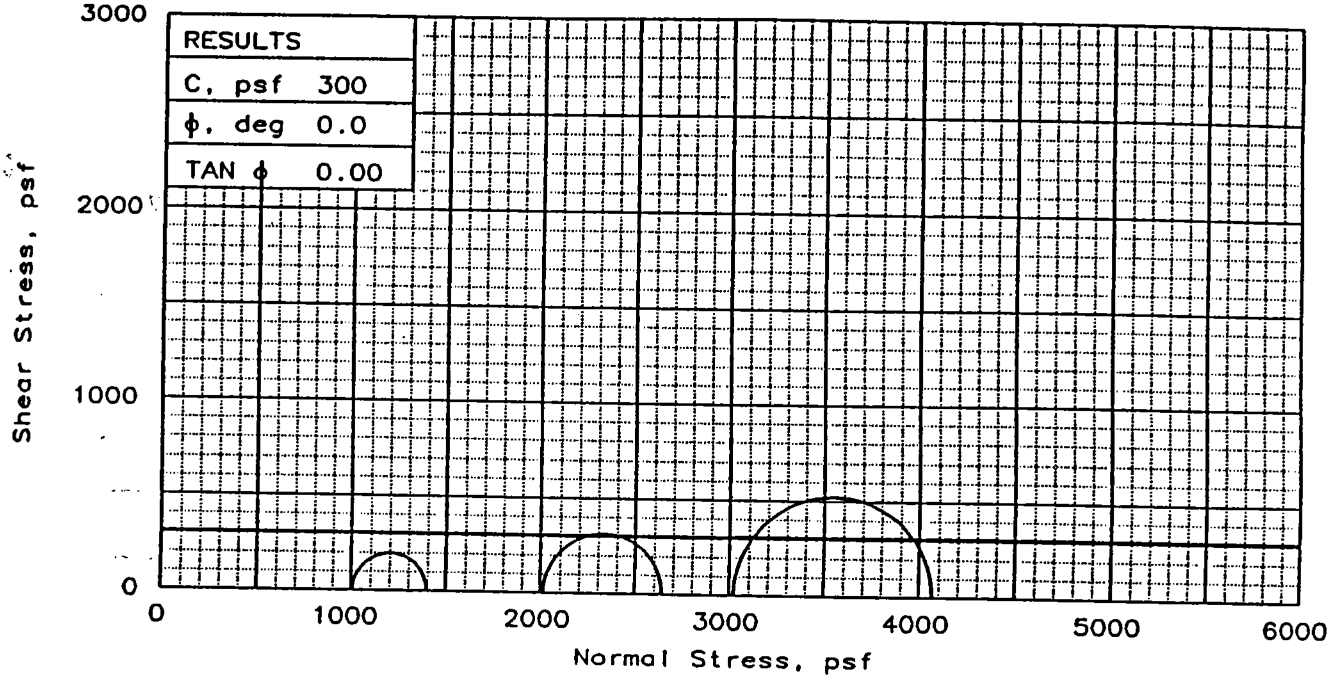
Stress Paths: + indicates end ○ indicates peak

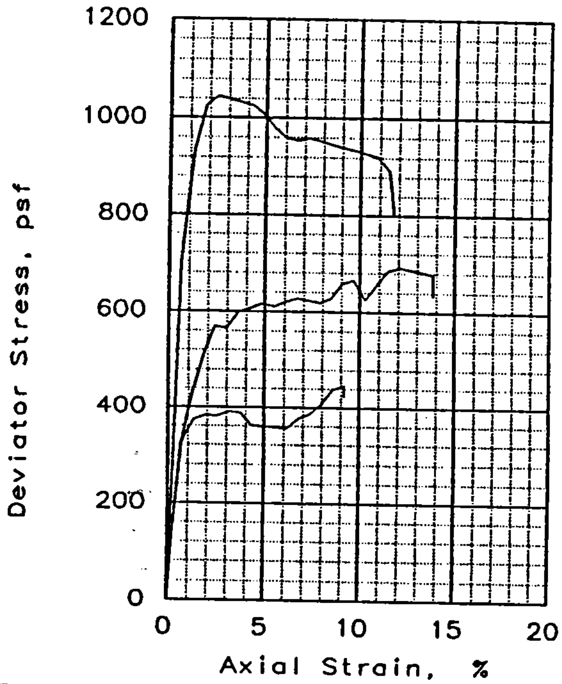
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-9U, Sample 2-B, Depth 4.6'

File: UU-7106 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	64.9	64.8	63.8
	DRY DENSITY, pcf	56.1	52.1	57.1
	SATURATION, %	86.9	77.8	87.7
	VOID RATIO	2.047	2.283	1.993
	DIAMETER, in	1.40	1.39	1.40
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	75.0	83.4	72.5
	DRY DENSITY, pcf	56.0	52.1	57.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.055	2.284	1.986
	DIAMETER, in	1.40	1.39	1.40
	HEIGHT, in	2.97	2.98	2.97
Strain rate, in/min		0.0969	0.0998	0.0985
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		391	627	1045
ULTIMATE STRESS, psf		424	633	801
σ_1 FAILURE, psf		1399	2643	4069
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ wd

LL= 118 PL= 28 PI= 90

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

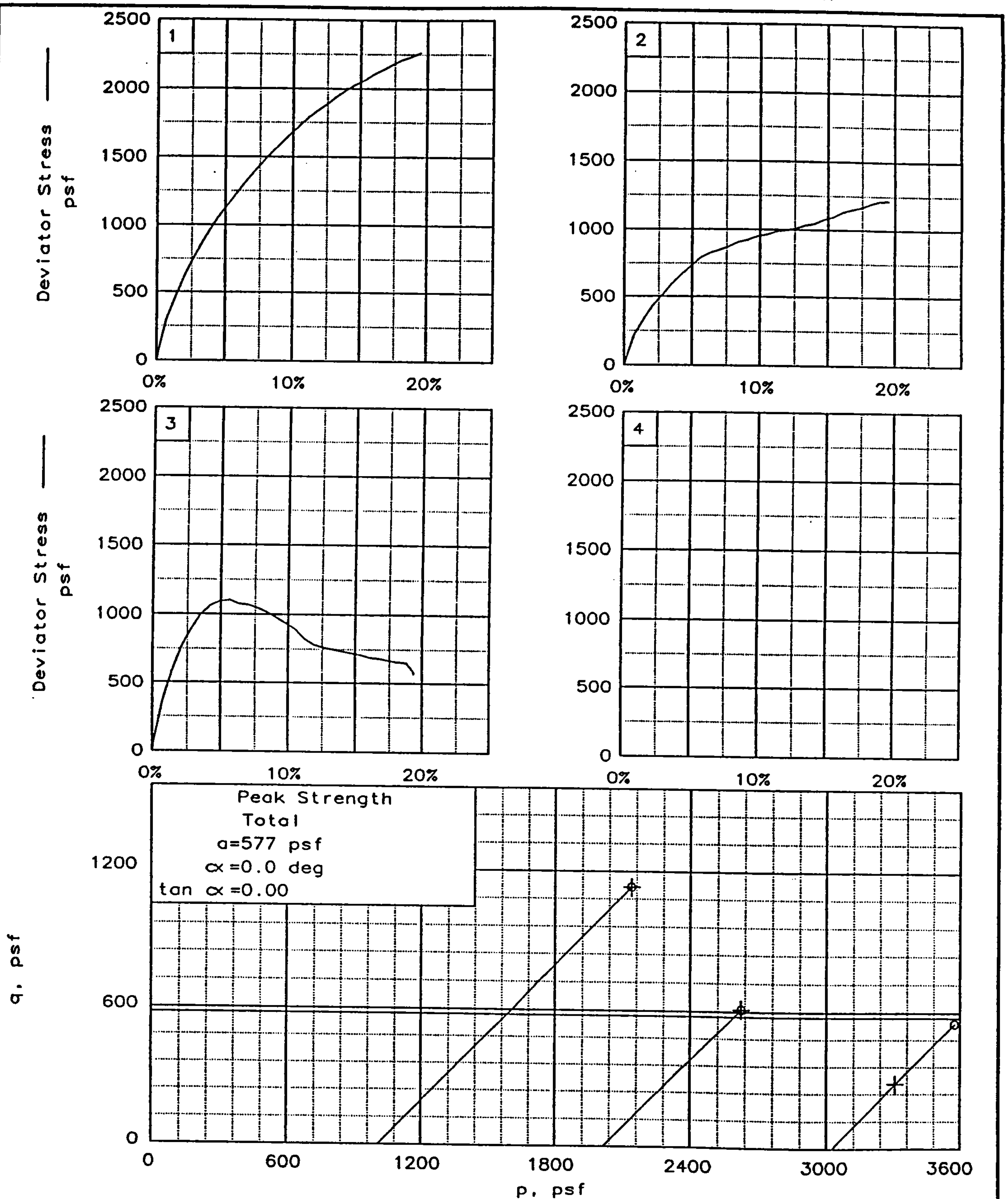
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGE-9U,
Sample 5-C, Depth 17.7'

PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



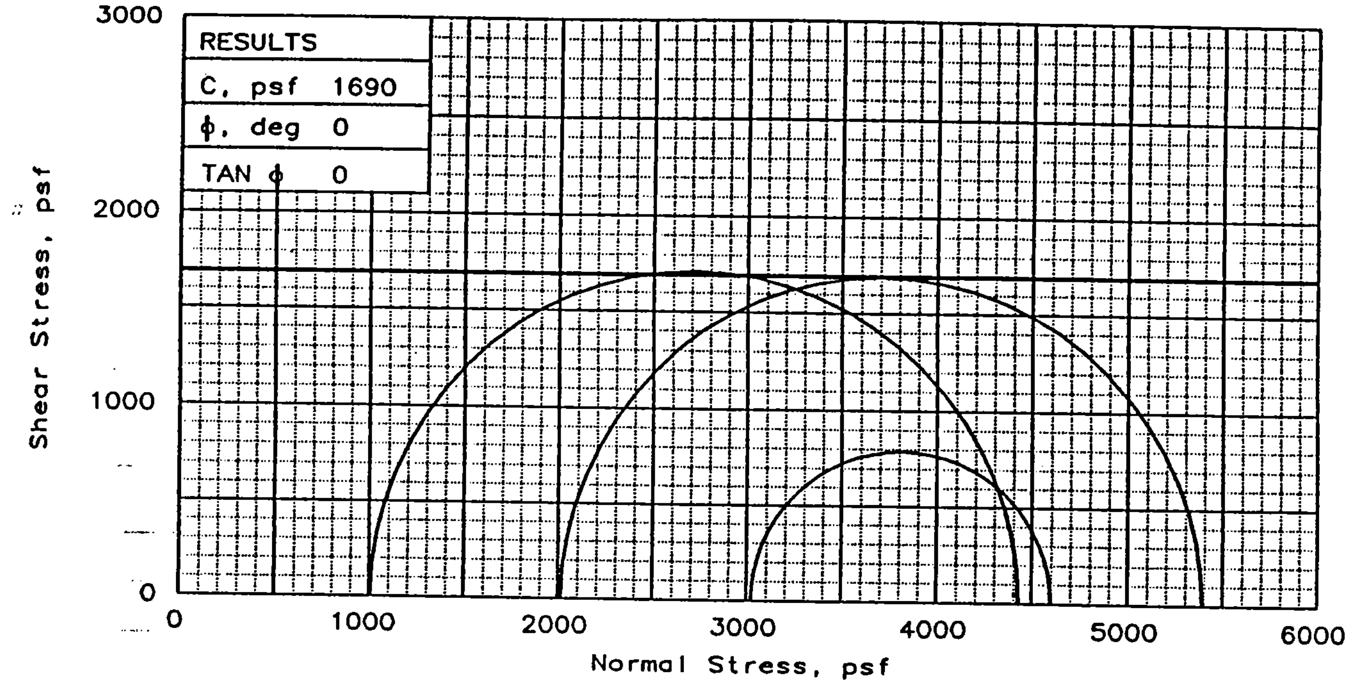
Stress Paths: + indicates end O indicates peak

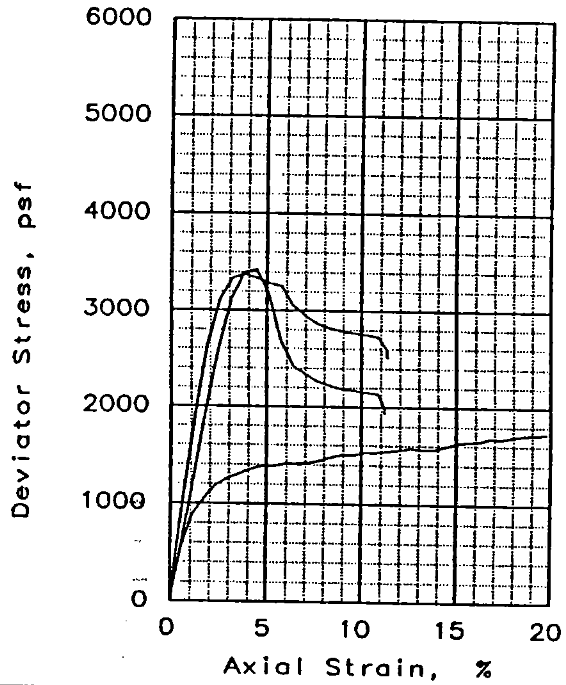
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-8U, Sample 22-D, Depth 76.8'

File: UU-6955 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	40.0	39.6	33.2
	DRY DENSITY, pcf	73.6	74.6	76.0
	SATURATION, %	83.2	84.4	73.3
	VOID RATIO	1.307	1.276	1.234
	DIAMETER, in	1.42	1.41	1.40
	HEIGHT, in	2.80	2.80	2.98
AT TEST	WATER CONTENT, %	47.8	46.7	44.1
	DRY DENSITY, pcf	73.8	74.8	77.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.301	1.269	1.199
	DIAMETER, in	1.42	1.41	1.40
	HEIGHT, in	2.80	2.80	2.99
Strain rate, in/min		0.0973	0.0968	0.1022
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		3422	3376	1576
ULTIMATE STRESS, psf		1934	2509	1730
σ_1 FAILURE, psf		4430	5392	4600
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: St LGr & T CH2 w/ lns & ors ML, ox, rts
LL= 82 PL= 33 PI= 49
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

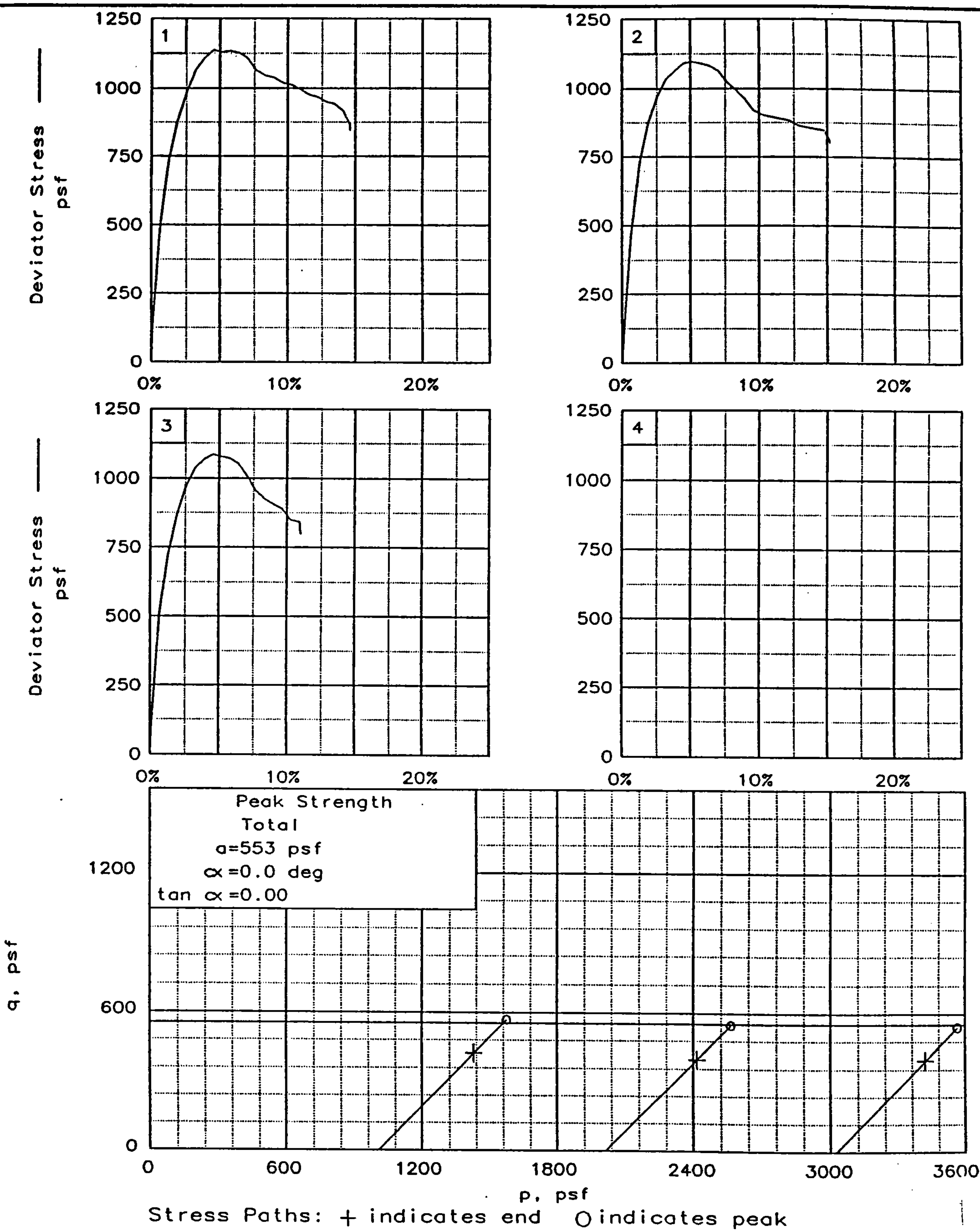
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-9U, Sample 2-B, Depth 4.6'

PROJ. NO.: 13622 DATE: 7-24-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

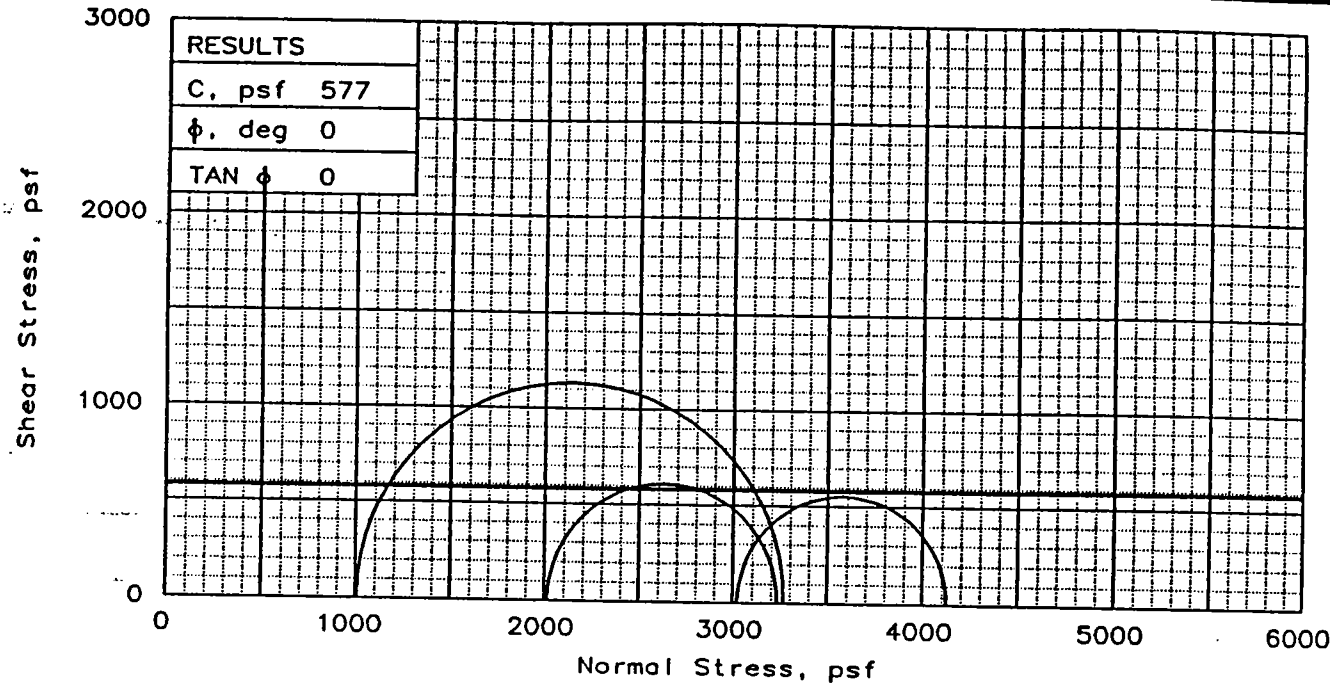


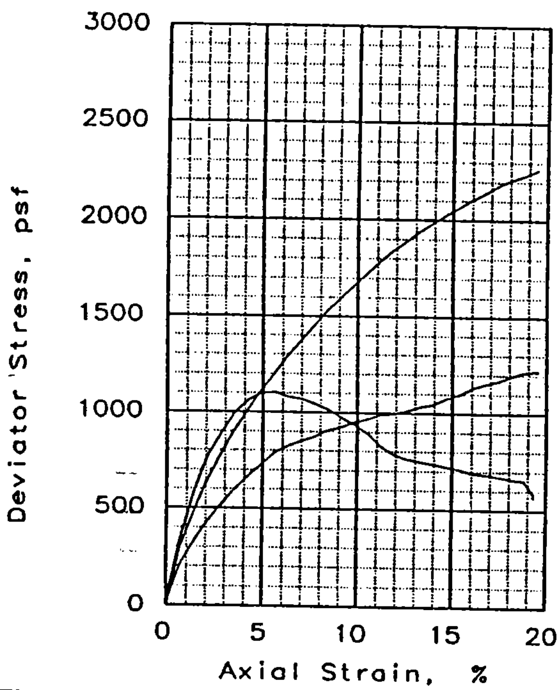
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-8U, Sample 17-C, Depth 61.8'

File: UU-6954 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	29.7	31.1	28.9
	DRY DENSITY, pcf	91.0	90.4	92.2
	SATURATION, %	94.0	97.1	94.3
	VOID RATIO	0.853	0.865	0.828
	DIAMETER, in	1.40	1.40	1.42
	HEIGHT, in	2.80	2.81	2.80
AT TEST	WATER CONTENT, %	31.8	32.4	30.8
	DRY DENSITY, pcf	90.7	89.9	92.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.859	0.874	0.831
	DIAMETER, in	1.40	1.40	1.42
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1083	0.1121	0.1116
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		2263	1218	1103
ULTIMATE STRESS, psf		2263	1218	567
σ_1 FAILURE, psf		3271	3234	4127
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: ST Gr CL3
w/ slf & ors CH
LL= 28 PL= 15 PI= 13
SPECIFIC GRAVITY= 2.7
REMARKS:

FIG. NO.: ______

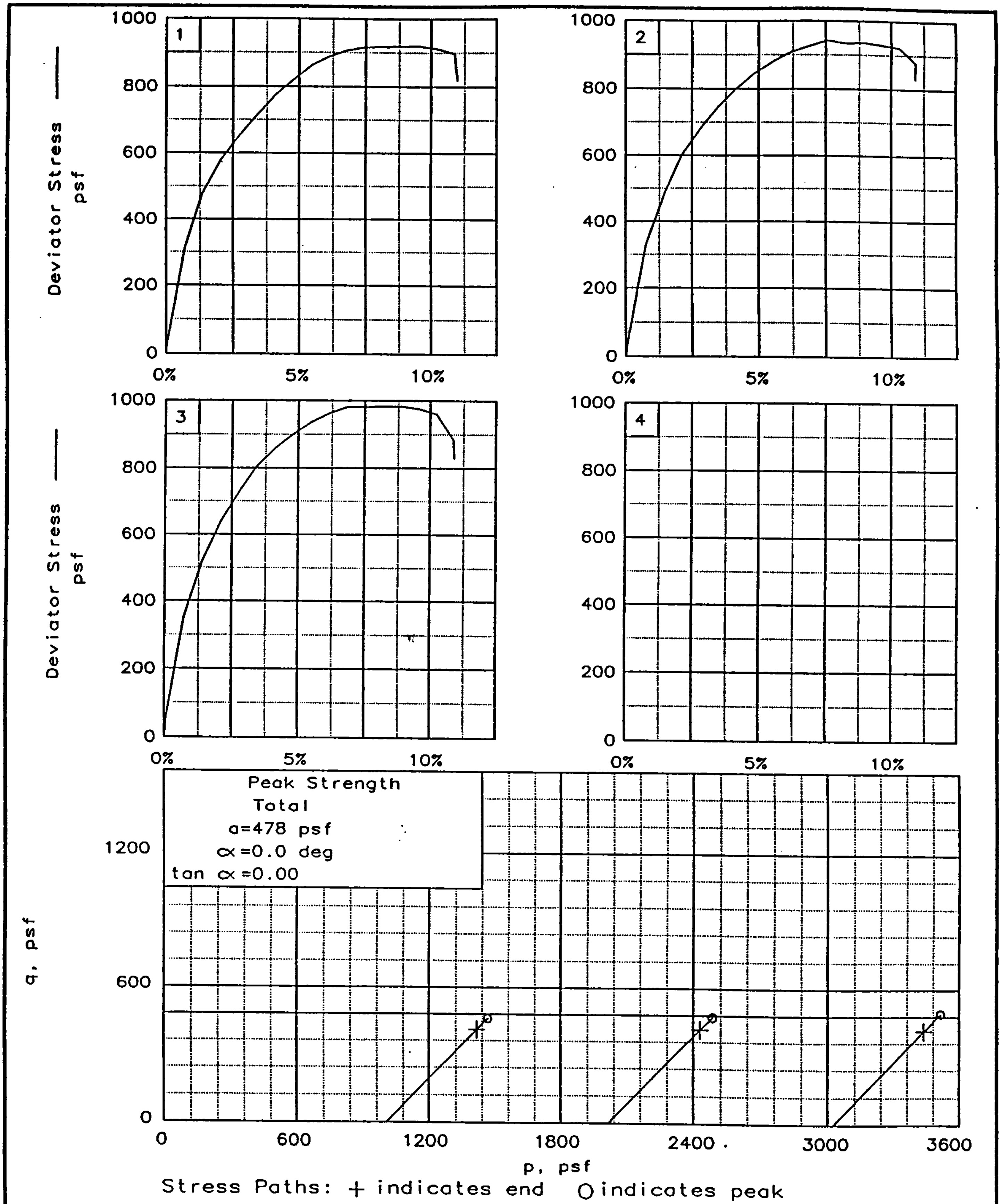
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-8U,
Sample 22-D, Depth 76.8'

PROJ. NO.: 13622 DATE: 7-12-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



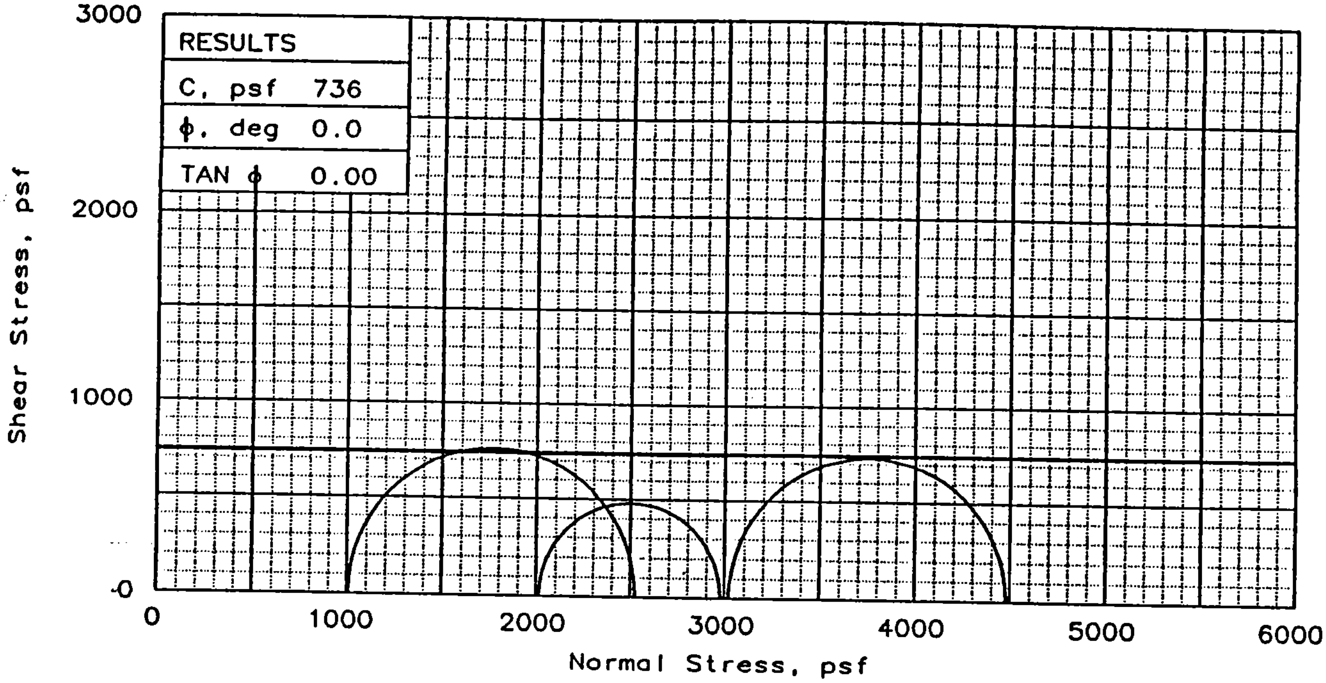
Client: U.S. Army Corps of Engineers

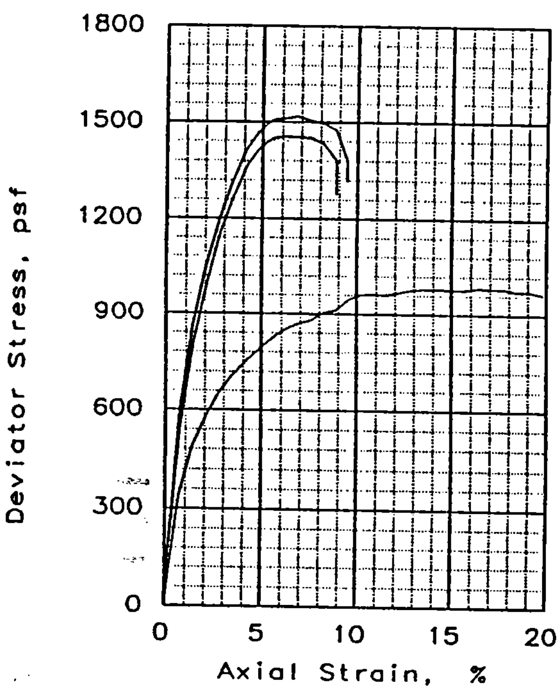
Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-9U, Sample 17-D, Depth 66.8'

File: UU-7112 Project No.: 13622 FIG. NO.: ____

RESULTS	
C, psf	736
ϕ, deg	0.0
TAN ϕ	0.00





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	43.6	45.3	42.7
	DRY DENSITY, pcf	76.7	74.8	76.7
	SATURATION, %	98.4	97.7	96.2
	VOID RATIO	1.197	1.252	1.199
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.97	2.97	2.97
AT TEST	WATER CONTENT, %	44.1	46.1	43.6
	DRY DENSITY, pcf	76.9	75.1	77.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.192	1.244	1.177
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1126	0.1163	0.1101
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1517	962	1455
ULTIMATE STRESS, psf		1318	965	1278
σ_1 FAILURE, psf		2525	2978	4479
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ slf
LL= 64 PL= 18 PI= 46
SPECIFIC GRAVITY= 2.7
REMARKS:

FIG. NO.: ____

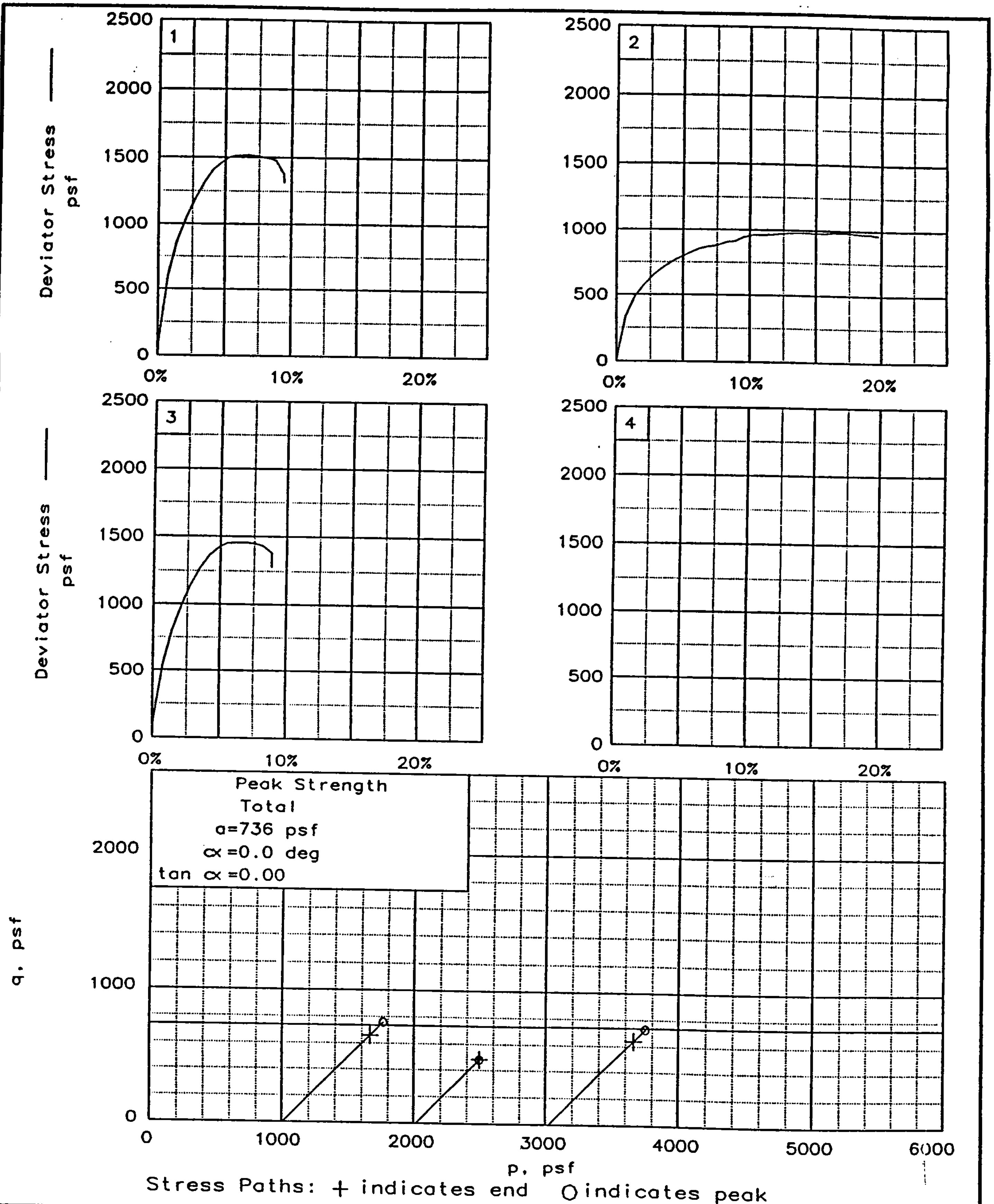
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-9U,
Sample 22-B, Depth 77.1'

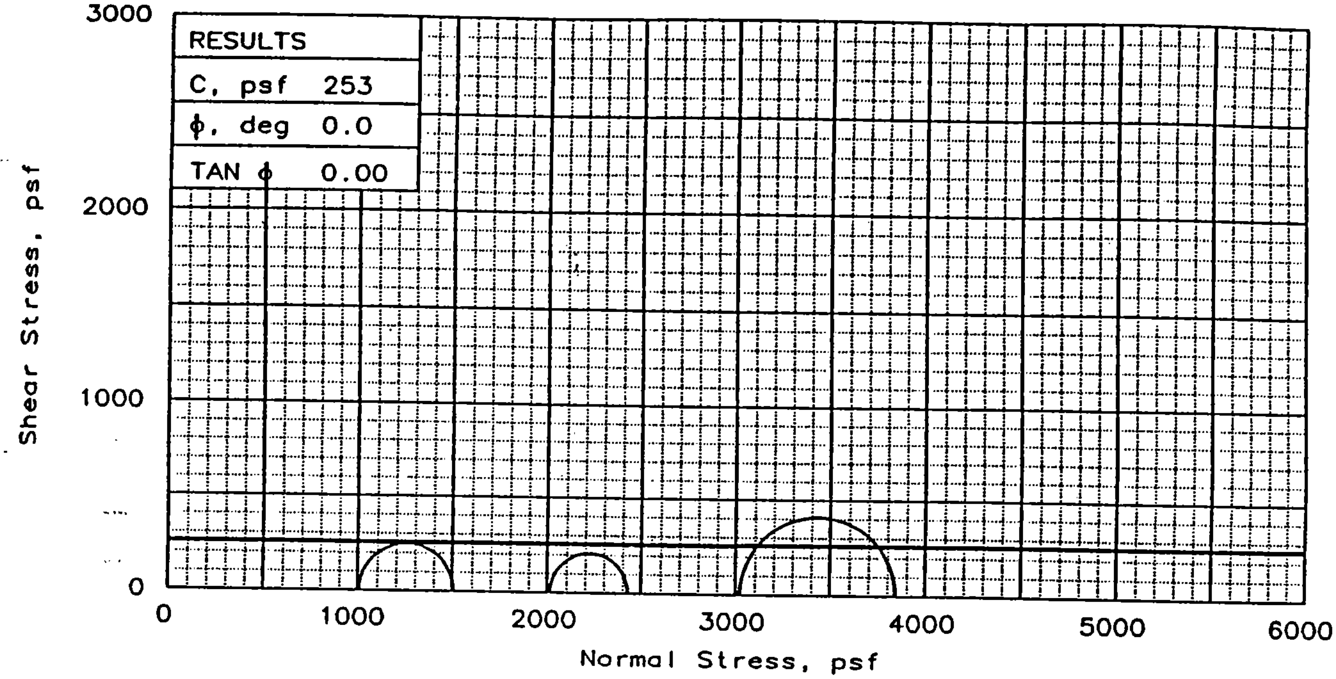
PROJ. NO.: 13622 DATE: 7-24-96

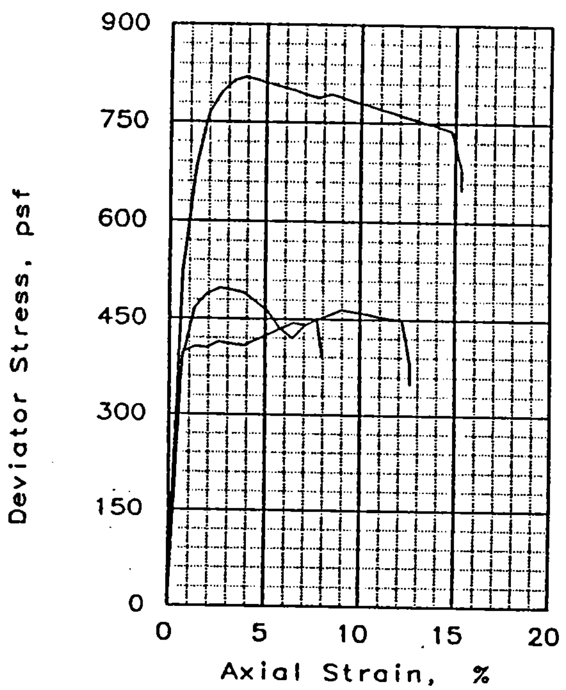
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-9U, Sample 22-B, Depth 77.1'
File: UU-7113 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	61.4	56.5	62.9
	DRY DENSITY, pcf	59.9	64.4	59.9
	SATURATION, %	90.7	93.6	92.8
	VOID RATIO	1.853	1.654	1.857
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.81	2.80	2.80
AT TEST	WATER CONTENT, %	68.4	60.5	67.5
	DRY DENSITY, pcf	59.5	64.4	60.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.875	1.657	1.851
	DIAMETER, in	1.41	1.41	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.0997	0.0952	0.0978
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		498	413	820
ULTIMATE STRESS, psf		348	391	649
σ_1 FAILURE, psf		1506	2429	3844
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns org & dec wd
LL= 103 PL= 32 PI= 71
SPECIFIC GRAVITY= 2.74
REMARKS:

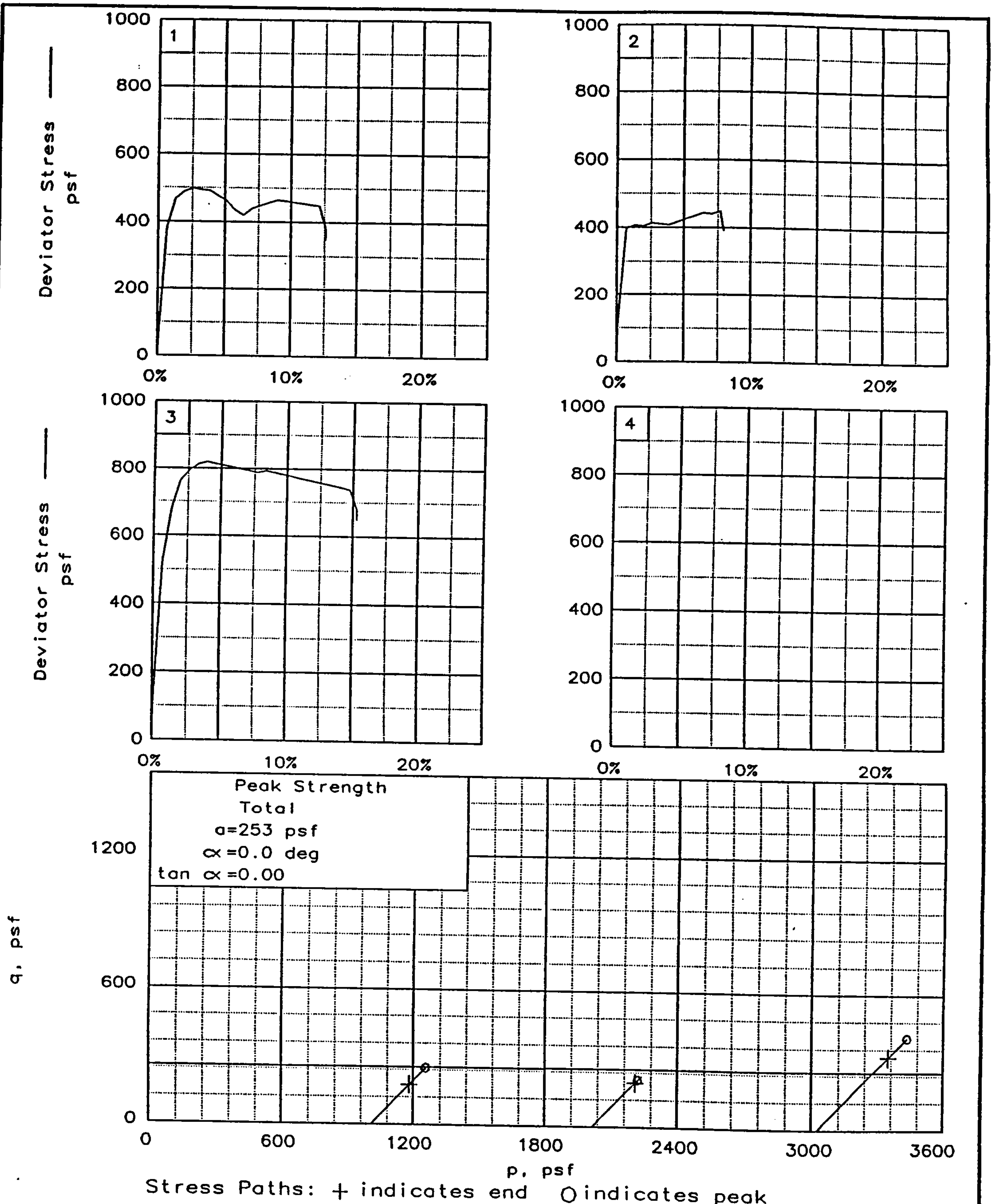
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-10U,
Sample 3-D, Depth 10.8'
PROJ. NO.: 13622 DATE: 7-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

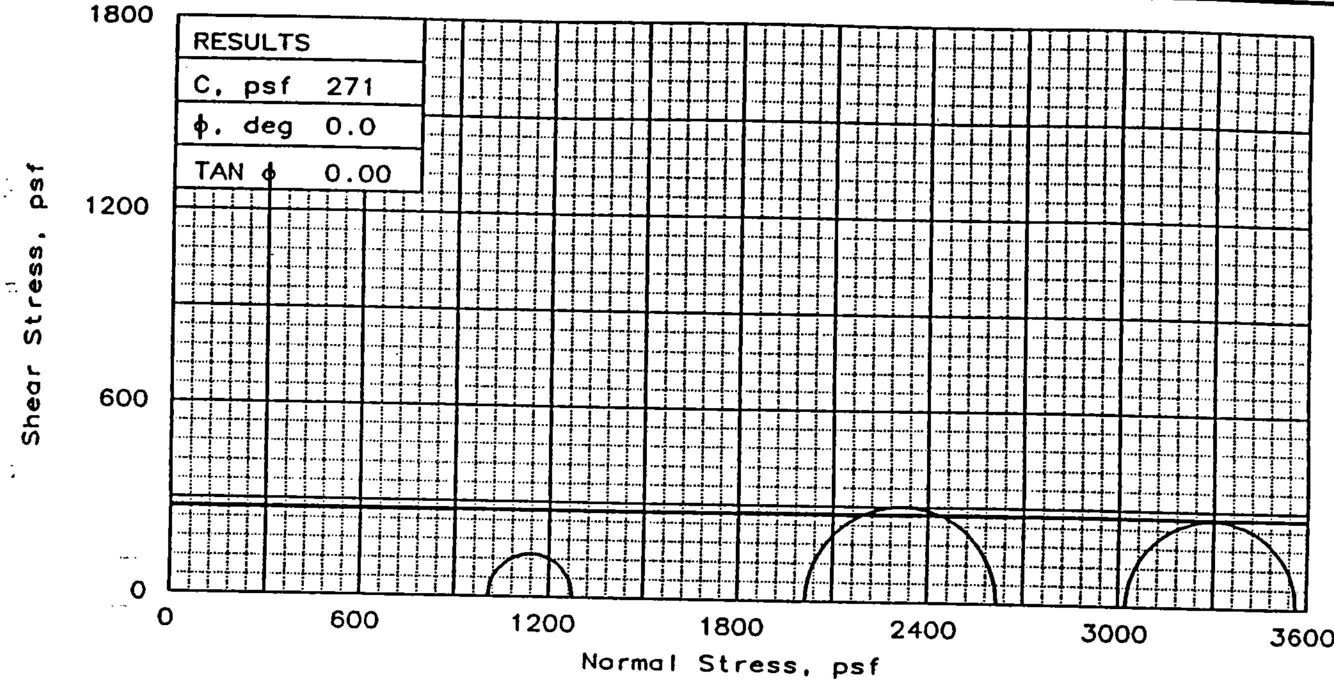


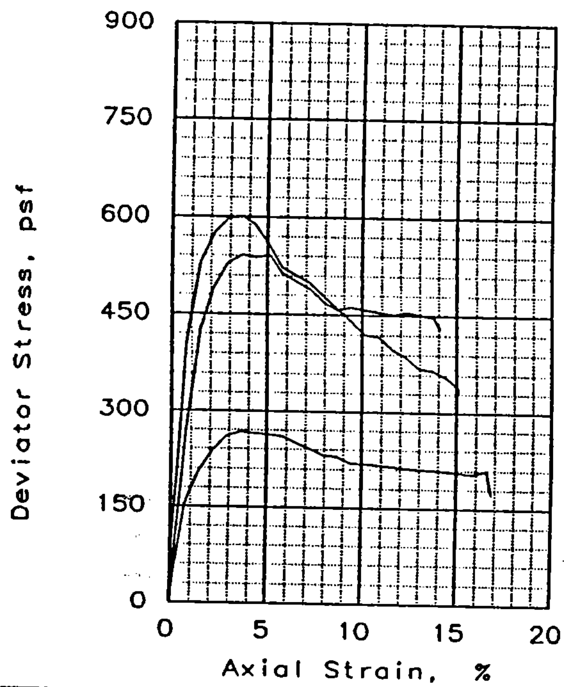
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-10U, Sample 3-D, Depth 10.8'

File: UU-7114 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	61.0	67.9	69.6
	DRY DENSITY, pcf	63.7	60.3	59.0
	SATURATION, %	99.2	101.2	100.4
	VOID RATIO	1.685	1.838	1.899
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.81	2.81	2.82
AT TEST	WATER CONTENT, %	61.9	68.2	71.6
	DRY DENSITY, pcf	63.4	59.6	57.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.696	1.868	1.962
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.80	2.80	2.80
Strain rate, in/min		0.1155	0.1152	0.1158
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		267	601	542
ULTIMATE STRESS, psf		172	331	431
σ_1 FAILURE, psf		1275	2617	3566
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH3 w/ lyr & lns ML & ars org
LL= 76 PL= 25 PI= 51
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

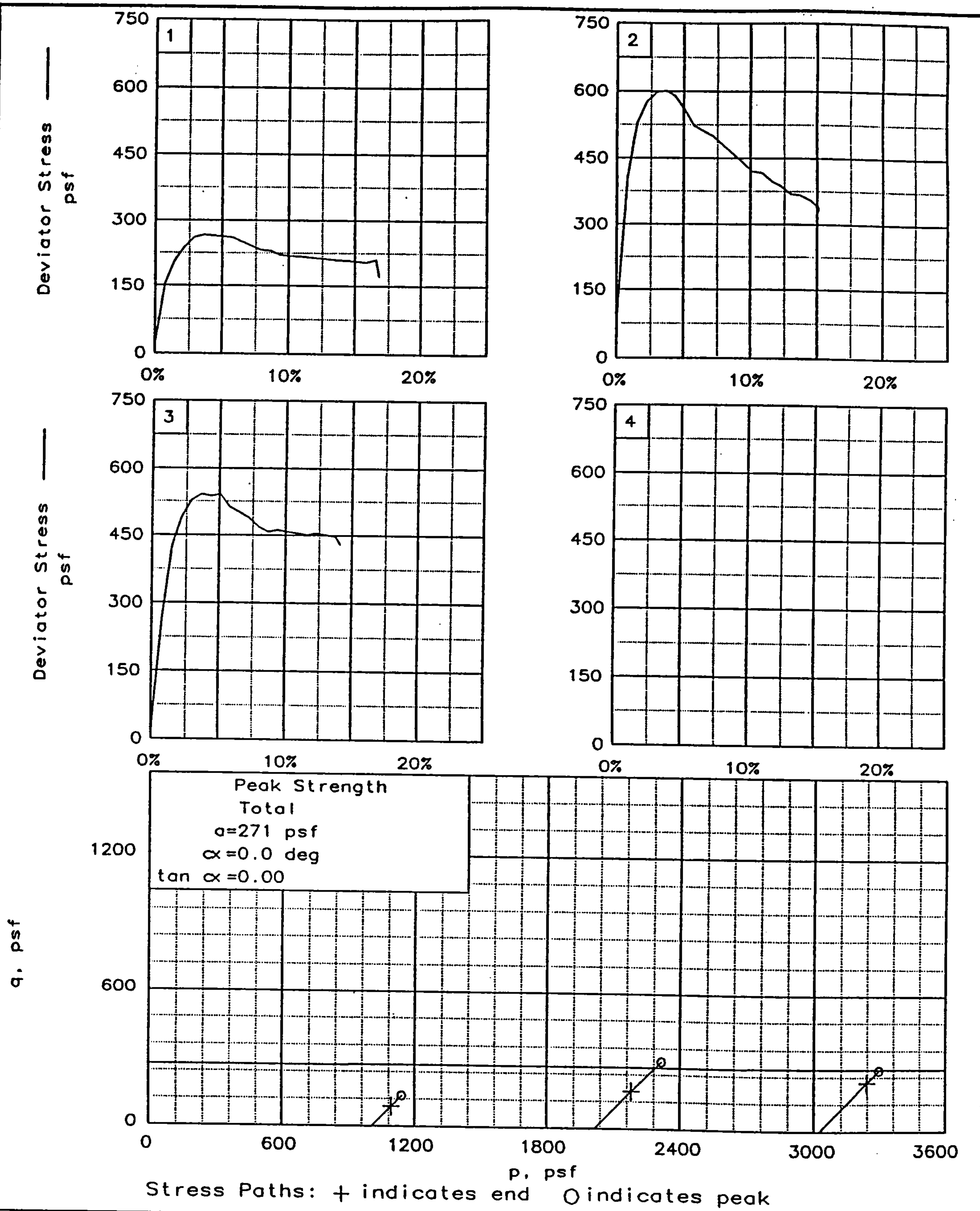
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-10U, Sample 6-B, Depth 21.5'

PROJ. NO.: 13622 DATE: 7-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

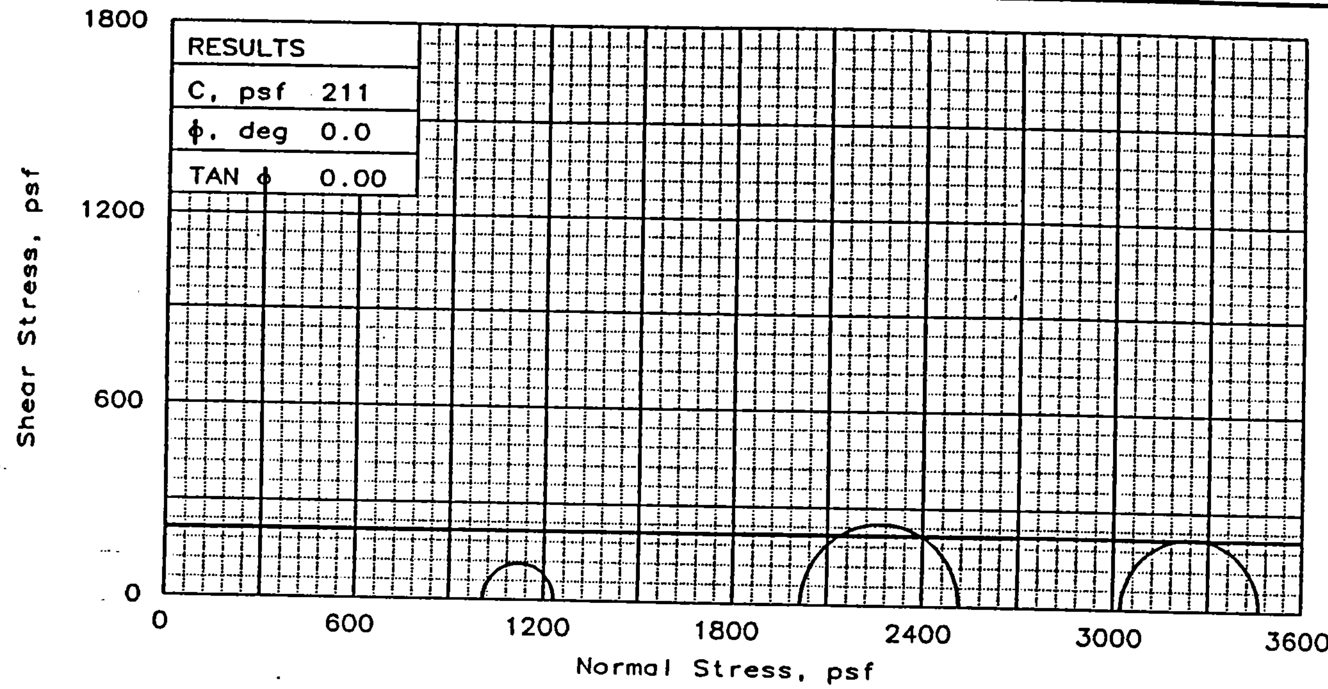


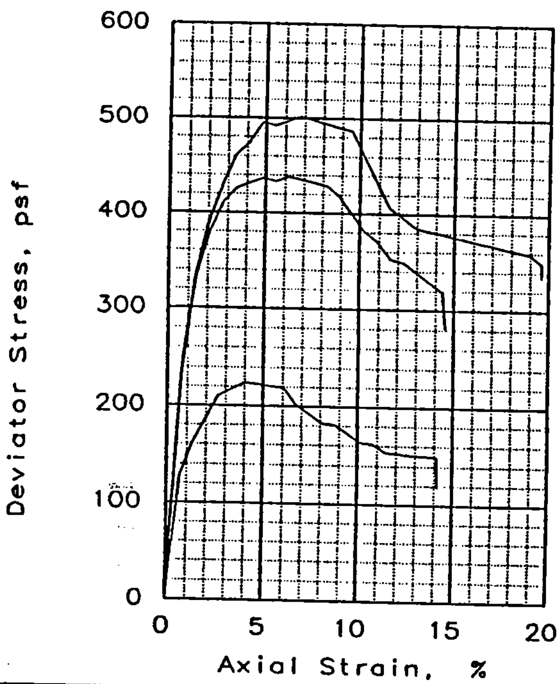
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-10U, Sample 6-B, Depth 21.5'

File: UU-7115 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	70.1	70.3	69.1
	DRY DENSITY, pcf	58.1	57.5	58.3
	SATURATION, %	98.7	97.6	97.9
	VOID RATIO	1.946	1.975	1.933
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	3.00	2.99	2.98
AT TEST	WATER CONTENT, %	73.2	73.4	70.9
	DRY DENSITY, pcf	56.9	56.8	58.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.006	2.011	1.942
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1137	0.1177	0.1161
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		224	501	438
ULTIMATE STRESS, psf		119	335	281
σ_1 FAILURE, psf		1232	2517	3462
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: XSo Gr CH4 w/ Ins ML
LL= 96 PL= 27 PI= 69
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

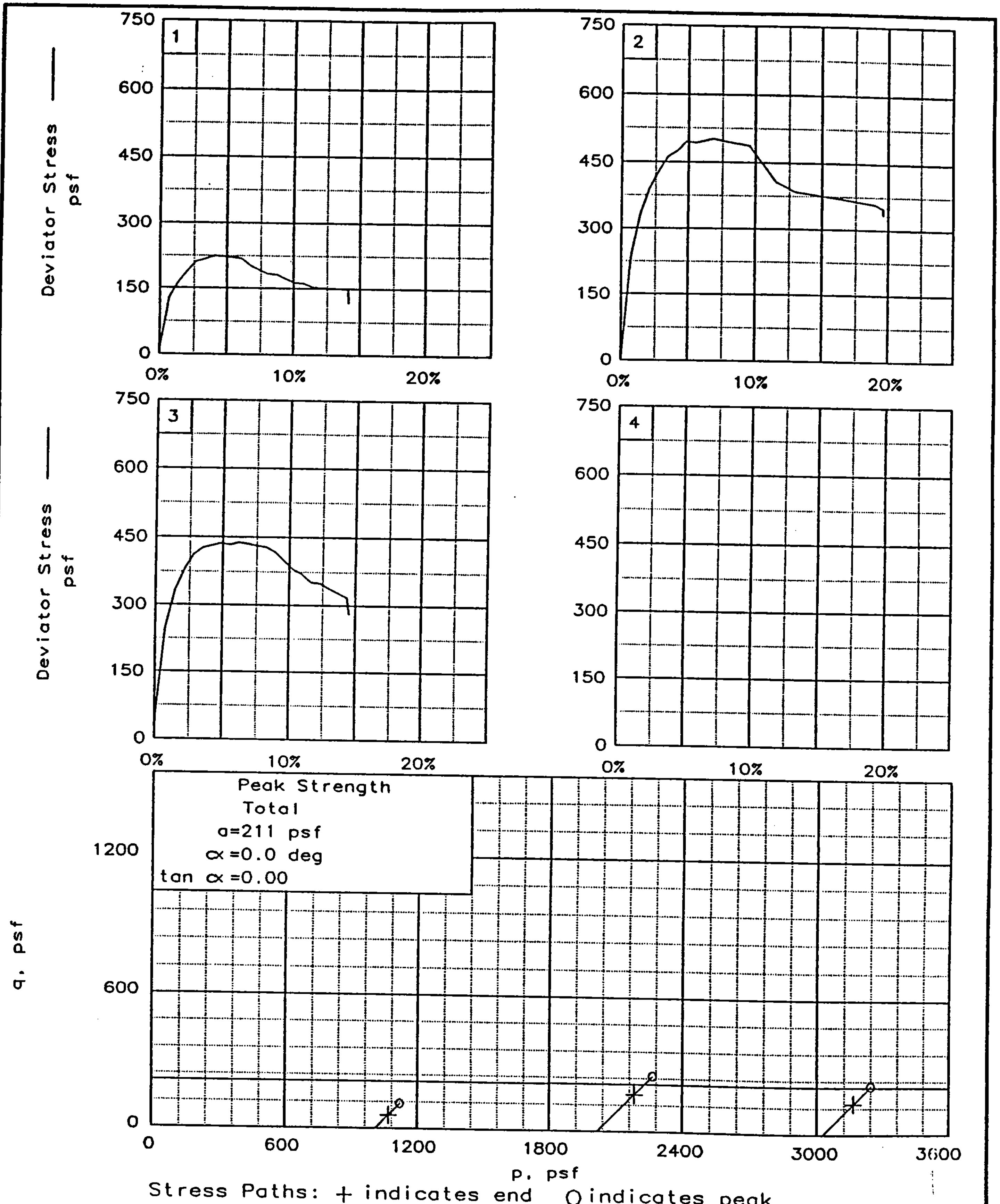
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-10U, Sample 8-D, Depth 30.8'

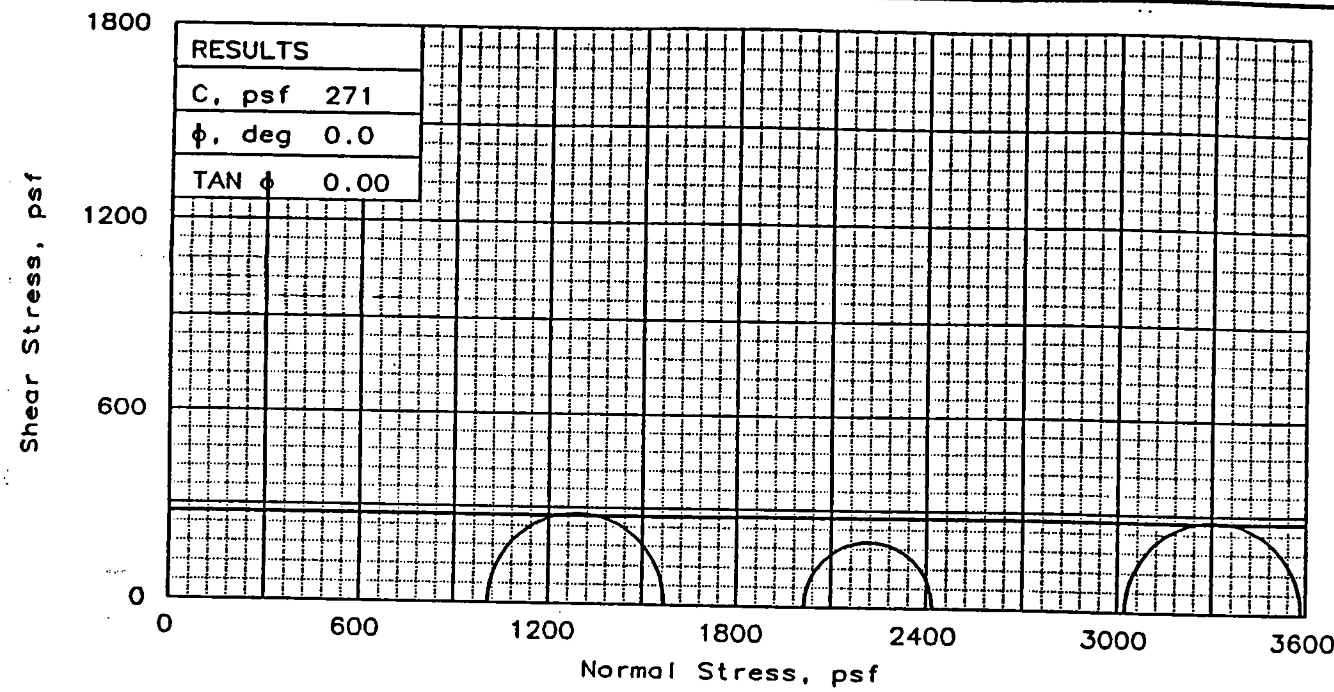
PROJ. NO.: 13622 DATE: 7-25-96

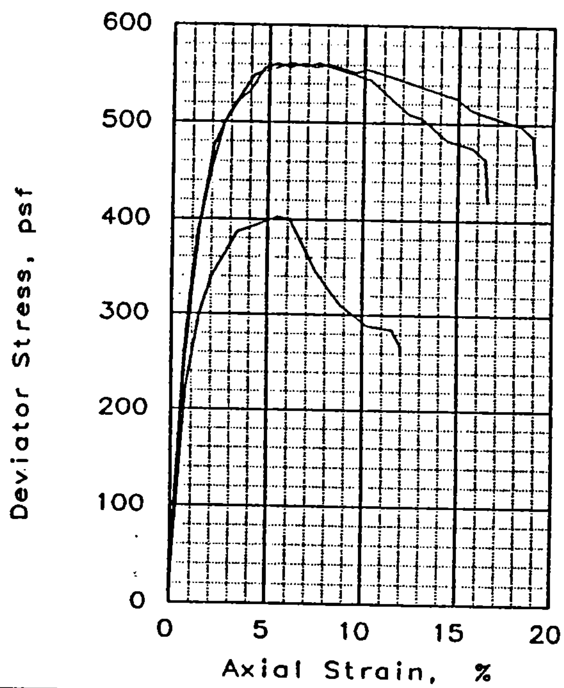
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGE-10U, Sample 8-D, Depth 30.8'
File: UU-7116 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.8	68.1	68.3
	DRY DENSITY, pcf	58.8	58.2	58.0
	SATURATION, %	97.4	96.3	96.0
	VOID RATIO	1.907	1.939	1.949
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.97	2.98	3.00
AT TEST	WATER CONTENT, %	69.3	70.7	73.2
	DRY DENSITY, pcf	59.0	58.3	56.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.898	1.936	2.006
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1149	0.1143	0.1135
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		561	403	560
ULTIMATE STRESS, psf		420	260	436
σ_1 FAILURE, psf		1569	2419	3584
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 86 PL= 27 PI= 59
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

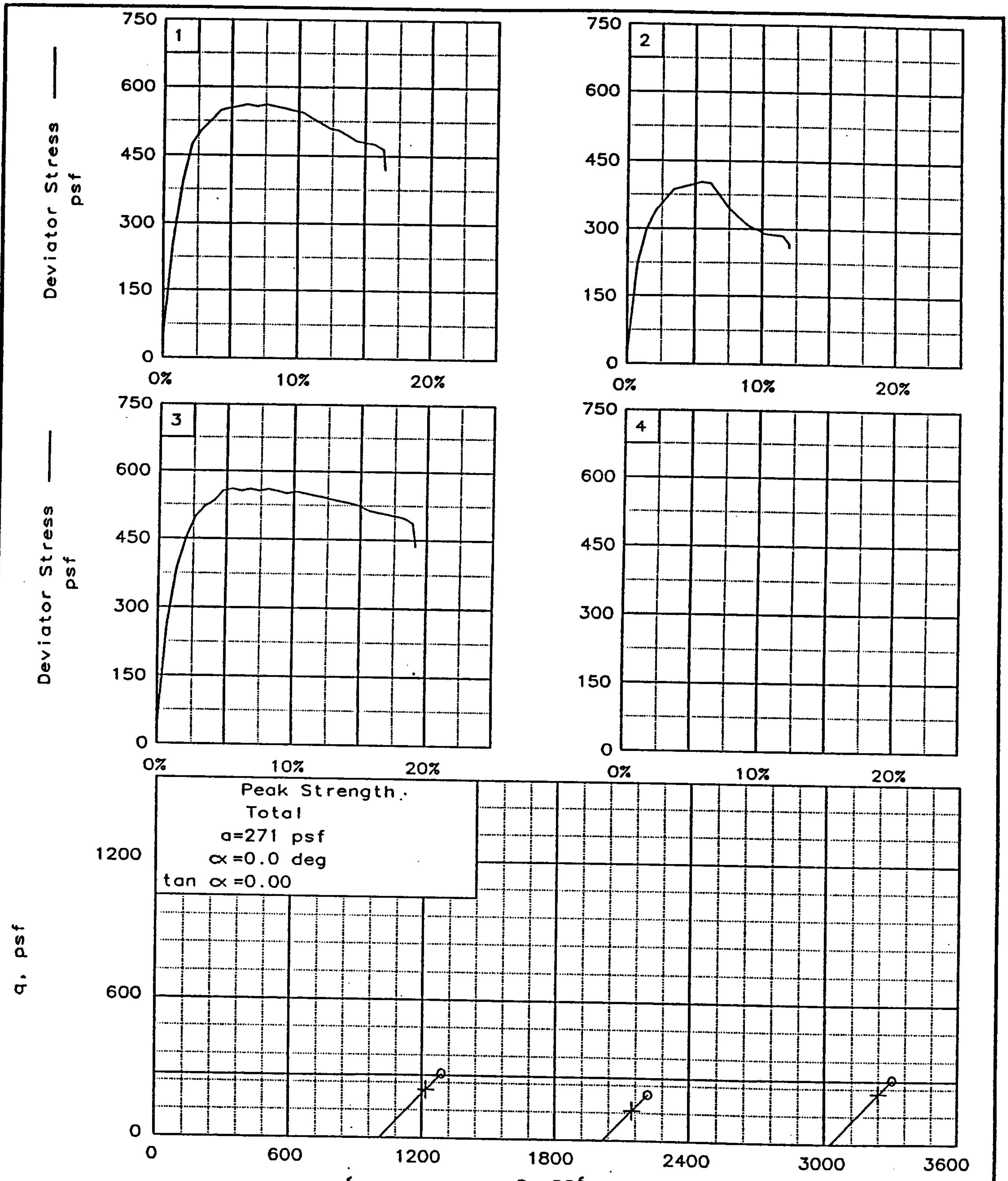
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-10U,
Sample 10-D, Depth 38.8'

PROJ. NO.: 13622 DATE: 7-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



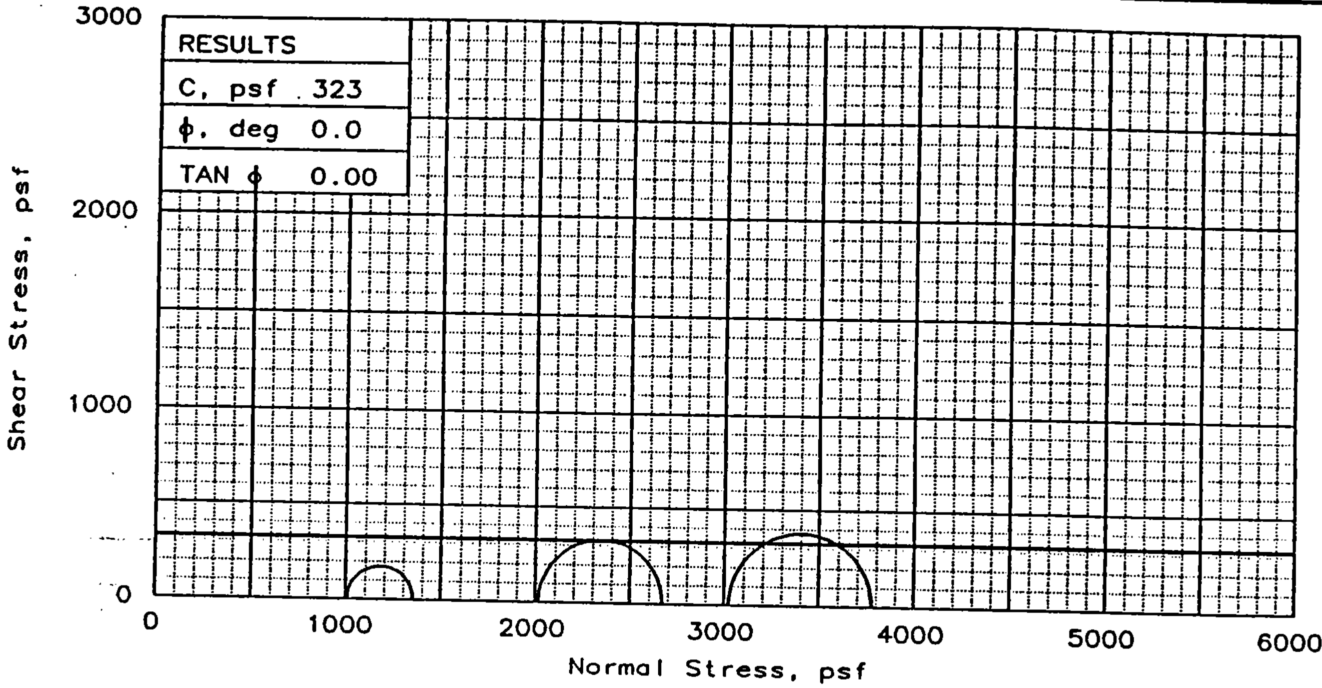
Stress Paths: + indicates end O indicates peak

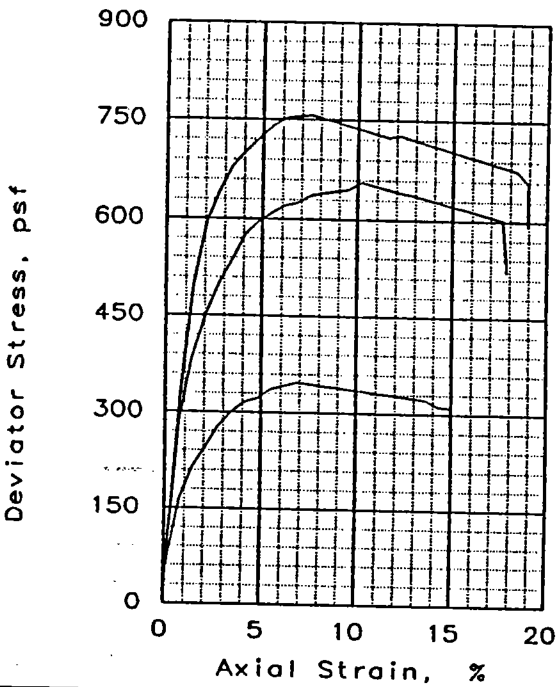
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-10U, Sample 10-D, Depth 38.8'

File: UU-7117 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	53.7	52.5	53.3
	DRY DENSITY, pcf	67.2	68.2	67.6
	SATURATION, %	95.2	95.5	95.4
	VOID RATIO	1.544	1.507	1.530
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	3.01	2.99	3.00
AT TEST	WATER CONTENT, %	59.4	55.9	57.9
	DRY DENSITY, pcf	65.1	67.6	66.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.627	1.532	1.586
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1155	0.1155	0.1134
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		347	657	757
ULTIMATE STRESS, psf		250	522	593
σ_1 FAILURE, psf		1355	2673	3781
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH3
w/ lyr & lns ML
LL= 72 PL= 25 PI= 47
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ____

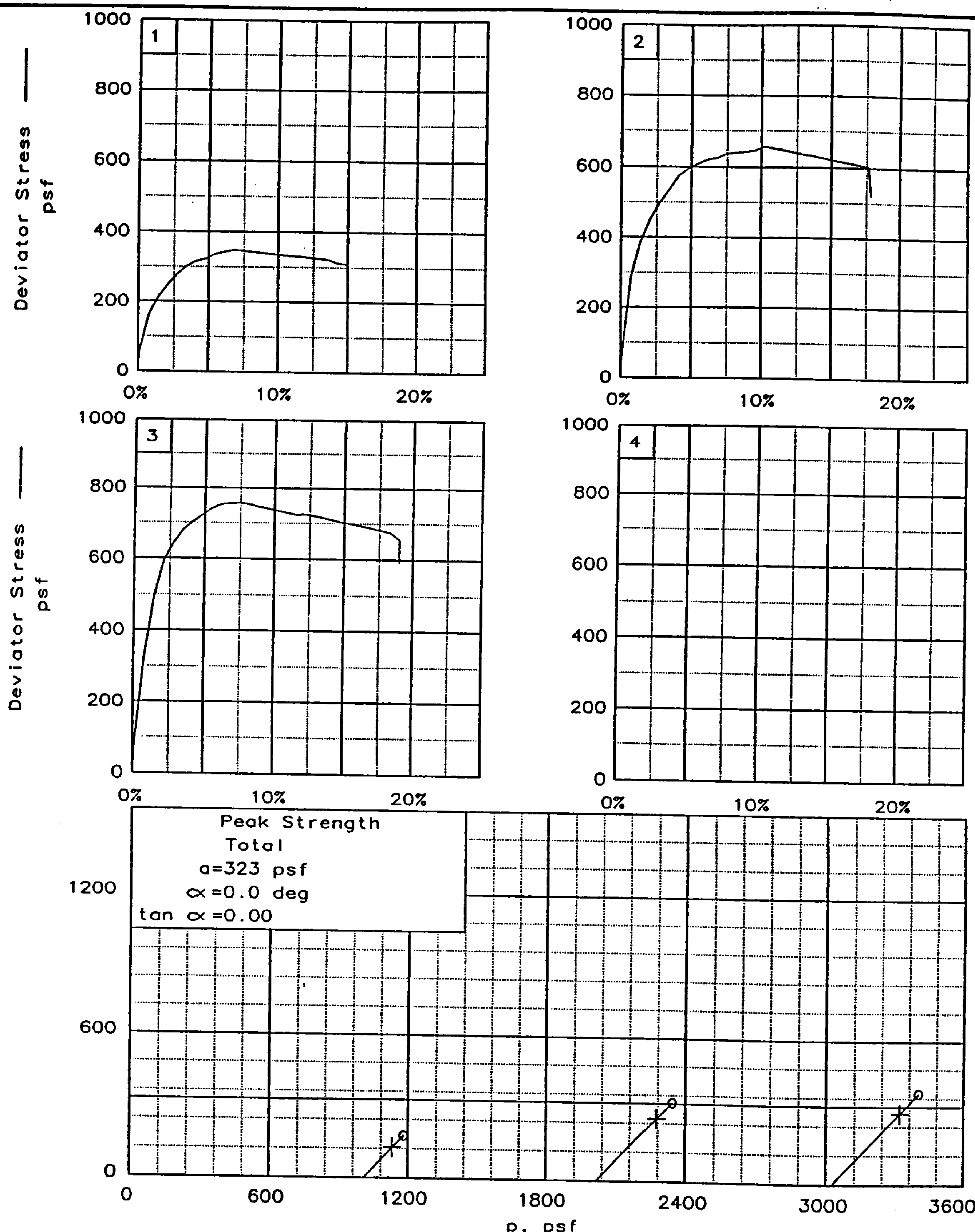
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-10U,
Sample 12-D, Depth 46.8'

PROJ. NO.: 13622 DATE: 7-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



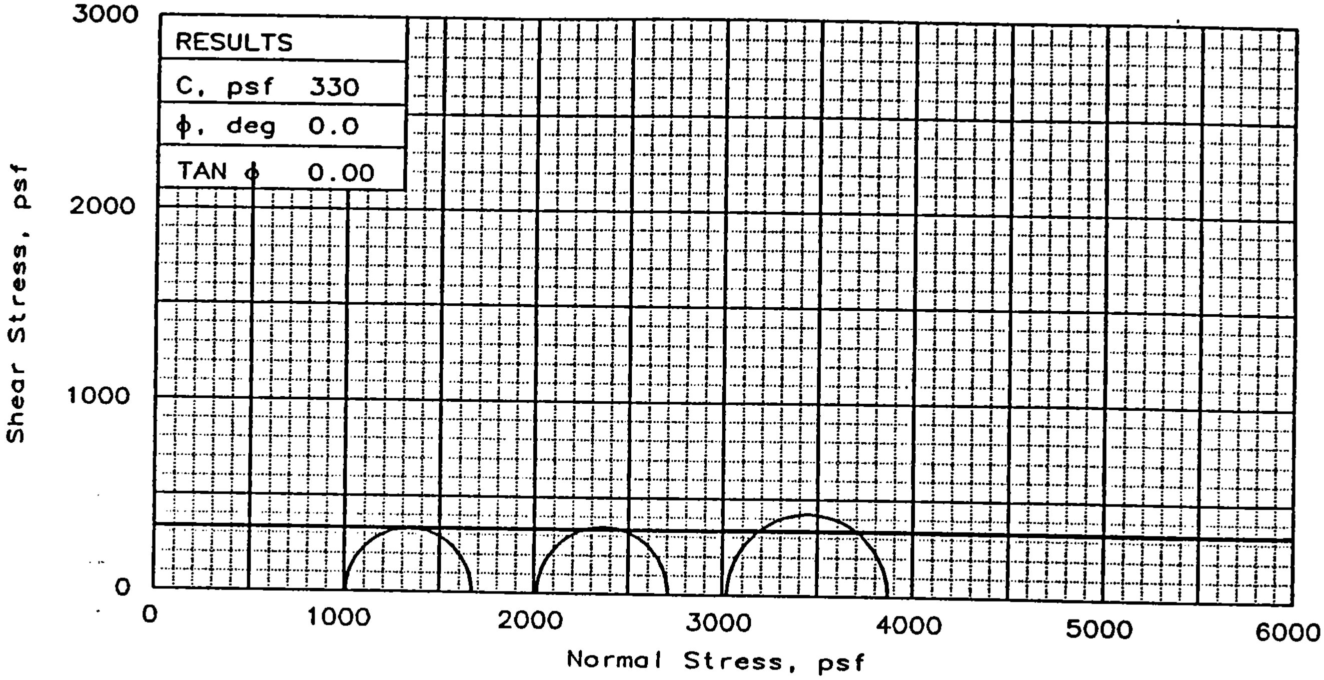
Stress Paths: + indicates end   O indicates peak

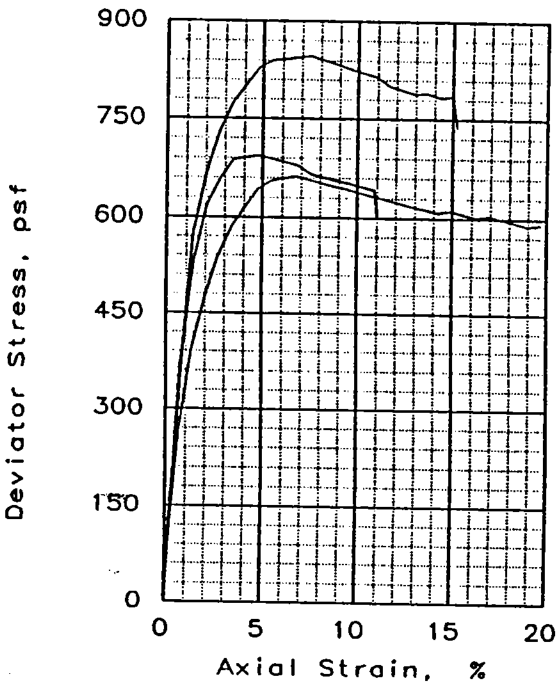
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-10U, Sample 12-D, Depth 46.8'

File: UU-7118   Project No.: 13622   FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	55.6	57.0	56.0
	DRY DENSITY, pcf	66.1	64.6	65.2
	SATURATION, %	96.5	95.2	95.0
	VOID RATIO	1.568	1.630	1.604
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.98	3.00	3.00
AT TEST	WATER CONTENT, %	58.0	62.0	61.4
	DRY DENSITY, pcf	65.9	63.2	63.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.578	1.686	1.670
	DIAMETER, in	1.40	1.40	1.40
	HEIGHT, in	2.97	2.98	2.98
Strain rate, in/min		0.1137	0.1129	0.1165
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		662	694	846
ULTIMATE STRESS, psf		591	601	738
σ_1 FAILURE, psf		1670	2710	3870
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ ars ML
LL= 80 PL= 28 PI= 52
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

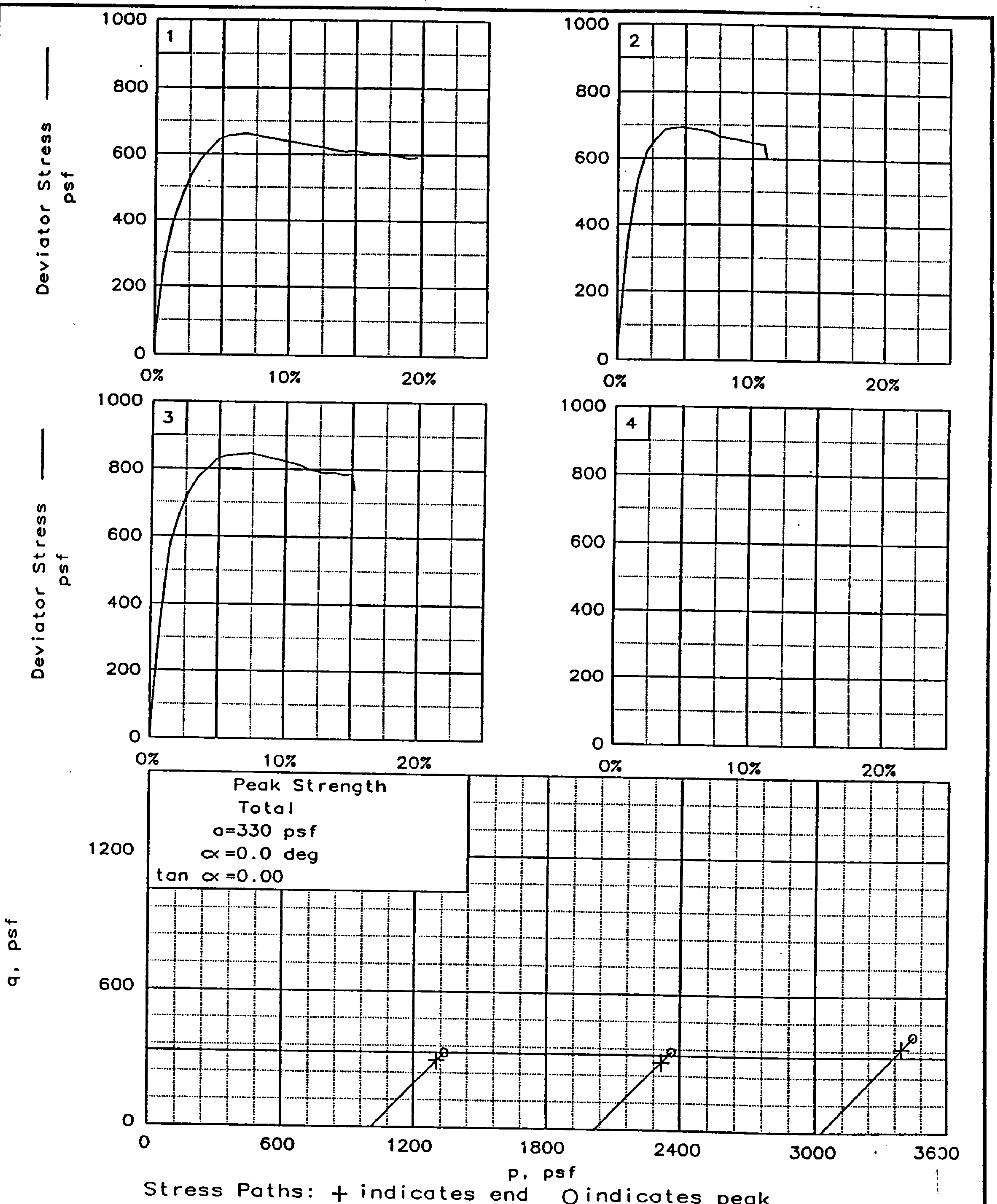
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGE-10U,
Sample 14-D, Depth 54.7'

PROJ. NO.: 13622 DATE: 7-25-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

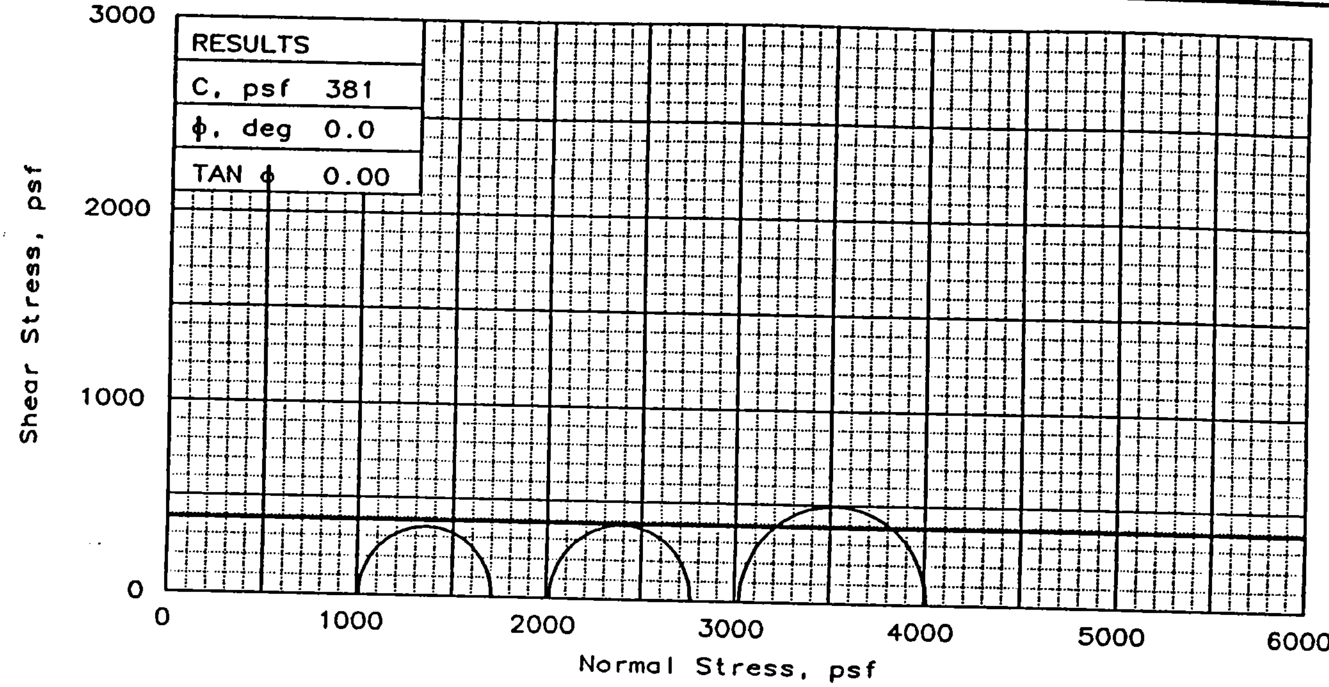


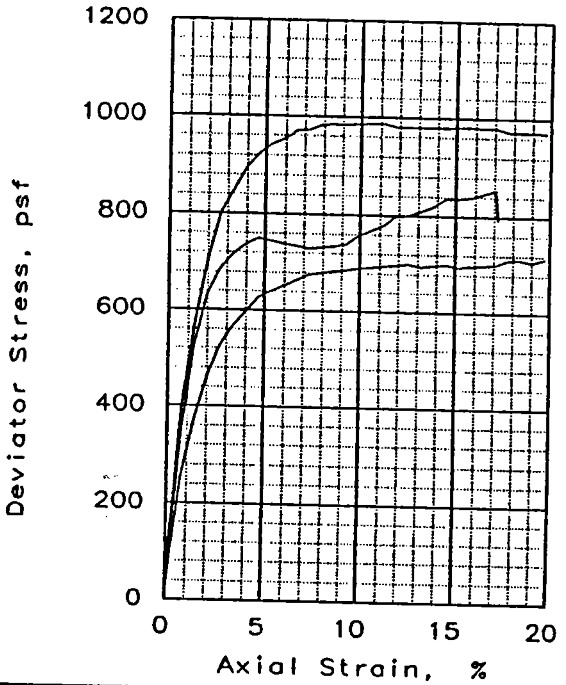
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGE-10U, Sample 14-D, Depth 54.7'

File: UU-7119 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	69.8	71.6	72.8
	DRY DENSITY, pcf	57.8	56.1	54.7
	SATURATION, %	97.9	96.1	94.0
	VOID RATIO	1.940	2.027	2.106
	DIAMETER, in	1.37	1.37	1.38
	HEIGHT, in	2.97	2.96	2.96
AT TEST	WATER CONTENT, %	71.6	73.7	76.1
	DRY DENSITY, pcf	57.6	56.5	55.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.948	2.004	2.069
	DIAMETER, in	1.37	1.37	1.38
	HEIGHT, in	2.97	2.97	2.97
Strain rate, in/min		0.1114	0.1109	0.1115
BACK PRESSURE, psf		0	0	0
OELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		701	750	987
ULTIMATE STRESS, psf		715	793	971
σ_1 FAILURE, psf		1709	2766	4011
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4 w/ ox, lns & ars ML, lg ars org, dw
LL= 98 PL= 32 PI= 66
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

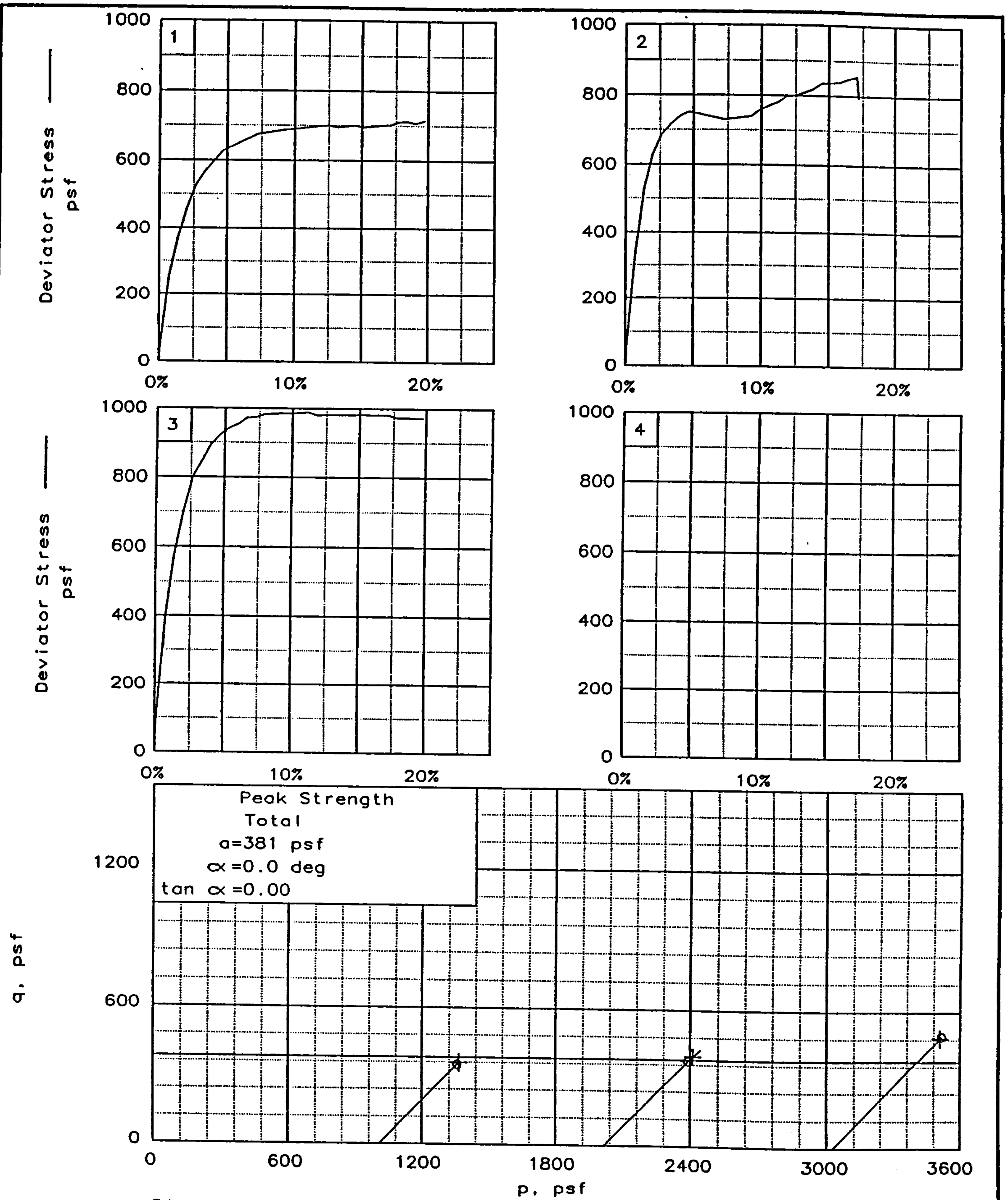
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-1U,
Sample 3-C, Depth 6.1'

PROJ. NO.: 13622 DATE: 7-30-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



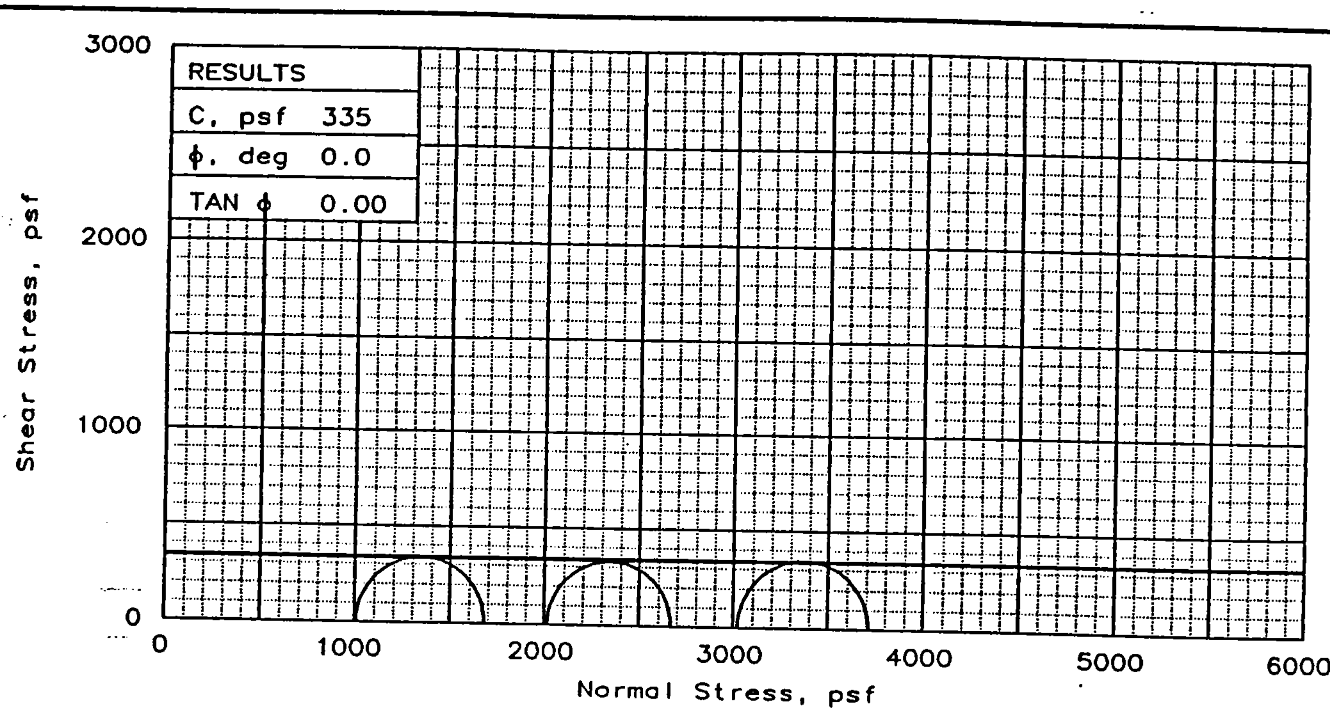
Stress Paths: + indicates end O indicates peak

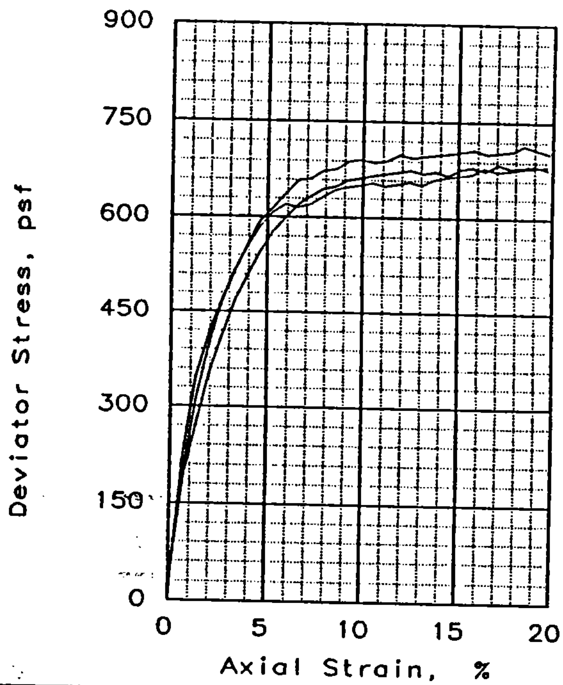
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-1U, Sample 3-C, Depth 6.1'

File: UU-7182 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	43.3	42.2	42.7
	DRY DENSITY, pcf	78.8	79.7	79.7
	SATURATION, %	101.3	100.9	102.2
	VOID RATIO	1.170	1.145	1.145
	DIAMETER, in	1.38	1.37	1.37
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	43.0	42.2	41.7
	DRY DENSITY, pcf	78.5	79.4	79.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.179	1.155	1.142
	DIAMETER, in	1.38	1.37	1.37
	HEIGHT, in	2.97	2.98	2.97
Strain rate, in/min		0.1089	0.1114	0.1124
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		676	654	692
ULTIMATE STRESS, psf		678	682	703
σ_1 FAILURE, psf		1684	2670	3716
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CL6 w/ Ins ML
LL= 47 PL= 18 PI= 29
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

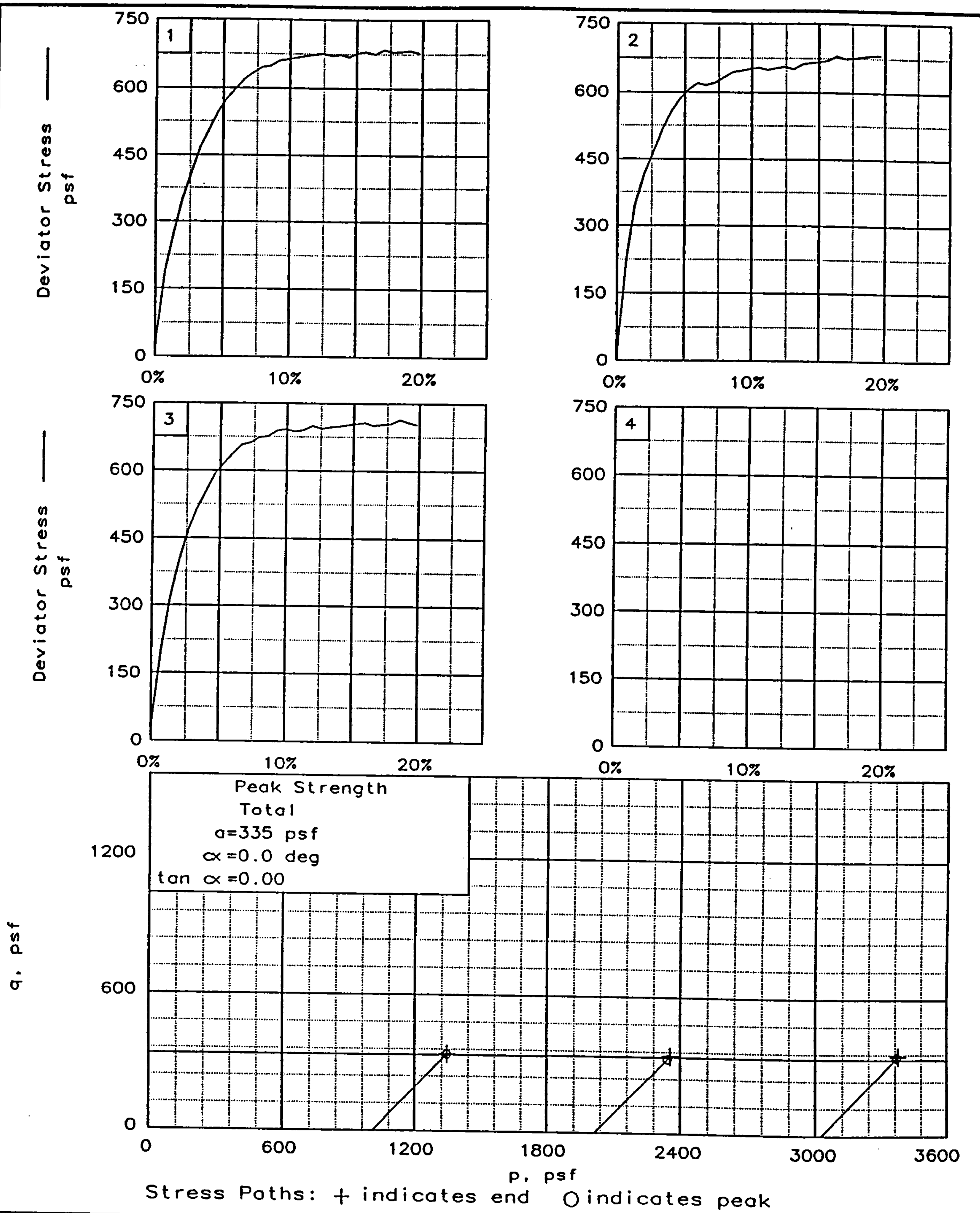
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-1U, Sample 6-B, Depth 18.9'

PROJ. NO.: 13622 DATE: 7-30-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

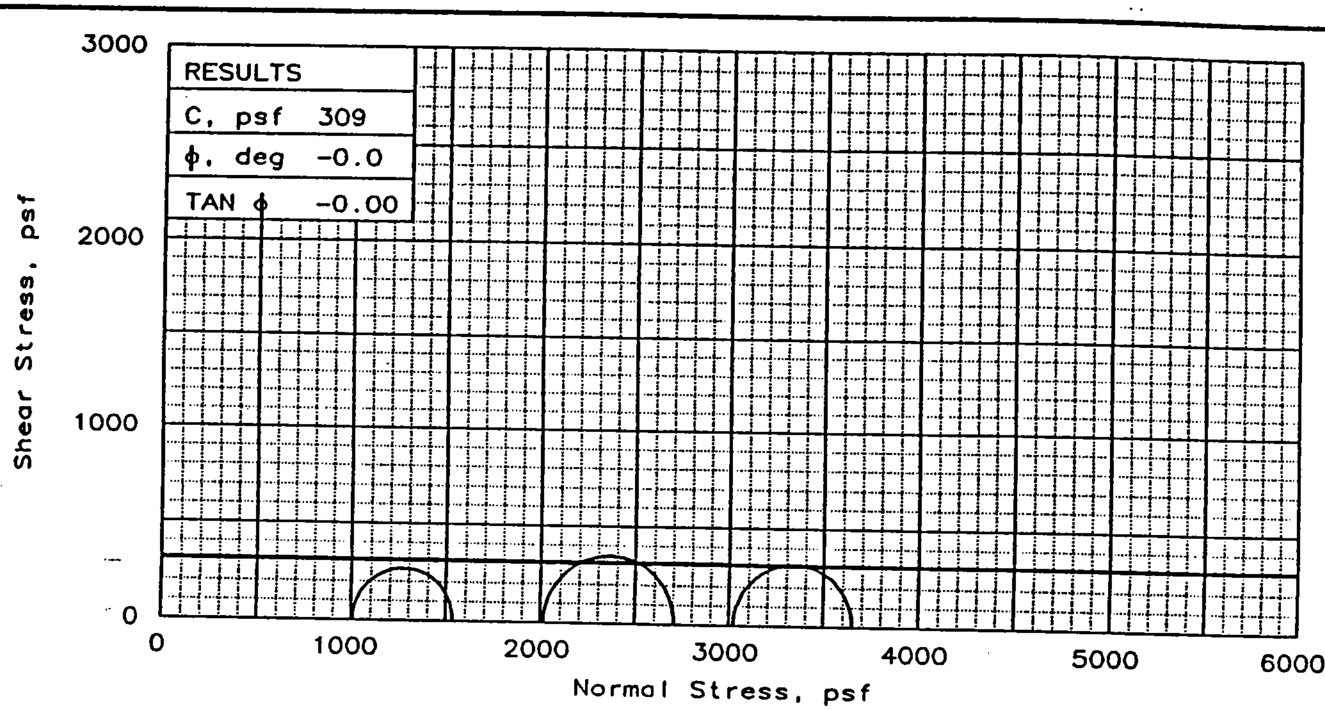


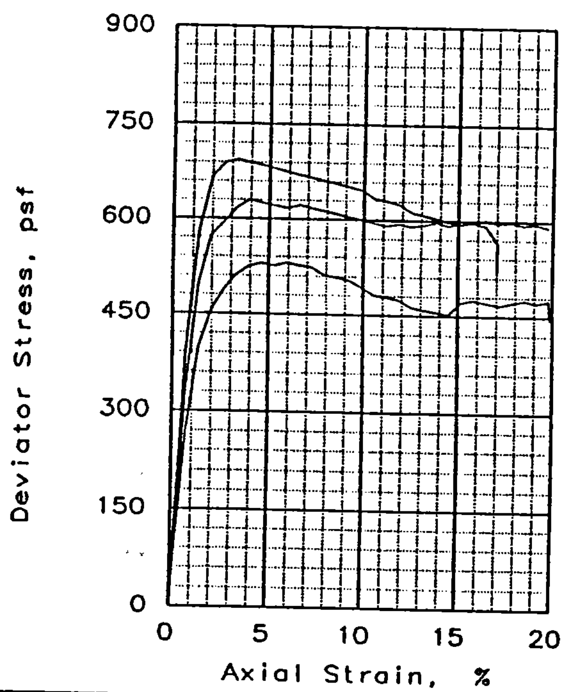
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-1U, Sample 6-B, Depth 18.9'

File: UU-7183 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	66.8	62.9	61.9
	DRY DENSITY, pcf	60.3	63.5	63.6
	SATURATION, %	99.7	101.7	100.4
	VOID RATIO	1.836	1.694	1.690
	DIAMETER, in	1.38	1.38	1.37
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	67.3	62.0	61.5
	DRY DENSITY, pcf	60.1	63.4	63.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.844	1.699	1.685
	DIAMETER, in	1.38	1.38	1.37
	HEIGHT, in	2.97	2.97	2.98
Strain rate, in/min		0.1121	0.1065	0.1116
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		531	694	630
ULTIMATE STRESS, psf		445	521	591
σ_1 FAILURE, psf		1539	2710	3654
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ Ins ML
LL= 93 PL= 27 PI= 66
SPECIFIC GRAVITY= 2.74
REMARKS:

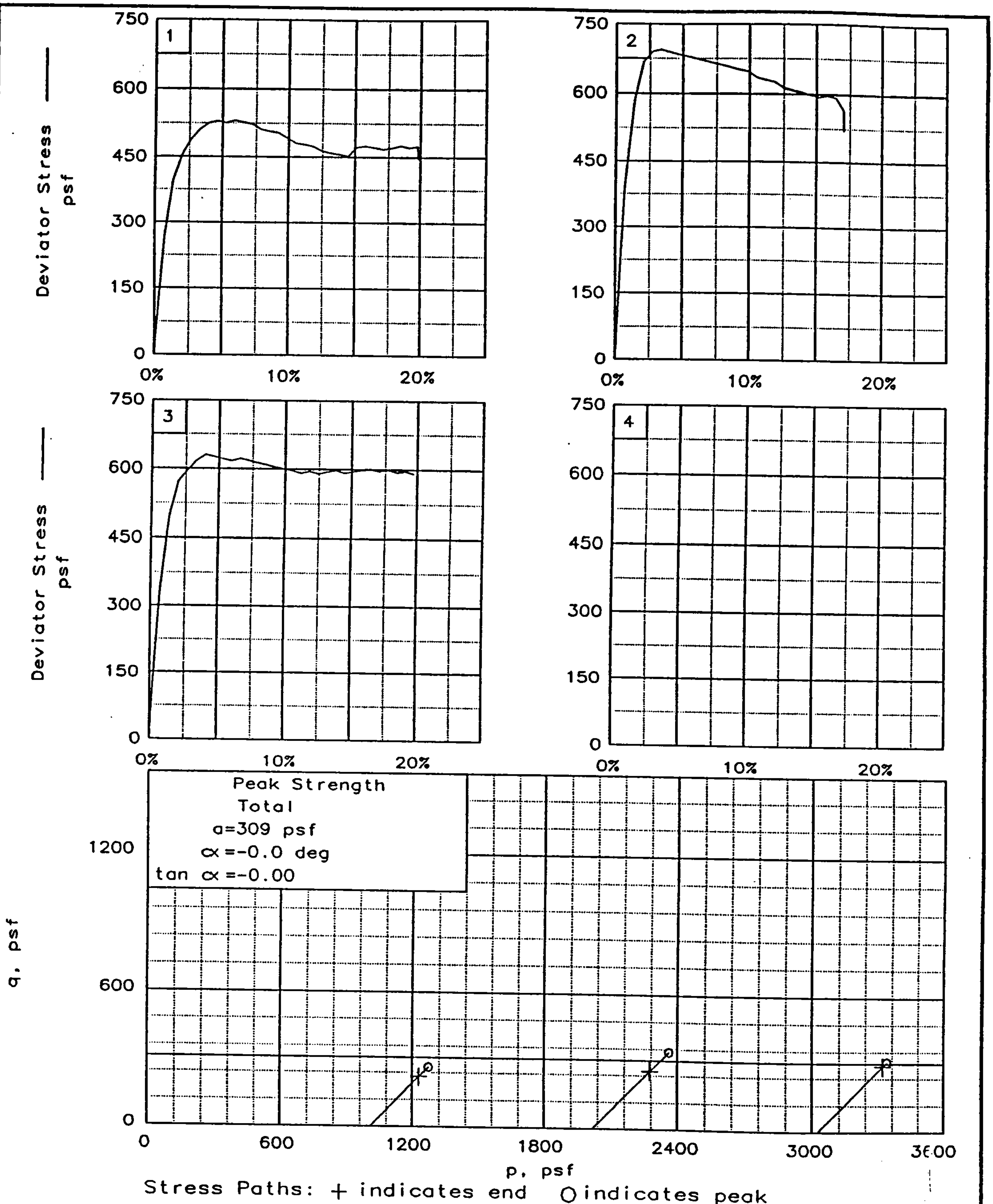
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-1U,
Sample 8-B, Depth 24.1'
PROJ. NO.: 13622 DATE: 7-30-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

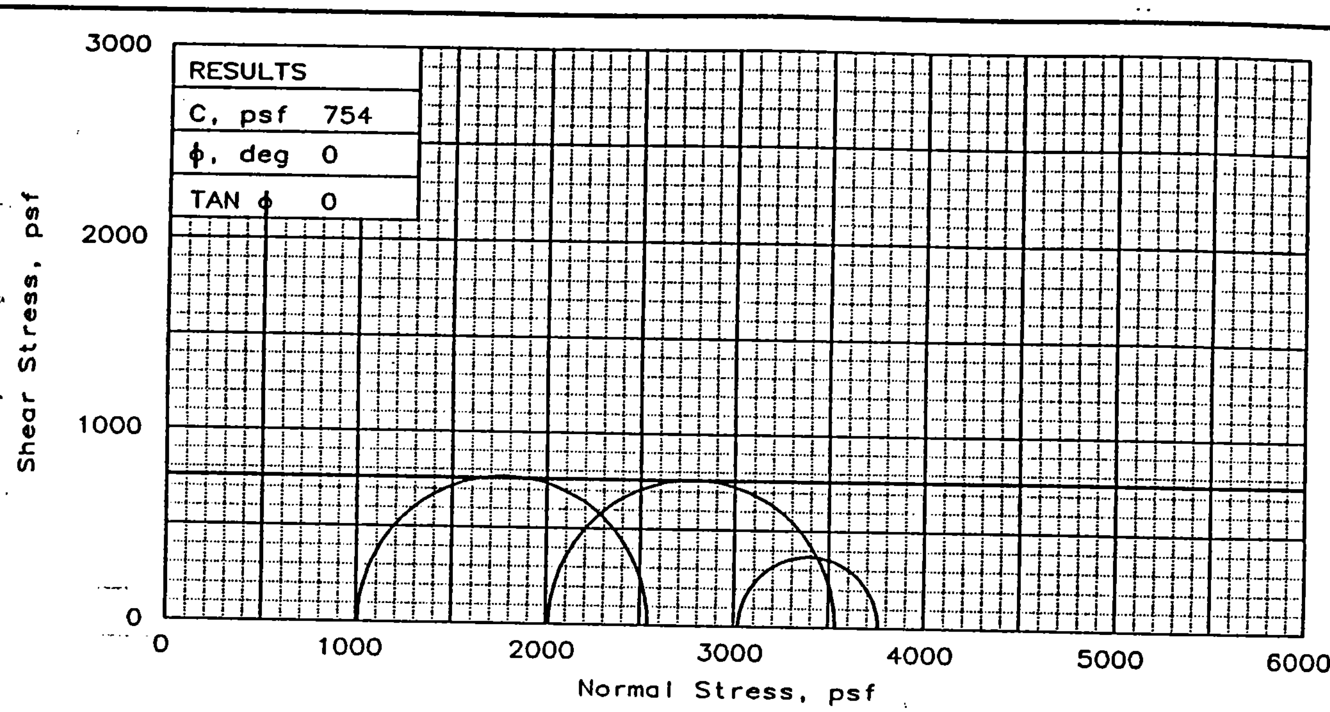


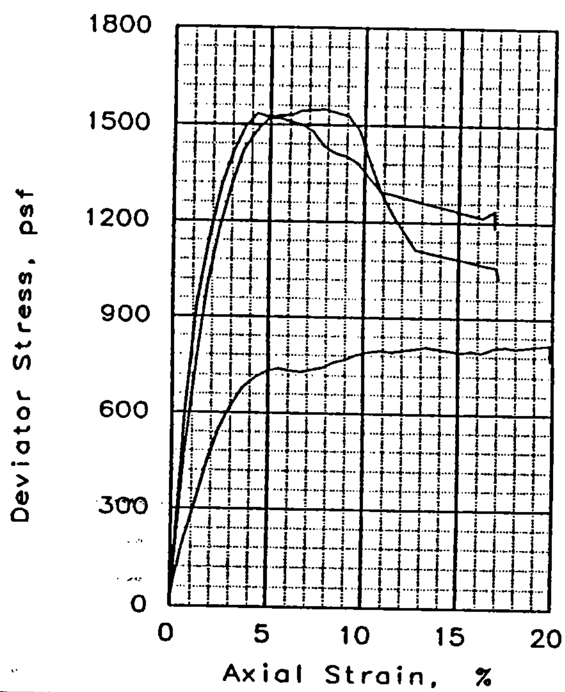
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-1U, Sample 8-B, Depth 24.1'

File: UU-7184 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.4	47.0	45.2
	DRY DENSITY, pcf	70.0	73.0	68.3
	SATURATION, %	103.8	96.3	82.8
	VOID RATIO	1.426	1.326	1.486
	DIAMETER, in	1.38	1.38	1.40
	HEIGHT, in	2.97	2.97	2.98
AT TEST	WATER CONTENT, %	52.6	47.8	53.9
	DRY DENSITY, pcf	69.9	73.8	68.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.431	1.301	1.465
	DIAMETER, in	1.38	1.38	1.40
	HEIGHT, in	2.97	2.98	2.99
Strain rate, in/min		0.0985	0.0995	0.1015
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1534	1519	739
ULTIMATE STRESS, psf		1026	1185	768
σ_1 FAILURE, psf		2542	3535	3763
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ ors SM
LL= 73 PL= 25 PI= 48
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

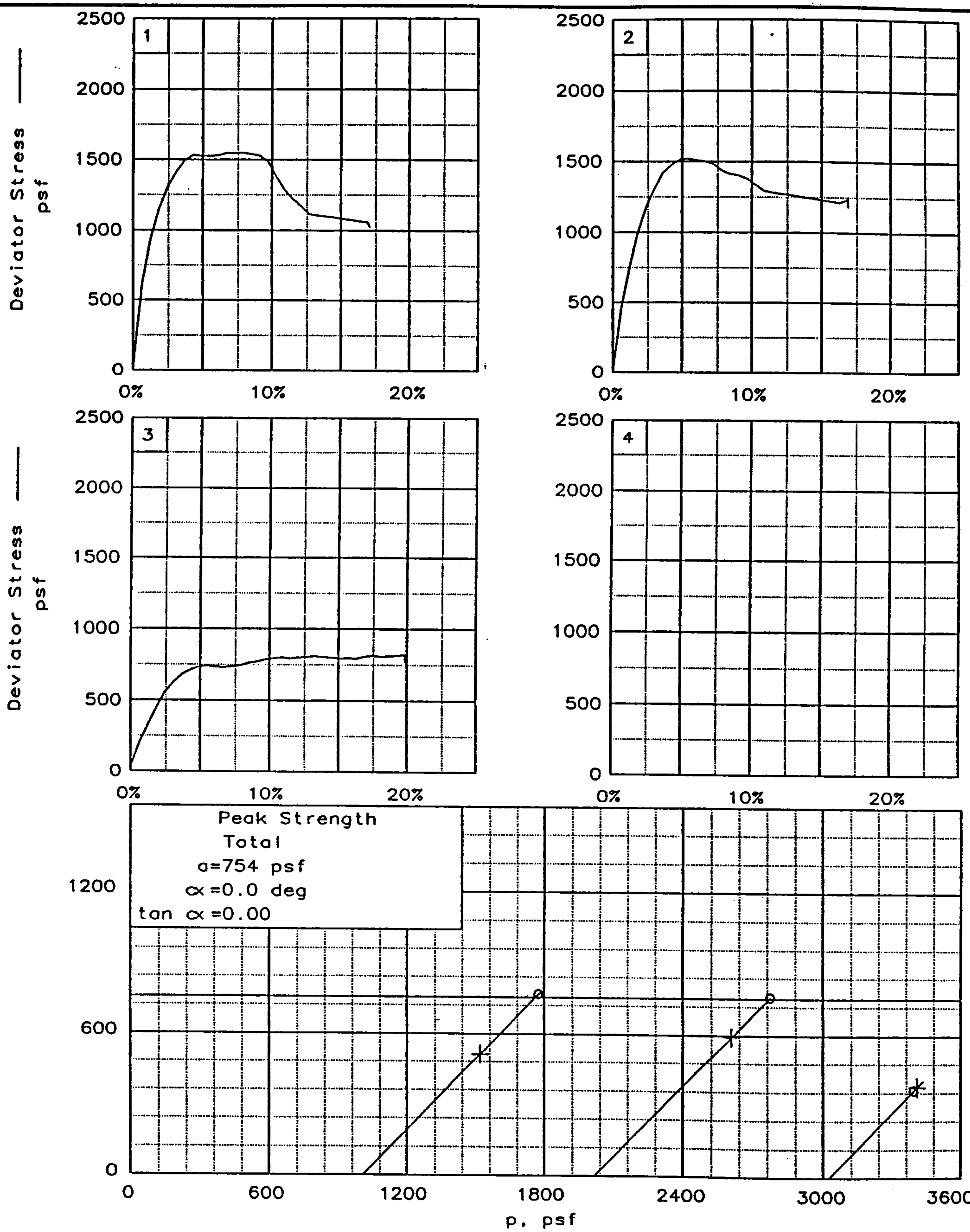
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-1U,
Sample 22-C, Depth 55.1'

PROJ. NO.: 13622 DATE: 7-30-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



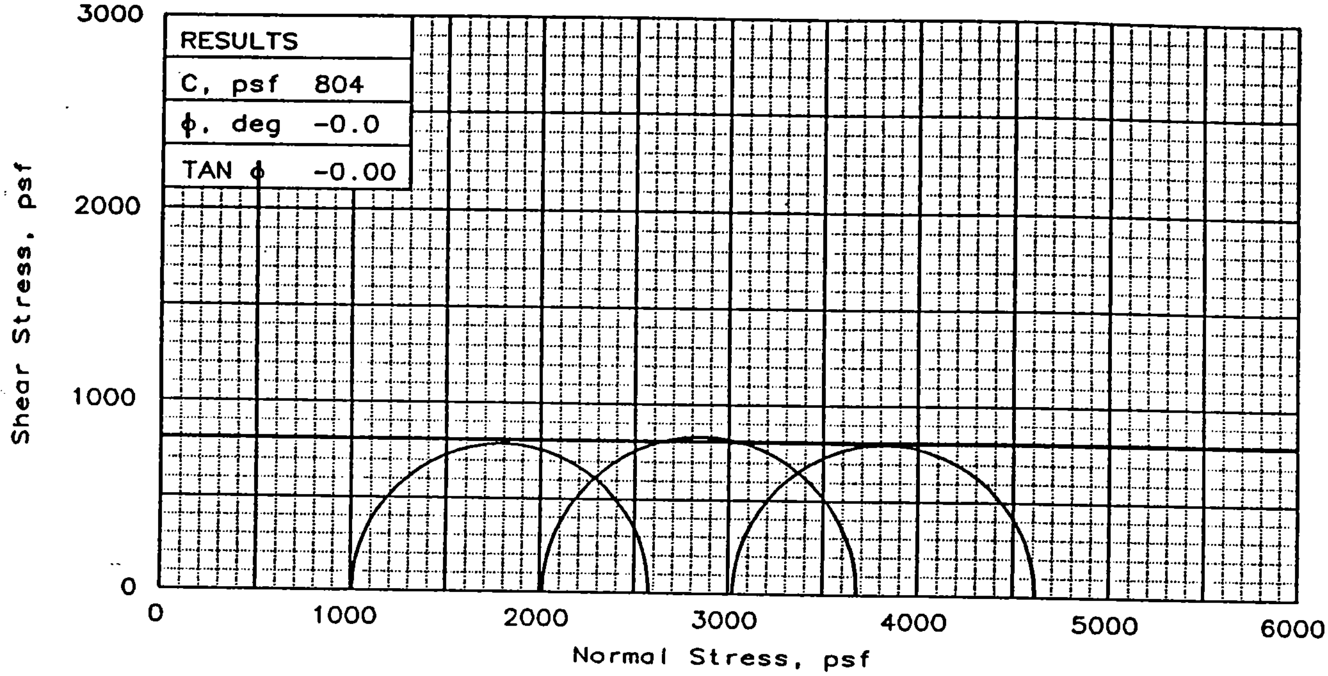
Stress Paths: + indicates end O indicates peak

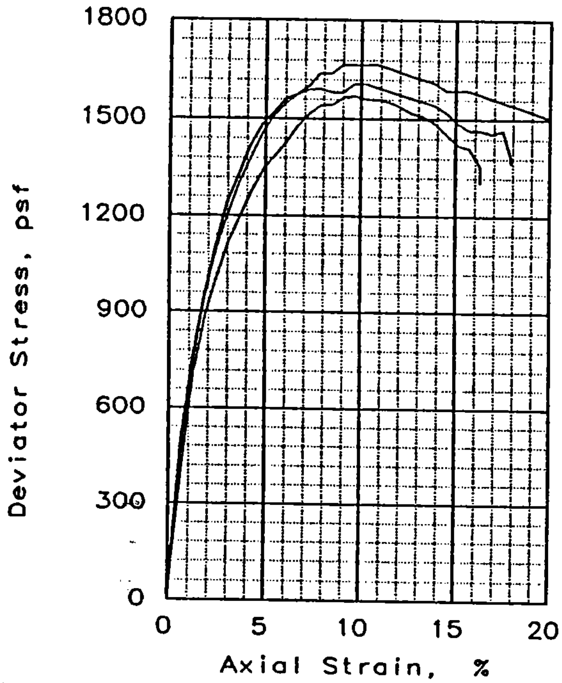
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-1U, Sample 22-C, Depth 55.1'

File: UU-7185 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	43.6	41.6	41.4
	DRY DENSITY, pcf	78.3	79.3	75.7
	SATURATION, %	101.3	99.2	90.6
	VOID RATIO	1.170	1.140	1.243
	DIAMETER, in	1.38	1.38	1.39
	HEIGHT, in	2.97	2.97	2.96
AT TEST	WATER CONTENT, %	42.7	41.2	44.7
	DRY DENSITY, pcf	78.6	80.0	76.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.161	1.121	1.215
	DIAMETER, in	1.38	1.38	1.39
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1012	0.1015	0.1016
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1570	1665	1591
ULTIMATE STRESS, psf		1304	1507	1365
σ_1 FAILURE, psf		2578	3681	4615
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ lns & ars ML, few ars org
LL= 65 PL= 25 PI= 40
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

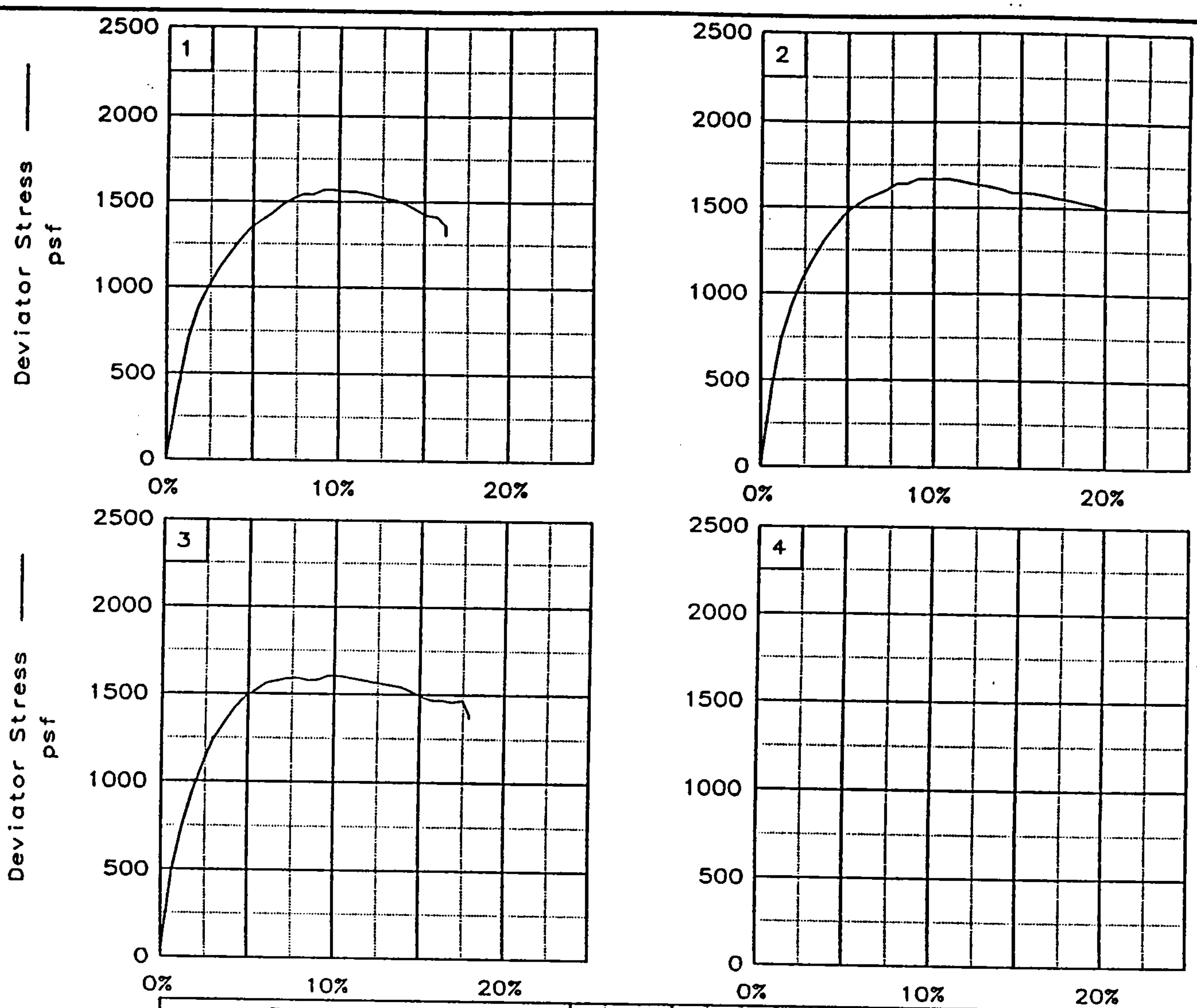
CLIENT: U.S. Army Corps of Engineers

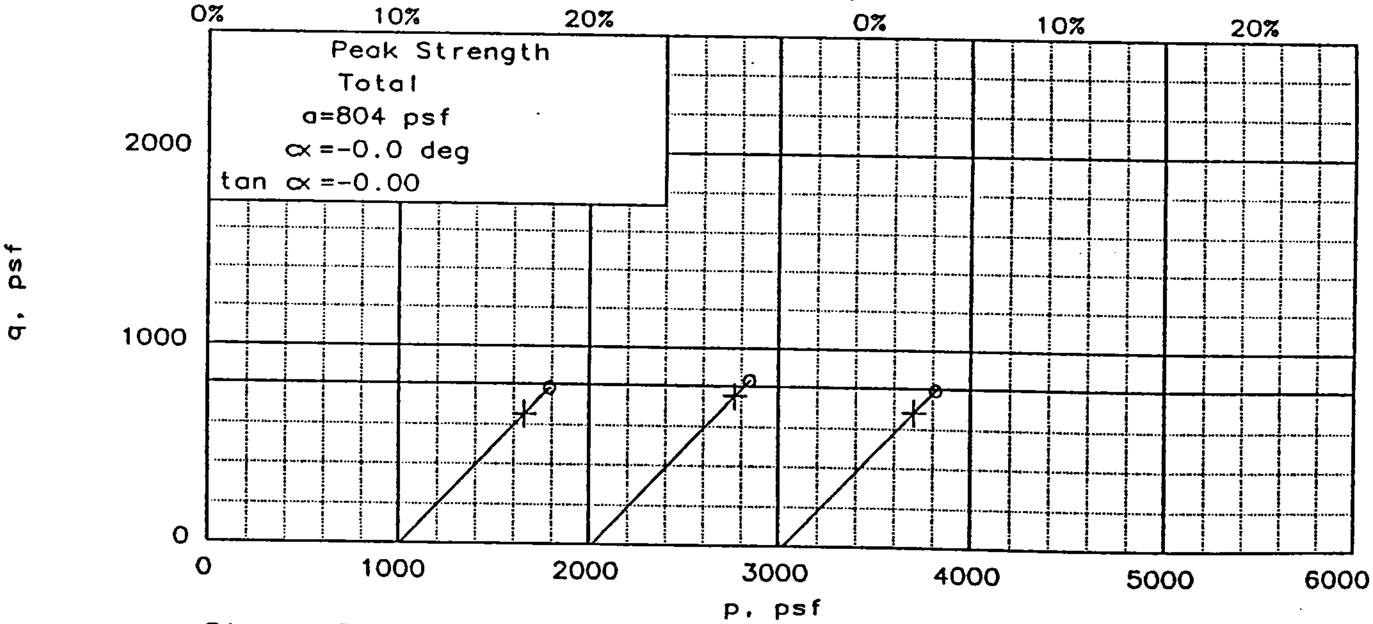
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-1U,
Sample 24-B, Depth 62.4'

PROJ. NO.: 13622 DATE: 7-30-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.





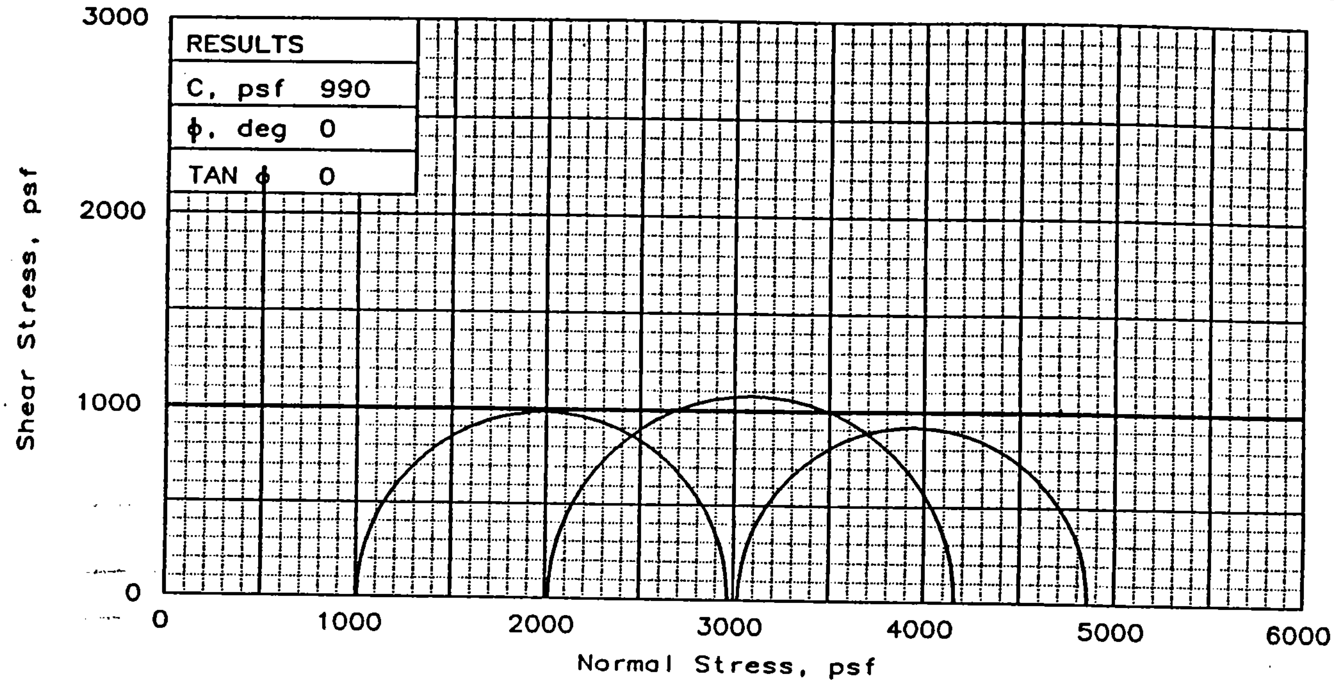
Stress Paths: + indicates end ○ indicates peak

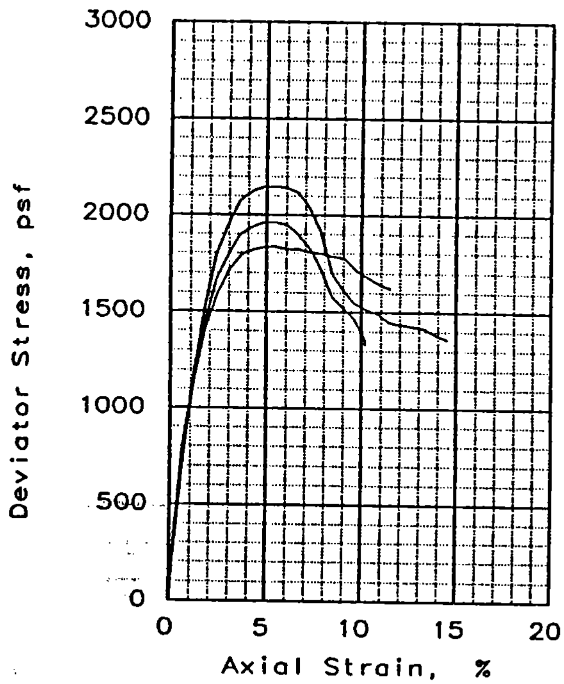
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-1U, Sample 24-B, Depth 62.4'

File: UU-7186 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.5	51.6	52.0
	DRY DENSITY, pcf	68.9	70.9	70.3
	SATURATION, %	100.7	100.1	99.4
	VOID RATIO	1.483	1.413	1.432
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	54.3	51.7	52.0
	DRY DENSITY, pcf	68.8	70.8	70.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.487	1.418	1.425
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0952	0.0806	0.0796
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1960	2146	1833
ULTIMATE STRESS, psf		1327	1362	1624
σ_1 FAILURE, psf		2968	4162	4857
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4

LL= 88 PL= 26 PI= 62
SPECIFIC GRAVITY= 2.74
REMARKS:

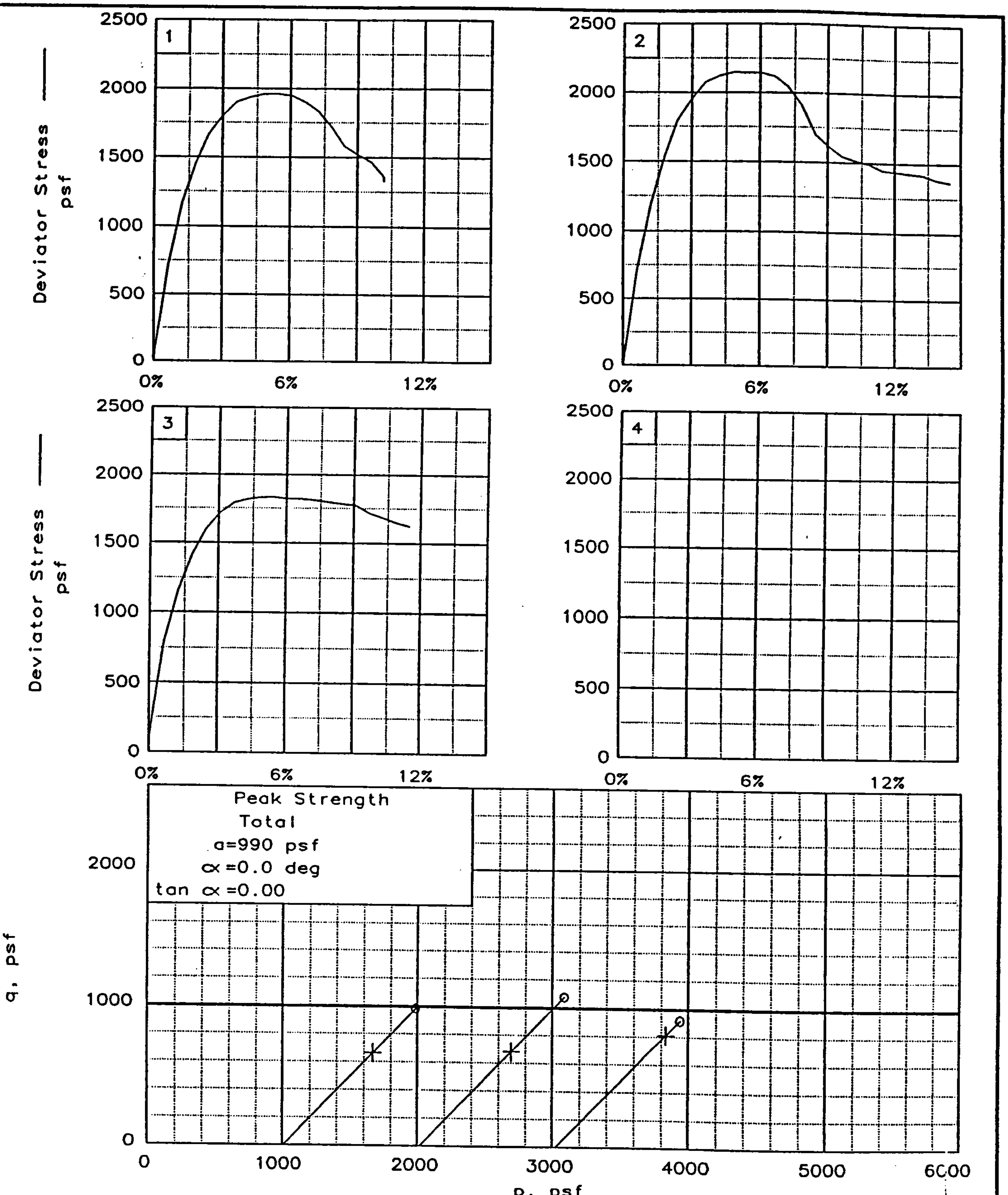
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-1U,
Sample 26-D, Depth 71.8'
PROJ. NO.: 13622 DATE: 7-30-96

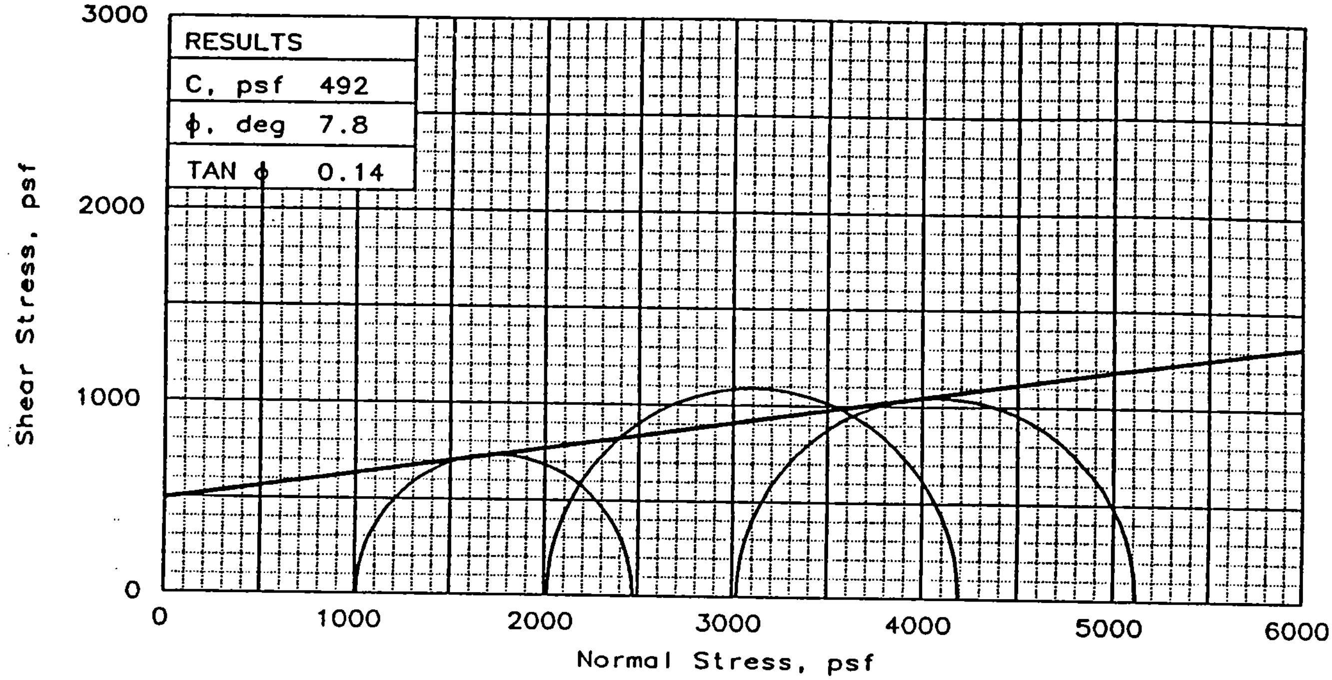
TRIAXIAL SHEAR TEST REPORT

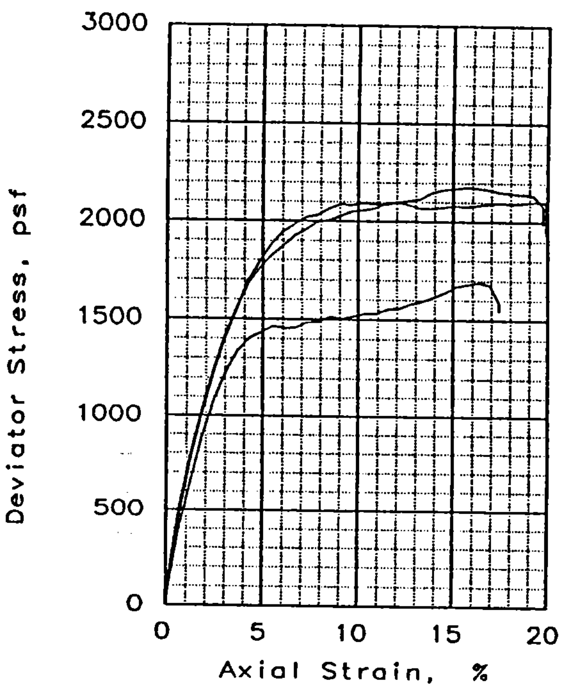
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-1U, Sample 26-D, Depth 71.8'
File: UU-7187 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	28.9	27.1	28.0
	DRY DENSITY, pcf	89.4	91.3	90.9
	SATURATION, %	88.0	86.3	88.5
	VOID RATIO	0.886	0.847	0.854
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.97	2.98	2.96
AT TEST	WATER CONTENT, %	32.7	30.9	30.8
	DRY DENSITY, pcf	89.6	91.9	92.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.882	0.834	0.830
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.99	2.98
Strain rate, in/min		0.1020	0.1017	0.1013
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1463	2177	2093
ULTIMATE STRESS, psf		1548	1987	1941
σ_1 FAILURE, psf		2471	4193	5117
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: ST Gr & Br CL6 w/ lyr,lns ML,lyr SP,ars org,ox
LL= 47 PL= 22 PI= 25
SPECIFIC GRAVITY= 2.7
REMARKS:

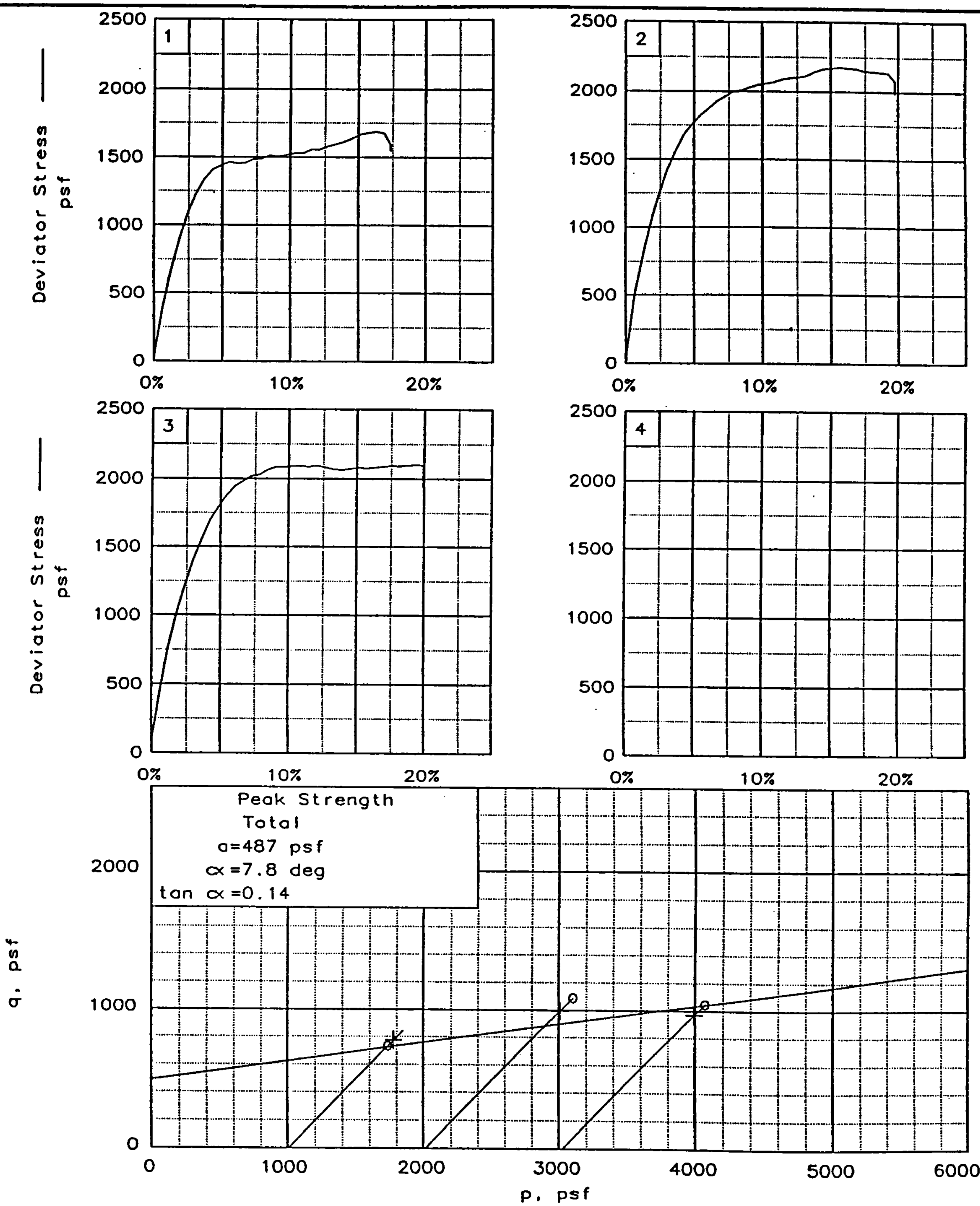
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-2U, Sample 2-B, Depth 5.3'
PROJ. NO.: 13622 DATE: 7-30-96

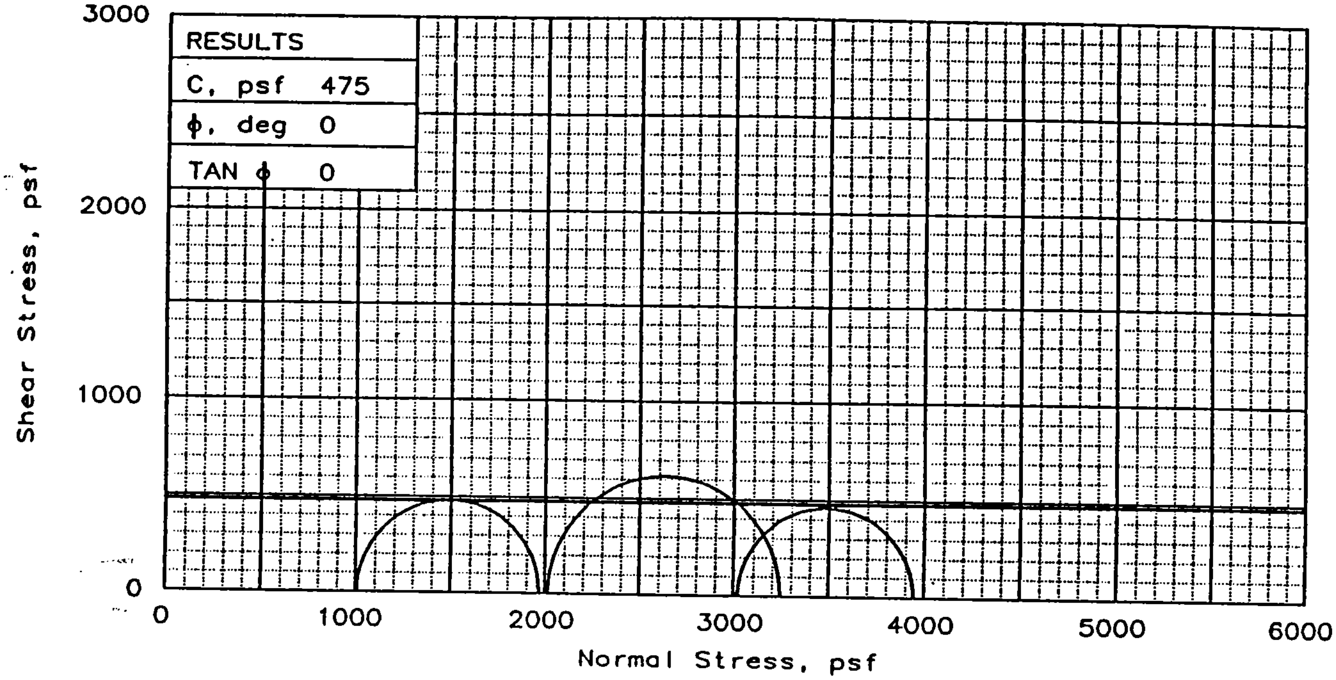
TRIAXIAL SHEAR TEST REPORT

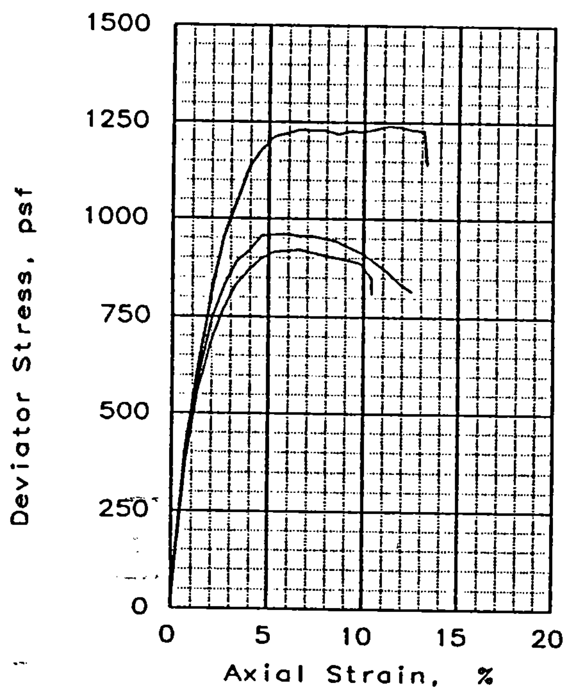
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-2U, Sample 2-B, Depth 5.3'
File: UU-7188 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	63.7	42.4	69.0
	DRY DENSITY, pcf	62.8	77.8	59.4
	SATURATION, %	101.1	96.8	100.7
	VOID RATIO	1.726	1.200	1.879
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.97	2.98	2.98
AT TEST	WATER CONTENT, %	62.3	44.0	68.2
	DRY DENSITY, pcf	63.2	77.6	59.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.706	1.205	1.870
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1141	0.1122	0.1082
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		961	1230	920
ULTIMATE STRESS, psf		816	1141	810
σ_1 FAILURE, psf		1969	3246	3944
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML, ors org
LL= 97 PL= 21 PI= 76
SPECIFIC GRAVITY= 2.74
REMARKS:

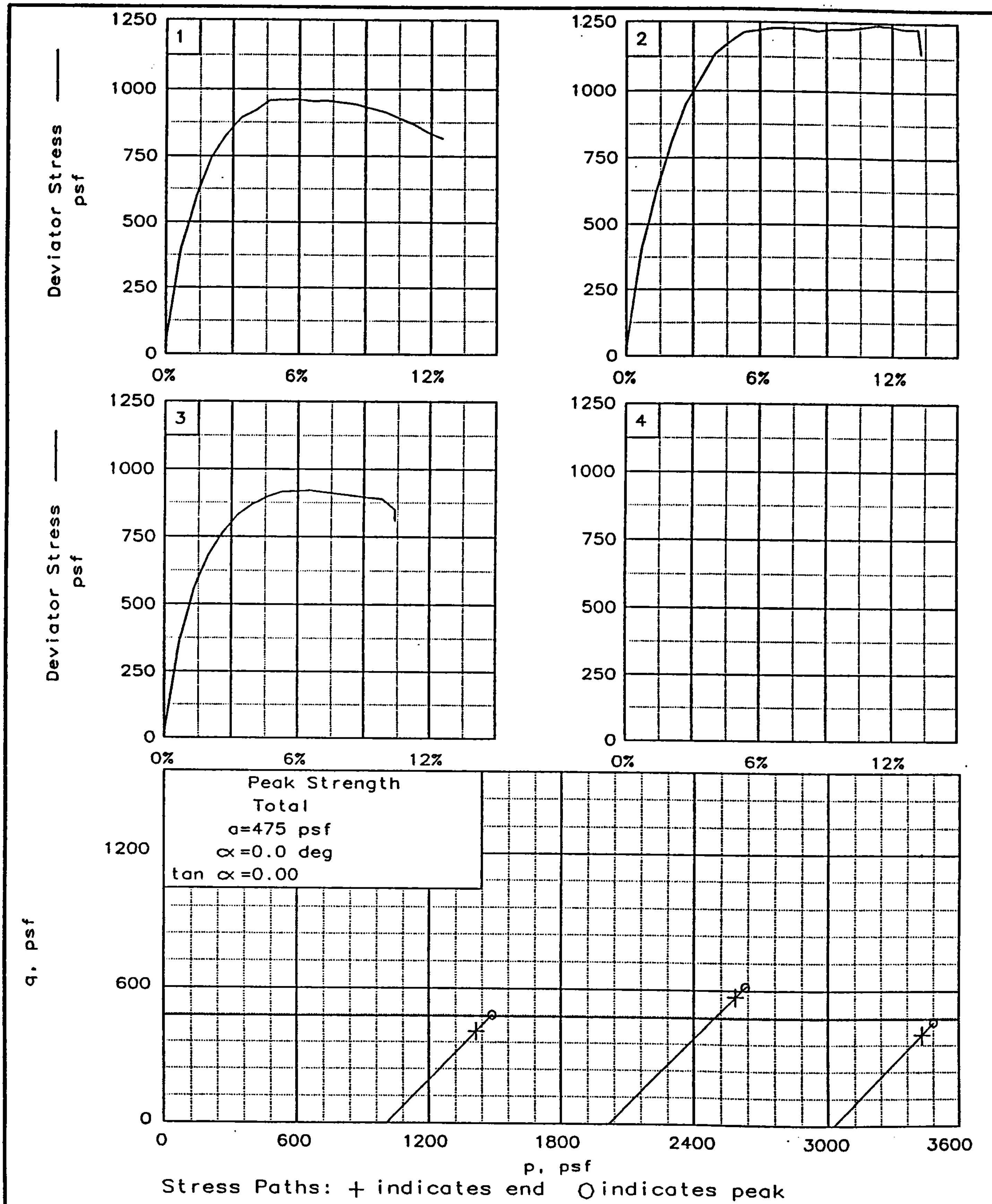
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

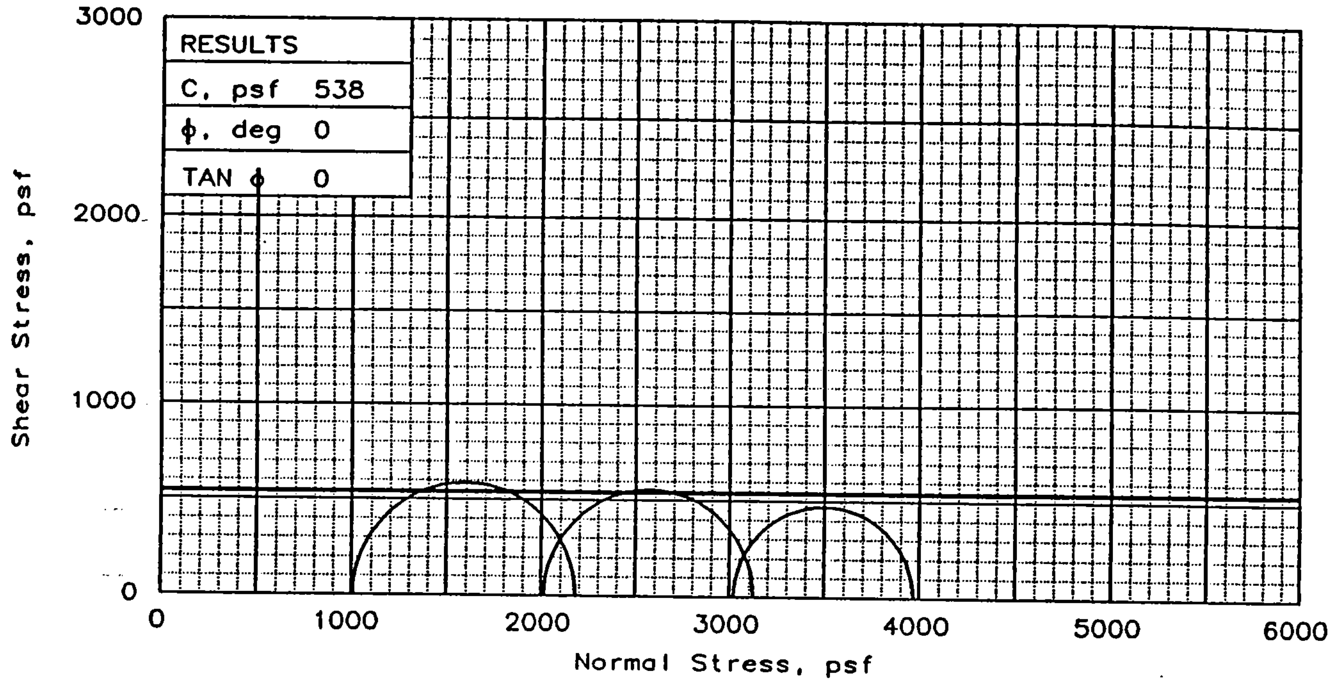
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-2U,
Sample 5-C, Depth 18.4'
PROJ. NO.: 13622 DATE: 7-30-96

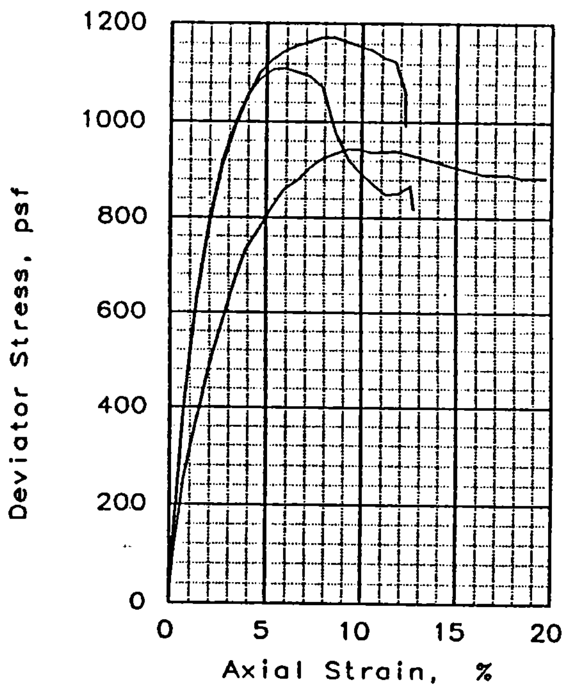
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-2U, Sample 5-C, Depth 18.4'
File: UU-7189 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	45.6	44.5	46.4
	DRY DENSITY, pcf	77.8	77.3	76.5
	SATURATION, %	104.4	100.6	102.9
	VOID RATIO	1.197	1.212	1.236
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	43.8	44.2	44.3
	DRY DENSITY, pcf	77.8	77.4	77.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.199	1.210	1.214
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1065	0.1068	0.1093
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1173	1110	944
ULTIMATE STRESS, psf		991	819	884
σ_1 FAILURE, psf		2181	3126	3968
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH3
w/ lyr & lns ML

LL= 67 PL= 25 PI= 42

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

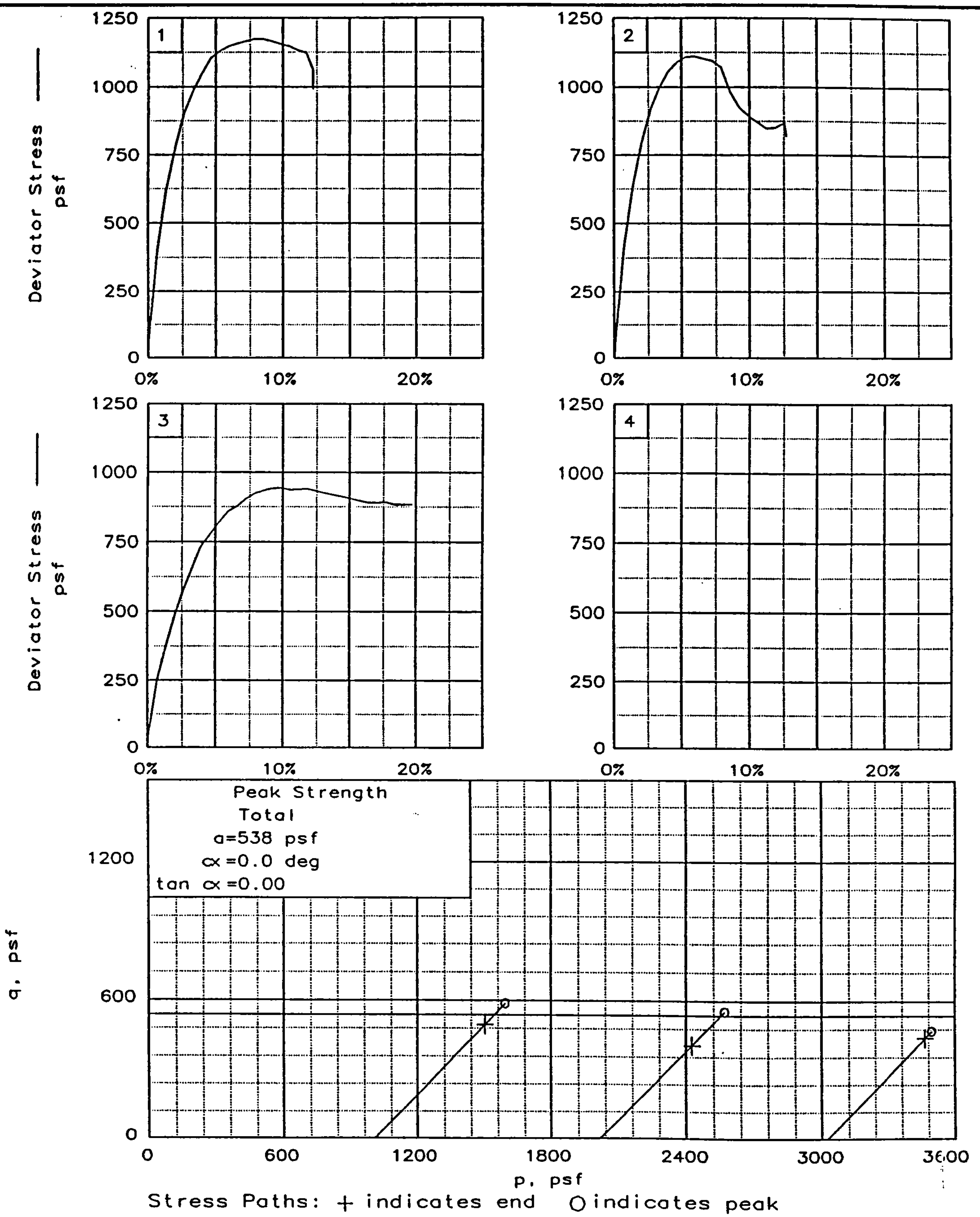
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-2U,
Sample 9-C, Depth 34.4'

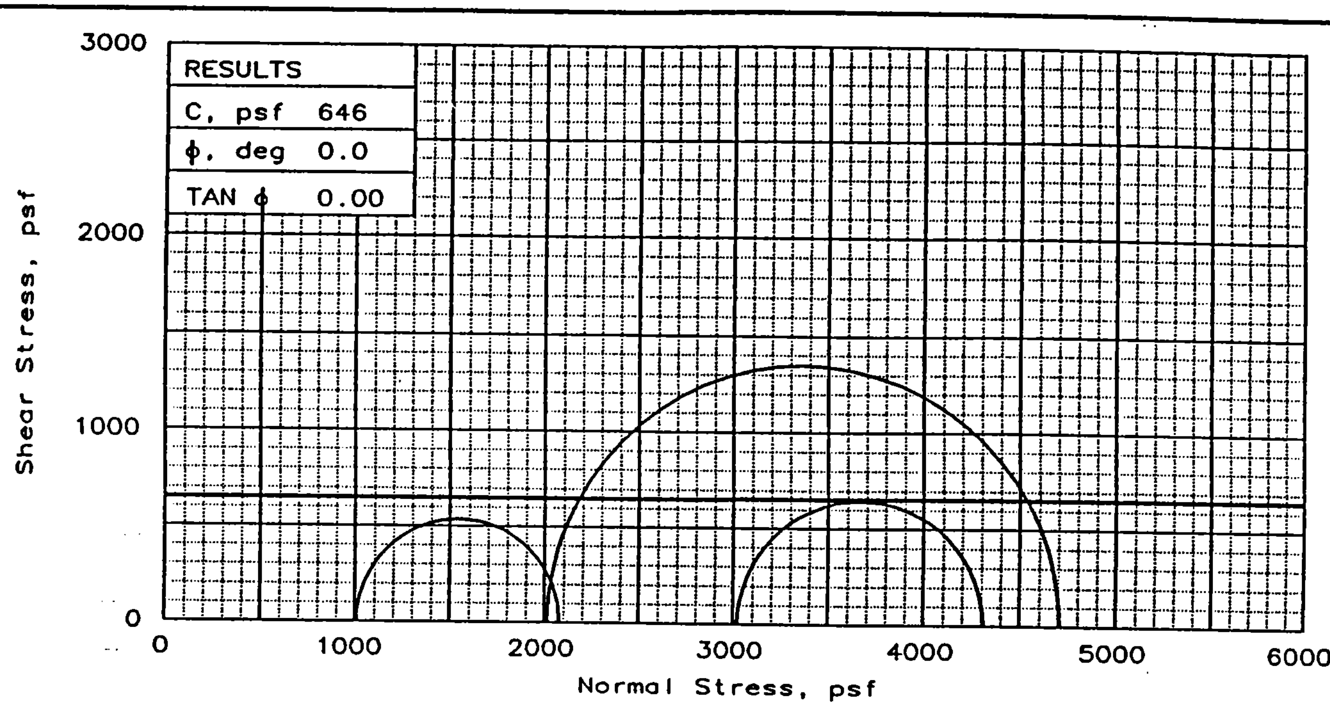
PROJ. NO.: 13622 DATE: 7-30-96

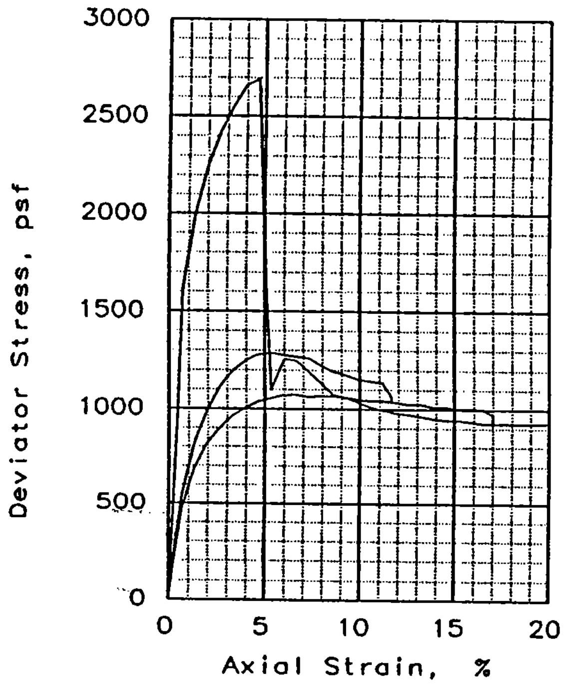
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-2U, Sample 9-C, Depth 34.4'
File: UU-7190 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.9	56.1	54.1
	DRY DENSITY, pcf	69.1	65.8	69.2
	SATURATION, %	102.5	96.5	101.2
	VOID RATIO	1.456	1.582	1.454
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	53.4	58.1	53.2
	DRY DENSITY, pcf	69.2	65.8	69.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.452	1.581	1.447
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1086	0.1074	0.1072
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1071	2693	1287
ULTIMATE STRESS, psf		922	928	1035
σ_1 FAILURE, psf		2079	4709	4311
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lns & ors ML

LL= 84 PL= 27 PI= 57

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

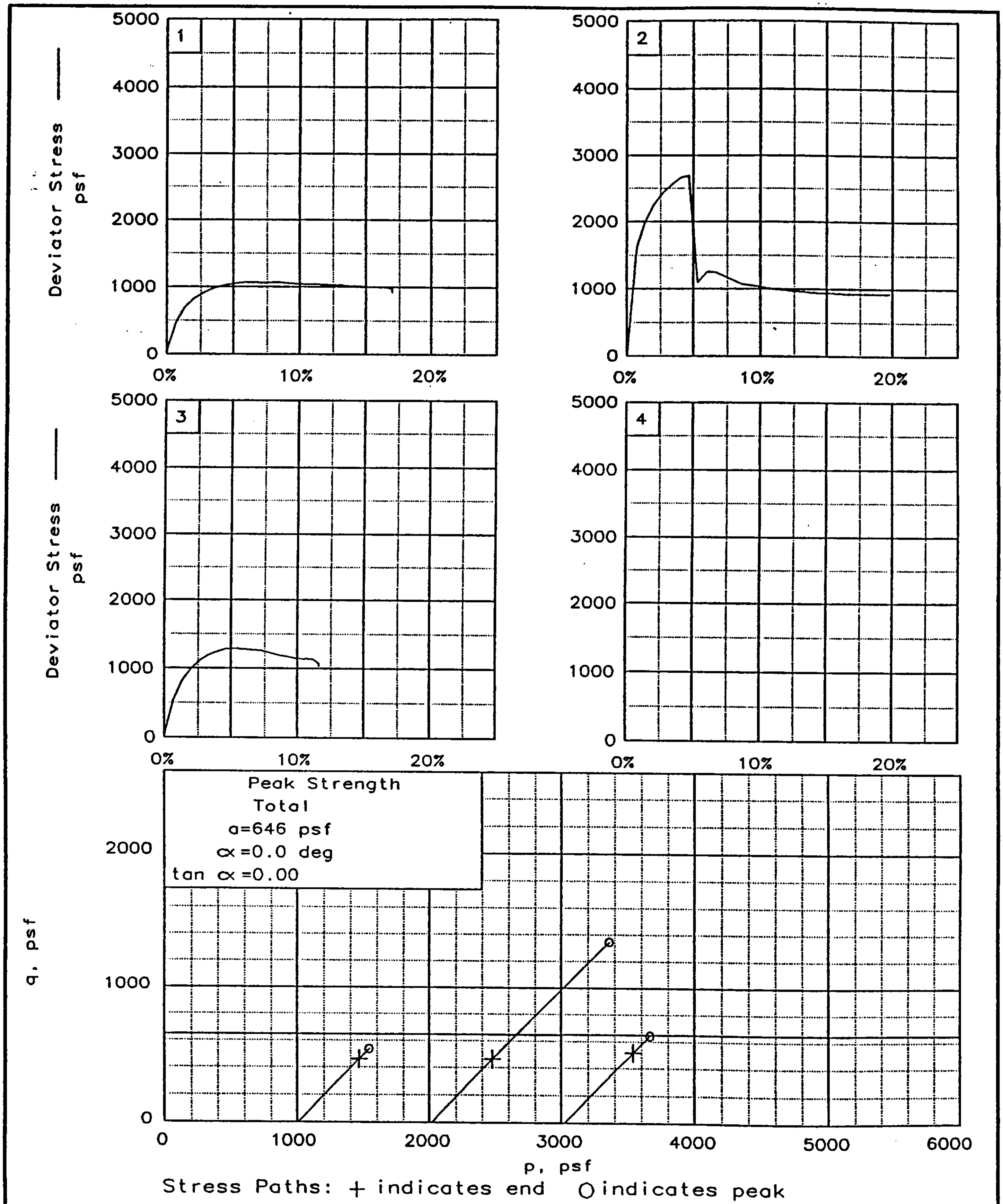
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-2U,
Sample 11-B, Depth 41.5'

PROJ. NO.: 13622 DATE: 7-31-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

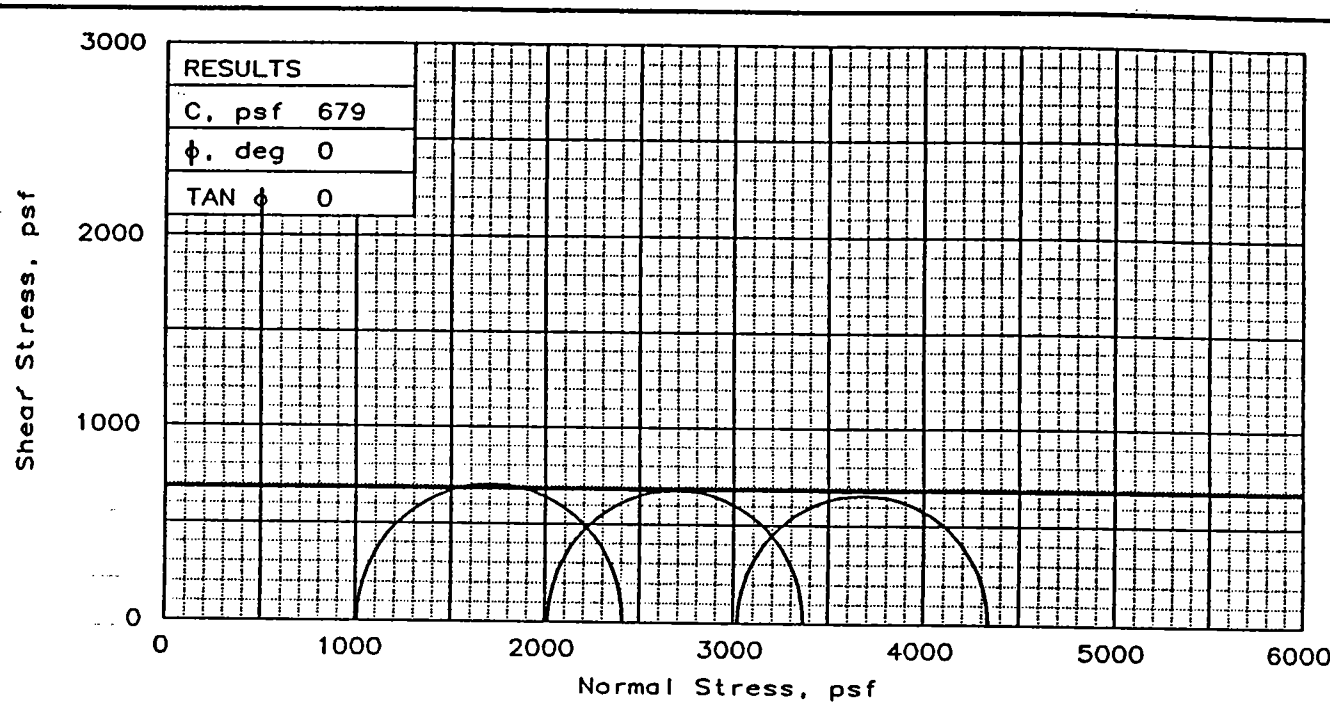


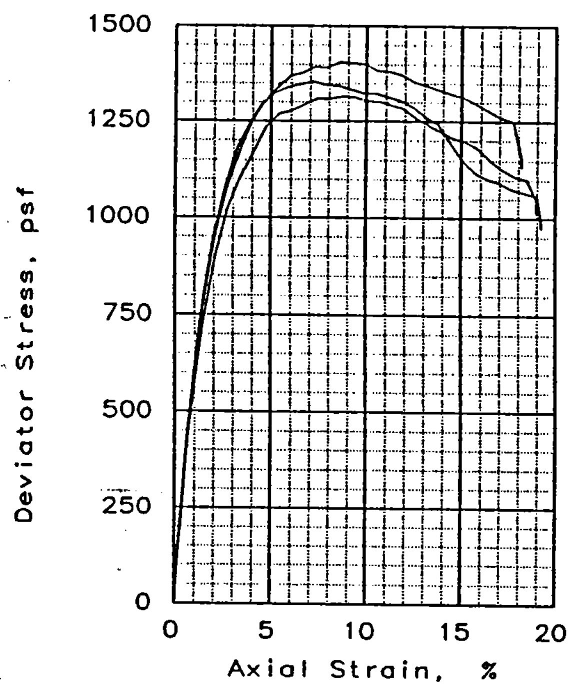
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-2U, Sample 11-B, Depth 41.5'

File: UU-7191 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	49.3	49.5	50.2
	DRY DENSITY, pcf	73.5	72.9	71.9
	SATURATION, %	102.2	101.2	100.4
	VOID RATIO	1.311	1.330	1.361
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	48.1	48.6	49.7
	DRY DENSITY, pcf	73.5	73.1	72.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.309	1.322	1.352
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1118	0.1107	0.1095
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1405	1354	1314
ULTIMATE STRESS, psf		1133	976	1014
σ_1 FAILURE, psf		2413	3370	4338
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lns, lyr & ars ML
LL= 75 PL= 24 PI= 51
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

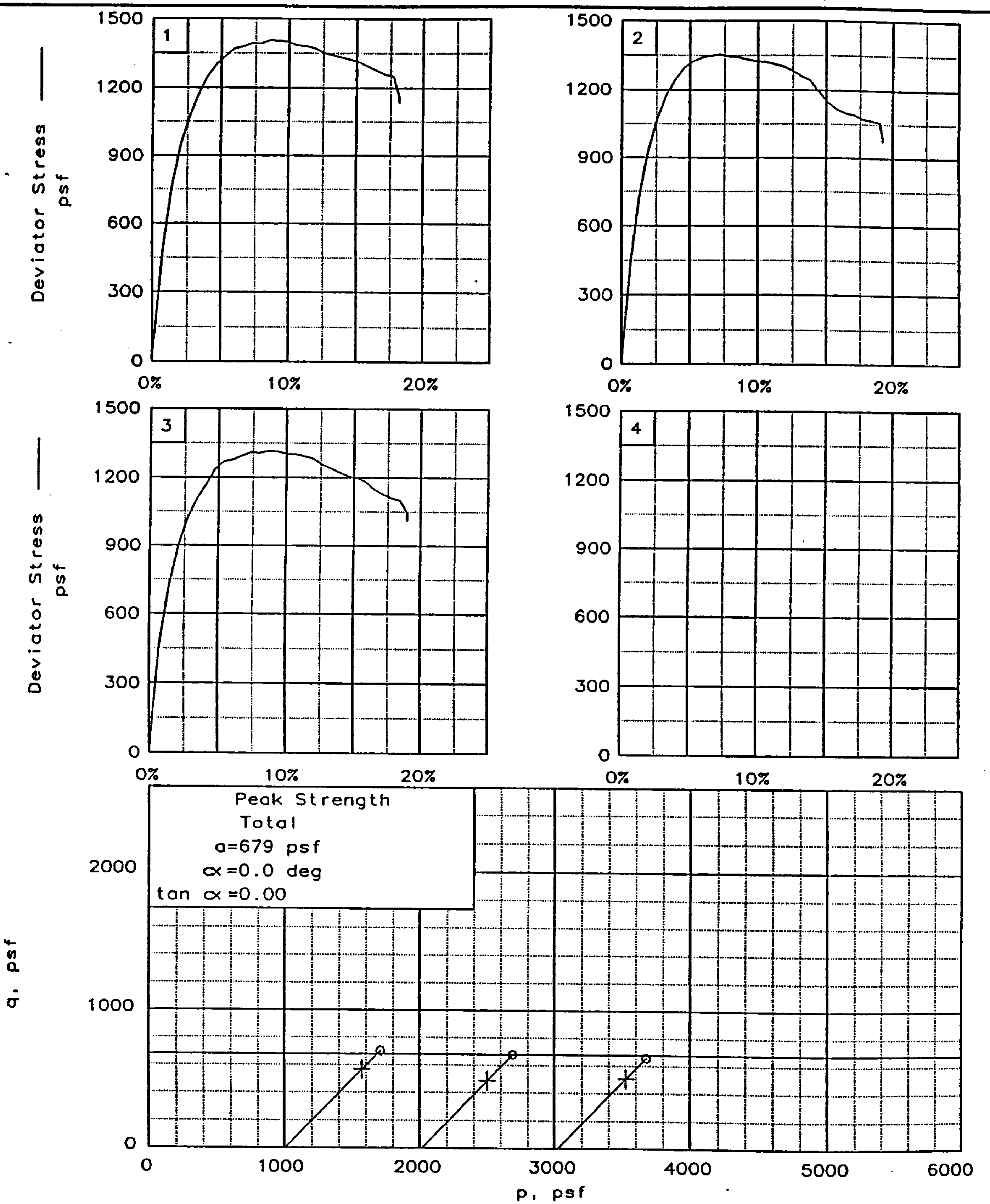
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-2U,
Sample 13-C, Depth 49.9'

PROJ. NO.: 13622 DATE: 7-31-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



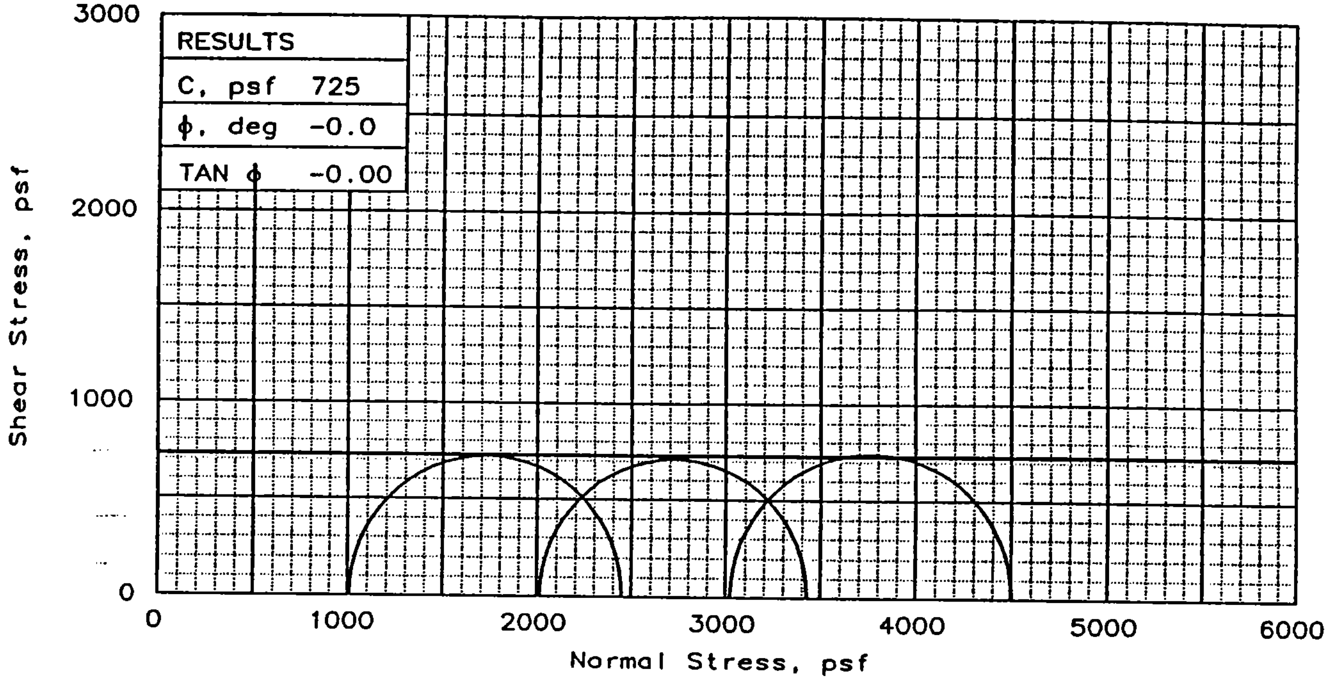
Stress Paths: + indicates end ○ indicates peak

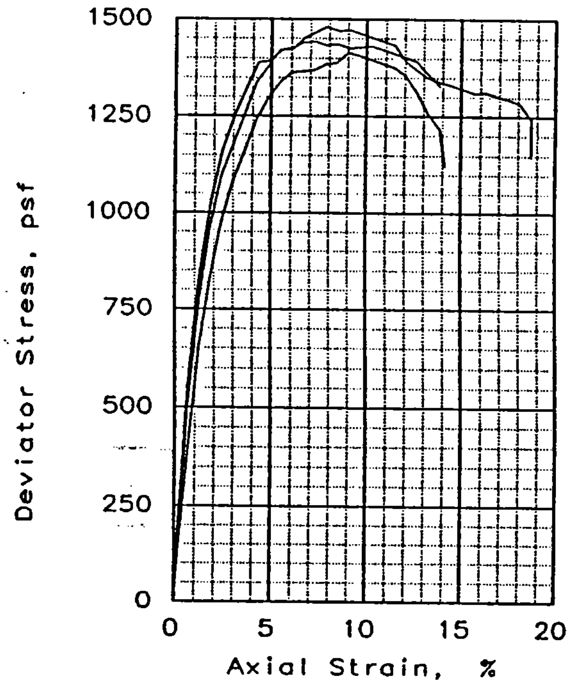
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-2U, Sample 13-C, Depth 49.9'

File: UU-7192 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	52.9	53.4	53.7
	DRY DENSITY, pcf	70.6	69.2	69.7
	SATURATION, %	102.4	99.9	101.8
	VOID RATIO	1.404	1.454	1.435
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	51.4	53.7	52.6
	DRY DENSITY, pcf	70.8	69.0	69.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.399	1.461	1.430
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0803	0.0992	0.1008
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1442	1415	1480
ULTIMATE STRESS, psf		1328	1123	1148
σ_1 FAILURE, psf		2450	3431	4504
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ sm ors ML
LL= 86 PL= 29 PI= 57
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

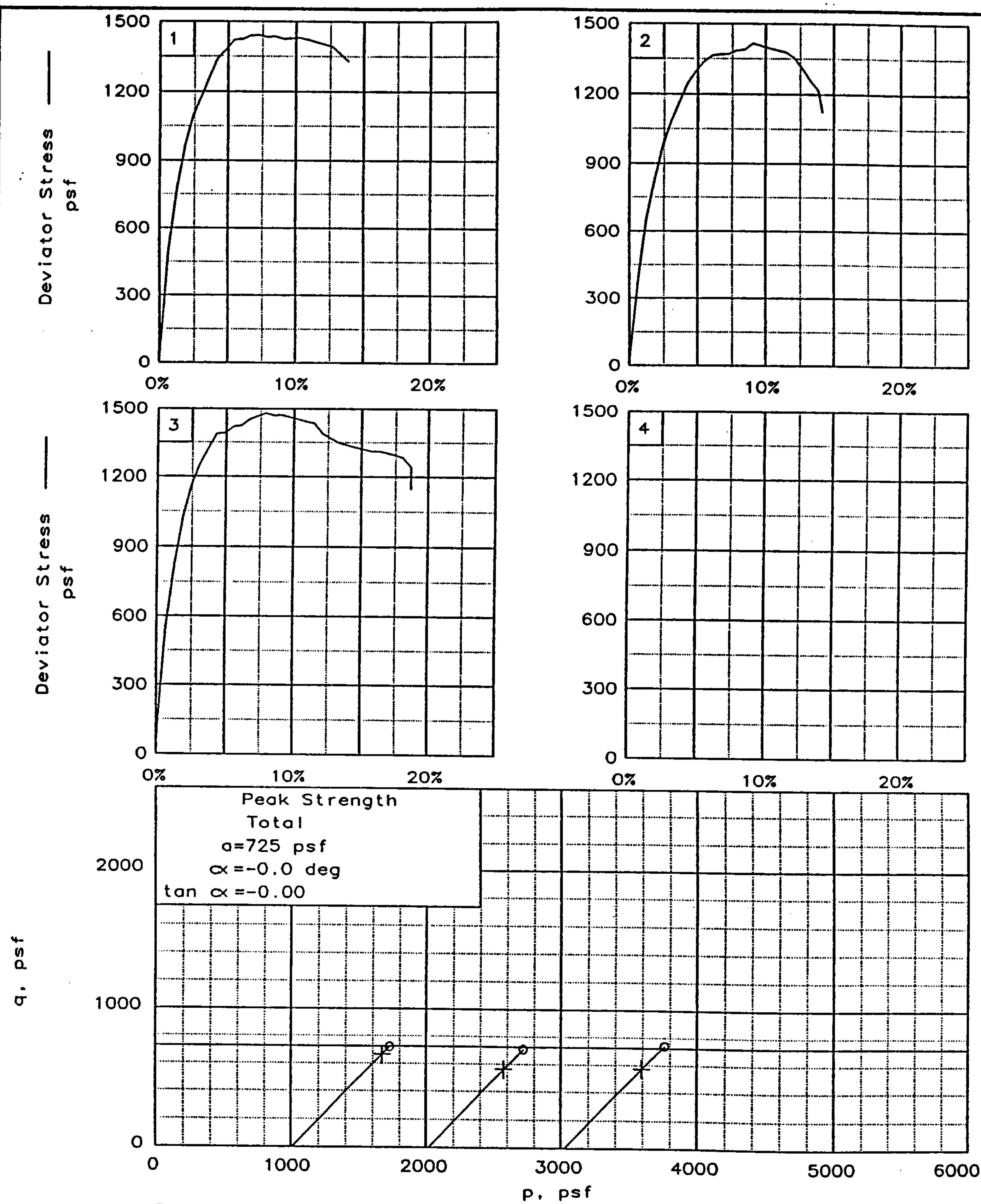
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-2U,
Sample 15-D, Depth 58.8'

PROJ. NO.: 13622 DATE: 7-31-96

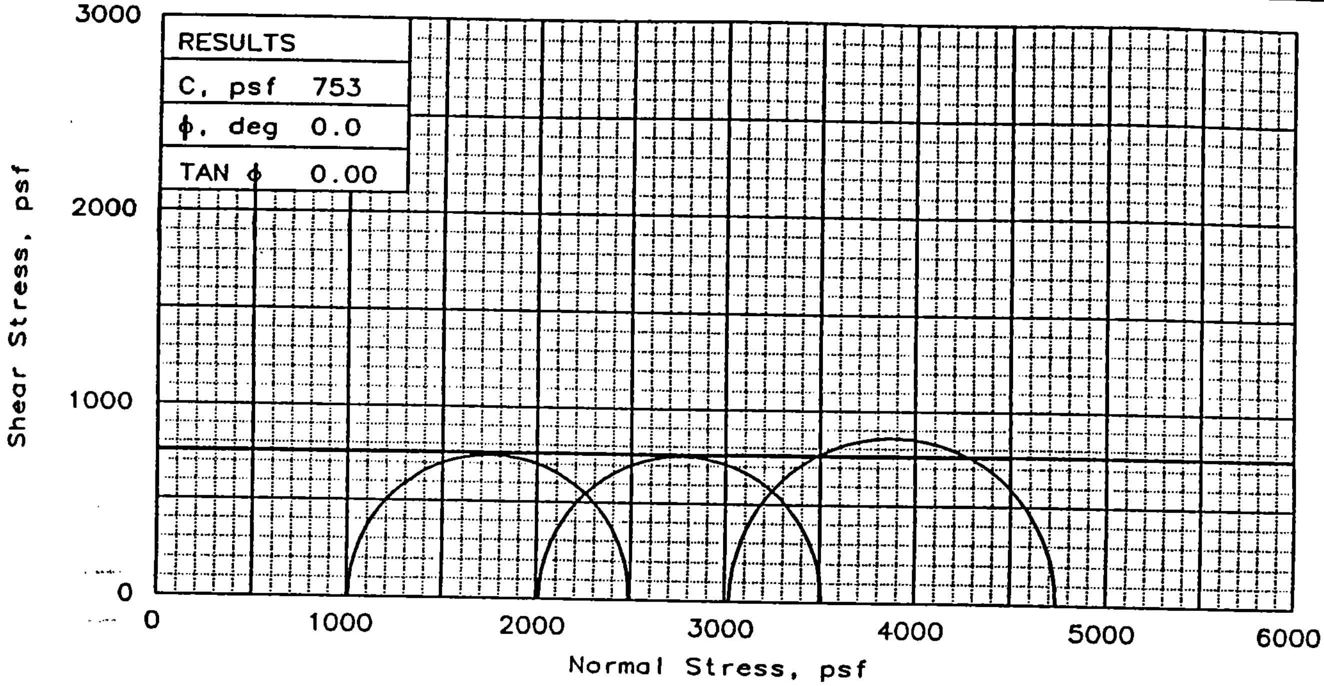
TRIAXIAL SHEAR TEST REPORT

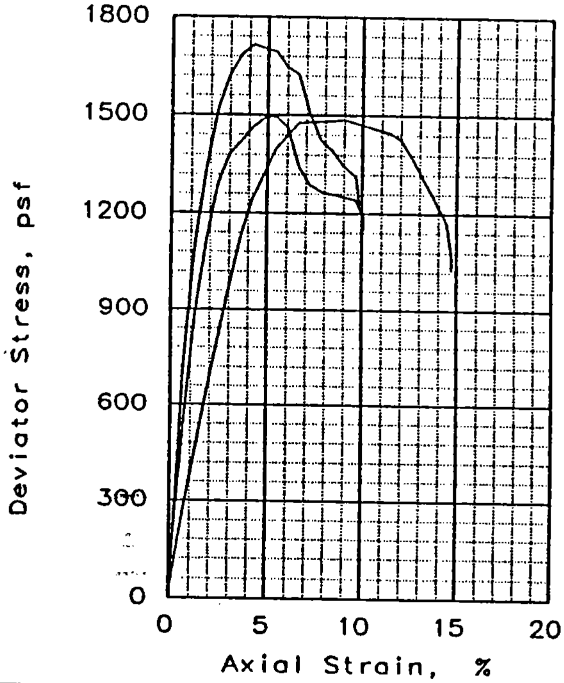
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-2U, Sample 15-D, Depth 58.8'
File: UU-7193 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	58.6	55.7	54.2
	DRY DENSITY, pcf	65.4	67.9	69.4
	SATURATION, %	99.3	100.5	101.5
	VOID RATIO	1.617	1.519	1.463
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	58.9	55.6	52.8
	DRY DENSITY, pcf	65.4	67.8	69.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.615	1.524	1.446
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0950	0.0955	0.0941
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1485	1495	1715
ULTIMATE STRESS, psf		1028	1153	1228
σ_1 FAILURE, psf		2493	3511	4739
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 89 PL= 30 PI= 59
SPECIFIC GRAVITY= 2.74
REMARKS:

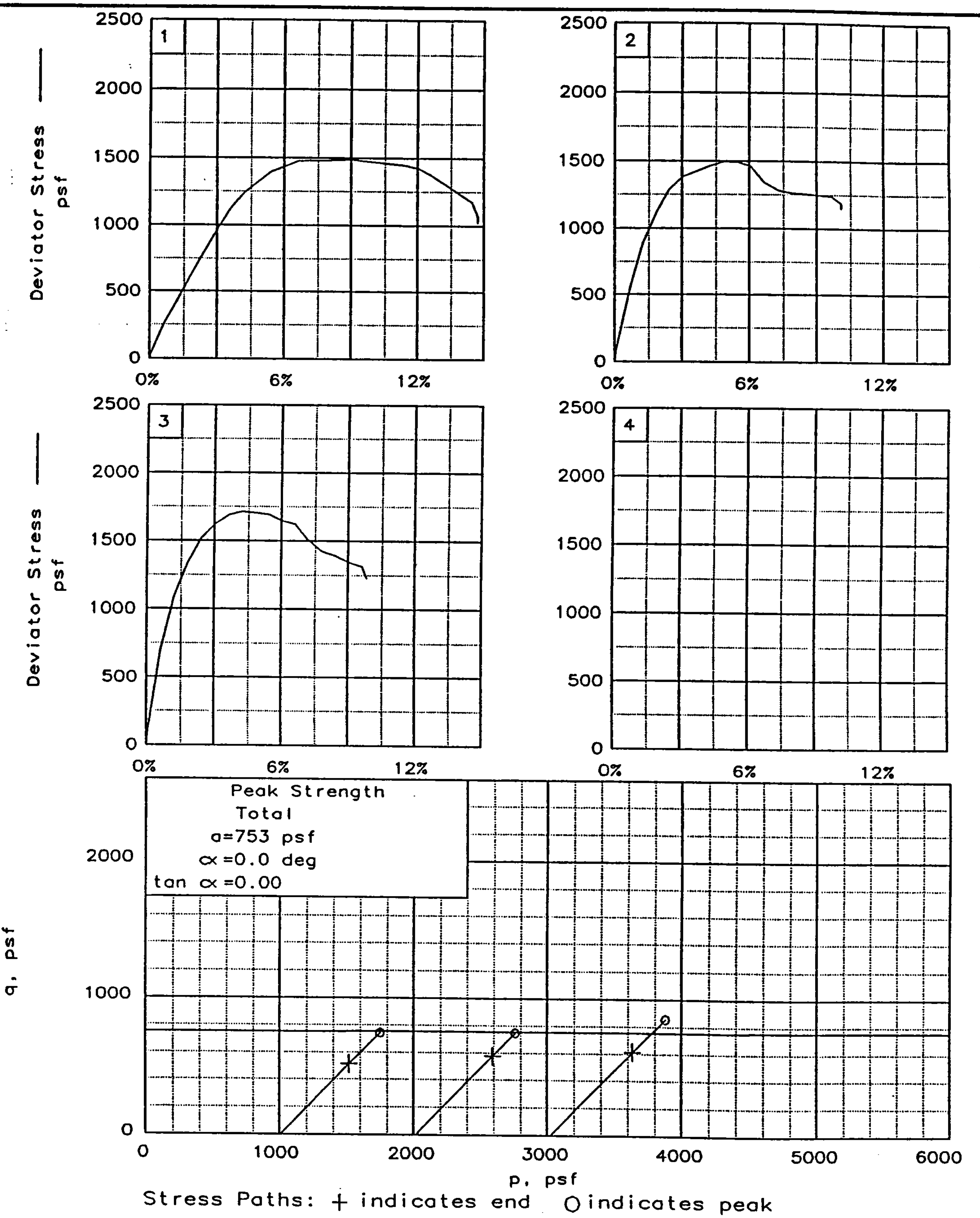
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-2U,
Sample 17-C, Depth 66.1'
PROJ. NO.: 13622 DATE: 7-31-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

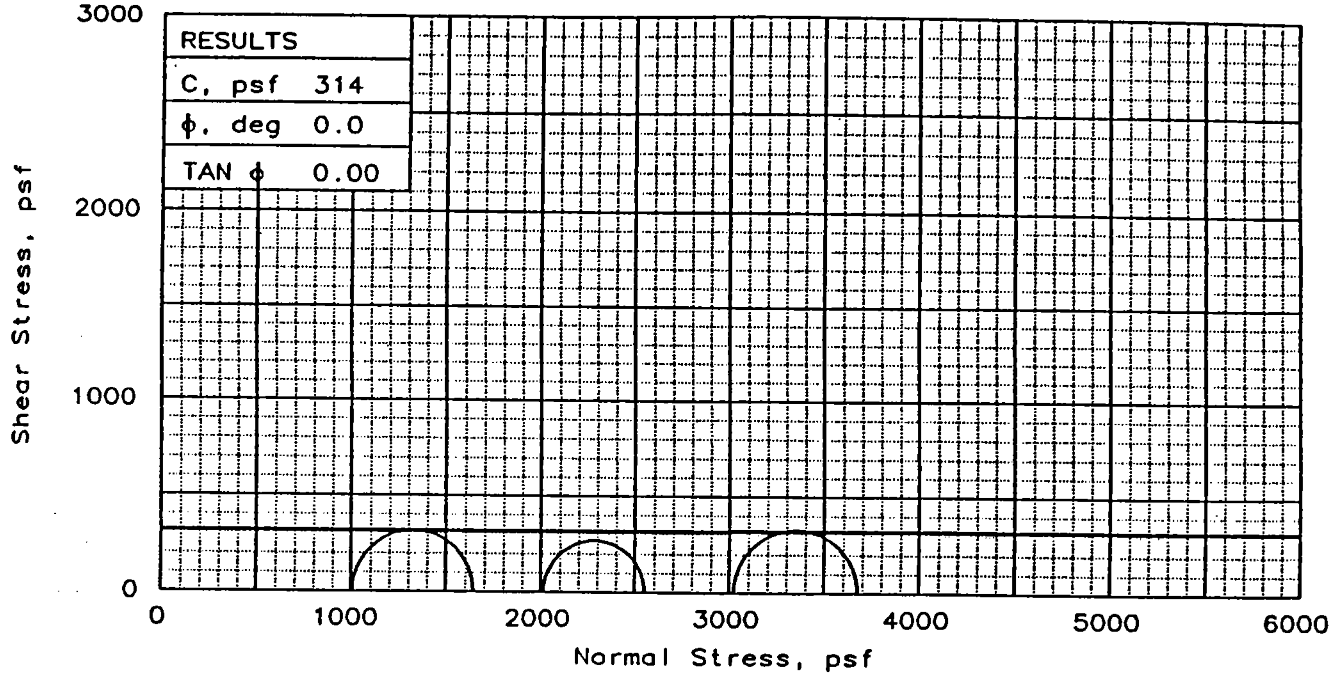


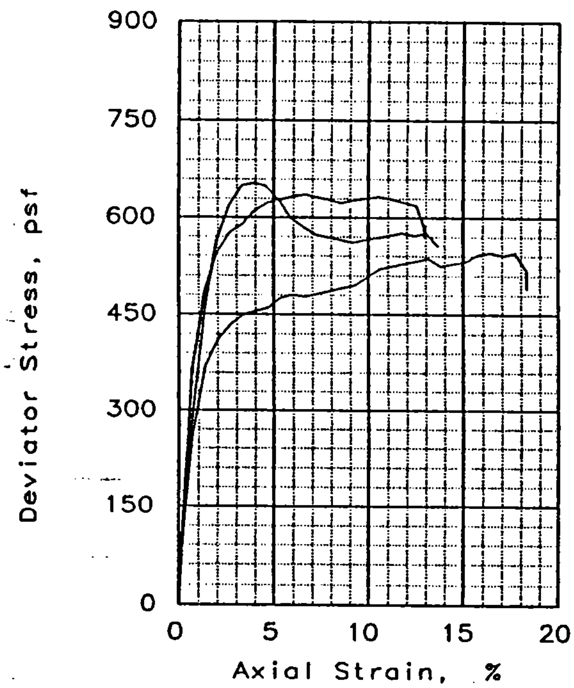
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-2U, Sample 17-C, Depth 66.1'

File: UU-7194 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.2	68.4	64.9
	DRY DENSITY, pcf	58.1	60.5	59.2
	SATURATION, %	94.7	102.5	94.1
	VOID RATIO	1.944	1.829	1.889
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	71.2	66.4	67.6
	DRY DENSITY, pcf	58.0	60.7	60.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.951	1.820	1.851
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1077	0.1092	0.0986
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		636	536	654
ULTIMATE STRESS, psf		569	490	556
σ_1 FAILURE, psf		1644	2552	3678
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4 w/ Ins ML, slf

LL= 100 PL= 32 PI= 68

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.:

CLIENT: U.S. Army Corps of Engineers

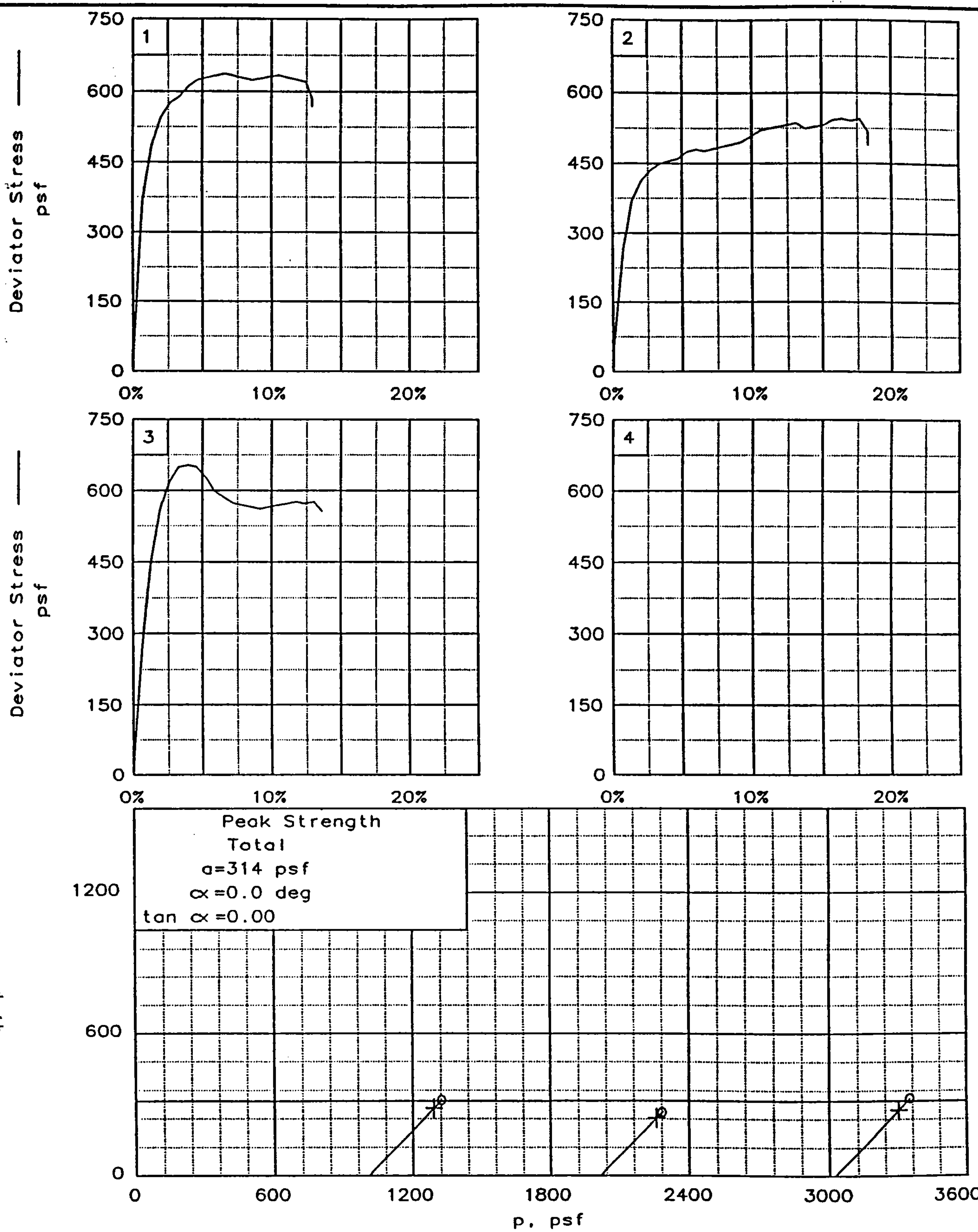
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-3U,
Sample 4-B, Depth 9.1'

PROJ. NO.: 13622 DATE: 7-31-96

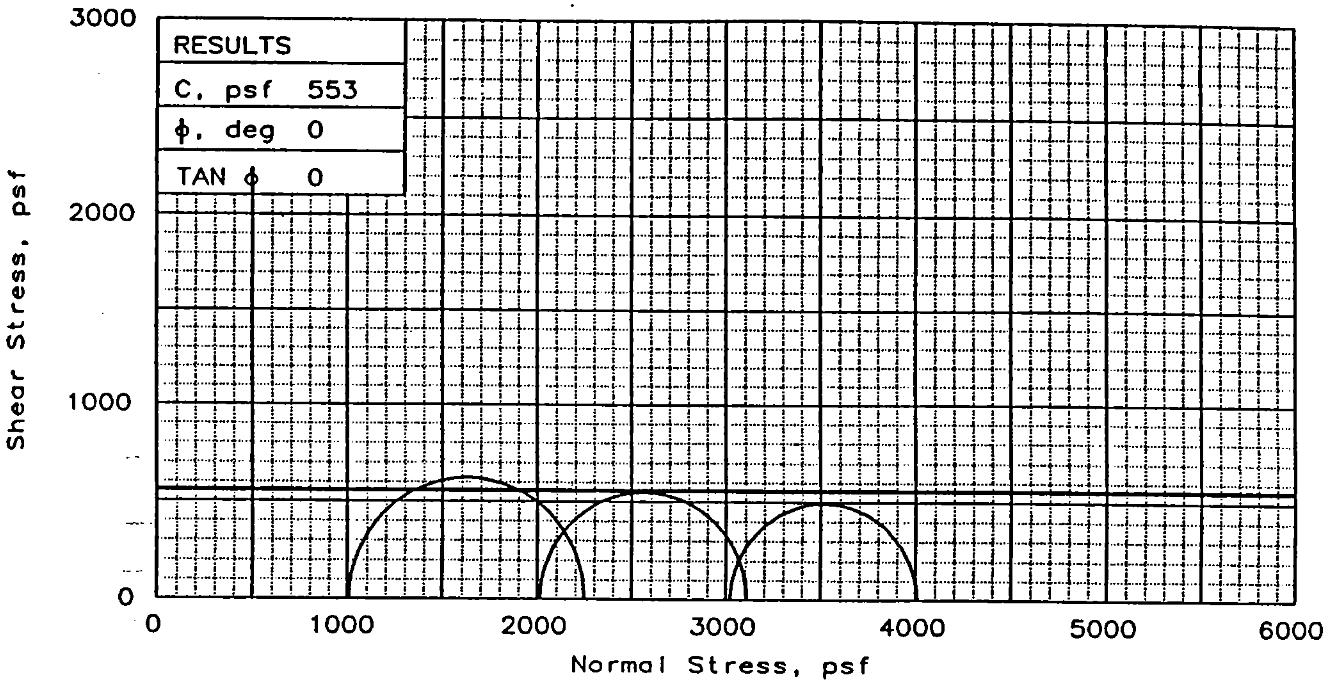
TRIAXIAL SHEAR TEST REPORT

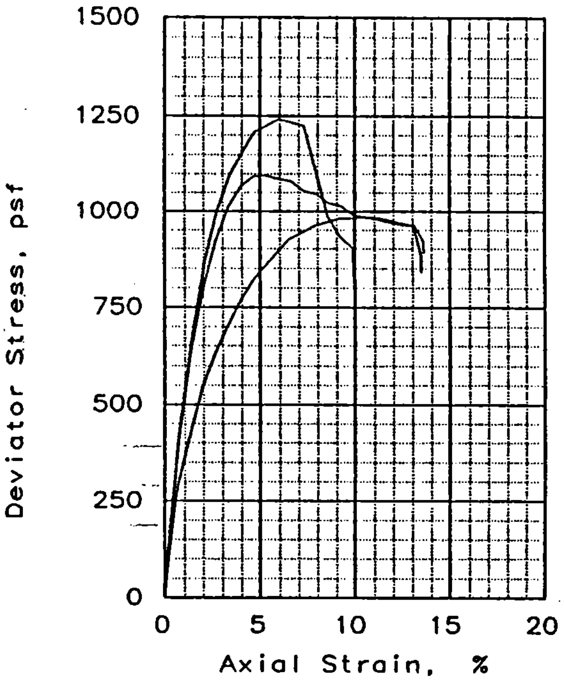
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-3U, Sample 4-B, Depth 9.1'
File: UU-7195 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	65.9	66.9	68.7
	DRY DENSITY, pcf	61.1	60.3	62.1
	SATURATION, %	100.3	99.7	107.3
	VOID RATIO	1.800	1.838	1.754
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	66.1	67.0	62.6
	DRY DENSITY, pcf	60.9	60.3	63.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.811	1.837	1.715
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1069	0.1097	0.1039
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1242	1094	984
ULTIMATE STRESS, psf		828	889	841
σ_1 FAILURE, psf		2250	3110	4008
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ Ins ML, slf
LL= 95 PL= 26 PI= 69
SPECIFIC GRAVITY= 2.74
REMARKS:

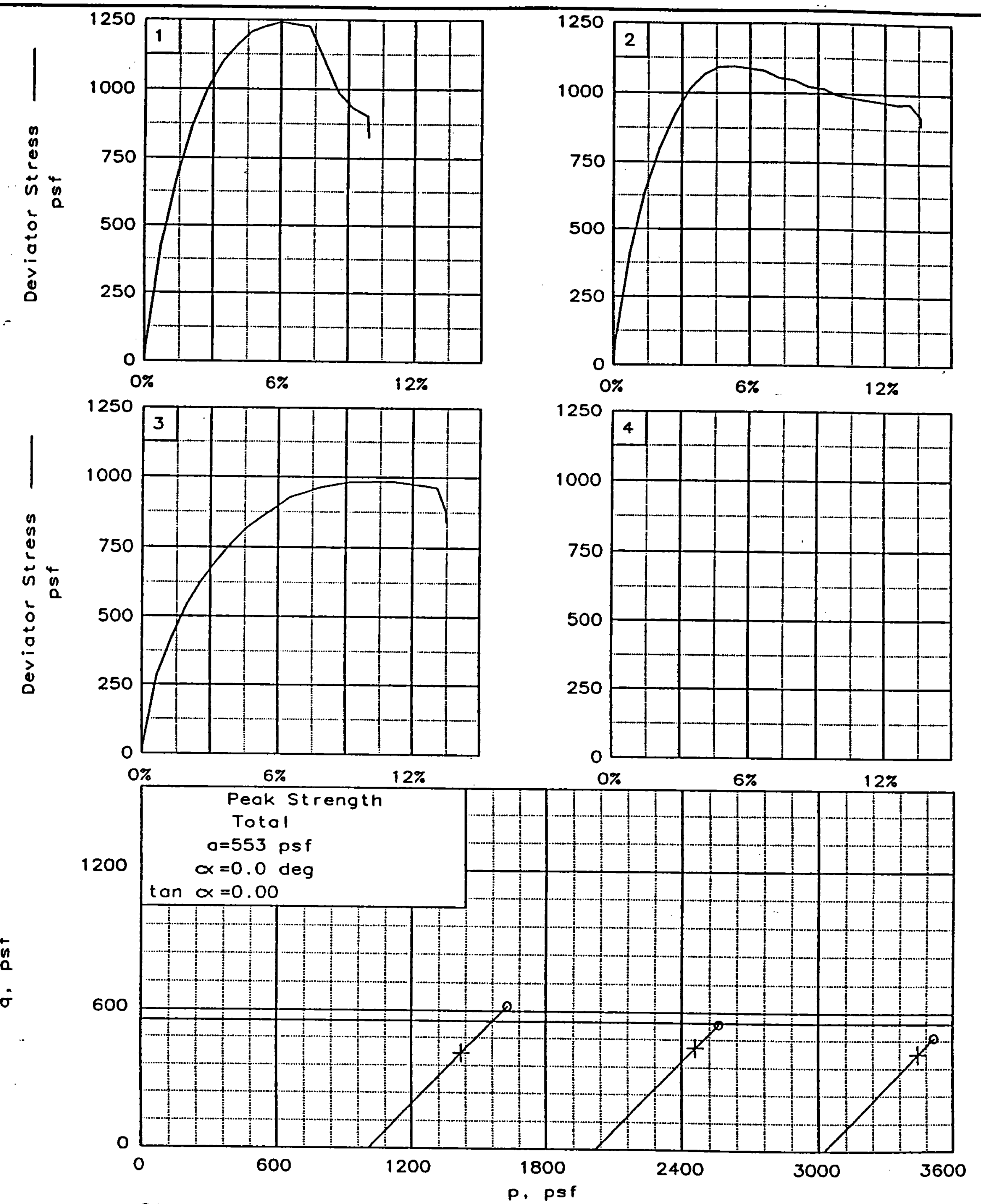
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-3U,
Sample 7-B, Depth 21.5'
PROJ. NO.: 13622 DATE: 7-31-96

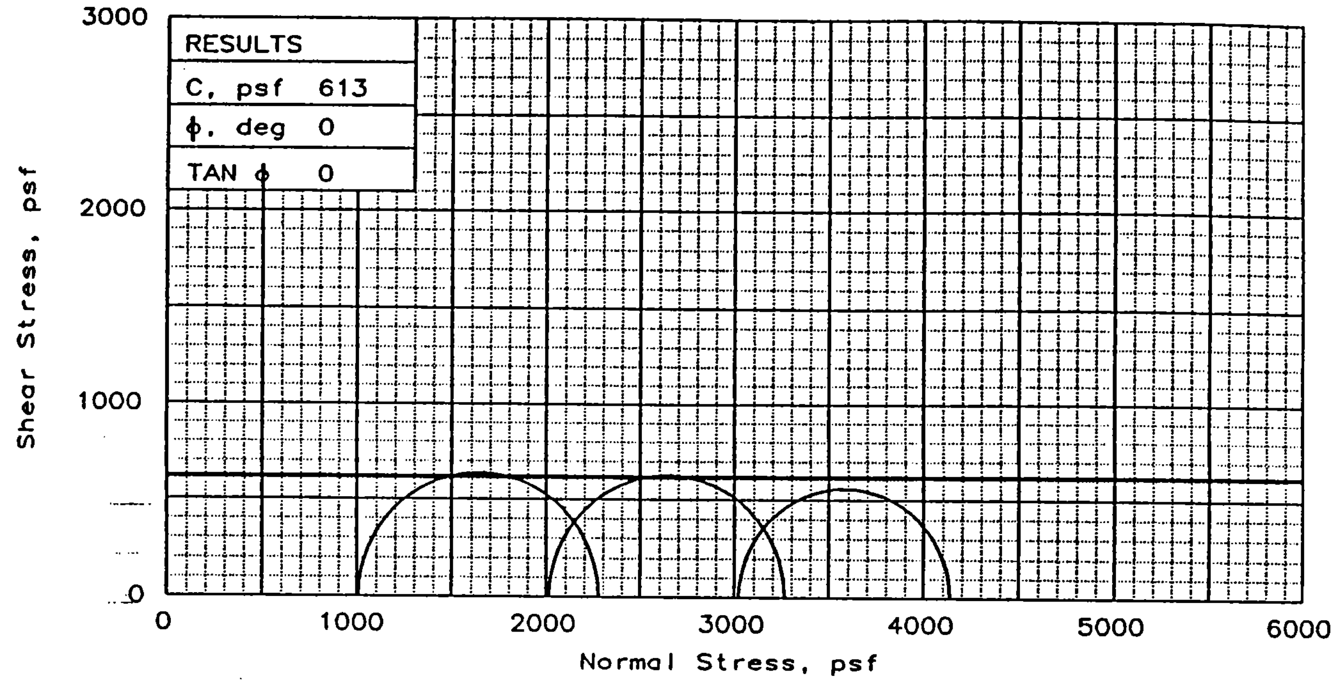
TRIAXIAL SHEAR TEST REPORT

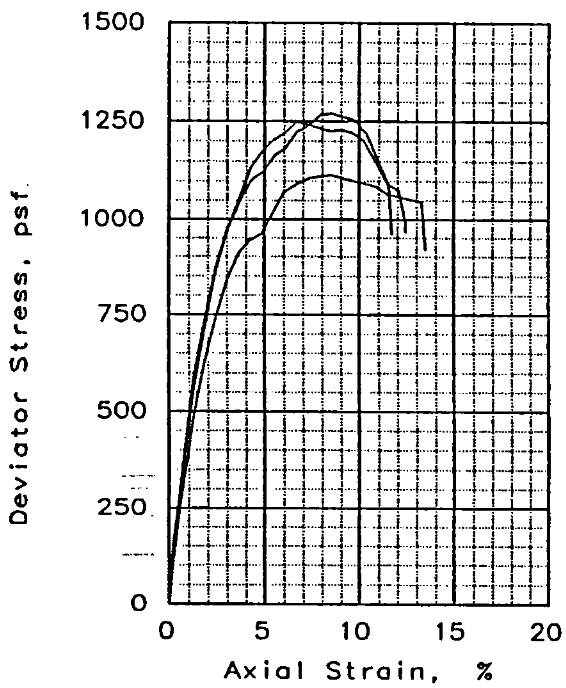
Eustis Engineering Company, Inc.



Stress Paths: + indicates end   O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-3U, Sample 7-B, Depth 21.5'
File: UU-7196   Project No.: 13622   FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	55.7	57.0	59.1
	DRY DENSITY, pcf	67.1	65.6	59.4
	SATURATION, %	98.4	97.1	86.1
	VOID RATIO	1.550	1.609	1.880
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.95
AT TEST	WATER CONTENT, %	56.5	58.5	66.9
	DRY DENSITY, pcf	67.1	65.7	60.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.549	1.602	1.834
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
Strain rate, in/min		0.0987	0.0995	0.0982
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1270	1249	1115
ULTIMATE STRESS, psf		962	967	919
σ_1 FAILURE, psf		2278	3265	4139
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4 w/ lyr & lns ML, slf & ars org
LL= 92 PL= 28 PI= 64
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

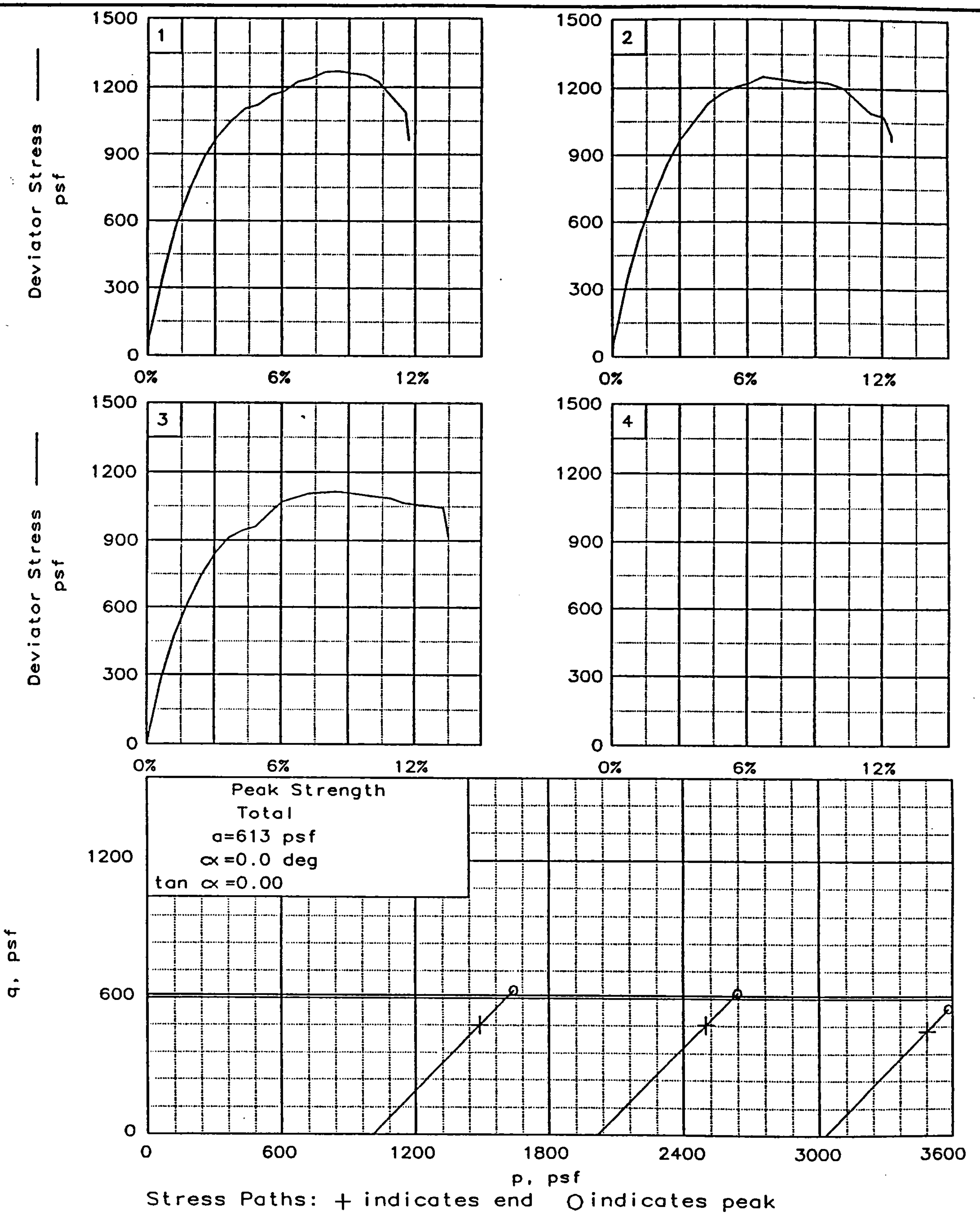
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-3U, Sample 8-C, Depth 26.4'

PROJ. NO.: 13622 DATE: 7-31-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

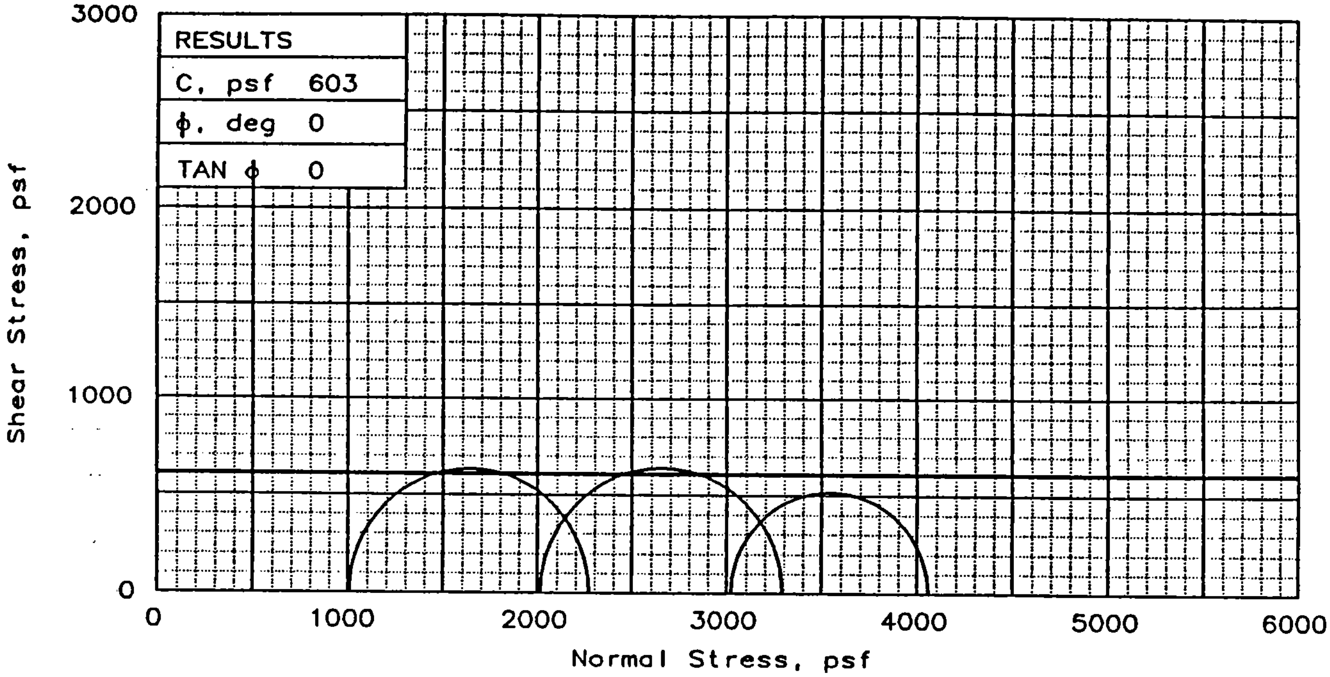


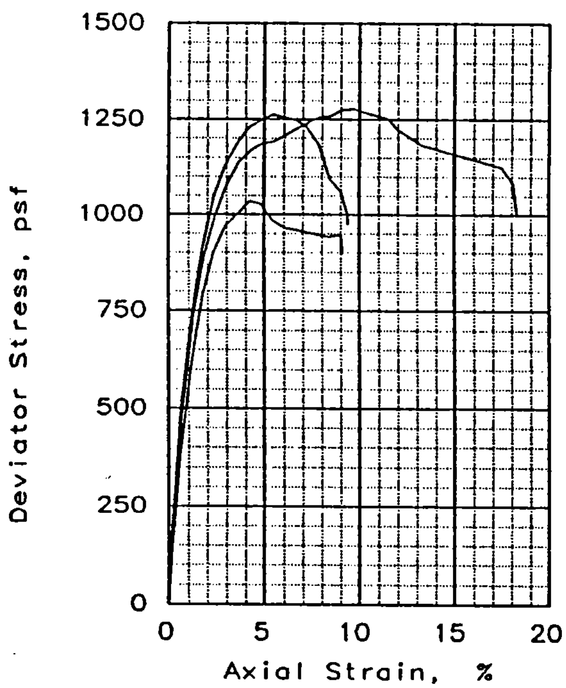
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-3U, Sample 8-C, Depth 26.4'

File: UU-7197 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.1	53.1	55.2
	DRY DENSITY, pcf	69.6	69.9	67.9
	SATURATION, %	101.7	100.5	99.6
	VOID RATIO	1.456	1.447	1.519
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	53.1	52.7	55.1
	DRY DENSITY, pcf	69.7	70.0	68.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.455	1.444	1.510
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0906	0.1011	0.0938
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1264	1278	1035
ULTIMATE STRESS, psf		976	996	899
σ_1 FAILURE, psf		2272	3294	4059
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lns ML
LL= 81 PL= 25 PI= 56
SPECIFIC GRAVITY= 2.74
REMARKS:

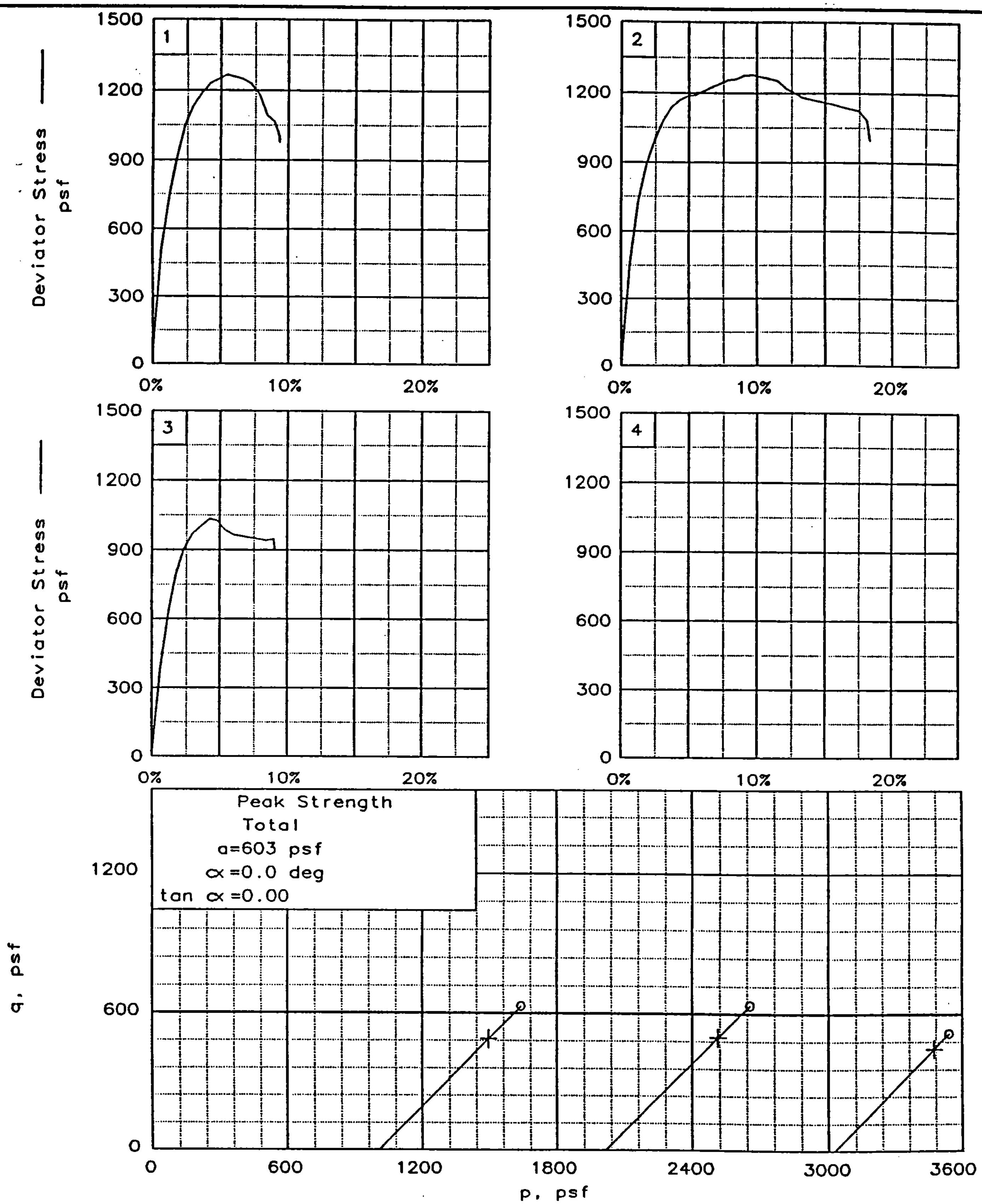
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-3U,
Sample 12-C, Depth 42.0'
PROJ. NO.: 13622 DATE: 8-1-96

TRIAXIAL SHEAR TEST REPORT

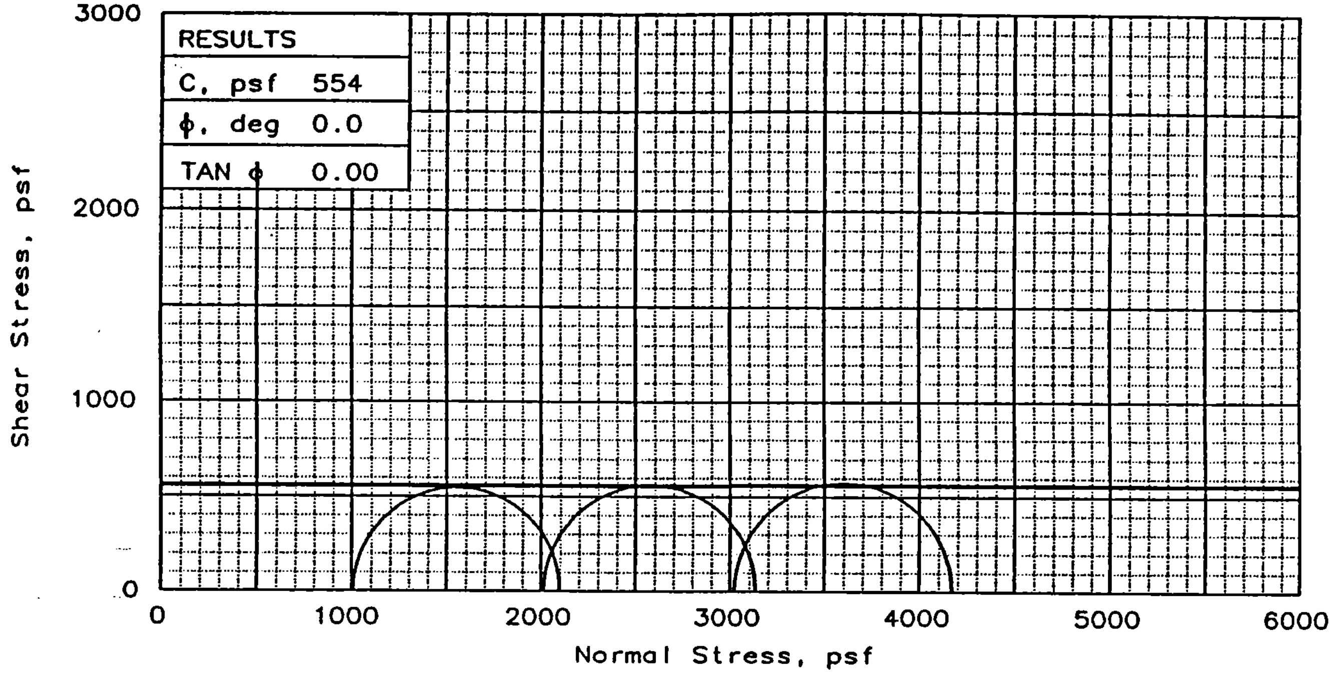
Eustis Engineering Company, Inc.

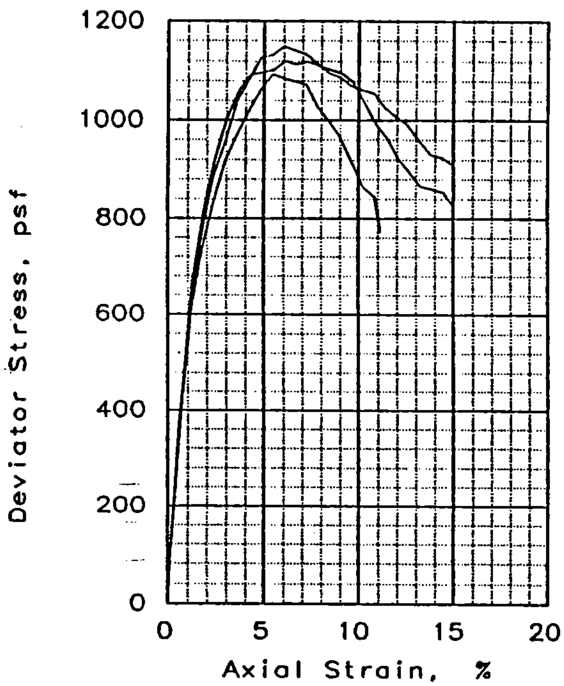
FIG. NO.: ______



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-3U, Sample 12-C, Depth 42.0'
File: UU-7198 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	53.2	52.3	52.5
	DRY DENSITY, pcf	69.6	69.9	70.0
	SATURATION, %	100.1	99.0	99.8
	VOID RATIO	1.456	1.448	1.442
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.98
AT TEST	WATER CONTENT, %	53.3	52.3	52.4
	DRY DENSITY, pcf	69.6	70.3	70.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.459	1.434	1.437
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0978	0.1002	0.1000
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1092	1120	1148
ULTIMATE STRESS, psf		773	804	839
σ_1 FAILURE, psf		2100	3136	4172
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lyr & lns ML

LL= 73 PL= 28 PI= 45

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

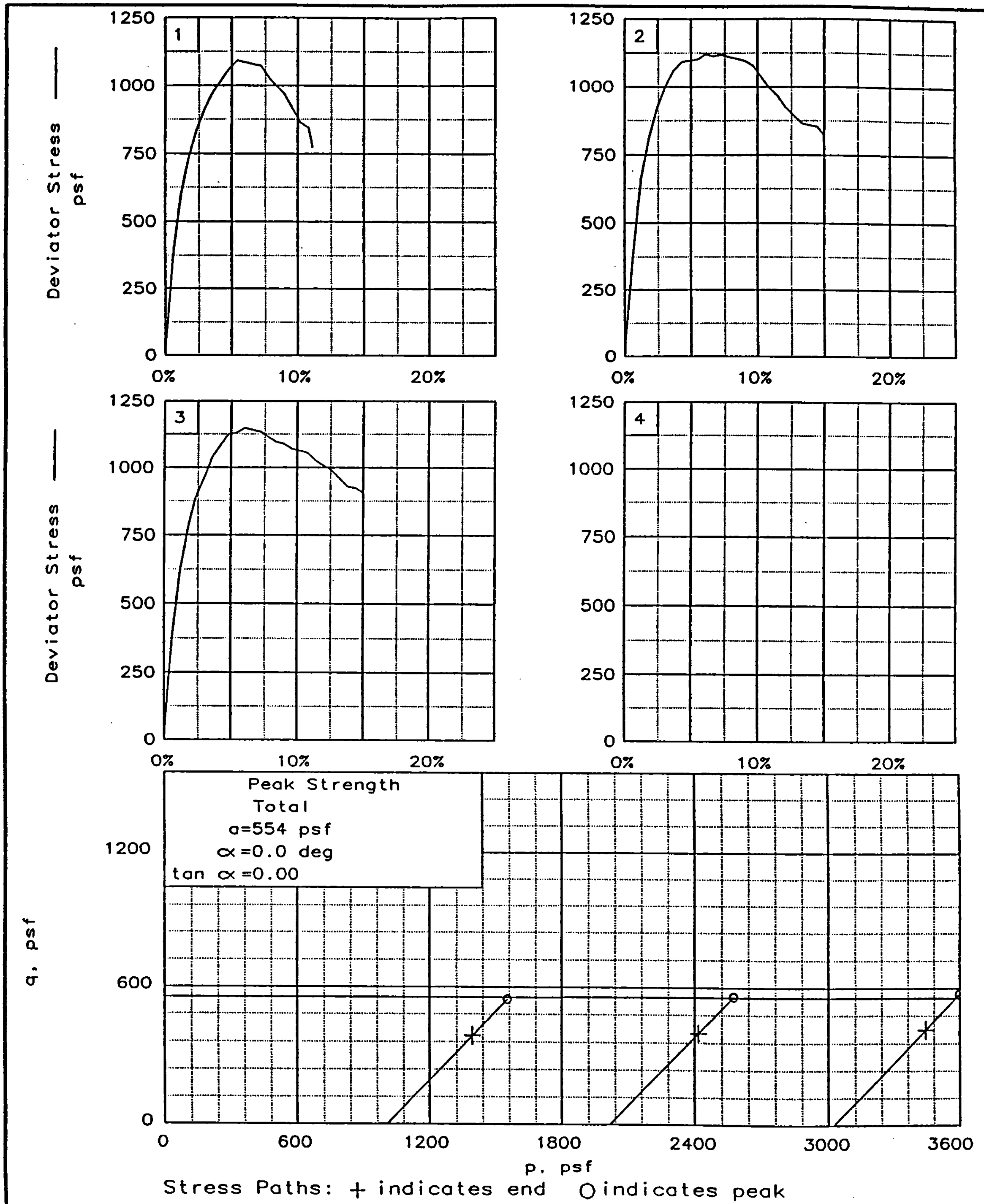
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-3U,
Sample 15-D, Depth 54.8'

PROJ. NO.: 13622 DATE: 8-1-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

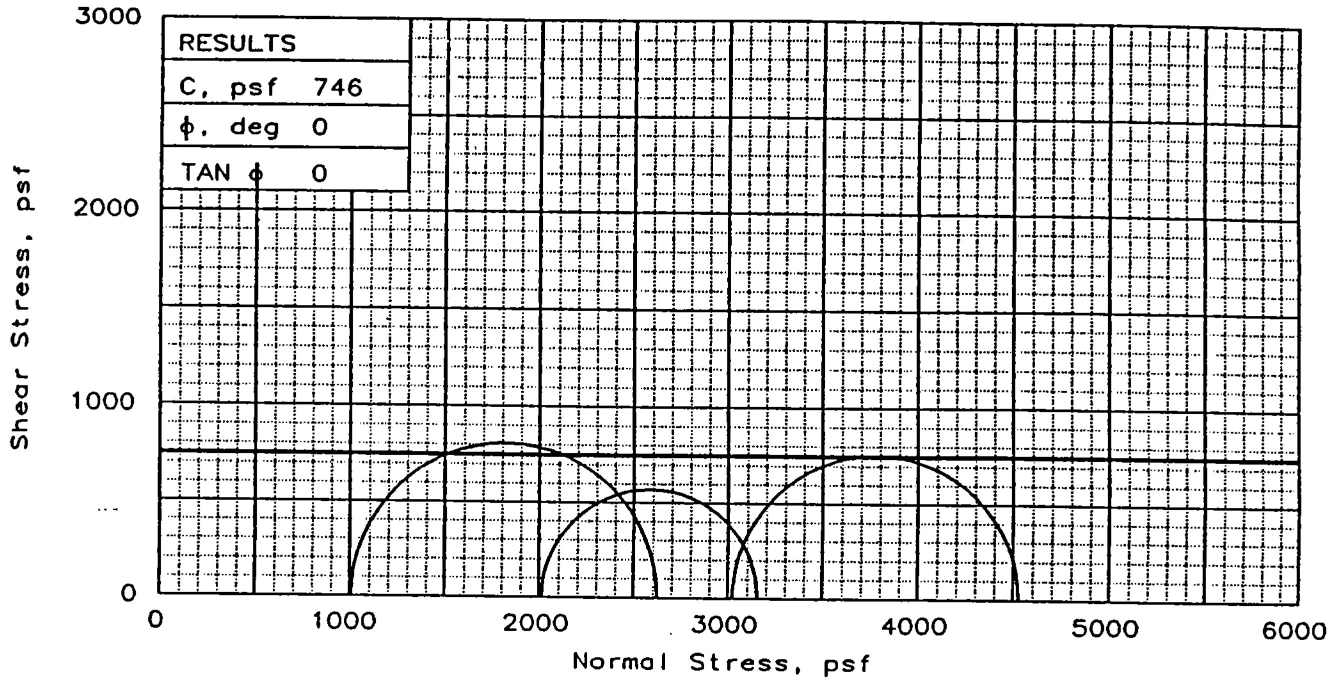


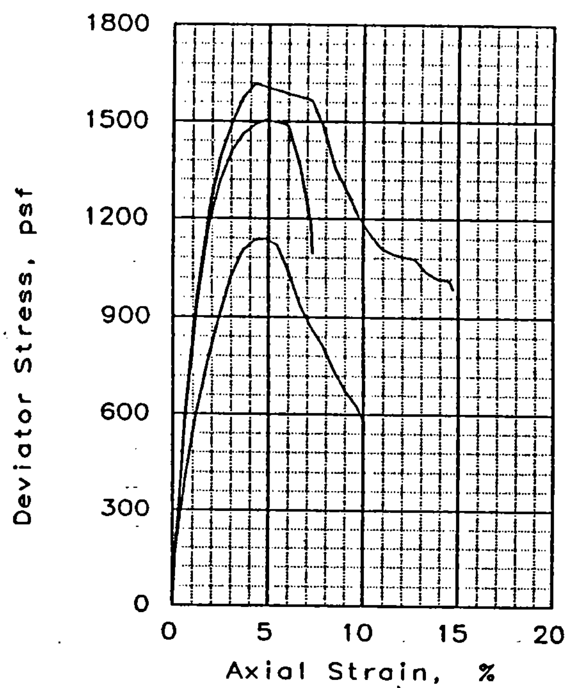
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-3U, Sample 15-D, Depth 54.8'

File: UU-7199 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	58.5	64.7	58.6
	DRY DENSITY, pcf	66.6	62.4	66.3
	SATURATION, %	102.2	101.9	101.5
	VOID RATIO	1.568	1.740	1.581
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	57.1	63.6	57.8
	DRY DENSITY, pcf	66.7	62.4	66.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.565	1.743	1.583
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0990	0.0962	0.0860
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1617	1139	1506
ULTIMATE STRESS, psf		986	550	1095
σ_1 FAILURE, psf		2625	3155	4530
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 96 PL= 27 PI= 69
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-3U,
Sample 17-C, Depth 62.1'
PROJ. NO.: 13622 DATE: 8-1-96

TRIAXIAL SHEAR TEST REPORT

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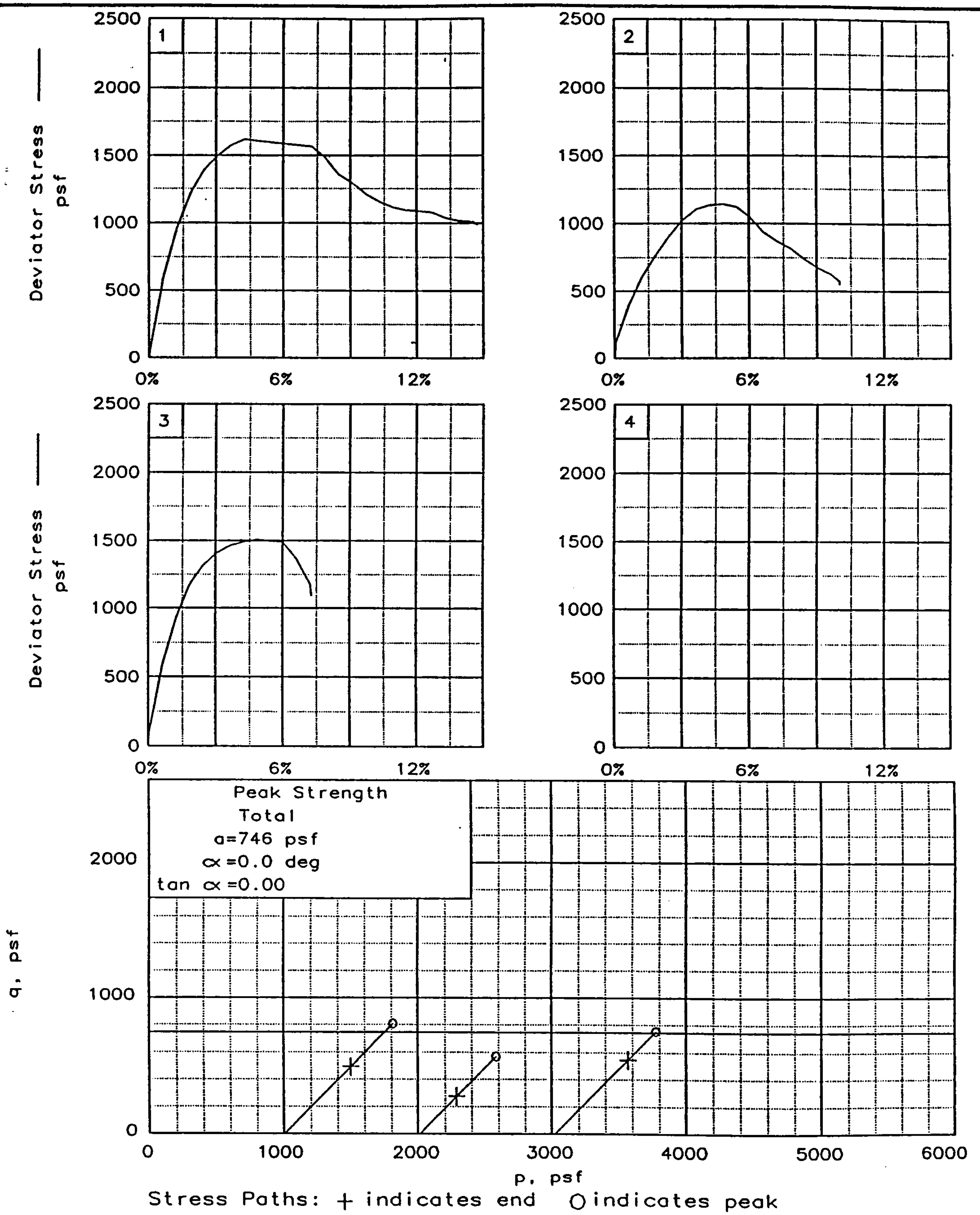
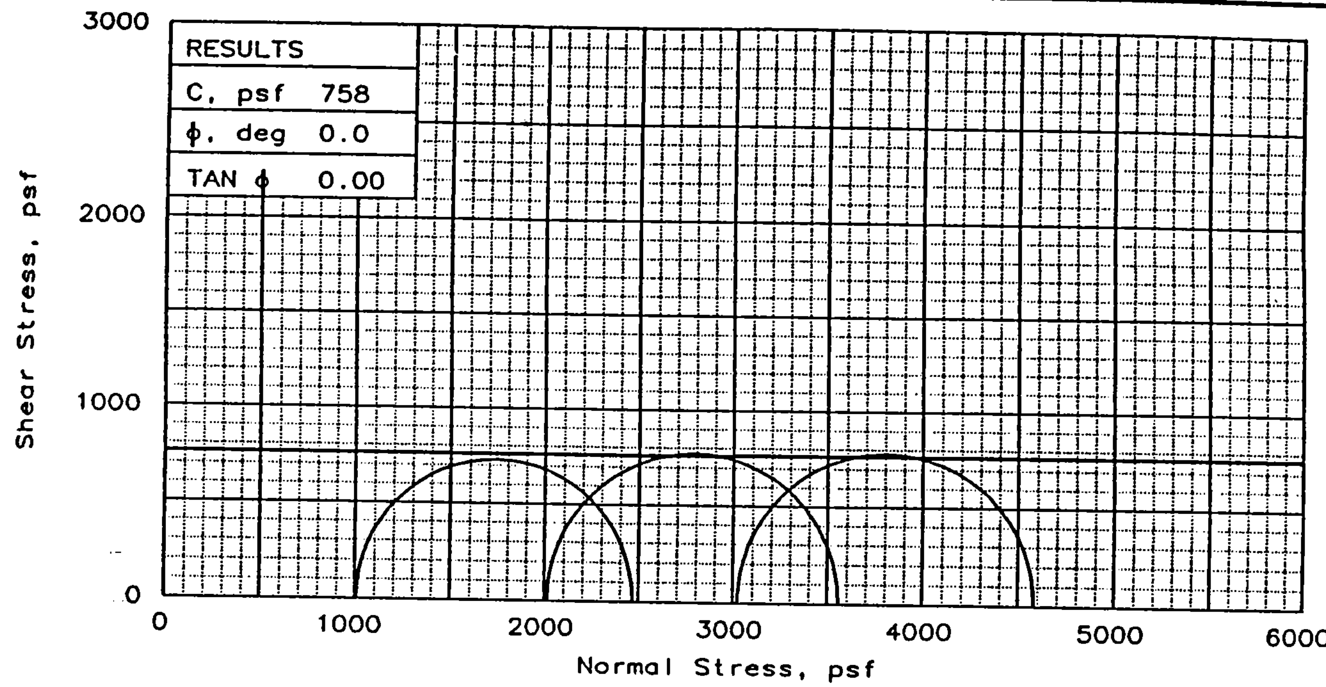


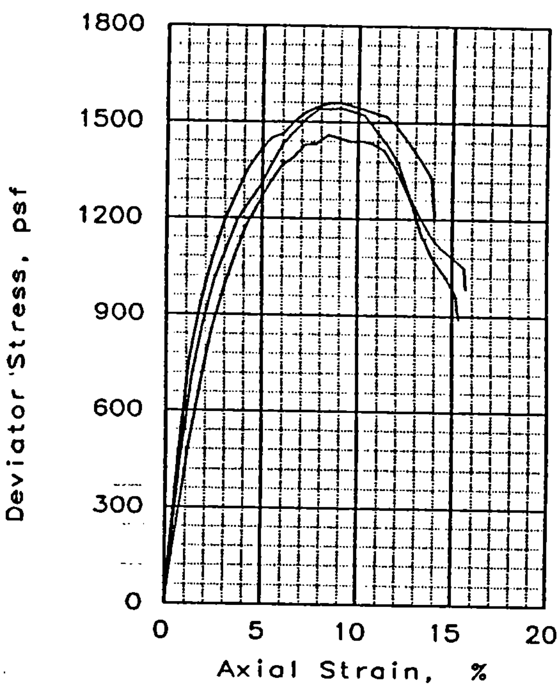
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-3U, Sample 17-C, Depth 62.1'

File: UU-7200 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	58.5	58.4	59.4
	DRY DENSITY, pcf	64.8	64.9	64.6
	SATURATION, %	97.8	97.7	98.7
	VOID RATIO	1.638	1.637	1.649
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.97	2.96	2.95
AT TEST	WATER CONTENT, %	58.8	57.9	57.1
	DRY DENSITY, pcf	65.5	66.1	66.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.612	1.587	1.564
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0973	0.0941	0.0956
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1460	1542	1560
ULTIMATE STRESS, psf		983	889	1195
σ_1 FAILURE, psf		2468	3558	4584
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 97 PL= 30 PI= 67
SPECIFIC GRAVITY= 2.74
REMARKS:

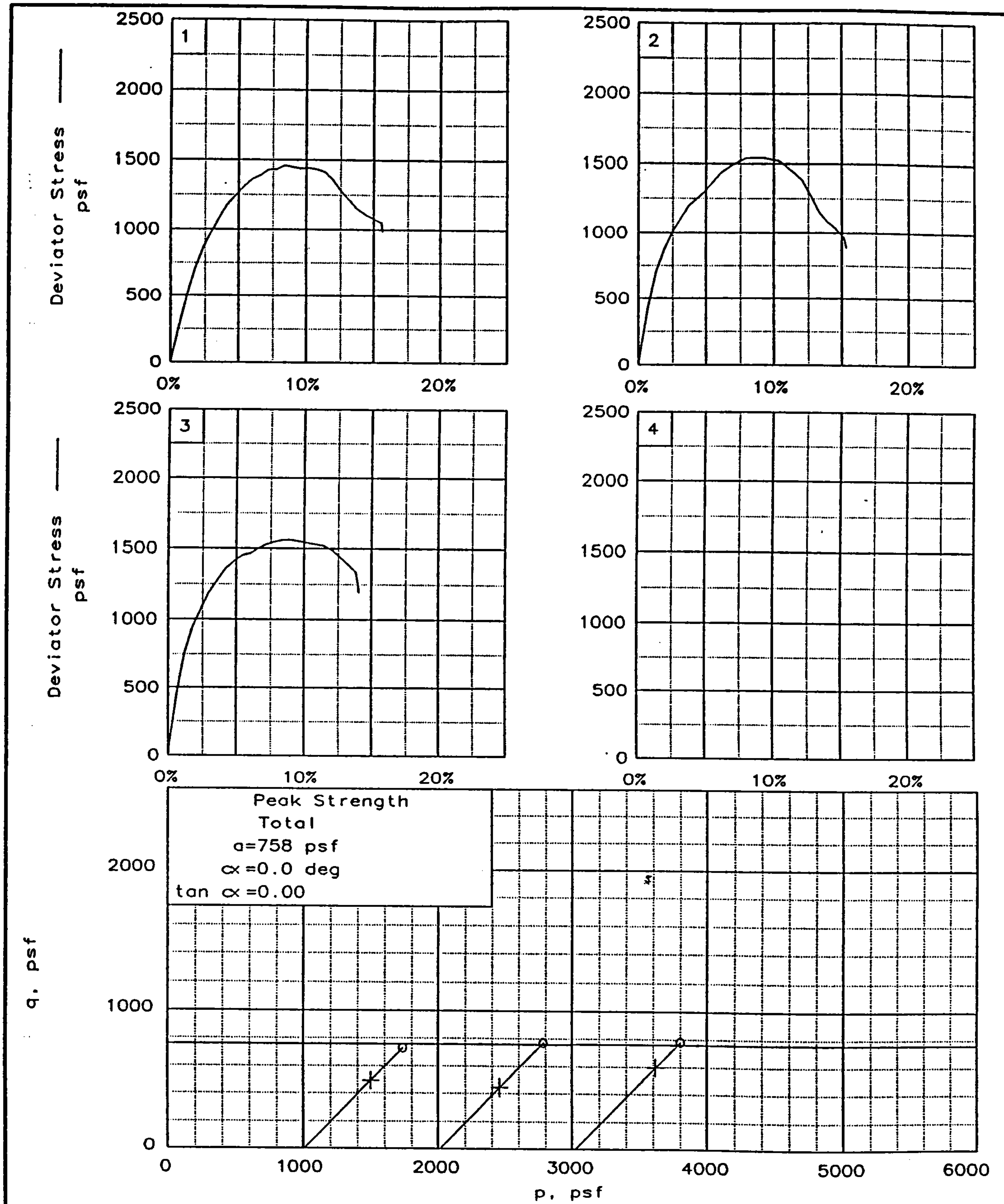
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-3U,
Sample 19-C, Depth 70.1'
PROJ. NO.: 13622 DATE: 8-1-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

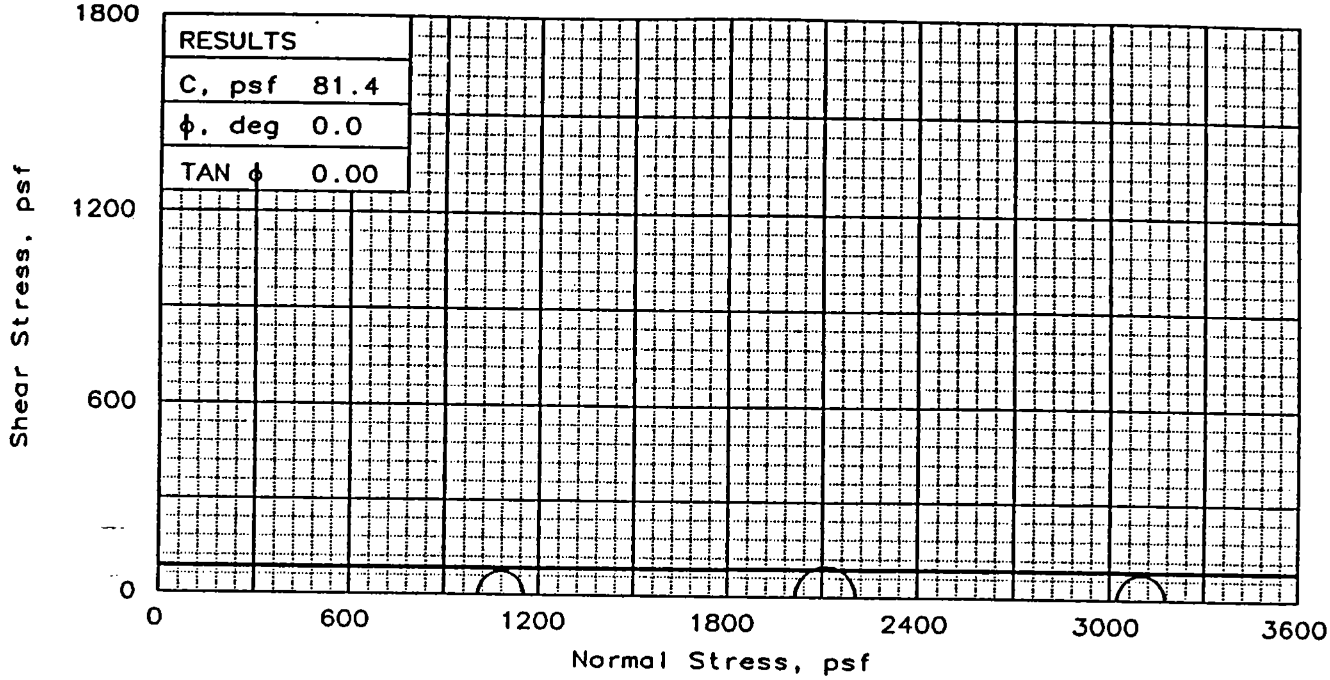
Client: U.S. Army Corps of Engineers

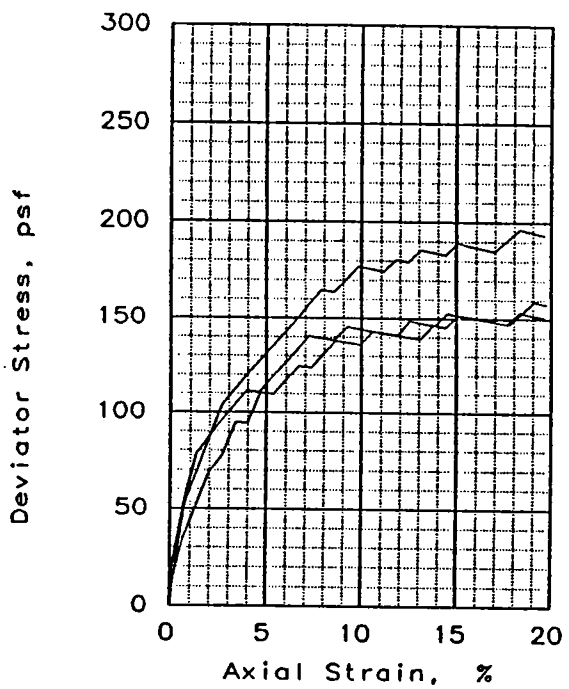
Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-3U, Sample 19-C, Depth 70.1'

File: UU-7201 Project No.: 13622 FIG. NO.: ____

RESULTS	
C, psf	81.4
ϕ, deg	0.0
TAN ϕ	0.00





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	60.8	52.8	54.8
	DRY DENSITY, pcf	65.4	69.6	69.1
	SATURATION, %	103.5	99.7	102.1
	VOID RATIO	1.598	1.440	1.459
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.99	2.98	2.98
AT TEST	WATER CONTENT, %	59.2	53.1	53.6
	DRY DENSITY, pcf	65.0	69.5	69.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.611	1.445	1.457
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1101	0.1115	0.1123
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		145	189	153
ULTIMATE STRESS, psf		151	193	158
σ_1 FAILURE, psf		1153	2205	3177
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH2
w/ lyr & ars ML, rts
LL= 58 PL= 20 PI= 38
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-4U,
Sample 2-B, Depth 4.4'

PROJ. NO.: 13622 DATE: 8-2-96

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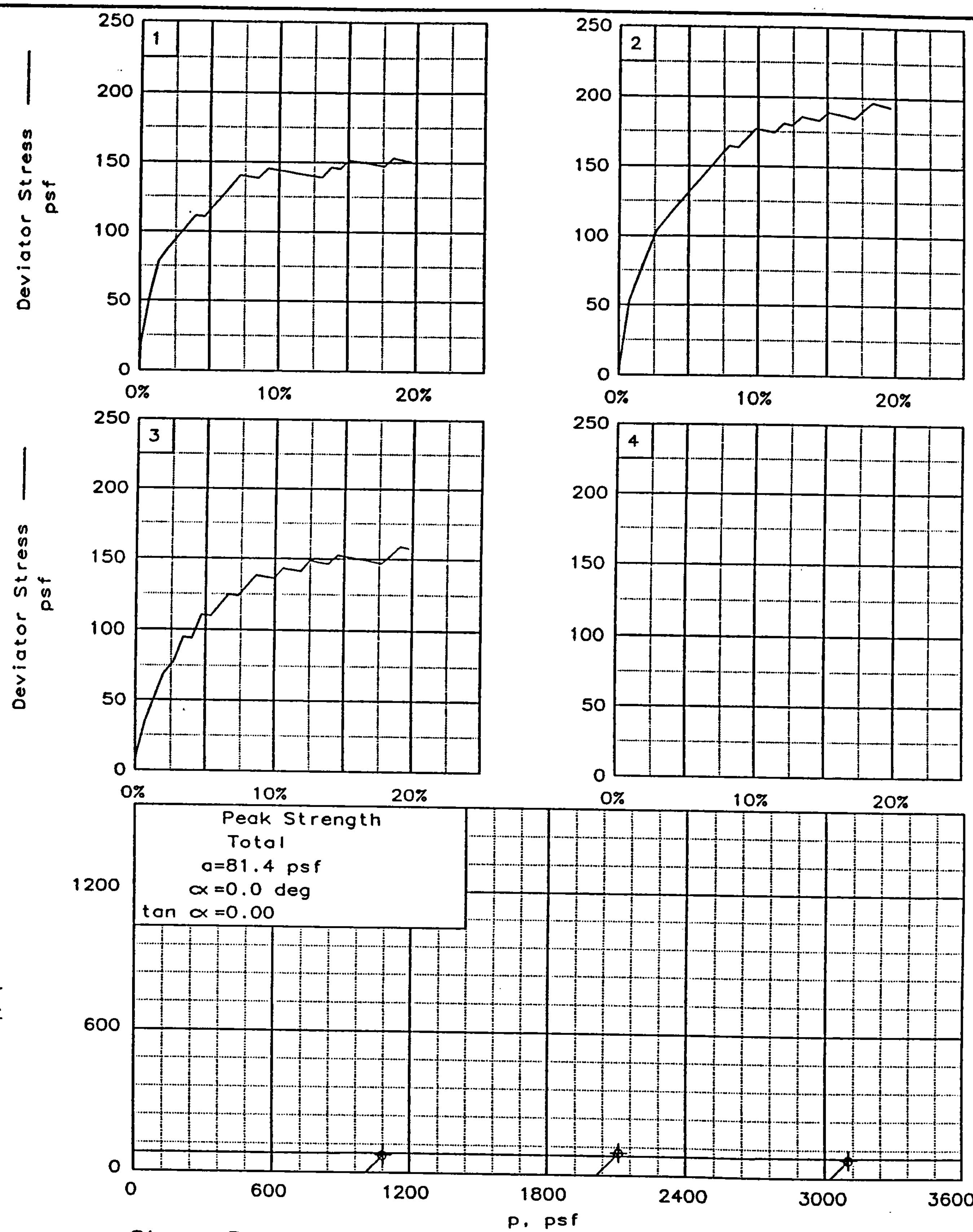
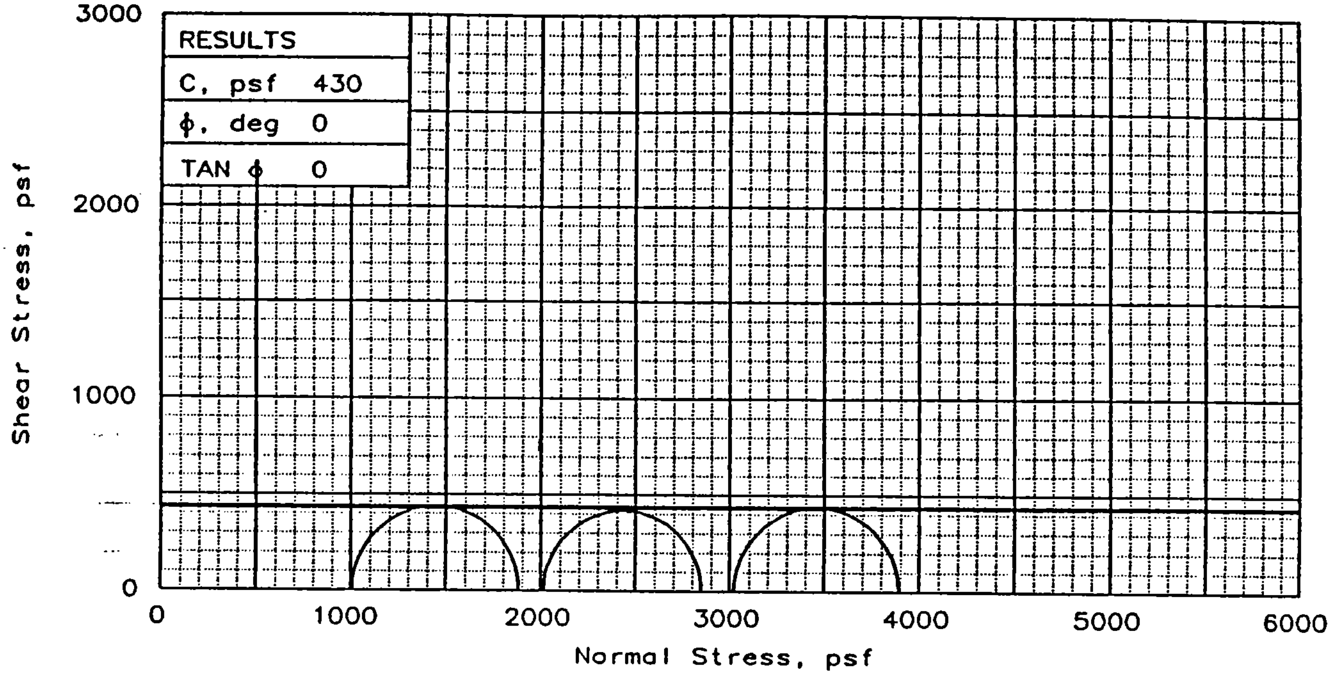
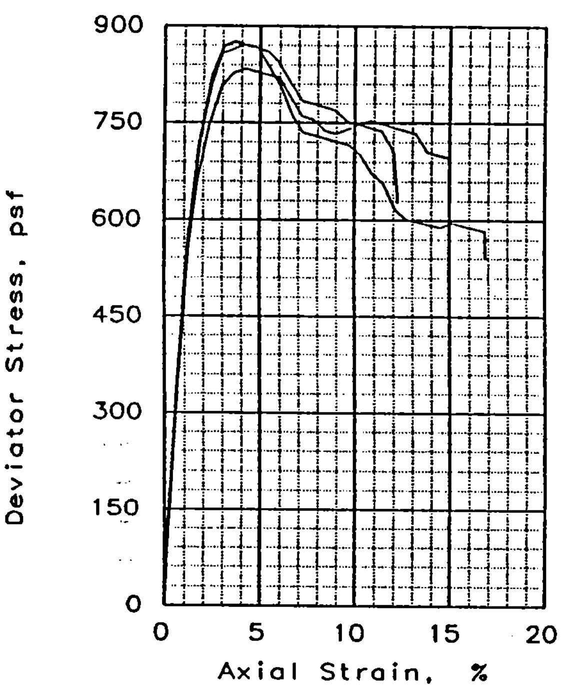


Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-4U, Sample 2-B, Depth 4.4'
File: UU-7231 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	86.9	84.7	85.0
	DRY DENSITY, pcf	49.3	50.9	50.4
	SATURATION, %	96.5	98.4	97.5
	VOID RATIO	2.468	2.358	2.391
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.97
AT TEST	WATER CONTENT, %	90.2	85.6	86.6
	DRY DENSITY, pcf	49.3	51.1	50.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.471	2.344	2.373
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0944	0.0834	0.0953
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		876	834	872
ULTIMATE STRESS, psf		540	696	627
σ_1 FAILURE, psf		1884	2850	3896
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CHOA w/ Tr org

LL= 128 PL= 35 PI= 93

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

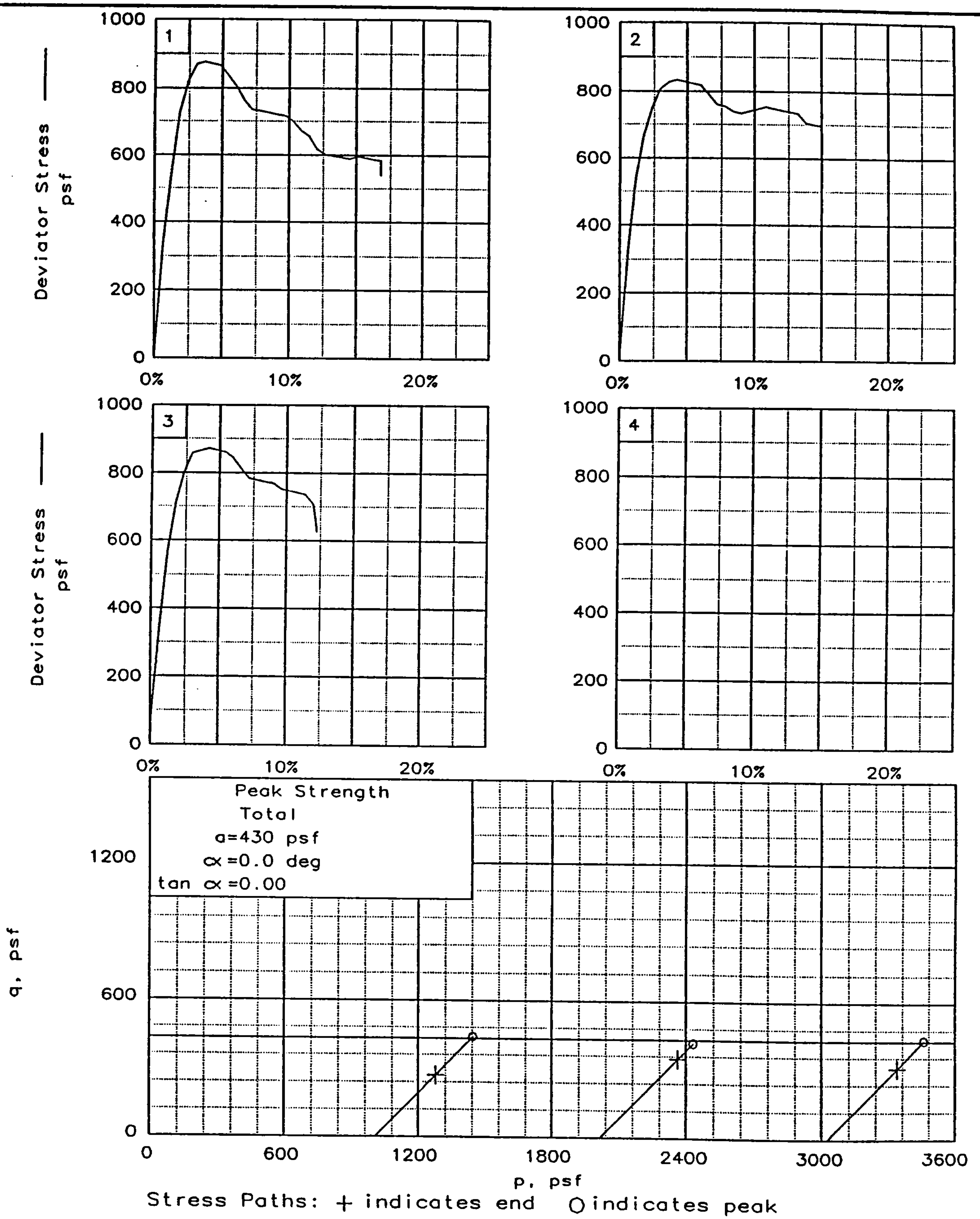
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-4U,
Sample 8-C, Depth 22.1'

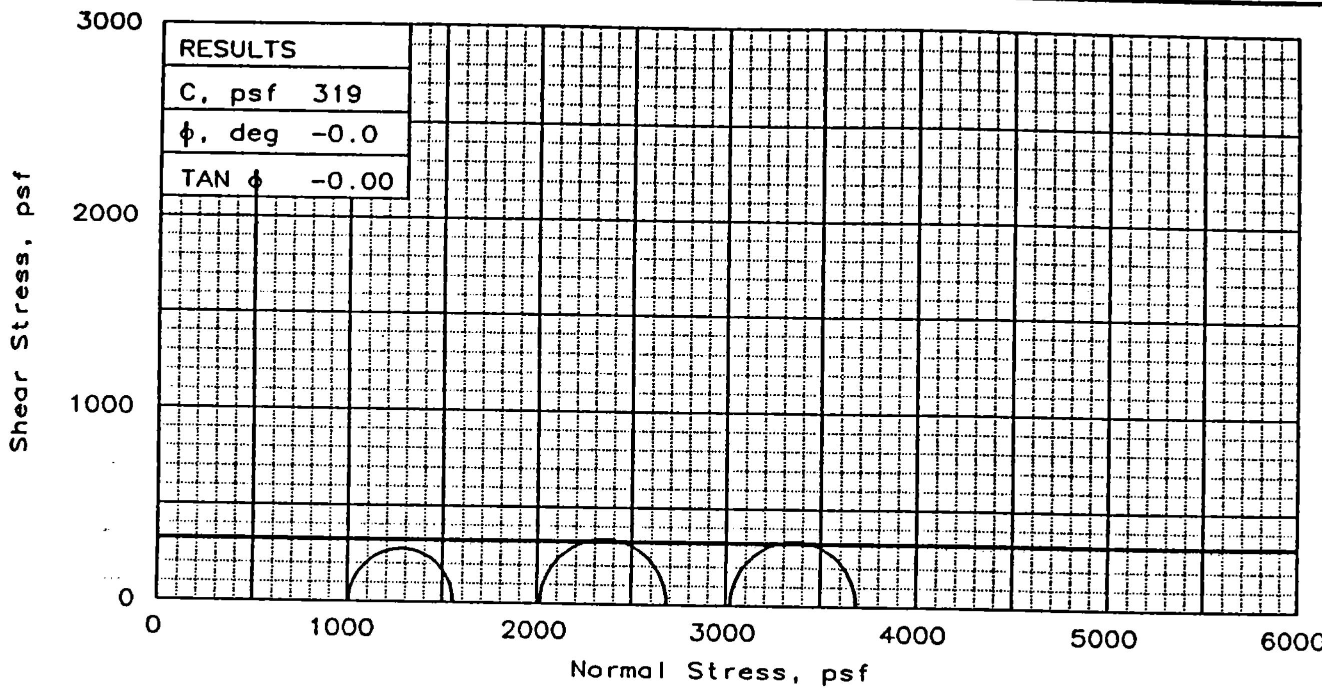
PROJ. NO.: 13622 DATE: 8-2-96

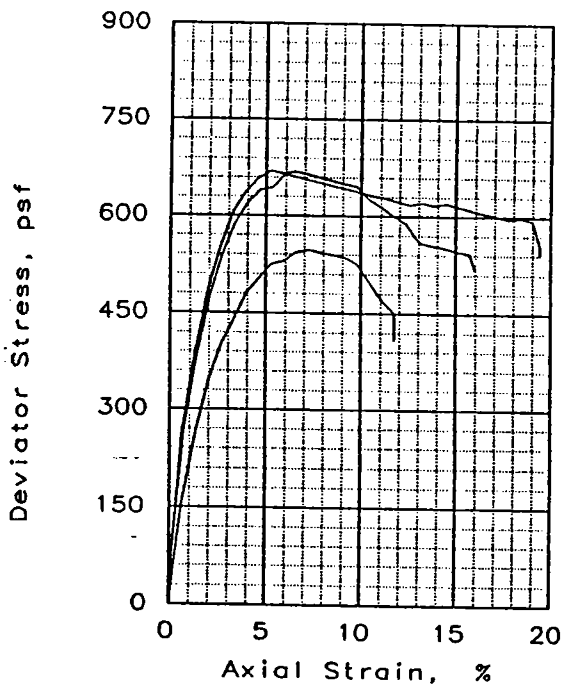
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-4U, Sample 8-C, Depth 22.1'
File: UU-7232 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	56.6	59.5	60.9
	DRY DENSITY, pcf	66.8	65.8	64.2
	SATURATION, %	99.5	101.8	100.4
	VOID RATIO	1.560	1.602	1.663
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	57.0	58.4	60.5
	DRY DENSITY, pcf	66.7	65.8	64.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.563	1.599	1.656
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1037	0.1108	0.1098
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		547	670	665
ULTIMATE STRESS, psf		410	519	541
σ_1 FAILURE, psf		1555	2686	3689
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns ML
LL= 72 PL= 24 PI= 48
SPECIFIC GRAVITY= 2.74
REMARKS:

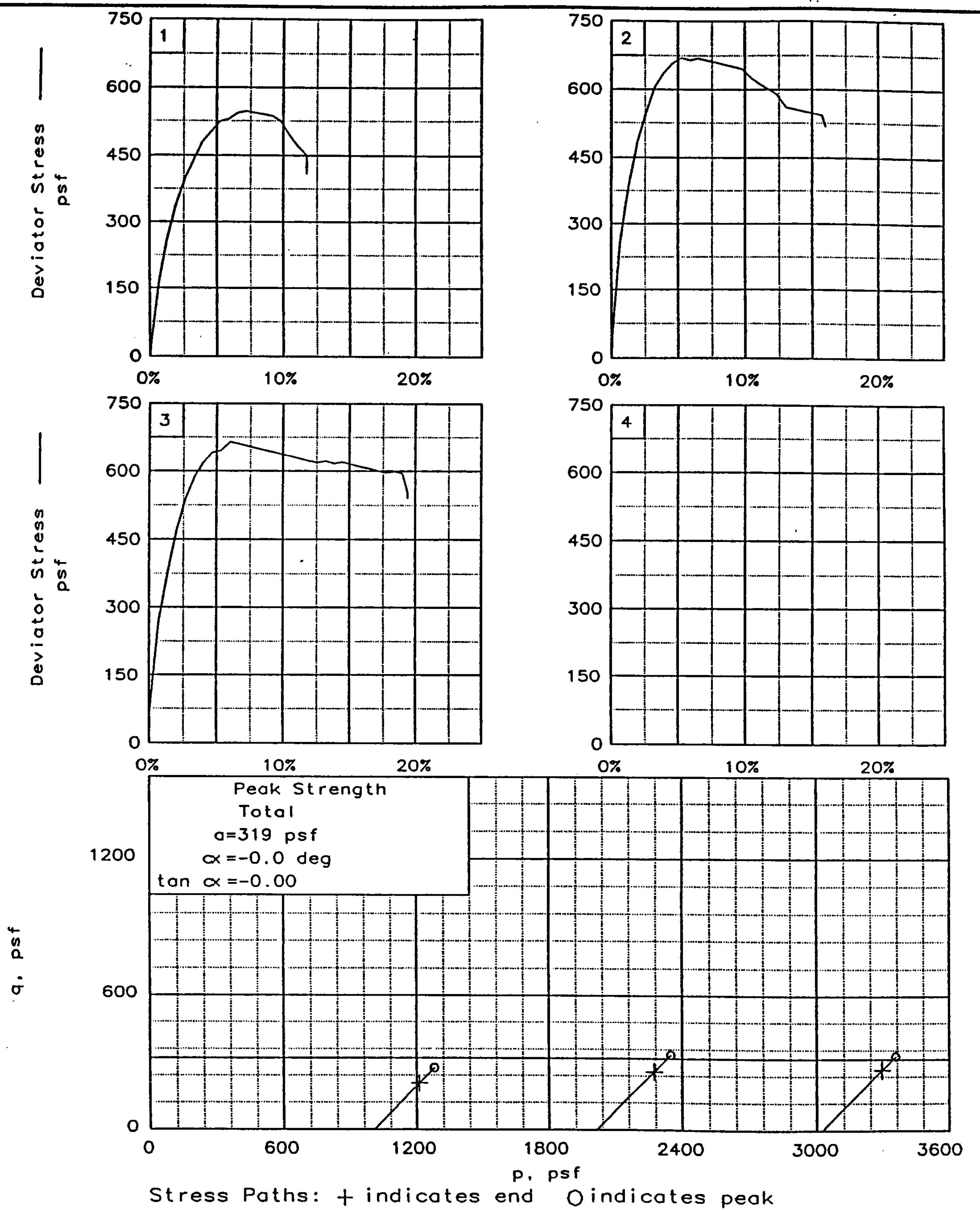
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-4U,
Sample 10-B, Depth 29.5'
PROJ. NO.: 13622 DATE: 8-5-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

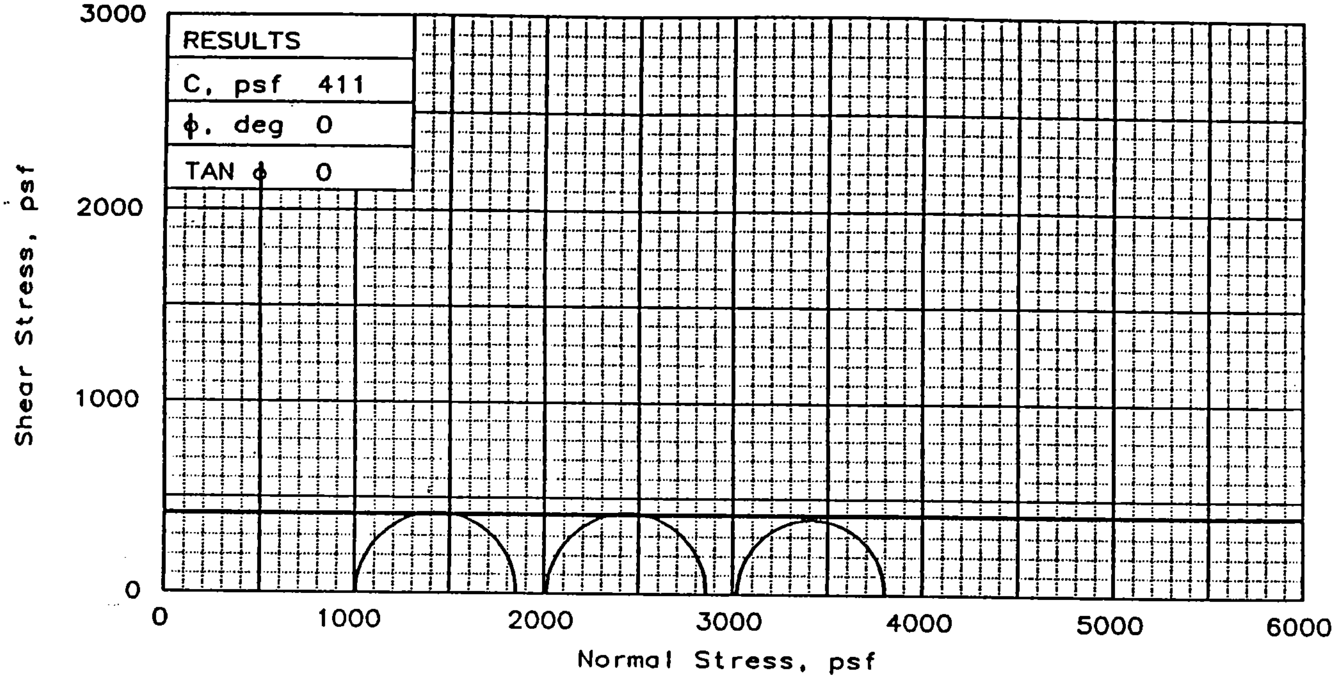


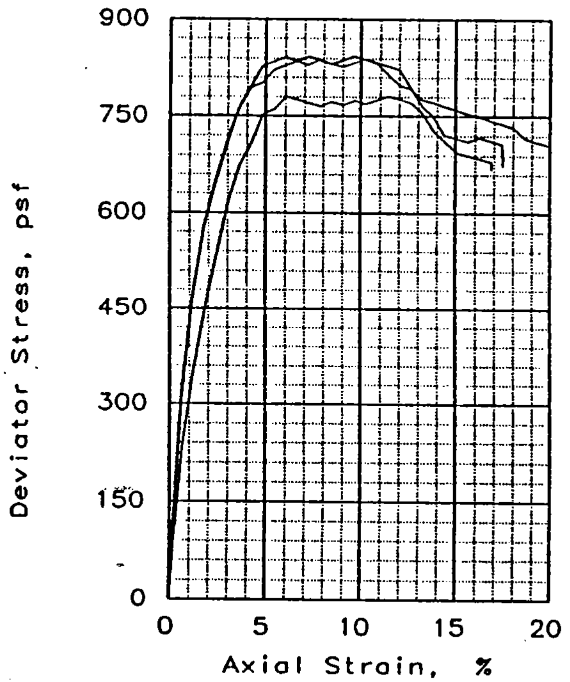
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-4U, Sample 10-B, Depth 29.5'

File: UU-7246 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	63.1	63.0	63.8
	DRY DENSITY, pcf	64.1	63.2	62.4
	SATURATION, %	104.0	101.6	100.8
	VOID RATIO	1.649	1.686	1.723
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	60.9	62.0	63.1
	DRY DENSITY, pcf	63.9	63.2	62.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.656	1.687	1.716
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0949	0.0943	0.1004
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		843	843	780
ULTIMATE STRESS, psf		675	706	669
σ_1 FAILURE, psf		1851	2859	3804
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lns & ars ML
LL= 101 PL= 31 PI= 70
SPECIFIC GRAVITY= 2.72
REMARKS:

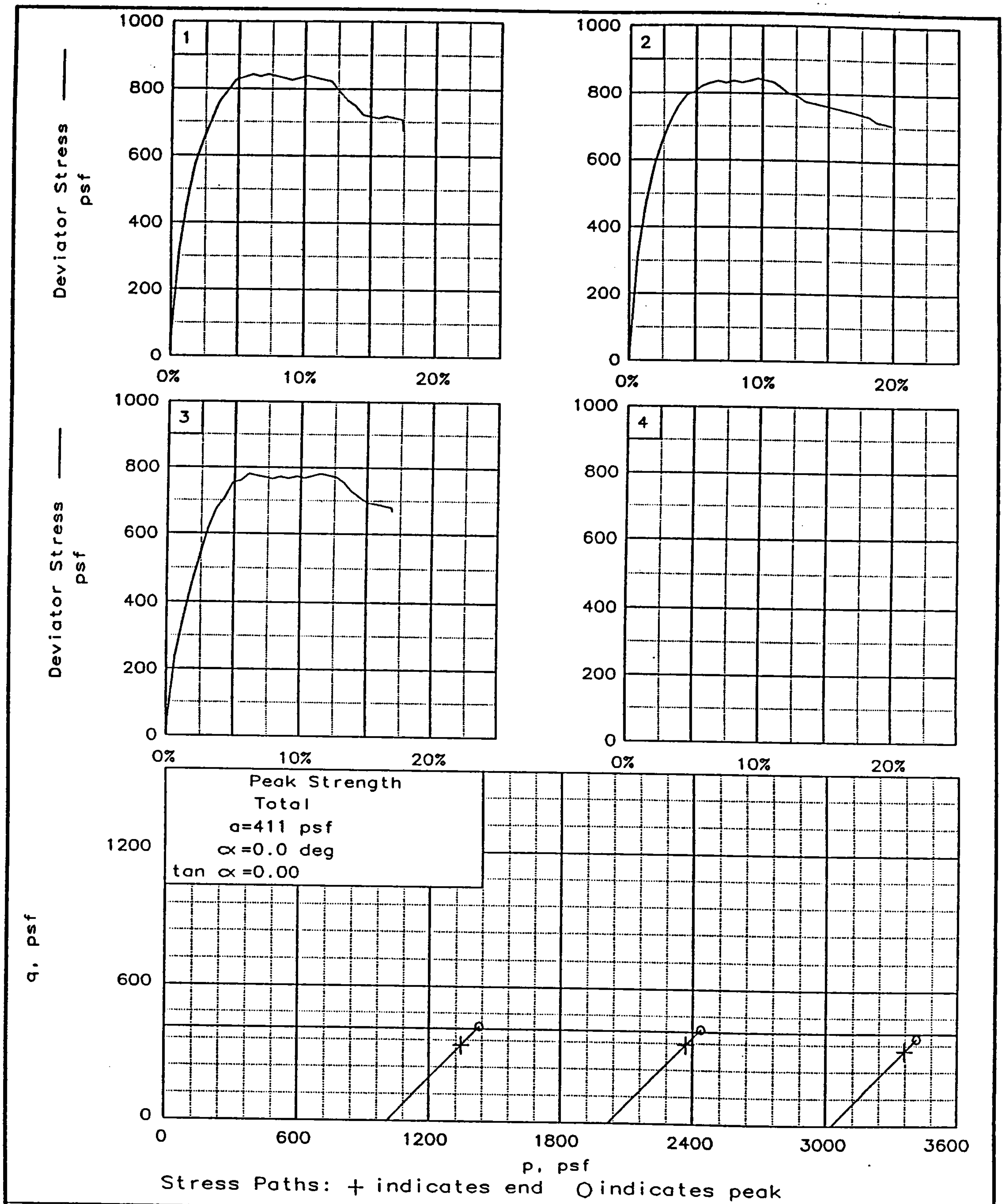
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

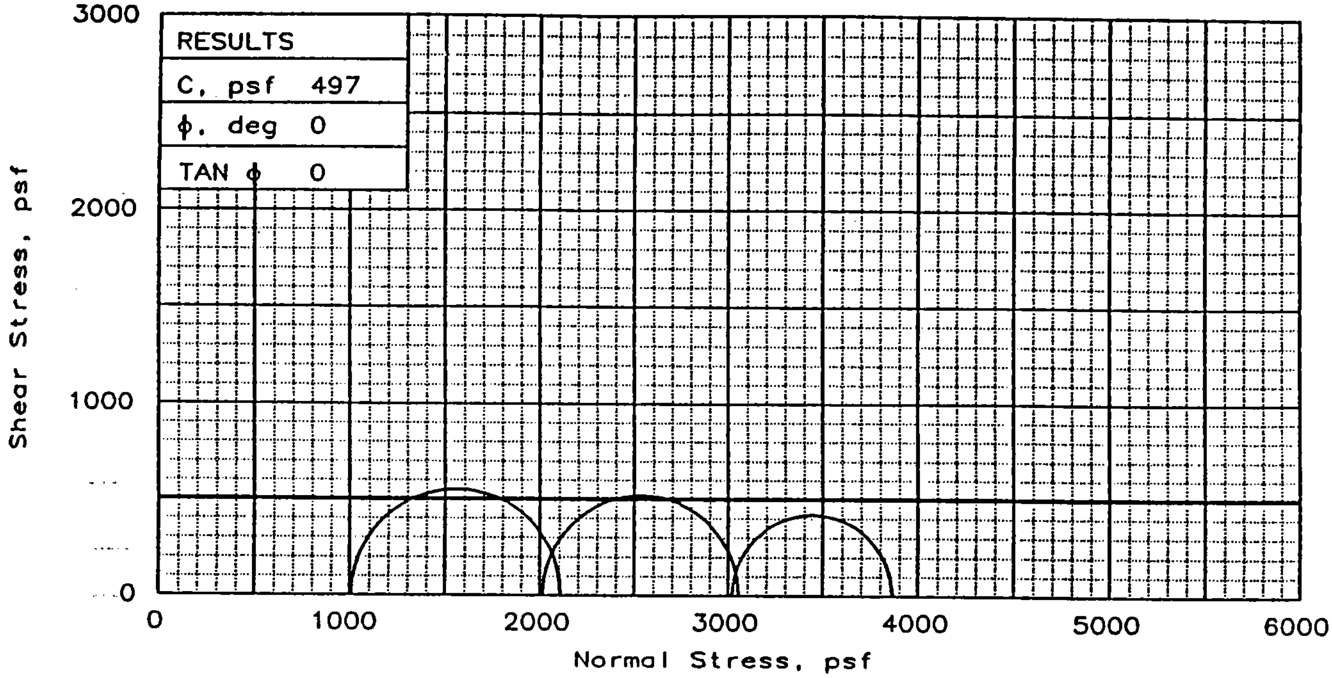
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-4U,
Sample 12-D, Depth 38.8'
PROJ. NO.: 13622 DATE: 8-5-96

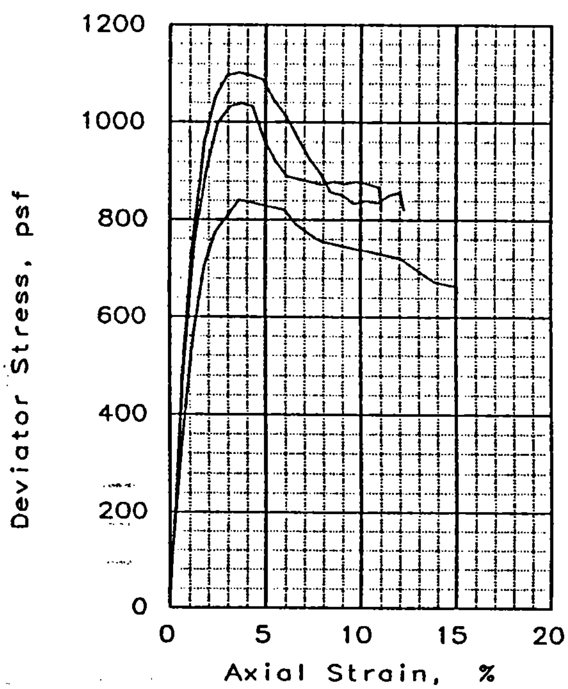
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-4U, Sample 12-D, Depth 38.8'
File: UU-7247 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.8	68.6	68.1
	DRY DENSITY, pcf	60.8	60.2	59.9
	SATURATION, %	102.5	102.0	100.4
	VOID RATIO	1.813	1.843	1.858
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	66.4	67.2	67.4
	DRY DENSITY, pcf	60.7	60.2	60.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.820	1.842	1.846
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0970	0.0929	0.0994
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1102	1038	841
ULTIMATE STRESS, psf		821	821	652
σ_1 FAILURE, psf		2110	3054	3865
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lyr & lns ML

LL= 83 PL= 26 PI= 57

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

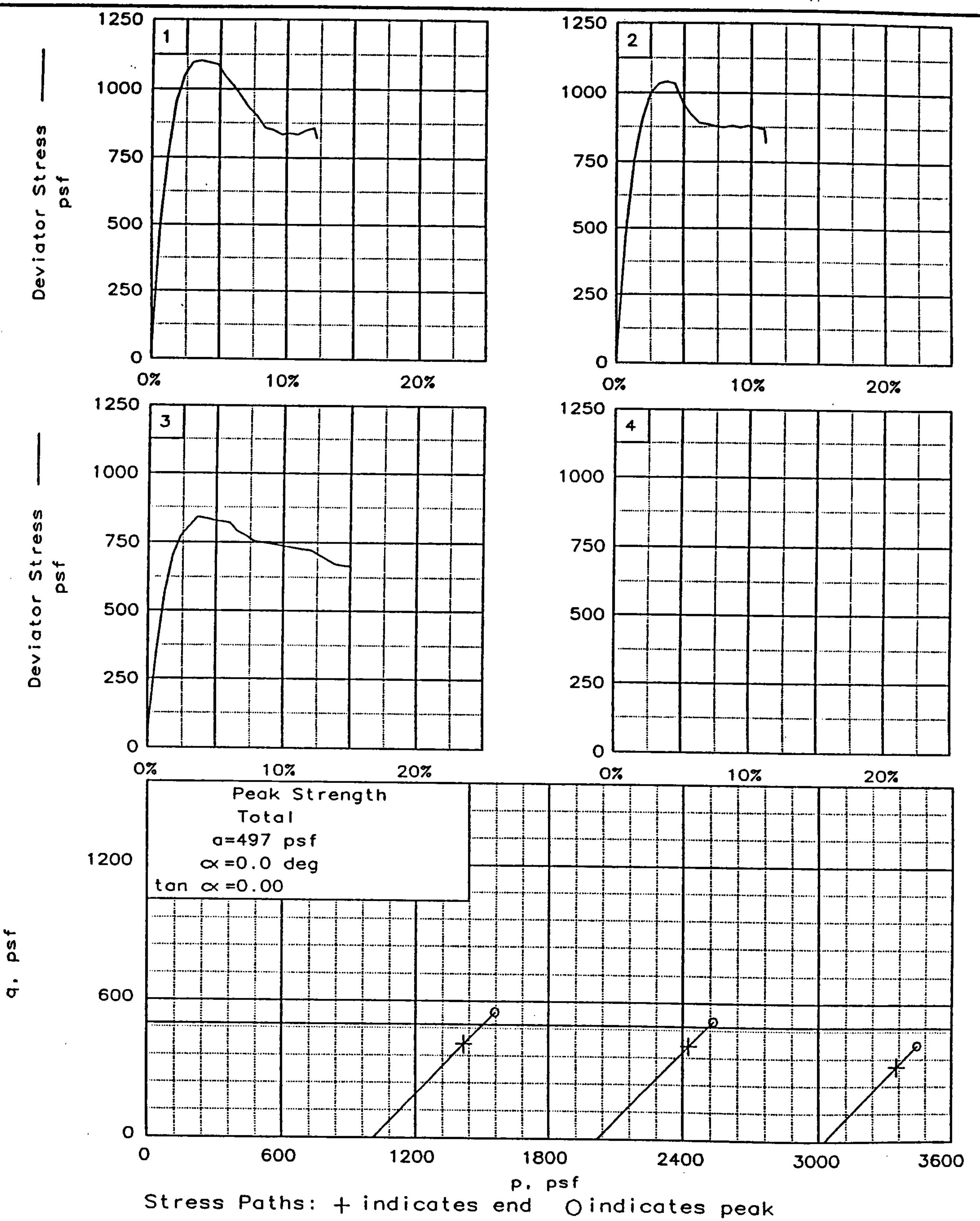
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-4U,
Sample 14-D, Depth 46.4'

PROJ. NO.: 13622 DATE: 8-6-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

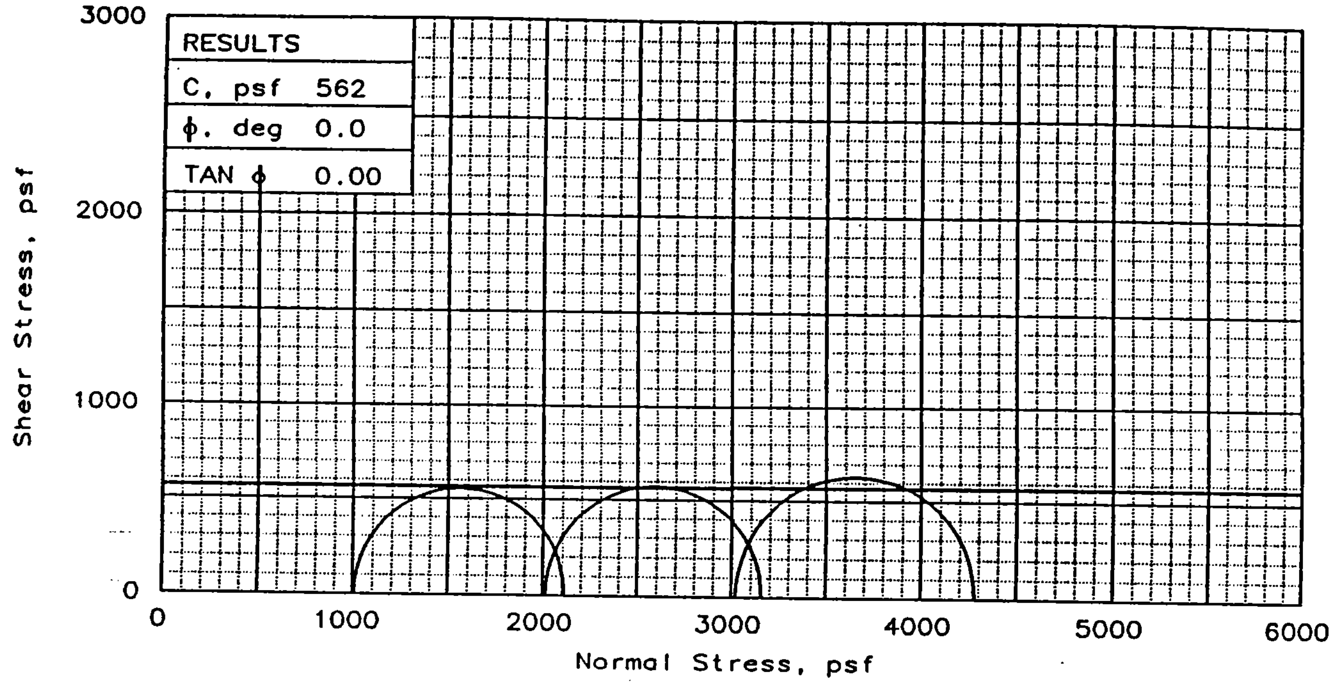


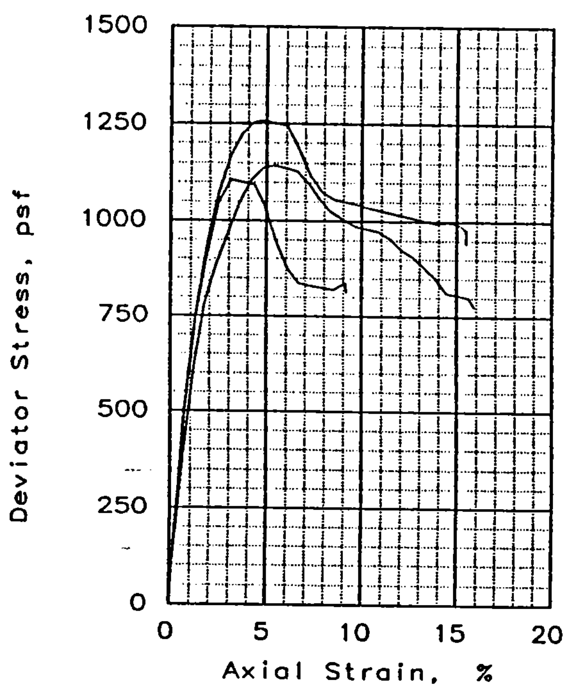
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-4U, Sample 14-D, Depth 46.4'

File: UU-7262 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.9	60.5	59.4
	DRY DENSITY, pcf	62.9	64.7	65.2
	SATURATION, %	100.3	100.8	100.3
	VOID RATIO	1.719	1.644	1.622
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	62.8	59.7	58.8
	DRY DENSITY, pcf	62.8	64.9	65.5
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.722	1.637	1.610
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0912	0.0977	0.0944
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1106	1143	1258
ULTIMATE STRESS, psf		813	776	943
σ_1 FAILURE, psf		2114	3159	4282
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 89 PL= 30 PI= 59
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-4U,
Sample 16-D, Depth 54.4'
PROJ. NO.: 13622 DATE: 8-6-96

TRIAXIAL SHEAR TEST REPORT

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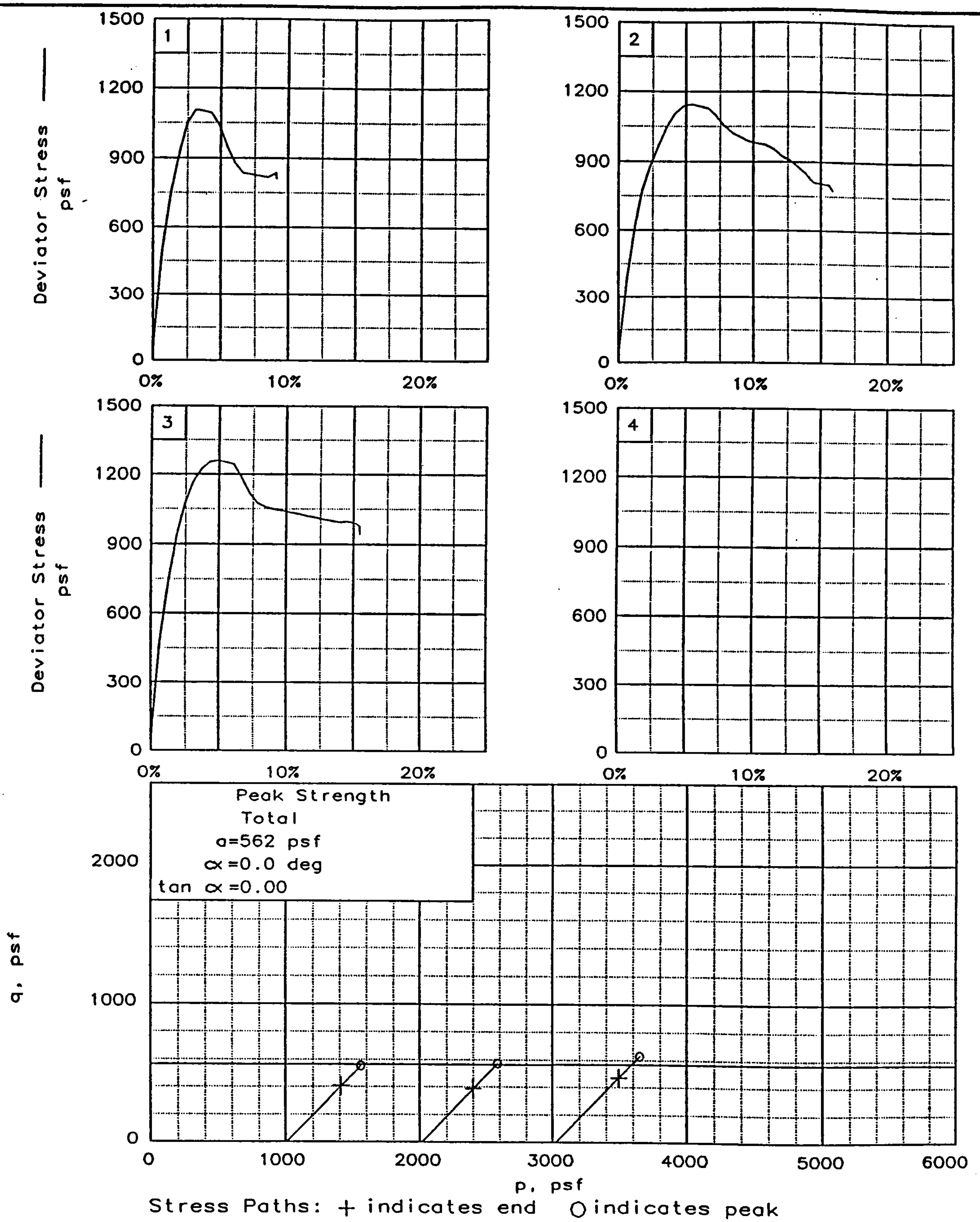
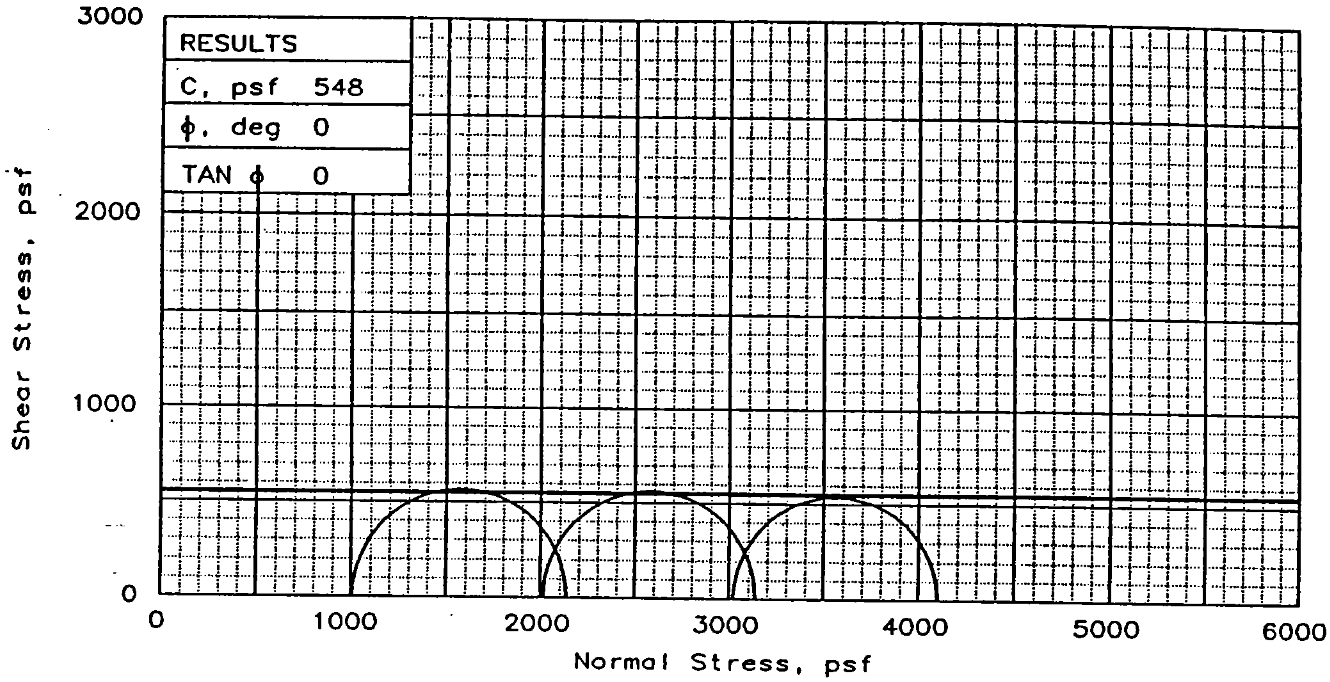
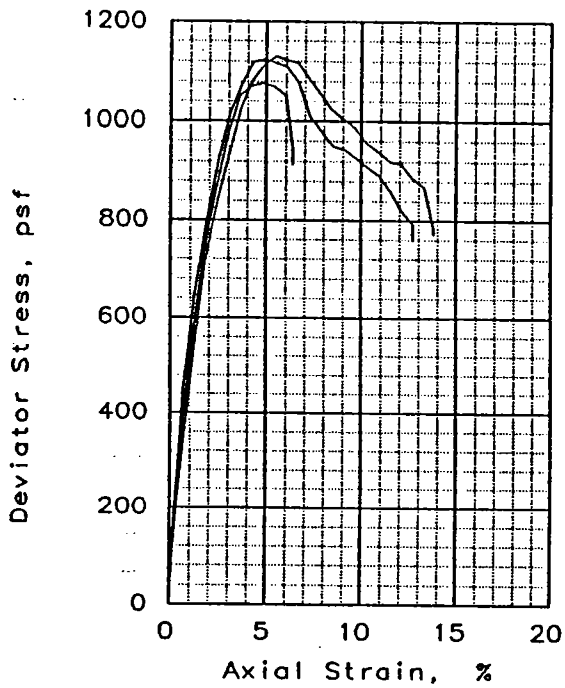


Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-4U, Sample 16-D, Depth 54.4'
File: UU-7263 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	66.4	64.7	65.0
	DRY DENSITY, pcf	61.7	62.7	62.2
	SATURATION, %	102.7	102.7	101.9
	VOID RATIO	1.770	1.728	1.749
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.98
AT TEST	WATER CONTENT, %	64.4	62.5	63.5
	DRY DENSITY, pcf	61.9	63.1	62.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.763	1.712	1.741
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0981	0.0992	0.0840
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1130	1123	1076
ULTIMATE STRESS, psf		773	759	912
σ_1 FAILURE, psf		2138	3139	4100
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lyr & lns SM

LL= 92 PL= 28 PI= 64

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-4U,
Sample 18-C, Depth 61.6'

PROJ. NO.: 13622 DATE: 8-6-96

TRIAXIAL SHEAR TEST REPORT

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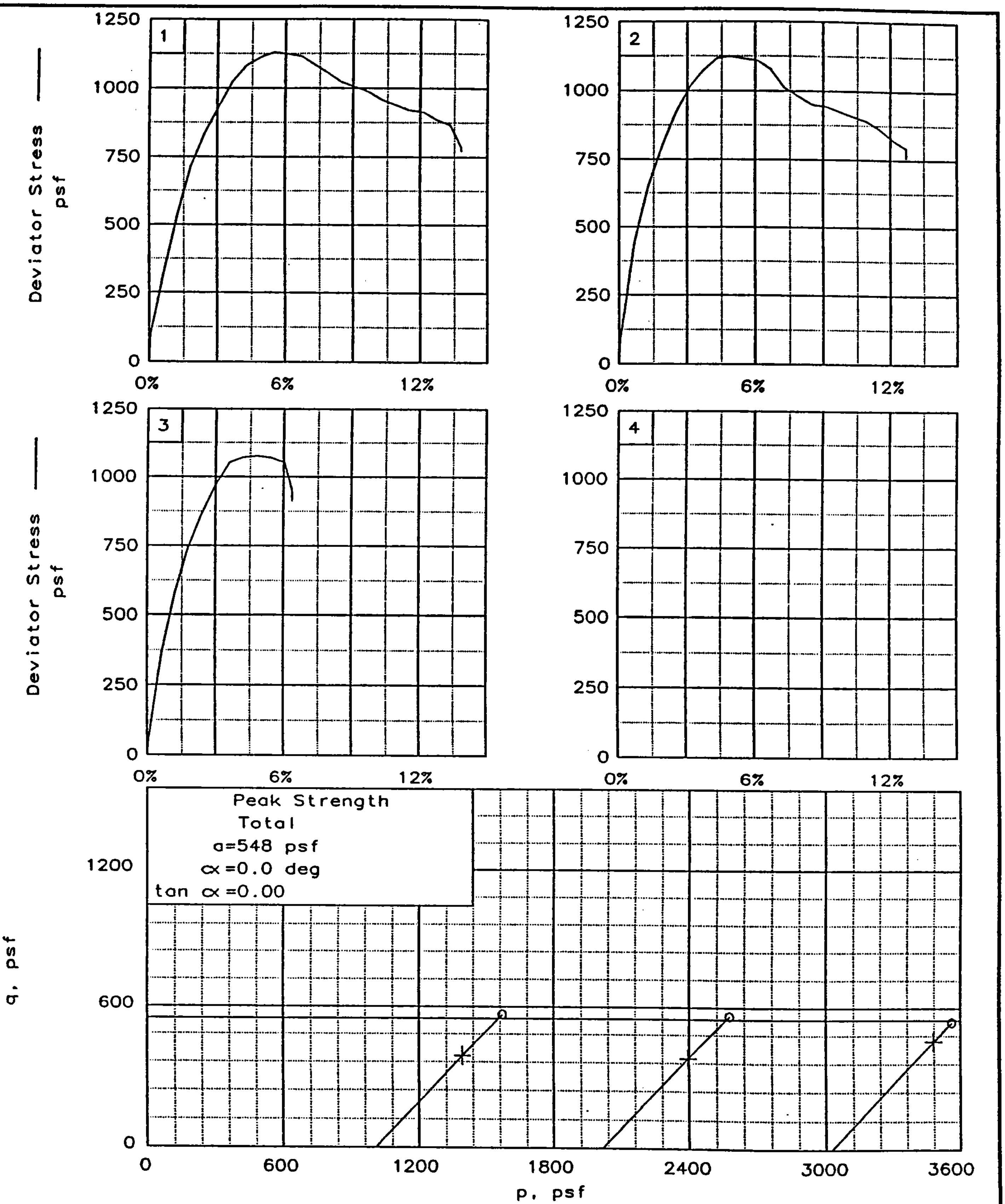
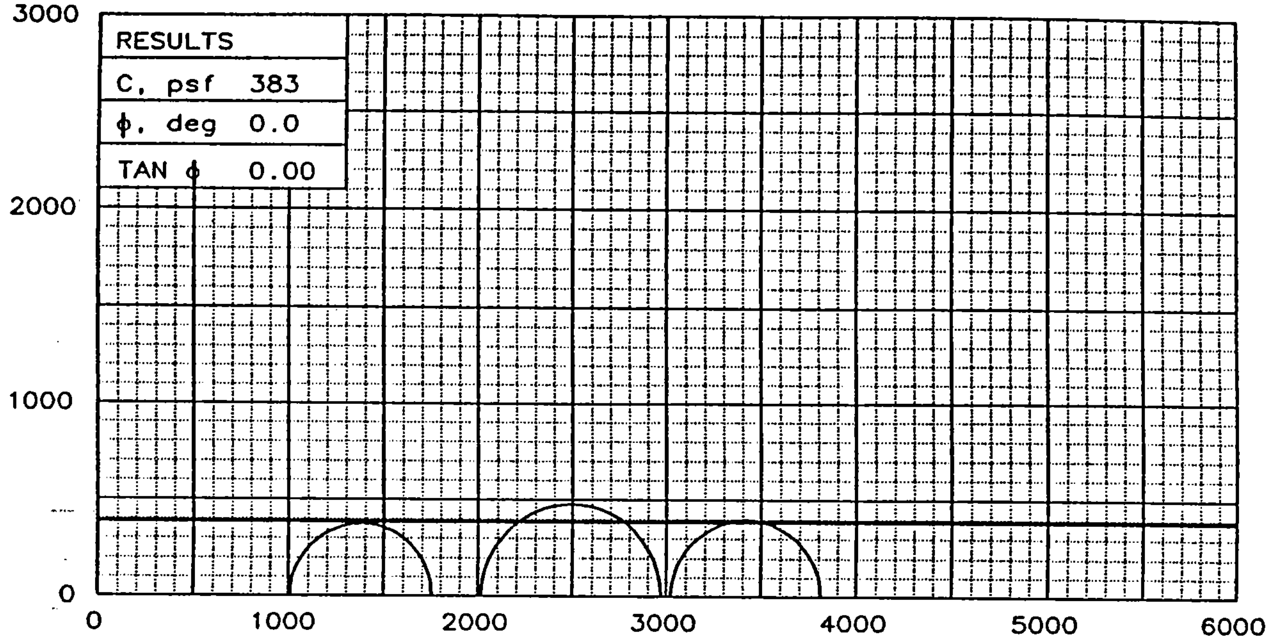
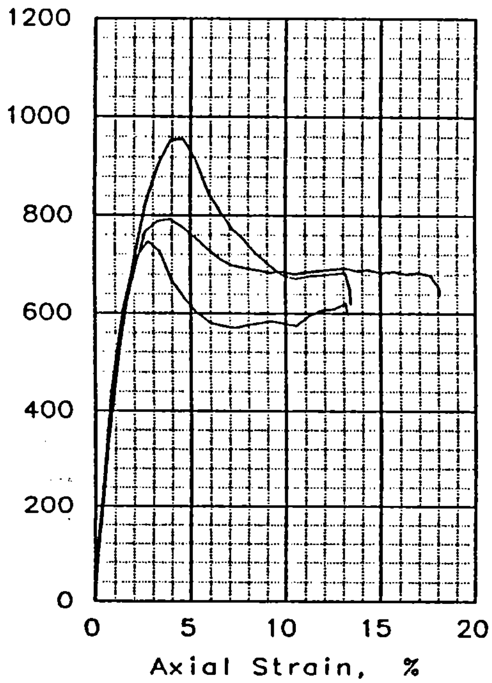


Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-4U, Sample 18-C, Depth 61.6'
File: UU-7264 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	64.1	62.6	62.8
	DRY DENSITY, pcf	62.4	63.8	63.6
	SATURATION, %	101.2	102.6	102.3
	VOID RATIO	1.723	1.661	1.669
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	63.8	61.3	61.3
	DRY DENSITY, pcf	62.1	63.6	63.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.734	1.668	1.667
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1087	0.0995	0.1075
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		748	955	792
ULTIMATE STRESS, psf		597	619	638
σ_1 FAILURE, psf		1756	2971	3816
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr org, ars PT & ML
LL= 98 PL= 27 PI= 71
SPECIFIC GRAVITY= 2.72
REMARKS:

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 3-B, Depth 9.4'

PROJ. NO.: 13622 DATE: 8-6-96

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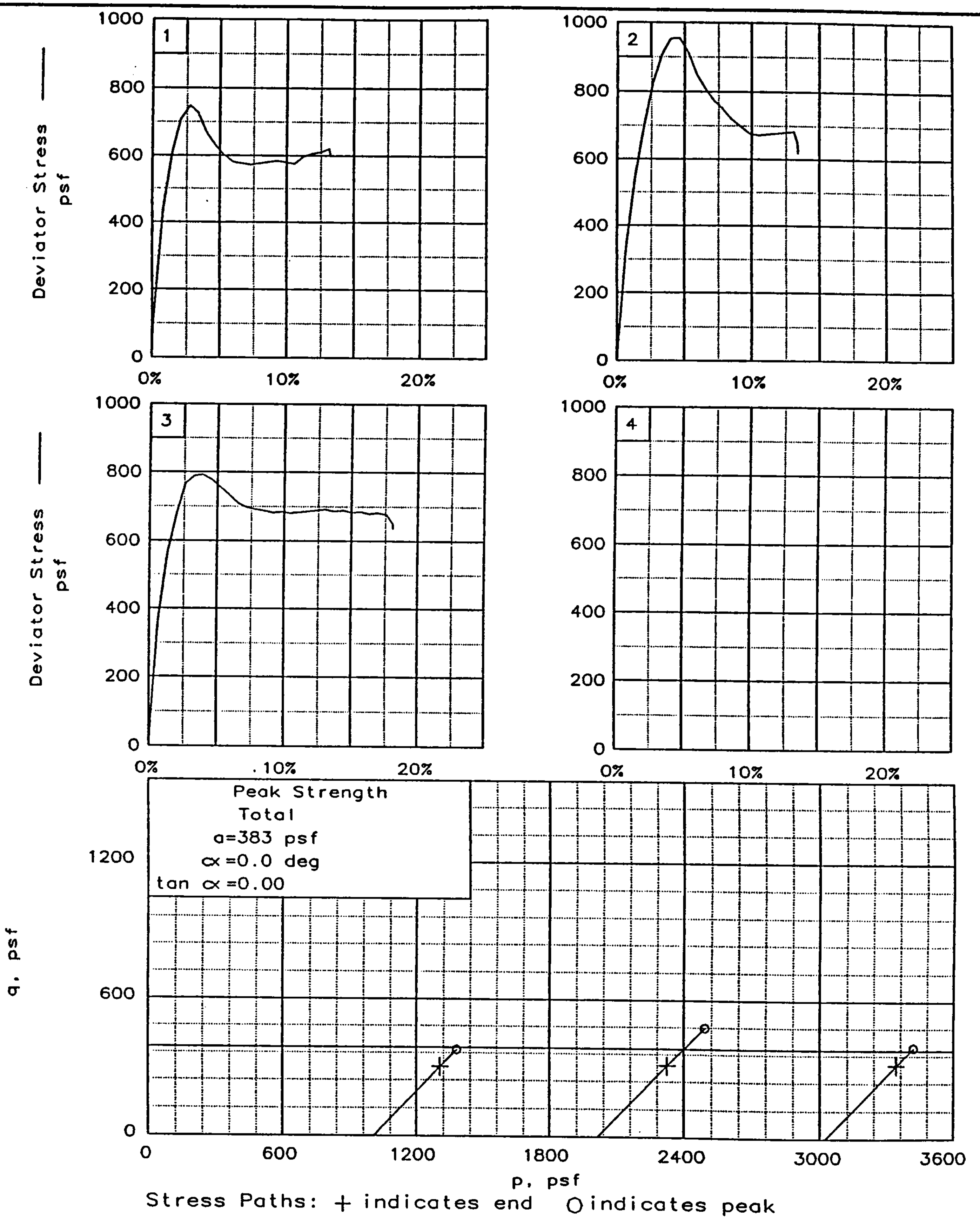
FIG. NO.: ______

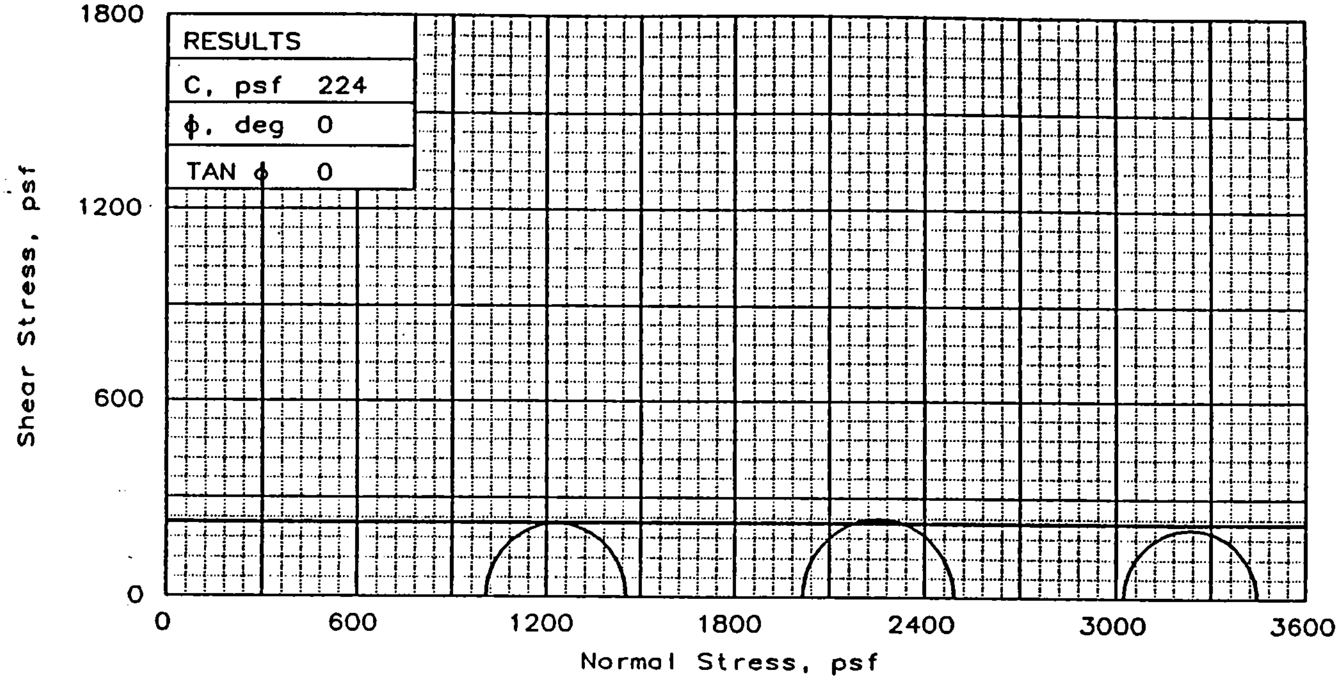


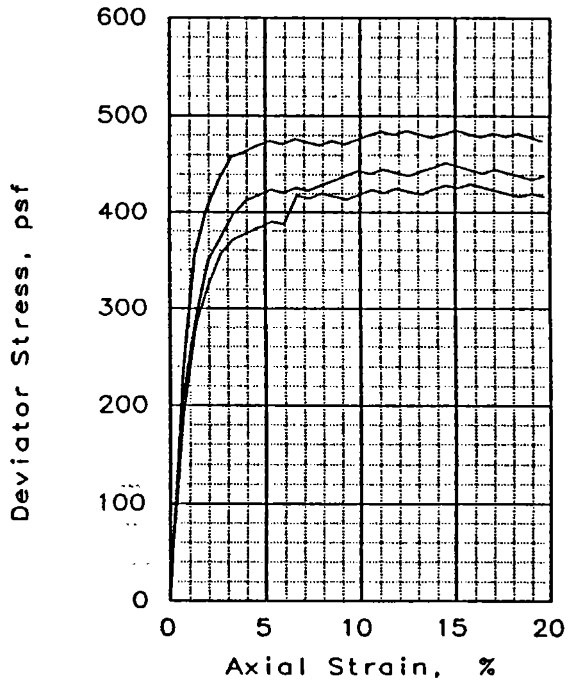
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-5U, Sample 3-B, Depth 9.4'

File: UU-7265 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	85.3	65.2	89.3
	DRY DENSITY, pcf	50.5	60.0	49.4
	SATURATION, %	98.3	96.9	99.6
	VOID RATIO	2.361	1.831	2.440
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	87.0	67.4	88.8
	DRY DENSITY, pcf	50.4	59.9	49.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.366	1.833	2.414
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1126	0.1057	0.1095
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		445	476	420
ULTIMATE STRESS, psf		438	474	417
σ_1 FAILURE, psf		1453	2492	3444
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: VSo Gr CH4
w/ ors org & ML, slf
LL= 89 PL= 29 PI= 60
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 4-D, Depth 14.4'

PROJ. NO.: 13622 DATE: 8-6-96

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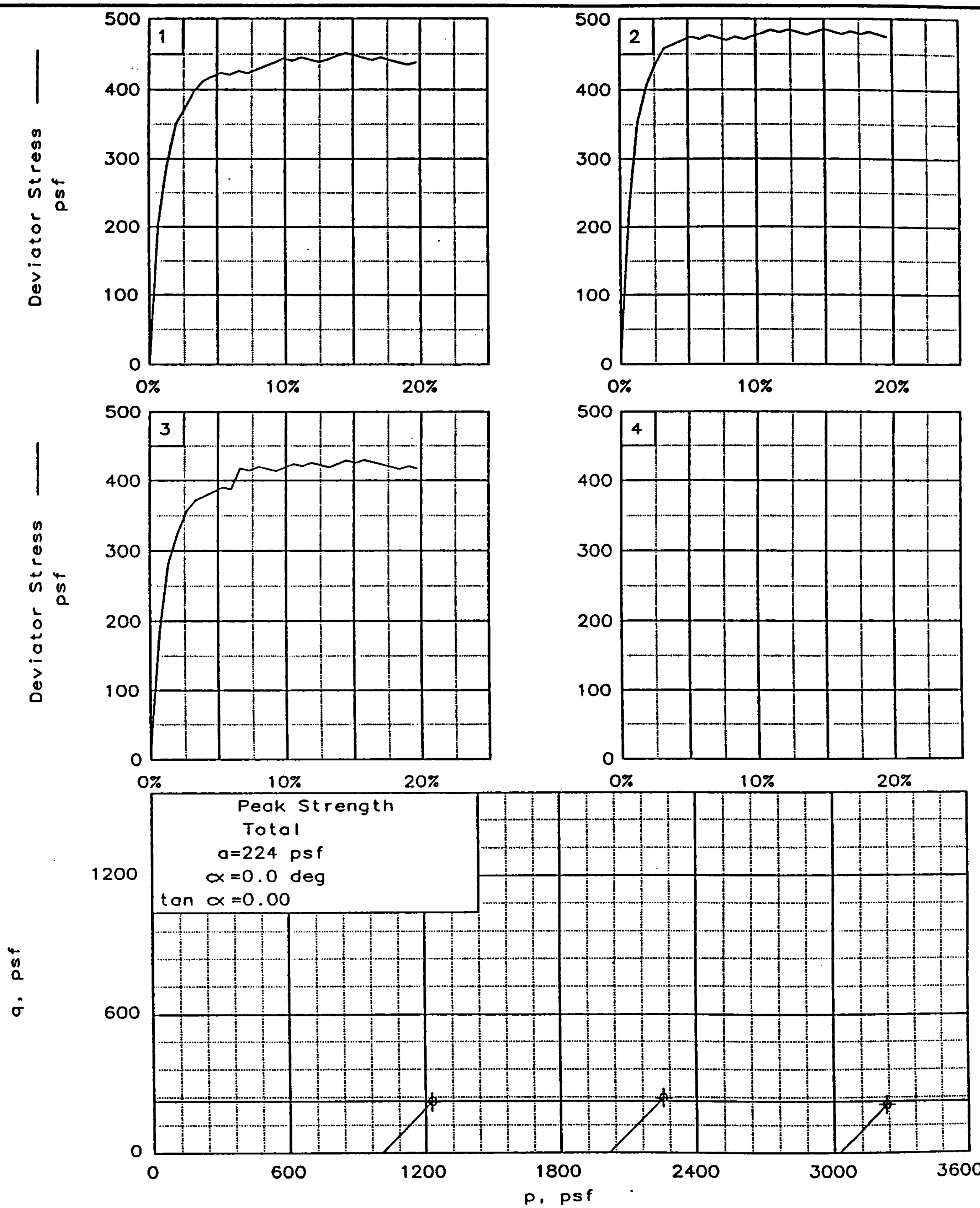
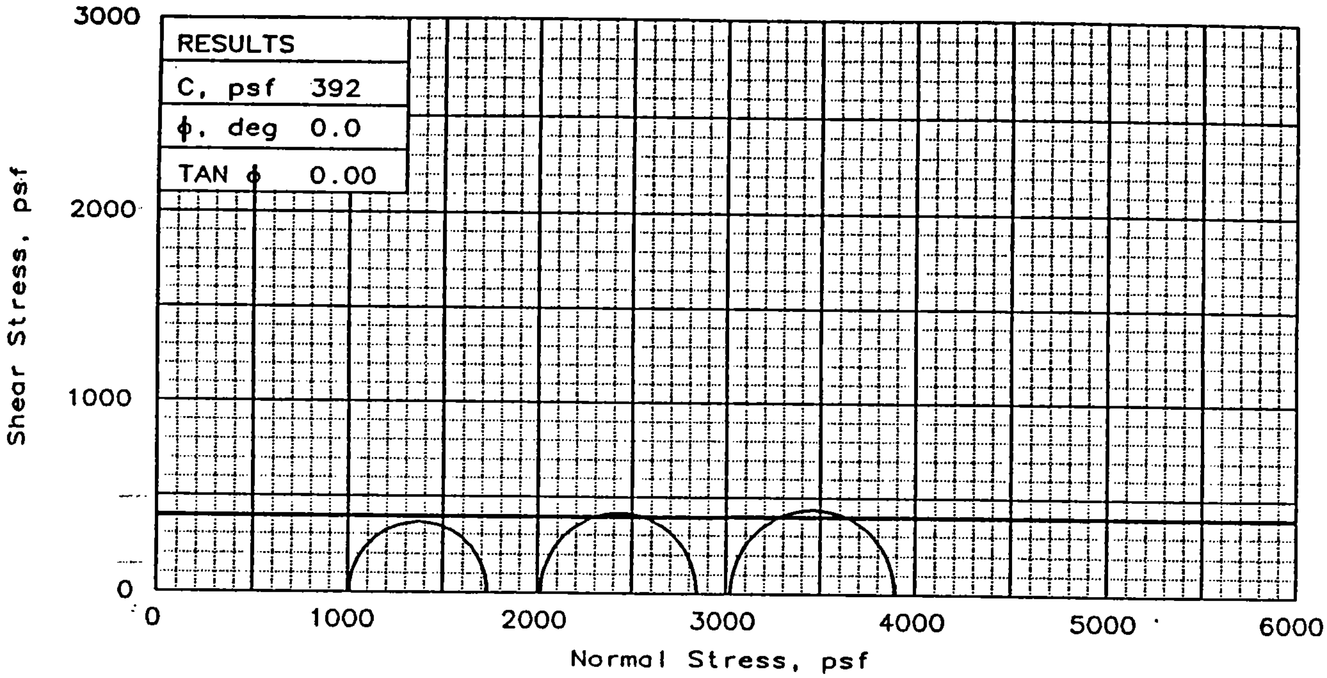
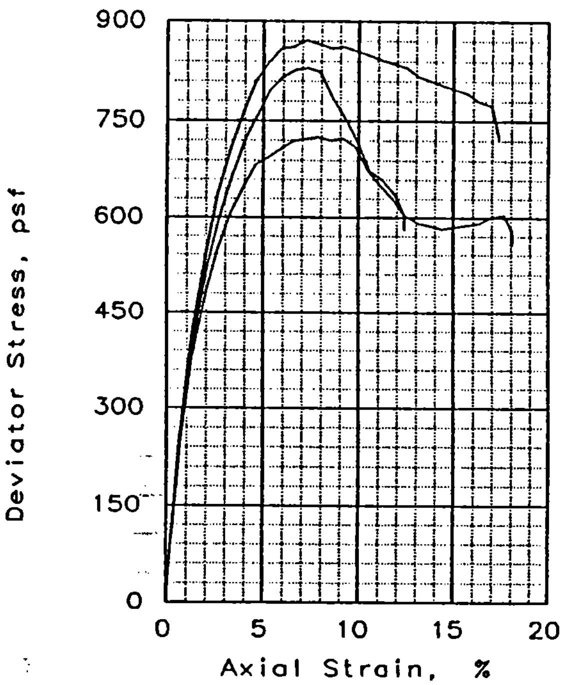


Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-5U, Sample 4-D, Depth 14.4'
File: UU-7266 Project No.: 13622 FIG. NO.: ____





	SPECIMEN NO.:	1	2	3
INITIAL	WATER CONTENT, %	120.0	122.7	119.4
	DRY DENSITY, pcf	38.8	37.8	38.7
	SATURATION, %	96.3	95.5	95.5
	VOID RATIO	3.412	3.520	3.424
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.99	2.98	2.97
AT TEST	WATER CONTENT, %	125.3	128.6	123.4
	DRY DENSITY, pcf	38.6	37.8	39.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	3.434	3.524	3.382
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
	Strain rate, in/min	0.1085	0.1094	0.1118
	BACK PRESSURE, psf	0	0	0
	CELL PRESSURE, psf	1008	2016	3024
	FAILURE STRESS, psf	726	829	872
	ULTIMATE STRESS, psf	557	580	725
	σ_1 FAILURE, psf	1734	2845	3896
	σ_3 FAILURE, psf	1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CHOC
w/ lns & ars org
LL= 188 PL= 63 PI= 125
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 7-D, Depth 27.2'
PROJ. NO.: 13622 DATE: 8-6-96

TRIAXIAL SHEAR TEST REPORT

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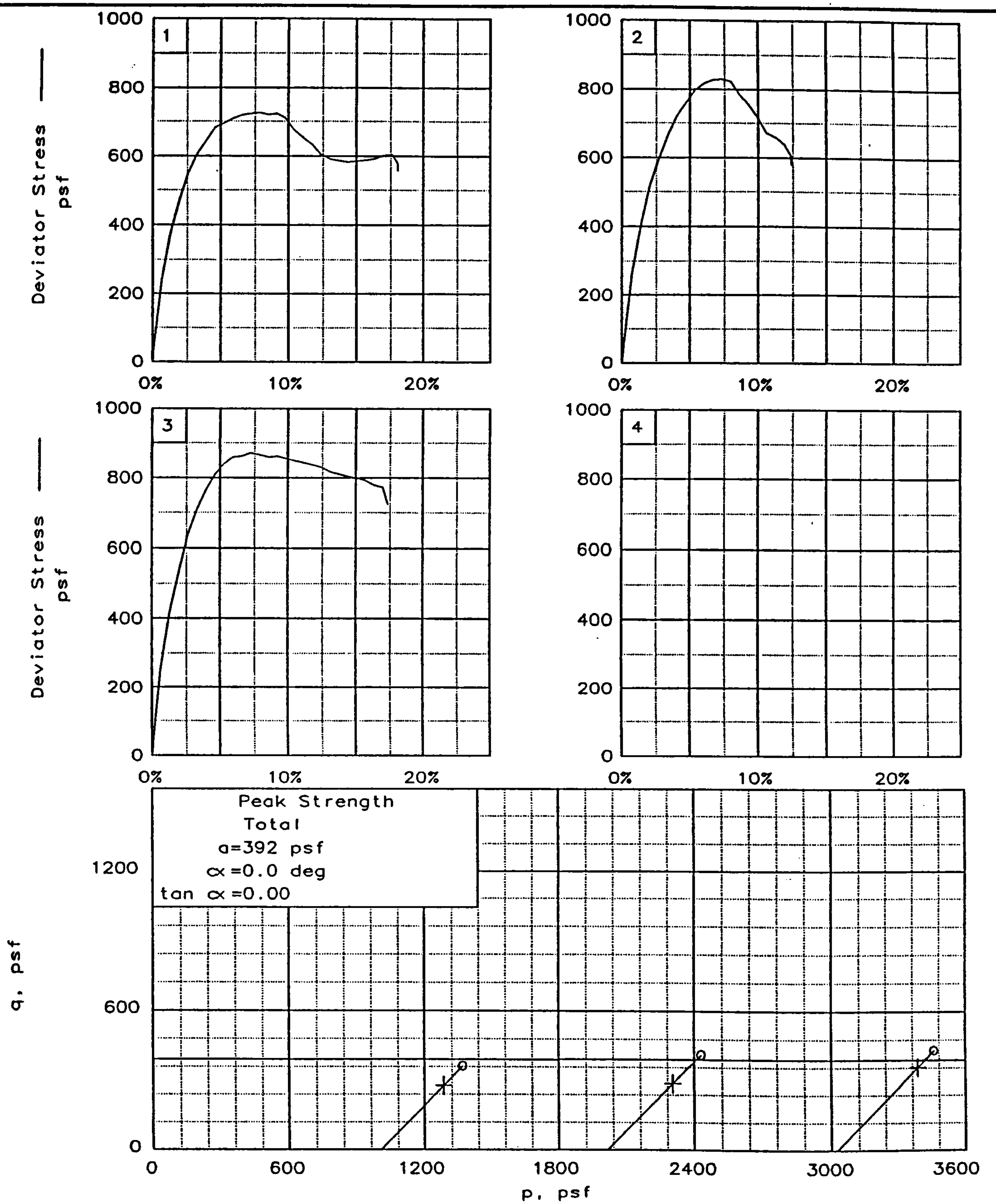
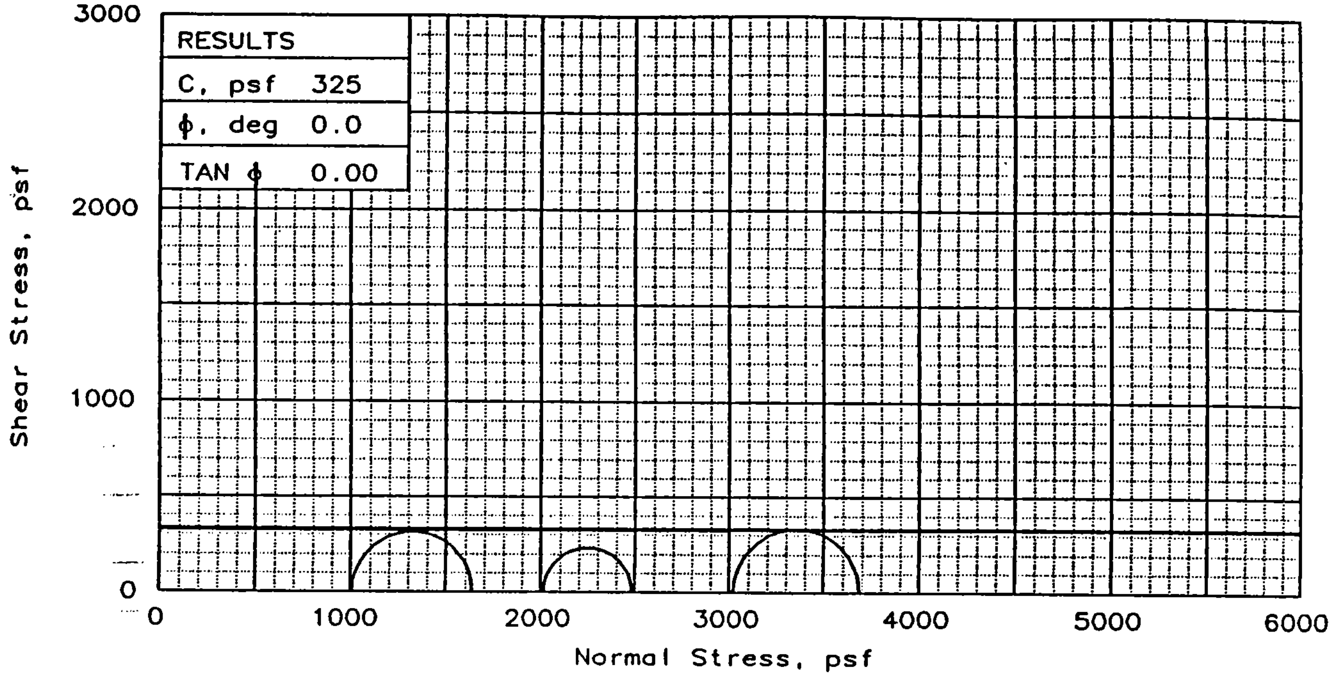
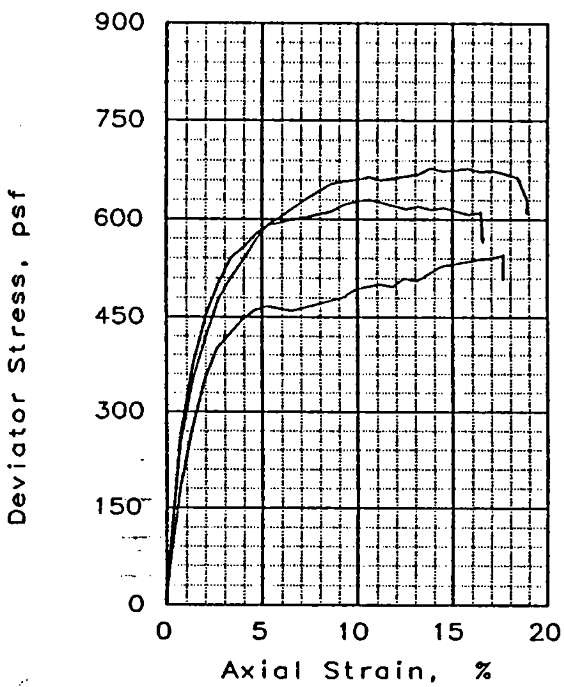


Stress Paths: + indicates end   O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-5U, Sample 7-D, Depth 27.2'
File: UU-7267   Project No.: 13622   FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	42.3	49.0	40.9
	DRY DENSITY, pcf	78.6	71.6	79.0
	SATURATION, %	99.1	97.2	96.8
	VOID RATIO	1.160	1.370	1.151
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	42.9	50.5	42.2
	DRY DENSITY, pcf	78.4	71.5	79.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.167	1.374	1.147
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1124	0.1120	0.1127
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		630	467	665
ULTIMATE STRESS, psf		566	508	610
σ_1 FAILURE, psf		1638	2483	3689
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr, lns & ors ML
LL= 90 PL= 26 PI= 64
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 9-C, Depth 33.6'

PROJ. NO.: 13622 DATE: 8-6-96

TRIAXIAL SHEAR TEST REPORT

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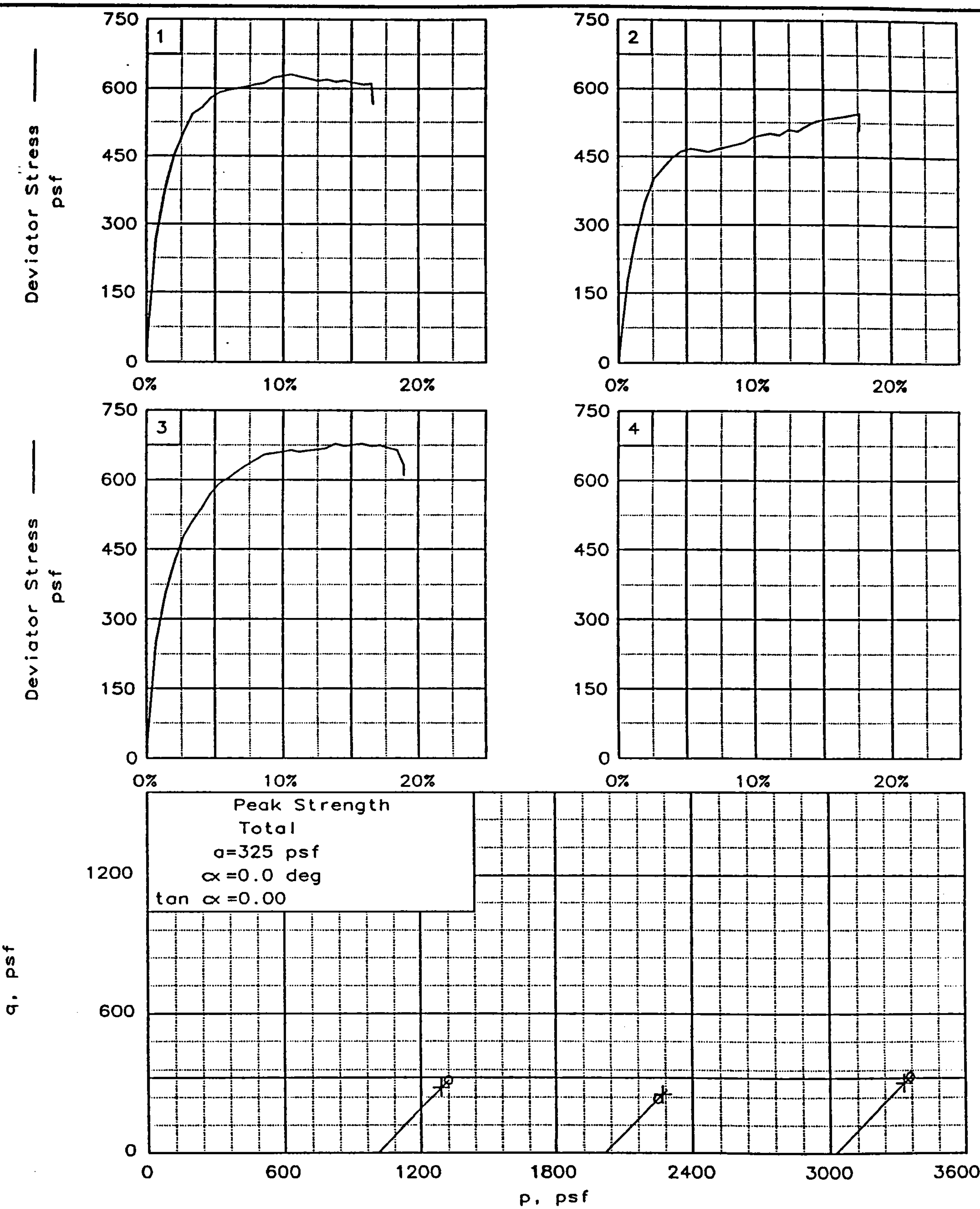
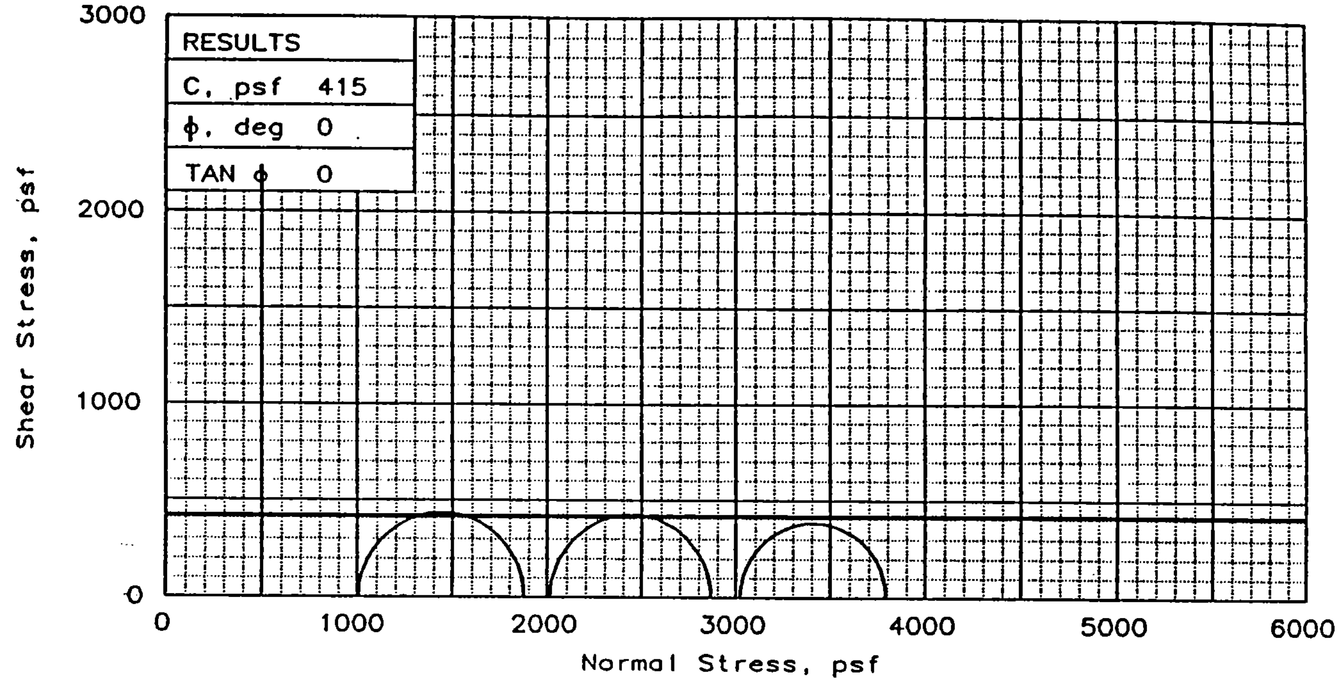
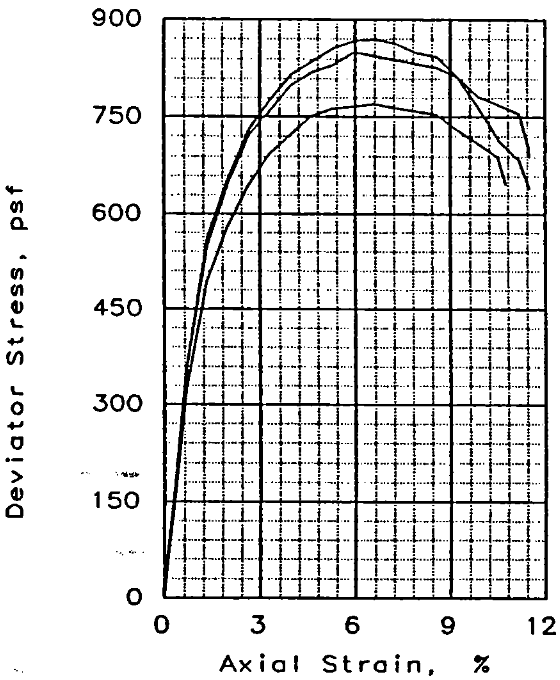


Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-5U, Sample 9-C, Depth 33.6'
File: UU-7268 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	65.3	65.3	65.4
	DRY DENSITY, pcf	62.2	61.7	61.6
	SATURATION, %	102.3	101.1	100.7
	VOID RATIO	1.749	1.771	1.777
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	64.0	64.5	64.4
	DRY DENSITY, pcf	62.1	61.8	61.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.754	1.768	1.764
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1087	0.1008	0.1091
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		869	851	770
ULTIMATE STRESS, psf		641	689	647
σ_1 FAILURE, psf		1877	2867	3794
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 92 PL= 31 PI= 61
SPECIFIC GRAVITY= 2.74
REMARKS:

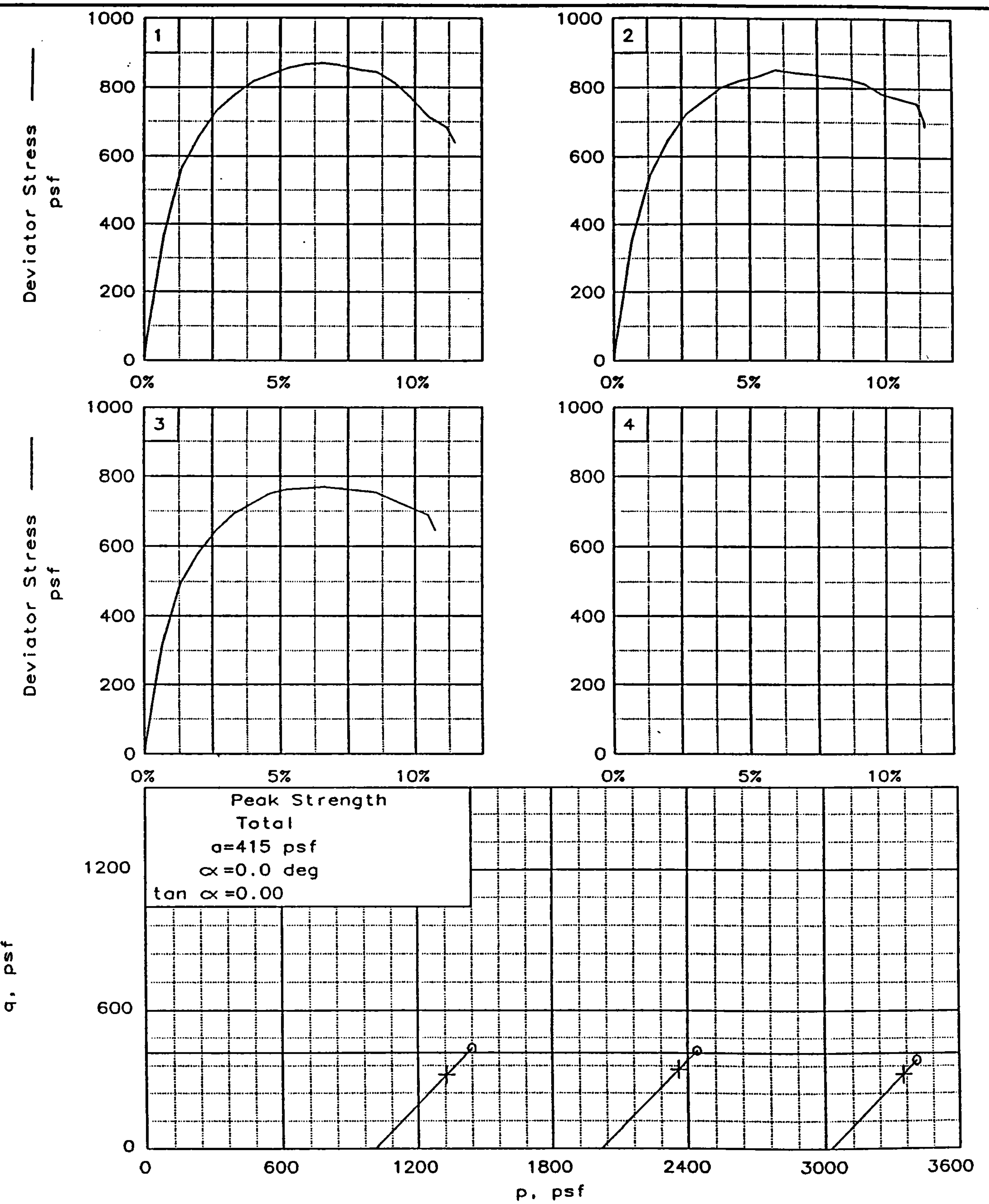
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 11-D, Depth 42.8'
PROJ. NO.: 13622 DATE: 8-6-96

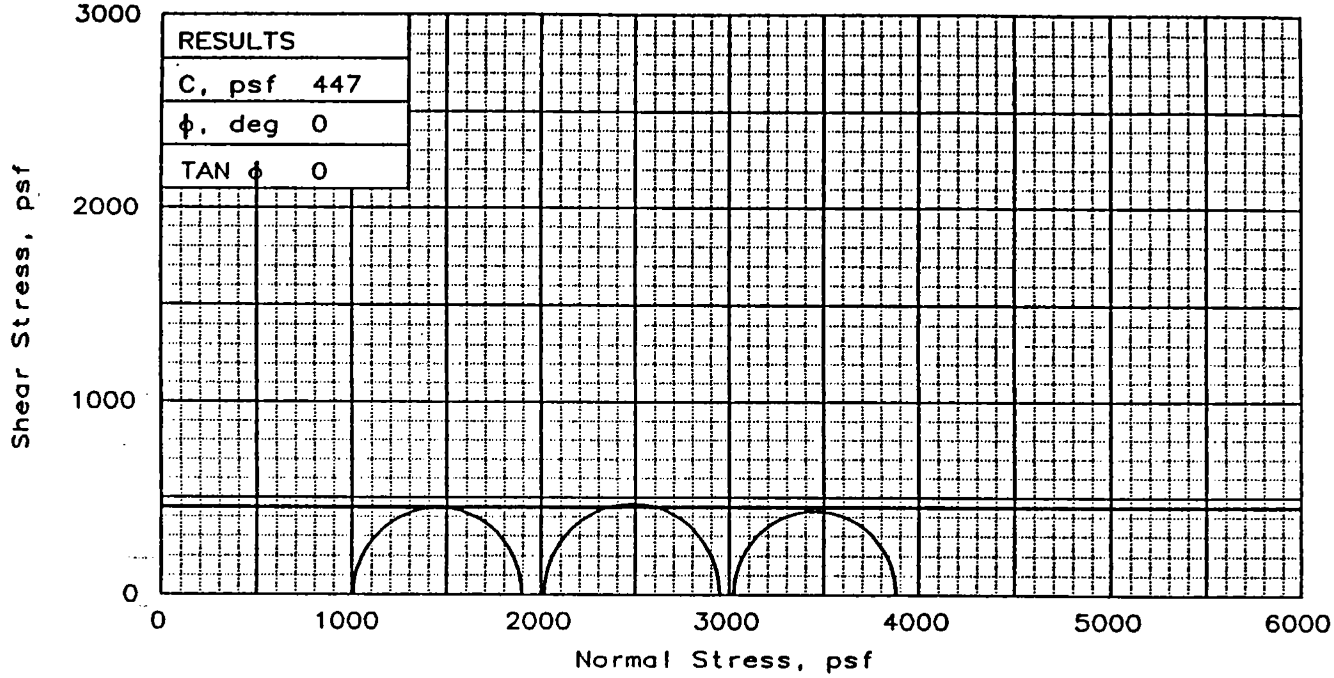
TRIAXIAL SHEAR TEST REPORT

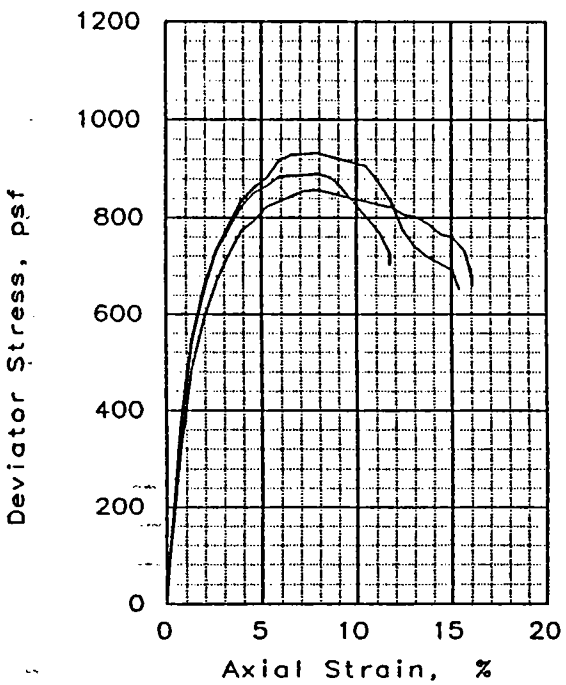
Eustis Engineering Company, Inc.



Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-5U, Sample 11-D, Depth 42.8'
File: UU-7269 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	66.0	66.2	66.4
	DRY DENSITY, pcf	61.4	61.5	60.7
	SATURATION, %	101.3	101.8	100.1
	VOID RATIO	1.786	1.782	1.818
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	65.1	64.9	65.8
	DRY DENSITY, pcf	61.4	61.5	61.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.784	1.779	1.802
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1079	0.1083	0.1093
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		890	932	858
ULTIMATE STRESS, psf		703	651	661
σ_1 FAILURE, psf		1898	2948	3882
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4 w/ lyr & lns ML
LL= 98 PL= 31 PI= 67
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

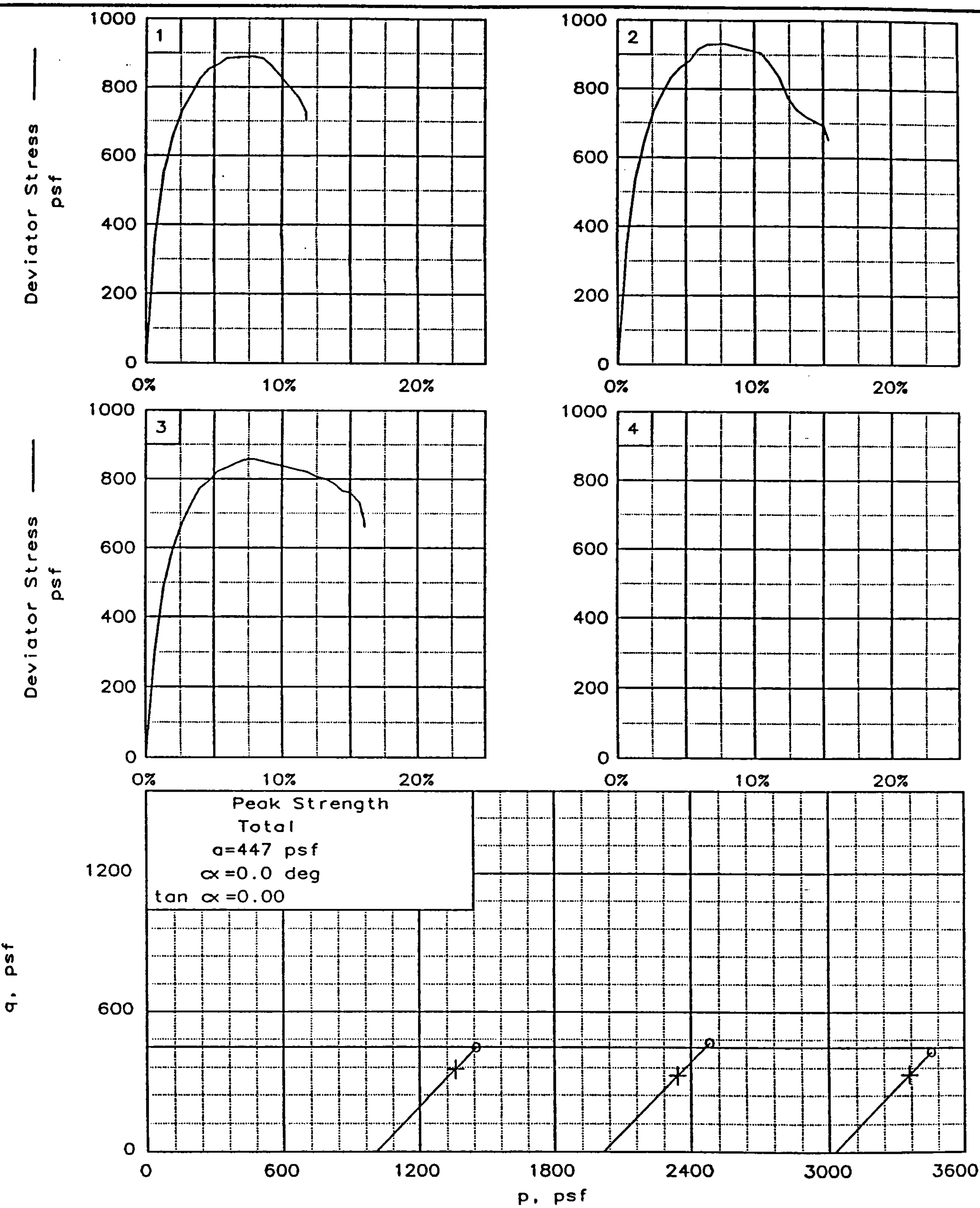
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 13-D, Depth 50.2'

PROJ. NO.: 13622 DATE: 8-7-96

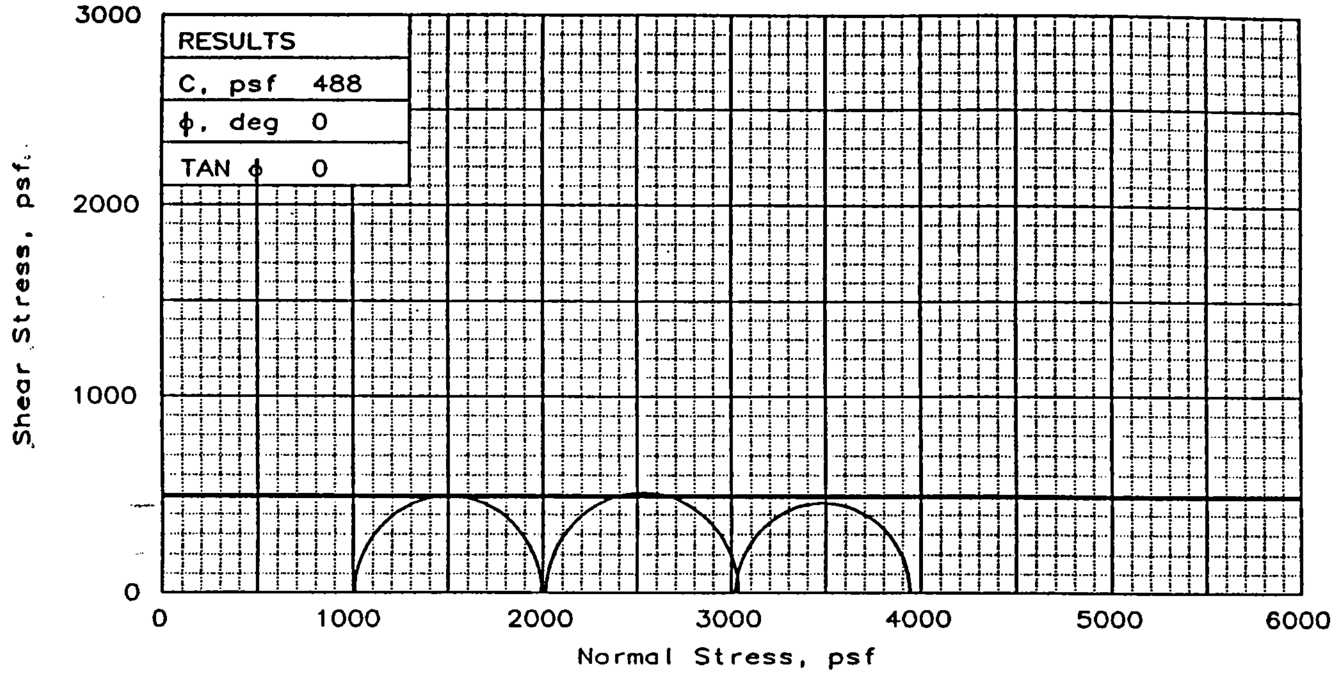
TRIAXIAL SHEAR TEST REPORT

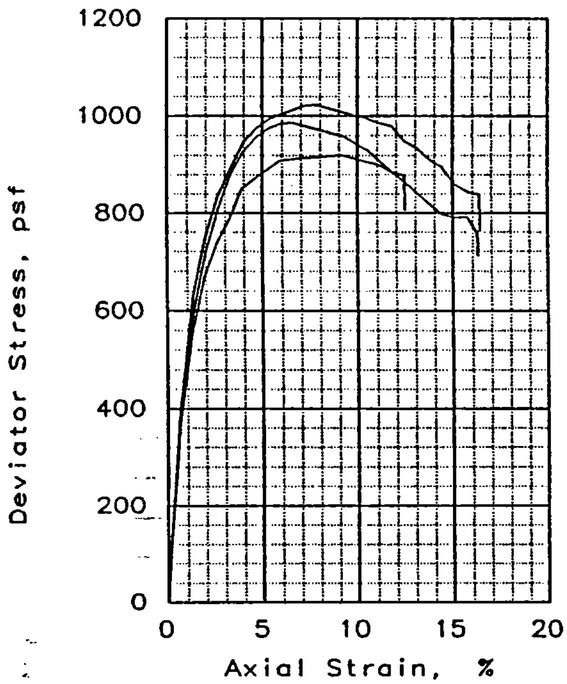
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-5U, Sample 13-D, Depth 50.2'
File: UU-7270 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	60.6	58.9	59.1
	DRY DENSITY, pcf	64.1	64.6	64.1
	SATURATION, %	99.4	97.9	97.0
	VOID RATIO	1.670	1.647	1.670
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	60.8	59.8	60.6
	DRY DENSITY, pcf	64.1	64.8	64.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.667	1.639	1.660
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1019	0.1042	0.1079
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		986	1022	919
ULTIMATE STRESS, psf		712	763	807
σ_1 FAILURE, psf		1994	3038	3943
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4 w/ lyr & lns ML

LL= 90 PL= 27 PI= 63

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

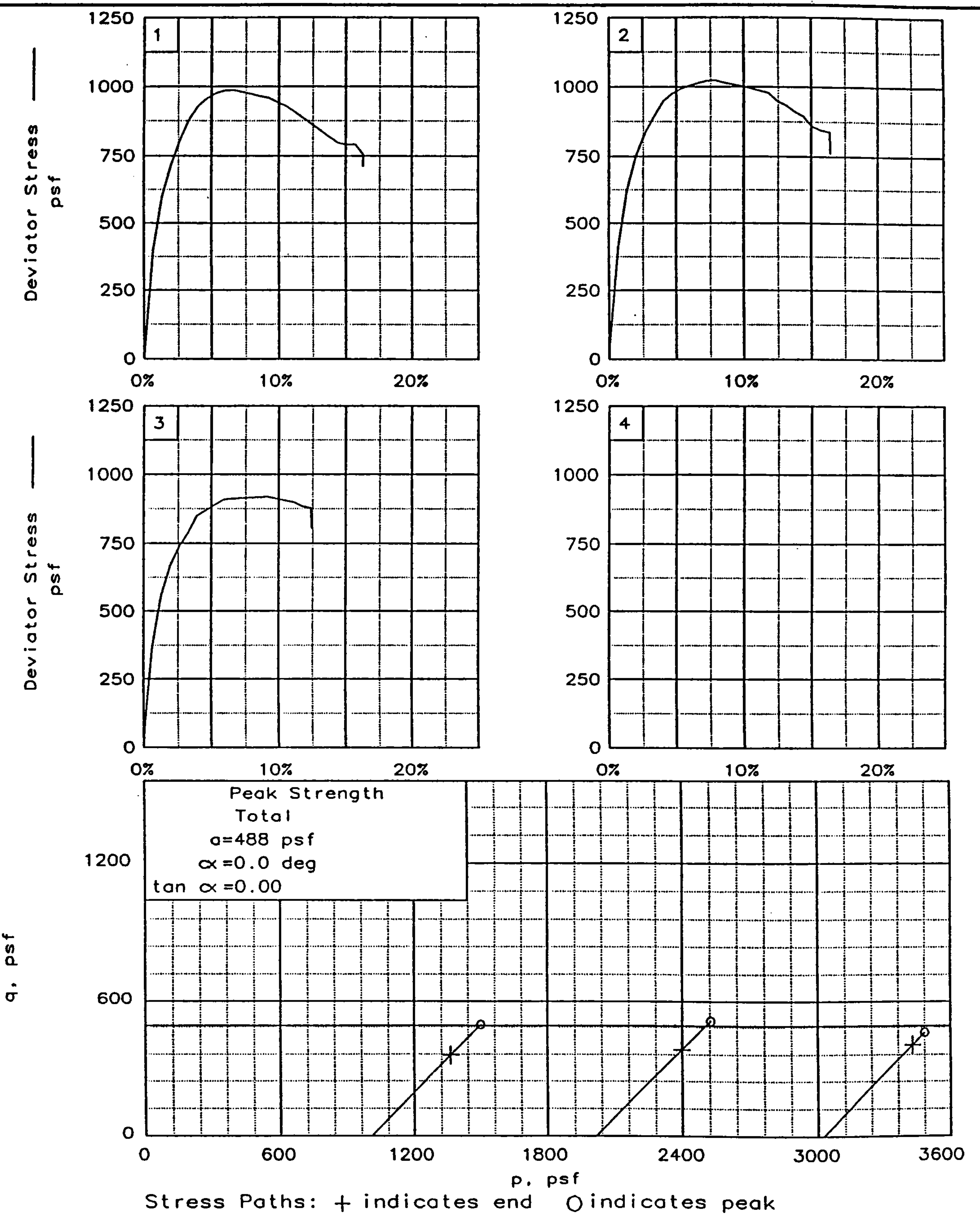
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-5U, Sample 15-D, Depth 58.1'

PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

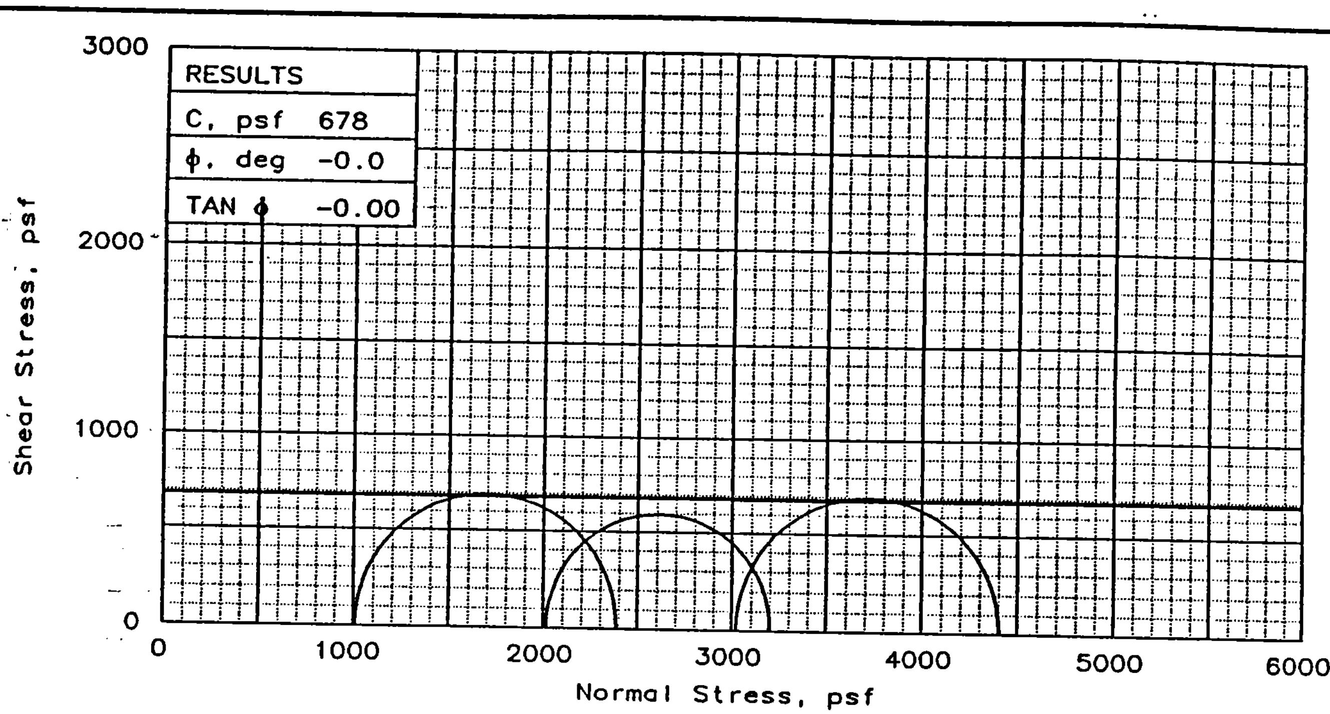


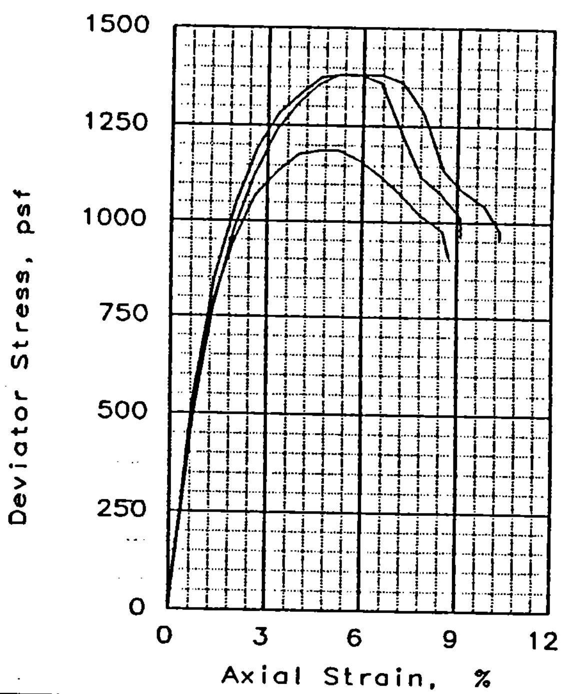
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-5U, Sample 15-D, Depth 58.1'

File: UU-7271 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	66.8	66.9	65.0
	DRY DENSITY, pcf	60.5	58.6	61.7
	SATURATION, %	100.1	95.4	100.4
	VOID RATIO	1.827	1.920	1.773
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	66.8	69.9	64.3
	DRY DENSITY, pcf	60.4	58.7	61.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.832	1.914	1.762
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0958	0.1069	0.1083
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1381	1188	1382
ULTIMATE STRESS, psf		958	907	955
σ_1 FAILURE, psf		2389	3204	4406
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 94 PL= 33 PI= 61
SPECIFIC GRAVITY= 2.74
REMARKS:

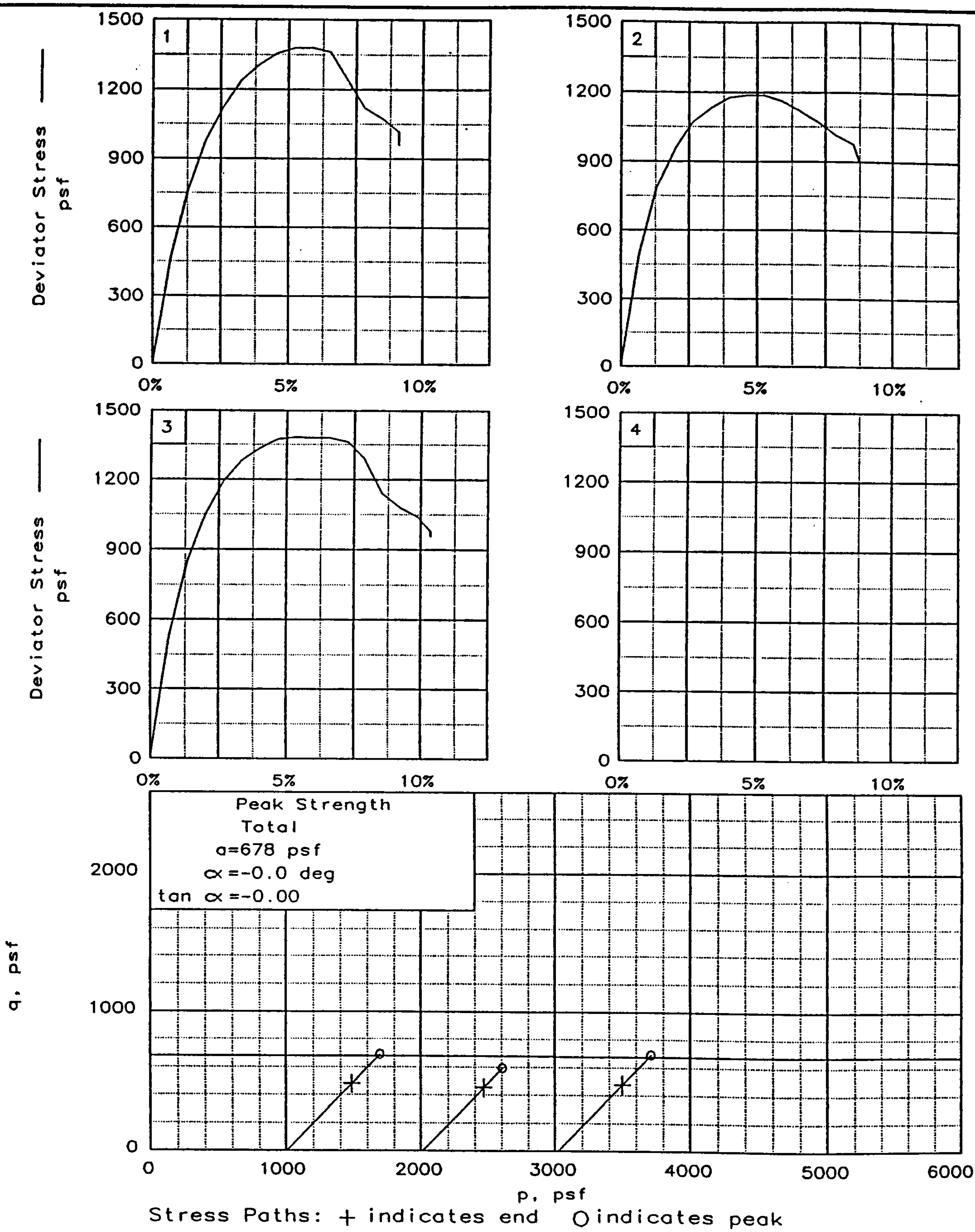
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-5U,
Sample 18-C, Depth 69.9'
PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

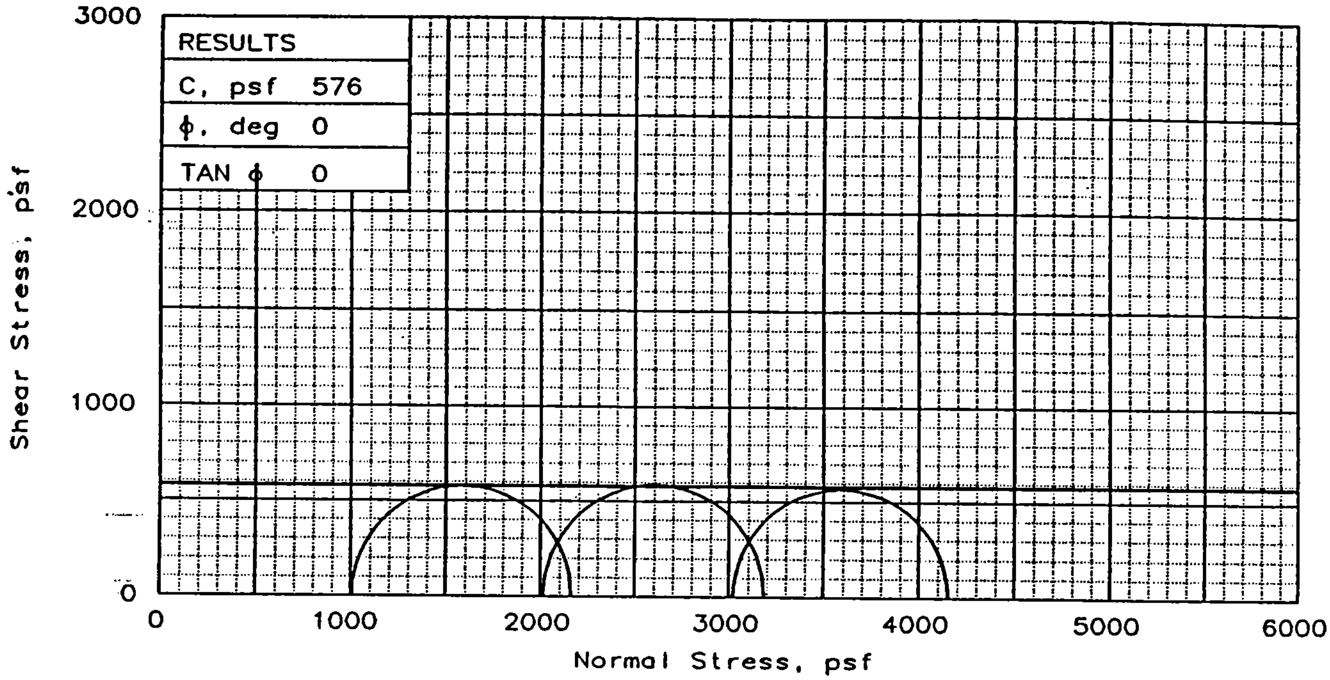


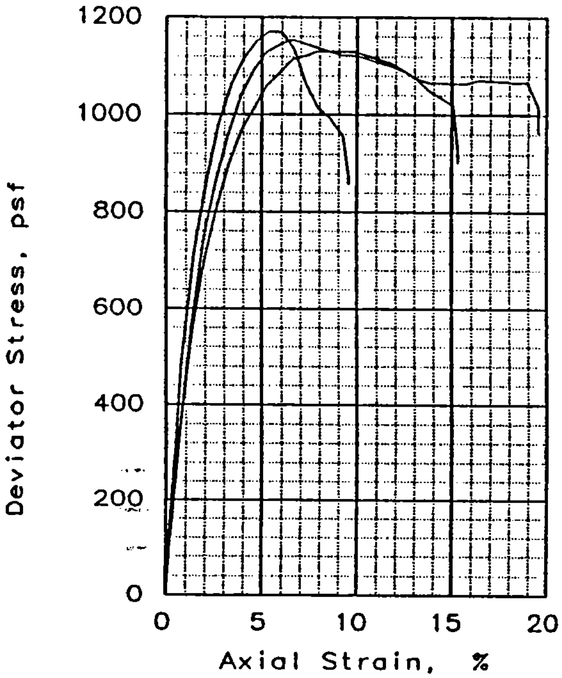
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-5U, Sample 18-C, Depth 69.9'

File: UU-7272 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.2	54.9	57.0
	DRY DENSITY, pcf	67.7	66.0	65.4
	SATURATION, %	97.4	94.4	96.7
	VOID RATIO	1.525	1.593	1.615
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.97
AT TEST	WATER CONTENT, %	55.4	57.4	58.1
	DRY DENSITY, pcf	67.9	66.5	66.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.519	1.572	1.593
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1095	0.0982	0.1076
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1154	1170	1130
ULTIMATE STRESS, psf		965	858	902
σ_1 FAILURE, psf		2162	3186	4154
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lyr & lns SM, lns ML

LL= 86 PL= 31 PI= 55

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

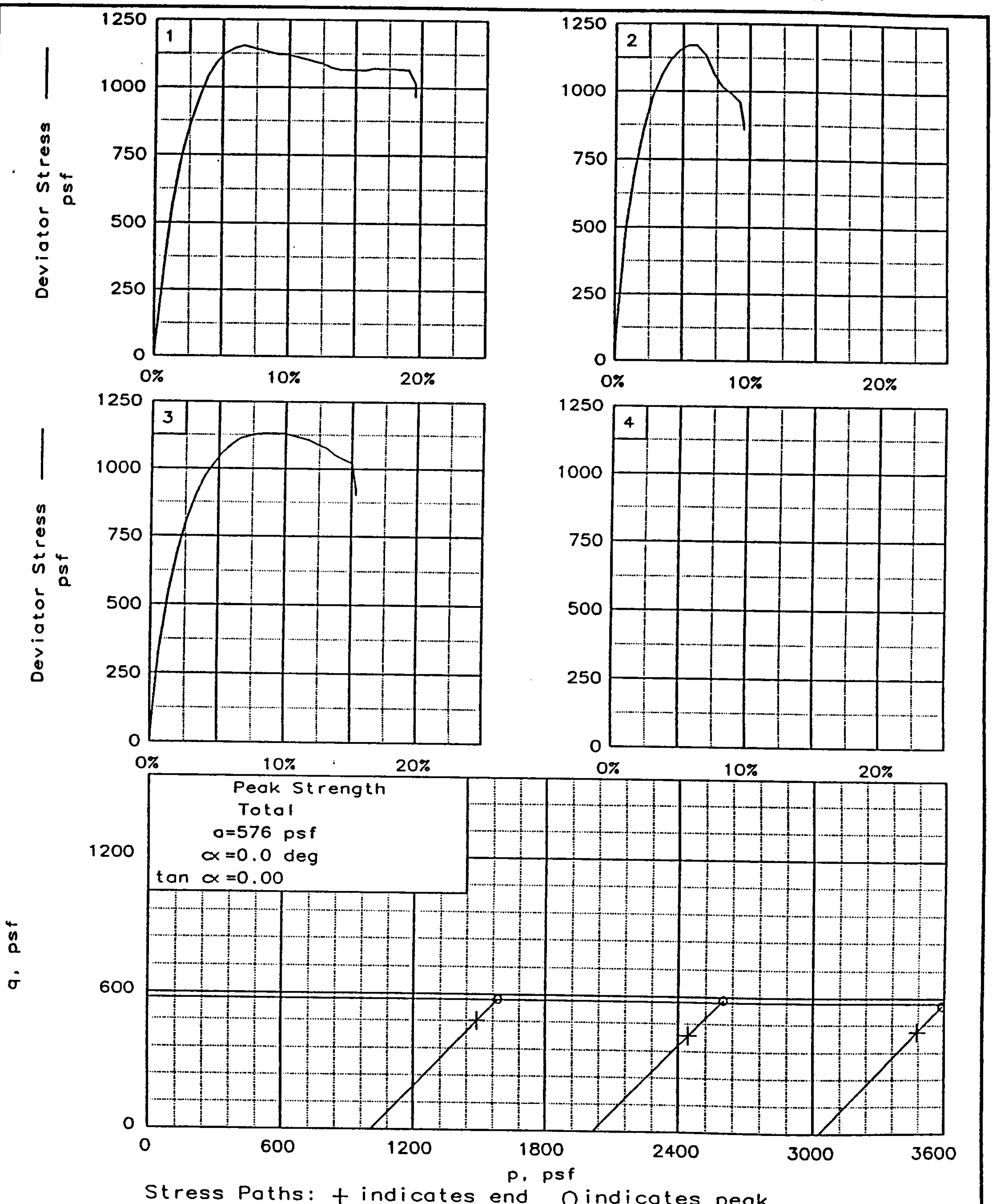
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-5U,
Sample 19-D, Depth 74.8'

PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

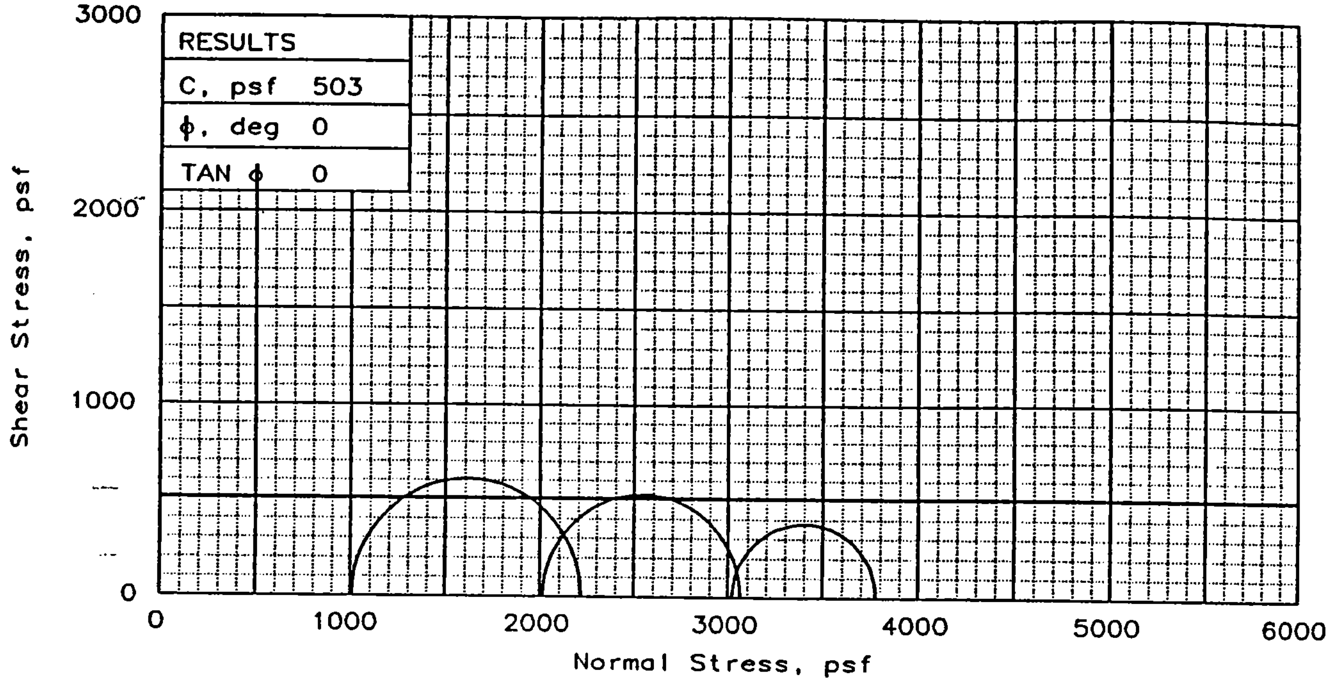


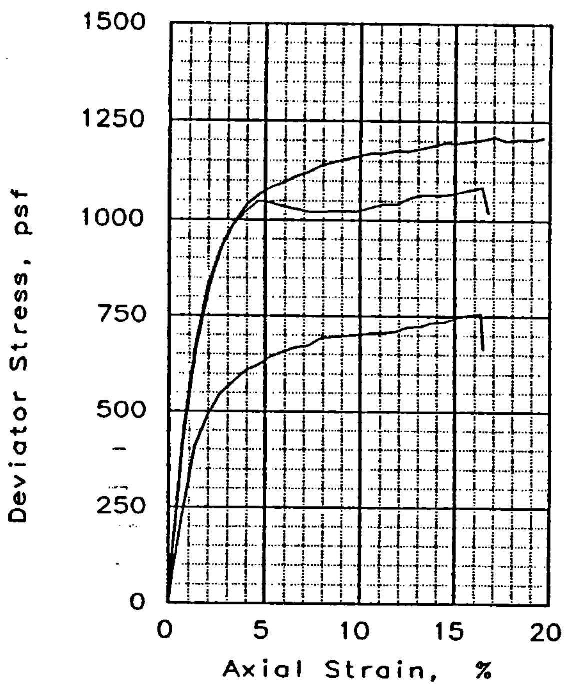
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-5U, Sample 19-D, Depth 74.8'

File: UU-7273 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	37.4	40.0	42.6
	DRY DENSITY, pcf	81.7	78.4	72.9
	SATURATION, %	93.8	92.7	86.9
	VOID RATIO	1.094	1.181	1.345
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	39.9	42.9	49.3
	DRY DENSITY, pcf	81.7	78.6	72.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.094	1.177	1.352
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1118	0.1109	0.1043
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1210	1050	756
ULTIMATE STRESS, psf		1208	1021	665
σ_1 FAILURE, psf		2218	3066	3780
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH3 w/ lns ML & ars org

LL= 69 PL= 23 PI= 46

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

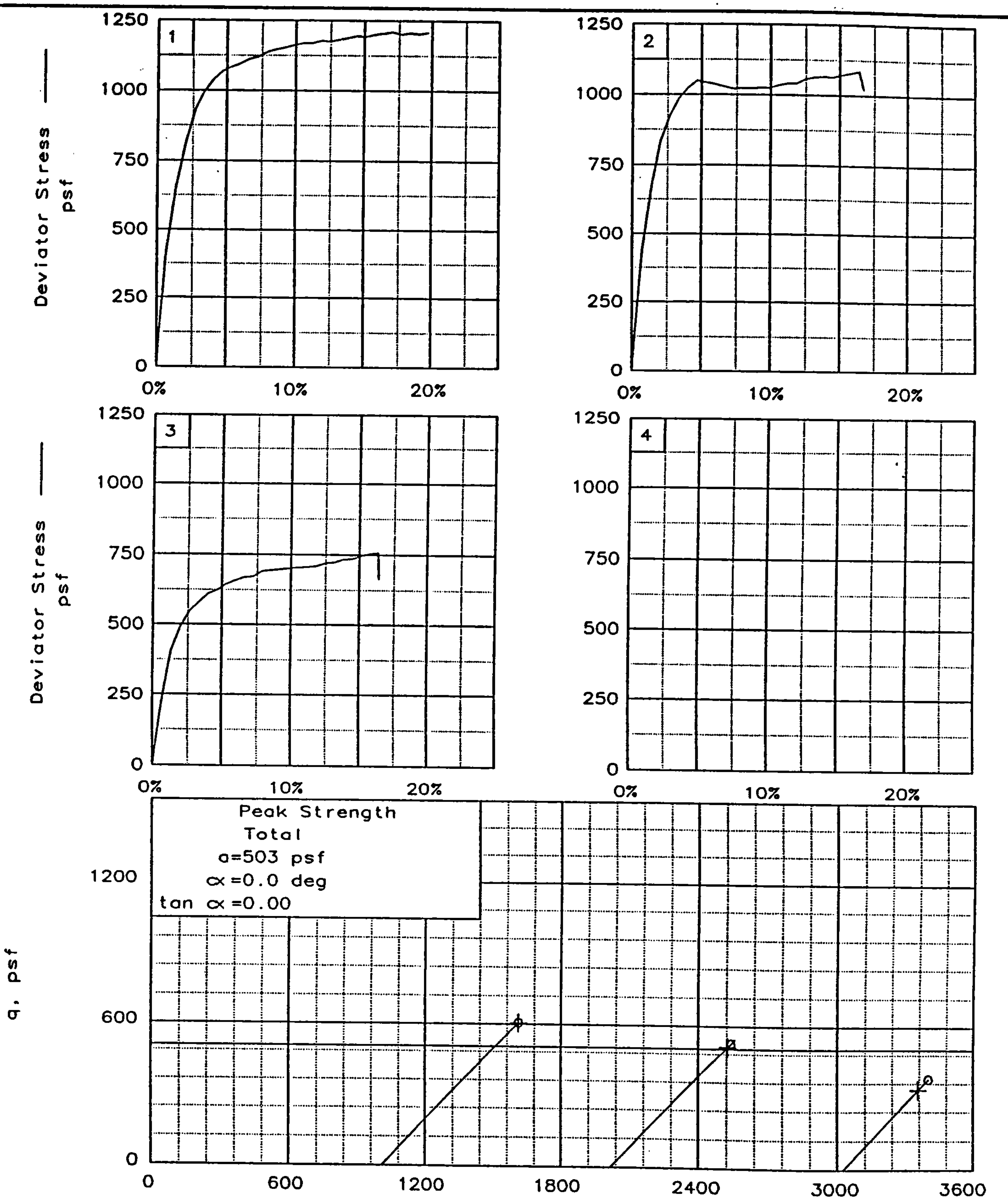
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-6U, Sample 2-D, Depth 6.2'

PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



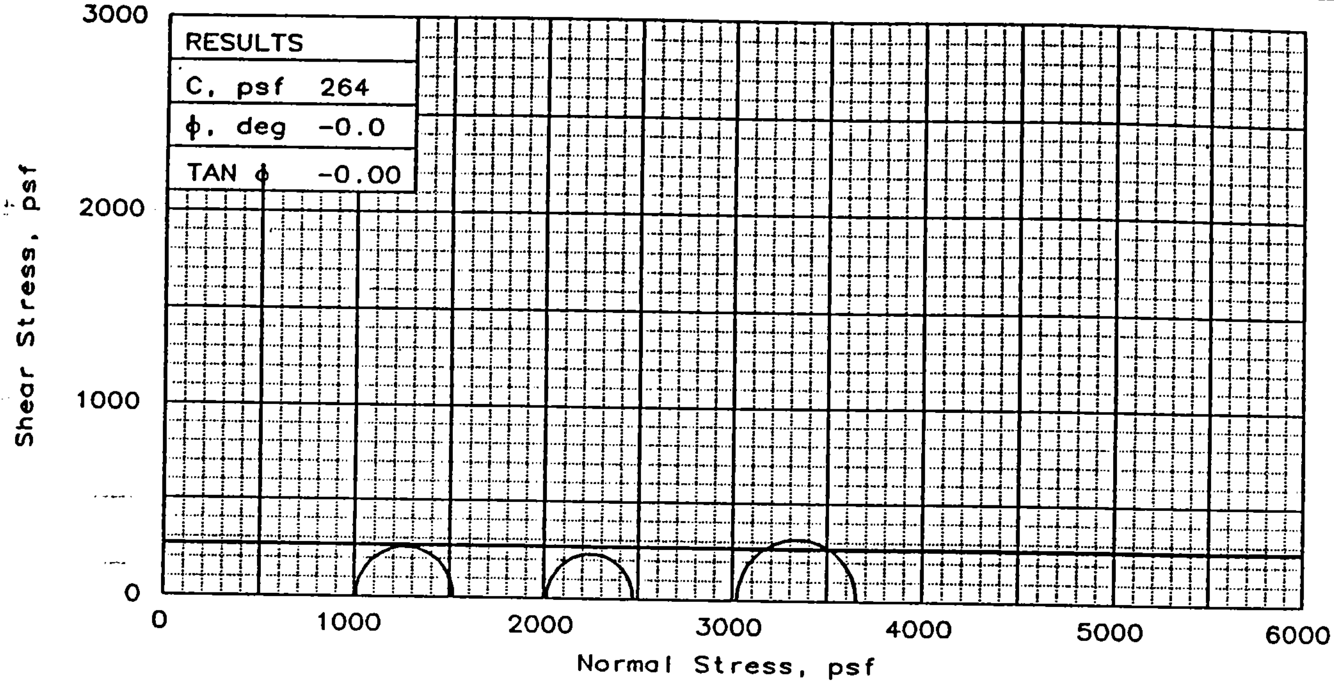
Stress Paths: + indicates end ○ indicates peak

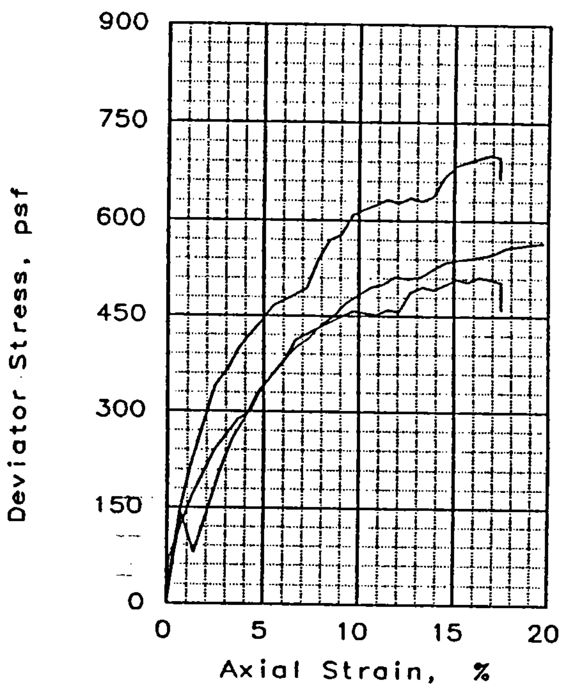
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-6U, Sample 2-D, Depth 6.2'

File: UU-7274 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	37.0	37.8	38.2
	DRY DENSITY, pcf	84.7	83.5	82.7
	SATURATION, %	99.5	98.6	97.9
	VOID RATIO	1.020	1.049	1.068
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	37.4	38.2	39.0
	DRY DENSITY, pcf	84.4	83.6	82.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.026	1.047	1.069
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1078	0.1008	0.1011
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		512	458	632
ULTIMATE STRESS, psf		567	461	664
σ_1 FAILURE, psf		1520	2474	3656
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CL6
w/ lyr & lns CH

LL= 40 PL= 18 PI= 22

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

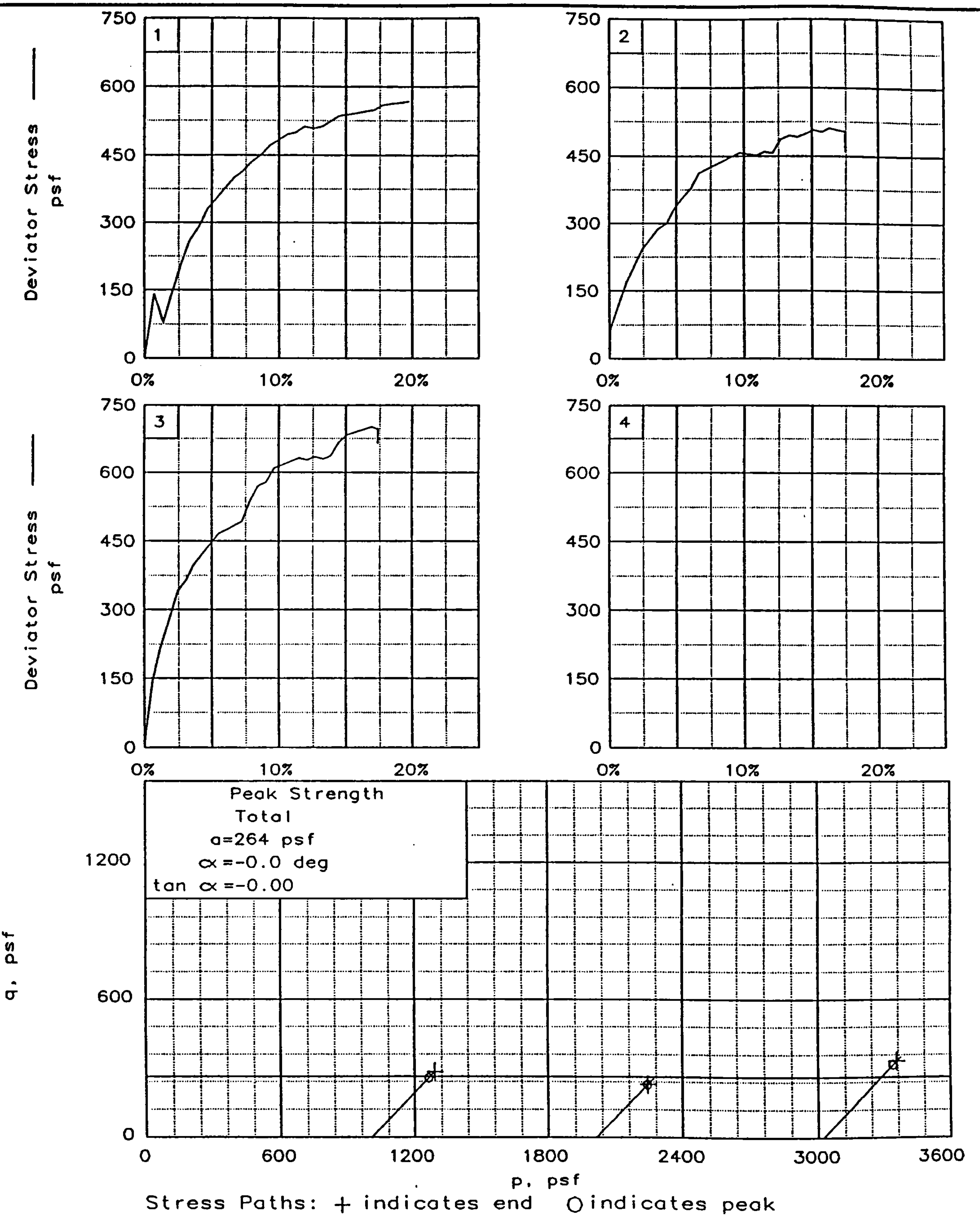
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-6U,
Sample 4-D, Depth 14.2'

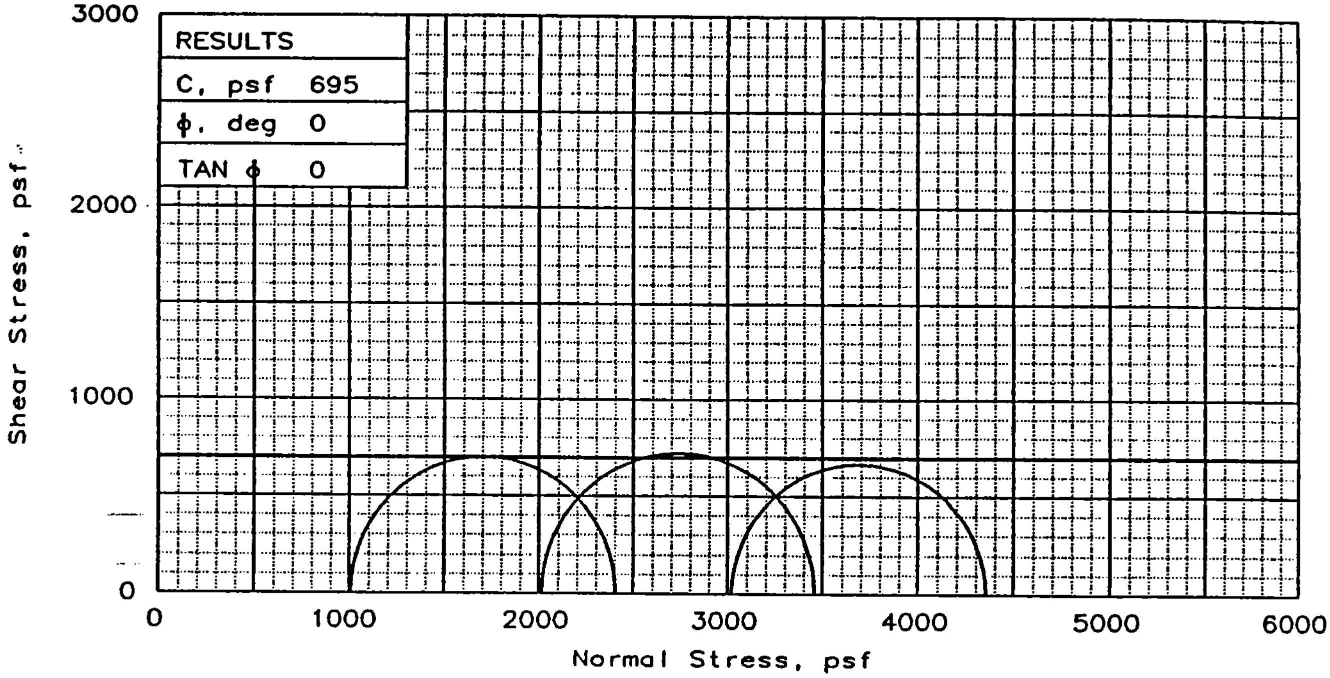
PROJ. NO.: 13622 DATE: 8-7-96

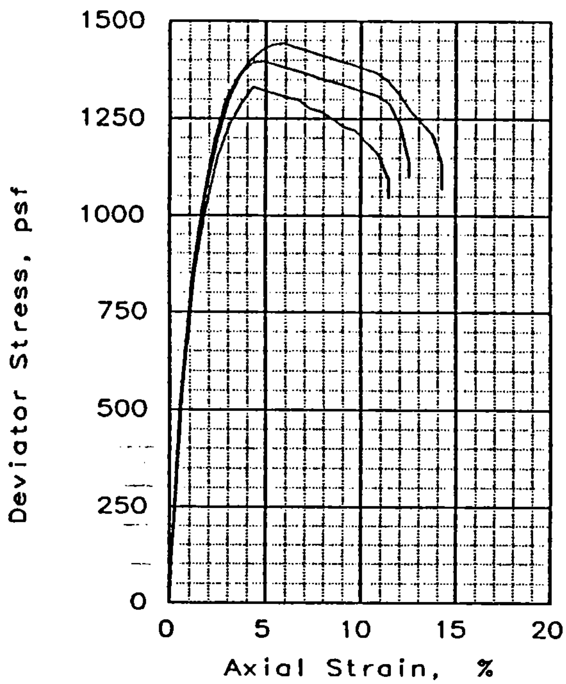
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-6U, Sample 4-D, Depth 14.2'
File: UU-7275 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	54.1	53.7	54.5
	DRY DENSITY, pcf	69.5	69.1	68.8
	SATURATION, %	102.1	100.3	101.0
	VOID RATIO	1.442	1.456	1.468
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	53.1	53.4	53.6
	DRY DENSITY, pcf	69.5	69.3	69.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.443	1.452	1.459
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0982	0.0919	0.0908
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf.		1008	2016	3024
FAILURE STRESS, psf		1397	1442	1331
ULTIMATE STRESS, psf		1103	1070	1047
σ_1 FAILURE, psf		2405	3458	4355
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lns & ars ML
LL= 82 PL= 26 PI= 56
SPECIFIC GRAVITY= 2.72
REMARKS:

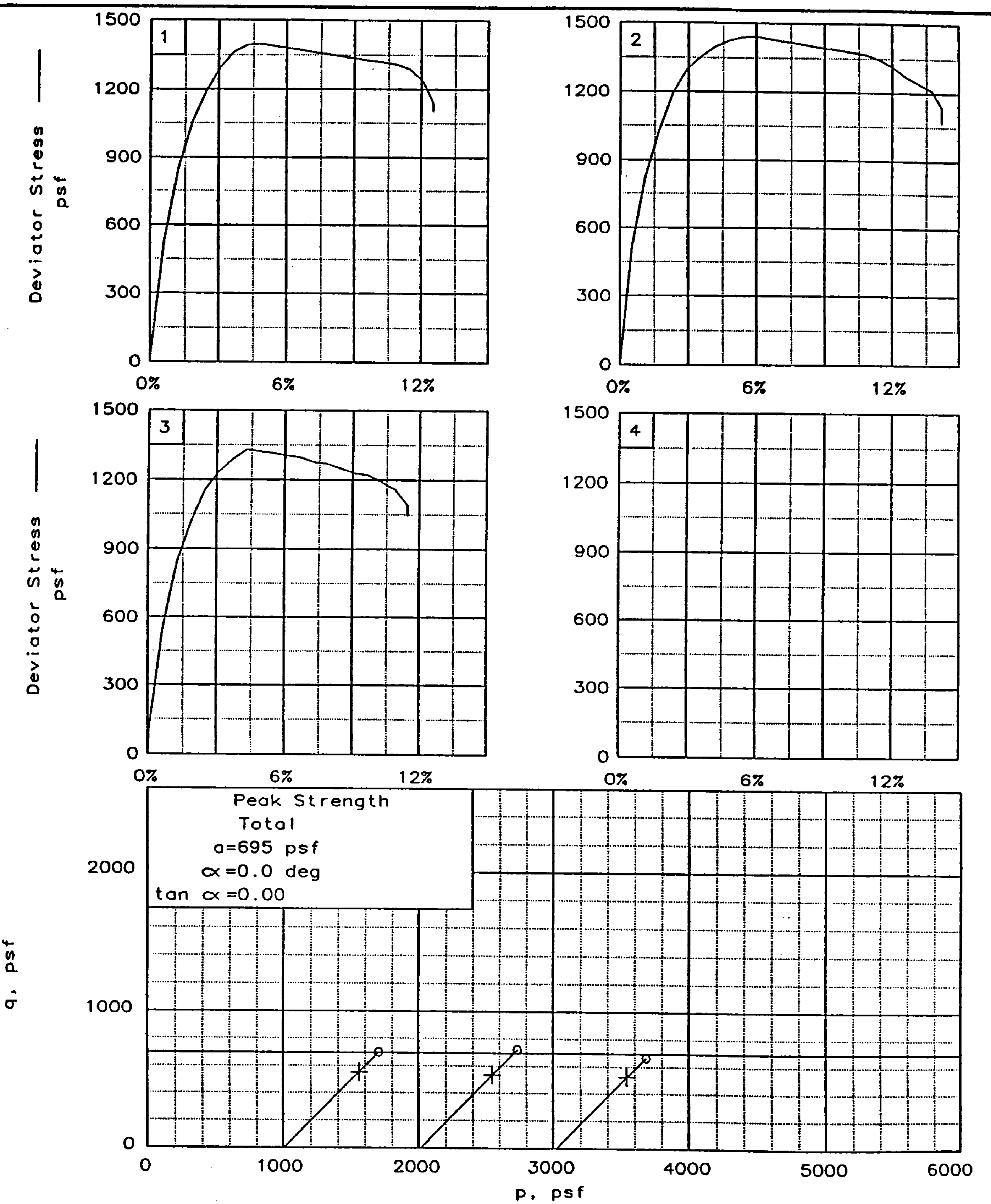
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-6U,
Sample 17-D, Depth 46.8'
PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



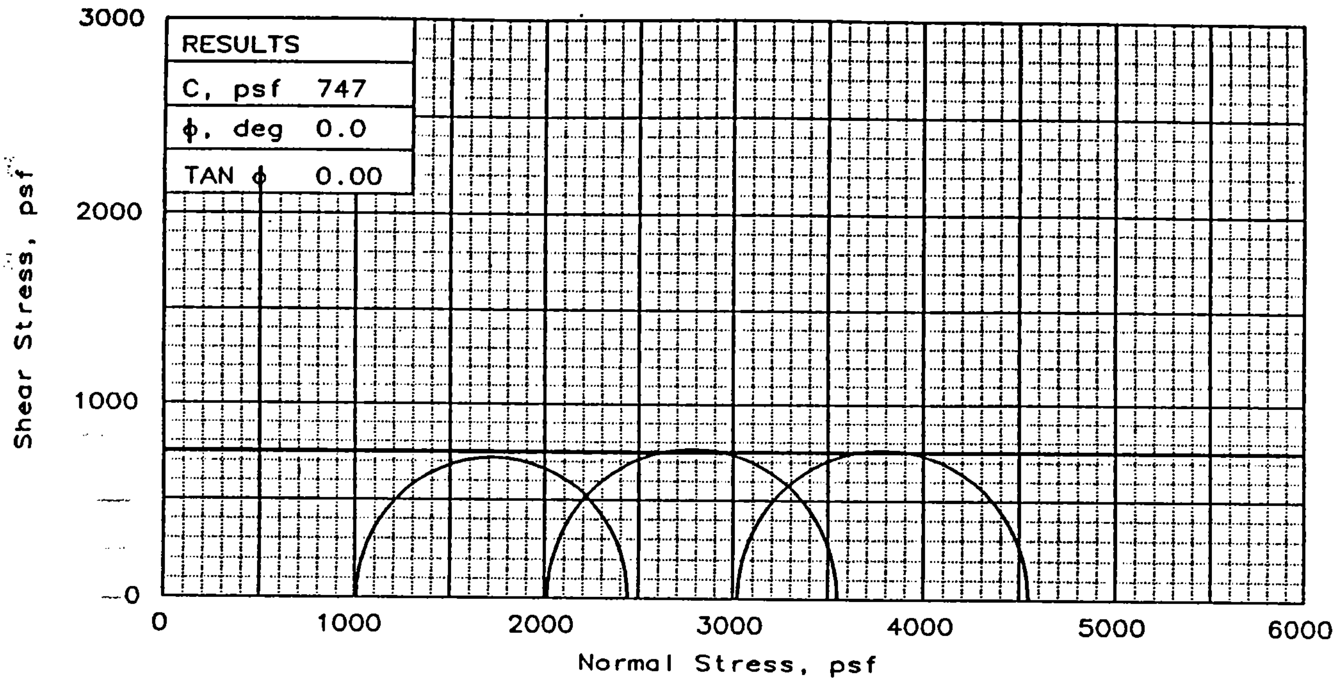
Stress Paths: + indicates end O indicates peak

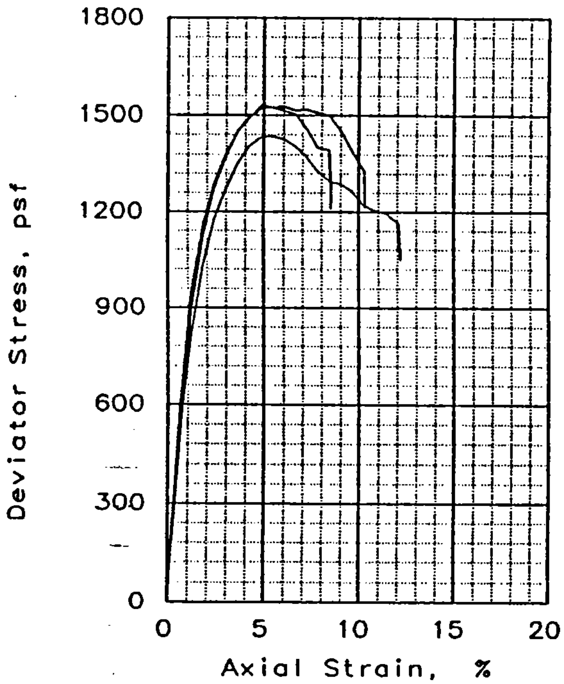
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-6U, Sample 17-D, Depth 46.8'

File: UU-7276 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	61.5	59.6	59.8
	DRY DENSITY, pcf	64.0	65.0	64.7
	SATURATION, %	101.2	100.6	100.1
	VOID RATIO	1.654	1.612	1.625
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	61.0	59.2	59.7
	DRY DENSITY, pcf	63.9	65.1	64.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.658	1.609	1.623
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0916	0.0854	0.0721
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1436	1533	1524
ULTIMATE STRESS, psf		1048	1212	1213
σ_1 FAILURE, psf		2444	3549	4548
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lns & ars ML
LL= 102 PL= 32 PI= 70
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

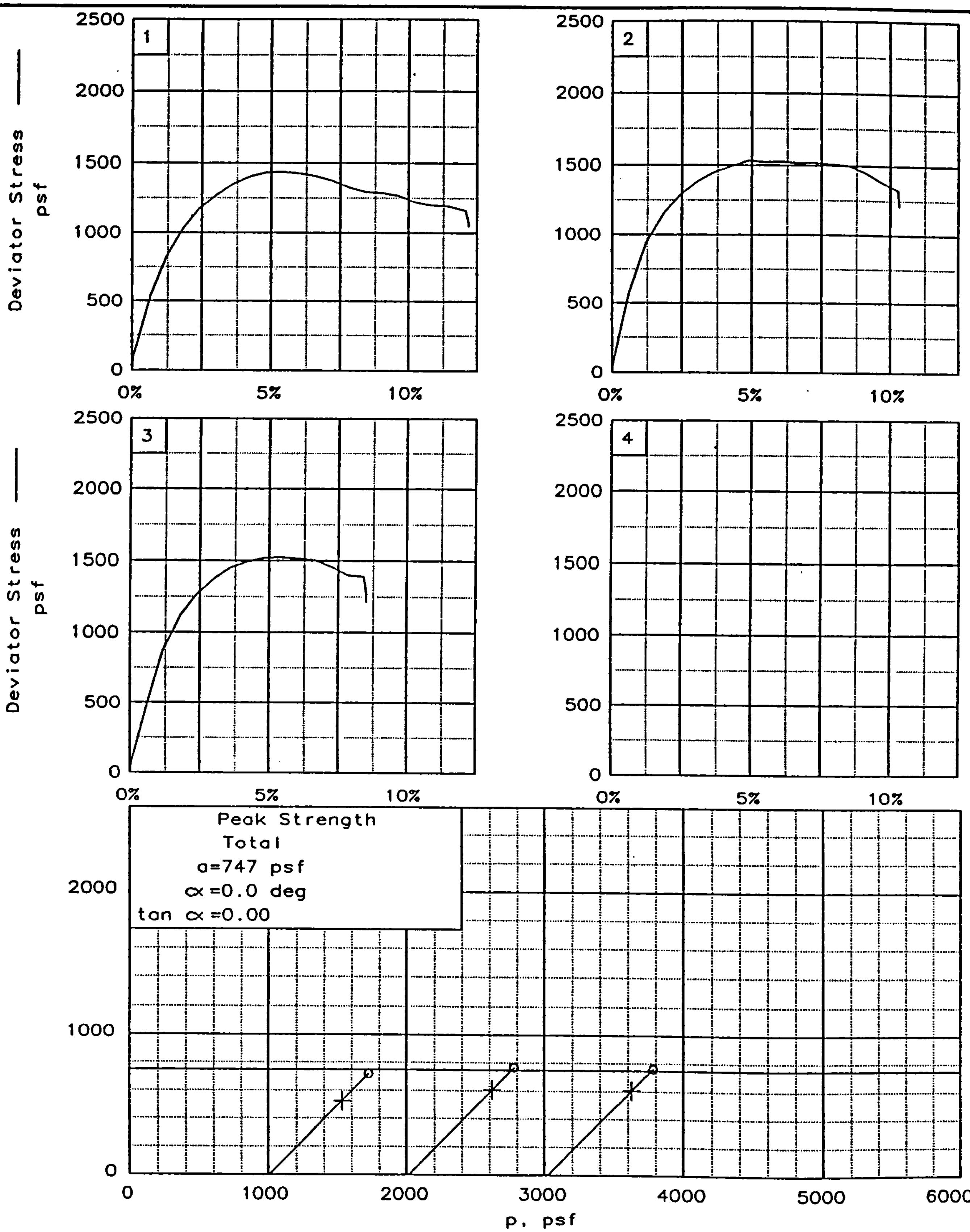
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-6U,
Sample 19-D, Depth 54.8'

PROJ. NO.: 13622 DATE: 8-7-96

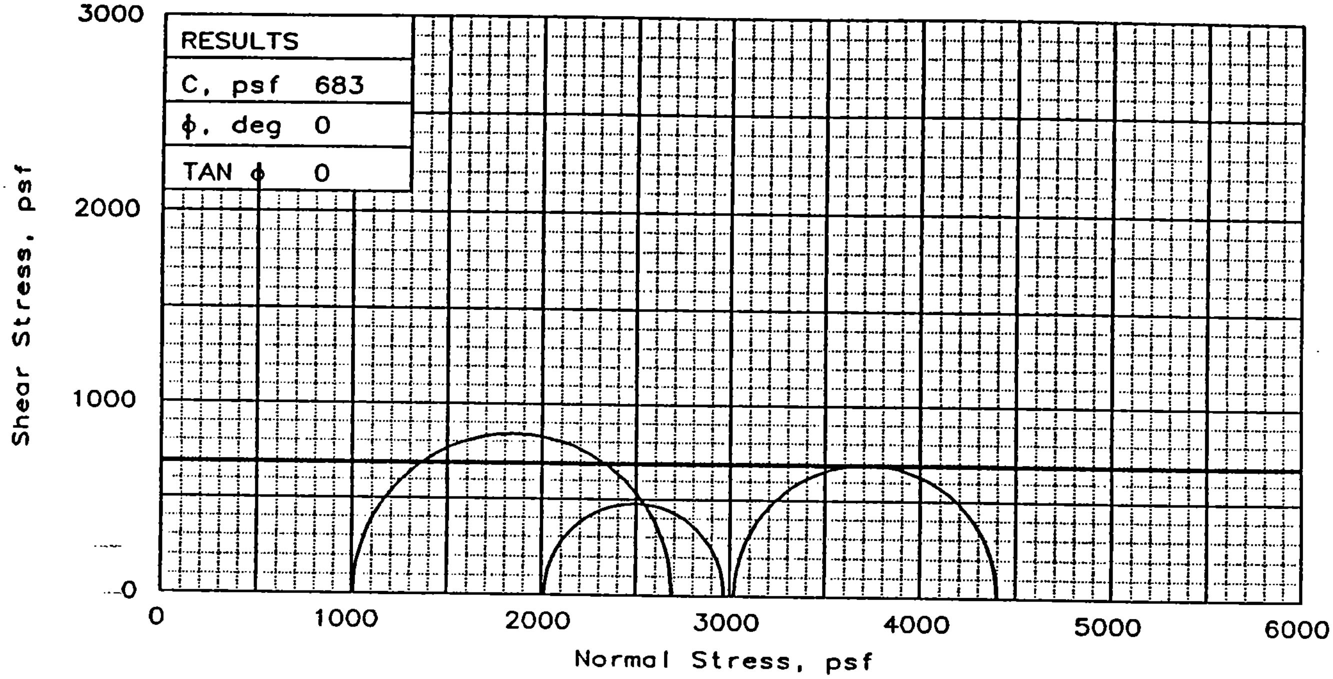
TRIAXIAL SHEAR TEST REPORT

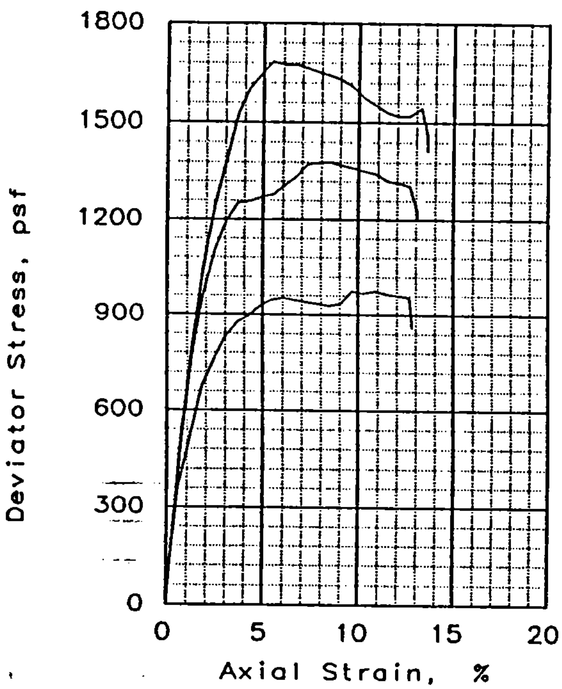
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-6U, Sample 19-D, Depth 54.8'
File: UU-7277 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	49.6	55.4	52.8
	DRY DENSITY, pcf	70.3	63.0	67.7
	SATURATION, %	94.7	88.6	94.8
	VOID RATIO	1.434	1.714	1.527
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	52.5	62.2	55.0
	DRY DENSITY, pcf	70.2	63.2	68.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.437	1.705	1.507
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0919	0.0932	0.1001
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1683	952	1379
ULTIMATE STRESS, psf		1414	861	1208
σ_1 FAILURE, psf		2691	2968	4403
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns ML
LL= 85 PL= 27 PI= 58
SPECIFIC GRAVITY= 2.74
REMARKS:

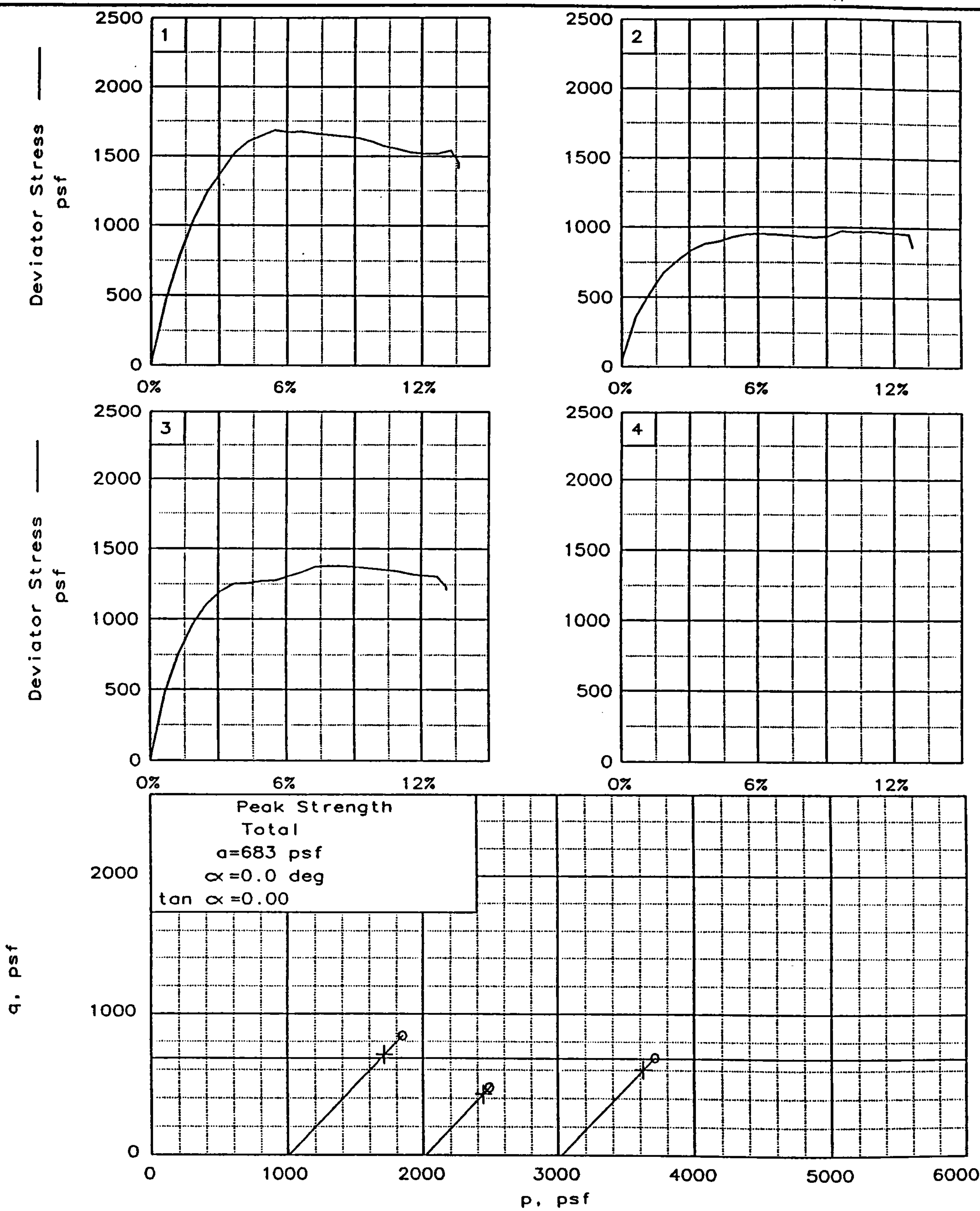
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-6U,
Sample 21-D, Depth 62.6'
PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



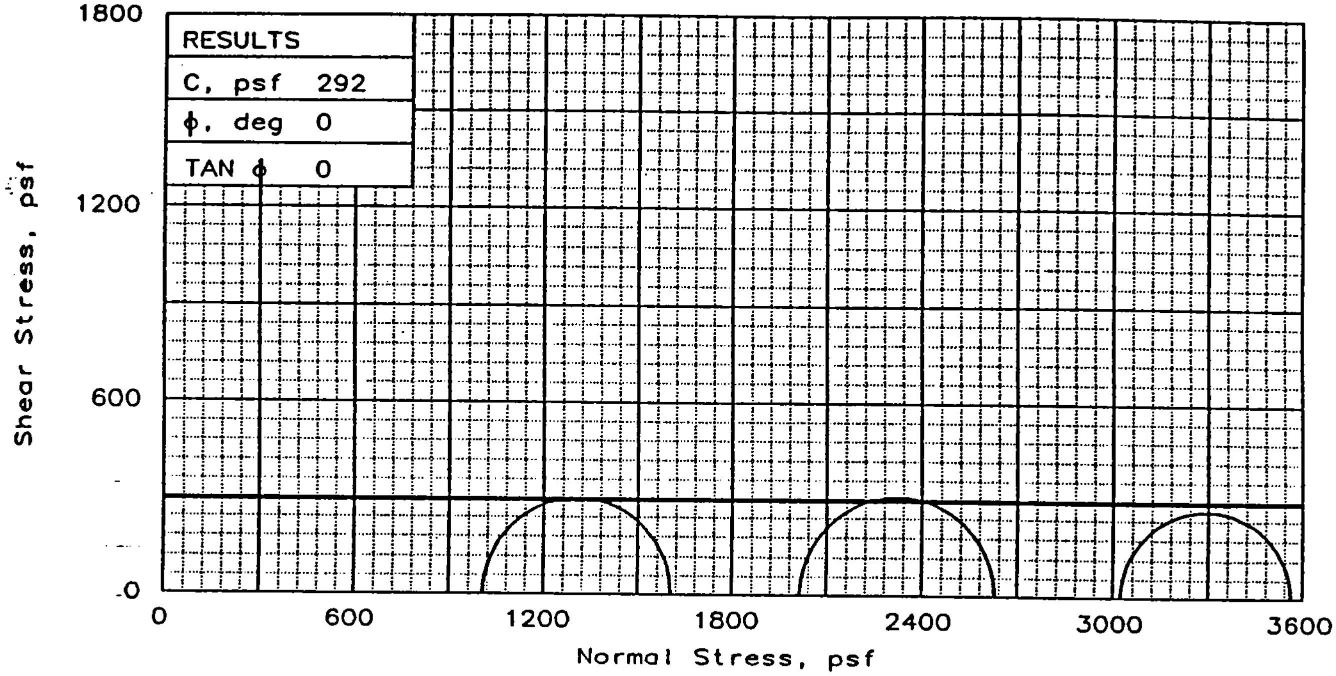
Stress Paths: + indicates end O indicates peak

Client: U.S. Army Corps of Engineers

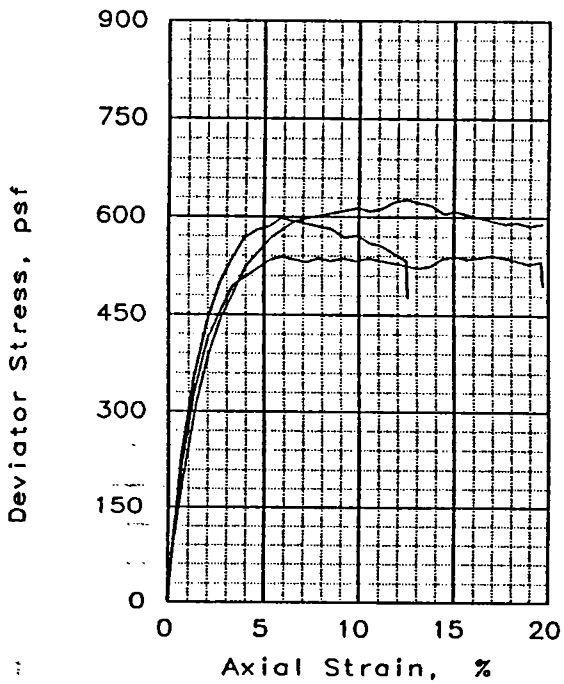
Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-6U, Sample 21-D, Depth 62.6'

File: UU-7278 Project No.: 13622 FIG. NO.: ____



RESULTS	
C, psf	292
φ, deg	0
TAN φ	0



SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	55.9	54.9	59.9
	DRY DENSITY, pcf	68.5	68.8	65.3
	SATURATION, %	102.7	101.9	101.8
	VOID RATIO	1.479	1.467	1.601
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	54.6	54.0	58.8
	DRY DENSITY, pcf	68.3	68.7	65.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.485	1.470	1.600
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1075	0.1122	0.1110
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		598	614	538
ULTIMATE STRESS, psf		477	590	496
σ_1 FAILURE, psf		1606	2630	3562
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3 w/ lns & ars ML, ars org, few conc
LL= 70 PL= 26 PI= 44
SPECIFIC GRAVITY= 2.72
REMARKS:

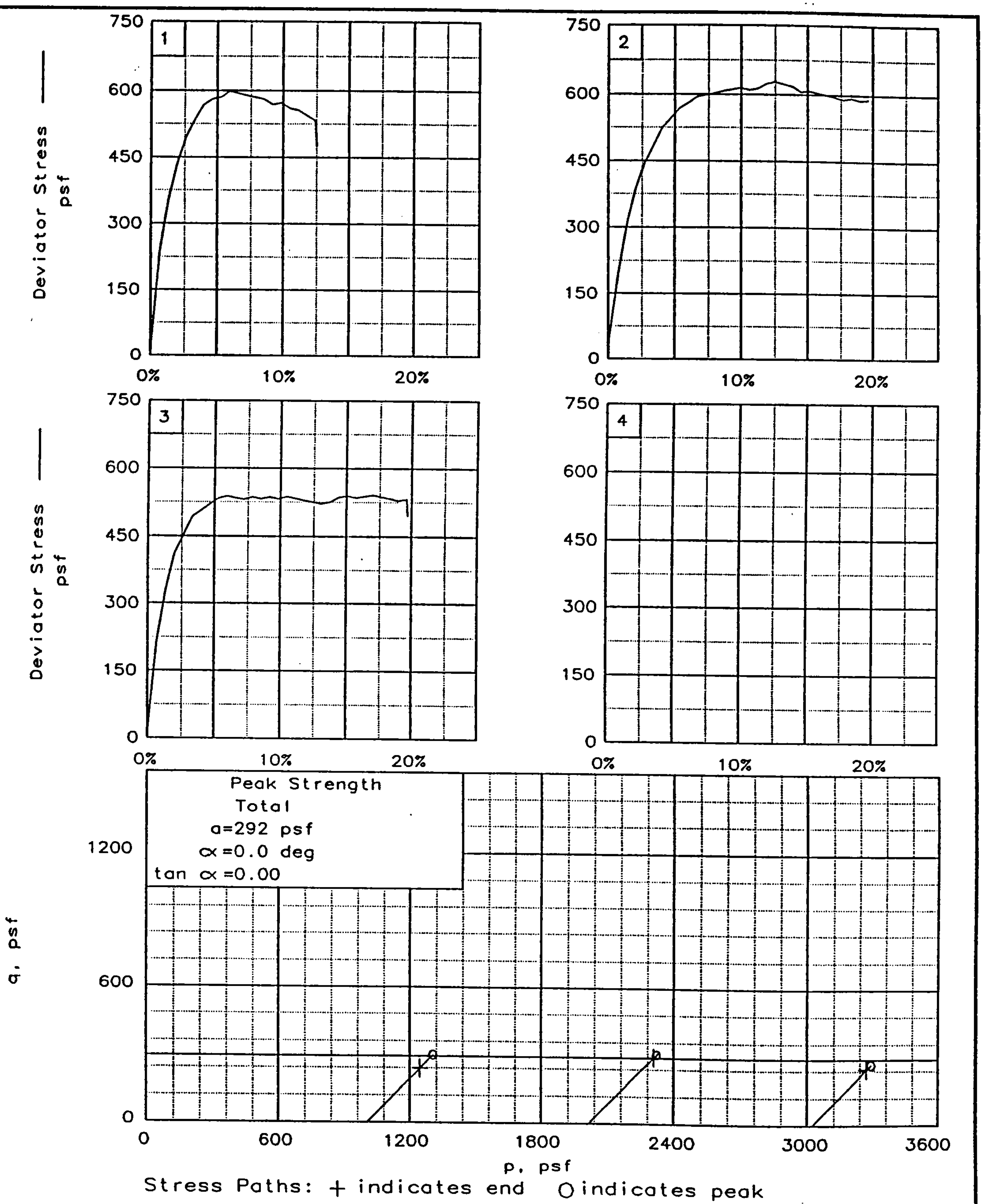
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-7U,
Sample 3-C, Depth 9.7'
PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

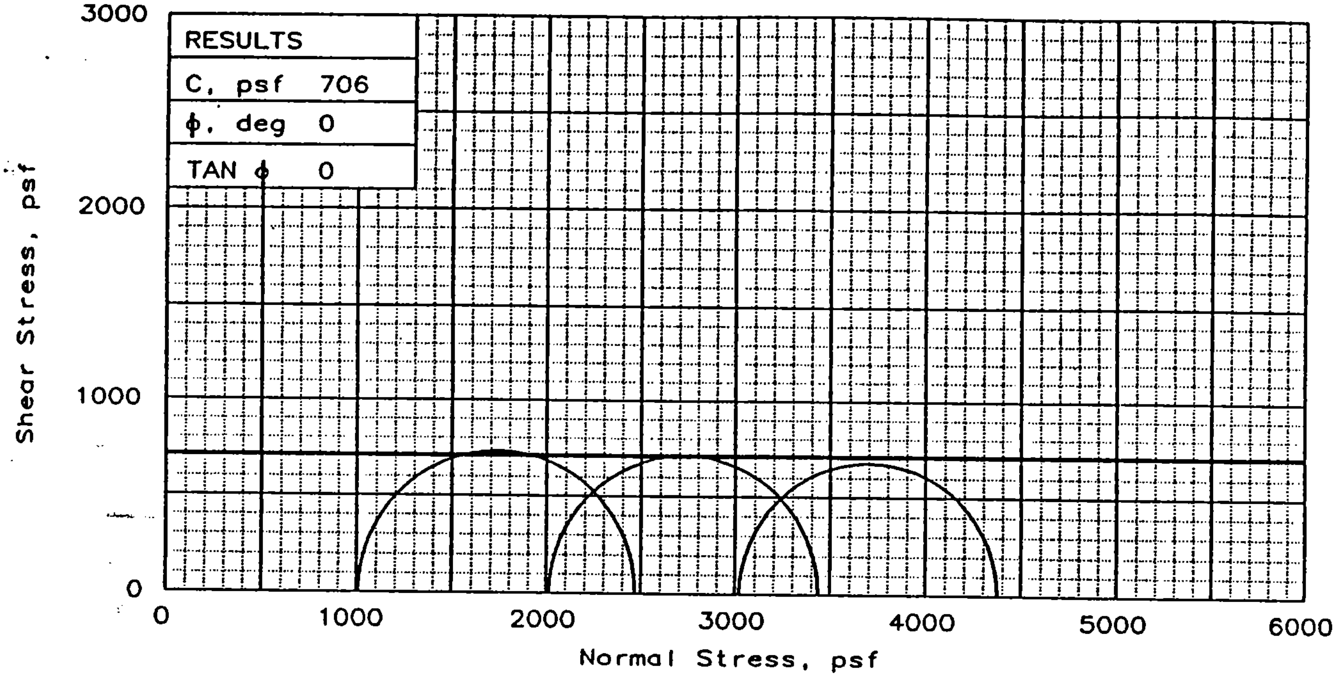


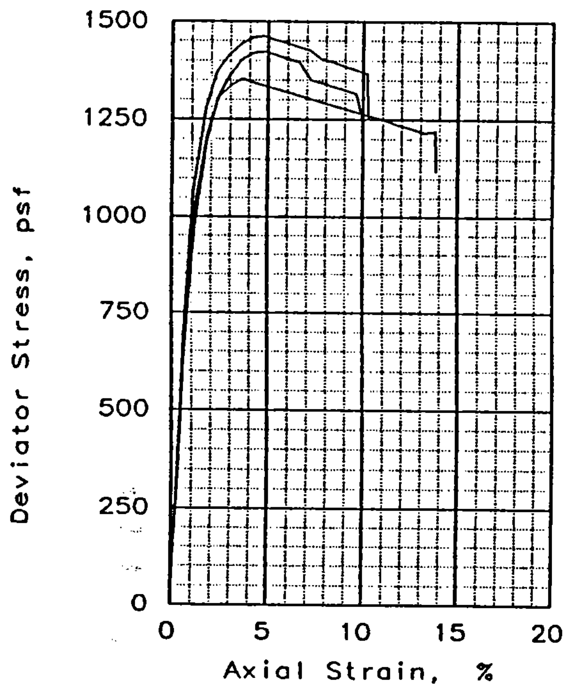
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-7U, Sample 3-C, Depth 9.7'

File: UU-7279 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	65.1	71.9	67.3
	DRY DENSITY, pcf	60.3	54.3	57.0
	SATURATION, %	97.3	91.8	92.4
	VOID RATIO	1.818	2.129	1.980
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.97
AT TEST	WATER CONTENT, %	66.8	77.5	71.6
	DRY DENSITY, pcf	60.3	54.7	57.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.816	2.107	1.947
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0965	0.0966	0.0949
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1462	1422	1352
ULTIMATE STRESS, psf		1250	1217	1119
σ_1 FAILURE, psf		2470	3438	4376
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr & Br CH4 w/
lyr & lns org, ors ML
LL= 104 PL= 36 PI= 68
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

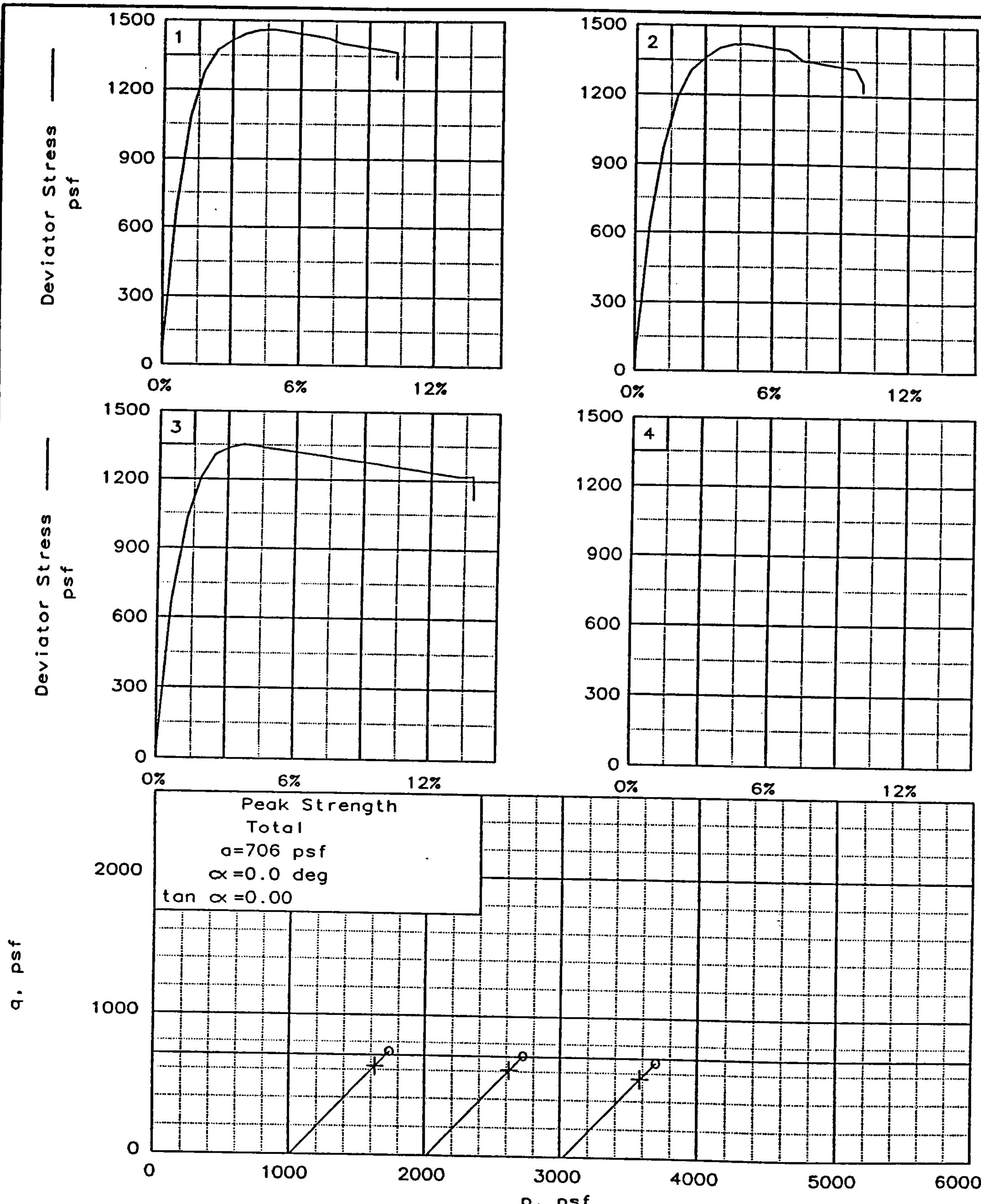
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-7U,
Sample 5-C, Depth 18.1'

PROJ. NO.: 13622 DATE: 8-7-96

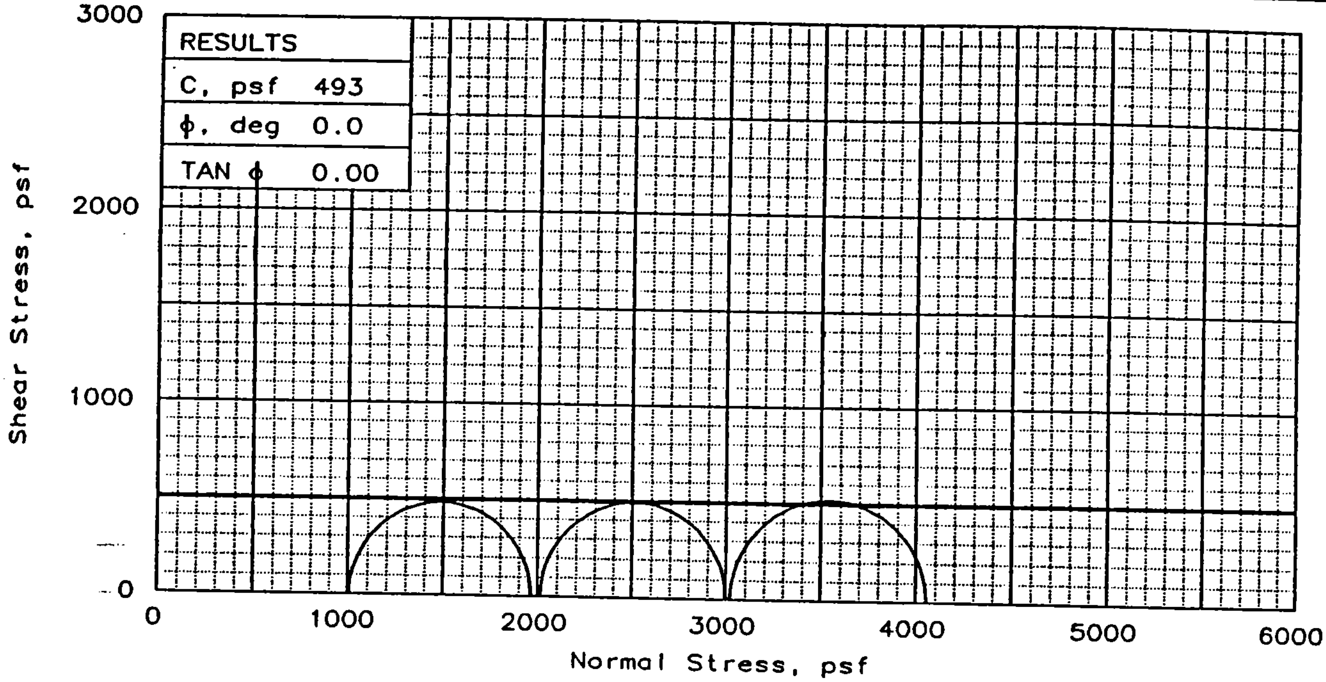
TRIAXIAL SHEAR TEST REPORT

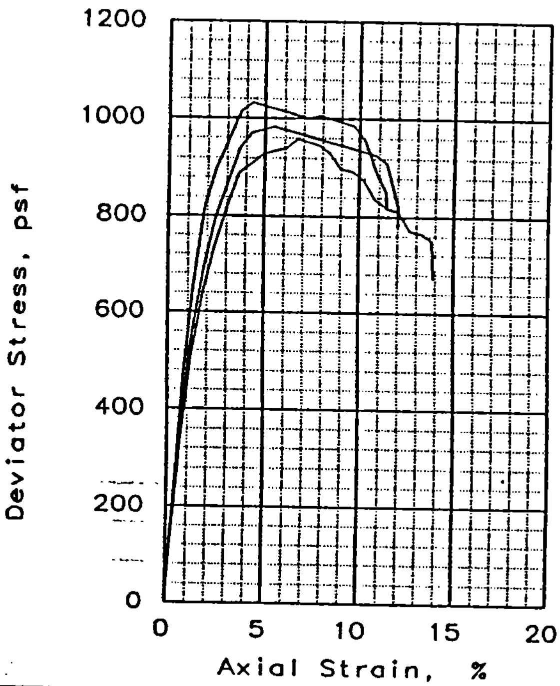
Eustis Engineering Company, Inc.



Stress Paths: + indicates end   O indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-7U, Sample 5-C, Depth 18.1'
File: UU-7280   Project No.: 13622   FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	69.8	72.9	73.6
	DRY DENSITY, pcf	59.5	57.7	57.4
	SATURATION, %	102.0	101.7	101.8
	VOID RATIO	1.876	1.964	1.980
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	68.4	71.7	72.2
	DRY DENSITY, pcf	59.5	57.7	57.4
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.875	1.965	1.979
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0928	0.0983	0.0975
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		958	983	1032
ULTIMATE STRESS, psf		671	777	817
σ_1 FAILURE, psf		1966	2999	4056
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lyr.&.lns ML

LL= 97 PL= 32 PI= 65

SPECIFIC GRAVITY= 2.74

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

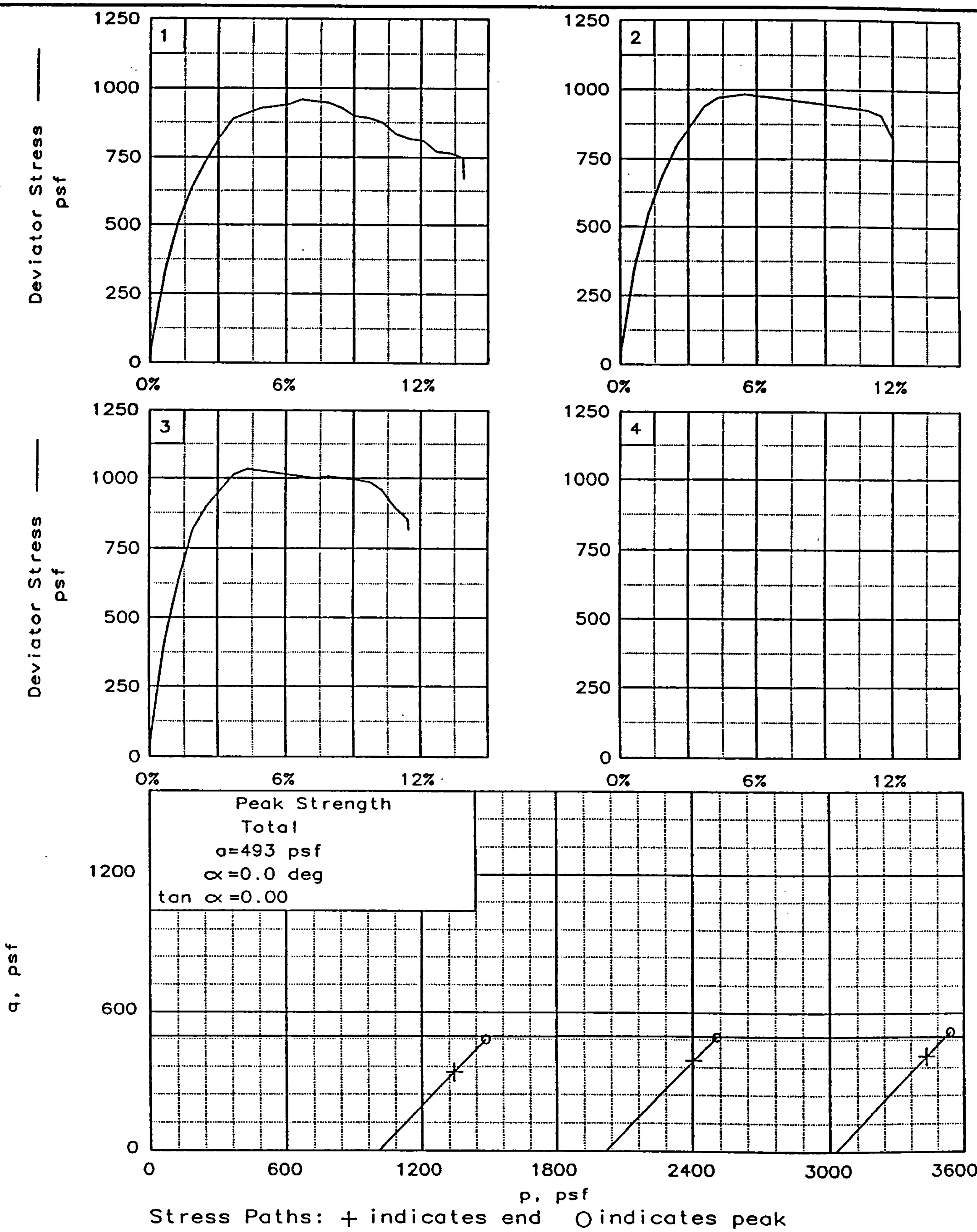
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-7U,
Sample 8-C, Depth 29.7'

PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

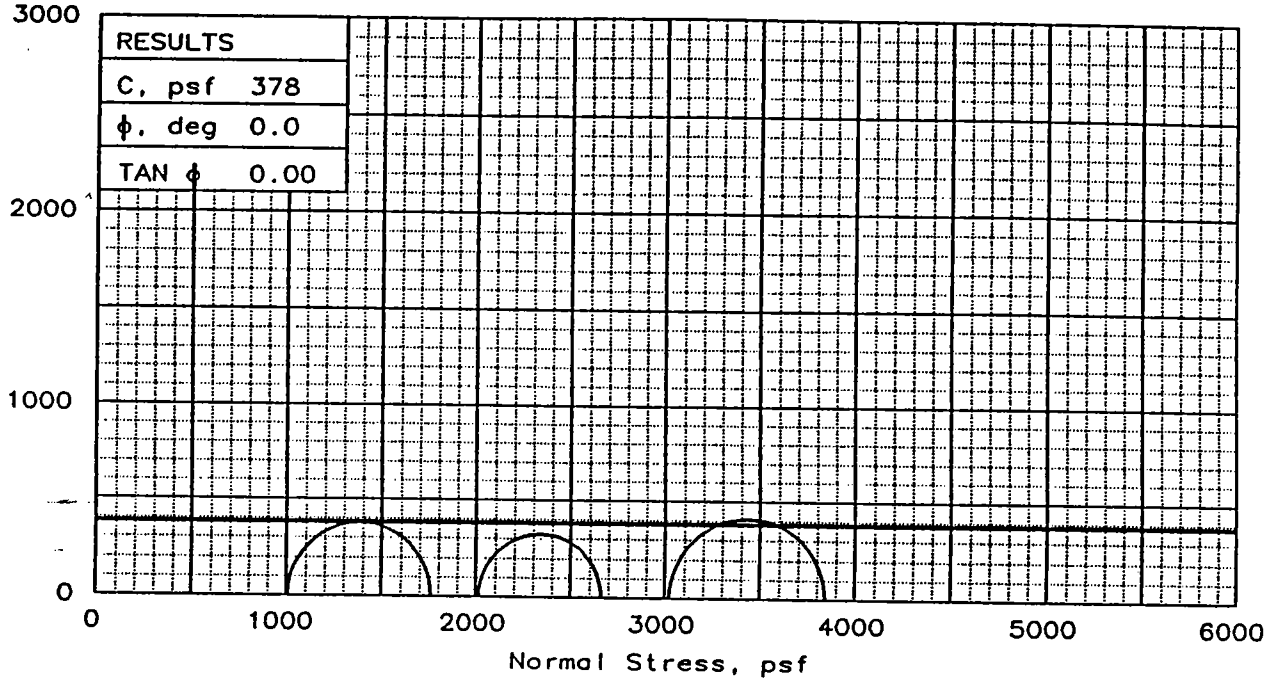


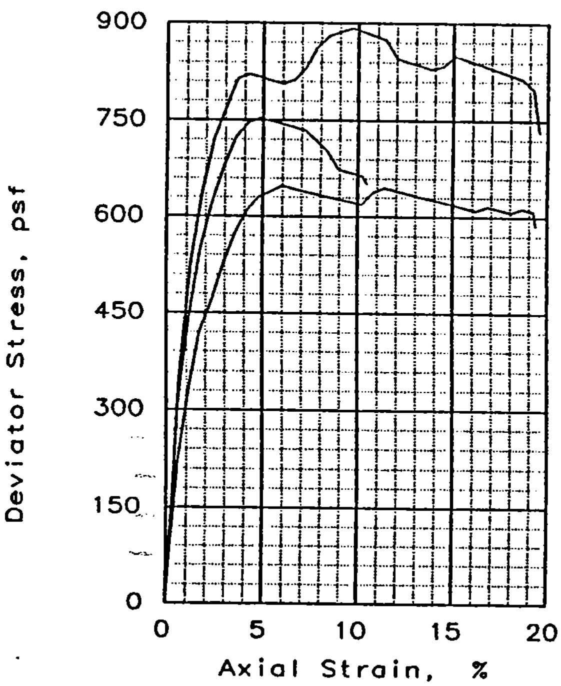
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-7U, Sample 8-C, Depth 29.7'

File: UU-7281 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	49.7	49.5	48.0
	DRY DENSITY, pcf	73.0	72.7	73.8
	SATURATION, %	101.4	100.3	99.9
	VOID RATIO	1.343	1.354	1.318
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	48.8	49.3	47.8
	DRY DENSITY, pcf	73.2	72.8	74.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.338	1.351	1.309
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0967	0.1014	0.1016
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		753	647	821
ULTIMATE STRESS, psf		650	587	732
σ_1 FAILURE, psf		1761	2663	3845
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns ML
LL= 67 PL= 23 PI= 44
SPECIFIC GRAVITY= 2.74
REMARKS:

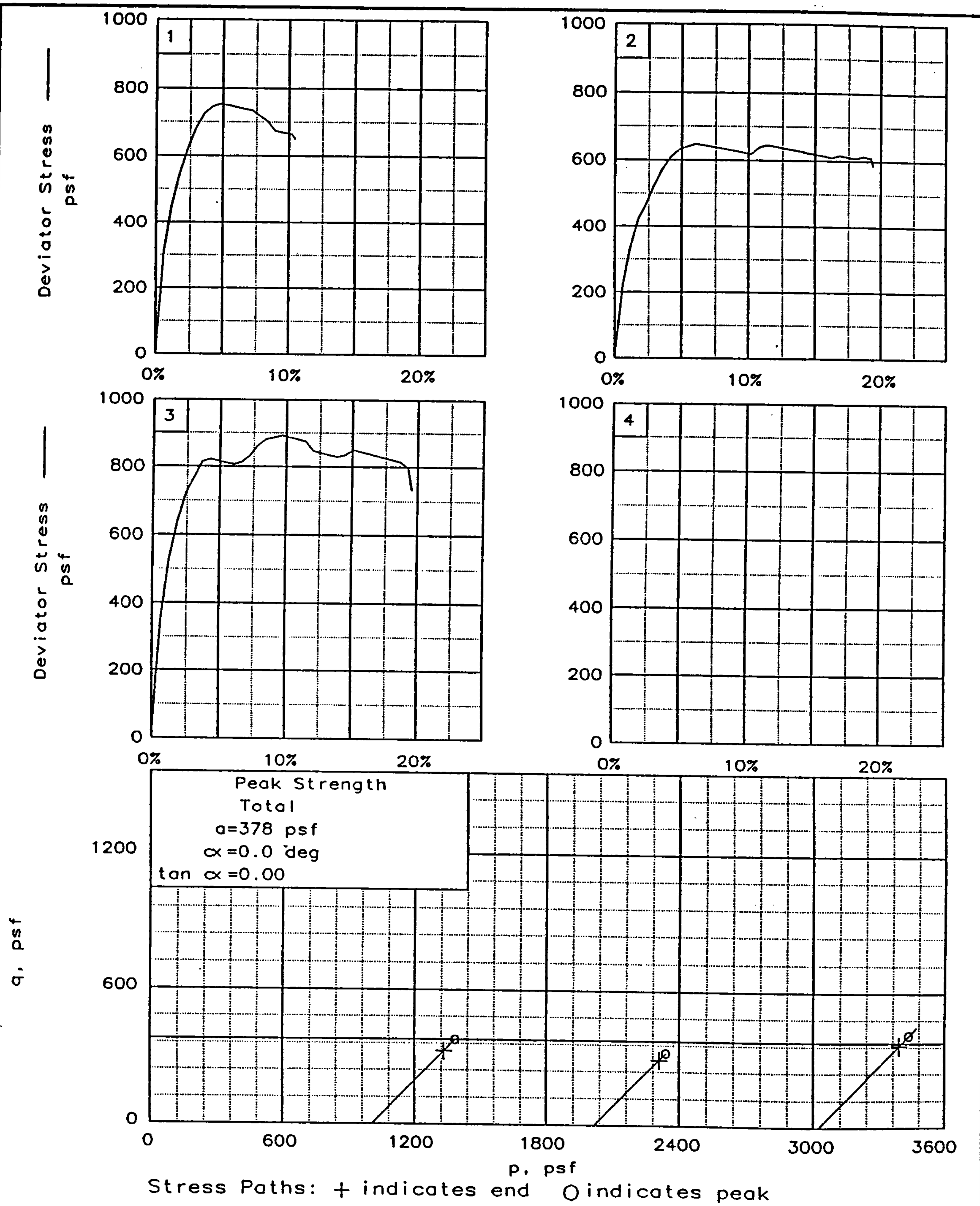
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-7U,
Sample 14-D, Depth 46.5'
PROJ. NO.: 13622 DATE: 8-7-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

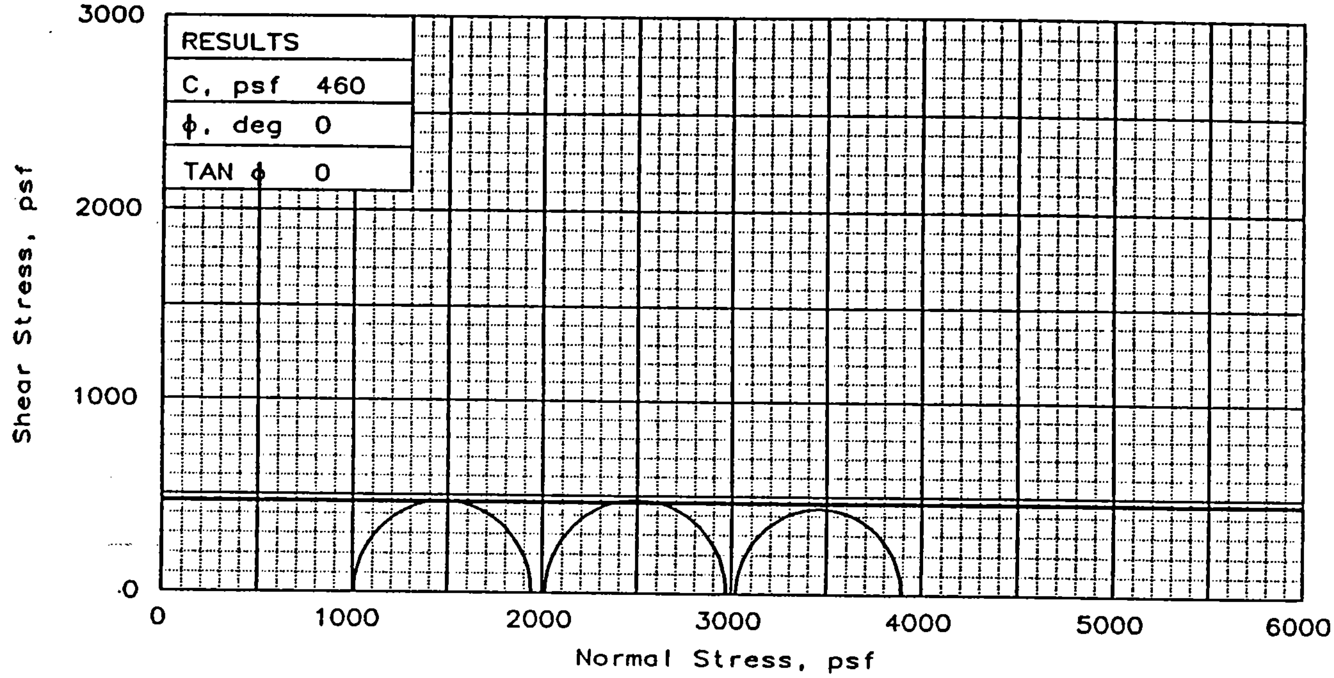


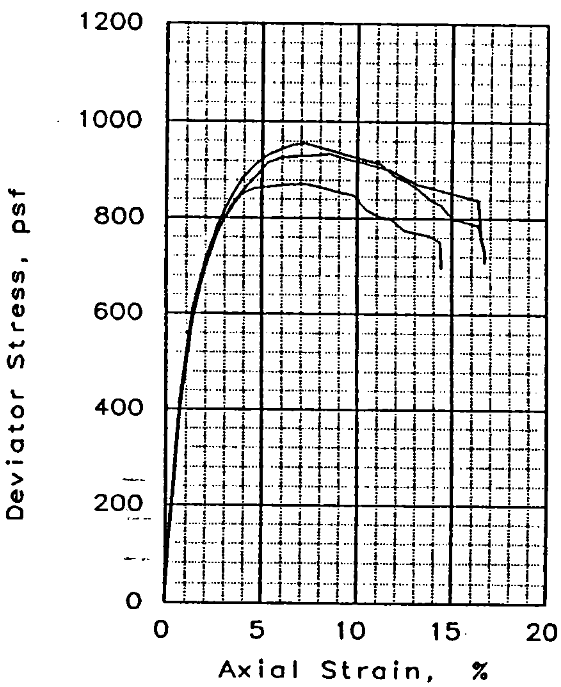
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-7U, Sample 14-D, Depth 46.5'

File: UU-7282 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.0	62.1	61.4
	DRY DENSITY, pcf	64.0	63.2	63.6
	SATURATION, %	102.1	100.0	100.0
	VOID RATIO	1.651	1.688	1.671
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.97
AT TEST	WATER CONTENT, %	60.6	61.4	60.7
	DRY DENSITY, pcf	64.1	63.6	64.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.649	1.670	1.650
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1077	0.0971	0.1078
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		934	955	872
ULTIMATE STRESS, psf		755	708	697
σ_1 FAILURE, psf		1942	2971	3896
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lns & ars ML
LL= 92 PL= 27 PI= 65
SPECIFIC GRAVITY= 2.72
REMARKS:

FIG. NO.: ______

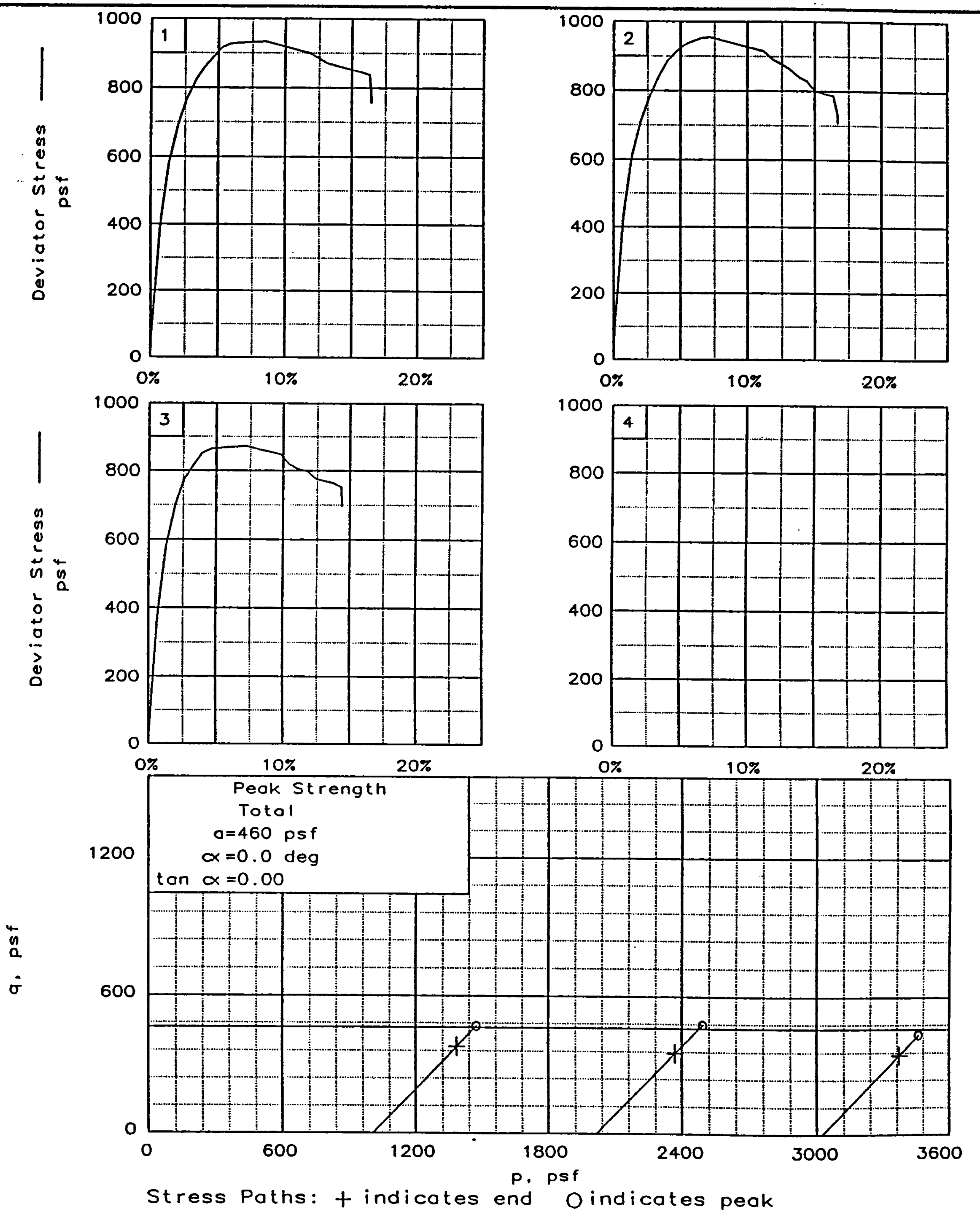
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-7U,
Sample 16-D, Depth 54.8'

PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

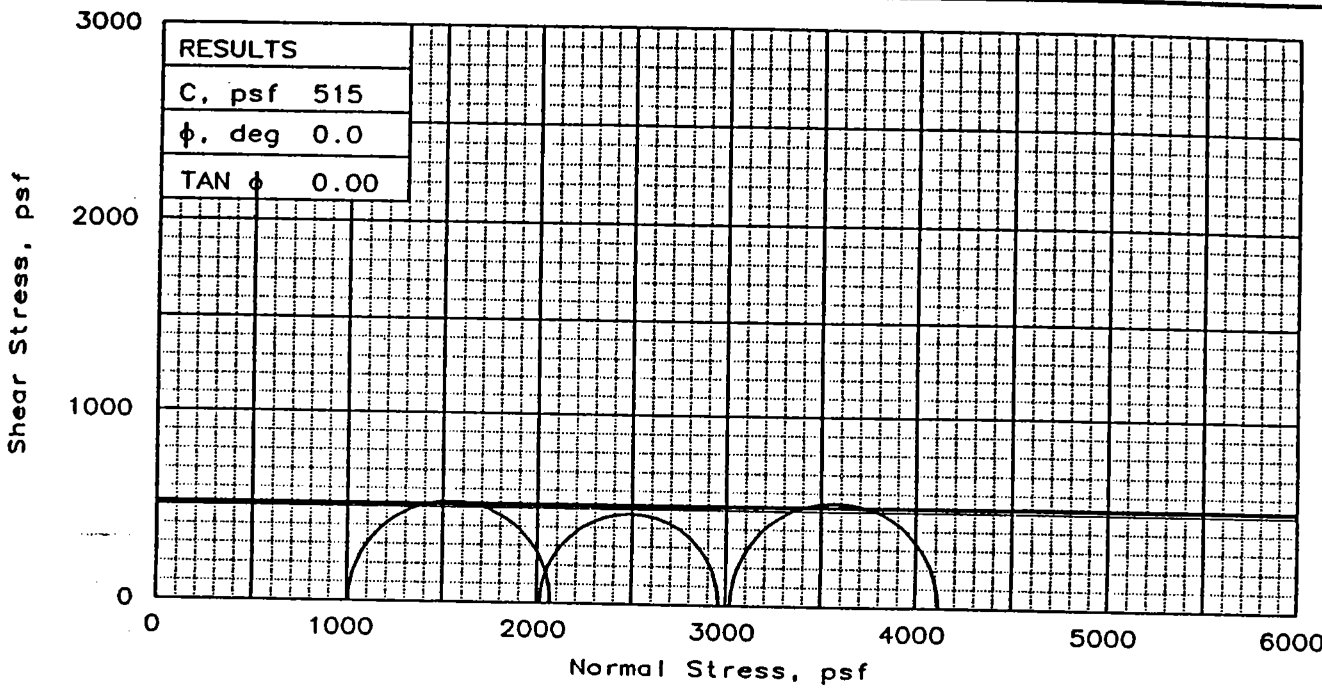


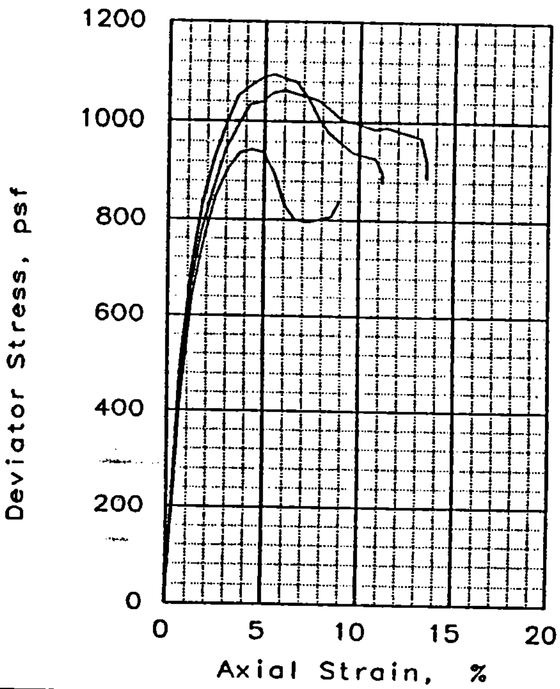
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-7U, Sample 16-D, Depth 54.8'

File: UU-7283 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.7	61.5	60.1
	DRY DENSITY, pcf	62.7	63.5	64.2
	SATURATION, %	99.9	99.9	99.4
	VOID RATIO	1.708	1.675	1.645
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.97	2.98	2.98
AT TEST	WATER CONTENT, %	62.2	61.1	60.4
	DRY DENSITY, pcf	63.1	63.8	64.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.693	1.661	1.642
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0958	0.0966	0.0929
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1062	945	1094
ULTIMATE STRESS, psf		887	840	877
σ_1 FAILURE, psf		2070	2961	4118
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: M Gr CH4
w/ lns & ors ML

LL= 91 PL= 27 PI= 64

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

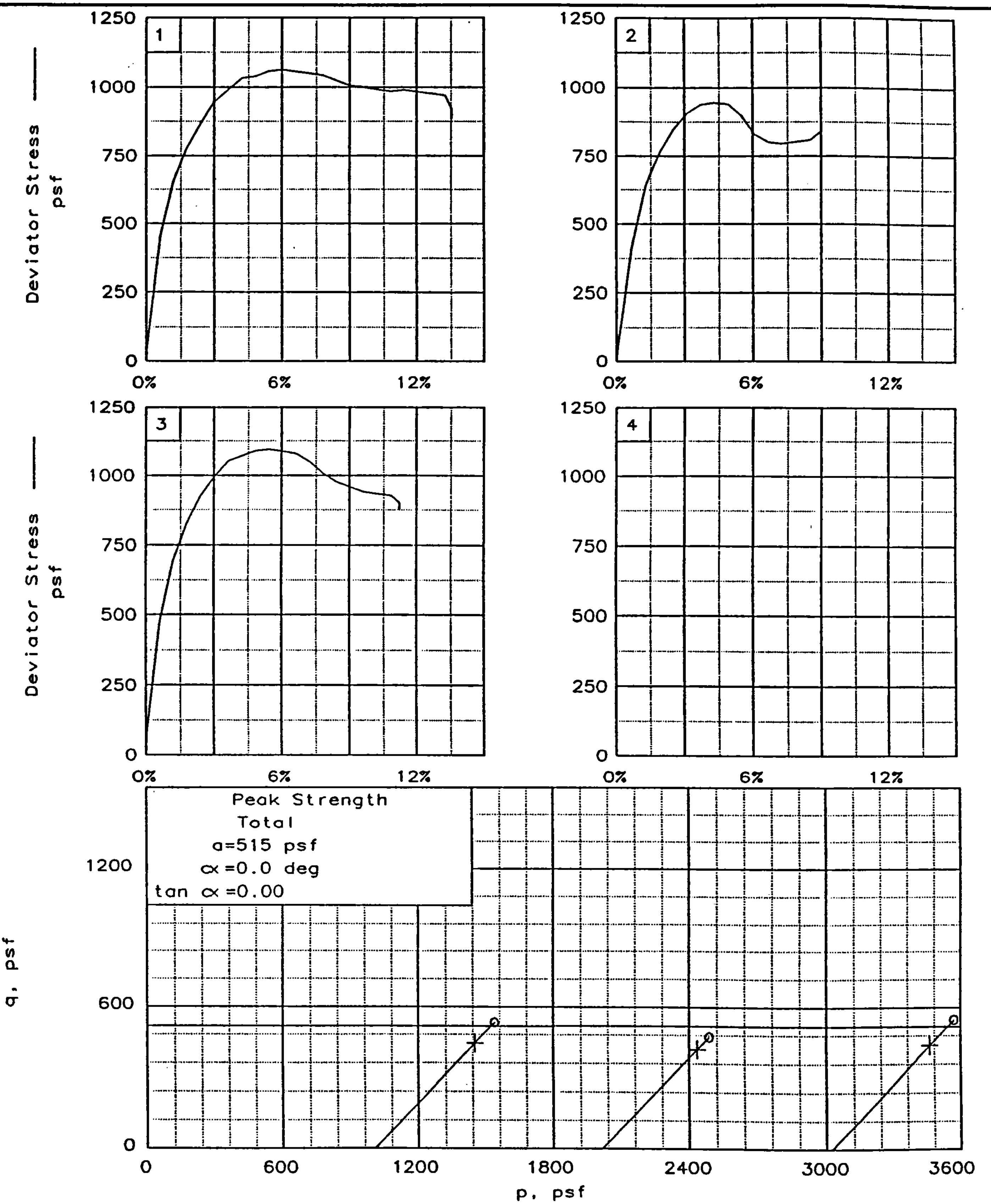
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-7U,
Sample 18-D, Depth 62.7'

PROJ. NO.: 13622 DATE: 8-8-96

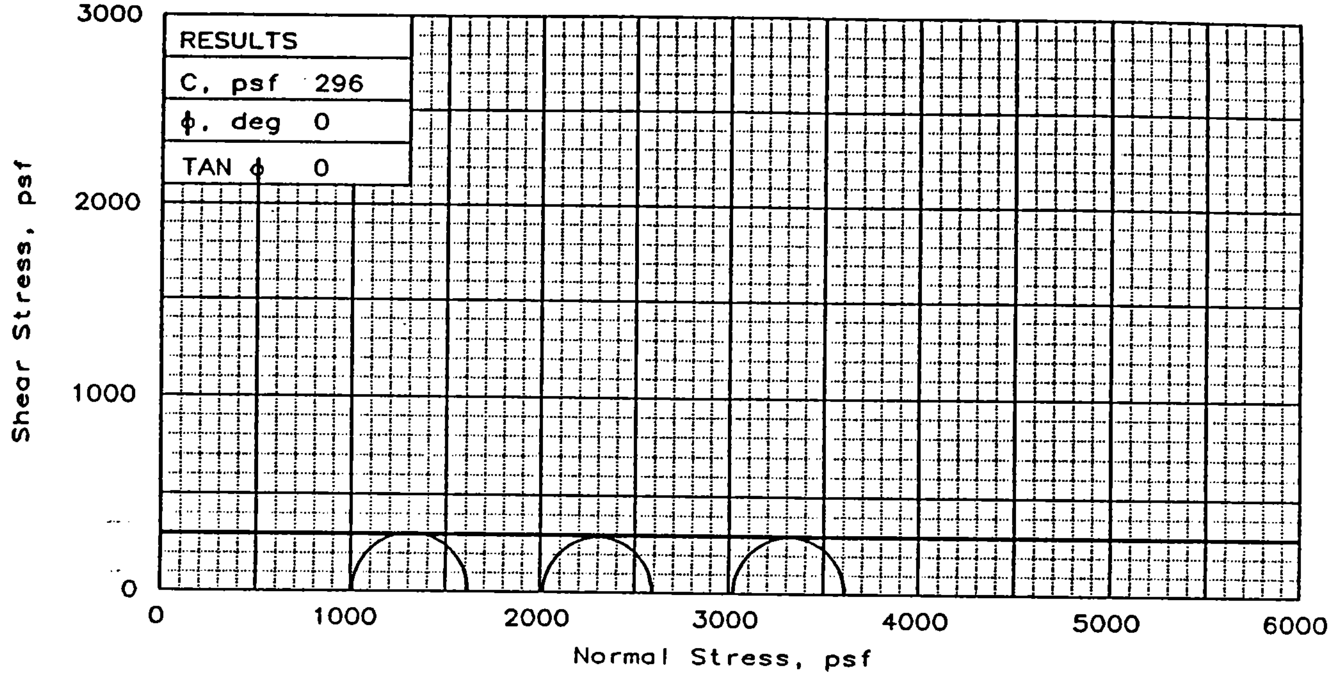
TRIAXIAL SHEAR TEST REPORT

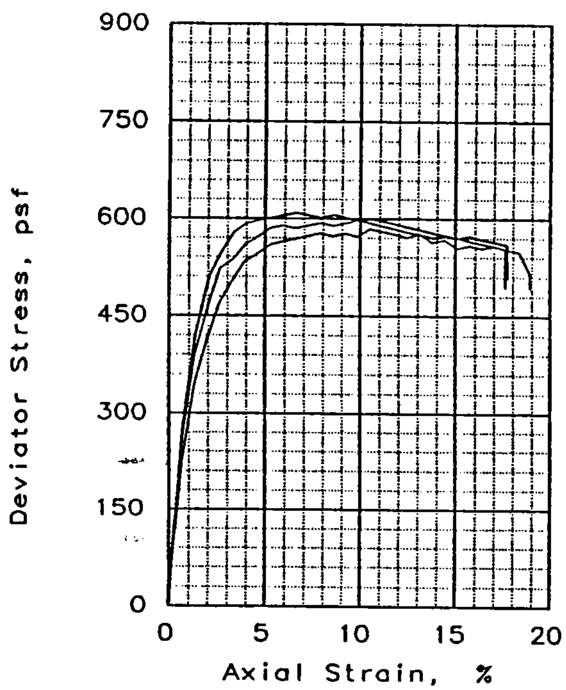
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-7U, Sample 18-D, Depth 62.7'
File: UU-7284 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	50.6	49.5	48.4
	DRY DENSITY, pcf	72.8	72.7	74.0
	SATURATION, %	102.7	100.4	101.2
	VOID RATIO	1.350	1.351	1.311
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	49.5	49.4	47.8
	DRY DENSITY, pcf	72.6	72.7	74.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.357	1.353	1.309
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1108	0.1106	0.1115
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		609	577	589
ULTIMATE STRESS, psf		494	494	508
σ_1 FAILURE, psf		1617	2593	3613
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH3
w/ lyr & lns ML
LL= 56 PL= 20 PI= 36
SPECIFIC GRAVITY= 2.74
REMARKS:

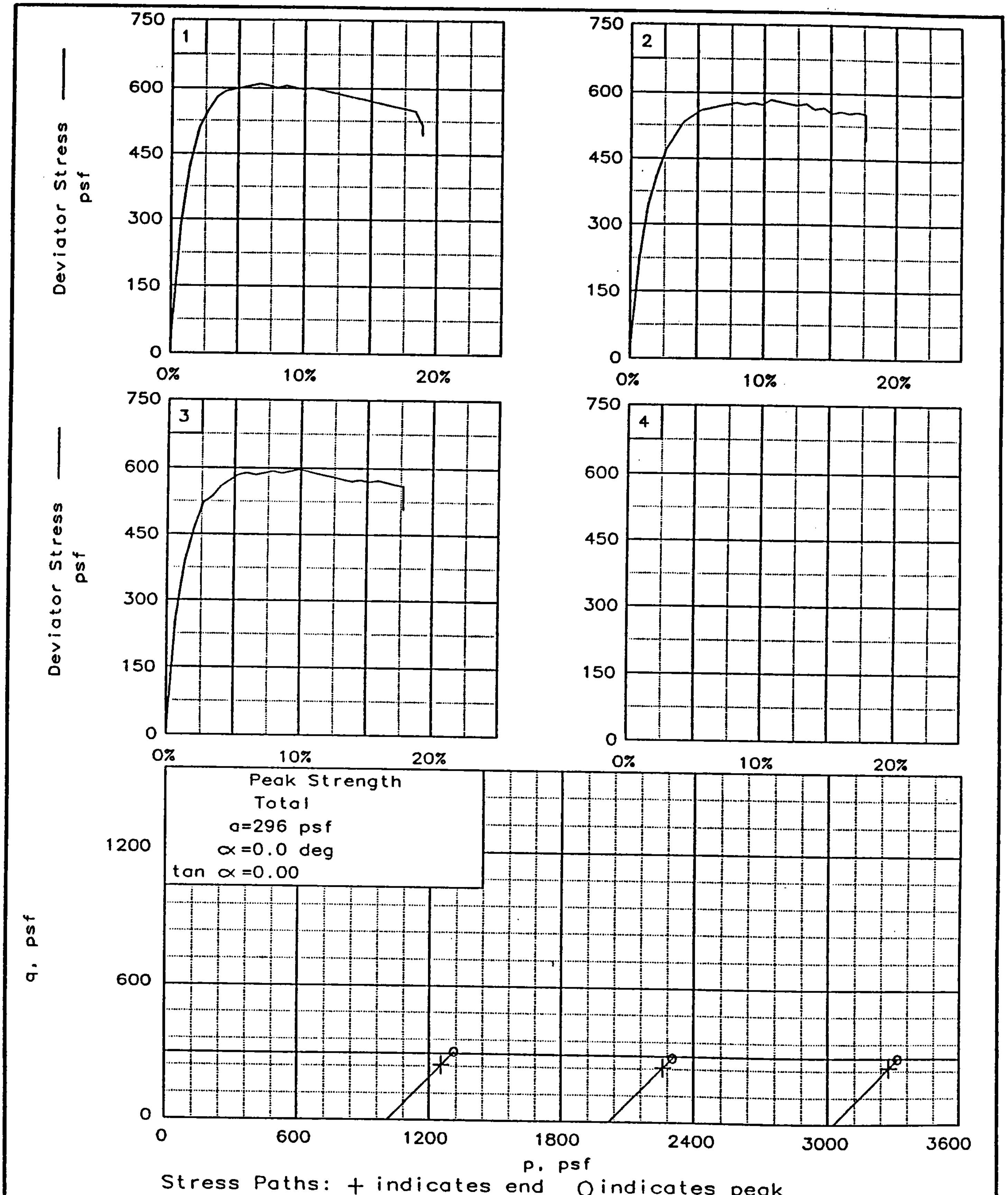
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

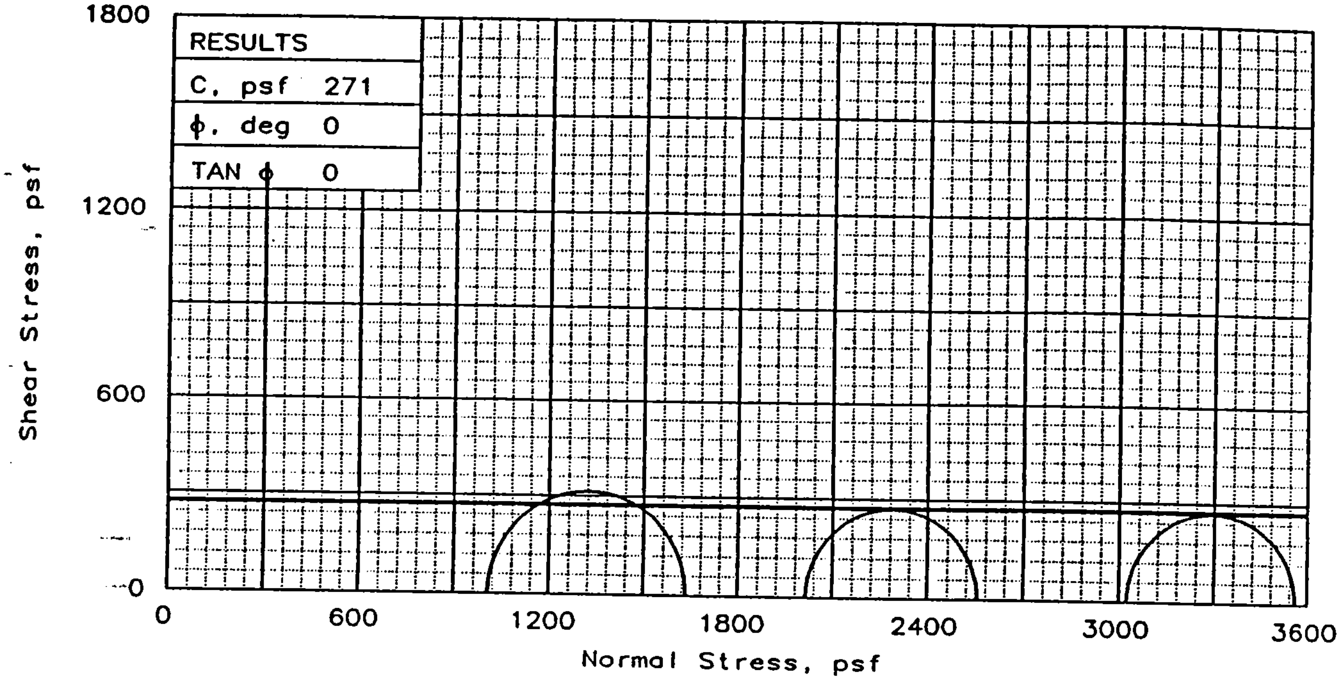
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 4-C, Depth 14.4'
PROJ. NO.: 13622 DATE: 8-8-96

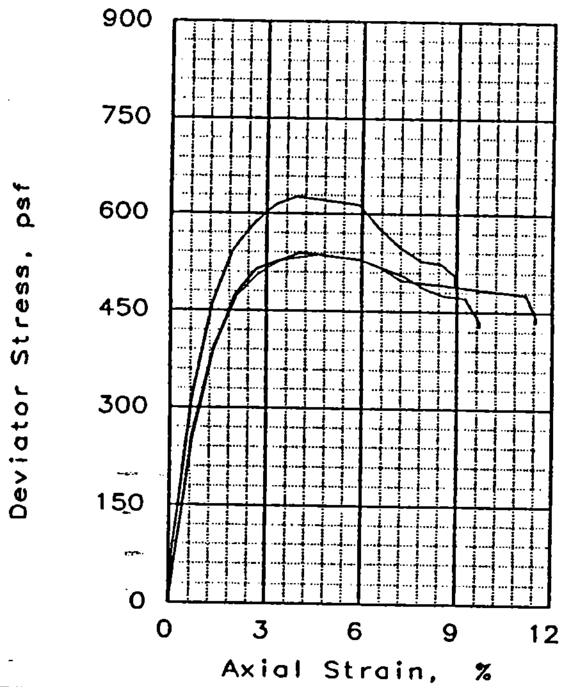
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-8U, Sample 4-C, Depth 14.4'
File: UU-7285 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	76.1	74.7	75.3
	DRY DENSITY, pcf	56.3	56.5	56.1
	SATURATION, %	102.3	100.8	100.6
	VOID RATIO	2.037	2.029	2.050
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	74.8	74.1	74.7
	DRY DENSITY, pcf	56.1	56.4	56.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	2.051	2.032	2.047
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1004	0.1083	0.1026
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		627	540	537
ULTIMATE STRESS, psf		489	427	435
σ_1 FAILURE, psf		1635	2556	3561
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 97 PL= 28 PI= 69
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

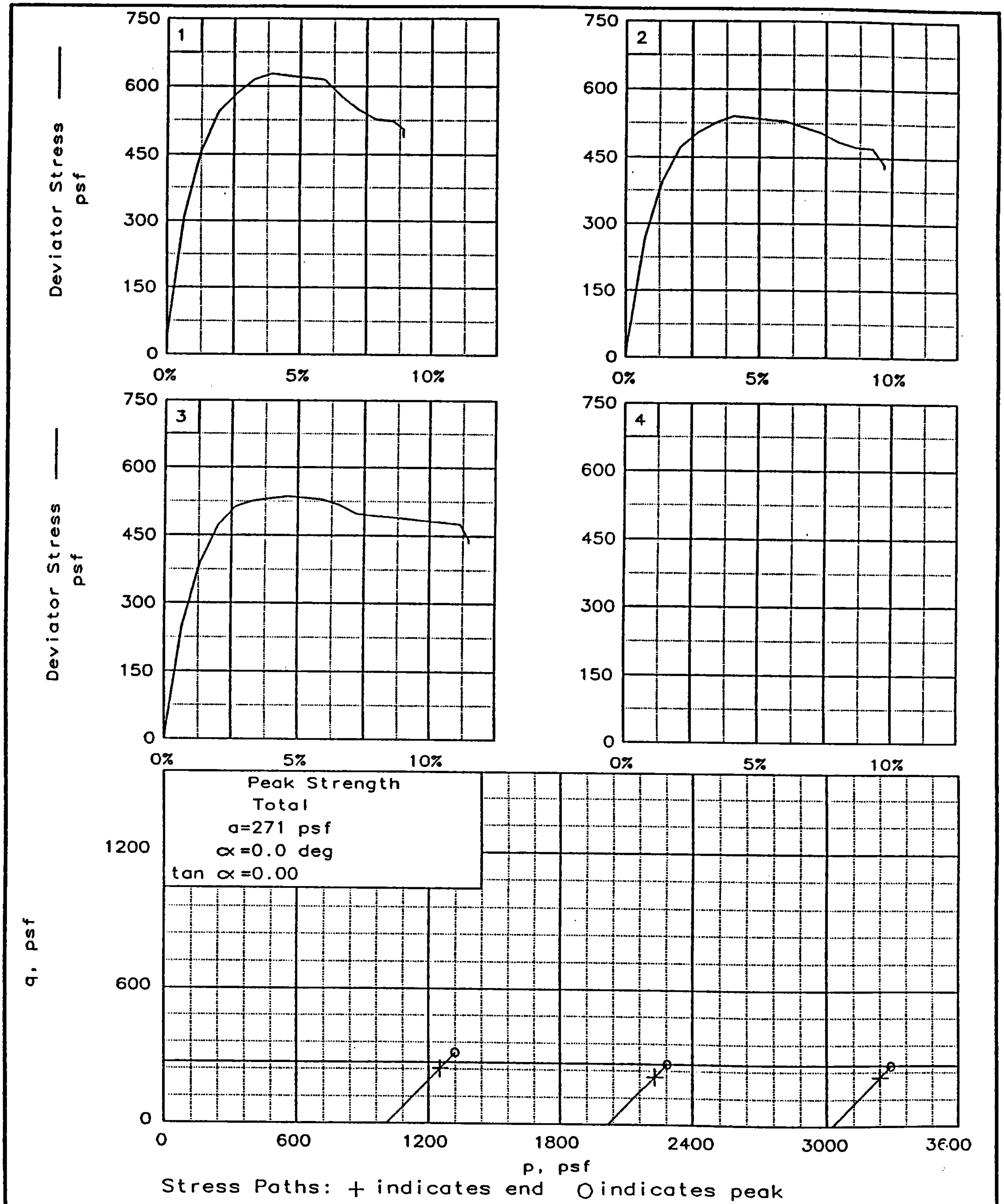
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 7-D, Depth 26.8'

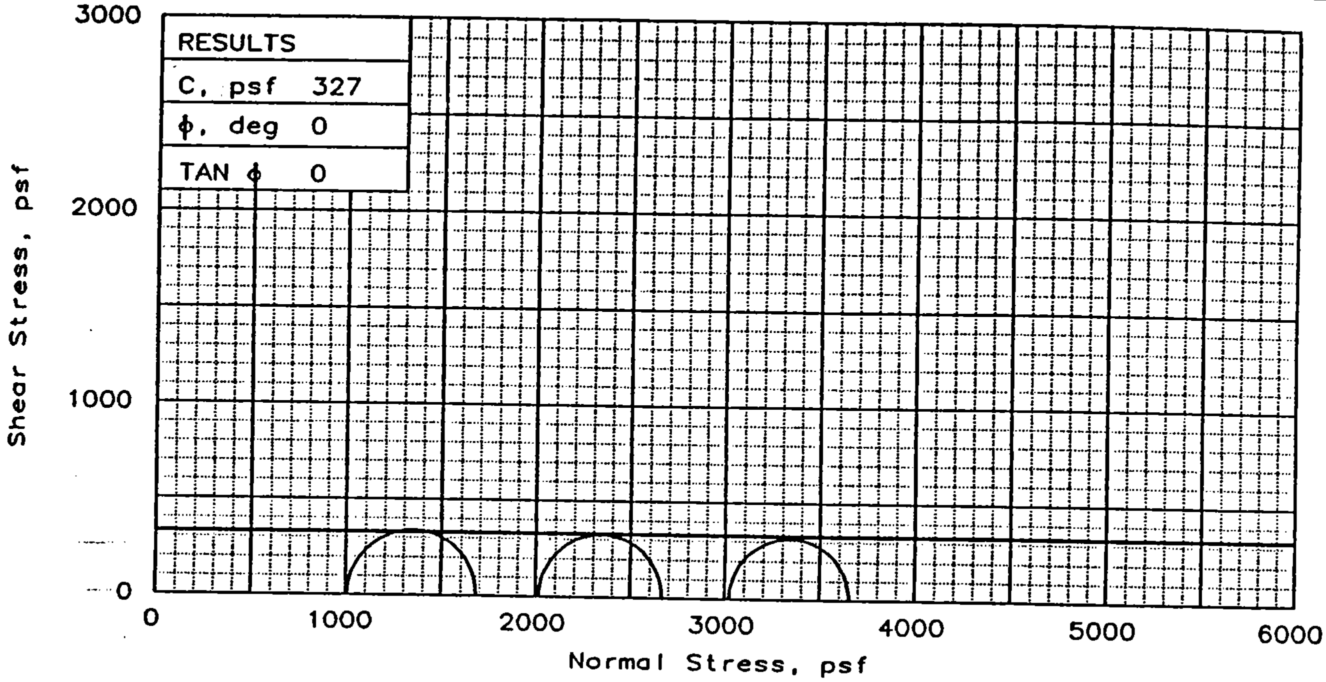
PROJ. NO.: 13622 DATE: 8-8-96

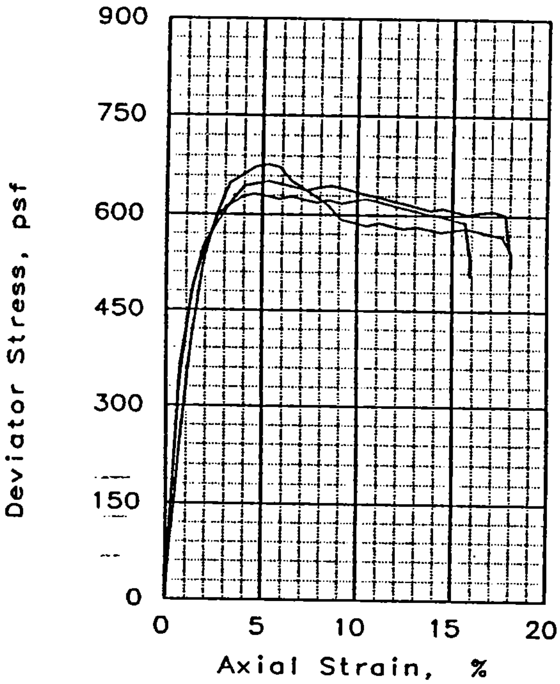
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-8U, Sample 7-D, Depth 26.8'
File: UU-7286 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	57.6	59.2	57.2
	DRY DENSITY, pcf	65.9	65.1	65.5
	SATURATION, %	99.3	100.1	97.5
	VOID RATIO	1.577	1.609	1.594
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	58.1	59.3	58.4
	DRY DENSITY, pcf	65.8	65.0	65.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.581	1.612	1.589
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1100	0.1011	0.1017
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		677	652	632
ULTIMATE STRESS, psf		519	550	504
σ_1 FAILURE, psf		1685	2668	3656
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained

SAMPLE TYPE: Undisturbed

DESCRIPTION: So Gr CH4
w/ lns & ars ML

LL= 76 PL= 23 PI= 53

SPECIFIC GRAVITY= 2.72

REMARKS:

FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

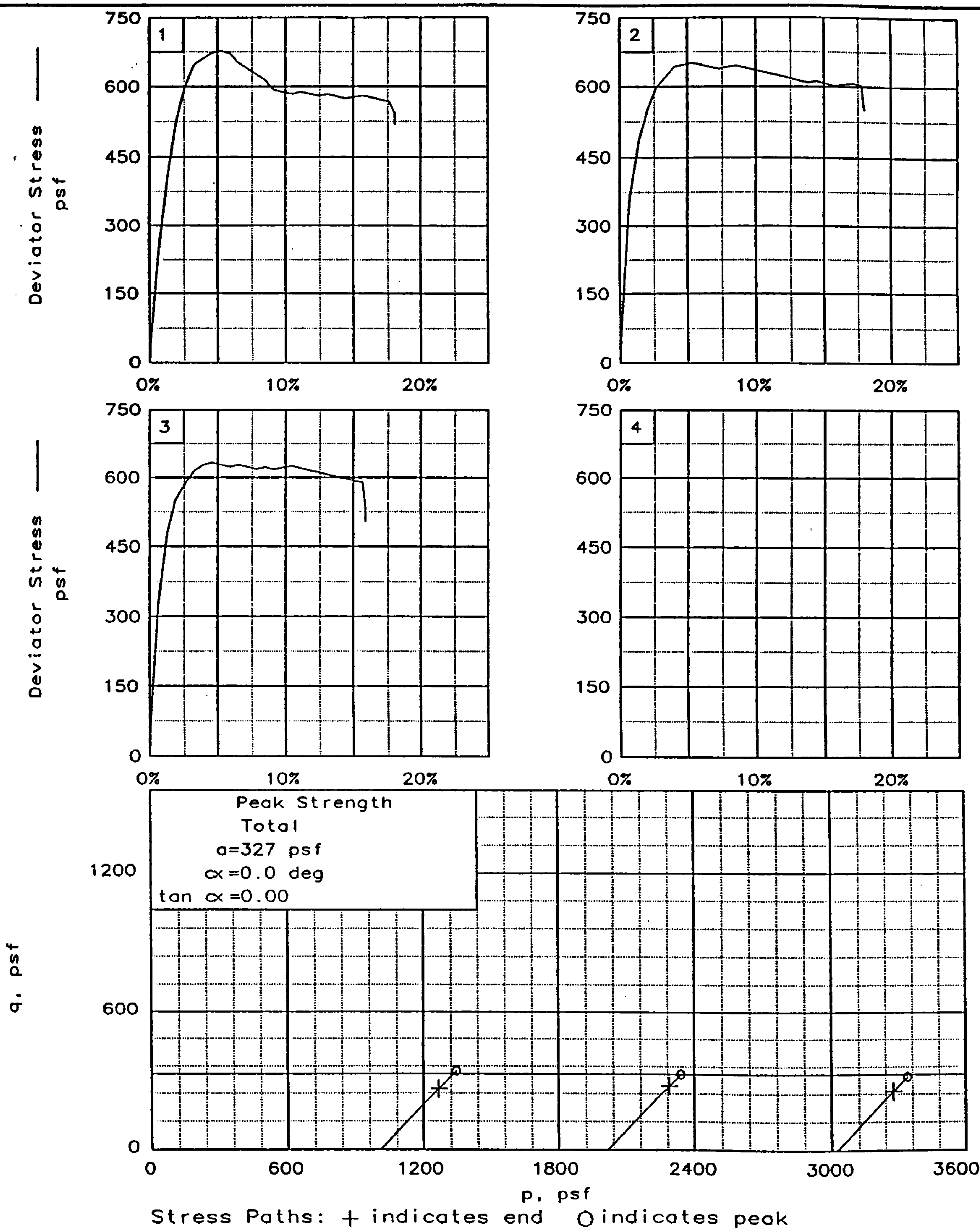
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012

SAMPLE LOCATION: Boring ALGW-8U,
Sample 9-D, Depth 34.8'

PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

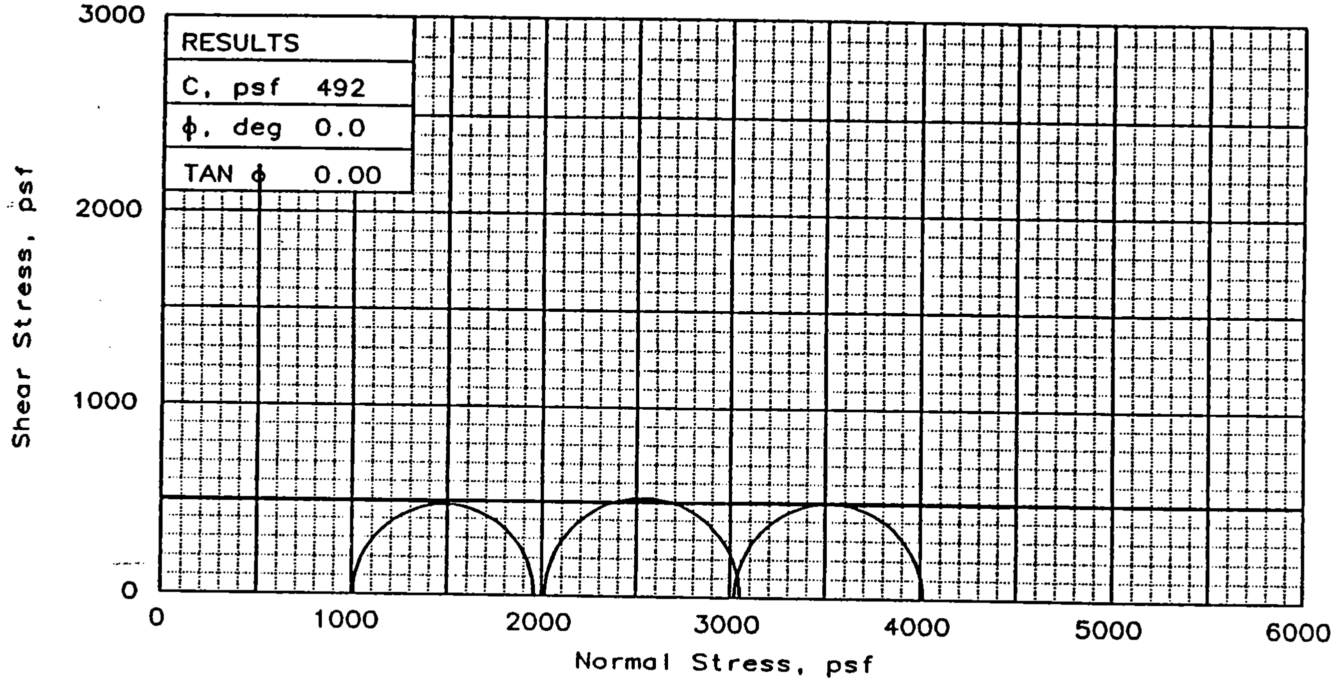


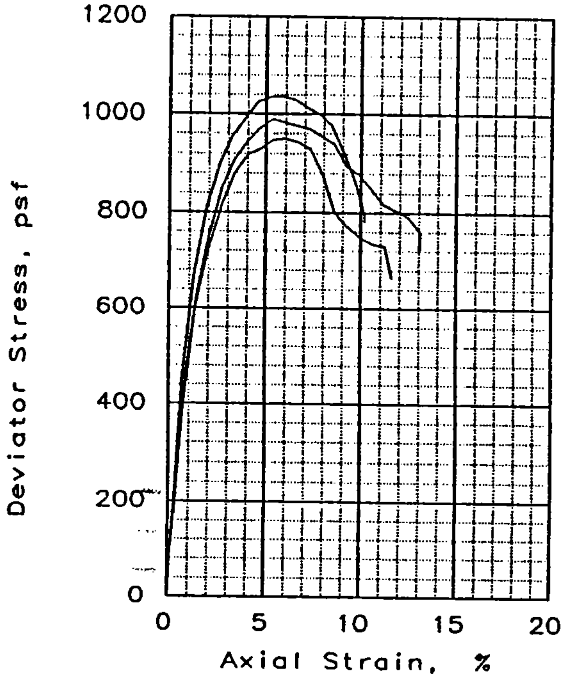
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-8U, Sample 9-D, Depth 34.8'

File: UU-7287 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.1	66.6	65.5
	DRY DENSITY, pcf	60.3	61.0	60.7
	SATURATION, %	100.0	101.0	98.6
	VOID RATIO	1.839	1.806	1.820
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	67.2	65.7	66.0
	DRY DENSITY, pcf	60.2	61.1	60.9
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.841	1.801	1.808
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1004	0.1072	0.0999
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		950	1037	990
ULTIMATE STRESS, psf		664	780	723
σ_1 FAILURE, psf		1958	3053	4014
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ Ins ML
LL= 96 PL= 32 PI= 64
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

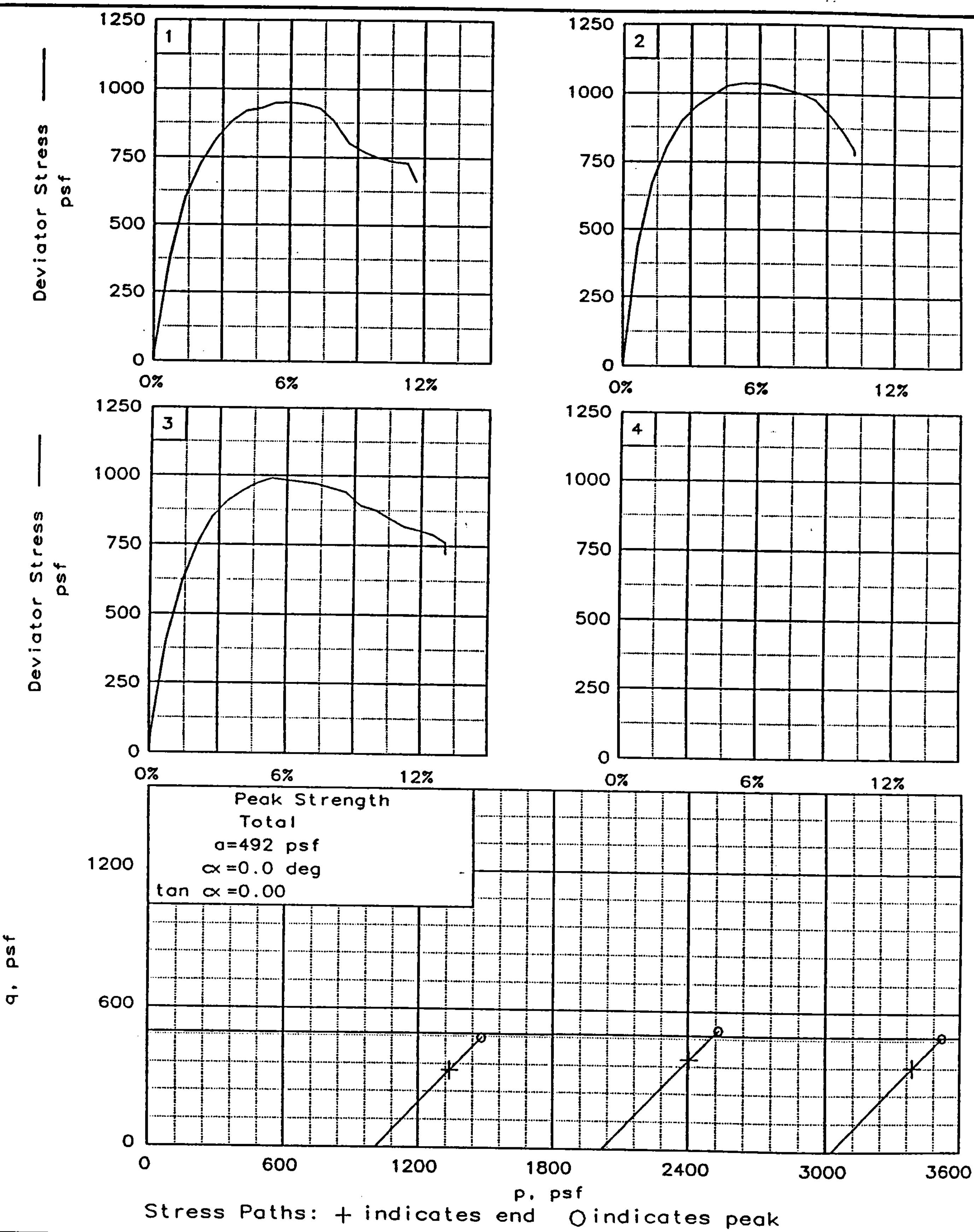
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 11-C, Depth 42.0'

PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

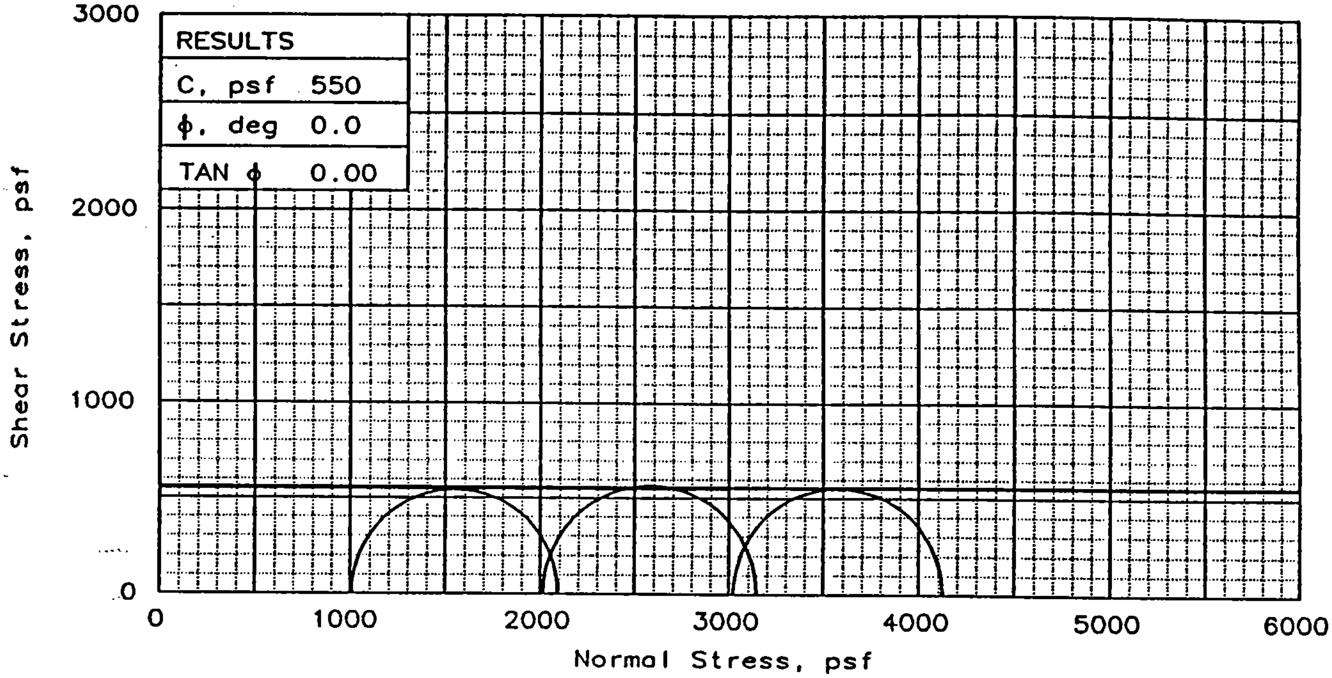


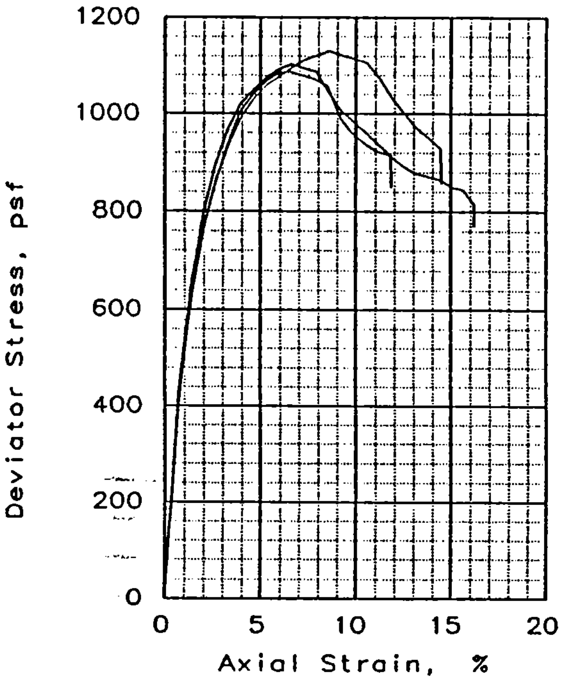
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-8U, Sample 11-C, Depth 42.0'

File: UU-7288 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	58.0	57.7	57.5
	DRY DENSITY, pcf	66.0	66.2	66.1
	SATURATION, %	100.2	100.4	99.7
	VOID RATIO	1.574	1.564	1.569
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	58.3	57.6	57.3
	DRY DENSITY, pcf	65.7	66.1	66.3
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.584	1.567	1.560
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0977	0.1040	0.1000
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1086	1130	1102
ULTIMATE STRESS, psf		771	858	851
σ_1 FAILURE, psf		2094	3146	4126
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ ars ML
LL= 85 PL= 27 PI= 58
SPECIFIC GRAVITY= 2.72
REMARKS:

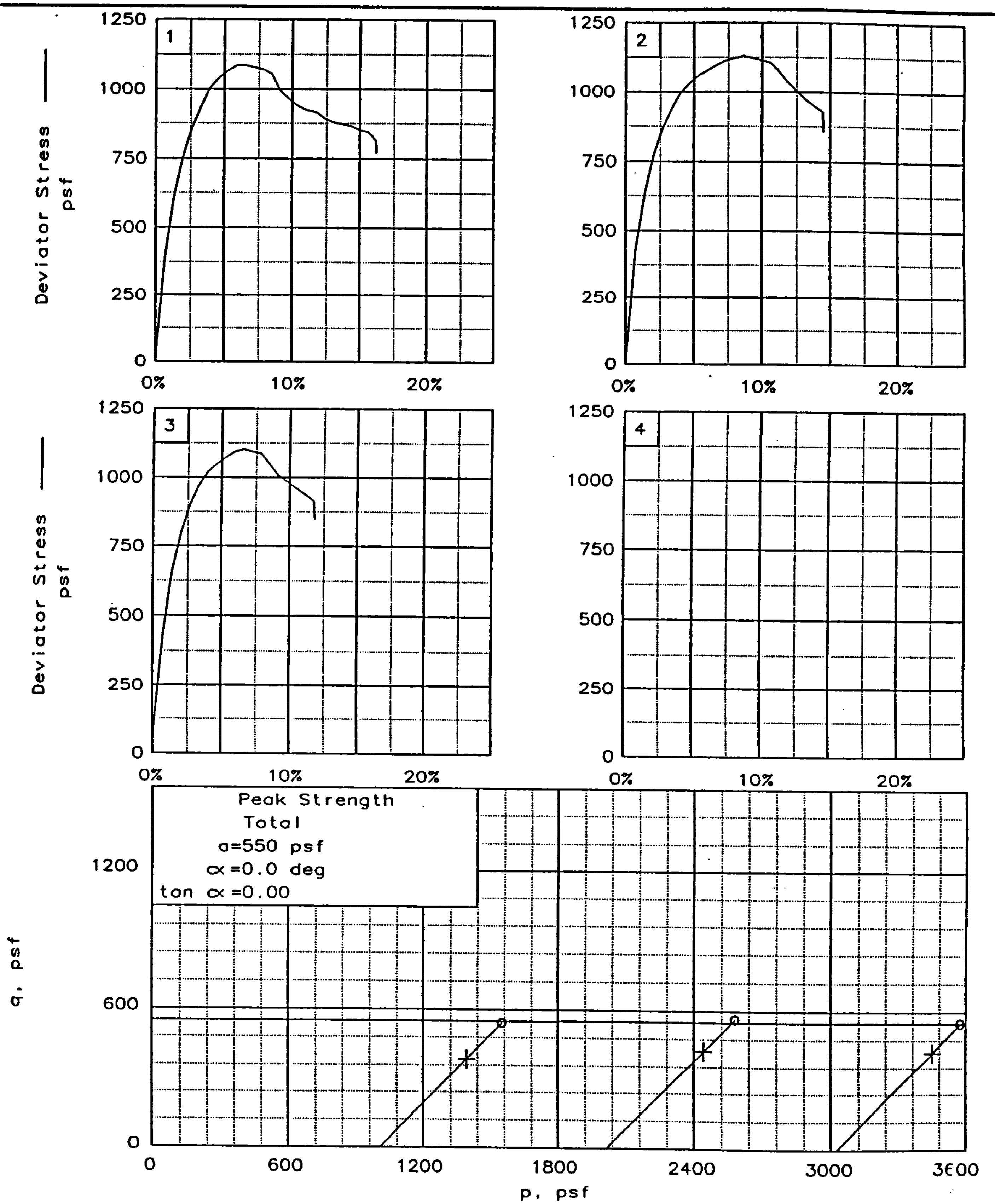
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 13-D, Depth 50.8'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



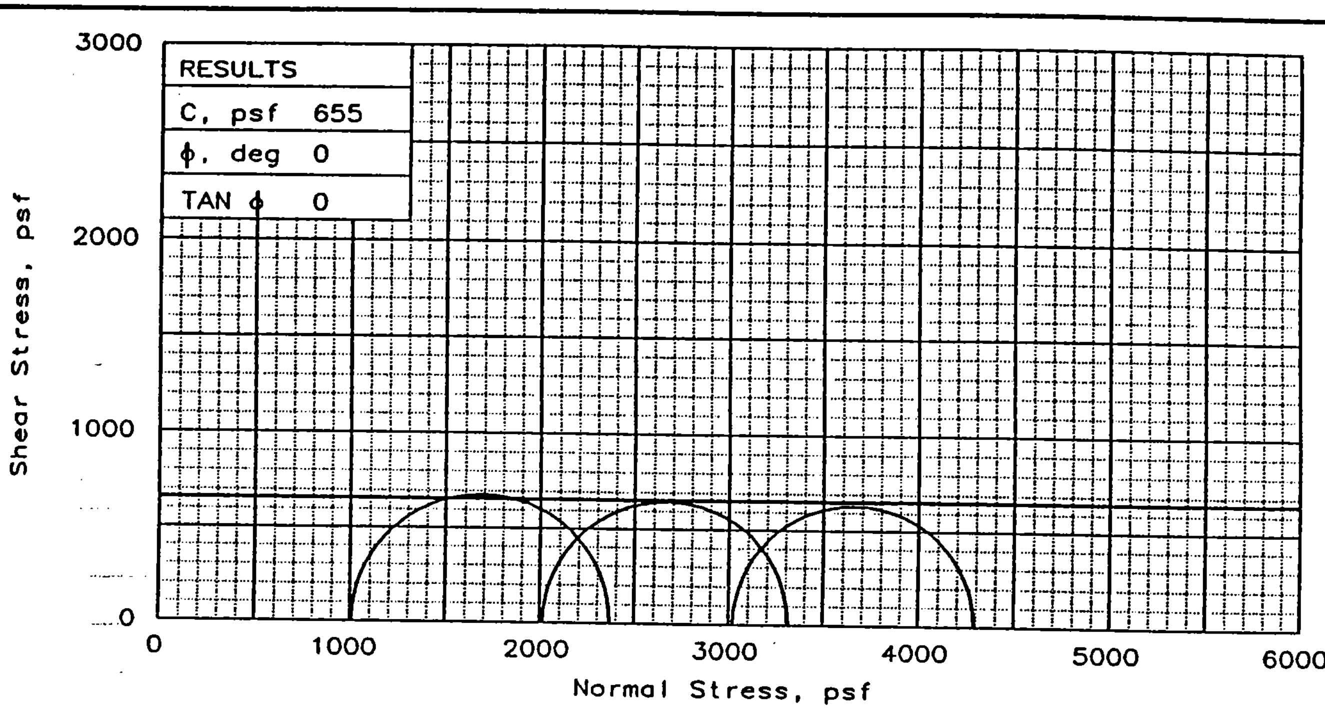
Stress Paths: + indicates end ○ indicates peak

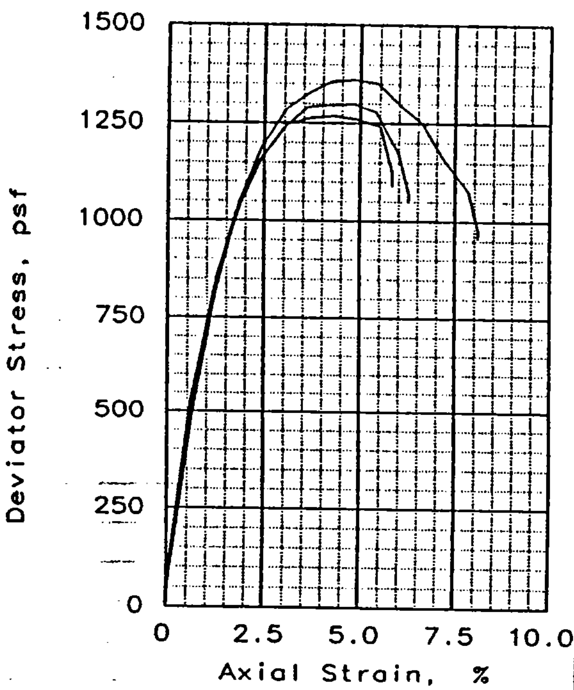
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-8U, Sample 13-D, Depth 50.8'

File: UU-7289 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	59.6	58.0	58.7
	DRY DENSITY, pcf	65.6	66.2	64.8
	SATURATION, %	101.6	100.3	97.9
	VOID RATIO	1.607	1.584	1.642
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	58.4	57.8	59.6
	DRY DENSITY, pcf	65.8	66.2	65.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.601	1.583	1.634
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0780	0.0899	0.0924
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1360	1299	1268
ULTIMATE STRESS, psf		955	1047	1089
σ_1 FAILURE, psf		2368	3315	4292
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & lns SM
LL= 84 PL= 27 PI= 57
SPECIFIC GRAVITY= 2.74
REMARKS:

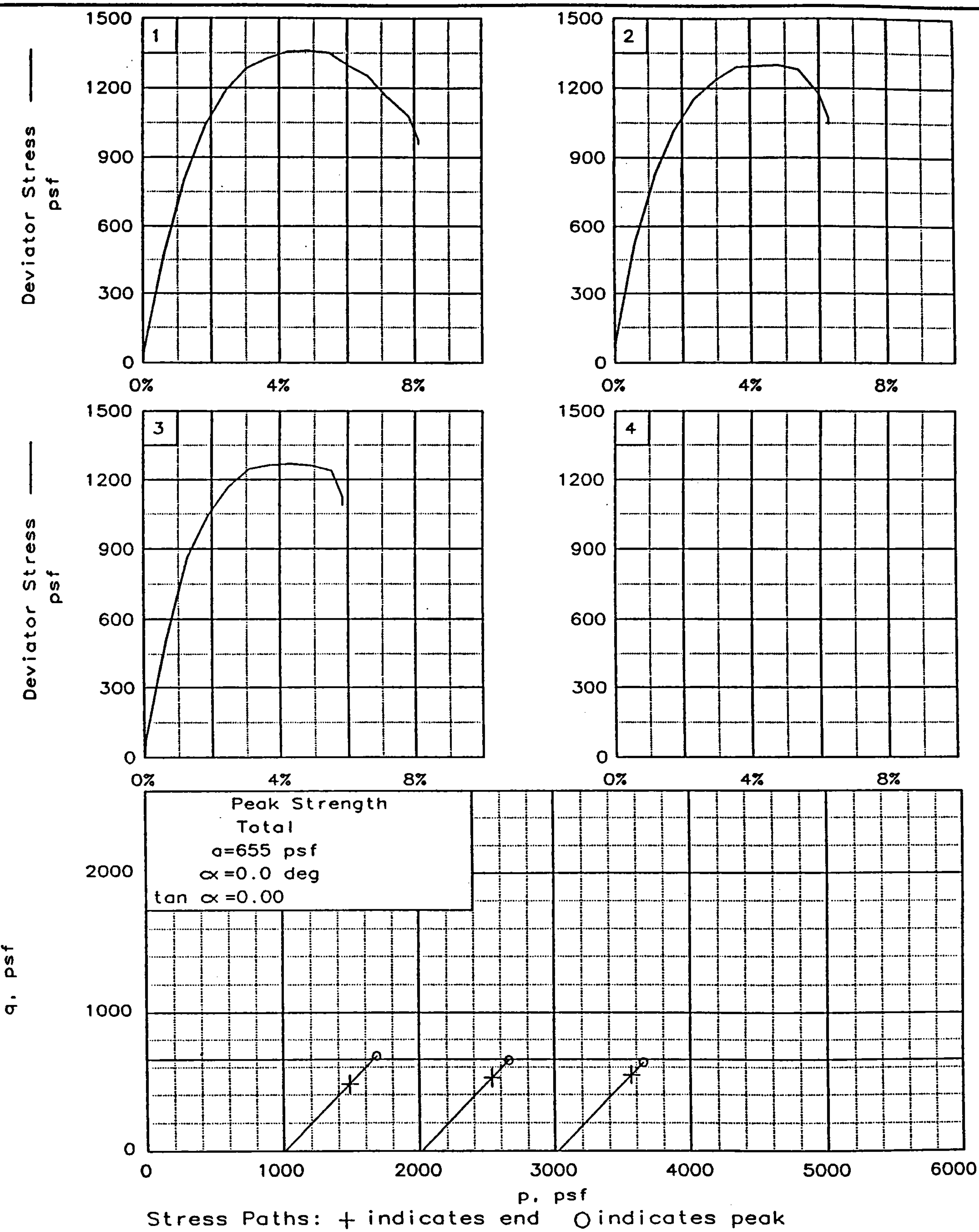
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 15-B, Depth 57.4'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

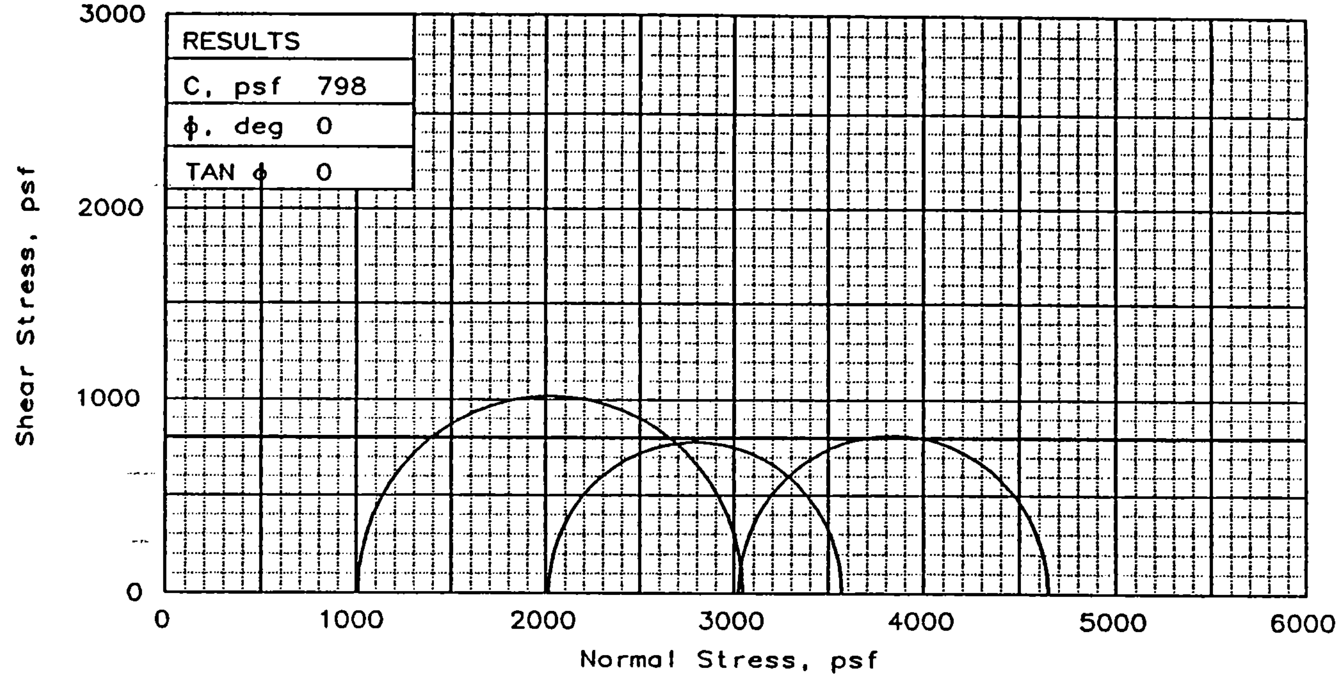


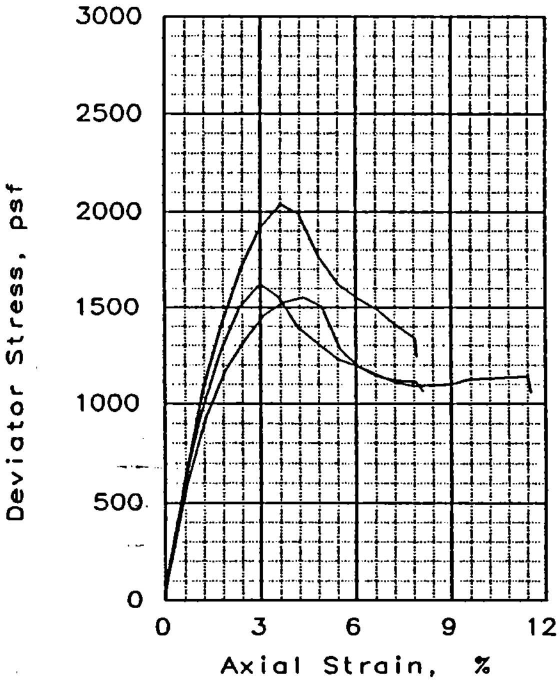
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-8U, Sample 15-B, Depth 57.4'

File: UU-7290 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	60.2	58.8	60.2
	DRY DENSITY, pcf	65.4	65.1	63.7
	SATURATION, %	102.6	99.3	98.3
	VOID RATIO	1.596	1.610	1.665
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	58.5	58.7	60.6
	DRY DENSITY, pcf	65.5	65.4	64.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.592	1.597	1.648
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0950	0.0834	0.0917
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		2039	1554	1624
ULTIMATE STRESS, psf		1243	1063	1056
σ_1 FAILURE, psf		3047	3570	4648
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lyr & ars SM, slf
LL= 94 PL= 29 PI= 65
SPECIFIC GRAVITY= 2.72
REMARKS:

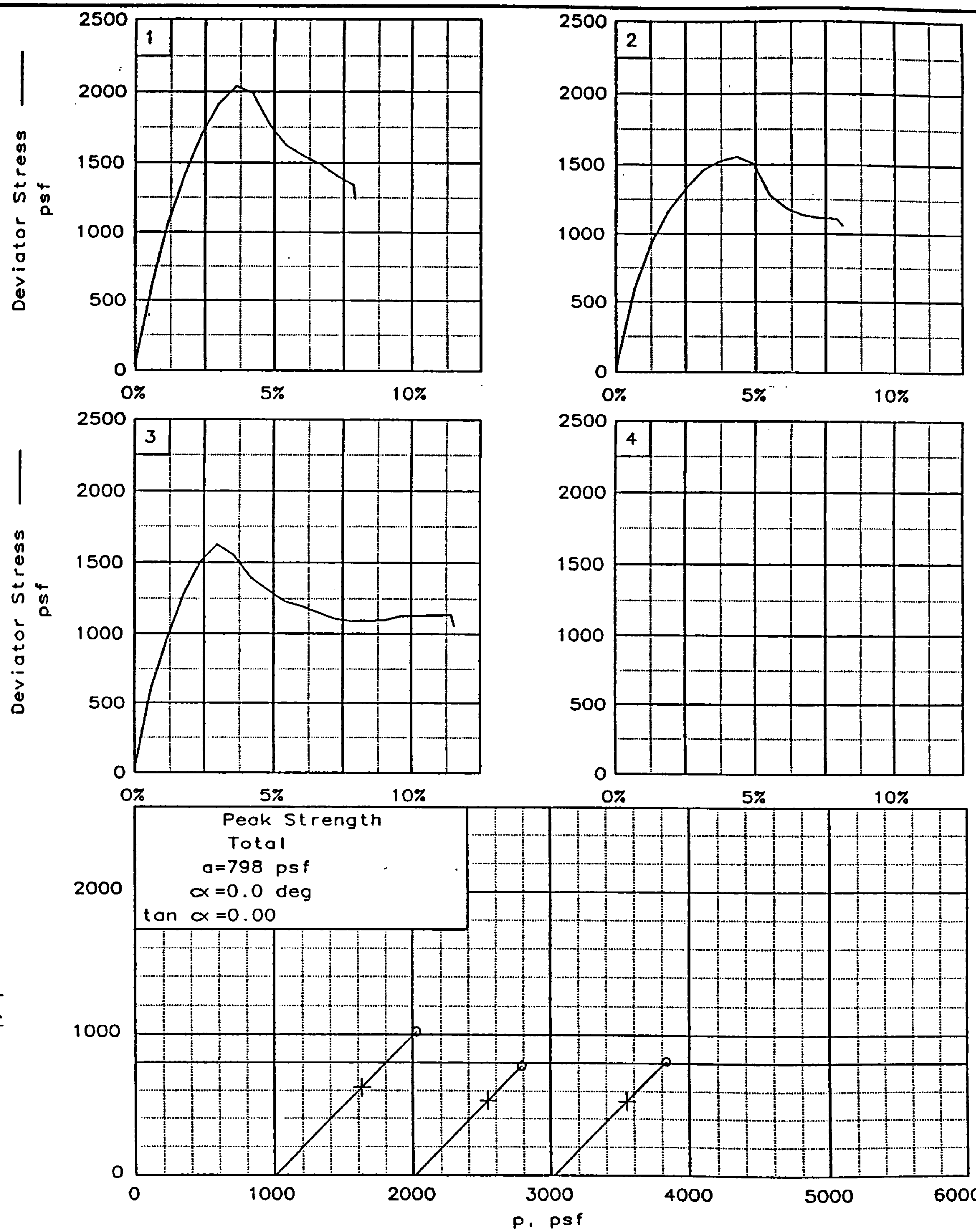
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 18-C, Depth 66.1'
PROJ. NO.: 13622 DATE: 8-8-96

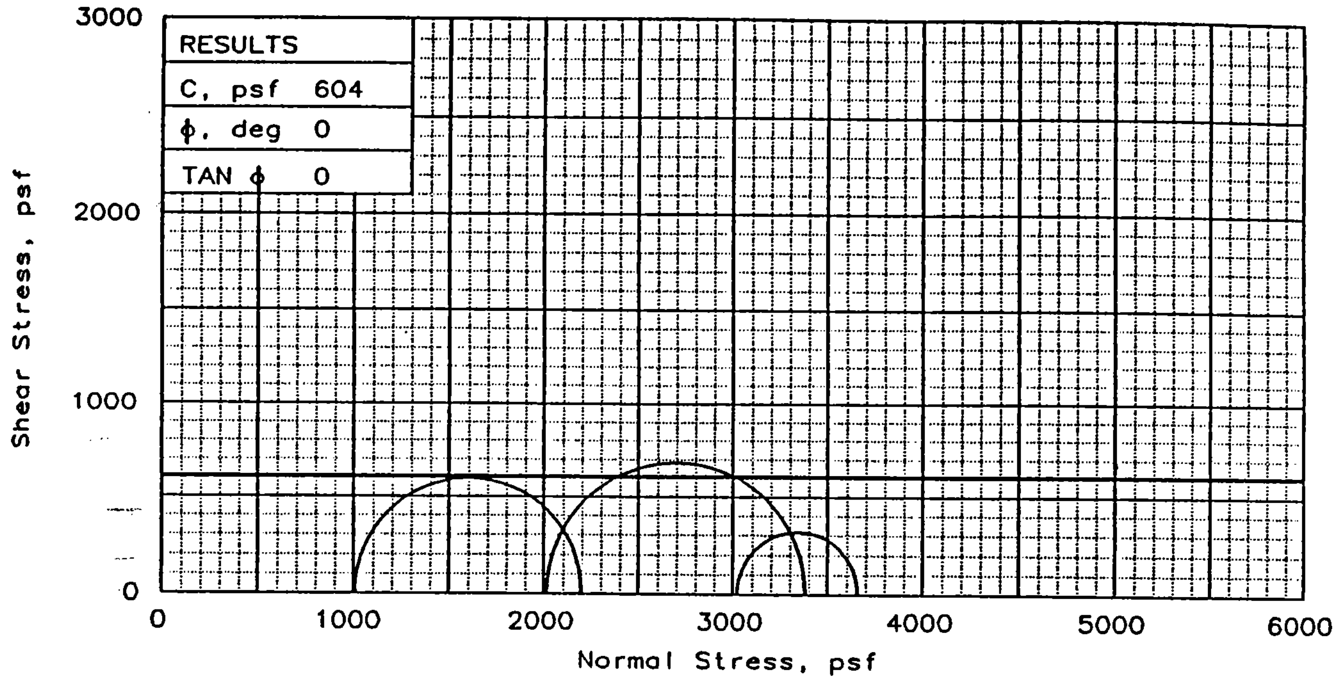
TRIAXIAL SHEAR TEST REPORT

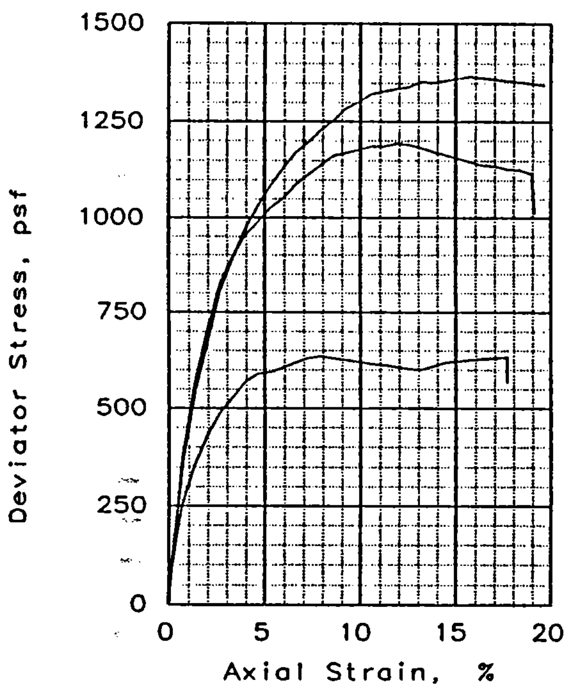
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-8U, Sample 18-C, Depth 66.1'
File: UU-7291 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	34.8	33.6	42.0
	DRY DENSITY, pcf	86.0	84.7	76.7
	SATURATION, %	98.0	91.6	94.8
	VOID RATIO	0.959	0.990	1.198
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.99	2.98	2.97
AT TEST	WATER CONTENT, %	35.9	36.4	43.9
	DRY DENSITY, pcf	85.5	85.1	77.1
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.970	0.982	1.185
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1114	0.1118	0.1106
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1192	1366	635
ULTIMATE STRESS, psf		1014	1345	567
σ_1 FAILURE, psf		2200	3382	3659
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CL5
w/ lyr & lns CH, slf
LL= 38 PL= 17 PI= 21
SPECIFIC GRAVITY= 2.7
REMARKS:

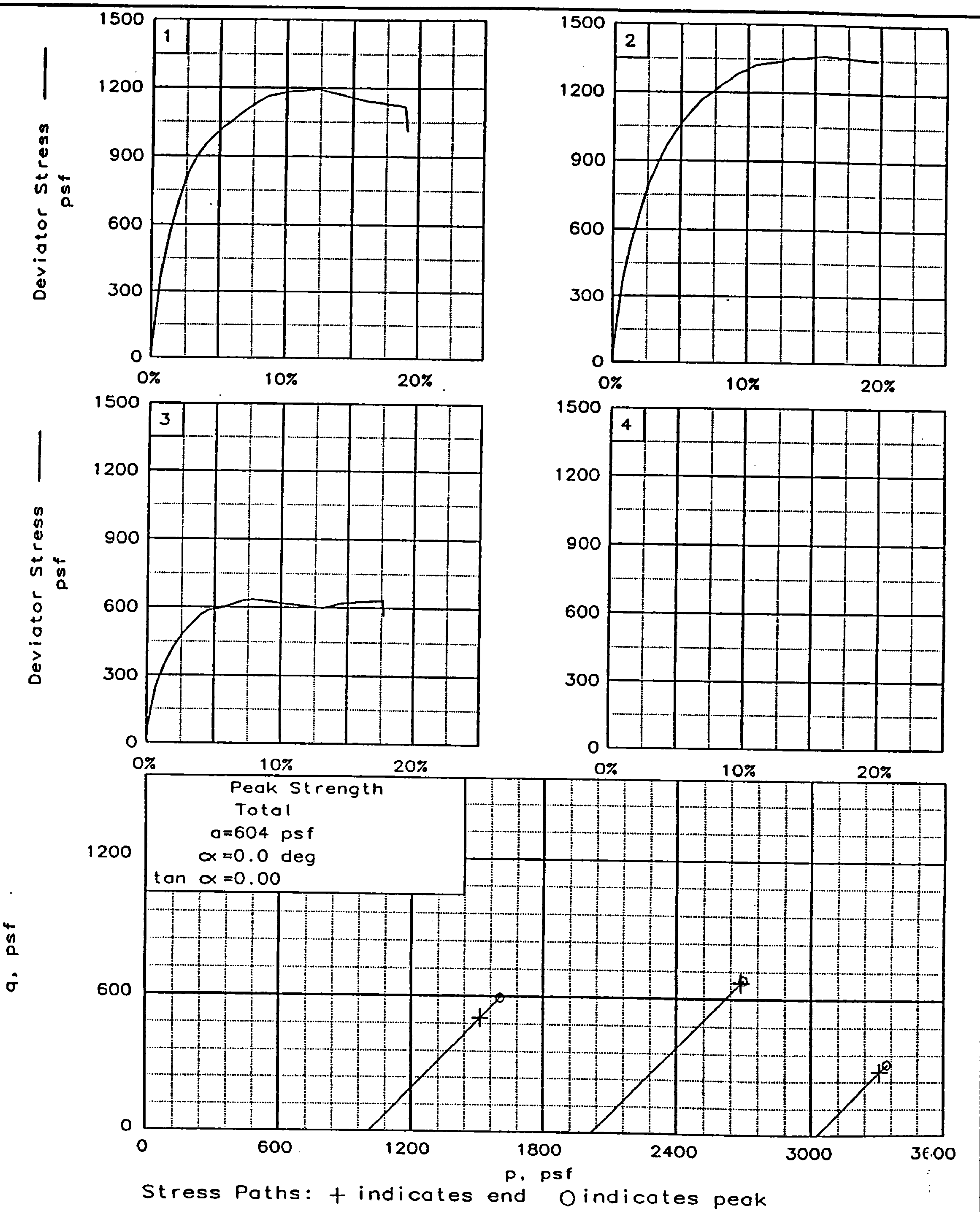
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-8U,
Sample 20-C, Depth 73.8'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

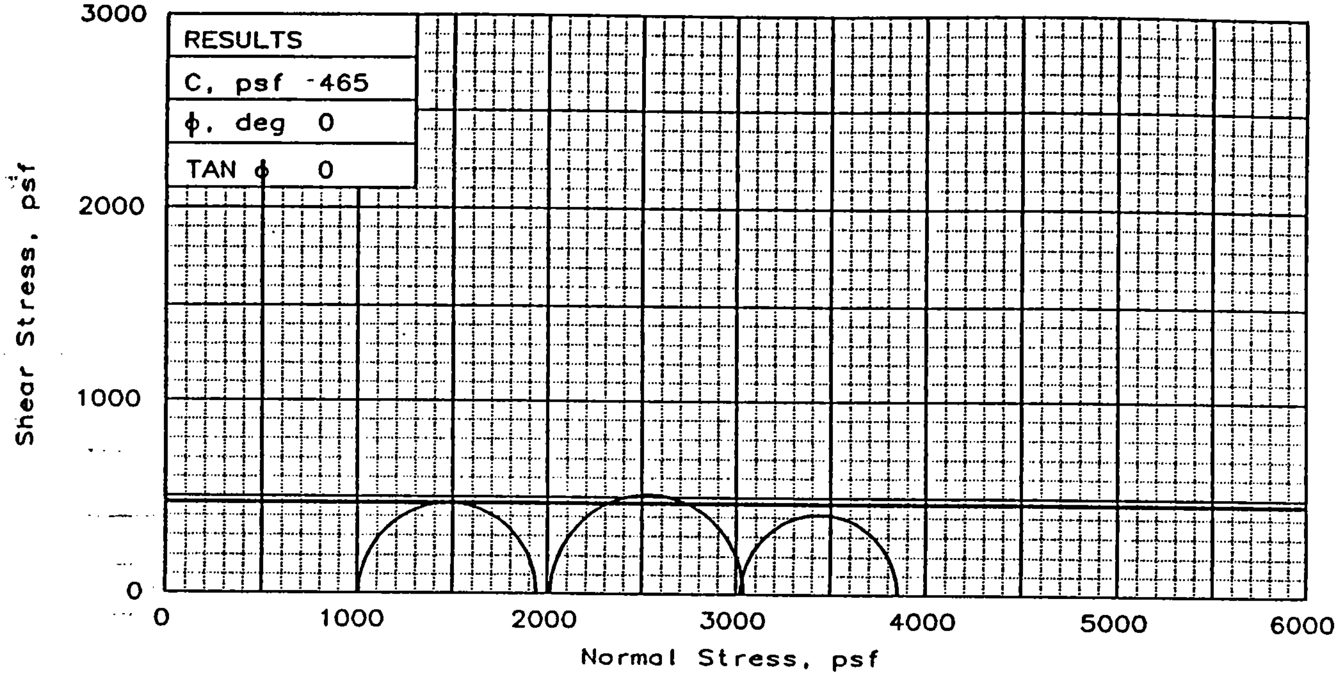


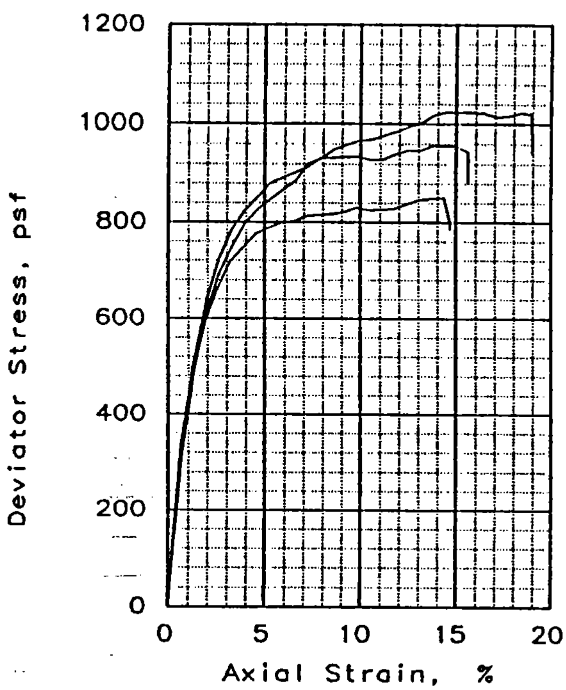
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-8U, Sample 20-C, Depth 73.8'

File: UU-7292 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	105.9	85.8	83.7
	DRY DENSITY, pcf	41.3	46.7	48.9
	SATURATION, %	92.7	88.8	92.3
	VOID RATIO	3.085	2.610	2.447
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.97	2.97
AT TEST	WATER CONTENT, %	114.9	95.5	88.8
	DRY DENSITY, pcf	41.1	47.1	49.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	3.101	2.578	2.398
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1096	0.1118	0.1094
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		935	1025	831
ULTIMATE STRESS, psf		882	942	786
σ_1 FAILURE, psf		1943	3041	3855
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Br CHOA w/ lyr & lns ML, rts
LL= 104 PL= 34 PI= 70
SPECIFIC GRAVITY= 2.7
REMARKS:

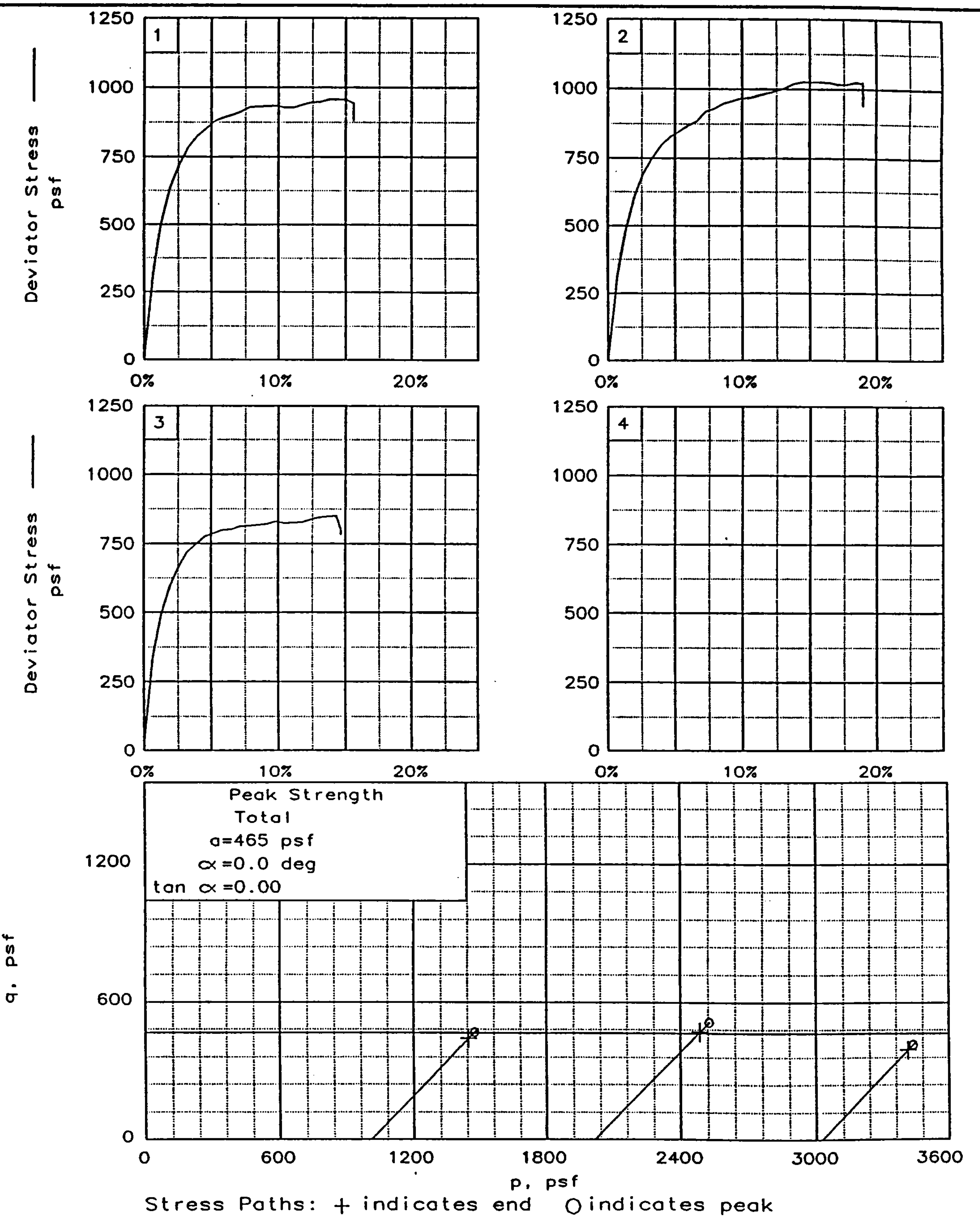
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

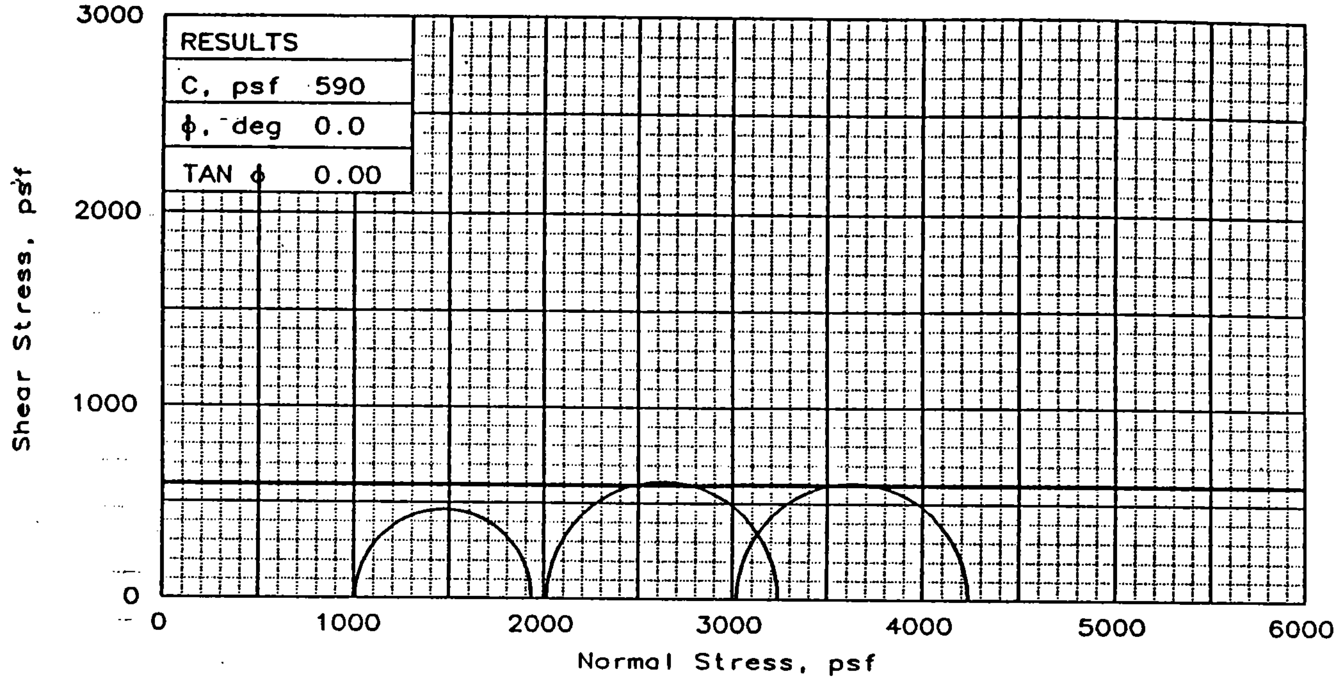
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U, Sample 2-C, Depth 5.8'
PROJ. NO.: 13622 DATE: 8-8-96

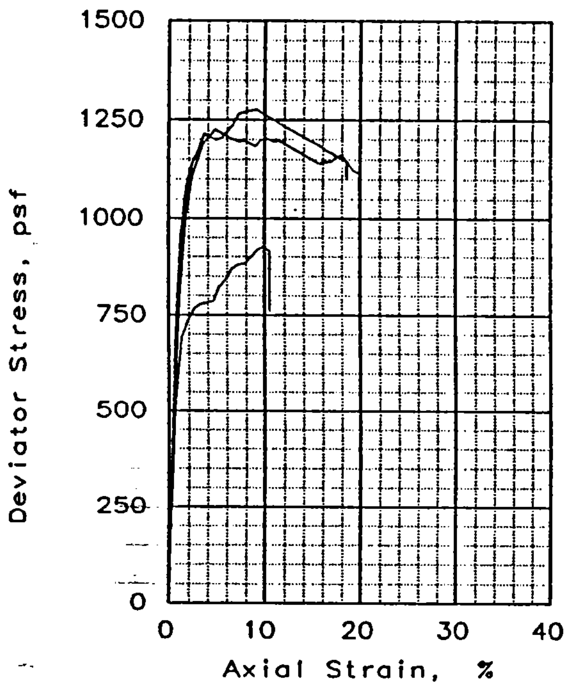
TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-9U, Sample 2-C, Depth 5.8'
File: UU-7293 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	55.9	54.9	55.8
	DRY DENSITY, pcf	64.3	67.2	63.6
	SATURATION, %	92.7	97.8	91.0
	VOID RATIO	1.640	1.527	1.668
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.97
AT TEST	WATER CONTENT, %	60.1	56.1	60.5
	DRY DENSITY, pcf	64.4	67.3	64.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.635	1.525	1.647
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0798	0.0996	0.1019
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		928	1225	1214
ULTIMATE STRESS, psf		761	1100	1029
σ_1 FAILURE, psf		1936	3241	4238
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH3
w/ ors ML & org
LL= 110 PL= 36 PI= 74
SPECIFIC GRAVITY= 2.72
REMARKS:

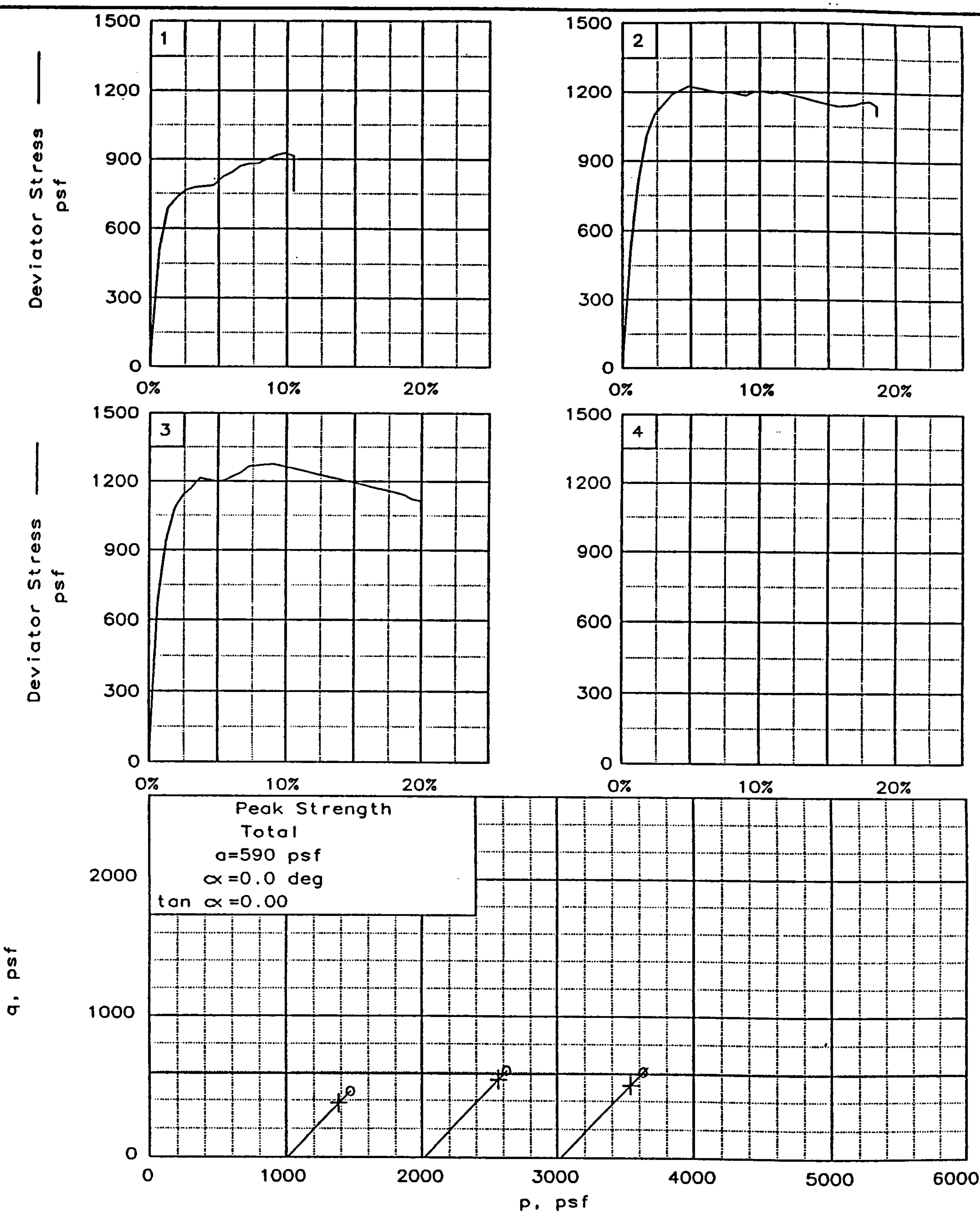
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. CACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U
Sample 5-B, Depth 17.2'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



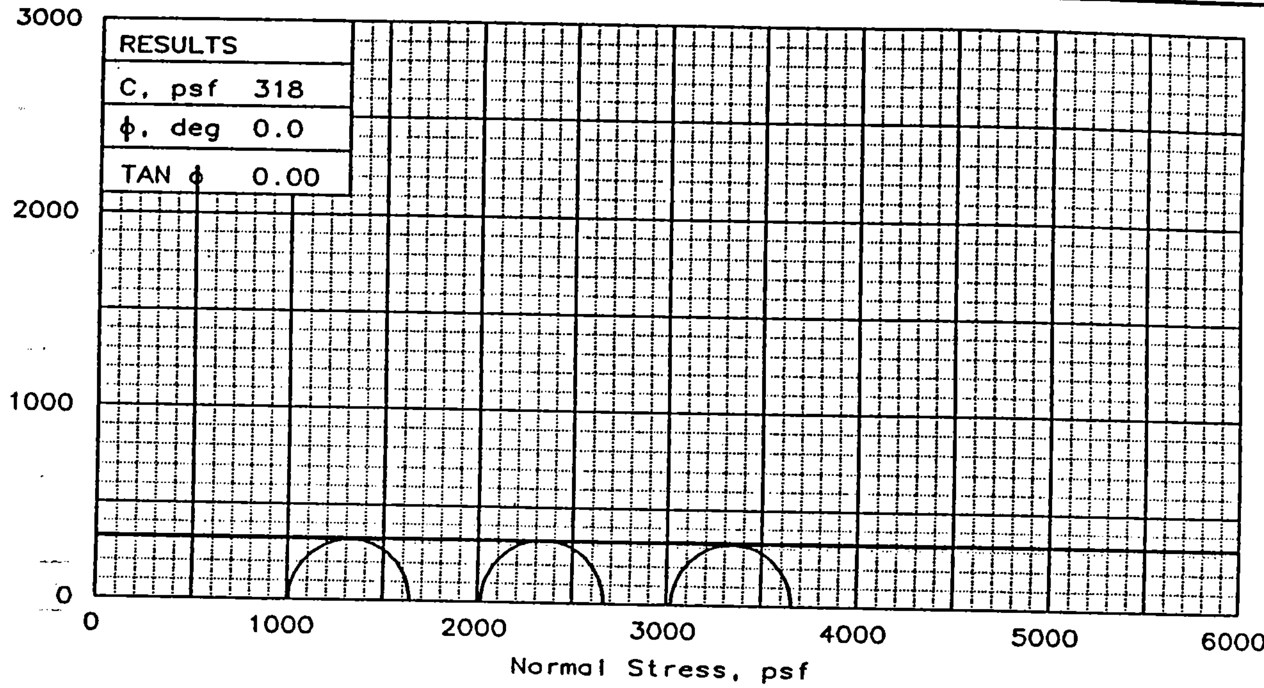
Stress Paths: + indicates end ○ indicates peak

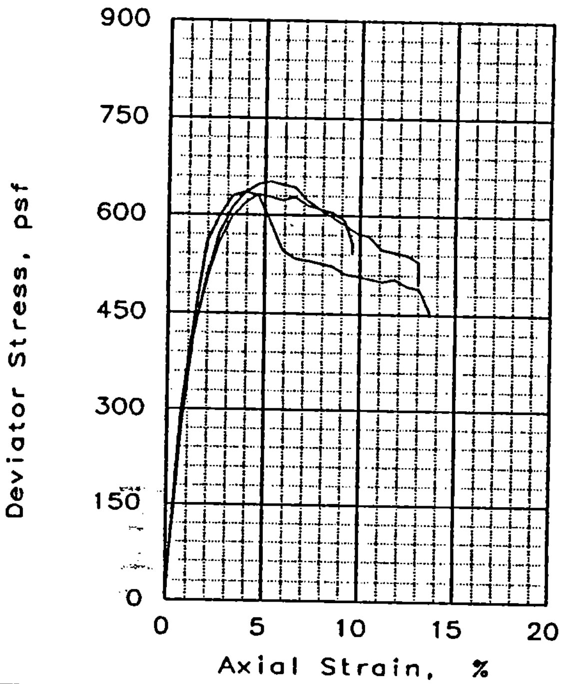
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. CACW29-95-D-0012

Location: Boring ALGW-9U Sample 5-B, Depth 17.2'

File: UU-7294 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	63.9	64.2	62.6
	DRY DENSITY, pcf	63.8	62.7	62.9
	SATURATION, %	104.1	101.8	99.7
	VOID RATIO	1.682	1.729	1.721
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	61.6	63.3	62.6
	DRY DENSITY, pcf	63.6	62.6	63.0
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.688	1.734	1.716
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1070	0.1053	0.1092
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		632	652	635
ULTIMATE STRESS, psf		498	541	448
σ_1 FAILURE, psf		1640	2668	3659
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML, ars org
LL= 86 PL= 24 PI= 62
SPECIFIC GRAVITY= 2.74
REMARKS:

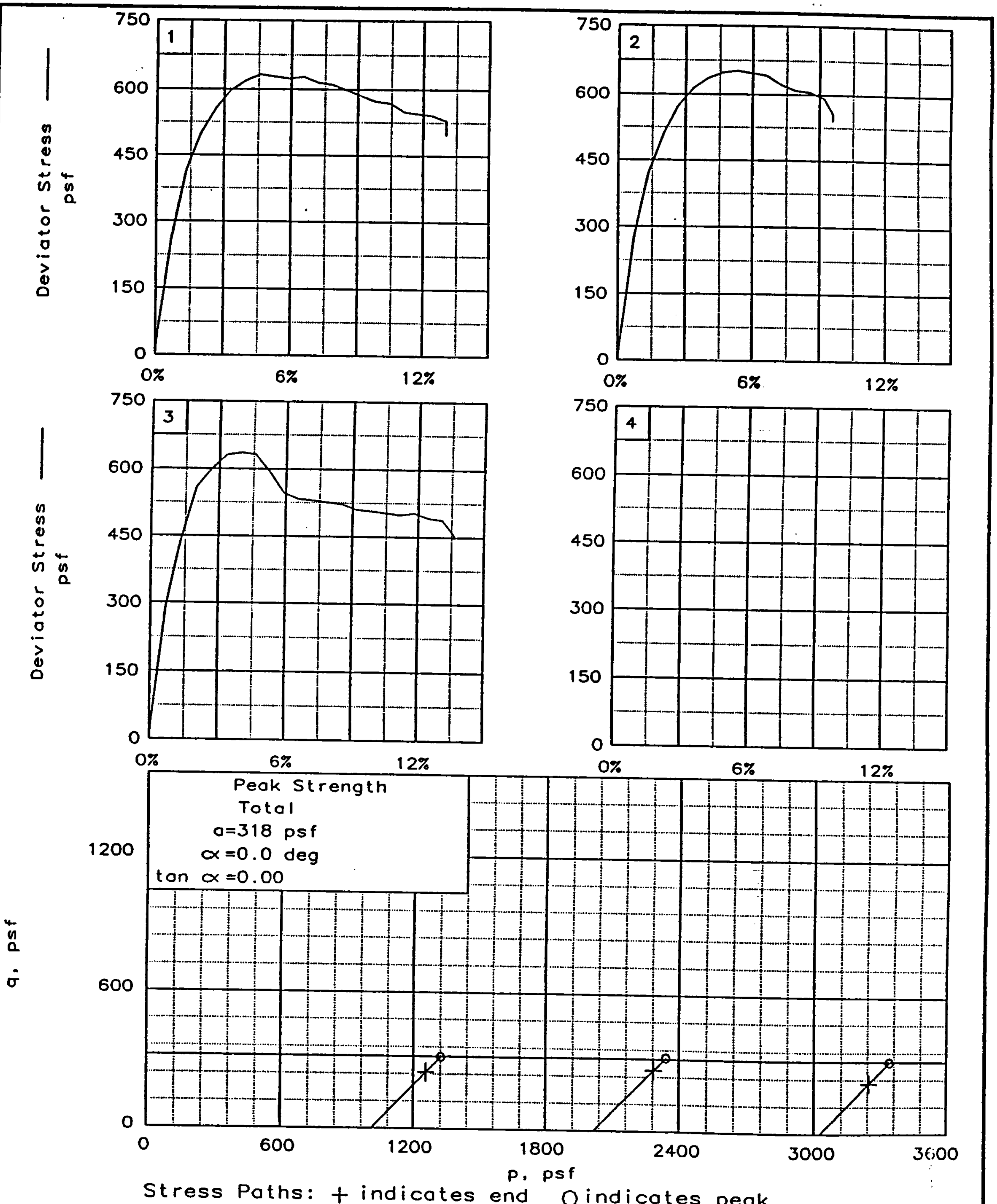
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U
Sample 7-B, Depth 25.5'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

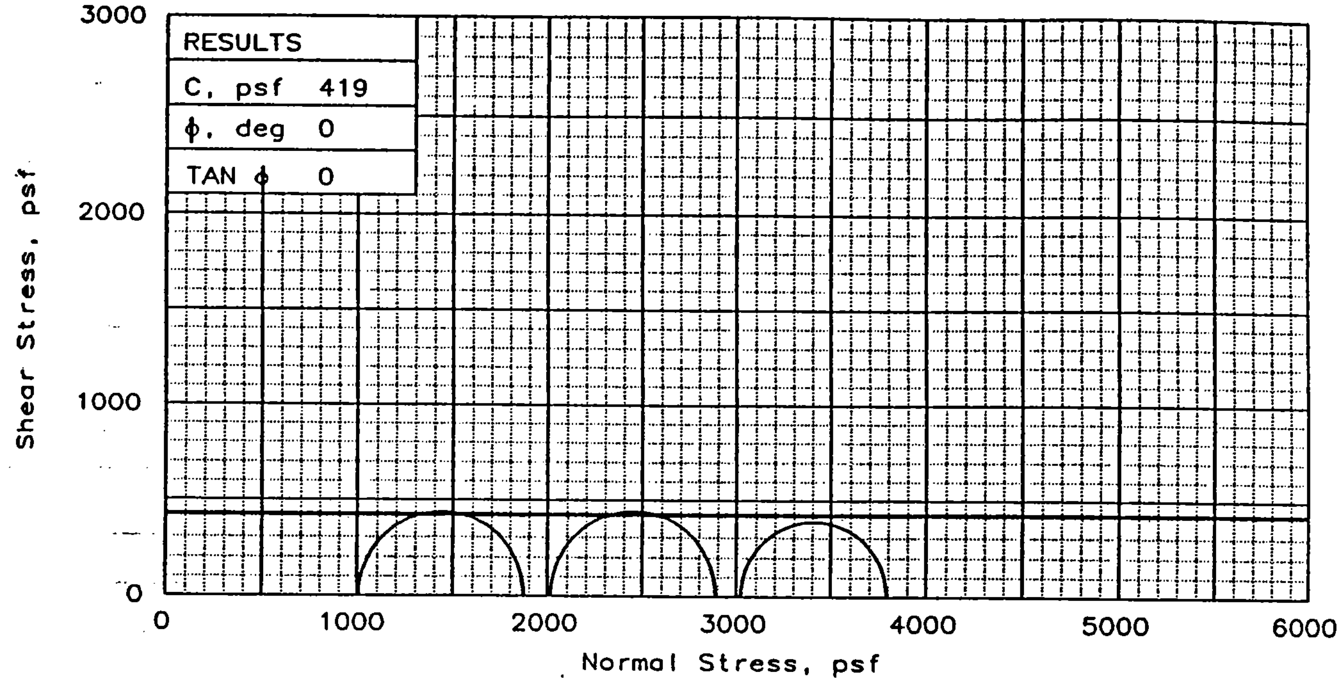


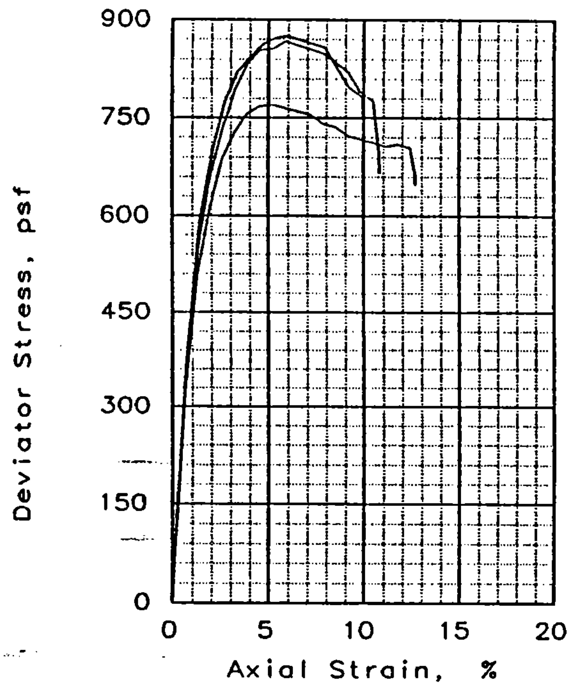
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-9U Sample 7-B, Depth 25.5'

File: UU-7295 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	62.6	62.6	63.0
	DRY DENSITY, pcf	63.7	63.1	61.0
	SATURATION, %	101.8	100.2	95.6
	VOID RATIO	1.684	1.713	1.805
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	61.5	62.3	65.6
	DRY DENSITY, pcf	63.7	63.2	61.2
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.686	1.707	1.797
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0993	0.0919	0.1025
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		867	875	770
ULTIMATE STRESS, psf		665	701	648
σ_1 FAILURE, psf		1875	2891	3794
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ lyr & lns ML
LL= 88 PL= 25 PI= 63
SPECIFIC GRAVITY= 2.74
REMARKS:

CLIENT: U.S. Army Corps of Engineers

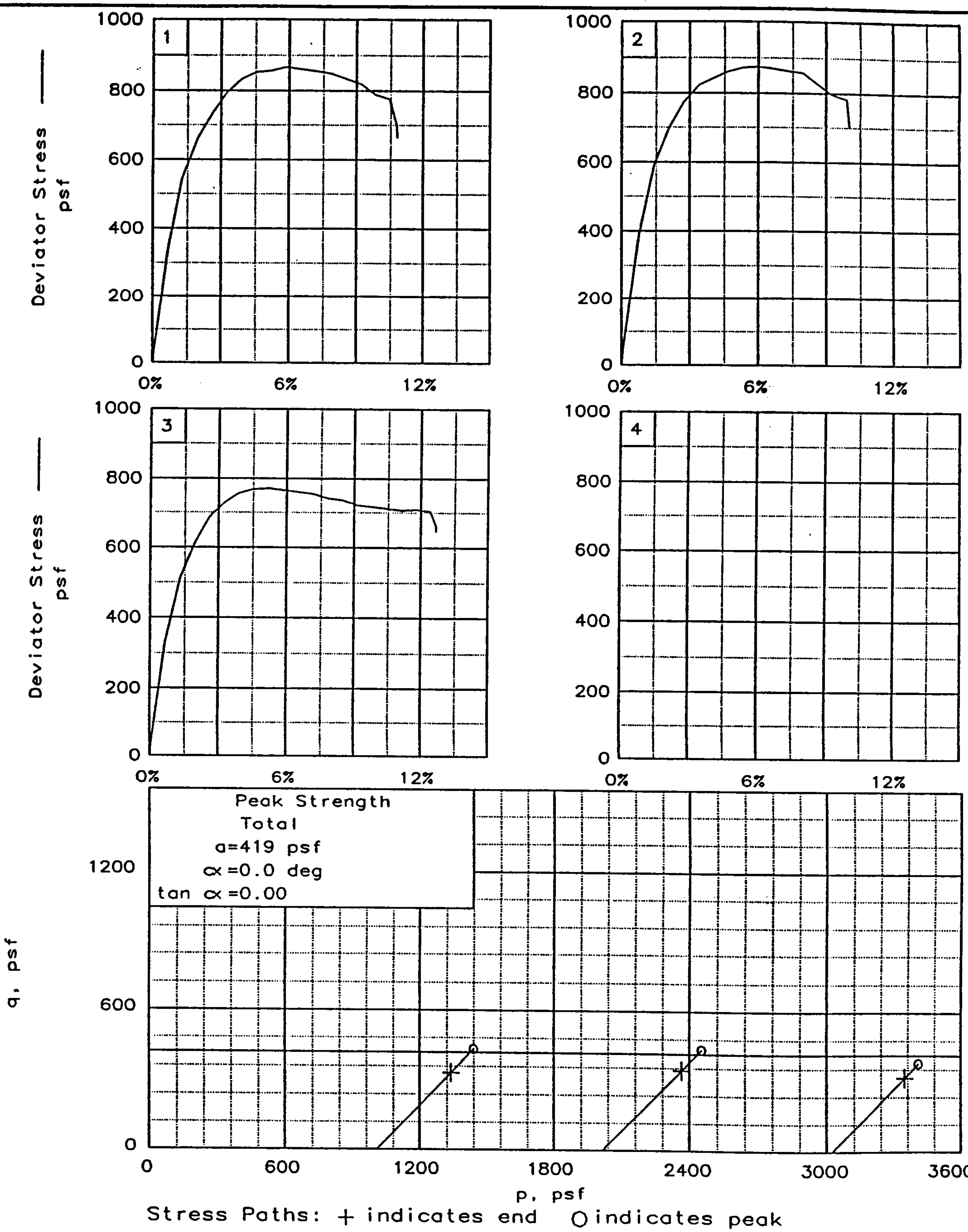
PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U,
Sample 9-C, Depth 34.1'

PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

FIG. NO.: ______

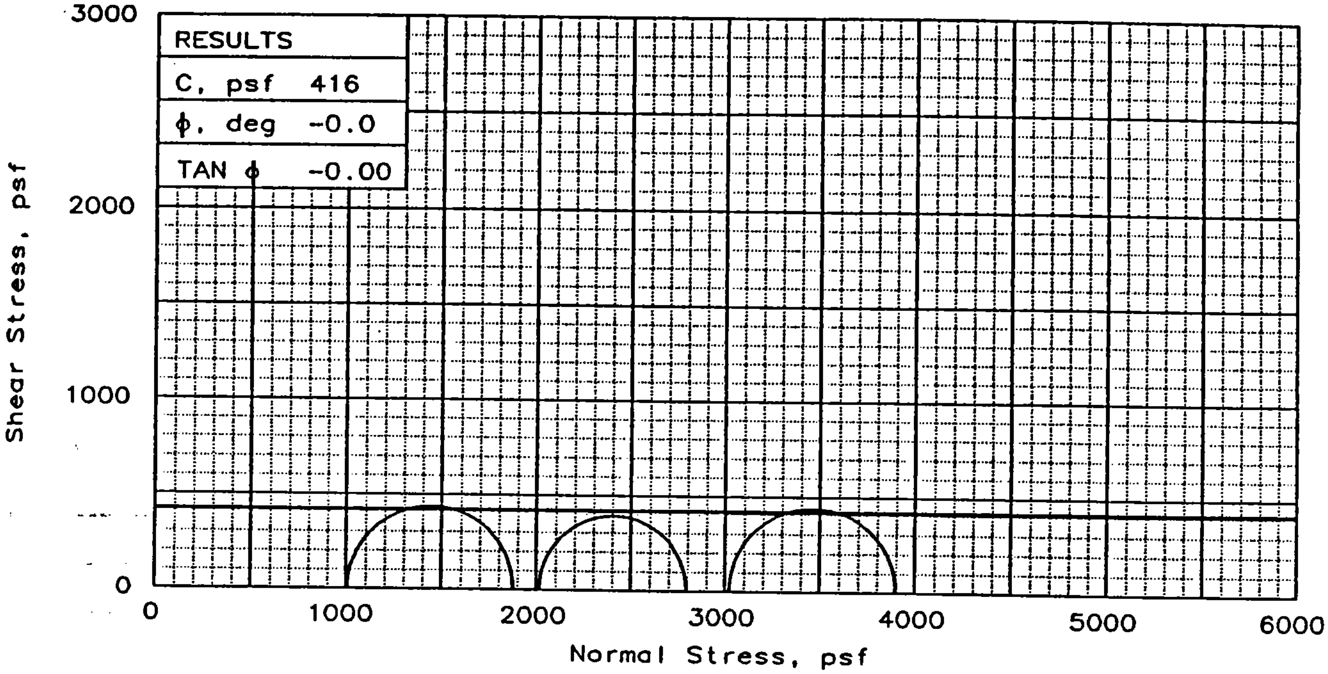


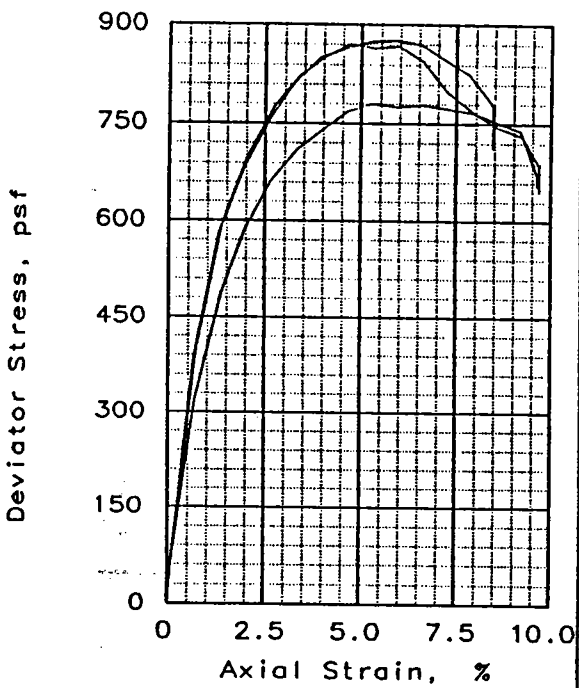
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-9U, Sample 9-C, Depth 34.1'

File: UU-7296 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	67.4	68.3	65.1
	DRY DENSITY, pcf	60.9	59.4	61.6
	SATURATION, %	102.2	99.6	100.5
	VOID RATIO	1.809	1.879	1.775
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	66.0	68.6	64.4
	DRY DENSITY, pcf	60.9	59.4	61.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.809	1.880	1.766
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.0996	0.1065	0.0985
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		871	780	876
ULTIMATE STRESS, psf		646	655	713
σ_1 FAILURE, psf		1879	2796	3900
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4 w/ Ins ML
LL= 94 PL= 27 PI= 67
SPECIFIC GRAVITY= 2.74
REMARKS:

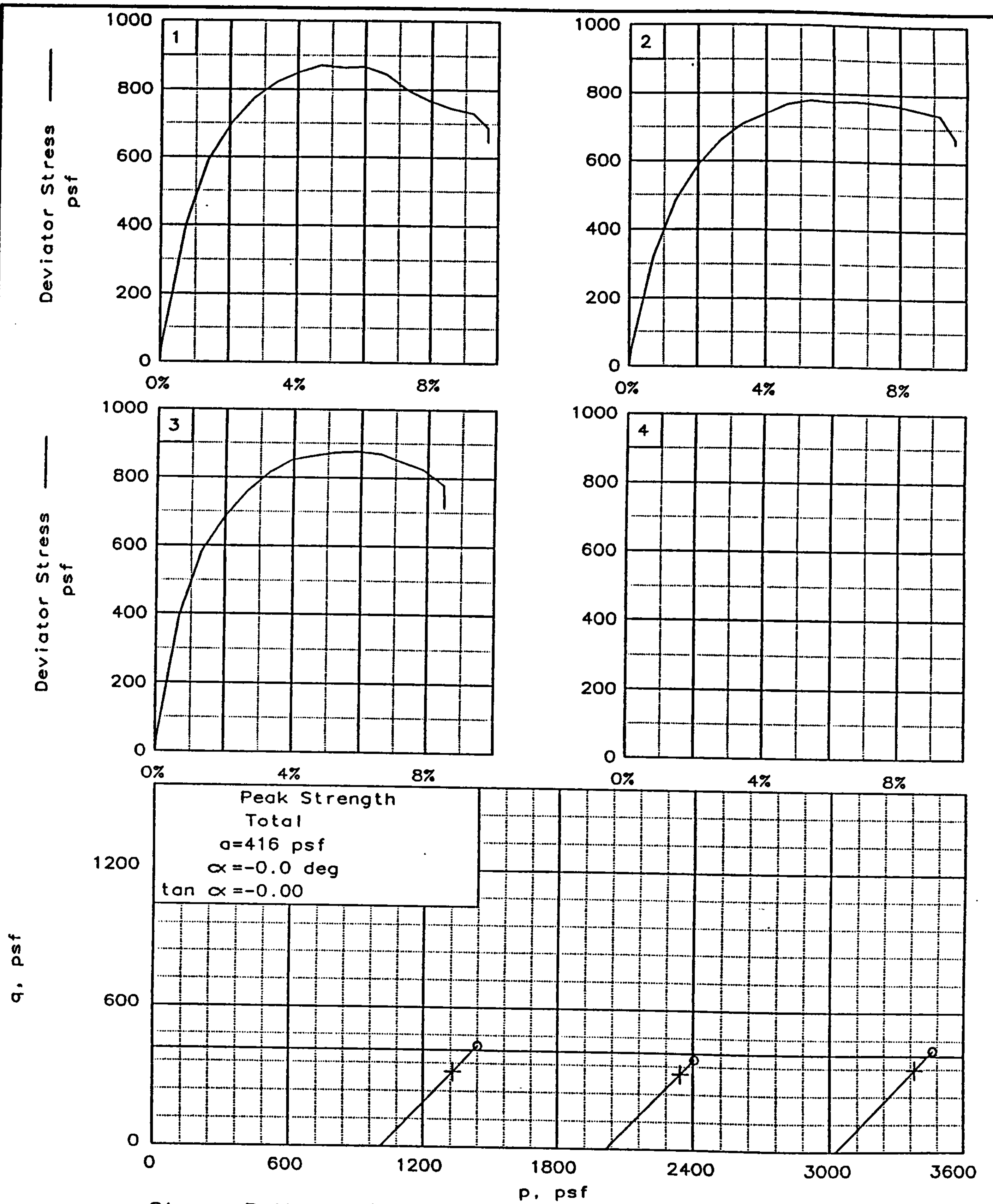
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U, Sample 11-D, Depth 42.8'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



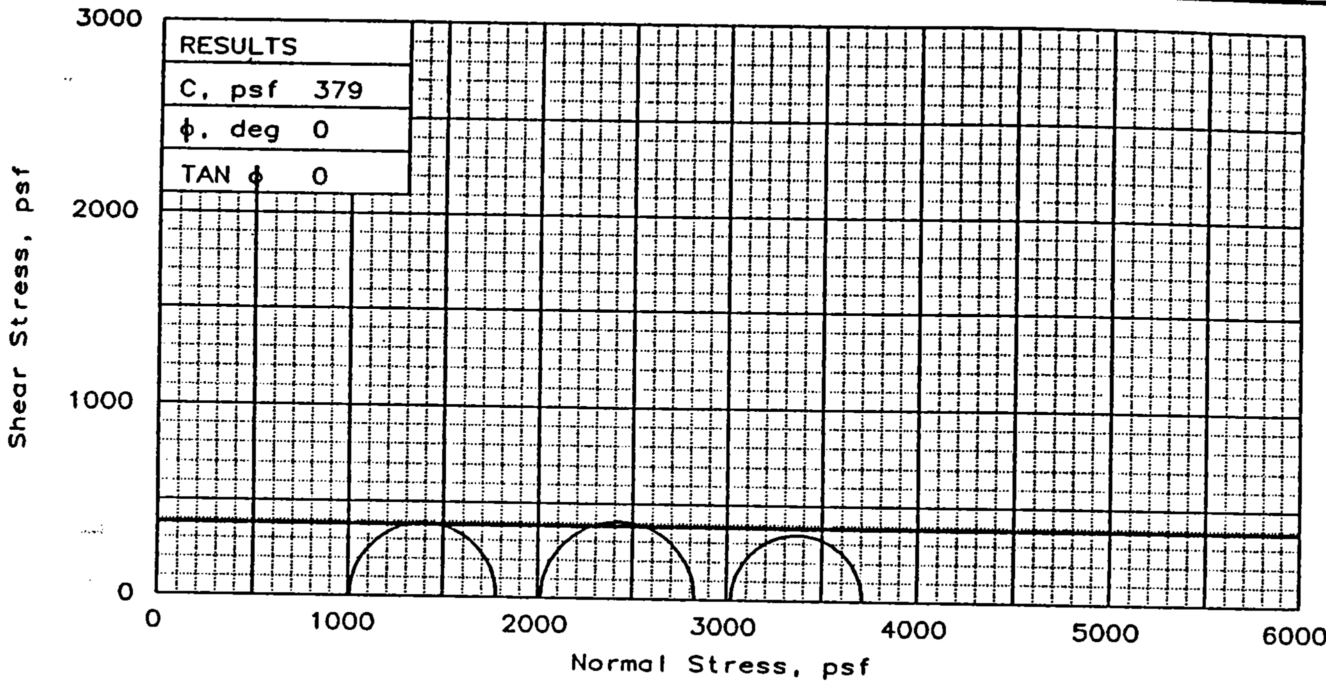
Stress Paths: + indicates end O indicates peak

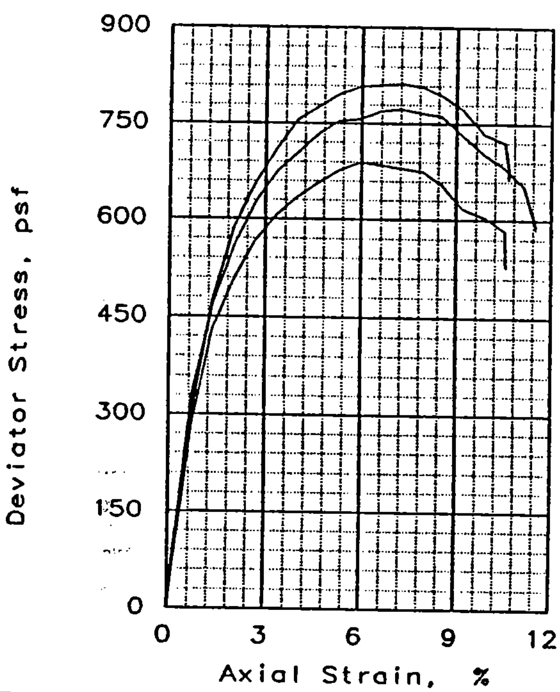
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-9U, Sample 11-D, Depth 42.8'

File: UU-7297 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	61.3	60.4	64.4
	DRY DENSITY, pcf	64.2	63.9	61.6
	SATURATION, %	101.0	99.2	99.8
	VOID RATIO	1.653	1.657	1.755
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	60.6	60.7	64.2
	DRY DENSITY, pcf	64.1	64.1	61.8
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.654	1.650	1.746
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1070	0.1008	0.0978
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		773	813	689
ULTIMATE STRESS, psf		587	664	528
σ_1 FAILURE, psf		1781	2829	3713
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: So Gr CH4
w/ ors ML
LL= 89 PL= 23 PI= 66
SPECIFIC GRAVITY= 2.727
REMARKS:

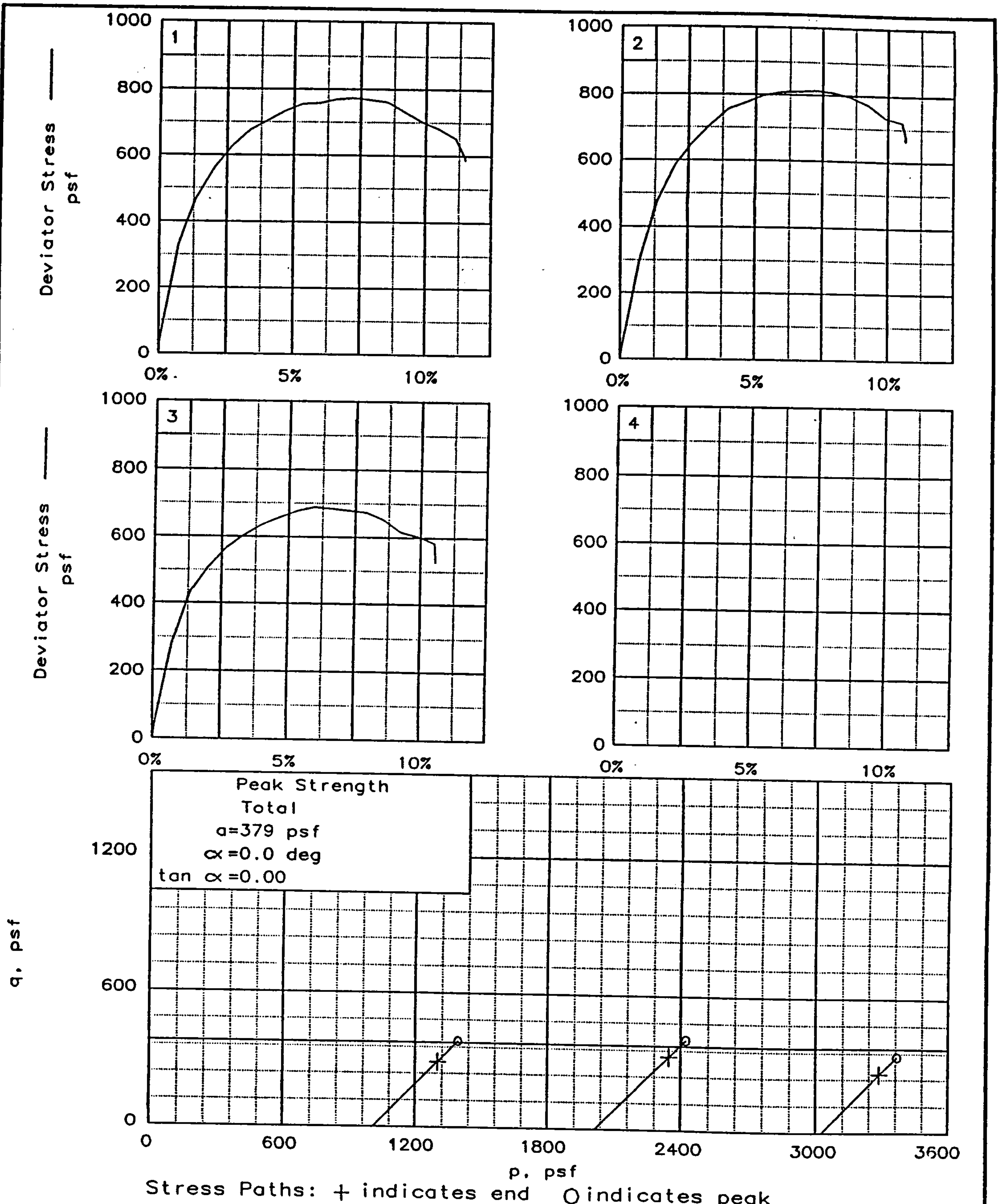
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No.DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U,
Sample 13-D, Depth 50.8'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.

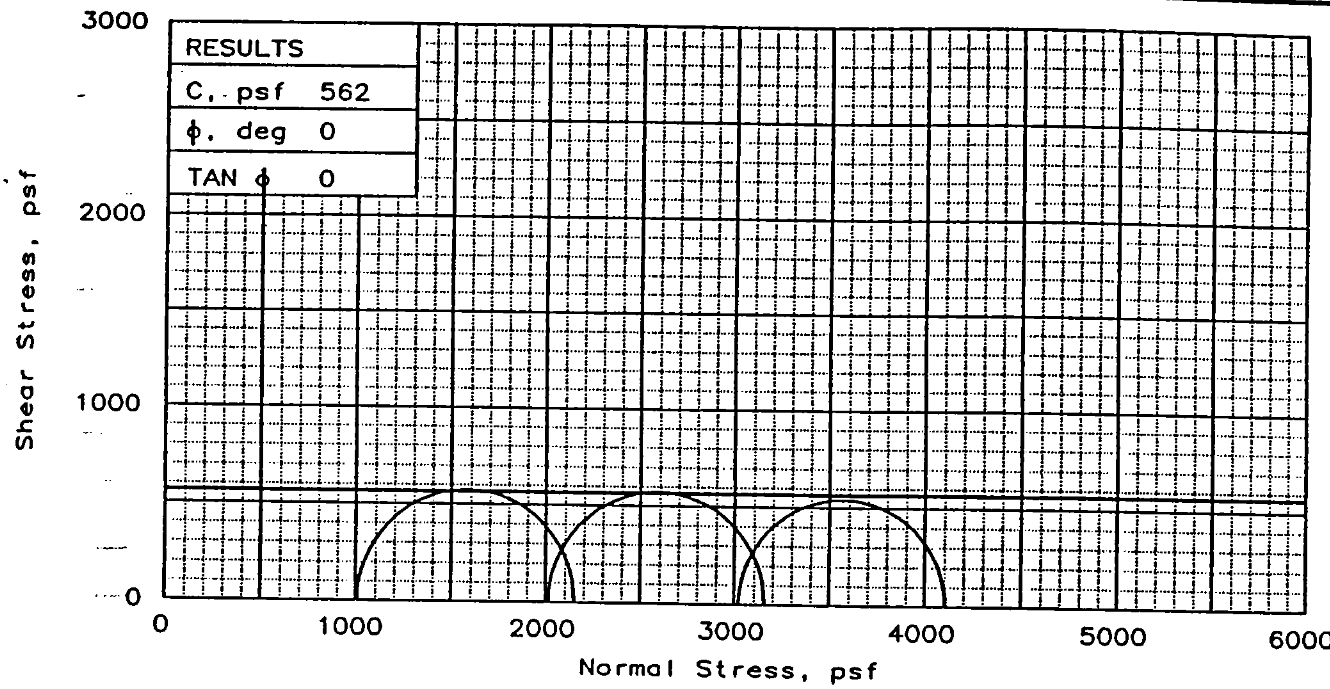


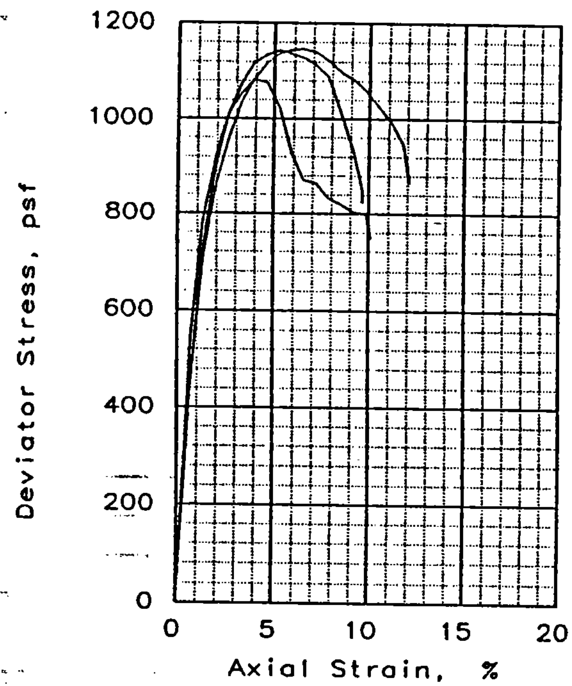
Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No.DACW29-95-D-0012

Location: Boring ALGW-9U, Sample 13-D, Depth 50.8'

File: UU-7298 Project No.: 13622 FIG. NO.: _____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	63.4	62.6	64.2
	DRY DENSITY, pcf	63.2	63.5	62.5
	SATURATION, %	101.8	101.2	101.2
	VOID RATIO	1.706	1.696	1.739
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	62.4	61.7	63.3
	DRY DENSITY, pcf	63.1	63.6	62.6
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	1.710	1.689	1.735
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1061	0.1014	0.1015
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1146	1143	1083
ULTIMATE STRESS, psf		866	824	749
σ_1 FAILURE, psf		2154	3159	4107
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CH4
w/ lns ML
LL= 82 PL= 23 PI= 59
SPECIFIC GRAVITY= 2.74
REMARKS:

FIG. NO.: ______

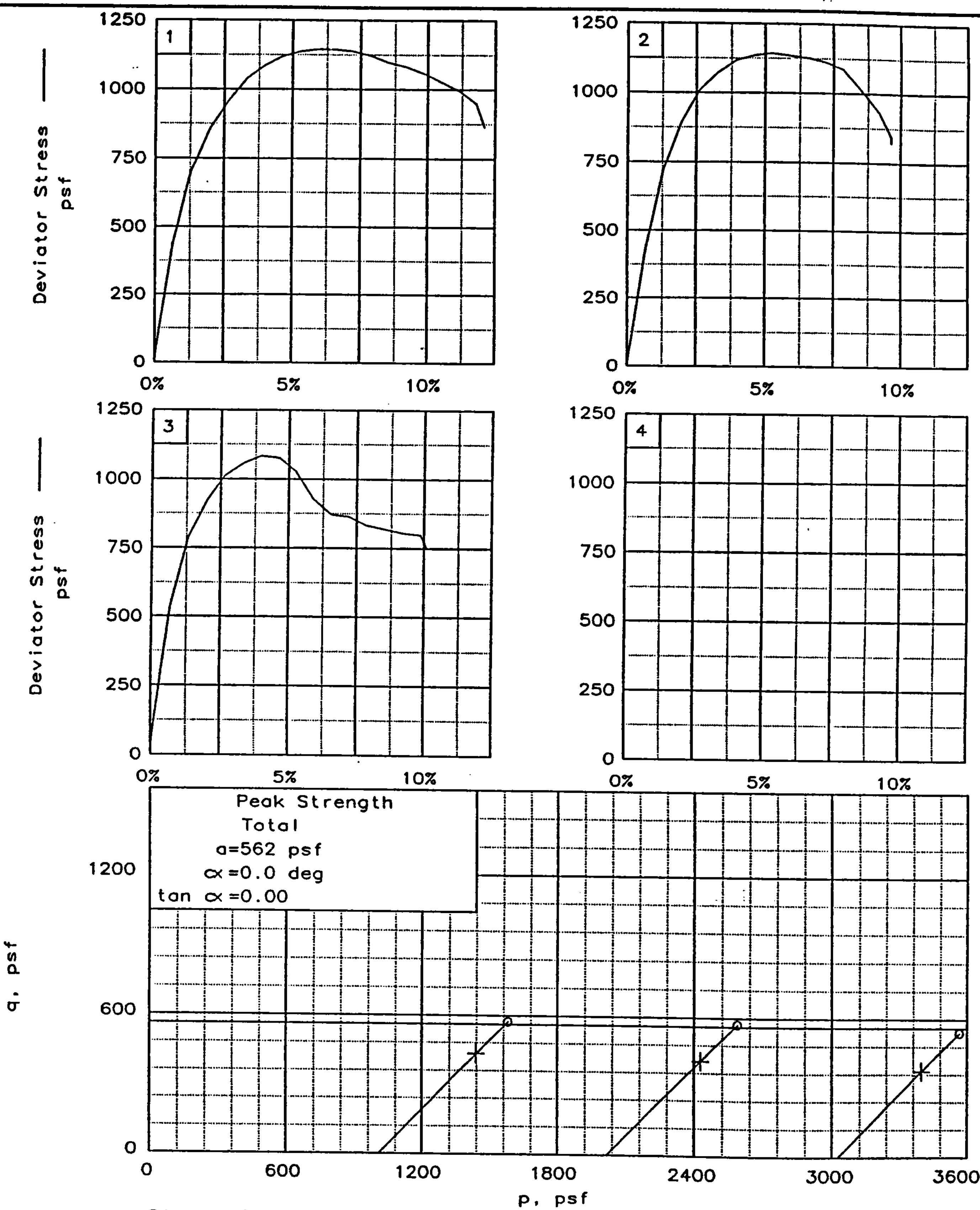
CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U,
Sample 15-D, Depth 48.8'

PROJ. NO.: 13622 DATE: 8-8-96

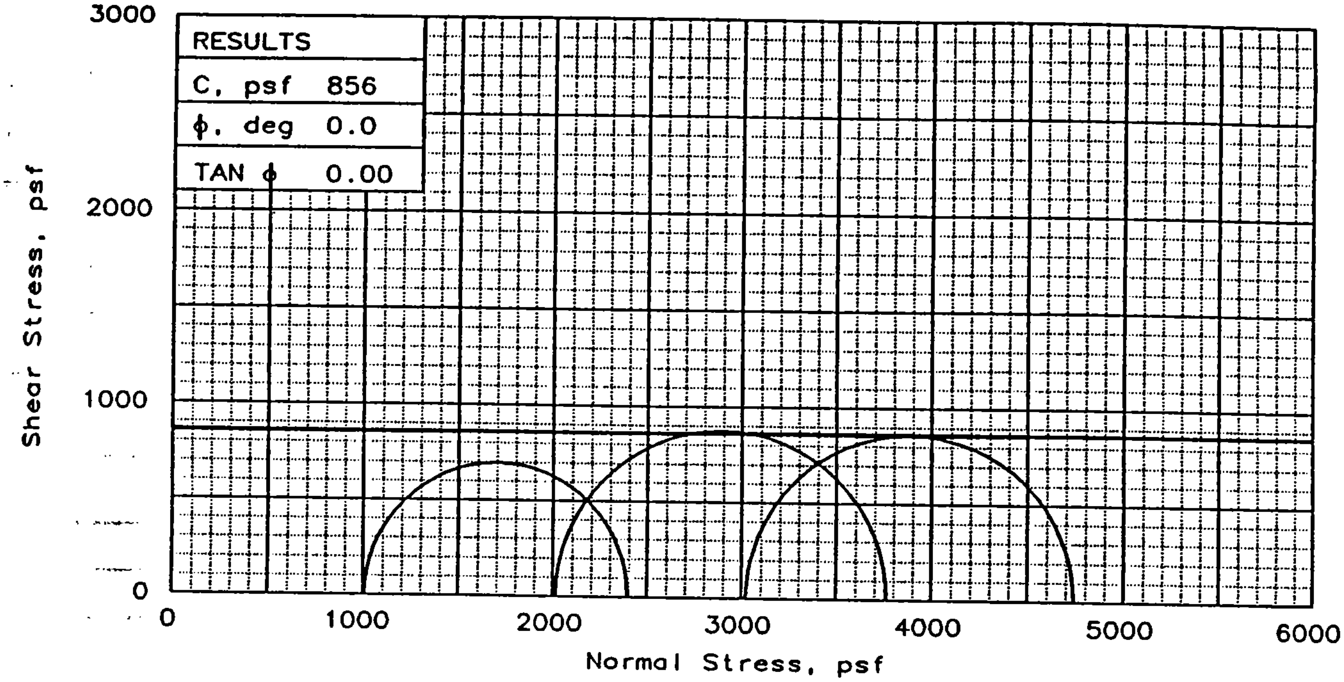
TRIAXIAL SHEAR TEST REPORT

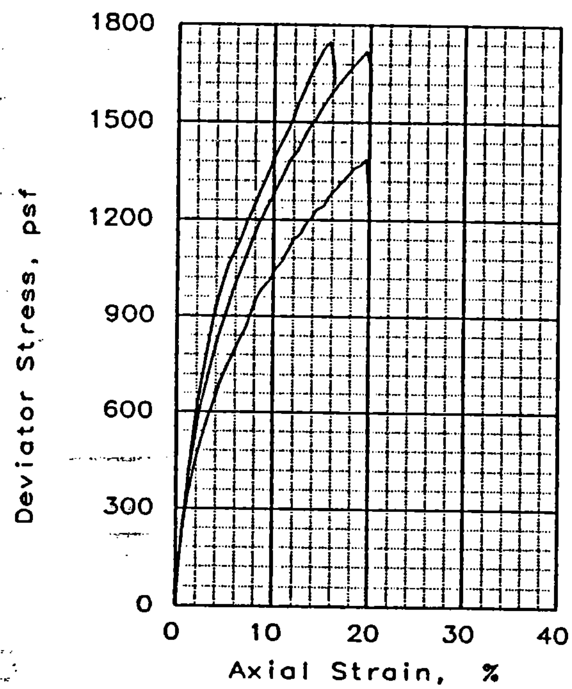
Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers
Project: Algiers Levee Contract No. DACW29-95-D-0012
Location: Boring ALGW-9U, Sample 15-D, Depth 48.8'
File: UU-7299 Project No.: 13622 FIG. NO.: ____





SPECIMEN NO.:		1	2	3
INITIAL	WATER CONTENT, %	29.9	28.3	29.3
	DRY DENSITY, pcf	94.3	95.0	93.3
	SATURATION, %	102.3	98.7	97.9
	VOID RATIO	0.788	0.774	0.807
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
AT TEST	WATER CONTENT, %	29.3	28.7	29.6
	DRY DENSITY, pcf	94.1	95.0	93.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.790	0.775	0.800
	DIAMETER, in	1.38	1.38	1.38
	HEIGHT, in	2.98	2.98	2.98
Strain rate, in/min		0.1031	0.1115	0.1121
BACK PRESSURE, psf		0	0	0
CELL PRESSURE, psf		1008	2016	3024
FAILURE STRESS, psf		1388	1750	1719
ULTIMATE STRESS, psf		1276	1619	1600
σ_1 FAILURE, psf		2396	3766	4743
σ_3 FAILURE, psf		1008	2016	3024

TYPE OF TEST:
Unconsolidated Undrained
SAMPLE TYPE: Undisturbed
DESCRIPTION: M Gr CL4
w/ slf
LL= 32 PL= 20 PI= 12
SPECIFIC GRAVITY= 2.7
REMARKS:

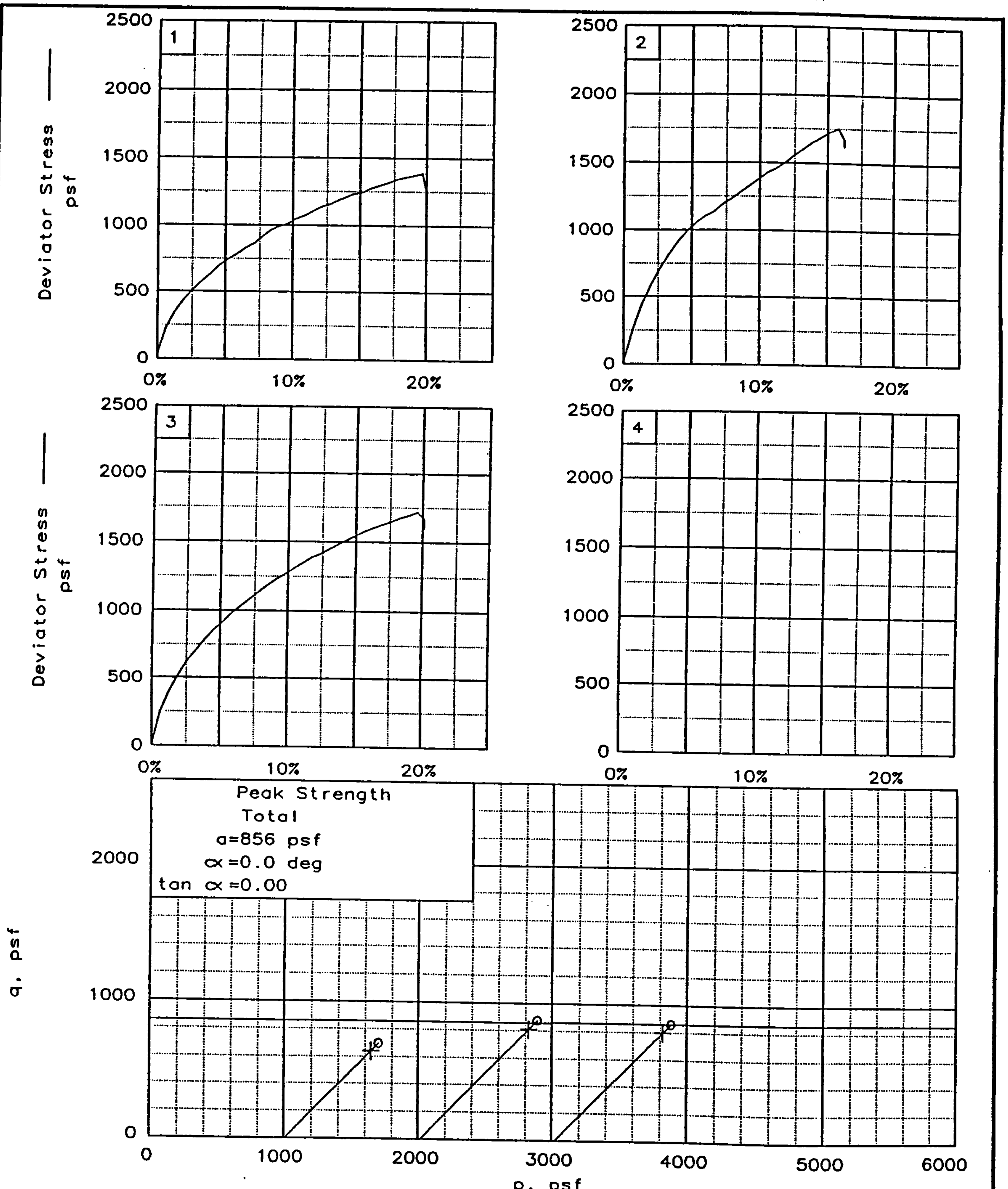
FIG. NO.: ______

CLIENT: U.S. Army Corps of Engineers

PROJECT: Algiers Levee
Contract No. DACW29-95-D-0012
SAMPLE LOCATION: Boring ALGW-9U,
Sample 22-C, Depth 77.9'
PROJ. NO.: 13622 DATE: 8-8-96

TRIAXIAL SHEAR TEST REPORT

Eustis Engineering Company, Inc.



Stress Paths: + indicates end ○ indicates peak

Client: U.S. Army Corps of Engineers

Project: Algiers Levee Contract No. DACW29-95-D-0012

Location: Boring ALGW-9U, Sample 22-C, Depth 77.9'

File: UU-7300 Project No.: 13622 FIG. NO.: ____

APPENDIX F-II

COMPUTER OUTPUT

WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS, LA
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
DESIGN MEMORANDUM NO. 2
EAST AND WEST OF ALGIERS CANAL

APPENDIX F-II

GEOTECHNICAL COMPUTER OUTPUT

Refer to Plate F-34

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 8.30.28

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¤ INPUT DATA ¤
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I.--HEADING:
'ALGIERS CANAL, EE14638
'REACH 4,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--CONTROL
CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.00

III.--WALL DATA
ELEVATION AT TOP OF WALL = 11.50 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

IV.B-- LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
100.00	100.00	.00	380.0	.00	.0	.00	.00	DEF	DEF

92.00	92.00	.00	350.0	.00	.0			DEF	DEF

V.B.-- LEFTSIDE LAYER DATA

LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
102.00	102.00	.00	380.0	.00	.0	.00	.00	DEF	DEF
92.00	92.00	.00	350.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 11.50 (FT)
LEFTSIDE ELEVATION = -3.50 (FT)
NO SEEPAGE

VII.--SURFACE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 8.30.36

SOIL PRESSURES FOR
CANTILEVER WALL DESIGN

I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 4,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

ELEV. (FT)	<-LEFTSIDE PRESSURES-> PASSIVE (PSF)	ACTIVE (PSF)	<---NET PRESSURES----> (SOIL PLUS WATER) ACTIVE (PSF)	PASSIVE (PSF)	<RIGHTSIDE PRESSURES-> ACTIVE (PSF)	PASSIVE (PSF)
11.50	.00	.00	.000	.000	.00	.00
10.50	.00	.00	62.400	62.400	.00	.00
9.50	.00	.00	124.800	124.800	.00	.00
8.50	.00	.00	187.200	187.200	.00	.00
7.50	.00	.00	249.600	249.600	.00	.00
6.50	.00	.00	312.000	312.000	.00	.00
5.50	.00	.00	374.400	374.400	.00	.00
4.50	.00	.00	436.800	436.800	.00	.00
3.50	.00	.00	499.200	499.200	.00	.00
3.00+	.00	.00	530.400	530.400	.00	.00
3.00-	760.00	.00	-229.600	1290.400	.00	760.00
2.75	748.64	.00	-202.636	1280.000	.00	734.00
2.50	737.27	.00	-175.673	1269.600	.00	708.00
2.00	783.64	.00	-190.836	1317.891	.00	725.09
1.50	830.51	.00	-206.510	1366.690	.00	742.69
.50	913.20	.00	-226.796	1453.239	.00	766.84
.00	937.78	.00	-220.178	1480.005	.00	762.40
-.50	959.92	.00	-211.123	1504.820	.00	756.02
-1.50	1032.69	.00	-221.491	1583.190	.00	771.99
-2.50	1115.91	.00	-242.309	1672.509	.00	798.91
-[illegible]50	1182.55	.00	-246.549	1761.091	.00	825.09
-[illegible]50	1218.96	.00	-282.964	1787.273	.00	851.27
-5.50	1239.53	.00	-303.535	1813.455	.00	877.45
-6.50	1259.62	.00	-323.618	1839.636	.00	903.64
-7.50	1279.95	.00	-343.945	1865.818	.00	929.82
-8.50	1300.27	.00	-364.273	1892.000	.00	956.00
-9.50	1320.60	.00	-384.600	1918.182	.00	982.18
-10.50	1340.93	.00	-404.927	1944.364	.00	1008.36
-11.50	1361.25	.00	-425.255	1970.545	.00	1034.55
-12.50	1381.58	.00	-445.582	1996.727	.00	1060.73
-13.50	1401.91	.00	-465.909	2022.909	.00	1086.91
-14.50	1422.24	.00	-486.236	2049.091	.00	1113.09
-15.50	1442.56	.00	-506.564	2075.273	.00	1139.27
-16.50	1462.89	.00	-526.891	2101.455	.00	1165.45
-17.50	1483.22	.00	-547.218	2127.636	.00	1191.64
-18.50	1503.55	.00	-567.545	2153.818	.00	1217.82
-19.50	1523.87	44.43	-587.873	2135.572	.00	1244.00
-20.50	1544.20	162.67	-608.200	2043.513	.00	1270.18
-21.50	1564.53	244.28	-628.527	1988.079	.00	1296.36
-22.50	1584.85	261.34	-648.855	1997.202	.00	1322.55
-23.50	1605.18	280.30	-669.182	2004.427	.00	1348.73
-24.50	1625.51	299.70	-689.509	2011.209	.00	1374.91
-25.50	1645.84	319.10	-709.836	2017.991	.00	1401.09
-26.50	1666.16	338.50	-730.164	2024.773	.00	1427.27
-27.50	1686.49	357.90	-750.491	2031.555	.00	1453.45

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS
DATE: 20-MAR-1998 TIME: 8.31.51

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¤ SUMMARY OF RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 4,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

WALL BOTTOM ELEV. (FT)	:	-17.26
PENETRATION (FT)	:	20.26
MAX. BEND. MOMENT (LB-FT)	:	17856.
AT ELEVATION (FT)	:	-6.38
MAX. SCALED DEFL. (LB-IN3)	:	7.6853E+09
AT ELEVATION (FT)	:	11.50

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS
DATE: 20-MAR-1998 TIME: 8.31.51

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¤ COMPLETE RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 4,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN3)	NET PRESSURE (PSF)
11.50	0.	0.	7.6853E+09	.00
10.50	10.	31.	7.2329E+09	62.40
9.50	83.	125.	6.7805E+09	124.80
8.50	281.	281.	6.3282E+09	187.20
7.50	666.	499.	5.8765E+09	249.60
6.50	1300.	780.	5.4260E+09	312.00
5.50	2246.	1123.	4.9777E+09	374.40
4.50	3567.	1529.	4.5334E+09	436.80
3.50	5325.	1997.	4.0953E+09	499.20
3.00	6387.	2254.	3.8795E+09	530.40
3.00	6387.	2254.	3.8795E+09	-229.60
2.75	6944.	2200.	3.7726E+09	-202.64
2.50	7488.	2153.	3.6665E+09	-175.67
2.00	8541.	2061.	3.4567E+09	-190.84
1.50	9548.	1962.	3.2506E+09	-206.51
.50	11403.	1745.	2.8511E+09	-226.80
.00	12247.	1634.	2.6586E+09	-220.18
-.50	13037.	1526.	2.4714E+09	-211.12
-1.50	14455.	1309.	2.1141E+09	-221.49
-2.50	15651.	1077.	1.7818E+09	-242.31
-3.50	16606.	833.	1.4765E+09	-246.55
-4.50	17310.	568.	1.1998E+09	-282.96
-5.50	17733.	275.	9.5303E+08	-303.53
-6.50	17853.	-39.	7.3684E+08	-323.62
-7.50	17650.	-372.	5.5146E+08	-343.95
-8.50	17102.	-726.	3.9653E+08	-364.27
-9.50	16190.	-1101.	2.7110E+08	-384.60
-10.50	14893.	-1496.	1.7359E+08	-404.93
-11.50	13192.	-1911.	1.0176E+08	-425.25
-12.50	11065.	-2346.	5.2659E+07	-445.58
-13.50	8493.	-2802.	2.2617E+07	-465.91
-13.73	7823.	-2912.	1.7869E+07	-470.67
-14.50	5511.	-3057.	7.1860E+06	91.88
-15.50	2623.	-2597.	1.2916E+06	826.67
-16.50	561.	-1403.	4.8574E+04	1561.45
-17.26	0.	0.	0.0000E+00	2121.41

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

III.--SOIL PRESSURES

ELEVATION (FT)	< LEFTSIDE PRESSURE (PSF) > PASSIVE	ACTIVE	<RIGHTSIDE PRESSURE (PSF) > ACTIVE	PASSIVE
11.50	0.	0.	0.	0.
10.50	0.	0.	0.	0.
9.50	0.	0.	0.	0.

8.50	0.	0.	0.	0.
7.50	0.	0.	0.	0.
6.50	0.	0.	0.	0.
5.50	0.	0.	0.	0.
4.50	0.	0.	0.	0.
3.50	0.	0.	0.	0.
3.00+	0.	0.	0.	0.
3.00-	760.	0.	0.	0.
2.75	749.	0.	0.	760.
2.50	737.	0.	0.	734.
2.00	784.	0.	0.	708.
1.50	831.	0.	0.	725.
.50	913.	0.	0.	743.
.00	938.	0.	0.	767.
-.50	960.	0.	0.	762.
-1.50	1033.	0.	0.	756.
-2.50	1116.	0.	0.	772.
-3.50	1183.	0.	0.	799.
-4.50	1219.	0.	0.	825.
-5.50	1240.	0.	0.	851.
-6.50	1260.	0.	0.	877.
-7.50	1280.	0.	0.	904.
-8.50	1300.	0.	0.	930.
-9.50	1321.	0.	0.	956.
-10.50	1341.	0.	0.	982.
-11.50	1361.	0.	0.	1008.
-12.50	1382.	0.	0.	1035.
-13.50	1402.	0.	0.	1061.
-13.73	1407.	0.	0.	1087.
-14.50	1422.	0.	0.	1093.
-15.50	1443.	0.	0.	1113.
-16.50	1463.	0.	0.	1139.
-17.26	1483.	0.	0.	1165.
-18.50	1504.	0.	0.	1192.
				1218.

 Refer to Plate F-34

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 8.28.39

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¤ INPUT DATA ¤
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I.--HEADING:
'ALGIERS CANAL, EE14638
'REACH 3,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--CONTROL
CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.00

III.--WALL DATA
ELEVATION AT TOP OF WALL = 11.50 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

IV.B-- LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
102.00	102.00	.00	380.0	.00	.0	.00	.00	DEF	DEF

102.00	102.00	.00	350.0	.00	.0			DEF	DEF

V.B.-- LEFTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
102.00	102.00	.00	380.0	.00	.0	.00	.00	DEF	DEF
102.00	102.00	.00	380.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 11.50 (FT)
LEFTSIDE ELEVATION = -3.50 (FT)
NO SEEPAGE

VII.--SURFACE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS
DATE: 20-MAR-1998 TIME: 8.28.49

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¤ SOIL PRESSURES FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 3,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

	<-LEFTSIDE PRESSURES->		<---NET PRESSURES----> (SOIL PLUS WATER)		<RIGHTSIDE PRESSURES->	
ELEV. (FT)	PASSIVE (PSF)	ACTIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)
11.50	.00	.00	.000	.000	.00	.00
10.50	.00	.00	62.400	62.400	.00	.00
9.50	.00	.00	124.800	124.800	.00	.00
8.50	.00	.00	187.200	187.200	.00	.00
7.50	.00	.00	249.600	249.600	.00	.00
6.50	.00	.00	312.000	312.000	.00	.00
5.50	.00	.00	374.400	374.400	.00	.00
4.50	.00	.00	436.800	436.800	.00	.00
3.50	.00	.00	499.200	499.200	.00	.00
3.00+	.00	.00	530.400	530.400	.00	.00
3.00-	760.00	.00	-229.600	1290.400	.00	.00
2.75	748.64	.00	-202.636	1280.455	.00	760.00
2.50	737.27	.00	-175.673	1270.509	.00	734.45
2.00	783.64	.00	-190.836	1319.709	.00	708.91
1.50	830.00	.00	-206.000	1369.409	.00	726.91
.50	922.73	.00	-236.327	1457.809	.00	745.41
.00	969.09	.00	-251.491	1486.509	.00	771.41
-.50	1015.45	.00	-266.655	1515.209	.00	768.91
-1.50	1108.43	.00	-297.226	1603.359	.00	766.41
-2.50	1200.91	.00	-327.309	1702.509	.00	792.16
-3.50	1277.55	.00	-341.549	1800.909	.00	828.91
-4.50	1323.96	.00	-387.964	1836.909	.00	864.91
-5.50	1354.53	.00	-418.535	1872.909	.00	900.91
-6.50	1384.62	.00	-448.618	1908.909	.00	936.91
-7.50	1414.95	.00	-478.945	1944.909	.00	972.91
-8.50	1445.27	.00	-509.273	1980.909	.00	1008.91
-9.50	1475.60	.00	-539.600	2016.909	.00	1044.91
-10.50	1505.93	.00	-569.927	2052.909	.00	1080.91
-11.50	1536.25	.00	-600.255	2088.909	.00	1116.91
-12.50	1566.58	.00	-630.582	2124.909	.00	1152.91
-13.50	1596.91	.00	-660.909	2160.909	.00	1188.91
-14.50	1627.24	.00	-691.236	2196.909	.00	1224.91
-15.50	1657.56	.00	-721.564	2232.909	.00	1260.91
-16.50	1687.89	25.32	-751.891	2243.593	.00	1296.91
-17.50	1718.22	140.79	-782.218	2164.118	.00	1332.91
-18.50	1748.55	281.32	-812.545	2059.587	.00	1368.91
-19.50	1778.87	342.05	-842.873	2034.862	.00	1404.91
-20.50	1809.20	367.10	-873.200	2045.809	.00	1440.91
-21.50	1839.53	396.50	-903.527	2052.409	.00	1476.91
-22.50	1869.85	425.90	-933.855	2059.009	.00	1512.91
-23.50	1900.18	455.30	-964.182	2065.609	.00	1548.91
-24.50	1930.51	484.70	-994.509	2072.209	.00	1584.91
-25.50	1960.84	514.10	-1024.836	2078.809	.00	1620.91
-26.50	1991.16	543.50	-1055.164	2085.409	.00	1656.91
-27.50	2021.49	572.90	-1085.491	2092.009	.00	1692.91

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 8.28.57

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¤  SUMMARY OF RESULTS FOR  ¤
¤  CANTILEVER WALL DESIGN   ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 3,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

```
WALL BOTTOM ELEV. (FT)     :      -14.58
     PENETRATION (FT)      :       17.58

MAX. BEND. MOMENT (LB-FT)  :      16584.
     AT ELEVATION (FT)     :       -5.00

MAX. SCALED DEFL. (LB-IN3) :  5.7319E+09
     AT ELEVATION (FT)     :       11.50
```

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 8.28.57

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¤   COMPLETE RESULTS FOR   ¤
¤  CANTILEVER WALL DESIGN  ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 3,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN3)	NET PRESSURE (PSF)
11.50	0.	0.	5.7319E+09	.00
10.50	10.	31.	5.3650E+09	62.40
9.50	83.	125.	4.9983E+09	124.80
8.50	281.	281.	4.6316E+09	187.20
7.50	666.	499.	4.2655E+09	249.60
6.50	1300.	780.	3.9006E+09	312.00
5.50	2246.	1123.	3.5379E+09	374.40
4.50	3567.	1529.	3.1792E+09	436.80
3.50	5325.	1997.	2.8267E+09	499.20
3.00	6387.	2254.	2.6537E+09	530.40
3.00	6387.	2254.	2.6537E+09	-229.60
2.75	6944.	2200.	2.5683E+09	-202.64
2.50	7488.	2153.	2.4835E+09	-175.67
2.00	8541.	2061.	2.3165E+09	-190.84
1.50	9548.	1962.	2.1532E+09	-206.00
.50	11402.	1741.	1.8394E+09	-236.33
.00	12242.	1619.	1.6897E+09	-251.49
-.50	13019.	1489.	1.5452E+09	-266.65
-1.50	14370.	1207.	1.2735E+09	-297.23
-2.50	15424.	895.	1.0266E+09	-327.31
-3.50	16153.	561.	8.0630E+08	-341.55
-4.50	16535.	196.	6.1386E+08	-387.96
-5.50	16532.	-207.	4.4993E+08	-418.53
-6.50	16111.	-641.	3.1451E+08	-448.62
-7.50	15241.	-1105.	2.0686E+08	-478.95
-8.50	13891.	-1599.	1.2549E+08	-509.27
-9.50	12033.	-2123.	6.8040E+07	-539.60
-10.50	9635.	-2678.	3.1308E+07	-569.93
-10.95	8386.	-2935.	2.0571E+07	-583.42
-11.50	6690.	-3140.	1.1144E+07	-158.08
-12.50	3598.	-2915.	2.5178E+06	608.33
-13.50	1115.	-1924.	1.9662E+05	1374.74
-14.50	6.	-166.	5.3487E+00	2141.14
-14.58	0.	0.	0.0000E+00	2199.66

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

III.--SOIL PRESSURES

ELEVATION (FT)	< LEFTSIDE PRESSURE (PSF)> PASSIVE	ACTIVE	<RIGHTSIDE PRESSURE (PSF)> ACTIVE	PASSIVE
11.50	0.	0.	0.	0.
10.50	0.	0.	0.	0.
9.50	0.	0.	0.	0.
8.50	0.	0.	0.	0.
7.50	0.	0.	0.	0.

6.50	0.	0.	0.	0.
5.50	0.	0.	0.	0.
4.50	0.	0.	0.	0.
3.50	0.	0.	0.	0.
3.00+	0.	0.	0.	0.
3.00-	760.	0.	0.	760.
2.75	749.	0.	0.	734.
2.50	737.	0.	0.	709.
2.00	784.	0.	0.	727.
1.50	830.	0.	0.	745.
.50	923.	0.	0.	771.
.00	969.	0.	0.	769.
-.50	1015.	0.	0.	766.
-1.50	1108.	0.	0.	792.
-2.50	1201.	0.	0.	829.
-3.50	1278.	0.	0.	865.
-4.50	1324.	0.	0.	901.
-5.50	1355.	0.	0.	937.
-6.50	1385.	0.	0.	973.
-7.50	1415.	0.	0.	1009.
-8.50	1445.	0.	0.	1045.
-9.50	1476.	0.	0.	1081.
-10.50	1506.	0.	0.	1117.
-10.95	1519.	0.	0.	1133.
-11.50	1536.	0.	0.	1153.
-12.50	1567.	0.	0.	1189.
-13.50	1597.	0.	0.	1225.
-14.50	1627.	0.	0.	1261.
-14.58	1658.	0.	0.	1297.
-16.50	1688.	25.	0.	1333.

 Refer to Plate F-33

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-MAR-1998 TIME: 16.03.41

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¤ INPUT DATA ¤
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I.--HEADING:
'ALGIERS CANAL, EE14638
'REACH 2,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--CONTROL
CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.00

III.--WALL DATA
ELEVATION AT TOP OF WALL = 11.50 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

IV.B-- LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
105.00	105.00	.00	380.0	.00	.0	.00	.00	DEF	DEF

97.50	97.50	.00	310.0	.00	.0	-12.00	.00	DEF	DEF
91.00	91.00	.00	310.0	.00	.0			DEF	DEF

V.B.-- LEFTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH- ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH- ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
105.00	105.00	.00	380.0	.00	.0	.00	.00	DEF	DEF
97.50	97.50	.00	310.0	.00	.0	-12.00	.00	DEF	DEF
91.00	91.00	.00	310.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 11.50 (FT)
LEFTSIDE ELEVATION = -3.50 (FT)
NO SEEPAGE

VII.--SURFACE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS
DATE: 19-MAR-1998
TIME: 16.03.53

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¤ SOIL PRESSURES FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 2,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

ELEV. (FT)	<-LEFTSIDE PRESSURES-> PASSIVE (PSF)	ACTIVE (PSF)	<---NET PRESSURES----> (SOIL PLUS WATER) ACTIVE (PSF)	PASSIVE (PSF)	<RIGHTSIDE PRESSURES-> ACTIVE (PSF)	PASSIVE (PSF)
11.50	.00	.00	.000	.000	.00	.00
10.50	.00	.00	62.400	62.400	.00	.00
9.50	.00	.00	124.800	124.800	.00	.00
8.50	.00	.00	187.200	187.200	.00	.00
7.50	.00	.00	249.600	249.600	.00	.00
6.50	.00	.00	312.000	312.000	.00	.00
5.50	.00	.00	374.400	374.400	.00	.00
4.50	.00	.00	436.800	436.800	.00	.00
3.50	.00	.00	499.200	499.200	.00	.00
3.00+	.00	.00	530.400	530.400	.00	.00
3.00-	760.00	.00	-229.600	1290.400	.00	760.00
2.75	749.32	.00	-203.318	1281.136	.00	735.14
2.50	738.64	.00	-177.036	1271.873	.00	710.27
2.00	786.36	.00	-193.564	1322.436	.00	729.64
1.50	835.27	.00	-211.265	1374.174	.00	750.17
.50	907.36	.00	-220.955	1451.937	.00	765.54
.00	906.29	.00	-188.688	1453.707	.00	736.11
-.50	903.39	.00	-154.593	1453.648	.00	704.85
50	967.71	.00	-156.510	1523.394	.00	712.19
-2.50	1057.16	.00	-183.559	1618.759	.00	745.16
-3.50	1129.03	.00	-193.026	1712.386	.00	776.39
-4.50	1170.67	.00	-234.668	1743.614	.00	807.61
-5.50	1196.47	.00	-260.466	1774.841	.00	838.84
-6.50	1221.78	.00	-285.777	1806.068	.00	870.07
-7.50	1247.33	.00	-311.332	1837.295	.00	901.30
-8.50	1272.89	.00	-336.886	1868.523	.00	932.52
-9.50	1298.44	32.16	-362.441	1867.591	.00	963.75
-10.50	1324.01	123.97	-388.006	1807.015	.00	994.99
-11.50	1349.53	197.02	-413.530	1765.169	.00	1026.18
-12.00	1361.47	208.40	-425.474	1768.568	.00	1040.97
-12.50	1371.83	217.04	-435.834	1773.119	.00	1054.16
-13.50	1390.92	238.87	-454.919	1776.047	.00	1078.92
-14.50	1409.96	297.28	-473.964	1742.361	.00	1103.64
-15.50	1429.02	377.44	-493.018	1686.926	.00	1128.36
-16.50	1448.07	419.11	-511.768	1669.985	.00	1153.09
-17.50	1467.13	434.15	-506.372	1679.668	.30	1177.82
-18.50	1486.18	452.25	-474.455	1686.295	24.76	1202.55
-19.50	1505.24	470.35	-456.100	1692.923	75.73	1227.27
-20.50	1524.29	488.45	-452.401	1699.550	113.14	1252.00
-21.50	1543.35	506.55	-447.115	1706.177	135.89	1276.73
-22.50	1562.40	524.65	-441.830	1712.805	160.23	1301.45
-23.50	1581.45	542.75	-436.545	1719.432	184.57	1326.18
-24.50	1600.51	560.85	-431.259	1726.059	208.91	1350.91
-[illegible] 50	1619.56	578.95	-425.974	1732.686	233.25	1375.64
-[illegible].50	1638.62	597.05	-420.688	1739.314	257.59	1400.36
-27.50	1657.67	615.15	-415.403	1745.941	281.93	1425.09

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-MAR-1998 TIME: 16.04.02

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¤ SUMMARY OF RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 2,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

```
WALL BOTTOM ELEV. (FT)     :        -19.09
     PENETRATION (FT)      :         22.09

MAX. BEND. MOMENT (LB-FT)  :        19214.
     AT ELEVATION (FT)     :         -7.52

MAX. SCALED DEFL. (LB-IN3) :    9.2776E+09
     AT ELEVATION (FT)     :         11.50
```

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-MAR-1998 TIME: 16.04.02

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¤ COMPLETE RESULTS FOR ¤

¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 2,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN3)	NET PRESSURE (PSF)
11.50	0.	0.	9.2776E+09	.00
10.50	10.	31.	8.7586E+09	62.40
9.50	83.	125.	8.2397E+09	124.80
8.50	281.	281.	7.7210E+09	187.20
7.50	666.	499.	7.2027E+09	249.60
6.50	1300.	780.	6.6857E+09	312.00
5.50	2246.	1123.	6.1709E+09	374.40
4.50	3567.	1529.	5.6601E+09	436.80
3.50	5325.	1997.	5.1555E+09	499.20
3.00	6387.	2254.	4.9065E+09	530.40
3.00	6387.	2254.	4.9065E+09	-229.60
2.75	6944.	2200.	4.7829E+09	-203.32
2.50	7487.	2153.	4.6602E+09	-177.04
2.00	8541.	2060.	4.4171E+09	-193.56
1.50	9546.	1959.	4.1778E+09	-211.27
.50	11397.	1743.	3.7118E+09	-220.96
.00	12242.	1640.	3.4860E+09	-188.69
-.50	13040.	1554.	3.2655E+09	-154.59
-1.50	14517.	1399.	2.8418E+09	-156.51
-2.50	15833.	1229.	2.4431E+09	-183.56
-3.50	16968.	1040.	2.0717E+09	-193.03
-4.50	17905.	827.	1.7296E+09	-234.67
-5.50	18610.	579.	1.4184E+09	-260.47
-6.50	19055.	306.	1.1394E+09	-285.78
-7.50	19214.	7.	8.9321E+08	-311.33
-8.50	19061.	-317.	6.8020E+08	-336.89
-9.50	18572.	-666.	5.0008E+08	-362.44
-10.50	17720.	-1042.	3.5200E+08	-388.01
-11.50	16480.	-1442.	2.3448E+08	-413.53
-12.00	15707.	-1652.	1.8654E+08	-425.47
-12.50	14827.	-1867.	1.4538E+08	-435.83
-13.50	12738.	-2313.	8.1838E+07	-454.92
-14.50	10195.	-2777.	4.0244E+07	-473.96
-14.51	10156.	-2784.	3.9791E+07	-474.23
-15.50	7256.	-3022.	1.6205E+07	-8.25
-16.50	4309.	-2794.	4.7027E+06	464.44
-17.50	1826.	-2093.	7.1331E+05	937.14
-18.50	281.	-919.	1.4446E+04	1409.83
-19.09	0.	0.	0.0000E+00	1690.23

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

III.--SOIL PRESSURES

ELEVATION (FT)	< LEFTSIDE PRESSURE (PSF) > PASSIVE	ACTIVE	<RIGHTSIDE PRESSURE (PSF) > ACTIVE	PASSIVE
11.50	0.	0.	0.	0.
10.50	0.	0.	0.	0.
9.50	0.	0.	0.	0.
8.50	0.	0.	0.	0.
7.50	0.	0.	0.	0.
6.50	0.	0.	0.	0.
5.50	0.	0.	0.	0.
4.50	0.	0.	0.	0.
3.50	0.	0.	0.	0.
3.00+	0.	0.	0.	0.
3.00-	760.	0.	0.	0.
2.75	749.	0.	0.	760.
2.50	739.	0.	0.	735.
2.00	786.	0.	0.	710.
1.50	835.	0.	0.	730.
.50	907.	0.	0.	750.
.00	906.	0.	0.	766.
-.50	903.	0.	0.	736.
-1.50	968.	0.	0.	705.
-2.50	1057.	0.	0.	712.
-3.50	1129.	0.	0.	745.
-4.50	1171.	0.	0.	776.
-5.50	1196.	0.	0.	808.
-6.50	1222.	0.	0.	839.
-7.50	1247.	0.	0.	870.
-8.50	1273.	0.	0.	901.
-9.50	1298.	32.	0.	933.
-10.50	1324.	124.	0.	964.
-11.50	1350.	197.	0.	995.
-12.00	1361.	208.	0.	1026.
-12.50	1372.	217.	0.	1041.
-13.50	1391.	239.	0.	1054.
-14.50	1410.	297.	0.	1079.
-14.51	1410.	298.	0.	1104.
-15.50	1429.	377.	0.	1104.
-16.50	1448.	419.	0.	1128.
-17.50	1467.	434.	0.	1153.
-18.50	1486.	452.	25.	1178.
-19.09	1505.	470.	76.	1203.
-20.50	1524.	488.	113.	1227.
			136.	1252.

Refer to Plate F-33

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-MAR-1998 TIME: 13.45.33

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¤ INPUT DATA ¤
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I.--HEADING:
'ALGIERS CANAL, EE14638
'REACH 1,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--CONTROL
CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.00

III.--WALL DATA
ELEVATION AT TOP OF WALL = 11.50 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

IV.B-- LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	3.00
30.00	.00
100.00	.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
105.00	105.00	.00	380.0	.00	.0	.00	.00	DEF	DEF

102.50	102.50	.00	380.0	.00	.0	DEF	DEF

V.B.-- LEFTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
105.00	105.00	.00	380.0	.00	.0	.00	.00	DEF	DEF
102.50	102.50	.00	380.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 11.50 (FT)
LEFTSIDE ELEVATION = -3.50 (FT)
NO SEEPAGE

VII.--SURFACE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS
DATE: 19-MAR-1998
TIME: 13.45.42

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¤ SOIL PRESSURES FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 1,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

	<-LEFTSIDE PRESSURES->		<---NET PRESSURES----> (SOIL PLUS WATER)		<RIGHTSIDE PRESSURES->	
ELEV. (FT)	PASSIVE (PSF)	ACTIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)
11.50	.00	.00	.000	.000	.00	.00
10.50	.00	.00	62.400	62.400	.00	.00
9.50	.00	.00	124.800	124.800	.00	.00
8.50	.00	.00	187.200	187.200	.00	.00
7.50	.00	.00	249.600	249.600	.00	.00
6.50	.00	.00	312.000	312.000	.00	.00
5.50	.00	.00	374.400	374.400	.00	.00
4.50	.00	.00	436.800	436.800	.00	.00
3.50	.00	.00	499.200	499.200	.00	.00
3.00+	.00	.00	530.400	530.400	.00	.00
3.00-	760.00	.00	-229.600	1290.400	.00	760.00
2.75	749.32	.00	-203.318	1281.136	.00	735.14
2.50	738.64	.00	-177.036	1271.873	.00	710.27
2.00	786.36	.00	-193.564	1322.436	.00	729.64
1.50	834.09	.00	-210.094	1373.003	.00	749.00
.50	929.54	.00	-243.138	1474.119	.00	787.72
.00	976.94	.00	-259.345	1524.363	.00	806.76
-.50	1023.74	.00	-274.942	1573.997	.00	825.20
-1.50	1116.95	.00	-305.752	1672.636	.00	861.44
-2.50	1209.66	.00	-336.059	1771.259	.00	897.66
-[illegible]0	1286.53	.00	-350.526	1869.886	.00	933.89
-4.50	1333.17	.00	-397.168	1906.114	.00	970.11
-5.50	1363.97	.00	-427.966	1942.341	.00	1006.34
-6.50	1394.28	.00	-458.277	1978.568	.00	1042.57
-7.50	1424.83	.00	-488.832	2014.795	.00	1078.80
-8.50	1455.39	.00	-519.386	2051.023	.00	1115.02
-9.50	1485.94	.00	-549.941	2087.250	.00	1151.25
-10.50	1516.50	.00	-580.495	2123.477	.00	1187.48
-11.50	1547.05	.00	-611.050	2159.705	.00	1223.70
-12.50	1577.60	.00	-641.605	2195.932	.00	1259.93
-13.50	1608.16	.00	-672.159	2232.159	.00	1296.16
-14.50	1638.71	.00	-702.714	2268.386	.00	1332.39
-15.50	1669.27	1.59	-733.268	2303.020	.00	1368.61
-16.50	1699.82	85.56	-763.823	2255.285	.00	1404.84
-17.50	1730.38	243.91	-794.377	2133.162	.00	1441.07
-18.50	1760.93	327.84	-824.932	2085.452	.00	1477.30
-19.50	1791.49	350.60	-855.486	2098.923	.00	1513.52
-20.50	1822.04	380.20	-886.041	2105.550	.00	1549.75
-21.50	1852.60	409.80	-916.595	2112.177	.00	1585.98
-22.50	1883.15	439.40	-947.150	2118.805	.00	1622.20
-23.50	1913.70	469.00	-977.705	2125.432	.00	1658.43
-24.50	1944.26	498.60	-1008.259	2132.059	.00	1694.66
-25.50	1974.81	528.20	-1038.814	2138.686	.00	1730.89
-26.50	2005.37	557.80	-1069.368	2145.314	.00	1767.11
-27.50	2035.92	587.40	-1099.923	2151.941	.00	1803.34

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-MAR-1998 TIME: 13.45.53

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¤   SUMMARY OF RESULTS FOR    ¤
¤   CANTILEVER WALL DESIGN    ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 1,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

```
WALL BOTTOM ELEV. (FT)     :        -14.32
     PENETRATION (FT)      :         17.32

MAX. BEND. MOMENT (LB-FT)  :        16409.
     AT ELEVATION (FT)     :         -4.86

MAX. SCALED DEFL. (LB-IN3) :    5.5605E+09
     AT ELEVATION (FT)     :         11.50
```

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-MAR-1998 TIME: 13.45.53

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¤   COMPLETE RESULTS FOR      ¤
¤   CANTILEVER WALL DESIGN    ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 1,I WALL, NEAR FLOOD GATE, WATER EL 11.5

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN3)	NET PRESSURE (PSF)
11.50	0.	0.	5.5605E+09	.00
10.50	10.	31.	5.2018E+09	62.40
9.50	83.	125.	4.8431E+09	124.80
8.50	281.	281.	4.4845E+09	187.20
7.50	666.	499.	4.1265E+09	249.60
6.50	1300.	780.	3.7697E+09	312.00
5.50	2246.	1123.	3.4151E+09	374.40
4.50	3567.	1529.	3.0645E+09	436.80
3.50	5325.	1997.	2.7201E+09	499.20
3.00	6387.	2254.	2.5512E+09	530.40
3.00	6387.	2254.	2.5512E+09	-229.60
2.75	6944.	2200.	2.4677E+09	-203.32
2.50	7487.	2153.	2.3850E+09	-177.04
2.00	8541.	2060.	2.2221E+09	-193.56
1.50	9546.	1959.	2.0628E+09	-210.09
.50	11394.	1732.	1.7571E+09	-243.14
.00	12230.	1607.	1.6114E+09	-259.34
-.50	13000.	1473.	1.4710E+09	-274.94
-1.50	14330.	1183.	1.2074E+09	-305.75
-2.50	15355.	862.	9.6842E+08	-336.06
-3.50	16047.	519.	7.5597E+08	-350.53
-4.50	16382.	145.	5.7120E+08	-397.17
-5.50	16323.	-268.	4.1468E+08	-427.97
-6.50	15837.	-711.	2.8631E+08	-458.28
-7.50	14891.	-1184.	1.8523E+08	-488.83
-8.50	13457.	-1689.	1.0982E+08	-519.39
-9.50	11504.	-2223.	5.7589E+07	-549.94
-10.50	9001.	-2788.	2.5156E+07	-580.50
-10.78	8185.	-2955.	1.8975E+07	-589.18
-11.50	5968.	-3170.	8.1947E+06	-11.56
-12.50	2927.	-2778.	1.5451E+06	795.38
-13.50	682.	-1579.	6.8294E+04	1602.32
-14.32	0.	0.	0.0000E+00	2261.76

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

III.--SOIL PRESSURES

ELEVATION (FT)	< LEFTSIDE PRESSURE (PSF)> PASSIVE	ACTIVE	<RIGHTSIDE PRESSURE (PSF)> ACTIVE	PASSIVE
11.50	0.	0.	0.	0.
10.50	0.	0.	0.	0.
9.50	0.	0.	0.	0.
8.50	0.	0.	0.	0.
7.50	0.	0.	0.	0.
6.50	0.	0.	0.	0.

5.50	0.	0.	0.	0.
4.50	0.	0.	0.	0.
3.50	0.	0.	0.	0.
3.00+	0.	0.	0.	0.
3.00-	760.	0.	0.	0.
2.75	749.	0.	0.	760.
2.50	739.	0.	0.	735.
2.00	786.	0.	0.	710.
1.50	834.	0.	0.	730.
.50	930.	0.	0.	749.
.00	977.	0.	0.	788.
-.50	1024.	0.	0.	807.
-1.50	1117.	0.	0.	825.
-2.50	1210.	0.	0.	861.
-3.50	1287.	0.	0.	898.
-4.50	1333.	0.	0.	934.
-5.50	1364.	0.	0.	970.
-6.50	1394.	0.	0.	1006.
-7.50	1425.	0.	0.	1043.
-8.50	1455.	0.	0.	1079.
-9.50	1486.	0.	0.	1115.
-10.50	1516.	0.	0.	1151.
-10.78	1525.	0.	0.	1187.
-11.50	1547.	0.	0.	1198.
-12.50	1578.	0.	0.	1224.
-13.50	1608.	0.	0.	1260.
-14.32	1639.	0.	0.	1296.
-15.50	1669.	2.	0.	1332.
				1369.

 Refer to Plate F-32

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 9.18.04

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¤ INPUT DATA ¤
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I.--HEADING:
'ALGIERS CANAL, EE14638
'REACH 2,I WALL, WEST SIDE, WATER EL 11.5

II.--CONTROL
CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.00

III.--WALL DATA
ELEVATION AT TOP OF WALL = 11.50 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	5.50
3.00	5.50
7.50	4.00
50.00	4.00

IV.B-- LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	5.50
7.00	5.50
35.50	-4.00
70.00	-4.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT.	MOIST WGHT.	ANGLE OF INTERNAL FRICTION	COH-ESION	ANGLE OF WALL FRICTION	ADH-ESION	<--BOTTOM--> ELEV.	SLOPE	<-SAFETY-> <-FACTOR-> ACT.	PASS.

(PCF)	(PCF)	(DEG)	(PSF)	(DEG)	(PSF)	(FT)	(FT/FT)		
105.00	105.00	.00	380.0	.00	.0	.00	.00	DEF	DEF
97.50	97.50	.00	310.0	.00	.0	-12.00	.00	DEF	DEF
91.00	91.00	.00	310.0	.00	.0			DEF	DEF

V.B.-- LEFTSIDE LAYER DATA

LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
105.00	105.00	.00	380.0	.00	.0	.00	.00	DEF	DEF
97.50	97.50	.00	310.0	.00	.0	-12.00	.00	DEF	DEF
91.00	91.00	.00	310.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 11.50 (FT)
LEFTSIDE ELEVATION = -4.00 (FT)
NO SEEPAGE

VII.--SURFACE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 9.18.15

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¤ SOIL PRESSURES FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 2,I WALL, WEST SIDE, WATER EL 11.5

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

	<-LEFTSIDE PRESSURES->		<---NET PRESSURES----> (SOIL PLUS WATER)		<RIGHTSIDE PRESSURES->	
ELEV. (FT)	PASSIVE (PSF)	ACTIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)
11.50	.00	.00	.000	.000	.00	.00
10.50	.00	.00	62.400	62.400	.00	.00
9.50	.00	.00	124.800	124.800	.00	.00
8.50	.00	.00	187.200	187.200	.00	.00
7.50	.00	.00	249.600	249.600	.00	.00
6.50	.00	.00	312.000	312.000	.00	.00
5.50+	.00	.00	374.400	374.400	.00	.00
5.50-	760.00	.00	-385.600	1134.400	.00	760.00
5.00	812.50	.00	-406.900	1188.405	.00	782.81
4.50	865.00	.00	-428.200	1242.410	.00	805.61
3.50	970.00	.00	-470.800	1326.588	.00	827.39
2.50	1075.00	.00	-513.400	1351.654	.00	790.05
1.50	1181.76	.00	-557.762	1373.324	.00	749.32
.50	1262.81	.00	-576.410	1423.958	.00	737.56
.00	1270.03	.00	-552.426	1424.291	.00	706.69
-.50	1260.32	15.07	-511.521	1405.771	.00	672.04
-1.50	1241.56	99.22	-430.360	1382.315	.00	670.33
-2.50	1242.47	201.71	-368.871	1382.208	.00	710.32
-3.50	1294.14	298.55	-358.144	1463.459	.00	826.01
-4.00	1323.68	339.31	-356.485	1535.657	.00	907.77
-4.50	1336.10	364.86	-368.905	1554.858	.00	952.51
-5.50	1345.25	400.79	-378.047	1549.856	.00	983.45
-6.50	1354.00	432.52	-386.800	1553.234	.00	1018.55
-7.50	1362.85	450.12	-395.650	1570.734	.00	1053.65
-8.50	1371.70	453.50	-404.500	1602.453	.00	1088.75
-9.50	1380.55	453.05	-413.350	1638.000	.00	1123.85
-10.50	1389.41	453.16	-422.210	1673.000	.00	1158.96
-11.50	1398.23	453.23	-426.296	1708.000	4.73	1194.03
-12.00	1401.82	452.45	-414.095	1725.500	20.53	1210.75
-12.50	1403.83	450.08	-392.361	1743.000	44.27	1225.88
-13.50	1406.21	443.71	-359.989	1778.000	79.02	1254.51
-14.50	1408.55	437.30	-335.459	1813.000	105.89	1283.10
-15.50	1410.90	430.90	-316.309	1848.000	127.39	1311.70
-16.50	1413.25	424.50	-302.928	1883.000	143.12	1340.30
-17.50	1415.60	418.10	-291.155	1918.000	157.24	1368.90
-18.50	1434.20	411.70	-295.300	1953.000	171.70	1397.50
-19.50	1462.80	405.30	-305.839	1988.000	189.76	1426.10
-20.50	1491.40	398.90	-309.500	2023.000	214.70	1454.70
-21.50	1520.00	389.16	-309.555	2061.337	243.24	1483.30
-22.50	1548.60	399.68	-309.500	2079.425	271.90	1511.90
-23.50	1577.20	531.65	-309.500	1976.050	300.50	1540.50
-24.50	1605.80	728.13	-309.500	1808.175	329.10	1569.10
-25.50	1634.40	796.69	-309.500	1768.212	357.70	1597.70

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 9.18.29

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¤ SUMMARY OF RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤
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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 2,I WALL, WEST SIDE, WATER EL 11.5

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

```
WALL BOTTOM ELEV. (FT)     :        -1.78
      PENETRATION (FT)     :         7.28

MAX. BEND. MOMENT (LB-FT)  :        3739.
      AT ELEVATION (FT)    :         2.95

MAX. SCALED DEFL. (LB-IN3) :   3.0345E+08
      AT ELEVATION (FT)    :        11.50
```

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 20-MAR-1998 TIME: 9.18.29

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¤ COMPLETE RESULTS FOR ¤
¤ CANTILEVER WALL DESIGN ¤

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I.--HEADING

'ALGIERS CANAL, EE14638
'REACH 2,I WALL, WEST SIDE, WATER EL 11.5

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN3)	NET PRESSURE (PSF)
11.50	0.	0.	3.0345E+08	.00
10.50	10.	31.	2.6643E+08	62.40
9.50	83.	125.	2.2945E+08	124.80
8.50	281.	281.	1.9262E+08	187.20
7.50	666.	499.	1.5630E+08	249.60
6.50	1300.	780.	1.2118E+08	312.00
5.50	2246.	1123.	8.8338E+07	374.40
5.50	2246.	1123.	8.8338E+07	-385.60
5.00	2759.	925.	7.3265E+07	-406.90
4.50	3170.	716.	5.9380E+07	-428.20
3.50	3665.	267.	3.5838E+07	-470.80
2.50	3689.	-225.	1.8561E+07	-513.40
1.50	3200.	-761.	7.5849E+06	-557.76
.91	2650.	-1095.	3.7458E+06	-568.81
.50	2165.	-1266.	2.0578E+06	-273.37
.00	1513.	-1312.	8.1849E+05	89.13
-.50	883.	-1177.	2.3364E+05	451.62
-1.50	53.	-363.	6.1430E+02	1176.61
-1.78	0.	0.	0.0000E+00	1382.28

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

III.--SOIL PRESSURES

ELEVATION (FT)	< LEFTSIDE PRESSURE (PSF)> PASSIVE	ACTIVE	<RIGHTSIDE PRESSURE (PSF)> ACTIVE	PASSIVE
11.50	0.	0.	0.	0.
10.50	0.	0.	0.	0.
9.50	0.	0.	0.	0.
8.50	0.	0.	0.	0.
7.50	0.	0.	0.	0.
6.50	0.	0.	0.	0.
5.50+	0.	0.	0.	0.
5.50-	760.	0.	0.	760.
5.00	813.	0.	0.	783.
4.50	865.	0.	0.	806.
3.50	970.	0.	0.	827.
2.50	1075.	0.	0.	790.
1.50	1182.	0.	0.	749.
.91	1230.	0.	0.	742.
.50	1263.	0.	0.	738.
.00	1270.	0.	0.	707.
-.50	1260.	15.	0.	672.
-1.50	1242.	99.	0.	670.

-1.78	1242.	202.	0.	710.
-3.50	1294.	299.	0.	826.

WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS, LA
EAST OF HARVEY CANAL HURRICANE PROTECTION PROJECT
DESIGN MEMORANDUM NO. 2
EAST AND WEST OF ALGIERS CANAL

APPENDIX B

DESIGN CALCULATIONS

PUMPING STATION FLOODWALL CALCULATIONS

JN3004 | ALGIERS CANAL | AAH | 11-11-97

BELLE CHASSE NO. 2.

FOR FAILURE SURFACE (B)(3),

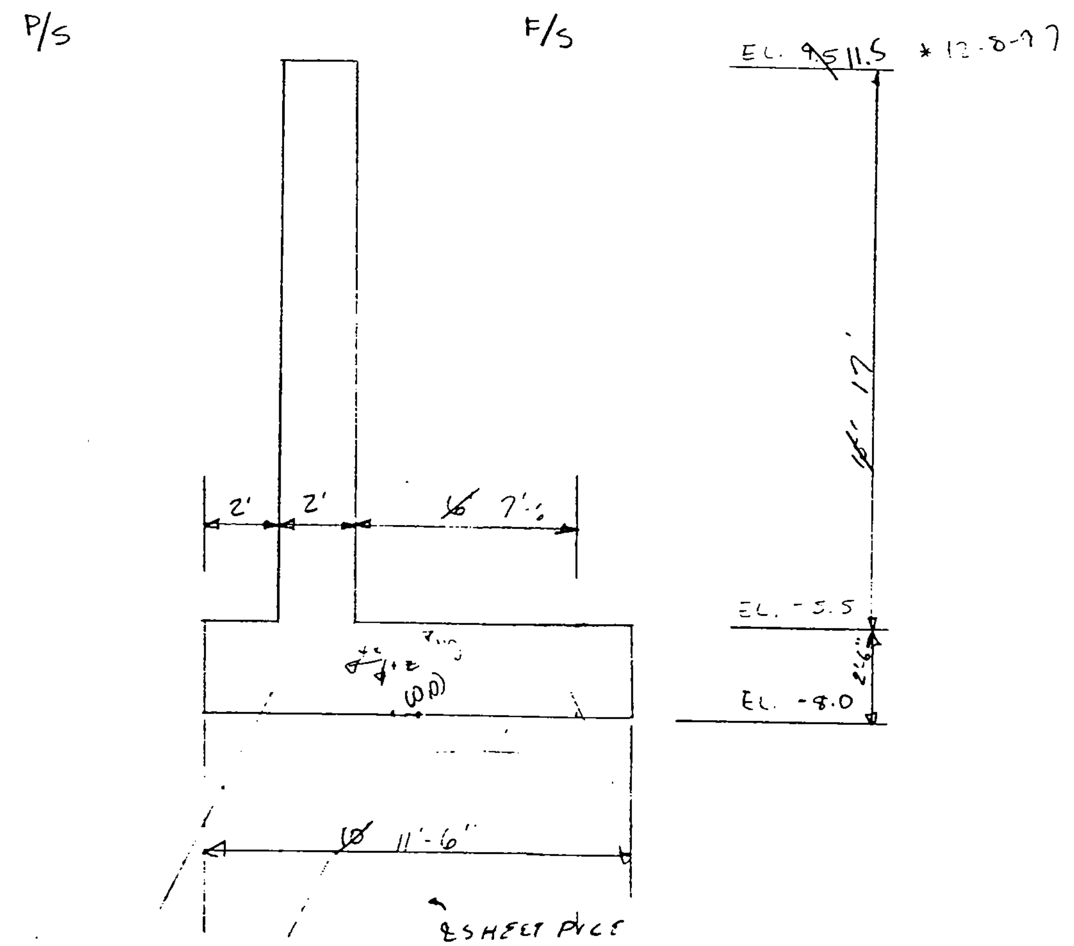
REQ'D PRESSURE = 2635 psf under intake basin area.

- THIS IS IMPOSSIBLE TO ACHEIVE WITH DL OF STRUCTURE + PILES IN TENSION -

- USE NEW T-WALL INFRONT OF EXISTING DISCHARGE BASIN

BELLE CHASSE NO. 2 PUMPING STATION.

- ADD T-WALL TO FRONT OF STATION
- PASS DISCHARGE PIPES THROUGH T-WALL
- EXISTING DISCHARGE BASIN IS LINED W/ RIPRAP
- TOP OF BASE SLAB @ EL -5.5
- DEPTH OF BASE SLAB = 2'-6"
- HEIGHT OF STEM = 15'
- TOE OF BASE SLAB IS 50' FROM EXISTING STATION
- LENGTH OF WALL = 86'



EUSTIS ENGINEERING COMPANY, INC.
Geotechnical Engineers
Metairie, Louisiana

Page ____
Date 11/26/97
Job 14638
By TWS
Project ____
Subject ____
Checked By ____

US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La.

Allowable Pile Load Capacities
T-Wall Foundation
Belle Chasse Pump Station No. 2

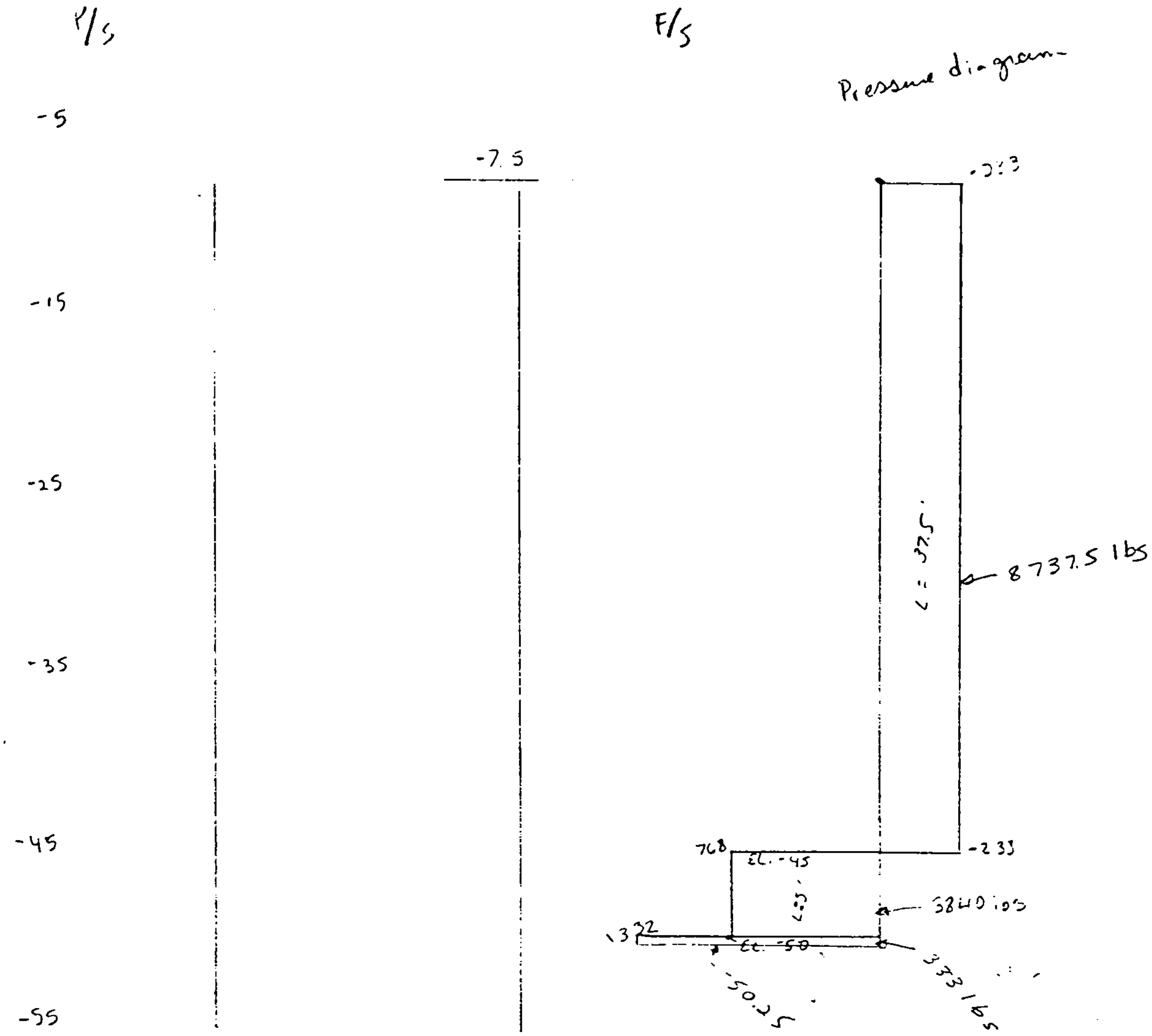
Pile Type	Pile Tip Elevation	Estimated Allowable Single Pile Load Capacity in Tons, Factor of Safety = 2.0: Compression	Tension
14-in. square, precast, prestressed concrete	-70	18	12
	-82	30	22
16-in square, precast, prestressed concrete	-70	21	14
	-82	34 (7?)	25 (56 k)

PRELIMINARY

Note: 1) Top of pile at el -7.5.
2) Capacity contribution to el -50 has been ignored.

CPGA INPUT:

```
10  BC#2 FRONTAL PROTECTION T-WALL
20  PROP 4030 3201 3201 196 2 0 ALL
30  ES L 83 ALL
40  PIN ALL
50  DLS S 60 24 600.2 223.1 132.6 1510.0 [illegible] H 1N AL
60  ASC S 196 457 0.8160 0.8560 2.0 0.0 ALL
70  BAT 2 ALL
80  ANGLE 0 OUT
90  ANGLE 180 OUT
100 PILE 1 0
110 2 0
120 3 0
130 4 0
140 5 0
150 6 0
160 7 0
170 8 0
180 9 0
190 10 0
200 11 0
210 12 0
220 13 0
230 14 0
240 15 0
250 16 0
260 17 0
270 18 0
280 19 0
290 20 0
300 LOAD 1 843 0 1040 0 -6325 0
310 LOAD 2 843 0 875 0 -5944 0
320 LOAD 3 786 0 811 0 -6172 0
330 LOAD 4 786 0 670 0 -5853 0
340 LOAD 5 172 0 864 0 -1869 0
350 LOAD 6 92 0 648 0 -892 0
360 FOUT 1 2 3 4 5 6 7 BC2OUT
370 PFO ALL
380 FPL N
```


P/S
F/S
Pressure diagram
-5
-15
-25
-35
-45
-55
-7.5
L = 37.5'
8737.5 lbs
-233
768
El. -45
5840 lbs
1332
El. -50
-50.25
333 lbs

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

MODULUS OF HORIZONTAL SUBGRADE REACTION
REACH 3

ELEVATION IN FEET NGVD	$\frac{K_h \times B}{DC}$
10 to 0	169
0 to -19	155
-19 to -40	167
-40 to -45	178
-45 to -50	222
-56 to -67	311

Where: K_h = Modulus of horizontal subgrade reaction (lbs/in.^{3})

B = Diameter of pile (inches)

C = Reduction factor for cyclic loading

C = 0.5 for cyclic loading
C = 1.0 for initial loading

D = Reduction factor for effect of group action

D	PILE SPACING IN DIRECTION OF LOADING
1.0	8B
0.85	7B
0.7	6B
0.55	5B
0.40	4B
0.25	3B

T-WALL LOADING CASES:

CASE I: STATIC WATER PRESSURE TO SWL, NO WIND, IMPERVIOUS SHEET PILE CUTOFF (100% FORCES)

CASE II: STATIC WATER PRESSURE TO SWL, NO WIND, PERVIOUS SHEET PILE CUTOFF (100% FORCES)

CASE III: STATIC WATER PRESSURE TO SWL+2', NO WIND, IMPERVIOUS SHEET PILE CUTOFF (75% FORCES)

CASE IV: STATIC WATER PRESSURE TO SWL+2', NO WIND, PERVIOUS SHEET PILE CUTOFF (75% FORCES)

CASE V: WATER @ LOW WATER LEVEL, NO WIND (100% FORCES)

CASE VI: WATER @ LOW WATER LEVEL, WIND FROM P/S (75% FORCES)

DEAD LOADS:

STEM: (~~15'~~ 17')(2')(.150 k/cf) = ~~4.5~~ 5.1 k/FT

BASE: (~~10'~~ 11.5')(2.5')(.150) = ~~5.63~~ 4.31 k/FT

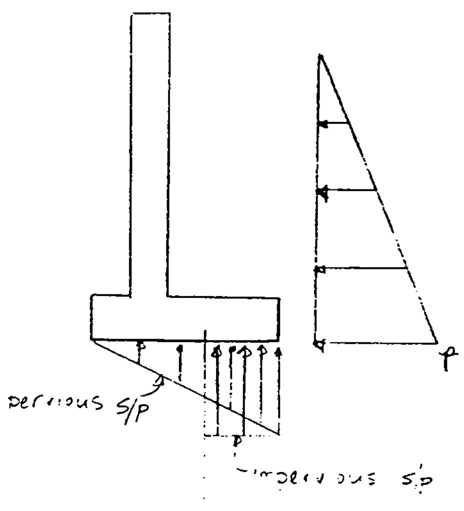
WATER:

@SWL: (~~13~~ 15)(~~6~~ 7.5)(~~.0624~~ .064) = ~~4.87~~ 7.2 k/FT

@SWL+2': (~~15~~ 17)(~~6~~ 7.5)(~~.0624~~ .064) = ~~5.62~~ 8.16 k/FT

@LOW WATER: (5.5)(~~6~~ 7.5)(~~.0654~~ .064) = ~~2.06~~ 2.64 k/FT

WATER LOADS:



@SWL: p = (~~15.5~~ 17.5)(~~.0624~~ .064) = ~~0.97~~ 1.12 k/FT²

@SWL+2' p = (~~17.5~~ 19.5)(~~.0624~~ .064) = ~~1.09~~ 1.25 k/FT²

@ low water p = (8)(~~.0624~~ .064) = ~~0.50~~ 0.51 k/FT²

WIND LOADS:

FROM PROTECTED SIDE:
WIND ABOVE EL. 0: (50 psf)(~~9.5'~~ 11.5') = ~~0.475~~ 0.575 klf

JN 3004 | ALGIERS CANAL | AAH | 11-18-97

T-WALL FORCE TABULATION

7+

No.	DESCRIPTION	FORCES (KIPS) Fx	Fy	Fz	LEVER ARM (FT) x	y	z	MOMENTS (FT·K) Mxx	Myy	Mzz
I	DEAD LOADS									
	(a) STEM			5.1	+2.75				-14.02	
	(b) BASE			4.31	0'				-0	
	(c) SWL			7.2	-2'				+14.4	
	(d) SWL+2'			8.16	-2'				+16.32	
	(e) LOW WATER			2.64	-2'				+5.28	
II	WATER LOADS									
	(a) SWL									
	(½)(1.12)(17.5)	9.8					-5.83		-57.13	
	buoyancy:									
	imp: (1.12)(4)			-4.48	-3.75				-16.8	
	per: (½)(1.12)(11.5)			-6.44	-1.92				-12.36	
	(b) SWL+2'									
	(½)(1.25)(19.5)	12.19					-6.5		-79.24	
	buoyancy:									
	imp: (1.25)(4)			-5.0	-3.75				-18.75	
	per: (½)(1.25)(11.5)			-7.19	-1.92				-13.80	
	(c) Low Water									
	(½)(0.51)(8)	2.0					-2.67		-5.34	
	buoyancy									
	imp: (0.51)(4)			-2.04	-3.75				-7.65	
	per: ½(0.51)(11.5)			-2.93	-1.92				-5.62	
III	WIND									
	(a) from P/5	-0.575					-13.75		+7.91	
IV	LATERAL SOIL PRESSURES (EQU ?) Fig (ANCHOR FORCE, FROM EUSTIS)	-4.6					0.0			
	Sheet Pile Pressures (from Eustis)	9.32 -3.84 -0.33 5.15					+26.5 +39.5 +42.625		+246.98 -151.68 -14.07 +81.25	

SOIL CONSTANT:

-use soil constant below el. -50 N.G.V.D.:

$$\frac{K_h * B}{D\,C} = 311$$

$K_h * B = ES$

$C = 1.0$

D = Reduction for group action.

Pile Spacing: 9'

$$\frac{9*12}{14} = 7.7$$

$D = .85 + 0.7(0.15)$
$= 0.96$

$ES = 311(1.0)(.96)$
$= 298.56$ psi
$= 0.298$ ksi

LOAD COMBINATIONS

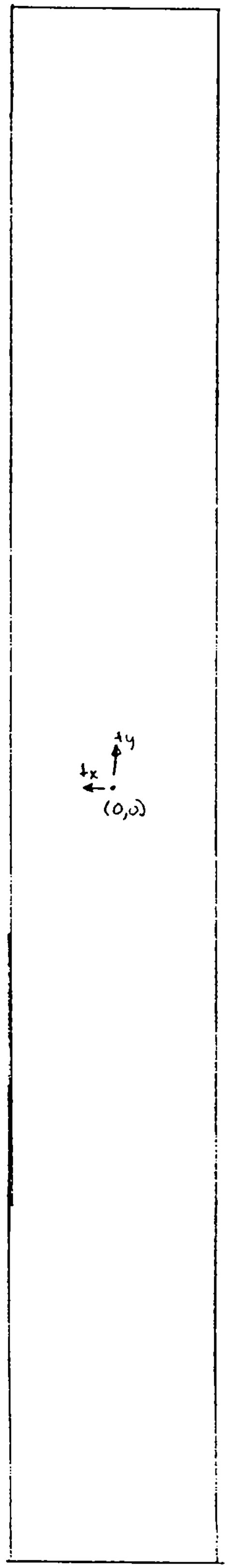
LOADING CASE	DESCRIPTION		FORCES F_x	FORCES F_z	MOMENTS M_{yy}
I	DL, SWL, IMP 100%	DL		+16.61	+0.38
		SWL	+9.8		-57.13
		IMP		-4.48	-16.80
		TOTAL	+9.8	+12.13	-73.55
		FOR 86':	+842.8	+1043.18	-6325.3
II	DL, SWL, PER 100%	DL		+16.61	+0.38
		SWL	+9.8		-57.13
		PER.		-6.44	-12.36
		TOTAL	+9.8	+10.17	-69.11
		FOR 86':	+842.8	+874.62	-5943.46
III	DL, SWL+2', IMP 75%	DL		+17.57	+2.30
		SWL+2'	+12.19		-79.24
		IMP		-5.0	-18.75
		TOTAL	+12.19	+12.57	-95.69
		75% TOTAL	+9.14	+9.43	-71.77
		FOR 86':	+786.04	+810.98	-6172.22
IV	DL, SWL+2', PER. 75%	DL		+17.57	+2.30
		SWL+2'	+12.19		-79.24
		PER.		-7.19	-13.80
		TOTAL	+12.19	+10.38	-90.74
		75% TOTAL	+9.14	+7.79	-68.06
		FOR 86':	+786.04	+669.94	-5853.16
V	DL, LOW WATER, IMP. 100%	DL		+12.05	-8.74
		LW	+2.0		-5.34
		IMP		-2.0	-7.65
		TOTAL	+2.0	+10.05	-21.73
		FOR 86':	+172	+864.3	-1868.78
VI	DL, LW, IMP, WIND 75%	DL		+12.05	-8.74
		LW	+2.0		-5.34
		IMP		-2.0	-7.65
		WIND	-0.58		+7.91
		TOTAL	+1.42	+10.05	-13.82
		75% TOTAL	+1.07	+7.54	-10.37
		FOR 86':	+92.02	+648.44	-891.82

JN 3004 | ALGIERS CANAL | AAH | 12-11-97

PILE LAYOUT

P/S

F/S

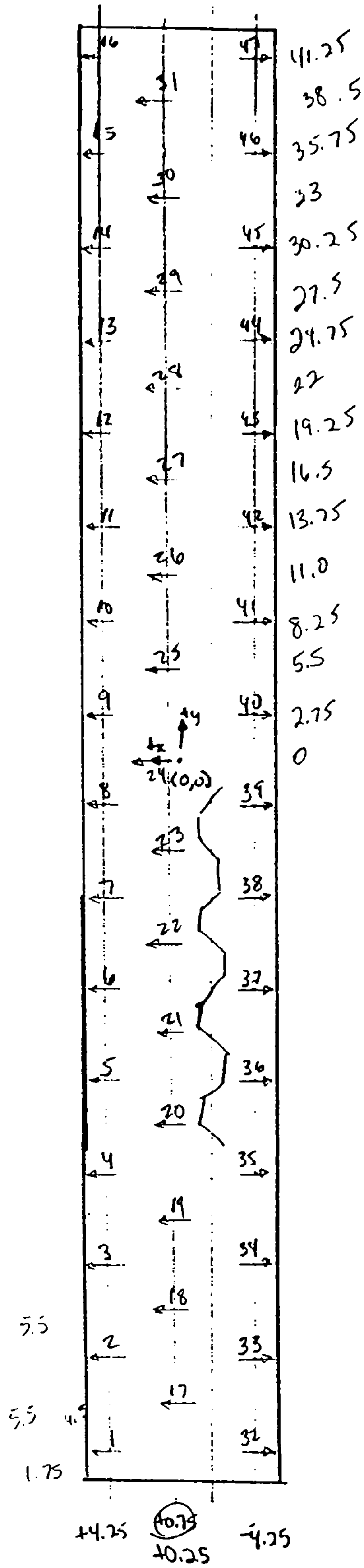


JN 3004 | ALGIERS CANAL | AAH | 12-11-97

PILE LAYOUT

P/S

F/S



```
1010 BELLE CHASSE NO. 2 FRONTAL PROTECTION T-WALL
1020 PROP 4030 3201 3201 196 2 0 ALL
1030 SOIL ES 0.298 LEN 83 0 ALL
1040 PIN ALL
1050 DLS S 67 49 600.2 223.1 1326 1510 1166.8 H 14 ALL
1060 ASC S 196 457 0.816 0.856 2 0 ALL
1070 BATTER 2 ALL
1080 ANGLE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 12 13 14 15 16
1085 ANGLE 0 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
1090 ANGLE 180 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
1100 PILE        1       4.25      -41.25  0
1105 PILE        2       4.25      -35.75  0
1110 PILE        3       4.25      -30.25  0
1115 PILE        4       4.25      -24.75  0
1120 PILE        5       4.25      -19.25  0
1125 PILE        6       4.25      -13.75  0
1130 PILE        7       4.25      -8.25   0
1135 PILE        8       4.25      8.25    0
1140 PILE        9       4.25      13.75   0
1145 PILE        10      4.25      19.25   0
1150 PILE        11      4.25      24.75   0
1155 PILE        12      4.25      30.25   0
1160 PILE        13      4.25      35.75   0
1161 PILE        14      4.25      41.25   0
1162 PILE        15      4.25      -2.75   0
1163 PILE        16      4.25      2.75    0
1164 PILE        17      0.25      -38.5   0
1165 PILE        18      0.25      -33.0   0
1166 PILE        19      0.25      -27.5   0
1167 PILE        20      0.25      -22.0   0
1168 PILE        21      0.25      -16.5   0
1169 PILE        22      0.25      -11.0   0
1170 PILE        23      0.25      -5.5    0
1171 PILE        24      0.25      0       0
1172 PILE        25      0.25      5.5     0
1173 PILE        26      0.25      11.0    0
1174 PILE        27      0.25      16.5    0
1175 PILE        28      0.25      22.0    0
1176 PILE        29      0.25      27.5    0
1177 PILE        30      0.25      33.0    0
1178 PILE        31      0.25      38.5    0
1179 PILE        32      -4.25     -41.25  0
1180 PILE        33      -4.25     -35.75  0
1181 PILE        34      -4.25     -30.25  0
1182 PILE        35      -4.25     -24.75  0
1183 PILE        36      -4.25     -19.25  0
1184 PILE        37      -4.25     -13.75  0
1185 PILE        38      -4.25     -8.25   0
1186 PILE        39      -4.25     -2.75   0
1187 PILE        40      -4.25     2.75    0
1188 PILE        41      -4.25     8.75    0
1188 PILE        42      -4.25     13.75   0
1188 PILE        43      -4.25     19.25   0
1188 PILE        44      -4.25     24.75   0
1188 PILE        45      -4.25     30.25   0
1188 PILE        46      -4.25     35.75   0
1188 PILE        47      -4.25     41.25   0
1300 LOAD        1       1239      0       1040    0      -6325    0
1310 LOAD        2       1239      0       875     0      -5944    0
1320 LOAD        3       1083      0       811     0      -6172    0
```

- have Tom Strenlam do capacities for -87 N.G.V.D. Pile tip

```
1330 LOAD      4     1083    0     670     0     -5853   0
1340 LOAD      5     588     0     864     0     -1869   0
1350 LOAD      6     389     0     648     0     -892    0
1360 FOUT      1     2       3     4       5     6       7 BC2OUT
1370 PFO ALL
1380 FPL N
```

```
********************************
* CORPS PROGRAM  #  X0080      *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-A  *   RUN DATE 12-11-97    RUN TIME 14:12:21
********************************
```

BELLE CHASSE NO. 2 FRONTAL PROTECTION T-WALL

THERE ARE 47 PILES AND
6 LOAD CASES IN THIS RUN.

```
ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                      X           Y           Z
                                    -----       -----       -----
WITH DIAGONAL COORDINATES = (       -4.25 ,    -41.25 ,       .00 )
                            (        4.25 ,     41.25 ,       .00 )
```

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40300E+04	.32010E+04	.32010E+04	.19600E+03	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.29800E+00	L	.83000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	4.25	-41.25	.00	2.00	.00	83.00	P
2	4.25	-35.75	.00	2.00	.00	83.00	P
3	4.25	-30.25	.00	2.00	.00	83.00	P
4	4.25	-24.75	.00	2.00	.00	83.00	P
5	4.25	-19.25	.00	2.00	.00	83.00	P
6	4.25	-13.75	.00	2.00	.00	83.00	P

7	4.25	-8.25	.00	2.00	.00	83.00	P
8	4.25	8.25	.00	2.00	.00	83.00	P
9	4.25	13.75	.00	2.00	.00	83.00	P
10	4.25	19.25	.00	2.00	.00	83.00	P
11	4.25	24.75	.00	2.00	.00	83.00	P
12	4.25	30.25	.00	2.00	.00	83.00	P
13	4.25	35.75	.00	2.00	.00	83.00	P
14	4.25	41.25	.00	2.00	.00	83.00	P
15	4.25	-2.75	.00	2.00	.00	83.00	P
16	4.25	2.75	.00	2.00	.00	83.00	P
17	.25	-38.50	.00	2.00	.00	83.00	P
18	.25	-33.00	.00	2.00	.00	83.00	P
19	.25	-27.50	.00	2.00	.00	83.00	P
20	.25	-22.00	.00	2.00	.00	83.00	P
21	.25	-16.50	.00	2.00	.00	83.00	P
22	.25	-11.00	.00	2.00	.00	83.00	P
23	.25	-5.50	.00	2.00	.00	83.00	P
24	.25	.00	.00	2.00	.00	83.00	P
25	.25	5.50	.00	2.00	.00	83.00	P
26	.25	11.00	.00	2.00	.00	83.00	P
27	.25	16.50	.00	2.00	.00	83.00	P
28	.25	22.00	.00	2.00	.00	83.00	P
29	.25	27.50	.00	2.00	.00	83.00	P
30	.25	33.00	.00	2.00	.00	83.00	P
31	.25	38.50	.00	2.00	.00	83.00	P
32	-4.25	-41.25	.00	2.00	180.00	83.00	P
33	-4.25	-35.75	.00	2.00	180.00	83.00	P
34	-4.25	-30.25	.00	2.00	180.00	83.00	P
35	-4.25	-24.75	.00	2.00	180.00	83.00	P
36	-4.25	-19.25	.00	2.00	180.00	83.00	P
37	-4.25	-13.75	.00	2.00	180.00	83.00	P
38	-4.25	-8.25	.00	2.00	180.00	83.00	P
39	-4.25	-2.75	.00	2.00	180.00	83.00	P
40	-4.25	2.75	.00	2.00	180.00	83.00	P
41	-4.25	8.75	.00	2.00	180.00	83.00	P
42	-4.25	13.75	.00	2.00	180.00	83.00	P
43	-4.25	19.25	.00	2.00	180.00	83.00	P
44	-4.25	24.75	.00	2.00	180.00	83.00	P
45	-4.25	30.25	.00	2.00	180.00	83.00	P
46	-4.25	35.75	.00	2.00	180.00	83.00	P
47	-4.25	41.25	.00	2.00	180.00	83.00	P

						3901.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	1239.0	.0	1040.0	.0	-6325.0	.0
2	1239.0	.0	875.0	.0	-5944.0	.0
3	1083.0	.0	811.0	.0	-6172.0	.0
4	1083.0	.0	670.0	.0	-5853.0	.0
5	588.0	.0	864.0	.0	-1869.0	.0
6	389.0	.0	648.0	.0	-892.0	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.15552E+05	.43894E-03	.94141E+04	-.37659E+04	-.10525E+07	-.19854E+04
.43894E-03	.80333E+03	-.87787E-03	-.32919E-03	-.44771E-01	.76915E+03
.94141E+04	-.87787E-03	.59798E+05	.76337E+04	-.57253E+05	.37659E+04
-.37659E+04	-.32920E-03	.76337E+04	.53220E+10	.38932E+06	-.76471E+09
-.10525E+07	-.44771E-01	-.57253E+05	.38931E+06	.10607E+09	.19205E+06
-.19855E+04	.76915E+03	.37659E+04	-.76471E+09	.19205E+06	.13856E+10

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 16.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 16.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 16.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 16.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 16.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 16.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.8897E-01	-.1596E-06	.3548E-02	.6414E-07	.1691E-03	.1298E-06
2	.1072E+00	-.1764E-06	-.1877E-02	.7063E-07	.3906E-03	.1436E-06
3	.6158E-01	-.1531E-06	.3786E-02	.6221E-07	-.8515E-04	.1241E-06
4	.7699E-01	-.1674E-06	-.8199E-03	.6777E-07	.1014E-03	.1359E-06
5	.6301E-01	-.2982E-07	.4928E-02	.1065E-07	.4164E-03	.2505E-07
6	.4942E-01	-.9800E-08	.3432E-02	.2676E-08	.3913E-03	.8728E-08

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
2	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#

3	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
4	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
5	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
6	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
7	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
8	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
9	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
10	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
11	1.4	.0	55.9	.0	-51.6	.0	.83	.34	1.25	.99	#
12	1.4	.0	55.9	.0	-51.6	.0	.83	.34	1.25	.99	#
13	1.4	.0	55.9	.0	-51.6	.0	.83	.34	1.25	.99	#
14	1.4	.0	55.9	.0	-51.6	.0	.83	.34	1.25	.99	#
15	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
16	1.4	.0	55.9	.0	-51.7	.0	.83	.34	1.25	.99	#
17	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
18	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
19	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
20	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
21	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
22	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
23	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
24	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
25	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
26	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
27	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
28	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
29	1.3	.0	67.4	.0	-49.4	.0	1.01	.36	1.31	1.05	#
30	1.3	.0	67.4	.0	-49.3	.0	1.01	.36	1.31	1.05	#
31	1.3	.0	67.4	.0	-49.3	.0	1.01	.36	1.31	1.05	#
32	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
33	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
34	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
35	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
36	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
37	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
38	-1.5	.0	-45.9	.0	53.7	.0	.94	.68	.74	.46	
39	-1.5	.0	-45.8	.0	53.7	.0	.94	.68	.74	.46	
40	-1.5	.0	-45.8	.0	53.7	.0	.94	.68	.74	.46	
41	-1.5	.0	-45.8	.0	53.7	.0	.94	.68	.74	.46	
42	-1.5	.0	-45.8	.0	53.7	.0	.93	.68	.74	.46	
43	-1.5	.0	-45.8	.0	53.7	.0	.93	.68	.74	.46	
44	-1.5	.0	-45.8	.0	53.7	.0	.93	.68	.74	.46	
45	-1.5	.0	-45.8	.0	53.7	.0	.93	.68	.74	.47	
46	-1.5	.0	-45.8	.0	53.7	.0	.93	.68	.74	.47	
47	-1.5	.0	-45.7	.0	53.6	.0	.93	.68	.74	.47	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	1.8	.0	45.1	.0	-66.8	.0	.67	.33	1.23	.90
2	1.8	.0	45.1	.0	-66.8	.0	.67	.33	1.23	.90
3	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90
4	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90
5	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90
6	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90
7	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90
8	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90

9	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
10	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
11	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
12	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
13	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
14	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
15	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
16	1.8	.0	45.1	.0	-66.7	.0	.67	.33	1.23	.90	
17	1.7	.0	71.7	.0	-61.5	.0	1.07	.37	1.36	1.05	#
18	1.7	.0	71.7	.0	-61.5	.0	1.07	.37	1.36	1.05	#
19	1.7	.0	71.7	.0	-61.5	.0	1.07	.37	1.36	1.05	#
20	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
21	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
22	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
23	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
24	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
25	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
26	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
27	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
28	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
29	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
30	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
31	1.7	.0	71.7	.0	-61.4	.0	1.07	.37	1.36	1.05	#
32	-1.8	.0	-50.6	.0	65.7	.0	1.03	.76	.74	.41	
33	-1.8	.0	-50.6	.0	65.7	.0	1.03	.76	.74	.41	
34	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
35	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
36	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
37	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
38	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
39	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
40	-1.8	.0	-50.5	.0	65.7	.0	1.03	.76	.74	.41	
41	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.41	
42	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.42	
43	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.42	
44	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.42	
45	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.42	
46	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.42	
47	-1.8	.0	-50.4	.0	65.6	.0	1.03	.76	.74	.42	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
2	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
3	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
4	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
5	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
6	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
7	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
8	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
9	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
10	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
11	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
12	.9	.0	55.2	.0	-32.4	.0	.82	.34	1.21	1.03	#
13	.9	.0	55.2	.0	-32.4	.0	.82	.34	1.21	1.03	#
14	.9	.0	55.2	.0	-32.4	.0	.82	.34	1.21	1.03	#

15	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
16	.9	.0	55.2	.0	-32.5	.0	.82	.34	1.21	1.03	#
17	.9	.0	49.4	.0	-33.7	.0	.74	.33	1.18	.99	#
18	.9	.0	49.4	.0	-33.7	.0	.74	.33	1.18	.99	#
19	.9	.0	49.4	.0	-33.7	.0	.74	.33	1.18	.99	#
20	.9	.0	49.4	.0	-33.7	.0	.74	.33	1.18	.99	#
21	.9	.0	49.4	.0	-33.7	.0	.74	.33	1.18	.99	#
22	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
23	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
24	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
25	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
26	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
27	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
28	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
29	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
30	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
31	.9	.0	49.4	.0	-33.6	.0	.74	.33	1.18	.99	#
32	-.9	.0	-44.6	.0	34.6	.0	.91	.62	.70	.51	
33	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
34	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
35	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
36	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
37	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
38	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
39	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
40	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
41	-.9	.0	-44.5	.0	34.6	.0	.91	.62	.70	.51	
42	-.9	.0	-44.4	.0	34.6	.0	.91	.62	.70	.51	
43	-.9	.0	-44.4	.0	34.6	.0	.91	.62	.71	.51	
44	-.9	.0	-44.4	.0	34.6	.0	.91	.62	.71	.51	
45	-.9	.0	-44.4	.0	34.6	.0	.91	.62	.71	.51	
46	-.9	.0	-44.4	.0	34.6	.0	.91	.62	.71	.51	
47	-.9	.0	-44.4	.0	34.6	.0	.91	.62	.71	.51	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
2	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
3	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
4	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
5	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
6	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
7	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
8	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
9	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
10	1.2	.0	46.1	.0	-45.1	.0	.69	.32	1.19	.95	#
11	1.2	.0	46.1	.0	-45.1	.0	.69	.32	1.19	.95	#
12	1.2	.0	46.1	.0	-45.1	.0	.69	.32	1.19	.95	#
13	1.2	.0	46.1	.0	-45.1	.0	.69	.32	1.19	.95	#
14	1.2	.0	46.1	.0	-45.1	.0	.69	.32	1.19	.95	#
15	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
16	1.2	.0	46.1	.0	-45.2	.0	.69	.32	1.19	.95	#
17	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
18	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
19	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
20	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#

21	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
22	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
23	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
24	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
25	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
26	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
27	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
28	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
29	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
30	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
31	1.2	.0	53.0	.0	-43.8	.0	.79	.34	1.22	.99	#
32	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
33	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
34	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
35	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
36	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
37	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
38	-1.2	.0	-48.5	.0	44.7	.0	.99	.69	.71	.47	
39	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
40	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
41	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
42	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
43	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
44	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
45	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
46	-1.2	.0	-48.4	.0	44.7	.0	.99	.69	.71	.47	
47	-1.2	.0	-48.3	.0	44.7	.0	.99	.69	.71	.47	

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
2	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
3	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
4	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
5	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
6	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
7	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
8	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
9	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
10	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
11	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
12	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
13	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
14	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
15	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
16	1.1	.0	21.6	.0	-40.2	.0	.32	.29	1.05	.84	
17	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
18	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
19	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
20	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
21	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
22	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
23	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
24	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
25	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
26	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#

27	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
28	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
29	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
30	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
31	.9	.0	49.9	.0	-34.5	.0	.74	.33	1.19	1.00	#
32	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
33	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
34	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
35	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
36	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
37	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
38	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
39	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
40	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
41	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
42	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
43	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
44	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
45	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
46	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	
47	-1.2	.0	-7.6	.0	43.0	.0	.15	.19	.91	.68	

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
2	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
3	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
4	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
5	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
6	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
7	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
8	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
9	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
10	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
11	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
12	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
13	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
14	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
15	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
16	.9	.0	11.6	.0	-32.6	.0	.17	.28	.99	.80	
17	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
18	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
19	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
20	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
21	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
22	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
23	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
24	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
25	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
26	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
27	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
28	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
29	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
30	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
31	.7	.0	38.3	.0	-27.3	.0	.57	.31	1.11	.95	#
32	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73	

33	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
34	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
35	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
36	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
37	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
38	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
39	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
40	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
41	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
42	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
43	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
44	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
45	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
46	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73
47	-.9	.0	-1.9	.0	34.5	.0	.04	.10	.92	.73

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	26.3	.0	49.4	.0	.0	.0
2	26.3	.0	49.4	.0	.0	.0
3	26.3	.0	49.4	.0	.0	.0
4	26.3	.0	49.4	.0	.0	.0
5	26.3	.0	49.4	.0	.0	.0
6	26.3	.0	49.4	.0	.0	.0
7	26.3	.0	49.4	.0	.0	.0
8	26.3	.0	49.4	.0	.0	.0
9	26.3	.0	49.4	.0	.0	.0
10	26.3	.0	49.4	.0	.0	.0
11	26.3	.0	49.4	.0	.0	.0
12	26.3	.0	49.4	.0	.0	.0
13	26.3	.0	49.4	.0	.0	.0
14	26.3	.0	49.4	.0	.0	.0
15	26.3	.0	49.4	.0	.0	.0
16	26.3	.0	49.4	.0	.0	.0
17	31.3	.0	59.7	.0	.0	.0
18	31.3	.0	59.7	.0	.0	.0
19	31.3	.0	59.7	.0	.0	.0
20	31.3	.0	59.7	.0	.0	.0
21	31.3	.0	59.7	.0	.0	.0
22	31.3	.0	59.7	.0	.0	.0
23	31.3	.0	59.7	.0	.0	.0
24	31.3	.0	59.7	.0	.0	.0
25	31.3	.0	59.7	.0	.0	.0
26	31.3	.0	59.7	.0	.0	.0
27	31.3	.0	59.7	.0	.0	.0
28	31.3	.0	59.7	.0	.0	.0
29	31.3	.0	59.7	.0	.0	.0
30	31.3	.0	59.7	.0	.0	.0
31	31.3	.0	59.7	.0	.0	.0
32	21.8	.0	-40.4	.0	.0	.0

33	21.8	.0	-40.4	.0	.0	.0
34	21.8	.0	-40.4	.0	.0	.0
35	21.8	.0	-40.4	.0	.0	.0
36	21.8	.0	-40.4	.0	.0	.0
37	21.8	.0	-40.4	.0	.0	.0
38	21.8	.0	-40.4	.0	.0	.0
39	21.8	.0	-40.4	.0	.0	.0
40	21.8	.0	-40.3	.0	.0	.0
41	21.8	.0	-40.3	.0	.0	.0
42	21.8	.0	-40.3	.0	.0	.0
43	21.8	.0	-40.3	.0	.0	.0
44	21.8	.0	-40.3	.0	.0	.0
45	21.8	.0	-40.3	.0	.0	.0
46	21.8	.0	-40.3	.0	.0	.0
47	21.8	.0	-40.3	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	21.8	.0	39.6	.0	.0	.0
2	21.8	.0	39.6	.0	.0	.0
3	21.8	.0	39.6	.0	.0	.0
4	21.8	.0	39.6	.0	.0	.0
5	21.8	.0	39.6	.0	.0	.0
6	21.8	.0	39.6	.0	.0	.0
7	21.8	.0	39.6	.0	.0	.0
8	21.8	.0	39.6	.0	.0	.0
9	21.8	.0	39.6	.0	.0	.0
10	21.8	.0	39.6	.0	.0	.0
11	21.8	.0	39.6	.0	.0	.0
12	21.8	.0	39.6	.0	.0	.0
13	21.8	.0	39.6	.0	.0	.0
14	21.8	.0	39.6	.0	.0	.0
15	21.8	.0	39.6	.0	.0	.0
16	21.8	.0	39.6	.0	.0	.0
17	33.6	.0	63.4	.0	.0	.0
18	33.6	.0	63.4	.0	.0	.0
19	33.6	.0	63.4	.0	.0	.0
20	33.6	.0	63.4	.0	.0	.0
21	33.6	.0	63.4	.0	.0	.0
22	33.6	.0	63.4	.0	.0	.0
23	33.6	.0	63.4	.0	.0	.0
24	33.6	.0	63.4	.0	.0	.0
25	33.6	.0	63.4	.0	.0	.0
26	33.6	.0	63.4	.0	.0	.0
27	33.6	.0	63.4	.0	.0	.0
28	33.6	.0	63.4	.0	.0	.0
29	33.6	.0	63.4	.0	.0	.0
30	33.6	.0	63.4	.0	.0	.0
31	33.6	.0	63.4	.0	.0	.0
32	24.2	.0	-44.4	.0	.0	.0
33	24.2	.0	-44.4	.0	.0	.0
34	24.2	.0	-44.4	.0	.0	.0
35	24.2	.0	-44.4	.0	.0	.0
36	24.2	.0	-44.4	.0	.0	.0
37	24.2	.0	-44.4	.0	.0	.0
38	24.2	.0	-44.4	.0	.0	.0

39	24.2	.0	-44.4	.0	.0	.0
40	24.2	.0	-44.3	.0	.0	.0
41	24.1	.0	-44.3	.0	.0	.0
42	24.1	.0	-44.3	.0	.0	.0
43	24.1	.0	-44.3	.0	.0	.0
44	24.1	.0	-44.3	.0	.0	.0
45	24.1	.0	-44.3	.0	.0	.0
46	24.1	.0	-44.3	.0	.0	.0
47	24.1	.0	-44.3	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	25.5	.0	49.0	.0	.0	.0
2	25.5	.0	49.0	.0	.0	.0
3	25.5	.0	49.0	.0	.0	.0
4	25.5	.0	49.0	.0	.0	.0
5	25.5	.0	49.0	.0	.0	.0
6	25.5	.0	49.0	.0	.0	.0
7	25.5	.0	49.0	.0	.0	.0
8	25.5	.0	49.0	.0	.0	.0
9	25.5	.0	49.0	.0	.0	.0
10	25.5	.0	49.0	.0	.0	.0
11	25.5	.0	49.0	.0	.0	.0
12	25.5	.0	49.0	.0	.0	.0
13	25.5	.0	49.0	.0	.0	.0
14	25.5	.0	49.0	.0	.0	.0
15	25.5	.0	49.0	.0	.0	.0
16	25.5	.0	49.0	.0	.0	.0
17	22.9	.0	43.8	.0	.0	.0
18	22.9	.0	43.8	.0	.0	.0
19	22.9	.0	43.8	.0	.0	.0
20	22.9	.0	43.8	.0	.0	.0
21	22.9	.0	43.8	.0	.0	.0
22	22.9	.0	43.8	.0	.0	.0
23	22.9	.0	43.8	.0	.0	.0
24	22.9	.0	43.8	.0	.0	.0
25	22.9	.0	43.8	.0	.0	.0
26	22.9	.0	43.8	.0	.0	.0
27	22.9	.0	43.8	.0	.0	.0
28	22.9	.0	43.8	.0	.0	.0
29	22.9	.0	43.8	.0	.0	.0
30	22.9	.0	43.8	.0	.0	.0
31	22.9	.0	43.8	.0	.0	.0
32	20.8	.0	-39.4	.0	.0	.0
33	20.8	.0	-39.4	.0	.0	.0
34	20.8	.0	-39.4	.0	.0	.0
35	20.8	.0	-39.4	.0	.0	.0
36	20.7	.0	-39.4	.0	.0	.0
37	20.7	.0	-39.4	.0	.0	.0
38	20.7	.0	-39.4	.0	.0	.0
39	20.7	.0	-39.4	.0	.0	.0
40	20.7	.0	-39.4	.0	.0	.0
41	20.7	.0	-39.3	.0	.0	.0
42	20.7	.0	-39.3	.0	.0	.0
43	20.7	.0	-39.3	.0	.0	.0
44	20.7	.0	-39.3	.0	.0	.0

45	20.7	.0	-39.3	.0	.0	.0
46	20.7	.0	-39.3	.0	.0	.0
47	20.7	.0	-39.3	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	21.7	.0	40.7	.0	.0	.0
2	21.7	.0	40.7	.0	.0	.0
3	21.7	.0	40.7	.0	.0	.0
4	21.7	.0	40.7	.0	.0	.0
5	21.7	.0	40.7	.0	.0	.0
6	21.7	.0	40.7	.0	.0	.0
7	21.7	.0	40.7	.0	.0	.0
8	21.7	.0	40.7	.0	.0	.0
9	21.7	.0	40.7	.0	.0	.0
10	21.7	.0	40.7	.0	.0	.0
11	21.7	.0	40.7	.0	.0	.0
12	21.7	.0	40.7	.0	.0	.0
13	21.7	.0	40.7	.0	.0	.0
14	21.7	.0	40.7	.0	.0	.0
15	21.7	.0	40.7	.0	.0	.0
16	21.7	.0	40.7	.0	.0	.0
17	24.8	.0	46.9	.0	.0	.0
18	24.8	.0	46.9	.0	.0	.0
19	24.8	.0	46.9	.0	.0	.0
20	24.8	.0	46.9	.0	.0	.0
21	24.8	.0	46.9	.0	.0	.0
22	24.8	.0	46.9	.0	.0	.0
23	24.8	.0	46.9	.0	.0	.0
24	24.8	.0	46.9	.0	.0	.0
25	24.8	.0	46.9	.0	.0	.0
26	24.8	.0	46.9	.0	.0	.0
27	24.8	.0	46.9	.0	.0	.0
28	24.8	.0	46.9	.0	.0	.0
29	24.8	.0	46.9	.0	.0	.0
30	24.8	.0	46.9	.0	.0	.0
31	24.8	.0	46.9	.0	.0	.0
32	22.8	.0	-42.9	.0	.0	.0
33	22.8	.0	-42.9	.0	.0	.0
34	22.8	.0	-42.8	.0	.0	.0
35	22.8	.0	-42.8	.0	.0	.0
36	22.8	.0	-42.8	.0	.0	.0
37	22.8	.0	-42.8	.0	.0	.0
38	22.8	.0	-42.8	.0	.0	.0
39	22.7	.0	-42.8	.0	.0	.0
40	22.7	.0	-42.8	.0	.0	.0
41	22.7	.0	-42.8	.0	.0	.0
42	22.7	.0	-42.8	.0	.0	.0
43	22.7	.0	-42.7	.0	.0	.0
44	22.7	.0	-42.7	.0	.0	.0
45	22.7	.0	-42.7	.0	.0	.0
46	22.7	.0	-42.7	.0	.0	.0
47	22.7	.0	-42.7	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	10.6	.0	18.8	.0	.0	.0
2	10.6	.0	18.8	.0	.0	.0
3	10.6	.0	18.8	.0	.0	.0
4	10.6	.0	18.8	.0	.0	.0
5	10.6	.0	18.8	.0	.0	.0
6	10.6	.0	18.8	.0	.0	.0
7	10.6	.0	18.8	.0	.0	.0
8	10.6	.0	18.8	.0	.0	.0
9	10.6	.0	18.8	.0	.0	.0
10	10.6	.0	18.8	.0	.0	.0
11	10.6	.0	18.8	.0	.0	.0
12	10.6	.0	18.8	.0	.0	.0
13	10.6	.0	18.8	.0	.0	.0
14	10.6	.0	18.8	.0	.0	.0
15	10.6	.0	18.8	.0	.0	.0
16	10.6	.0	18.8	.0	.0	.0
17	23.2	.0	44.2	.0	.0	.0
18	23.2	.0	44.2	.0	.0	.0
19	23.2	.0	44.2	.0	.0	.0
20	23.2	.0	44.2	.0	.0	.0
21	23.2	.0	44.2	.0	.0	.0
22	23.2	.0	44.2	.0	.0	.0
23	23.2	.0	44.2	.0	.0	.0
24	23.2	.0	44.2	.0	.0	.0
25	23.2	.0	44.2	.0	.0	.0
26	23.2	.0	44.2	.0	.0	.0
27	23.2	.0	44.2	.0	.0	.0
28	23.2	.0	44.2	.0	.0	.0
29	23.2	.0	44.2	.0	.0	.0
30	23.2	.0	44.2	.0	.0	.0
31	23.2	.0	44.2	.0	.0	.0
32	4.4	.0	-6.3	.0	.0	.0
33	4.4	.0	-6.3	.0	.0	.0
34	4.4	.0	-6.3	.0	.0	.0
35	4.4	.0	-6.3	.0	.0	.0
36	4.4	.0	-6.3	.0	.0	.0
37	4.4	.0	-6.3	.0	.0	.0
38	4.4	.0	-6.3	.0	.0	.0
39	4.4	.0	-6.3	.0	.0	.0
40	4.4	.0	-6.3	.0	.0	.0
41	4.4	.0	-6.3	.0	.0	.0
42	4.4	.0	-6.2	.0	.0	.0
43	4.4	.0	-6.2	.0	.0	.0
44	4.4	.0	-6.2	.0	.0	.0
45	4.4	.0	-6.2	.0	.0	.0
46	4.4	.0	-6.2	.0	.0	.0
47	4.4	.0	-6.2	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	6.0	.0	10.0	.0	.0	.0
2	6.0	.0	10.0	.0	.0	.0

3	6.0	.0	10.0	.0	.0	.0
4	6.0	.0	10.0	.0	.0	.0
5	6.0	.0	10.0	.0	.0	.0
6	6.0	.0	10.0	.0	.0	.0
7	6.0	.0	10.0	.0	.0	.0
8	6.0	.0	10.0	.0	.0	.0
9	6.0	.0	10.0	.0	.0	.0
10	6.0	.0	10.0	.0	.0	.0
11	6.0	.0	10.0	.0	.0	.0
12	6.0	.0	10.0	.0	.0	.0
13	6.0	.0	10.0	.0	.0	.0
14	6.0	.0	10.0	.0	.0	.0
15	6.0	.0	10.0	.0	.0	.0
16	6.0	.0	10.0	.0	.0	.0
17	17.8	.0	33.9	.0	.0	.0
18	17.8	.0	33.9	.0	.0	.0
19	17.8	.0	33.9	.0	.0	.0
20	17.8	.0	33.9	.0	.0	.0
21	17.8	.0	33.9	.0	.0	.0
22	17.8	.0	33.9	.0	.0	.0
23	17.8	.0	33.9	.0	.0	.0
24	17.8	.0	33.9	.0	.0	.0
25	17.8	.0	33.9	.0	.0	.0
26	17.8	.0	33.9	.0	.0	.0
27	17.8	.0	33.9	.0	.0	.0
28	17.8	.0	33.9	.0	.0	.0
29	17.8	.0	33.9	.0	.0	.0
30	17.8	.0	33.9	.0	.0	.0
31	17.8	.0	33.9	.0	.0	.0
32	1.7	.0	-1.3	.0	.0	.0
33	1.7	.0	-1.3	.0	.0	.0
34	1.7	.0	-1.3	.0	.0	.0
35	1.7	.0	-1.3	.0	.0	.0
36	1.7	.0	-1.3	.0	.0	.0
37	1.7	.0	-1.3	.0	.0	.0
38	1.7	.0	-1.3	.0	.0	.0
39	1.7	.0	-1.3	.0	.0	.0
40	1.7	.0	-1.3	.0	.0	.0
41	1.7	.0	-1.3	.0	.0	.0
42	1.7	.0	-1.3	.0	.0	.0
43	1.7	.0	-1.3	.0	.0	.0
44	1.7	.0	-1.3	.0	.0	.0
45	1.7	.0	-1.3	.0	.0	.0
46	1.7	.0	-1.3	.0	.0	.0
47	1.7	.0	-1.3	.0	.0	.0

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PLAQUEMINES PUMP STATION ADDITION:

Stability Analysis w/SWL = 9.5:

FAILURE SURFACE (A)(1) Requires a Vertical Pressure of 1435 psf.

Base slab thickness = 1'-6"

wt = (1.5')(150-91) = 90 psf

floor slab thickness = 1'-0"

wt = (1.0)(150) = 150 psf

Walls:

INTAKE BASIN FRONT WALL:

2' x 15.75' over 32.33'

wt = ((2)(15.75/32.33))(150) = 146 psf

SIDE WALLS:

2@ 2' x 23.25' over 60'

wt = ((2)(2)(23.25/60))(150) = 232.5 psf

total wt = 90 + 150 + 146 + 232.5 = 618.5 psf

Pressure to be taken by tension piles: 1435 - 618.5
= 816.5 psf

- CAN NOT VERIFY TENSION CONNECTORS IN PILES,
∴ REQUIRE NEW T-WALL.

. NEW T-WALL ~ 54' FROM FRONT EDGE OF BLDG.

PLAQUEMINES PUMP STATION - ORIGINAL

FOR FAILURE SURFACE Ⓐ①, REQ'D PRESSURE : 1337 psf
FAILURE SURFACE @ el -23

BASE SLAB THICKNESS = 2'

$wt = (150 - 91)(2) = 118 \text{ psf}$

FLOOR SLAB THICKNESS = 8"

$wt = (8/12)(150) = 100 \text{psf}$

WALLS: 2@ 14" x 23' over 62'-8"

$wt = \frac{2(\frac{14}{12}')(23')(150 \text{ pcf})}{62.67} = 128.4 \text{ psf}$

COLUMNS:
12 @ 14"x18" x 23'
12 @ 14"x22" x 23'
4 @ 16"x 30" x 23'
4 @ 16"x 39" x 23'
4 @ 14"x14" x 23'
over 62'-8' x 78'-2"

$wt = [12(\frac{14}{12})(\frac{18}{12})(23)(150) + 12(\frac{14}{12})(\frac{22}{12})(23)(150) + 4(\frac{16}{12})(\frac{30}{12})(23)(150) + 4(\frac{16}{12})(\frac{39}{12})(23)(150) + 4(\frac{14}{12})(\frac{14}{12})(23)(150)] / 62.67 * 78.167$

$= 58.3 \text{psf}$

Total wt = 118 + 100 + 128 + 58 = 404 psf

Pressure to be taken by piles in tension = 1337-404
= 933 psf

Passive wedge area = (62.67')(7') = 438.69 sf

Total load to be taken by piles in tension = $\frac{933(438.69)}{1000} = 409^K$

PILES = 28

Req'd tension per pile = 409/28 = 14.6 K/PILE (2c)

PLAQUEMINES PUMPSTATION (CONT.)

FAILURE SURFACE (B)(4) el -30 - Req'd Pressure = 650 psf

total wt = 404 psf

Pressure to be taken by piles in tension: 650-404 = 246 psf

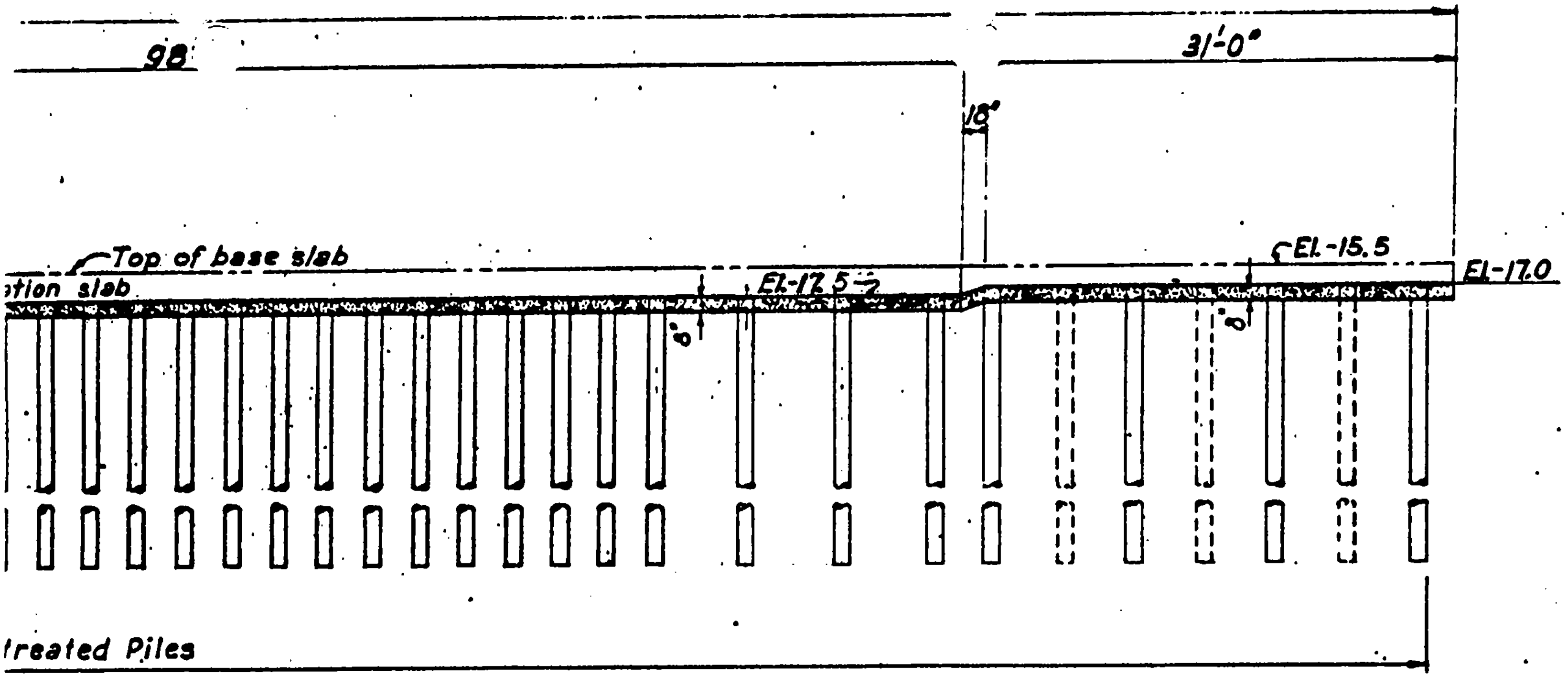
Passive wedge area = (62.67')(14') = 877.38 sf

Total load to be taken by piles in tension:

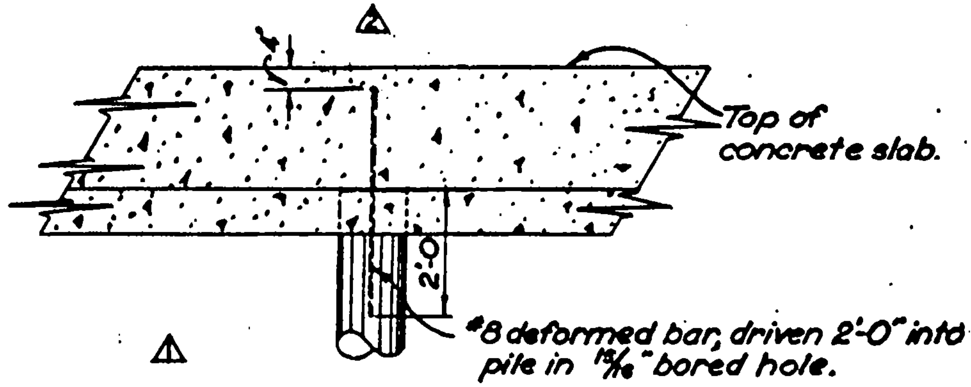
$$\frac{(246)(877.38)}{1000} = 216^K$$

piles = 49

Req'd tension per pile = 216/49 = 4.4 K/pile



A-A



TYPICAL PILE ANCHOR
(For all untreated piles and piles under fuel oil tank supports)
SCALE

NOTE:
Test piles shall be driven to El.-71.0 and test loads indicate d
12 tons per pile the
drawing may be reduc
For estimate purpose
-75.0 has been assum
furnished will be deter
officer after completi
For details of foun

THIS PLAN
CHANGE OF
CONTRACT
eng-1856

REVISION	DATE	
3	9-18-52	Added one pil
2	7-15-52	Revised pile ar
1	5-23-52	Revised in accorda

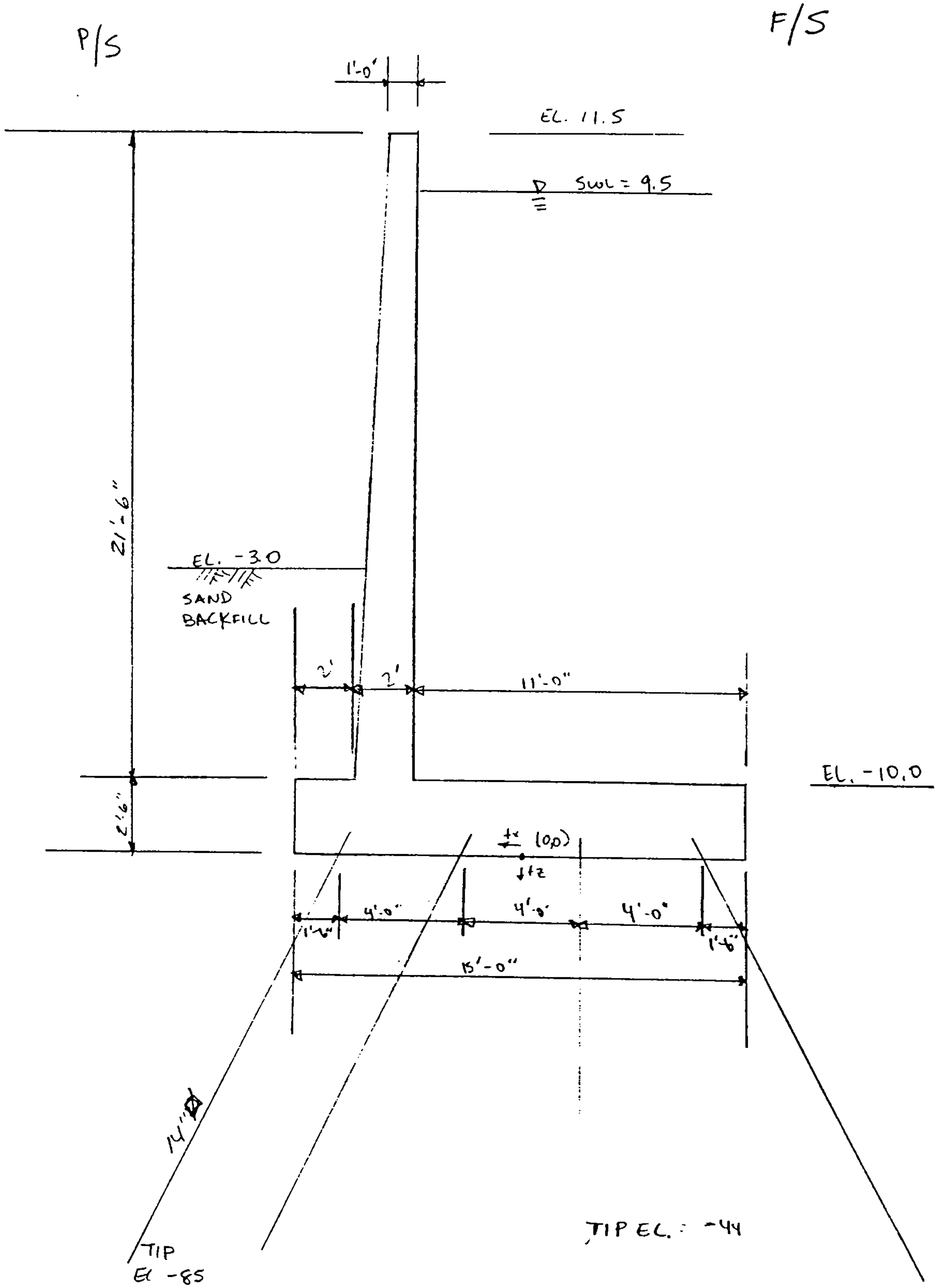
CORPS OF ENGI
OFFICE OF THE
NEW OR

DRAWN BY: J.C.M.
TRACED BY: J.C.M.
CHECKED BY: J.A.D.

INTRACOASTAL
ALGIERS
PLAQUEMINES P.
PILI

SUBMITTED: [signature]
CHIEF, DESIGN BRANCH
APPROVED: [signature]
CHIEF, ENGINEERING DIVISION

ORIGINAL STATION



JN 3004	ALGIERS CANAL	AAH	2-6-98	1

PLAQUEMINES PUMP STATION: (ORIGINAL STATION)
T-WALL IN FRONT OF EXISTING DISCHARGE BASIN SLAB:

- REANALYSIS DUE TO SWL = 9.5 NGVD:

FOR FAILURE SURFACE (A)(1), REQ'D PRESSURE = 1797 psf

DEAD LOAD PRESSURE = 404 psf

PRESSURE TO BE TAKEN BY TENSION PILES = 1797 - 404
= 1393 psf

PASSIVE WEDGE AREA = 438 S.F.

Total load to be taken by tension piles = $\frac{(1393)(438)}{1000}$ = 610^K

PILES = 28

TENSION/PILE = 610/28 = 21.7^K = 10.9^T N.G.

- PUT NEW T-WALL IN FRONT OF DISCHARGE BASIN SLAB.

LOADS:

DEADLOADS:

STEM: ① (1')(21.5)(.150 k/cf) = 3.23 k/FT
② (½)(1)(21.5)(.150) = 1.61 k/FT

BASE: (15')(2.5')(.150) = 5.63 k/FT

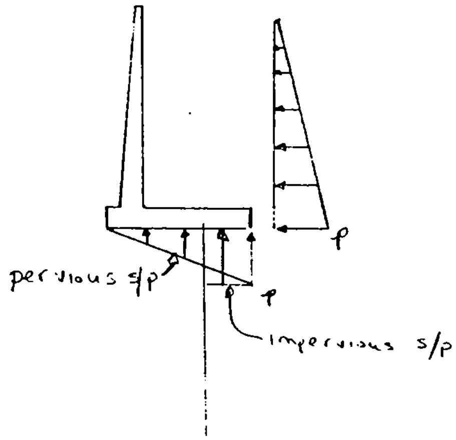
WATER OVER BASE:

@SWL: (11')(19.5')(.064) = 13.73 k/FT
@SWL+2': (11')(21.5')(.064) = 15.14 k/FT
@Low Water: (11')(10')(.064) = 7.04 k/FT

SOIL OVER BASE:

(2')(7')(.120) = 1.68 k/FT

WATER LOADS:



@ SWL: $p = (22)(.064) = 1.41\ ^{K}/_{FT^2}$

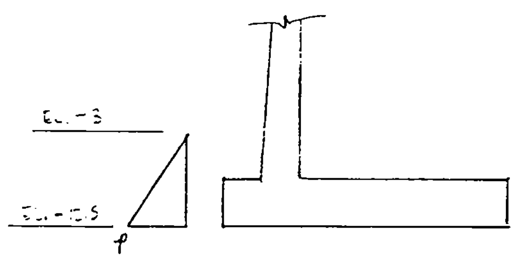
@ SWL + 2': $p = (24)(.064) = 1.54$

@ low water $p = (12.5)(.064) = 0.80$

WIND LOADS:

P/S: WIND above el 0.0: $(50\,psf)(11.5) = 0.575\,klf$

Soil Pressure on P/S: (add w DL)



- Use "at rest" soil pressures:

$p_o = \gamma z K_o$

$K_o = 1 - \sin\phi$
$= 1 - \sin 30$
$= 0.5$

$p_o = (.120)(9.5)(.5)$
$= 0.57$

$P = \frac{1}{2}(.57)(9.5) = 2.71^{K}$ @ $9.5/3 = 3.17'$

T-WALL LOADING CASES:

I: STATIC WATER PRESSURE TO SWL, NO WIND, IMPERVIOUS SHEET PILE CUTOFF (100% FORCES)

II: STATIC WATER PRESSURE TO SWL, NO WIND, PERVIOUS SHEET PILE CUTOFF (100% FORCES)

III: STATIC WATER PRESSURE TO SWL+2', NO WIND, IMPERVIOUS SHEET PILE CUTOFF (75% FORCES)

IV STATIC WATER PRESSURE TO SWL+2', NO WIND, PERVIOUS SHEET PILE CUTOFF (75% FORCES)

V WATER @ LOW WATER LEVEL, NO WIND (100% FORCES)

VI WATER @ LOW WATER LEVEL, WIND FROM P/S (75% FORCES)

T-WALL FORCE TABULATION

DESCRIPTION	FORCES (KIPS) F_x	F_z	LEVER ARM (FT) x	z	MOMENTS ('k) M_{y-y}
DEADLOADS					
STEM(1)		3.23	+4.0		- 12.92
STEM(2)		1.61	+4.83		- 7.78
BASE		5.63	0		
SWL		13.73	-2.0		+ 27.46
SWL+2'		15.14	-2.0		+ 30.28
LOW WATER		7.04	-2.0		+ 14.08
Soil on P/S		1.68	6.5		- 10.92
	-2.71			-3.17	+ 8.59
WATER LOADS					
(a) SWL					
(½)(1.41)(22) =	15.51			- 7.33	- 113.69
buoyancy:					
imp: (1.41)(5.5) =		- 7.75	-4.75		- 36.81
per: ½(1.41)(15) =		-10.575	-2.5		- 26.44
(b) SWL+2'					
½(1.54)(24) =	18.48			- 8.0	- 147.84
buoyancy:					
imp: (1.54)(5.5)		- 8.47	-4.75		- 40.23
per: ½(1.54)(15)		- 11.55	-2.5		- 28.88
(c) Low WATER					
½(0.80)(12.5)	5.0			- 4.17	- 20.85
buoyancy:					
imp: (.80)(5.5)		- 4.4	-4.75		- 20.90
per: ½(.80)(15) =		- 6.0	-2.5		- 15.0
WIND					
P/S	-0.575			-19.25	+ 11.07
LATERAL SOIL PRESSURE (FROM EUSTIS)					
ANCHOR FORCE (INCLUDE w/ DL)	+3.7			0	

LOAD COMBINATIONS:

LOADING CASE	DESCRIPTION		FORCES F_x	F_z	MOMENTS M_y
I	DL, SWL, IMP S/P 100%	DL	0.99	25.88	4.43
		SWL	15.51		-113.69
		IMP		-7.75	-36.81
		TOTAL FOR 50'			
II	DL, SWL, PER S/P 100%	DL	0.99	25.88	4.43
		SWL	15.51		-113.69
		PER		-10.58	-26.44
		TOTAL FOR 50'			
III	DL, SWL+2', IMP S/P 75%	DL	0.99	27.29	7.25
		SWL+2'	18.48		-147.84
		IMP		-8.47	-40.23
		TOTAL 75% FOR 50'			
IV	DL, SWL+2', PER S/P 75%	DL	0.99	27.29	7.25
		SWL+2'	18.48		-147.84
		PER		-11.55	-28.88
		TOTAL 75% FOR 50'			
V	DL, LOW WATER 100%	DL	0.99	19.19	-8.95
		LW	5.0		-20.85
		IMP		-4.4	-20.90
		TOTAL FOR 50'			
VI	DL, LOW WATER, WIND 75%	DL	0.99	19.19	-8.95
		LW	5.0		-20.85
		IMP		-4.4	-20.90
		WIND	-.58		+11.07
		TOTAL 75% FOR 50'			

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

MODULUS OF HORIZONTAL SUBGRADE REACTION
REACH 2

ELEVATION IN FEET NGVD	$\frac{K_h \times B}{DC}$
10 to 0	169
0 to -30	138
-30 to -40	152
-40 to -50	182
-50 to -60	211
-60 to -68	237

Where: K_h = Modulus of horizontal subgrade reaction ($lbs/in.^3$)

B = Diameter of pile (inches)

C = Reduction factor for cyclic loading

C = 0.5 for cyclic loading
C = 1.0 for initial loading

D = Reduction factor for effect of group action

D	PILE SPACING IN DIRECTION OF LOADING
1.0	8B
0.85	7B
0.7	6B
0.55	5B
0.40	4B
0.25	3B

AXIAL AND HORIZONTAL RESISTANCE OF BATTER PILES

ESTIMATED FROM ALLOWABLE VERTICAL LOAD CAPACITY

L = VERTICAL COMPONENT OF BATTER PILE EMBEDMENT LENGTH.

V = ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY OF A PILE DRIVEN VERTICALLY WITH EMBEDMENT LENGTH, L.

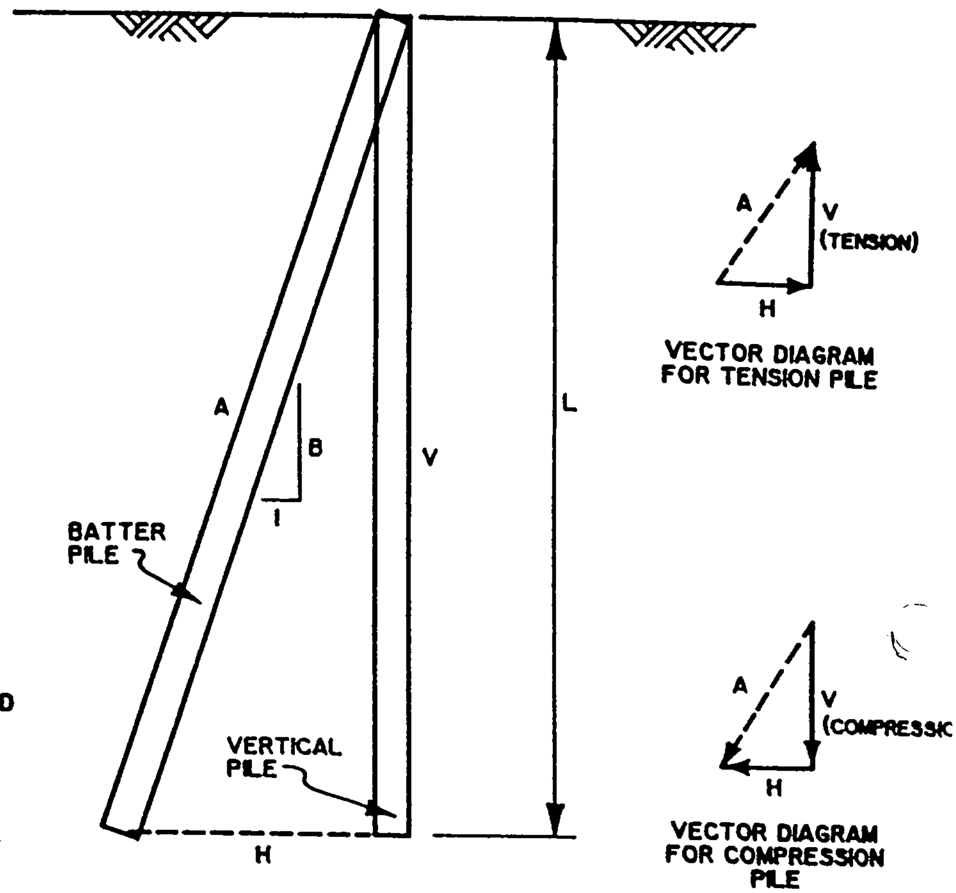
B = BATTER OF PILE EXPRESSED AS A RATIO OF VERTICAL DISTANCE TO ONE FOOT HORIZONTAL DISTANCE.

H = HORIZONTAL RESISTANCE OF BATTER PILE ESTIMATED AS FOLLOWS:

$$H = \frac{V}{B}$$

A = ALLOWABLE AXIAL PILE LOAD CAPACITY OF A SINGLE BATTER PILE ESTIMATED AS FOLLOWS:

$$A = \sqrt{V^2 \left(1 + \frac{1}{B^2}\right)}$$



NOTE: THE AXIAL LOAD RESISTANCE OF A VERTICAL PILE, V, IS DEPENDENT ON THE TYPE OF LOADING--TENSION OR COMPRESSION. CAUTION SHOULD BE EXERCISED TO INSURE THAT THE CORRECT VERTICAL CAPACITY IS USED.

SOIL CONSTANT:

-use weighted average of soil constant below el. -44:

$$\frac{K_h * B}{DC} = \frac{(6)(182) + 10(211) + 8(237)}{24}$$

$= 212$

$ES = K_h * B$

$ES = (212)(D)(C)$

$C = 1.0$

D = Reduction factor for group action

Assume 14" ∅ Piles Spaced @ 12' in direction of Loading

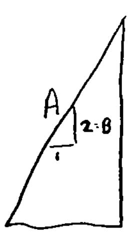
$144 = 14(X)$
$10.2 = X$

$D = 1.0$

$ES = 212$

Allowable Pile Loads:

-use Pile Tip: -80 NGVD C = 22^T = 44^k T = 18^T = 36^k



V: 44C
= 36T

Length: -12.5, -80 : 67.5' Vert.

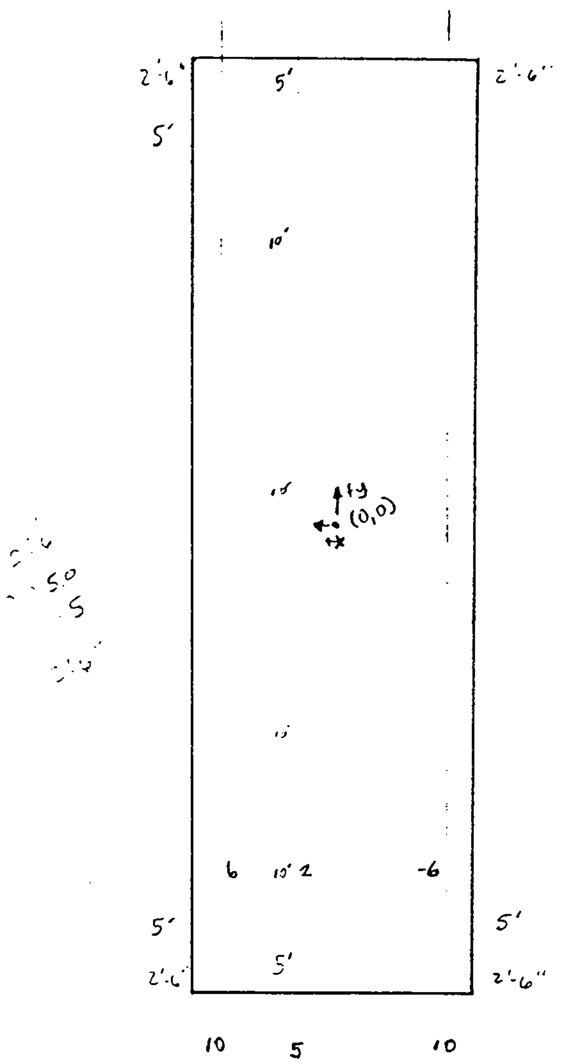
Length: 75.5'

$$A = \sqrt{V^2\left(1+\frac{1}{B^2}\right)}$$

$A_C = \sqrt{(44)^2(1.25)}$ $A_T = \sqrt{(36)^2(1.25)}$

$A_C = 49^K$ $A_T = 40^K$

· use 50' length of wall



	x	y	z
1	6	-22.5	0
2		-17.5	
3		-12.5	
4		-7.5	
5		-2.5	
6		2.5	
7		7.5	
8		12.5	
9		17.5	
10	6	22.5	
11	2	-20	
12		-10	
13		0	
14		10	
15	2	20	
16	-6	-22.5	
17		-17.5	
18		-12.5	
19		-7.5	
20		-2.5	
21		2.5	
22		7.5	
23		12.5	
24		17.5	
25	-6	22.5	0

LOAD COMBINATIONS					
LOADING	DESCRIPTION		FORCES		MOMENTS
CASE			Fx	Fz	My
1	DL,SWL,IMP. S/P	DL	0.99	25.88	4.43
	100%	SWL	15.51		-113.69
		IMP		-7.75	-36.81
		TOTAL	16.5	18.13	-146.07
		FOR 50'	825	906.5	-7303.5
2	DL,SWL,PER. S/P	DL	0.99	25.88	4.43
	100%	SWL	15.51		-113.69
		IMP		-10.58	-26.44
		TOTAL	16.5	15.3	-135.7
		FOR 50'	825	765	-6785
3	DL,SWL+2',IMP S/P	DL	0.99	27.29	7.25
	75%	SWL	18.48		-147.84
		IMP		-8.47	-40.23
		TOTAL	19.47	18.82	-180.82
		75% TOTAL	14.6025	14.115	-135.615
		FOR 50'	730.125	705.75	-6780.75
4	DL,SWL+2',PER S/P	DL	0.99	27.29	7.25
	75%	SWL	18.48		-147.84
		IMP		-11.55	-28.88
		TOTAL	19.47	15.74	-169.47
		75% TOTAL	14.6025	11.805	-127.1025
		FOR 50'	730.125	590.25	-6355.125
5	DL,LOW WATER	DL	0.99	19.19	-8.95
	100%	SWL	5		-28.85
		IMP		-4.4	-20.9
		TOTAL	5.99	14.79	-58.7
		FOR 50'	299.5	739.5	-2935
6	DL,LOW WATER,WIND	DL	0.99	19.19	-8.95
	75%	SWL	5		-20.85
		IMP		-4.4	-20.9
		WIND	-0.58		11.07
		TOTAL	5.41	14.79	-39.63
		75% TOTAL	4.0575	11.0925	-29.7225
		FOR 50'	202.875	554.625	-1486.125

FILENAME:
D:PILE/F QTZ

```
1010 PLAQUEMINES FRONTAL PROTECTION T-WALL
1020 PROP 4030 3201 3201 196 2 0 ALL
1030 SOIL ES 0.212 LEN 75.5 0 ALL
1040 PIN ALL
1050 DLS S 49 40 600.2 223.1 132.6 1510 1166.8 H 14 ALL
1060 ASC S 196 457 0.816 0.856 2 0 ALL
1070 BATTER 2 ALL
1080 ANGLE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 12 13 14 15
1085 ANGLE 0 16 17 18 19 20 21 22 23
1090 ANGLE 180 24 25 26 27 28 29 30 31 32 33 34 35
1100 PILE        1        6       -22   0
1105 PILE        2        6       -18   0
1110 PILE        3        6       -14   0
1115 PILE        4        6       -10   0
1120 PILE        5        6       -6    0
1125 PILE        6        6       -2    0
1130 PILE        7        6       2     0
1135 PILE        8        6       6     0
1140 PILE        9        6       10    0
1145 PILE        10       6       14    0
1146 PILE        11       6       18    0
1147 PILE        12       6       22    0
1150 PILE        13       2       -20   0
1155 PILE        14       2       -16   0
1160 PILE        15       2       -12   0
1161 PILE        16       2       -8    0
1162 PILE        17       2       -4    0
1163 PILE        18       2       0     0
1164 PILE        19       2       4     0
1165 PILE        20       2       8     0
1166 PILE        21       2       12    0
1167 PILE        22       2       16    0
1168 PILE        23       2       20    0
1169 PILE        24       -6      -22   0
1170 PILE        25       -6      -18   0
1180 PILE        26       -6      -14   0
1190 PILE        27       -6      -10   0
1200 PILE        28       -6      -6    0
1210 PILE        29       -6      -2    0
1220 PILE        30       -6      2     0
1230 PILE        31       -6      6     0
1240 PILE        32       -6      10    0
1250 PILE        33       -6      14    0
1260 PILE        34       -6      18    0
1270 PILE        35       -6      22    0
1300 LOAD        1        825     0        906.5     0       -7303.5  0
1310 LOAD        2        825     0        765.0     0       -6785  0
1320 LOAD        3        730.1     0      705.75     0      -6780.8  0
1330 LOAD        4        730.1     0      590.25     0      -6355.1   0
1340 LOAD        5        299.5     0      739.5     0       -2935  0
1350 LOAD        6        202.9     0      554.6     0       -1486.1   0
1360 FOUT        1        2         3      4         5       6        7 PLAQOUT
1370 PFO ALL
1380 FPL PLAQPLOT
```

```
********************************
* CORPS PROGRAM  #  X0080      *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-A  *   RUN DATE 02-11-98     RUN TIME 15:21:36
********************************
```

PLAQUEMINES FRONTAL PROTECTION T-WALL

THERE ARE 44 PILES AND
6 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

```
                                 X          Y           Z
                               -----      -----       -----
WITH DIAGONAL COORDINATES = (  -6.00 ,   -24.50 ,      .00 )
                            (   6.00 ,    24.50 ,      .00 )
```

```
********************************************************************************
```

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40300E+04	.32010E+04	.32010E+04	.19600E+03	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

```
********************************************************************************
```

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.21200E+00	L	.75500E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

```
********************************************************************************
```

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	6.00	-24.50	.00	2.00	.00	75.50	P
2	6.00	-21.00	.00	2.00	.00	75.50	P
3	6.00	-17.50	.00	2.00	.00	75.50	P
4	6.00	-14.00	.00	2.00	.00	75.50	P
5	6.00	-10.50	.00	2.00	.00	75.50	P
6	6.00	-7.00	.00	2.00	.00	75.50	P

7	6.00	-3.50	.00	2.00	.00	75.50	P
8	6.00	.00	.00	2.00	.00	75.50	P
9	6.00	3.50	.00	2.00	.00	75.50	P
10	6.00	7.00	.00	2.00	.00	75.50	P
11	6.00	10.50	.00	2.00	.00	75.50	P
12	6.00	14.00	.00	2.00	.00	75.50	P
13	6.00	17.50	.00	2.00	.00	75.50	P
14	6.00	21.00	.00	2.00	.00	75.50	P
15	6.00	24.50	.00	2.00	.00	75.50	P
16	2.00	-22.75	.00	2.00	.00	75.50	P
17	2.00	-19.25	.00	2.00	.00	75.50	P
18	2.00	-15.75	.00	2.00	.00	75.50	P
19	2.00	-12.25	.00	2.00	.00	75.50	P
20	2.00	-8.75	.00	2.00	.00	75.50	P
21	2.00	-5.25	.00	2.00	.00	75.50	P
22	2.00	-1.75	.00	2.00	.00	75.50	P
23	2.00	1.75	.00	2.00	.00	75.50	P
24	2.00	5.25	.00	2.00	.00	75.50	P
25	2.00	8.75	.00	2.00	.00	75.50	P
26	2.00	12.25	.00	2.00	.00	75.50	P
27	2.00	15.75	.00	2.00	.00	75.50	P
28	2.00	19.25	.00	2.00	.00	75.50	P
29	2.00	22.75	.00	2.00	.00	75.50	P
30	-6.00	-24.50	.00	2.00	180.00	75.50	P
31	-6.00	-21.00	.00	2.00	180.00	75.50	P
32	-6.00	-17.50	.00	2.00	180.00	75.50	P
33	-6.00	-14.00	.00	2.00	180.00	75.50	P
34	-6.00	-10.50	.00	2.00	180.00	75.50	P
35	-6.00	-7.00	.00	2.00	180.00	75.50	P
36	-6.00	-3.50	.00	2.00	180.00	75.50	P
37	-6.00	.00	.00	2.00	180.00	75.50	P
38	-6.00	3.50	.00	2.00	180.00	75.50	P
39	-6.00	7.00	.00	2.00	180.00	75.50	P
40	-6.00	10.50	.00	2.00	180.00	75.50	P
41	-6.00	14.00	.00	2.00	180.00	75.50	P
42	-6.00	17.50	.00	2.00	180.00	75.50	P
43	-6.00	21.00	.00	2.00	180.00	75.50	P
44	-6.00	24.50	.00	2.00	180.00	75.50	P

						3322.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	825.0	.0	906.5	.0	-7303.5	.0
2	825.0	.0	765.0	.0	-6785.0	.0
3	730.1	.0	705.8	.0	-6780.8	.0
4	730.1	.0	590.3	.0	-6355.1	.0
5	299.5	.0	739.5	.0	-2935.0	.0
6	202.9	.0	554.6	.0	-1486.1	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.15810E+05	.45384E-03	.96904E+04	-.62500E-01	-.17277E+07	-.31250E-01
.45384E-03	.58256E+03	-.90767E-03	.74506E-08	-.65352E-01	.44486E+04
.96904E+04	-.90767E-03	.61493E+05	.28125E+00	-.46959E+06	.62500E-01
.00000E+00	.37253E-08	.12500E+00	.19414E+10	.00000E+00	-.27777E+09
-.17277E+07	-.65352E-01	-.46959E+06	.20000E+01	.22862E+09	.10000E+01
-.15625E-01	.44486E+04	.00000E+00	-.27777E+09	.30000E+01	.50132E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 15.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 15.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 15.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 15.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.4175E-01	-.2626E-07	.7766E-02	-.2564E-12	-.5190E-04	.1703E-11
2	.6994E-01	-.3019E-07	.2779E-02	.2040E-13	.1781E-03	.1393E-11
3	.2841E-01	-.2723E-07	.6016E-02	-.1257E-12	-.1289E-03	.1829E-11
4	.5152E-01	-.3043E-07	.1936E-02	.1005E-12	.5972E-04	.1574E-11
5	-.1611E-01	.4244E-08	.1266E-01	-.7367E-12	-.2498E-03	.5469E-12
6	.7309E-02	.5731E-08	.7816E-02	-.5128E-12	-.6715E-05	-.6699E-13

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
2	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
3	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
4	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
5	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#

6	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
7	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
8	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
9	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
10	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
11	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
12	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
13	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
14	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
15	.4	.0	50.5	.0	-17.1	.0	1.03	.13	1.15	1.04	#
16	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
17	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
18	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
19	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
20	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
21	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
22	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
23	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
24	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
25	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
26	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
27	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
28	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
29	.4	.0	46.6	.0	-17.7	.0	.95	.13	1.13	1.01	#
30	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
31	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
32	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
33	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
34	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
35	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
36	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
37	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
38	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
39	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
40	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
41	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
42	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
43	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	
44	-.5	.0	-26.3	.0	20.8	.0	.66	.37	.77	.64	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
2	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
3	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
4	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
5	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
6	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
7	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
8	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
9	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
10	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
11	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
12	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
13	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
14	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#

15	.9	.0	38.9	.0	-35.7	.0	.79	.14	1.13	.94	#
16	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
17	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
18	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
19	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
20	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
21	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
22	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
23	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
24	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
25	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
26	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
27	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
28	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
29	.8	.0	52.2	.0	-33.7	.0	1.07	.15	1.20	1.01	#
30	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
31	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
32	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
33	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
34	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
35	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
36	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
37	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
38	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
39	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
40	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
41	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
42	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
43	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	
44	-.9	.0	-30.2	.0	37.0	.0	.76	.45	.78	.58	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
2	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
3	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
4	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
5	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
6	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
7	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
8	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
9	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
10	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
11	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
12	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
13	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
14	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
15	.2	.0	46.0	.0	-9.9	.0	.94	.13	1.11	1.03	#
16	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
17	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
18	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
19	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
20	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
21	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
22	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
23	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#

24	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
25	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
26	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
27	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
28	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
29	.3	.0	36.4	.0	-11.4	.0	.74	.15	1.07	.98	#
30	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
31	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
32	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
33	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
34	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
35	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
36	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
37	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
38	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
39	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
40	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
41	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
42	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
43	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	
44	-.3	.0	-27.2	.0	12.8	.0	.68	.36	.74	.65	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
2	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
3	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
4	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
5	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
6	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
7	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
8	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
9	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
10	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
11	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
12	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
13	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
14	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
15	.6	.0	36.5	.0	-25.1	.0	.74	.15	1.10	.95	#
16	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
17	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
18	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
19	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
20	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
21	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
22	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
23	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
24	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
25	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
26	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
27	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
28	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
29	.6	.0	41.0	.0	-24.4	.0	.84	.14	1.12	.97	#
30	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60	
31	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60	
32	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60	

33	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
34	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
35	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
36	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
37	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
38	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
39	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
40	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
41	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
42	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
43	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60
44	-.6	.0	-30.4	.0	26.0	.0	.76	.43	.76	.60

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
2	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
3	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
4	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
5	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
6	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
7	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
8	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
9	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
10	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
11	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
12	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
13	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
14	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
15	-.4	.0	35.2	.0	15.0	.0	.72	.15	1.07	.96	#
16	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
17	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
18	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
19	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
20	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
21	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
22	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
23	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
24	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
25	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
26	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
27	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
28	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
29	-.3	.0	16.5	.0	12.1	.0	.34	.19	.97	.87	#
30	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
31	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
32	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
33	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
34	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
35	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
36	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
37	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
38	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
39	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
40	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	
41	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82	

42	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82
43	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82
44	.2	.0	4.3	.0	-8.9	.0	.09	.22	.90	.82

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
2	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
3	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
4	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
5	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
6	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
7	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
8	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
9	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
10	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
11	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
12	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
13	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
14	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
15	.0	.0	18.6	.0	-1.5	.0	.38	.19	.95	.91	#
16	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
17	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
18	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
19	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
20	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
21	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
22	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
23	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
24	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
25	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
26	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
27	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
28	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
29	.0	.0	18.1	.0	-1.6	.0	.37	.19	.95	.91	#
30	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
31	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
32	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
33	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
34	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
35	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
36	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
37	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
38	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
39	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
40	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
41	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
42	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
43	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#
44	-.1	.0	5.7	.0	5.2	.0	.12	.22	.90	.83	#

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	23.0	.0	45.0	.0	.0	.0
2	23.0	.0	45.0	.0	.0	.0
3	23.0	.0	45.0	.0	.0	.0
4	23.0	.0	45.0	.0	.0	.0
5	23.0	.0	45.0	.0	.0	.0
6	23.0	.0	45.0	.0	.0	.0
7	23.0	.0	45.0	.0	.0	.0
8	23.0	.0	45.0	.0	.0	.0
9	23.0	.0	45.0	.0	.0	.0
10	23.0	.0	45.0	.0	.0	.0
11	23.0	.0	45.0	.0	.0	.0
12	23.0	.0	45.0	.0	.0	.0
13	23.0	.0	45.0	.0	.0	.0
14	23.0	.0	45.0	.0	.0	.0
15	23.0	.0	45.0	.0	.0	.0
16	21.2	.0	41.5	.0	.0	.0
17	21.2	.0	41.5	.0	.0	.0
18	21.2	.0	41.5	.0	.0	.0
19	21.2	.0	41.5	.0	.0	.0
20	21.2	.0	41.5	.0	.0	.0
21	21.2	.0	41.5	.0	.0	.0
22	21.2	.0	41.5	.0	.0	.0
23	21.2	.0	41.5	.0	.0	.0
24	21.2	.0	41.5	.0	.0	.0
25	21.2	.0	41.5	.0	.0	.0
26	21.2	.0	41.5	.0	.0	.0
27	21.2	.0	41.5	.0	.0	.0
28	21.2	.0	41.5	.0	.0	.0
29	21.2	.0	41.5	.0	.0	.0
30	12.2	.0	-23.3	.0	.0	.0
31	12.2	.0	-23.3	.0	.0	.0
32	12.2	.0	-23.3	.0	.0	.0
33	12.2	.0	-23.3	.0	.0	.0
34	12.2	.0	-23.3	.0	.0	.0
35	12.2	.0	-23.3	.0	.0	.0
36	12.2	.0	-23.3	.0	.0	.0
37	12.2	.0	-23.3	.0	.0	.0
38	12.2	.0	-23.3	.0	.0	.0
39	12.2	.0	-23.3	.0	.0	.0
40	12.2	.0	-23.3	.0	.0	.0
41	12.2	.0	-23.3	.0	.0	.0
42	12.2	.0	-23.3	.0	.0	.0
43	12.2	.0	-23.3	.0	.0	.0
44	12.2	.0	-23.3	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	18.2	.0	34.4	.0	.0	.0
2	18.2	.0	34.4	.0	.0	.0

3	18.2	.0	34.4	.0	.0	.0
4	18.2	.0	34.4	.0	.0	.0
5	18.2	.0	34.4	.0	.0	.0
6	18.2	.0	34.4	.0	.0	.0
7	18.2	.0	34.4	.0	.0	.0
8	18.2	.0	34.4	.0	.0	.0
9	18.2	.0	34.4	.0	.0	.0
10	18.2	.0	34.4	.0	.0	.0
11	18.2	.0	34.4	.0	.0	.0
12	18.2	.0	34.4	.0	.0	.0
13	18.2	.0	34.4	.0	.0	.0
14	18.2	.0	34.4	.0	.0	.0
15	18.2	.0	34.4	.0	.0	.0
16	24.1	.0	46.3	.0	.0	.0
17	24.1	.0	46.3	.0	.0	.0
18	24.1	.0	46.3	.0	.0	.0
19	24.1	.0	46.3	.0	.0	.0
20	24.1	.0	46.3	.0	.0	.0
21	24.1	.0	46.3	.0	.0	.0
22	24.1	.0	46.3	.0	.0	.0
23	24.1	.0	46.3	.0	.0	.0
24	24.1	.0	46.3	.0	.0	.0
25	24.1	.0	46.3	.0	.0	.0
26	24.1	.0	46.3	.0	.0	.0
27	24.1	.0	46.3	.0	.0	.0
28	24.1	.0	46.3	.0	.0	.0
29	24.1	.0	46.3	.0	.0	.0
30	14.3	.0	-26.6	.0	.0	.0
31	14.3	.0	-26.6	.0	.0	.0
32	14.3	.0	-26.6	.0	.0	.0
33	14.3	.0	-26.6	.0	.0	.0
34	14.3	.0	-26.6	.0	.0	.0
35	14.3	.0	-26.6	.0	.0	.0
36	14.3	.0	-26.6	.0	.0	.0
37	14.3	.0	-26.6	.0	.0	.0
38	14.3	.0	-26.6	.0	.0	.0
39	14.3	.0	-26.6	.0	.0	.0
40	14.3	.0	-26.6	.0	.0	.0
41	14.3	.0	-26.6	.0	.0	.0
42	14.3	.0	-26.6	.0	.0	.0
43	14.3	.0	-26.6	.0	.0	.0
44	14.3	.0	-26.6	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	20.8	.0	41.0	.0	.0	.0
2	20.8	.0	41.0	.0	.0	.0
3	20.8	.0	41.0	.0	.0	.0
4	20.8	.0	41.0	.0	.0	.0
5	20.8	.0	41.0	.0	.0	.0
6	20.8	.0	41.0	.0	.0	.0
7	20.8	.0	41.0	.0	.0	.0
8	20.8	.0	41.0	.0	.0	.0
9	20.8	.0	41.0	.0	.0	.0
10	20.8	.0	41.0	.0	.0	.0
11	20.8	.0	41.0	.0	.0	.0

12	20.8	.0	41.0	.0	.0	.0
13	20.8	.0	41.0	.0	.0	.0
14	20.8	.0	41.0	.0	.0	.0
15	20.8	.0	41.0	.0	.0	.0
16	16.5	.0	32.4	.0	.0	.0
17	16.5	.0	32.4	.0	.0	.0
18	16.5	.0	32.4	.0	.0	.0
19	16.5	.0	32.4	.0	.0	.0
20	16.5	.0	32.4	.0	.0	.0
21	16.5	.0	32.4	.0	.0	.0
22	16.5	.0	32.4	.0	.0	.0
23	16.5	.0	32.4	.0	.0	.0
24	16.5	.0	32.4	.0	.0	.0
25	16.5	.0	32.4	.0	.0	.0
26	16.5	.0	32.4	.0	.0	.0
27	16.5	.0	32.4	.0	.0	.0
28	16.5	.0	32.4	.0	.0	.0
29	16.5	.0	32.4	.0	.0	.0
30	12.5	.0	-24.2	.0	.0	.0
31	12.5	.0	-24.2	.0	.0	.0
32	12.5	.0	-24.2	.0	.0	.0
33	12.5	.0	-24.2	.0	.0	.0
34	12.5	.0	-24.2	.0	.0	.0
35	12.5	.0	-24.2	.0	.0	.0
36	12.5	.0	-24.2	.0	.0	.0
37	12.5	.0	-24.2	.0	.0	.0
38	12.5	.0	-24.2	.0	.0	.0
39	12.5	.0	-24.2	.0	.0	.0
40	12.5	.0	-24.2	.0	.0	.0
41	12.5	.0	-24.2	.0	.0	.0
42	12.5	.0	-24.2	.0	.0	.0
43	12.5	.0	-24.2	.0	.0	.0
44	12.5	.0	-24.2	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	16.9	.0	32.4	.0	.0	.0
2	16.9	.0	32.4	.0	.0	.0
3	16.9	.0	32.4	.0	.0	.0
4	16.9	.0	32.4	.0	.0	.0
5	16.9	.0	32.4	.0	.0	.0
6	16.9	.0	32.4	.0	.0	.0
7	16.9	.0	32.4	.0	.0	.0
8	16.9	.0	32.4	.0	.0	.0
9	16.9	.0	32.4	.0	.0	.0
10	16.9	.0	32.4	.0	.0	.0
11	16.9	.0	32.4	.0	.0	.0
12	16.9	.0	32.4	.0	.0	.0
13	16.9	.0	32.4	.0	.0	.0
14	16.9	.0	32.4	.0	.0	.0
15	16.9	.0	32.4	.0	.0	.0
16	18.9	.0	36.4	.0	.0	.0
17	18.9	.0	36.4	.0	.0	.0
18	18.9	.0	36.4	.0	.0	.0
19	18.9	.0	36.4	.0	.0	.0
20	18.9	.0	36.4	.0	.0	.0

21	18.9	.0	36.4	.0	.0	.0
22	18.9	.0	36.4	.0	.0	.0
23	18.9	.0	36.4	.0	.0	.0
24	18.9	.0	36.4	.0	.0	.0
25	18.9	.0	36.4	.0	.0	.0
26	18.9	.0	36.4	.0	.0	.0
27	18.9	.0	36.4	.0	.0	.0
28	18.9	.0	36.4	.0	.0	.0
29	18.9	.0	36.4	.0	.0	.0
30	14.2	.0	-26.9	.0	.0	.0
31	14.2	.0	-26.9	.0	.0	.0
32	14.2	.0	-26.9	.0	.0	.0
33	14.2	.0	-26.9	.0	.0	.0
34	14.2	.0	-26.9	.0	.0	.0
35	14.2	.0	-26.9	.0	.0	.0
36	14.2	.0	-26.9	.0	.0	.0
37	14.2	.0	-26.9	.0	.0	.0
38	14.2	.0	-26.9	.0	.0	.0
39	14.2	.0	-26.9	.0	.0	.0
40	14.2	.0	-26.9	.0	.0	.0
41	14.2	.0	-26.9	.0	.0	.0
42	14.2	.0	-26.9	.0	.0	.0
43	14.2	.0	-26.9	.0	.0	.0
44	14.2	.0	-26.9	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	15.4	.0	31.7	.0	.0	.0
2	15.4	.0	31.7	.0	.0	.0
3	15.4	.0	31.7	.0	.0	.0
4	15.4	.0	31.7	.0	.0	.0
5	15.4	.0	31.7	.0	.0	.0
6	15.4	.0	31.7	.0	.0	.0
7	15.4	.0	31.7	.0	.0	.0
8	15.4	.0	31.7	.0	.0	.0
9	15.4	.0	31.7	.0	.0	.0
10	15.4	.0	31.7	.0	.0	.0
11	15.4	.0	31.7	.0	.0	.0
12	15.4	.0	31.7	.0	.0	.0
13	15.4	.0	31.7	.0	.0	.0
14	15.4	.0	31.7	.0	.0	.0
15	15.4	.0	31.7	.0	.0	.0
16	7.1	.0	14.9	.0	.0	.0
17	7.1	.0	14.9	.0	.0	.0
18	7.1	.0	14.9	.0	.0	.0
19	7.1	.0	14.9	.0	.0	.0
20	7.1	.0	14.9	.0	.0	.0
21	7.1	.0	14.9	.0	.0	.0
22	7.1	.0	14.9	.0	.0	.0
23	7.1	.0	14.9	.0	.0	.0
24	7.1	.0	14.9	.0	.0	.0
25	7.1	.0	14.9	.0	.0	.0
26	7.1	.0	14.9	.0	.0	.0
27	7.1	.0	14.9	.0	.0	.0
28	7.1	.0	14.9	.0	.0	.0
29	7.1	.0	14.9	.0	.0	.0

30	-2.1	.0	3.7	.0	.0	.0
31	-2.1	.0	3.7	.0	.0	.0
32	-2.1	.0	3.7	.0	.0	.0
33	-2.1	.0	3.7	.0	.0	.0
34	-2.1	.0	3.7	.0	.0	.0
35	-2.1	.0	3.7	.0	.0	.0
36	-2.1	.0	3.7	.0	.0	.0
37	-2.1	.0	3.7	.0	.0	.0
38	-2.1	.0	3.7	.0	.0	.0
39	-2.1	.0	3.7	.0	.0	.0
40	-2.1	.0	3.7	.0	.0	.0
41	-2.1	.0	3.7	.0	.0	.0
42	-2.1	.0	3.7	.0	.0	.0
43	-2.1	.0	3.7	.0	.0	.0
44	-2.1	.0	3.7	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	8.4	.0	16.7	.0	.0	.0
2	8.4	.0	16.7	.0	.0	.0
3	8.4	.0	16.7	.0	.0	.0
4	8.4	.0	16.7	.0	.0	.0
5	8.4	.0	16.7	.0	.0	.0
6	8.4	.0	16.7	.0	.0	.0
7	8.4	.0	16.7	.0	.0	.0
8	8.4	.0	16.7	.0	.0	.0
9	8.4	.0	16.7	.0	.0	.0
10	8.4	.0	16.7	.0	.0	.0
11	8.4	.0	16.7	.0	.0	.0
12	8.4	.0	16.7	.0	.0	.0
13	8.4	.0	16.7	.0	.0	.0
14	8.4	.0	16.7	.0	.0	.0
15	8.4	.0	16.7	.0	.0	.0
16	8.1	.0	16.2	.0	.0	.0
17	8.1	.0	16.2	.0	.0	.0
18	8.1	.0	16.2	.0	.0	.0
19	8.1	.0	16.2	.0	.0	.0
20	8.1	.0	16.2	.0	.0	.0
21	8.1	.0	16.2	.0	.0	.0
22	8.1	.0	16.2	.0	.0	.0
23	8.1	.0	16.2	.0	.0	.0
24	8.1	.0	16.2	.0	.0	.0
25	8.1	.0	16.2	.0	.0	.0
26	8.1	.0	16.2	.0	.0	.0
27	8.1	.0	16.2	.0	.0	.0
28	8.1	.0	16.2	.0	.0	.0
29	8.1	.0	16.2	.0	.0	.0
30	-2.4	.0	5.2	.0	.0	.0
31	-2.4	.0	5.2	.0	.0	.0
32	-2.4	.0	5.2	.0	.0	.0
33	-2.4	.0	5.2	.0	.0	.0
34	-2.4	.0	5.2	.0	.0	.0
35	-2.4	.0	5.2	.0	.0	.0
36	-2.4	.0	5.2	.0	.0	.0
37	-2.4	.0	5.2	.0	.0	.0
38	-2.4	.0	5.2	.0	.0	.0

39	-2.4	.0	5.2	.0	.0	.0
40	-2.4	.0	5.2	.0	.0	.0
41	-2.4	.0	5.2	.0	.0	.0
42	-2.4	.0	5.2	.0	.0	.0
43	-2.4	.0	5.2	.0	.0	.0
44	-2.4	.0	5.2	.0	.0	.0

MAX LOADS: 52.2^k C (LOAD CASE 2)

-30.4^k T (LOAD CASE 4)

ALLOWABLES (TIP EL. -80) - 49^k C

40^k T

-say ok go to tip el -85

APRIL8 February 4, 1998 Page 1

RECEIVED
FEB 4 1998
D. E. I.

MEMO DATE:2/4/98
TO:DEI
MS APRIL HURRY
FROM: EUSTIS ENGINEERING
TOM STREMLAU
SUBJECT: PREL DATA
PLAQ PUMP STATION UNITS 1 AND 2

I HAVE ENCLOSED REANALYSIS OF P STATION FOR THE HIGHER STORM WATER LEVEL. I HAVE INCLUDED A MARKED UP COPY OF PREVIOUS PRESENTATION BUT INCLUDING IMPACT OF RAISED WATER LEVEL. ASSUME WILL NEED NEW FRONTAL PROTECTION. HAVE INCLUDED SLPOE STABILITY AND T WALL ANALYSIS WITH NEW WALL. ALSO PRESENT PREL PILE CAPACITY FOR PILES TO SUPPORT T WALL.

FILE 3004
DISTRIBUTION
WB AH
JH

EUSTIS ENGINEERING COMPANY, INC.
Geotechnical Engineers
Metairie, Louisiana

Page ______

Date 2/4/98

Job 14638

By TUS

Projec ______

Subjec ______

Checked By ______

call
Tom

ask to
doublecheck
capacities

[illegible] Army Corps of Engineers
[illegible]t of Harvey Canal
[illegible]ricane Protection Project
[illegible]erson Parish, La.

PRELIMINARY

[illegible] Pile Load Capacities
[illegible]all Foundation

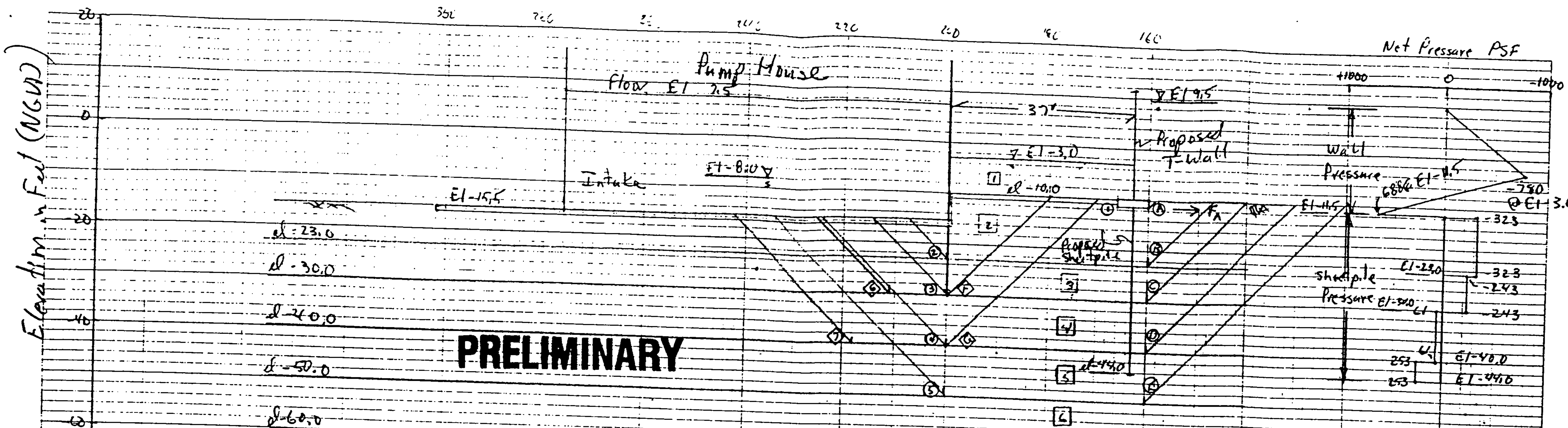
[illegible]mine Pump Station Unit 1+2

70
.05
350

Pile Type	Pile Tip Elevation NGVD	Estimated Allowable Single Pile Load Capacity in Tons, Factor of Safety = 2.0: Compression	Tension
14-in. square Precast, Prestressed Concrete	-60	10	7
	-70	17	12
	-80	22	18
16-in. square Precast, Prestressed Concrete	-60	12	8
	-70	19	14
	-80	25	20

Note: 1) Top of pile at el -11.0
2) Capacity contribution to el -44.0 has been ignored.

PRELIMINARY



Strata No	Soil Type	Unit Weight PCF	Unfactored Friction Angle Degrees	Unfactored Cohesion - PSF Average	Unfactored Cohesion - PSF Bottom	Safety Factor of 1.3 Friction Angle Degrees	Safety Factor of 1.3 Cohesion - PSF Average	Safety Factor of 1.3 Cohesion - PSF Bottom
1	Sand Fill	120	30	0	0	24	0	0
2	Clay, Silty Clay, Organic Clay and Humus	91	0	310	310	0	238	238
3	Clay	101	0	310	310	0	238	238
4	Clay	101	0	343	376	0	264	289
5	Clay	101	0	409	442	0	313	340
6	Clay	101	0	475	507	0	365	390

T-Wall Analysis
Summation of Forces
(Using Factored Shear Strengths)

Failure Surface	ΣR Resisting lbs/ft	ΣD Driving lbs/ft	ΣR-ΣD lbs/ft	Change in Net Force lbs/ft	Equivalent Pressure PSF/Ft
(A)(1)	5673	8154	-2481	—	—
(B)(2)	19278	25475	-6197	-3716	-323
(C)(3)	25442	33840	-7898	1701	-243
(D)(4)	38542	45827	-7285	613	61
(E)(5)	53102	57858	-4756	2529	253

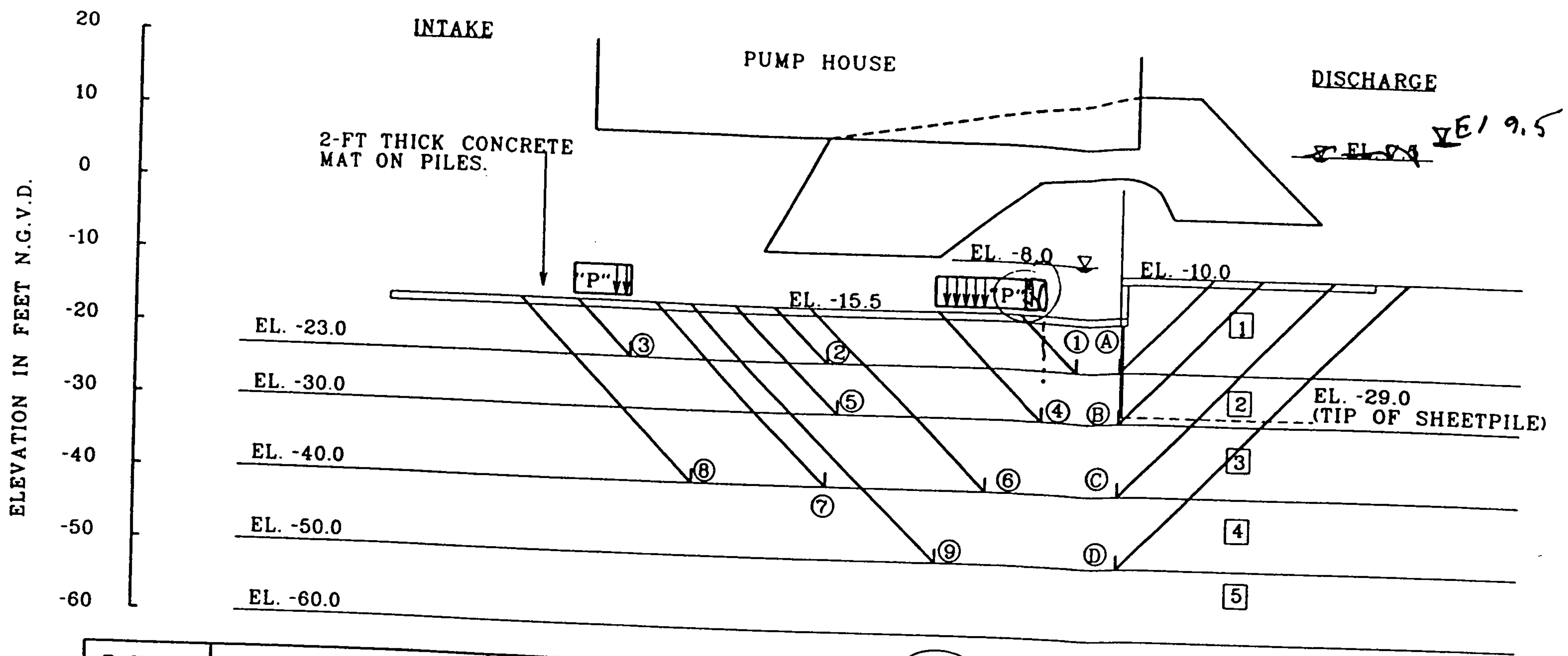
Stability of Pump Station

Failure Surface	Summation of Forces Resisting lbs/ft	Summation of Forces Driving lbs/ft	Factor of Safety*
(F)(6)	25525	18486	1.38
(G)(7)	42615	26759	1.59

*Using Unfactored Soil Parameters

Notes:
1) To satisfy moment equilibrium, summing moments about base of footing at El -11.5 requires sheetpile penetration to El -44.0.
2) Maximum moment occurs at El -23.0 and is 21.3 ft kips/ft of wall.
3) Calculated Anchor Force, F_A, is 3.7 kips/ft of wall at El -11.5.
4) The anchor load and indicated T-wall pressure must be supported by driven batter piles.
5) Using the Harr method of seepage analysis, the factor of safety against piping failure is 5 or more if the sheetpile tip is at El -44.0.
6) Reach 2 soil parameters were used for these analyses.

Slope Stability and T Wall Analyses
Units 1 and 2, Plaquemines Pumping Station
US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La



NOTE : 1) "P" IS REQUIRED VERTICAL PRESSURE ACROSS TOP OF PASSIVE WEDGES TO ACHIEVE A CALCULATED FACTOR OF SAFETY OF 1.3 OR MORE AGAINST A STABILITY FAILURE.

2) SEEPAGE ANALYSIS BY HARR METHOD INDICATES A FACTOR OF SAFETY OF 2 AGAINST PIPING WHICH IS CONSIDERED ACCEPTABLE.

3) REACH 2 SOIL PARAMETERS WERE USED FOR THESE ANALYSES.

FAILURE SURFACE	SUMMATION OF FORCES LB/FT		FACTOR OF SAFETY	VERTICAL PRESSURE, P, IN PSF TO ACHIEVE FACTOR OF SAFETY - 1.3
	RESISTING	DRIVING		
Ⓐ ①	14286	~~21021~~ 24470	~~0.68~~ 0.58	~~1337~~ 1747
Ⓐ ②	24826	~~21021~~ 24470	~~1.18~~ 1.01	~~258~~ 716
Ⓐ ③	33506	~~21021~~ 24470	~~1.59~~ 1.37	-
Ⓑ ④	24527	~~28289~~ 32551	~~0.87~~ 0.75	~~650~~ 944
Ⓑ ⑤	33517	~~28289~~ 32551	~~1.18~~ 1.03	~~178~~ 467
Ⓒ ⑥	41620	~~38718~~ 44145	~~1.07~~ 0.94	~~274~~ 495
Ⓒ ⑦	49892	~~38718~~ 44145	~~1.29~~ 1.13	~~14~~ 235
Ⓒ ⑧	57036	~~38718~~ 44145	~~1.47~~ 1.29	-
Ⓓ ⑨	62277	~~49197~~ 55796	~~1.27~~ 1.12	~~37~~ 229

STRATUM NO.	SOIL TYPE	UNIT WEIGHT IN PCF	FRICTION ANGLE DEGREES	COHESION - PSF	
				AVERAGE	BOTTOM
1	CLAY, SILTY CLAY, ORGANIC CLAY & HUMUS	91.0	0	310	310
2	CLAY	101.0	0	310	310
3	CLAY	101.0	0	343	~~382~~ 376
4	CLAY	101.0	0	409	442
5	CLAY	101.0	0	475	507

PRELIMINARY

20' 0 20'

SCALE

EUSTIS ENGINEERING COMPANY, INC.

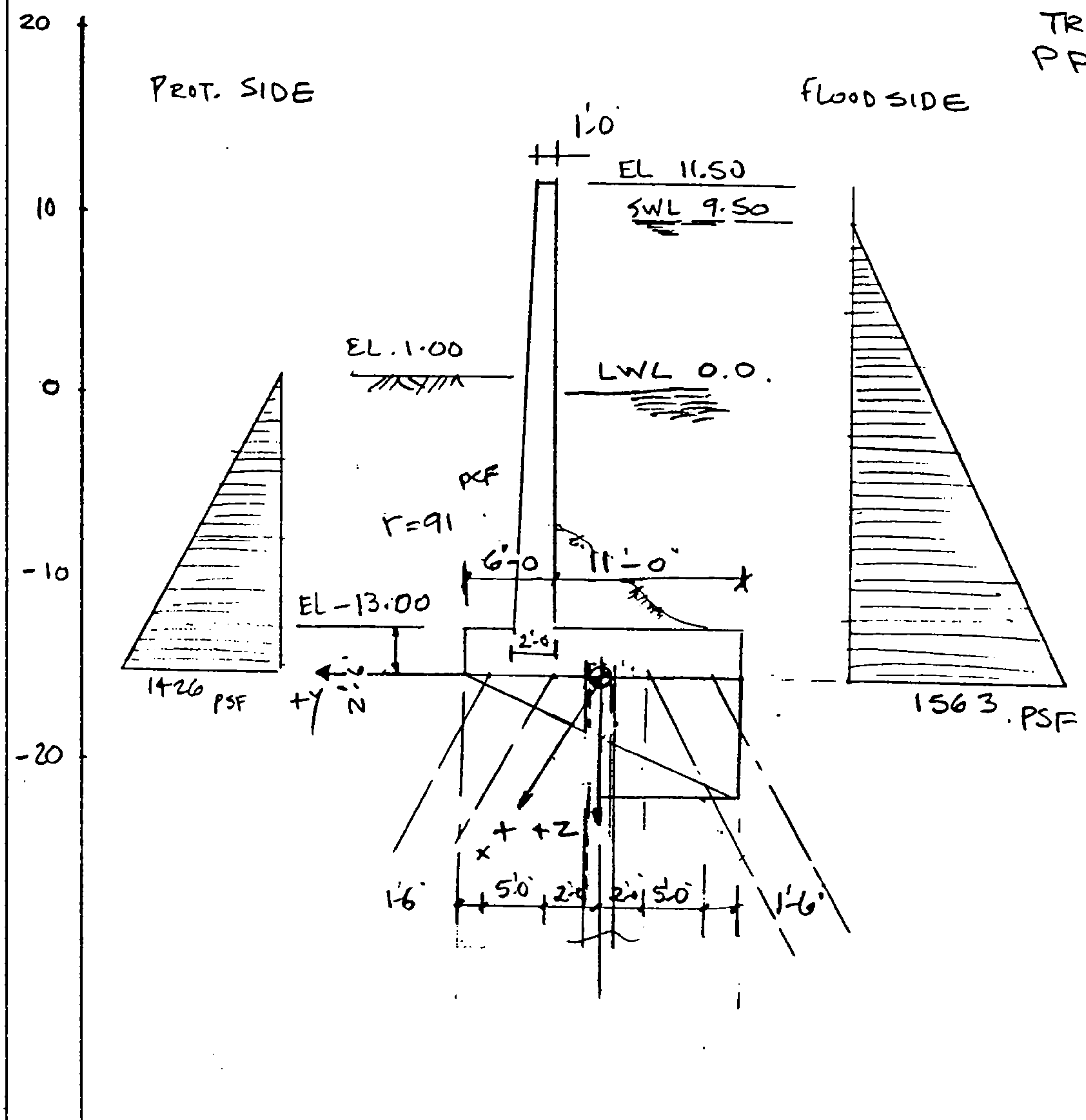
Revised SWL El 9.5

SLOPE STABILITY ANALYSES
PLAQUEMINE PUMP STATION

U. S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

ADDITION TO PLAQUEMINES PUMP STATION
(ALGIERS CANAL)

TRIAL 2.
PPSTWO3.



FLOOD SIDE: WATER PR SWL 9.5 = (9.5 + 15.5) 62.5 = 1563 PSF

WATER LEVEL EL 11.5 = (11.5 + 15.5) 62.5 = 1688 PSF

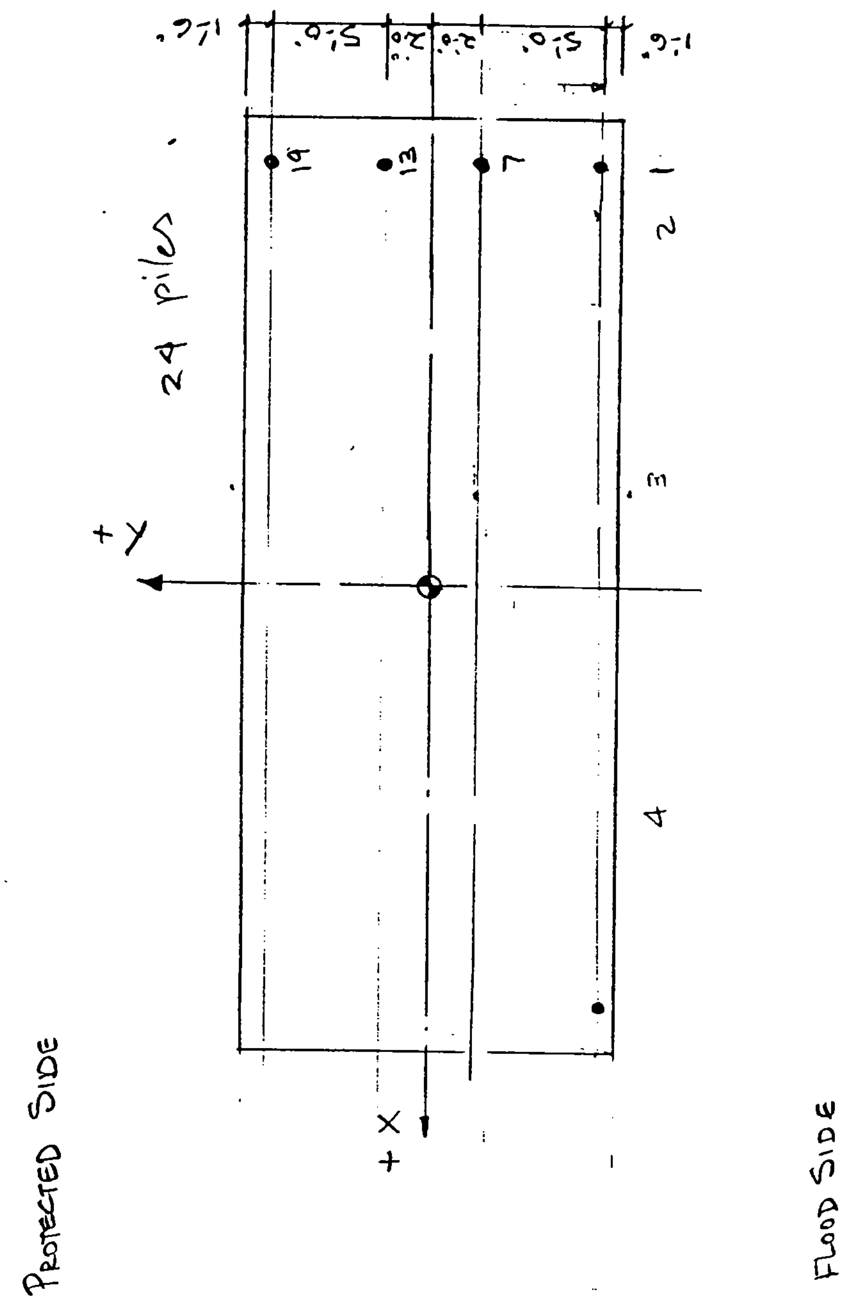
LWL EL 0.0 = (0 + 15.5) 62.5 = 969 PSF

PROT. SIDE :

Earth pr @ rest = .95 × 91 × 16.5 ≃ 1426 PSF.

K_o = 0.95 for in-situ soil

MS | ADDITION TO PLAQUEMINES PUMPING STA | 2

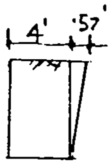


− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 1K
1	DEAD LOAD					
	WT. OF STEM & BASE					
	STEM.					
	24.5'×1'×.15		3.68	3.0		+ 11.04 ↶
	½×24.5×1'×.15		1.84	3.83		+ 7.04 ↶
	BASE 17×2.5'×.15 KCF		6.38	−		−
	TOTAL	−	11.90 K ↓	−		+ 18.08 ↶
2	SOIL + WATER ON FLOODSIDE. SWL 9.50					
	a) VERTICAL					
	1) Water 11'×22.5'×.0625		15.47	3.00		− 46.41 1K ↷
	2) Soil		−			
	b) LATERAL					
	1) Water ½×1563×25'	19.54		8.33	8.33'	+ 162.77 ↶
	TOTAL	19.5 K ←	15.47 K ↓			+ 116.36 ↶

MS. | ADDITION TO PLAQUEMINES PUMPING STA.

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 1K
3	BUOYANCY SWL EL 9.50					
	PERVIOUS ½ × 1563 × 17'		−13.3	2.83		37.64
	IMPERVIOUS 1563 × 8.5		−13.3	4.25		+56.5
4)	SOIL + WATER ON PROTECTED SIDE					
	a) VERTICAL					
	1) WATER	—	—	—	—	—
	2) SOIL 					
	.091 × 4.0' × 14'		5.10	6.5		+ 33.1
	½ × .091 × .57 × 14'		0.36	4.31		+ 1.55
	b) LATERAL					
	1) WATER					
	2) SOIL					
	½ × 1.426 × 16.5	−11.76			5.5	−64.70
		−11.76	5.46			−30.05

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 'K
5)	SOIL + WATER ON FLOODSIDE SWL +2'-0" W.S. EL 11.50					
	a) VERTICAL					
	1) WATER					
	11'×24.5'×.0625		16.84	3.00		−50.53 ↻
	2) SOIL	—				
	b) Lateral.					
	1) Water.					
	½×1688×27'	22.80		9.00		205.2 ↻
	TOTAL	22.80	16.84			154.67 ↻
6)	BUOYANCY W.S. EL 11.50					
	PERVIOUS ½×1688×17		−14.35	2.83		+40.60 ↺
	IMPER 1688×8.5		−14.35	4.25		+61.0 ↺

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 'K
7)	SOIL + WATER ON FLOODSIDE LWL = 0.0					
	a) Vertical					
	1) Water 11'X13'X.0625		8,94	3.00		26.82 ↻
	2) soil	–	-	–	–	–
	b) Lateral					
	1) Water ½x0.969X15.5	7.50			5.17	38.82 ↺
		7.50	8,94			12.00 ↺
8)	BUOYANCY LWL 0.0.					
	PERVIOUS ½x.969x17'		-8.24	2.83		23.32 ↺
	IMPERVIOUS 0.969 x 8.5		-8.24	4.25		35.02 ↺

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 1K
9)	WIND FROM F/S					
	11.5 X .05	0.58	–	–	21.25	12.21 1K ↺
10)	WIND FROM P/S					
	10.5 X .05	-0.52			21.75	11.31 ↻

LOAD COMBINATIONS.

LD. CASE NO.	DESCRIPTION	← Fy	Fz ↓	MOMENT MXX
1	SWL @ 9.5 PERV. SHT. PILE SOIL @ PROT. SIDE UPTO EL 1.00 NO WIND			
	1) D.L.		11.90	+18.08 ↶
	2) SOIL + WATER FLOODSIDE	+19.54	15.47	+116.36 ↶
	3) BUOY PERV		−13.30	+37.64 ↶
	4) SOIL + WATER PROT. SIDE.	−11.76	5.46	−30.05 ↷
	Unbalanced Force	+6.3		
	TOTAL PER LFT	14.08	19.53	142.03 ↶
	TOTAL PER 40'	+563.2	781.2	5,681.2 ↶
2	SWL @ 9.5 IMPER. SHT. PILE, SOIL @ PROT. SIDE, UPTO EL 1.00 NO WIND			
	1). DL.		11.90	+18.08 ↶
	2) SOIL + WATER FLOOD SIDE	19.54	15.47	+116.36 ↶
	3) BUOY IMP		−13.3	+56.5 ↶
	4) SOIL + WATER PR. SIDE	−11.76	5.46	−30.05 ↷
	UNBALANCED FORCE	+6.3		
	TOTAL PER LFT	14.08	19.53	160.89 ↶
	TOTAL PER 40'-0"	+563.2	781.2	6435.6 ↶

LOAD COMBINATIONS.

LD. CASE NO.	DESCRIPTION	← Fy	Fz ↓	MOMENT MXX
3	W.S. EL 11.5, PERV. SHT. PILE, SOIL ON P/S UPTO EL 1.00 NO WIND			
	1) D.L.		11.90	18.08 ↺
	5) SOIL + WATER FLOODSIDE	+22.80	16.84	154.67 ↺
	6) BUOY PERV		−14.35	+ 40.60 ↺
	4) SOIL + WATER PROT. SIDE	−11.76		
	UNBALANCED FORCE	+6.3		
	TOTAL PER LFT	17.34	14.39	213.35 ↺
	0.75 X TOTAL PER 40'	520.2	431.70	6,400.5
4	W.S. EL 11.5, IMP. SHT. PILE, SOIL ON P/S UPTO EL 1.00, NO WIND			
	1) D.L.		+11.90	18.08 ↺
	5) SOIL + WATER F/S	+22.80	+16.84	154.67 ↺
	6) BUOY IMP		−14.35	+ 61.0 ↺
	4) SOIL + WATER F/S	−11.76		
	UNBALANCED FORCE	+6.3		
	TOTAL PER LFT	17.34	14.39	233.75
	0.75 X TOTAL PER 40'-0"	520.2	431.7	+7012.5 ↺

LOAD COMBINATIONS.

LD. COMB NO.	DESCRIPTION	← Fy	Fz ↓	MOMENT MXX
5	LWL @ 0.0 NO WIND PERV. SHEET PILING			
	1) DL		11.90	+18.08
	7) SOIL+WATER FLOODSIDE	7.50	8.94	+12.00
	8) PERV. SH. PIL		-8.24	23.32
	4) SOIL+WATER P/S	-11.76	5.46	-30.05
	TOTAL PER LFT	-4.26	18.06	23.35
	TOTAL PER 40'	-170.4	722.4	934.0
6	LWL @ 0.0 NO WIND IMPERVIOUS SHEET PILING			
	1) DL.		11.90	+18.08
	7) SOIL+WATER FLOODSIDE	7.50	8.94	+12.00
	8) IMP. SHT. PL		-8.24	35.02
	4) SOIL+WATER P/S.	-11.76	5.46	-30.05
	TOTAL PER LFT	-4.26	18.06	35.05
	TOTAL PER 40'-0"	-170.4	722.4	1402

LOAD COMBINATIONS.

LD. COMB No.	DESCRIPTION	← Fy	Fz ↓	MOMENT MXX
7	LWL @ 0.0 WIND FROM F/S IMP. SHT. PIL			
	LOAD COMB 6)	-4.26	18.06	35.05 ↶
	BASIC LD CASE 9) WIND FRM F/S	0.58		12.21 ↶
	TOTAL PER LFT	-3.68	18.06	47.26 ↶
	TOTAL PER 40'	-147.2	722.4	189.0 ↶
8	LWL @ 0.0 WIND FROM P/S PERV. SHT. PIL			
	LOAD COMB 5)	-4.26	18.06	23.35 ↶
	BASIC LD CASE 10) WIND FROM P/S	-0.52		11.31 ↷
	TOTAL PER LFT	-4.78	18.06	12.04
	TOTAL PER 40'-0"	-191.2	722.4	481.6 1K ↶

4726 × 40 = 189.04

COMPUTER INPUT

14" x 14" SQ. P.P.C. PILES.

Area = 14x14 = 196 in^2 $I = \frac{1}{12} \times 14 \times 14^3$

$= 3201 \ in^4$

$S = 457 \ in^3$.

E_s : Pile Spacing 5'-0" on Prot. Side Rows.

Spacing = 60/14 = 4.3

At 4B D = 0.4.

Es = 138 Pci x 0.4 = 55 pci

= .055 kci.

Piles length Tip El. − 90.0 Cut off −15.0

Length = 75'

Capacity = 72 kips Comp.

52 kips Tension

SUMMARY OF LOADS

ALL PILES 16"x16" @ 2:1 BATTER

DESCRIPTION	MAX. AXIAL LOAD IN KIPS		MAX CBF	Asc ksi.	–
	COMP.	TENS.			
FLOODSIDE		-60.0 (4)	.57 (4)	–	
MIDD ROW NEXT TO F/S	99.0 (6)	-11.7 (1)	–	1.40 (6)	
MIDD ROW NEXT TO P/S	74.1 (1)	-41.4 (6)	–	–	
PROT. SIDE	93.9 (4)	–	–	–	

Vertical loads =

comp = 99 x 0.89 = 88.1^K

= <u>44</u> Ton.

Tension = -60 x 0.89 = 54^K

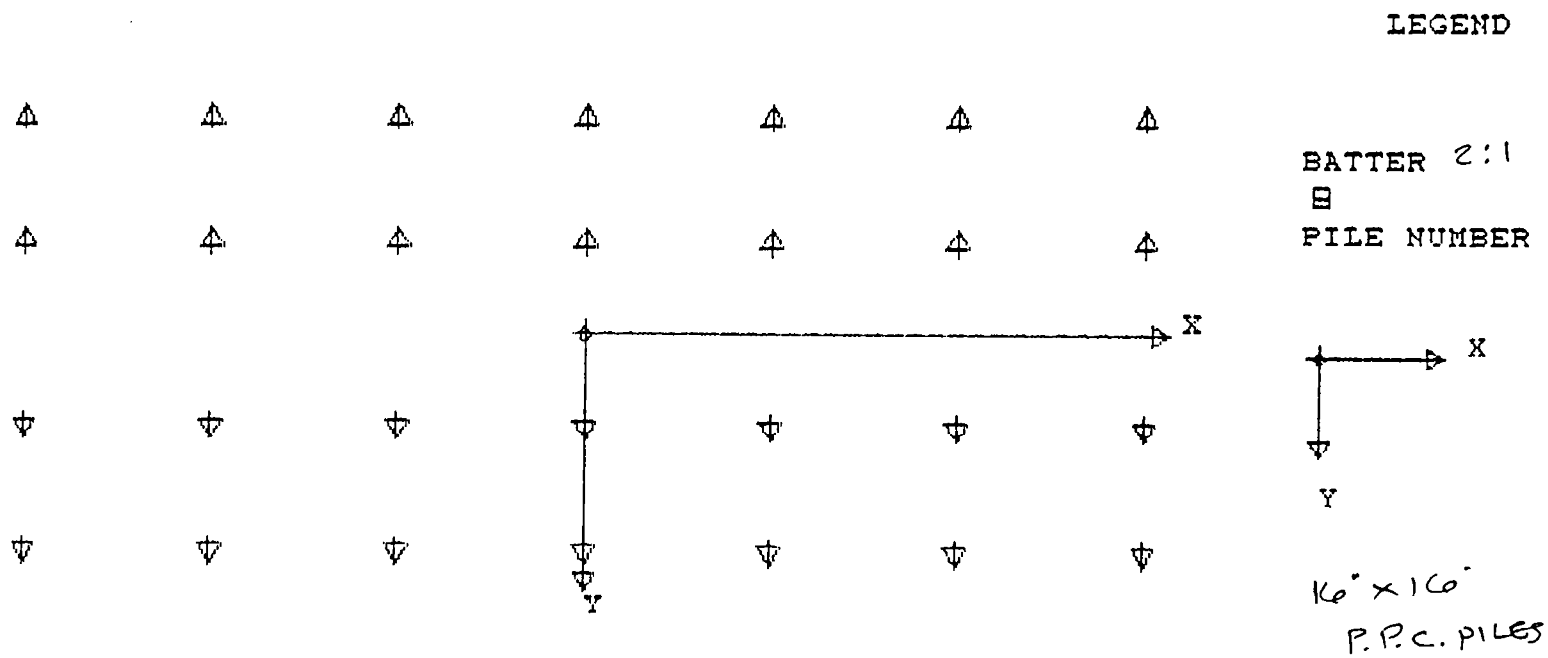
= <u>27</u> Ton

<u>Pile Tip -92.0</u>

Allow. Comp = 44 Tons.

Tens = 32 Tons.

ADDITION TO PLAQUEMINES PUMP STATION



DISPLAY OF PILE LAYOUT 01-APR-1998 16.57.15

EUSTIS ENGINEERING COMPANY, INC.
Geotechnical Engineers
Metairie, Louisiana

Page
Date 2/4/98
Job 14638
By TUS
Project
Subject
Checked By

US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La.

Allowable Pile Load Capacities
T-Wall Foundation

PRELIMINARY

Plaquemine Pump Station Unit 1&2
and Addition to Pump Station

Pile Type	Pile Tip Elevation NGVD	Estimated Allowable Single Pile Load Capacity in Tons, Factor of Safety = 2.0: Compression	Tension
14-in. square Precast, Prestressed Concrete	-60	10	7
	-70	17	12
	-80	24	18
	-90	36	26
	-100	45	36
16-in. square Precast, Prestressed Concrete	-60	12	8
	-70	19	14
	-80	27	20
	-90	42	30
	-100	51	41

Note: 1) Dredge level between El -10.0 and -13.0.
2) Capacity contribution to el -44.0 has been ignored.
3) Soil parameters below El -80 have been assumed. Soil borings must be performed to confirm soil conditions below this level for final design.

EUSTIS ENGINEERING COMPANY, INC.
Geotechnical Engineers
Metairie, Louisiana

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Job 14638
By THS
Checked By ____

Project ____

Subject ____

US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La.

Allowable Pile Load Capacities
T-Wall Foundation

Plaquemine Pump Station Unit 1+2
and Addition to Pump Stati.

PRELIMINARY

Pile Type	Pile Tip Elevation NGVD	Estimated Allowable Single Pile Load Capacity in Tons, Factor of Safety = 2.0: Compression	Tension
14-in. square Precast, Prestressed Concrete	-60	10	7
	-70	17	12
	-80	22	18
16-in. square Precast, Prestressed Concrete	-60	12	8
	-70	19	14
	-80	25	20

Note: 1) Dredge level between El -10.0 and -15.0.
2) Capacity contribution to el -44.0 has been ignored.

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

MODULUS OF HORIZONTAL SUBGRADE REACTION
REACH 2

ELEVATION IN FEET	$\frac{K_h \times B}{DC}$
10 to 0	169
0 to -30	138
-30 to -40	152
-40 to -50	182
-50 to -60	211
-60 to -68	237

Where: K_h = Modulus of horizontal subgrade reaction (lbs/in.^{3})

B = Diameter of pile (inches)

C = Reduction factor for cyclic loading

C = 0.5 for cyclic loading
C = 1.0 for initial loading

PRELIMINARY

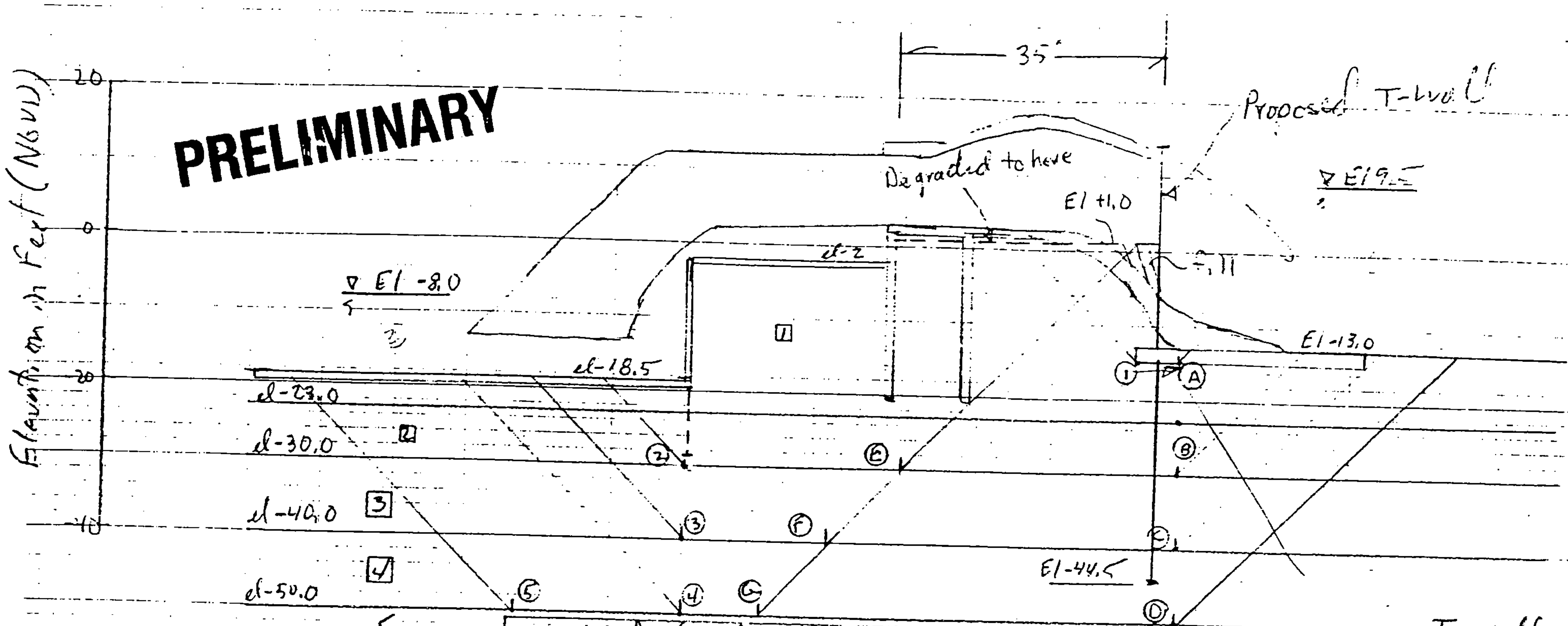
D = Reduction factor for effect of group action

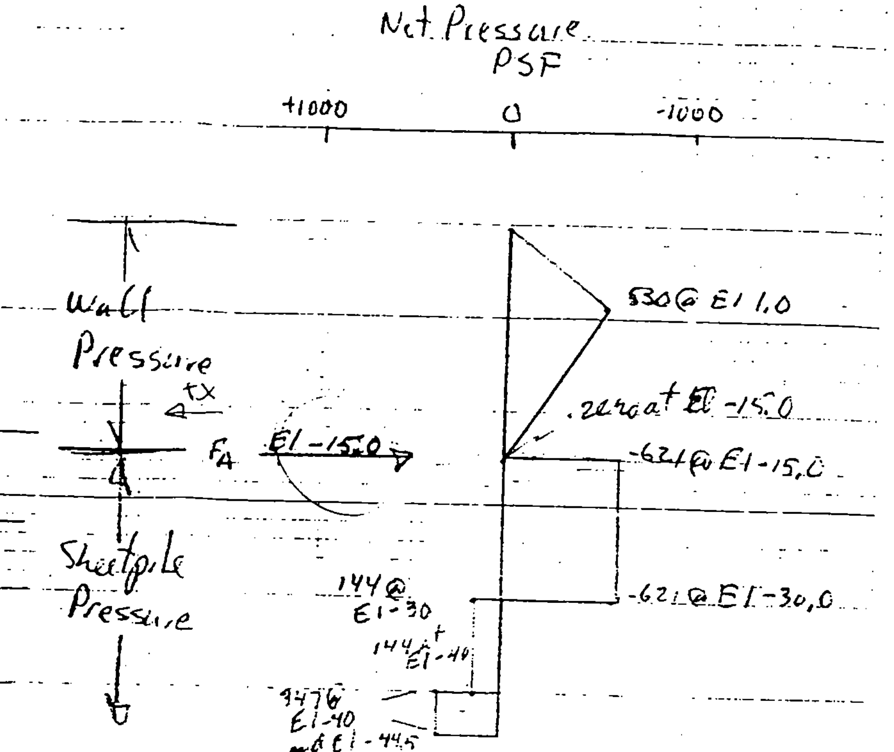
D	PILE SPACING IN DIRECTION OF LOADING
1.0	8B
0.85	7B
0.7	6B
0.55	5B
0.40	4B
0.25	3B

EUSTIS ENGINEERING COMPANY, INC.

FIGURE B

TWLPC
STPQ.3





Strata No.	Soil Type	Unit Weight PCF	Unfactored: Friction Angle Degrees	Unfactored: Cohesion - PSF Average	Unfactored: Cohesion - PSF Bottom	Safety Factor of 1.3: Friction Angle Degrees	Safety Factor of 1.3: Cohesion - PSF Average	Safety Factor of 1.3: Cohesion - PSF Bottom
1	Clay, Silty Clay, Organic Clay + Humus	91.0	0	310	310	0	238	238
2	Clay	101.0	0	310	310	0	238	238
3	Clay	101.0	0	343	376	0	264	289
4	Clay	101.0	0	409	442	0	315	340
5	Clay	101.0	0	475	507	0	365	390

T-wall Analysis

Summation of Forces (Using Factored Shear Strengths)

Failure Surface	ΣR Resisting lbs/Ft	ΣD Driving lbs/Ft	ΣR - ΣD lbs/Ft	Change in Net Force lbs/Ft	Equivalent Pressure PSF
Ⓐ①	10563	6172	4391	—	
Ⓑ②	29786	34707	-4921	-9312	-621
Ⓒ③	43675	47157	-3482	+1439	+144
Ⓓ④	59604	59614	-10	+3472	+347

Note: 1) To satisfy moment equilibrium, summing moments about base of footing at El -15.0, requires sheetpile penetration to El -44.5.
2) Maximum moment occurs at El -25.0 and is 32.1 Ft Kips/Ft of Wall.
3) Calculated Anchor Force, F_A, is 6.3 Kips per Ft of wall at El -15.0.
4) The anchor load and indicated T wall pressures must be supported by driven batter piles. Axial capacity of these piles above el -44.5 must be ignored.
5) Using the Harr Method of seepage analysis, the factor of safety against piping failure is four or more if the sheetpile tip is at El -44.5.
6) Reach 2 soil parameters were used for these analyses.

Stability of Pump Station

Failure Surface	Summation of Forces lbs/Ft Resisting	Summation of Forces lbs/Ft Driving	Factor of Safety
Ⓔ②	35340	26594	1.33
Ⓕ③	46838	35551	1.32
Ⓖ⑤	66596	42356	1.57

Slope Stability and Proposed T Wall Analyses
Addition to Plaquemines Pump Station
US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La.

EE14638 ... [illegible]

Enclosure →

O:\PILE\PPSTW05 04/01/98
Last Modified: 04-01-98 at 16:08:48

```
100 ADDITION TO PLAQUEMINES PUMP STATION-
150 T WALL ANALYSIS
200 PROF 4074 5461 5461 256 2 0 ALL
300 SOIL ES 0.035 LEN 75 0 ALL
320 PIN ALL
410 DLS S 84 60 985 294 188 2341 1760 H 16 ALL
430 ASC S 256 683 .813 .955 1.75 0 ALL
440 BAT 2 1 2 3 4 5 6 7
441 BAT 2 8 9 10 11 12 13 14
442 BAT 2 15 16 17 18 19 20 21
443 BAT 2 22 23 24 25 26 27 28
450 ANG 270 1 2 3 4 5 6 7 8 9 10 11 12 13 14
455 ANG 90 15 16 17 18 19 20 21 22 23 24 25 26 27 28
460 PILE 1 -18.0 -7.0 0 8 -18.0 -3.0 0
465 PILE 15 -18.0 3.0 0 22 -18.0 7.0 0
470 ROW X 7 1 6 AT 6.0
480 ROW X 7 8 6 AT 6.0
485 ROW X 7 15 6 AT 6.0
490 ROW X 7 22 6 AT 6.0
500 LOA 1 0 563.2 781.2 5681.2 0 0
510 LOA 2 0 563.2 781.2 6435.6 0 0
520 LOA 3 0 520.2 431.7 6400.5 0 0
540 LOA 4 0 520.2 431.7 7012.5 0 0
550 LOA 5 0 -170.4 722.4 934.0 0 0
560 LOA 6 0 -170.4 722.4 1402 0 0
570 LOA 7 0 -147.2 722.4 189 0 0
580 LOA 8 0 -191.2 722.4 481.6 0 0
610 FOU 1 2 3 4 5 6 7 PPSTW50
620 PFO ALL
630 FPL PPSTWD5
```

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*******************************
* CORPS PROGRAM  #  X0080      *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-A *  RUN DATE 04-01-98    RUN TIME 16:08:36
*******************************
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ADDITION TO PLAQUEMINES PUMP STATION
T WALL ANALYSIS

THERE ARE 28 PILES AND
8 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
WITH DIAGONAL COORDINATES = (	-18.00 ,	-7.00 ,	.00)
(	18.00 ,	7.00 ,	.00)

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.54610E+04	.54610E+04	.25600E+03	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.35000E-01	L	.75000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-18.00	-7.00	.00	2.00	270.00	75.00	P
2	-12.00	-7.00	.00	2.00	270.00	75.00	P
3	-6.00	-7.00	.00	2.00	270.00	75.00	P
4	.00	-7.00	.00	2.00	270.00	75.00	P
5	6.00	-7.00	.00	2.00	270.00	75.00	P
6	12.00	-7.00	.00	2.00	270.00	75.00	P
7	18.00	-7.00	.00	2.00	270.00	75.00	P
8	-18.00	-3.00	.00	2.00	270.00	75.00	P
9	-12.00	-3.00	.00	2.00	270.00	75.00	P
10	-6.00	-3.00	.00	2.00	270.00	75.00	P
11	.00	-3.00	.00	2.00	270.00	75.00	P
12	6.00	-3.00	.00	2.00	270.00	75.00	P
13	12.00	-3.00	.00	2.00	270.00	75.00	P
14	18.00	-3.00	.00	2.00	270.00	75.00	P
15	-18.00	3.00	.00	2.00	90.00	75.00	P
16	-12.00	3.00	.00	2.00	90.00	75.00	P
17	-6.00	3.00	.00	2.00	90.00	75.00	P
18	.00	3.00	.00	2.00	90.00	75.00	P
19	6.00	3.00	.00	2.00	90.00	75.00	P
20	12.00	3.00	.00	2.00	90.00	75.00	P
21	18.00	3.00	.00	2.00	90.00	75.00	P
22	-18.00	7.00	.00	2.00	90.00	75.00	P
23	-12.00	7.00	.00	2.00	90.00	75.00	P
24	-6.00	7.00	.00	2.00	90.00	75.00	P
25	.00	7.00	.00	2.00	90.00	75.00	P
26	6.00	7.00	.00	2.00	90.00	75.00	P
27	12.00	7.00	.00	2.00	90.00	75.00	P
28	18.00	7.00	.00	2.00	90.00	75.00	P

						2100.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	563.2	781.2	5681.2	.0	.0
2	.0	563.2	781.2	6435.6	.0	.0
3	.0	520.2	431.7	6400.5	.0	.0
4	.0	520.2	431.7	7012.5	.0	.0
5	.0	-170.4	722.4	934.0	.0	.0
6	.0	-170.4	722.4	1402.0	.0	.0

7	.0	-147.2	722.4	189.0	.0	.0
8	.0	-191.2	722.4	481.6	.0	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.11003E+03	-.36044E-03	-.41185E-03	-.43252E-01	.00000E+00	-.45776E-03
-.36044E-03	.13067E+05	.12207E-03	.15548E+07	.15625E-01	.15625E-01
-.41185E-03	.12207E-03	.51937E+05	-.62500E-01	.31250E-01	.15625E-01
-.43252E-01	.15548E+07	-.62500E-01	.21689E+09	.40000E+01	.00000E+00
-.93132E-09	.15625E-01	.00000E+00	.40000E+01	.10770E+10	-.40000E+01
-.21362E-03	.15625E-01	.15625E-01	.00000E+00	-.40000E+01	.27141E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 14.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 14.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 1

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 14.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 14.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.1976E-06	.3877E-01	.1504E-01	.3637E-04	-.6976E-12	-.3098E-11
2	.1985E-06	.4989E-02	.1504E-01	.3203E-03	-.1262E-11	-.1153E-11
3	.1631E-06	-.1583E-01	.8312E-02	.4676E-03	-.1507E-11	.4325E-12
4	.1638E-06	-.4323E-01	.8312E-02	.6979E-03	-.1965E-11	.2010E-11
5	.1261E-07	-.1305E+00	.1391E-01	.9875E-03	-.1774E-11	.6714E-11
6	.1320E-07	-.1515E+00	.1391E-01	.1164E-02	-.2124E-11	.7921E-11
7	.1721E-07	-.8510E-01	.1391E-01	.6205E-03	-.1070E-11	.4098E-11
8	.7092E-08	-.1211E+00	.1391E-01	.8948E-03	-.1566E-11	.6171E-11

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
2	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
3	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
4	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
5	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
6	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
7	-.2	.0	-15.3	.0	11.4	.0	.26	.16	.91	.74
8	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
9	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
10	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
11	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
12	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
13	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
14	-.2	.0	-11.7	.0	11.6	.0	.20	.13	.93	.75
15	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
16	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
17	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
18	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
19	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
20	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
21	.1	.0	74.1	.0	-7.8	.0	.88	.15	1.26	1.09
22	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11
23	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11
24	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11
25	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11
26	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11
27	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11
28	.1	.0	77.7	.0	-7.6	.0	.93	.17	1.27	1.11

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
2	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
3	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
4	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
5	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
6	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
7	.0	.0	-29.8	.0	-.2	.0	.50	.27	.84	.70
8	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
9	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
10	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
11	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
12	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
13	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
14	.0	.0	2.1	.0	1.7	.0	.03	.24	.97	.82
15	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
16	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
17	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
18	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
19	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
20	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
21	.0	.0	60.3	.0	2.1	.0	.72	.14	1.19	1.05
22	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1[illegible]
23	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1.17
24	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1.17
25	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1.17
26	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1.17
27	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1.17
28	-.1	.0	92.1	.0	4.1	.0	1.10	.25	1.32	1.17

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
2	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
3	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
4	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
5	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
6	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
7	.1	.0	-47.8	.0	-8.0	.0	.80	.45	.78	.61
8	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80
9	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80
10	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80
11	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80
12	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80

13	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80
14	.1	.0	-1.3	.0	-5.1	.0	.02	.02	.96	.80
15	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
16	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
17	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
18	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
19	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
20	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
21	-.1	.0	35.7	.0	7.2	.0	.43	.19	1.11	.94
22	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12
23	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12
24	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12
25	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12
26	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12
27	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12
28	-.1	.0	82.2	.0	10.1	.0	.98	.19	1.29	1.12

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
2	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
3	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
4	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
5	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
6	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
7	.2	.0	-59.5	.0	-17.4	.0	.99	.57	.75	.56
8	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
9	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
10	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
11	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
12	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
13	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
14	.2	.0	10.0	.0	-13.1	.0	.12	.23	1.01	.83
15	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
16	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
17	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
18	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
19	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
20	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
21	-.2	.0	24.5	.0	15.2	.0	.29	.21	1.07	.89
22	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15
23	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15
24	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15
25	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15
26	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15
27	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15

28	-.3	.0	93.9	.0	19.5	.0	1.12	.26	1.35	1.15

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
2	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
3	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
4	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
5	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
6	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
7	.6	.0	-7.8	.0	-41.9	.0	.13	.14	.99	.72
8	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
9	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
10	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
11	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
12	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
13	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
14	.5	.0	90.4	.0	-35.9	.0	1.08	.24	1.36	1.11
15	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	.63
16	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	.63
17	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	[illegible]
18	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	.63
19	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	.63
20	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	.63
21	-.5	.0	-32.8	.0	39.5	.0	.55	.36	.88	.63
22	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00
23	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00
24	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00
25	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00
26	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00
27	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00
28	-.6	.0	65.5	.0	45.5	.0	.78	.14	1.28	1.00

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68
2	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68
3	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68
4	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68
5	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68
6	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68
7	.7	.0	-16.8	.0	-49.2	.0	.28	.23	.96	.68

8	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
9	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
10	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
11	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
12	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
13	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
14	.6	.0	99.0	.0	-42.1	.0	1.18	.28	1.40	1.14
15	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
16	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
17	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
18	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
19	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
20	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
21	-.6	.0	-41.4	.0	45.6	.0	.69	.45	.86	.58
22	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03
23	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03
24	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03
25	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03
26	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03
27	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03
28	-.7	.0	74.4	.0	52.7	.0	.89	.15	1.32	1.03

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
2	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
3	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
4	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
5	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
6	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
7	.4	.0	9.0	.0	-26.5	.0	.11	.25	1.03	.81
8	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
9	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
10	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
11	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
12	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
13	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
14	.3	.0	70.7	.0	-22.7	.0	.84	.13	1.26	1.06
15	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
16	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
17	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
18	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
19	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
20	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
21	-.4	.0	-13.1	.0	26.2	.0	.22	.16	.94	.72
22	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96

23	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96
24	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96
25	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96
26	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96
27	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96
28	-.4	.0	48.7	.0	30.0	.0	.58	.16	1.19	.96

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
2	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
3	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
4	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
5	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
6	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
7	.5	.0	-1.5	.0	-38.6	.0	.02	.07	1.01	.75
8	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1.11
9	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1.11
10	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1.11
11	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1.11
12	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1[illegible]
13	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1.11
14	.5	.0	87.6	.0	-33.1	.0	1.04	.22	1.35	1.11
15	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
16	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
17	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
18	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
19	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
20	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
21	-.5	.0	-29.9	.0	36.6	.0	.50	.33	.89	.64
22	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98
23	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98
24	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98
25	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98
26	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98
27	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98
28	-.6	.0	59.1	.0	42.1	.0	.70	.15	1.25	.98

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	7.0	-13.7	.0	.0	.0
2	.0	7.0	-13.7	.0	.0	.0
3	.0	7.0	-13.7	.0	.0	.0
4	.0	7.0	-13.7	.0	.0	.0
5	.0	7.0	-13.7	.0	.0	.0
6	.0	7.0	-13.7	.0	.0	.0
7	.0	7.0	-13.7	.0	.0	.0
8	.0	5.4	-10.4	.0	.0	.0
9	.0	5.4	-10.4	.0	.0	.0
10	.0	5.4	-10.4	.0	.0	.0
11	.0	5.4	-10.4	.0	.0	.0
12	.0	5.4	-10.4	.0	.0	.0
13	.0	5.4	-10.4	.0	.0	.0
14	.0	5.4	-10.4	.0	.0	.0
15	.0	33.2	66.2	.0	.0	.0
16	.0	33.2	66.2	.0	.0	.0
17	.0	33.2	66.2	.0	.0	.0
18	.0	33.2	66.2	.0	.0	.0
19	.0	33.2	66.2	.0	.0	.0
20	.0	33.2	66.2	.0	.0	.0
21	.0	33.2	66.2	.0	.0	.0
22	.0	34.8	69.5	.0	.0	.0
23	.0	34.8	69.5	.0	.0	.0
24	.0	34.8	69.5	.0	.0	.0
25	.0	34.8	69.5	.0	.0	.0
26	.0	34.8	69.5	.0	.0	.0
27	.0	34.8	69.5	.0	.0	.0
28	.0	34.8	69.5	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	13.3	-26.6	.0	.0	.0
2	.0	13.3	-26.6	.0	.0	.0
3	.0	13.3	-26.6	.0	.0	.0
4	.0	13.3	-26.6	.0	.0	.0
5	.0	13.3	-26.6	.0	.0	.0
6	.0	13.3	-26.6	.0	.0	.0
7	.0	13.3	-26.6	.0	.0	.0
8	.0	-.9	1.9	.0	.0	.0
9	.0	-.9	1.9	.0	.0	.0
10	.0	-.9	1.9	.0	.0	.0
11	.0	-.9	1.9	.0	.0	.0

12	.0	-.9	1.9	.0	.0	.0
13	.0	-.9	1.9	.0	.0	.0
14	.0	-.9	1.9	.0	.0	.0
15	.0	26.9	53.9	.0	.0	.0
16	.0	26.9	53.9	.0	.0	.0
17	.0	26.9	53.9	.0	.0	.0
18	.0	26.9	53.9	.0	.0	.0
19	.0	26.9	53.9	.0	.0	.0
20	.0	26.9	53.9	.0	.0	.0
21	.0	26.9	53.9	.0	.0	.0
22	.0	41.1	82.4	.0	.0	.0
23	.0	41.1	82.4	.0	.0	.0
24	.0	41.1	82.4	.0	.0	.0
25	.0	41.1	82.4	.0	.0	.0
26	.0	41.1	82.4	.0	.0	.0
27	.0	41.1	82.4	.0	.0	.0
28	.0	41.1	82.4	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	21.3	-42.8	.0	.0	.0
2	.0	21.3	-42.8	.0	.0	.0
3	.0	21.3	-42.8	.0	.0	.0
4	.0	21.3	-42.8	.0	.0	.0
5	.0	21.3	-42.8	.0	.0	.0
6	.0	21.3	-42.8	.0	.0	.0
7	.0	21.3	-42.8	.0	.0	.0
8	.0	.5	-1.2	.0	.0	.0
9	.0	.5	-1.2	.0	.0	.0
10	.0	.5	-1.2	.0	.0	.0
11	.0	.5	-1.2	.0	.0	.0
12	.0	.5	-1.2	.0	.0	.0
13	.0	.5	-1.2	.0	.0	.0
14	.0	.5	-1.2	.0	.0	.0
15	.0	15.9	32.0	.0	.0	.0
16	.0	15.9	32.0	.0	.0	.0
17	.0	15.9	32.0	.0	.0	.0
18	.0	15.9	32.0	.0	.0	.0
19	.0	15.9	32.0	.0	.0	.0
20	.0	15.9	32.0	.0	.0	.0
21	.0	15.9	32.0	.0	.0	.0
22	.0	36.7	73.6	.0	.0	.0
23	.0	36.7	73.6	.0	.0	.0
24	.0	36.7	73.6	.0	.0	.0
25	.0	36.7	73.6	.0	.0	.0
26	.0	36.7	73.6	.0	.0	.0

27	.0	36.7	73.6	.0	.0	.0
28	.0	36.7	73.6	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	26.4	-53.3	.0	.0	.0
2	.0	26.4	-53.3	.0	.0	.0
3	.0	26.4	-53.3	.0	.0	.0
4	.0	26.4	-53.3	.0	.0	.0
5	.0	26.4	-53.3	.0	.0	.0
6	.0	26.4	-53.3	.0	.0	.0
7	.0	26.4	-53.3	.0	.0	.0
8	.0	-4.6	8.8	.0	.0	.0
9	.0	-4.6	8.8	.0	.0	.0
10	.0	-4.6	8.8	.0	.0	.0
11	.0	-4.6	8.8	.0	.0	.0
12	.0	-4.6	8.8	.0	.0	.0
13	.0	-4.6	8.8	.0	.0	.0
14	.0	-4.6	8.8	.0	.0	.0
15	.0	10.8	22.0	.0	.0	.0
16	.0	10.8	22.0	.0	.0	.0
17	.0	10.8	22.0	.0	.0	.0
18	.0	10.8	22.0	.0	.0	.0
19	.0	10.8	22.0	.0	.0	.0
20	.0	10.8	22.0	.0	.0	.0
21	.0	10.8	22.0	.0	.0	.0
22	.0	41.8	84.1	.0	.0	.0
23	.0	41.8	84.1	.0	.0	.0
24	.0	41.8	84.1	.0	.0	.0
25	.0	41.8	84.1	.0	.0	.0
26	.0	41.8	84.1	.0	.0	.0
27	.0	41.8	84.1	.0	.0	.0
28	.0	41.8	84.1	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	3.0	-7.2	.0	.0	.0
2	.0	3.0	-7.2	.0	.0	.0
3	.0	3.0	-7.2	.0	.0	.0
4	.0	3.0	-7.2	.0	.0	.0
5	.0	3.0	-7.2	.0	.0	.0
6	.0	3.0	-7.2	.0	.0	.0

7	.0	3.0	-7.2	.0	.0	.0
8	.0	-40.9	80.7	.0	.0	.0
9	.0	-40.9	80.7	.0	.0	.0
10	.0	-40.9	80.7	.0	.0	.0
11	.0	-40.9	80.7	.0	.0	.0
12	.0	-40.9	80.7	.0	.0	.0
13	.0	-40.9	80.7	.0	.0	.0
14	.0	-40.9	80.7	.0	.0	.0
15	.0	-15.1	-29.1	.0	.0	.0
16	.0	-15.1	-29.1	.0	.0	.0
17	.0	-15.1	-29.1	.0	.0	.0
18	.0	-15.1	-29.1	.0	.0	.0
19	.0	-15.1	-29.1	.0	.0	.0
20	.0	-15.1	-29.1	.0	.0	.0
21	.0	-15.1	-29.1	.0	.0	.0
22	.0	28.7	58.8	.0	.0	.0
23	.0	28.7	58.8	.0	.0	.0
24	.0	28.7	58.8	.0	.0	.0
25	.0	28.7	58.8	.0	.0	.0
26	.0	28.7	58.8	.0	.0	.0
27	.0	28.7	58.8	.0	.0	.0
28	.0	28.7	58.8	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	6.9	-15.3	.0	.0	.0
2	.0	6.9	-15.3	.0	.0	.0
3	.0	6.9	-15.3	.0	.0	.0
4	.0	6.9	-15.3	.0	.0	.0
5	.0	6.9	-15.3	.0	.0	.0
6	.0	6.9	-15.3	.0	.0	.0
7	.0	6.9	-15.3	.0	.0	.0
8	.0	-44.8	88.3	.0	.0	.0
9	.0	-44.8	88.3	.0	.0	.0
10	.0	-44.8	88.3	.0	.0	.0
11	.0	-44.8	88.3	.0	.0	.0
12	.0	-44.8	88.3	.0	.0	.0
13	.0	-44.8	88.3	.0	.0	.0
14	.0	-44.8	88.3	.0	.0	.0
15	.0	-19.1	-36.7	.0	.0	.0
16	.0	-19.1	-36.7	.0	.0	.0
17	.0	-19.1	-36.7	.0	.0	.0
18	.0	-19.1	-36.7	.0	.0	.0
19	.0	-19.1	-36.7	.0	.0	.0
20	.0	-19.1	-36.7	.0	.0	.0
21	.0	-19.1	-36.7	.0	.0	.0

22	.0	32.6	66.9	.0	.0	.0
23	.0	32.6	66.9	.0	.0	.0
24	.0	32.6	66.9	.0	.0	.0
25	.0	32.6	66.9	.0	.0	.0
26	.0	32.6	66.9	.0	.0	.0
27	.0	32.6	66.9	.0	.0	.0
28	.0	32.6	66.9	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-4.3	7.9	.0	.0	.0
2	.0	-4.3	7.9	.0	.0	.0
3	.0	-4.3	7.9	.0	.0	.0
4	.0	-4.3	7.9	.0	.0	.0
5	.0	-4.3	7.9	.0	.0	.0
6	.0	-4.3	7.9	.0	.0	.0
7	.0	-4.3	7.9	.0	.0	.0
8	.0	-31.9	63.1	.0	.0	.0
9	.0	-31.9	63.1	.0	.0	.0
10	.0	-31.9	63.1	.0	.0	.0
11	.0	-31.9	63.1	.0	.0	.0
12	.0	-31.9	63.1	.0	.0	.0
13	.0	-31.9	63.1	.0	.0	.0
14	.0	-31.9	63.1	.0	.0	.0
15	.0	-6.2	-11.5	.0	.0	.0
16	.0	-6.2	-11.5	.0	.0	.0
17	.0	-6.2	-11.5	.0	.0	.0
18	.0	-6.2	-11.5	.0	.0	.0
19	.0	-6.2	-11.5	.0	.0	.0
20	.0	-6.2	-11.5	.0	.0	.0
21	.0	-6.2	-11.5	.0	.0	.0
22	.0	21.4	43.7	.0	.0	.0
23	.0	21.4	43.7	.0	.0	.0
24	.0	21.4	43.7	.0	.0	.0
25	.0	21.4	43.7	.0	.0	.0
26	.0	21.4	43.7	.0	.0	.0
27	.0	21.4	43.7	.0	.0	.0
28	.0	21.4	43.7	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	.2	-1.5	.0	.0	.0

2	.0	.2	-1.5	.0	.0	.0
3	.0	.2	-1.5	.0	.0	.0
4	.0	.2	-1.5	.0	.0	.0
5	.0	.2	-1.5	.0	.0	.0
6	.0	.2	-1.5	.0	.0	.0
7	.0	.2	-1.5	.0	.0	.0
8	.0	-39.6	78.1	.0	.0	.0
9	.0	-39.6	78.1	.0	.0	.0
10	.0	-39.6	78.1	.0	.0	.0
11	.0	-39.6	78.1	.0	.0	.0
12	.0	-39.6	78.1	.0	.0	.0
13	.0	-39.6	78.1	.0	.0	.0
14	.0	-39.6	78.1	.0	.0	.0
15	.0	-13.8	-26.5	.0	.0	.0
16	.0	-13.8	-26.5	.0	.0	.0
17	.0	-13.8	-26.5	.0	.0	.0
18	.0	-13.8	-26.5	.0	.0	.0
19	.0	-13.8	-26.5	.0	.0	.0
20	.0	-13.8	-26.5	.0	.0	.0
21	.0	-13.8	-26.5	.0	.0	.0
22	.0	25.9	53.1	.0	.0	.0
23	.0	25.9	53.1	.0	.0	.0
24	.0	25.9	53.1	.0	.0	.0
25	.0	25.9	53.1	.0	.0	.0
26	.0	25.9	53.1	.0	.0	.0
27	.0	25.9	53.1	.0	.0	.0
28	.0	25.9	53.1	.0	.0	.0

PLANTERS - STATION ADDITION

STABILITY ANALYSIS FOR SWL = 9.5 NGVD:

- FOR FAILURE SURFACE (B)(2), Vertical Pressure Req'd = 1520 psf

slab thickness = 2'-6"

wt = (2.5)(150 - 117) = 82.5 psf

machinery floor : 3'

wt = (3)(150) = 450 psf

total wt = 82.5 + 450 = 532.5 N.G.

- piles do not have tension connectors,

∴ T-wall is Req'd

LOCATION: ~~45'~~ 75' (?) from existing T-wall

- at edge of existing discharge basin slab

FLOODWALL SHEET PILE TYPE:

I-WALLS @ GATES

MAX MOMENT : $19.2^{k'}/ft$ wall

(from Eustis Report)

$$S_{req'd} = \frac{M}{0.65\,f_y} = \frac{(19.2)(12)}{.65(50)}$$

$$= 7.09\ in^3/ft$$

- use Costeel CZ 67 S: 10.69 in^3/ft

BC#2 M_{MAX} : $46^{k \cdot ft}/ft$ WALL

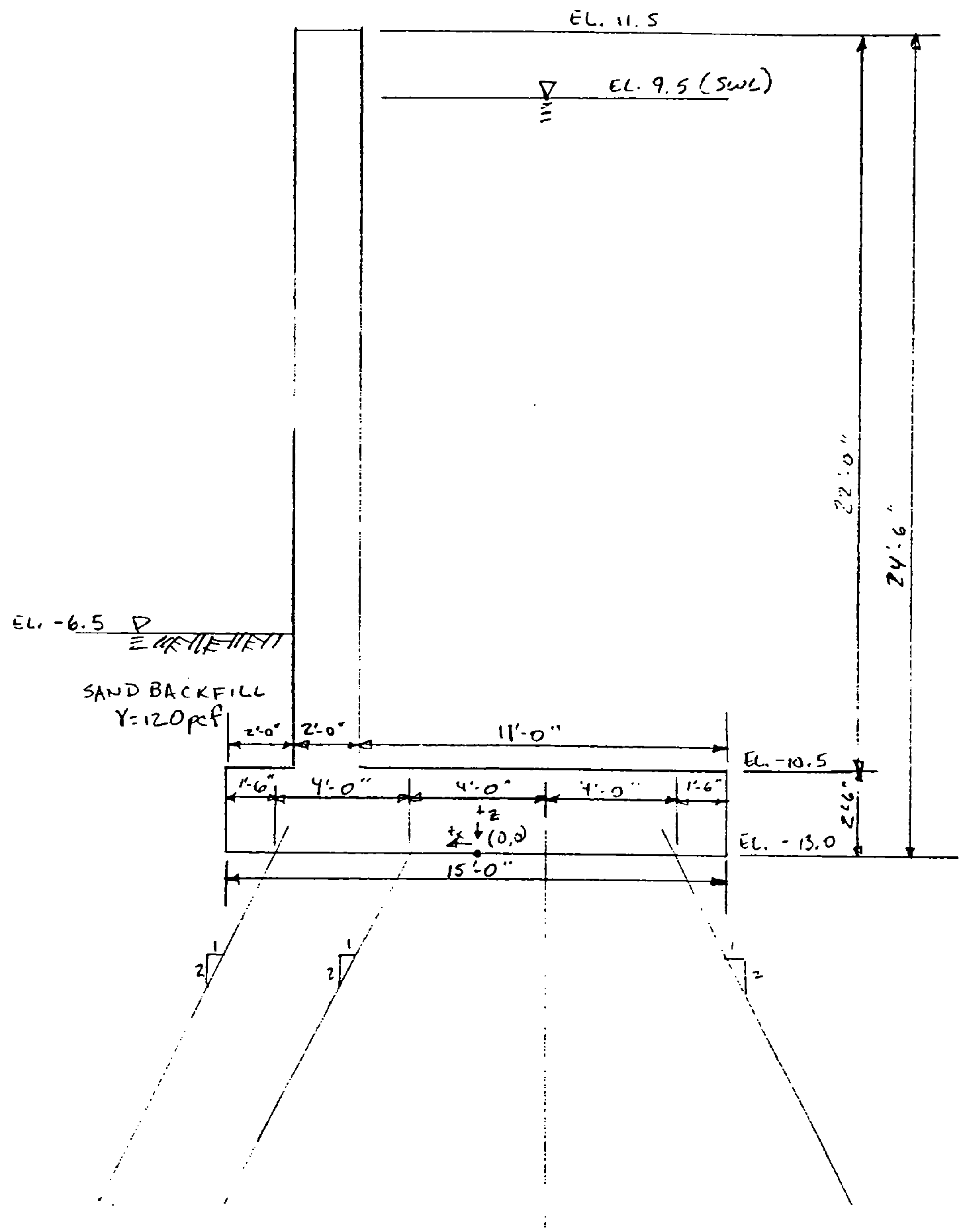
$$S_{req'd} : \frac{(46)(12)}{.65(50)}$$

$$: 16.98\ in^3/ft\ WALL$$

- use Costeel CZ 107
S = 17.48 in^3/ft wall

PLANTERS - ORIGINAL STATION - PUMPS 1-5

- PUT T-WALL AT EDGE OF EXISTING DISCHARGE BASIN SLAB.



T-WALL LOADING CASES:

Case I: Static water pressure to SWL, no wind, impervious sheet pile cut-off (100% forces)

Case II: Static water pressure to SWL, no wind, pervious sheet pile cut-off (100% forces)

Case III: Static water pressure to SWL+2', no wind, impervious sheet pile (75% forces)

Case IV: Static water pressure to SWL+2', no wind, pervious sheet pile (75% forces)

Case V: water at low water level, no wind, (100% forces)

Case VI. Water at low water level, wind from flood side (75%)

DEAD LOADS (PER LINEAR FT.)

STEM: (22')(2')(.150 K/FT³) =	6.6 K/FT
BASE (15)(2.5)(.150) =	5.63

WATER OVER BASE:

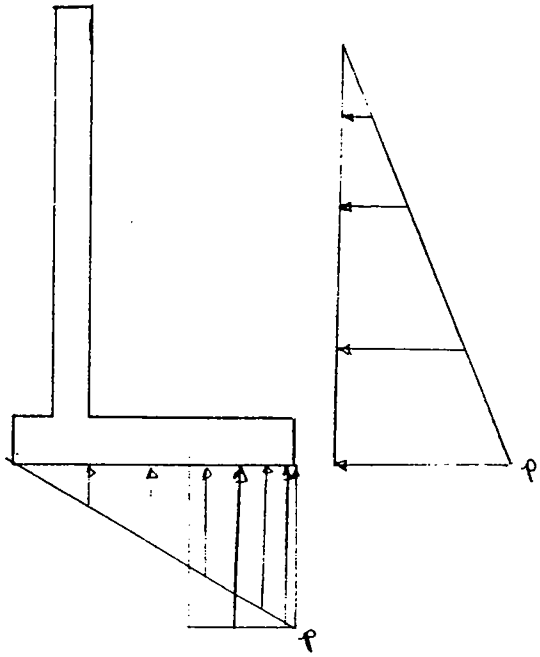
SWL: (11)(20)(.064) =	14.08
SWL+2': (11)(22)(.064) =	15.49
LOW WATER: (11)(10.5)(0.064) =	7.39

SAND ON P/S:

(2')(4')(.120) =	0.96 K/FT

WATER LOADS:

SWL = 9.5 NGVD :

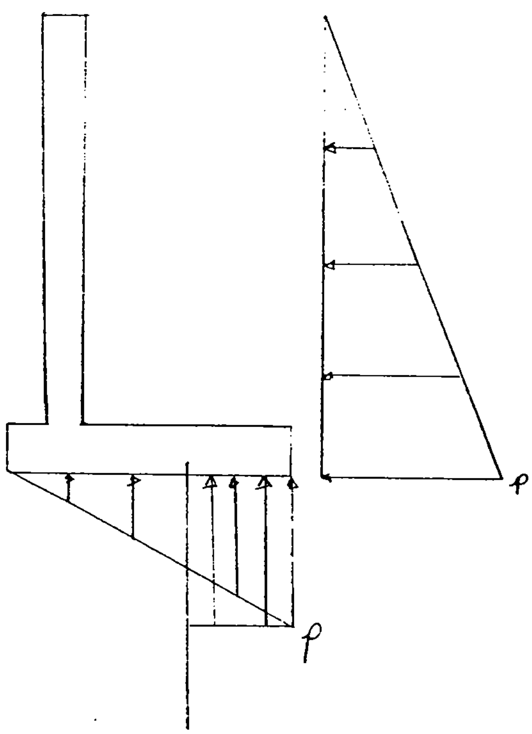


@SWL:
$p = (22.5)(.064)$
$= 1.44 \ ^{k}/_{FT\ FT}$

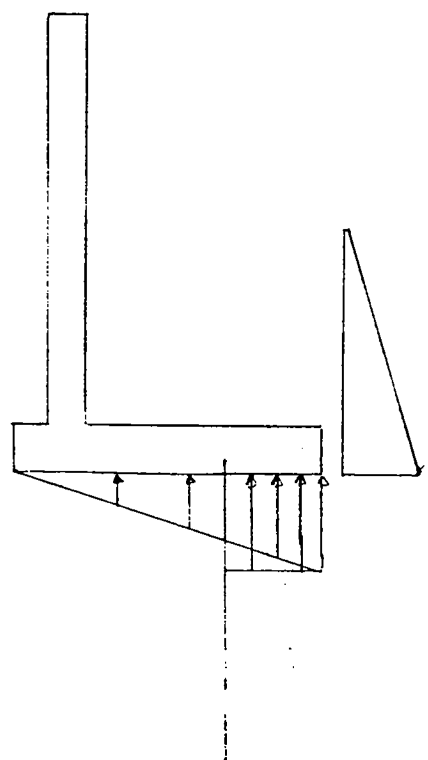
@SWL+2':
$p = (24.5)(.064)$
$= 1.57 \ ^{k}/_{FT \cdot FT}$

@LOW WATER:
$p = (13)(.064)$
$= 0.83 \ ^{k}/_{FT\ FT}$

SWL+2'



LOW WATER: (EL. 0.0 NGVD)



WIND LOADS:

FROM FLOOD SIDE @ LOW WATER:

$(50 psf)(11.5') = 575 \text{ \#/FT}$

JN ~~3003~~ 3004 | COUSINS PUMP STATION FLOODWALL PLANTERS | AAH | 1-16-98 | 6

FLOODWALL FORCE TABULATION

NO.	DESCRIPTION	FORCES (KIPS)			LEVER ARM (FT)			MOMENTS (FT.K)		
		F_x	F_y	F_z	x	Y	Z	M_{x-x}	M_{y-y}	M_{z-z}
1	DEAD LOADS									
	(a) STEM			6.60	+4.5				-29.7	
	(b) BASE			5.63	0				0	
	(c) SWL			14.08	-2.0				28.16	
	(d) SWL+2'			15.49	-2.0				30.98	
	(e) LOW WATER			7.39	-2.0				14.78	
	(f) Sand on P/S			0.96	+6.5				-6.24	
2.	WATER LOADS									
	(a) SWL									
	½(1.44)(22.5) =	16.20					-7.5		-121.5	
	buoyancy:									
	impervious: (1.44)(5.5)			-7.92	-4.75				-37.62	
	pervious: ½(1.44)(15)			-10.80	-2.5				-27.00	
	(b) SWL+2'									
	(½)(1.57)(24.5) =	19.23					-8.17		-157.11	
	buoyancy:									
	imp. (1.57)(5.5)			-8.64	-4.75				-41.04	
	per. (½)(1.57)(15)			-11.78	-2.5				-29.45	
	(c) LOW WATER									
	(½)(0.83)(13) =	5.40					-4.33		-23.38	
	buoyancy:									
	imp. (.83)(5.5)			-4.56	-4.75				-21.66	
	per. ½(.83)(15)			-6.23	-2.5				-15.58	
3.	WIND:									
	from Flood Side	0.58					-18.75		-10.88	

LOAD COMBINATIONS

LOADING CASE	DESCRIPTION		FORCES F_x	FORCES F_z	MOMENTS M_{y-y}
I	DL, SWL, IMP. S/P 100%	DL		27.27	-7.79
		SWL	16.20		-121.5
		IMP.		-7.92	-37.62
		TOTAL	16.20	19.35	-166.91
		FOR 52'	842.4	1006.20	-8679.32
II	DL, SWL, PER S/P 100%	DL		27.27	-7.79
		SWL	16.20		-121.5
		PER.		-10.80	-27.00
		TOTAL	16.20	16.47	-156.40
		FOR 52'	842.4	856.44	-8132.80
III	DL, SWL+2', IMP. S/P 75%	DL		28.68	-4.96
		SWL+2'	19.23		-157.11
		IMP.		-8.64	-41.04
		TOTAL	19.23	20.04	-203.11
		75%	14.42	15.03	-152.33
		FOR 52'	749.84	781.56	-7921.16
IV	DL, SWL+2', PER. S/P 75%	DL		28.68	-4.96
		SWL+2'	19.23		-157.11
		PER.		-11.78	-29.45
		TOTAL	19.23	16.90	-191.52
		75%	14.42	12.68	-143.64
		FOR 52'	749.84	659.36	-7469.28
V	DL, LOW WATER, IMP. S/P 100%	DL		20.58	-21.16
		LOW WATER	5.40		-23.38
		IMP.		-4.56	-21.66
		TOTAL	5.40	16.02	-66.20
		FOR 52'	280.8	833.04	-3442.40
VI	DL, LOW WATER, IMP. S/P, WIND 75%	DL		20.58	-21.16
		LOW WATER	5.40		-23.38
		IMP.		-4.56	-21.66
		WIND	0.58		-10.88
		TOTAL	5.98	16.02	-77.08
		75%	4.48	12.02	-57.81
		FOR 52'	232.96	625.04	-3006.12

SOIL CONSTANT:

- PILE CAPACITY ABOVE EL. -31.5 IS TO BE IGNORED.

- CALCULATE ES USING WEIGHTED AVERAGE BELOW EL. -31.5:

$$\frac{K_h * B}{DC} = [(167)(8.5') + (178)(15) + (222)(5) + 311(11)]/39.5'$$

$$\frac{K_h * B}{DC} = 218$$

$C = 1.0$

$D = 0.21$

- use 14' piles @ 4' spacing:

$AB = 48''$

$14A = 48$

$A = 3.43$

D	A
.25	3
0.21	3.43
.40	4

$ES = K_h * B = 218(1)(.21)$

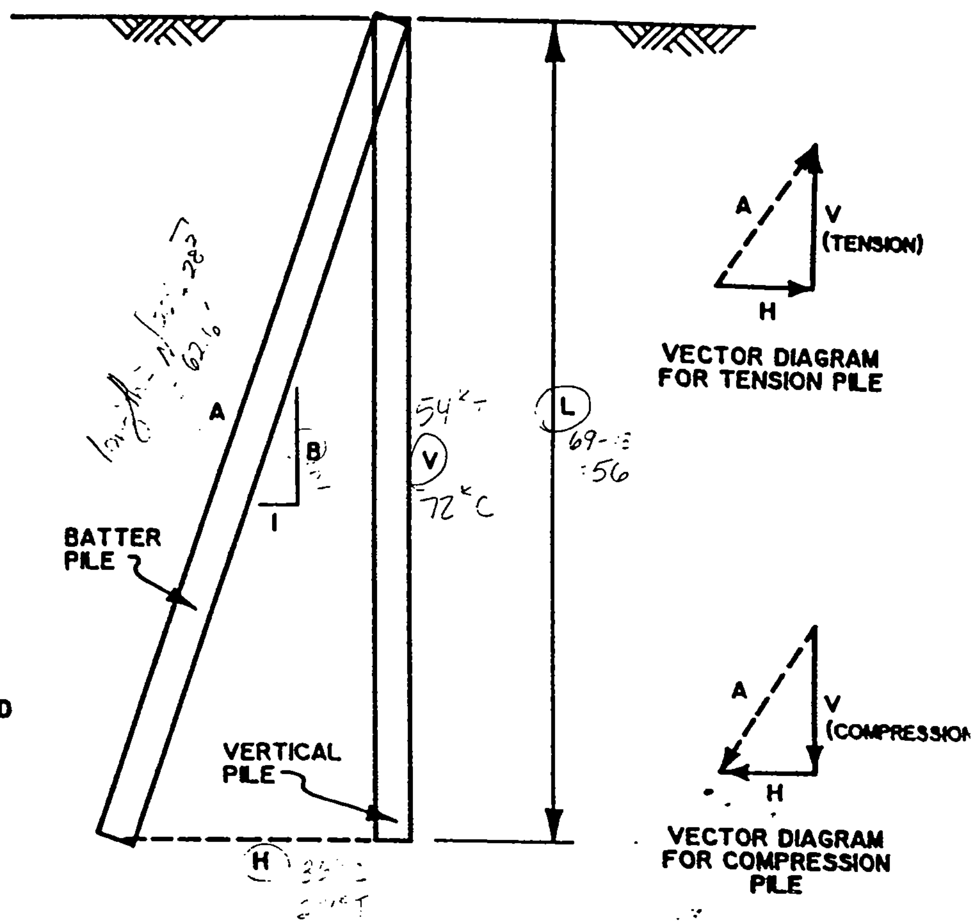
$= 45.78$

- run CPGA FOR A 52' LENGTH OF WALL

AXIAL AND HORIZONTAL RESISTANCE OF BATTER PILES

ESTIMATED FROM ALLOWABLE VERTICAL LOAD CAPACITY

L = VERTICAL COMPONENT OF BATTER PILE EMBEDMENT LENGTH.



V = ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY OF A PILE DRIVEN VERTICALLY WITH EMBEDMENT LENGTH, L.

B = BATTER OF PILE EXPRESSED AS A RATIO OF VERTICAL DISTANCE TO ONE FOOT HORIZONTAL DISTANCE.

H = HORIZONTAL RESISTANCE OF BATTER PILE ESTIMATED AS FOLLOWS:

$$H = \frac{V}{B}$$

A = ALLOWABLE AXIAL PILE LOAD CAPACITY OF A SINGLE BATTER PILE ESTIMATED AS FOLLOWS:

$$A = \sqrt{V^2 \left(1 + \frac{1}{B^2}\right)}$$

$A = \sqrt{(72)^2(1.25)} = 80^K$

$= \sqrt{(54)^2(1.25)} = 60^K$

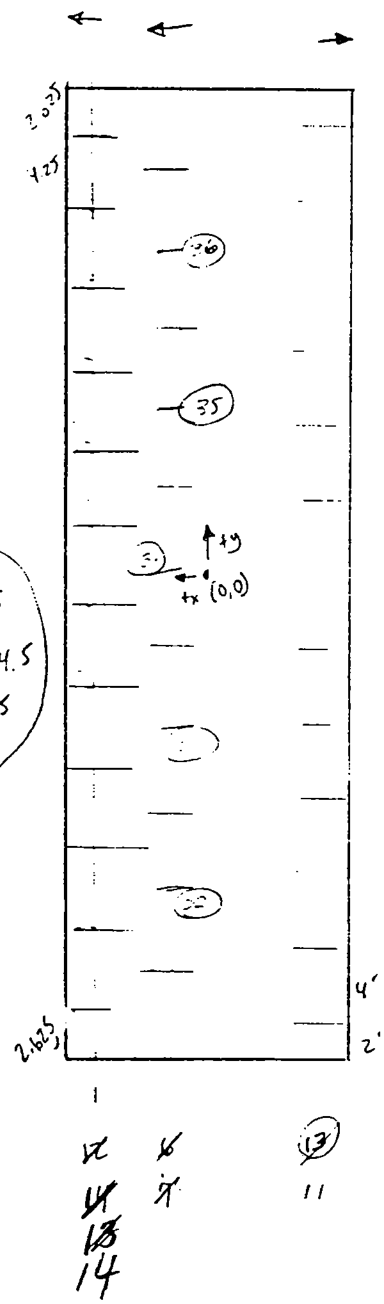
NOTE: THE AXIAL LOAD RESISTANCE OF A VERTICAL PILE, V, IS DEPENDENT ON THE TYPE OF LOADING--TENSION OR COMPRESSION. CAUTION SHOULD BE EXERCISED TO INSURE THAT THE CORRECT VERTICAL CAPACITY IS USED.

PILE SPACING:

1	6	-24.375	0
2		-20.625	
3		-16.875	
4		-13.125	
5		-9.375	
6		-5.625	
7		1.875	
8			
9			
10			
11			
12			
13			
14			
15	2	-22.5	0
16		-15	
17		-7.5	
18		0	
19			
20			
21			
22	-6	-22.5	
23		-18	
24		-13.5	
25		-9	
26		-4.5	
27		0	
28			
29			
30			
31			
32			

14 7 11 = 32

1.625 @ 3.75 1.625
3.5 6@7.5 3.5
3.5 10@4.5 3.5



#	x	y
1	6	23.375
2	6	19.125
3	6	14.875
4	6	10.625
5	6	6.375
6	6	2.125
7	6	-2.125
8	6	-6.375
9	6	-10.625
10	6	-14.875
11	6	-19.125
12	6	-23.375
13	2	21.25
14	2	12.75
15	2	+4.25
16	2	-4.25
17	2	-12.75
18	2	-21.25
19	-6	24
20	-6	20
21	-6	16
22	-6	12
23	-6	8
24	-6	4
25	-6	0
26	-6	-4
27	-6	-8
28	-6	-12
29	-6	-16
30	-6	-20
31	-6	-24

PRELIMINARY

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

REACH 3

ALLOWABLE PILE LOAD CAPACITIES
SQUARE PRECAST, PRESTRESSED CONCRETE PILES
TOP OF PILE AND DREDGE DEPTH AT EL -10.5

SIZE	PILE TIP ELEVATION IN FEET NGVD	ALLOWABLE PILE LOAD CAPACITY IN TONS FACTOR OF SAFETY ≈ 2	
		COMPRESSION	TENSION
12-In. Square	-39 -49 -59 -69	12 16 23 30	9 12 16 22
14-In. Square	-39 -49 -59 -69	15 20 27 36	11 15 20 27
16-In. Square	-39 -49 -59 -69	17 23 31 41	12 16 23 30

These allowable pile load capacities are suitable for piles supporting new T-wall at Units 1 through 5 of Planters Pump Station.

PRELIMINARY

EUSTIS ENGINEERING COMPANY, INC.

```
1010 PLANTERS PUMP STATION FRONTAL PROTECTION TWALL
1020 PROP 4030 3201 3201 196 2 0 ALL
1030 SOIL ES 0.046 LEN 63 0 ALL
1040 PIN ALL
1050 DLS S 80 60 600.2 223.1 132.6 1510 1166.8 H 14 ALL
1060 ASC S 196 457 0.816 0.856 2 0 ALL
1070 BATTER 2 ALL
1080 ANGLE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
1085 ANGLE 0 16 17 18 19 20 21
1090 ANGLE 180 22 23 24 25 26 27 28 29 30 31 32
1110 PILE 1 6 -24.375 0
1111 PILE 2 6 -20.625 0
1112 PILE 3 6 -16.875 0
1113 PILE 4 6 -13.125 0
1114 PILE 5 6 -9.375 0
1120 PILE 6 6 -5.625 0
1121 PILE 7 6 -1.875 0
1122 PILE 8 6 1.875 0
1123 PILE 9 6 5.625 0
1124 PILE 10 6 9.375 0
1130 PILE 11 6 13.125 0
1131 PILE 12 6 16.875 0
1132 PILE 13 6 20.625 0
1133 PILE 14 6 24.375 0
1134 PILE 15 2 -20.5 0
1140 PILE 16 2 -15.0 0
1141 PILE 17 2 -7.5 0
1142 PILE 18 2 0 0
1143 PILE 19 2 7.5 0
1144 PILE 20 2 15.0 0
1150 PILE 21 2 20.5 0
1151 PILE 22 -6 -22.5 0
1152 PILE 23 -6 -18 0
1153 PILE 24 -6 -13.5 0
1154 PILE 25 -6 -9 0
1160 PILE 26 -6 -4.5 0
1161 PILE 27 -6 0 0
1162 PILE 28 -6 4.5 0
1163 PILE 29 -6 9 0
1164 PILE 30 -6 13.5 0
1170 PILE 31 -6 18 0
1180 PILE 32 -6 22.5 0
1210 LOAD 1 842.4 0 1006.2 0 -8679.32 0
1220 LOAD 2 842.4 0 856.44 0 -8132.8 0
1230 LOAD 3 749.84 0 781.56 0 -7921.16 0
1240 LOAD 4 749.84 0 659.36 0 -7469.28 0
1250 LOAD 5 280.8 0 833.04 0 -3442.4 0
1260 LOAD 6 232.96 0 625.04 0 -3006.12 0
1280 FOUT 1 2 3 4 5 6 7 PPSOUT1
1290 PFO ALL
1300 FPL PPSOUT2
```

```
*********************************
* CORPS PROGRAM  #  X0080      *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-A  *   RUN DATE 01-23-98    RUN TIME 16:28:30
*********************************
```

PLANTERS PUMP STATION FRONTAL PROTECTION TWALL

THERE ARE 32 PILES AND
6 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
WITH DIAGONAL COORDINATES =	(-6.00 ,	-24.38 ,	.00)
	(6.00 ,	24.38 ,	.00)

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40300E+04	.32010E+04	.32010E+04	.19600E+03	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.46000E-01	L	.63000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	6.00	-24.38	.00	2.00	.00	63.00	P
2	6.00	-20.63	.00	2.00	.00	63.00	P
3	6.00	-16.88	.00	2.00	.00	63.00	P
4	6.00	-13.13	.00	2.00	.00	63.00	P
5	6.00	-9.38	.00	2.00	.00	63.00	P
6	6.00	-5.63	.00	2.00	.00	63.00	P

7	6.00	-1.88	.00	2.00	.00	63.00	P
8	6.00	1.88	.00	2.00	.00	63.00	P
9	6.00	5.63	.00	2.00	.00	63.00	P
10	6.00	9.38	.00	2.00	.00	63.00	P
11	6.00	13.13	.00	2.00	.00	63.00	P
12	6.00	16.88	.00	2.00	.00	63.00	P
13	6.00	20.63	.00	2.00	.00	63.00	P
14	6.00	24.38	.00	2.00	.00	63.00	P
15	2.00	-20.50	.00	2.00	.00	63.00	P
16	2.00	-15.00	.00	2.00	.00	63.00	P
17	2.00	-7.50	.00	2.00	.00	63.00	P
18	2.00	.00	.00	2.00	.00	63.00	P
19	2.00	7.50	.00	2.00	.00	63.00	P
20	2.00	15.00	.00	2.00	.00	63.00	P
21	2.00	20.50	.00	2.00	.00	63.00	P
22	-6.00	-22.50	.00	2.00	180.00	63.00	P
23	-6.00	-18.00	.00	2.00	180.00	63.00	P
24	-6.00	-13.50	.00	2.00	180.00	63.00	P
25	-6.00	-9.00	.00	2.00	180.00	63.00	P
26	-6.00	-4.50	.00	2.00	180.00	63.00	P
27	-6.00	.00	.00	2.00	180.00	63.00	P
28	-6.00	4.50	.00	2.00	180.00	63.00	P
29	-6.00	9.00	.00	2.00	180.00	63.00	P
30	-6.00	13.50	.00	2.00	180.00	63.00	P
31	-6.00	18.00	.00	2.00	180.00	63.00	P
32	-6.00	22.50	.00	2.00	180.00	63.00	P

						2016.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	842.4	.0	1006.2	.0	-8679.3	.0
2	842.4	.0	856.4	.0	-8132.8	.0
3	749.8	.0	781.6	.0	-7921.2	.0
4	749.8	.0	659.4	.0	-7469.3	.0
5	280.8	.0	833.0	.0	-3442.4	.0
6	233.0	.0	625.0	.0	-3006.1	.0

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ORIGINAL PILE GROUP STIFFNESS MATRIX

.13481E+05	.40109E-03	.83417E+04	.00000E+00	-.16416E+07	.00000E+00
.40109E-03	.13469E+03	-.80218E-03	-.37253E-08	-.57757E-01	.16163E+04
.83417E+04	-.80218E-03	.53521E+05	.15625E+00	-.64226E+06	.62500E-01
.15625E-01	-.37253E-08	.15625E+00	.16449E+10	-.20000E+01	-.28525E+09
-.16416E+07	-.57757E-01	-.64226E+06	.00000E+00	.22351E+09	.00000E+00
-.62500E-01	.16163E+04	.46875E-01	-.28525E+09	-.50000E+01	.41490E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 11.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 11.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 11.
LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 11.
LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.
LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 7.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.2380E-01	-.1094E-06	.1201E-01	-.1993E-11	-.2567E-03	-.1810E-11
2	.7284E-01	-.1315E-06	.6037E-02	.1125E-11	.1157E-03	.1297E-10
3	.1369E-01	-.1162E-06	.8878E-02	-.1930E-11	-.2992E-03	-.3420E-11
4	.5415E-01	-.1342E-06	.3978E-02	.6380E-12	.8127E-05	.8767E-11
5	-.6218E-01	.4105E-07	.1818E-01	-.5783E-11	-.5893E-03	-.2266E-10
6	-.5864E-01	.2305E-07	.1420E-01	-.5041E-11	-.5513E-03	-.2064E-10

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
2	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
3	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
4	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
5	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
6	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
7	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
8	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
9	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
10	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
11	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
12	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
13	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
14	.0	.0	79.2	.0	-1.9	.0	.99	.37	1.26	1.22	#
15	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#
16	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#
17	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#

18	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#
19	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#
20	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#
21	.1	.0	56.2	.0	-3.3	.0	.70	.18	1.15	1.10	#
22	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
23	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
24	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
25	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
26	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
27	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
28	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
29	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
30	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
31	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	
32	-.1	.0	-34.3	.0	4.6	.0	.57	.43	.69	.63	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
2	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
3	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
4	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
5	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
6	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
7	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
8	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
9	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
10	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
11	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
12	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
13	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
14	.3	.0	63.8	.0	-16.4	.0	.80	.24	1.22	1.11	#
15	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
16	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
17	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
18	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
19	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
20	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
21	.3	.0	74.2	.0	-15.8	.0	.93	.33	1.27	1.16	#
22	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
23	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
24	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
25	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
26	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
27	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
28	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
29	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
30	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
31	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	
32	-.3	.0	-41.2	.0	17.8	.0	.69	.54	.68	.57	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI

1	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
2	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
3	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
4	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
5	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
6	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
7	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
8	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
9	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
10	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
11	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
12	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
13	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
14	.0	.0	69.7	.0	.3	.0	.87	.29	1.21	1.17	#
15	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
16	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
17	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
18	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
19	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
20	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
21	.0	.0	42.8	.0	-1.3	.0	.54	.14	1.08	1.03	#
22	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
23	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
24	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
25	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
26	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
27	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
28	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
29	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
30	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
31	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	
32	.0	.0	-36.5	.0	1.6	.0	.61	.45	.67	.63	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
2	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
3	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
4	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
5	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
6	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
7	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
8	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
9	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
10	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
11	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
12	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
13	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
14	.2	.0	56.9	.0	-11.6	.0	.71	.19	1.17	1.08	#
15	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#
16	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#
17	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#
18	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#
19	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#
20	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#

21	.2	.0	57.7	.0	-11.6	.0	.72	.19	1.18	1.08	#
22	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
23	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
24	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
25	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
26	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
27	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
28	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
29	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
30	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
31	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	
32	-.2	.0	-42.1	.0	12.5	.0	.70	.54	.67	.57	

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
2	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
3	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
4	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
5	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
6	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
7	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
8	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
9	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
10	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
11	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
12	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
13	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
14	-.3	.0	55.2	.0	20.5	.0	.69	.17	1.18	1.05	#
15	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
16	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
17	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
18	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
19	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
20	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
21	-.3	.0	2.3	.0	17.4	.0	.03	.25	.91	.79	
22	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
23	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
24	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
25	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
26	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
27	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
28	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
29	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
30	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
31	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#
32	.3	.0	12.8	.0	-16.5	.0	.16	.20	.96	.85	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
2	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#

3	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
4	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
5	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
6	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
7	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
8	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
9	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
10	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
11	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
12	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
13	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
14	-.3	.0	45.9	.0	19.0	.0	.57	.13	1.13	1.01	#
15	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
16	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
17	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
18	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
19	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
20	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
21	-.3	.0	-3.5	.0	16.1	.0	.06	.08	.87	.76	
22	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
23	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
24	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
25	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
26	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
27	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
28	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
29	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
30	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
31	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	
32	.3	.0	7.2	.0	-15.8	.0	.09	.22	.93	.82	

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	35.5	.0	70.9	.0	.0	.0
2	35.5	.0	70.9	.0	.0	.0
3	35.5	.0	70.9	.0	.0	.0
4	35.5	.0	70.9	.0	.0	.0
5	35.5	.0	70.9	.0	.0	.0
6	35.5	.0	70.9	.0	.0	.0
7	35.5	.0	70.9	.0	.0	.0
8	35.5	.0	70.9	.0	.0	.0
9	35.5	.0	70.9	.0	.0	.0
10	35.5	.0	70.9	.0	.0	.0
11	35.5	.0	70.9	.0	.0	.0
12	35.5	.0	70.9	.0	.0	.0
13	35.5	.0	70.9	.0	.0	.0
14	35.5	.0	70.9	.0	.0	.0
15	25.2	.0	50.2	.0	.0	.0
16	25.2	.0	50.2	.0	.0	.0
17	25.2	.0	50.2	.0	.0	.0

18	25.2	.0	50.2	.0	.0	.0
19	25.2	.0	50.2	.0	.0	.0
20	25.2	.0	50.2	.0	.0	.0
21	25.2	.0	50.2	.0	.0	.0
22	15.4	.0	-30.7	.0	.0	.0
23	15.4	.0	-30.7	.0	.0	.0
24	15.4	.0	-30.7	.0	.0	.0
25	15.4	.0	-30.7	.0	.0	.0
26	15.4	.0	-30.7	.0	.0	.0
27	15.4	.0	-30.7	.0	.0	.0
28	15.4	.0	-30.7	.0	.0	.0
29	15.4	.0	-30.7	.0	.0	.0
30	15.4	.0	-30.7	.0	.0	.0
31	15.4	.0	-30.7	.0	.0	.0
32	15.4	.0	-30.7	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	28.8	.0	56.9	.0	.0	.0
2	28.8	.0	56.9	.0	.0	.0
3	28.8	.0	56.9	.0	.0	.0
4	28.8	.0	56.9	.0	.0	.0
5	28.8	.0	56.9	.0	.0	.0
6	28.8	.0	56.9	.0	.0	.0
7	28.8	.0	56.9	.0	.0	.0
8	28.8	.0	56.9	.0	.0	.0
9	28.8	.0	56.9	.0	.0	.0
10	28.8	.0	56.9	.0	.0	.0
11	28.8	.0	56.9	.0	.0	.0
12	28.8	.0	56.9	.0	.0	.0
13	28.8	.0	56.9	.0	.0	.0
14	28.8	.0	56.9	.0	.0	.0
15	33.4	.0	66.2	.0	.0	.0
16	33.4	.0	66.2	.0	.0	.0
17	33.4	.0	66.2	.0	.0	.0
18	33.4	.0	66.2	.0	.0	.0
19	33.4	.0	66.2	.0	.0	.0
20	33.4	.0	66.2	.0	.0	.0
21	33.4	.0	66.2	.0	.0	.0
22	18.7	.0	-36.7	.0	.0	.0
23	18.7	.0	-36.7	.0	.0	.0
24	18.7	.0	-36.7	.0	.0	.0
25	18.7	.0	-36.7	.0	.0	.0
26	18.7	.0	-36.7	.0	.0	.0
27	18.7	.0	-36.7	.0	.0	.0
28	18.7	.0	-36.7	.0	.0	.0
29	18.7	.0	-36.7	.0	.0	.0
30	18.7	.0	-36.7	.0	.0	.0
31	18.7	.0	-36.7	.0	.0	.0
32	18.7	.0	-36.7	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K

1	31.1	.0	62.3	.0	.0	.0
2	31.1	.0	62.3	.0	.0	.0
3	31.1	.0	62.3	.0	.0	.0
4	31.1	.0	62.3	.0	.0	.0
5	31.1	.0	62.3	.0	.0	.0
6	31.1	.0	62.3	.0	.0	.0
7	31.1	.0	62.3	.0	.0	.0
8	31.1	.0	62.3	.0	.0	.0
9	31.1	.0	62.3	.0	.0	.0
10	31.1	.0	62.3	.0	.0	.0
11	31.1	.0	62.3	.0	.0	.0
12	31.1	.0	62.3	.0	.0	.0
13	31.1	.0	62.3	.0	.0	.0
14	31.1	.0	62.3	.0	.0	.0
15	19.2	.0	38.3	.0	.0	.0
16	19.2	.0	38.3	.0	.0	.0
17	19.2	.0	38.3	.0	.0	.0
18	19.2	.0	38.3	.0	.0	.0
19	19.2	.0	38.3	.0	.0	.0
20	19.2	.0	38.3	.0	.0	.0
21	19.2	.0	38.3	.0	.0	.0
22	16.3	.0	-32.6	.0	.0	.0
23	16.3	.0	-32.6	.0	.0	.0
24	16.3	.0	-32.6	.0	.0	.0
25	16.3	.0	-32.6	.0	.0	.0
26	16.3	.0	-32.6	.0	.0	.0
27	16.3	.0	-32.6	.0	.0	.0
28	16.3	.0	-32.6	.0	.0	.0
29	16.3	.0	-32.6	.0	.0	.0
30	16.3	.0	-32.6	.0	.0	.0
31	16.3	.0	-32.6	.0	.0	.0
32	16.3	.0	-32.6	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	25.6	.0	50.8	.0	.0	.0
2	25.6	.0	50.8	.0	.0	.0
3	25.6	.0	50.8	.0	.0	.0
4	25.6	.0	50.8	.0	.0	.0
5	25.6	.0	50.8	.0	.0	.0
6	25.6	.0	50.8	.0	.0	.0
7	25.6	.0	50.8	.0	.0	.0
8	25.6	.0	50.8	.0	.0	.0
9	25.6	.0	50.8	.0	.0	.0
10	25.6	.0	50.8	.0	.0	.0
11	25.6	.0	50.8	.0	.0	.0
12	25.6	.0	50.8	.0	.0	.0
13	25.6	.0	50.8	.0	.0	.0
14	25.6	.0	50.8	.0	.0	.0
15	26.0	.0	51.5	.0	.0	.0
16	26.0	.0	51.5	.0	.0	.0
17	26.0	.0	51.5	.0	.0	.0
18	26.0	.0	51.5	.0	.0	.0
19	26.0	.0	51.5	.0	.0	.0
20	26.0	.0	51.5	.0	.0	.0

21	26.0	.0	51.5	.0	.0	.0
22	19.0	.0	-37.5	.0	.0	.0
23	19.0	.0	-37.5	.0	.0	.0
24	19.0	.0	-37.5	.0	.0	.0
25	19.0	.0	-37.5	.0	.0	.0
26	19.0	.0	-37.5	.0	.0	.0
27	19.0	.0	-37.5	.0	.0	.0
28	19.0	.0	-37.5	.0	.0	.0
29	19.0	.0	-37.5	.0	.0	.0
30	19.0	.0	-37.5	.0	.0	.0
31	19.0	.0	-37.5	.0	.0	.0
32	19.0	.0	-37.5	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	24.4	.0	49.5	.0	.0	.0
2	24.4	.0	49.5	.0	.0	.0
3	24.4	.0	49.5	.0	.0	.0
4	24.4	.0	49.5	.0	.0	.0
5	24.4	.0	49.5	.0	.0	.0
6	24.4	.0	49.5	.0	.0	.0
7	24.4	.0	49.5	.0	.0	.0
8	24.4	.0	49.5	.0	.0	.0
9	24.4	.0	49.5	.0	.0	.0
10	24.4	.0	49.5	.0	.0	.0
11	24.4	.0	49.5	.0	.0	.0
12	24.4	.0	49.5	.0	.0	.0
13	24.4	.0	49.5	.0	.0	.0
14	24.4	.0	49.5	.0	.0	.0
15	.8	.0	2.2	.0	.0	.0
16	.8	.0	2.2	.0	.0	.0
17	.8	.0	2.2	.0	.0	.0
18	.8	.0	2.2	.0	.0	.0
19	.8	.0	2.2	.0	.0	.0
20	.8	.0	2.2	.0	.0	.0
21	.8	.0	2.2	.0	.0	.0
22	-6.0	.0	11.3	.0	.0	.0
23	-6.0	.0	11.3	.0	.0	.0
24	-6.0	.0	11.3	.0	.0	.0
25	-6.0	.0	11.3	.0	.0	.0
26	-6.0	.0	11.3	.0	.0	.0
27	-6.0	.0	11.3	.0	.0	.0
28	-6.0	.0	11.3	.0	.0	.0
29	-6.0	.0	11.3	.0	.0	.0
30	-6.0	.0	11.3	.0	.0	.0
31	-6.0	.0	11.3	.0	.0	.0
32	-6.0	.0	11.3	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	20.3	.0	41.2	.0	.0	.0
2	20.3	.0	41.2	.0	.0	.0

3	20.3	.0	41.2	.0	.0	.0
4	20.3	.0	41.2	.0	.0	.0
5	20.3	.0	41.2	.0	.0	.0
6	20.3	.0	41.2	.0	.0	.0
7	20.3	.0	41.2	.0	.0	.0
8	20.3	.0	41.2	.0	.0	.0
9	20.3	.0	41.2	.0	.0	.0
10	20.3	.0	41.2	.0	.0	.0
11	20.3	.0	41.2	.0	.0	.0
12	20.3	.0	41.2	.0	.0	.0
13	20.3	.0	41.2	.0	.0	.0
14	20.3	.0	41.2	.0	.0	.0
15	-1.8	.0	-3.0	.0	.0	.0
16	-1.8	.0	-3.0	.0	.0	.0
17	-1.8	.0	-3.0	.0	.0	.0
18	-1.8	.0	-3.0	.0	.0	.0
19	-1.8	.0	-3.0	.0	.0	.0
20	-1.8	.0	-3.0	.0	.0	.0
21	-1.8	.0	-3.0	.0	.0	.0
22	-3.4	.0	6.3	.0	.0	.0
23	-3.4	.0	6.3	.0	.0	.0
24	-3.4	.0	6.3	.0	.0	.0
25	-3.4	.0	6.3	.0	.0	.0
26	-3.4	.0	6.3	.0	.0	.0
27	-3.4	.0	6.3	.0	.0	.0
28	-3.4	.0	6.3	.0	.0	.0
29	-3.4	.0	6.3	.0	.0	.0
30	-3.4	.0	6.3	.0	.0	.0
31	-3.4	.0	6.3	.0	.0	.0
32	-3.4	.0	6.3	.0	.0	.0

MAX LOAD: = 79.2 k C (LOAD CASE - 1)

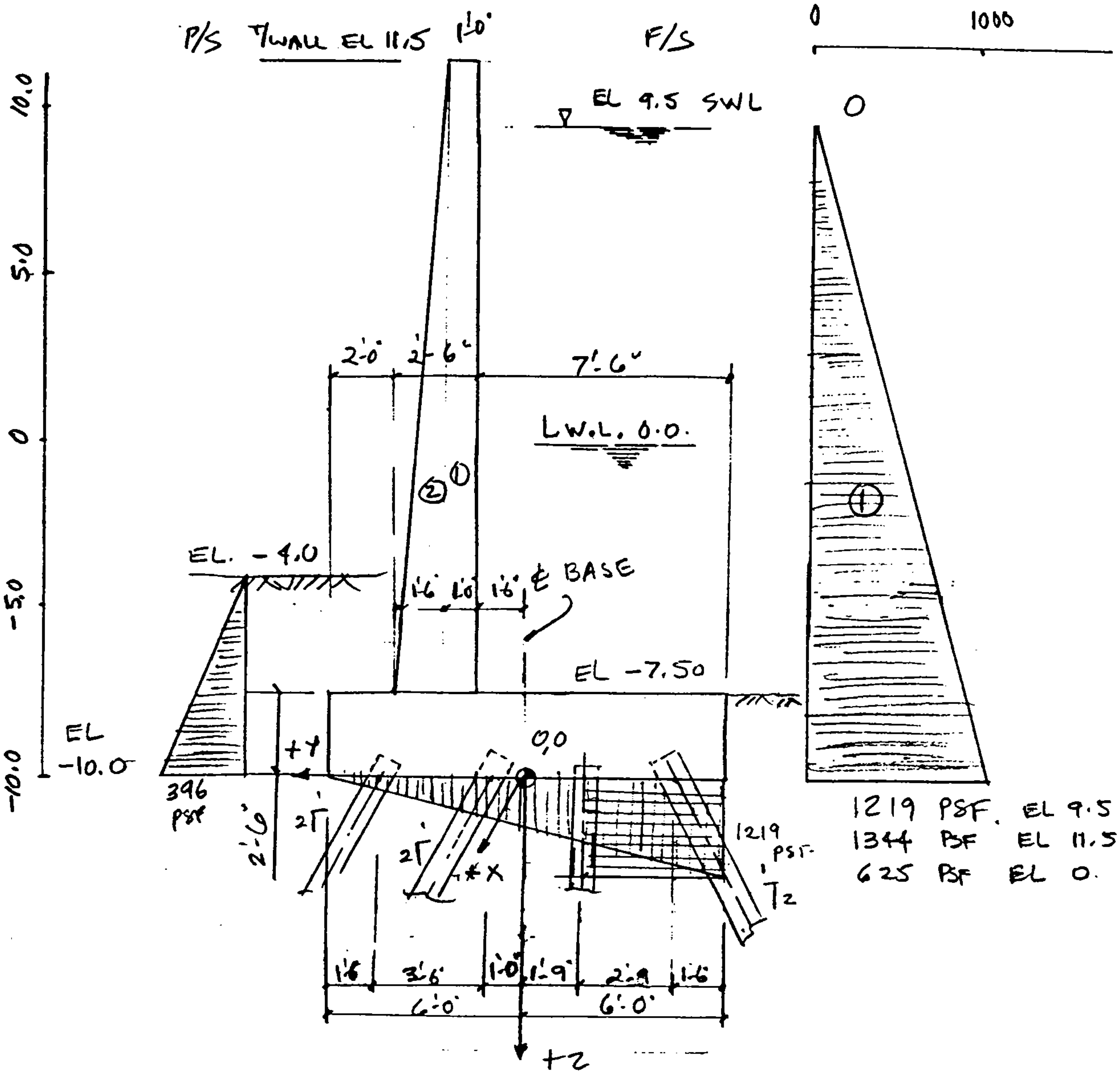
= 42.1 k T (LOAD CASE 4)

ALLOWABLES = 80 k C > 79.2 OK

60 k T > 42.1 OK

Addition

DESIGN OF T-WALL.



CROSS-SECTION SCALE 1" = 5'0"

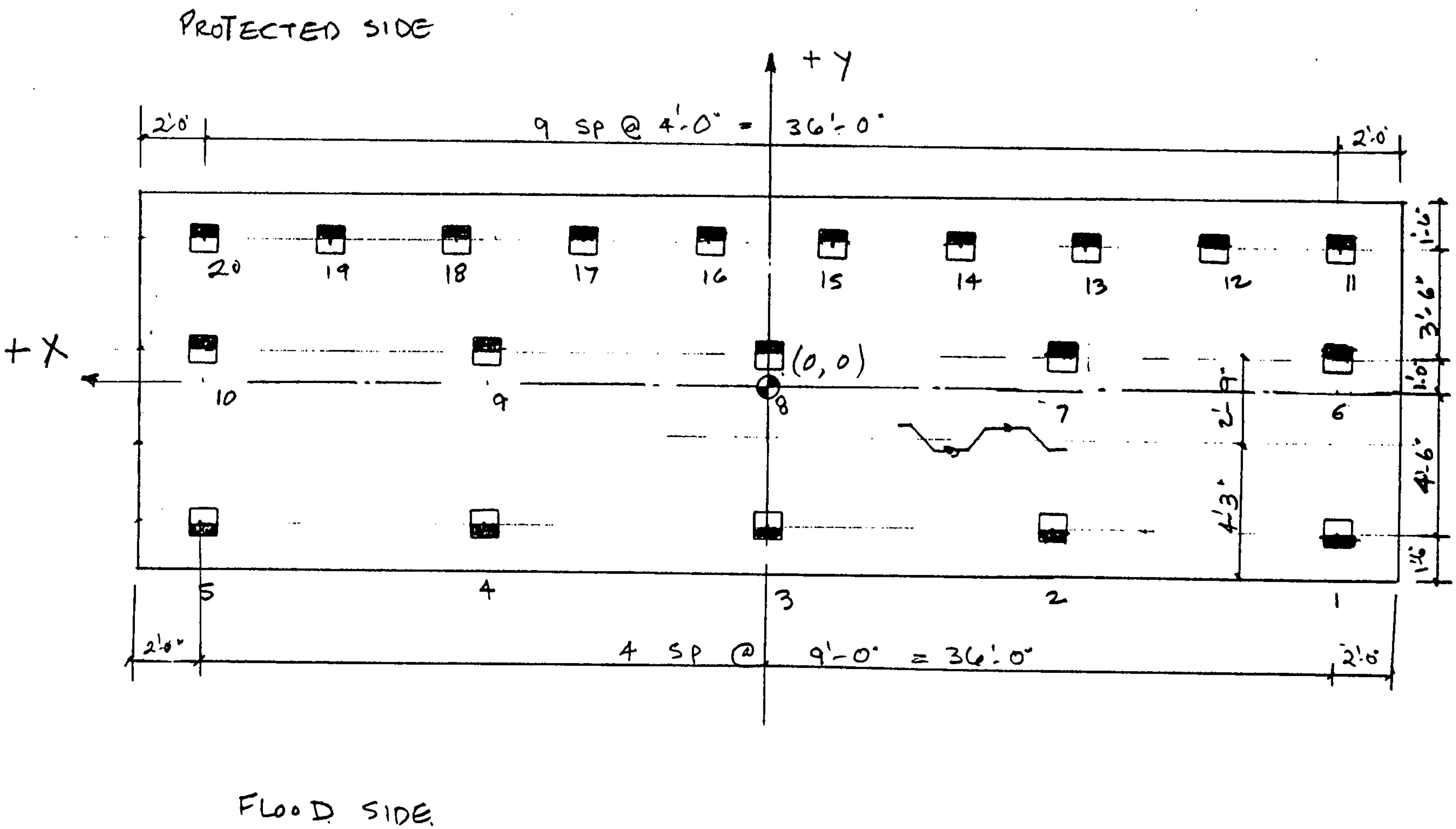
WATER PR ON F/S

SWL 9.5	P = 62.5 × 19.5	= 1219 PSF
HWL 11.5	P = 62.5 × 21.5	= 1344 PSF
LWL 0.0	P = 62.5 × 10	= 625 PSF.

Soil Pr. @ REST ON P/S

= 0.55 × 120 × 6' = 396 PSF

MS



PLANTERS PUMP STA

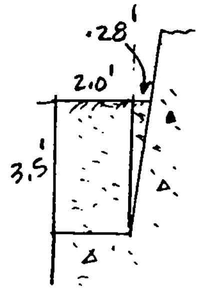
3/26/98

2

B LOADS ON T-WALL.

− Clockwise
+ Anticlockwise

LOAD CASE NO	DESCRIPTION	← +Fy KIPS	↓ +Fz KIPS	$\bar{y}$ Ft	$\bar{z}$ Ft	MOMENT Mx 1K
	DEAD LOAD					
1	STEM: 1.0 × 19.0 × .15		2.85	2.0		+ 5.70 ↶
	½ × 1.5 × 19 × .15		2.14	3.00		+ 6.42 ↶
	BASE: 12 × 2.5 × .15		4.50	—	—	—
	TOTAL		9.49			+ 12.12 ↶
2	WATER & SOIL FORCES. F/S.					
	S.W.L. EL 9.50					
	a) WT. OF WATER ON F/S					
	7.5′ × 17′ × .0625	—	7.97	-2.25	—	− 17.93 ↷
	b) WT. OF SOIL ON F/S.	—	—	—		—
	c) LATERAL WATER PR.					
	½ × 1.219 × 19.5 @ EL. -3.50	11.89			6.5	+ 77.29 ↶
	2(a+b+c)	11.89	7.97			+ 59.36 ↶
3	SOIL FORCES P/S.					
	a) 2′ × 3.5′ × .120 KCF		0.84	5.0		+ 4.2 ↶
	b) ½ × .28′ × 3.5′ × .12		0.06	3.91		+ 0.23 ↶
	c) LATERAL SOIL PR.					
	$\frac{.396}{2}$ × 6′	-1.2			2.0	− 3.6 KFt ↷
	3 a+b+c	-1.2	0.90			+ 0.83 ↶



−CLOCKWISE
+ ANTICLOCKWISE

LD CASE	DESCRIPTION	+Fy	+Fz	$\bar{y}$ Ft	$\bar{z}$ Ft	MOMENT Mx IK
4	UPLIFT FORCES W.S. EL 9.5					
	a) IMPERVIOUS SHEETPILE 1.219 × 4.25		-5.18	3.87		+ 20.05
	b) PERVIOUS SHEETPILE ½ × 1.219 × 12.0		-7.32	2.0		+ 14.68
5	WATER + SOIL FORCES F/S. H.W.L. EL 11.50					
	a) WT. OF WATER ON F/S 7.5' × 19' × .0625		8.91	-2.25		20.05
	b) soil	—	—	—	—	—
	c) LATERAL WATER PR ½ × 1.344 × 21.5'	14.45			7.17	103.6
	5 a+b+c	14.45	8.91			123.65
6	UPLIFT FORCES W.S. EL 13.5					
	a) IMPERVIOUS SHEET PILE 1.344 × 4.25		-5.71	3.87		- 22.10
	b) PERVIOUS SHEETPILE ½ × 1.344 × 12.0		-8.06	2.0		- 16.12

LD CASE	DESCRIPTION	+Fy ← K	+Fz ↓ K	ȳ ft	z̄ ft	MOMENT Mx 1K
7	WIND FORCE FROM F/S					
	50 PSF × 11.8 @ EL 5.75	.58	–		15.75	9.06 1K ↺
8	WIND FORCE FROM P/S					
	50 PSF × 15.5' @ EL 3.75	.78	–		13.75	– 10.73 1K ↻
9	WATER & SOIL FORCES F/S					
	W.S.EL 0.0. LWL					
	a) WT. OF WATER ON F/S					
	7.5'×7.5'×.0625		+3.52	-2.25		– 7.92 ↻
	b) WT. OF SOIL ON F/S	–	–	–	–	–
	c) LATERAL WATER PR					
	½×.625×10.0' @ EL -6.67	3.13			3.33	10.42 ↺
	9 (a+b+c)	3.13	3.52			2.50 ↺
10	UPLIFT FORCES					
	a) Imp. sheet piles					
	.625 × 4.25		-2.66	3.87		-10.28 ↺
	b) Perv. sheet piles					
	½×.625×12.0		-3.75	2.0		- 7.5 ↺

LOAD COMBINATIONS.

- clockwise
+ anticlock

LD. COMB NO.	DESCRIPTION	← +Fy	+Fz ↓	MOMENT MXX
1	Static Water pr with Water at SWL. No wind, Imp. sheet pile plus soil on p/s.			
	LOAD CASE NO. 1		9.49	+ 12.12
	" 2(a+b+c)	+11.89	7.97	+ 59.36
	" 3(a+b+c)	- 1.2	0.90	+0.83
	" 4 a)		- 5.18	+ 20.05
	TOTAL PER LFt	10.69	13.18	92.36
	TOTAL PER 40'	427.6	527.2	3694.4
2	Static Water pr. With Water at SWL. No wind, perv. Sheet piles With soil on P/S.			
	LOAD CASE NO. 1		9.49	+12.12
	" 2(a+b+c)	+11.89	7.97	+ 59.36
	" 3(a+b+c	- 1.2	0.90	±0.83
	" 4 (b)		-7.32	+14.68
	TOTAL PER LFT	10.69	11.04	86.99
	TOTAL PER 40'-0"	427.6	441.6	3479.6

LOAD COMBINATIONS.

LD. COMB No.	DESCRIPTION	+ Fy ←	+ Fz ↓	MOMENT MXX
3	Static water pr with water at EL 11.5, No wind Imp. sheet piles plus soil on P/s.			
	LOAD CASE NO. 1		9.49	+ 12.12
	" 5 (a+b+c)	14.45	8.91	+ 123.65
	" 3 (a+b+c)	−1.2	0.90	+ 0.83
	" 6 a		−5.71	− 22.10
	TOTAL PER LFT	13.25	13.59	114.50
	75% → TOTAL PER 40'x.75	397.5	407.7	3,435.0
4	Static water pr. with water at EL 11.5, No wind, Perv. sheet piles plus soil on P/s			
	LOAD CASE NO 1		9.49	+ 12.12
	" 5 (a+b+c)	14.45	8.91	+ 123.65
	" 3 (a+b+c)	− 1.2	0.90	+ 0.83
	" 6 b		− 8.06	− 16.12
	TOTAL PER LFT	13.25	11.24	120.48
	75% → TOTAL PER 40'0"x.75	397.5	337.2	3614.4

LOAD COMBINATIONS.

LD. COMB NO.	DESCRIPTION	← +Fy	↓ +Fz	MOMENT MXX
5	Static Water pr with water at LWL. No Wind imp sheet piles w/ soil on P/S.			
	LOAD CASE 1		9.49	+12.12
	" 9(a+b+c)	3.13	3.52	2.50
	" 3(a+b+c)	-1.2	0.90	+0.83
	" 10 a		-2.5	-10.0
	TOTAL PER LFT	1.93	11.41	5.45
	TOTAL PER 40'	77.2	456.4	218.0
6	Static Water pr. With water @ LWL No wind perv. sheet piles w/ soil on P/S.			
	LOAD CASE 1		9.49	+12.12
	" 9(a+b+c)	3.13	3.52	2.50
	" 3(a+b+c)	-1.2	0.90	+0.83
	" 10 b		-3.75	-7.50
	TOTAL PER LFT	1.93	10.16	7.95
	TOTAL PER 40'-0"	77.2	406.4	318.0

LOAD COMBINATIONS.

LD. COMB No.	DESCRIPTION	← +Fy	+Fz ↓	MOMENT MXX
7	Static Water pr. with water @ LWL Wind from F/s, perv. Sheet piles soil on P/s.			
	LOAD COMB 5	1.93	10.16	7.95
	LOAD CASE 7	0.58		9.06
	TOTAL PER LFt	2.51	10.16	17.01
	TOTAL PER 40'	100.4	427.6	612
8	Static Water pr. with water @ LWL Wind from P/s, Imp sheet piles soil on P/s			
	LOAD COMB 5	1.93	11.41	5.45
	LOAD CASE 8	-0.78		-10.73
	TOTAL PER LFT	1.15	11.41	-5.28
	TOTAL PER 40'-0"	46.0	456.40	-211.20

100 Planters Pump Station T Wall

200 Prop 4074 3201 3201 196 2.0 0.0 ALL

300 S01 ES .039 LEN 60 0 ALL

320 AN ALL

FROM PILE LIBRARY SUPP. BY COE

410 OLS 5 72 54 600 223 1.33 1510 1167 H 14

430 ASC 5 196 457 0.816 0.856 1.75 0.0 ALL ALL

440 BAT 2.0 ALL

450 ANG 270 1 TO 5

455 ANG 90 6 TO 20

460 PIL 1 -17.5 -4.5 0.0

461 PIL 6 -17.5 1.0 0.0

463 PIL 11 -17.5 -4.5 0.0

465 ROW X 6 1 5 @ 7.0

480 ROW X 5 7 4 @ 8.75

485 ROW X 6 12 5 @ 7.0

500 LOA 1 0 427.6 560.4 3605 0 0

510 LOA 2 0 427.6 462.8 3411.2 0 0

520 LOA 3 0 397.5 433.5 3402 0 0

530 LOA 4 0 397.5 353.1 3563 0 0

600 FOU 1 2 3 4 5 6 TWALLP01

610 PFO ALL

1620 FPL N

SUMMARY OF PILE LOADS.

REF. FILE PPSTW10

DT MAR. 30 - 98
(11:22:34)

	DESCRIPTION	MAX. COMP	MAX. TENS.	CBF	MAX. COMP STR	MAX TENS. STR
1	FLOODSIDE PILES	33.8 (5)	-51.8 (4)	0.65 (4)	1.04 (15)	-
2	MIDDLE ROW	38.9 (8)	-0.6 (4)	0.21 (3)	1.06 (8)	-
3	PROTECTED SIDE.	71.7 (1)	-	0.25 (4)	1.24 (1)	-

Max. Axial Compression = 71.7^k = 36.0 Tons

Vertical component = 32.2 Tons.
sin 63.4 = 0.89

Pile Tip Reqd -65.0 using F.O.S
Cut. off -9.25 - 2.0

Per Soil Report (Preliminary, Eustis Engg.)

Length of pile = (55'-9") 1.12
62'-6"

PRELIMINARY

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

REACH 3

ALLOWABLE PILE LOAD CAPACITIES
SQUARE PRECAST, PRESTRESSED CONCRETE PILES
TOP OF PILE AND DREDGE DEPTH AT EL -10.5

SIZE	PILE TIP ELEVATION IN FEET NGVD	ALLOWABLE PILE LOAD CAPACITY IN TONS FACTOR OF SAFETY ≈ 2	
		COMPRESSION	TENSION
12-In. Square	-39 -49 -59 -69	12 16 23 30	9 12 16 22
14-In. Square	-39 -49 -59 -69	15 20 27 36	11 15 20 27
16-In. Square	-39 -49 -59 -69	17 23 31 41	12 16 23 30

These allowable pile load capacities are suitable for piles supporting new T-wall at Units 1 through 5 of Planters Pump Station.

PRELIMINARY

EUSTIS ENGINEERING COMPANY, INC.

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

MODULUS OF HORIZONTAL SUBGRADE REACTION
REACH 3

ELEVATION IN FEET	$\frac{K_h \times B}{DC}$
10 to 0	169
0 to -19	155
-19 to -40	167
-40 to -45	178
-45 to -50	222
-56 to -67	311

Where: K_h = Modulus of horizontal subgrade reaction (lbs/in.^{3})

B = Diameter of pile (inches)

C = Reduction factor for cyclic loading

C = 0.5 for cyclic loading
C = 1.0 for initial loading

PRELIMINARY

D = Reduction factor for effect of group action

D	PILE SPACING IN DIRECTION OF LOADING
1.0	8B
0.85	7B
0.7	6B
0.55	5B
0.40	4B
0.25	3B

EUSTIS ENGINEERING COMPANY, INC.

FIGURE C

T-WALL LOADING CASES:

Case I: Static water pressure to SWL, no wind, impervious sheet pile cut-off (100% forces)

Case II: Static water pressure to SWL, no wind, pervious sheet pile cut off (100% forces)

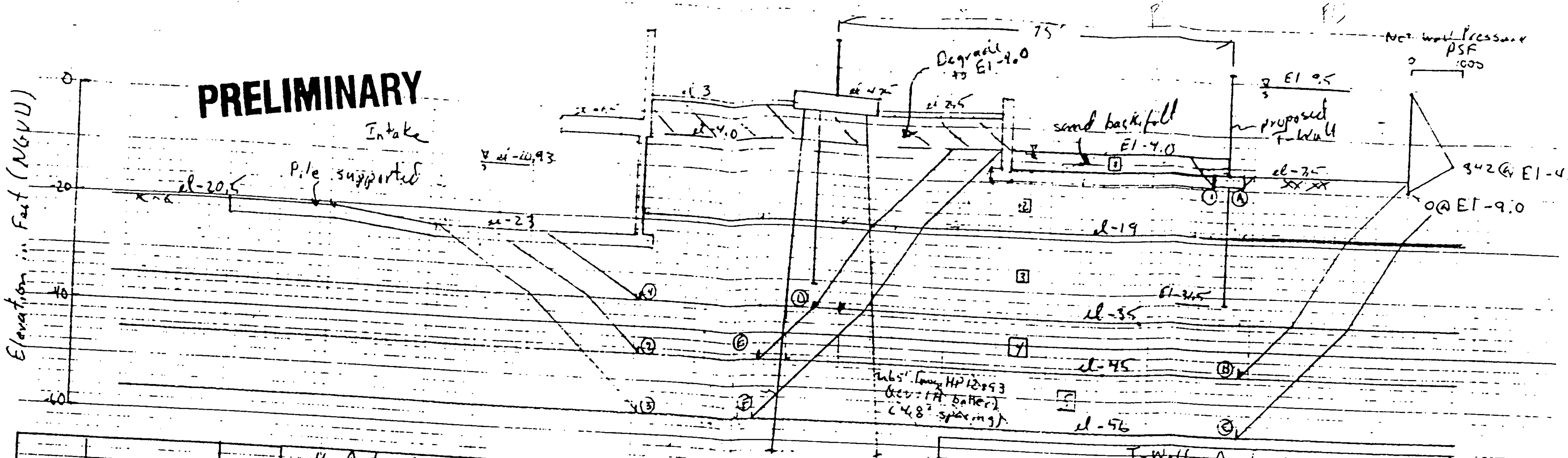
Case III: Static water pressure to SWL+2', no wind, impervious sheet pile (75% forces)

Case IV: Static water pressure to SWL+2', no wind, pervious sheet pile (75% forces)

Case V: water at low water level, no wind, (100% forces)

Case VI. Water at low water level, wind from flood side (75%)

PRELIMINARY



Scale: 1" = 20'

Strata No	Soil Type	Unit Weight PCF	Unfactored Friction Angle Degrees	Unfactored Cohesion PSF Average	Unfactored Cohesion PSF Bottom	Safety Factor = 1.28 Friction Angle Degrees	Safety Factor = 1.28 Cohesion PSF Average	Safety Factor = 1.28 Cohesion PSF Bottom
1	Sand Backfill	120	30	0	0	24	0	0
2	Clay, Silty Clay, Organic Clay and Humus	102	0	350	350	0	273	273
3	Sandy Silt	117	25	0	0	20	0	0
4	Clay	103	0	400	400	0	312	312
5	Clay	103	0	500	600	0	391	468

Notes: 1) Analysis indicates no unbalanced force beneath the base of the proposed T wall at El -9.0 to maintain stability with respect to a factor of safety of 1.28. A small unbalanced load is indicated if a factor of safety of 1.30 is used. A factor of safety of 1.28 is considered acceptable.

2) Sheetpile cutoff must penetrate to El -31.5 or below to have a factor of safety of 4.0 against piping using the Harr Method of seepage analysis.

3) T Wall pressures must be carried by a batter pile foundation.

4) Reach 3 soil parameters were used for these analyses. The location of Stratum 3 is based on Boring ALGW-7.

T-Wall Analysis
Summation of Forces (Using Factored Shear Strengths)

Failure Surface	ΣR Resisting lb/ft	ΣD Driving lb/ft	ΣR-ΣD	Change in Net Force lb/ft
(A)(1)	5351	8223	-2872	—
(B)(2)	70426	73245	-2869	3
(C)(2)	105854	94392	11462	14331

Global Stability of Pump Station

Failure Surface	Summation of Forces lb/ft Resisting	Summation of Forces lb/ft Driving	Factor of Safety
(D)(4)	41579	28923	1.44
(E)(2)	53601	41370	1.30
(E)(3)	79532	55062	1.44

Slope Stability and T Wall Analyses
Units 6 through 9
Planters Pump Station
U.S. Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La

EE 14630 TVS

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U:\PILE\PPSTW01                                             03/30/98
Last Modified:  03-30-98 at 11:22:34

 100 PLANTERS PUMP STATION T WALL
200 PROP 4074 3201 3201 196 2 0 ALL
300 SOIL ES 0.039 LEN 60 0 ALL
320 PIN ALL
410 DLS S 72 54 600 223 132 1510 1166 H 14 ALL
430 ASC S 196 457 .816 .856 1.75 0 ALL
440 BAT 2 ALL
450 ANG 270 1 2 3 4 5
455 ANG 90 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
460 PILE 1 -17.5 -4.5 0 6 -17.5 1.0 0 11 -18.0 4.5 0
465 ROW X 5 1 4 AT 8.75
480 ROW X 5 6 4 AT 8.75
485 ROW X 10 11 9 AT 4.0
500 LOA 1 0 427.6 527.2 3694.4 0 0
510 LOA 2 0 427.6 441.6 3479.6 0 0
520 LOA 3 0 397.5 407.7 3435 0 0
530 LOA 4 0 397.5 337.2 3614.4 0 0
540 LOA 5 0 77.2 456.4 218 0 0
550 LOA 6 0 77.2 406.4 318 0 0
560 LOA 7 0 100.4 456.4 612 0 0
570 LOA 8 0 46 456.4 -211.2 0 0
610 FOU 1 2 3 4 5 6 7 PPSTW10
620 PFO ALL
630 PPL N
```

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******************************
* CORPS PROGRAM  #   X0080    *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-A *   RUN DATE 03-30-98     RUN TIME 11:22:57
******************************
```

PLANTERS PUMP STATION T WALL

THERE ARE 20 PILES AND
8 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

		X	Y	Z
WITH DIAGONAL COORDINATES =	(	-18.00 ,	-4.50 ,	.00)
	(	18.00 ,	4.50 ,	.00)

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.39000E-01	L	.60000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-17.50	-4.50	.00	2.00	270.00	60.00	F
2	-8.75	-4.50	.00	2.00	270.00	60.00	F
3	.00	-4.50	.00	2.00	270.00	60.00	F
4	8.75	-4.50	.00	2.00	270.00	60.00	F
5	17.50	-4.50	.00	2.00	270.00	60.00	F
6	-17.50	1.00	.00	2.00	90.00	60.00	F
7	-8.75	1.00	.00	2.00	90.00	60.00	F
8	.00	1.00	.00	2.00	90.00	60.00	F
9	8.75	1.00	.00	2.00	90.00	60.00	F
10	17.50	1.00	.00	2.00	90.00	60.00	F
11	-18.00	4.50	.00	2.00	90.00	60.00	F
12	-14.00	4.50	.00	2.00	90.00	60.00	F
13	-10.00	4.50	.00	2.00	90.00	60.00	F
14	-6.00	4.50	.00	2.00	90.00	60.00	F
15	-2.00	4.50	.00	2.00	90.00	60.00	F
16	2.00	4.50	.00	2.00	90.00	60.00	F
17	6.00	4.50	.00	2.00	90.00	60.00	F
18	10.00	4.50	.00	2.00	90.00	60.00	F
19	14.00	4.50	.00	2.00	90.00	60.00	F
20	18.00	4.50	.00	2.00	90.00	60.00	F

						1200.00	

****

APPLIED LOADS

LOAD CASE	FX K	FY K	FZ K	MX FT-K	MY FT-K	MZ FT-K
1	.0	427.6	527.2	3694.4	.0	.0
2	.0	427.6	441.6	3479.6	.0	.0
3	.0	397.5	407.7	3435.0	.0	.0
4	.0	397.5	337.2	3614.4	.0	.0
5	.0	77.2	456.4	218.0	.0	.0
6	.0	77.2	406.4	318.0	.0	.0
7	.0	100.4	456.4	612.0	.0	.0
8	.0	46.0	456.4	-211.2	.0	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.74583E+02 -.31678E-03 -.52794E-03 -.26082E-01 .18626E-08 -.12306E+04

-.31678E-03	.89319E+04	.88573E+04	.77059E+06	.62500E-01	.00000E+00
-.52794E-03	.88573E+04	.35504E+05	.58582E+06	.12500E+00	-.31250E-01
-.26082E-01	.77059E+06	.58582E+06	.78925E+08	.60000E+01	.10000E+01
.93132E-09	.46875E-01	.93750E-01	.60000E+01	.72886E+09	-.16836E+09
-.12306E+04	.15625E-01	-.15625E-01	.10000E+01	-.16836E+09	.18353E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 10.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.2160E-06	-.2307E-01	.8683E-02	.7225E-03	-.7018E-11	-.6223E-11
2	.2062E-06	.6098E-02	.3612E-02	.4427E-03	-.6075E-11	-.6814E-11
3	.1919E-06	-.1392E-01	.4667E-02	.6235E-03	-.6294E-11	-.6302E-11
4	.1847E-06	-.2519E-01	.3027E-02	.7730E-03	-.6680E-11	-.6700E-11
5	.7716E-07	.7004E-02	.1332E-01	-.1341E-03	-.8213E-12	.1032E-11
6	.7197E-07	.1708E-02	.1196E-01	-.5712E-04	-.1007E-11	.7435E-12
7	.8626E-07	-.1078E-01	.1399E-01	.9453E-04	-.1753E-11	.5636E-12
8	.6517E-07	.2095E-01	.1314E-01	-.3342E-03	.1033E-12	.1688E-11

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES

B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.0	-37.3	.0	-7.9	.0	.69	.47	.68	.61	
2	.1	.0	-37.3	.0	-7.9	.0	.69	.47	.68	.61	
3	.1	.0	-37.3	.0	-7.9	.0	.69	.47	.68	.61	
4	.1	.0	-37.3	.0	-7.9	.0	.69	.47	.68	.61	
5	.1	.0	-37.3	.0	-7.9	.0	.69	.47	.68	.61	
6	-.1	.0	11.5	.0	6.5	.0	.16	.20	.93	.86	#
7	-.1	.0	11.5	.0	6.5	.0	.16	.20	.93	.86	#
8	-.1	.0	11.5	.0	6.5	.0	.16	.20	.93	.86	#
9	-.1	.0	11.5	.0	6.5	.0	.16	.20	.93	.86	#
10	-.1	.0	11.5	.0	6.5	.0	.16	.20	.93	.86	#
11	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
12	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
13	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
14	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
15	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
16	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
17	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
18	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
19	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#
20	-.2	.0	71.7	.0	9.6	.0	1.00	.31	1.24	1.16	#

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	-46.3	.0	-.8	.0	.86	.56	.62	.58	
2	.0	.0	-46.3	.0	-.8	.0	.86	.56	.62	.58	
3	.0	.0	-46.3	.0	-.8	.0	.86	.56	.62	.58	
4	.0	.0	-46.3	.0	-.8	.0	.86	.56	.62	.58	
5	.0	.0	-46.3	.0	-.8	.0	.86	.56	.62	.58	
6	.0	.0	23.8	.0	-.3	.0	.33	.18	.98	.94	#
7	.0	.0	23.8	.0	-.3	.0	.33	.18	.98	.94	#
8	.0	.0	23.8	.0	-.3	.0	.33	.18	.98	.94	#
9	.0	.0	23.8	.0	-.3	.0	.33	.18	.98	.94	#
10	.0	.0	23.8	.0	-.3	.0	.33	.18	.98	.94	#
11	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12	#
12	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12	#
13	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12	#
14	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12	#

15	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12
16	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12
17	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12
18	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12
19	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12
20	.0	.0	60.6	.0	1.6	.0	.84	.22	1.17	1.12

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.1	.0	-43.7	.0	-5.8	.0	.81	.54	.65	.58
2	.1	.0	-43.7	.0	-5.8	.0	.81	.54	.65	.58
3	.1	.0	-43.7	.0	-5.8	.0	.81	.54	.65	.58
4	.1	.0	-43.7	.0	-5.8	.0	.81	.54	.65	.58
5	.1	.0	-43.7	.0	-5.8	.0	.81	.54	.65	.58
6	-.1	.0	10.3	.0	4.1	.0	.14	.21	.92	.86
7	-.1	.0	10.3	.0	4.1	.0	.14	.21	.92	.86
8	-.1	.0	10.3	.0	4.1	.0	.14	.21	.92	.86
9	-.1	.0	10.3	.0	4.1	.0	.14	.21	.92	.86
10	-.1	.0	10.3	.0	4.1	.0	.14	.21	.92	.86
11	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
12	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
13	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.
14	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
15	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
16	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
17	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
18	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
19	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12
20	-.1	.0	62.3	.0	6.8	.0	.86	.23	1.19	1.12

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.1	.0	-51.8	.0	-9.1	.0	.96	.65	.61	.53
2	.1	.0	-51.8	.0	-9.1	.0	.96	.65	.61	.53
3	.1	.0	-51.8	.0	-9.1	.0	.96	.65	.61	.53
4	.1	.0	-51.8	.0	-9.1	.0	.96	.65	.61	.53
5	.1	.0	-51.8	.0	-9.1	.0	.96	.65	.61	.53
6	-.1	.0	-.6	.0	6.4	.0	.01	.02	.87	.80
7	-.1	.0	-.6	.0	6.4	.0	.01	.02	.87	.80
8	-.1	.0	-.6	.0	6.4	.0	.01	.02	.87	.80
9	-.1	.0	-.6	.0	6.4	.0	.01	.02	.87	.80
10	-.1	.0	-.6	.0	6.4	.0	.01	.02	.87	.80

11	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
12	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
13	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
14	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
15	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
16	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
17	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
18	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
19	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#
20	-.2	.0	63.8	.0	9.8	.0	.89	.25	1.20	1.12	#

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.1	.0	33.8	.0	3.6	.0	.47	.15	1.04	.98	#
2	-.1	.0	33.8	.0	3.6	.0	.47	.15	1.04	.98	#
3	-.1	.0	33.8	.0	3.6	.0	.47	.15	1.04	.98	#
4	-.1	.0	33.8	.0	3.6	.0	.47	.15	1.04	.98	#
5	-.1	.0	33.8	.0	3.6	.0	.47	.15	1.04	.98	#
6	.0	.0	30.2	.0	-.2	.0	.42	.16	1.01	.97	#
7	.0	.0	30.2	.0	-.2	.0	.42	.16	1.01	.97	#
8	.0	.0	30.2	.0	-.2	.0	.42	.16	1.01	.97	#
9	.0	.0	30.2	.0	-.2	.0	.42	.16	1.01	.97	#
10	.0	.0	30.2	.0	-.2	.0	.42	.16	1.01	.97	#
11	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
12	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
13	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
14	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
15	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
16	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
17	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
18	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
19	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#
20	.0	.0	19.0	.0	-.8	.0	.26	.19	.95	.91	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	28.2	.0	1.9	.0	.39	.17	1.00	.96	#
2	.0	.0	28.2	.0	1.9	.0	.39	.17	1.00	.96	#
3	.0	.0	28.2	.0	1.9	.0	.39	.17	1.00	.96	#
4	.0	.0	28.2	.0	1.9	.0	.39	.17	1.00	.96	#
5	.0	.0	28.2	.0	1.9	.0	.39	.17	1.00	.96	#
6	.0	.0	24.1	.0	.8	.0	.33	.18	.98	.94	#

7	.0	.0	24.1	.0	.8	.0	.33	.18	.98	.94
8	.0	.0	24.1	.0	.8	.0	.33	.18	.98	.94
9	.0	.0	24.1	.0	.8	.0	.33	.18	.98	.94
10	.0	.0	24.1	.0	.8	.0	.33	.18	.98	.94
11	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
12	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
13	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
14	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
15	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
16	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
17	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
18	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
19	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91
20	.0	.0	19.3	.0	.6	.0	.27	.19	.96	.91

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.0	.0	28.3	.0	-1.3	.0	.39	.17	1.00	.96
2	.0	.0	28.3	.0	-1.3	.0	.39	.17	1.00	.96
3	.0	.0	28.3	.0	-1.3	.0	.39	.17	1.00	.96
4	.0	.0	28.3	.0	-1.3	.0	.39	.17	1.00	.96
5	.0	.0	28.3	.0	-1.3	.0	.39	.17	1.00	.96
6	-.1	.0	19.3	.0	3.8	.0	.27	.19	.96	.91
7	-.1	.0	19.3	.0	3.8	.0	.27	.19	.96	.91
8	-.1	.0	19.3	.0	3.8	.0	.27	.19	.96	.91
9	-.1	.0	19.3	.0	3.8	.0	.27	.19	.96	.91
10	-.1	.0	19.3	.0	3.8	.0	.27	.19	.96	.91
11	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
12	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
13	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
14	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
15	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
16	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
17	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
18	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
19	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95
20	-.1	.0	27.2	.0	4.2	.0	.38	.17	1.00	.95

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-.1	.0	41.1	.0	7.5	.0	.57	.14	1.08	1.01
2	-.1	.0	41.1	.0	7.5	.0	.57	.14	1.08	1.01

3	-.1	.0	41.1	.0	7.5	.0	.57	.14	1.08	1.01
4	-.1	.0	41.1	.0	7.5	.0	.57	.14	1.08	1.01
5	-.1	.0	41.1	.0	7.5	.0	.57	.14	1.08	1.01
6	.1	.0	38.9	.0	-3.4	.0	.54	.14	1.06	1.01
7	.1	.0	38.9	.0	-3.4	.0	.54	.14	1.06	1.01
8	.1	.0	38.9	.0	-3.4	.0	.54	.14	1.06	1.01
9	.1	.0	38.9	.0	-3.4	.0	.54	.14	1.06	1.01
10	.1	.0	38.9	.0	-3.4	.0	.54	.14	1.06	1.01
11	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
12	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
13	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
14	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
15	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
16	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
17	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
18	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
19	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86
20	.1	.0	11.1	.0	-4.8	.0	.15	.20	.92	.86

****

PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	16.6	-33.4	.0	.0	.0
2	.0	16.6	-33.4	.0	.0	.0
3	.0	16.6	-33.4	.0	.0	.0
4	.0	16.6	-33.4	.0	.0	.0
5	.0	16.6	-33.4	.0	.0	.0
6	.0	5.1	10.4	.0	.0	.0
7	.0	5.1	10.4	.0	.0	.0
8	.0	5.1	10.4	.0	.0	.0
9	.0	5.1	10.4	.0	.0	.0
10	.0	5.1	10.4	.0	.0	.0
11	.0	31.9	64.2	.0	.0	.0
12	.0	31.9	64.2	.0	.0	.0
13	.0	31.9	64.2	.0	.0	.0
14	.0	31.9	64.2	.0	.0	.0
15	.0	31.9	64.2	.0	.0	.0
16	.0	31.9	64.2	.0	.0	.0
17	.0	31.9	64.2	.0	.0	.0
18	.0	31.9	64.2	.0	.0	.0
19	.0	31.9	64.2	.0	.0	.0

20	.0	31.9	64.2	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	20.7	-41.4	.0	.0	.0
2	.0	20.7	-41.4	.0	.0	.0
3	.0	20.7	-41.4	.0	.0	.0
4	.0	20.7	-41.4	.0	.0	.0
5	.0	20.7	-41.4	.0	.0	.0
6	.0	10.6	21.2	.0	.0	.0
7	.0	10.6	21.2	.0	.0	.0
8	.0	10.6	21.2	.0	.0	.0
9	.0	10.6	21.2	.0	.0	.0
10	.0	10.6	21.2	.0	.0	.0
11	.0	27.1	54.3	.0	.0	.0
12	.0	27.1	54.3	.0	.0	.0
13	.0	27.1	54.3	.0	.0	.0
14	.0	27.1	54.3	.0	.0	.0
15	.0	27.1	54.3	.0	.0	.0
16	.0	27.1	54.3	.0	.0	.0
17	.0	27.1	54.3	.0	.0	.0
18	.0	27.1	54.3	.0	.0	.0
19	.0	27.1	54.3	.0	.0	.0
20	.0	27.1	54.3	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	19.5	-39.2	.0	.0	.0
2	.0	19.5	-39.2	.0	.0	.0
3	.0	19.5	-39.2	.0	.0	.0
4	.0	19.5	-39.2	.0	.0	.0
5	.0	19.5	-39.2	.0	.0	.0
6	.0	4.5	9.2	.0	.0	.0
7	.0	4.5	9.2	.0	.0	.0
8	.0	4.5	9.2	.0	.0	.0
9	.0	4.5	9.2	.0	.0	.0
10	.0	4.5	9.2	.0	.0	.0
11	.0	27.7	55.7	.0	.0	.0
12	.0	27.7	55.7	.0	.0	.0
13	.0	27.7	55.7	.0	.0	.0
14	.0	27.7	55.7	.0	.0	.0
15	.0	27.7	55.7	.0	.0	.0

16	.0	27.7	55.7	.0	.0	.0
17	.0	27.7	55.7	.0	.0	.0
18	.0	27.7	55.7	.0	.0	.0
19	.0	27.7	55.7	.0	.0	.0
20	.0	27.7	55.7	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	23.0	-46.4	.0	.0	.0
2	.0	23.0	-46.4	.0	.0	.0
3	.0	23.0	-46.4	.0	.0	.0
4	.0	23.0	-46.4	.0	.0	.0
5	.0	23.0	-46.4	.0	.0	.0
6	.0	-.4	-.5	.0	.0	.0
7	.0	-.4	-.5	.0	.0	.0
8	.0	-.4	-.5	.0	.0	.0
9	.0	-.4	-.5	.0	.0	.0
10	.0	-.4	-.5	.0	.0	.0
11	.0	28.4	57.2	.0	.0	.0
12	.0	28.4	57.2	.0	.0	.0
13	.0	28.4	57.2	.0	.0	.0
14	.0	28.4	57.2	.0	.0	.0
15	.0	28.4	57.2	.0	.0	.0
16	.0	28.4	57.2	.0	.0	.0
17	.0	28.4	57.2	.0	.0	.0
18	.0	28.4	57.2	.0	.0	.0
19	.0	28.4	57.2	.0	.0	.0
20	.0	28.4	57.2	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-15.1	30.3	.0	.0	.0
2	.0	-15.1	30.3	.0	.0	.0
3	.0	-15.1	30.3	.0	.0	.0
4	.0	-15.1	30.3	.0	.0	.0
5	.0	-15.1	30.3	.0	.0	.0
6	.0	13.5	27.0	.0	.0	.0
7	.0	13.5	27.0	.0	.0	.0
8	.0	13.5	27.0	.0	.0	.0
9	.0	13.5	27.0	.0	.0	.0
10	.0	13.5	27.0	.0	.0	.0
11	.0	8.5	17.0	.0	.0	.0

12	.0	8.5	17.0	.0	.0	.0
13	.0	8.5	17.0	.0	.0	.0
14	.0	8.5	17.0	.0	.0	.0
15	.0	8.5	17.0	.0	.0	.0
16	.0	8.5	17.0	.0	.0	.0
17	.0	8.5	17.0	.0	.0	.0
18	.0	8.5	17.0	.0	.0	.0
19	.0	8.5	17.0	.0	.0	.0
20	.0	8.5	17.0	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-12.6	25.2	.0	.0	.0
2	.0	-12.6	25.2	.0	.0	.0
3	.0	-12.6	25.2	.0	.0	.0
4	.0	-12.6	25.2	.0	.0	.0
5	.0	-12.6	25.2	.0	.0	.0
6	.0	10.8	21.5	.0	.0	.0
7	.0	10.8	21.5	.0	.0	.0
8	.0	10.8	21.5	.0	.0	.0
9	.0	10.8	21.5	.0	.0	.0
10	.0	10.8	21.5	.0	.0	.0
11	.0	8.6	17.3	.0	.0	.0
12	.0	8.6	17.3	.0	.0	.0
13	.0	8.6	17.3	.0	.0	.0
14	.0	8.6	17.3	.0	.0	.0
15	.0	8.6	17.3	.0	.0	.0
16	.0	8.6	17.3	.0	.0	.0
17	.0	8.6	17.3	.0	.0	.0
18	.0	8.6	17.3	.0	.0	.0
19	.0	8.6	17.3	.0	.0	.0
20	.0	8.6	17.3	.0	.0	.0

LOAD CASE - 7

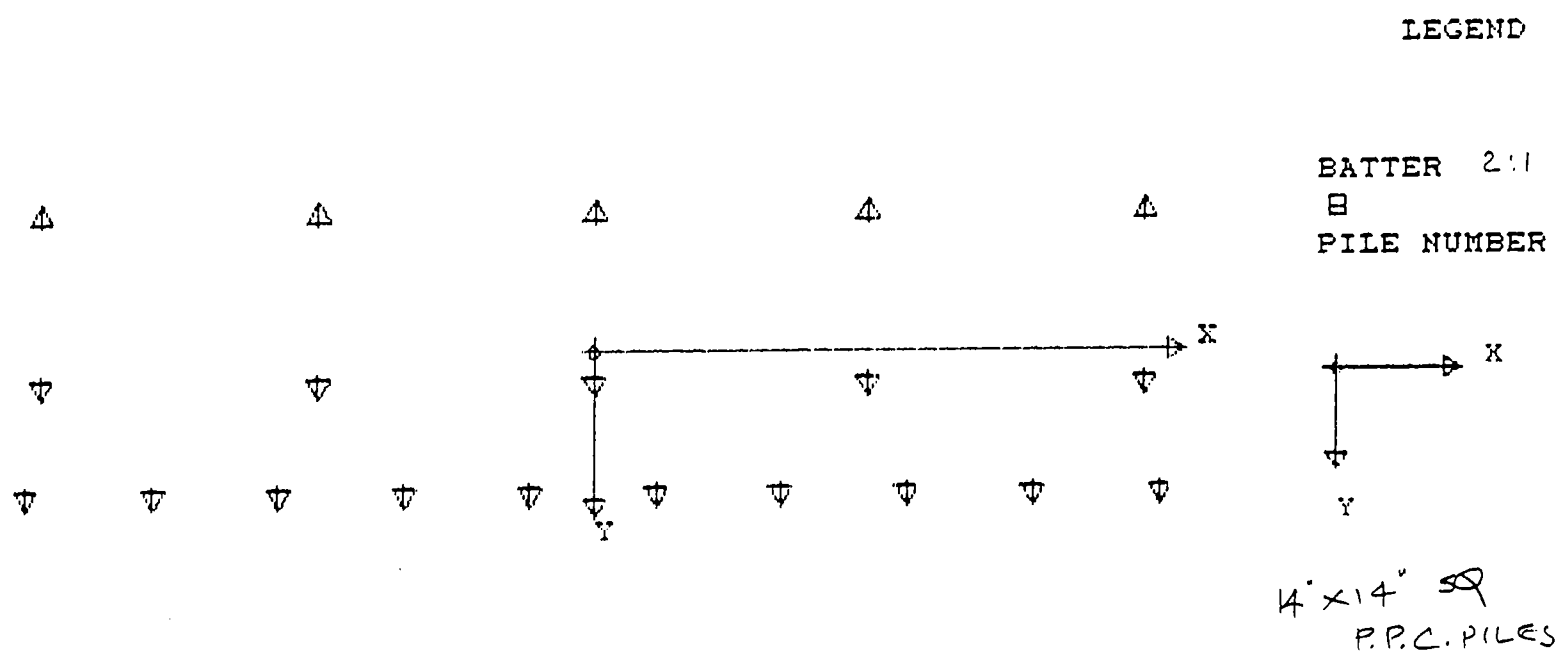
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-12.7	25.3	.0	.0	.0
2	.0	-12.7	25.3	.0	.0	.0
3	.0	-12.7	25.3	.0	.0	.0
4	.0	-12.7	25.3	.0	.0	.0
5	.0	-12.7	25.3	.0	.0	.0
6	.0	8.6	17.3	.0	.0	.0
7	.0	8.6	17.3	.0	.0	.0

8	.0	8.6	17.3	.0	.0	.0
9	.0	8.6	17.3	.0	.0	.0
10	.0	8.6	17.3	.0	.0	.0
11	.0	12.1	24.3	.0	.0	.0
12	.0	12.1	24.3	.0	.0	.0
13	.0	12.1	24.3	.0	.0	.0
14	.0	12.1	24.3	.0	.0	.0
15	.0	12.1	24.3	.0	.0	.0
16	.0	12.1	24.3	.0	.0	.0
17	.0	12.1	24.3	.0	.0	.0
18	.0	12.1	24.3	.0	.0	.0
19	.0	12.1	24.3	.0	.0	.0
20	.0	12.1	24.3	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	.0	-18.3	36.8	.0	.0	.0
2	.0	-18.3	36.8	.0	.0	.0
3	.0	-18.3	36.8	.0	.0	.0
4	.0	-18.3	36.8	.0	.0	.0
5	.0	-18.3	36.8	.0	.0	.0
6	.0	17.4	34.8	.0	.0	.0
7	.0	17.4	34.8	.0	.0	.0
8	.0	17.4	34.8	.0	.0	.0
9	.0	17.4	34.8	.0	.0	.0
10	.0	17.4	34.8	.0	.0	.0
11	.0	5.0	9.8	.0	.0	.0
12	.0	5.0	9.8	.0	.0	.0
13	.0	5.0	9.8	.0	.0	.0
14	.0	5.0	9.8	.0	.0	.0
15	.0	5.0	9.8	.0	.0	.0
16	.0	5.0	9.8	.0	.0	.0
17	.0	5.0	9.8	.0	.0	.0
18	.0	5.0	9.8	.0	.0	.0
19	.0	5.0	9.8	.0	.0	.0
20	.0	5.0	9.8	.0	.0	.0

PLANTER'S PUMP STATION



DISPLAY OF PILE LAYOUT 01-APR-1998 16.57.15

S&WB #13 UNITS 1-3 STABILITY ANALYSIS

SWL = 9.5

- FAILURE SURFACE (B)(4) - Req'd Pressure = 1211 psf

wt = 663 psf

remaining pressure = 1211 - 663 = 548 psf

area = 1043.34

total load = (1043.34)(548)/1000 = 572[k]

#Piles = 86

load/pile = 572/86 = 6.6[k]/pile

allowable = 20[k] **OK**

- FAILURE SURFACE (C)(8), req'd pressure = 1008

wt = 663

remaining wt = 1008 - 663 = 345 psf

area = 1513 sf

total load = (345)(1513)/1000 = 522[k]

#piles = 119

load/pile = 522/119 = 4.4[k] **OK**

- station is stable, no T-wall req'd

S&WB #13 - STABILITY ANALYSIS FOR UNITS 4-7

SWL = 9.5 NGVD

- FOR FAILURE SURFACE Ⓑ③, Req'd Pressure = 1478 psf

total wt = 865.7 psf

Pressure to be taken by tension piles = 1478 - 865.7
= 612.3 psf

area = 907.5 sf

Total load to be taken by piles = $\frac{612.3(907.5)}{1000}$ = 555.6^K

piles = 66 , tension/pile = 555.6/66 = 8.4^K/pile

- need 8.4^K/pile - capacity below -40

Capacity = 13^T = 26^K OK

- FAILURE SURFACE Ⓑ④ - Pressure = 778 psf

wt = 222.5 psf

remaining wt = 778 - 222.5 = 555.2 psf

area = 1028.5 sf

total load = 555.2(1028.5)/1000 = 571.3 K

piles = 25

load/pile = 571.3/25 = 22.8 K

Capacity = 26^K OK

- FAILURE SURFACE Ⓒ⑥, Req'd Pressure = 971 psf

wt = 865

Remaining wt = 971 - 865 = 106 psf

OK

- FAILURE SURFACE Ⓒ⑦, Req'd Pressure = 389

wt = 222.5

Remaining wt = 389 - 222.5 = 166.5 psf

area = 2238.5

total load = (166.5)(2238.5)/1000 = 372.7^K

piles = 82

load/pile = 372.7/82 = 4.5^K/pile

allowable = 22^K OK

- NO T-wall needed

SEWERAGE & WATER BOARD #13:

STATION ADDITION:

TOP OF DISCHARGE TUBE - EL. 33.0 C.D = 12.57 NGVD.

ORIGINAL STATION:

TOP OF CONCRETE DISCHARGE TUBE = 33.00 C.D. = 12.57

TOP OF WALL @ VERTICAL PUMPS: 33.00 C.D. = 12.57

TOP OF WALL OUTSIDE OF PUMP AREA = 33.00 = 12.57 NGVD.

TOP OF BASE SLAB = 26.31 CD = 5.88

- Top of Levee - 9.5

- transition 10 H: 1V →

vertical difference = 9.5 - 5.88 = 3.62

need 36.2' for transition.

→ have 100' - ok

JN3004	S&WB # 11	AAH	3-12-98

S&WB # 11 - WEST STATION - MODIFIED BY ADDING CONCRETE DISCHARGE TUBE

SWL: 9.5 NGVD

- FOR FAILURE SURFACE (B)(1), Req'd Pressure = 2110 psf

wt = 319 psf

Remaining wt = 2110 - 319 = 1791 psf

total load/pile = (1791)(13')(71')/1000(66)

= 25^k /pile

Allowable = 22^k N.G.

- Fwall is req'd

National Brand

59 WB# 11

SWL = 9.5

T-Wall Analyses still require vertical pressure:

HORIZONTAL PUMP STATION' (NEW STATION)

Failure Surface (B)(2) requires pressure of 278 psf

EAST

- total wt of station = 266 psf

difference of 278 - 266 = 12 psf - say ok

Failure Surface (C)(4) requires pressure of 249 psf

- total wt of station = 266 psf > 249 ok

ORIGINAL STATION:

STABILITY ANALYSIS OF STATION ONLY:

FAILURE SURFACE (A)(1) Requires Pressure of 2585 psf

total wt of station = 319 psf

Pressure to be taken by tension piles = 2585 - 319 = 2266 psf

piles in passive wedge area = 66

WEST

Tension per pile: (2266)(13)(71')/1000(66)

= 32^{K} per pile

Allowable tension per pile = 22^{K} N.G.

- T-WALL IS NEEDED. ~63' from edge of building

S&WB #11 Summary:

@ SWL = 7.5:

ORIGINAL STATION IS STABLE, NO T-WALL NEEDED

NEW STATION IS NOT STABLE, T-WALL REQUIRED

@ SWL = 9.5:

- EUSTIS HAS NOT FINISHED STABILITY ANALYSIS YET

SEWERAGE & WATER BOARD # 11

FLOODWALL TO EL. 12.75
EXCEPT WINDOWS

ORIGINAL STATION

FAILURE SURFACE Ⓐ①:

REQ'D PRESSURE = 1668 psf

BASE SLAB THICKNESS = 22"

wt = (150 pcf - 92 pcf)(22/12) = 106.33 psf

(92 pcf = wt. soil used by Eustis in stability analysis)

FLOOR SLAB THICKNESS = 8"

wt = (150)(8/12) = 100 psf

WALLS: 2 WALLS @ 14" THICK x 21.25'

wt = (14/12)(21.25)(150)(2) = 7437.5 plf / 66.08' = 112.5 psf

TOTAL = 106.33 + 100 + 112.5 = 318.83 psf

Pressure to be taken by tension piles = 1668 - 319 = 1349 psf

piles in passive wedge area (13' width) = 66

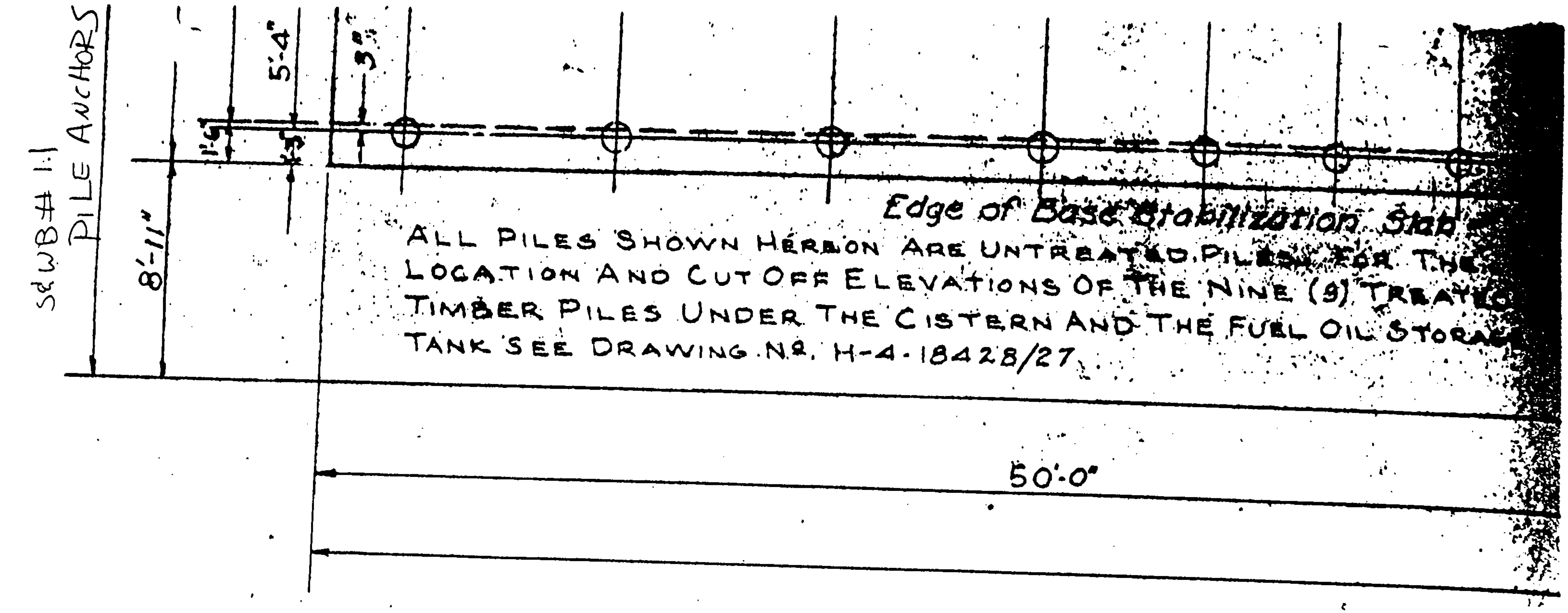
Total load in passive wedge area = (1349 psf)(13')(71')/1000 = 1245 k

Ave req'd tension load per pile = 1245/66 = 18.9 k/pile

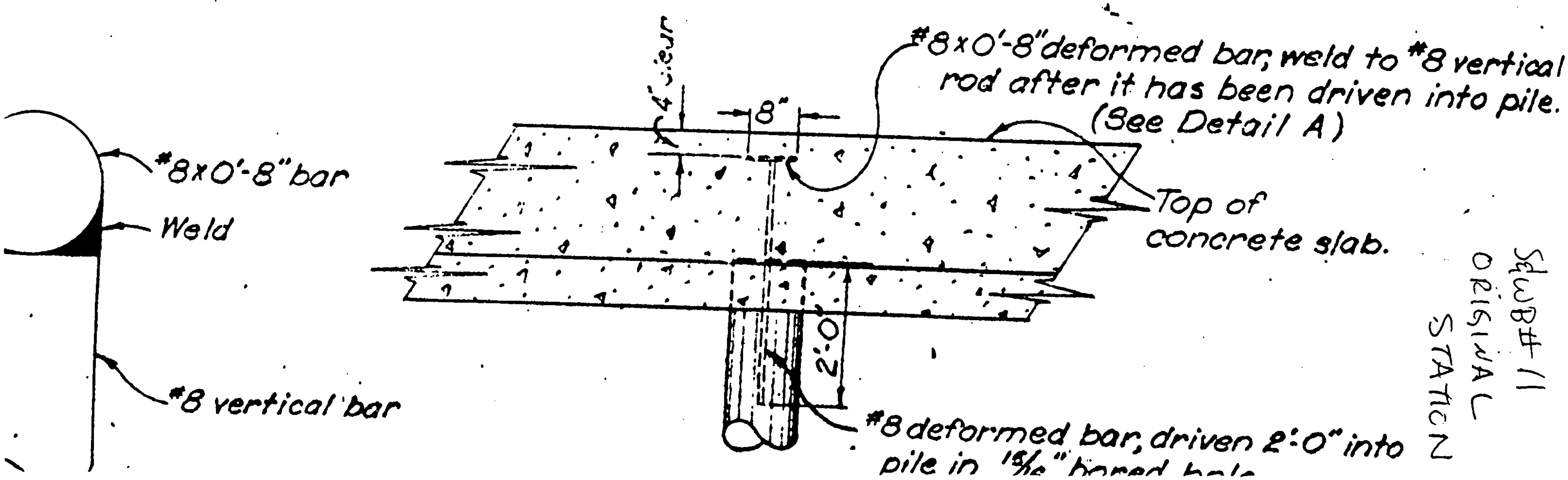
→ Available tension per pile below el. -21 = 22 k/pile

22 > 18.9 ok

– Station is stable at SPH Levels, NO T-WALL IS NEEDED.
– MODIFY EXISTING FLOODWALL TO EL. 9.5



SdWB#11 PILE ANCHORS
8'-11"
5'-4"
3'
Edge of Base Stabilization Slab
ALL PILES SHOWN HEREON ARE UNTREATED PILES. FOR THE LOCATION AND CUT OFF ELEVATIONS OF THE NINE (9) TREATED TIMBER PILES UNDER THE CISTERN AND THE FUEL OIL STORA TANK SEE DRAWING Nº. H-4-18428/27.
50'-0"



#8x0'-8" bar
Weld
#8 vertical bar
4" clear
8"
#8x0'-8" deformed bar, weld to #8 vertical rod after it has been driven into pile. (See Detail A)
Top of concrete slab.
2'-0"
#8 deformed bar, driven 2'-0" into pile in 1⅛" bored hole
SdWB#11 ORIGINAL STATION

SEWERAGE & WATER BOARD # 11 (CONT.)

FLOODWALL TO 32.5 C.D (TOP OF DISCHARGE TUBE)

NEW STATION:

FOR FAILURE SURFACE (B)(2):

REQUIRED PRESSURE = 942 psf

BASE SLAB THICKNESS = 2'-0"

wt = (150-92)(2) = 116 psf

FLOOR SLAB THICKNESS = 1'-0"

wt = 150 psf

TOTAL wt = 266 psf

Pressure to be taken by tension piles = 942-266 = 676 psf

Passive wedge area is 21' x 60.5' = 1270.5 sf

Total tension load in passive wedge = 676(1270.5)/1000 = 859 K

piles = 85 + ½(12) = 91

Total tension req'd per pile = 859/91 = 9.4 K

- below el -40

- Tension capacity (by Eustis) = 18 K

18 > 9.4 OK.

- Station is stable for failure surface (B)(2) - NO T-WALL NEEDED.

- Tension connectors ? - call NY Associates - 885-0500

MR. LOGAN NY Assoc. 11-11-97 → - THERE ARE NO TENSION CONNECTORS FOR PILES UNDER THE BASE SLAB

S&WB # 11 (CONT.)

FAILURE SURFACE (C)(4) - Req'd Pressure = 699 psf

Total wt = 266 psf

Pressure to be taken by tension piles = 699 - 266 = 433 psf

Passive wedge area = 30' x 60.5' = 1815 sf

Total tension load in passive wedge area = 433(1815)/1000 = 786 K

PILES = ½(12) + 12(8) + 8(2) = 118

Req'd tension per pile: 786/118 = 6.6 K /pile
below failure surface el. -50

Tension capacity (by Eustis) = 14 K
14 > 6.6 OK

FAILURE SURFACE (D)(7): Req'd pressure = 300 psf

total wt = 266 psf

Pressure to be taken by tension piles = 300-266 = 34 psf

Passive wedge area = 40' x 60.5' = 2420 sf

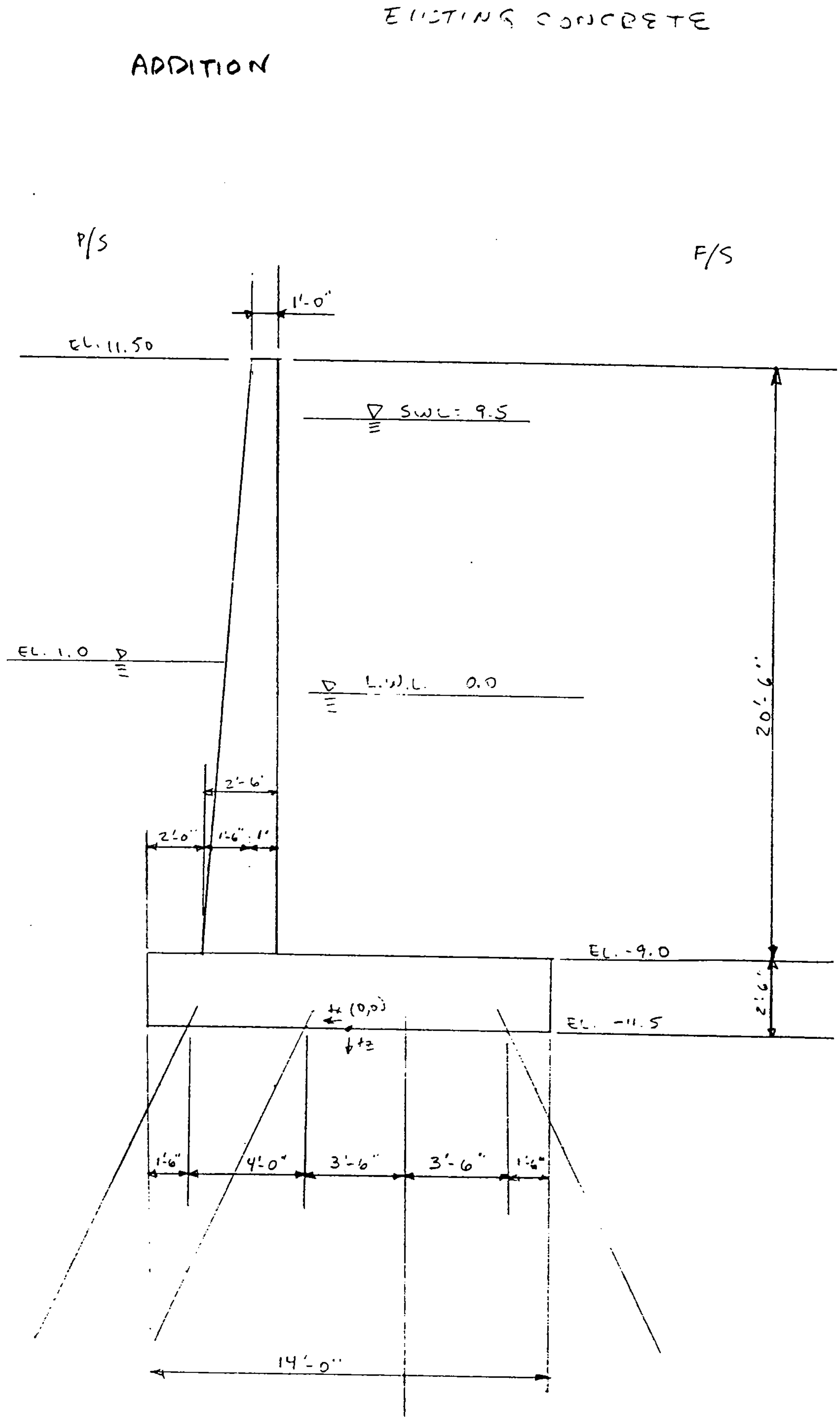
Total tension load on passive wedge = 34(2420)/1000 = 82 K

piles = 9(8) + 8 + ½(12) = 86

Req'd tension per pile = 82/86 = 1 K/pile

- below failure surface el -60

JN 3004 | ... CANAL 5 WB #11 EAST | AAH | 3-30-98 | 1



LEAD LOADS:

STEM: ① (20.5')(1')(.150) = 3.08 K/FT
② (½)(1.5')(20.5')(.150) = 2.31

BASE: (2.5')(14')(.150) = 5.25

WATER OVER BASE:

F/S: SWL: (18.5)(9.5)(.0625) = 10.98 K/FT
SWL+2' (20.5)(9.5)(.0625) = 12.17
LWL: (9)(9.5)(.0625) = 5.34

P/S: (10)(2)(.0625) = 1.25

WATER PRESSURE:

F/S: SWL (21')(.0625) = 1.31 K/FT.FT

SWL+2': (23)(.0625) = 1.44

LWL: (11.5)(.0625) = 0.72

P/S: (10.0)(.0625) = 0.63

WIND PRESSURE ABOVE EL. 1.0 P/S:

(10.5')(50 psf) = 0.52 K/FT

T-WALL LOADING CASES:

I. STATIC WATER PRESSURE TO SWL, NO WIND, IMPERVIOUS SHEET PILE CUTOFF (100% FORCES)

II: STATIC WATER PRESSURE TO SWL, NO WIND, PERVIOUS SHEET PILE CUTOFF (100% FORCES)

III: STATIC WATER PRESSURE TO SWL+2', NO WIND, IMPERVIOUS SHEET PILE CUTOFF (75% FORCES)

IV STATIC WATER PRESSURE TO SWL+2', NO WIND, PERVIOUS SHEET PILE CUTOFF (75% FORCES)

V WATER @ LOW WATER LEVEL, NO WIND (100% FORCES)

VI WATER @ LOW WATER LEVEL, WIND FROM P/S (75% FORCES)

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T-WALL FORCE TABULATION

DESCRIPTION	FORCES (KIPS)		LEVER ARM		MOMENTS (+↻)
	F_x	F_z	x	z	M_y
DEAD LOADS:					
STEM		3.08	3.0		-9.24
		2.31	4.0		-9.24
BASE		5.25	0		0
SWL		10.98	-2.25		+24.71
SWL+2'		12.17	-2.25		+27.38
LWL		5.34	-2.25		+12.02
P/S		1.25	6.0		-7.50
WATER LOADS					
SWL					
½(1.31)(21)	13.76			-7.0	-96.32
Buoyancy:					
impervious: (1.31)(5.0)		-6.55	-4.5		-29.48
pervious: (½)(1.31)(14)		-9.17	-2.33		-21.37
SWL+2':					
½(1.44)(23)	16.56			-7.67	-127.02
Buoyancy:					
impervious (1.44)(5)		-7.2	-4.5		-32.40
pervious (½)(1.44)(14)		-10.08	-2.33		-23.49
LWL:					
½(.72)(11.5)	4.14			3.83	-15.86
Buoyancy:					
impervious: (.72)(5)		-3.6	-4.5		-16.20
pervious: (½)(.72)(14)		-5.04	-2.33		-11.74
WATER ON P/S: (½)(.63)(10.0)	-3.15			-5.83	+18.36
WIND ON P/S (.52)(10.5)	-.52			-17.75	+9.23

LOAD COMBINATIONS

LOADING CASE	DESCRIPTION		FORCES F_x	FORCES F_z	MOMENTS M_y
I	DL, SWL, IMP S/P 100%	DL		22.87	-1.27
		SWL	10.61		-77.96
		IMP S/P		-6.55	-29.48
		TOTAL	10.61	16.32	-108.71
		FOR 40'	424.4	652.8	-4348.4
II	DL, SWL, PER S/P 100%	DL		22.87	-1.27
		SWL	10.61		-77.96
		PER		-9.17	-21.37
		TOTAL	10.61	13.70	-100.60
		FOR 40'	424.4	548.0	-4024.0
III	DL, SWL+2', IMP. 75%	DL		24.06	+1.4
		SWL+2'	13.41		-108.66
		IMP		-7.2	-32.40
		TOTAL	13.41	16.86	-139.66
		75%	10.06	12.65	-104.75
		FOR 40'	402.4	505.8	-4189.8
IV	DL, SWL+2', PER. 75%	DL		24.06	+1.4
		SWL+2'	13.41		-108.66
		PER.		-10.08	-23.49
		TOTAL	13.41	13.98	-130.75
		75%	10.06	10.49	-98.06
		FOR 40'	402.4	419.4	-3922.5
V	DL, LWL, IMP 100%	DL		17.23	-13.96
		LWL	0.99		2.50
		IMP		-3.6	-16.20
		TOTAL	0.99	13.63	-27.66
		FOR 40'	39.6	545.2	-1106.4
VI	DL, LWL, WIND 75%	DL		17.23	-13.96
		LWL	0.99		2.50
		IMP		-3.6	-16.20
		WIND	-0.52		9.23
		TOTAL	0.47	13.63	-18.43
		75%	0.35	10.22	-13.82
		FOR 40'	14.1	408.9	-552.9

LINE 300: $P_{SOIL} = E_S$

E SOIL $E_S = K_h B$

FROM EUSTIS: $\frac{K_h B}{D C} = 213$

$C = 1.0$

D: 14" PILES @ 4'-0" SPACING

SPACING: $\frac{48}{14} = 3.4B$

$D = 0.25 + (.4 - .25)(.4)$
$= 0.31$

$K_h B = (213)(0.31)(1.0)$
$= 66 \text{ psi} = 0.066 \text{ ksi}$

PILE CAPACITY (FROM EUSTIS)

14" Ø, PILE TIP -69 N.G.V.D., TOP OF PILE @ -11.5

COMP: 32 TONS
TENS: 24 TONS } VERTICAL CAPACITY

VERTICAL LENGTH: 69-11.5 = 57.5'

BATTER: 2V:1H

OVERALL LENGTH = $\sqrt{(57.5)^2+(\frac{57.5}{2})^2}$: 64'

OVERALL CAPACITY. COMP: $\sqrt{(32)^2+(\frac{32}{2})^2}$ = 35.8^T = 71.6^K

TENS: $\sqrt{(24)^2+(12)^2}$ = 26.8^T = 53.6^K

JN 3004 | [illegible] | S4WB#11 EAST | AAH | 3-31-98 | 8

[illegible]

100	S4WB#11 EAST	T-WALL									
200	PROP	4074	3201	3201	196	2.0	0.0	ALL			
300	SOIL	ES	0.066	LEN	64	0	ALL				
320	PIN	ALL									
400	DLS	5	72	54	600	223	133	1510	1127	[illegible]	14 ALL
420	ASC	5	196	457	0.816	0.856	1.75	0.0	ALL		
440	BAT	2.0	ALL								
450	ANG	~~180~~ 0	1	TO	15						
455	ANG	~~0~~ 0	16	TO	20						
460	PILE	1	5.5	-18	0						
465	PILE	11	1.5	-18	0						
470	PILE	16	-5.5	-18	0						
475	ROW	Y	10	1	9	AT	4.0				
480	ROW	Y	5	11	4	AT	9.0				
485	ROW	Y	5	16	4	AT	9.0				
500	LOAD	1	424.4	0	652.8	0	-4348.4	0			
510	LOAD	2	424.4	0	548.0	0	-4024.0	0			
520	LOAD	3	402.4	0	505.8	0	-4189.8	0			
530	LOAD	4	402.4	0	419.4	0	-3922.5	0			
540	LOAD	5	39.6	0	545.2	0	-1106.4	0			
550	LOAD	6	14.1	0	408.9	0	-552.9	0			
600	FOUT	1	2	3	4	5	6	7	SWEPED		
610	PFO	ALL									
620	PFL	SWEEP									

SUMMARY OF PILE LOADS:

	MAX C	MAX T
PROTECTED SIDE	73.9k	—
MIDDLE ROW	35.7k	-28.0k
FLOOD SIDE	48.8k	-43.0k

ALLOWABLE: C = 71.6k

T = 53.6k

(73.9 - 71.6)/71.6 = 3.21% over

∴ use tip elevation slightly deeper than -69 NGVD

- use -72 NGVD - add note to verify w/ deeper borings during final design.

```
100 S&WB #11 EAST T-WALL
200 PROP 4074 3201 3201 196 2.0 0.0 ALL
300 SOIL ES 0.066 LEN 64 0 ALL
320 PIN ALL
400 DLS S 72 54 600 223 133 1510 1167 H 14 ALL
420 ASC S 196 457 0.816 0.856 1.75 0.0 ALL
440 BAT 2.0 ALL
450 ANG 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
455 ANG 180 16 17 18 19 20
460 PILE 1 5.5 -18 0
465 PILE 11 1.5 -18 0
470 PILE 16 -5.5 -18 0
475 ROW Y 10 1 9 AT 4.0
480 ROW Y 5 11 4 AT 9.0
485 ROW Y 5 16 4 AT 9.0
500 LOAD 1 424.4 0 652.8 0 -4348.4 0
510 LOAD 2 424.4 0 548.0 0 -4024.0 0
520 LOAD 3 402.4 0 505.8 0 -4189.8 0
530 LOAD 4 402.4 0 419.4 0 -3922.5 0
540 LOAD 5 39.6 0 545.2 0 -1106.4 0
550 LOAD 6 14.1 0 408.9 0 -552.9 0
600 FOUT 1 2 3 4 5 6 7 SWB11EO
610 PFO ALL
620 FPL SWB11EP
```

```
*******************************
* CORPS PROGRAM  #  X0080     *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 86/09/02-A *   RUN DATE 03-31-98     RUN TIME 13:19:53
*******************************
```

S&WB #11 EAST T-WALL

THERE ARE 20 PILES AND
6 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
WITH DIAGONAL COORDINATES =	(-5.50 ,	-18.00 ,	.00)
	(5.50 ,	18.00 ,	.00)

****

PILE PROPERTIES AS INPUT

E KSI	I1 IN**4	I2 IN**4	A IN**2	C33	B66
.40740E+04	.32010E+04	.32010E+04	.19600E+03	.20000E+01	.00000E+00

THESE PILE PROPERTIES APPLY TO THE FOLLOWING PILES -

ALL

****

SOIL DESCRIPTIONS AS INPUT

ES	ESOIL K/IN**2	LENGTH	L FT	LU FT
	.66000E-01	L	.64000E+02	.00000E+00

THIS SOIL DESCRIPTION APPLIES TO THE FOLLOWING PILES -

ALL

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	5.50	-18.00	.00	2.00	.00	64.00	P
2	5.50	-14.00	.00	2.00	.00	64.00	P
3	5.50	-10.00	.00	2.00	.00	64.00	P
4	5.50	-6.00	.00	2.00	.00	64.00	P
5	5.50	-2.00	.00	2.00	.00	64.00	P
6	5.50	2.00	.00	2.00	.00	64.00	P

7	5.50	6.00	.00	2.00	.00	64.00	P
8	5.50	10.00	.00	2.00	.00	64.00	P
9	5.50	14.00	.00	2.00	.00	64.00	P
10	5.50	18.00	.00	2.00	.00	64.00	P
11	1.50	-18.00	.00	2.00	.00	64.00	P
12	1.50	-9.00	.00	2.00	.00	64.00	P
13	1.50	.00	.00	2.00	.00	64.00	P
14	1.50	9.00	.00	2.00	.00	64.00	P
15	1.50	18.00	.00	2.00	.00	64.00	P
16	-5.50	-18.00	.00	2.00	180.00	64.00	P
17	-5.50	-9.00	.00	2.00	180.00	64.00	P
18	-5.50	.00	.00	2.00	180.00	64.00	P
19	-5.50	9.00	.00	2.00	180.00	64.00	P
20	-5.50	18.00	.00	2.00	180.00	64.00	P

						1280.00	

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	424.4	.0	652.8	.0	-4348.4	.0
2	424.4	.0	548.0	.0	-4024.0	.0
3	402.4	.0	505.8	.0	-4189.8	.0
4	402.4	.0	419.4	.0	-3922.5	.0
5	39.6	.0	545.2	.0	-1106.4	.0
6	14.1	.0	408.9	.0	-552.9	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.84063E+04	.18131E-03	.82956E+04	-.15625E-01	-.89593E+06	-.15625E-01
.18131E-03	.11066E+03	-.36261E-03	.00000E+00	-.23932E-01	.23239E+04
.82956E+04	-.36261E-03	.33293E+05	-.31250E-01	-.69916E+06	.31250E-01
-.15625E-01	.00000E+00	-.31250E-01	.70475E+09	.00000E+00	-.15768E+09
-.89593E+06	-.23932E-01	-.69916E+06	.00000E+00	.11147E+09	.00000E+00
.00000E+00	.23239E+04	.31250E-01	-.15768E+09	.00000E+00	.17831E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	-.2627E-01	-.4038E-07	.1369E-01	-.4916E-12	-.5934E-03	-.2308E-11
2	.1419E-01	-.5907E-07	.7166E-02	.6528E-12	-.2742E-03	.9128E-13
3	-.2021E-01	-.6036E-07	.8458E-02	-.2850E-12	-.5604E-03	-.9478E-12
4	.1313E-01	-.7577E-07	.3079E-02	.6581E-12	-.2974E-03	.1030E-11
5	-.1148E+00	.8622E-07	.2660E-01	-.3315E-11	-.8747E-03	-.8718E-11
6	-.7649E-01	.7129E-07	.1979E-01	-.2247E-11	-.5502E-03	-.6383E-11

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
2	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
3	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
4	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
5	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
6	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
7	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
8	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
9	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
10	-.3	.0	73.9	.0	14.1	.0	1.03	.33	1.26	1.16	#
11	-.2	.0	20.9	.0	10.3	.0	.29	.18	.99	.90	#
12	-.2	.0	20.9	.0	10.3	.0	.29	.18	.99	.90	#
13	-.2	.0	20.9	.0	10.3	.0	.29	.18	.99	.90	#
14	-.2	.0	20.9	.0	10.3	.0	.29	.18	.99	.90	#
15	-.2	.0	20.9	.0	10.3	.0	.29	.18	.99	.90	#
16	.2	.0	-22.9	.0	-10.4	.0	.42	.30	.76	.68	
17	.2	.0	-22.9	.0	-10.4	.0	.42	.30	.76	.68	
18	.2	.0	-22.9	.0	-10.4	.0	.42	.30	.76	.68	
19	.2	.0	-22.9	.0	-10.4	.0	.42	.30	.76	.68	
20	.2	.0	-22.9	.0	-10.4	.0	.42	.30	.76	.68	

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
2	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#

3	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
4	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
5	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
6	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
7	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
8	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
9	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
10	.0	.0	60.2	.0	-.4	.0	.84	.21	1.16	1.12	#
11	.0	.0	35.7	.0	-2.2	.0	.50	.15	1.04	.99	#
12	.0	.0	35.7	.0	-2.2	.0	.50	.15	1.04	.99	#
13	.0	.0	35.7	.0	-2.2	.0	.50	.15	1.04	.99	#
14	.0	.0	35.7	.0	-2.2	.0	.50	.15	1.04	.99	#
15	.0	.0	35.7	.0	-2.2	.0	.50	.15	1.04	.99	#
16	.0	.0	-33.5	.0	2.3	.0	.62	.41	.69	.64	
17	.0	.0	-33.5	.0	2.3	.0	.62	.41	.69	.64	
18	.0	.0	-33.5	.0	2.3	.0	.62	.41	.69	.64	
19	.0	.0	-33.5	.0	2.3	.0	.62	.41	.69	.64	
20	.0	.0	-33.5	.0	2.3	.0	.62	.41	.69	.64	

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
2	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
3	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
4	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
5	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
6	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
7	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
8	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
9	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
10	-.2	.0	65.7	.0	11.5	.0	.91	.26	1.22	1.13	#
11	-.1	.0	15.7	.0	7.9	.0	.22	.19	.95	.88	#
12	-.1	.0	15.7	.0	7.9	.0	.22	.19	.95	.88	#
13	-.1	.0	15.7	.0	7.9	.0	.22	.19	.95	.88	#
14	-.1	.0	15.7	.0	7.9	.0	.22	.19	.95	.88	#
15	-.1	.0	15.7	.0	7.9	.0	.22	.19	.95	.88	#
16	.2	.0	-34.3	.0	-9.2	.0	.63	.44	.70	.62	
17	.2	.0	-34.3	.0	-9.2	.0	.63	.44	.70	.62	
18	.2	.0	-34.3	.0	-9.2	.0	.63	.44	.70	.62	
19	.2	.0	-34.3	.0	-9.2	.0	.63	.44	.70	.62	
20	.2	.0	-34.3	.0	-9.2	.0	.63	.44	.70	.62	

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
2	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
3	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
4	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
5	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
6	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
7	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
8	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#

9	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
10	.0	.0	54.4	.0	-.5	.0	.76	.17	1.13	1.09	#
11	.0	.0	27.9	.0	-2.4	.0	.39	.17	1.00	.95	#
12	.0	.0	27.9	.0	-2.4	.0	.39	.17	1.00	.95	#
13	.0	.0	27.9	.0	-2.4	.0	.39	.17	1.00	.95	#
14	.0	.0	27.9	.0	-2.4	.0	.39	.17	1.00	.95	#
15	.0	.0	27.9	.0	-2.4	.0	.39	.17	1.00	.95	#
16	.0	.0	-43.0	.0	1.3	.0	.80	.52	.64	.59	
17	.0	.0	-43.0	.0	1.3	.0	.80	.52	.64	.59	
18	.0	.0	-43.0	.0	1.3	.0	.80	.52	.64	.59	
19	.0	.0	-43.0	.0	1.3	.0	.80	.52	.64	.59	
20	.0	.0	-43.0	.0	1.3	.0	.80	.52	.64	.59	

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
2	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
3	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
4	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
5	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
6	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
7	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
8	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
9	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
10	-.8	.0	50.1	.0	41.9	.0	.70	.13	1.20	.98	#
11	-.7	.0	-28.0	.0	36.3	.0	.52	.42	.79	.59	
12	-.7	.0	-28.0	.0	36.3	.0	.52	.42	.79	.59	
13	-.7	.0	-28.0	.0	36.3	.0	.52	.42	.79	.59	
14	-.7	.0	-28.0	.0	36.3	.0	.52	.42	.79	.59	
15	-.7	.0	-28.0	.0	36.3	.0	.52	.42	.79	.59	
16	.6	.0	48.8	.0	-34.8	.0	.68	.12	1.18	.99	#
17	.6	.0	48.8	.0	-34.8	.0	.68	.12	1.18	.99	#
18	.6	.0	48.8	.0	-34.8	.0	.68	.12	1.18	.99	#
19	.6	.0	48.8	.0	-34.8	.0	.68	.12	1.18	.99	#
20	.6	.0	48.8	.0	-34.8	.0	.68	.12	1.18	.99	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
2	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
3	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
4	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
5	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
6	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
7	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
8	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
9	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
10	-.5	.0	33.2	.0	27.9	.0	.46	.16	1.09	.92	#
11	-.5	.0	-15.9	.0	24.4	.0	.29	.25	.83	.68	
12	-.5	.0	-15.9	.0	24.4	.0	.29	.25	.83	.68	
13	-.5	.0	-15.9	.0	24.4	.0	.29	.25	.83	.68	
14	-.5	.0	-15.9	.0	24.4	.0	.29	.25	.83	.68	

15	-.5	.0	-15.9	.0	24.4	.0	.29	.25	.83	.68	
16	.4	.0	40.4	.0	-22.6	.0	.56	.14	1.11	.97	#
17	.4	.0	40.4	.0	-22.6	.0	.56	.14	1.11	.97	#
18	.4	.0	40.4	.0	-22.6	.0	.56	.14	1.11	.97	#
19	.4	.0	40.4	.0	-22.6	.0	.56	.14	1.11	.97	#
20	.4	.0	40.4	.0	-22.6	.0	.56	.14	1.11	.97	#

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	32.8	.0	66.2	.0	.0	.0
2	32.8	.0	66.2	.0	.0	.0
3	32.8	.0	66.2	.0	.0	.0
4	32.8	.0	66.2	.0	.0	.0
5	32.8	.0	66.2	.0	.0	.0
6	32.8	.0	66.2	.0	.0	.0
7	32.8	.0	66.2	.0	.0	.0
8	32.8	.0	66.2	.0	.0	.0
9	32.8	.0	66.2	.0	.0	.0
10	32.8	.0	66.2	.0	.0	.0
11	9.2	.0	18.8	.0	.0	.0
12	9.2	.0	18.8	.0	.0	.0
13	9.2	.0	18.8	.0	.0	.0
14	9.2	.0	18.8	.0	.0	.0
15	9.2	.0	18.8	.0	.0	.0
16	10.1	.0	-20.6	.0	.0	.0
17	10.1	.0	-20.6	.0	.0	.0
18	10.1	.0	-20.6	.0	.0	.0
19	10.1	.0	-20.6	.0	.0	.0
20	10.1	.0	-20.6	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	26.9	.0	53.8	.0	.0	.0
2	26.9	.0	53.8	.0	.0	.0
3	26.9	.0	53.8	.0	.0	.0
4	26.9	.0	53.8	.0	.0	.0
5	26.9	.0	53.8	.0	.0	.0
6	26.9	.0	53.8	.0	.0	.0
7	26.9	.0	53.8	.0	.0	.0
8	26.9	.0	53.8	.0	.0	.0
9	26.9	.0	53.8	.0	.0	.0
10	26.9	.0	53.8	.0	.0	.0
11	16.0	.0	31.9	.0	.0	.0
12	16.0	.0	31.9	.0	.0	.0
13	16.0	.0	31.9	.0	.0	.0
14	16.0	.0	31.9	.0	.0	.0

15	16.0	.0	31.9	.0	.0	.0
16	15.0	.0	-30.0	.0	.0	.0
17	15.0	.0	-30.0	.0	.0	.0
18	15.0	.0	-30.0	.0	.0	.0
19	15.0	.0	-30.0	.0	.0	.0
20	15.0	.0	-30.0	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	29.2	.0	58.9	.0	.0	.0
2	29.2	.0	58.9	.0	.0	.0
3	29.2	.0	58.9	.0	.0	.0
4	29.2	.0	58.9	.0	.0	.0
5	29.2	.0	58.9	.0	.0	.0
6	29.2	.0	58.9	.0	.0	.0
7	29.2	.0	58.9	.0	.0	.0
8	29.2	.0	58.9	.0	.0	.0
9	29.2	.0	58.9	.0	.0	.0
10	29.2	.0	58.9	.0	.0	.0
11	6.9	.0	14.1	.0	.0	.0
12	6.9	.0	14.1	.0	.0	.0
13	6.9	.0	14.1	.0	.0	.0
14	6.9	.0	14.1	.0	.0	.0
15	6.9	.0	14.1	.0	.0	.0
16	15.2	.0	-30.7	.0	.0	.0
17	15.2	.0	-30.7	.0	.0	.0
18	15.2	.0	-30.7	.0	.0	.0
19	15.2	.0	-30.7	.0	.0	.0
20	15.2	.0	-30.7	.0	.0	.0

LOAD CASE - 4

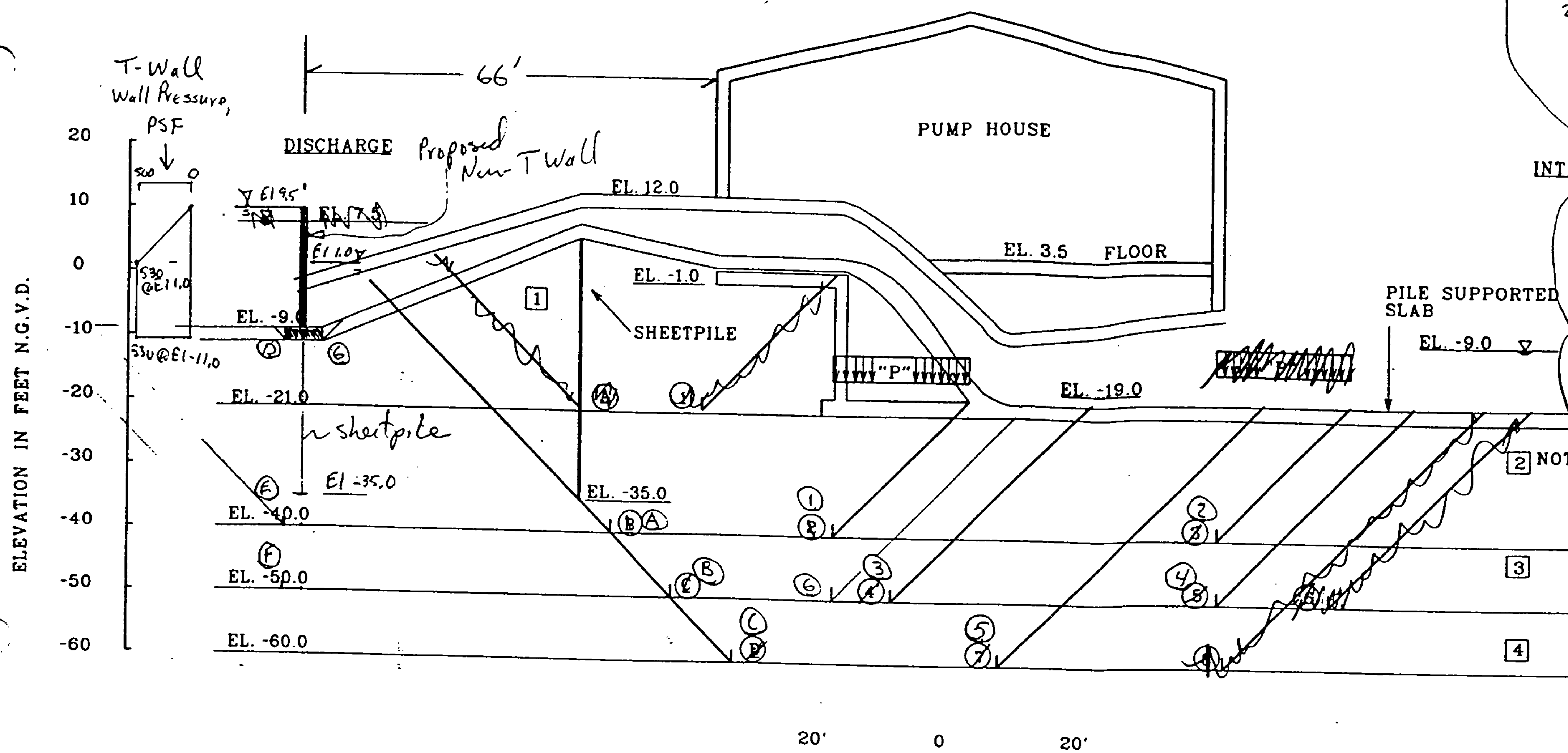
PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	24.4	.0	48.7	.0	.0	.0
2	24.4	.0	48.7	.0	.0	.0
3	24.4	.0	48.7	.0	.0	.0
4	24.4	.0	48.7	.0	.0	.0
5	24.4	.0	48.7	.0	.0	.0
6	24.4	.0	48.7	.0	.0	.0
7	24.4	.0	48.7	.0	.0	.0
8	24.4	.0	48.7	.0	.0	.0
9	24.4	.0	48.7	.0	.0	.0
10	24.4	.0	48.7	.0	.0	.0
11	12.5	.0	24.9	.0	.0	.0
12	12.5	.0	24.9	.0	.0	.0
13	12.5	.0	24.9	.0	.0	.0
14	12.5	.0	24.9	.0	.0	.0
15	12.5	.0	24.9	.0	.0	.0
16	19.2	.0	-38.4	.0	.0	.0
17	19.2	.0	-38.4	.0	.0	.0
18	19.2	.0	-38.4	.0	.0	.0
19	19.2	.0	-38.4	.0	.0	.0
20	19.2	.0	-38.4	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	21.7	.0	45.2	.0	.0	.0
2	21.7	.0	45.2	.0	.0	.0
3	21.7	.0	45.2	.0	.0	.0
4	21.7	.0	45.2	.0	.0	.0
5	21.7	.0	45.2	.0	.0	.0
6	21.7	.0	45.2	.0	.0	.0
7	21.7	.0	45.2	.0	.0	.0
8	21.7	.0	45.2	.0	.0	.0
9	21.7	.0	45.2	.0	.0	.0
10	21.7	.0	45.2	.0	.0	.0
11	-13.1	.0	-24.7	.0	.0	.0
12	-13.1	.0	-24.7	.0	.0	.0
13	-13.1	.0	-24.7	.0	.0	.0
14	-13.1	.0	-24.7	.0	.0	.0
15	-13.1	.0	-24.7	.0	.0	.0
16	-22.4	.0	43.4	.0	.0	.0
17	-22.4	.0	43.4	.0	.0	.0
18	-22.4	.0	43.4	.0	.0	.0
19	-22.4	.0	43.4	.0	.0	.0
20	-22.4	.0	43.4	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	14.4	.0	29.9	.0	.0	.0
2	14.4	.0	29.9	.0	.0	.0
3	14.4	.0	29.9	.0	.0	.0
4	14.4	.0	29.9	.0	.0	.0
5	14.4	.0	29.9	.0	.0	.0
6	14.4	.0	29.9	.0	.0	.0
7	14.4	.0	29.9	.0	.0	.0
8	14.4	.0	29.9	.0	.0	.0
9	14.4	.0	29.9	.0	.0	.0
10	14.4	.0	29.9	.0	.0	.0
11	-7.5	.0	-14.0	.0	.0	.0
12	-7.5	.0	-14.0	.0	.0	.0
13	-7.5	.0	-14.0	.0	.0	.0
14	-7.5	.0	-14.0	.0	.0	.0
15	-7.5	.0	-14.0	.0	.0	.0
16	-18.4	.0	35.9	.0	.0	.0
17	-18.4	.0	35.9	.0	.0	.0
18	-18.4	.0	35.9	.0	.0	.0
19	-18.4	.0	35.9	.0	.0	.0
20	-18.4	.0	35.9	.0	.0	.0



2) The Low Weighted Creep Ratio is 3.8 for a new T Wall cut off wall tip at El -35. This is considered acceptable protection against potential piping.

4) T Wall analysis indicates no unbalanced forces beneath base of proposed new T wall at El -11.0. Batter piles must be used to carry the indicated T-Wall pressure.

NOTE :
1) "P" IS REQUIRED VERTICAL PRESSURE ACROSS TOP OF PASSIVE WEDGES TO ACHIEVE A CALCULATED FACTOR OF SAFETY OF 1.3 OR MORE AGAINST A STABILITY FAILURE.

2) ~~SEEPAGE ANALYSIS BY HARR METHOD INDICATES A FACTOR OF SAFETY OF 6 OR MORE AGAINST PIPING WHICH IS CONSIDERED ACCEPTABLE.~~

3) REACH ~~2~~ 4 SOIL PARAMETERS WERE USED FOR THESE ANALYSES. ~~LOCATION OF STRATUM 2 IS BASED ON BORING ALCW-7.~~

Global Stability of Pump Station

FAILURE SURFACE	SUMMATION OF FORCES LB/FT		FACTOR OF SAFETY	VERTICAL PRESSURE, P, IN PSF TO ACHIEVE FACTOR OF SAFETY = 1.3
	RESISTING	DRIVING		
~~A-1~~	~~34145~~	~~16088~~	~~2.13~~	-
A B ~~8~~ 1	51147 ~~61163~~	45190 ~~59743~~	1.13 ~~0.87~~	278 ~~942~~
A B ~~8~~ 2	73287 ~~73308~~	45185 ~~59138~~	1.62 ~~1.24~~	— ~~131~~
B C ~~4~~ 3	69247 ~~69263~~	60989 ~~74848~~	1.14 ~~0.92~~	249 ~~699~~
B C ~~5~~ 4	90188 ~~90106~~	60902 ~~74856~~	1.48 ~~1.20~~	— ~~199~~
~~C-6~~	~~87474~~	~~74754~~	~~1.30~~	
C D ~~7~~ 5	97133 ~~97150~~	73152 ~~86872~~	1.33 ~~1.12~~	— ~~300~~
~~D-8~~	~~110008~~	~~86736~~	~~1.36~~	-

STRATUM NO.	SOIL TYPE	UNIT WEIGHT IN PCF	Unfactored FRICTION ANGLE DEGREES	Unfactored COHESION - PSF AVERAGE	Unfactored COHESION - PSF BOTTOM	Factor of Safety=1.3 Friction Angle Degrees	Factor of Safety=1.3 Cohesion PSF Average	Factor of Safety=1.3 Cohesion PSF Bottom
1	CLAY, SILTY CLAY, ORGANIC CLAY & HUMUS	92.0	0	350	350	–	269	269
2	CLAY	101.0	0	350	350	0	269	26
3	CLAY	101.0	0	400	400	0	308	308
4	CLAY	101.0	0	480	560	0	369	43

T-Wall Analysis

Summation of Forces (Using Factored Shear Strengths)

Failure surface	ΣR Resisting lb/ft	ΣD Driving lb/ft	ΣR-ΣD	Change in Net Force, lb/ft
D 6	4142	8327	-4185	—
E 1	51110	51916	-806	3379
F 6	66784	66066	718	1524

SLOPE STABILITY and Proposed T Wall ANALYSES ~~OF EAST PUMP STATION AT~~

N.O. S&WB PUMP STATION NO. 11 East

U. S. ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA

EUSTIS ENGINEERING COMPANY, INC.

Revised PLATE 54

U.S ARMY CORPS OF ENGINEERS
EAST OF HARVEY CANAL
HURRICANE PROTECTION PROJECT
JEFFERSON PARISH, LOUISIANA
Proposed T Wall
54 WB P. Station ~~REACH~~ 11 East

ALLOWABLE PILE LOAD CAPACITIES
SQUARE PRECAST, PRESTRESSED CONCRETE PILES
TOP OF PILE AT EL -10

SIZE	PILE TIP ELEVATION IN FEET NGVD	ALLOWABLE PILE LOAD CAPACITY IN TONS FACTOR OF SAFETY ≈ 2	
		COMPRESSION	TENSION
12-In. Square	-39	12 ~~16~~	9 ~~12~~
	-49	16 ~~20~~	12 ~~16~~
	-59	21 ~~26~~	16 ~~20~~
	-69	27 ~~32~~	20 ~~24~~
14-In. Square	-39	14 ~~19~~	10 ~~14~~
	-49	19 ~~24~~	14 ~~18~~
	-59	25 ~~30~~	18 ~~23~~
	-69	32 ~~37~~	24 ~~28~~

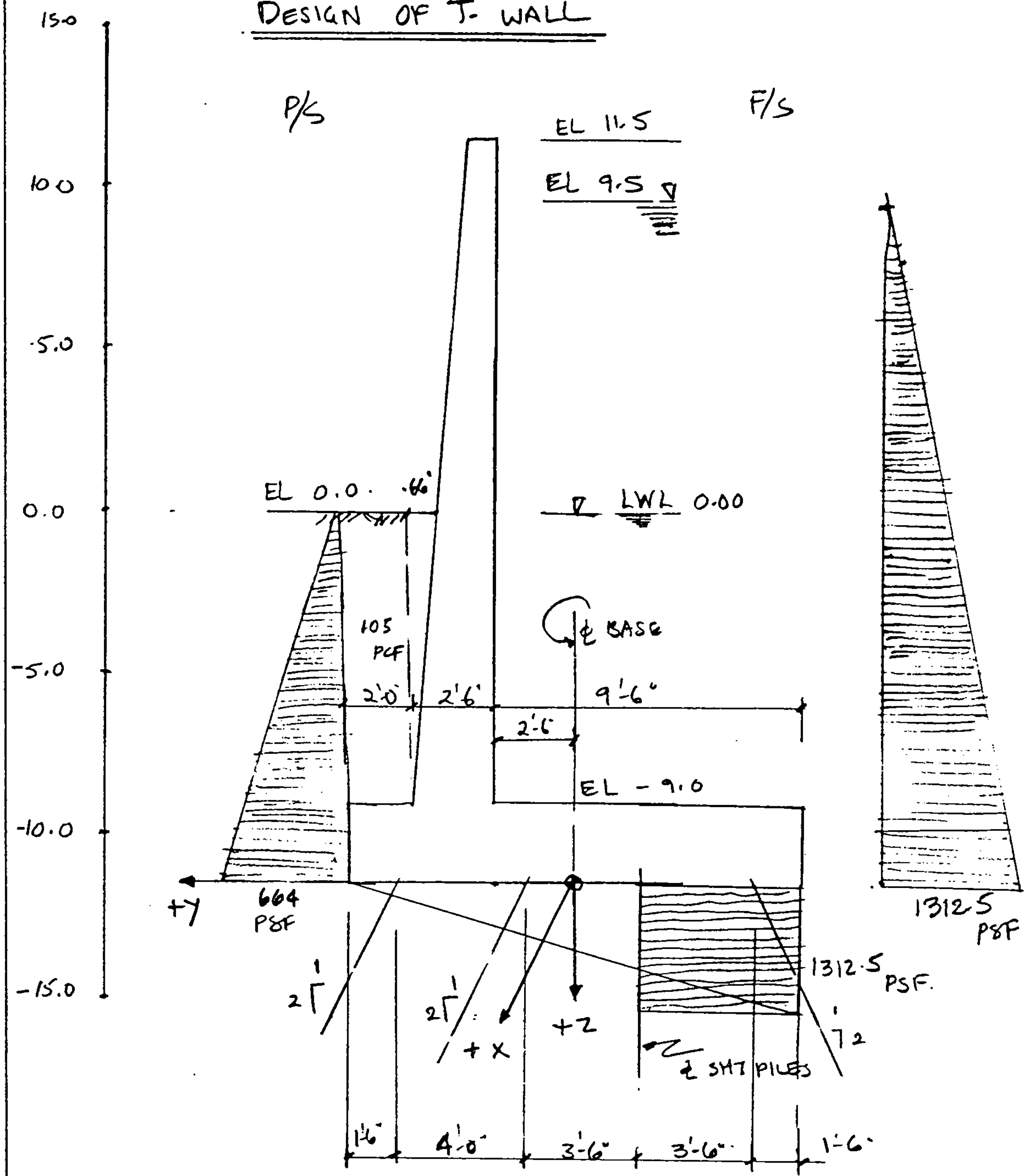
EUSTIS ENGINEERING COMPANY, INC.

~~PLATE 42~~
Plate X

S& WB #11 WEST

ORIGINAL.

DESIGN OF T- WALL

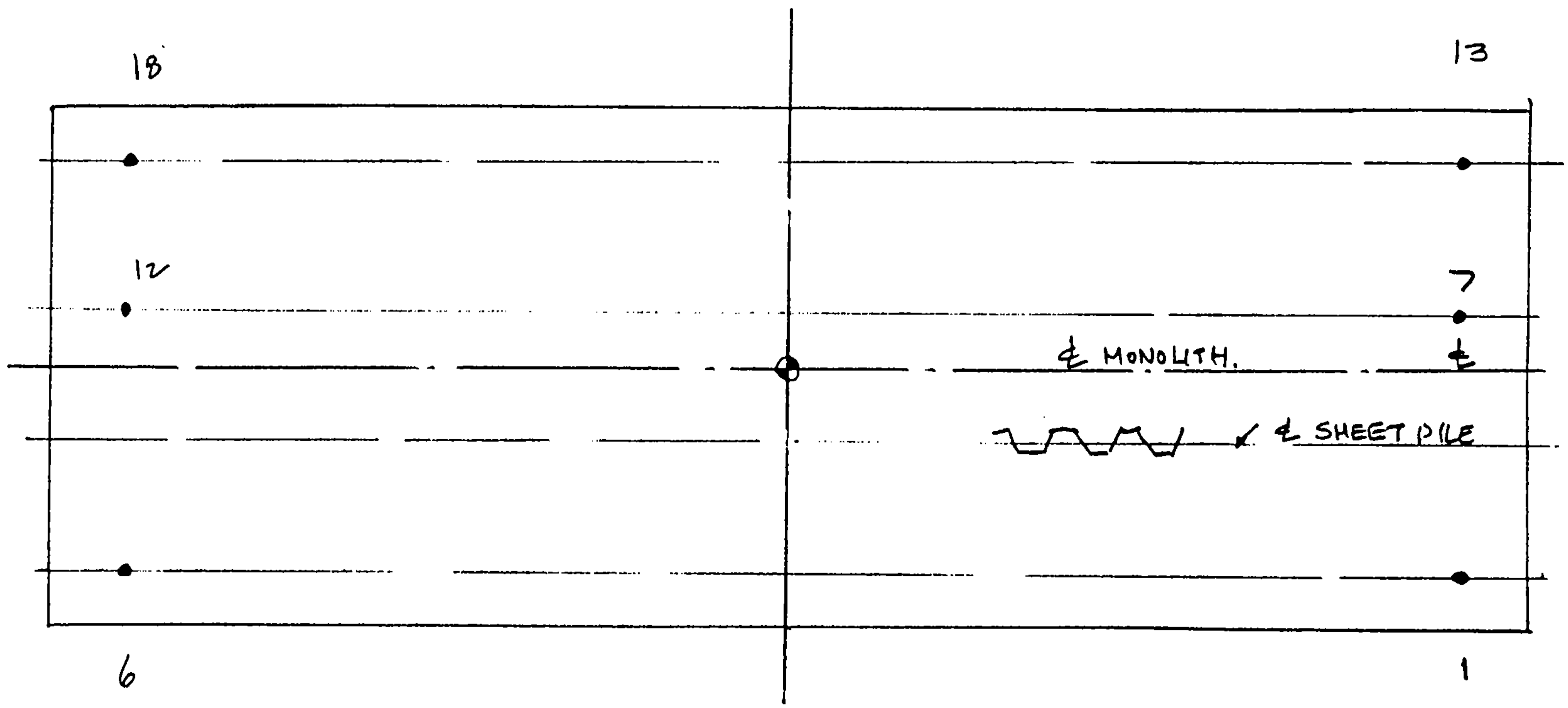


SECTION.

Water Pr.

F/s	SWL @ 9.5	62.5 X (21)	= 1313	PSF
	W.L @ 11.5	62.5 X 23	= 1438.	PSF
P/S	Soil Pr @ Rest	= 0.55 X 11.5 X 105	= 664	PSF

PROTECTED SIDE



FLOODSIDE

- CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 'K
1	DEAD LOAD					
	WT. OF STEM & BASE					
	STEM					
	20.5 × 1 × .15		3.08	3.0	9.5	9.24 ↶
	½ × 20.5 × 1.5 × .15		2.31	4.0		9.24 ↶
	BASE		5.25			–
	14' × 2.5' × .15					
	Total		10.64 ↓			18.48 ↶
2	WATER ON FLOODSIDE					
	SWL 9.50					
	a) VERTICAL					
	9.5 × 18.5 × .0625		10.98	2.25		24.7 ↷
	b) LATERAL					
	½ × 1313 × 21	13.8			7.0	96.6 ↶
	Total	13.8 ←	10.98 ↓			71.9 ↶

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 1K
3	BUOYANCY SWL EL 9.50					
	a) PERVIOUS ½×1313×14′		−9.2	2.33		21.44 ↺
	b) IMPERVIOUS 1313×5		−6.56	4.5		29.5 ↻
4)	SOIL ON PROTECTED SIDE					
	a) VERT. 2′×9′×.105 KCF		1.89	6.0		+11.34 ↺
	½×.66′×9′×.105		0.31	4.78		+1.48 ↻
	b) Lateral soil ½×.664×11.5′	−3.82			3.83	−15.21 ↻
		−3.82 →	2.20 ↓			−2.39)

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 1K
5)	WATER ON FLOODSIDE EL. SWL +2.0 W.S. EL. 11.5					
	a) VERTICAL 9.5×20.5'×.0625		12.18	2.25		27.40 ↻
	b) LATERAL ½×1.438×23.0	16.54		7.67		126.86 ↺
	Total	16.54 ←	12.18 ↓			99.46 ↺
6)	BUOYANCY W.S. EL 11.50					
	a) PERVIOUS ½×1.438×14'		−10.07	2.33		23.46 ↺
	b) IMPERVIOUS 1.438×5'		−7.2	4.5		32.4 ↺

MS.

− CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 'K
7)	WATER ON FLOODSIDE LWL = 0.0					
	a) Vertical Water 9.5×9.0×.0625		5.35	3.00		16.05 ↷
	b) Lateral Pr. 11.5×.0625 = .719; ½×.719×11.5	4.13			3.83	15.83 ↶
	Total	4.13 ←	5.35 ↓			0.22 ↶
8)	Buoyancy LWL 0.0					
	Pervious ½×0.719×14		-5.03	2.33		11.73 ↶
	Impervious 0.719×5'		-3.60	4.5		16.2 ↶

MS.

- CLOCKWISE
+ ANTICLOCK

BASIC LOAD COND	DESCRIPTION	+ ← F_y KIPS	+ ↓ F_z KIPS	$\bar{y}$ FT	$\bar{z}$ FT	MOMENT 1K
9)	WIND FROM F/S					
	11.5 X .05	0.58			17.25	10.00 ↻
		0.58 ←				10.00 ↻
10)	WIND FROM P/S					
	11.5 X .05	-0.58			17.25	10.00 ↻
		0.58 →				10.00 ↻

LOAD COMBINATIONS.

LD. COMB No.	DESCRIPTION	← Fy	Fz ↓	MOMENT MXX
1	SWL @ EL 9.5 PERV. SHT. PILE, SOIL @ PROT. SIDE UPTO EL 0.0, NO WIND			
	1) D.L.		10.64	18.48 ↶
	2) Water F/S.	13.8	10.98	71.9 ↶
	3 a) Buoy Perv.		−9.2	21.44 ↶
	4) Soil PROT. SIDE	−3.97	2.20	−2.39 ↷
	Unbalanced Soil	+2.1		
	TOTAL PER LFT	11.93	14.62	109.43 ↶
	TOTAL PER 40'	477.2	584.8	4377.2
2	SWL @ EL 9.5, IMP. SHT. PILE, SOIL @ PROT. SIDE UPTO EL 0.0. NO WIND			
	1) D.L.		10.64	18.48 ↶
	2) WATER F/S	13.8	10.98	71.9 ↶
	3 b) Buoy IMP		−6.56	29.5 ↶
	4) Soil P/S	−3.97	2.20	−2.39 ↷
	unbalanced Soil	+2.1		
	TOTAL PER LFT	11.93	17.26	117.49 ↶
	TOTAL PER 40'0"	477.2	690.4	4,700 ↶

LOAD COMBINATIONS.

LD. COMB NO.	DESCRIPTION	← Fy	Fz ↓	MOMENT MXX
3	W.S. EL 11.5, PERV. SHT. PILE, SOIL ON P/S UPTO EL 0.0 NO WIND			
	1) D.L.		10.64	18.48 ↺
	5) WATER F/S	16.54	12.18	99.46 ↺
	6 a) BUOY PERV		-10.07	23.46 ↺
	4) SOIL P/S Unbalanced Soil	-3.97	2.20	-2.39 ↻
	TOTAL PER LFT	12.57	14.95	139.01 ↺
	TOTAL PER 40'x.75	377.1	448.5	4170.3 ↺
4	W.S. EL 11.5, IMP. SHT. PILE, SOIL ON P/S UPTO EL 0.0 NO WIND.			
	1) D.L.		10.64	18.48 ↺
	5) Water F/S	16.54	12.18	99.46 ↺
	6 b) BUOY IMP		-7.2	32.4 ↺
	4) SOIL P/S Unbalanced soil	-3.97	2.20	-2.39 ↻
	TOTAL PER LFT	12.57	17.82	147.95 ↺
	TOTAL PER 40'0"x.75	377.1	534.6	4439 ↺

APRIL16 April 20, 1998 Page 1

RECEIVED
APR 20 1998

D. E. I.

MEMO
TO:DEI
ATTENTION: MS APRIL HURRY
FROM:EUSTIS ENGINEERING
TOM STREMLAU
SUBJECT: PREL INFO OF MODIFIED S &WB STATION 11 WEST
ALGIERS CANAL PROJECT

I HAVE ENCLOSED PREL PENCILED COPIES OF SLOPE STABILITY AND T WALL ANALYSES FOR A MODIFIED P STATION 11 WEST WITH A NEW T WALL 63' FROM FACE OF PUMP HOUSE.

ALSO I INCLUDED PILE CAPACITY INFO FOR PILES SUPPORTING NEW T WALL.

FILE

DISTRIBUTION

WB AH ✓

JH

EUSTIS ENGINEERING COMPANY, INC.
Geotechnical Engineers
Metairie, Louisiana

Page ______
Date 3/3/98
Job 14638
By RLS
Checked By ______

Project ______
PRELIMINARY
Subject ______

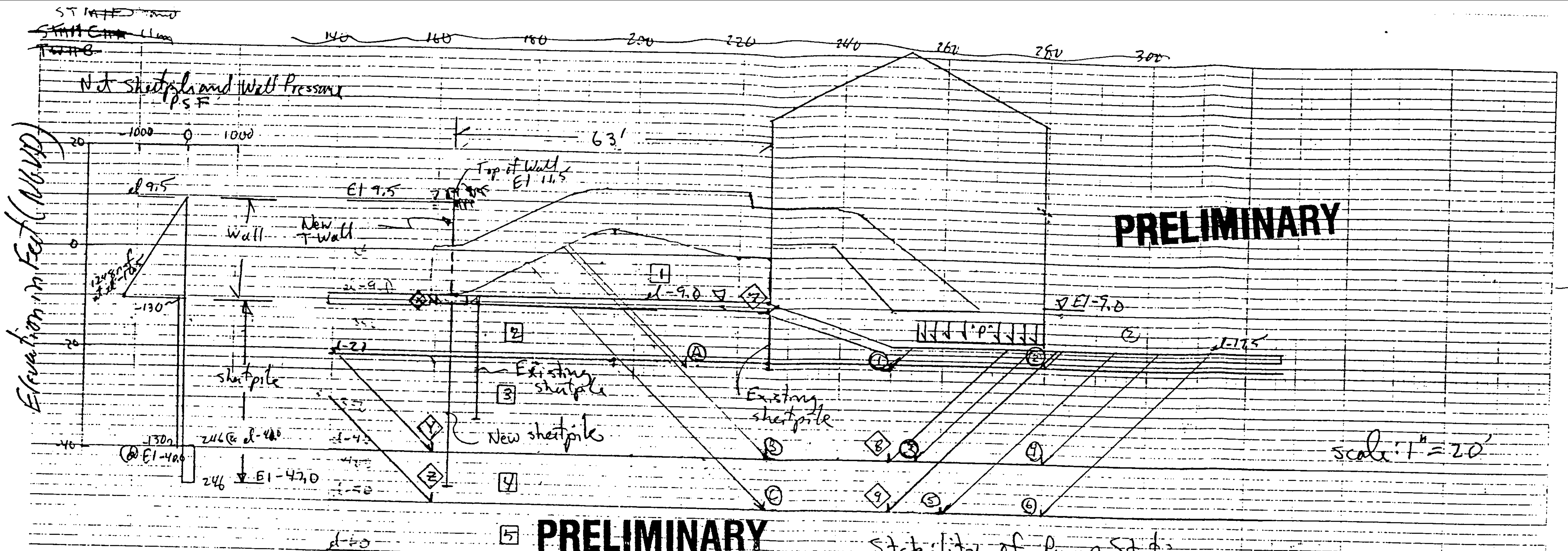
US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La.

Allowable Pile Load Capacities
T Wall Foundation

Modified S+WB Station 11 West

Pile Type	Pile Tip Elevation	Estimated Allowable Single Pile Load Capacity in Tons, Factor of Safety = 2.0 — Compression	Tension
14 in. Sq. Precast, Prestressed Concrete	-80	25	18
	-90	37	27
	-100	50	37
	-110	60	48
16 in. Sq. Precast, Prestressed Concrete	-80	29	21
	-90	43	31
	-100	57	42
	-110	68	55

Note: 1) Capacity contribution to El -47 has been ignored.
2) Reach 4 soil parameters have been used for this analysis. However, soil parameters below El -80 have been assumed. Soil borings must be performed to confirm soil conditions below this level for final design.



PRELIMINARY

Soil Parameters

Stratum No.	Soil type	Unit Weight PCF	Unfactored: Friction Angle Degrees	Unfactored: Cohesion PSF Average	Unfactored: Cohesion PSF Bottom	Safety Factor = 1.3: Friction Angle Degrees	Safety Factor = 1.3: Cohesion PSF Average	Safety Factor = 1.3: Cohesion PSF Bottom
1	Fill: Clay	105.0	0	350	350	0	269	269
2	Clay, Silty Clay, Organic Clay + Humus	92.0	0	350	350	0	269	269
3	Clay	101.0	0	350	350	0	269	269
4	Clay	101.0	0	400	400	0	308	308
5	Clay	101.0	0	480	560	0	369	431
6	Clay	101.0	0	630	700	0	485	538

Stability of Pump Station

Failure Surface	Summation of Forces lbs/ft: Resisting	Summation of Forces lbs/ft: Driving	Factor of Safety	Vertical Pressure, P, in PSF to Achieve Factor of Safety of 1.3 *
Ⓐ①	33613	26724	1.26	193
Ⓐ②	44113	26724	1.65	—
Ⓑ③	54529	49310	1.11	327
Ⓑ④	63279	49310	1.28	28
Ⓒ⑤	72208	60590	1.19	155
Ⓒ⑥	79808	60590	1.32	—

* Using Unfactor soil parameters

Notes:
1) Sheetpile beneath T wall must penetrate to El -47.0 to satisfy moment equilibrium
2) Maximum moment occurs at El -27 and is 17.2 ft.Kips/ft of wall.
3) Calculated anchor force, F_A, at El -10.5 is 2.1 Kips/ft of wall.
4) The anchor load and T wall pressure must be carried by driven batter piles. Axial capacity of batter piles carrying these lateral loads must be ignored above El -47.0.
5) Seepage analysis by Harr Method indicates a factor of safety of 4.6 which is considered acceptable.
6) "P" is required vertical pressure across top of passive wedges to achieve a calculated factor of safety of 1.3 or more against a stability failure.

T Wall Analysis

Summation of Forces Using Factored Shear Strengths

Failure Surface	ΣR Resisting lbs/ft	ΣD Driving lbs/ft	ΣR-ΣD lbs/ft	Change in Net Force lbs/ft	Equivalent Pressure PSF
X 7	18561	10650	7911	—	—
Y 8	52993	48932	4061	-3850	-130
Z 9	68823	62307	6516	2455	246

Slope Stability and T Wall Analyses
Modified S+WB Pump Station 11 West
US Army Corps of Engineers
East of Harvey Canal
Hurricane Protection Project
Jefferson Parish, La.

Fig.

PUMPING STATION MECHANICAL CALCULATIONS

Calculations - Belle Chasse 2 Pumping Station

1) Priming Horsepower Available

Assumptions: - Future -10.00 pump start up
- 115,000 gpm flowrate to prime tube
- 70% Efficiency at priming

Priming Head

STATIC = EL. -10.00 to + 15.50 (top of pipe) = 25.50

Velocity Head = $V^2/2g = (256/28.27)^2 / 2 \cdot 32.2 = 9.06^2/64.4 = 1.28$

Hf/2 (Halfpipe) = $\dfrac{[80'/100] .2083 \left(\frac{100}{140}\right)^{1.86} \left(\frac{115,000^{1.86}}{72^{4.866}}\right)}{2} = 0.11$

26.88'

Horsepower Req'd at Priming

$$H.P. = \frac{115,000\,(26.88)}{(3960)\,(.70)\,(1)} = 1115.2 \text{ h.p.}$$

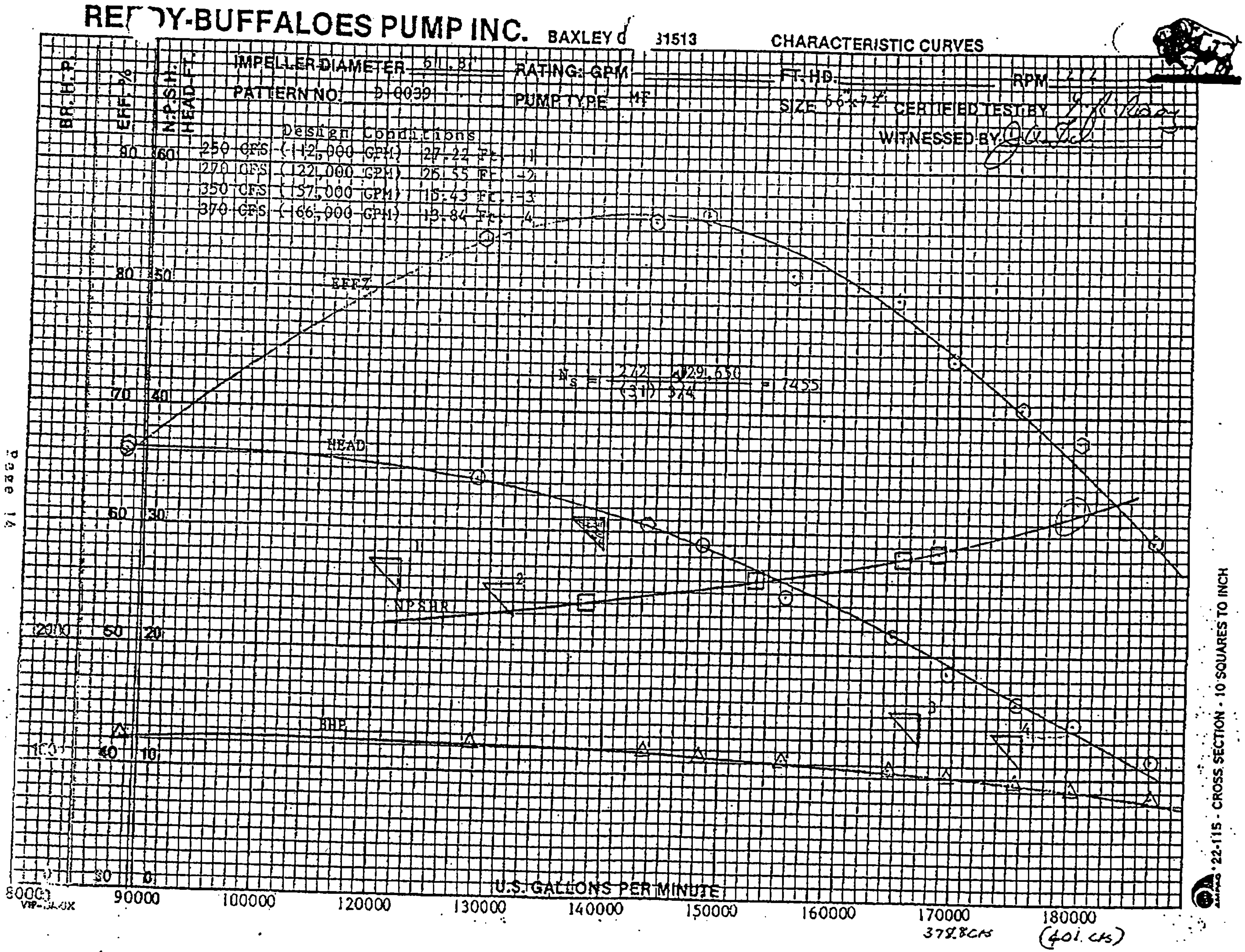
Available priming horsepower = 1280 h.p.

Additional head loss due to extended 72 inch pipe

$$H_f = \left(\frac{36'}{100}\right) .2083 \left(\frac{100}{140}\right)^{1.86} \left(\frac{180,000^{1.86}}{72^{4.866}}\right) = \underline{0.218 \text{ ft.}}$$

Horsepower demand due to additional friction

$$H.P. = \frac{(180000 \text{ gpm})\,(0.218 \text{ ft})}{(3960)\cdot(0.75)\,(1)} = \underline{13.21 \text{ horsepower}}$$



BELLE CHASSE NO. 2 PUMPING STATION
PUMP CURVE

Calculations Planters Pumping Station

Head and Horsepower requirements

1) 72 inch (310 cfs) pumps – station addition

a) Pipe friction – 64 ft. Tube extension

$$\Delta H_f = \frac{64\,ft}{100}(.2083)\left(\frac{100}{140}\right)^{1.86}\left(\frac{[(310)(448.8)]^{1.86}}{84^{4.866}}\right) = \underline{0.114\ ft}$$

b) horse power

$$Hp = \frac{(310)(448.8)(0.114\,ft)}{3960\,(.78)(1)} = \underline{5.13\ h.p.}$$

2) 72 inch (290 cfs) pumps – original station

a) Pipe friction – 64 ft Tube extension

$$\Delta H_f = \frac{64}{100}(.2083)\left(\frac{100}{140}\right)^{1.86}\left(\frac{[(290)(448.8)]^{1.86}}{78^{4.866}}\right) = \underline{0.144\ ft.}$$

b) horse power

$$Hp = \frac{(290)(448.8)(0.144\,ft.)}{3960(.81)(1)} = \underline{5.84\ h.p.}$$

3) 36 inch (50 cfs) vertical pump

a) Pipe friction – 64 ft tube extension

$$\Delta H_f = \frac{64}{100}(.2083)\left(\frac{100}{140}\right)^{1.86}\left(\frac{[(50)(448.8)]^{1.86}}{36^{4.866}}\right) = \underline{0.236\ ft}$$

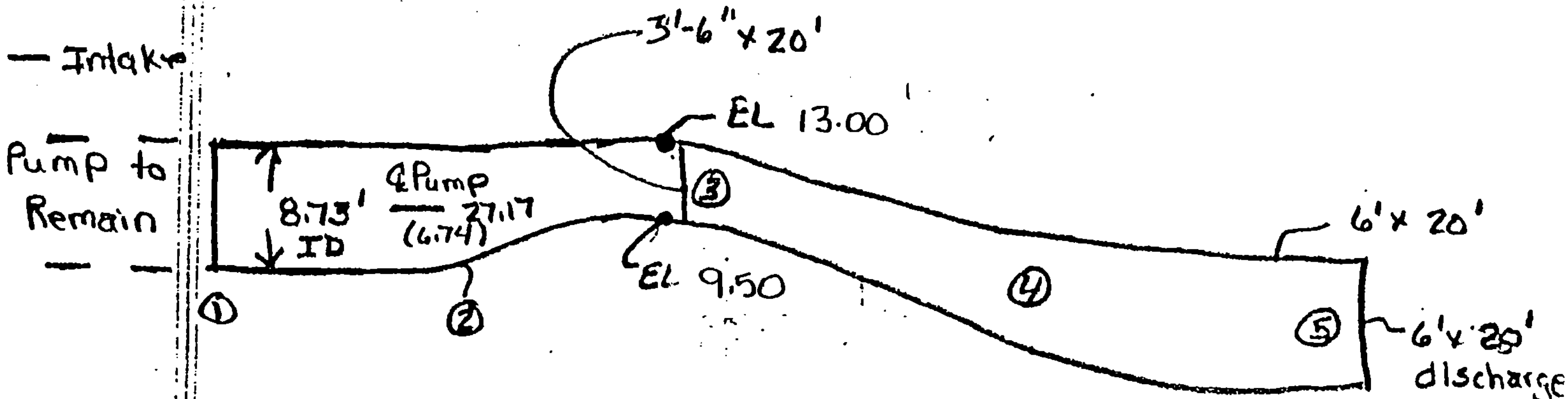
b) horsepower

$$Hp = \frac{(50)(448.8)(0.236')}{3960\,(.75)(1)} = \underline{1.78\ h.p.}$$

New Orleans Sewerage & Water Board STA. #11
Calculations on 100" wood Propeller Pumps

Scope - Replace Steel Conical Discharge tube w/ Flaring Concrete discharge - Determine head loss change and affect on pump operation

Method - Calculate total head loss attributed to the pump by the existing mitered elbow and cone. Calculate the total head losses that would be attributed to the pump when using the flared concrete discharge. By taking the difference in these arrangements we can add these losses to the operating point on the curve and determine flow changes as well as new horsepower deman[d]



1) Upleg of Siphon 105"Ø Discharge to 3.5'x 20'

$h_f = L\left(V/(CR^{2/3})\right)^2$ $R = W \cdot D / W + 2D$

$C = 1.486/n$ $n = 0.012$ $C = 1.486/0.012 = 123.83$

	105"Ø	3.5'x20'	Average
Area	60.13 ft²	70.00	65.07
R	2.188	2.59	2.389
$V_{250\,cfs}$ Q/A	4.16	3.57	3.87
$V_{230\,cfs}$	3.83	3.29	3.56
$V_{210\,cfs}$	3.49	3.00	3.25

use L = length = 45'

$$h_f = \left(\frac{Q/65.07}{(123.83)(2.389)^{2/3}}\right)^2 \cdot 45 \Rightarrow h_f = 2.17\times10^{-7}Q^2$$

2) Down leg of Siphon - 3.5'x 20' to 6'x20'

	3.5'x20'	6'x 20'	Avg.
Area	70.0	120	95.0
R	2.59	3.75	3.17
$V_{250\,cfs}$	3.57	2.083	2.83
$V_{230\,cfs}$	3.29	1.917	2.60
$V_{210\,cfs}$	3.00	1.75	2.38

L = 26'

$$h_f = \left[\frac{(Q/95.)}{(123.83)(3.17)^{2/3}}\right]^2 \cdot 26$$

$$h_f = 4.0\times10^{-8}\,Q^2$$

3) Siphon Crown Elbow

$h_f = 0.25 \sqrt{\Delta/90°} \left(V^2/2g\right)$

where $\Delta = 45°$ & $V = Q/A = (Q/70)$

$h_f = 0.25 \sqrt{45/90} \left((Q/70)^2/2 \cdot 32.2\right)$

$h_f = \underline{5.60 \times 10^{-7} Q^2}$

4. Exit loss $6' \times 20' = 120 \text{ ft}^2$

$h_f = \frac{V^2}{2g} = \frac{(Q/A)^2}{2g} = \frac{(Q/120)^2}{2 \cdot 32.2}$

$= \underline{1.078 \times 10^{-6} Q^2}$

Total losses in new concrete discharge =

$H_f = 2.17 \times 10^{-7} Q^2 + 4.0 \times 10^{-8} Q^2 + 5.6 \times 10^{-7} Q^2 + 1.078 \times 10^{-8} Q^2$

$H_{f\ TOTAL} = \underline{\underline{8.28 \times 10^{-7} Q^2}}$ or 0.052 ft @ 250 cfs

3) Exit Loss

$K = 1.0$ Area $= \pi/4\,(L \times w) = \pi/4 \times 17 \times 12 = 160.22$

$A = 160.22\ ft^2$

$V = Q/A = Q/160.22$

$H_f = 1.0 \left[\dfrac{Q^2/A^2}{2 \cdot 32.2} \right] = 1.0 \left[\dfrac{Q^2/160.22^2}{64.4} \right]$

$H_f = 6.05 \times 10^{-7}\, Q^2$

$H_{f\,TOTAL} = 5.54 \times 10^{-7} Q^2 + 1.16 \times 10^{-6} Q^2 + 6.05 \times 10^{-7} Q^2$
$= \underline{2.319 \times 10^{-6}\, Q^2}$ or 0.145 ft. @ 250cfs

Difference in head losses between new system and existing discharge.

$\Delta H_f = H_f$ proposed $- H_f$ existing
$= 8.28 \times 10^{-7}\, Q^2 - 2.319 \times 10^{-6}\, Q^2$
$= \underline{-1.491 \times 10^{-6}\, Q^2}$

Therefore the discharge system proposed will actually reduce the friction losses in the total pump system. In terms of feet of friction losses which equates to feet of additional pool to pool head available, it is as follows

$\Delta H_{f\,250cfs} = 1.491 \times 10^{-6} (250^2) = 0.093$ ft

Calculations P.S. # 13 Vertical Pumps

1) Estimated Priming Horsepower 72"Ø pumps

STATIC EL - 10.00 to EL. 1.88 (top of pipe) = 22.88

Velocity Head $V^2/2g = \left[\frac{200/28.27}{2 \cdot 32.2}\right]^2$ = 6.78

Frictional Head $\frac{128/100\,[.2083]\left[\frac{100}{140}\right]^{1.86}}{2}\left[\frac{90{,}000^{1.86}}{72^{4.866}}\right]$ = 0.20

Total 23.86

Priming Horse power = $\frac{(23.86)(90{,}000\text{ gpm})}{(3960)(.72)(1)}$ = 753 h.p.

2) Additional head loss due to extended discharge (72")

$H_f = 40/100\,[.2083]\left[100/140\right]^{1.86}\left[\frac{(250 \cdot 448.8)^{1.86}}{(72)^{4.866}}\right] = 0.100 \text{ ft}$

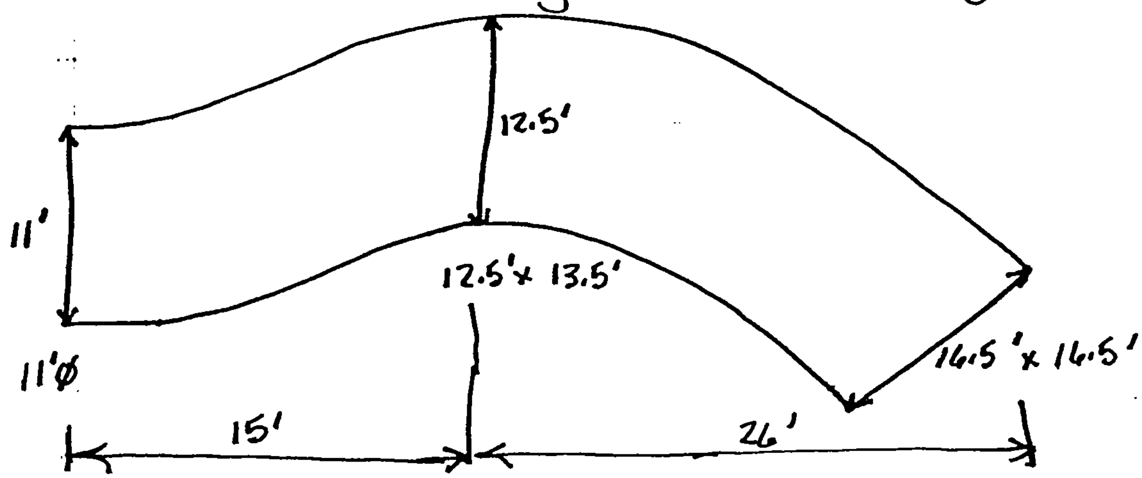
3) Horsepower due to extended pipe (72")

$H.P. = \frac{(0.100)(112{,}200\text{ gpm})}{(3960)(.76)(1)} = 3.76 \text{ H.P.}$

Calculations: Plaquemines Pump STA (NO.1)
132" Worthington Pumps

Scope: Replace Existing Concrete discharge tubes with Flaring Steel Discharge - Determine Differential Head loss between each system

1) Losses in Existing Concrete Discharge



A) Upleg of siphon (132"Ø to 12.5' x 13.5')

$h_f = L(V/CR^{2/3})^2$ $C = 1.484/n$ $n = 0.012$ $C = 123.83$

$R = WD/W+2D$ or $R = r/2$

	132"Ø	12.5' x 13.5'	Avg.
Area	95.03 ft²	168.75	131.89
R		4.27	3.51
V_{900cfs}	9.47 fps	5.33	7.40

Length = 15'

$$h_f = \left(\frac{Q/131.89^2}{(123.83)\ 7.40^{2/3}}\right)^2 \times 15' \qquad h_f = \underline{4.0 \times 10^{-9}\ Q^2}$$

b) Downleg of Siphon 12.5 x 13.5 to 16.5 x 16.5'

	12.5 x 13.5	16.5 x 16.5	Avg
Area	168.75	272.25	220.5
R	4.27	5.50	489
V_{900cfs}	5.33	3.31	4.32

Length = 26'

$$H_f = \left[\frac{(Q/220.5)}{(123.83)(4.32)^{2/3}}\right]^2 \times 26' = \underline{5.0 \times 10^{-9} Q^2}$$

c) Siphon Crown Elbow

$$h_f = 0.25\sqrt{\Delta/90}\; V^2/2g \qquad \text{where } \Delta = 115° \quad V = Q/A = Q/162.5$$

$$h_f = 0.25\sqrt{115/90}\,(Q/162.5)^2/64.4 = \underline{1.66 \times 10^{-7} Q^2}$$

d) Exit Loss

16.5 ft x 16.5 ft = 272.25 ft^2

$$h_f = V^2/2g = (Q/A)^2/2g = (Q/272.25)^2/64.4$$

$$h_f = \underline{2.09 \times 10^{-7} Q^2}$$

Total Friction losses in Existing Concrete Tubes

$$H_f = 4.0 \times 10^{-9} Q^2 + 5.0 \times 10^{-9} Q^2 + 1.66 \times 10^{-7} Q^2 + 2.09 \times 10^{-7} Q^2$$

$$H_{f_{TOTAL}} = \underline{\underline{3.84 \times 10^{-7} Q^2}}$$

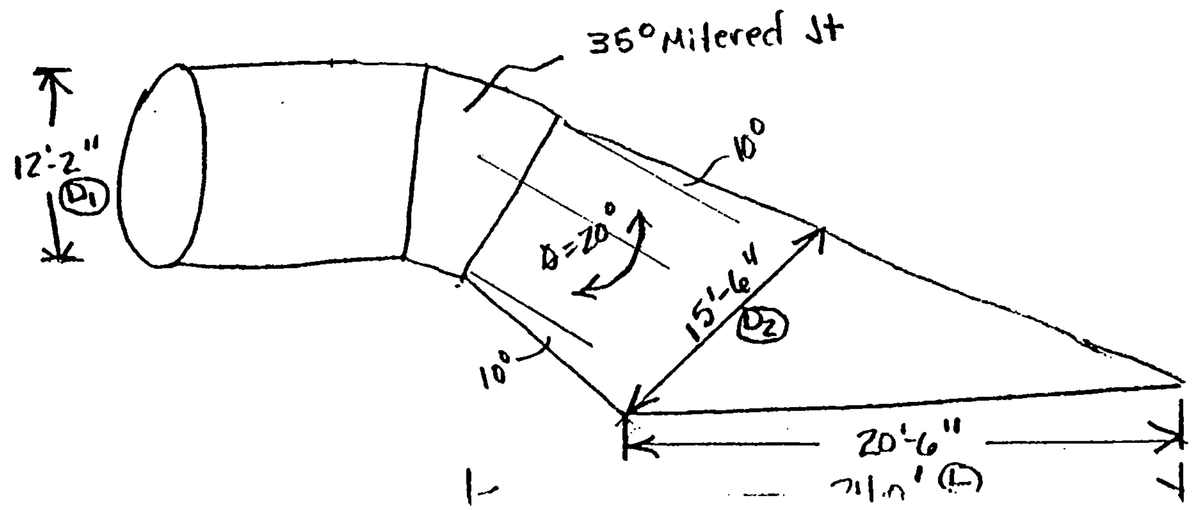
Belle Chase #1

12 Foot Diameter Original Wood Horizontal Pumps

Scope - Replace Steel Conical Discharge Tube with Flared steel Cone including offsets to achieve the minimum 9.50 NGVD Flood Protection

Method - Cakulate the head loss in the existing steel cone to be replaced. Calculate the losses in the replacement discharge arrangement By taking the difference in headlosses for the two arrangements we can determine what additional head is place on the pump. Since the existing engines are already overloaded at higher pool to pool heads, whatever additional head would only decrease this available pool to pool operating envelope.

Existing Cone



1) 35° Mitered Joint use $K = 0.129$

$$H_f = K\frac{V^2}{2g} \qquad V = Q/A$$

$$= (.129)\left(\frac{Q^2/A^2}{2 \cdot 32.2}\right) \Rightarrow A = \frac{12.16^2\pi}{4} = 116.26 \text{ ft}^2$$

$$= (.129)\left(\frac{Q^2/116.26^2}{64.4}\right)$$

$$= \underline{1.48 \times 10^{-7}\ Q^2}$$

2) Loss thru Cone

$$H_f = K\left[1-\left(\frac{D_1}{D_2}\right)^2\right]^2 \frac{V^2}{2g}$$

$A = 116.26$

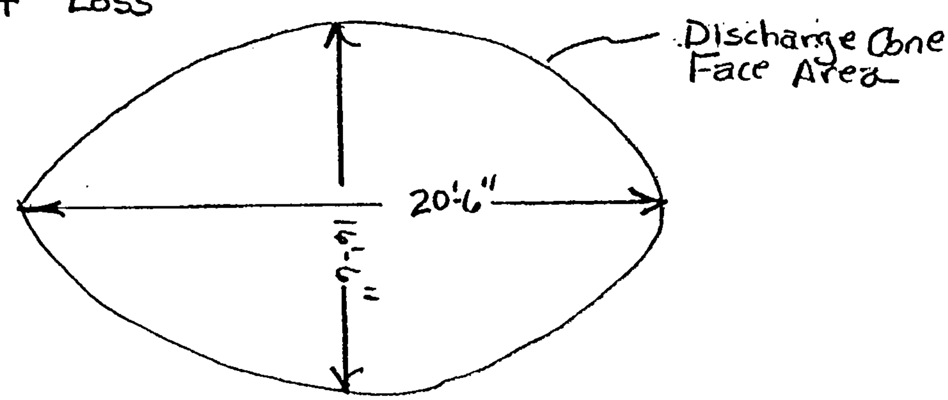
From HI III B-6

$K = 0.50$

$$H_f = 0.50\left[1-\left(\frac{12.17}{15.50}\right)^2\right]^2 \frac{Q^2/116.26^2}{64.4}$$

$$H_f = \underline{8.4 \times 10^{-8}\ Q^2}$$

3) Exit Loss



$$\text{Area} = \pi/4\ (L \times W) = (\pi/4)(20.5 \times 16.5) = 265.66 \text{ ft}^2$$

$$H_f = K\frac{V^2}{2g} \quad \text{where } K = 1.0 \text{ and } V = Q/A$$

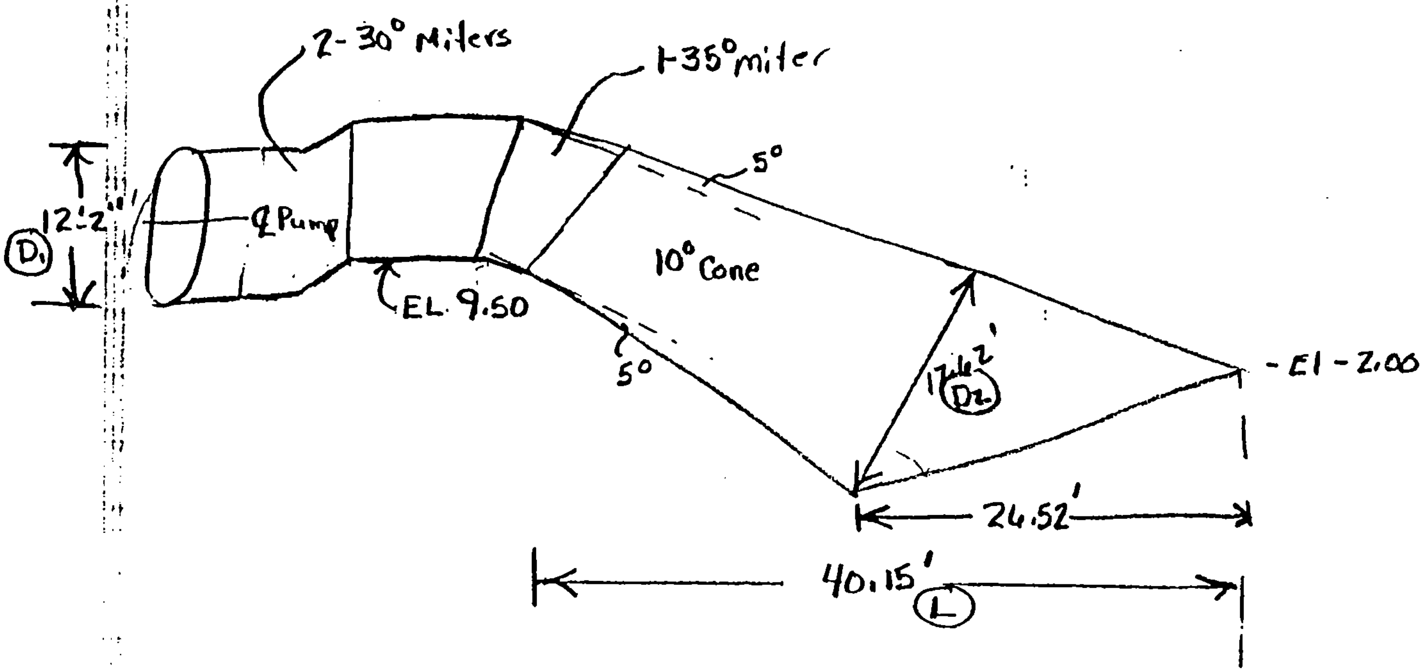
$$= (1.0)\left(\frac{Q^2/A^2}{2g}\right) = 1.0\left(\frac{Q^2/265.66^2}{64.4}\right)$$

$$= \underline{2.20 \times 10^{-7}\ Q^2}$$

$$H_{f\ TOTAL} = 1.48 \times 10^{-7} Q^2 + 8.4 \times 10^{-8} Q^2 + 2.20 \times 10^{-7} Q^2$$

$$= \underline{4.52 \times 10^{-7}\ Q^2}$$

Replacement Discharge Cone



1) Mitered losses   146" I.D. Pipe

a) 2 - 30° 3 piece miters $K = 0.112$

b) 1 - 35° 1 piece miter $K = 0.129$

Total Mitered losses $= K \frac{V^2}{2g}$ $K = (2)(0.112) + (1)(0.129)$

$V = Q/A$ $K = 0.353$

$A = \pi (12.17^2/4) =$

$$H_f = 0.353 \frac{Q^2/A^2}{64.4} = 0.353 \frac{Q^2/114.26^2}{64.4} =$$

$$H_f = \underline{4.06 \times 10^{-7} Q^2}$$

2) Straight Pipe 12'-2" Ø × 20' Long)

$V = Q/A$ $\quad \varepsilon = .00002$ $\quad A = \pi \frac{12.17^2}{4} = 116.26$ $\quad \varepsilon/D = .0000016$

$N_{RE} = \frac{VD}{\nu}$ where $V = 6.88$ ft/se $\quad D = 12.17$ $\quad \nu = .00001217$

$N_{RE} = (6.88)(12.17)/.00001217 = 6.88 \times 10^6$

From Fig III A-3 $f = 0.0096$

$H_f = f(L/D)(V^2/2g)$ where $V = Q/A$

$= (0.0096)(20/12.17)\ Q^2/116.26^2/64.4$

$= \underline{1.80 \times 10^{-8} Q^2}$

3) Cone

$h_f = k\left(1 - (D_1/D_2)^2\right)^2 V^2/2g$

$\Rightarrow K = 0.30 \qquad A = 116.26$

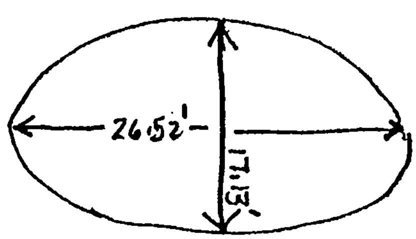
$h_f = 0.30\left(1 - (12.17/17.62)^2\right)^2 \frac{Q^2/116.26^2}{64.4}$

$= \underline{9.40 \times 10^{-8} Q^2}$

4) Exit Loss

Area $= \frac{\pi}{4}(L \times w) = \frac{\pi}{4}(26.52 \times 17.13)$

$A = 356.73$



$H_f = K(V^2/2g)$ where $K = 1.0$ and $V = Q/A$

$= 1.0\left(\frac{Q^2/356.73^2}{2 \cdot 32.2}\right)$

$\underline{H_f = 1.22 \times 10^{-7} Q^2}$

Total Losses in 12 ft Wood Pump Replacement Discharge

$$H_{f\ TOTAL} = 4.06 \times 10^{-7} Q^2 + 1.80 \times 10^{-8} Q^2 + 9.40 \times 10^{-8} Q^2 + 1.22 \times 10^{-7} Q^2$$

$$= \underline{\underline{6.40 \times 10^{-7} Q^2}}$$

Therefore the difference in head losses between the two systems are:

$$\Delta H_{f\ total} = H_{f\ proposed} - H_{f\ existing}$$

$$= 6.40 \times 10^{-7} Q^2 - 4.52 \times 10^{-7} Q^2$$

$$= \underline{\underline{1.88 \times 10^{-7} Q^2}}$$

Therefore at its nom al flow rate of 800 cfs

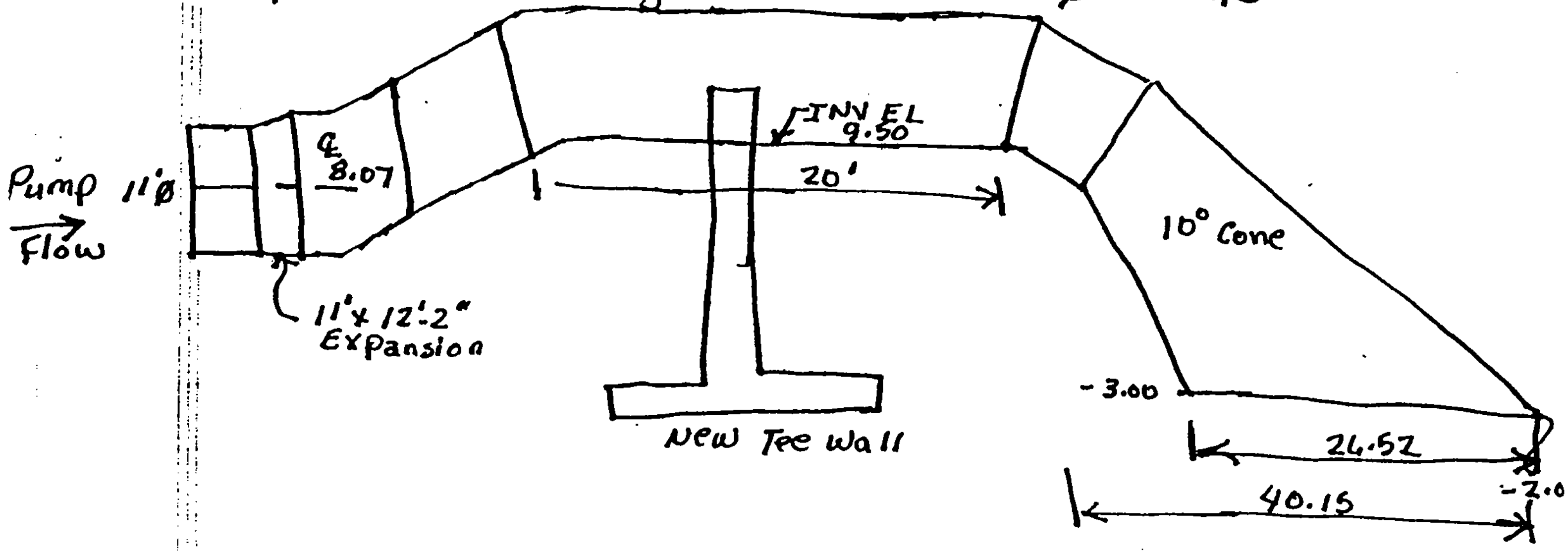
$$H_{f\ additional} = 1.88 \times 10^{-7} (800)^2 = 0.120 \text{ ft.}$$

Additional Horse power due to additional friction loss

$$H.P. = \frac{(800)(448.8)(0.12)}{(3960)(.68)} = 16.0 \text{ h.p.}$$

Plaquemines Pump Station (NO. 1)

2) Replacement Discharge Cone - 132"Ø Pumps



A) Expansion 132"Ø to 146"Ø

$A_{132"} = 95.03\ ft^2 \qquad A_{146"} = 116.26\ ft^2$

$$H_f = \frac{(V_1 - V_2)^2}{2g} = \frac{(Q/A_1 - Q/A_2)^2}{2g} = Q^2\left(\frac{1}{A_1} - \frac{1}{A_2}\right)^2$$

$$H_f = \frac{Q^2\left(1/95.03 - 1/116.26\right)^2}{2 \cdot 32.2} = \underline{5.7 \times 10^{-8}\ Q^2}$$

B) Mitered Losses 146"Ø Pipe

a) 2 - 36° 3 piece Miters $K = 0.112$

b) 1 - 35° 1 piece Miter $K = 0.129$

Total Mitered losses $= K\,V^2/2g \Rightarrow K = (2)(0.112) + (1)(0.129) = 0.353$

$$H_f = 0.353\ \frac{Q^2/A^2}{64.4} = 0.353\ \frac{Q^2/116.26^2}{64.4}$$

$$H_f = \underline{4.06 \times 10^{-7}\ Q^2}$$

c) Straight Pipe 146" ø × 20' long

$V = Q/A$ $\varepsilon = 0.0002$ $A = \frac{\pi (12.17)^2}{4} = 116.26$ ε/D .000016

$N_{RE} = VD/\nu$ where $V = 6.88$ fps $D = 12.17$ $\nu = .00001217$

$N_{RE} = (6.88)(12.17)/(.00001217) = 6.88 \times 10^6$

From H.I. Fig III A-3 $f = 0.0096$

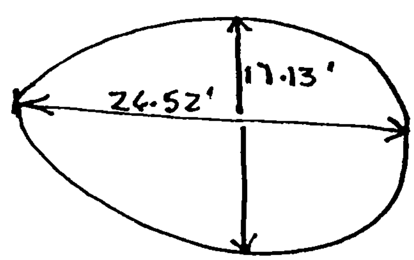
$$H_f = f(L/D)(V^2/2g) \quad \text{where } V = Q/A$$
$$= (0.0096)(20/12.17)(Q^2/116.26^2)/64.4$$
$$= \underline{1.80 \times 10^{-8} Q^2}$$

d) Cone

$$h_f = K(1-(D_1/D_2)^2)^2 V^2/2g$$
$K = 0.30$ $A = 116.26$
$$h_f = 0.30\,(1-(12.17/17.62)^2)^2 \left(\frac{Q^2/116.26^2}{64.4}\right)$$
$$h_f = \underline{9.40 \times 10^{-8} Q^2}$$

e) Exit Loss - Cone

Area $= \pi/4 (L \times W) = \frac{\pi}{4}(26.52 \times 17.13)$
$= 356.73 \text{ ft}^2$



$$H_f = K(V^2/2g) \quad K = 1.0 \quad V = Q/A$$
$$= 1.0(Q^2/A^2/64.4) = \frac{Q^2/356.73^2}{64.4}$$
$$= \underline{1.22 \times 10^{-7} Q^2}$$

Total Losses $= 5.7 \times 10^{-8} Q^2 + 4.06 \times 10^{-7} Q^2 + 1.80 \times 10^{-8} Q^2 + 9.4 \times 10^{-8} Q^2 + 1.22 \times 10^{-7} Q^2$

$$= \underline{\underline{6.97 \times 10^{-7} Q^2}}$$

Therefore the difference in head losses between the proposed discharge tube and that of the existing is as follows

$$\Delta H_f = H_{f\ proposed} - H_{f\ Existing}$$

$$= 6.97 \times 10^{-7} Q^2 - 3.84 \times 10^{-7} Q^2$$

$$= 3.13 \times 10^{-7} Q^2$$

At the nominal flow rate of 900 cfs, the additional head seen by the pump is:

$$H_{f\,900} = 3.13 \times 10^{-7} (900)^2 = 0.253 \text{ ft.}$$

Additional Horsepower Required

$$H.P. = \frac{(900 \text{ cfs})(448.8)(0.253 \text{ ft})}{(3960)(0.68)} = 37.95 \text{ H.P.}$$

*** FROM DECEMBER 1983 REPORT PREPARED BY
PRESCOTT FOLLET & ASSOCIATES CONCERNING
PLAQUEMINES PUMPING STATION

SECTION IV

PUMPING EQUIPMENT MODIFICATIONS AND OPERATION

The purpose of this Phase I Report is to provide methods of rehabilitating the existing pumping equipment and to propose additional pump priming capacity to accelerate the start up procedure. These proposals will enhance the overall drainage resulting in quicker response during pump priming, enhance the flow rate of the oldest pumping equipment such that full rated capacity can be obtained at all operating water levels, and return the old equipment to new condition thereby extending their productive life by perhaps another 10 to 15 years. Consideration is also being given to adding pump capacity to the plant in an effort to compensate for increased runoff. Twenty years have passed since the newest pumps were installed, normal development, land subsidence, lowering of water tables, all contribute to usual gradual increase in station capacity demands. It should be noted that we have considered replacement of the two 1953 diesel engines with new engines of the same horsepower but the initial cost would be excessive (approximately $900,000) and we believe that the existing engines can be rebuilt to give at least 10 to 15 years additional service.

We have obtained copies of the original "Horsepower Performance Test" for the Baldwin-Hamilton engines and these tests define the original engine horsepower for both engines. During these "tests" the engine demand for these original pumping conditions were established and the throttle control blocked at a point ten percent (10%) above the required horsepower. This information was given by Mr. Rentschler of Baldwin-Hamilton. See letter dated August 3, 1983 (Appendix). The purpose of this setting was to guarantee against engine overload if for some reason the pump propeller was jammed by debris.

These engines, in the proposed rehabilitation process, will have their speed-horsepower control recalibrated to meet the present operating conditions.

During a heavy rainstorm this spring the oldest equipment was placed into operation and after several hours of pumping at full capacity the engine speed deteriorated. Flow capacity was reduced by approximately thirty-five (35%) percent by this speed reduction. It is the general opinion of Mr. Rentschler, and this office, that this speed change was caused by the need for engine overhaul and the locked in throttle setting. After engine work is completed and the required adjustments made we can expect design pump speed during operation at normal hydraulic head conditions.

We have directed most of our study toward the oldest pumps and engines since their need for performance improvement is the most apparent. We plan also to recommend that all existing engines and pumps be inspected for damage or wear which may reduce their capacity. This will require that pump inspection ports be opened and pump propellers, diffusers, along with other internals subject to wear or damage be thoroughly checked. These individual pieces should be compared to the manufacturer's drawings or operational manuals to insure conformity.

The newest four diesel engines will also be inspected along with tabulating their approximate hours of operation. This information will then be studied to establish a predictable preventative maintenance program or rehabilitate the equipment if this need is indicated.

Since this pumping station is the total and only means of providing drainage for the Belle Chasse area it is the recommendation of this report that all equipment be returned to top efficiency condition. Only with the plant in first class operating condition can adequate and reliable drainage be provided for the drainage district.

Operational requirements have resulted in increases in the power demand for pumping with the original 144 inch drainage pumps. These changes, which have taken place in steps since the early years of this station's operation have steadily increased the differential pressure against which the engines must perform. This fact is the primary reason for the need to rehabilitate the equipment and increase the power capabilities of the existing diesel engines.

The original pumping station drawings indicate suction basin design high water elevation as EL - 4.0 Ft. and low water elevation as EL - 6.0

Ft. the outfall basin water elevation is indicated as EL +4.0 Ft.

The National Geodetic departments charged with maintaining vertical datum control have adjusted the reference bench marks in this entire area in recent years. We have not yet run a level loop to the Plaquemines Pumping Station but we estimate this elevation correction as 1.3 Ft. downward. As listed in an earlier section the original design water levels when corrected are:

Suction Basin High Water Level................EL -5.3 Ft.
Suction Basin Low Water Level.................EL -7.3 Ft.
Discharge Basin High Water Level.............EL +2.7 Ft.
Pool to Pool Pumping Head........................8.0 Ft.
Present Suction Basin Low Water ....EL -8.0 Ft.
Present Suction Basin High Water.............EL -6.0 Ft.*
Discharge Basin "Hurricane Tide" Water........EL +6.0 Ft.*
Pool to Pool at Extreme Conditions..............12.0 Ft.
*Hurricane Conditions

The water levels listed in Mr. Olano's April 18, 1983 (See Appendix) letter are assumed to be recorded in accordance with the new corrected elevations. We feel that his datum for water levels is relatively up to date because the drainage system has several automatic recording water level gages and these must have been corrected recently. We will work with corrected current water levels as:

Suction Basin High Water (Pumps Put Into Operation).........EL - 8.0 Ft.

Suction Basin Low Water (Pumps Shutdown)....................EL - 9.0 Ft.

Initially these pumps were operating with a total pool to pool differential of 8.0 Ft. (-5.3 Ft. to +2.7 Ft.) and a maximum of 10.0 Ft. (-7.3 Ft. to +2.7 Ft.) Presently they should be operating under normal drainage situations with a total pool to pool differential of 10.7 Ft. (-8.0 Ft. to +2.7 Ft.) and a maximum differential under normal drainage of 11.7 Ft. (-9.0 Ft. to +2.7 Ft.). This differential head increase is expanded by the possibility of "Hurricane Tide" discharge basin level. In the event of a Hurricane Tide the outfall elevation is predicted to reach EL. +6.0 Ft. Under these conditions the suction basin water level would be higher than the normal -8.0 Ft. elevation possibly -6.0. Even with minimal "overbank storage" the pool to pool pumping head would equal or exceed 10.0 Ft.

Under the normal drainage conditions the additional pool to pool differential of 1.7 Ft. (say two feet) represents twenty-five percent of the original pool to pool. The expected differential under hurricane conditions could increase the power demand further. From a horsepower demand viewpoint this is an increase equal to the existing available reserve power.

Presently these pumps "should be" operating at these higher heads; because of other considerations the station operators have devised the methods mentioned in the previous sections to circumvent this higher demand on the equipment. On those occasions when flooding rains required the use of all equipment the pump's diesel engine drives were unable to maintain full pump speed. When these engines are rehabilitated and produce the necessary horsepower under these circumstances the pumps will be capable of producing design pumping capacity at all regular operating conditions.

The following tabulation of pump capacity; pool to pool water levels, and required horsepower was taken from pump curves for 12 Ft. Wood Screw Pump -61.56" pitch at 97 R.P.M. (Engine Speed 625 R.P.M.):

Pool To Pool	C.F.S.	G.P.M.	H.P.
8.0 Ft.	820	368,000	1100
10.0 Ft.	780	350,100	1280
10.7 Ft.	760	341,100	1340
11.7 Ft.	750	336,600	1420

The "Engine Manual" and "Rating Curves for Baldwin Series 600 Engines" lists various rated horsepower for these engines. This information was used to predict the future usefulness of these pump drives. Horsepower ratings are generally a function of the engine design features, permissible B.M.E.P. levels, combined with the manufacturer's desire for a long life product. The Baldwin engine curves at 140 B.M.E.P. lists 1315 as its maximum horsepower rating. The engine manual lists 1200 H.P. under the heading "H.P. for traction". Since these engines were originally used in diesel locomotive applications this traction H.P. is 10% derating of the 140 B.M.E.P. rating. The derating is a conservative approach because of the long operational hours at high horsepower demand that locomotive service requires.

We propose to have the engine throttle and governor reset to provide for 10% increase in horsepower above the 1315 listed. Increasing these settings will provide adequate power at all pumping situations including the highest hydraulic head condition and still will be, we feel, within the engines capabilities.

This increase of 10% would mean that the engine rated B.M.E.P. is increase from 140 which is listed to 154 B.M.E.P. Since drainage pumping equipment seldom is called upon to operate at maximum horsepower for extended time periods we are not concerned that using the higher rated B.H.P. (Brake Horsepower) will accelerate engine wear. After the engines have been totally rehabilitated we feel that this ten percent overload caused from pumping at 11.7 Ft. pool to pool could be handled without equipment damage.

B.M.E.P. which stands for Brake Mean Effective Pressure is a measure of performance of a diesel engine. It is a difficult term to appreciate since it has only a theoretical existence. It is stated as being the average (or mean) effective pressure inside the cylinder during the power stroke which would produce power equal to the engine horsepower. This average pressure times the piston area will develop the force necessary to produce power. The higher the B.M.E.P. the higher the demands on the engine components and the lower the B.M.E.P. the lower the demands on the engines. Naturally the engine power pressures are higher at the top of the stroke and lower at the end giving an average pressure to produce the required power.

The engine application at this station does not require that this equipment run at the Higher B.M.E.P. situation on a regular basis. Only when the suction level reaches elevation -9.0 and the discharge basin level at elevation +2.7 or under hurricane tide and high water suction levels will the power demand be a maximum. In short it is our opinion that these engines can safely be expected to perform satisfactorily at all of the water level situations mentioned in this report.

The engine rehabilitation contemplated for this application is extensive but can be accomplished at the site. In order for these two engines to be rebuilt to "as new" capabilities all of the areas where age or normal wear could be expected to reduce the horsepower must be replaced. Since they are presently in running condition without evidence of misalignment or broken components we feel that the exchange of existing major components for factory rebuilt components is the most economical method to propose. The general listing illustrate the extent of these replacement parts.

a. Replace cylinder heads with factory exchange rebuilt units.

b. Replace with new all cylinder liners.

c. Inspect crankshaft for wear; if necessary regrind all journal areas.

d. Install all new main bearings.

e. Install new bearings on all engine drive train components. (Camshaft, camshaft drive, water pump drive, etc.)

f. Replace turbocharger assembly with factory reconditioned unit.

g. Replace all six fuel injectors with factory reconditioned units.

h. Replace engine governor with factory reconditioned unit.

i. Replace water pump with factory reconditioned unit.

j. Replace lubricating oil pump with new unit.

k. Replace fuel oil transfer pump, recondition strainer and fuel filters. Inspect entire fuel transfer system for leaks or obstructions.

l. Inspect and recondition engine starting system.

After the engines are disassembled some additional areas of repair may come to light. Since the direction of this program is to return these engines to "new" condition we are recommending complete rebuilding to factory tolerances instead of repairing the obvious damage only. When complete they are expected to develop their design B.H.P. and with the modifications mentioned to accept the ten percent extra occasional demand.

When the engines begin developing their rated horsepower on a regular basis the rejected heat from the jacket water system must be transferred thru the heat exchanges to waste. The existing atmospheric (open) heat exchangers presently in use have been trouble free to this time but an increase in horsepower demand must be accompanied by some increase in heat transfer capacity. This can be accomplished by adding water flow thru the basin. The mechanics of these alterations should not be extremely costly and will be detailed when final planning is accomplished.

The attached bar graph illustrates the estimated time scheduling which will be necessary to accomplish the rehabilitation with a minimum of equipment "out of service" at one time. The "inspection" which can be done without disassembly is shown separately from the more involved "condition survey". Inspection of the original pumping station engines will be completed first. As the necessary rehabilitation is being done and the involved equipment "out of service" these speed reduction drives and horizontal pumps will be completely surveyed. All information from this survey will be studied and recommendations made for whatever corrective measures appear to be required.

All rehabilitation work on the original station equipment will be complete before the newer units are scheduled for any inspection or survey of condition.

The cost of this engine, cooling system and related rehabilitation are estimated (for budget purposes) to be approximately $150,000.00 for each unit. It is our opinion from conversations with persons who are knowledgeable about these pumps and engines that this rehabilitation will return the equipment to its original capabilities.

The work outlined in this report for the original pumping station equipment and through inspection of the newer equipment units will serve to expand the pumping station ability from its present strained capacity to its original 3800 C.F.S.

Sections II and III of this report outline the hydraulic operation of this drainage district and give an insight into its history and design. These sections are perhaps a tribute to the Operations Department who manipulate the water levels to avoid flooding during heavy rains. The manipulation of water levels enhances the pumping capacity, it does not however replace capacity. It is our opinion that the existing pumps could be more quickly brought into operation if additional vacuum pump capacity were added to the present system.

The existing vacuum pump system consists of two Nash liquid seal pumps driven by diesel engines for servicing all four horizontal drainage pumps. The vacuum priming piping is interconnected by a manifold at the pumps which makes it possible to use both vacuum pumps for priming each drainage pump. This is the most efficient use of the existing equipment but the drainage pumps can only be put into service by a series start-up; one after the other. The priming time for all four pumps under these conditions is very long and can be a burden to the system if rapid runoff is the initial situation.

It is our recommendation that two new vacuum pumps be added to serve primarily the 1963 addition pumps. The existing priming equipment would remain where it is to serve the renovated system. The new and existing piping would, of course, be interconnected to guarantee continuity in case of equipment failure. These two new vacuum priming pumps with their related piping and accessories would cost approximately $60,000.00 for each installation. (Total Cost $120,000.)

We feel that these two new Vacuum Priming pumps would prove to be a most valuable addition to the overall pumping station operation. It does not add to the existing drainage pump capacity but it provides the means whereby the existing pumps can be brought into service quickly when the need is imminent.

The attached "Time Schedule" bar graph for the recommended work illustrates the estimated time required for each phase of the project. The fact that several phases of this renovation are being accomplished at one time is apparent from this type graph. Each individual project has a time period for "Inspection", "Design", "Specifications", and "Bidding". These separated divisions of each project make it possible to monitor the work as it progresses which with renovation is very important.

The Phase II section of the Report to be submitted subsequent to this Phase I Report will deal with what further improvements might be recommended at the Plaquemines Pumping Station. Some of these considerations would include long term pumping requirements with additional pumping capacity, repowering the existing pumps for the higher pool to pool heads, methods to improve trash screen cleaning procedures and other general recommendations for the "long term".

The Phase I recommendations should be thought of as "short term" (less than 20 years) improvements to maximize the pumping capability of the existing Plaquemines Pumping Station until the end of the 20th century.

SECTION V

CONCLUSIONS

As a result of our study of the existing condition of the pumping equipment in the original (1953) portion of the Plaquemines Pumping Station we have reached the following conclusion:

1.) Main diesel engine in the 1953 portion of the station are no longer adequate for developing full capacity of the two 144" diameter horizontal pumps.

2.) Priming time for all four (4) horizontal pumps can be shortened by installing two (2) additional priming pumps which will improve the pumping capability of the station.

3.) There is a reliable source of new or reconditioned parts for the engines driving the 144" diameter horizontal pumps (1953).

4.) There are a sufficient number of machine shops in the general area who could make the necessary replacements at the site.

5.) Replacement of the major engine components of the 1953 engines is preferable to random repair of parts that are obviously worn out on these engines.

6.) Replacement of 1953 diesel engines with new engines of equivalent horsepower is not cost effective at this time.

7.) At some future date replacement of the 1953 engines with higher horsepower with matching reduction gears may be warranted due to higher pool to pool requirements resulting from lowering of suction side water levels.

8.) Rebuilding the existing engines for the 1953 horizontal pumps should extend the life of these engines by 10 to 15 years at which time they probably should be totally replaced as outlined in conclusion No.7.

9.) Lowering suction bells on 1953 horizontal pumps would not be cost effective at this time. When the 1953 engines are replaced with new larger engines, lowering the bells would be required and cost effective.

10.) Additional pumping capacity of at least 500 c.f.s. would be desirable at this time however the Phase II Report will define more clearly the need for additional capacity at the Plaquemines Pumping Station.

11.) At present the 1963 pumping equipment appears to be functioning properly however a complete inspection of this equipment could reveal areas needing preventative maintenance.

12.) The water cooling system for the 1953 engines may be insufficient after the engines are rebuilt and operated at higher speeds.

SECTION VI

RECOMMENDATIONS AND COST ESTIMATE

Based on the conclusions outlined in Section V the following recommendations can be made:

1.) Inspect all existing mechanical equipment in the entire station as outlined below:

INSPECTION OF EXISTING EQUIPMENT

a. Inspect Original Station Diesel Engines for repair requirements.

b. Condition Survey of Vacuum Priming Equipment and System.

c. Condition Survey of Original Station Drainage Pumps.

d. Condition Survey of Original Station Speed Reduction Gear Drives.

e. Condition Survey of Original Station Pump Suction and Discharge Piping.

f. Condition Survey of Suction Basin Trash Screens.

g. Condition Survey of Emergency Generator and Electrical system.

h. Condition Survey of Newer Station Addition Diesel Engines.

i. Condition Survey of Newer Station Addition Drainage Pumps.

j. Condition Survey of Newer Station Addition Speed Reduction Gear Drives.

2.) Rebuild, at the site, the two (2) main diesel engines that drive the 1953 - 144" horizontal pumps.

3.) Rebuild or repair any other equipment components including trash screens that may need replacement or adjustment.

4.) Modify and expand station engine cooling system.

5.) Install two (2) vacuum pumps and piping system for 1963 portion of the station. Existing vacuum pumps would be interconnected with new vacuum pumps but would be basically dedicated to 1953 pumps.

CONSTRUCTION COST ESTIMATE

	Item	Cost
1.	Rebuild Original Station Diesel Engines	$ 300,000.00
*	New Engines (Not Recommended)	($ 900,000.00)
2.	Modify Original Station Engine Cooling System	$ 40,000.00
3.	Purchase and Install Two New Vacuum Pumps and Associated Piping System	$ 120,000.00
4.	Inspection and Condition Survey by Equipment Representative or equivalent	$ 20,000.00
5.	Engineering Inspection, Design and Specification	$ 60,000.00
ESTIMATED TOTAL COST FOR REHABILITATION		$ 540,000.00

The Time Schedule in Section IV shows graphically the time estimated for each separate division of the work from "Inspection" thru "Test". The final five months are devoted to a condition survey of the 1960 addition equipment. It is apparent from this schedule that eighteen months will be required for the project. This is a minimum time estimate and is dependent upon each phase moving in a positive direction quickly and as predicted. The time schedule therefore is an optimistic approach to upgrading the pumping station. The schedule does not list all inspection work to be included, only those areas we feel must be renovated are shown.

The Pumping Station is the only means of providing drainage for the Belle Chasse area. The work proposed will return the pumping equipment to its original capacity of 3800 C.F.S. Unless additional pumping capacity is added to the system we will only have that which existed in 1963. Phase II of this report will address the problem of run-off increases, future development, and related necessary drainage system improvements.

NAME PLATE DATA FOR PUMPING STATION EQUIPMENT

Horizontal Propeller Pump No. 1
Order No. RR-335 (Installed 1955) Unit No. 1
Capacity 800 CFS   Static Head 8 Ft.   RPM - 97
Built By:
    Hardie-Tynes Manufacturing Company
    Birmingham, Alabama

Westinghouse Horizontal Pedestal Gear for Pump No. 1
Serial No. 112214
Ratio 6.429:1.0   Size 50   Type LMR
Style PH-13629-1   Service Factor 1.25
Pinion Speed .625 RPM
Catalog Rating H.P. 1500
Service Rating H.P. 1200

Diesel Engine No. 1
Model 606A   Rated BHP 1200   625 RPM
Serial No. 7031   12-3/4" Bore X 15½" stroke
Build 7th Month 1952
Baldwin Lima Hamilton Corporation
Philadelphia, Pennsylvania

Horizontal Propeller Pump No. 2
Order No. RR-335 (Installed 1955) Unit No. 2
Capacity 800 CFS   Static Head 8 Ft.   RPM - 97
Built By:
    Hardie-Tynes Manufacturing Company
    Birmingham, Alabama

Westinghouse Horizontal Pedestal Gear for Pump No. 2
Serial No. 112215
Ratio 6.429:1.0   Size 50   Type LMR
Style PH-13629-1   Service Factor 1.25
Pinion Speed .625 RPM
Catalog Rating H.P. 1500
Service Rating H.P. 1200

Diesel Engine No. 2
Model 606A   Rated BHP 1200   625 RPM
Serial No. 7032   12-3/4" Bore X 15½" stroke
Built 7th Month 1952
Baldwin Lima Hamilton Corporation
Philadelphia, Pennsylvania

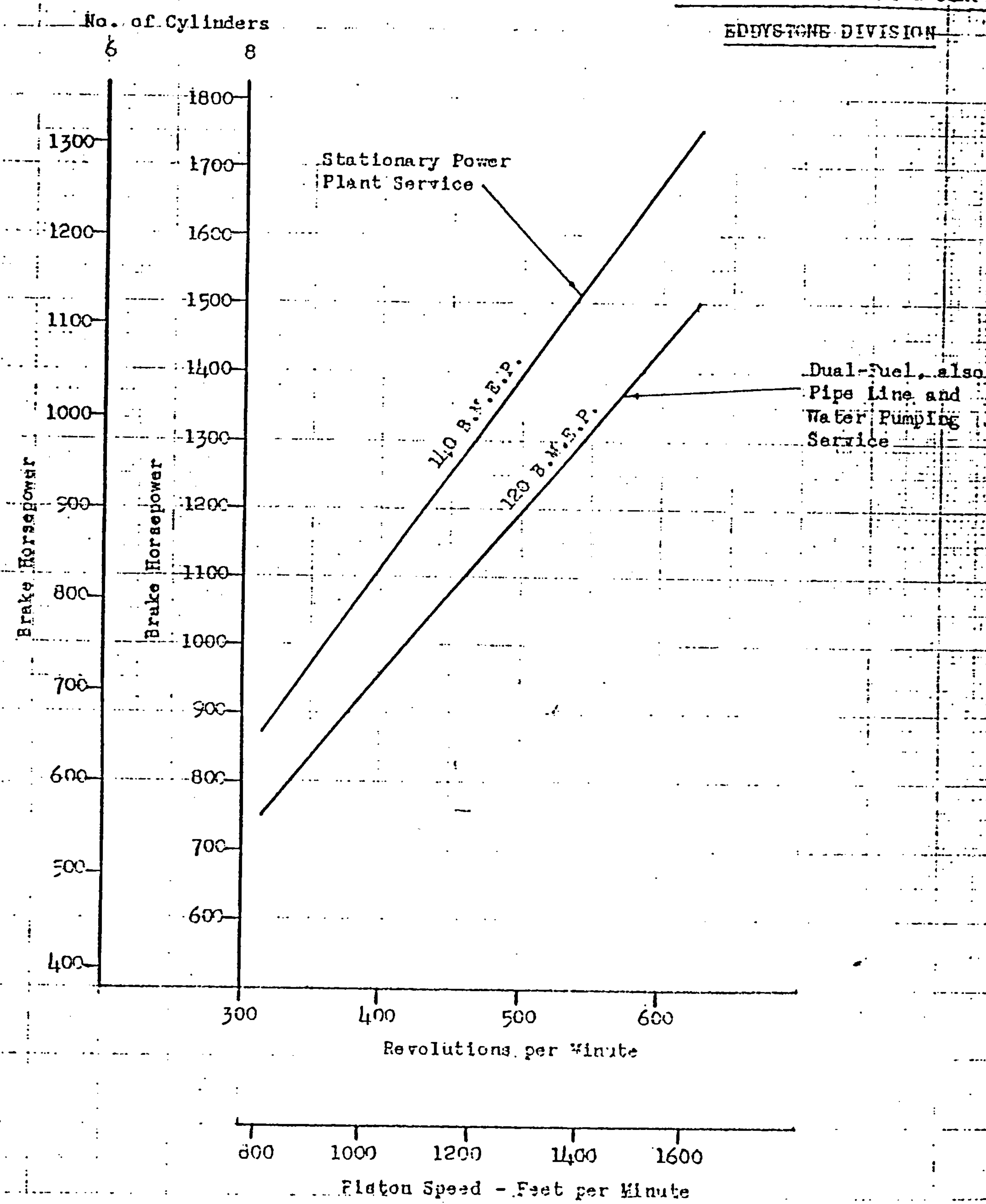
Vertical Pump - Pump No. 3
Fairbanks Morse Pump Company
Contract No. - DA-16-047-ENG-1774
Serial No. 794401 Built 7th Month 1953
Size 54 6310 Pump
150 CFS at 8 Ft. Hd. 248 RPM
Pomona Works - Pomona, California

Right Angle Gear For Pump No. 3
Universal Gear Corporation
Model PRV-25 Ratio 2.9:1
Serial No. 42113-1

Diesel Engine No. 3
Fairbanks Morse Engine Company
Model 31A6¼
H.P. = 240 RPM - 720
Serial No. 960807

BALDWIN-LIMA-HAMILTON CORP.

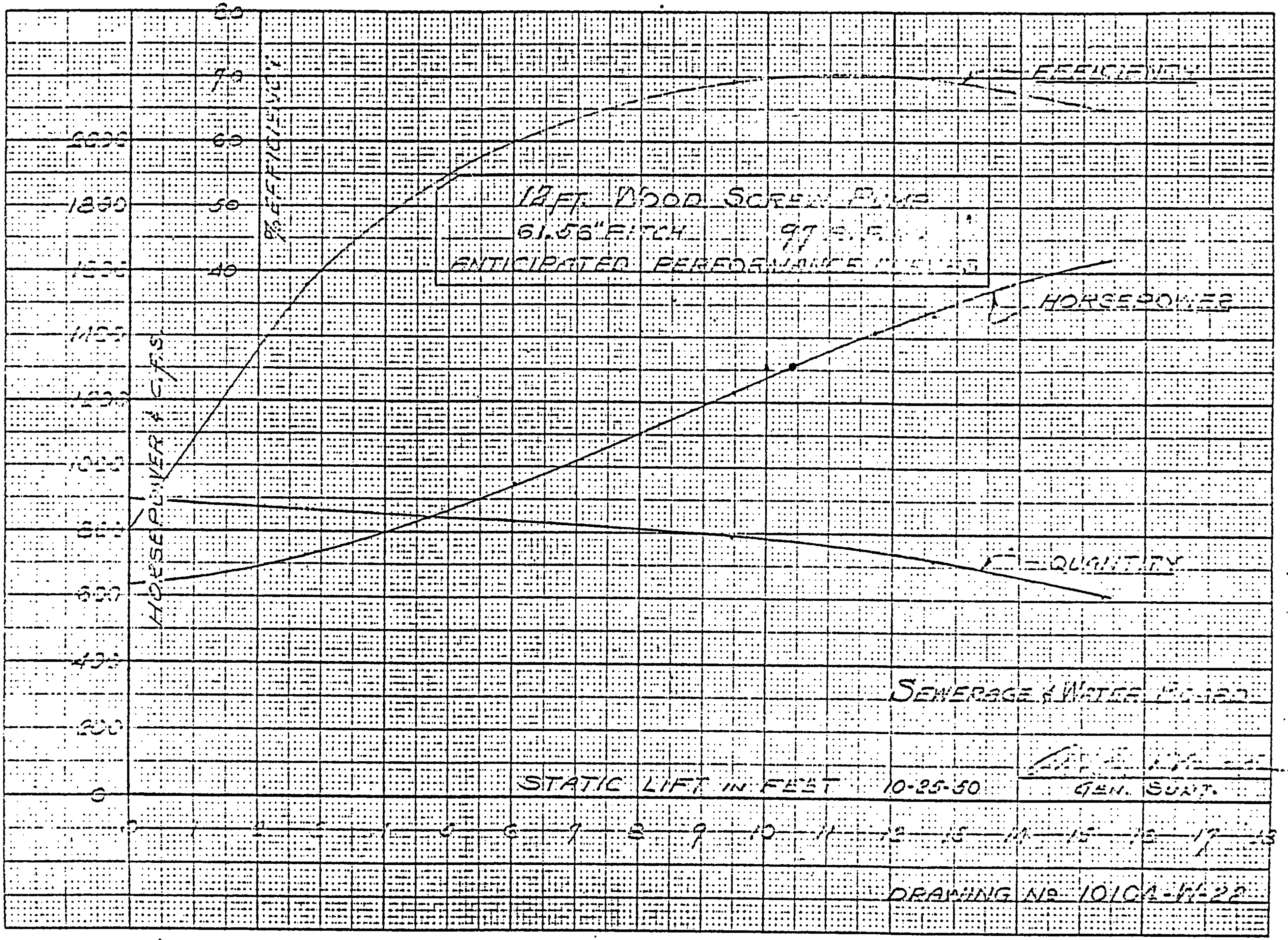
EDDYSTONE DIVISION



RATING CURVES FOR BALDWIN SERIES 600

Supercharged Diesel Engines
Bore 12-3/4" Stroke 15-1/2"

20 X 20 PER INCH



Baldwin-Hamilton
an Company

BALDWIN-HAMILTON COMPANY
One Country View Road
Malvern, PA 19355
Phone 215-647-9900
Telex 83-1395

August 3, 1983

Prescott Follett & Associates Inc.
Consulting Engineers
822 Baronne Street
New Orleans, LA 70113
ATTN: Mr. James A.Tocho

RE: Plaquemines Pumping Station
Diesel Engines
Serial Numbers 7031 & 7032

Dear Sir:

With reference to your July 11 letter describing the operation of subject diesel engines, a review of the application would indicate that we should give more thought to the matter before making a definite decision regarding the future for these engines.

The engine manual that was published for these units shows the pumps to be rated at 800 C.F.S. with an 8 Ft.head. Your letter states this is now a 10 Ft. head and you anticipate a 3 Ft. change in water level differential which will increase the total dynamic head and the horsepower demand.

We made a review of the engine block-test record and note that the engines were tested for 1220 HP at 100% load and 1340 HP at 110% load. These values would place the engine load within normal demands at present but will not allow for future load demands which you anticipate will go to 1500 HP. We do not recommend operating these engines at 1500 HP.

You mentioned that during a flooding rain this past spring that the engines were not maintaining their goverened speed of 625 RPM. This could be an indication of engine overloading and not necessarily an indication of the need for overhaul. We note that at 110% load, or 1340 HP, the rack millimeter is 30 mm on engine 7031 and 29mm on engine 7032. It is normal practice to operate the engine at 110% load when on the test block and then take note of the mm reading on the No. 1 pump rack, add one mm and install a stop collar on the pump rack in the rear of the pump. This prevents loading the engine beyond 1340 HP. If the load demand should exceed 1340 HP, the fuel delivery will be restricted and the engine speed will drop off with any further increase in the loading. We should mention also that the #1 pump may have been changed at some time and the stop collar applied at a lower setting. The pump control linkage must be free to allow the pump rack to open-up to 30 mm or whatever the maximum load demands.

Baldwin-Hamilton

8270

When on the test block, the engines are connected to a generator. The load on the engine can then be set accurately to any desired value by adjusting the field for the desired output. When connected directly to the pump drive it is difficult to determine the actual horsepower demand. It would need to be calculated on the basis of the pump design data. We are sending herewith, copies of the test figures taken when the engines were checked out on the test block. By taking note of the fuel pump millimeter reading and the exhaust temperature of the engine, a comparison can be made against the test record and a close approximation of the horsepower can be determined.

We hope you will find the actual pump demand within the load capabilities of the engine so that we can count on keeping the units in service.

Regarding your request for a list of "parts for complete overhaul"; you will find herewith a complete engine parts list. In each area we indicated with an "X" those parts that most likely need to be replaced due to normal wear or deterioration.

In order to make a realistic recommendation on overhaul requirements, it would be necessary to have specific information on the conditions of major engine components. Inasmuch as this information is not usually available until the engine is disassembled, cleaned and inspected it would appear that serious consideration be given toward a major overhaul, especially if total accumulated running time has exceeded 20,000 hours. In order that you will have some idea of what is involved, we are enclosing eight sheets of form 01 which we would use for the initial inspection process (make extra copies for your file). We would then use this information to itemize the parts and material requirements. The approximate time required to tear-down an engine would be 300 man hours. The approximate time required to re-assemble an engine would be 700 man hours.

We no longer have shop facilities to perform the work, however we have re-built a number of Baldwin engines at a shop in South Carolina. Obviously even a major overhaul would cost much less than new engines.

This information, although not resolving any problems, will give you a good enough view of the overall picture and enable you to arrive at the correct solution. Please do not hesitate to contact Mr. Matt Gray as questions arise.

Very truly yours,

Henry A. Rentschler
President

HAR:par
Enclosures

CC: Matt Gray - Baldwin-Hamilton (Malvern)

FLOODGATE CALCULATIONS

EAST OF HARVEY FDM	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
FLOODGATES PILE DESIGN	Job No. 9551-01	Designed By: R. CHOPIN	Date: 4/29/98	Checked By:	Page 1 of 18

DEAD LOADS:

(1'-10" FLOOD WALLS EITHER SIDE)

$$(8.5' \times 1.8333' \times 4.5')(150\ pcf) = 10{,}519^{\#} = \underline{10.52^{K}}$$

(2'-6" PILASTERS EITHER SIDE)

$$(2.5' \times 2.5' \times 9.25')(150\ pcf) = 8{,}672^{\#} = \underline{8.67^{K}}$$

(MONOLITH BASE)

$$(8' \times 40' \times 2.5')(150\ pcf) = 120{,}000^{\#} = \underline{120^{K}}$$

(FLOOD GATE)

$$(2 \times 28.5' \times 62^{\#}/FT) + \left[\left(\frac{0.3125''}{12''/'} \times 27.167' \times 8.5'\right) + \left(6 \times 7.333' \times 0.3333' \times \frac{0.375''}{12''/'}\right)\right.$$

$$+ \left(2 \times 7.9167' \times 1.9792' \times \frac{0.5''}{12''/'}\right) + \left(6 \times 7.9167' \times 0.5' \times \frac{0.5''}{12''/'}\right)$$

$$+ \left(4 \times 7.9167' \times 2' \times \frac{0.375''}{12''/'}\right) + \left(28.5' \times 0.5' \times \frac{0.5''}{12''/'}\right)$$

$$\left. + \left(2 \times 29.5' \times \frac{0.4418\ IN^2}{144\ IN^2/FT^2}\right)\right](490\ pcf) = 5{,}646^{\#} = 5.65^{K}$$

HORIZONTAL REACTION ON HINGES

$$\left(5.65^{K} \times \frac{28.5'}{2}\right) / 7.5833' = \underline{10.62^{K}}$$

TENSION ON TOP
COMPRESSION ON BOTTOM

VERTICAL REACTION ON HINGES

$$= \underline{2.825^{K}}$$ ON TOP + BOTTOM

DEAD LOAD FORCES ABOUT THE ORIGIN:

$\Sigma F_z = 2 \times 10.52^K + 2 \times 8.67^K + 120^K + 5.65^K = \underline{164.03^K}$

$\Sigma F_y = 0$

$\Sigma F_x = 0$ (HINGES CANCEL OUT)

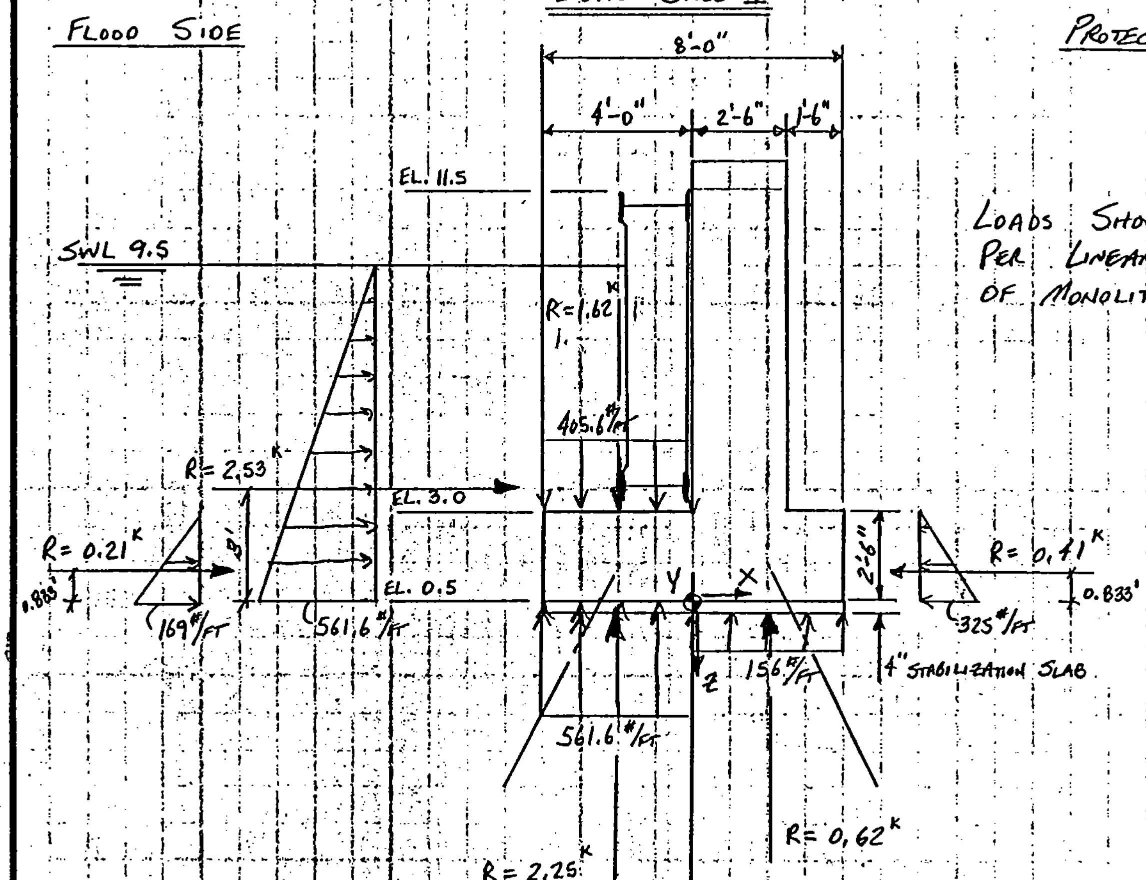
ΣM_x (GATE CLOSED) $= 5.65' \times 14.25' - 2.825^K \times 10.7083' + 2.825^K \times 3.125' = \underline{59.09 \text{ FT}\cdot\text{K}}$

ΣM_x (GATE OPEN) $= 5.65' \times 14.25' + 2.825^K \times 10.7083' - 2.825^K \times 3.125' = \underline{101.94 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = 2 \times 10.52^K \times -0.9167' + 2 \times 8.67^K \times -1.25' + 5.65^K \times -0.3333' = \underline{-42.85 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = 0$

LOAD CASE I

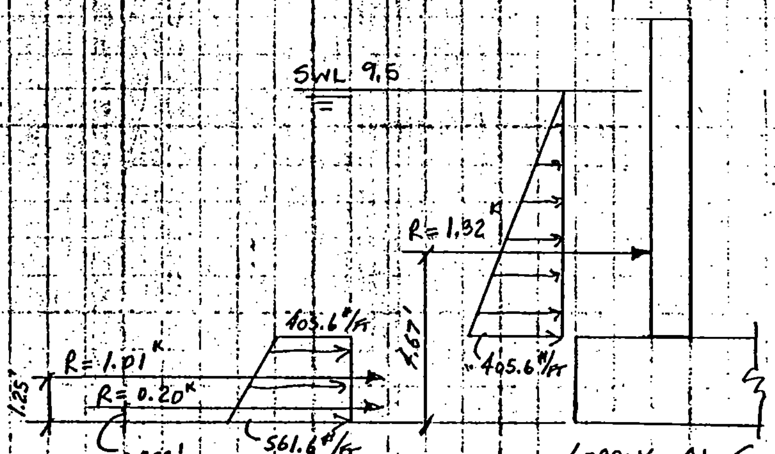


LOADS SHOWN PER LINEAR FOOT OF MONOLITH.

40'-0" MONOLITH
26'-0" GATE OPENING

$\gamma_{H_2O} = 62.4\ \#/FT^3$

$\gamma_{SOIL} = 130\ \#/FT^3$



LOADING ON GATE PER LINEAR FOOT

LOAD CASE I:

GATE REACTIONS

$TOP = R \times 1.545' / 7.5833' = 0.2037\,R$

$BOTTOM = R - 0.2037R = 0.7963\,R$

$TOTAL\ TOP\ REACTION = (27.167')(0.2037)(1.32^K) = 7.31^K$

$TOTAL\ BOTTOM\ REACTION = (27.167')(0.7963)(1.32^K) = 28.56^K$

LIVE LOADS ABOUT ORIGIN:

$\Sigma F_x = (40')(0.21^K + 2.53^K - 0.41^K) = \underline{93.2^K}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = (40')(1.62^K - 2.25^K - 0.62^K) = \underline{-50^K}$

$\Sigma M_x = \underline{0}$

$\Sigma M_y = (-0.21^K \times 0.8333' - 2.53^K \times 3' + 1.62^K \times 2' - 2.25^K \times 2' + 0.62^K \times 2' + 0.41^K \times 0.8333')(40')$
$= \underline{-297.73\ FT \cdot K}$

$\Sigma M_z = 0$

TOTAL LOADS ABOUT ORIGIN

$\Sigma F_x = 0 + 93.2^K = \boxed{93.2^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = 164.03^K - 50^K = \boxed{114.03^K}$

$\Sigma M_x = 59.09\ FT \cdot K + 0 = \boxed{59.09\ FT \cdot K}$

$\Sigma M_y = -42.85\ FT \cdot K - 297.73\ FT \cdot K = \boxed{-340.58\ FT \cdot K}$

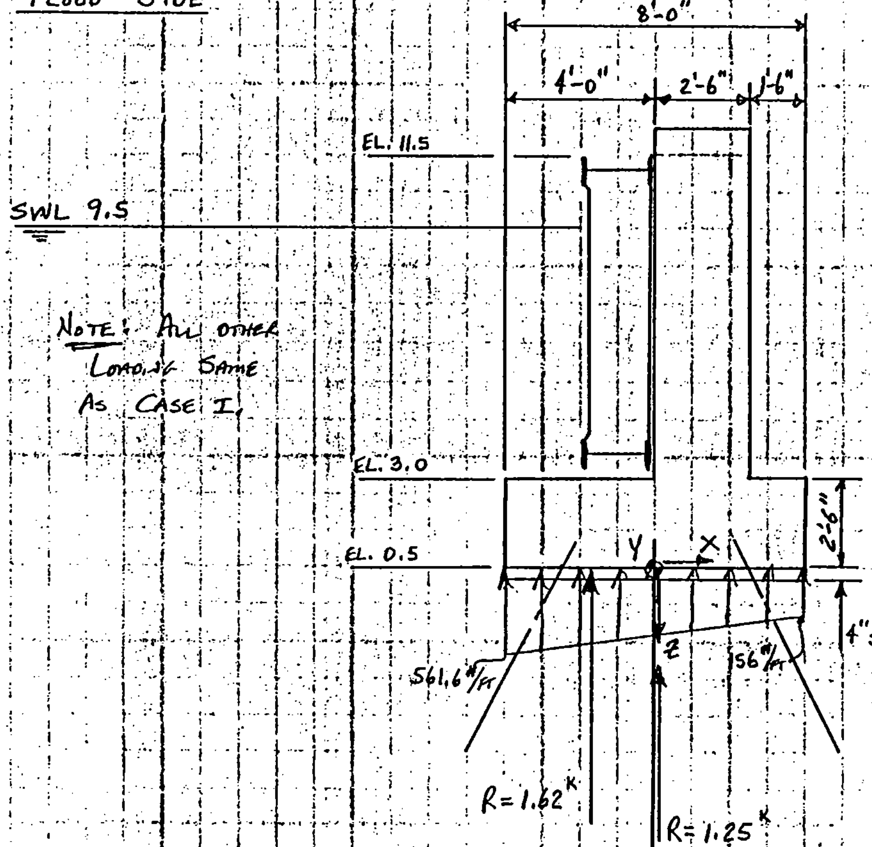
$\Sigma M_z = 0 + 0 = \boxed{0}$

EAST OF HARVEY FDM	**BURK-KLEINPETER, INC.** ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL
FLOODGATES PILE DESIGN	Job No. 9551-01 / Designed By: R. CHOPIN / Date: 4/29/98 / Checked By: / Page 5 of 18

LOAD CASE II

FLOOD SIDE

PROTECTED SIDE



LOADS SHOWN PER LINEAR FOOT OF MONOLITH.

NOTE: ALL OTHER LOADING SAME AS CASE I.

40'-0" MONOLITH
26'-0" GATE OPENING

LOAD CASE II:

LIVE LOADS ABOUT ORIGIN:

$\Sigma F_x = (40')(0.21^K + 2.53^K - 0.41^K) = \underline{93.2^K}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = (40')(1.62^K - 1.62^K - 1.25^K) = \underline{-50^K}$

$\Sigma M_x = \underline{0}$

$\Sigma M_y = (40')(-0.21^K \times 0.8333' - 2.53^K \times 3' + 1.62^K \times 2' - 1.62^K \times 1.3333' + 1.25^K \times 0 + 0.41^K \times 0.8333')$
$= \underline{-253.73 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = 0$

TOTAL LOADS ABOUT ORIGIN

$\Sigma F_x = 0 + 93.2^K = \boxed{93.2^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

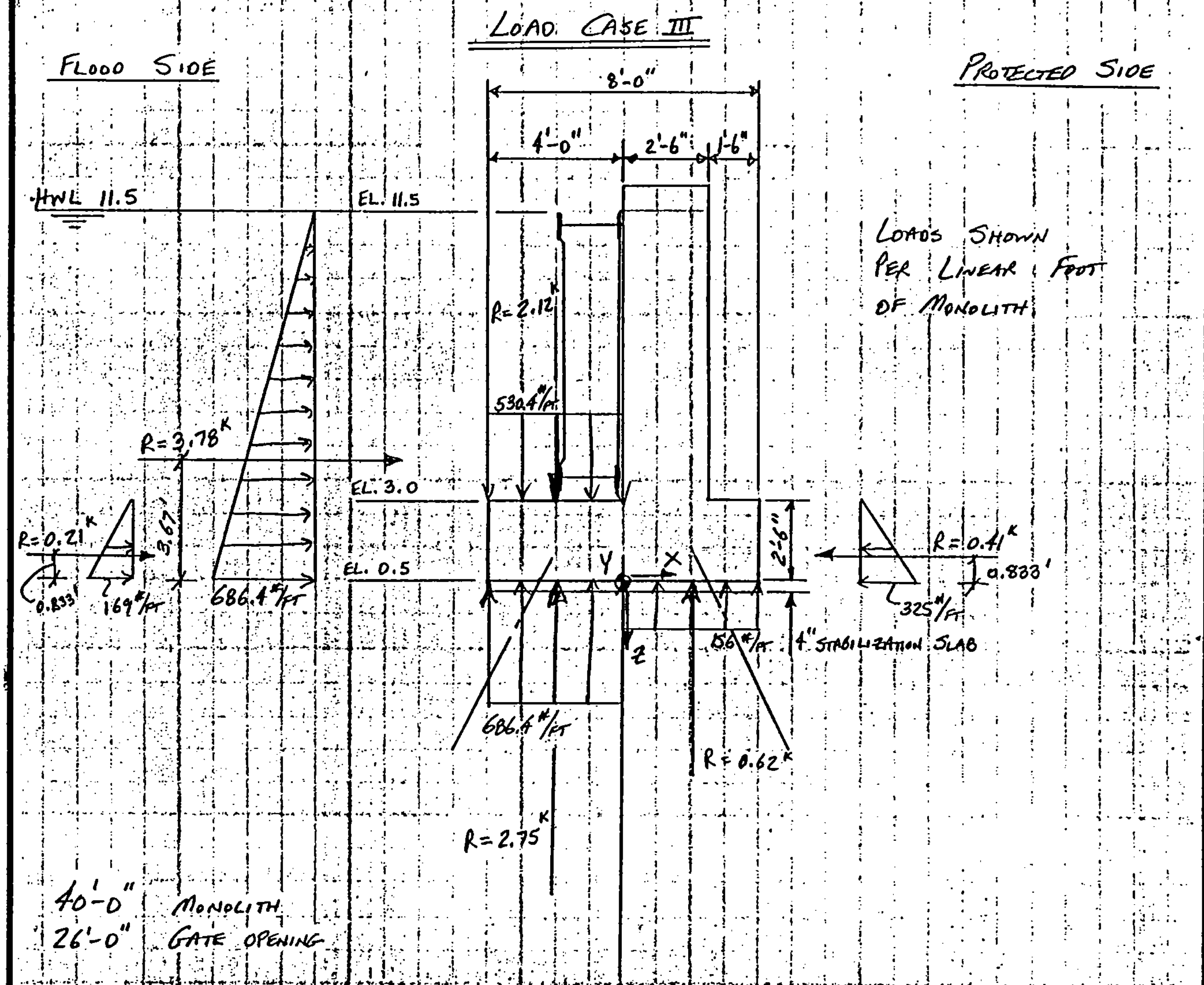
$\Sigma F_z = 164.03^K - 50^K = \boxed{114.03^K}$

$\Sigma M_x = 59.09 \text{ FT}\cdot\text{K} + 0 = \boxed{59.09 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = -42.85 \text{ FT}\cdot\text{K} - 253.73 \text{ FT}\cdot\text{K} = \boxed{-296.58 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

EAST OF HARVEY FDM FLOODGATES PILE DESIGN	**BURK-KLEINPETER, INC.** ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
	Job No. 9551-01	Designed By: R. CHOPIN	Date: 4/29/98	Checked By:	Page 7 of 18



LOAD CASE III:

LIVE LOADS ABOUT ORIGIN:

$\Sigma F_x = (40')(0.21^K + 3.78^K - 0.41^K) = \underline{143.2^K}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = (40')(2.12^K - 2.75^K - 0.62^K) = \underline{-50^K}$

$\Sigma M_x = \underline{0}$

$\Sigma M_y = (40')(-0.21^K \times 0.8333' - 3.78^K \times 3.67' + 2.12^K \times 2' - 2.75^K \times 2' + 0.62^K \times 2' + 0.41^K \times 0.8333')$
$= \underline{-549.04 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = \underline{0}$

TOTAL LOADS ABOUT ORIGIN (75% FORCES USED)

$\Sigma F_x = (0 + 143.2^K)(0.75) = \boxed{107.4^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = (164.03^K - 50^K)(0.75) = \boxed{85.52^K}$

$\Sigma M_x = (59.09 \text{ FT}\cdot\text{K} + 0)(0.75) = \boxed{44.32 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = (-42.85 \text{ FT}\cdot\text{K} - 549.04 \text{ FT}\cdot\text{K})(0.75) = \boxed{-443.92 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

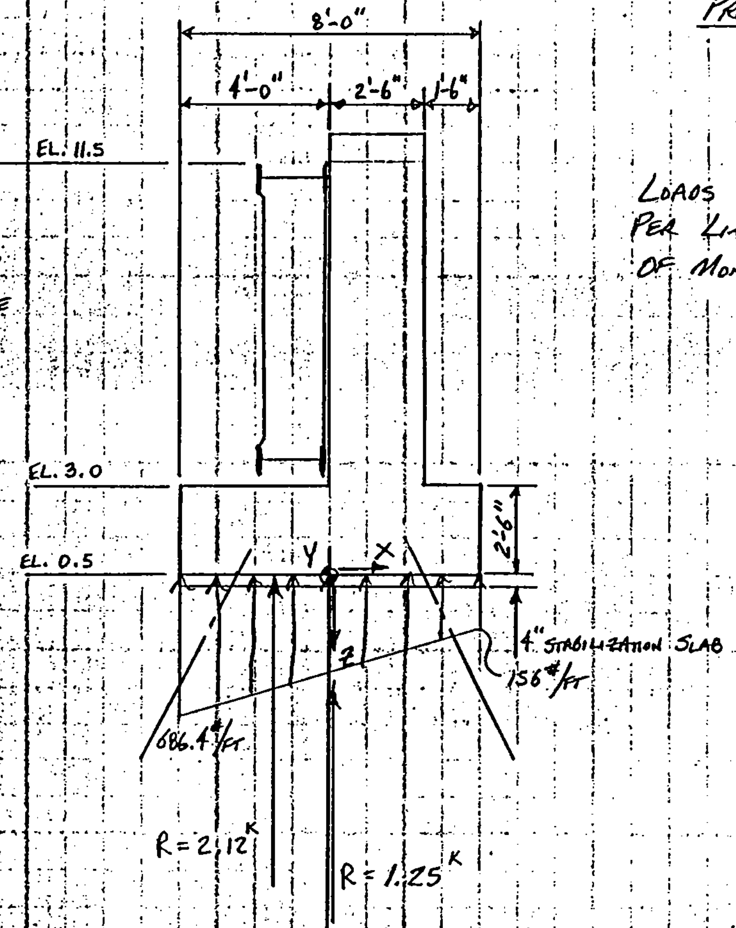
EAST OF HARVEY FDM FLOODGATES PILE DESIGN	**BURK-KLEINPETER, INC.** ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
	Job No. 9551-01	Designed By: R. CHOPIN	Date: 4/29/98	Checked By:	Page 9 of 18

LOAD CASE IV

FLOOD SIDE

PROTECTED SIDE

HWL 11.5



NOTE: ALL OTHER LOADING SAME AS CASE III

LOADS SHOWN PER LINEAR FOOT OF MONOLITH.

40'-0" MONOLITH
26'-0" GATE OPENING

Computation Sheet

LOAD CASE IV:

LIVE LOADS ABOUT ORIGIN:

$\Sigma F_x = (40')(0.21^K + 3.78^K - 0.41^K) = \underline{143.2^K}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = (40')(2.12^K - 2.12^K - 1.25^K) = \underline{-50^K}$

$\Sigma M_x = \underline{0}$

$\Sigma M_y = (40')(-0.21^K \times 0.8333' - 3.78^K \times 3.67' + 2.12^K \times 2' - 2.12^K \times 1.3333' + 1.25^K \times 0 + 0.41^K \times 0.8333')$
$= \underline{-491.70 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = \underline{0}$

TOTAL LOADS ABOUT ORIGIN (75% FORCES USED)

$\Sigma F_x = (0 + 143.2^K)(0.75) = \boxed{107.4^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = (164.03^K - 50^K)(0.75) = \boxed{85.52^K}$

$\Sigma M_x = (59.09 \text{ FT}\cdot\text{K} + 0)(0.75) = \boxed{44.32 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = (-42.85 \text{ FT}\cdot\text{K} - 491.70 \text{ FT}\cdot\text{K})(0.75) = \boxed{-400.91 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

LOAD CASE V: GATE OPEN, NO WIND, TRUCK ON PROTECTED SIDE EDGE OF BASE SLAB.

LIVE LOADS ABOUT ORIGIN: (ONE TRUCK TOWARDS HINGE SIDE OF GATE OPENING)

$\Sigma F_x = 0$

$\Sigma F_y = 0$

$\Sigma F_z = 32^K$

$\Sigma M_x = 16^K \times 11' + 16^K \times 5' = 256$ FT·K

$\Sigma M_y = -32^K \times 4' = -128$ FT·K

$\Sigma M_z = 0$

TOTAL LOADS ABOUT ORIGIN:

$\Sigma F_x = 0 + 0 = \boxed{0}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = 164.03^K + 32^K = \boxed{196.03^K}$

$\Sigma M_x = 101.94$ FT·K $+ 256$ FT·K $= \boxed{357.94 \text{ FT·K}}$

$\Sigma M_y = -42.85$ FT·K $- 128$ FT·K $= \boxed{-170.85 \text{ FT·K}}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

LOAD CASE VI: GATE OPEN, NO WIND, 2-TRUCKS ON PROTECTED SIDE FACE OF BASE SLAB.

LIVE LOADS ABOUT ORIGIN:

$\Sigma F_x = \underline{0}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = 32^K + 32^K = \underline{64^K}$

$\Sigma M_x = 16^K \times 11' + 16^K \times 5' + 16^K \times 1' - 16^K \times 5' = \underline{192 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = -64^K \times 4' = \underline{-256 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = \underline{0}$

TOTAL LOADS ABOUT ORIGIN:

$\Sigma F_x = \boxed{0}$

$\Sigma F_y = \boxed{0}$

$\Sigma F_z = 164.03^K + 64^K = \boxed{228.03^K}$

$\Sigma M_x = 101.94 \text{ FT}\cdot\text{K} + 192 \text{ FT}\cdot\text{K} = \boxed{293.94 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = -42.85 \text{ FT}\cdot\text{K} - 256 \text{ FT}\cdot\text{K} = \boxed{-298.85 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = \boxed{0}$

EAST OF HARVEY FDM	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
FLOODGATES PILE DESIGN	Job No. 9551-01	Designed By: R.CHOPIN	Date: 4/29/98	Checked By:	Page 14 of 18

LOAD CASE VIII: GATE OPEN, NO WIND, 2-TRUCKS ON FLOOD SIDE FACE OF BASE SLAB.

LIVE LOADS ABOUT ORIGIN:

$\Sigma F_x = 0$

$\Sigma F_y = 0$

$\Sigma F_z = 64^K$

$\Sigma M_x = 192$ FT.K

$\Sigma M_y = 64^K \times 4' = 256$ FT.K

$\Sigma M_z = 0$

TOTAL LOADS ABOUT ORIGIN:

$\Sigma F_x = \boxed{0}$

$\Sigma F_y = \boxed{0}$

$\Sigma F_z = \boxed{228.03^K}$

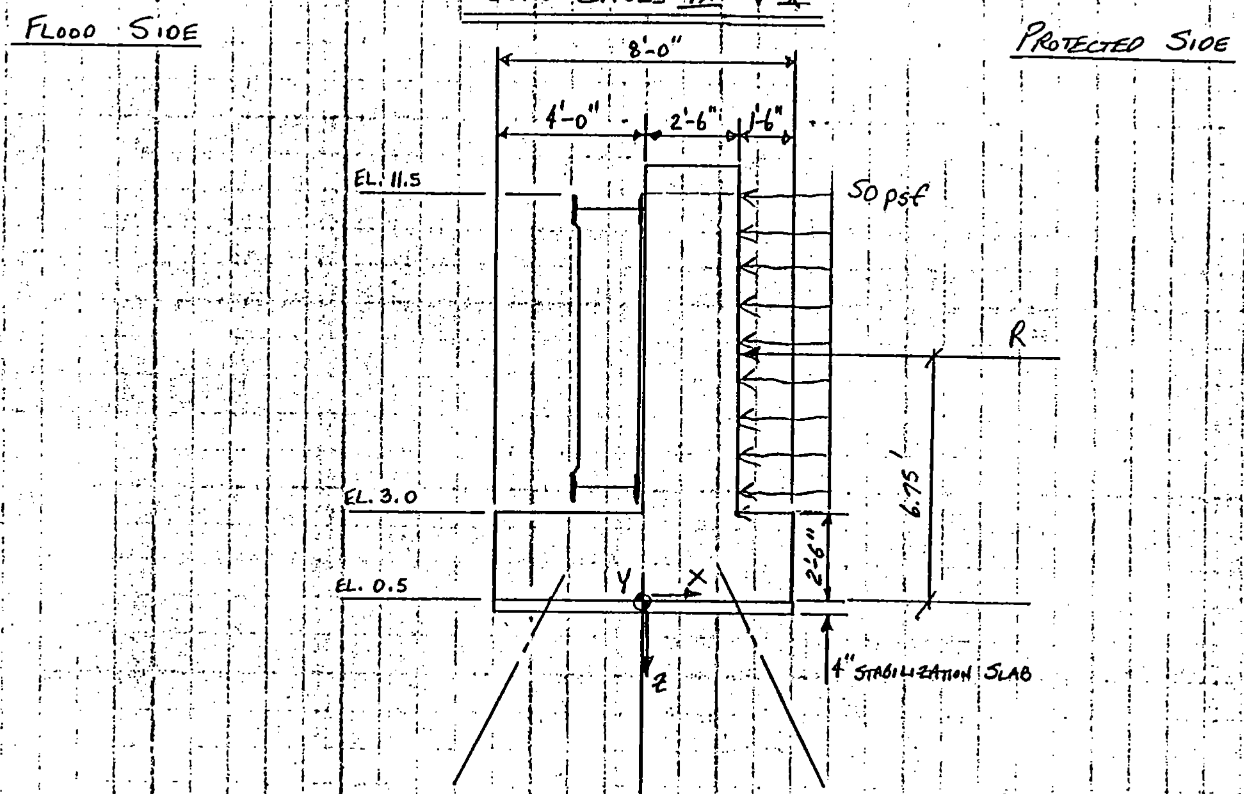
$\Sigma M_x = \boxed{293.94 \text{ FT.K}}$

$\Sigma M_y = -42.85$ FT.K $+ 256$ FT.K $= \boxed{213.15 \text{ FT.K}}$

$\Sigma M_z = \boxed{0}$

EAST OF HARVEY FDM FLOODGATES PILE DESIGN	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
	Job No. 9551-01	Designed By: R. CHOPIN	Date: 4/29/98	Checked By:	Page 15 of 18

WIND LOADING FOR
LOAD CASES IX + X



40'-0" MONOLITH
26'-0" GATE OPENING

WIND LOADING ABOUT ORIGIN:

$\Sigma F_x = (-50\ psf)(8.5')(14') = \underline{-5.95^k}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = \underline{0}$

$\Sigma M_x = \underline{0}$

$\Sigma M_y = 5.95^k \times 6.75' = \underline{40.16\ ft\cdot k}$

$\Sigma M_z = \underline{0}$

LOAD CASE IX: GATE OPEN, WIND FROM PROTECTED SIDE, TRUCK ON FLOOD SIDE EDGE OF BASE SLAB.

TOTAL LOADS ABOUT ORIGIN (75% FORCES USED)

$\Sigma F_x = (0 - 5.95^K)(0.75) = \boxed{-4.46^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = (196.03^K + 0)(0.75) = \boxed{147.02^K}$

$\Sigma M_x = (357.94 \text{ FT}\cdot\text{K} + 0)(0.75) = \boxed{268.46 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = (85.15 \text{ FT}\cdot\text{K} + 40.16 \text{ FT}\cdot\text{K})(0.75) = \boxed{93.98 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

LOAD CASE X: GATE OPEN, WIND FROM PROTECTED SIDE, 2-TRUCKS ON FLOOD SIDE EDGE OF BASE SLAB.

TOTAL LOADS ABOUT ORIGIN (75% FORCES USED)

$\Sigma F_x = \boxed{-4.46^K}$

$\Sigma F_y = \boxed{0}$

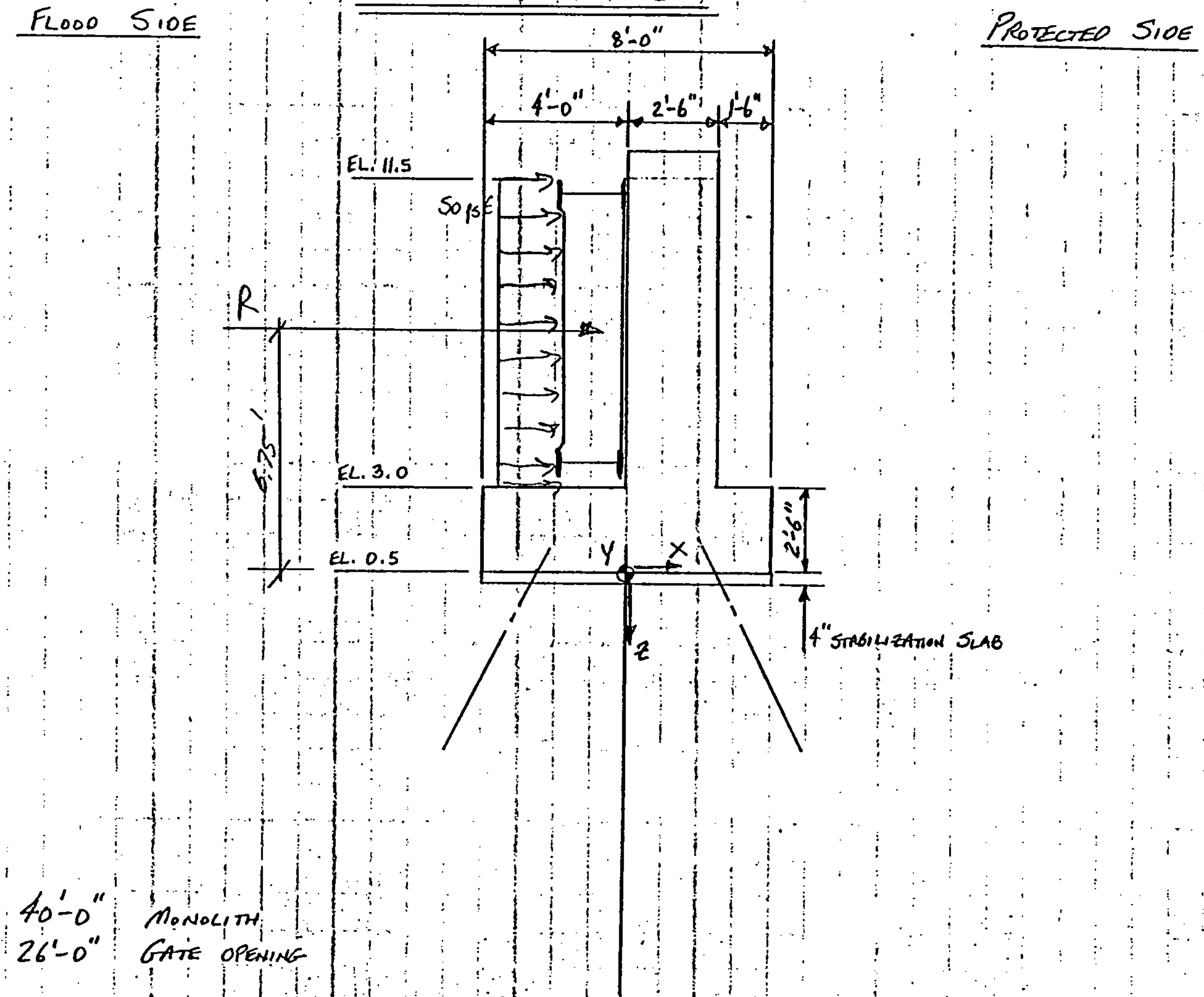
$\Sigma F_z = (228.03^K + 0)(0.75) = \boxed{171.02^K}$

$\Sigma M_x = (293.94 \text{ FT}\cdot\text{K} + 0)(0.75) = \boxed{220.46 \text{ FT}\cdot\text{K}}$

$\Sigma M_y = (213.15 \text{ FT}\cdot\text{K} + 40.16 \text{ FT}\cdot\text{K})(0.75) = \boxed{189.98 \text{ FT}\cdot\text{K}}$

$\Sigma M_z = \boxed{0}$

WIND LOADING FOR LOAD CASES XI + XII



40'-0" MONOLITH
26'-0" GATE OPENING

WIND LOADING ABOUT ORIGIN:

$\Sigma F_x = (50\,psf)(8.5' \times 7' + 8.5' \times 27.167'/2) = \underline{8.75^K}$

$\Sigma F_y = \underline{0}$

$\Sigma F_z = \underline{0}$

$\Sigma M_x = \underline{0}$

$\Sigma M_y = +8.75^K \times 6.75' = \underline{-59.06\ FT\cdot K}$

$\Sigma M_z = (-50\,psf)(8.5' \times \frac{27.167'}{2})(14.25') + (50\,psf)(8.5' \times 7')(16.5') = \underline{-33.18\ FT\cdot K}$

LOAD CASE XI: GATE OPEN, WIND FROM FLOOD SIDE, TRUCK ON PROTECTED SIDE EDGE OF BASE SLAB.

TOTAL LOADS ABOUT ORIGIN (75 % FORCES USED)

$\Sigma F_x = (0 + 8.75^K)(0.75) = \boxed{6.56^K}$

$\Sigma F_y = \boxed{0}$

$\Sigma F_z = (196.03^K + 0)(0.75) = \boxed{147.02^K}$

$\Sigma M_x = (357.94 \text{ FT.K} + 0)(0.75) = \boxed{268.46 \text{ FT.K}}$

$\Sigma M_y = (-170.85 \text{ FT.K} - 59.06 \text{ FT.K})(0.75) = \boxed{-172.43 \text{ FT.K}}$

$\Sigma M_z = (0 - 33.18 \text{ FT.K})(0.75) = \boxed{-24.89 \text{ FT.K}}$

LOAD CASE XII: GATE OPEN, WIND FROM FLOOD SIDE, 2-TRUCKS ON PROTECTED SIDE EDGE OF BASE SLAB.

TOTAL LOADS ABOUT ORIGIN (75 % FORCES USED)

$\Sigma F_x = \boxed{6.56^K}$

$\Sigma F_y = \boxed{0}$

$\Sigma F_z = (228.03^K + 0)(0.75) = \boxed{171.02^K}$

$\Sigma M_x = (293.94 \text{ FT.K} + 0)(0.75) = \boxed{220.46 \text{ FT.K}}$

$\Sigma M_y = (-298.85 \text{ FT.K} - 59.06 \text{ FT.K})(0.75) = \boxed{-268.43 \text{ FT.K}}$

$\Sigma M_z = (0 - 33.18 \text{ FT.K})(0.75) = \boxed{-24.89 \text{ FT.K}}$

EAST OF HARVEY FDM	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
FLOODGATES PILE DESIGN	Job No. 9551-01	Designed By: R. CHOPIN	Date: 5/1/98	Checked By:	Page 18a of 18a

LOAD CASE XIII : GATE CLOSED, WIND FROM PROTECTED SIDE

WIND LOADING ABOUT ORIGIN:

$\Sigma F_x = (-50\,psf)(8.5')(40') = -17^K$

$\Sigma F_y = 0$

$\Sigma F_z = 0$

$\Sigma M_x = 0$

$\Sigma M_y = 17^K \times 6.75' = 114.75\ FT\cdot K$

$\Sigma M_z = 0$

TOTAL LOADS ABOUT ORIGIN (75% FORCES USED)

$\Sigma F_x = (-17^K + 0)(0.75) = \boxed{-12.75^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = 0 + 0 = \boxed{0}$

$\Sigma M_x = (0 + 59.09\ FT\cdot K)(0.75) = \boxed{44.32\ FT\cdot K}$

$\Sigma M_y = (114.75\ FT\cdot K - 42.85\ FT\cdot K)(0.75) = \boxed{53.93\ FT\cdot K}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

LOAD CASE XIV: GATE CLOSED, WIND FROM FLOOD SIDE

TOTAL LOADS ABOUT ORIGN (75% FORCES USED)

$\Sigma F_x = (17^K + 0)(0.75) = \boxed{12.75^K}$

$\Sigma F_y = 0 + 0 = \boxed{0}$

$\Sigma F_z = 0 + 0 = \boxed{0}$

$\Sigma M_x = (0 + 59.09\ FT\cdot K)(0.75) = \boxed{44.32\ FT\cdot K}$

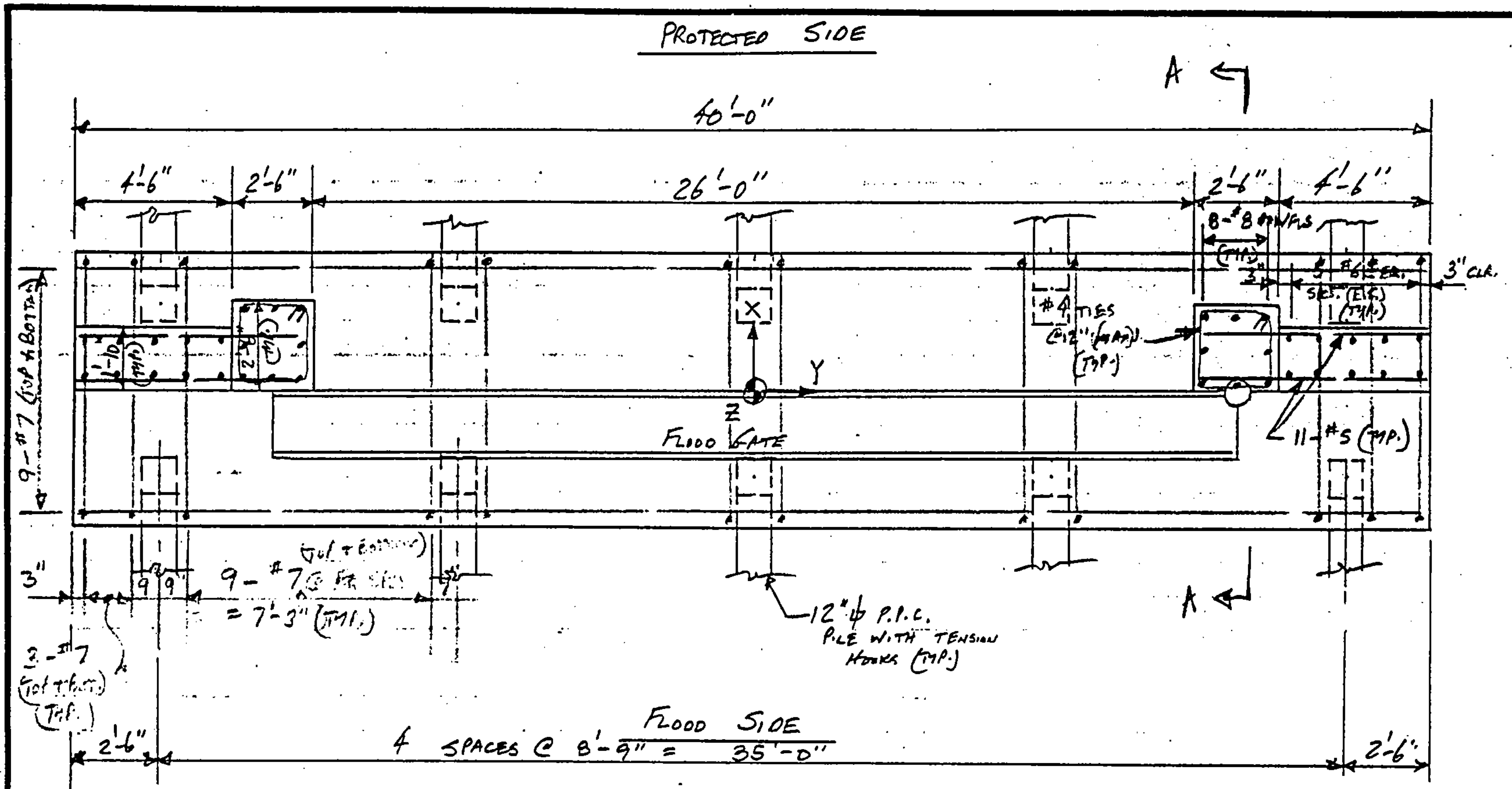
$\Sigma M_y = (-114.75\ FT\cdot K - 42.85\ FT\cdot K)(0.75) = \boxed{-118.2\ FT\cdot K}$

$\Sigma M_z = 0 + 0 = \boxed{0}$

WALLS #6 @ 12" E.F. VERT.
11-#5 E.F. HORIZONTAL

PILASTERS 3-#8 E.F.
#4 TIES @ 12" O.C.

BASE TRANS. #7 @ 12" O.C. TOP & BOT.
LONG. 9-#7



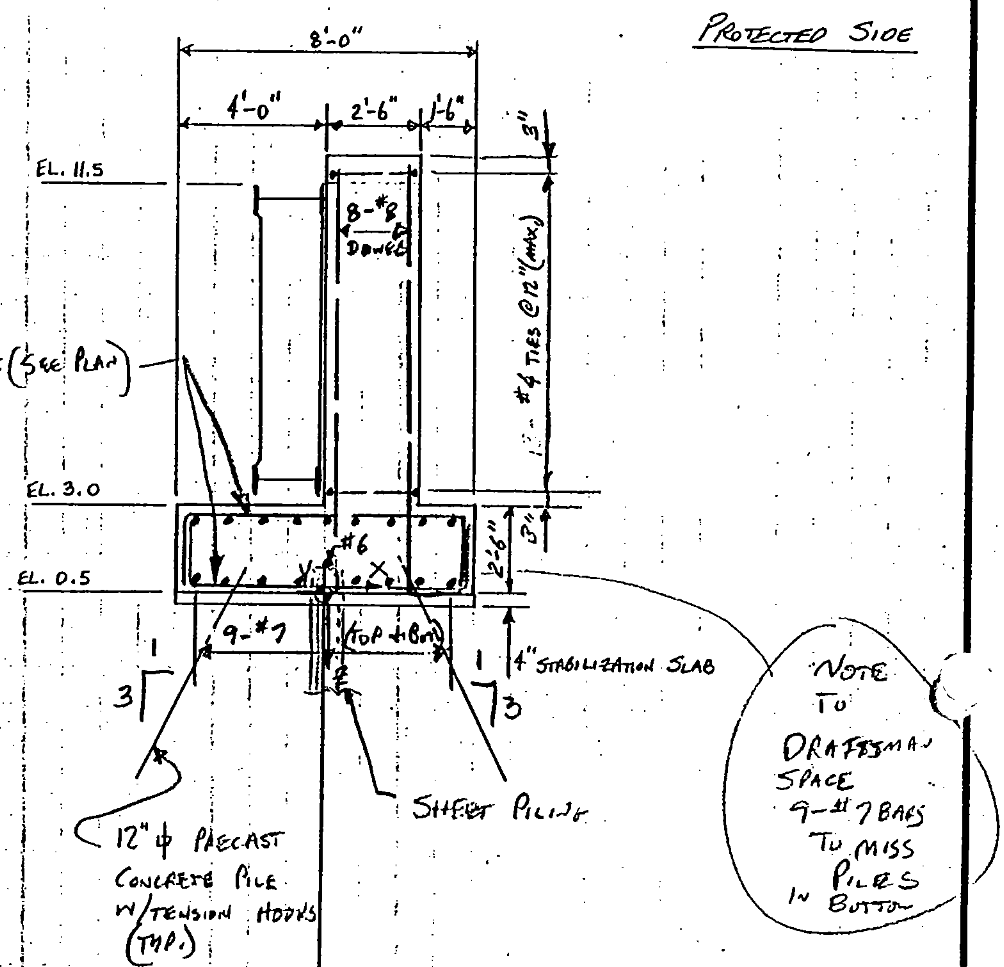
EAST OF HARVEY FDM
FLOODGATES REINFORCING DETAILS

BURK-KLEINPETER, INC.
ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS
NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL

Job No. 9551-01
Designed By: R. CHOPIN
Date: 5/4/98
Checked By:
Page 1 of 2

Computation Sheet

EAST OF HARVEY FDM FLOODGATES REINFORCING DETAILS	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
	Job No. 9551-01	Designed By: R. CHOPIN	Date: 5/4/98	Checked By:	Page 2 of 2



40'-0" MONOLITH
26'-0" GATE OPENING

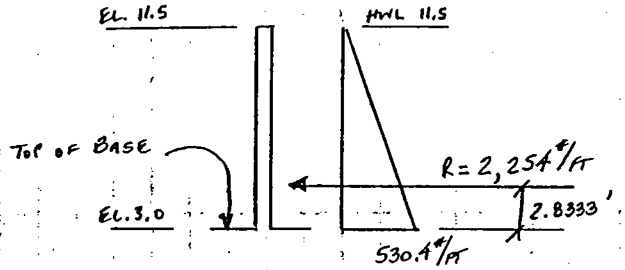
NOTE: BURN HOLES IN SHEET PILING TO PASS REINFORCEMENT

SECTION A-A

$f'_c = 4{,}000$ psi
$f_y = 60{,}000$ psi

WALL DESIGN:

BY INSPECTION LOAD CASE III WILL GOVERN.



$M = (2{,}254\ \#/FT)(2.8333') = 6{,}386$ FT.#/FT.

$V = 2{,}254\ \#/FT.$

$M_u = (1.7)(1.3)(6{,}386$ FT.#/FT$) = \underline{14{,}113 \text{ FT.\#/FT}}$

$V_u = (1.7)(1.3)(2{,}254\ \#/FT) = \underline{4{,}981\ \#/FT.}$

FLEXURE DESIGN:

$\rho_{min} = 200/60{,}000 = 0.0033$

$\rho_b = \left(\frac{0.85\,\beta_1 f'_c}{f_y}\right)\left(\frac{87{,}000}{87{,}000 + f_y}\right)$ $\beta_1 = 0.85$ FOR $f'_c = 4{,}000$ PSI

$\rho_b = \left(\frac{(0.85)(0.85)(4{,}000)}{60{,}000}\right)\left(\frac{87{,}000}{87{,}000+60{,}000}\right) = 0.0285$

$\rho_{MAX\ RECOMMENDED} = 0.25 \times 0.0285 = 0.0071$

$d = 22'' - 3''_{COVER} - (7/8'')(1/2)_{\#7\ BAR} = 18.56''$

$\rho_{MAX\ PERMITTED} = 0.375 \times 0.0285 = 0.0107$

$R_n = \frac{M_u}{\phi b d^2} = \frac{(14{,}113\ FT.\#)(12''/')}{(0.9)(12'')(18.56'')^2} = 45.52$

$\rho = \frac{0.85 f'_c}{f_y}\left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'_c}}\right) = 0.0008 < \rho_{min} = 0.0033$

USE 1/3 INCREASE $\rho = 1.33 \times 0.0008 = 0.0011$

MIN. $A_{TEMP\ E.F.} = \frac{0.0028 \times 22" \times 12"}{2} = 0.37\ in^2/ft$

$A_{S_{REQ'D}} = (0.0011)(12")(18.56") = 0.245\ in^2/FT$

USE #6 BARS @ 12" o.c. (E.F.) IN WALLS

CHECK SHEAR ACROSS BASE OF THE WALL:

$V_u = 4,981\ \#/ft$

$\phi V_c = \phi 2 \sqrt{f'_c}\ bd = (0.85)(2)\sqrt{4,000}\ (12")(18.56") = 23,946\#$

$23,946\# > 4,981\#$ O.K.

TEMPERATURE + SHRINKAGE REINFORCEMENT:

$A_{S_{TEMP}} = 0.0028 \times 22" \times 8.5' \times 12"/' = 6.283\ in^2$

$A_{S_{TEMP}}$ EACH FACE $= 6.283\ in^2/2 = 3.142\ in^2/FACE$

USE 11 - #5 BARS E.F.

PILASTER DESIGN: (2'-6" X 2'-6" PILASTERS)

GATE REACTIONS:

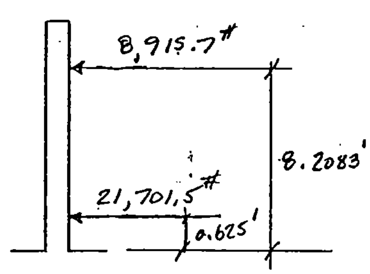
TOP = $R \times 2.2083'/7.5833' = 0.2912R$

BOTTOM = $R - 0.2912R = 0.7088R$

TOTAL GATE REACTIONS ON PILASTERS

TOP = $(0.2912)(2,254\ \#/FT)(27.167'/2) = 8,915.7\#$

BOTTOM = $(0.7088)(2,254\ \#/FT)(27.167'/2) = 21,701.5\#$



$M = 8,915.7^{\#} \times 8.2083' + 21,701.5^{\#} \times 0.625' = 86,747 \text{ FT}\cdot\#$

$V = 8,915.7^{\#} + 21,701.5^{\#} = 30,617^{\#}$

$M_u = (1.7)(1.3)(86,747 \text{ FT}\cdot\#) = \underline{191,711 \text{ FT}\cdot\#}$

$V_u = (1.7)(1.3)(30,617^{\#}) = \underline{67,664^{\#}}$

$d = 30'' - 3'' - (1'')(\tfrac{1}{2}) = 26.5''$
(3" = COVER, 1" = #8 BARS)

$R_n = \dfrac{M_u}{\phi b d^2} = \dfrac{(191,711 \text{ FT}\cdot\#)(12''/')}{(0.9)(30'')(26.5'')^2} = 121.33$

$\rho = 0.0021 < \rho_{min} = 0.0033$

USE $\frac{1}{3}$ INCREASE $1.33 \times 0.0021 = 0.0028$

$A_{s\,REQ'D.} = (0.0028)(30'')(26.5'') = 2.23 \text{ in}^2$

3 – #8 E.F.

CHECK SHEAR AT BASE OF PILASTER:

$V_u = 67,664^{\#}$

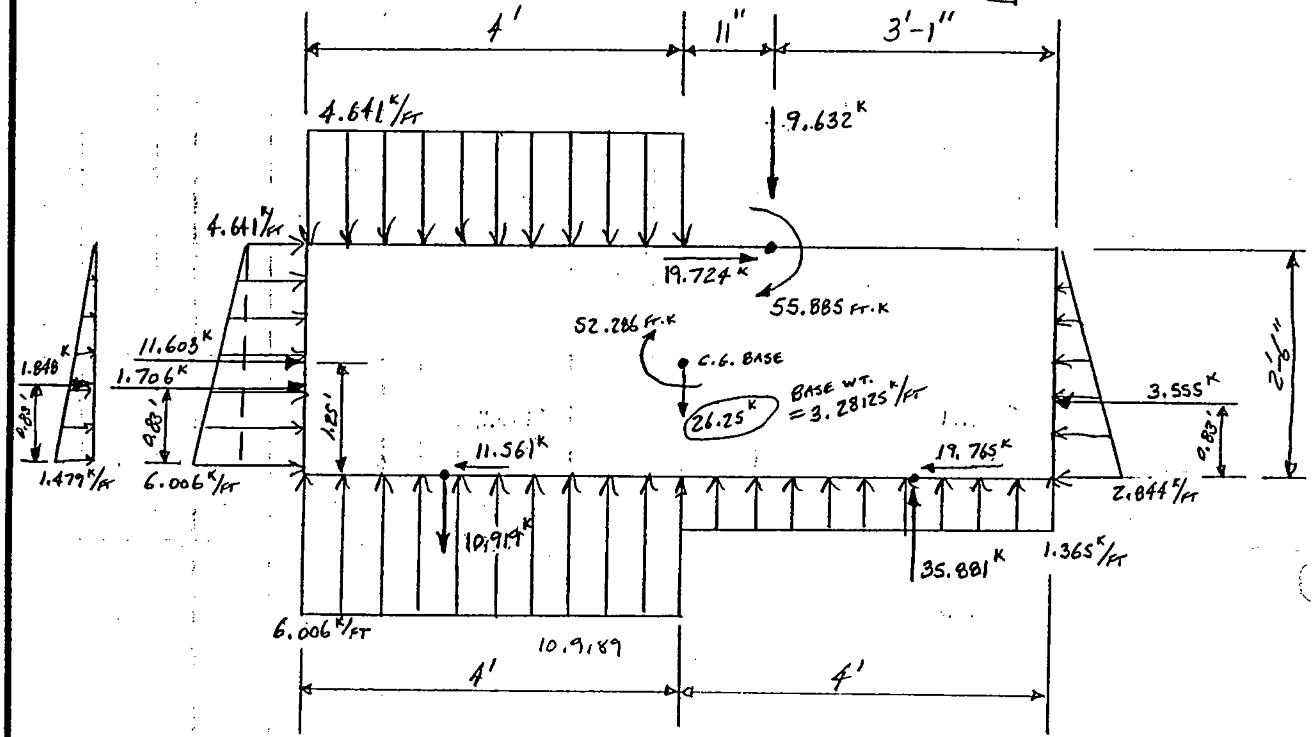
$\phi V_c = (0.85)(2)\sqrt{4,000}\,(30'')(26.5'') = 85,476^{\#} > 67,664^{\#}$ O.K.

USE #4 TIES @ 12" O.C. AROUND #8 VERTICAL BARS

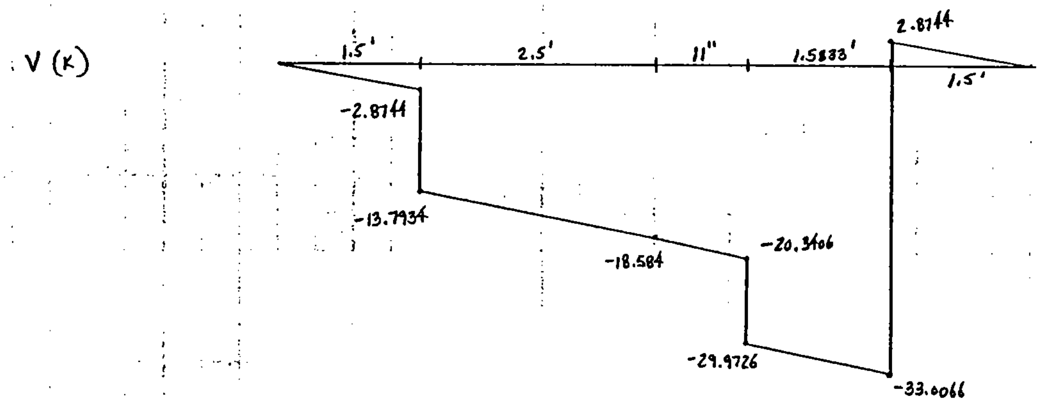
EAST OF HARVEY FDM	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
FLOODGATES CONCRETE DESIGN	Job No. 9551-01	Designed By: R. CHOPIN	Date: 5/4/98	Checked By:	Page 4 of 7

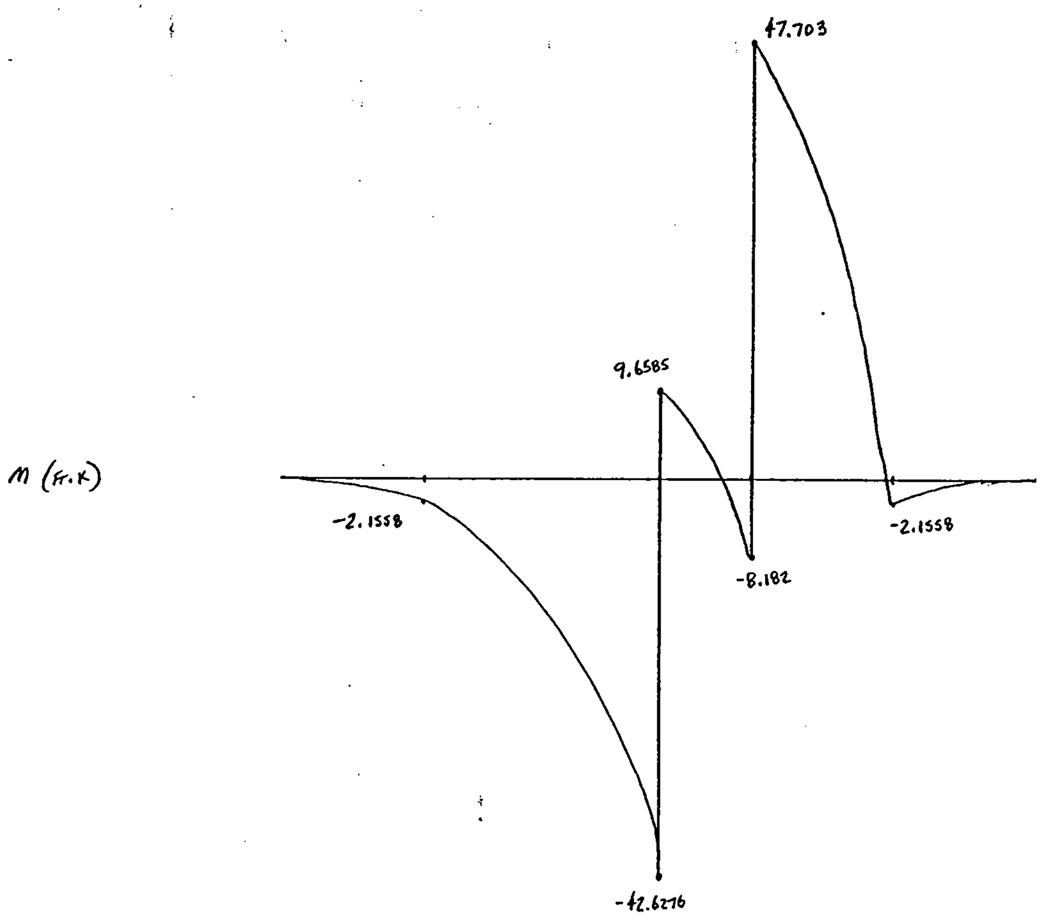
BASE DESIGN: (LOOK AT 8'-9" WIDE SECTION OF BASE)

[USE AVERAGE PILE REACTIONS FROM COMPUTER OUTPUT WITHOUT 75% REDUCTION ∴ INCREASE AVERAGE PILE REACTIONS BY 1/3.]



EAST OF HARVEY FDM FLOODGATES CONCRETE DESIGN	BURK-KLEINPETER, INC. ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL				
	Job No. 9551-01	Designed By: R. CHOPIN	Date: 5/5/98	Checked By:	Page 5 of 7





TRANSVERSE FLEXURE DESIGN:

$M_u = (1.7)(1.3)(47.703 \text{ FT}\cdot\text{K}) = 106 \text{ FT}\cdot\text{K}$ (POSITIVE MOMENT)

$M_u = (1.7)(1.3)(-42.6276 \text{ FT}\cdot\text{K}) = -95 \text{ FT}\cdot\text{K}$ (NEGATIVE MOMENT)

$d_{POS} = 30'' - 9'' - \frac{1}{2}'' = 20.5''$
No. 8 BARS

$d_{NEG} = 30'' - 3'' - \frac{1}{2}'' = 26.5''$

$R_{n_{POS}} = \dfrac{(106 \text{ FT}\cdot\text{K})(12''/')(1{,}000 \#/\text{K})}{(0.9)(105'')(20.5'')^2} = 32.03$

$R_{n_{NEG}} = \dfrac{(95 \text{ FT}\cdot\text{K})(12''/')(1{,}000 \#/\text{K})}{(0.9)(105'')(26.5'')^2} = 17.18$

$\rho_{POS} = 0.0005 < \rho_{MIN} = 0.0033$ USE $1.33 \times 0.0005 = 0.0007$

$A_{s_{POS}} = (0.0007)(105'')(20.5'') = 1.54 \text{ IN}^2$

$\rho_{NEG} = 0.0003$ USE $1.33 \times 0.0003 = 0.0004$

$A_{s_{NEG}} = (0.0004)(105'')(26.5'') = 1.12 \text{ IN}^2$

CHECK TEMPERATURE AND SHRINKAGE REQUIREMENTS IN SAME DIRECTION

$A_{s_{TEMP}} = (0.0028 \times 30'' \times 105'')/2 = 4.41 \text{ IN}^2$ ← GOVERNS
TOP + BOT

USE #7 @ 12" O.C. TOP + BOTTOM

LONGITUDINAL FLEXURE DESIGN:

(GATE OPEN WITH TRUCKS CROSSING)

$M_{MAX_{POS.\ TRUCK}} = 16.5 \text{ FT}\cdot\text{K}$

$M_{MAX_{NEG\ TRUCK}} = -24.5 \text{ FT}\cdot\text{K}$

$V_{MAX_{TRUCK}} = 16.3^{K}$

$M_{u_{POST.}} = (1.7)(1.3)\left[3^{K}/_{FT} \times (8.75')^2/10 + 16.5 \text{ FT·K}\right] = 87.2 \text{ FT·K}$

$M_{u_{NEG}} = (1.7)(1.3)\left[3^{K}/_{FT} \times (8.75')^2/10 + 24.5 \text{ FT·K}\right] = 105 \text{ FT·K}$

$$R_{n_{POS}} = \frac{(87.2 \text{ FT·K})(12''/')(1{,}000^{\#}/K)}{(0.9)(96'')(20.5'')^2} = 28.82$$

$$R_{n_{NEG}} = \frac{(105 \text{ FT·K})(12''/')(1{,}000^{\#}/K)}{(0.9)(96'')(26.5'')^2} = 20.77$$

$\rho_{POS} = 0.0005$ USE $1.33 \times 0.0005 = 0.0007$

$A_{S_{POS}} = (0.0007)(96'')(20.5'') = 1.38 \text{ IN}^2$

$\rho_{NEG} = 0.0003$ USE $1.33 \times 0.0003 = 0.0005$

$A_{S_{NEG}} = (0.0005)(96'')(26.5'') = 1.28 \text{ IN}^2$

CHECK TEMPERATURE AND SHRINKAGE REQUIREMENTS IN SAME DIRECTION

$A_{S_{TEMP,\ TOP + BOT}} = (0.0028 \times 96'' \times 30'')/2 = 4.03 \text{ IN}^2$

USE 9 - #7 BARS TOP + BOTTOM

CHECK BASE FOR TORSION

MAX. TORSION AT FACE OF PILE SUPPORTS

TORSION PER FOOT OF WALL

$(55.885 \text{ FT·K} + 52.286 \text{ FT·K})/8.75' = 12.37 \text{ FT·K/FT}$

$T_U = (1.7)(1.3)(12.37 \text{ FT·K/FT})(4.375') = 119.6 \text{ FT·K}$

TORSIONAL STRENGTH OF CONCRETE

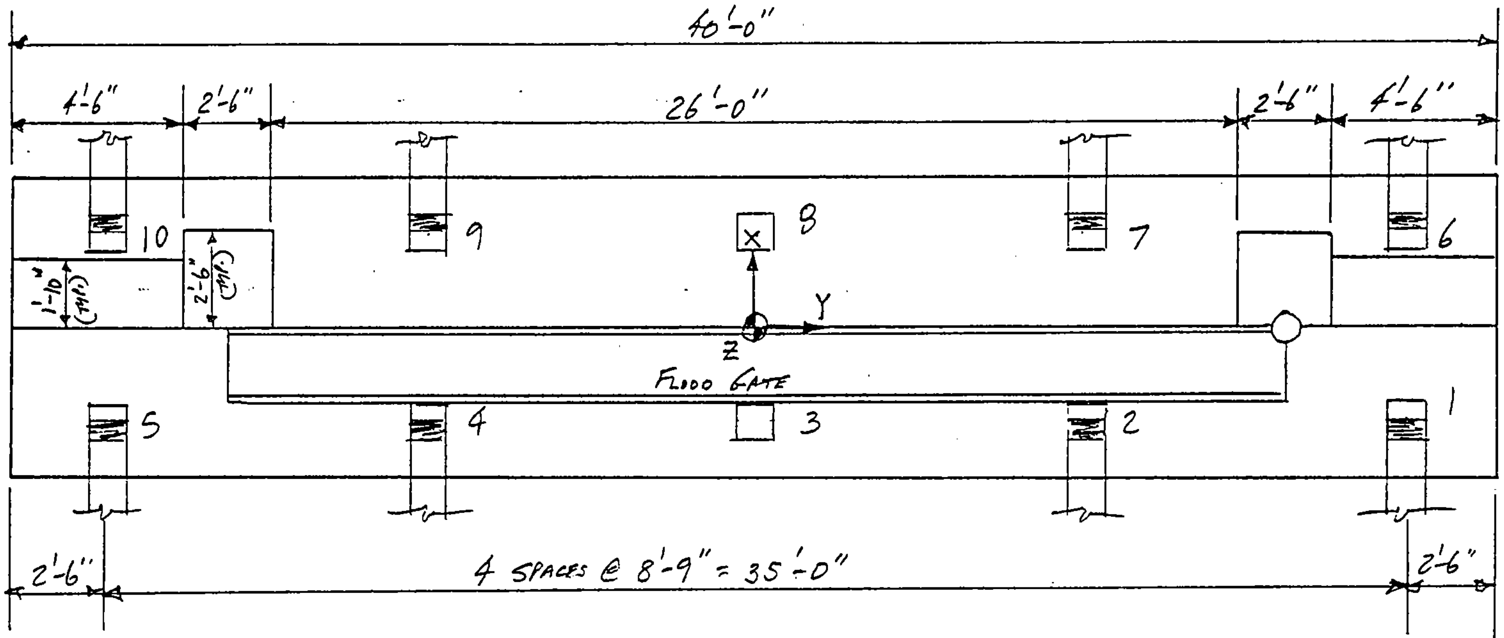
$\phi T_C = \phi\left(0.5\sqrt{f'_c}\ \Sigma x^2 y\right)$ WHERE $\phi = 0.85$

$= (0.85)(0.5)\sqrt{4{,}000}\,(96'')^2(30'') = 7{,}431{,}605 \text{ IN·\#}$

$= 619 \text{ FT·K} > 119.6 \text{ FT·K}$. O.K.

BY INSPECTION PUNCHING + BEAM SHEAR O.K.

PROTECTED SIDE



FLOOD SIDE

INPUT FILE "FG2" 14" ϕ 70' Lnk

EAST OF HARVEY FDM

FLOODGATES

BURK-KLEINPETER, INC.
ENGINEERS, ARCHITECTS, PLANNERS, ENVIRONMENTAL SCIENTISTS
NEW ORLEANS, LA BATON ROUGE, LA TUSCALOOSA, AL

Job No.	Designed By:	Date:	Checked By:	Page of
9551-01	R. Chapin	5/1/98		

Computation Sheet

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1000 FG2 5/1/1998 BKI 9551 FLOODGATE MONOLITH -
1005 CONCRETE PILES 14 INCH (2 PILE / 8 FT. BASE 8.75 FT. SPACING)
1010 PIN ALL
1020 BIJ 29.532 29.532 1901.2 0 0 0 0 0 3 8
1030 BIJ 29.532 29.532 1798.4 0 0 0 0 0 1 2 4 TO 7 9 10
1040 TENSION 1.0 ALL
1050 DLS S 70.0 54.0 736.0 210.7 173.0 1548.7 1123.5 H 14 3 8
1060 DLS S 73.8 56.9 736.0 210.7 173.0 1548.7 1123.5 H 14 1 2 4 TO 7 9 10
1070 ASC S 196 457.3 0.822 0.901 1.75 0.00 ALL
1080 PMAXMOM 30.85 30.85 ALL
1090 BATTER 3.0 1 2 4 TO 7 9 10
1100 ANGLE 180 1 TO 5
1110 ANGLE 0 6 TO 10
1120 PILE 1 -2.50 17.50 0.00 6 2.50 17.50 0.00
1130 ROW Y 5 1 4 AT -8.7500
1140 ROW Y 5 6 4 AT -8.7500
1150 LOAD 1    93.20 0.00 114.03  59.09 -340.58   0.00
1160 LOAD 2    93.20 0.00 114.03  59.09 -296.58   0.00
1170 LOAD 3   107.40 0.00  85.52  44.32 -443.92   0.00
1180 LOAD 4   107.40 0.00  85.52  44.32 -400.91   0.00
1190 LOAD 5     0.00 0.00 196.03 357.94 -170.85   0.00
1200 LOAD 6     0.00 0.00 228.03 293.94 -298.85   0.00
1210 LOAD 7     0.00 0.00 196.03 357.94   85.15   0.00
1220 LOAD 8     0.00 0.00 228.03 293.94  213.15   0.00
1230 LOAD 9    -4.46 0.00 147.02 268.46   93.98   0.00
1240 LOAD 10   -4.46 0.00 171.02 220.46  189.98   0.00
1250 LOAD 11    6.56 0.00 147.02 268.46 -172.43 -24.89
1260 LOAD 12    6.56 0.00 171.02 220.46 -268.43 -24.89
1261 LOAD 13 -12.75 0.00   0.00  44.32   53.93   0.00
1262 LOAD 14  12.75 0.00   0.00  44.32 -118.20   0.00
1270 TOUT 1 2 3 4 5 7
1280 FOUT 1 2 3 4 5 6 7 OFG2
1290 PSO 1
1300 PFO ALL
1310 FPL PFG2
```

70' Piles

FG2 1/11

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*******************************
* CORPS PROGRAM  #  X0080     *   CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 90/11/30   *   RUN DATE 98/05/01  RUN TIME 10.16.36
*******************************
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FG2 5/1/1998 BKI 9551 FLOODGATE MONOLITH
CONCRETE PILES 14 INCH (2 PILE / 8 FT. BASE 8.75 FT. SPACING)

THERE ARE 10 PILES AND
14 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX

	X	Y	Z
WITH DIAGONAL COORDINATES =	(-2.50 ,	-17.50 ,	.00)
	(2.50 ,	17.50 ,	.00)

****

PILE STIFFNESSES AS INPUT

.29532E+02	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.29532E+02	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.19012E+04	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00

THIS MATRIX APPLIES TO THE FOLLOWING PILES -

3 8

.29532E+02	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.29532E+02	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.17984E+04	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00

THIS MATRIX APPLIES TO THE FOLLOWING PILES -

1 2 4 5 6 7 9 10

****

PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM	X FT	Y FT	Z FT	BATTER	ANGLE	LENGTH FT	FIXITY
1	-2.50	17.50	.00	3.00	180.00		P
2	-2.50	8.75	.00	3.00	180.00		P

FGZ 2/11

3	-2.50	.00	.00	V	180.00	P
4	-2.50	-8.75	.00	3.00	180.00	P
5	-2.50	-17.50	.00	3.00	180.00	P
6	2.50	17.50	.00	3.00	.00	P
7	2.50	8.75	.00	3.00	.00	P
8	2.50	.00	.00	V	.00	P
9	2.50	-8.75	.00	3.00	.00	P
10	2.50	-17.50	.00	3.00	.00	P

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	93.2	.0	114.0	59.1	-340.6	.0
2	93.2	.0	114.0	59.1	-296.6	.0
3	107.4	.0	85.5	44.3	-443.9	.0
4	107.4	.0	85.5	44.3	-400.9	.0
5	.0	.0	196.0	357.9	-170.9	.0
6	.0	.0	228.0	293.9	-298.9	.0
7	.0	.0	196.0	357.9	85.2	.0
8	.0	.0	228.0	293.9	213.2	.0
9	-4.5	.0	147.0	268.5	94.0	.0
10	-4.5	.0	171.0	220.5	190.0	.0
11	6.6	.0	147.0	268.5	-172.4	-24.9
12	6.6	.0	171.0	220.5	-268.4	-24.9
13	-12.8	.0	.0	44.3	53.9	.0
14	12.8	.0	.0	44.3	-118.2	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.17104E+04	.61856E-04	.84128E-11	.00000E+00	-.12736E+06	-.18557E-02
.61856E-04	.29532E+03	-.18557E-03	-.17347E-17	-.55670E-02	-.16280E-09
.81855E-11	-.18557E-03	.16775E+05	.00000E+00	.14552E-10	.55670E-02
.00000E+00	.00000E+00	.00000E+00	.35754E+09	.00000E+00	-.22352E-06
-.12736E+06	-.55670E-02	.14552E-10	.00000E+00	.15097E+08	.16701E+00
-.18557E-02	-.16189E-09	.55670E-02	-.23097E-06	.16701E+00	.45781E+08

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 1.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 1.

LOAD CASE 9. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.
LOAD CASE 10. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = [illegible]
LOAD CASE 11. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.
LOAD CASE 12. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 1.
LOAD CASE 13. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.
LOAD CASE 14. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

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PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	.9233E-01	-.5488E-08	.6798E-02	.1983E-05	.5082E-03	.1062E-11
2	.9933E-01	-.5181E-08	.6798E-02	.1983E-05	.6022E-03	.1003E-11
3	.9821E-01	-.8400E-08	.5098E-02	.1487E-05	.4756E-03	.1626E-11
4	.1051E+00	-.8101E-08	.5098E-02	.1487E-05	.5676E-03	.1568E-11
5	-.2719E-01	.6154E-08	.1169E-01	.1201E-04	-.3652E-03	-.1191E-11
6	-.4757E-01	.6463E-08	.1359E-01	.9865E-05	-.6388E-03	-.1251E-11
7	.1355E-01	.7936E-08	.1169E-01	.1201E-04	.1820E-03	-.1536E-11
8	.3393E-01	.1002E-07	.1359E-01	.9865E-05	.4556E-03	-.1940E-1[illegible]
9	.7946E-02	.6515E-08	.8764E-02	.9010E-05	.1417E-03	-.1261E-1[illegible]
10	.2323E-01	.8082E-08	.1020E-01	.7399E-05	.3469E-03	-.1564E-1[illegible]
11	-.1713E-01	.3787E-08	.8764E-02	.9010E-05	-.2816E-03	-.6524E-05
12	-.3241E-01	.4019E-08	.1020E-01	.7399E-05	-.4868E-03	-.6524E-05
13	-.1146E-01	.1386E-08	.2106E-16	.1487E-05	-.5383E-04	-.2682E-12
14	.1233E-02	-.1833E-08	-.2093E-16	.1487E-05	-.8355E-04	.3548E-12

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PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO
(F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-2.8	.0	-14.2	.0	86.3	.0	.25	.39	1.02	.56
2	-2.8	.0	-14.5	.0	86.2	.0	.26	.39	1.02	.5[illegible]
3	-2.7	.0	41.9	.0	84.1	.0	.60	.24	1.30	.[illegible]
4	-2.8	.0	-15.3	.0	86.1	.0	.27	.40	1.01	.5[illegible]
5	-2.8	.0	-15.6	.0	86.0	.0	.27	.41	1.01	.55

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6	2.7	.0	38.8	.0	-82.1	.0	.53	.25	1.28	.84
7	2.7	.0	38.5	.0	-82.2	.0	.52	.25	1.28	.84
8	2.7	.0	-16.1	.0	-84.1	.0	.30	.41	1.00	.56
9	2.7	.0	37.7	.0	-82.3	.0	.51	.26	1.27	.83
10	2.7	.0	37.4	.0	-82.4	.0	.51	.26	1.27	.83

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-3.0	.0	-13.4	.0	93.1	.0	.23	.40	1.04	.55
2	-3.0	.0	-13.7	.0	93.1	.0	.24	.40	1.03	.55
3	-2.9	.0	47.3	.0	90.5	.0	.68	.23	1.34	.87
4	-3.0	.0	-14.4	.0	93.0	.0	.25	.41	1.03	.55
5	-3.0	.0	-14.8	.0	92.9	.0	.26	.41	1.03	.54
6	2.9	.0	38.0	.0	-89.0	.0	.51	.27	1.29	.82
7	2.9	.0	37.6	.0	-89.0	.0	.51	.27	1.29	.82
8	2.9	.0	-21.4	.0	-90.5	.0	.40	.49	.99	.51
9	2.9	.0	36.9	.0	-89.2	.0	.50	.27	1.28	.82
10	2.9	.0	36.6	.0	-89.2	.0	.50	.27	1.28	.81

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-2.9	.0	-22.3	.0	90.6	.0	.39	.50	.99	.51
2	-2.9	.0	-22.5	.0	90.5	.0	.40	.51	.98	.51
3	-2.9	.0	36.8	.0	89.5	.0	.53	.27	1.28	.81
4	-2.9	.0	-23.1	.0	90.4	.0	.41	.51	.98	.51
5	-2.9	.0	-23.3	.0	90.4	.0	.41	.52	.98	.51
6	2.8	.0	40.7	.0	-87.4	.0	.55	.25	1.30	.84
7	2.8	.0	40.5	.0	-87.5	.0	.55	.25	1.30	.84
8	2.9	.0	-17.4	.0	-89.5	.0	.32	.44	1.01	.54
9	2.8	.0	39.9	.0	-87.6	.0	.54	.26	1.30	.83
10	2.8	.0	39.7	.0	-87.6	.0	.54	.26	1.29	.83

LOAD CASE - 4

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-3.2	.0	-21.5	.0	97.3	.0	.38	.51	1.00	.50
2	-3.2	.0	-21.7	.0	97.2	.0	.38	.51	1.00	.50
3	-3.1	.0	42.1	.0	95.7	.0	.60	.26	1.32	.83
4	-3.1	.0	-22.3	.0	97.1	.0	.39	.52	1.00	.50
5	-3.1	.0	-22.5	.0	97.1	.0	.40	.52	1.00	.49
6	3.1	.0	39.9	.0	-94.1	.0	.54	.27	1.31	.82
7	3.1	.0	39.7	.0	-94.2	.0	.54	.27	1.31	.82
8	3.1	.0	-22.7	.0	-95.7	.0	.42	.52	.99	.50
9	3.1	.0	39.1	.0	-94.3	.0	.53	.27	1.31	.82
10	3.1	.0	38.9	.0	-94.3	.0	.53	.27	1.31	.81

LOAD CASE - 5

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PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.7	.0	21.0	.0	-22.6	.0	.28	.24	1.06	.8[illegible]	#
2	.7	.0	18.9	.0	-22.9	.0	.26	.24	1.05	.[illegible]	#
3	.8	.0	1.4	.0	-24.8	.0	.02	.31	.96	.7[illegible]	
4	.8	.0	14.6	.0	-23.7	.0	.20	.25	1.03	.84	
5	.8	.0	12.4	.0	-24.0	.0	.17	.26	1.02	.83	
6	-1.0	.0	27.5	.0	30.8	.0	.37	.22	1.11	.89	#
7	-1.0	.0	25.3	.0	30.4	.0	.34	.23	1.10	.88	#
8	-.8	.0	43.0	.0	24.8	.0	.61	.20	1.17	.99	#
9	-1.0	.0	21.0	.0	29.7	.0	.28	.24	1.07	.86	
10	-.9	.0	18.9	.0	29.3	.0	.26	.24	1.06	.85	

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	1.4	.0	21.1	.0	-42.1	.0	.29	.26	1.10	.84	
2	1.4	.0	19.3	.0	-42.4	.0	.26	.27	1.09	.83	
3	1.4	.0	-10.6	.0	-43.3	.0	.20	.24	.94	.67	
4	1.4	.0	15.8	.0	-43.0	.0	.21	.28	1.08	.81	
5	1.4	.0	14.0	.0	-43.3	.0	.19	.29	1.07	.80	
6	-1.7	.0	32.4	.0	51.1	.0	.44	.23	1.18	.88	
7	-1.6	.0	30.6	.0	50.8	.0	.41	.23	1.17	.87	
8	-1.4	.0	62.3	.0	43.3	.0	.89	.16	1.31	1.04	#
9	-1.6	.0	27.1	.0	50.3	.0	.37	.25	1.15	.85	
10	-1.6	.0	25.3	.0	50.0	.0	.34	.25	1.14	.84	

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.6	.0	25.9	.0	17.4	.0	.35	.23	1.07	.92	#
2	-.6	.0	23.7	.0	17.0	.0	.32	.23	1.06	.91	#
3	-.4	.0	32.6	.0	12.3	.0	.47	.21	1.09	.96	#
4	-.5	.0	19.4	.0	16.3	.0	.26	.24	1.04	.89	#
5	-.5	.0	17.2	.0	15.9	.0	.23	.24	1.02	.88	#
6	.3	.0	22.6	.0	-9.2	.0	.31	.23	1.04	.92	#
7	.3	.0	20.5	.0	-9.6	.0	.28	.24	1.03	.91	#
8	.4	.0	11.8	.0	-12.3	.0	.17	.25	.99	.86	#
9	.3	.0	16.2	.0	-10.3	.0	.22	.24	1.01	.88	#
10	.3	.0	14.0	.0	-10.6	.0	.19	.25	1.00	.87	#

LOAD CASE - 8

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-1.2	.0	30.8	.0	37.8	.0	.42	.22	1.14	.90	#
2	-1.2	.0	29.0	.0	37.5	.0	.39	.22	1.13	.89	#
3	-1.0	.0	51.8	.0	30.9	.0	.74	.18	1.23	1.02	[illegible]
4	-1.2	.0	25.5	.0	36.9	.0	.34	.23	1.11	.8[illegible]	
5	-1.2	.0	23.7	.0	36.6	.0	.32	.24	1.10	.8[illegible]	
6	.9	.0	22.7	.0	-28.7	.0	.31	.23	1.08	.87	#

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7	.9	.0	20.9	.0	-29.0	.0	.28	.24	1.07	.87	#
8	1.0	.0	-.1	.0	-30.9	.0	.00	.08	.97	.75	
9	1.0	.0	17.4	.0	-29.6	.0	.24	.25	1.05	.85	
10	1.0	.0	15.6	.0	-29.9	.0	.21	.26	1.05	.84	

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	20.9	.0	11.2	.0	.28	.24	1.03	.90	#
2	-.4	.0	19.3	.0	10.9	.0	.26	.24	1.02	.90	#
3	-.2	.0	24.7	.0	7.2	.0	.35	.23	1.04	.93	#
4	-.3	.0	16.1	.0	10.3	.0	.22	.24	1.01	.88	#
5	-.3	.0	14.5	.0	10.1	.0	.20	.25	1.00	.87	#
6	.2	.0	15.4	.0	-5.0	.0	.21	.25	.99	.89	#
7	.2	.0	13.8	.0	-5.3	.0	.19	.25	.98	.88	#
8	.2	.0	8.6	.0	-7.2	.0	.12	.26	.96	.85	#
9	.2	.0	10.6	.0	-5.8	.0	.14	.25	.97	.86	#
10	.2	.0	9.0	.0	-6.1	.0	.12	.26	.96	.85	#

LOAD CASE - 10

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.9	.0	24.6	.0	26.5	.0	.33	.23	1.08	.89	#
2	-.9	.0	23.3	.0	26.2	.0	.32	.23	1.08	.88	#
3	-.7	.0	39.2	.0	21.2	.0	.56	.20	1.15	.98	#
4	-.8	.0	20.6	.0	25.8	.0	.28	.24	1.06	.87	#
5	-.8	.0	19.3	.0	25.6	.0	.26	.24	1.06	.86	#
6	.6	.0	15.5	.0	-19.7	.0	.21	.25	1.02	.86	#
7	.6	.0	14.2	.0	-19.9	.0	.19	.25	1.02	.85	
8	.7	.0	-.4	.0	-21.2	.0	.01	.06	.95	.77	
9	.7	.0	11.5	.0	-20.4	.0	.16	.26	1.00	.84	
10	.7	.0	10.2	.0	-20.6	.0	.14	.27	1.00	.83	

LOAD CASE - 11

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.4	.0	12.7	-.2	-13.0	.0	.17	.25	.99	.86	#
2	.4	.0	11.5	-.2	-13.9	.0	.16	.25	.99	.85	#
3	.5	.0	.6	-.2	-15.6	.0	.01	.30	.94	.79	
4	.5	.0	9.1	-.2	-15.6	.0	.12	.26	.98	.83	
5	.5	.0	7.8	-.2	-16.4	.0	.11	.27	.98	.83	
6	-.6	.0	23.6	-.2	19.1	.0	.32	.23	1.06	.90	#
7	-.6	.0	21.6	-.2	19.4	.0	.29	.23	1.05	.89	#
8	-.5	.0	32.7	-.2	15.6	.0	.47	.21	1.10	.95	#
9	-.7	.0	17.6	-.2	20.1	.0	.24	.24	1.04	.87	#
10	-.7	.0	15.6	-.2	20.4	.0	.21	.25	1.03	.86	#

LOAD CASE - 12

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST

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	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	.9	.0	12.8	-.2	-27.7	.0	.17	.27	1.03	.83	
2	.9	.0	11.8	-.2	-28.5	.0	.16	.27	1.02	.8[illegible]	
3	1.0	.0	-8.4	-.2	-29.5	.0	.16	.18	.92	.7[illegible]	
4	1.0	.0	10.0	-.2	-30.1	.0	.14	.28	1.02	.81	
5	1.0	.0	9.0	-.2	-30.9	.0	.12	.29	1.02	.80	
6	-1.1	.0	27.3	-.2	34.4	.0	.37	.22	1.12	.89	#
7	-1.1	.0	25.6	-.2	34.8	.0	.35	.23	1.11	.88	#
8	-1.0	.0	47.1	-.2	29.5	.0	.67	.19	1.21	1.00	#
9	-1.2	.0	22.2	-.2	35.5	.0	.30	.24	1.09	.86	
10	-1.2	.0	20.4	-.2	35.9	.0	.28	.25	1.08	.85	

LOAD CASE - 13

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.3	.0	4.3	.0	-10.3	.0	.06	.27	.95	.82
2	.3	.0	4.0	.0	-10.3	.0	.05	.28	.94	.82
3	.3	.0	-3.1	.0	-10.4	.0	.06	.06	.91	.78
4	.3	.0	3.5	.0	-10.4	.0	.05	.28	.94	.82
5	.3	.0	3.2	.0	-10.5	.0	.04	.28	.94	.82
6	-.3	.0	-3.2	.0	10.5	.0	.06	.07	.91	.78
7	-.3	.0	-3.5	.0	10.4	.0	.06	.07	.91	.78
8	-.3	.0	3.1	.0	10.4	.0	.04	.28	.94	.81
9	-.3	.0	-4.0	.0	10.3	.0	.07	.08	.90	.78
10	-.3	.0	-4.3	.0	10.3	.0	.08	.08	.90	.78

LOAD CASE - 14

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.0	.0	-4.4	.0	.4	.0	.08	.06	.88	.80	
2	.0	.0	-4.7	.0	.4	.0	.08	.06	.88	.80	
3	.0	.0	-4.8	.0	1.1	.0	.09	.06	.88	.80	
4	.0	.0	-5.2	.0	.3	.0	.09	.07	.87	.79	
5	.0	.0	-5.5	.0	.3	.0	.10	.07	.87	.79	
6	.0	.0	5.5	.0	-.3	.0	.07	.26	.93	.85	#
7	.0	.0	5.2	.0	-.3	.0	.07	.26	.93	.85	#
8	.0	.0	4.8	.0	-1.1	.0	.07	.27	.93	.84	#
9	.0	.0	4.7	.0	-.4	.0	.06	.27	.93	.85	#
10	.0	.0	4.4	.0	-.4	.0	.06	.27	.92	.84	#

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PILE FORCES IN GLOBAL GEOMETRY

LOAD CASE - 1

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	7.1	.0	-12.6	.0	.0	.0

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2	7.3	.0	-12.9	.0	.0	.0
3	2.7	.0	41.9	.0	.0	.0
4	7.5	.0	-13.6	.0	.0	.0
5	7.6	.0	-13.9	.0	.0	.0
6	14.8	.0	36.0	.0	.0	.0
7	14.7	.0	35.6	.0	.0	.0
8	2.7	.0	-16.1	.0	.0	.0
9	14.5	.0	35.0	.0	.0	.0
10	14.4	.0	34.6	.0	.0	.0

LOAD CASE - 2

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	7.1	.0	-11.7	.0	.0	.0
2	7.2	.0	-12.1	.0	.0	.0
3	2.9	.0	47.3	.0	.0	.0
4	7.4	.0	-12.7	.0	.0	.0
5	7.5	.0	-13.1	.0	.0	.0
6	14.7	.0	35.1	.0	.0	.0
7	14.6	.0	34.8	.0	.0	.0
8	2.9	.0	-21.4	.0	.0	.0
9	14.4	.0	34.1	.0	.0	.0
10	14.3	.0	33.8	.0	.0	.0

LOAD CASE - 3

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	9.8	.0	-20.2	.0	.0	.0
2	9.9	.0	-20.5	.0	.0	.0
3	2.9	.0	36.8	.0	.0	.0
4	10.1	.0	-21.0	.0	.0	.0
5	10.2	.0	-21.2	.0	.0	.0
6	15.6	.0	37.8	.0	.0	.0
7	15.5	.0	37.5	.0	.0	.0
8	2.9	.0	-17.4	.0	.0	.0
9	15.3	.0	37.0	.0	.0	.0
10	15.2	.0	36.7	.0	.0	.0

LOAD CASE - 4

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	9.8	.0	-19.4	.0	.0	.0
2	9.9	.0	-19.6	.0	.0	.0
3	3.1	.0	42.1	.0	.0	.0
4	10.0	.0	-20.1	.0	.0	.0
5	10.1	.0	-20.4	.0	.0	.0
6	15.5	.0	36.9	.0	.0	.0
7	15.4	.0	36.7	.0	.0	.0
8	3.1	.0	-22.7	.0	.0	.0
9	15.3	.0	36.2	.0	.0	.0
10	15.2	.0	35.9	.0	.0	.0

LOAD CASE - 5

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-7.3	.0	19.7	.0	.0	.0
2	-6.7	.0	17.7	.0	.0	.0
3	-.8	.0	1.4	.0	.0	.0
4	-5.3	.0	13.6	.0	.0	.0
5	-4.7	.0	11.5	.0	.0	.0
6	7.7	.0	26.4	.0	.0	.0
7	7.1	.0	24.3	.0	.0	.0
8	-.8	.0	43.0	.0	.0	.0
9	5.7	.0	20.2	.0	.0	.0
10	5.1	.0	18.2	.0	.0	.0

LOAD CASE - 6

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-8.0	.0	19.6	.0	.0	.0
2	-7.4	.0	17.9	.0	.0	.0
3	-1.4	.0	-10.6	.0	.0	.0
4	-6.3	.0	14.5	.0	.0	.0
5	-5.8	.0	12.8	.0	.0	.0
6	8.7	.0	31.2	.0	.0	.0
7	8.1	.0	29.6	.0	.0	.0
8	-1.4	.0	62.3	.0	.0	.0
9	7.0	.0	26.2	.0	.0	.0
10	6.5	.0	24.5	.0	.0	.0

LOAD CASE - 7

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-7.6	.0	24.7	.0	.0	.0
2	-7.0	.0	22.7	.0	.0	.0
3	.4	.0	32.6	.0	.0	.0
4	-5.6	.0	18.6	.0	.0	.0
5	-5.0	.0	16.5	.0	.0	.0
6	7.4	.0	21.4	.0	.0	.0
7	6.8	.0	19.3	.0	.0	.0
8	.4	.0	11.8	.0	.0	.0
9	5.4	.0	15.2	.0	.0	.0
10	4.8	.0	13.2	.0	.0	.0

LOAD CASE - 8

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-8.6	.0	29.6	.0	.0	.0
2	-8.0	.0	27.9	.0	.0	.0

FG2 10/11

3	1.0	.0	51.8	.0	.0	.0
4	-6.9	.0	24.5	.0	.0	.0
5	-6.4	.0	22.8	.0	.0	.0
6	8.1	.0	21.2	.0	.0	.0
7	7.5	.0	19.6	.0	.0	.0
8	1.0	.0	-.1	.0	.0	.0
9	6.4	.0	16.2	.0	.0	.0
10	5.9	.0	14.5	.0	.0	.0

LOAD CASE - 9

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-6.3	.0	20.0	.0	.0	.0
2	-5.8	.0	18.4	.0	.0	.0
3	.2	.0	24.7	.0	.0	.0
4	-4.8	.0	15.4	.0	.0	.0
5	-4.3	.0	13.8	.0	.0	.0
6	5.0	.0	14.6	.0	.0	.0
7	4.5	.0	13.1	.0	.0	.0
8	.2	.0	8.6	.0	.0	.0
9	3.5	.0	10.0	.0	.0	.0
10	3.0	.0	8.5	.0	.0	.0

LOAD CASE - 10

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-7.0	.0	23.6	.0	.0	.0
2	-6.6	.0	22.3	.0	.0	.0
3	.7	.0	39.2	.0	.0	.0
4	-5.7	.0	19.8	.0	.0	.0
5	-5.3	.0	18.6	.0	.0	.0
6	5.5	.0	14.5	.0	.0	.0
7	5.1	.0	13.2	.0	.0	.0
8	.7	.0	-.4	.0	.0	.0
9	4.3	.0	10.7	.0	.0	.0
10	3.9	.0	9.5	.0	.0	.0

LOAD CASE - 11

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-4.4	.0	11.9	.0	.0	.0
2	-4.1	.0	10.8	.0	.0	.0
3	-.5	.0	.6	.0	.0	.0
4	-3.3	.0	8.4	.0	.0	.0
5	-3.0	.0	7.3	.0	.0	.0
6	6.9	.0	22.6	.0	.0	.0
7	6.2	.0	20.7	.0	.0	.0
8	-.5	.0	32.7	.0	.0	.0
9	5.0	.0	16.9	.0	.0	.0
10	4.3	.0	15.0	.0	.0	.0

FGZ 11/11

LOAD CASE - 12

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-4.9	.0	11.8	.0	.0	.0
2	-4.6	.0	10.9	.0	.0	.0
3	-1.0	.0	-8.4	.0	.0	.0
4	-4.1	.0	9.2	.0	.0	.0
5	-3.8	.0	8.3	.0	.0	.0
6	7.6	.0	26.3	.0	.0	.0
7	7.0	.0	24.6	.0	.0	.0
8	-1.0	.0	47.1	.0	.0	.0
9	5.9	.0	21.4	.0	.0	.0
10	5.4	.0	19.8	.0	.0	.0

LOAD CASE - 13

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	-1.7	.0	4.0	.0	.0	.0
2	-1.6	.0	3.7	.0	.0	.0
3	-.3	.0	-3.1	.0	.0	.0
4	-1.4	.0	3.2	.0	.0	.0
5	-1.3	.0	3.0	.0	.0	.0
6	-1.3	.0	-3.0	.0	.0	.0
7	-1.4	.0	-3.2	.0	.0	.0
8	-.3	.0	3.1	.0	.0	.0
9	-1.6	.0	-3.7	.0	.0	.0
10	-1.7	.0	-4.0	.0	.0	.0

LOAD CASE - 14

PILE	PX K	PY K	PZ K	MX IN-K	MY IN-K	MZ IN-K
1	1.4	.0	-4.2	.0	.0	.0
2	1.5	.0	-4.5	.0	.0	.0
3	.0	.0	-4.8	.0	.0	.0
4	1.7	.0	-5.0	.0	.0	.0
5	1.8	.0	-5.2	.0	.0	.0
6	1.8	.0	5.2	.0	.0	.0
7	1.7	.0	5.0	.0	.0	.0
8	.0	.0	4.8	.0	.0	.0
9	1.5	.0	4.5	.0	.0	.0
10	1.4	.0	4.2	.0	.0	.0

FILL QUANTITY SPEADSHEETS

Reach 1 -- East Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
318+06.06							
318+07.06				0		23.48	0.43
320+06.68				0		53.76	285.53
322+06.56				0		67.49	448.8
324+06.55				0		60.76	474.98
326+06.49				0		61.96	454.38
328+06.44				0		60.45	453.26
330+06.38				0		72.54	492.41
332+38.79				0		2.62	323.48
332+65.				0		2.47	2.47
332+88.				0		1.51	1.7
333+11.				0		0	0.64
333+34.				0		0	0
333+57.				0		0	0
334+06.32				0		0	0
336+06.32				0		0	0
338+06.32				0		87.64	324.59
340+06.32				0		42.89	483.44
342+06.32				0		34.03	284.89
344+06.32				0		27.96	229.59
346+06.32				0		16.66	165.26
348+06.32				0		34.47	189.37
350+06.32				0		31.95	246
352+06.32				0		46.43	290.3
354+06.32				0		36.15	305.85
356+06.32				0		8.77	166.37
358+06.32				0		37	169.52
360+06.32				0		38	277.78
362+06.34				0		48.99	322.22
364+06.34				0		21.3	260.33
366+06.32				0		80.62	377.44
368+06.34				0		96.72	656.88
370+06.34				0		83.33	666.85
372+06.32				0		62.1	538.58
374+06.34				0		72.51	498.61
376+06.34				0		79.45	562.81

377+60.01				0		76.1	442.65
378+06.34				0		72.78	127.73
380+06.34				0		67.54	519.7
382+06.34				0		58.92	468.37
384+06.37				0		94.08	566.75
386+06.34				0		164.95	959.23
388+06.34				0		160.66	1205.96
390+06.34				0		157.15	1177.07
392+06.34				0		143.95	1115.19
394+06.34				0		99.88	903.07
396+06.34				0		69.07	625.74
397+64.				0		66.49	395.78
397+88.				0		42.25	48.33
398+06.34				0		48.06	30.67
400+06.34				0		76.8	462.44
401+80.				0		115.39	618.07
402+06.34				0		6.23	59.32
404+06.34				0		21.46	102.56
406+06.34				0		10.64	118.89
406+11.				0		0	0.92
406+18.				0		16.86	2.19
406+25.				0		0	2.19
406+55.41				0		0	0
408+06.34				0		25.62	86.04
408+05.77				0		25.67	71.48
410+05.77				0		20.51	171.04
412+05.77				0		17.15	139.48
414+06.37				0		19.41	135.81
416+06.34				0		51.15	261.29
418+05.77				0		82.81	494.73
420+05.77				0		119.84	750.56
422+05.77				0		117.24	878.07
424+05.77				0		89.37	765.22
426+05.77				0		101.82	708.11
428+05.77				0		66.62	623.85
430+05.77				0		64.82	486.81
432+05.77				0		26.07	336.63
434+05.77				0		44.31	260.67
436+05.77				0		64.7	403.74
438+05.77				0		45.43	407.89

TOTAL			Cut (C.Y.)		0	Fill (C.Y.)	26,889.00

Reach 1 -- West Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
1111+06.11							
1111+06.28		#		0		66.62	0.21
1113+06.28		#		0		58.57	463.67
1115+06.28		#		0		83.49	526.15
1117+06.28		#		0		69.38	566.19
1119+11.81		#		0		52.85	465.22
1121+34.47		#		0		33.9	357.7
1123+11.81		#		0		65.27	325.68
1125+11.81		#		0		81.63	544.07
1125+71.11		#		0		49.78	144.31
1126+08.61		#		0		55.92	73.4
1127+11.81		#		0		91.67	282.06
1129+11.81		#		0		99.99	709.85
1131+11.81		#		0		73.44	642.33
1133+11.81		#		0		70.36	532.59
1135+11.81		#		0		33.84	385.93
1137+11.81		#		0		52.39	319.37
1139+11.81		#		0		48.75	374.59
1141+11.81		#		0		90.07	514.15
1143+12.27		#		0		102.59	715.2
1145+12.27		#		0		76.87	664.67
1147+12.27		#		0		124.42	745.52
1149+12.27		#		0		77.39	747.44
1150+35.		#		0		43.03	273.69
1150+53.5		#		0		0	14.74
1150+65.		#		0		37.71	8.03
1151+12.27		#		0		44.56	72.02
1153+12.27		#		0		79.57	459.74
1153+42.27		#		0		45.54	69.51
1153+72.27		#		0		47.99	51.96
1154+02.27		#		0		66.88	63.82
1154+29.77		#		0		75.57	72.54
1154+56.87		#		0		72.57	74.34
1154+70.		#		0		56.51	31.39
1154+92.5		#		0		0	23.55
1155+12.27		#		0		60.92	22.3
1157+12.27		#		0		136.25	730.26

1159+12.27		#		0		94.28	853.81
1161+19.67		#		0		103.09	758.05
1163+12.27		#		0		110.5	761.8
1165+26.16		#		0		46	619.88
1167+12.27		#		0		125.04	589.49
1169+12.27		#		0		127.11	933.89
1171+12.27		#		0		59.92	692.7
1173+11.49		#		0		59.92	442.12
1174+15.		#		0		73.13	255.04
1174+33.6		#		0		66.33	48.04
1175+11.49		#		0		78.2	208.47
1177+11.49		#		0		58.12	504.89
1179+11.49		#		0		60.31	438.63
1181+11.49		#		0		95.19	575.93
1182+36.27		#		0		34.4	299.45
1183+11.49		#		0		58.13	128.89
1184+00.32		#		0		46.22	171.66
1185+11.49		#		0		140.33	384.05
1187+11.49		#		0		46.27	691.11
1189+23.32		#		0		47.12	366.35
1191+11.49		#		0		61	376.76
1193+11.49		#		0		67.78	476.96
1194+41.99		#		0		37.61	254.69
1195+11.49		#		0		33.75	91.84
1197+11.49		#		0		32.94	247
1199+11.49		#		0		24.7	213.48
1201+01.49		#		0		29.68	191.34
1203+46.23		#		0		53.58	377.35
1205+01.09		#		0		43.5	278.4
1207+11.49		#		0		23.45	260.86
1209+11.49		#		0		13.87	138.22
1210+36.33		#		0		25.83	91.78
1211+11.48		#		0		32.93	81.77
1213+11.48		#		0		16.24	182.11
1215+17.34		#		0		30.82	179.4
1217+23.14		#		0		18.8	189.11
1219+28.94		#		0		26.85	173.98
1220+96.11		#		0		20.7	147.2
1221+48.23		#		0		18.14	37.49
1223+48.23		#		0		32.98	189.33
1225+48.23		#		0		36.8	258.44
1225+87.27		#		0		38.51	54.45
1227+52.26		#		0		35	224.6
1229+52.26		#		0		37.49	268.48

1230+43.21		#		0		41.24	132.6
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**26,910.08**

Reach 2 -- East Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
438+06.34							
440+05.77				0		58.14	214.72
442+05.77				0		78.81	507.22
444+05.77				0		96.04	647.59
446+05.77				0		138.42	868.37
448+05.77				0		129.99	994.11
449+05.77				0		143.47	506.41
450+05.77				0		135.91	517.37
452+05.77				0		130.59	987.04
454+05.77				0		150.98	1042.85
456+05.77				0		127.3	1030.67
458+05.77				0		149.4	1024.81
460+05.77				0		175.26	1202.44
488+05.21				0		179.68	18400.62
490+05.21				0		168.04	1287.85
491+11.95				0		188.51	704.78
492+05.13				0		192.79	657.95
494+05.13				0		99.92	1084.11
496+04.2				0		126.19	833.55
496+06.21			Belle Chasse Pumping			0	4.7
499+68.			Station No. 1			0	0
499+68.17				0		137.44	1776.92
500+89.58				0		141.15	626.36
501+98.71				0		99.87	487.08
503+98.71				0		151.88	932.41
506+11.71				0		112.67	1043.5
507+98.71				0		132.26	848.18
510+17.82				0		95.7	924.97
510+46.63				0		114.41	112.1
511+98.63				0		143.03	724.65
513+98.63				0		117.43	964.67
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**40,958.00**

Reach 2 -- West Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
1038+43.							
1038+43.05				0		117.43	0.11
1040+42.4				0		159.19	1021.19
1042+42.4				0		146.41	1131.85
1044+42.4				0		115.28	969.22
1045+89.96				0		102.02	593.79
1046+23.94				0		118.22	138.59
1046+42.4				0		168.05	97.86
1046+42.4				0		169.23	0
1047+51.94				0		152.85	653.35
1047+89.94				0		104.4	181.03
1048+42.4				0		91.69	190.5
1049+21.83				0		84.35	258.94
1049+45.91				0		95.73	80.3
1050+42.4				0		73.25	301.94
1051+61.48				0		15.89	196.57
1052+94.08				0		49.64	160.91
1053+61.41				0		51.96	126.68
1055+61.41				0		20.68	269.04
1055+73.09				0		18.23	8.42
1055+97.09				0		90.85	48.48
1057+18.99				0		45.68	308.2
1058+88.77				0		2.78	152.36
1060+83.17				0		30.89	121.21
1062+57.67				0		33.49	208.04
1062+77.58				0		0	12.35
1062+97.67				0		34.05	12.67
1064+22.85				0		23.17	132.64
1064+72.06				0		4.92	25.6
1066+41.16				0		32.14	116.05
1081+06.44				0		195.56	6178.6
1081+65.98				0		155.58	387.16
1081+92.98				0		0	77.79
1082+19.98				0		121.98	60.99
1082+46.98				0		0	60.99
1082+74.37				0		121.6	61.68
1083+06.34				0		0	71.99

1083+38.41				0		142.11	84.4
1085+06.44				0		129.4	844.85
1087+06.44				0		127.86	952.81
1089+51.88				0		91.94	999.03
1091+31.08				0		35.52	422.98
1092+12.32				0		82.02	176.83
1093+06.33				0		54.64	237.91
1093+14.45				0		33.41	13.24
1094+65.94				0		71.22	293.53
1097+06.28				0		94.75	738.69
1097+53.26				0		0	82.43
1099+06.33				0		110.8	314.08
1101+06.28				0		154.02	980.57
1103+06.28				0		111.42	983.11
1105+06.28				0		147.74	959.85
1107+06.28				0		77.91	835.74
1109+06.28				0		72.4	556.7
1111+06.28				0		66.62	514.89
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**24,408.73**

Reach 3 -- East Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
514+00.							
515+98.73				0		178.58	657.21
517+98.63				0		141.28	1184.07
519+98.63				0		169.19	1149.89
521+98.63				0		152.35	1190.89
523+98.63				0		118.61	1003.56
525+98.63				0		96.21	795.63
527+98.63				0		106.45	750.59
529+98.63				0		105.47	784.89
531+13.63				0		41.2	312.35
532+17.2				0		121	311.09
533+98.47				0		90.96	711.52
535+98.47				0		55.51	542.48
537+98.47				0		36.1	339.3
539+98.47				0		69.98	392.89
541+98.47				0		88.13	585.59
543+98.47				0		95.99	681.93
545+98.47				0		104.69	743.26
547+98.47				0		137.85	898.3
549+98.47				0		136.84	1017.37
551+98.47				0		142.42	1034.3
553+98.47				0		154.05	1098.04
555+98.47				0		160.84	1166.26
557+98.47				0		151.15	1155.52
559+98.47				0		160.64	1154.78
561+98.47				0		104.91	983.52
563+98.47				0		83.3	697.07
565+98.47				0		62.86	541.33
567+98.47				0		47.43	408.48
569+82.				0		69.3	396.73
570+11.97				0		0	38.46
570+36.97				0		43.63	20.2
570+81.47				0		76.67	99.14
571+98.47				0		83.33	346.67
572+39.47				0		29.34	85.55
572+48.92				0		8.66	6.65

573+98.15				0		150.79	440.64
575+98.15				0		60.87	783.93
577+98.15				0		80.19	522.44
579+98.15				0		25.28	390.63
581+98.15				0		41.57	247.59
583+48.15				0		39.84	226.14
583+68.15				0		0	14.76
583+98.15				0		54.19	30.11
585+98.15				0		90.1	534.41
587+98.15				0		63.36	568.37
589+98.15				0		29.74	344.81
591+98.15				0		14.52	163.93
593+98.15				0		29.27	162.19
595+98.15				0		40.56	258.63
597+98.15				0		34.05	276.33
599+98.15				0		19.5	198.33
600+58.15				0		0	21.67
600+75.3				0		0	0
600+88.15				0		0	0
601+98.15				0		10.7	21.8
603+98.15				0		0	39.63
605+98.15				0		9.62	35.63
607+98.15				0		11.78	79.26
609+98.15				0		7.85	72.7
611+98.15				0		8.27	59.7
613+98.15				0		0	30.63
615+98.15				0		0	0
617+98.15				0		0	0
619+98.15				0		0	0
621+98.15				0		17.59	65.15
623+98.15				0		63.61	300.74
625+98.15				0		75.88	516.63
626+41.65				0		0	61.13
626+66.65				0		0	0
626+91.65				0		0	0
627+18.52				0		63.18	31.44
627+60.53			Belle Chasse Pumping			0	49.15
629+00.			Station No. 2			0	0
627+28.21				0		0	11.34
629+47.71				0		79.1	321.53
630+83.21				0		0	198.48
631+08.21				0		0	0
631+33.21				0		0	0

631+58.21				0		32.69	15.13
631+97.71				0		57.53	65.99
633+97.71				0		98.27	577.04
635+97.71				0		118.9	804.33
637+97.71				0		124.17	900.26
639+97.71				0		109.55	865.63
641+97.71				0		120.92	853.59
643+97.71				0		140.8	969.33
645+97.71				0		148.68	1072.15
647+97.71				0		148.66	1101.26
649+97.71				0		154.53	1122.93
651+97.71				0		163.77	1178.89
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**39,891.89**

Reach 3 -- West Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
897+02.65							
897+09.				0		188.94	22.22
899+09.				0		204.21	1456.11
900+58.41				0		190.87	1093.13
901+09.75				0		190.76	362.83
903+09.75				0		131.68	1194.22
905+09.75				0		126.72	957.04
907+09.75				0		162.75	1072.11
909+09.75				0		143.74	1135.15
911+09.75				0		148.92	1083.93
913+09.75				0		211.42	1334.59
915+09.75				0		129.98	1264.44
917+09.75				0		104.58	868.74
919+09.75				0		85.17	702.78
921+09.75				0		103.51	698.81
923+09.75				0		129.67	863.63
923+87.49				0		97.31	326.77
924+63.				0		16.08	158.56
925+38.22				0		48.72	90.26
927+39.38			Planters Pumping			0	181.49
932+46.79			Station			0	0
950+43.4				0		4.45	2466.67
952+43.4				0		13.49	66.44
954+43.4				0		21.79	130.67
956+43.4				0		40.61	231.11
958+43.4				0		36.19	284.44
960+43.4				0		21.59	214
962+43.4				0		32.4	199.96
963+29.88				0		43.02	120.78
964+43.41				0		33.25	160.35
966+43.41				0		63.78	359.37
968+43.41				0		112.41	652.56
968+99.41				0		16.4	133.58
970+41.41				0		48.87	171.64
971+52.78				0		18.16	138.24
972+43.41				0		70.39	148.62

974+90.91				0		95.47	760.19
975+14.69				0		70.54	73.11
975+44.69				0		63.39	74.41
977+42.9				0		28.48	337.21
978+13.29				0		0	37.12
978+42.5				0		36.25	19.61
979+13.				0		110.19	191.19
979+83.5				0		64	227.41
979+92.64				0		51.83	19.61
981+95.				0		53.64	395.24
982+20.06				0		19.47	33.93
982+45.				0		30.28	22.98
984+00.				0		46.97	221.74
984+13.47				0		5.01	12.97
984+29.47				0		76.96	24.29
984+47.49				0		71.54	49.56
986+47.49				0		52.88	460.81
988+47.49				0		86.39	515.81
990+47.49				0		108.22	720.78
990+93.82				0		85.76	166.43
991+18.82				0		26.13	51.8
991+43.82				0		71.9	45.38
992+22.46				0		24.81	140.84
992+47.49				0		63.88	41.11
993+29.69				0		90.39	234.83
993+59.69				0		54.86	80.69
993+89.69				0		114.25	93.95
994+47.49				0		132.91	264.55
996+47.49				0		100.44	864.26
998+47.49				0		91.71	711.67
1000+47.49				0		107.65	738.37
1001+51.91				0		50.57	305.95
1002+47.49				0		103.33	272.4
1003+19.72				0		58.27	216.15
1003+84.76				0		0	70.18
1004+43.29				0		86.28	93.52
1004+62.32				0		77.2	57.61
1004+72.32				0		45.58	22.74
1004+82.32				0		76.81	22.66
1005+57.22				0		66.33	198.54
1005+67.22				0		45.89	20.78
1005+77.22				0		72.54	21.93
1006+43.29				0		72.5	177.46

1008+04.				0		58.94	391.18
1008+43.29				0		107.03	120.76
1010+43.29				0		110.63	806.15
1011+04.9				0		105	246.02
1012+43.29				0		120.84	578.78
1014+43.29				0		107.37	845.22
1016+60.78				0		41.95	601.4
1017+14.26				0		65.78	106.69
1017+24.26				0		59.79	23.25
1017+34.26				0		77.79	25.48
1018+43.29				0		109.09	377.32
1019+30.62				0		82.95	310.57
1019+50.62				0		42.67	46.53
1019+70.62				0		62.24	38.86
1020+24.36				0		61.14	122.79
1022+43.29				0		125.96	758.55
1022+58.93				0		104.42	66.72
1022+73.93				0		67.35	47.71
1022+88.93				0		95.83	45.33
1023+53.18				0		69.28	196.45
1024+43.29				0		40.53	183.24
1026+43.29				0		82.64	456.19
1027+46.8				0		49.58	253.45
1028+43.29				0		90.86	250.95
1028+52.37				0		89.38	30.31
1029+50.26				0		82.43	311.45
1030+43.29				0		139.29	381.97
1032+43.29				0		182.97	1193.56
1032+96.76				0		183.63	363
1033+06.76				0		169.4	65.38
1033+16.76				0		180.08	64.72
1034+32.72				0		174.09	760.55
1034+52.72				0		132.49	113.55
1034+72.72				0		174.08	113.54
1035+24.74				0		145.65	308.01
1036+62.05				0		195.77	868.16
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**40,930.80**

Reach 4 -- East Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
652+00.							
653+97.71				0		138.69	507.79
655+97.71				0		112.96	932.04
657+97.91				0		136.14	1507.4
659+97.71				0		136.98	1010.54
661+97.71				0		117.54	942.67
663+29.57				0		117.02	572.76
664+00.				0		101.41	284.89
666+00.				0		84.46	688.41
668+00.				0		37.13	450.33
670+00.				0		27.86	240.7
672+00.				0		108.6	505.41
672+81.52				0		120.88	346.43
673+55.89				0		1.85	169.03
674+00.				0		89.01	74.22
676+00.				0		132.19	819.26
678+00.				0		104.13	875.26
680+00.				0		73.51	657.93
682+00.				0		59.53	492.74
684+00.				0		37.18	358.19
686+00.				0		52.24	331.19
686+48.74				0		73.13	113.16
688+00.				0		67.58	394.14
690+00.				0		35.85	383.07
692+00.				0		64.45	371.48
694+00.				0		85.25	554.44
696+00.				0		71.39	580.15
698+00.				0		66.89	512.15
700+00.				0		98.51	612.59
702+00.				0		97.03	724.22
704+00.				0		141.88	884.85
704+87.95				0		143.05	464.07
706+00.				0		181.85	674.17
708+00.				0		201.75	1420.74
710+00.				0		218.69	1557.19
712+00.				0		174.02	1454.48

714+00.				0		182.07	1318.85
715+22.46				0		150.83	754.94
716+00.				0		133.51	408.29
718+00.				0		46.96	668.41
720+00.				0		125.68	639.41
721+08.91				0		158.92	574
722+00.				0		143.43	510.02
724+00.				0		163.94	1138.41
725+77.71				0		171.8	1104.9
726+32.91				0		196.66	376.65
728+00.				0		167.41	1126.53
730+00.				0		162.32	1221.22
732+00.				0		163.61	1207.15
734+00.				0		176.39	1259.26
734+94.21				0		130.41	535.25
735+31.12				0		130.93	178.63
735+54.67				0		67.24	86.42
736+00.				0		99.78	140.2
738+00.				0		124.09	829.15
740+00.				0		121.86	910.93
742+00.				0		148.32	1000.67
742+72.99				0		126.98	372.11
744+23.			NOS&WB Pumping			0	352.75
792+73.			Station No. 11			0	0
748+00.				0		149.28	2696.14
749+24.3				0		69.85	504.4
750+09.4				0		144	337.01
752+00.				0		105.63	881.1
752+55.				0		147.79	258.11
752+74.7				0		170.22	116.01
752+95.				0		164.47	125.82
753+49.				0		153.89	318.36
754+00.				0		146.6	283.8
754+28.3				0		24.98	89.92
755+11.68				0		0	38.57
756+00.				0		112.18	183.48
758+00.				0		103.31	798.11
760+00.				0		100.2	753.74
762+00.				0		87.48	695.11
764+00.				0		85.33	640.04
766+00.				0		106.15	709.19
766+52.97				0		118.36	220.23
768+00.				0		122.55	655.94

769+12.93				0		0	256.29
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**48,303.78**

Reach 4 -- West Bank

Excavation and Embankment Quantities							
Station			*TOTAL Excavation (Area Ft^2)**	*TOTAL Excavation (VOL YD^3)**		*TOTAL Embankment (Area Ft^2)**	*TOTAL Embankment (VOL YD^3)**
775+00.							
775+97.25				0		159.49	287.23
776+90.92				0		181.63	591.72
778+90.92				0		188.94	1372.48
780+90.92				0		204.21	1456.11
782+90.92				0		190.87	1463.26
784+90.92				0		190.76	1413.44
785+51.19				0		131.68	359.88
786+49.35				0		126.72	469.71
787+48.55				0		162.75	531.77
788+90.92				0		143.74	808.06
790+90.51				0		148.92	1081.7
792+90.11				0		211.42	1331.92
794+66.05				0		129.98	1112.33
796+21.27				0		104.58	674.23
798+21.27				0		85.17	702.78
799+07.69				0		103.51	301.96
800+95.43				0		129.67	810.69
802+95.43				0		97.31	840.67
804+95.43				0		16.08	419.96
805+37.23				0		48.72	50.16
805+62.31				0		4.45	24.69
805+86.89				0		13.49	8.17
806+95.43				0		21.79	70.91
808+95.43				0		40.61	231.11
810+95.43				0		36.19	284.44
812+95.43				0		21.59	214
814+95.43				0		32.4	199.96
816+95.43				0		43.02	279.33
818+95.43				0		33.25	282.48
820+02.07				0		63.78	191.62
821+86.23				0		112.41	600.87
823+70.39				0		16.4	439.29
824+96.92				0		48.87	152.94
826+96.92				0		18.16	248.26
828+96.92				0		70.39	327.96

829+87.87				0		95.47	279.35
830+96.93				0		70.54	335.28
832+96.93				0		63.39	496.04
834+96.93				0		28.48	340.26
836+56.28				0		0	84.04
838+10.31				0		36.25	103.4
839+31.54				0		110.19	328.76
840+55.78				0		64	400.77
841+80.02				0		51.83	266.49
842+96.49				0		53.64	227.48
844+12.96				0		19.47	157.69
845+24.28				0		30.28	102.56
846+63.37				0		46.97	198.98
848+02.46				0		5.01	133.89
849+07.88				0		76.96	160.02
850+13.3				0		71.54	289.9
851+89.3				0		52.88	405.52
853+77.24				0		86.39	484.71
855+00.84				0		108.22	445.44
856+24.45				0		85.76	444.03
857+42.93				0		26.13	245.49
859+40.36				0		71.9	358.41
861+41.7				0		24.81	360.59
863+43.03				0		63.88	330.67
865+43.03				0		90.39	571.37
867+43.03				0		54.86	537.96
869+43.04				0		114.25	626.36
869+76.36				0		132.91	152.51
869+94.36				0		100.44	77.78
870+81.1				0		91.71	308.65
871+27.06				0		107.65	169.68
871+67.82				0		50.57	119.43
871+89.72				0		103.33	62.41
873+10.72				0		58.27	362.1
874+63.63			NOS&WB Pumping			0	165
880+50.1			Station No. 13			0	0
882+49.46				0		0	1012.97
883+20.52				0		86.28	113.54
883+42.82				0		77.2	67.51
883+70.47				0		45.58	62.87
883+89.82				0		76.81	43.86
884+78.03				0		66.33	233.82
885+86.23				0		45.89	224.86

887+09.				0		72.54	269.25
889+09.				0		72.5	537.19
891+09.				0		58.94	486.81
893+09.				0		159.49	809
895+09.				0		181.63	1263.41
897+09.				0		188.94	1372.48
TOTAL			**Cut (C.Y.)**	**0**		**Fill (C.Y.)**	**36,266.68**