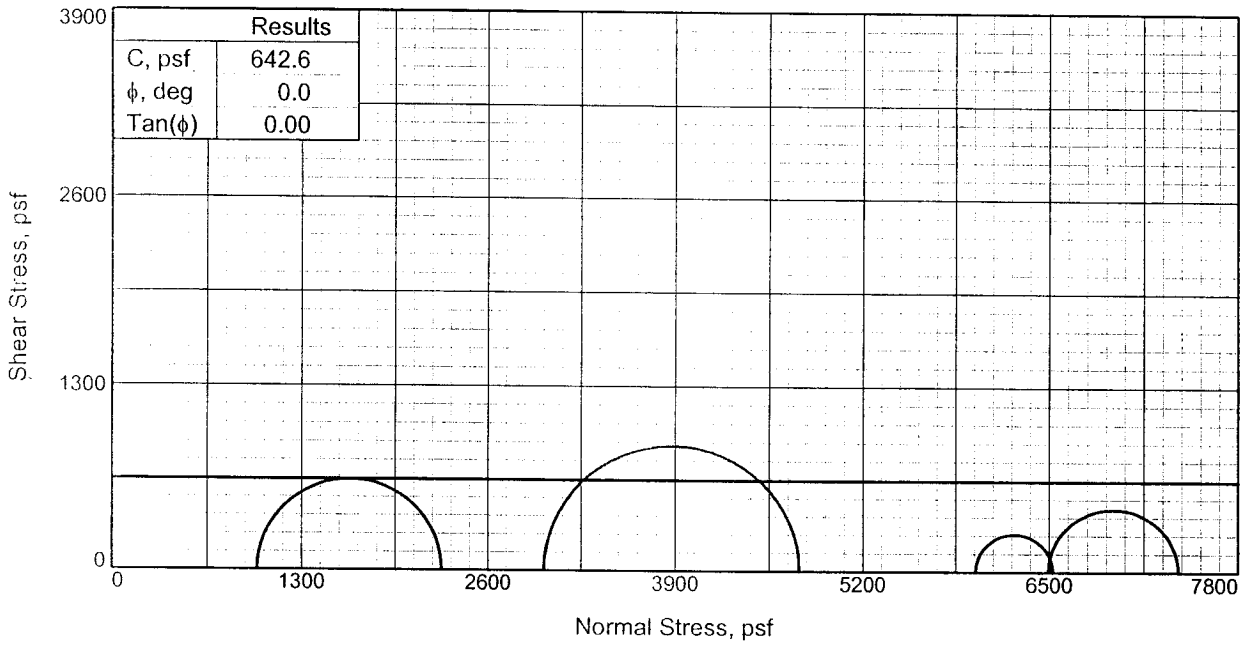
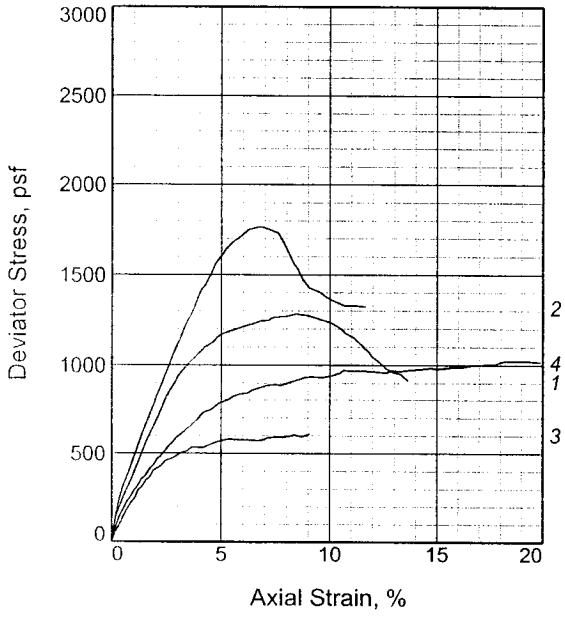




Specimen No.		1	2	3	4
Initial	Water Content,	41.3	41.6	49.3	47.7
	Dry Density, pcf	77.7	77.0	68.7	73.8
	Saturation,	95.4	94.3	91.6	100.4
	Void Ratio	1.1696	1.1902	1.4540	1.2827
	Diameter, in.	1.388	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930	2.930
At Test	Water Content,	43.3	44.1	53.2	47.4
	Dry Density, pcf	77.7	77.0	69.2	74.0
	Saturation,	100.0	100.0	100.0	100.0
	Void Ratio	1.1690	1.1902	1.4364	1.2790
	Diameter, in.	1.388	1.388	1.385	1.387
	Height, in.	2.930	2.930	2.923	2.928
Strain rate, in./min.		0.031	0.030	0.001	0.030
Back Pressure, psf		0.0	0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4	6494.4
Fail. Stress, psf		1281.5	1765.9	534.3	890.8
Ult. Stress, psf		912.3	1319.7	608.6	1015.4
σ_1 Failure, psf		2275.1	4761.1	6524.7	7385.2
σ_3 Failure, psf		993.6	2995.2	5990.4	6494.4

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTUTRBED
Description: M GR CH2 W/ TR-WD

LL= 60 **PL=** 31 **PI=** 29
Assumed Specific Gravity= 2.7
Remarks: TORVANE = 0.260 TSF

Client: URS Corporation

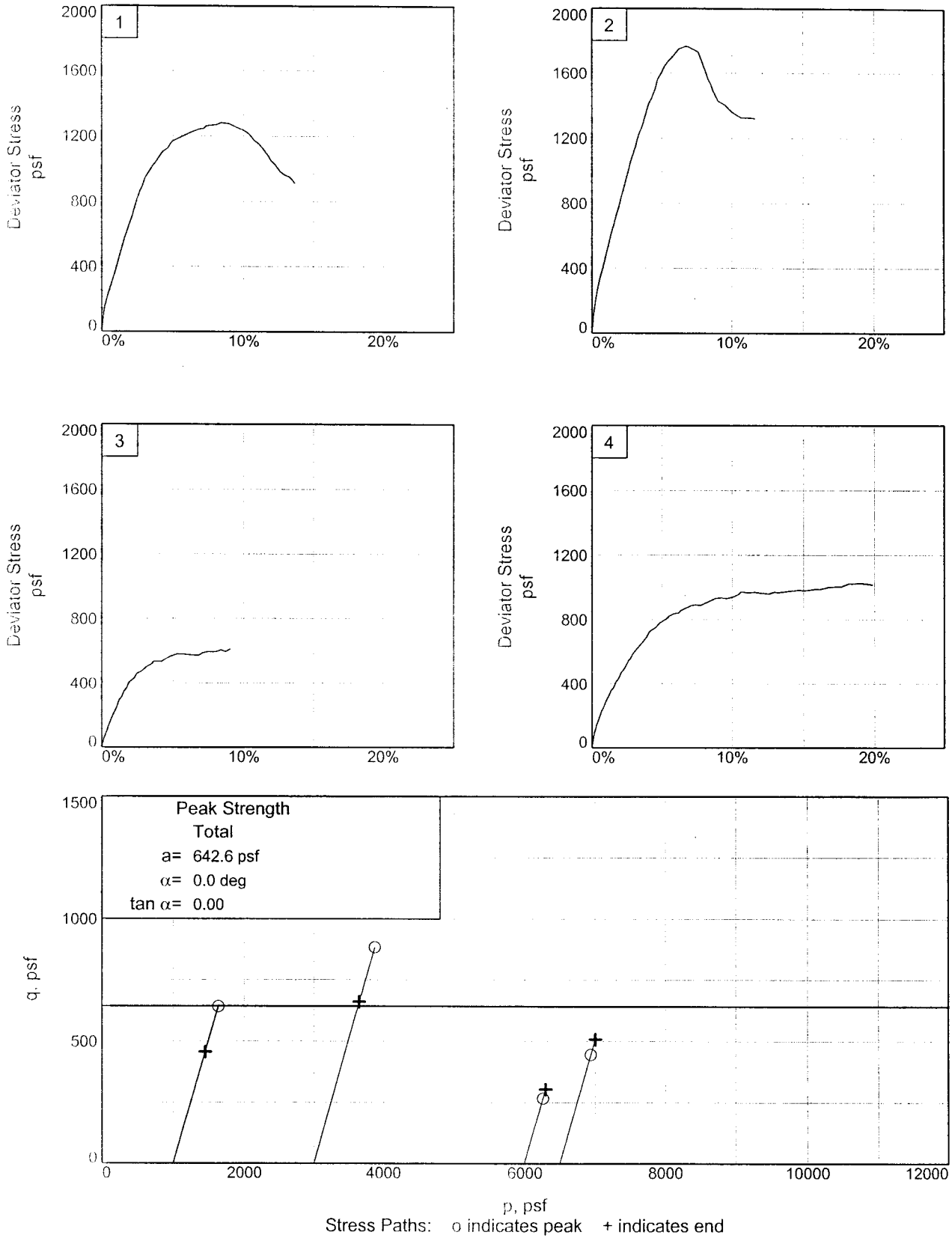
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 19.0
Sample Number: 3A
Proj. No.: 19082 **Date:** 12/01/05

TRIAXIAL SHEAR TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Figure 1

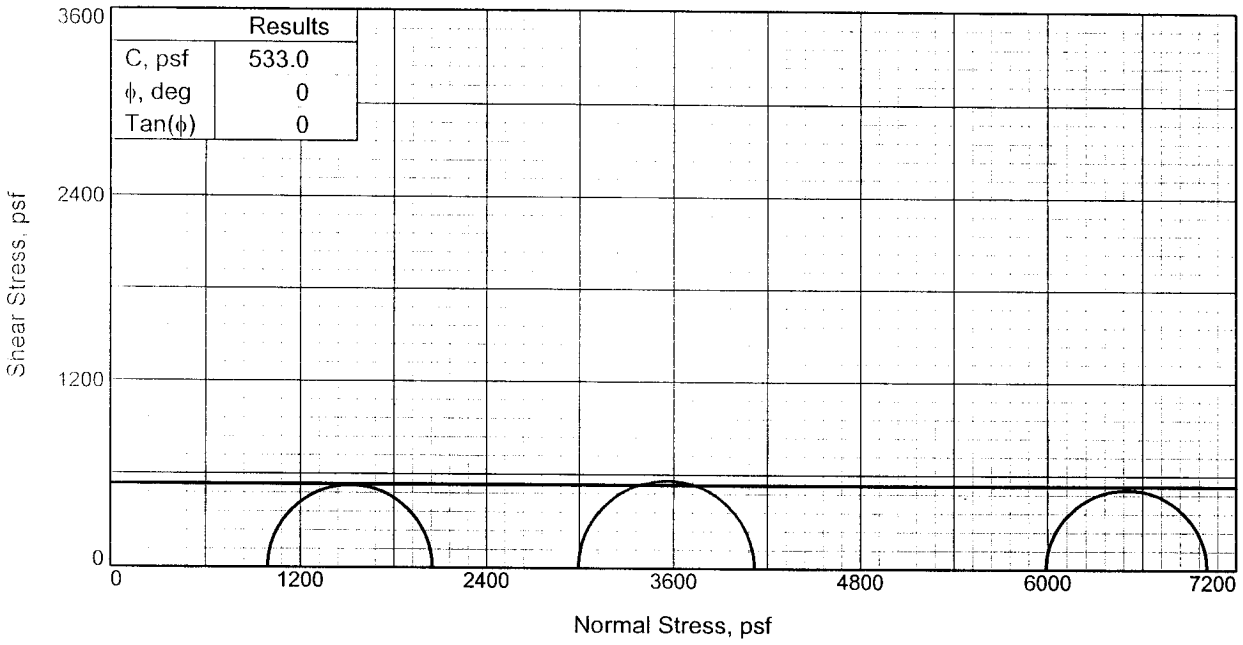
Tested By: RR **Checked By:** DP

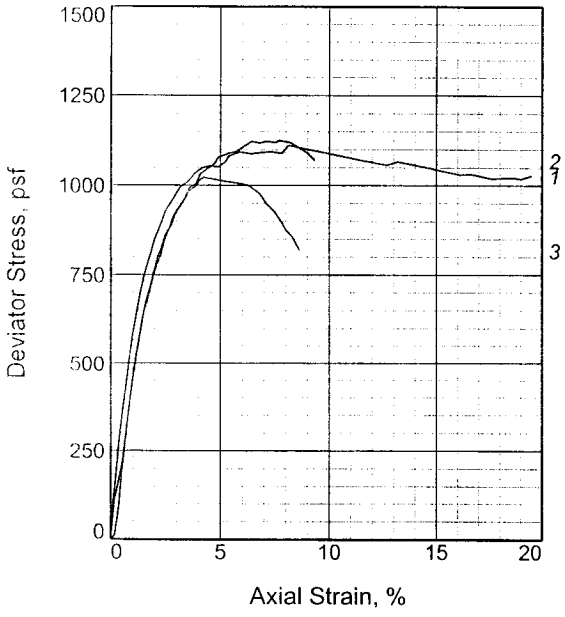


Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 19.0 **Sample Number:** 3A
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** DP





Specimen No.		1	2	3
Initial	Water Content,	59.5	63.3	62.4
	Dry Density, pcf	62.5	59.6	60.6
	Saturation,	94.3	93.1	94.1
	Void Ratio	1.7170	1.8501	1.8029
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930
At Test	Water Content,	63.1	68.0	66.1
	Dry Density, pcf	62.5	59.6	60.7
	Saturation,	100.0	100.0	100.0
	Void Ratio	1.7153	1.8501	1.7983
	Diameter, in.	1.388	1.388	1.387
	Height, in.	2.929	2.930	2.928
Strain rate, in./min.		0.029	0.031	0.029
Back Pressure, psf		0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4
Fail. Stress, psf		1054.2	1121.8	1021.8
Ult. Stress, psf		1027.0	1069.9	818.2
σ_1 Failure, psf		2047.8	4117.0	7012.2
σ_3 Failure, psf		993.6	2995.2	5990.4

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: M GR CH4 W/ LNS ML, TR-WD

LL= 92 **PL=** 28 **PI=** 64
Assumed Specific Gravity= 2.72
Remarks: TORAVNE = 0.240 TSF

Client: URS Corporation

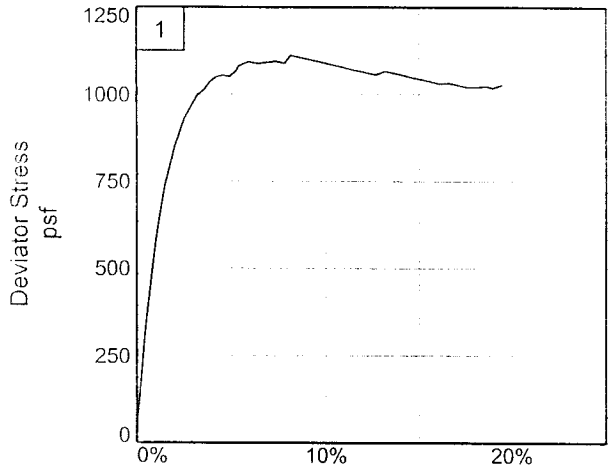
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 21.8
Sample Number: 4B
Proj. No.: 19082 **Date:** 12/01/05

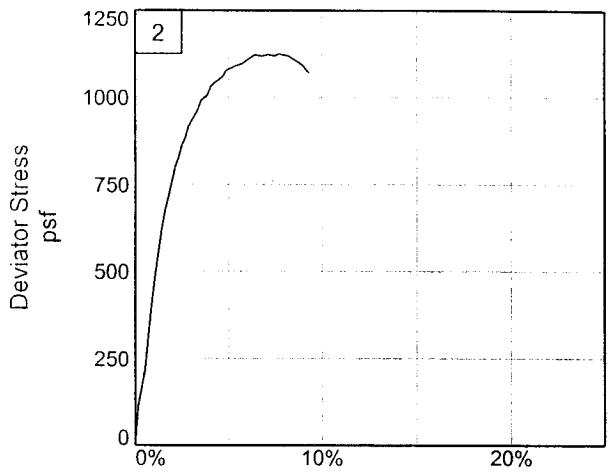
TRIAXIAL SHEAR TEST REPORT

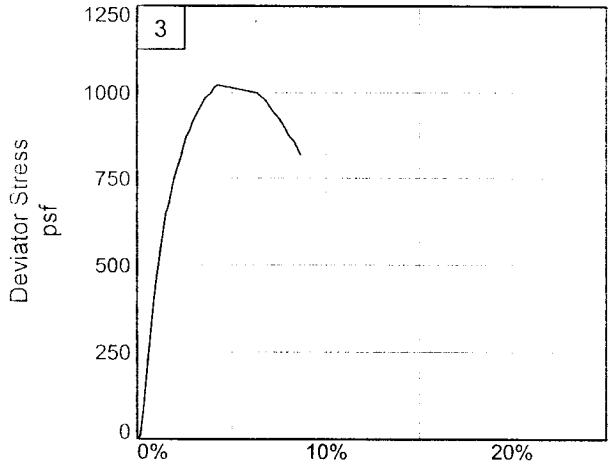
EUSTIS ENGINEERING COMPANY, INC.

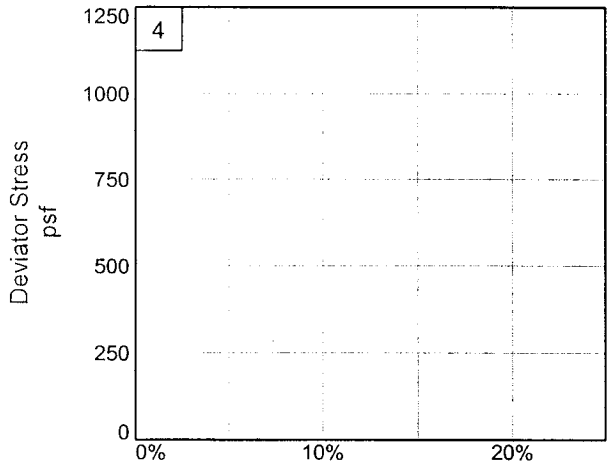
Figure 1

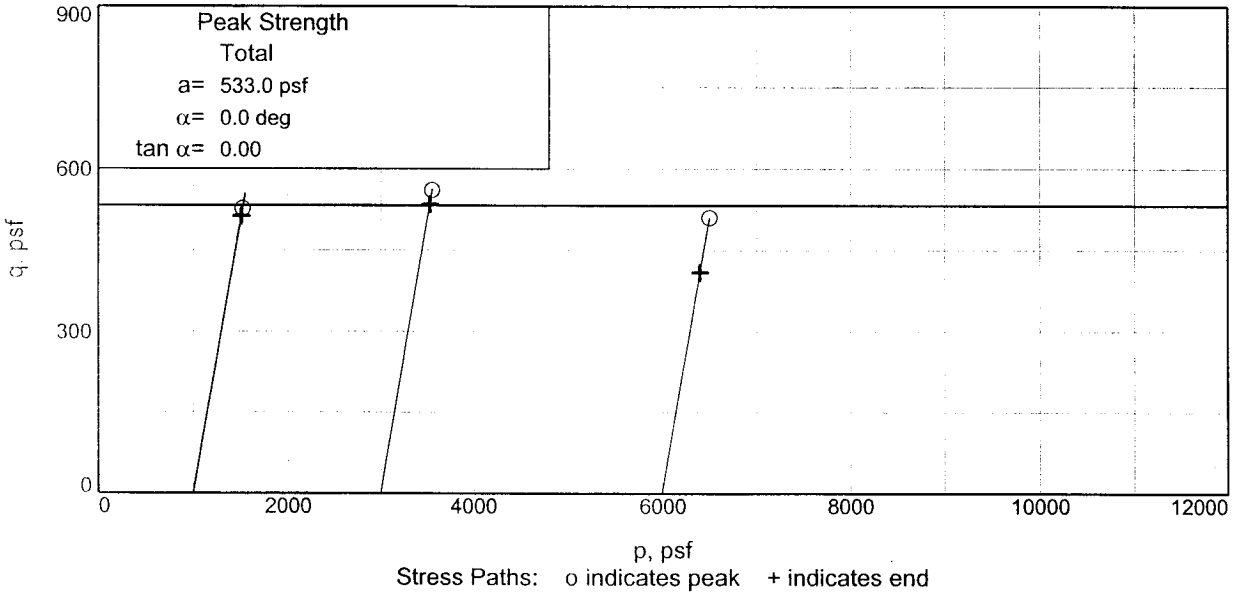
Tested By: RR **Checked By:** DP







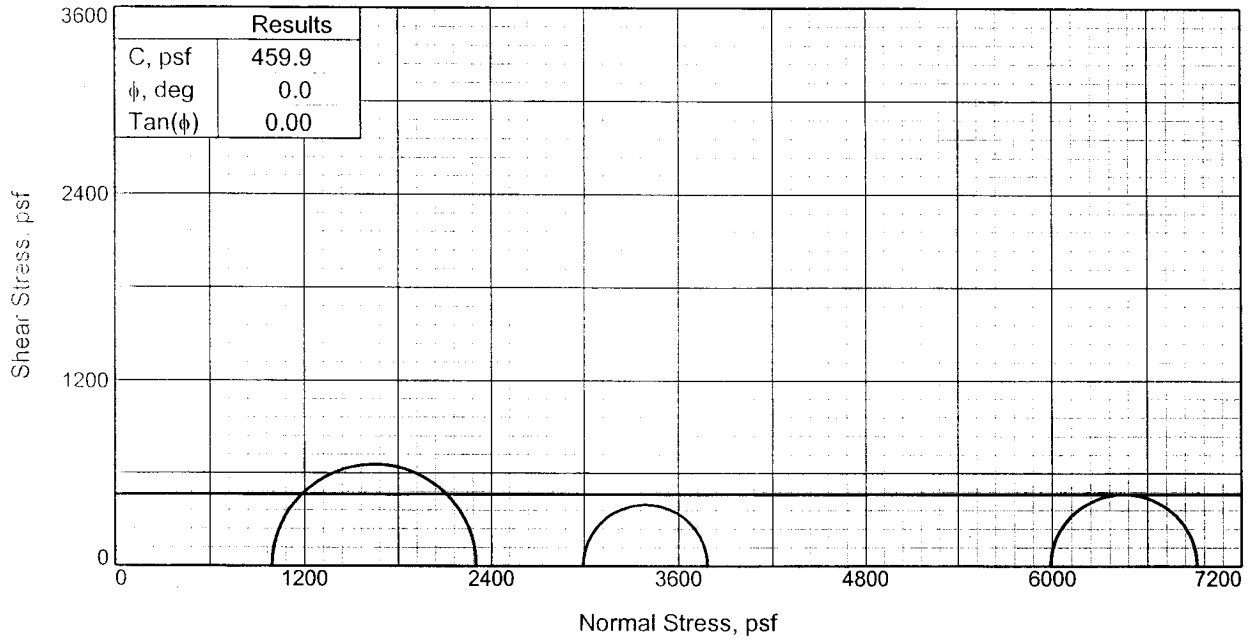


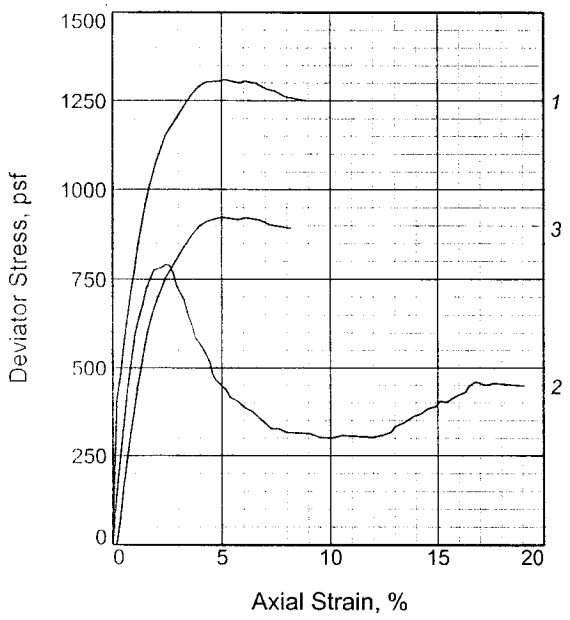


Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 21.8 **Sample Number:** 4B
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** DP





Specimen No.		1	2	3
Initial	Water Content,	72.7	80.4	80.8
	Dry Density, pcf	55.2	50.6	50.8
	Saturation,	95.3	92.7	93.8
	Void Ratio	2.0748	2.3588	2.3436
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930
At Test	Water Content,	76.2	86.6	86.0
	Dry Density, pcf	55.3	50.6	50.9
	Saturation,	100.0	100.0	100.0
	Void Ratio	2.0726	2.3547	2.3382
	Diameter, in.	1.388	1.387	1.387
	Height, in.	2.929	2.929	2.928
Strain rate, in./min.		0.001	0.030	0.029
Back Pressure, psf		0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4
Fail. Stress, psf		1309.2	789.9	923.0
Ult. Stress, psf		1248.8	446.9	892.0
σ_1 Failure, psf		2302.8	3785.1	6913.4
σ_3 Failure, psf		993.6	2995.2	5990.4

Type of Test:
Unconsolidated Undrained
Sample Type: Undisturbed
Description: SO Gr CH4 w/ wd, ars ML, SL

LL= 121 **PL=** 43 **PI=** 78
Assumed Specific Gravity= 2.72
Remarks: Torvane = 0.250 tsf

Client: URS Corporation

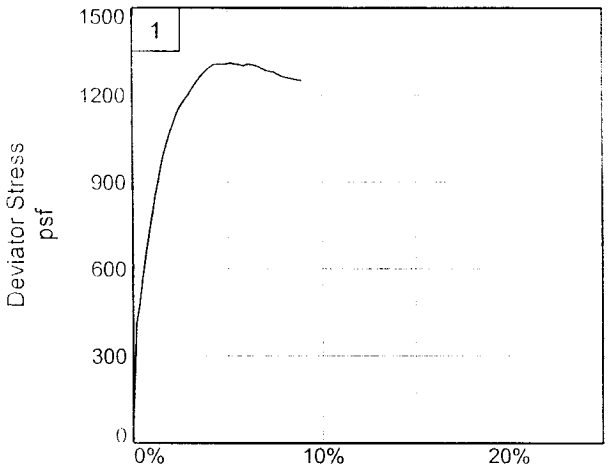
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 23.8
Sample Number: 5B
Proj. No.: 19082 **Date:** 12-1-05

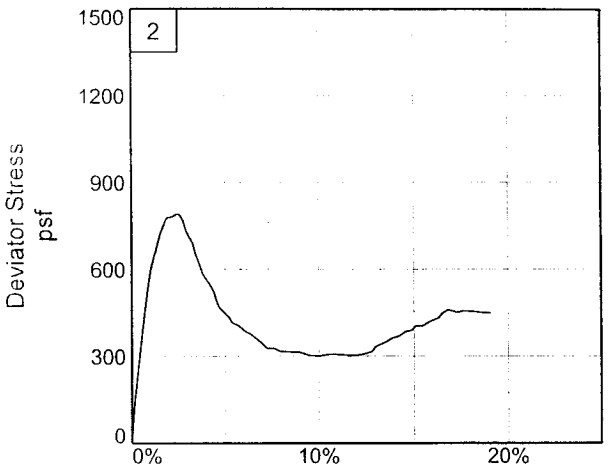
TRIAXIAL SHEAR TEST REPORT

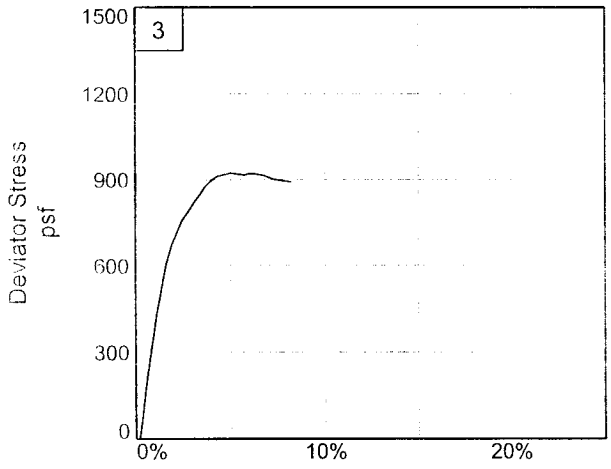
EUSTIS ENGINEERING COMPANY, INC.

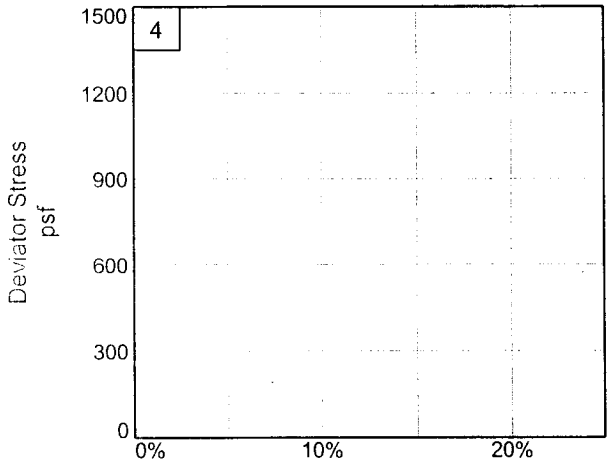
Figure 1

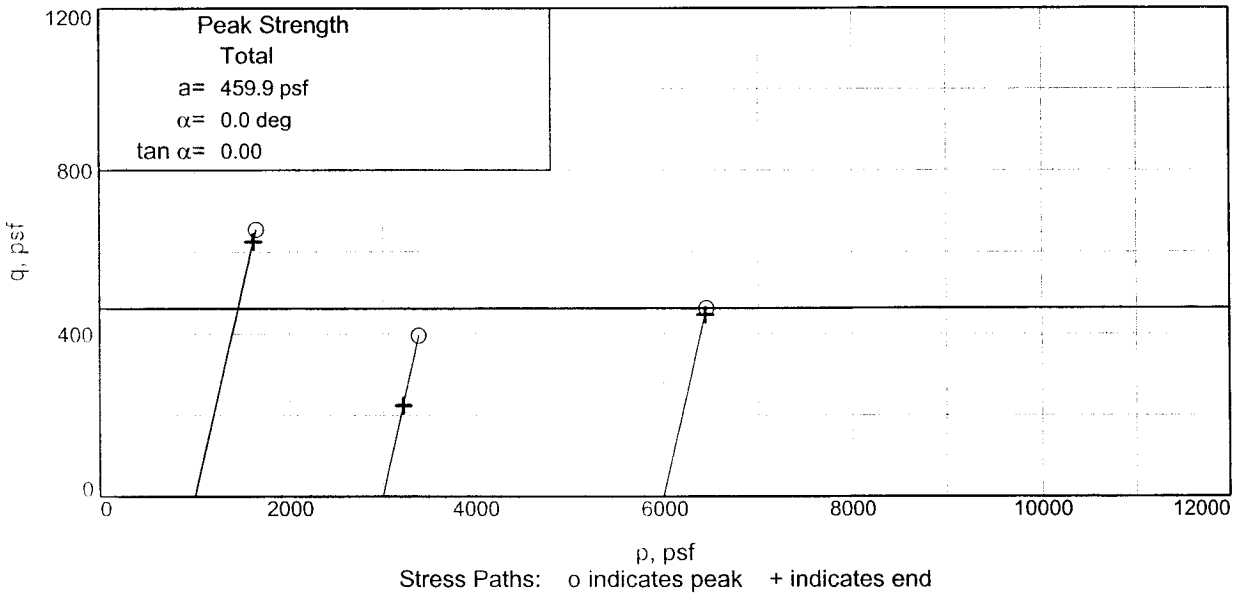
Tested By: RR **Checked By:** JS









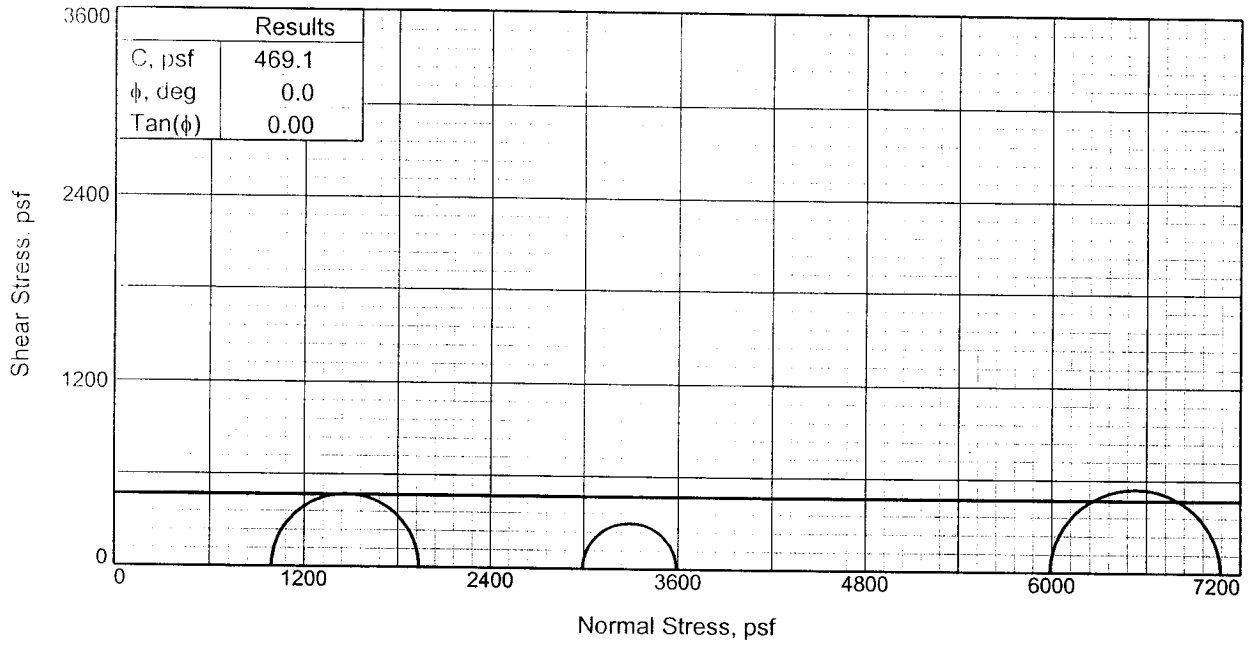


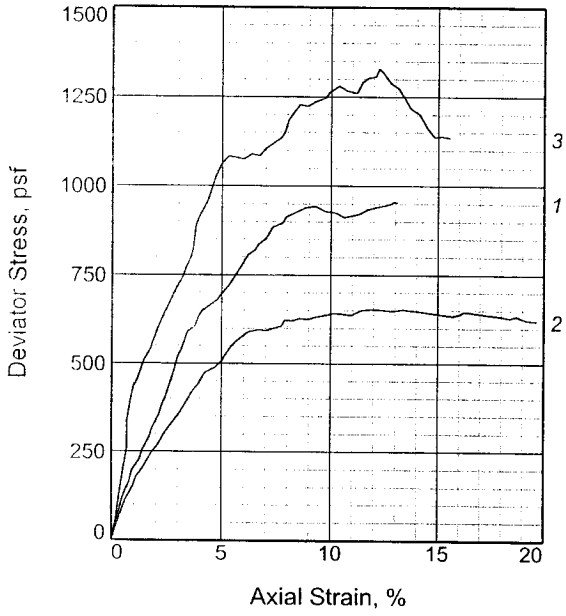
Stress Paths: o indicates peak + indicates end

Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 23.8 **Sample Number:** 5B
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** JS





Specimen No.		1	2	3
Initial	Water Content,	263.2	278.4	317.4
	Dry Density, pcf	17.6	16.7	15.8
	Saturation,	83.9	83.9	89.5
	Void Ratio	7.6827	8.1333	8.6863
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930
At Test	Water Content,	312.7	332.0	354.1
	Dry Density, pcf	17.7	16.7	15.8
	Saturation,	100.0	100.0	100.0
	Void Ratio	7.6623	8.1333	8.6744
	Diameter, in.	1.387	1.388	1.387
	Height, in.	2.928	2.930	2.929
Strain rate, in./min.		0.028	0.029	0.029
Back Pressure, psf		0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4
Fail. Stress, psf		942.6	594.9	1082.5
Ult. Stress, psf		952.6	619.3	1134.0
σ_1 Failure, psf		1936.2	3590.1	7072.9
σ_3 Failure, psf		993.6	2995.2	5990.4

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: SO DGR & GR PT W/ WD, RT

LL= 209 PL= 45 **PI=** 164
Assumed Specific Gravity= 2.45
Remarks:

Client: URS Corporation

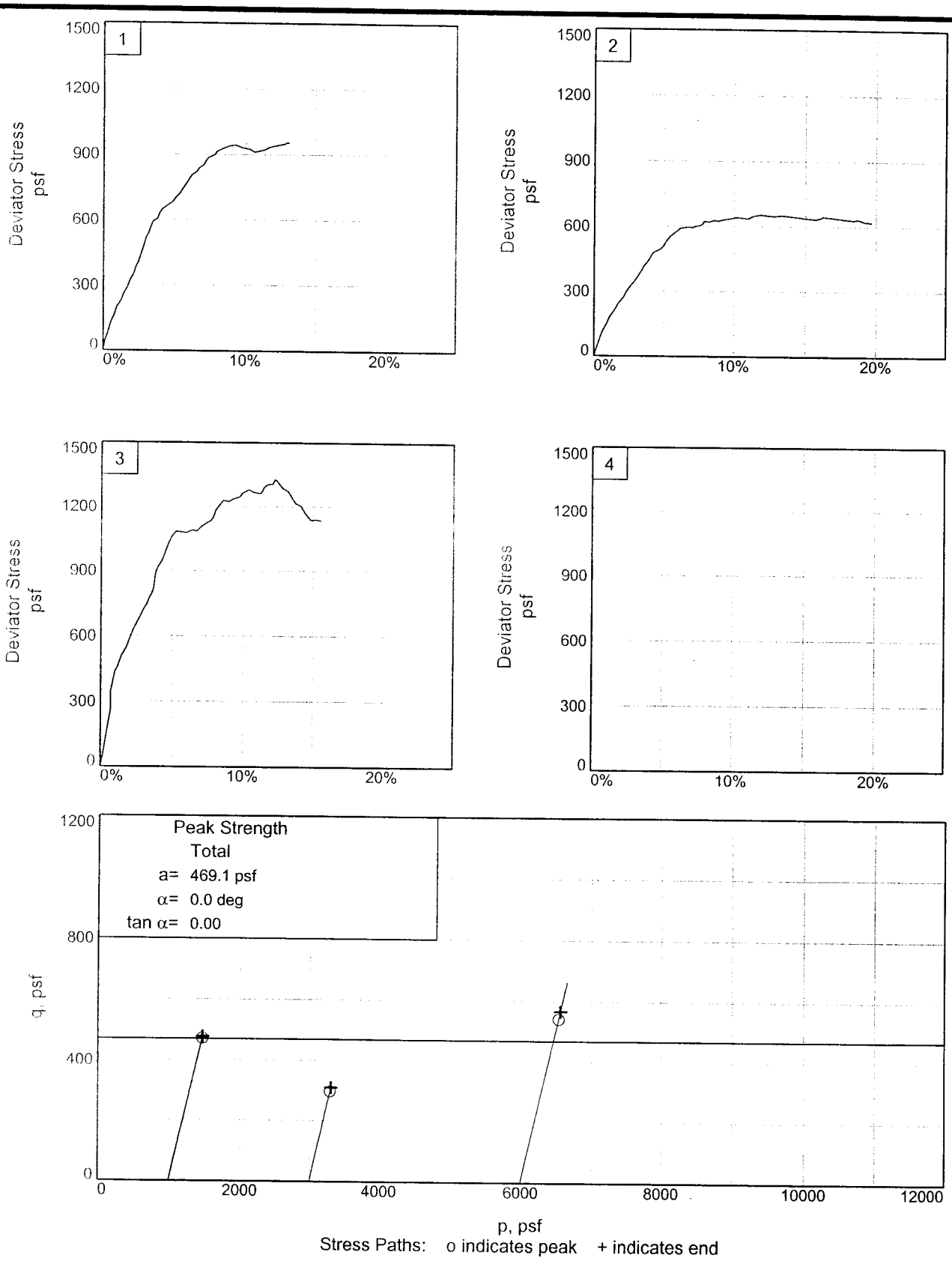
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 28.7
Sample Number: 6C
Proj. No.: 19082 **Date:** 12-8-05

TRIAXIAL SHEAR TEST REPORT

EUSTIS ENGINEERING COMPANY, INC.

Figure 1

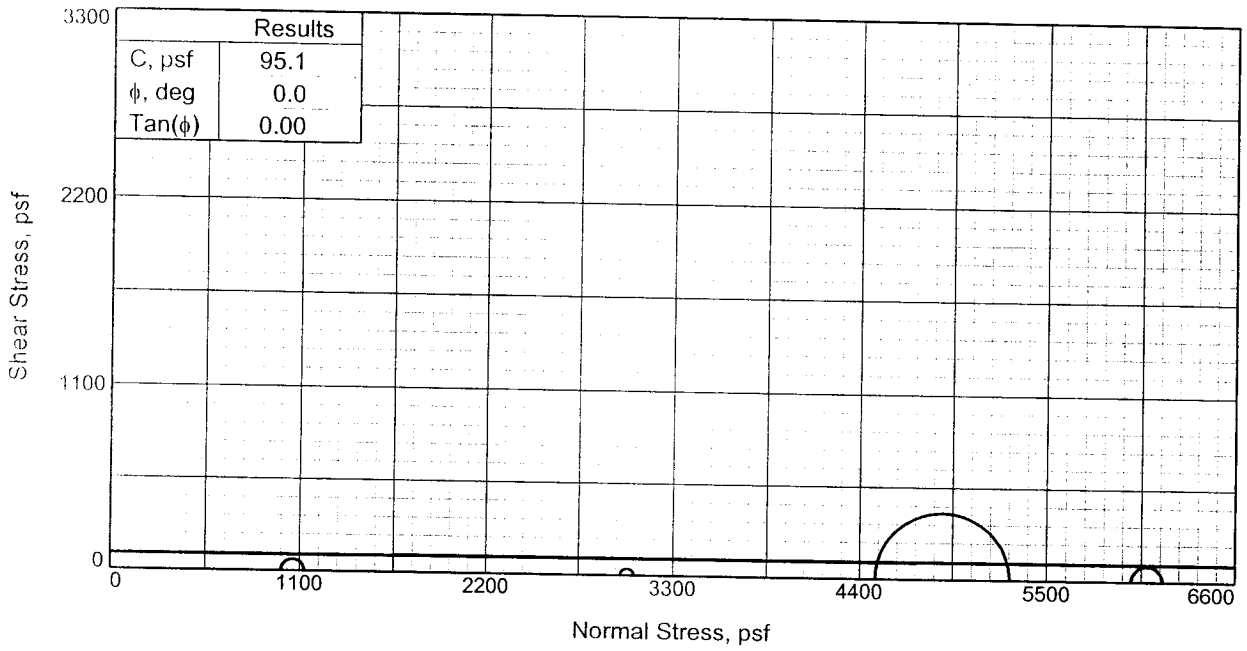
Tested By: RR **Checked By:** JS

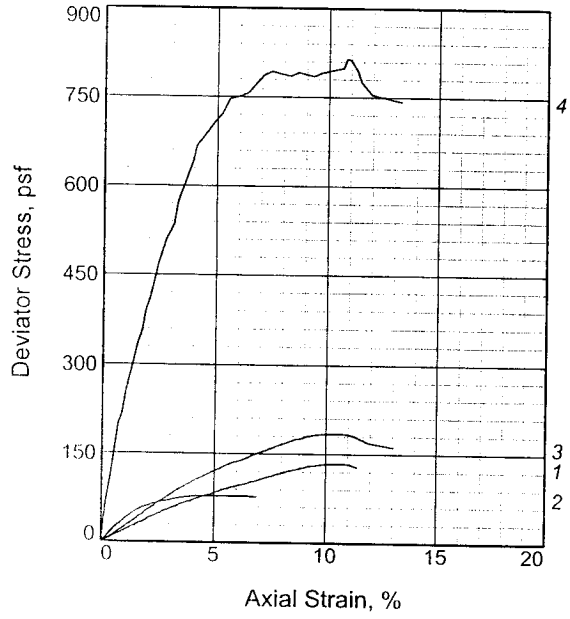


Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 28.7 **Sample Number:** 6C
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** JS





Specimen No.		1	2	3	4
Initial	Water Content,	296.1	295.9	278.5	289.6
	Dry Density, pcf	15.8	16.3	17.3	16.9
	Saturation,	83.5	86.5	87.2	88.3
	Void Ratio	8.6891	8.3840	7.8248	8.0330
	Diameter, in.	1.388	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930	2.930
At Test	Water Content,	354.3	342.0	319.0	327.9
	Dry Density, pcf	15.8	16.3	17.3	16.9
	Saturation,	100.0	100.0	100.0	100.0
	Void Ratio	8.6802	8.3782	7.8158	8.0330
	Diameter, in.	1.388	1.388	1.388	1.388
	Height, in.	2.929	2.929	2.929	2.930
Strain rate, in./min.		0.030	0.001	0.029	0.030
Back Pressure, psf		0.0	0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4	4492.8
Fail. Stress, psf		133.7	78.4	183.6	792.9
Ult. Stress, psf		127.3	77.1	161.4	742.6
σ_1 Failure, psf		1127.3	3073.6	6174.0	5285.7
σ_3 Failure, psf		993.6	2995.2	5990.4	4492.8

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: VSO DGR & BR PT W/ WD, RT

LL= 459 **PL=** 144 **PI=** 315
Assumed Specific Gravity= 2.45
Remarks: TORVANE = 0.350 TSF

Client: URS Corporation

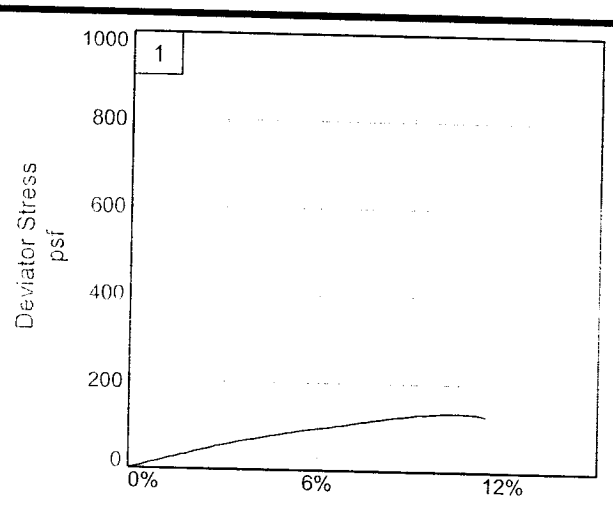
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 29.8
Sample Number: 7B
Proj. No.: 19082 **Date:** 12-1-05

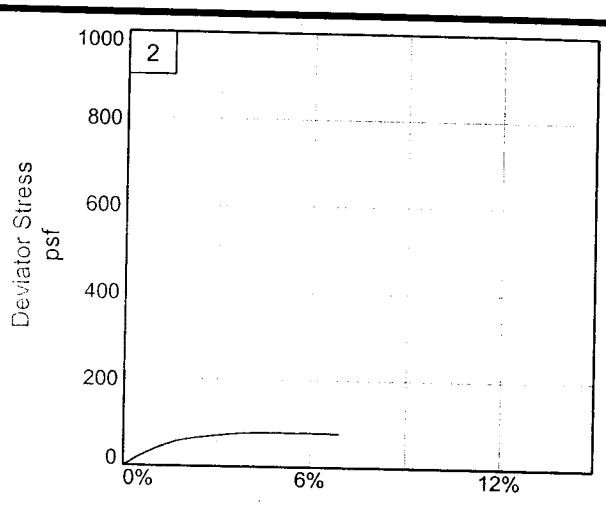
TRIAXIAL SHEAR TEST REPORT

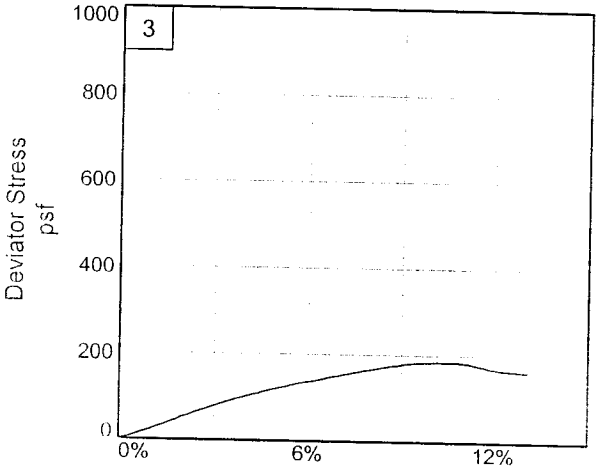
EUSTIS ENGINEERING COMPANY, INC.

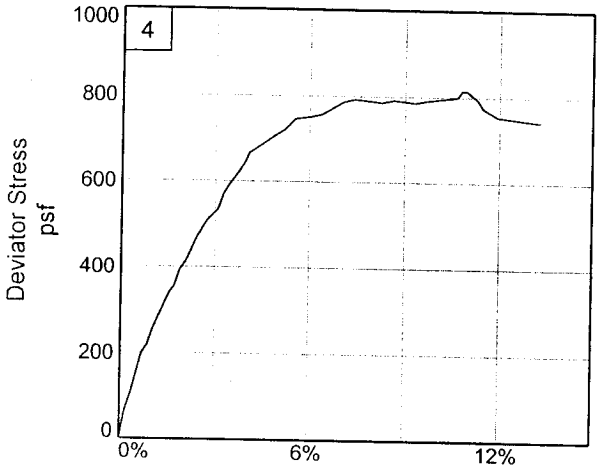
Figure 1

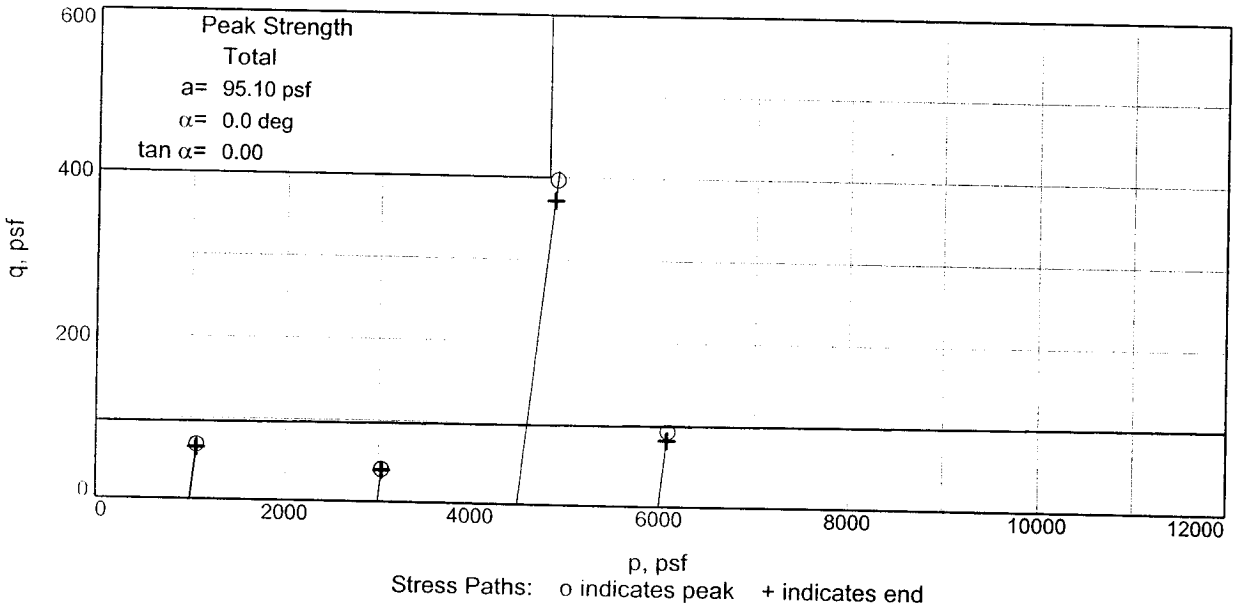
Tested By: RR **Checked By:** JS











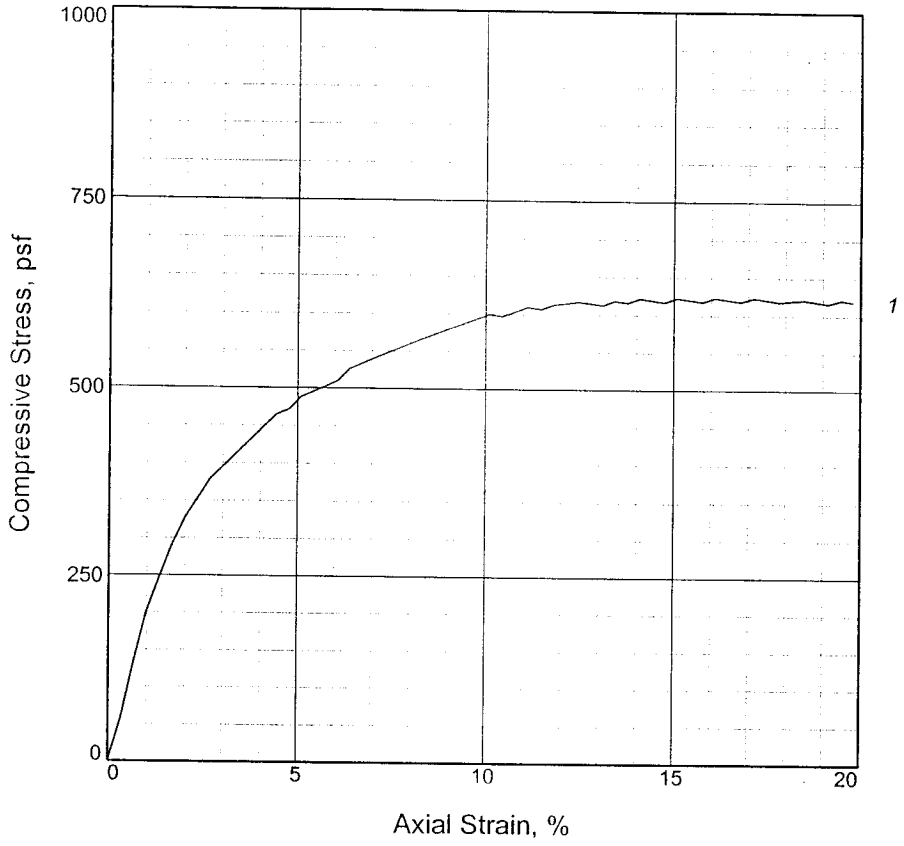
Stress Paths: o indicates peak + indicates end

Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 29.8 **Sample Number:** 7B
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** JS

UNCONFINED COMPRESSION TEST



Specimen No.	1			
Unconfined strength, psf	598.9			
Undrained shear strength, psf	299.5			
Failure strain, %	10.1			
Strain rate, in./min.	0.058			
Water content, %	49.7			
Wet density, pcf	104.6			
Dry density, pcf	69.8			
Saturation, %	94.5			
Void ratio	1.4310			
Specimen diameter, in.	1.388			
Specimen height, in.	2.930			
Height/diameter ratio	2.11			

Description: SO GR CH3 W/ LNS ML, TR-RT

LL =	PL =	PI =	Assumed GS= 2.72	Type: UNDISTURBED

Project No.: 19082
Date: 11/02/05

Remarks:
TORVANE = 0.160 TSF

Client: URS Corporation

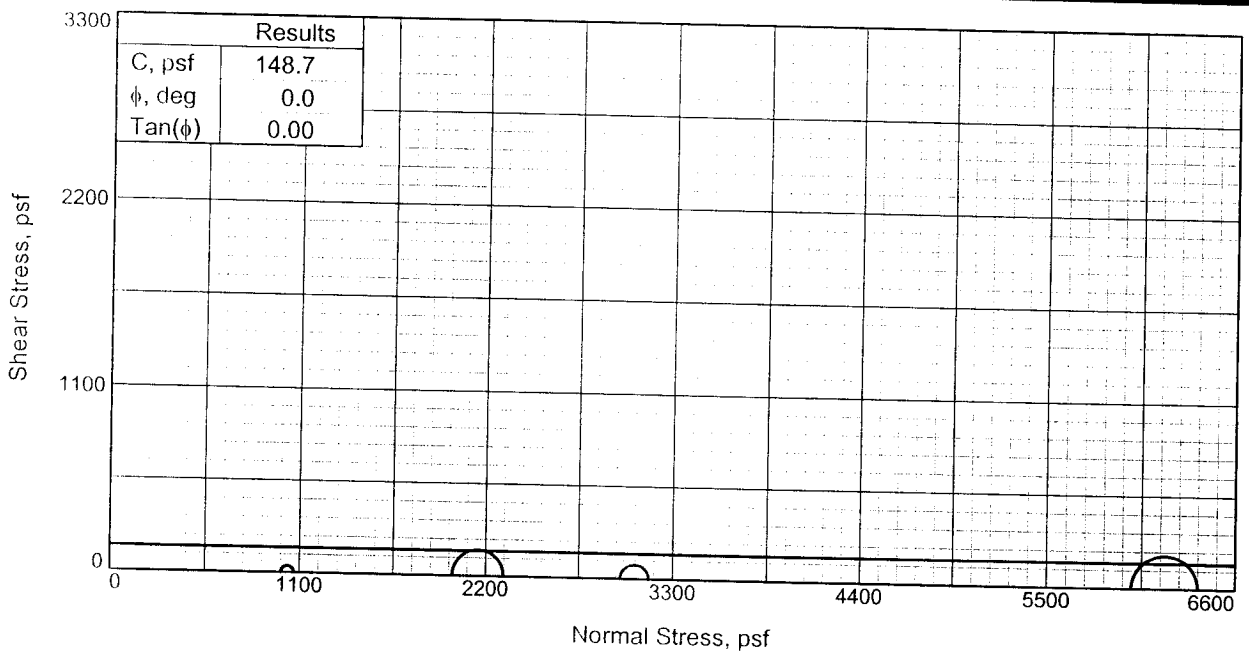
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 31.8
Sample Number: 8B

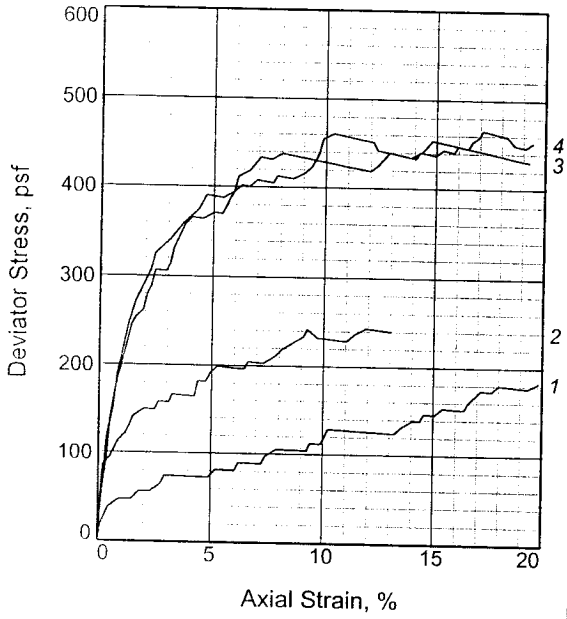
UNCONFINED COMPRESSION TEST

EUSTIS ENGINEERING COMPANY, INC.

Figure 1

Tested By: ZH **Checked By:** DP





Specimen No.		1	2	3	4
Initial	Water Content,	61.6	50.8	57.9	56.0
	Dry Density, pcf	61.8	71.9	63.4	65.3
	Saturation,	95.6	100.9	93.5	95.6
	Void Ratio	1.7657	1.3797	1.6976	1.5805
	Diameter, in.	1.388	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930	2.930
At Test	Water Content,	64.2	50.3	61.9	58.5
	Dry Density, pcf	62.0	71.9	63.4	65.4
	Saturation,	100.0	100.0	100.0	100.0
	Void Ratio	1.7595	1.3790	1.6960	1.5786
	Diameter, in.	1.387	1.388	1.388	1.388
	Height, in.	2.928	2.930	2.929	2.929
Strain rate, in./min.		0.029	0.029	0.030	0.030
Back Pressure, psf		0.0	0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4	2001.6
Fail. Stress, psf		73.6	165.7	390.2	306.5
Ult. Stress, psf		183.3	240.0	430.3	452.6
σ_1 Failure, psf		1067.2	3160.9	6380.6	2308.1
σ_3 Failure, psf		993.6	2995.2	5990.4	2001.6

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: VSO GR CH3 W/ LNS ML

LL= 71 **PL=** 23 **PI=** 48
Assumed Specific Gravity= 2.74
Remarks: TORVANE = 0.150 TSF

Client: URS Corporation

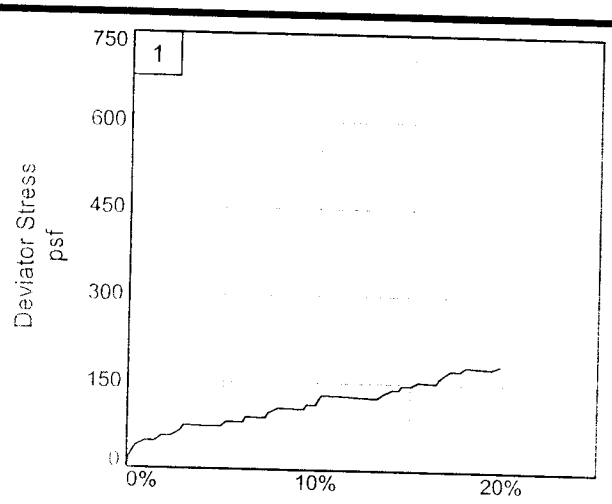
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 33.8
Sample Number: 9B
Proj. No.: 19082 **Date:** 12-1-05

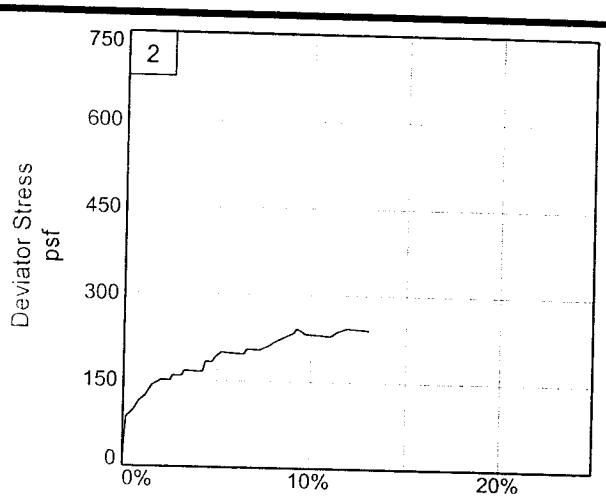
TRIAXIAL SHEAR TEST REPORT

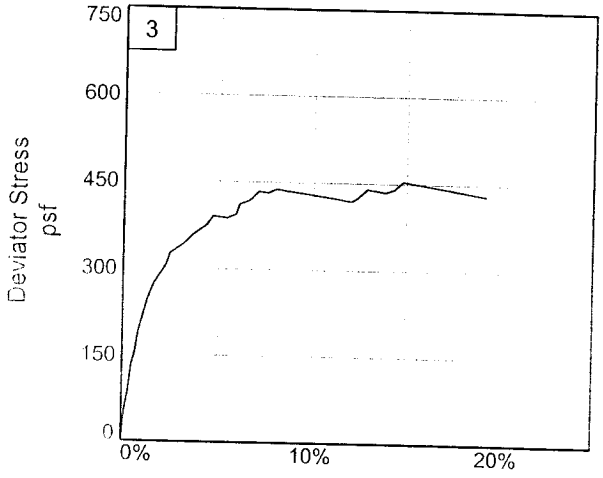
EUSTIS ENGINEERING COMPANY, INC.

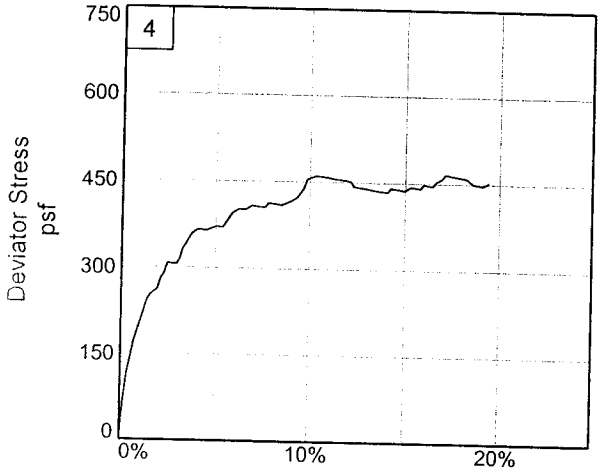
Figure 1

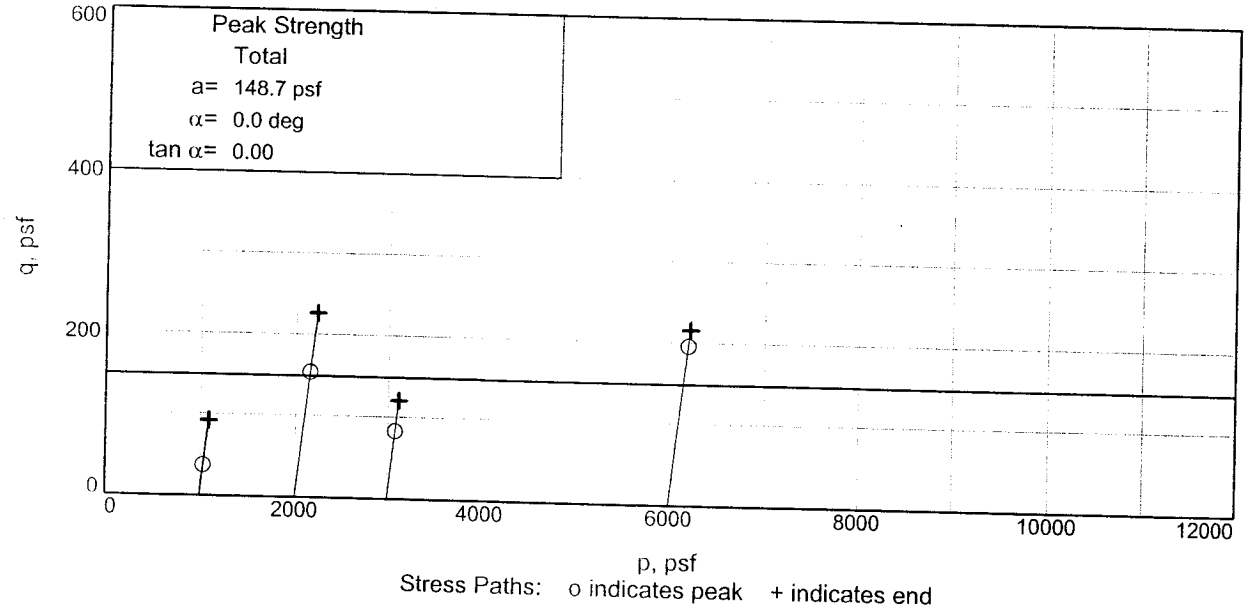
Tested By: RR **Checked By:** JS











Stress Paths: o indicates peak + indicates end

Client: URS Corporation

Project: U.S. Army Corps of Engineers

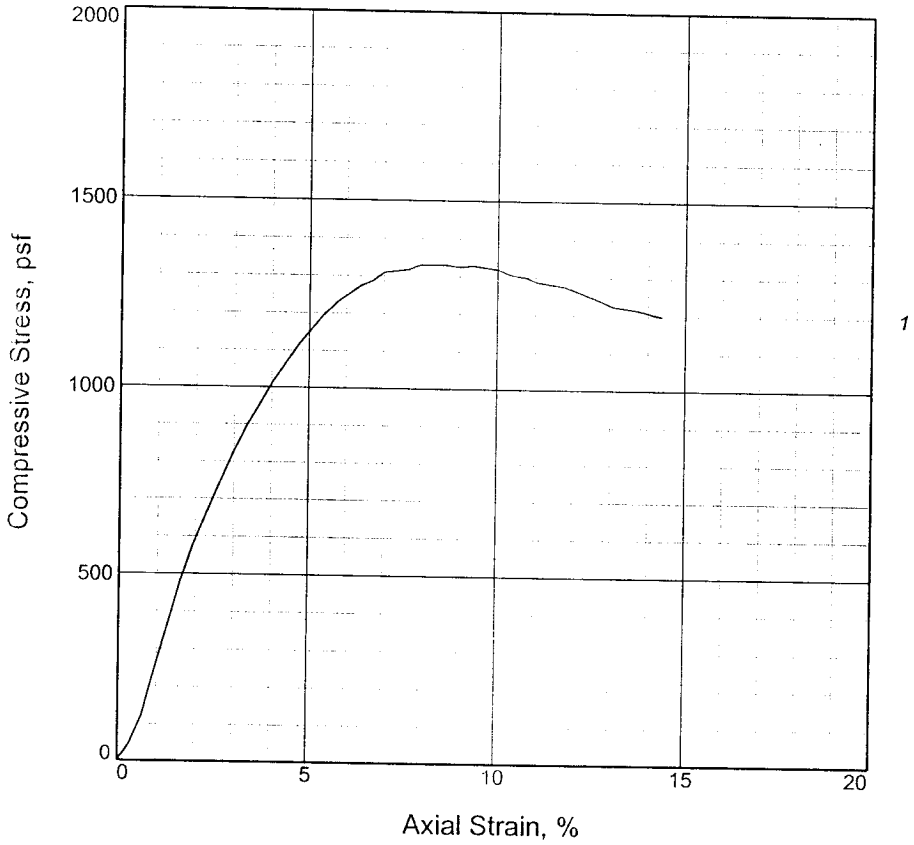
Source of Sample: IHNC-TFG-3U **Depth:** 33.8 **Sample Number:** 9B

Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** JS

UNCONFINED COMPRESSION TEST



Specimen No.	1			
Unconfined strength, psf	1331.0			
Undrained shear strength, psf	665.5			
Failure strain, %	8.0			
Strain rate, in./min.	0.059			
Water content, %	63.2			
Wet density, pcf	99.3			
Dry density, pcf	60.8			
Saturation, %	95.5			
Void ratio	1.8116			
Specimen diameter, in.	1.388			
Specimen height, in.	2.930			
Height/diameter ratio	2.11			

Description: M GR CH4 W/ SL

LL =	PL =	PI =	Assumed GS= 2.74	Type: UNDISTURBED

Project No.: 19082
Date: 12/2/05

Remarks:
TORVANE = 0.290 TSF

Client: URS Corporation

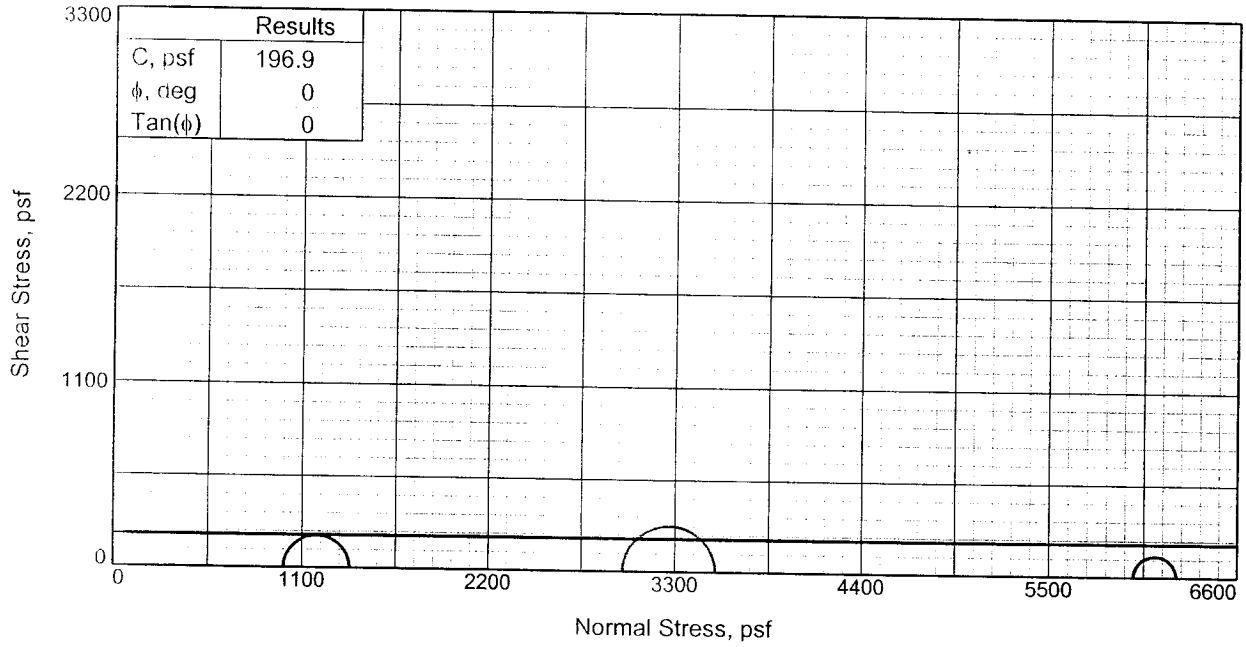
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 51.7
Sample Number: 10C

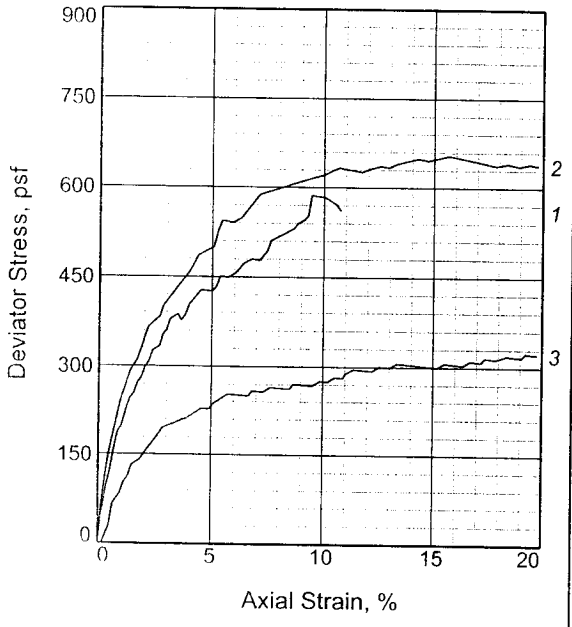
UNCONFINED COMPRESSION TEST

EUSTIS ENGINEERING COMPANY, INC.

Figure 1

Tested By: RR **Checked By:** DP





Specimen No.		1	2	3
Initial	Water Content,	65.0	66.3	60.9
	Dry Density, pcf	59.2	58.2	62.9
	Saturation,	94.6	94.1	97.3
	Void Ratio	1.8694	1.9169	1.7017
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930
At Test	Water Content,	68.6	69.4	62.2
	Dry Density, pcf	59.2	58.8	63.1
	Saturation,	100.0	100.0	100.0
	Void Ratio	1.8668	1.8889	1.6907
	Diameter, in.	1.388	1.384	1.386
	Height, in.	2.929	2.921	2.926
Strain rate, in./min.		0.030	0.029	0.029
Back Pressure, psf		0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4
Fail. Stress, psf		386.0	543.5	251.9
Ult. Stress, psf		560.8	637.9	321.6
σ_1 Failure, psf		1379.6	3538.7	6242.3
σ_3 Failure, psf		993.6	2995.2	5990.4

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: VSO GR CH4 W/ ARS SP, SIF

LL= 84 **PL=** 26 **PI=** 58
Assumed Specific Gravity= 2.72
Remarks: TORVANE = 0.060 TSF

Client: URS Corporation

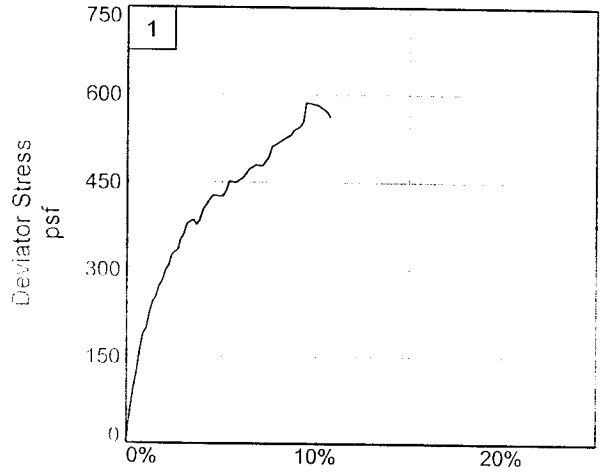
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 54.0
Sample Number: 11A
Proj. No.: 19082 **Date:** 12/01/05

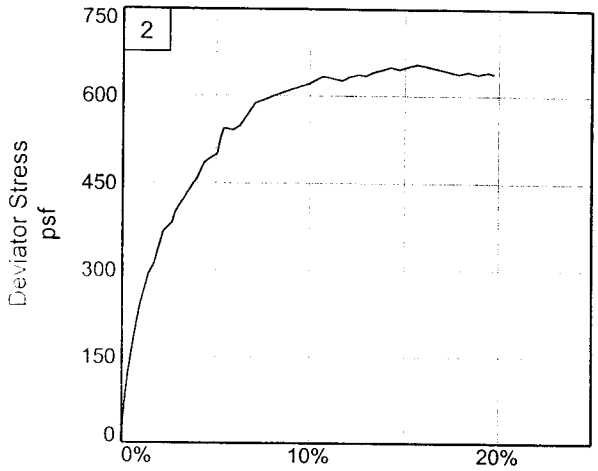
TRIAXIAL SHEAR TEST REPORT

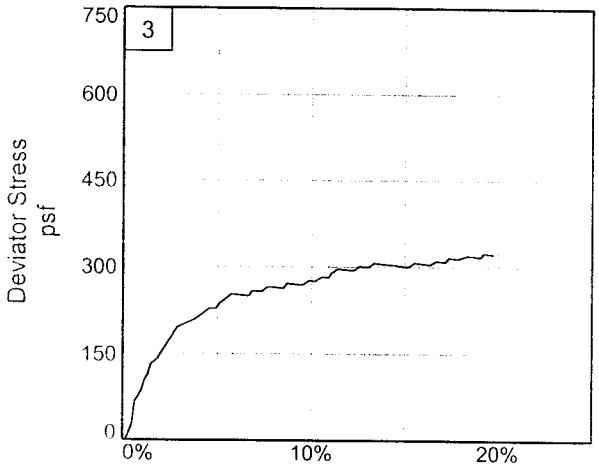
EUSTIS ENGINEERING COMPANY, INC.

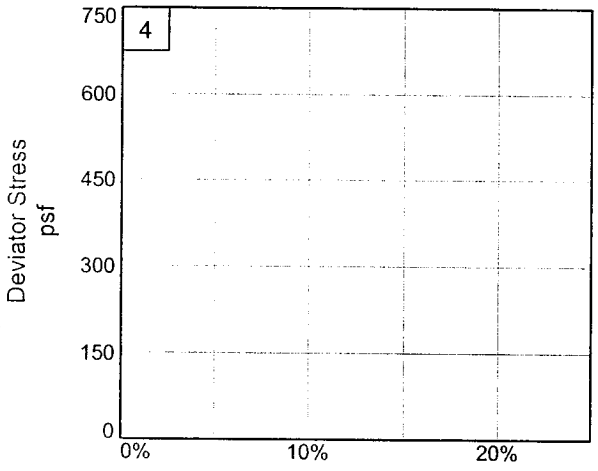
Figure 1

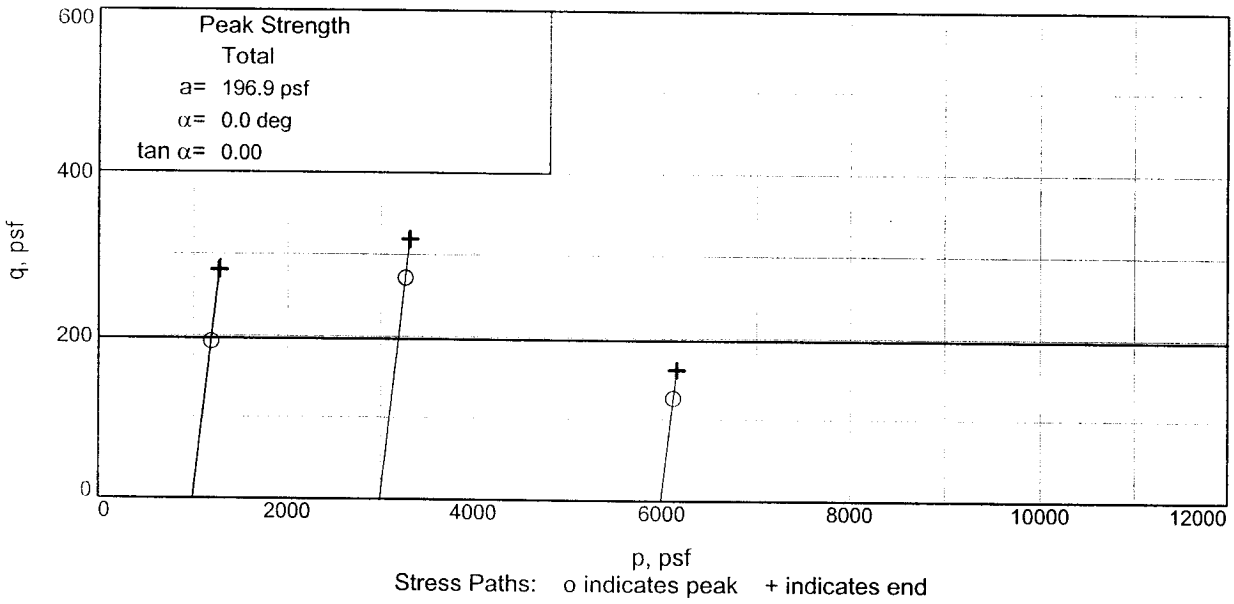
Tested By: RR **Checked By:** DP











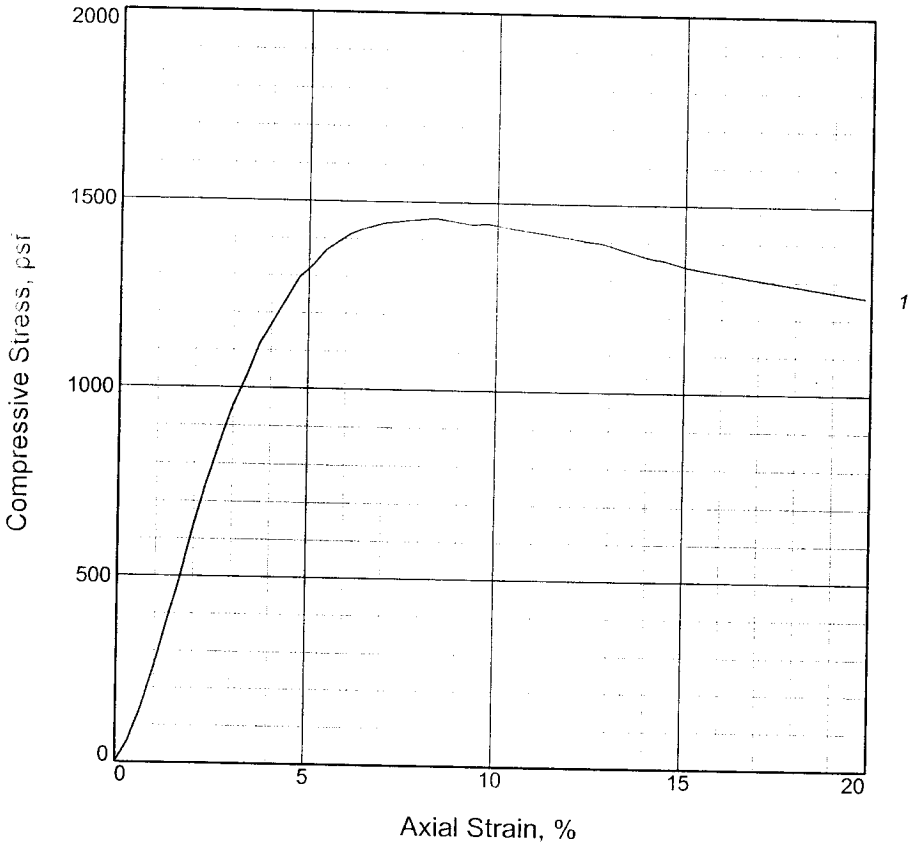
Stress Paths: o indicates peak + indicates end

Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 54.0 **Sample Number:** 11A
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** DP

UNCONFINED COMPRESSION TEST



Specimen No.	1			
Unconfined strength, psf	1456.8			
Undrained shear strength, psf	728.4			
Failure strain, %	8.3			
Strain rate, in./min.	0.059			
Water content, %	38.3			
Wet density, pcf	111.3			
Dry density, pcf	80.5			
Saturation, %	93.8			
Void ratio	1.1097			
Specimen diameter, in.	1.388			
Specimen height, in.	2.930			
Height/diameter ratio	2.11			

Description: M GR CH4 W/ SL, SIF

LL =	PL =	PI =	Assumed GS= 2.72	Type: UNDISTURBED

Project No.: 19082
Date: 12/02/05

Remarks:
TORVANE = 0.270 TSF

Client: URS Corporation

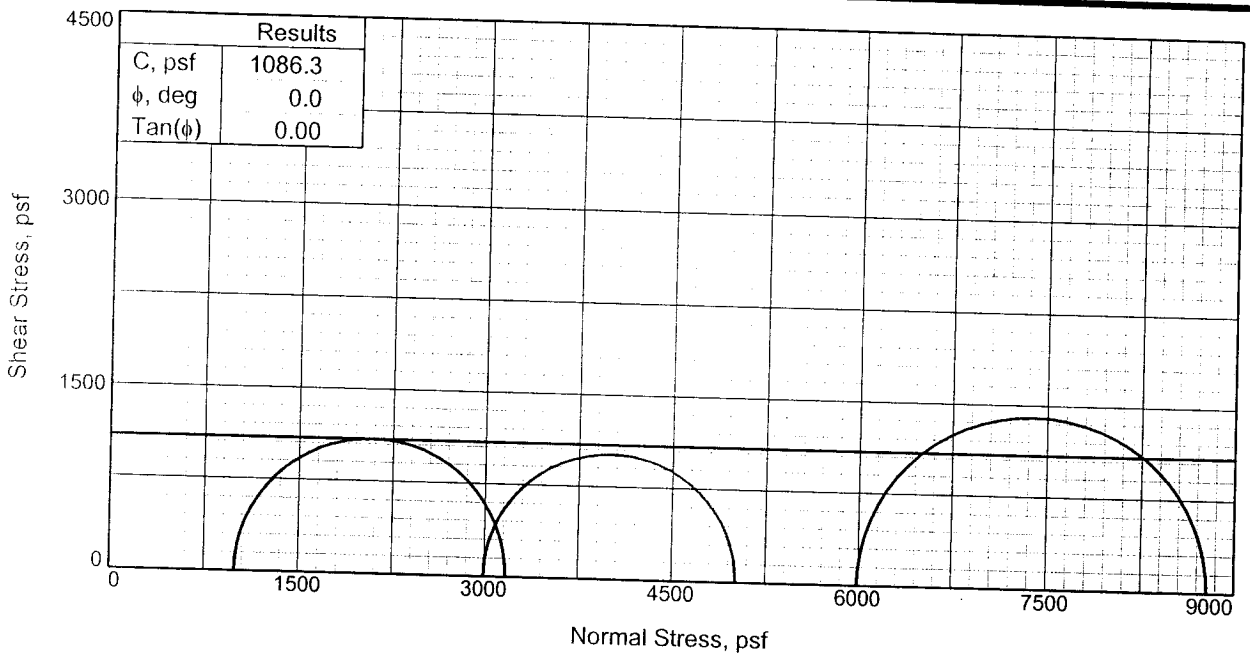
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 82.7
Sample Number: 22C

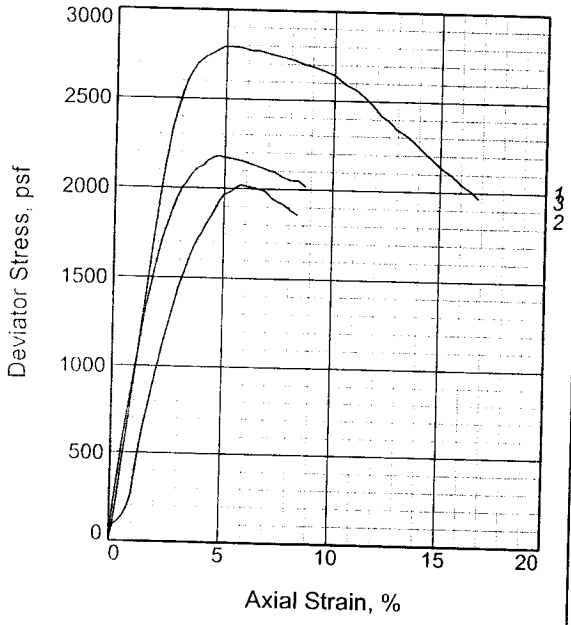
UNCONFINED COMPRESSION TEST

EUSTIS ENGINEERING COMPANY, INC.

Figure 1

Tested By: ZH **Checked By:** DP





Specimen No.		1	2	3
Initial	Water Content,	24.9	25.2	24.8
	Dry Density, pcf	98.4	98.4	98.2
	Saturation,	94.4	95.2	93.4
	Void Ratio	0.7126	0.7136	0.7162
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930
At Test	Water Content,	26.3	26.4	26.4
	Dry Density, pcf	98.5	98.4	98.4
	Saturation,	100.0	100.0	100.0
	Void Ratio	0.7114	0.7122	0.7131
	Diameter, in.	1.388	1.388	1.387
	Height, in.	2.929	2.929	2.928
Strain rate, in./min.		0.030	0.029	0.029
Back Pressure, psf		0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4
Fail. Stress, psf		2178.0	2018.8	2791.5
Ult. Stress, psf		2015.3	1857.5	1965.2
σ_1 Failure, psf		3171.6	5014.0	8781.9
σ_3 Failure, psf		993.6	2995.2	5990.4

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: ST LGR & T CL4

LL= 35 **PL=** 14 **PI=** 21
Assumed Specific Gravity= 2.7
Remarks: TORVANE = 0.450 TSF

Client: URS Corporation

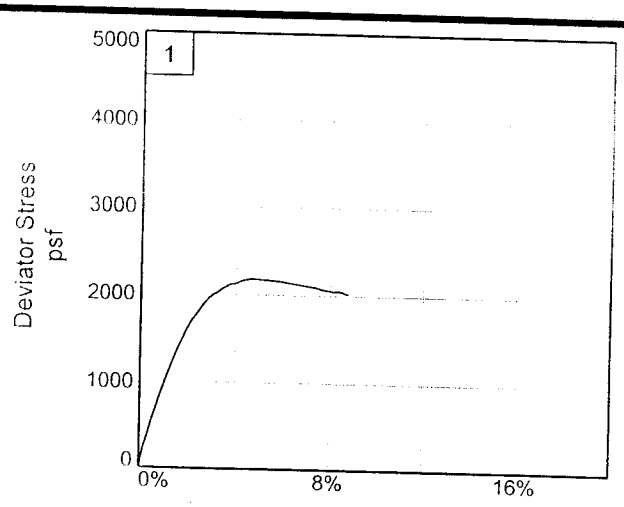
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 85.8
Sample Number: 23B
Proj. No.: 19082 **Date:** 12/01/05

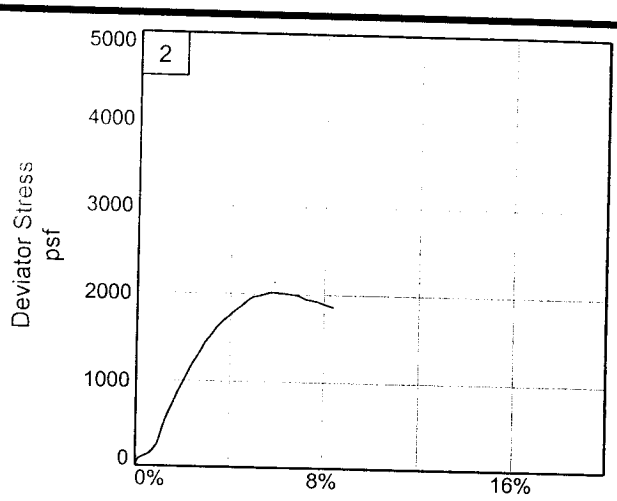
TRIAXIAL SHEAR TEST REPORT

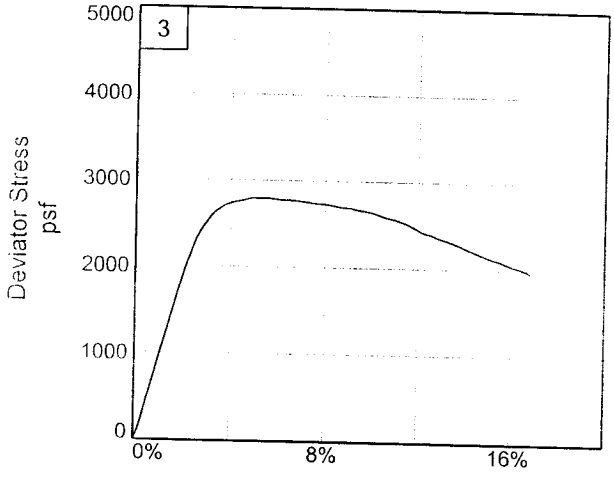
EUSTIS ENGINEERING COMPANY, INC.

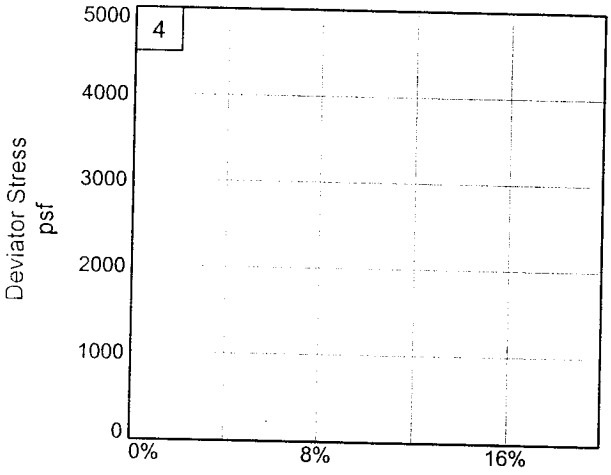
Figure 1

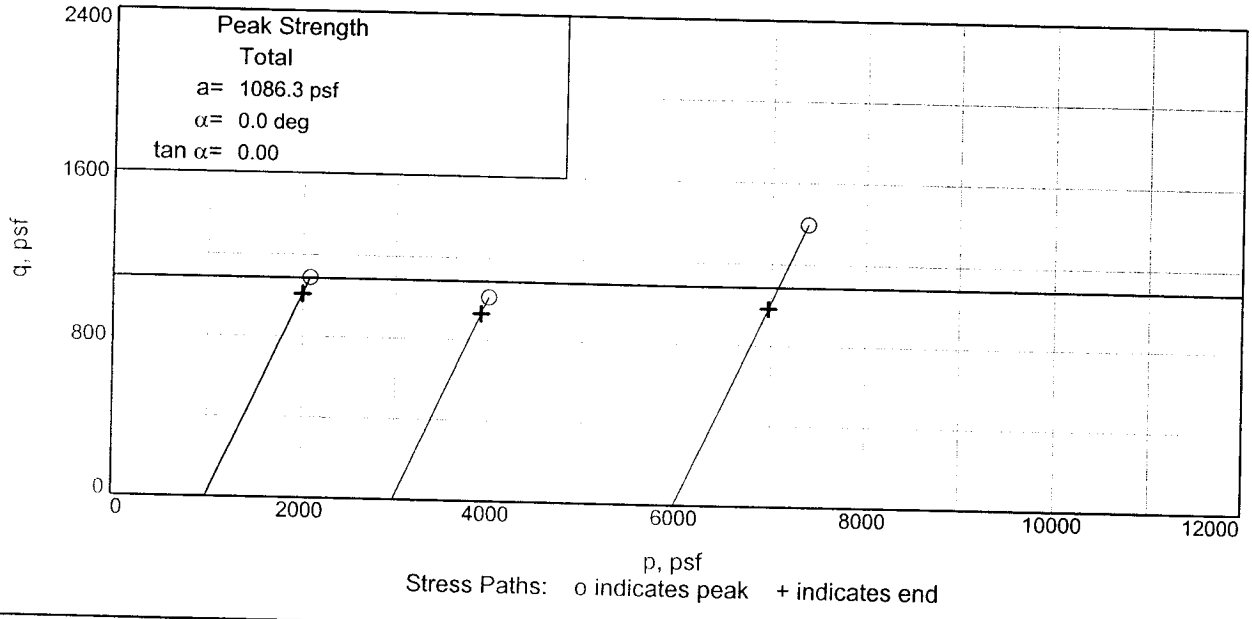
Tested By: RR **Checked By:** DP









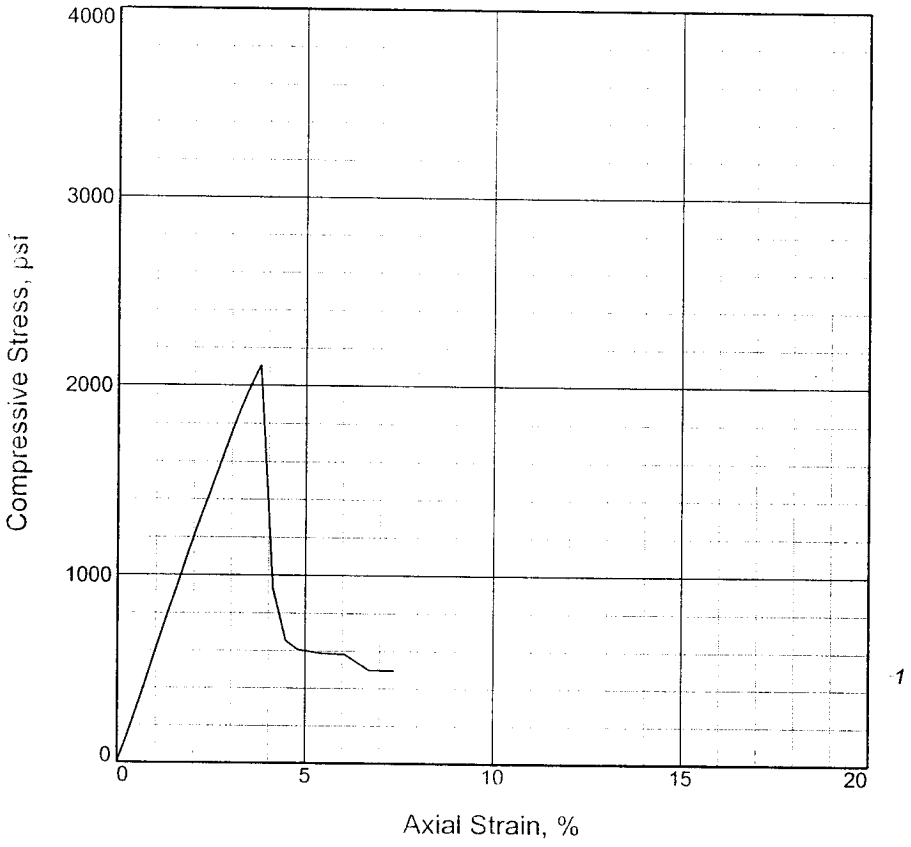


Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 85.8 **Sample Number:** 23B
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: RR **Checked By:** DP

UNCONFINED COMPRESSION TEST



Specimen No.	1			
Unconfined strength, psf	2106.2			
Undrained shear strength, psf	1053.1			
Failure strain, %	3.8			
Strain rate, in./min.	0.059			
Water content, %	45.0			
Wet density, pcf	101.8			
Dry density, pcf	70.2			
Saturation, %	85.8			
Void ratio	1.4360			
Specimen diameter, in.	1.388			
Specimen height, in.	2.930			
Height/diameter ratio	2.11			

Description: ST GR & T CH4 W/ SL

LL =	PL =	PI =	**Assumed GS=** 2.74	**Type:** UNDISTURBED

Project No.: 19082
Date: 12-1-05

Remarks:
TORVANE = 0.850 TSF

Client: URS Corporation

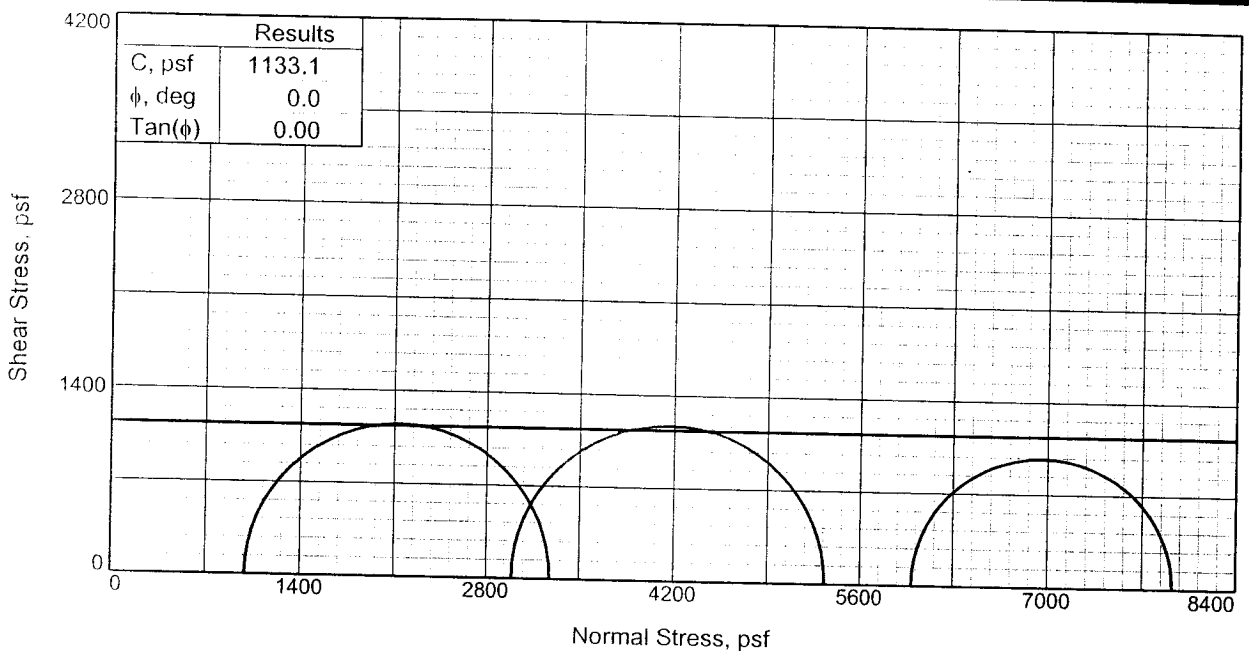
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 92.8
Sample Number: 26B

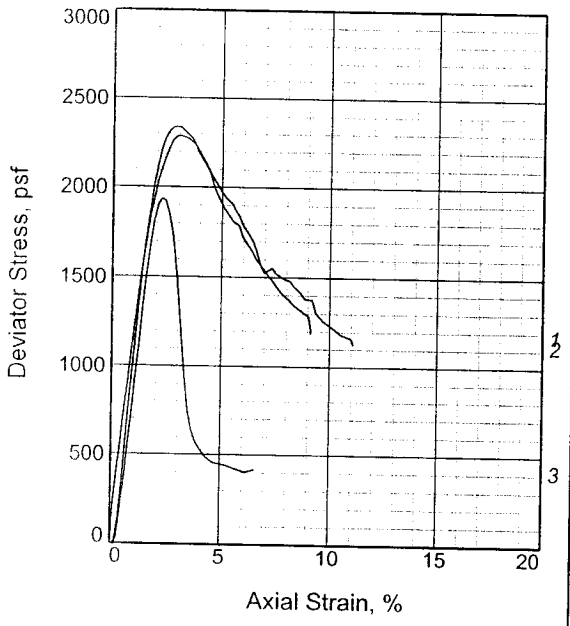
UNCONFINED COMPRESSION TEST

EUSTIS ENGINEERING COMPANY, INC.

Figure 1

Tested By: RR **Checked By:** JS





Specimen No.		1	2	3
Initial	Water Content,	33.1	39.2	39.3
	Dry Density, pcf	84.3	79.8	79.8
	Saturation,	88.7	94.5	94.7
	Void Ratio	1.0139	1.1282	1.1278
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.930	2.930	2.930
At Test	Water Content,	37.2	41.4	41.4
	Dry Density, pcf	84.4	79.8	79.9
	Saturation,	100.0	100.0	100.0
	Void Ratio	1.0129	1.1269	1.1265
	Diameter, in.	1.388	1.388	1.388
	Height, in.	2.929	2.929	2.929
Strain rate, in./min.		0.028	0.029	0.029
Back Pressure, psf		0.0	0.0	0.0
Cell Pressure, psf		993.6	2995.2	5990.4
Fail. Stress, psf		2288.5	2338.6	1936.0
Ult. Stress, psf		1185.1	1125.6	417.9
σ_1 Failure, psf		3282.1	5333.8	7926.4
σ_3 Failure, psf		993.6	2995.2	5990.4

Type of Test:
Unconsolidated Undrained
Sample Type: UNDISTURBED
Description: ST GR & T CH4 W/ SL

LL= 91 **PL=** 29 **PI=** 62
Assumed Specific Gravity= 2.72
Remarks: TORVANE = 0.750 TSF

Client: URS Corporation

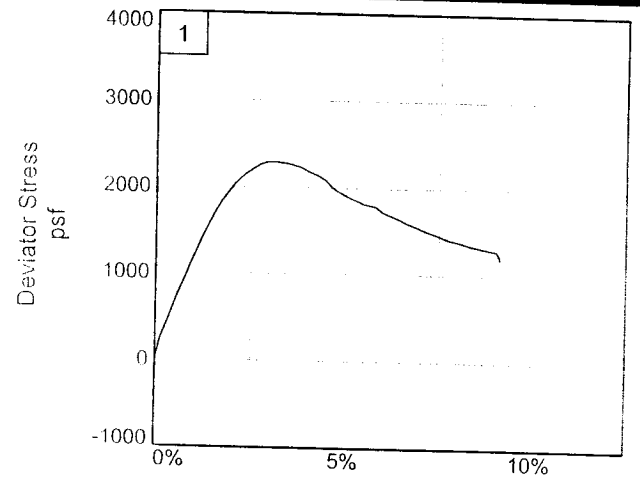
Project: U.S. Army Corps of Engineers
Inner Harbor Navigational Canal
Source of Sample: IHNC-TFG-3U **Depth:** 96.8
Sample Number: 27B
Proj. No.: 19082 **Date:** 12/01/05

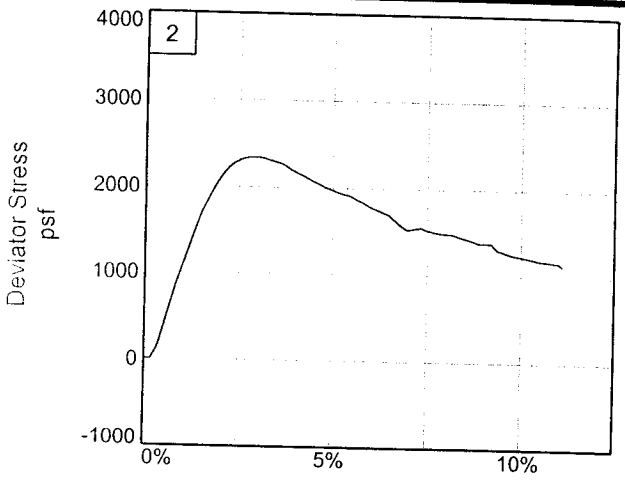
TRIAXIAL SHEAR TEST REPORT

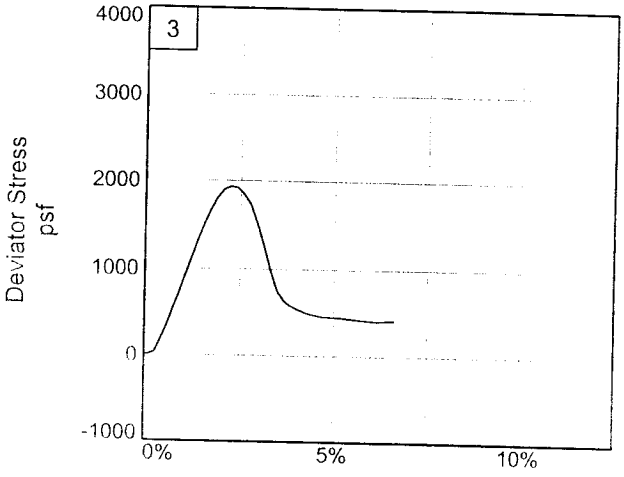
EUSTIS ENGINEERING COMPANY, INC.

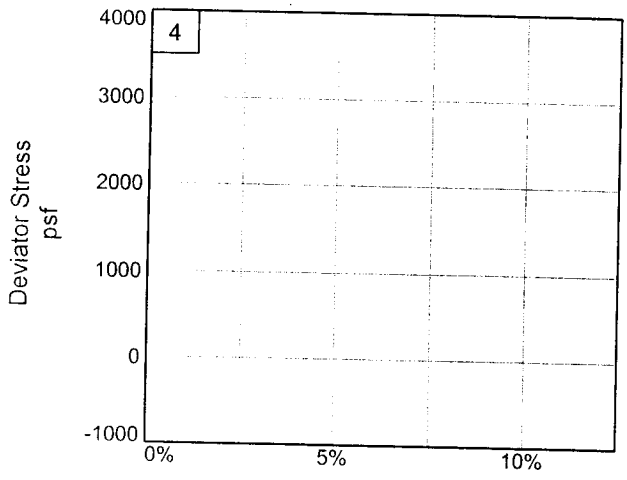
Figure 1

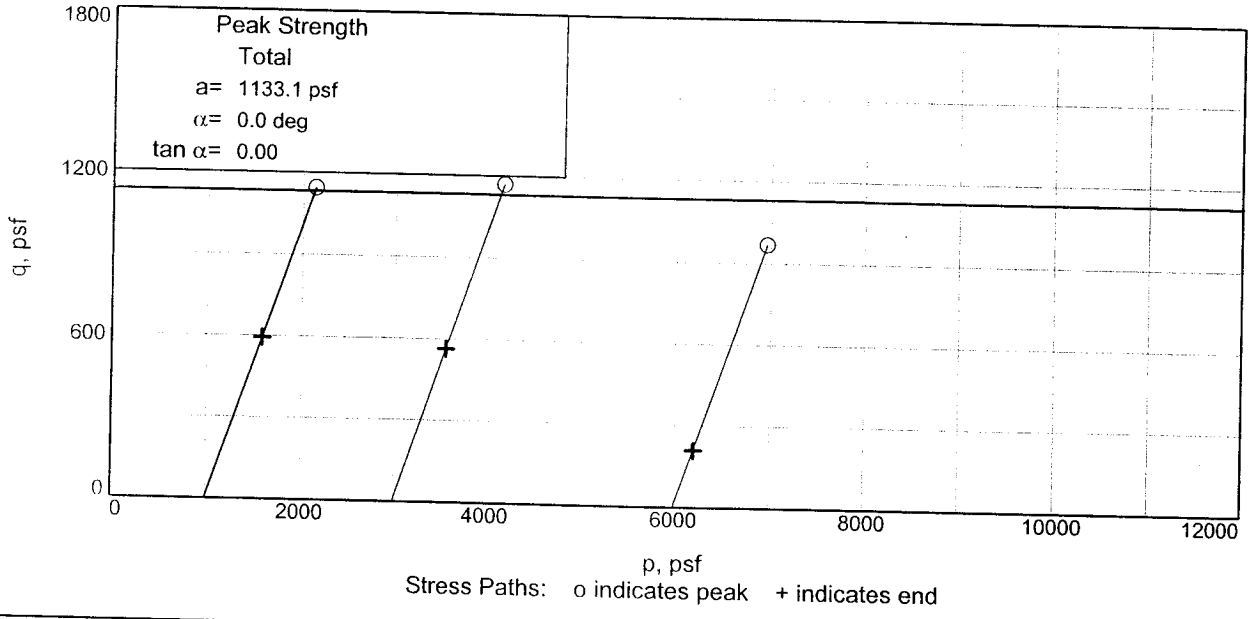
Tested By: JL **Checked By:** DP











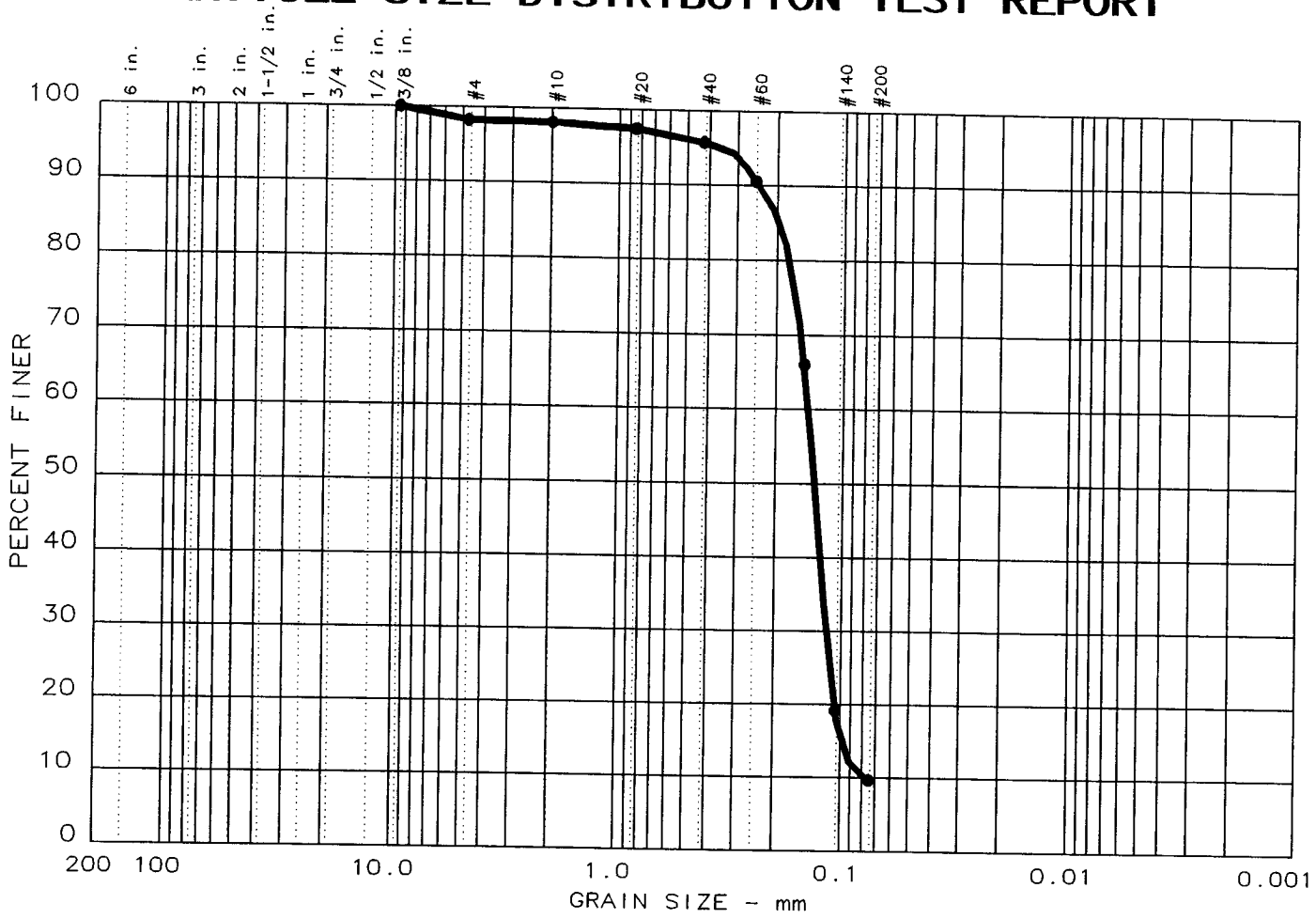
Stress Paths: o indicates peak + indicates end

Client: URS Corporation
Project: U.S. Army Corps of Engineers
Source of Sample: IHNC-TFG-3U **Depth:** 96.8 **Sample Number:** 27B
Project No.: 19082 **Figure** 2

EUSTIS ENGINEERING COMPANY, INC.

Tested By: JL **Checked By:** DP

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	0.0	1.7	88.6	9.7		SP		

SIEVE inches size	PERCENT FINER ●		
0.375	100.0		

GRAIN SIZE			
D_{60}	0.14		
D_{30}	0.12		
D_{10}	0.07		

COEFFICIENTS			
C_c	1.23		
C_u	1.9		

SIEVE number size	PERCENT FINER ●		
4	98.3		
10	98.1		
20	97.4		
40	95.7		
60	90.5		
100	66.0		
140	19.2		
200	9.7		

Sample information:
● BorIHNC-TFC3U, Sample 13
Gr SP W/ TR-SIF

Remarks:
Sample depth 59.5'

Eustis Engineering Company, Inc.

Project No.: 19082
Project: USACE - IHNC

Date: 12-5-05 Data Sheet No. ____