

Summary of Information for prior borings

Hole #	Latitude	Longitude	Northing (Y)	Easting (X)	Surface Elev. (ft)	Begin Core Elev. (ft)	Bottom Hole Elev. (ft.)	Notes
HCN-79	39.082968	-84.523335	400868.4950	1394203.6000	541.2	NA	499.7	NR
HCN-80	39.083189	-84.523380	400949.2520	1394192.6330	540.3	465.3	455.3	
HCN-81	39.083622	-84.523433	401107.2520	1394181.1250	528.7	NA	463.2	NR
HCN-82	39.083744	-84.523494	401152.0630	1394164.8100	532.5	460	450	
HCN-83	39.084085	-84.523620	401277.0280	1394131.8360	535.9	456.9	446.9	
HCN-84	39.084488	-84.523438	401423.0970	1394197.5740	494.1	428.6	416.6	
HCN-85	39.084710	-84.523433	401503.2030	1394199.3690	488.9	423.9	411.9	
HCN-86	39.084929	-84.523479	401583.9460	1394172.7860	486.7	426.2	415.2	
HCN-87	39.085121	-84.523498	401653.1280	1394174.3370	488.7	421.7	411.2	
S-1	39.081503	-84.523300	400334.9898	1394201.5668	553.1	NA	526.7	R*
S-2	39.081782	-84.523283	400436.2416	1394208.5833	552	NA	527	R*
S-3	39.082058	-84.523285	400536.6818	1394210.3906	551	NA	520.9	R*
S-4	39.082319	-84.523300	400631.9362	1394208.3412	549.2	NA	520.5	R*
S-5	39.082607	-84.523366	400737.0665	1394191.7545	548.5	NA	519.8	R*
S-6	39.082874	-84.523442	400834.8060	1394172.5812	549.2	NA	520.5	R*
S-7	39.083145	-84.523525	400934.0037	1394151.1590	548.5	NA	523.3	R*
S-8	39.083432	-84.523560	401038.7169	1394143.4873	545.7	NA	515.9	R*
S-9	39.083674	-84.523618	401127.3727	1394129.0844	544.7	NA	508.9	R*

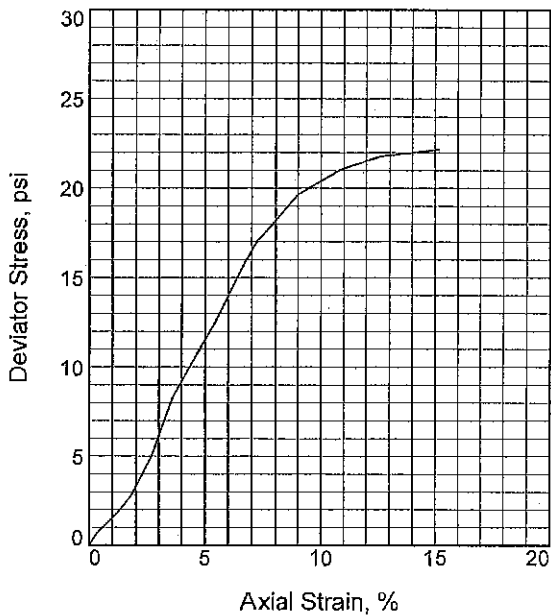
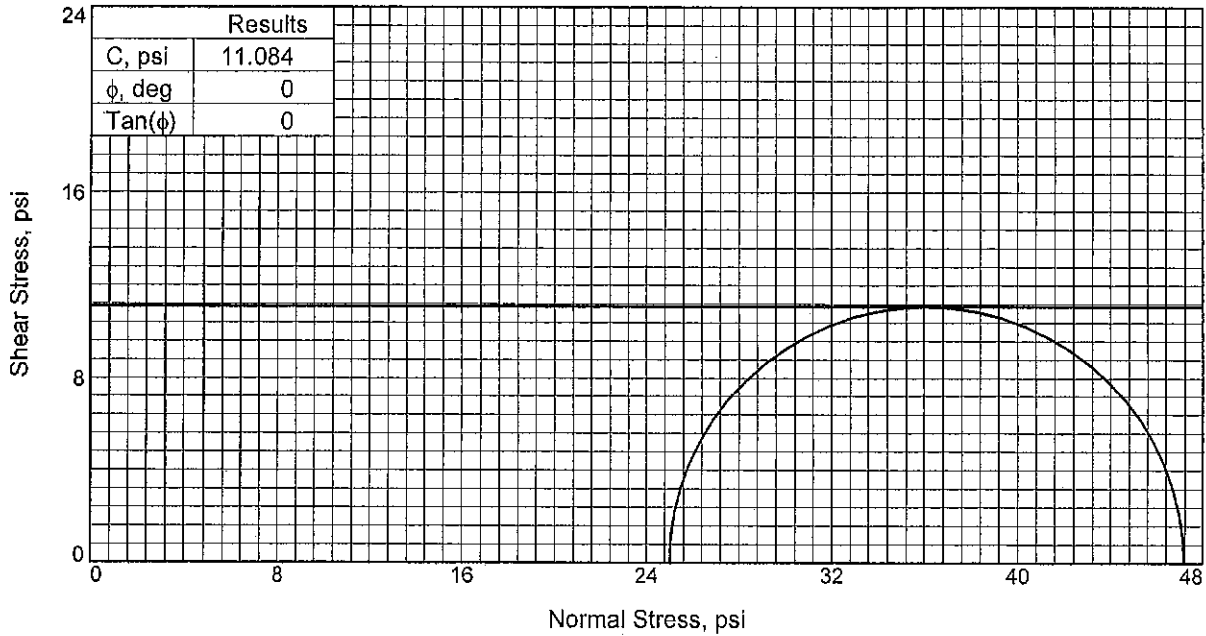
NOTES:

NR = NO REFUSAL

R = REFUSAL

* Sounding was advanced through weak shale

Soil Test Results (HCN Borings)



Sample No.		1
Initial	Water Content, %	28.7
	Dry Density, pcf	95.9
	Saturation, %	102.3
	Void Ratio	0.7574
	Diameter, in.	2.860
At Test	Height, in.	5.540
	Water Content, %	28.7
	Dry Density, pcf	95.9
	Saturation, %	102.3
	Void Ratio	0.7574
	Diameter, in.	2.860
	Height, in.	5.540
	Strain rate, in./min.	0.055
	Back Pressure, psi	0.00
	Cell Pressure, psi	25.00
Fail. Stress, psi	22.17	
Ult. Stress, psi		
σ_1 Failure, psi	47.17	
σ_3 Failure, psi	25.00	

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN SILT, MOIST - MED STIFF

LL= 26 PL= 22 PI= 4

Assumed Specific Gravity= 2.70

Remarks: Lab No. 11,721

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-65 **Depth:** 25-27'

Sample Number: 10/ST

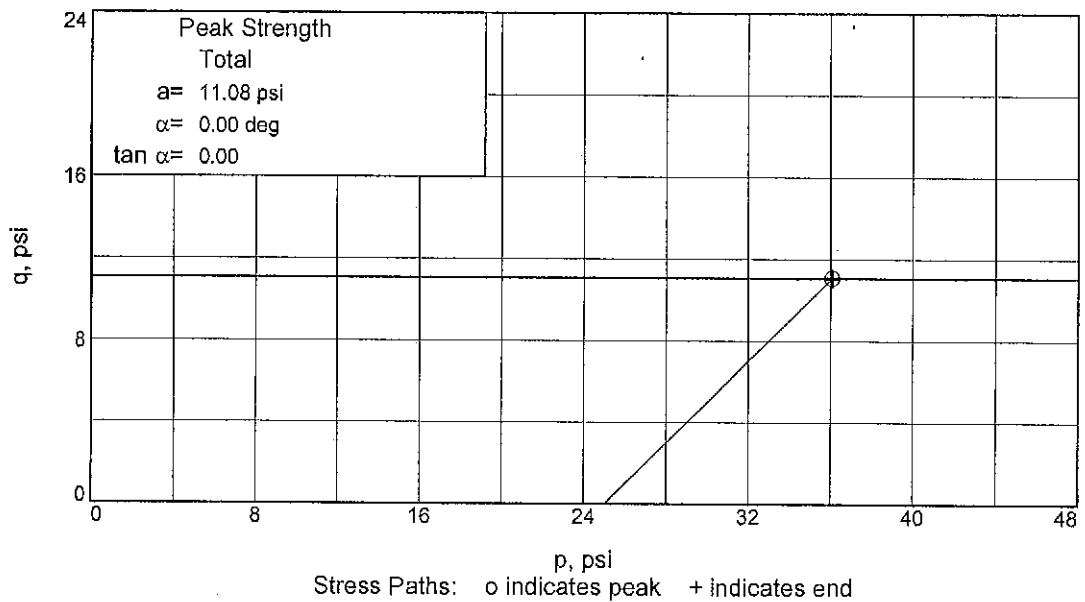
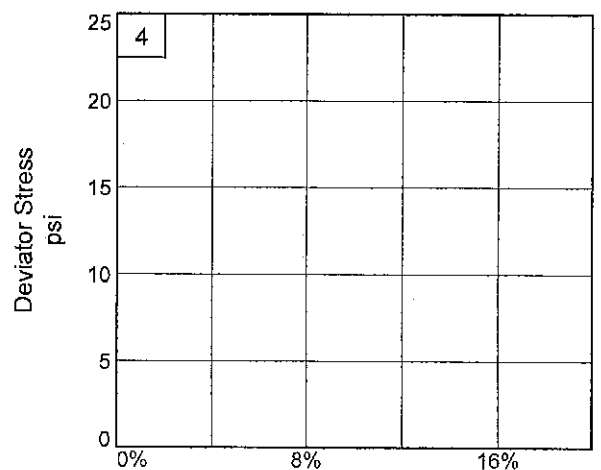
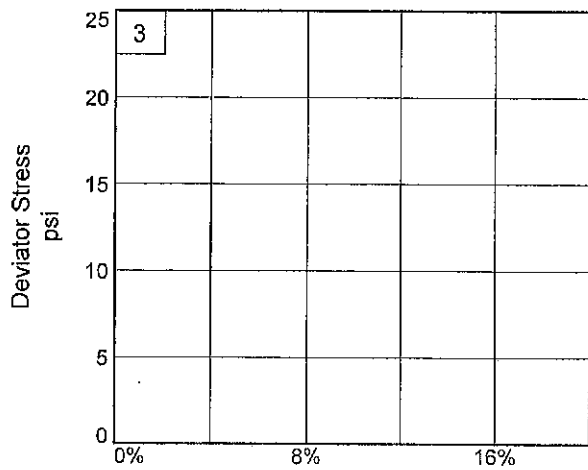
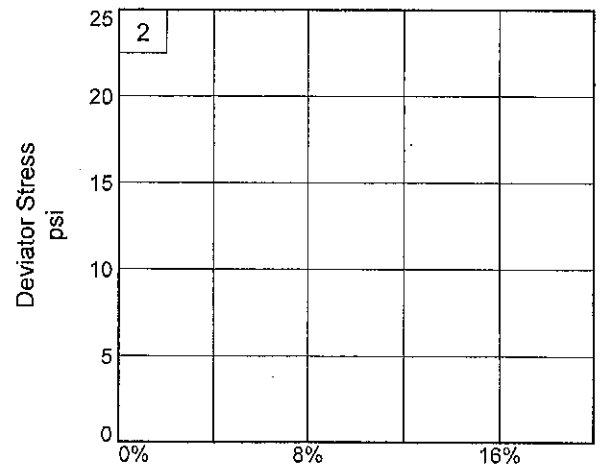
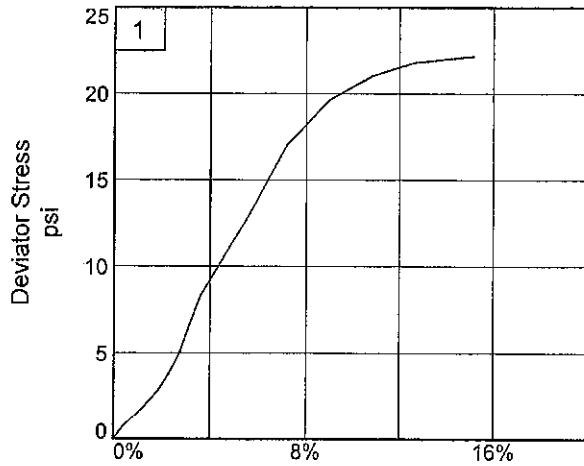
Proj. No.: N1105229 **Date Sampled:** 1-6-11

TRIAxIAL SHEAR TEST REPORT

H.C. Nutting
A Terracon Company

Figure _____

Tested By: SV Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-65

Depth: 25-27'

Sample Number: 10/ST

Project No.: N1105229

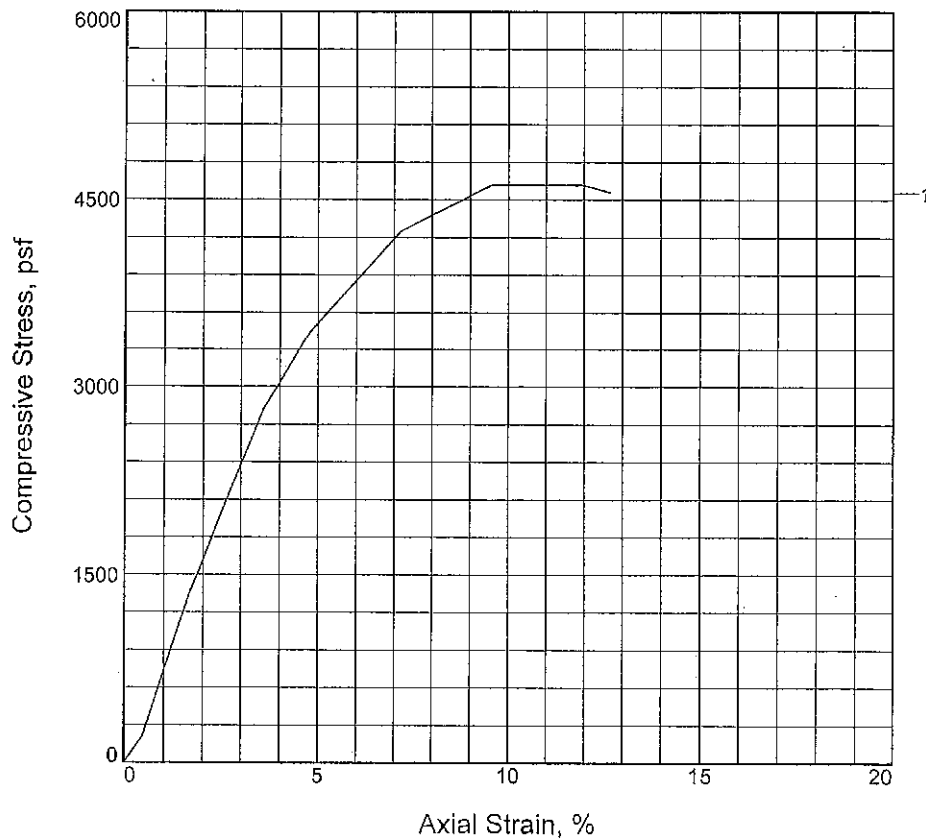
Figure _____

H.C. Nutting - A Terracon Company

Tested By: SV

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	4619.1			
Undrained shear strength, psf	2309.6			
Failure strain,	9.6			
Strain rate, in./min.	0.041			
Water content, %	N/A			
Wet density, pcf	131.2			
Dry density, pcf	N/A			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	2.840			
Specimen height, in.	4.180			
Height/diameter ratio	1.47			

Description: BROWN GRAY GRAVELLY LEAN CLAY, MOIST - STIFF

LL = 41	PL = 21	PI = 20	Assumed GS= 2.70	Type: ST
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Project No.: N1105229
Date: 12-29-10
Remarks:
 Lab No. 12,217

Figure _____

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY

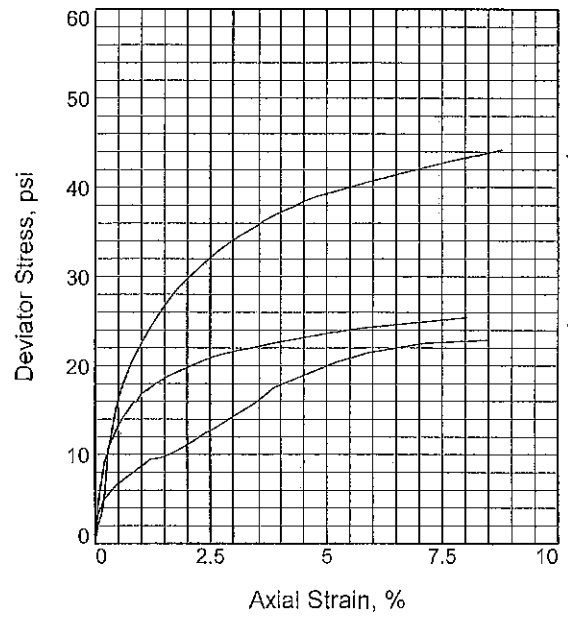
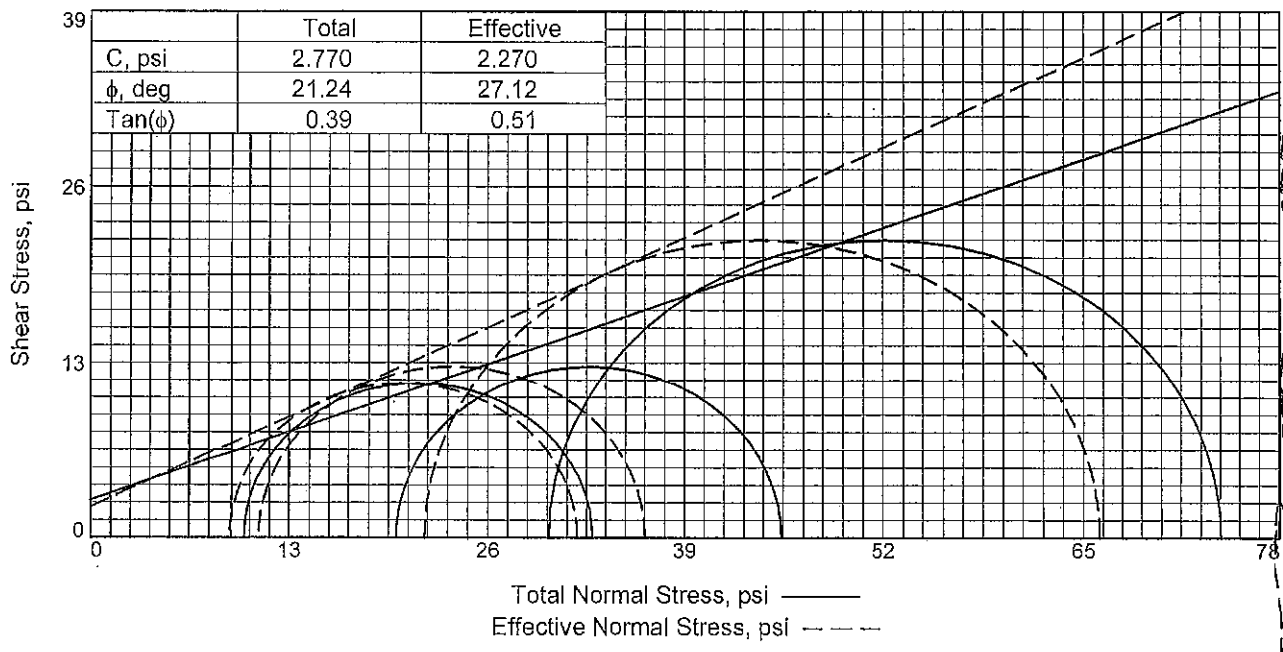
Source of Sample: HCN-66 **Depth:** 10-12'

Sample Number: 5/ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV Checked By: GS



Sample No.	1	2	3
Initial			
Water Content,	30.5	25.2	26.0
Dry Density, pcf	92.7	96.2	94.6
Saturation,	99.9	89.7	88.9
Void Ratio	0.8310	0.7656	0.7947
Diameter, in.	2.880	2.866	2.871
Height, in.	5.770	5.760	5.757
At Test			
Water Content,	28.7	26.4	27.5
Dry Density, pcf	95.3	98.8	97.1
Saturation,	100.0	100.0	100.0
Void Ratio	0.7818	0.7181	0.7483
Diameter, in.	2.854	2.840	2.846
Height, in.	5.718	5.708	5.707
Strain rate, in./min.	0.001	0.001	0.001
Back Pressure, psi	60.00	60.00	60.00
Cell Pressure, psi	70.00	80.00	90.00
Fail. Stress, psi	22.88	25.40	44.17
Total Pore Pr., psi	61.00	69.00	68.10
Ult. Stress, psi			
Total Pore Pr., psi			
$\bar{\sigma}_1$ Failure, psi	31.88	36.40	66.07
$\bar{\sigma}_3$ Failure, psi	9.00	11.00	21.90

Type of Test:
CU with Pore Pressures

Sample Type: ST

Description: GRAY SILT

LL= 27 PL= 22 PI= 5

Assumed Specific Gravity= 2.72

Remarks: Lab No. 12,221
Electrical Shut down during test, unable to retrieve data after that point.

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

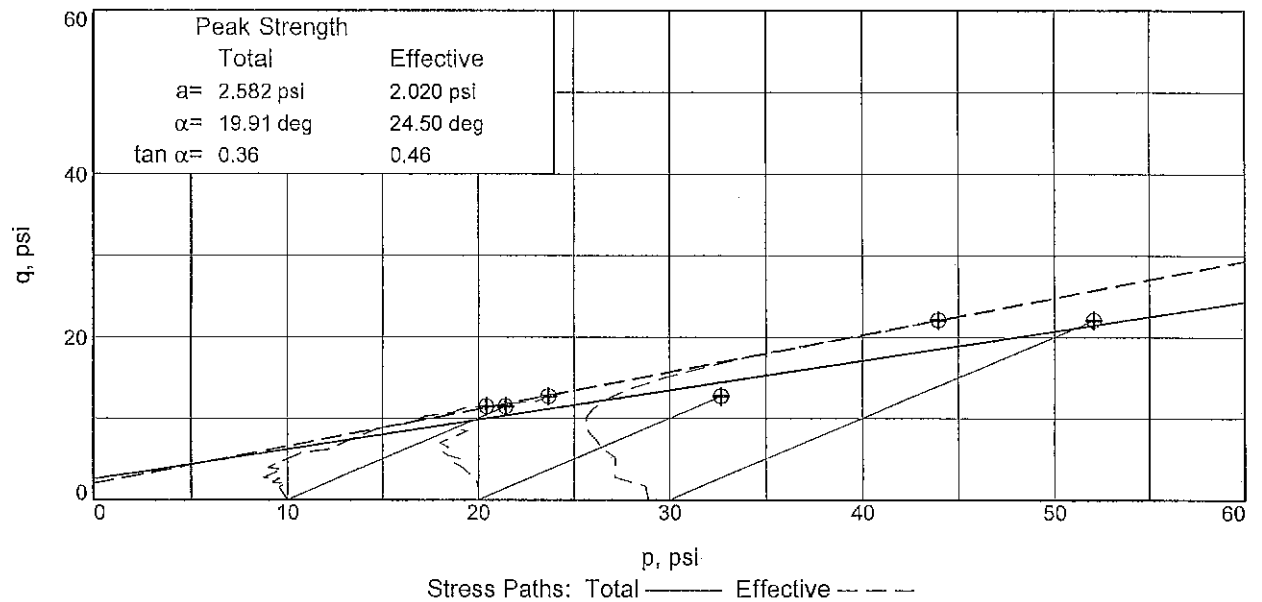
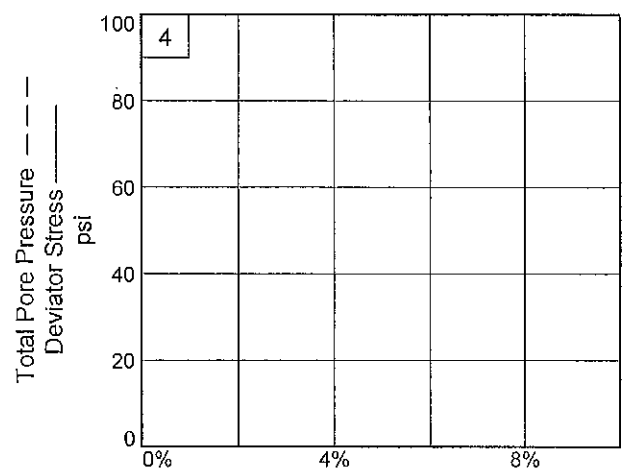
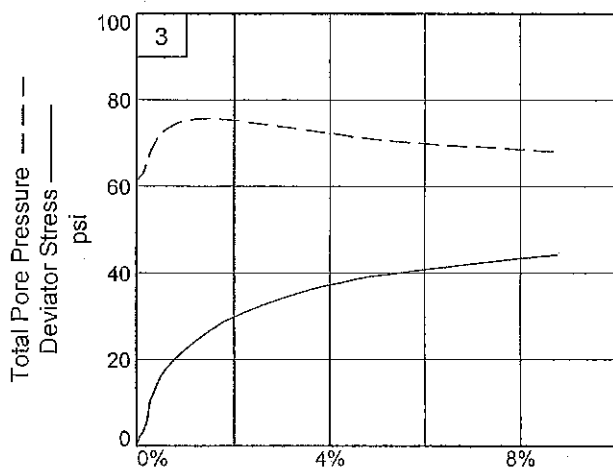
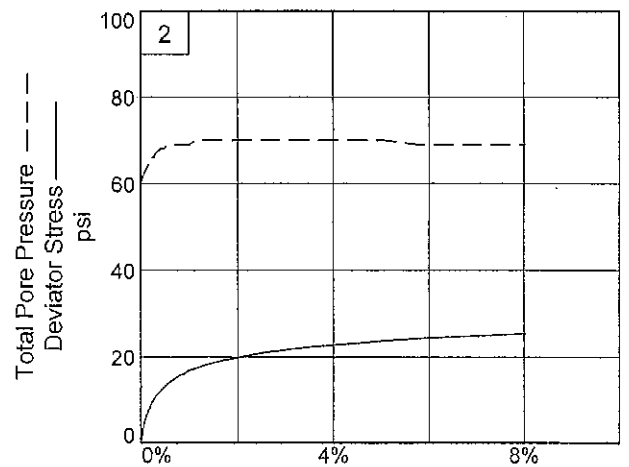
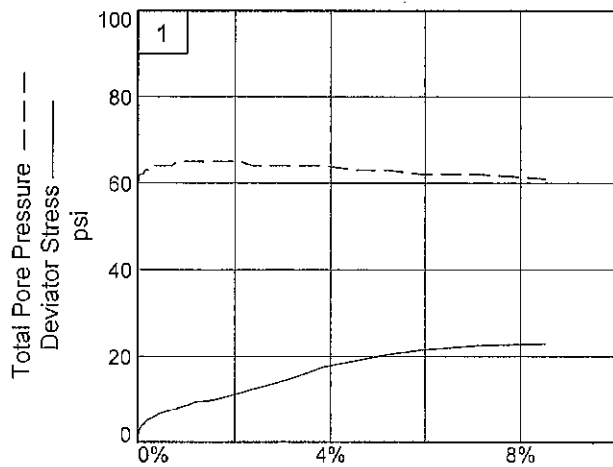
Source of Sample: HCN-66 **Depth:** 20-22'

Sample Number: 9/ST

Proj. No.: N1105229 **Date:** 12-3-10

TRIAxIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-66

Depth: 20-22'

Sample Number: 9/ST

Project No.: N1105229

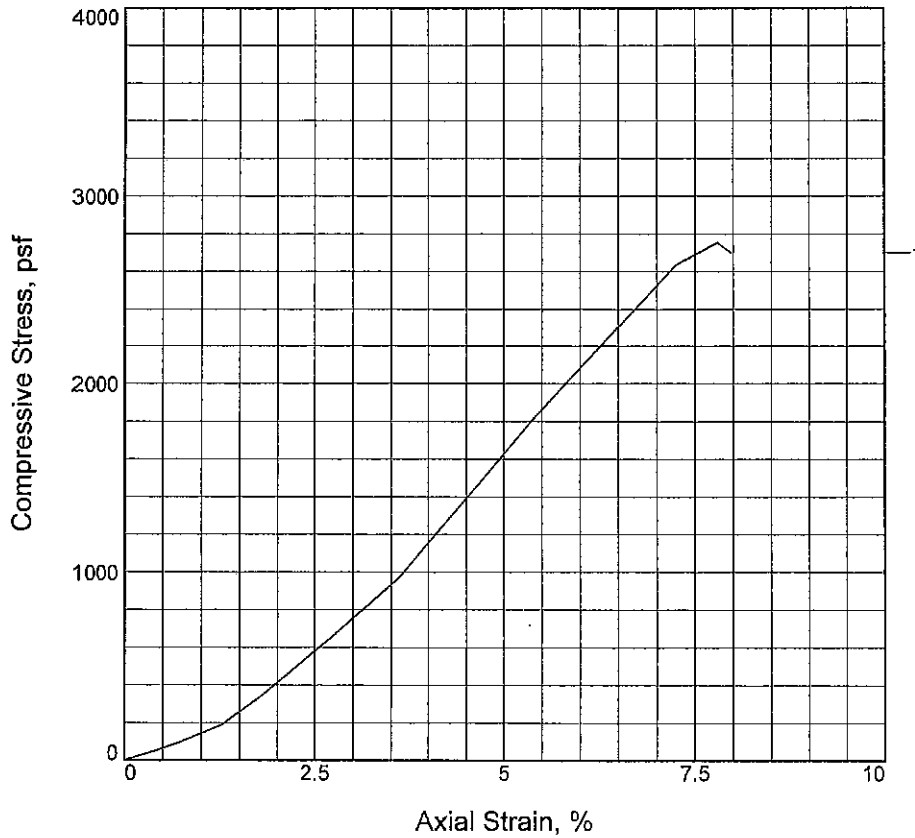
Figure _____

H. C. NUTTING COMPANY

Tested By: FCE _____

Checked By: GS _____

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	2754.2			
Undrained shear strength, psf	1377.1			
Failure strain, %	7.8			
Strain rate, in./min.	0.055			
Water content, %	25.3			
Wet density, pcf	127.8			
Dry density, pcf	102.0			
Saturation, %	104.7			
Void ratio	0.6532			
Specimen diameter, in.	2.830			
Specimen height, in.	5.520			
Height/diameter ratio	1.95			

Description: BROWN LEAN CLAY W/SILT LENSES, MOIST - STIFF

LL = PL = PI = Assumed GS= 2.70 Type: ST

Project No.: N1105229

Date Sampled: 1-31-11

Remarks:
Lab No. 743

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-66 **Depth:** 22-24'

Sample Number: 10/ST

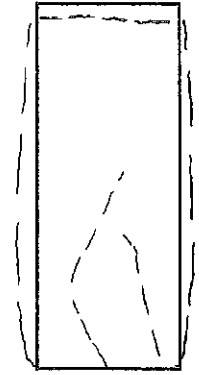
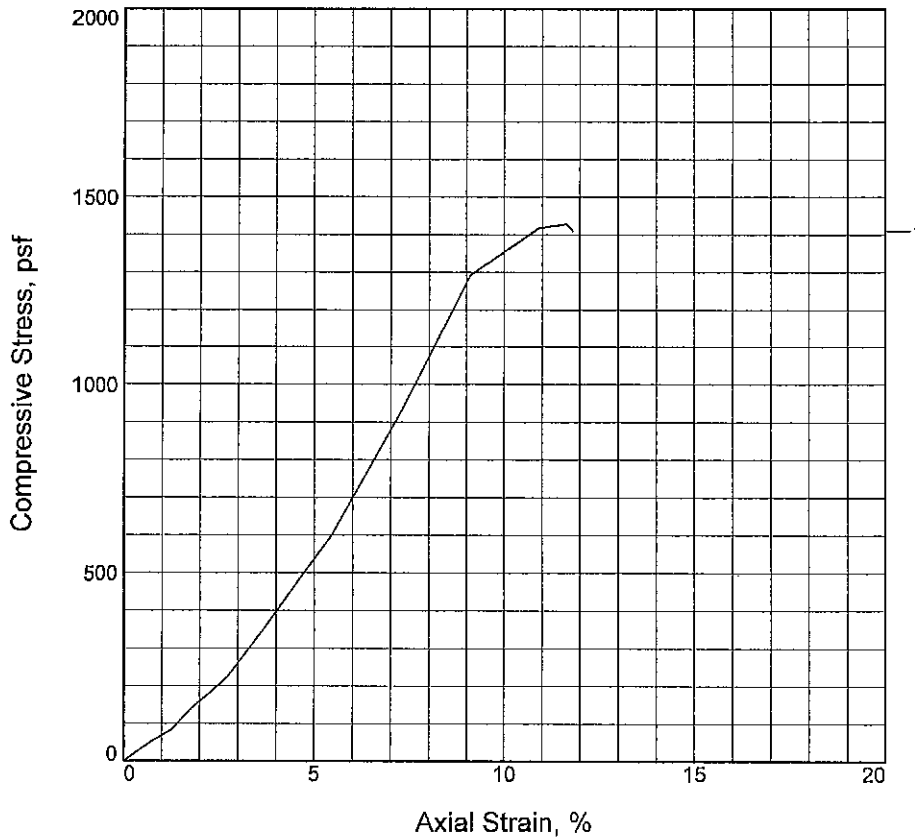
UNCONFINED COMPRESSION TEST

H.C. Nutting
A Terracon Company

Figure _____

Tested By: SV Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	1428.1			
Undrained shear strength, psf	714.1			
Failure strain, %	11.6			
Strain rate, in./min.	0.055			
Water content, %	28.5			
Wet density, pcf	122.6			
Dry density, pcf	95.4			
Saturation, %	100.3			
Void ratio	0.7671			
Specimen diameter, in.	2.860			
Specimen height, in.	5.500			
Height/diameter ratio	1.92			

Description: BROON LEAN CLAY W/SILT AND SAND LENSES, MOIST - MED STIFF

LL = 28 PL = 19 PI = 9 Assumed GS = 2.70 Type: ST

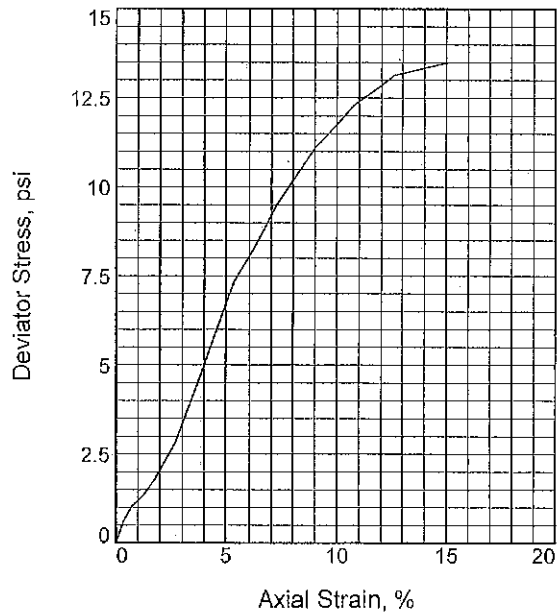
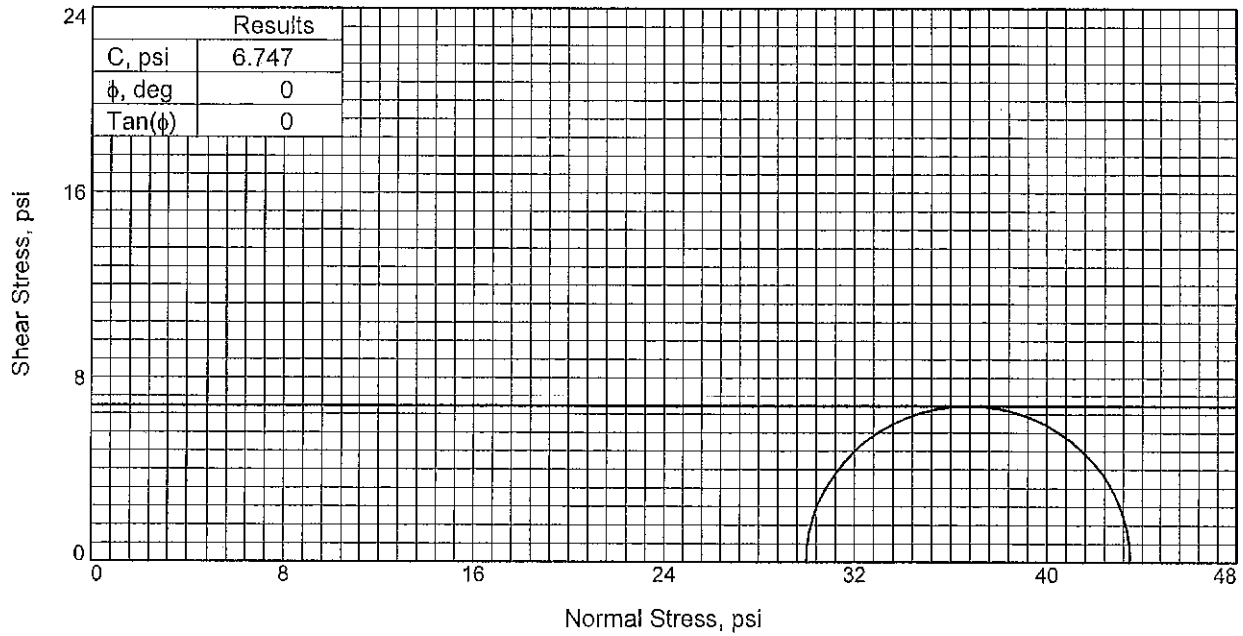
Project No.: N1105229
Date Sampled: 1-31-11
Remarks:
 Lab No. 744

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY
Source of Sample: HCN-66 **Depth:** 28-30'
Sample Number: 12/ST

UNCONFINED COMPRESSION TEST
H.C. Nutting
 A Terracon Company

Figure _____

Tested By: SV Checked By: GS



Sample No.	1	
Initial	Water Content,	27.6
	Dry Density, pcf	98.3
	Saturation,	104.2
	Void Ratio	0.7147
	Diameter, in.	2.850
At Test	Height, in.	5.560
	Water Content,	27.6
	Dry Density, pcf	98.3
	Saturation,	104.2
	Void Ratio	0.7147
	Diameter, in.	2.850
	Height, in.	5.560
	Strain rate, in./min.	0.055
	Back Pressure, psi	0.00
	Cell Pressure, psi	30.00
Fail. Stress, psi	13.49	
Ult. Stress, psi		
σ_1 Failure, psi	43.49	
σ_3 Failure, psi	30.00	

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN LEAN CLAY W/SILT AND SAND LENSES, MOIST - MED STIFF

LL= 28 PL= 19 PI= 9

Assumed Specific Gravity: 2.70

Remarks: Lab No. 12,224

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCÉ BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-66 **Depth:** 28-30'

Sample Number: 12/ST

Proj. No.: N1105229 **Date:** 12-6-10

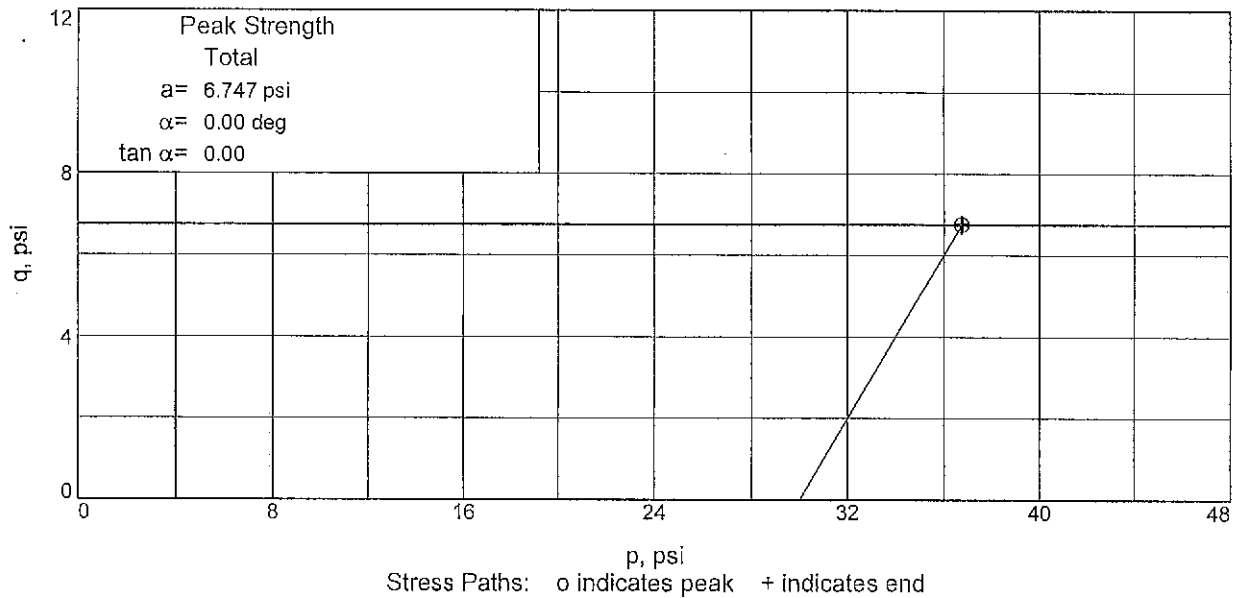
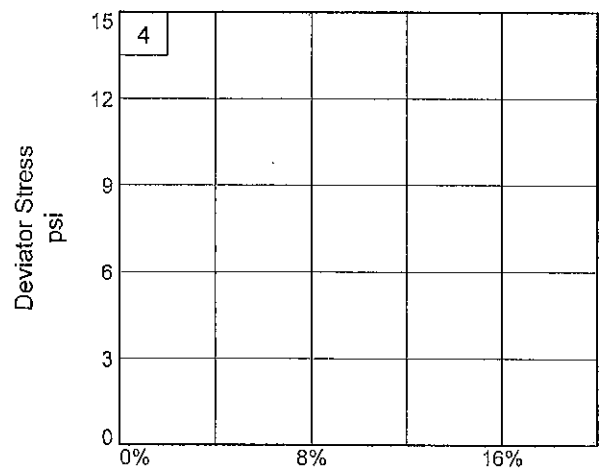
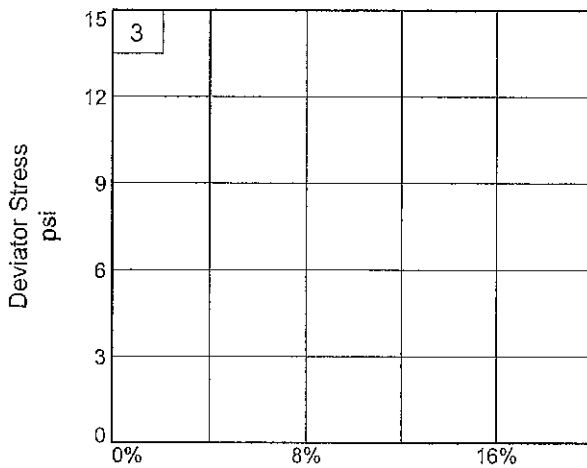
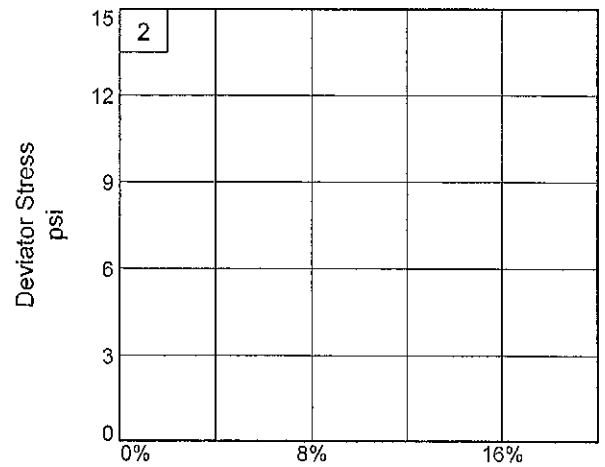
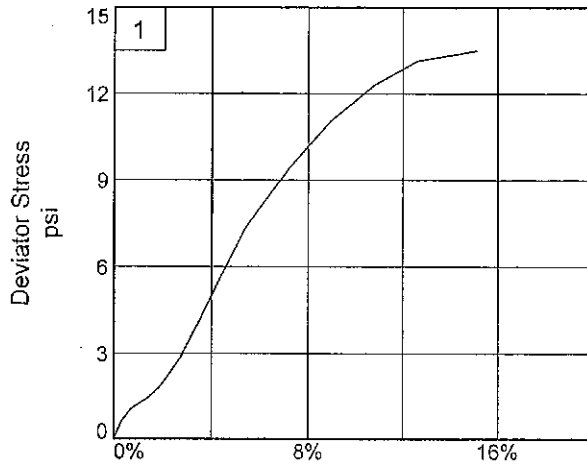
TRIAXIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: SV

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-66

Depth: 28-30'

Sample Number: 12/ST

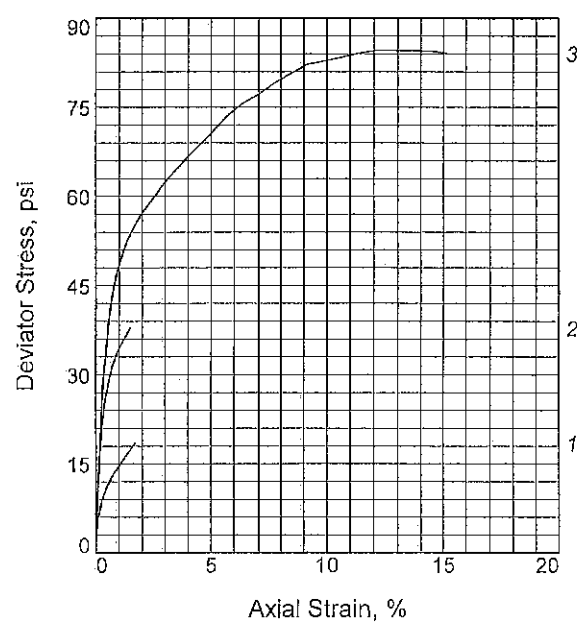
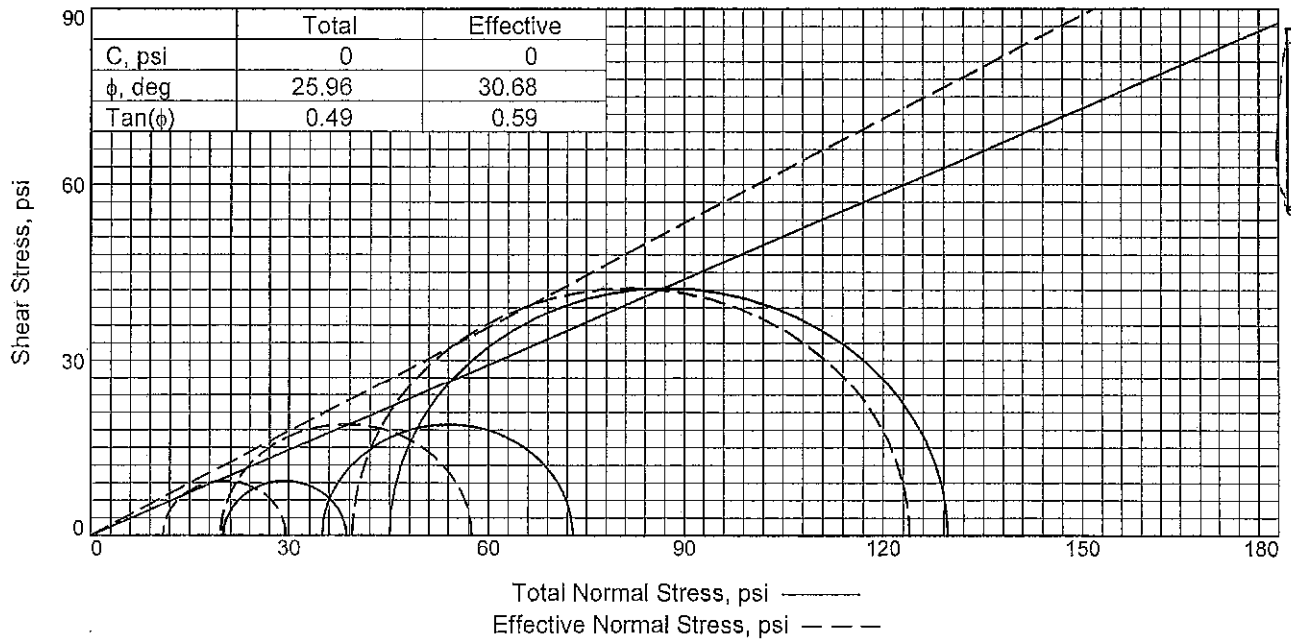
Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS



	1	2	3	
Sample No.				
Initial	Water Content,	24.1	24.1	24.1
	Dry Density, pcf	102.5	102.5	102.5
	Saturation,	99.8	99.8	99.8
	Void Ratio	0.6566	0.6566	0.6566
	Diameter, in.	2.894	2.894	2.894
	Height, in.	5.782	5.782	5.782
At Test	Water Content,	24.1	24.1	24.0
	Dry Density, pcf	102.5	102.6	102.7
	Saturation,	100.0	100.0	100.0
	Void Ratio	0.6566	0.6548	0.6530
	Diameter, in.	2.894	2.918	2.939
	Height, in.	5.782	5.681	5.595
Strain rate, in./min.	0.001	0.001	0.001	
Back Pressure, psi	50.0	50.0	50.0	
Cell Pressure, psi	70.0	85.0	95.0	
Fail. Stress, psi	18.5	37.9	84.6	
Total Pore Pr., psi	59.0	65.4	55.6	
Ult. Stress, psi				
Total Pore Pr., psi				
$\bar{\sigma}_1$ Failure, psi	29.5	57.5	124.0	
$\bar{\sigma}_3$ Failure, psi	11.0	19.6	39.4	

Type of Test:
CU with Pore Pressures

Sample Type: Stage Test

Description: GRAY SILTY CLAY

LL= 24 PL= 20 PI= 4

Assumed Specific Gravity= 2.72

Remarks: Lab No. 12,226

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-66 **Depth:** 35-37'

Sample Number: 14/ST

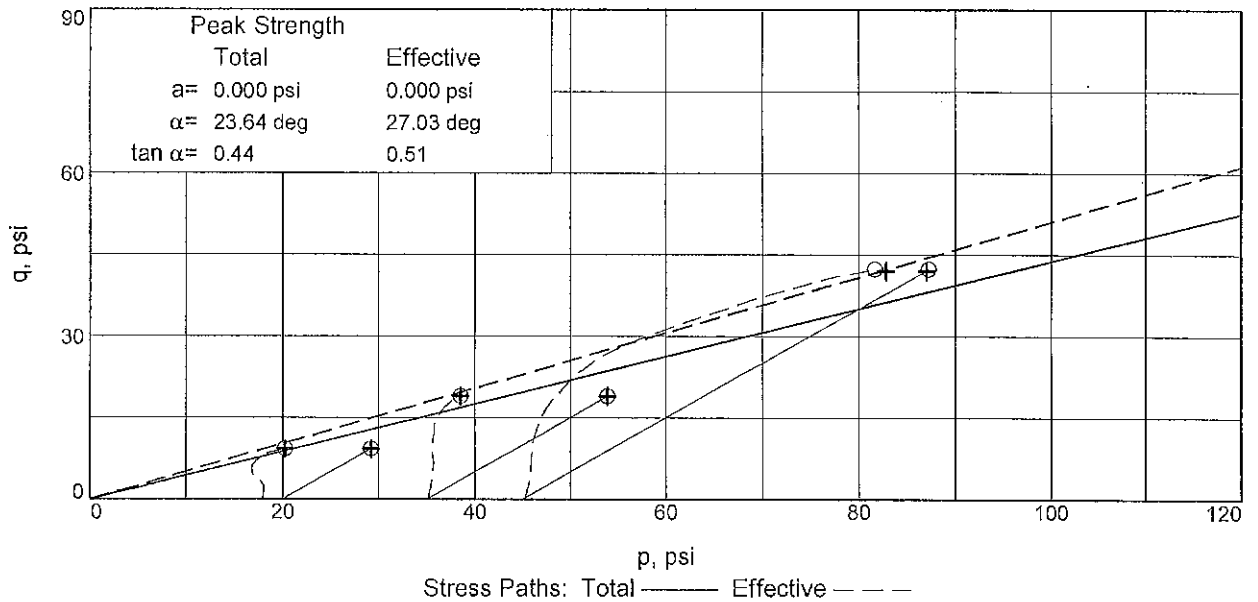
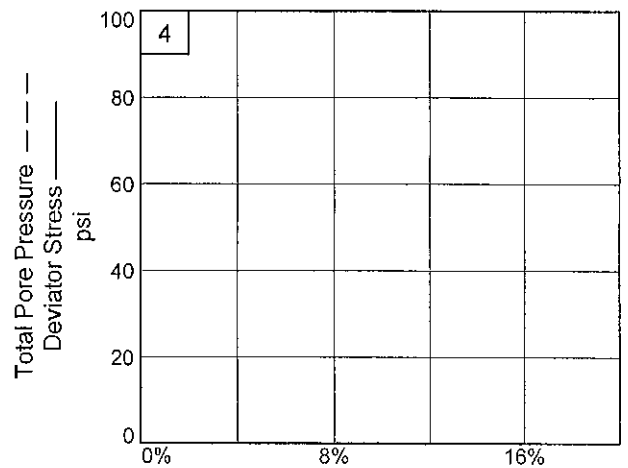
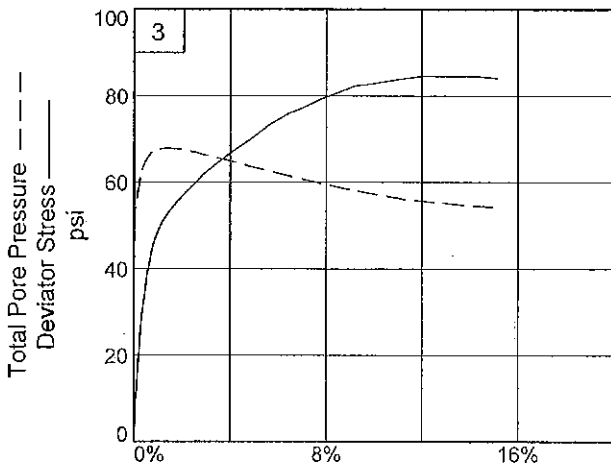
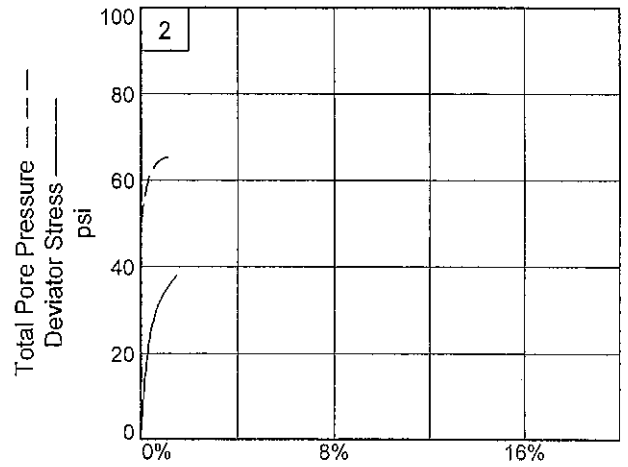
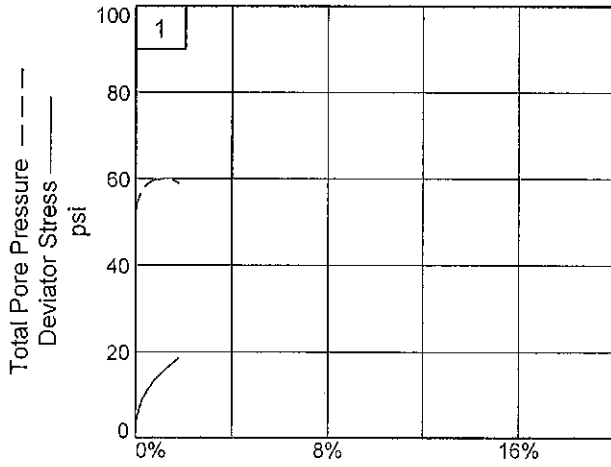
Proj. No.: N1105229 **Date:** 1-6-11

TRIAxIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Tested By: FCE

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-66

Depth: 35-37'

Sample Number: 14/ST

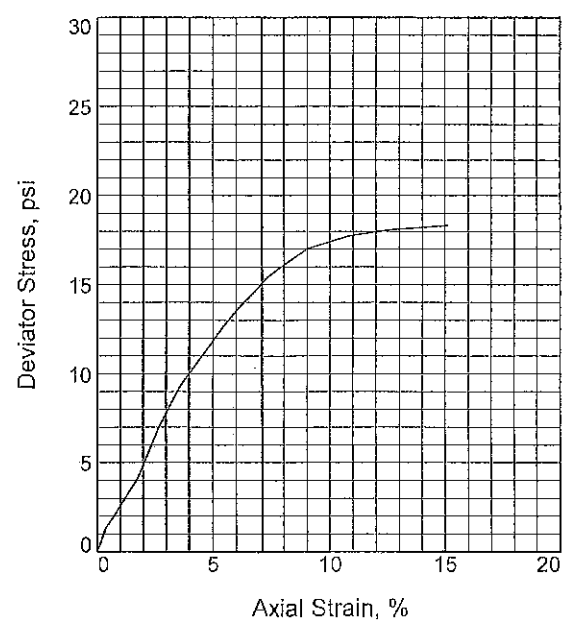
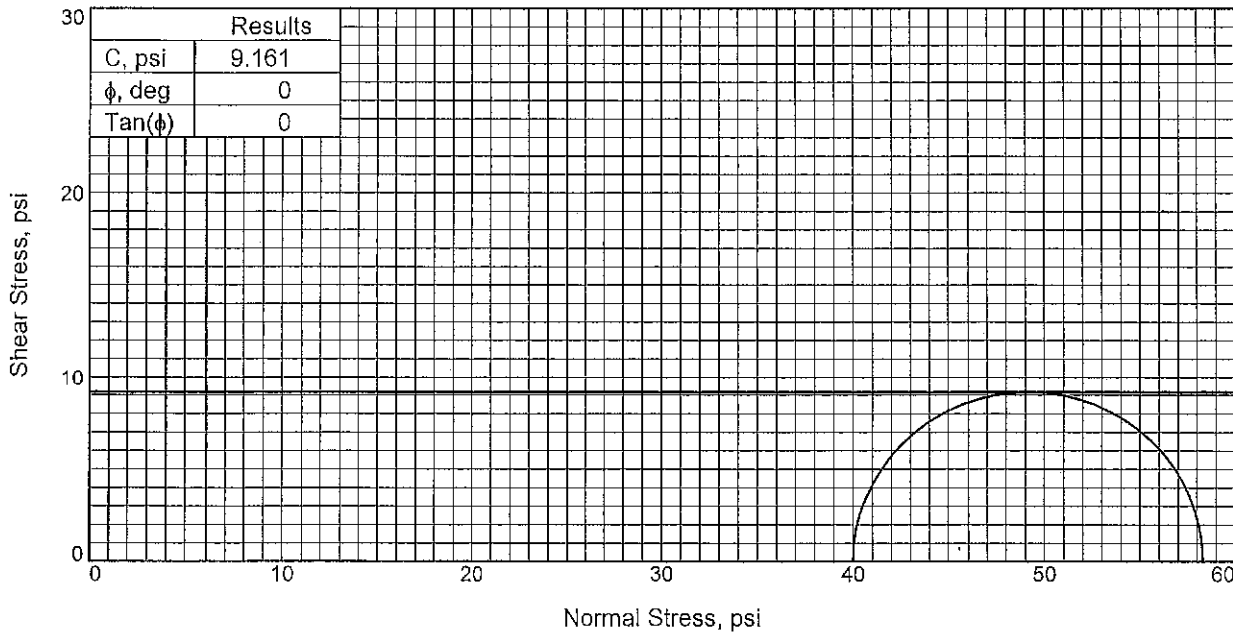
Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

Tested By: FCE

Checked By: GS



Sample No.		1
Initial	Water Content,	28.9
	Dry Density, pcf	94.8
	Saturation,	99.8
	Void Ratio	0.7842
	Diameter, in.	2.870
	Height, in.	5.560
At Test	Water Content,	28.9
	Dry Density, pcf	94.8
	Saturation,	99.8
	Void Ratio	0.7842
	Diameter, in.	2.870
	Height, in.	5.560
Strain rate, in./min.		0.055
Back Pressure, psi		0.00
Cell Pressure, psi		40.00
Fail. Stress, psi		18.32
Ult. Stress, psi		
σ_1 Failure, psi		58.32
σ_3 Failure, psi		40.00

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN LEAN CLAY, MOIST - MED STIFF

LL= 29 PL= 21 PI= 8

Assumed Specific Gravity= 2.71

Remarks: Lab No. 12,227

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-66 **Depth:** 40-42'

Sample Number: 16/ST

Proj. No.: N1105229 **Date:** 12-29-10

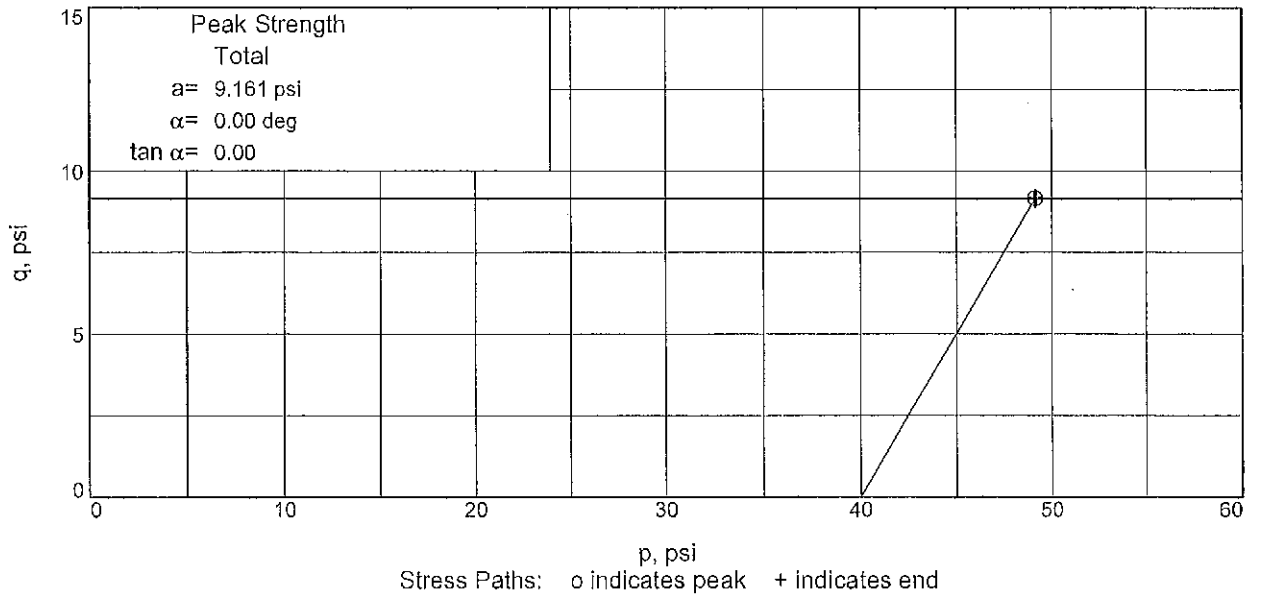
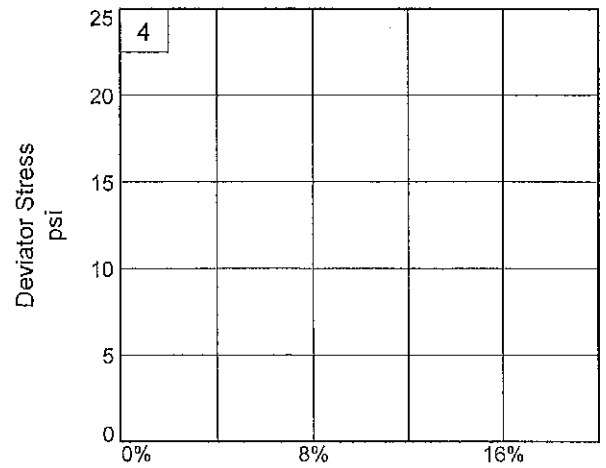
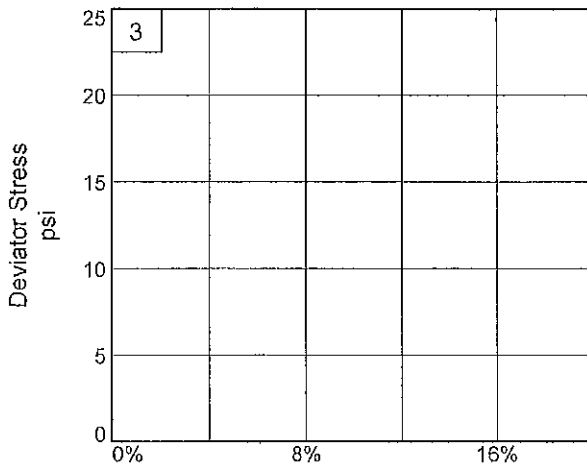
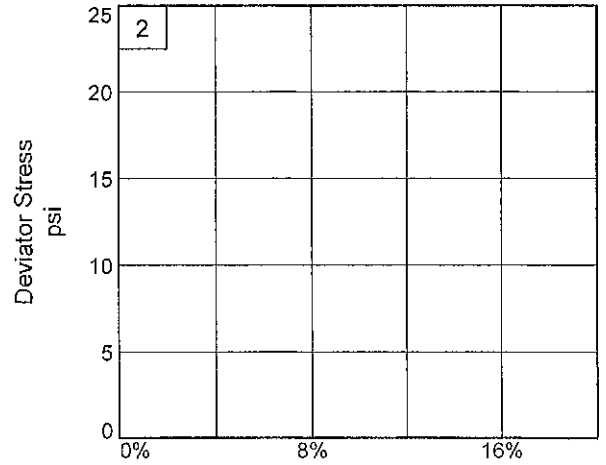
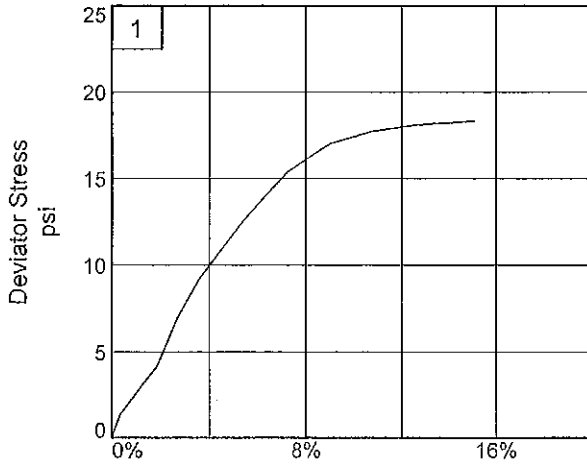
TRIAxIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: SV

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-66

Depth: 40-42'

Sample Number: 16/ST

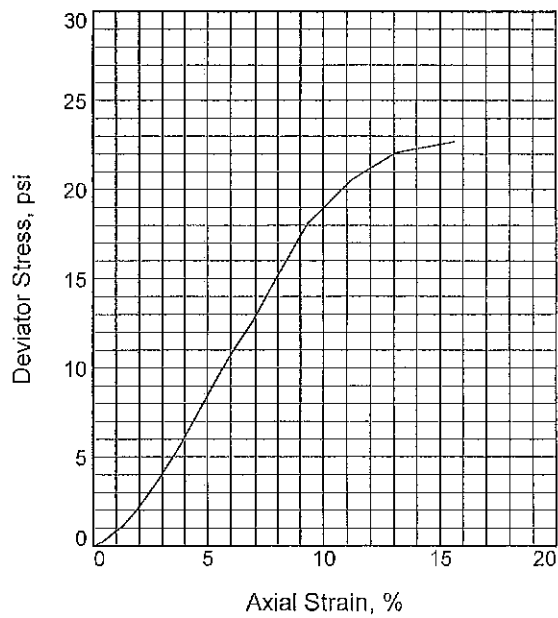
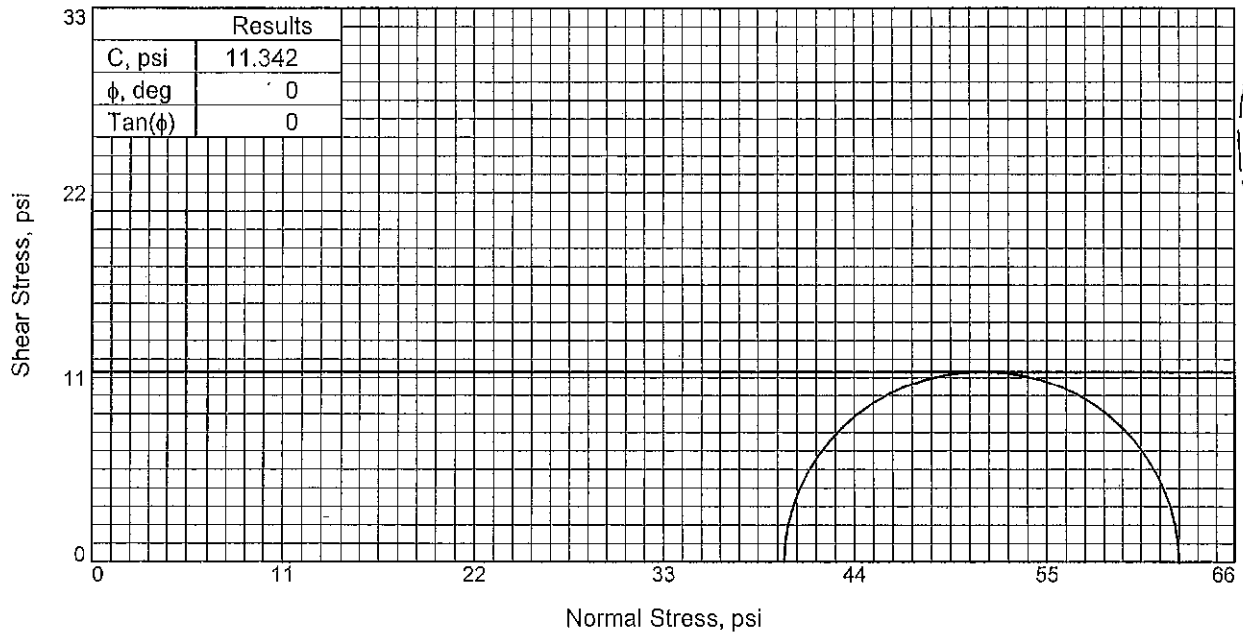
Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

Tested By: SV _____

Checked By: GS _____



Sample No.		1
Initial	Water Content,	26.9
	Dry Density, pcf	101.0
	Saturation,	108.6
	Void Ratio	0.6696
	Diameter, in.	2.870
At Test	Height, in.	5.370
	Water Content,	26.9
	Dry Density, pcf	101.0
	Saturation,	108.6
	Void Ratio	0.6696
Diameter, in.		2.870
Height, in.		5.370
Strain rate, in./min.		0.053
Back Pressure, psi		0.00
Cell Pressure, psi		40.00
Fail. Stress, psi		22.68
Ult. Stress, psi		
σ_1 Failure, psi		62.68
σ_3 Failure, psi		40.00

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN LEAN CLAY W/SILT
LENSES, MOIST - MED STIFF

Assumed Specific Gravity= 2.70

Remarks: Lab No. 12,182

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-67 **Depth:** 40-42'

Sample Number: 14/ST

Proj. No.: N1105229 **Date:** 11-27-10

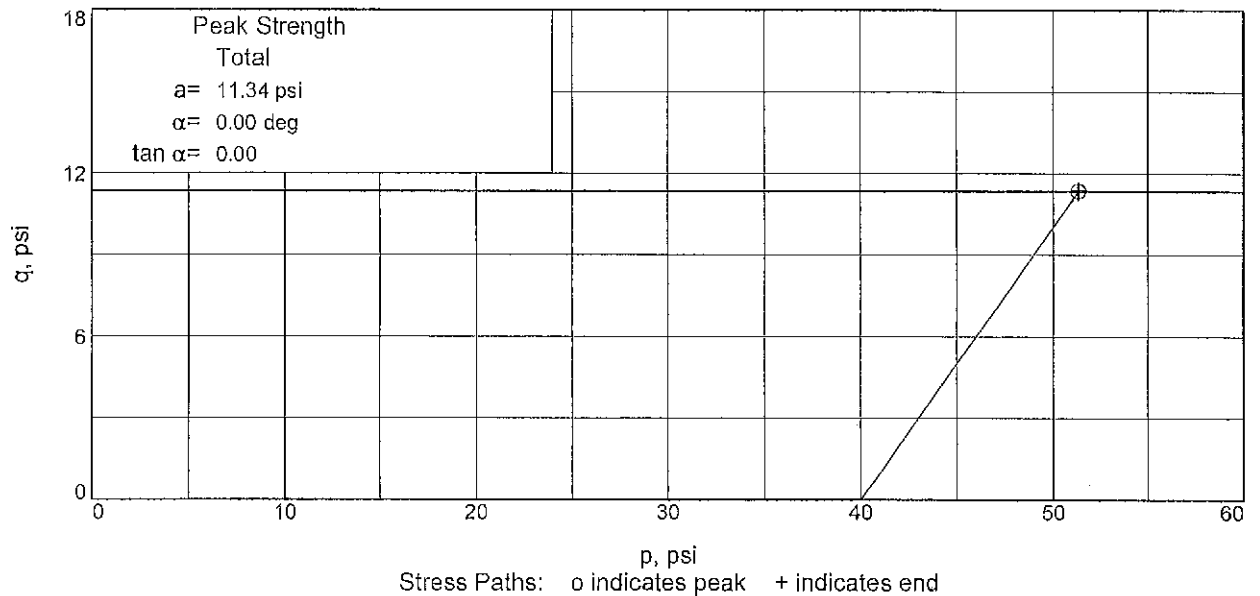
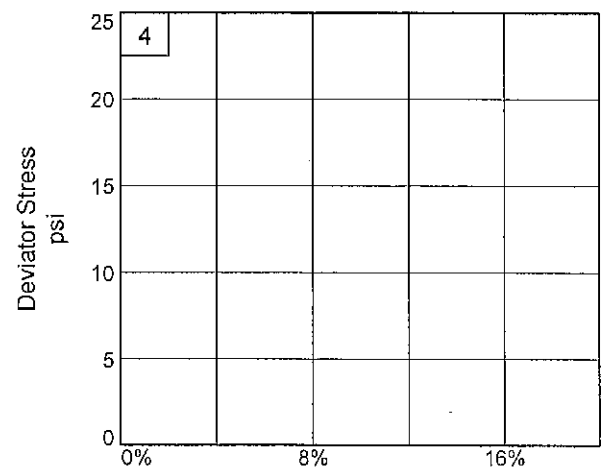
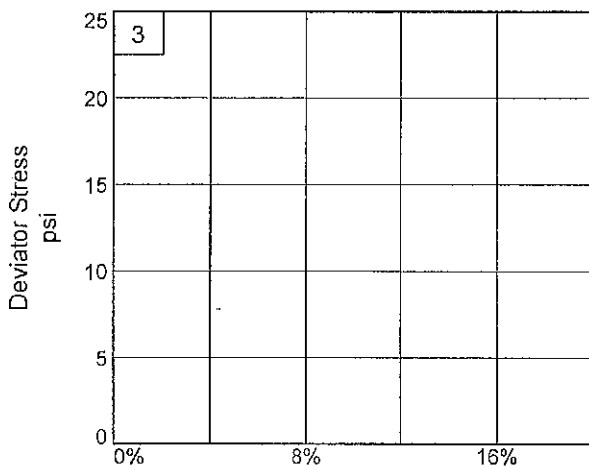
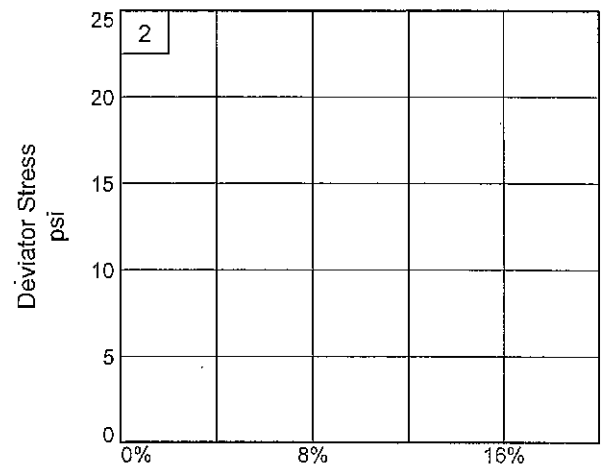
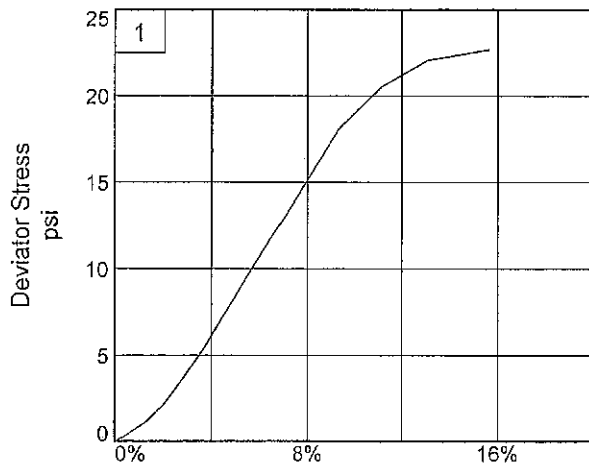
TRIAxIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: SV

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-67

Depth: 40-42'

Sample Number: 14/ST

Project No.: N1105229

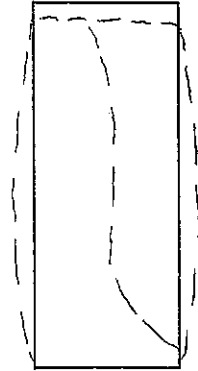
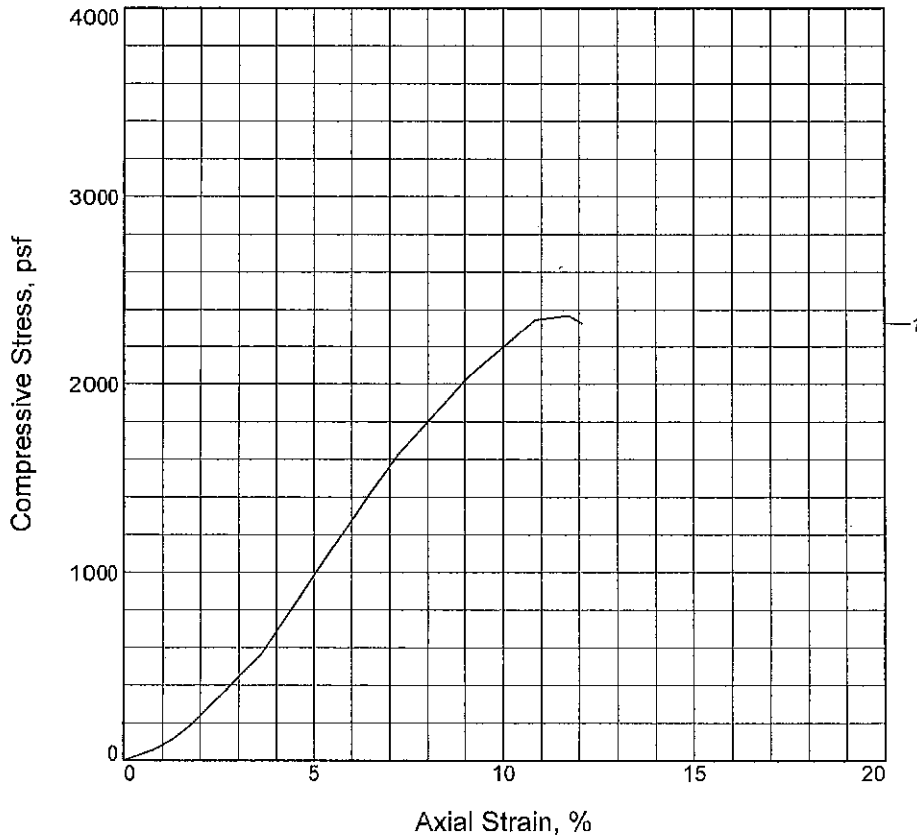
Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	2367.9			
Undrained shear strength, psf	1184.0			
Failure strain, %	11.7			
Strain rate, in./min.	0.055			
Water content, %	26.0			
Wet density, pcf	126.5			
Dry density, pcf	100.4			
Saturation, %	103.4			
Void ratio	0.6792			
Specimen diameter, in.	2.820			
Specimen height, in.	5.540			
Height/diameter ratio	1.96			

Description: GRAY LEAN CLAY W/SILT LENSES, MOIST - MED STIFF

LL = PL = PI = Assumed GS= 2.70 Type: ST

Project No.: N1105229

Date Sampled: 2-10-11

Remarks:
Lab No. 12,187

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KY

Source of Sample: HCN-67 **Depth:** 55-57'

Sample Number: 19/ST

UNCONFINED COMPRESSION TEST

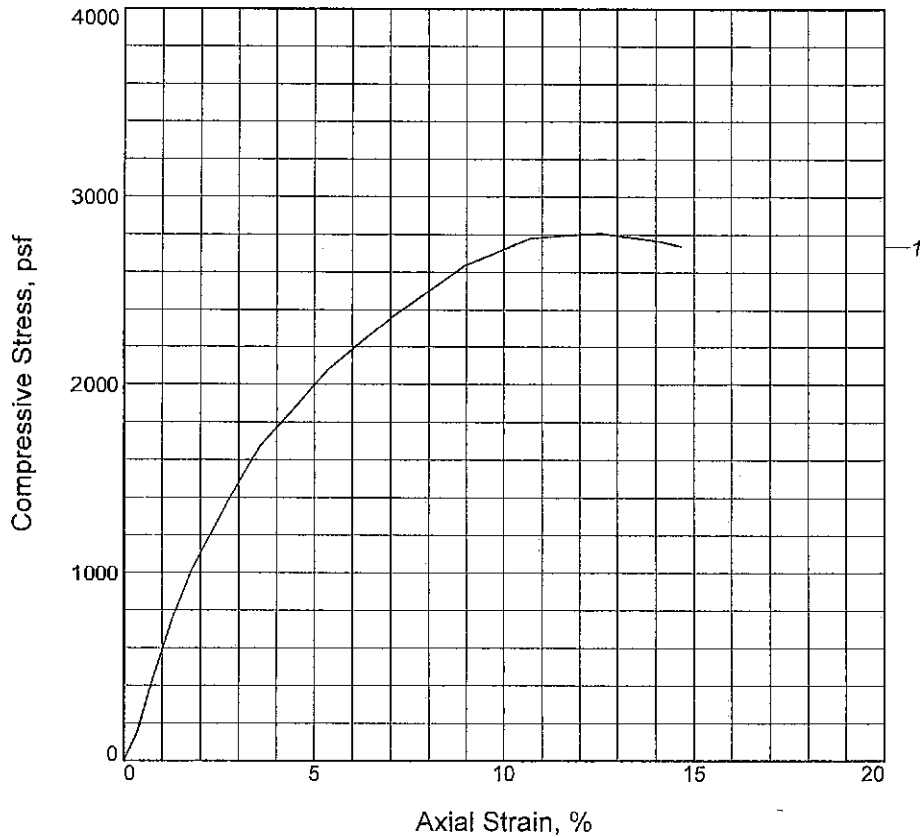
H.C. Nutting
A Terracon Company

Figure _____

Tested By: SV _____

Checked By: GS _____

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	2807.8			
Undrained shear strength, psf	1403.9			
Failure strain, %	12.5			
Strain rate, in./min.	0.055			
Water content, %	24.6			
Wet density, pcf	126.5			
Dry density, pcf	101.6			
Saturation, %	100.6			
Void ratio	0.6596			
Specimen diameter, in.	2.730			
Specimen height, in.	5.590			
Height/diameter ratio	2.05			

Description: GRAY LEAN CLAY W/SAND LENSES, MOIST - STIFF

LL = **PL =** **PI =** **Assumed GS= 2.70** **Type: ST**

Project No.: N1105229

Date Sampled: 2-10-11

Remarks:

Lab No. 12,192

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KY

Source of Sample: HCN-67 **Depth:** 75-77'

Sample Number: 24/ST

UNCONFINED COMPRESSION TEST

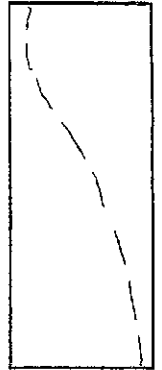
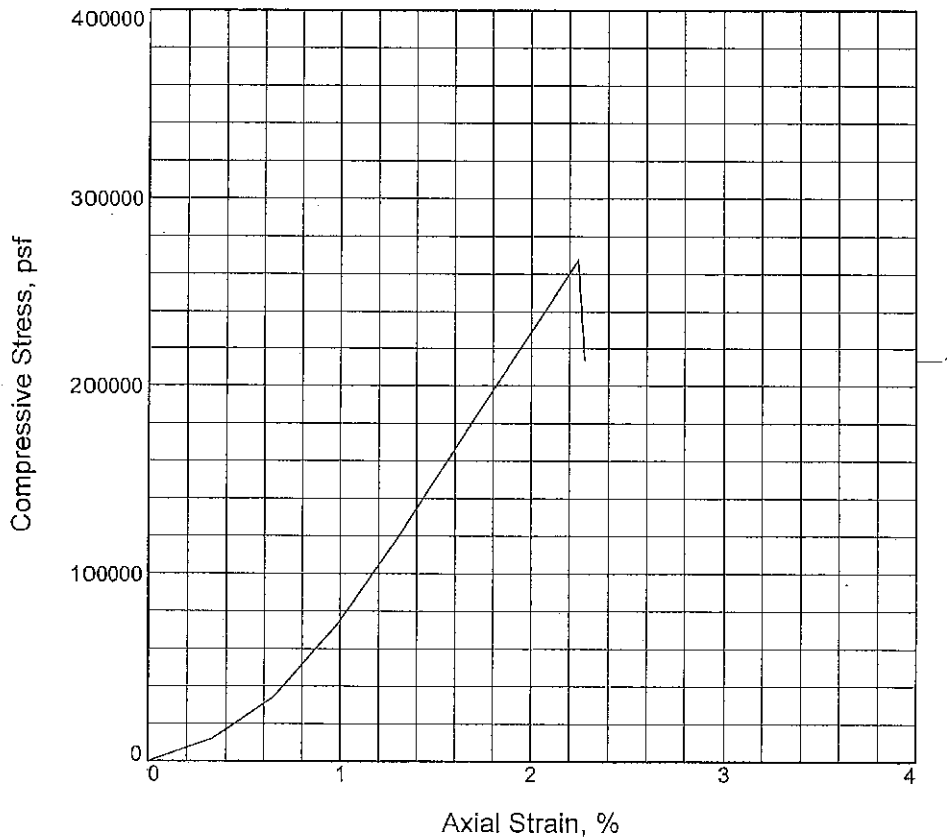
H.C. Nutting
A Terracon Company

Figure _____

Tested By: SV

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	267575.5		
Undrained shear strength, psf	133787.7		
Failure strain,	2.2		
Strain rate, in./min.	0.030		
Water content, %	3.7		
Wet density, pcf	157.8		
Dry density, pcf	152.1		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.970		
Specimen height, in.	3.070		
Height/diameter ratio	1.56		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-4-11

Remarks:
Lab No. 14,915

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-68 Depth: 68.4-68.8'

Sample Number: C3

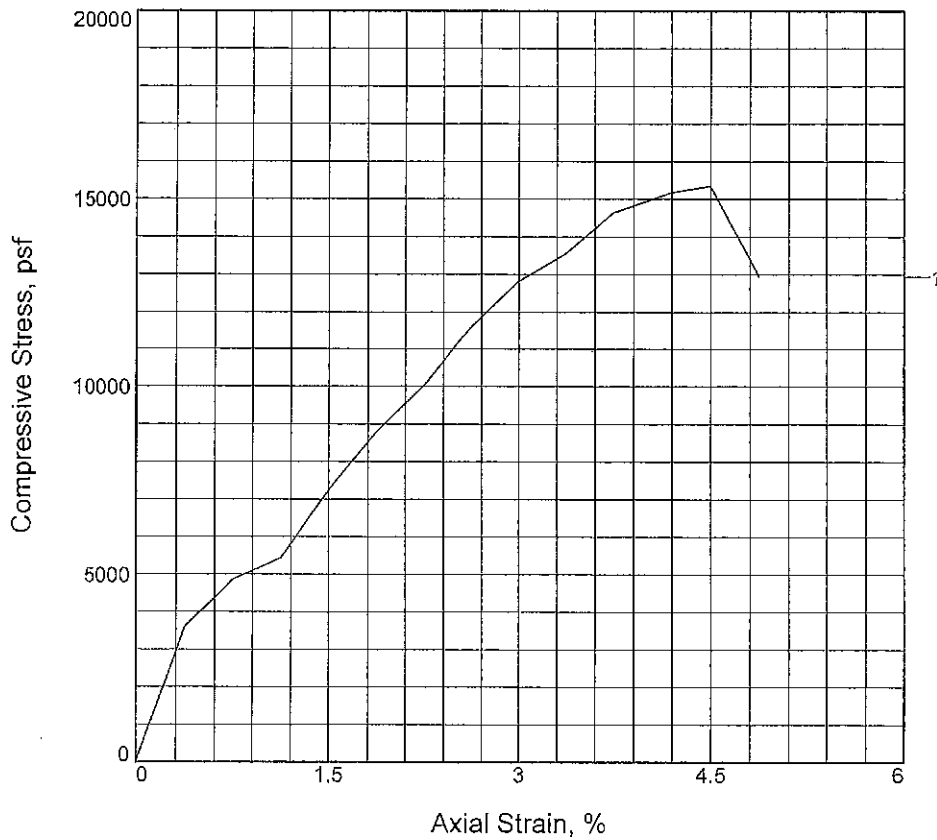
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: SV Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	15343.1		
Undrained shear strength, psf	7671.5		
Failure strain,	4.5		
Strain rate, in./min.	0.026		
Water content, %	11.3		
Wet density, pcf	141.6		
Dry density, pcf	127.3		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	2.010		
Specimen height, in.	2.670		
Height/diameter ratio	1.33		

Description: SHALE

LL =	PL =	PI =	Assumed GS=	Type: Shale
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Project No.: N1105229
 Date: 1-5-11
 Remarks:
 Lab No. 14,930

Figure _____

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY

Source of Sample: HCN-72 **Depth:** 68.9-69.2'

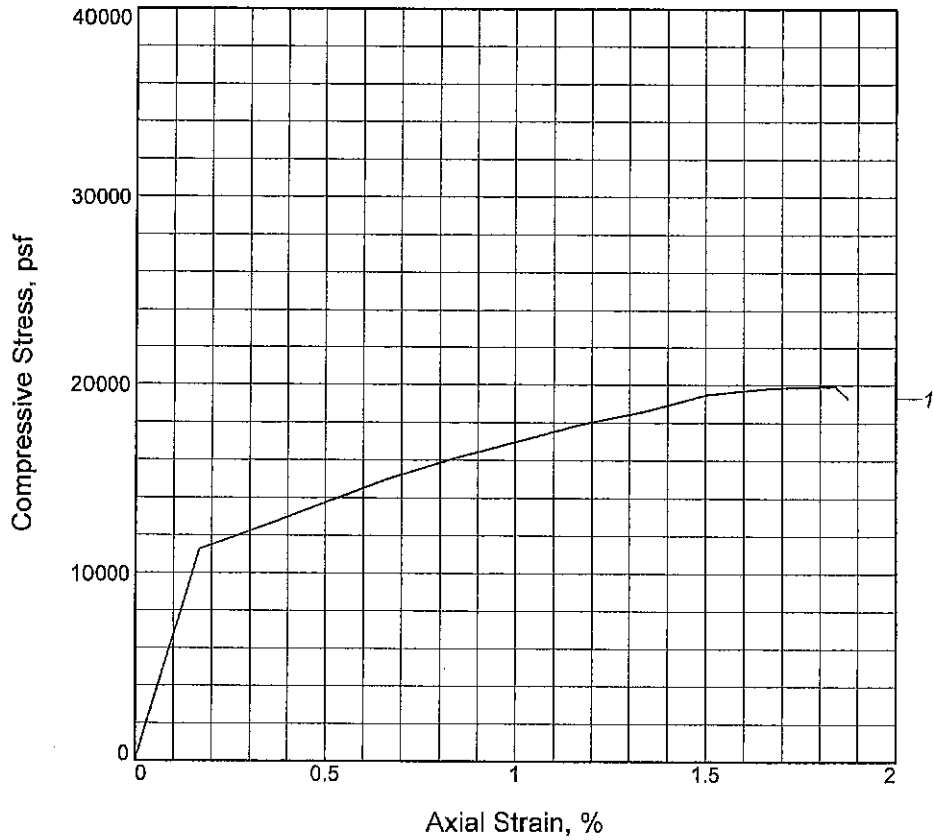
Sample Number: C1

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: MRE _____ Checked By: GS _____

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	19933.0			
Undrained shear strength, psf	9966.5			
Failure strain, %	1.8			
Strain rate, in./min.	0.029			
Water content, %	6.1			
Wet density, pcf	144.4			
Dry density, pcf	136.0			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	2.060			
Specimen height, in.	2.990			
Height/diameter ratio	1.45			

Description: SHALE

LL =	PL =	PI =	Assumed GS=	Type: Shale
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Project No.: N1105229
Date Sampled: 1-27-11
Remarks:
 Lab No. 13,080

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY
Source of Sample: HCN-72 **Depth:** 70.5-70.9'
Sample Number: C1

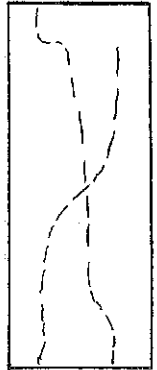
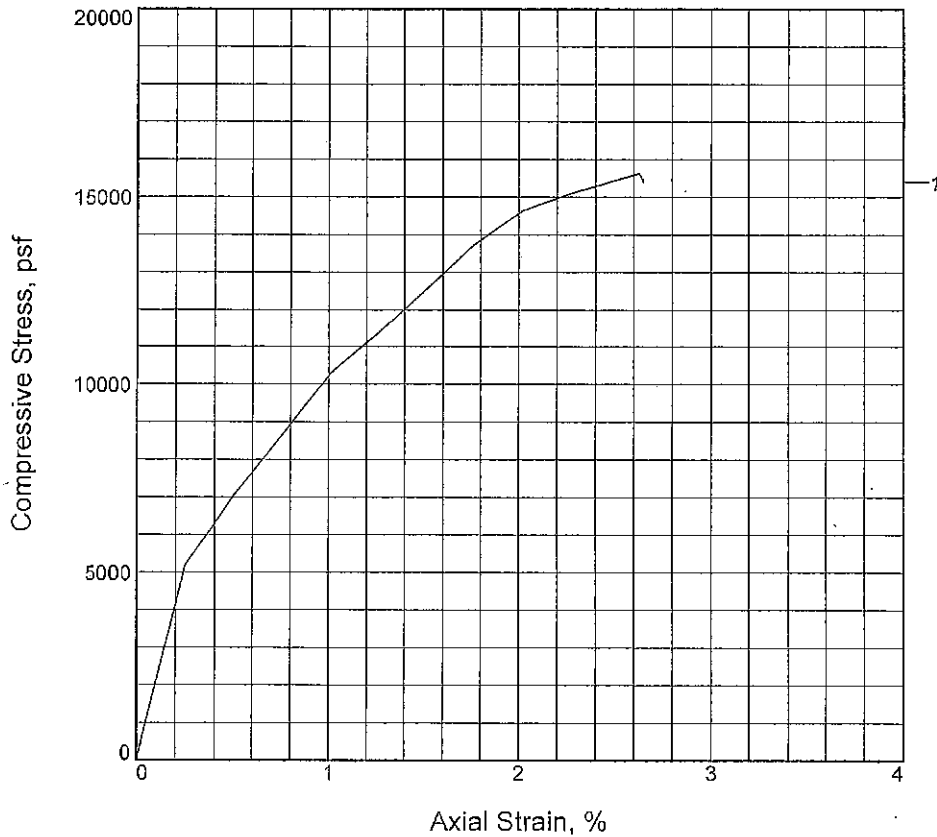
Figure _____

UNCONFINED COMPRESSION TEST
H.C. Nutting
 A Terracon Company

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	15624.5			
Undrained shear strength, psf	7812.2			
Failure strain,	2.6			
Strain rate, in./min.	0.039			
Water content, %	8.4			
Wet density, pcf	145.9			
Dry density, pcf	134.6			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	2.070			
Specimen height, in.	3.960			
Height/diameter ratio	1.91			

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-5-11

Remarks:
Lab No. 14,931

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-72 **Depth:** 70.5-71'

Sample Number: C2

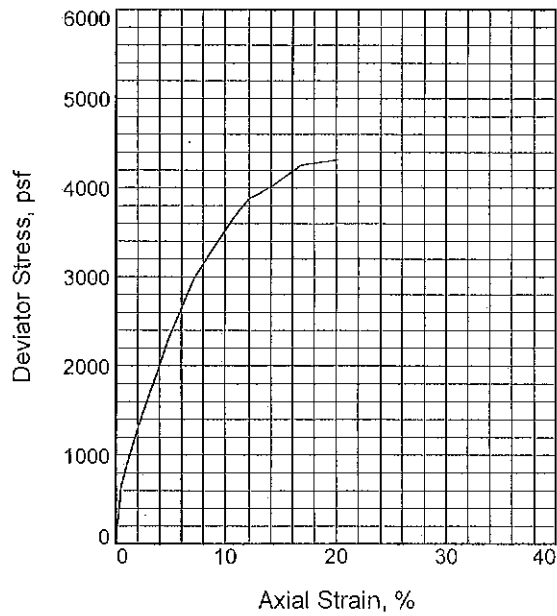
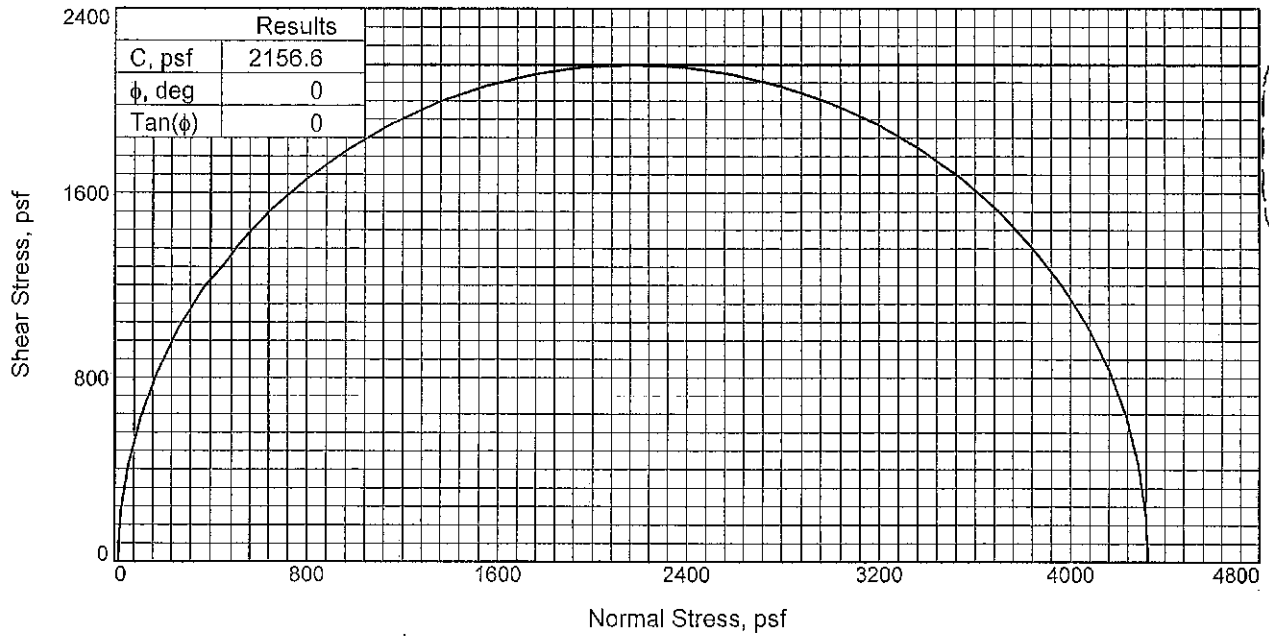
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS



Sample No.	1	
Initial	Water Content,	21.4
	Dry Density, pcf	101.8
	Saturation,	88.1
	Void Ratio	0.6563
	Diameter, in.	2.790
At Test	Height, in.	4.170
	Water Content,	21.4
	Dry Density, pcf	101.8
	Saturation,	88.1
	Void Ratio	0.6563
	Diameter, in.	2.790
	Height, in.	4.170
Strain rate, in./min.	0.041	
Back Pressure, psf	0.0	
Cell Pressure, psf	16.0	
Fail. Stress, psf	4313.2	
Ult. Stress, psf		
σ_1 Failure, psf	4329.2	
σ_3 Failure, psf	16.0	

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN LEAN CLAY, MOIST - STIFF

LL= 31 PL= 20 PI= 11

Assumed Specific Gravity= 2.70

Remarks: Lab No. 11,480

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-73 **Depth:** 15-17'

Sample Number: 7/ST

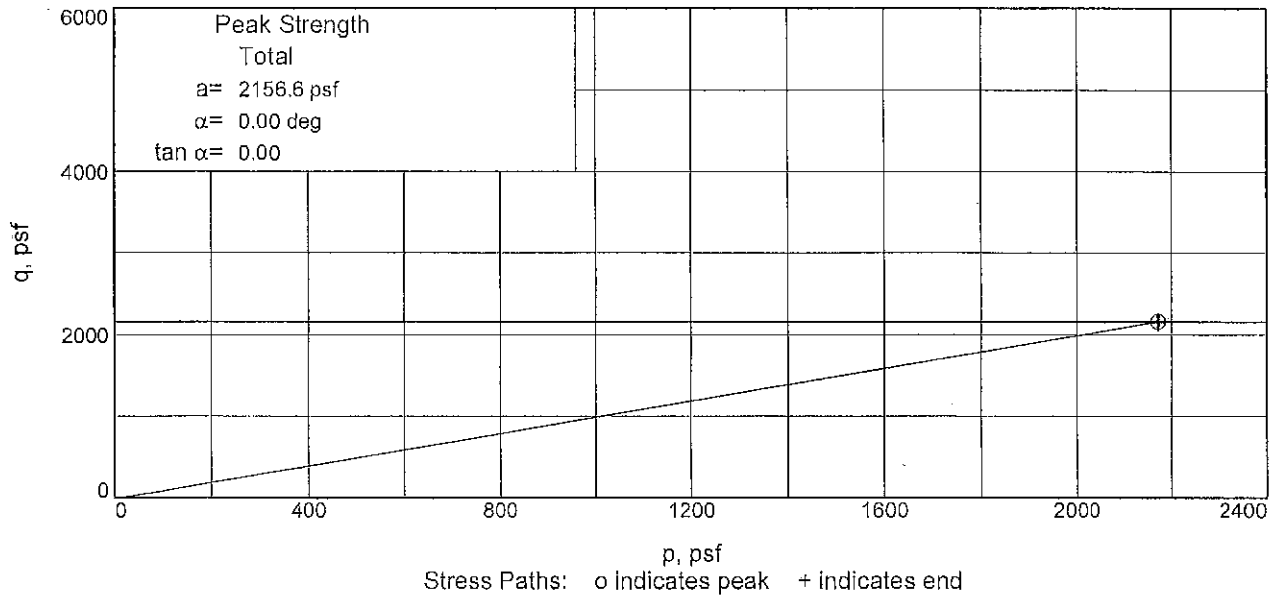
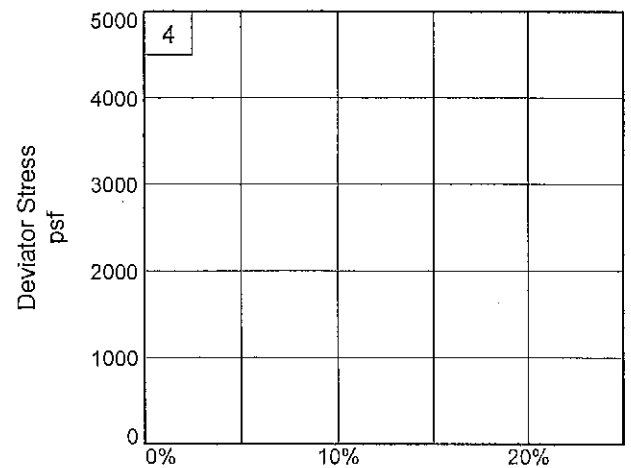
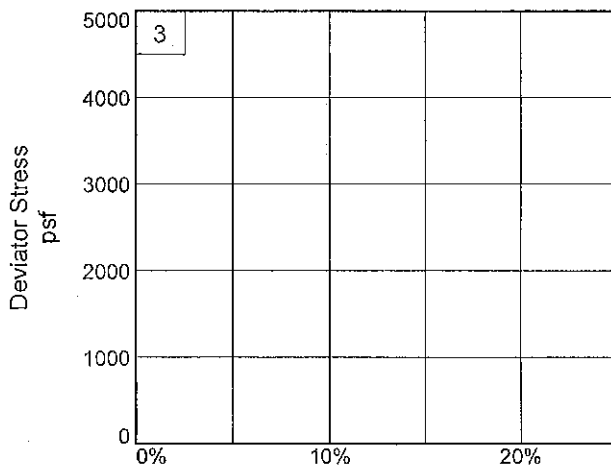
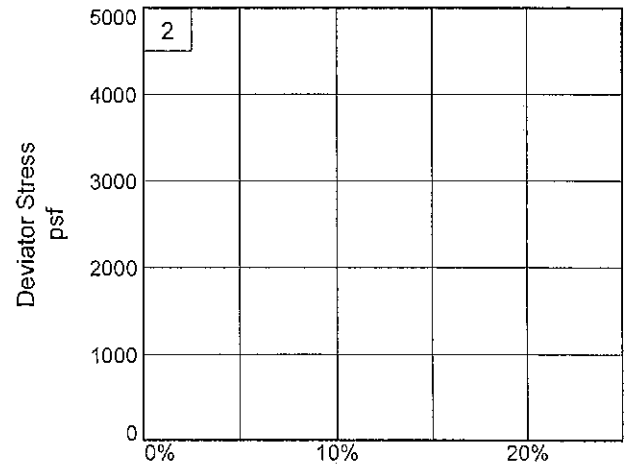
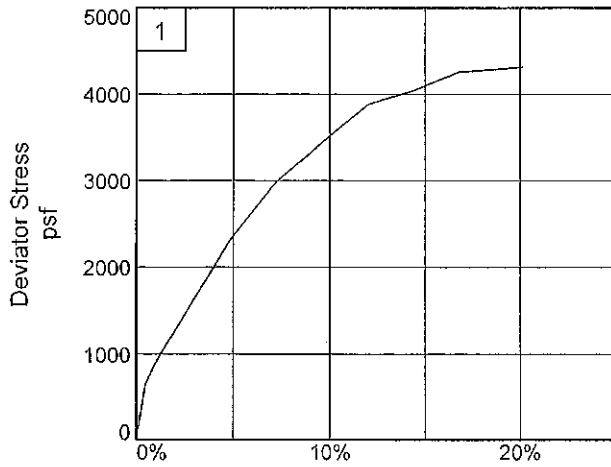
Proj. No.: N1105229 **Date:** 12-3-10

TRIAXIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: SV Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-73

Depth: 15-17'

Sample Number: 7/ST

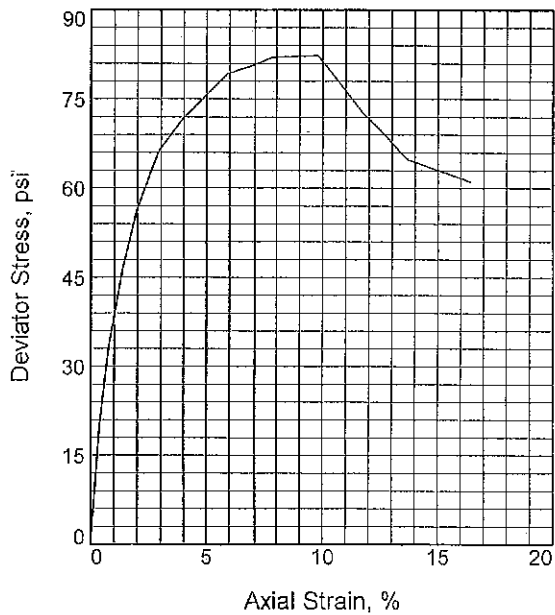
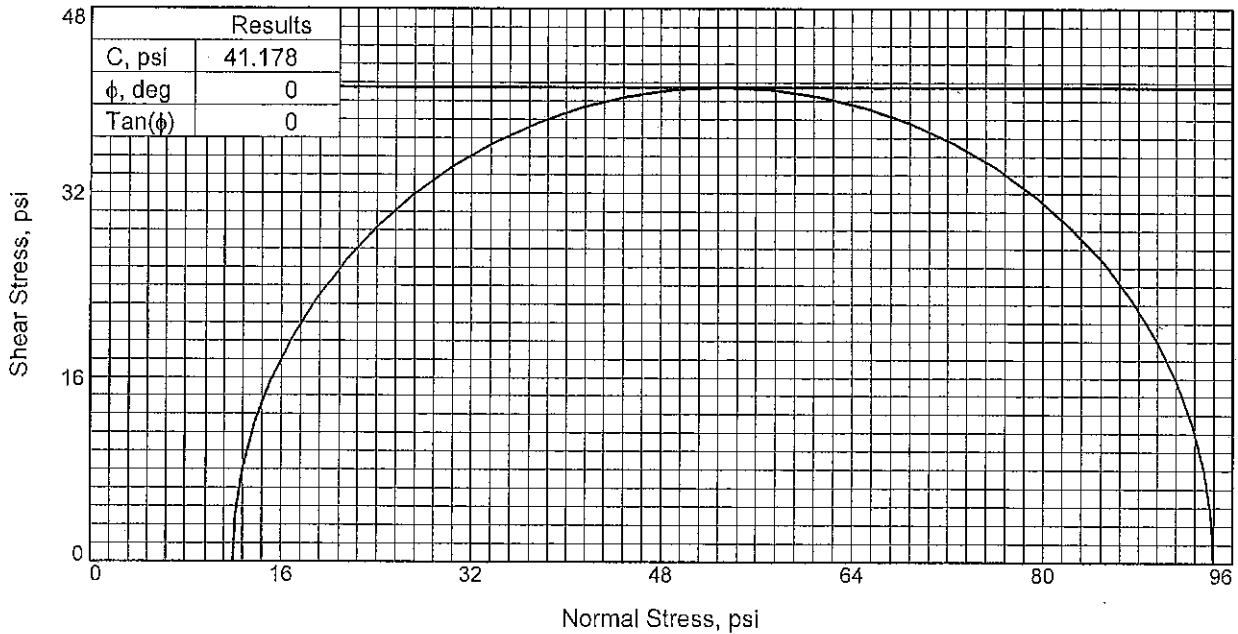
Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS



Sample No.		1
Initial	Water Content,	14.3
	Dry Density, pcf	120.7
	Saturation,	97.2
	Void Ratio	0.3969
	Diameter, in.	2.850
At Test	Height, in.	5.110
	Water Content,	14.3
	Dry Density, pcf	120.7
	Saturation,	97.2
	Void Ratio	0.3969
Diameter, in.		2.850
	Height, in.	5.110
Strain rate, in./min.		0.051
Back Pressure, psi		0.00
Cell Pressure, psi		12.00
Fail. Stress, psi		82.36
Ult. Stress, psi		
σ_1 Failure, psi		94.36
σ_3 Failure, psi		12.00

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN LEAN CLAY WITH SAND

LL= 43 PL= 21 PI= 22

Assumed Specific Gravity= 2.70

Remarks: Lab No. 11,617

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJIS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-74 **Depth:** 12.5-14.5'

Sample Number: 6/ST

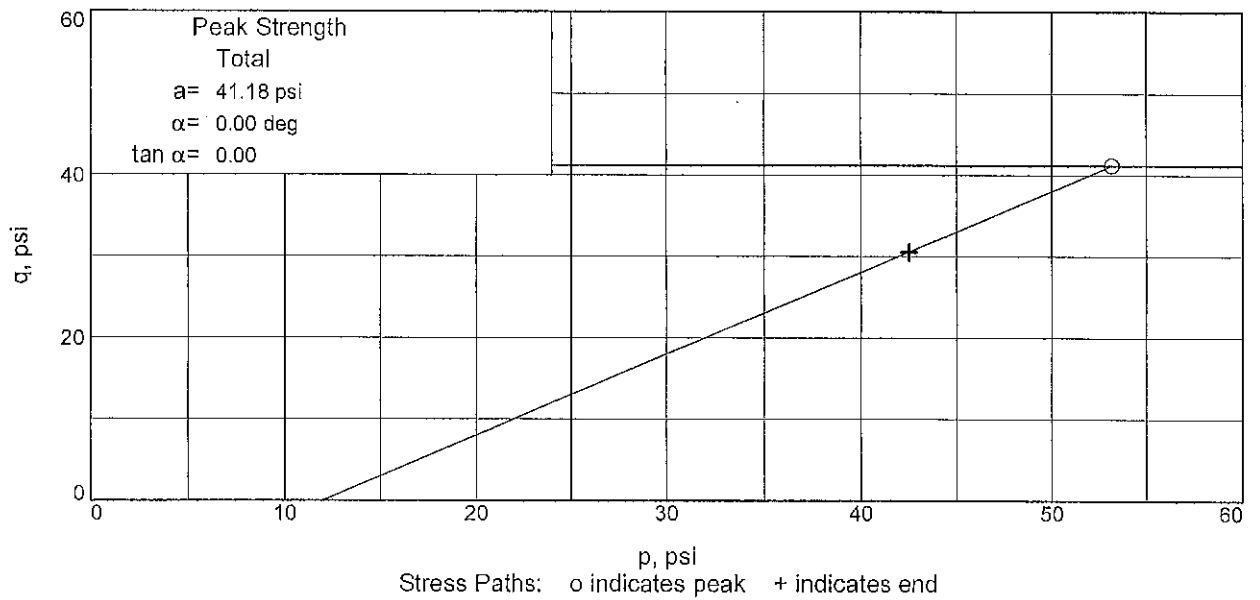
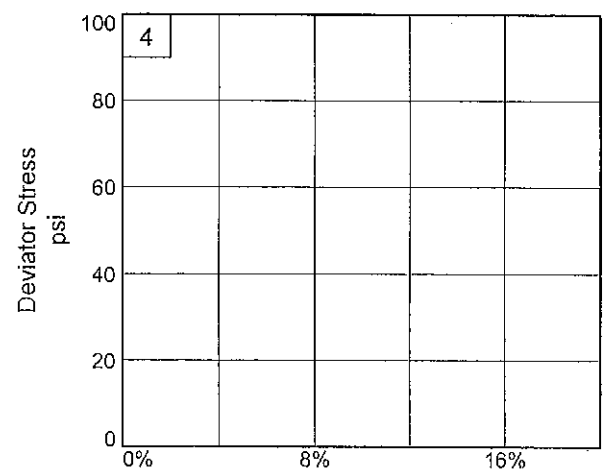
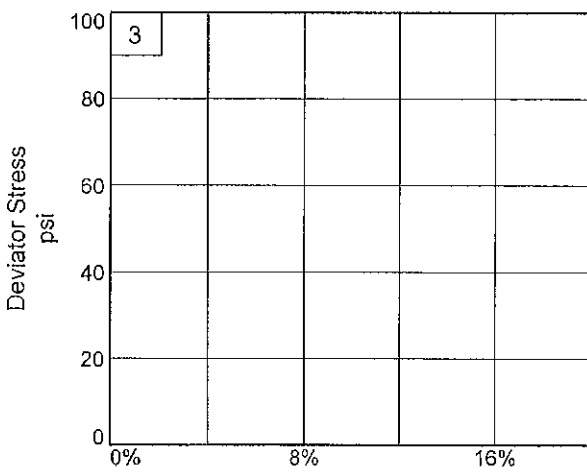
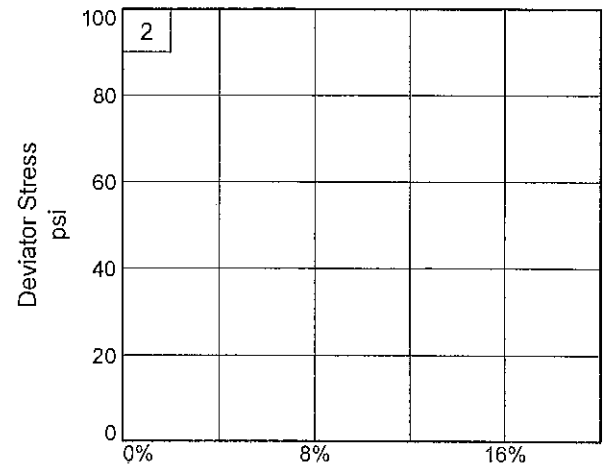
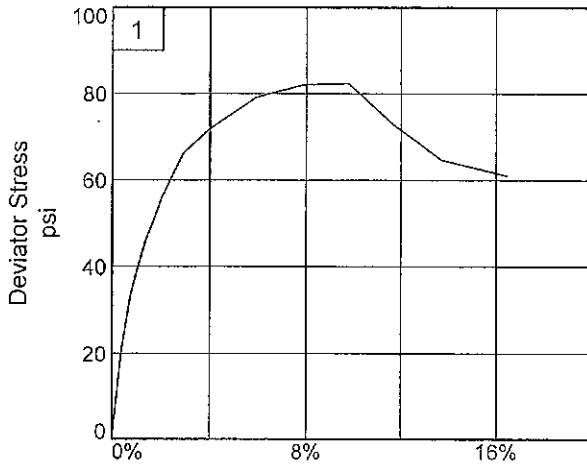
Proj. No.: N1105229 **Date:** 12-29-10

TRIAxIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: SV Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-74

Depth: 12.5-14.5'

Sample Number: 6/ST

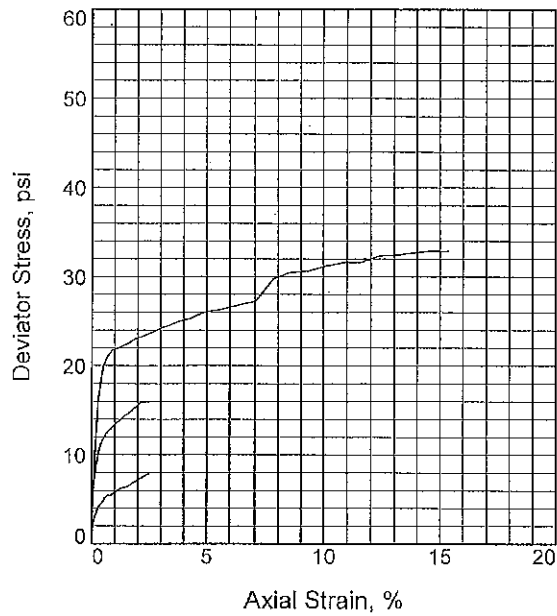
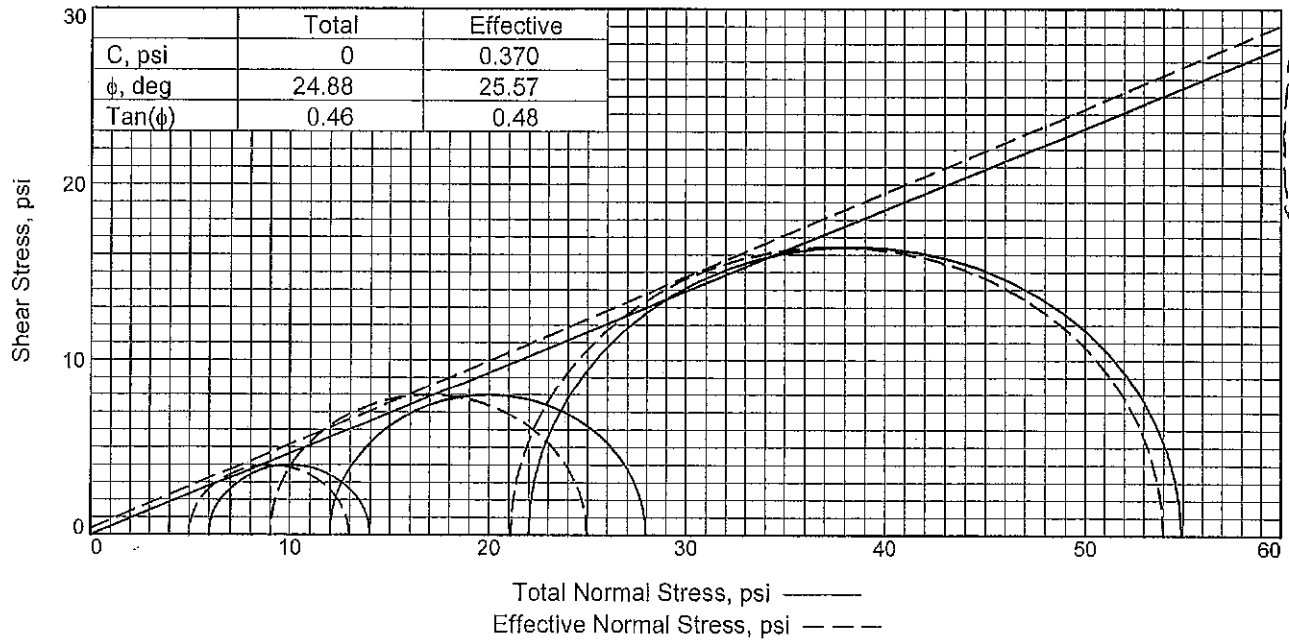
Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS



Sample No.	1	2	3	
Initial	Water Content,	18.8	18.8	18.8
	Dry Density, pcf	111.4	111.4	111.4
	Saturation,	98.8	98.8	98.8
	Void Ratio	0.5129	0.5129	0.5129
	Diameter, in.	2.852	2.852	2.852
	Height, in.	5.707	5.707	5.707
At Test	Water Content,	18.7	18.7	18.6
	Dry Density, pcf	112.0	112.1	112.2
	Saturation,	100.0	100.0	100.0
	Void Ratio	0.5050	0.5042	0.5025
	Diameter, in.	2.847	2.883	2.920
	Height, in.	5.697	5.553	5.407
Strain rate, in./min.	0.001	0.001	0.001	
Back Pressure, psi	60.00	60.00	60.00	
Cell Pressure, psi	66.00	72.00	82.00	
Fail. Stress, psi	7.96	15.97	32.90	
Total Pore Pr., psi	61.00	63.00	60.90	
Ult. Stress, psi				
Total Pore Pr., psi				
$\bar{\sigma}_1$ Failure, psi	12.96	24.97	54.00	
$\bar{\sigma}_3$ Failure, psi	5.00	9.00	21.10	

Type of Test:

CU with Pore Pressures

Sample Type: Stage Test

Description: BROWN LEAN CLAY WITH SAND

LL= 43 PL= 21 PI= 22

Assumed Specific Gravity= 2.70

Remarks: Lab No. 11,617

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-74 **Depth:** 12.5-14.5'

Sample Number: 6/ST

Proj. No.: N1105229

Date: 12-3-10

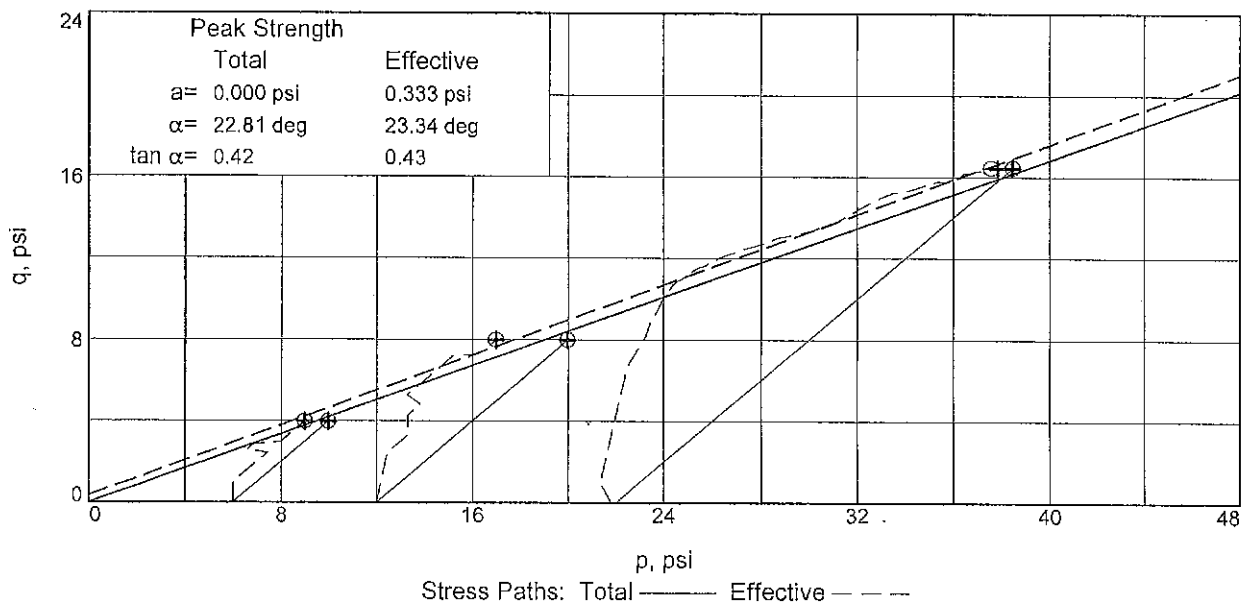
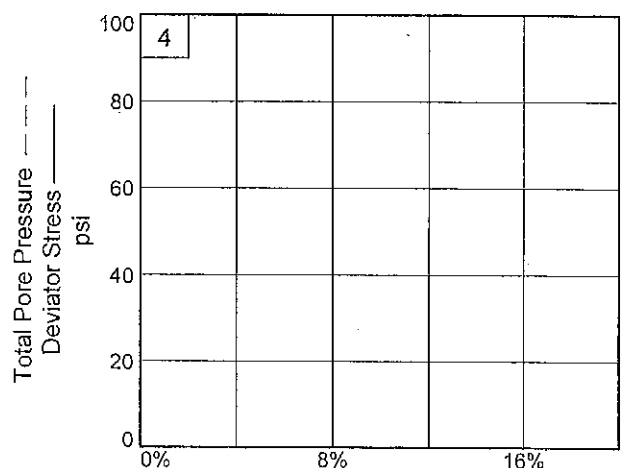
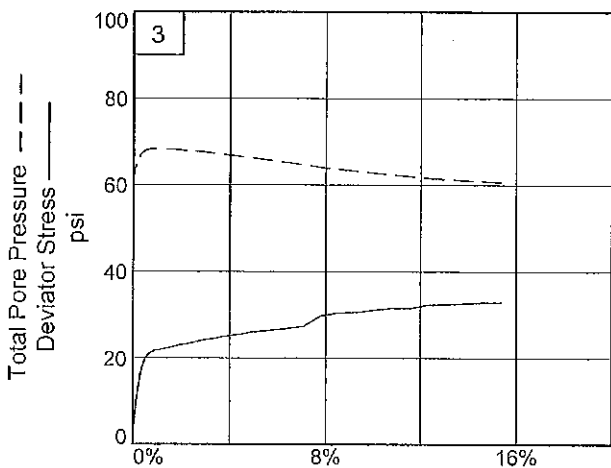
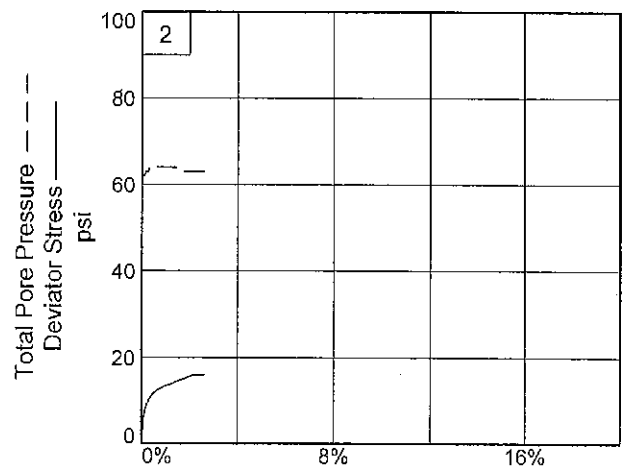
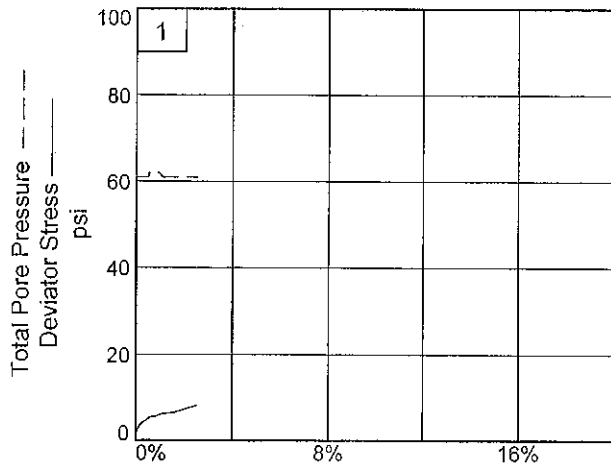
TRIAXIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: FCE

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-74

Depth: 12.5-14.5'

Sample Number: 6/ST

Project No.: N1105229

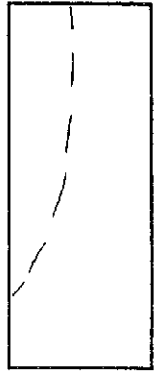
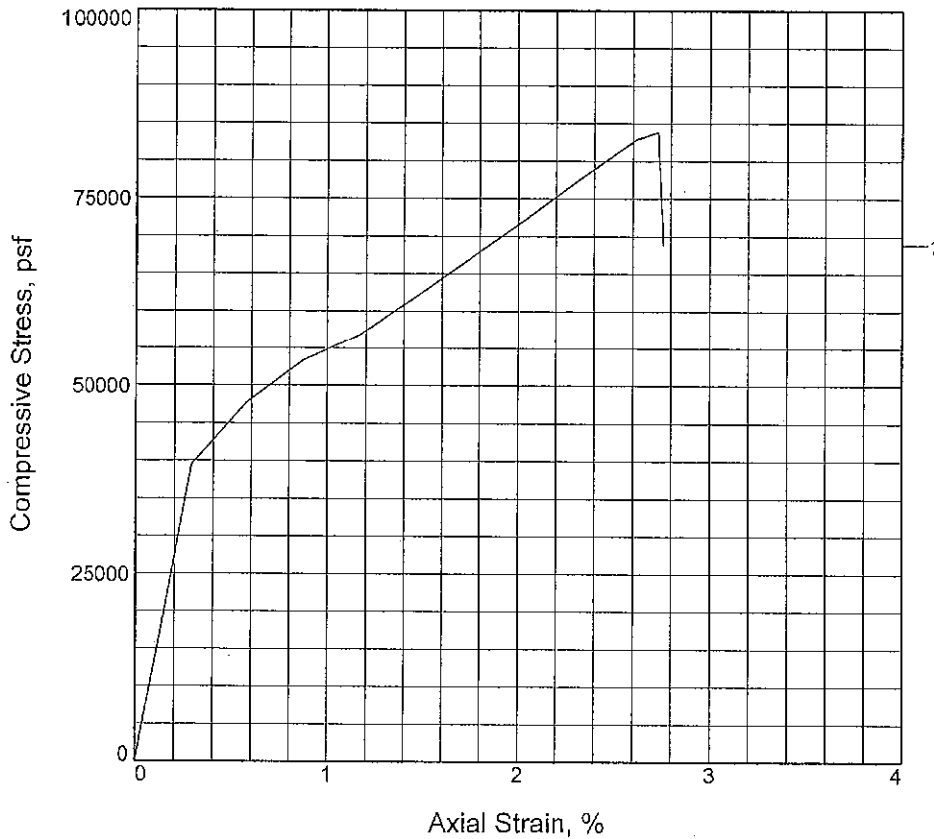
Figure _____

H. C. NUTTING COMPANY

Tested By: FCE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	83817.1		
Undrained shear strength, psf	41908.5		
Failure strain,	2.7		
Strain rate, in./min.	0.034		
Water content, %	5.2		
Wet density, pcf	144.5		
Dry density, pcf	137.3		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.970		
Specimen height, in.	3.440		
Height/diameter ratio	1.75		

Description: SHALE

LL = PL = PI = GS = Type: Shale

Project No.: N1105229

Date: 1-11-11

Remarks:
Lab No. 14,933

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-74 **Depth:** 69.2-69.6'

Sample Number: C2

UNCONFINED COMPRESSION TEST

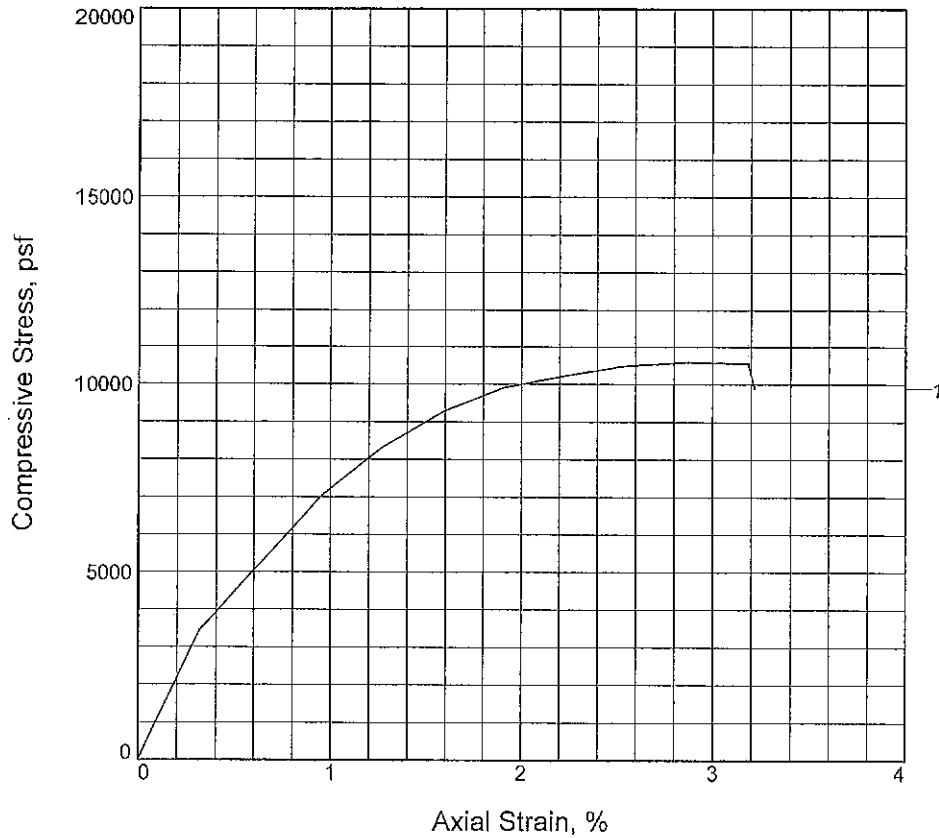
H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	10588.1		
Undrained shear strength, psf	5294.0		
Failure strain,	2.9		
Strain rate, in./min.	0.031		
Water content, %	13.5		
Wet density, pcf	141.8		
Dry density, pcf	125.0		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	2.030		
Specimen height, in.	3.140		
Height/diameter ratio	1.55		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-17-11

Remarks:

Lab No. 13,079

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-74

Depth: 69.2-69.5'

Sample Number: C3

UNCONFINED COMPRESSION TEST

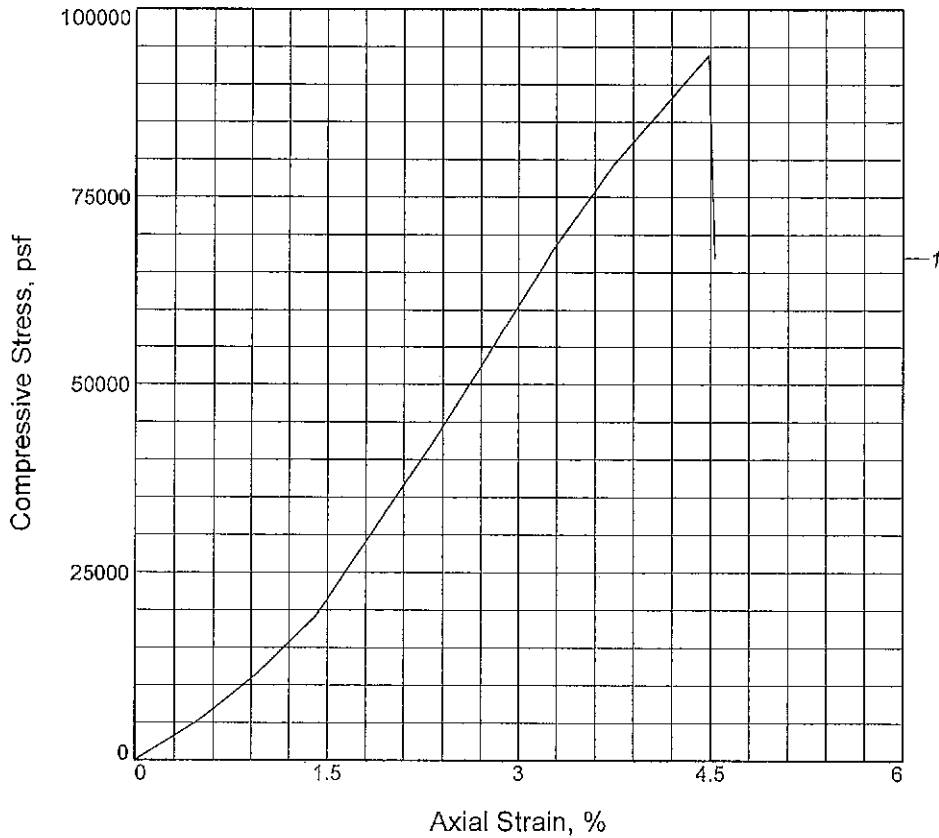
H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	93894.9			
Undrained shear strength, psf	46947.5			
Failure strain,	4.5			
Strain rate, in./min.	0.021			
Water content, %	4.5			
Wet density, pcf	149.4			
Dry density, pcf	143.0			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.980			
Specimen height, in.	2.140			
Height/diameter ratio	1.08			

Description: SHALE

LL = PL = PI = GS= Type: Shale

Project No.: N1105229

Date: 1-12-11

Remarks:

Lab No. 14,932

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-74

Depth: 71-71.4'

Sample Number: C3

UNCONFINED COMPRESSION TEST

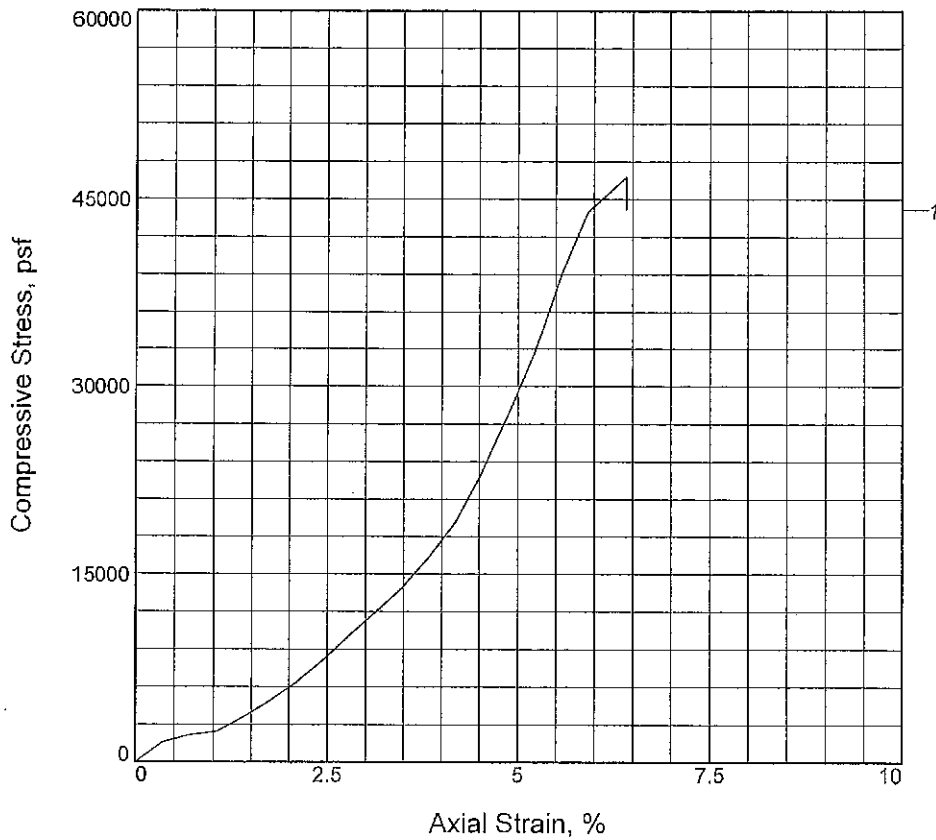
H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	46734.7		
Undrained shear strength, psf	23367.3		
Failure strain,	6.4		
Strain rate, in./min.	0.028		
Water content, %	6.1		
Wet density, pcf	152.9		
Dry density, pcf	144.0		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.970		
Specimen height, in.	2.870		
Height/diameter ratio	1.46		

Description: SHALE
 LL = PL = PI = GS = **Type:** Shale

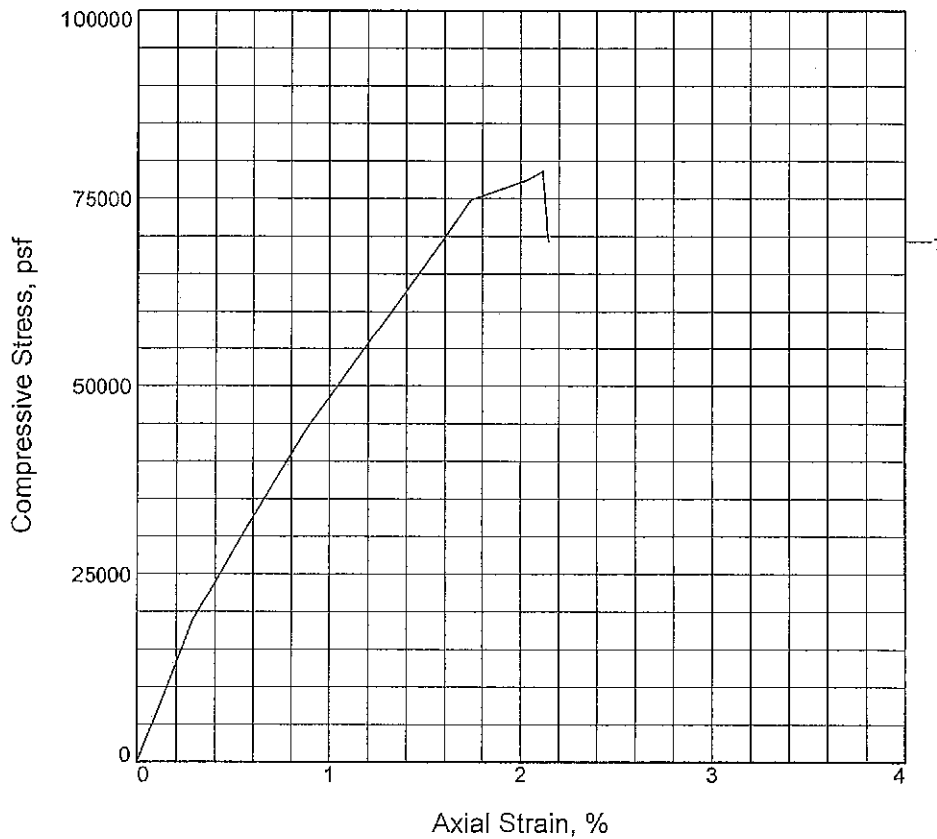
Project No.: N1105229
Date: 1-11-11
Remarks:
 Lab No. 14,917

 Figure _____

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY
Source of Sample: HCN-78 **Depth:** 78.5-78.9'
Sample Number: C5
 UNCONFINED COMPRESSION TEST
H. C. NUTTING COMPANY

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	78614.2		
Undrained shear strength, psf	39307.1		
Failure strain,	2.1		
Strain rate, in./min.	0.034		
Water content, %	6.7		
Wet density, pcf	156.5		
Dry density, pcf	146.7		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.970		
Specimen height, in.	3.450		
Height/diameter ratio	1.75		

Description: SHALE

LL = **PL =** **PI =** **Assumed GS=** **Type:** Shale

Project No.: N1105229

Date: 1-6-11

Remarks:
Lab No. 14,196

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-82 **Depth:** 80.5-81'

Sample Number: C3

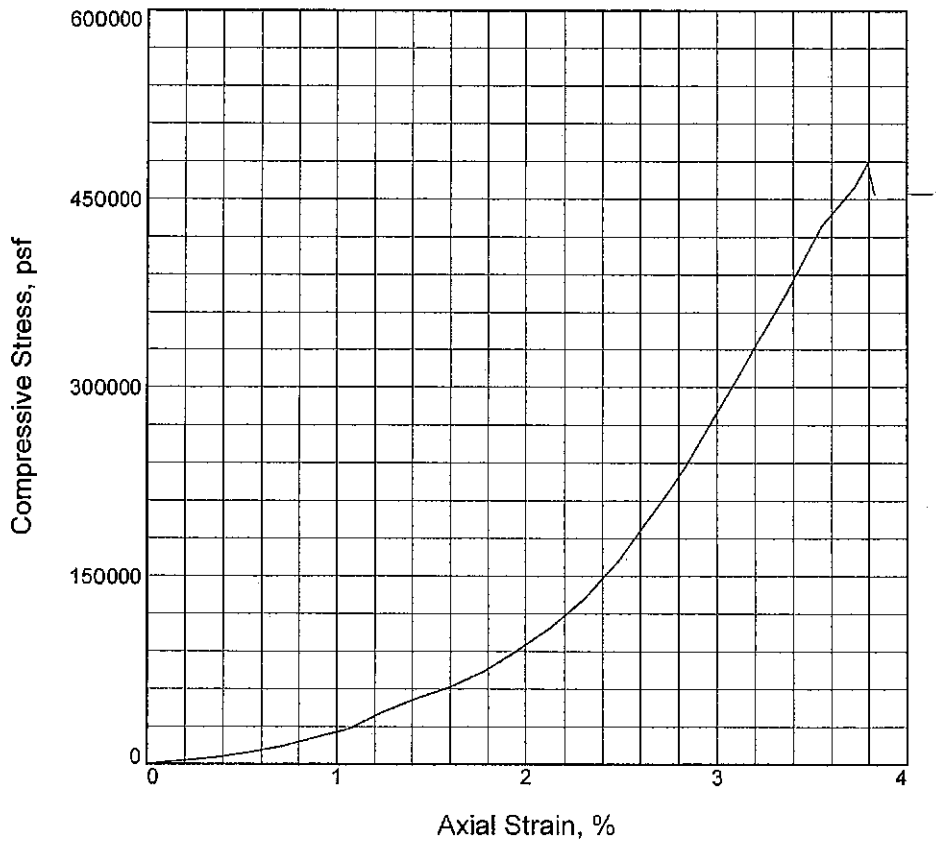
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: MRE **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	478596.2		
Undrained shear strength, psf	239298.1		
Failure strain, %	3.8		
Strain rate, in./min.	0.028		
Water content, %	1.5		
Wet density, pcf	155.0		
Dry density, pcf	152.7		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.970		
Specimen height, in.	2.820		
Height/diameter ratio	1.43		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date Sampled: 2-17-11

Remarks:

Lab No. 14,016

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-83 **Depth:** 83-83.4'

Sample Number: C2

UNCONFINED COMPRESSION TEST

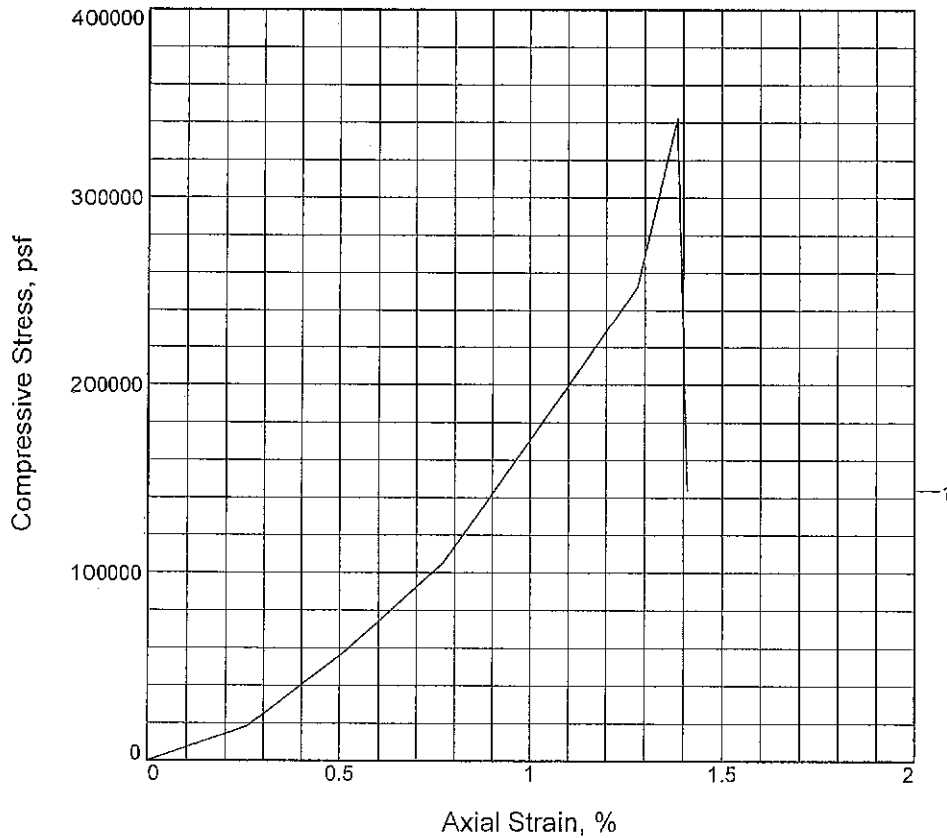
H.C. Nutting
A Terracon Company

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	342005.3		
Undrained shear strength, psf	171002.6		
Failure strain,	1.4		
Strain rate, in./min.	0.039		
Water content, %	3.1		
Wet density, pcf	156.1		
Dry density, pcf	151.4		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.940		
Specimen height, in.	3.900		
Height/diameter ratio	2.01		

Description: SHALE

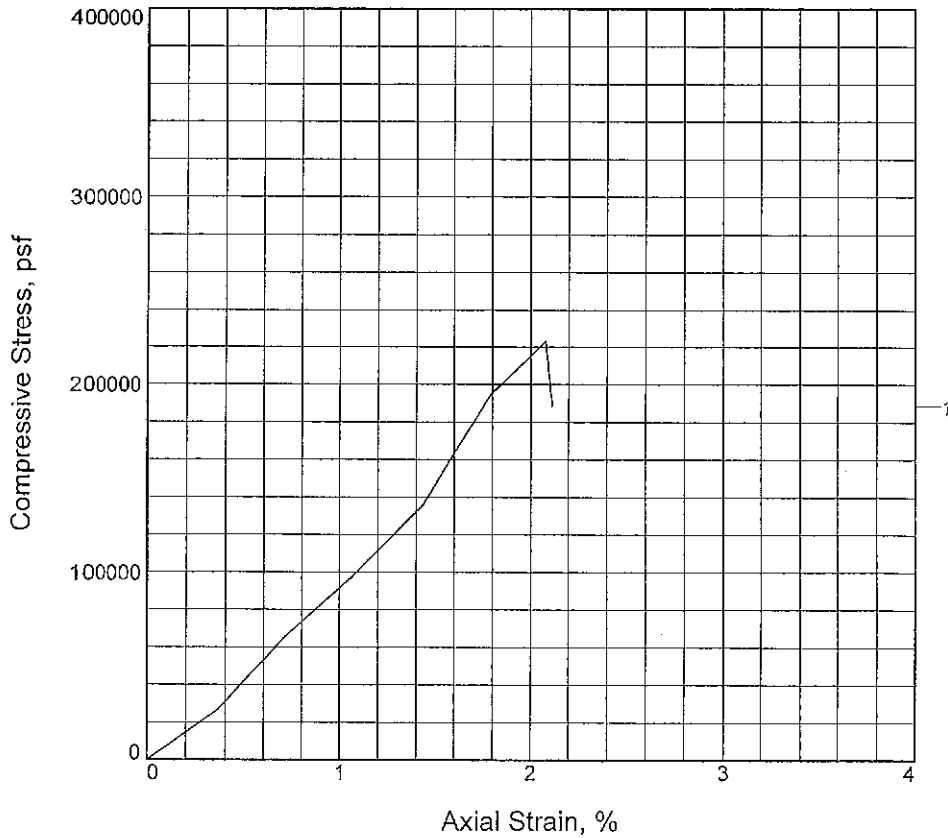
LL = PL = PI = GS = Type: Shale

<p>Project No.: N1105229 Date: 1-11-11 Remarks: Lab No. 13,906</p>	<p>Client: PARSONS BRINCKERHOFF Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS KENTON COUNTY, KENTUCKY Source of Sample: HCN-84 Depth: 66-66.5' Sample Number: C1</p>
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UNCONFINED COMPRESSION TEST
H. C. NUTTING COMPANY

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	223138.0			
Undrained shear strength, psf	111569.0			
Failure strain,	2.1			
Strain rate, in./min.	0.027			
Water content, %	7.4			
Wet density, pcf	156.1			
Dry density, pcf	145.3			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.950			
Specimen height, in.	2.790			
Height/diameter ratio	1.43			

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-6-11

Remarks:
Lab No. 13,956

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-85 **Depth:** 67.2-67.6'

Sample Number: C2

UNCONFINED COMPRESSION TEST

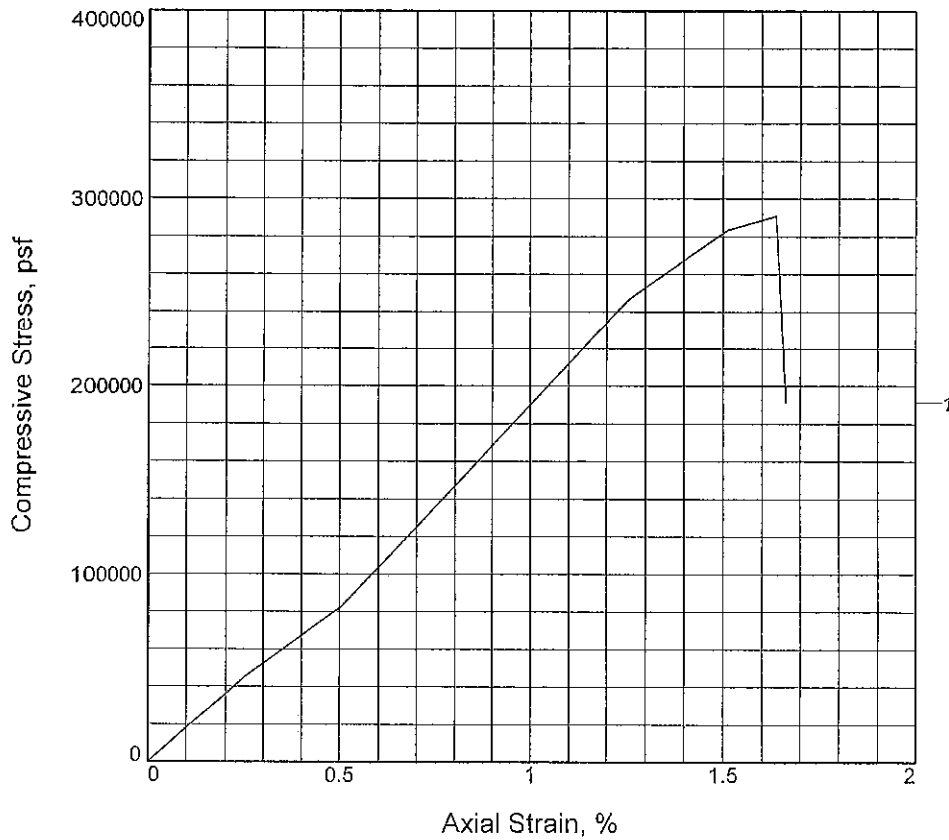
H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	290862.9			
Undrained shear strength, psf	145431.5			
Failure strain,	1.6			
Strain rate, in./min.	0.039			
Water content, %	4.2			
Wet density, pcf	161.3			
Dry density, pcf	154.8			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.940			
Specimen height, in.	3.970			
Height/diameter ratio	2.05			

Description: SHALE

LL =	PL =	PI =	Assumed GS=	Type: Shale
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Project No.: N1105229

Date: 1-6-11

Remarks:
Lab No. 13,957

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-85 **Depth:** 72.75-73.1'

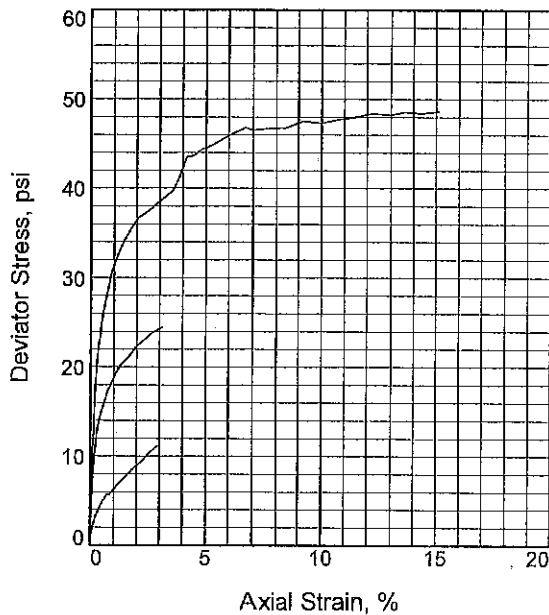
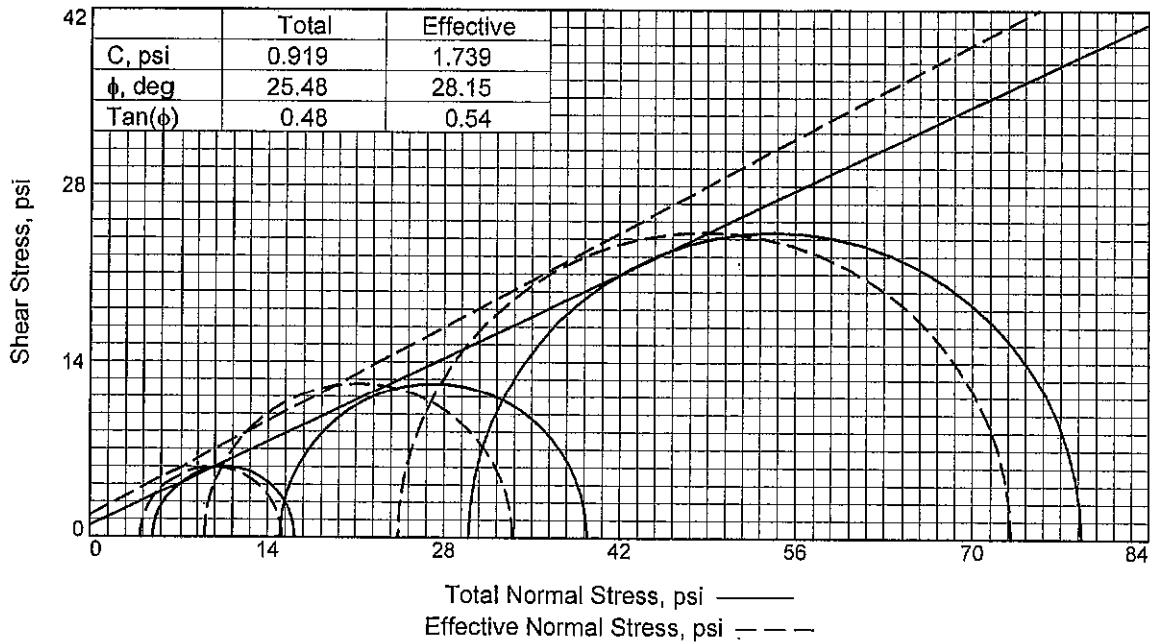
Sample Number: C2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: MRE Checked By: GS



Sample No.		1	2	3
Initial	Water Content, %	27.9	27.9	27.9
	Dry Density, pcf	100.8	100.8	100.8
	Saturation, %	111.9	111.9	111.9
	Void Ratio	0.6726	0.6726	0.6726
	Diameter, in.	2.788	2.788	2.788
	Height, in.	5.785	5.785	5.785
At Test	Water Content, %	24.8	24.5	24.4
	Dry Density, pcf	100.9	101.5	101.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6700	0.6611	0.6592
	Diameter, in.	2.787	2.823	2.867
	Height, in.	5.782	5.603	5.426
Strain rate, in./min.		0.000	0.000	0.000
Back Pressure, psi		60.00	60.00	60.00
Cell Pressure, psi		65.00	75.00	90.00
Fail. Stress, psi		11.15	24.45	48.63
Total Pore Pr., psi		61.00	66.00	65.60
Ult. Stress, psi				
Total Pore Pr., psi				
$\bar{\sigma}_1$ Failure, psi		15.15	33.45	73.03
$\bar{\sigma}_3$ Failure, psi		4.00	9.00	24.40

Type of Test:

CU with Pore Pressures

Sample Type: Stage Test

Description: BROWN LEAN CLAY WITH SAND, MOIST - STIFF

LL= 49 PL= 27 PI= 22

Assumed Specific Gravity= 2.70

Remarks: Lab No. 14,025

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-86 **Depth:** 18-20'

Sample Number: 8/ST

Proj. No.: N1105229

Date Sampled:

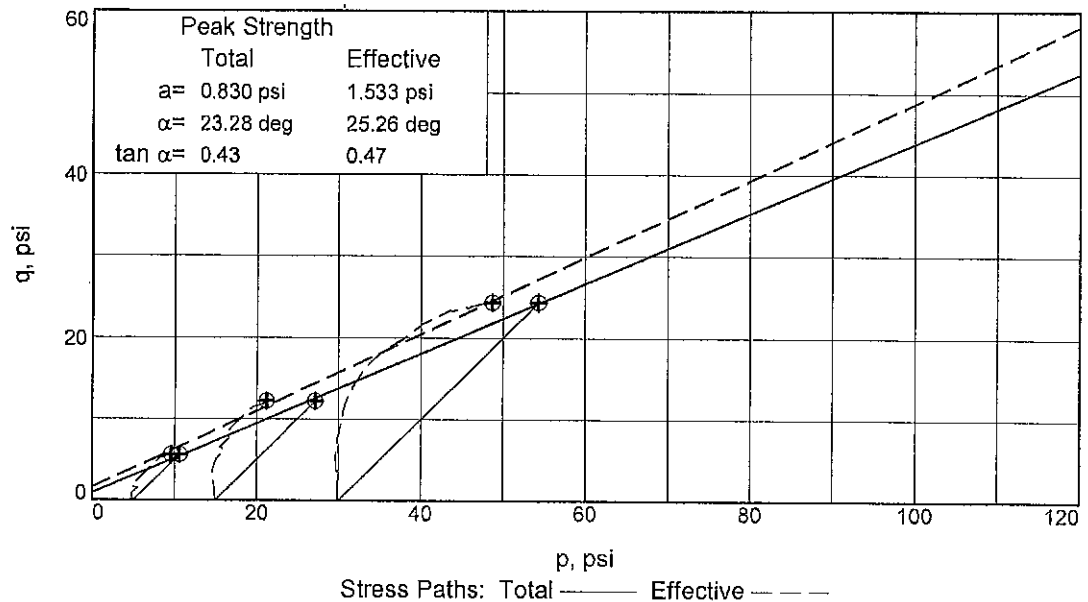
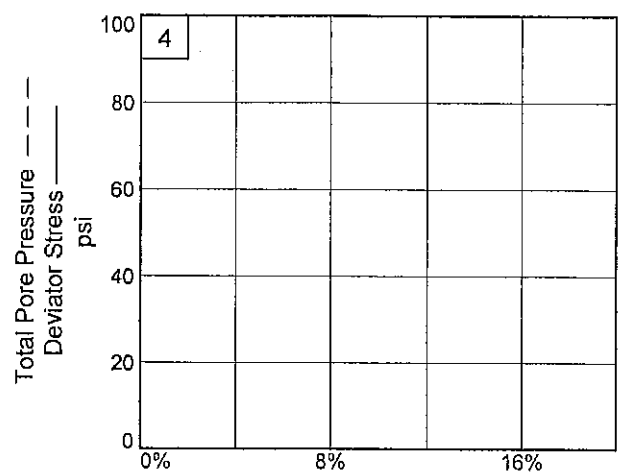
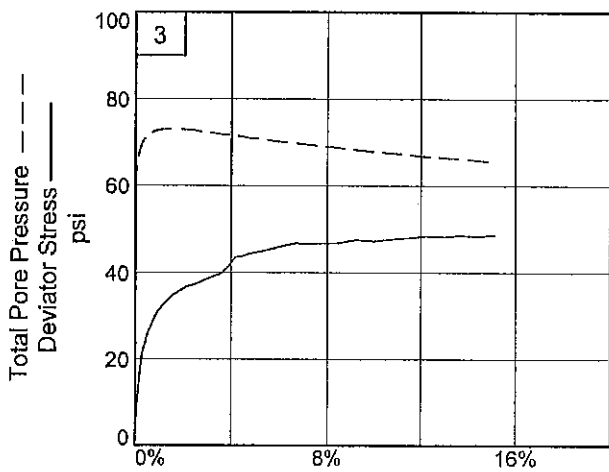
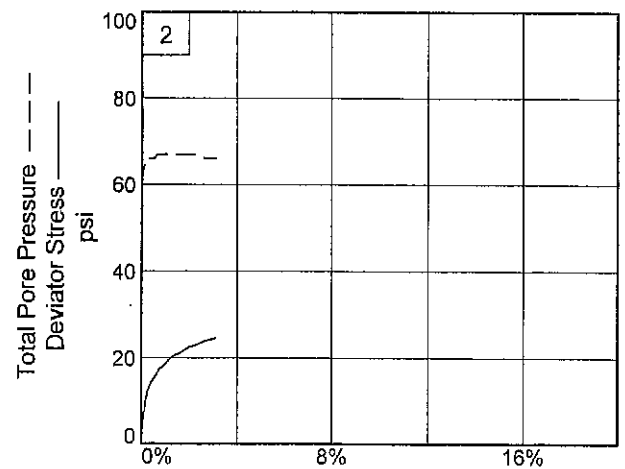
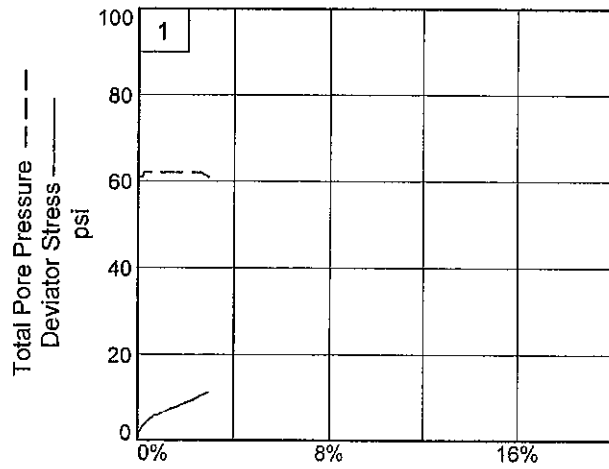
TRIAXIAL SHEAR TEST REPORT

H.C. Nutting
A Terracon Company

Figure _____

Tested By: FCE

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-86

Depth: 18-20'

Sample Number: 8/ST

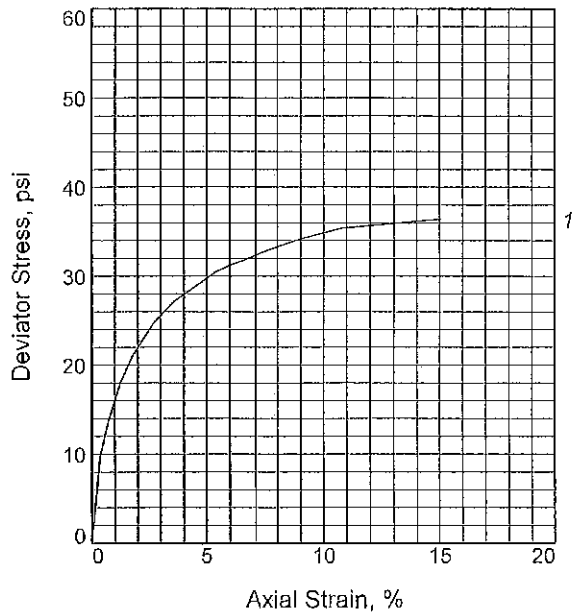
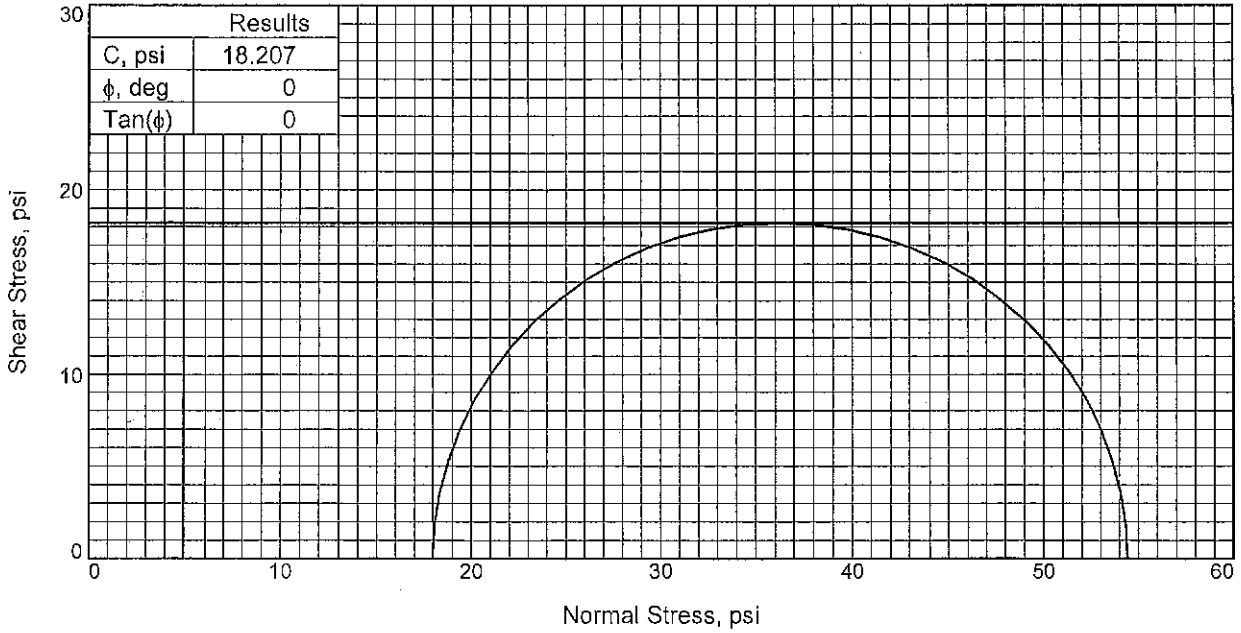
Project No.: N1105229

Figure _____

H.C. Nutting - A Terracon Company

Tested By: FCE

Checked By: GS



Sample No.	1	
Initial	Water Content,	27.2
	Dry Density, pcf	96.5
	Saturation,	98.1
	Void Ratio	0.7471
	Diameter, in.	2.840
Height, in.	5.580	
At Test	Water Content,	27.2
	Dry Density, pcf	96.5
	Saturation,	98.1
	Void Ratio	0.7471
	Diameter, in.	2.840
Height, in.	5.580	
Strain rate, in./min.	0.055	
Back Pressure, psi	0.00	
Cell Pressure, psi	18.00	
Fail. Stress, psi	36.41	
Ult. Stress, psi		
σ_1 Failure, psi	54.41	
σ_3 Failure, psi	18.00	

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: BROWN LEAN CLAY WITH SAND,
MOIST - STIFF

LL= 49 PL= 27 PI= 22

Assumed Specific Gravity= 2.70

Remarks: Lab No. 14,025

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

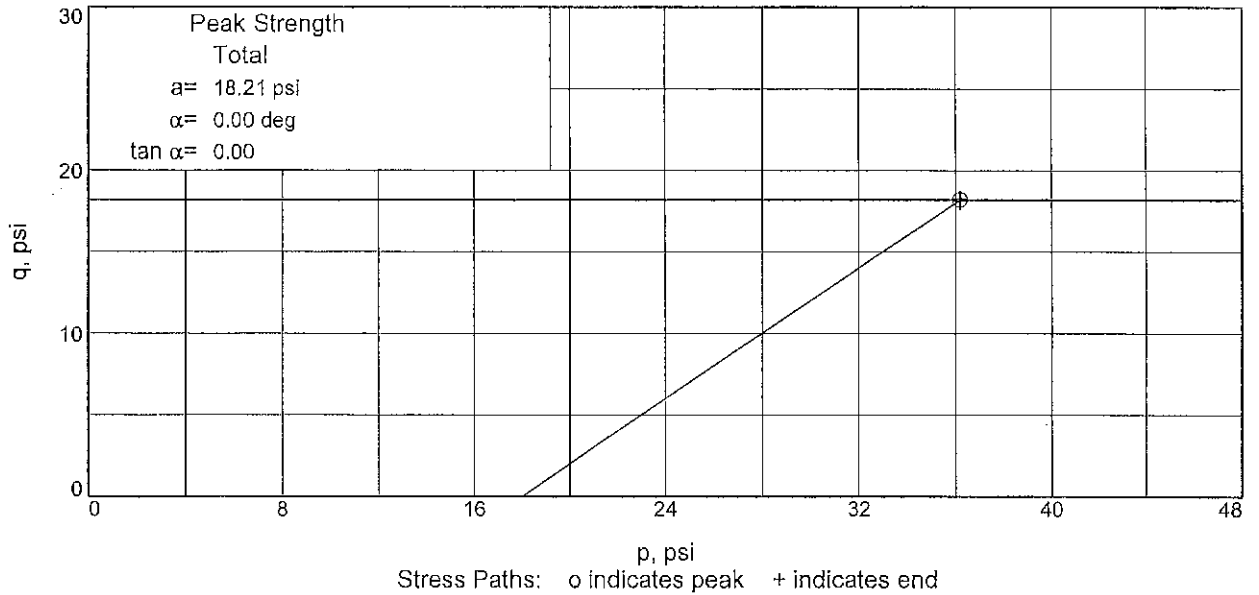
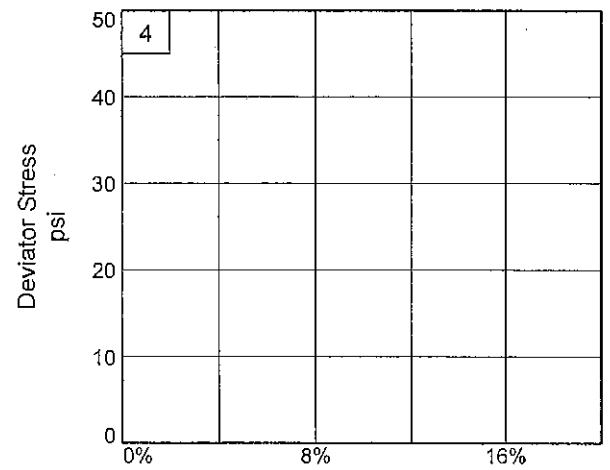
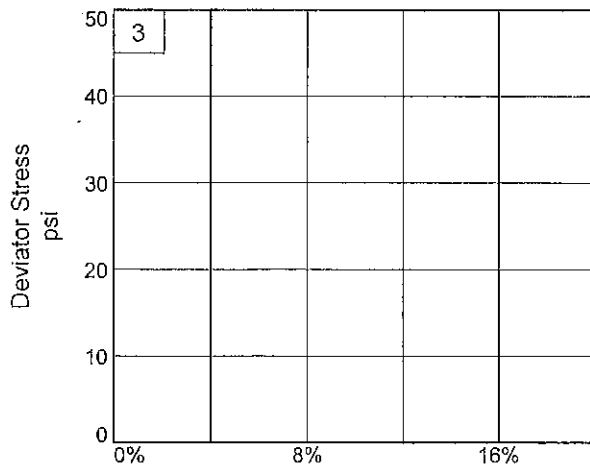
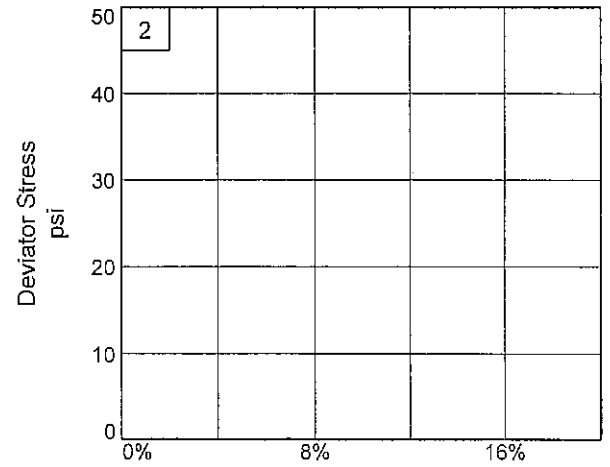
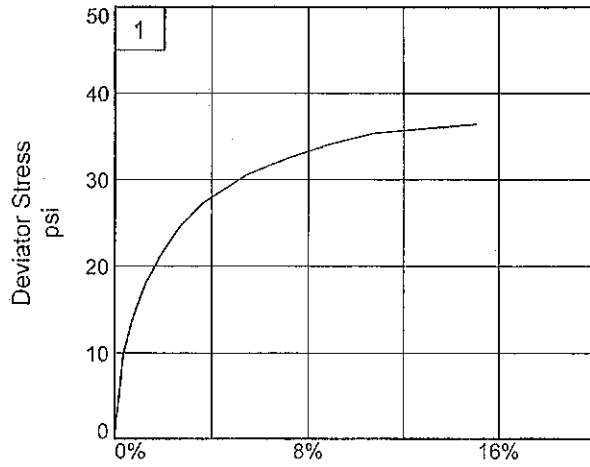
Source of Sample: HCN-86 **Depth:** 18-20'

Sample Number: 8/ST

Proj. No.: N1105229 **Date:** 1-18-11

TRIAXIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-86

Depth: 18-20'

Sample Number: 8/ST

Project No.: N1105229

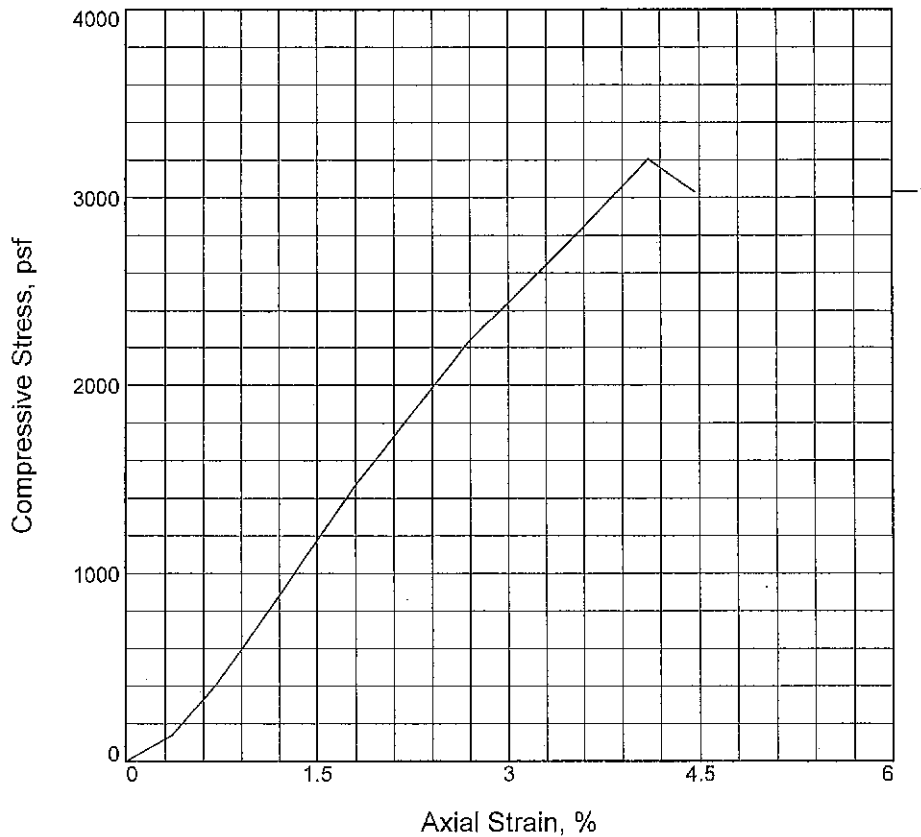
Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	3205.1		
Undrained shear strength, psf	1602.5		
Failure strain,	4.1		
Strain rate, in./min.	0.056		
Water content, %	17.0		
Wet density, pcf	118.6		
Dry density, pcf	101.4		
Saturation, %	69.3		
Void ratio	0.6629		
Specimen diameter, in.	2.820		
Specimen height, in.	5.600		
Height/diameter ratio	1.99		

Description: BROWN GRAVELLY LEAN CLAY WITH SAND, MOIST - STIFF

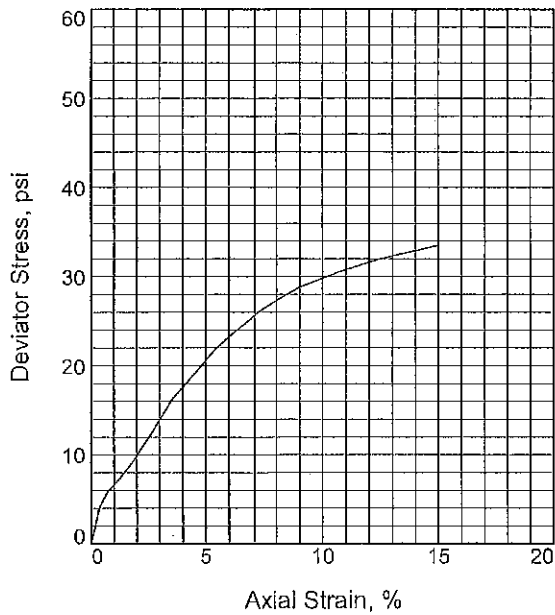
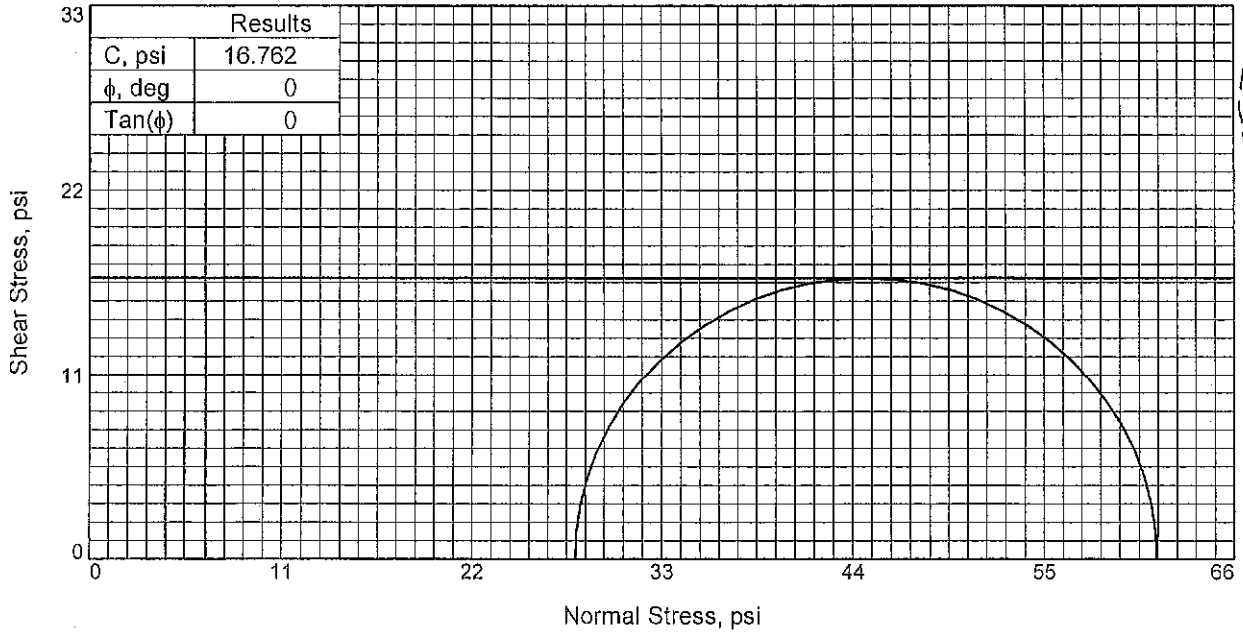
LL = 29 PL = 19 PI = 10 Assumed GS = 2.70 Type: ST

<p>Project No.: N1105229 Date: 1-28-11 Remarks: Lab No. 747</p>	<p>Client: PARSONS BRINCKERHOFF Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS KENTON COUNTY, KENTUCKY Source of Sample: HCN-86 Depth: 28-30' Sample Number: 11/ST</p>
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UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV Checked By: GS



Sample No.		1
Initial	Water Content,	21.4
	Dry Density, pcf	105.1
	Saturation,	95.5
	Void Ratio	0.6040
	Diameter, in.	2.860
At Test	Height, in.	5.590
	Water Content,	21.4
	Dry Density, pcf	105.1
	Saturation,	95.5
	Void Ratio	0.6040
Diameter, in.		2.860
Height, in.		5.590
Strain rate, in./min.		0.055
Back Pressure, psi		0.00
Cell Pressure, psi		28.00
Fail. Stress, psi		33.52
Ult. Stress, psi		
σ_1 Failure, psi		61.52
σ_3 Failure, psi		28.00

Type of Test:

Unconsolidated Undrained

Sample Type: ST

Description: BROWN GRAVELLY LEAN CLAY
W/SAND, MOIST -STIFF

LL= 29 PL= 19 PI= 10

Assumed Specific Gravity= 2.70

Remarks: Lab No. 14,028

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-86 **Depth:** 28-30'

Sample Number: 11/ST

Proj. No.: N1105229

Date: 2-4-11

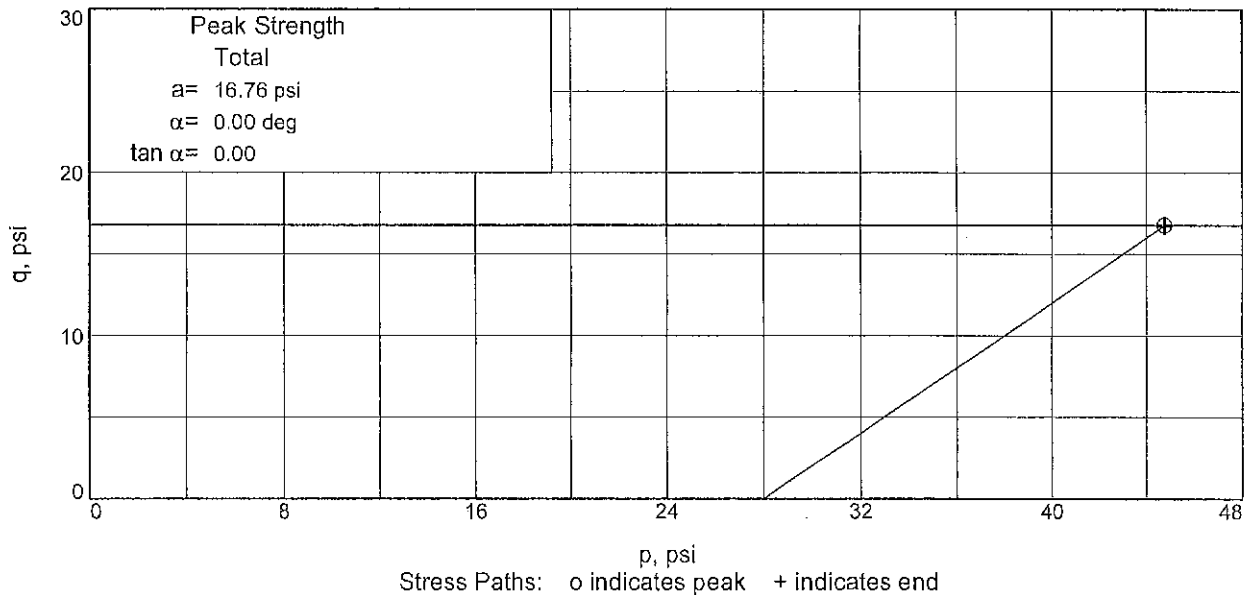
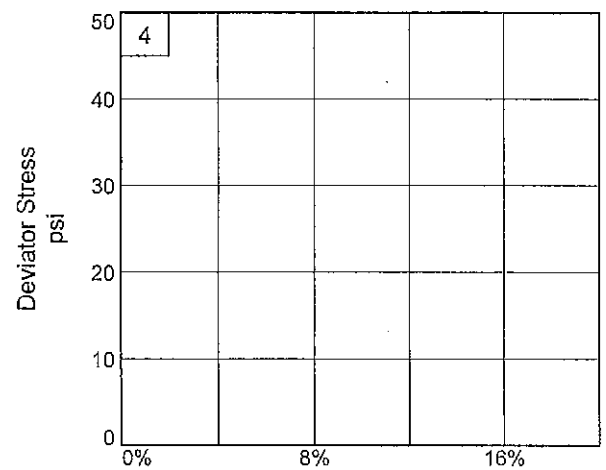
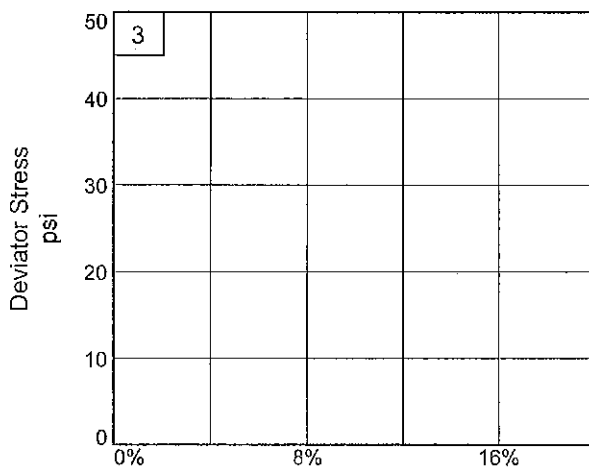
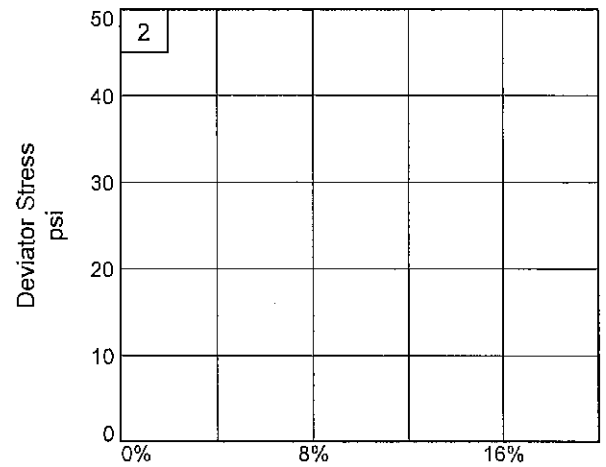
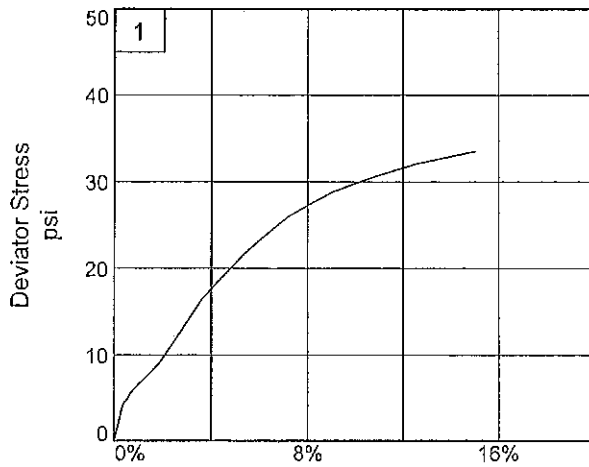
TRIAXIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: SV

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-86

Depth: 28-30'

Sample Number: 11/ST

Project No.: NI105229

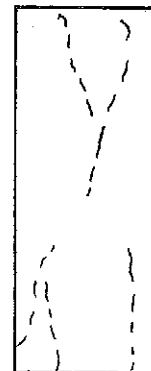
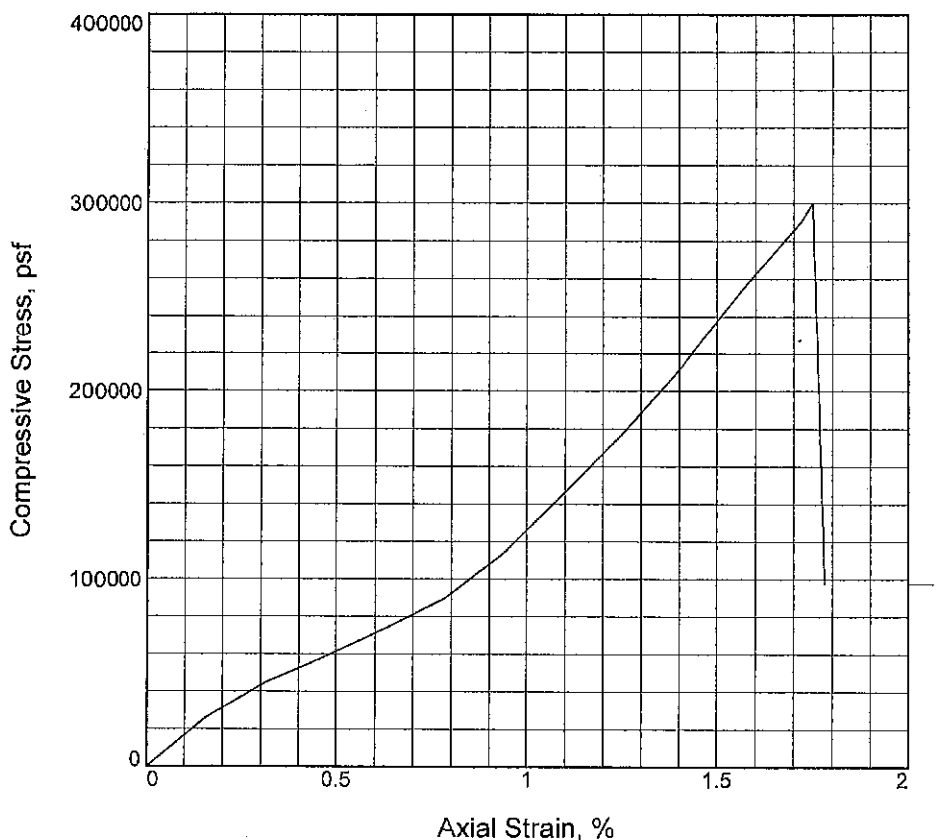
Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	300094.0			
Undrained shear strength, psf	150047.0			
Failure strain, %	1.8			
Strain rate, in./min.	0.032			
Water content, %	2.7			
Wet density, pcf	98.0			
Dry density, pcf	95.5			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	2.350			
Specimen height, in.	3.200			
Height/diameter ratio	1.36			

Description: SHALE

LL =	PL =	PI =	Assumed GS=	Type: Shale
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Project No.: N1105229

Date Sampled: 1-31-11

Remarks:

Lab No. 14,037

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-86 **Depth:** 70.1-70.5'

Sample Number: C3

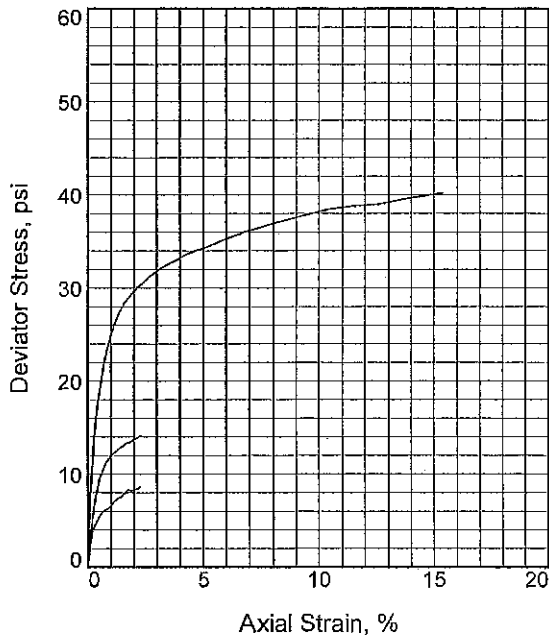
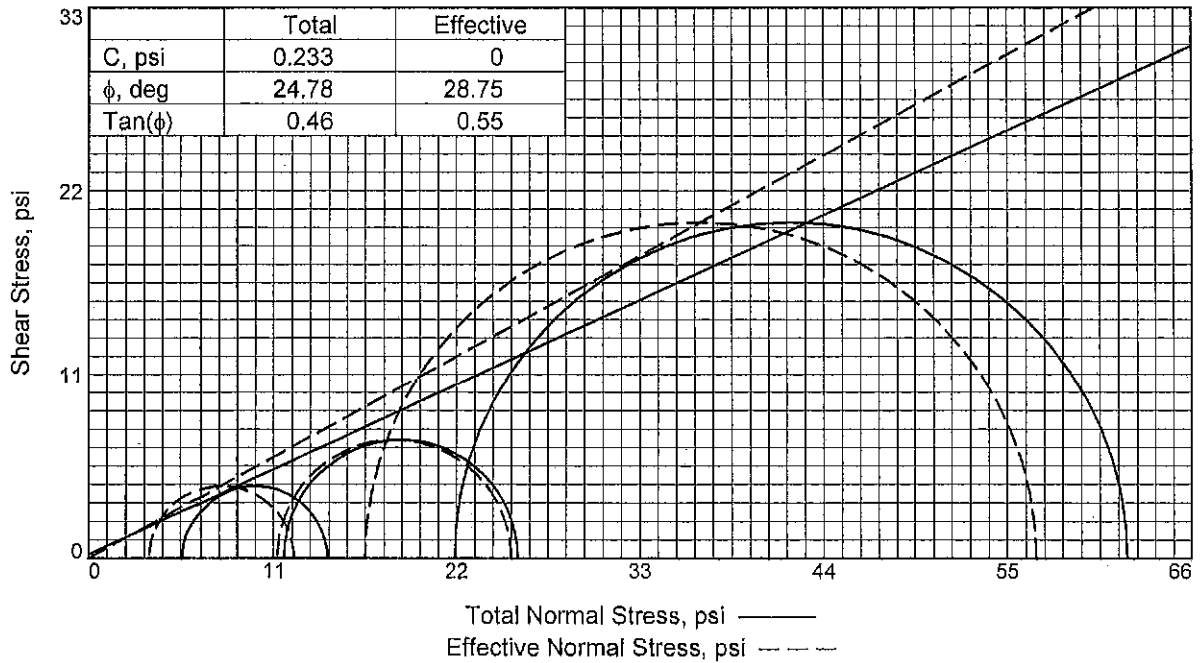
UNCONFINED COMPRESSION TEST

H.C. Nutting
A Terracon Company

Figure _____

Tested By: MRE

Checked By: GS



Sample No.		1	2	3
Initial	Water Content, %	17.2	17.2	17.2
	Dry Density, pcf	108.3	108.3	108.3
	Saturation, %	83.5	83.5	83.5
	Void Ratio	0.5569	0.5569	0.5569
	Diameter, in.	2.871	2.871	2.871
	Height, in.	5.853	5.853	5.853
At Test	Water Content, %	19.9	19.8	19.8
	Dry Density, pcf	109.6	109.8	109.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5378	0.5354	0.5346
	Diameter, in.	2.859	2.891	2.924
	Height, in.	5.829	5.694	5.562
Strain rate, in./min.		0.001	0.001	0.001
Back Pressure, psi		100.00	100.00	100.00
Cell Pressure, psi		105.60	111.60	121.90
Fail. Stress, psi		8.60	14.10	40.21
Total Pore Pr., psi		102.00	100.40	105.40
Ult. Stress, psi				
Total Pore Pr., psi				
$\bar{\sigma}_1$ Failure, psi		12.20	25.30	56.71
$\bar{\sigma}_3$ Failure, psi		3.60	11.20	16.50

Type of Test:

CU with Pore Pressures

Sample Type: Stage Test

Description: OLIVE GRAY W/ VERY DARK
GRAY TR BROWN SANDY LEAN CLAY

LL= 32 PL= 20 PI= 12

Assumed Specific Gravity= 2.70

Remarks: Lab No.

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-87 **Depth:** 5-7'

Sample Number: 3/ST

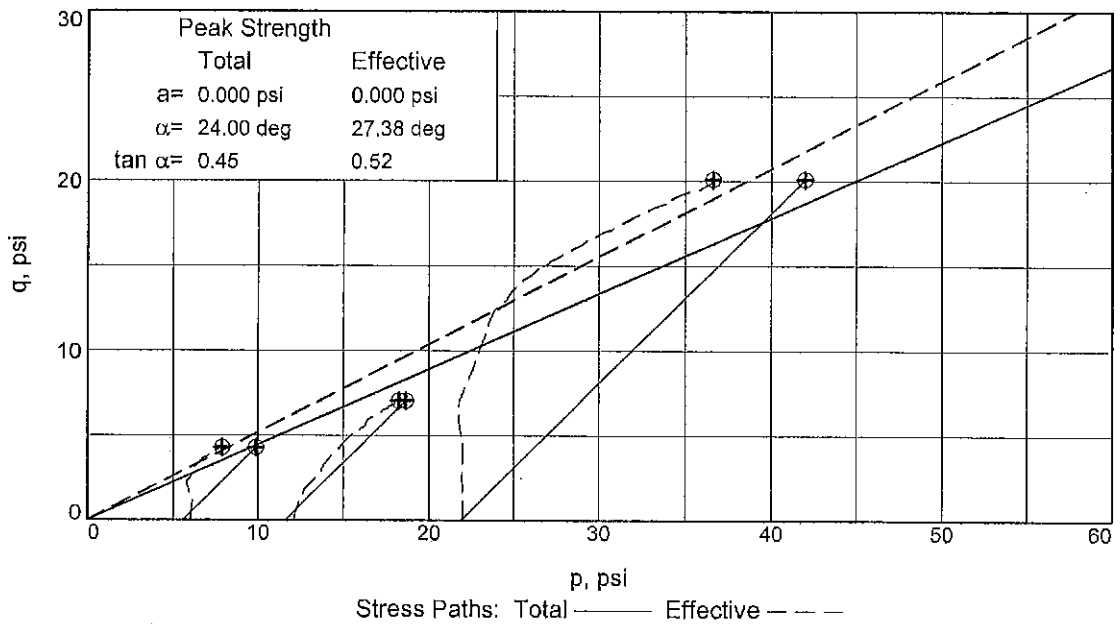
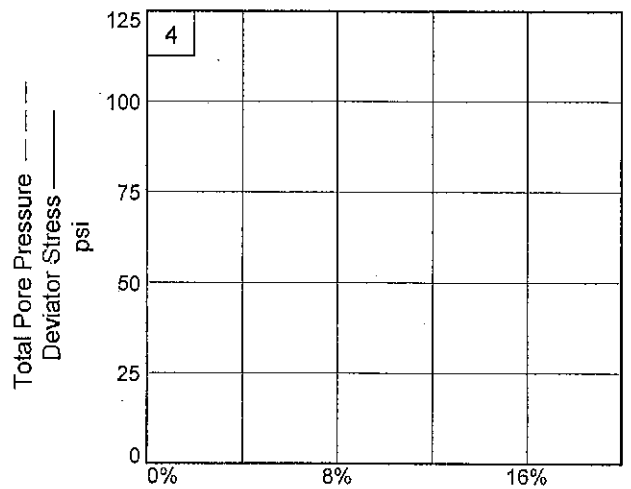
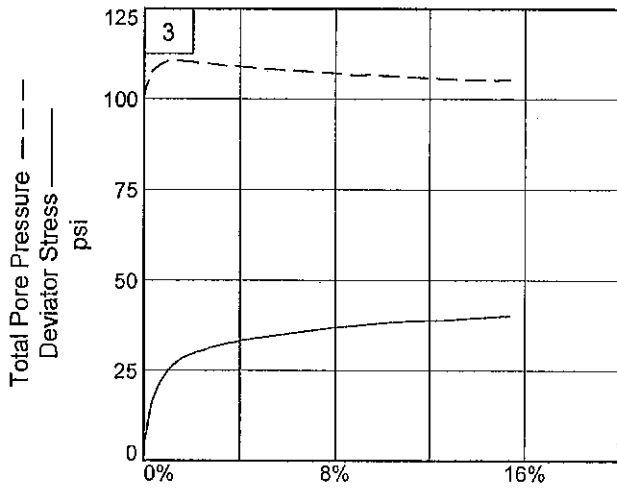
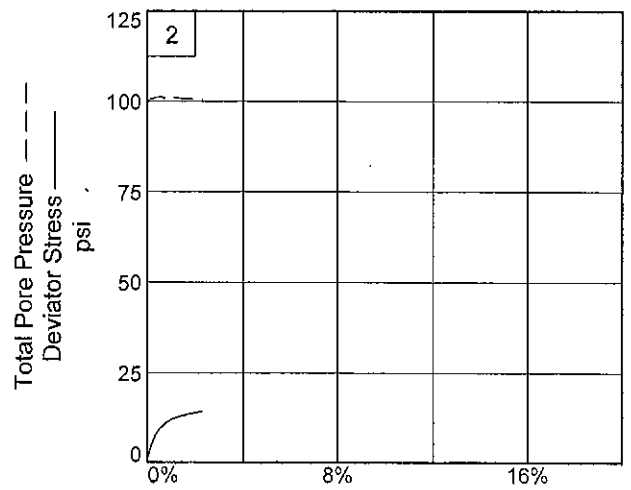
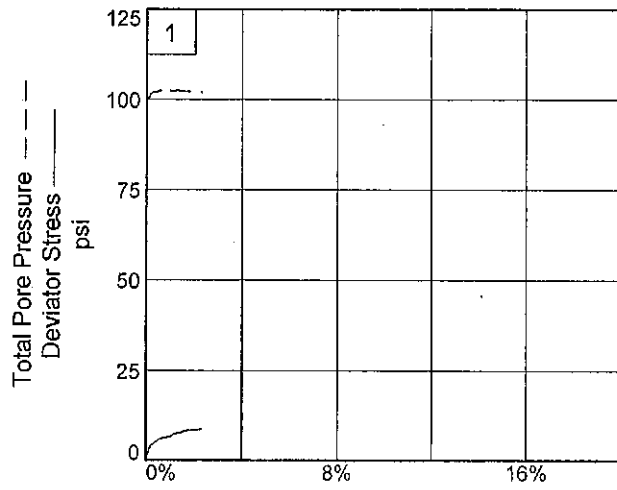
Proj. No.: N1105229

Date Sampled: 1-24-11

TRIAxIAL SHEAR TEST REPORT

H.C. Nutting
A Terracon Company

Figure _____



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-87

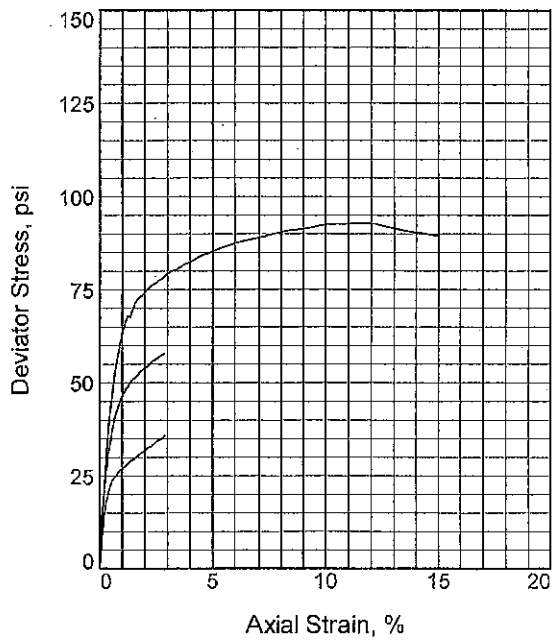
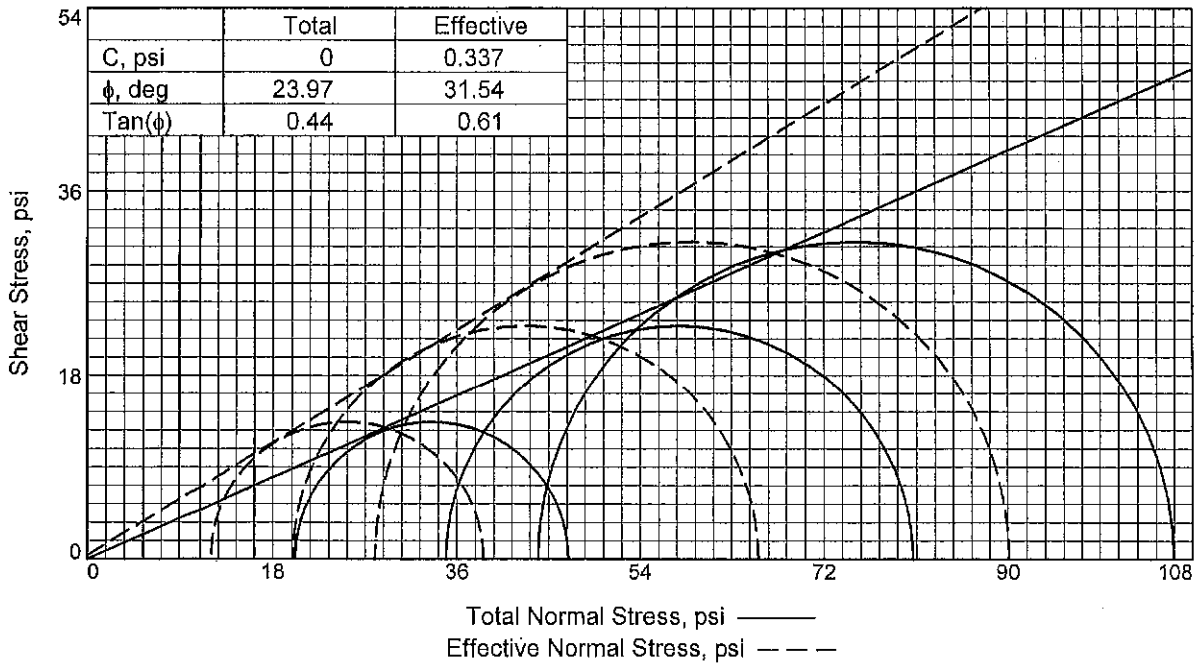
Depth: 5-7'

Sample Number: 3/ST

Project No.: N1105229

Figure _____

H.C. Nutting - A Terracon Company



Sample No.		1	2	3
Initial	Water Content, %	25.7	25.7	25.7
	Dry Density, pcf	100.1	100.1	100.1
	Saturation, %	101.6	101.6	101.6
	Void Ratio	0.6842	0.6842	0.6842
	Diameter, in.	2.865	2.865	2.865
	Height, in.	5.845	5.845	5.845
At Test	Water Content, %	21.4	21.3	21.3
	Dry Density, pcf	106.9	107.0	107.1
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5768	0.5751	0.5743
	Diameter, in.	2.803	2.843	2.884
	Height, in.	5.719	5.552	5.392
Strain rate, in./min.		0.004	0.004	0.004
Back Pressure, psi		106.00	100.56	100.58
Cell Pressure, psi		126.14	135.52	144.57
Fail. Stress, psi		26.80	45.72	62.16
Total Pore Pr., psi		114.30	115.60	116.60
Ult. Stress, psi				
Total Pore Pr., psi				
$\bar{\sigma}_1$ Failure, psi		38.64	65.64	90.13
$\bar{\sigma}_3$ Failure, psi		11.84	19.92	27.97

Type of Test:
CU with Pore Pressures

Sample Type: Stage Test

Description: OLIVE GRAY W/REDDISH BROWN SANDY LEAN CLAY

Assumed Specific Gravity= 2.70

Remarks:

Figure _____

Client: PARSONS BRINCKERHOFF

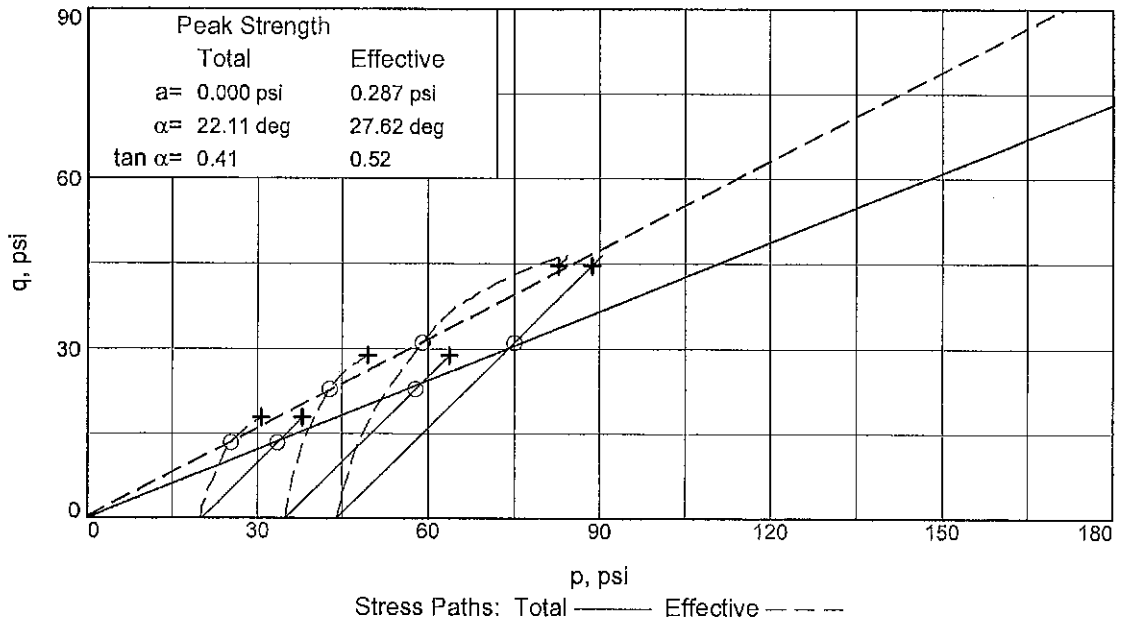
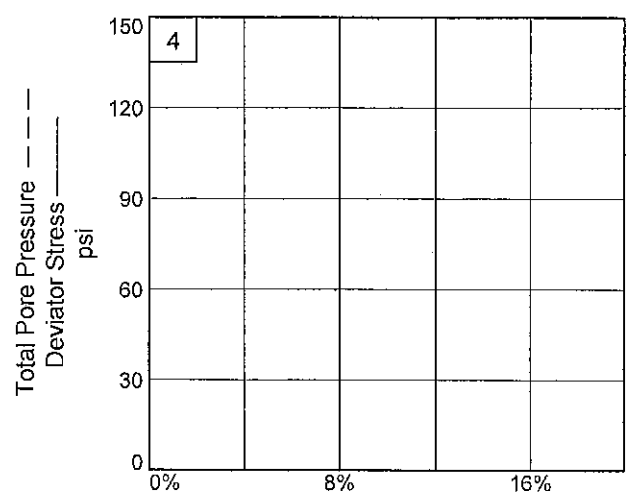
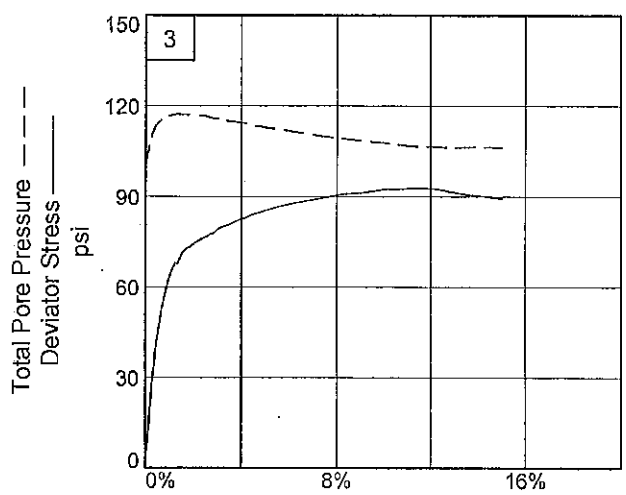
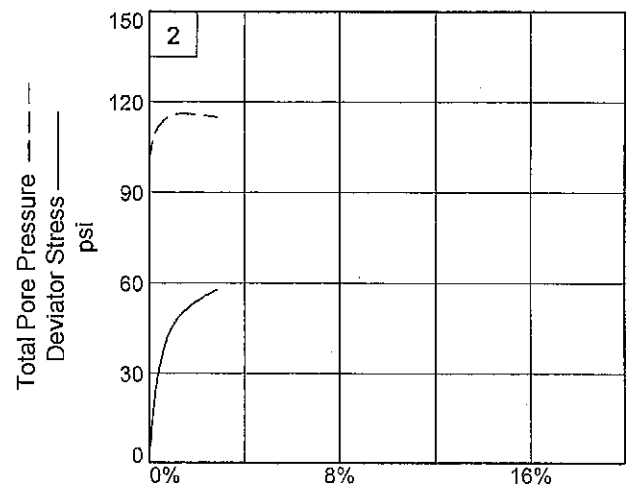
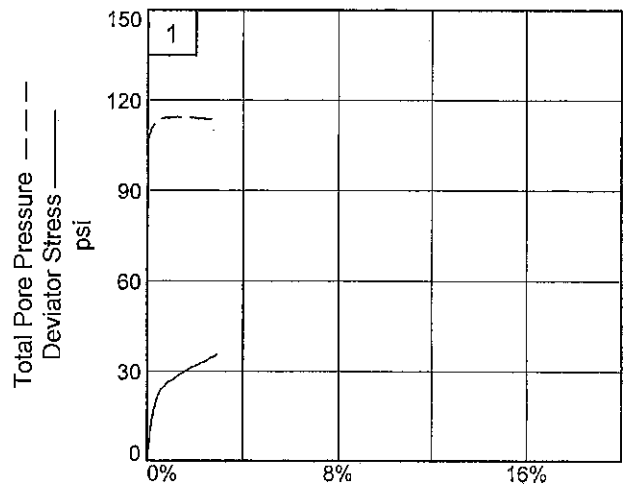
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWIS KENTON COUNTY, KENTUCKY

Source of Sample: HCN-87 **Depth:** 34-36'

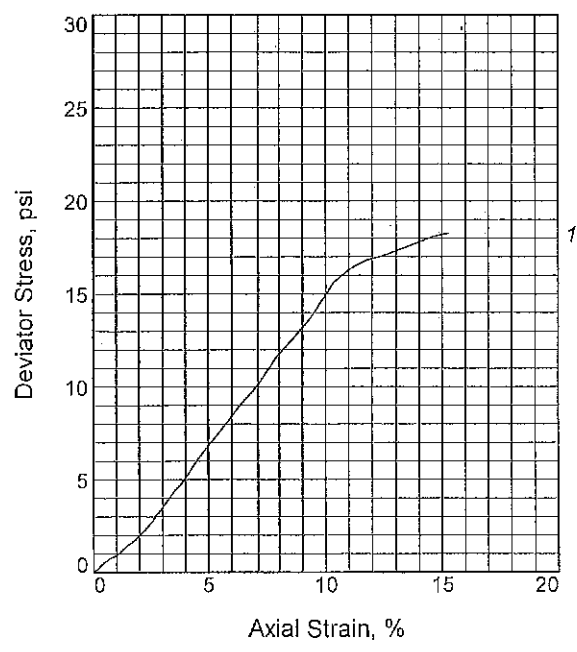
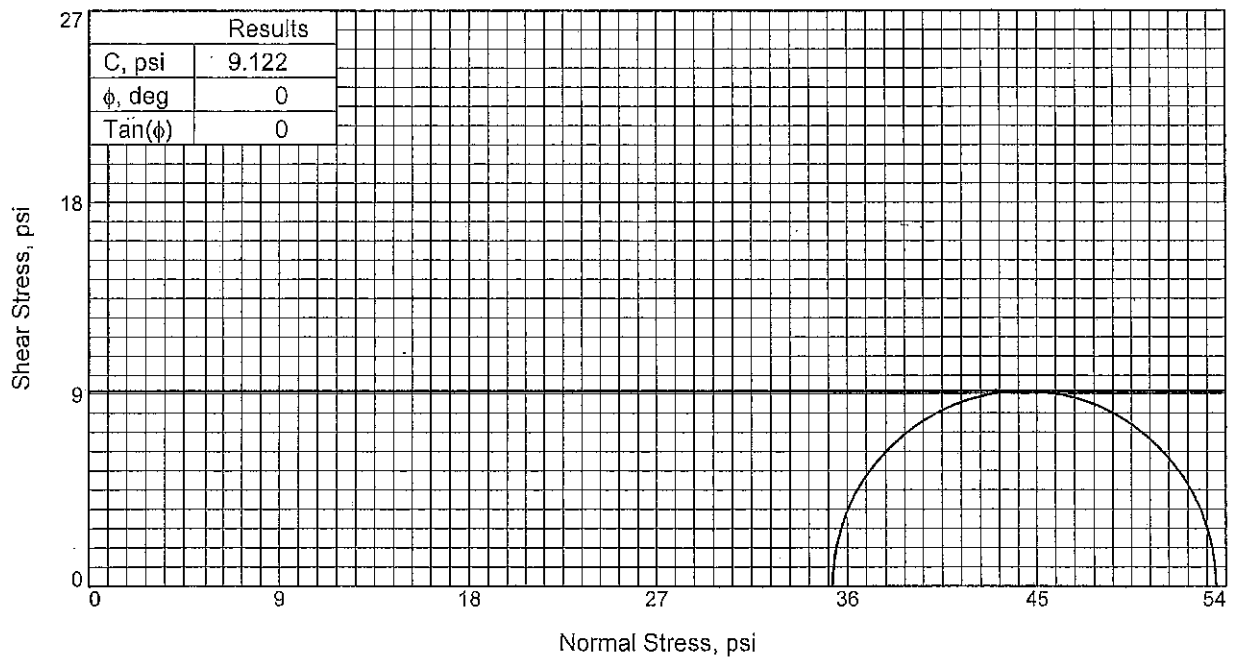
Sample Number: 13/ST

Proj. No.: N1105229 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
H.C. Nutting
 A Terracon Company



Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
Source of Sample: HCN-87 **Depth:** 34-36' **Sample Number:** 13/ST
Project No.: N1105229 **Figure** _____ **H.C. Nutting - A Terracon Company**



Sample No.		1
Initial	Water Content,	28.3
	Dry Density, pcf	102.2
	Saturation,	117.7
	Void Ratio	0.6500
	Diameter, in.	2.834
At Test	Height, in.	5.730
	Water Content,	28.3
	Dry Density, pcf	102.2
	Saturation,	117.7
	Void Ratio	0.6500
Diameter, in.		2.834
Height, in.		5.730
Strain rate, in./min.		0.057
Back Pressure, psi		0.00
Cell Pressure, psi		35.30
Fail. Stress, psi		18.24
Ult. Stress, psi		
σ_1 Failure, psi		53.54
σ_3 Failure, psi		35.30

Type of Test:
Unconsolidated Undrained

Sample Type: ST

Description: OLIVE GRAY W/REDDISH BROWN SANDY LEAN CLAY

LL= 39 PL= 22 PI= 17

Assumed Specific Gravity= 2.70

Remarks:

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-87 **Depth:** 34-36'

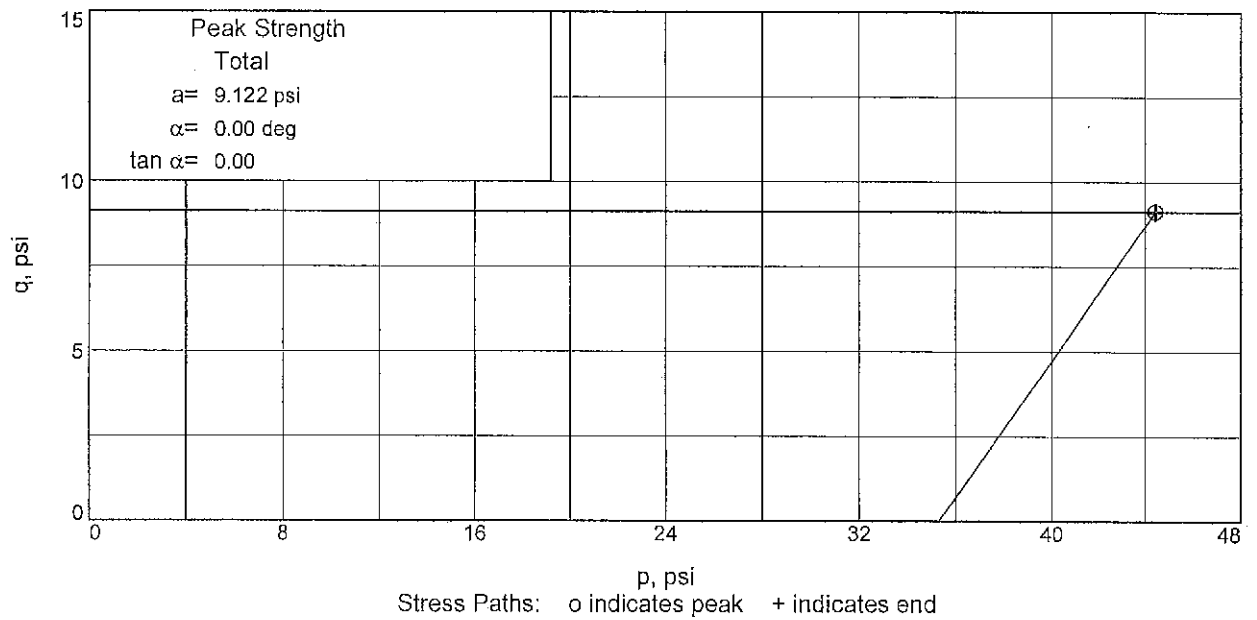
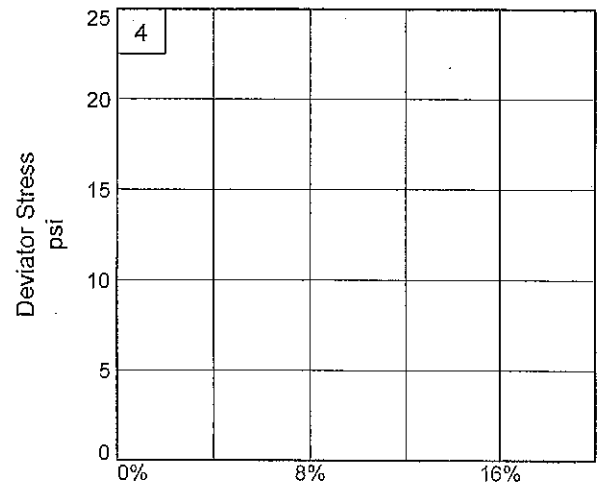
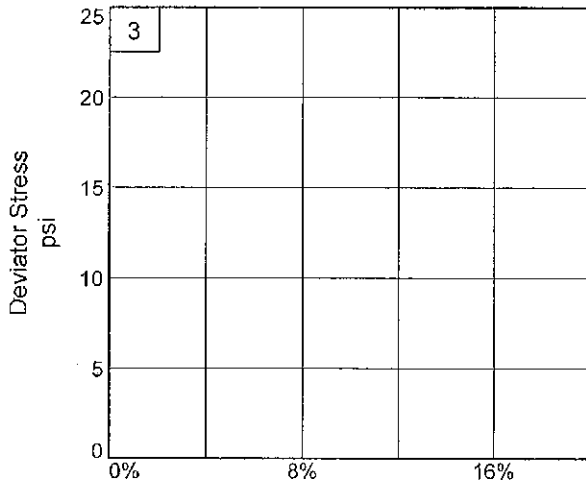
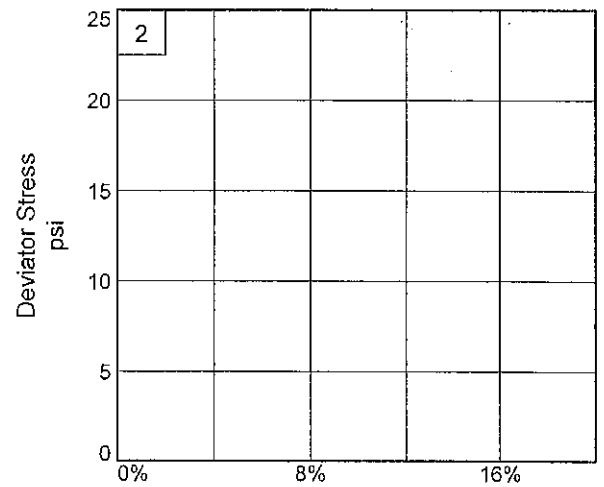
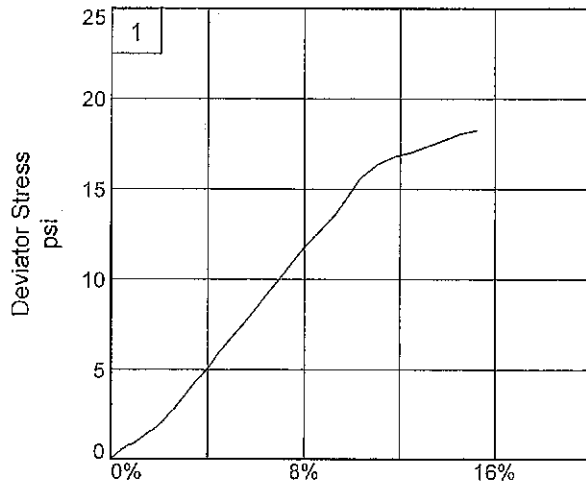
Sample Number: 13/ST

Proj. No.: N1105229 **Date:** 1-24-11

Figure _____

TRIAxIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-87

Depth: 34-36'

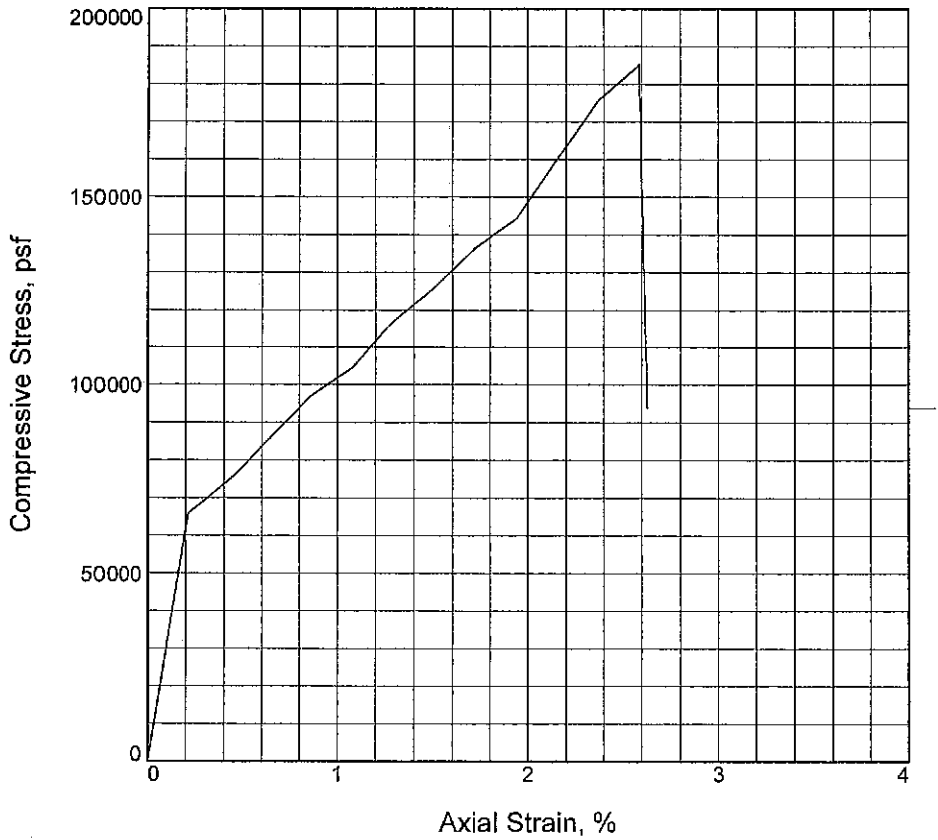
Sample Number: 13/ST

Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	185110.2		
Undrained shear strength, psf	92555.1		
Failure strain, %	2.6		
Strain rate, in./min.	0.023		
Water content, %	5.6		
Wet density, pcf	159.8		
Dry density, pcf	151.3		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.950		
Specimen height, in.	2.320		
Height/diameter ratio	1.19		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date Sampled: 1-27-11

Remarks:

Lab No. 13,836

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-87 **Depth:** 73.5-73.9'

Sample Number: C2

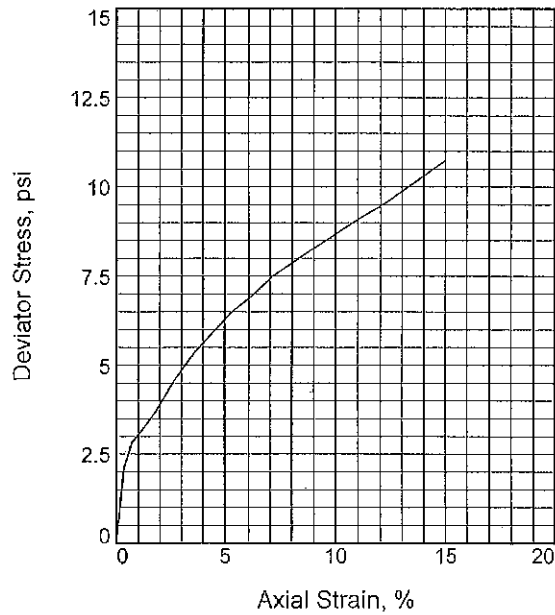
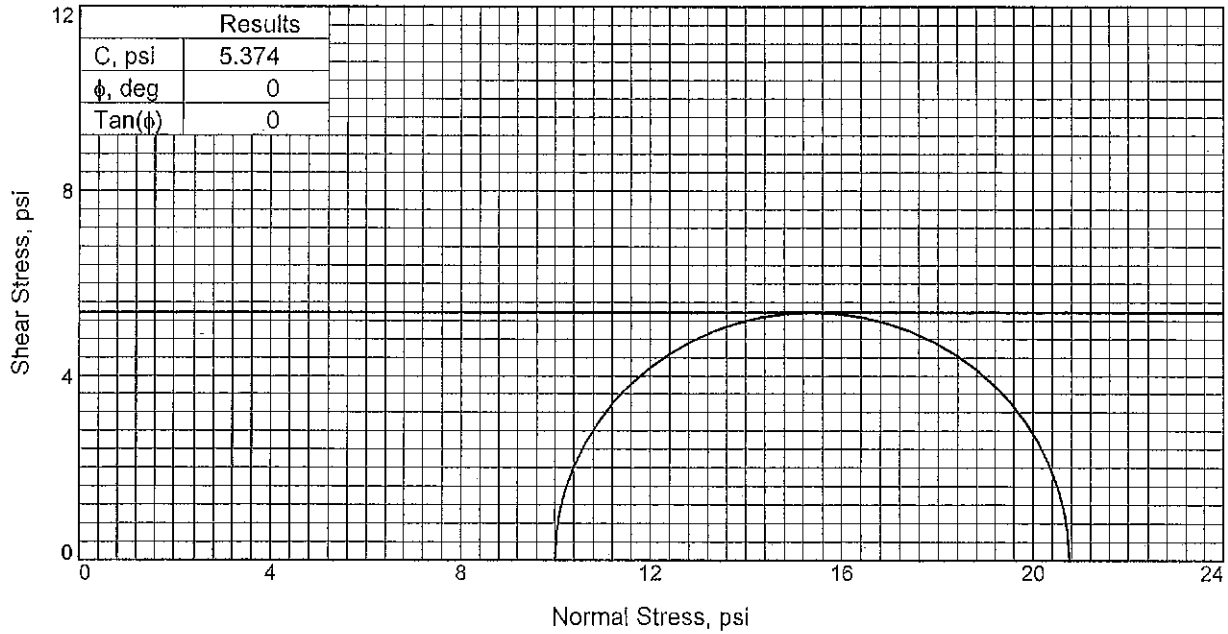
UNCONFINED COMPRESSION TEST

H.C. Nutting
A Terracon Company

Figure _____

Tested By: MRE

Checked By: GS



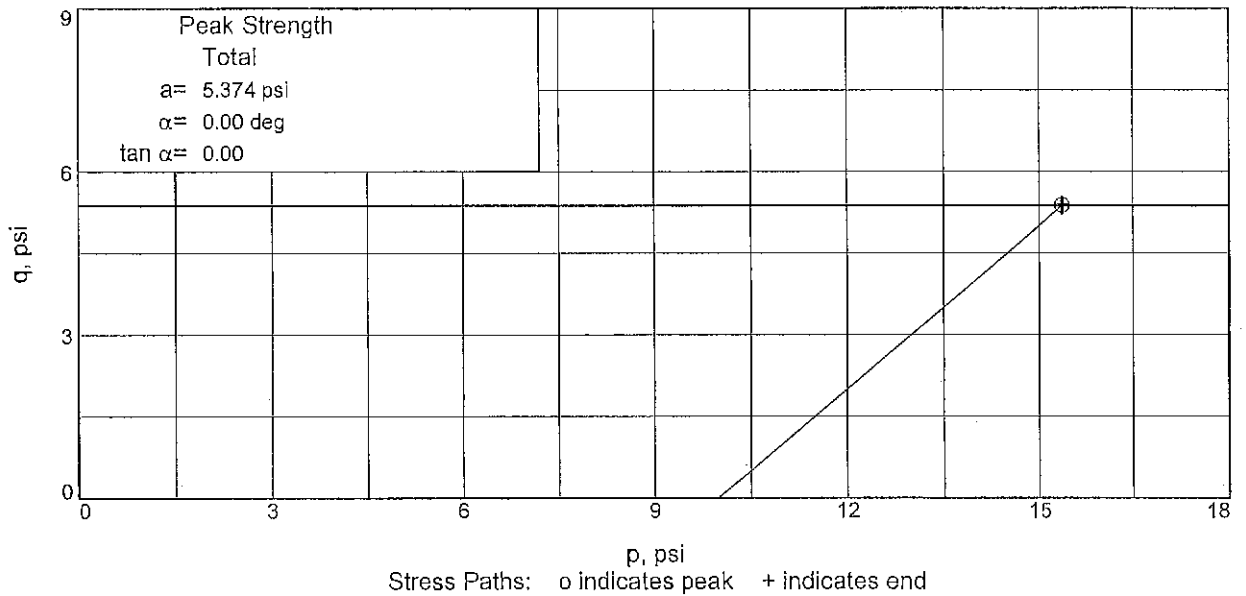
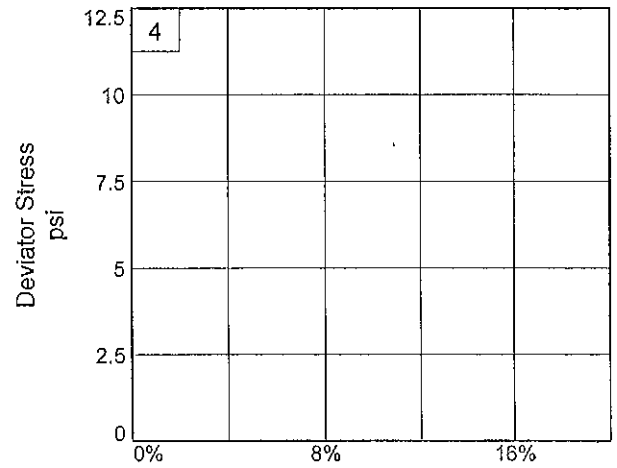
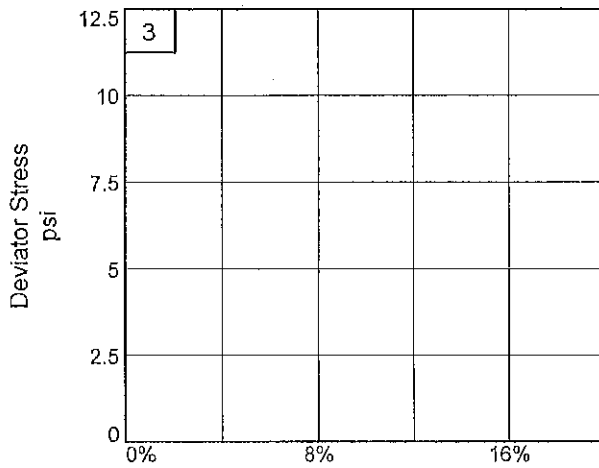
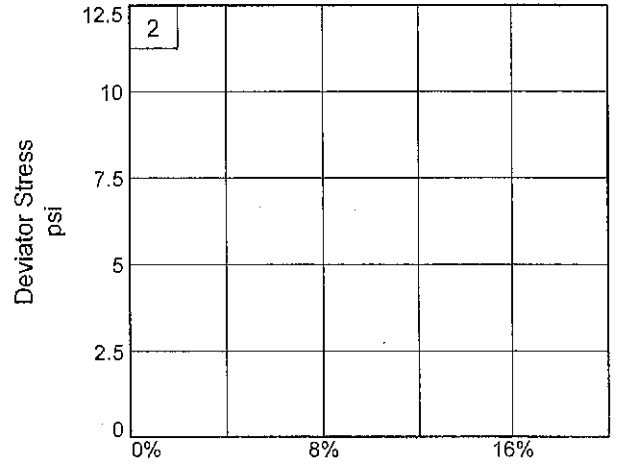
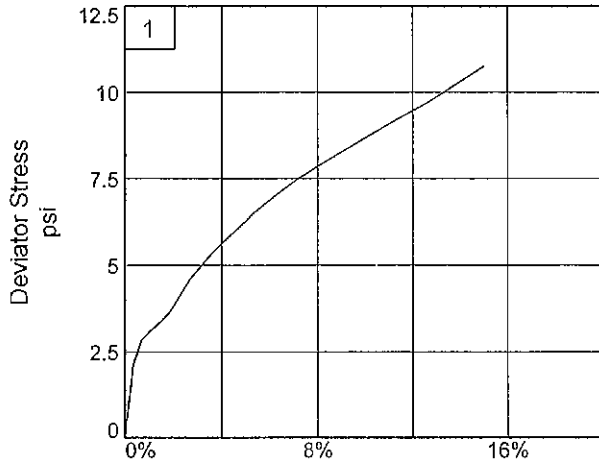
Sample No.	1	
Initial	Water Content,	24.1
	Dry Density, pcf	94.6
	Saturation,	83.1
	Void Ratio	0.7823
	Diameter, in.	2.780
At Test	Height, in.	5.600
	Water Content,	24.1
	Dry Density, pcf	94.6
	Saturation,	83.1
	Void Ratio	0.7823
Strain rate, in./min.	Diameter, in.	2.780
	Height, in.	5.600
	Back Pressure, psi	0.00
	Cell Pressure, psi	10.00
	Fail. Stress, psi	10.75
	Ult. Stress, psi	
	σ_1 Failure, psi	20.75
σ_3 Failure, psi	10.00	

Type of Test:
Unconsolidated Undrained
Sample Type: ST
Description: BROWN SILTY CLAY
LL= 27 PL= 20 PI= 7
Assumed Specific Gravity= 2.70
Remarks: Lab No. 11,658

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY
Source of Sample: HCN-88 **Depth:** 10-12'
Sample Number: 5/ST
Proj. No.: N1105229 **Date:** 11-30-10

TRIAXIAL SHEAR TEST REPORT
H. C. NUTTING COMPANY

Tested By: SV Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-88

Depth: 10-12'

Sample Number: 5/ST

Project No.: N1105229

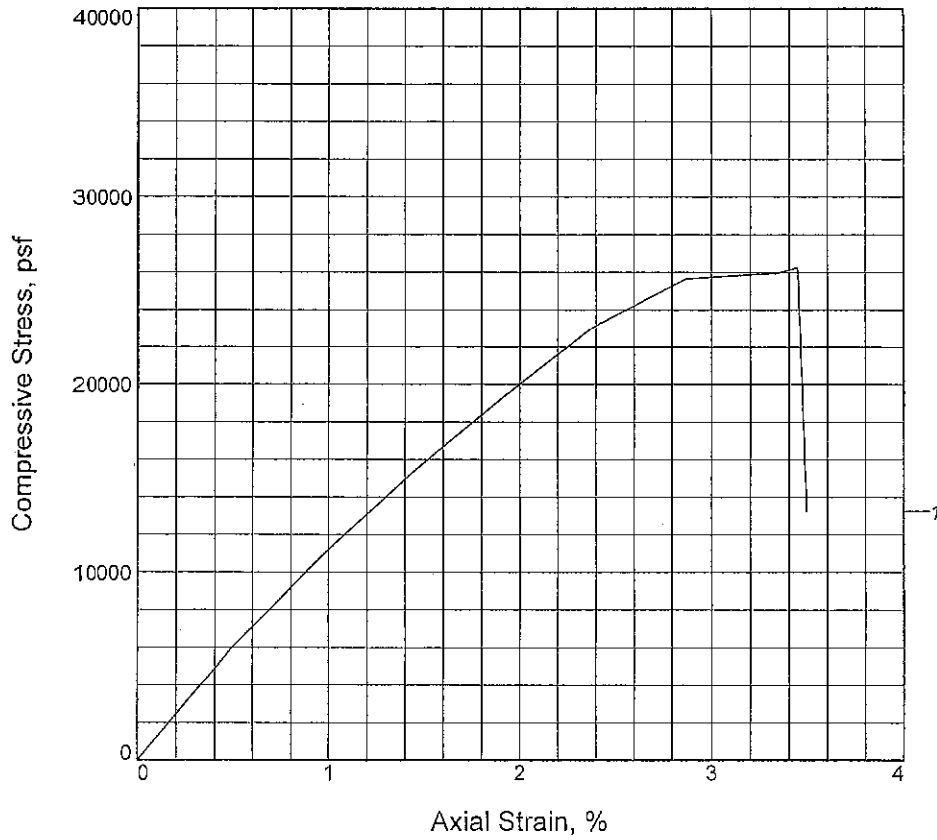
Figure _____

H. C. NUTTING COMPANY

Tested By: SV

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	26244.7		
Undrained shear strength, psf	13122.4		
Failure strain,	3.4		
Strain rate, in./min.	0.020		
Water content, %	8.6		
Wet density, pcf	144.1		
Dry density, pcf	132.6		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	2.000		
Specimen height, in.	2.090		
Height/diameter ratio	1.04		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-5-11

Remarks:
Lab No. 13,190

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-110 Depth: 59.5-60'

Sample Number: C2

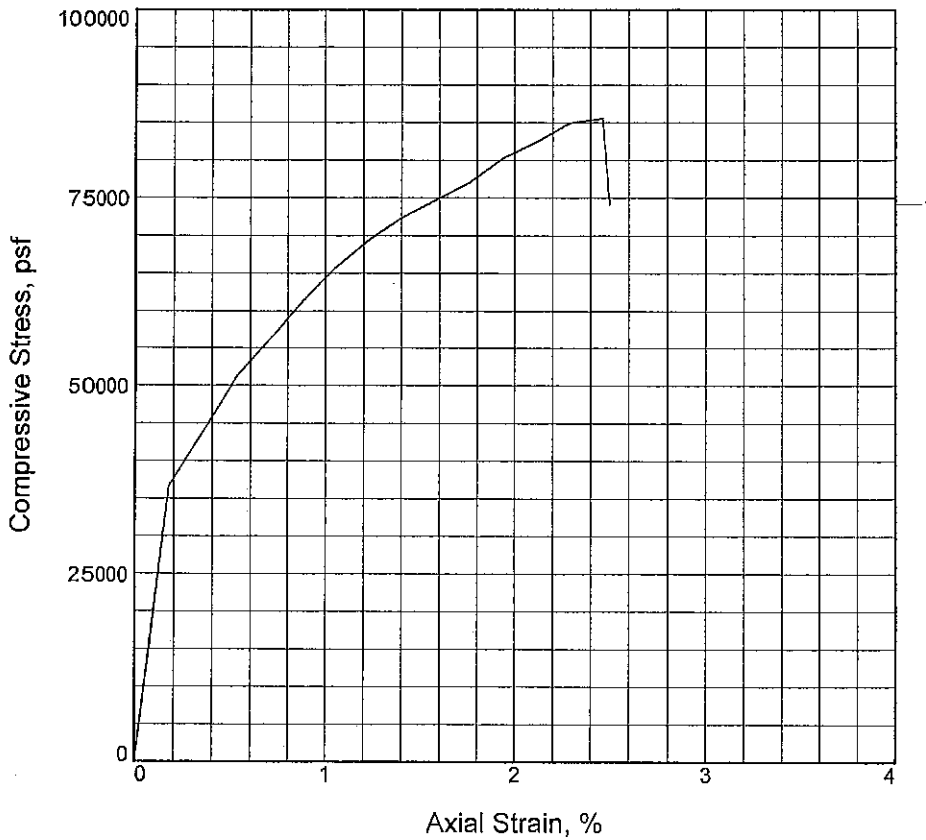
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	85506.5			
Undrained shear strength, psf	42753.3			
Failure strain, %	2.5			
Strain rate, in./min.	0.028			
Water content, %	6.3			
Wet density, pcf	156.2			
Dry density, pcf	146.9			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.770			
Specimen height, in.	2.840			
Height/diameter ratio	1.60			

Description: SHALE

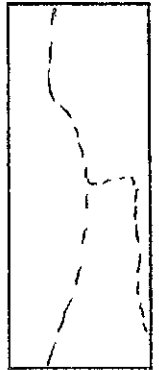
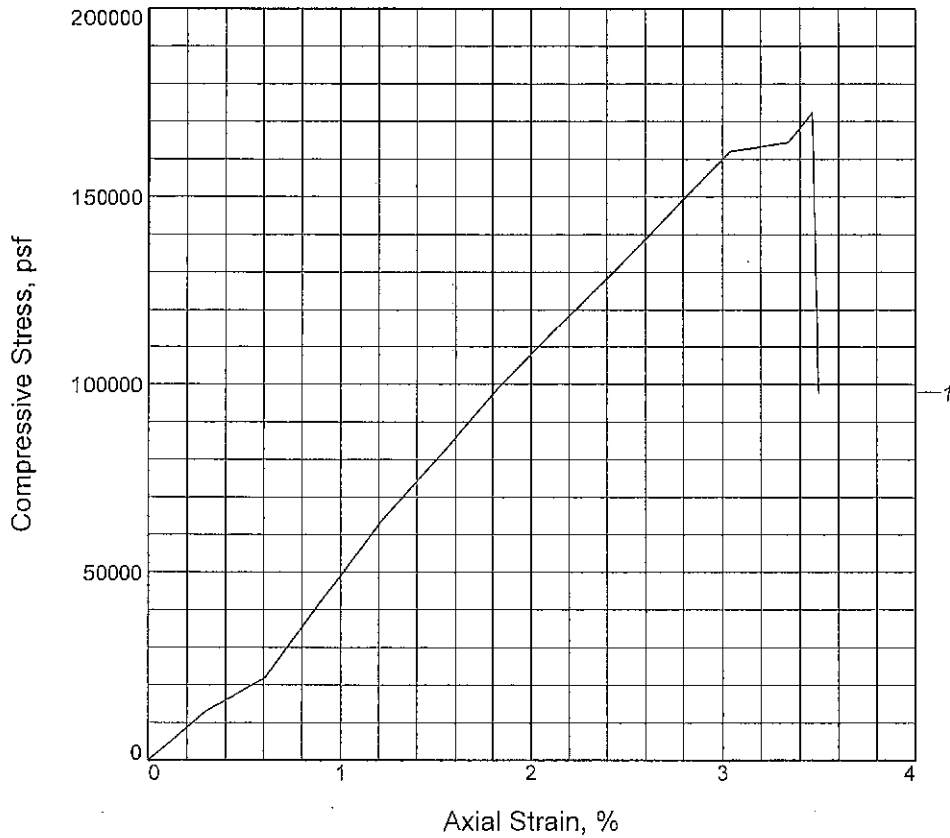
LL = PL = PI = Assumed GS= Type: Shale

<p>Project No.: N1105229 Date Sampled: 1-31-11 Remarks: Lab No. 13,078</p>	<p>Client: PARSONS BRINCKERHOFF Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS KENTON COUNTY, KENTUCKY Source of Sample: HCN-111 Depth: 64.1-64.5' Sample Number: C2</p>
UNCONFINED COMPRESSION TEST H.C. Nutting A Terracon Company	

Figure _____

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	172384.8		
Undrained shear strength, psf	86192.4		
Failure strain,	3.5		
Strain rate, in./min.	0.032		
Water content, %	3.1		
Wet density, pcf	158.1		
Dry density, pcf	153.3		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.900		
Specimen height, in.	3.290		
Height/diameter ratio	1.73		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-6-11

Remarks:
Lab No. 13,203

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-112 **Depth:** 56.5-57'

Sample Number: C2

UNCONFINED COMPRESSION TEST

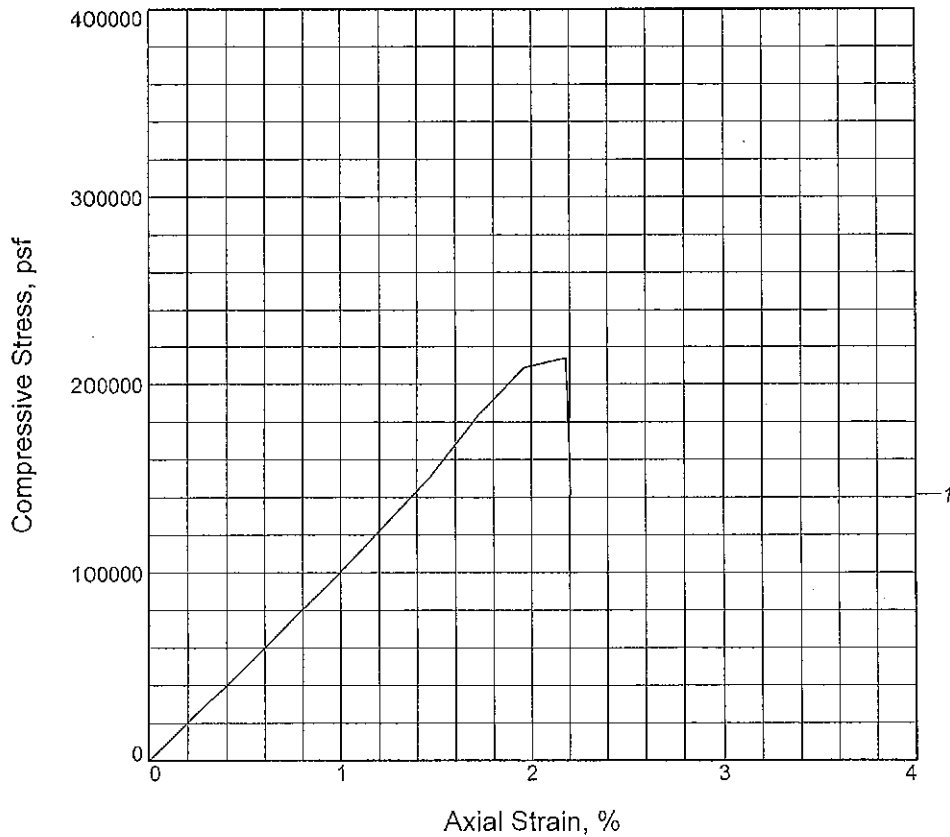
H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	213943.0		
Undrained shear strength, psf	106971.5		
Failure strain,	2.2		
Strain rate, in./min.	0.040		
Water content, %	4.1		
Wet density, pcf	155.4		
Dry density, pcf	149.3		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.950		
Specimen height, in.	4.080		
Height/diameter ratio	2.09		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date: 1-6-11

Remarks:
Lab No. 13,204

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-112 **Depth:** 62.7-63.1'

Sample Number: C2

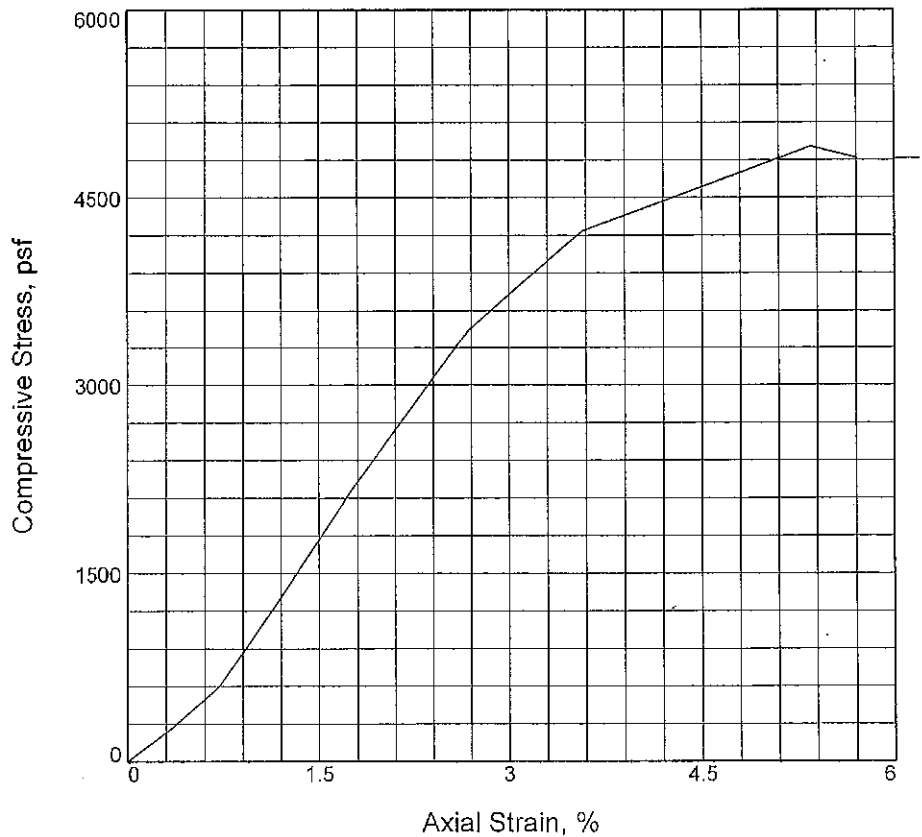
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	4907.5			
Undrained shear strength, psf	2453.7			
Failure strain,	5.4			
Strain rate, in./min.	0.056			
Water content, %	21.4			
Wet density, pcf	127.1			
Dry density, pcf	104.7			
Saturation, %	94.6			
Void ratio	0.6095			
Specimen diameter, in.	2.840			
Specimen height, in.	5.600			
Height/diameter ratio	1.97			

Description: BROWN LEAN CLAY WITH GRAVEL, MOIST - STIFF

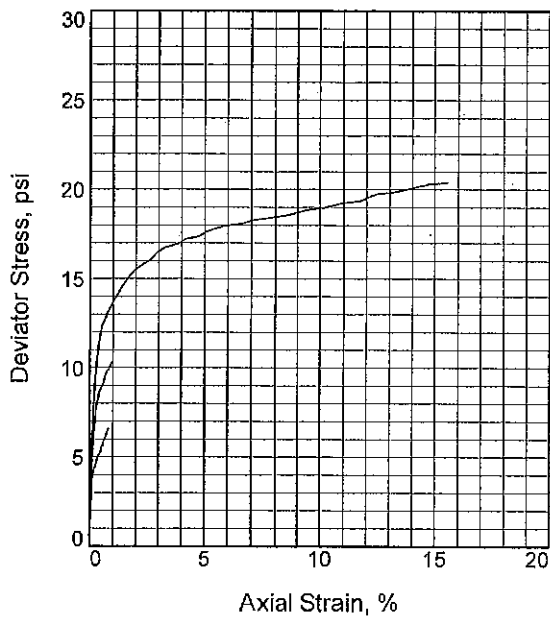
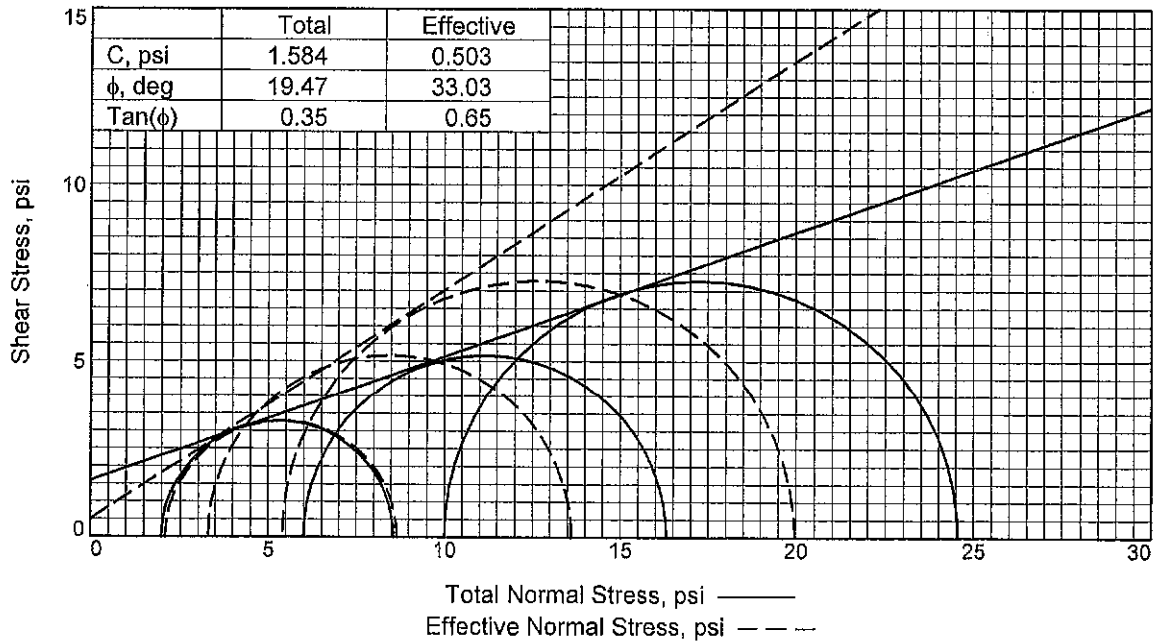
LL = 48 **PL = 22** **PI = 26** **Assumed GS= 2.70** **Type: ST**

Project No.: N1105229
Date: 12-30-10
Remarks:
 Lab No. 13,343

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY
Source of Sample: HCN-113 **Depth:** 5-7'
Sample Number: 3/ST

UNCONFINED COMPRESSION TEST
H. C. NUTTING COMPANY

Tested By: SV **Checked By:** GS



Sample No.		1	2	3
Initial	Water Content, %	21.3	21.3	21.3
	Dry Density, pcf	106.6	106.6	106.6
	Saturation, %	98.8	98.8	98.8
	Void Ratio	0.5817	0.5817	0.5817
	Diameter, in.	2.821	2.821	2.821
	Height, in.	5.697	5.697	5.697
At Test	Water Content, %	20.8	20.7	20.6
	Dry Density, pcf	108.0	108.0	108.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5609	0.5601	0.5575
	Diameter, in.	2.809	2.820	2.832
	Height, in.	5.672	5.625	5.567
	Strain rate, in./min.	0.001	0.001	0.001
	Back Pressure, psi	60.00	60.00	60.00
	Cell Pressure, psi	62.00	66.00	70.00
	Fail. Stress, psi	6.56	10.31	14.56
	Total Pore Pr., psi	59.90	62.70	64.60
	Ult. Stress, psi			
	Total Pore Pr., psi			
	$\bar{\sigma}_1$ Failure, psi	8.66	13.61	19.96
	$\bar{\sigma}_3$ Failure, psi	2.10	3.30	5.40

Type of Test:

CU with Pore Pressures

Sample Type: Stage Test

Description: BROWN LEAN CLAY

Assumed Specific Gravity= 2.70

Remarks: Lab No. 13,343

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-113 **Depth:** 5-7'

Sample Number: 3/ST

Proj. No.: N1105229

Date Sampled: 1-28-11

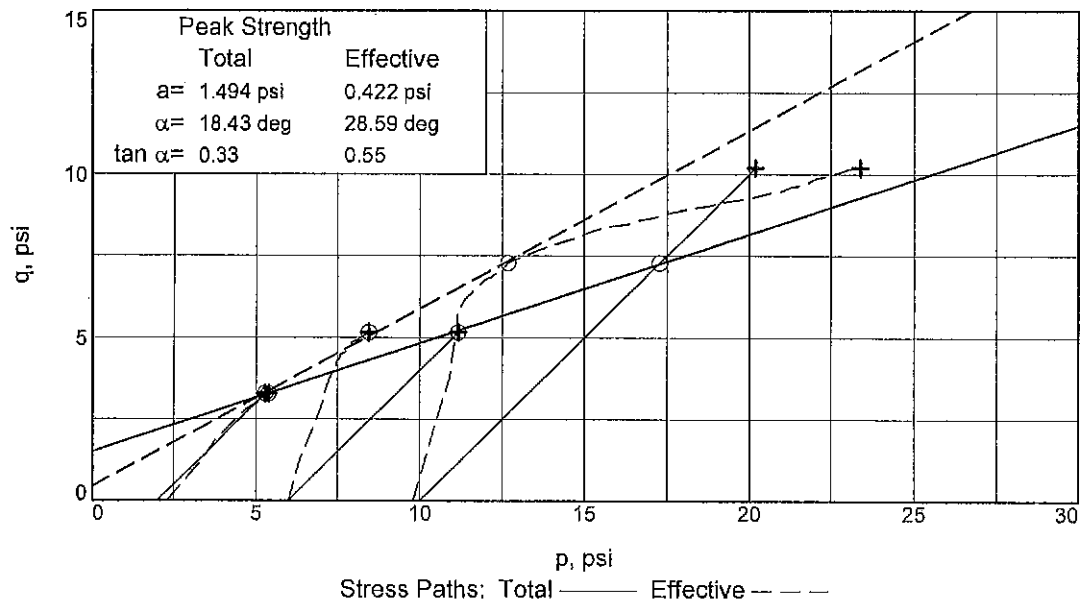
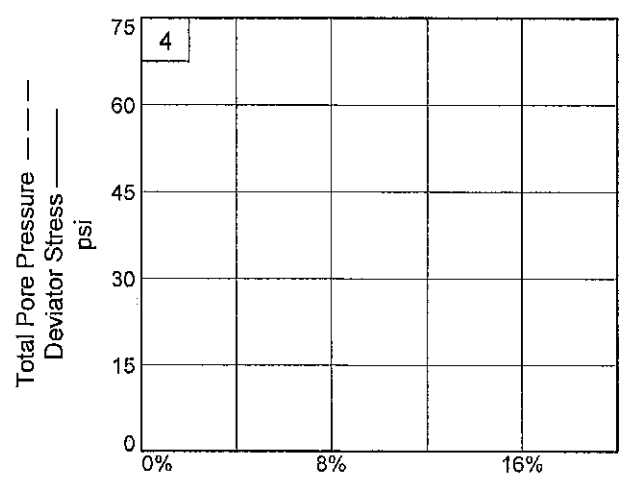
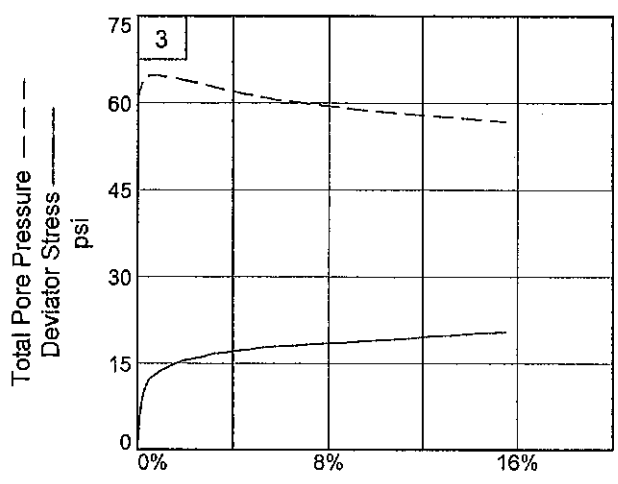
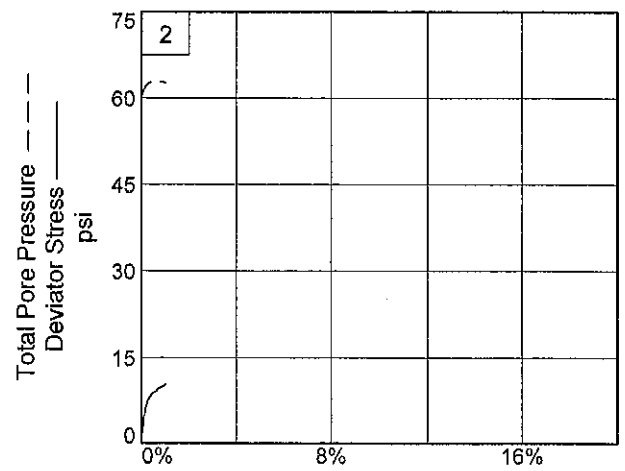
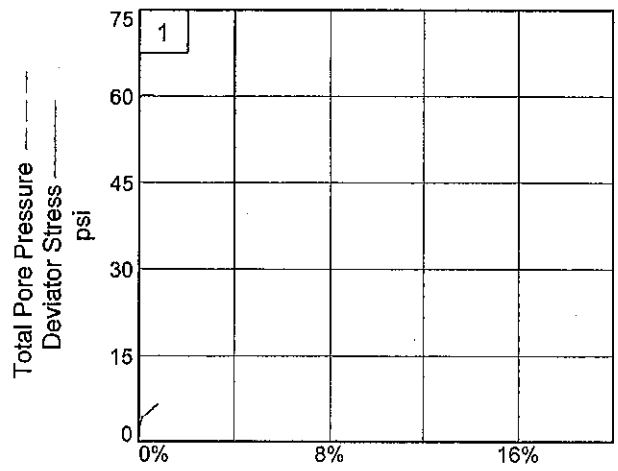
TRIAXIAL SHEAR TEST REPORT

H.C. Nutting
A Terracon Company

Figure _____

Tested By: FCE

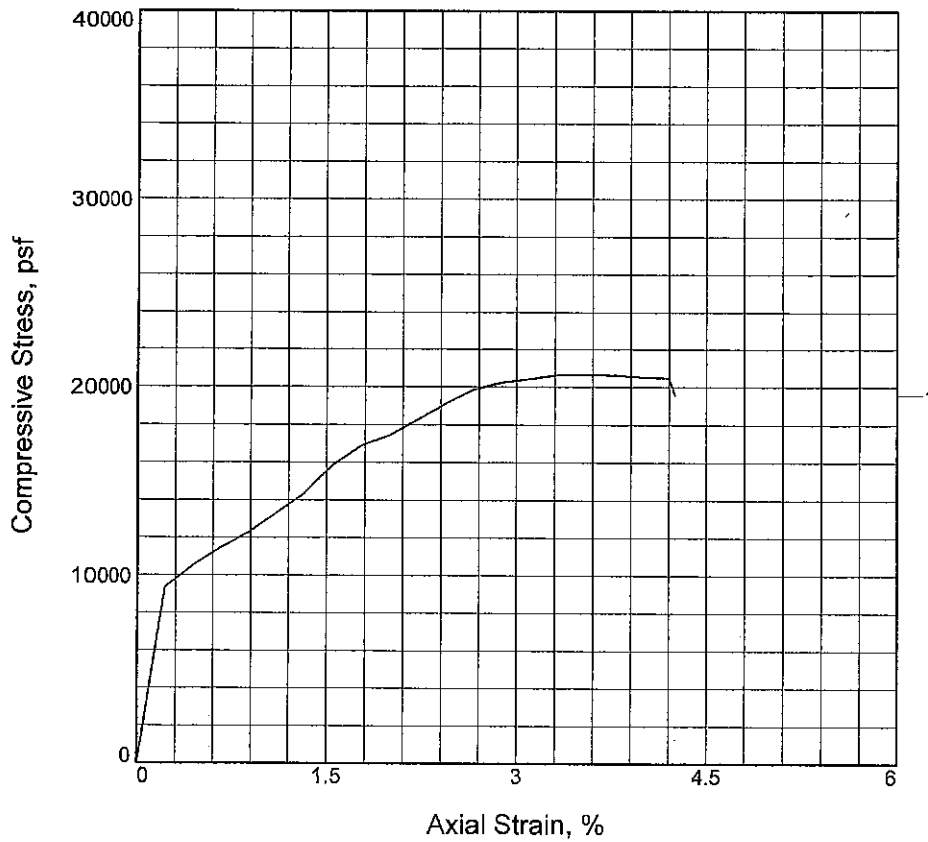
Checked By: GS



Client: PARSONS BRINCKERHOFF
 Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 Source of Sample: HCN-113 Depth: 5-7' Sample Number: 3/ST
 Project No.: N1105229 Figure _____ H.C. Nutting - A Terracon Company

Tested By: FCE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	20677.4		
Undrained shear strength, psf	10338.7		
Failure strain, %	3.5		
Strain rate, in./min.	0.022		
Water content, %	7.6		
Wet density, pcf	115.7		
Dry density, pcf	107.6		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.990		
Specimen height, in.	2.260		
Height/diameter ratio	1.14		

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229

Date Sampled: 1-27-11

Remarks:
Lab No. 13,737

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-116 **Depth:** 47.8-48.2'

Sample Number: C1

UNCONFINED COMPRESSION TEST

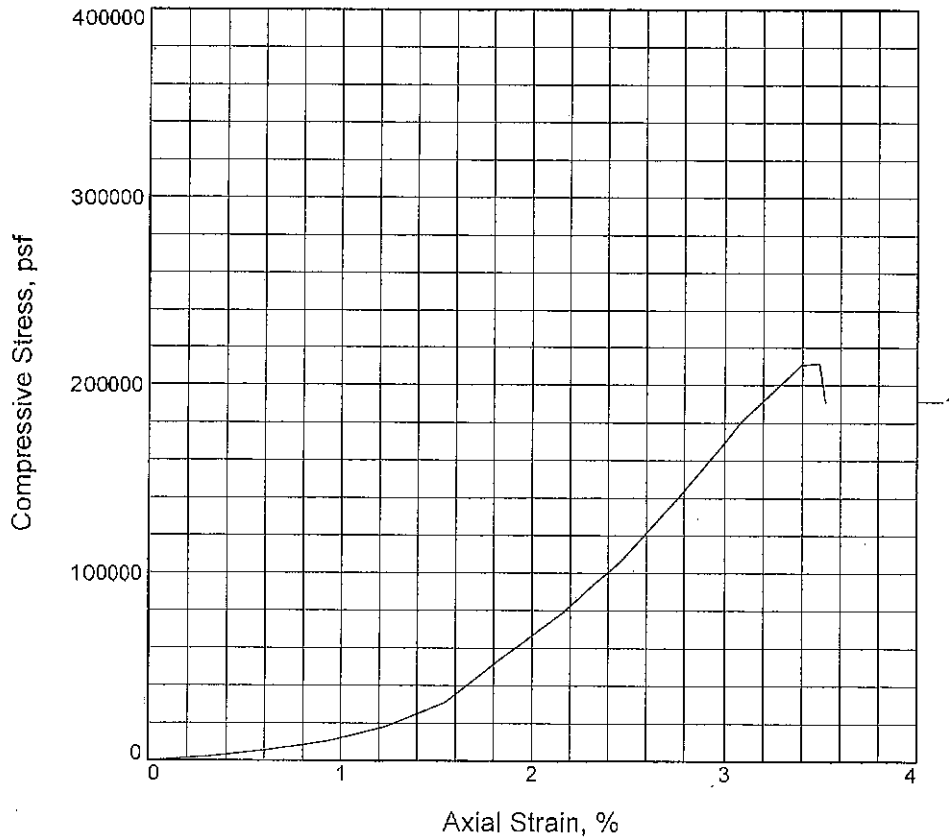
H.C. Nutting
A Terracon Company

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	211563.6			
Undrained shear strength, psf	105781.8			
Failure strain,	3.5			
Strain rate, in./min.	0.032			
Water content, %	3.7			
Wet density, pcf	148.7			
Dry density, pcf	143.4			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.970			
Specimen height, in.	3.240			
Height/diameter ratio	1.64			

Description: SHALE

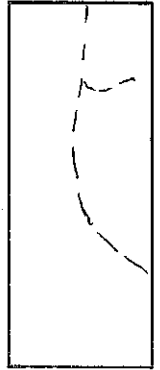
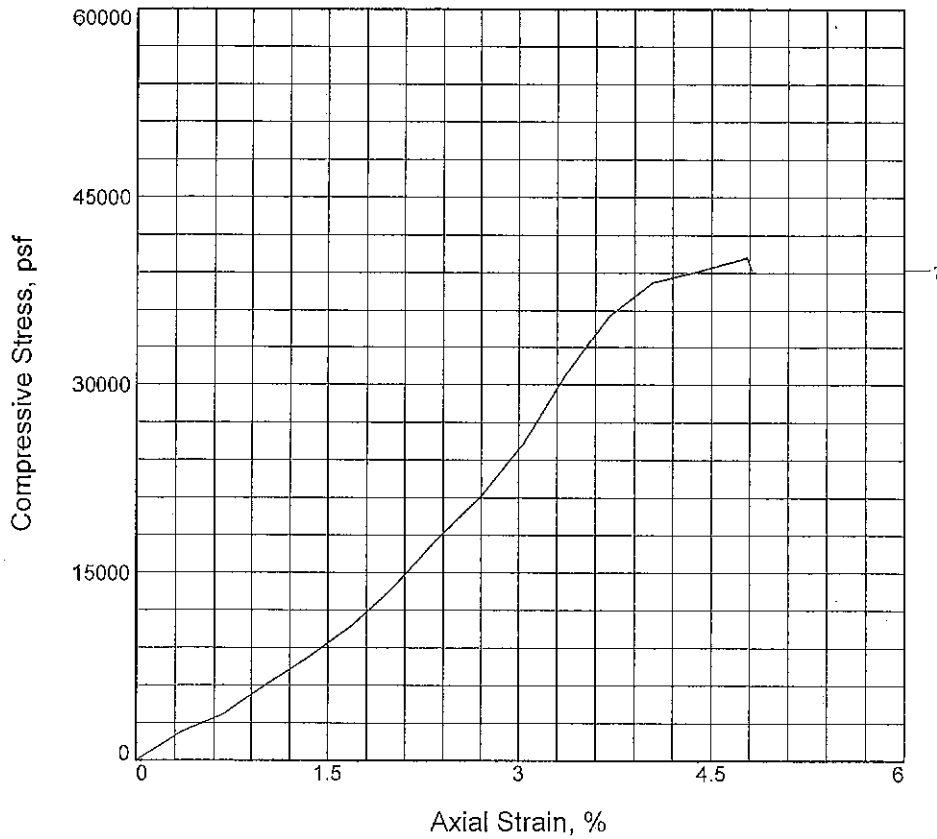
LL = PL = PI = GS = Type: Shale

<p>Project No.: NI105229 Date: 1-11-11 Remarks: Lab No. 13,207</p>	<p>Client: PARSONS BRINCKERHOFF Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS KENTON COUNTY, KENTUCKY Source of Sample: HCN-113 Depth: 59.3-59.6' Sample Number: C2</p>
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UNCONFINED COMPRESSION TEST
H. C. NUTTING COMPANY

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	40197.1		
Undrained shear strength, psf	20098.6		
Failure strain,	4.8		
Strain rate, in./min.	0.029		
Water content, %	8.4		
Wet density, pcf	149.3		
Dry density, pcf	137.7		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	2.000		
Specimen height, in.	2.970		
Height/diameter ratio	1.49		

Description: SHALE

LL = PL = PI = GS = Type: Shale

Project No.: N1105229

Date: 1-11-11

Remarks:
Lab No. 13,208

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-113 Depth: 60.9-70.3'

Sample Number: C3

UNCONFINED COMPRESSION TEST

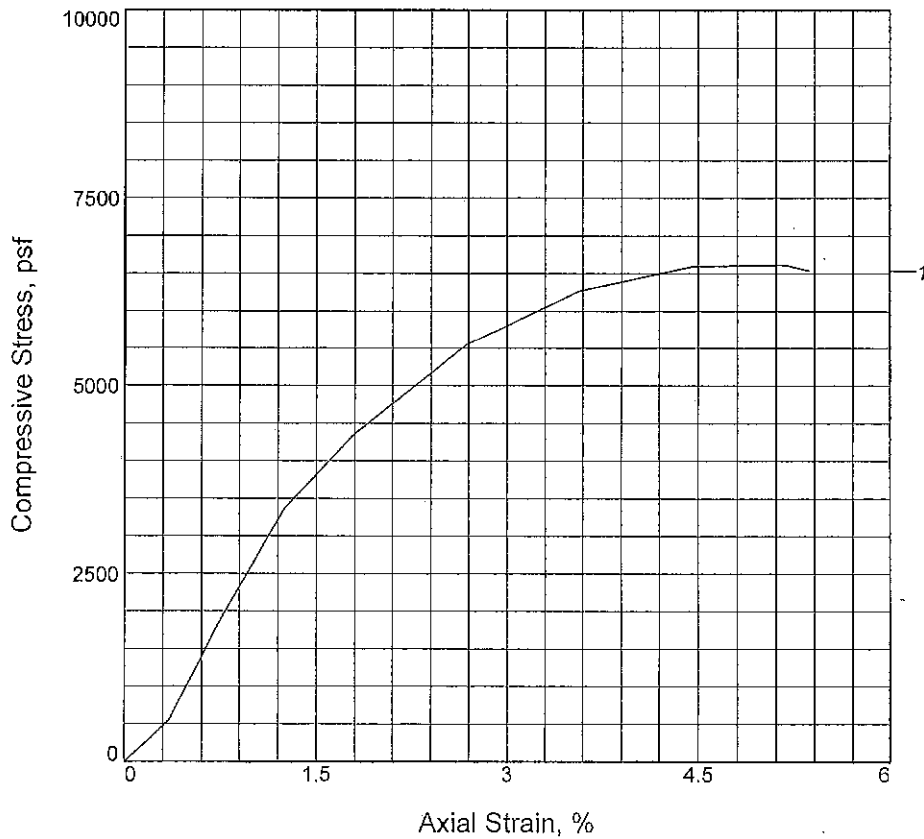
H. C. NUTTING COMPANY

Figure _____

Tested By: MRE

Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	6610.1			
Undrained shear strength, psf	3305.0			
Failure strain,	5.2			
Strain rate, in./min.	0.056			
Water content, %	19.2			
Wet density, pcf	135.5			
Dry density, pcf	113.7			
Saturation, %	107.5			
Void ratio	0.4825			
Specimen diameter, in.	2.860			
Specimen height, in.	5.600			
Height/diameter ratio	1.96			

Description: BROWN LEAN CLAY WITH GRAVEL, MOIST - STIFF

LL = 48 PL = 22 PI = 26 Assumed GS = 2.70 Type: ST

Project No.: N1105229

Date: 12-30-10

Remarks:
Lab No. 13,348

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
KENTON COUNTY, KENTUCKY

Source of Sample: HCN-113 **Depth:** 18-20'

Sample Number: 8/ST

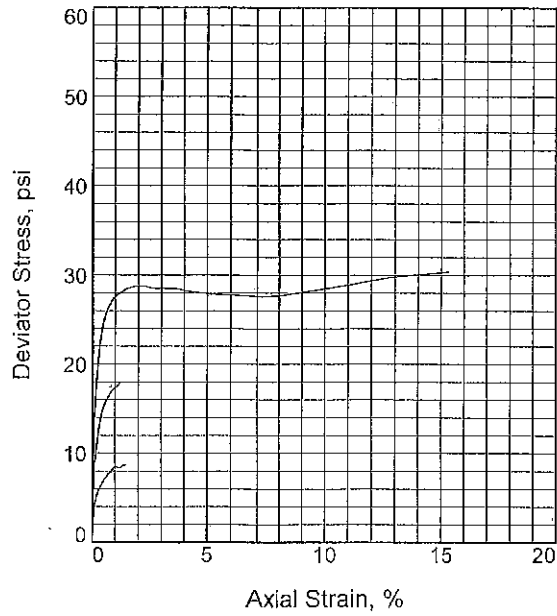
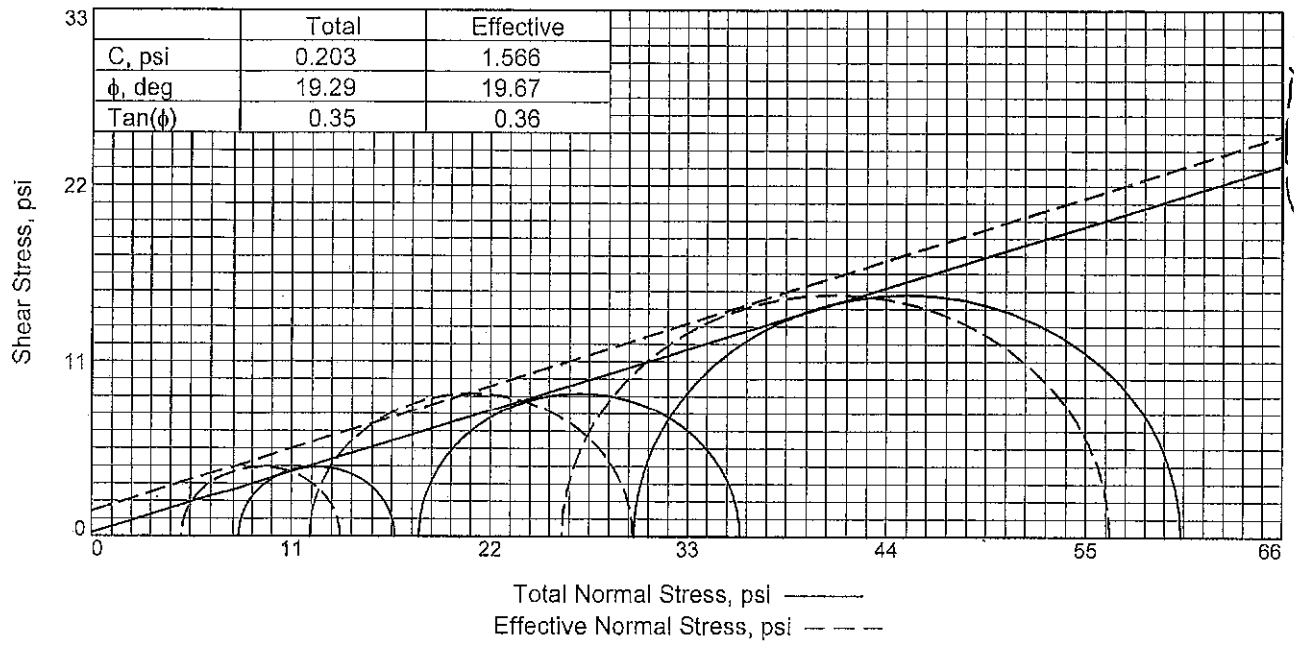
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: SV

Checked By: GS



Sample No.		1	2	3
Initial	Water Content,	22.5	22.5	22.5
	Dry Density, pcf	104.2	104.2	104.2
	Saturation,	98.1	98.1	98.1
	Void Ratio	0.6180	0.6180	0.6180
	Diameter, in.	2.862	2.862	2.862
	Height, in.	5.778	5.778	5.778
At Test	Water Content,	22.5	22.4	22.2
	Dry Density, pcf	104.9	105.0	105.3
	Saturation,	100.0	100.0	100.0
	Void Ratio	0.6071	0.6054	0.6002
	Diameter, in.	2.856	2.875	2.890
	Height, in.	5.765	5.680	5.604
Strain rate, in./min.		0.001	0.001	0.001
Back Pressure, psi		60.00	60.00	60.00
Cell Pressure, psi		68.00	78.00	90.00
Fail. Stress, psi		8.68	17.95	30.34
Total Pore Pr., psi		63.00	66.00	64.00
Ult. Stress, psi				
Total Pore Pr., psi				
$\bar{\sigma}_1$ Failure, psi		13.68	29.95	56.34
$\bar{\sigma}_3$ Failure, psi		5.00	12.00	26.00

Type of Test:
 CU with Pore Pressures
Sample Type: ST
Description: BROWN LEAN CLAY WITH GRAVEL, MOIST - STIFF
 LL= 48 PL= 22 PI= 26
Assumed Specific Gravity= 2.70
Remarks: Lab No. 13,348

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY
Source of Sample: HCN-113 **Depth:** 18-20'
Sample Number: 8/ST
Proj. No.: N1105229 **Date:** 1-6-11

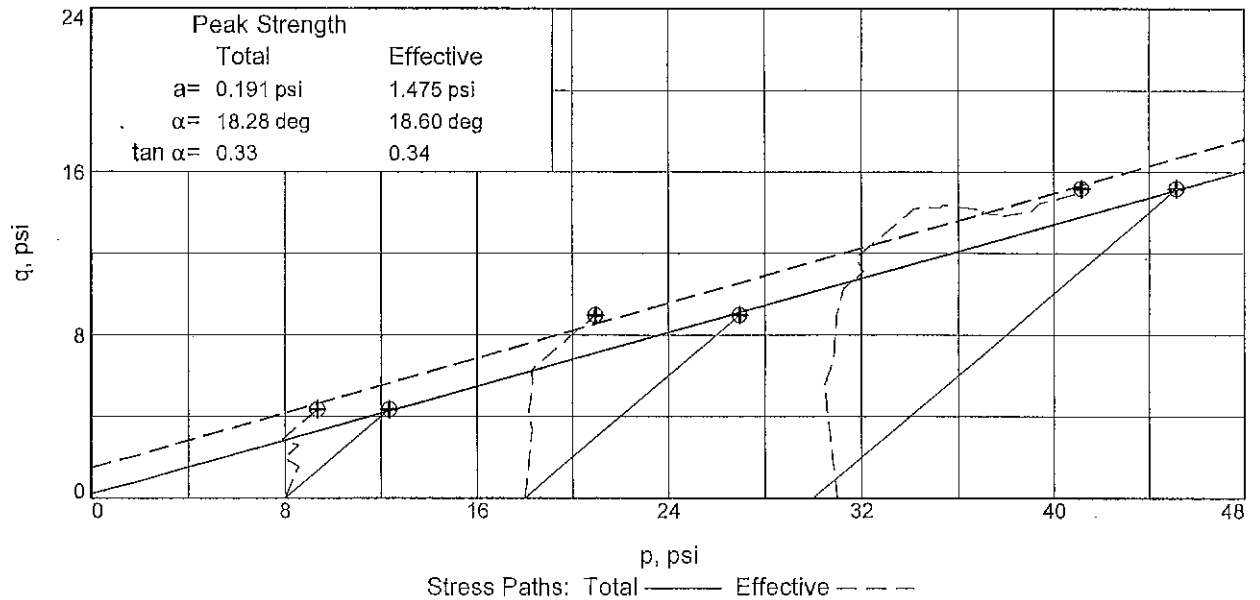
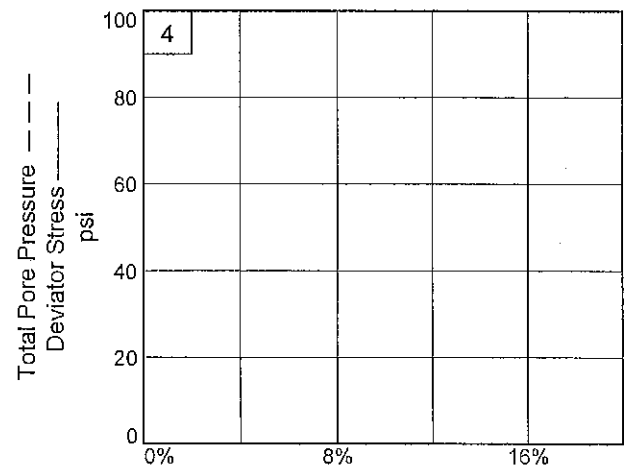
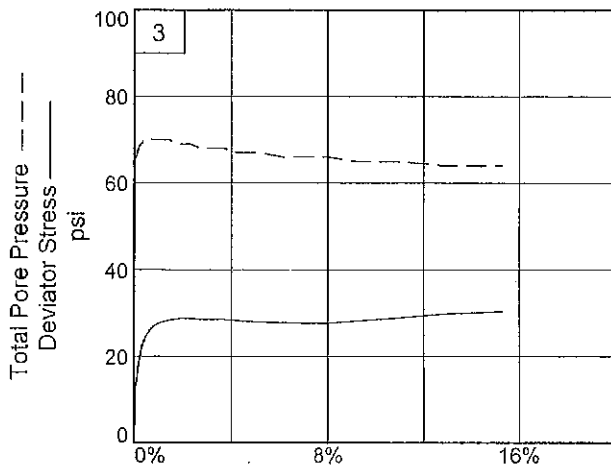
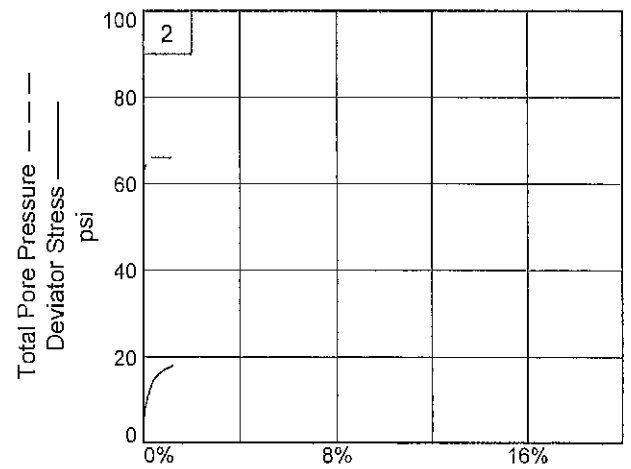
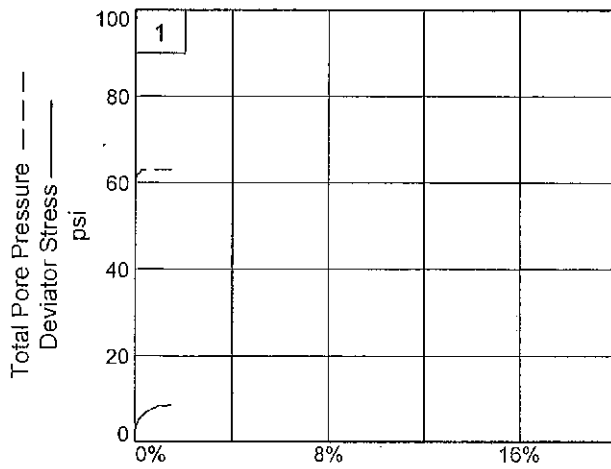
TRIAXIAL SHEAR TEST REPORT

H. C. NUTTING COMPANY

Figure _____

Tested By: FCE

Checked By: GS



Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS

Source of Sample: HCN-113

Depth: 18-20'

Sample Number: 8/ST

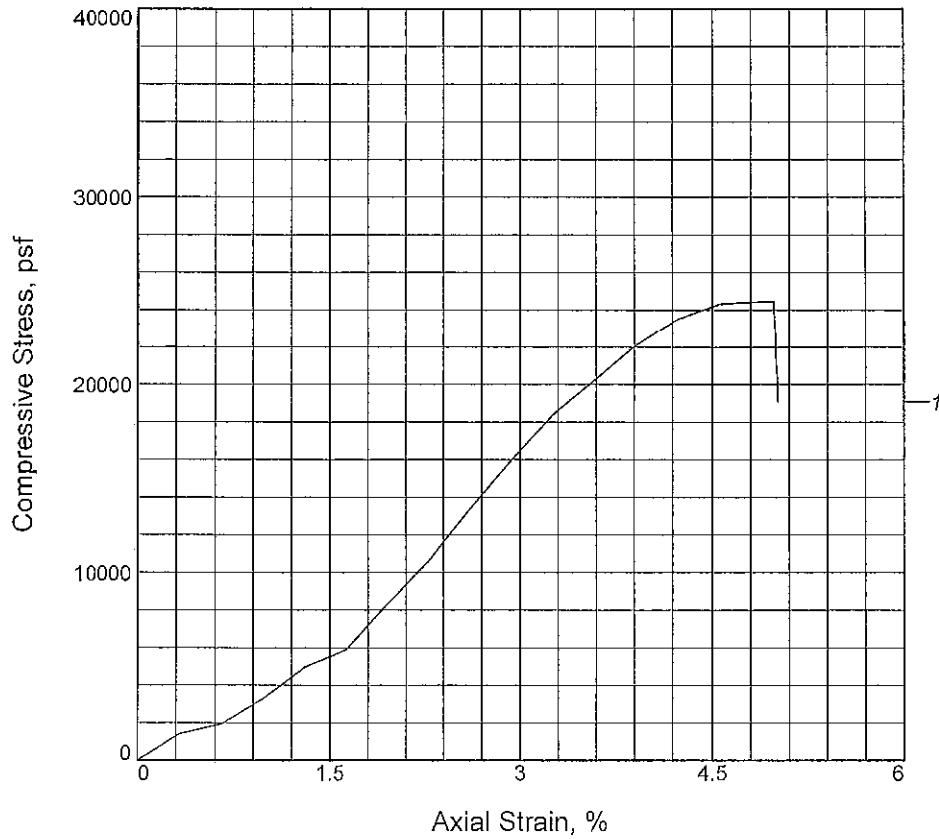
Project No.: N1105229

Figure _____

H. C. NUTTING COMPANY

Tested By: FCE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1		
Unconfined strength, psf	24449.7		
Undrained shear strength, psf	12224.9		
Failure strain,	5.0		
Strain rate, in./min.	0.030		
Water content, %	8.1		
Wet density, pcf	152.5		
Dry density, pcf	141.1		
Saturation, %	N/A		
Void ratio	N/A		
Specimen diameter, in.	1.910		
Specimen height, in.	3.070		
Height/diameter ratio	1.61		

Description: SHALE

LL =	PL =	PI =	Assumed GS=	Type: Shale
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Project No.: N1105229
 Date: 1-6-11
 Remarks:
 Lab No. 13,193

Figure _____

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY

Source of Sample: HCN-114 **Depth:** 47.5-48'

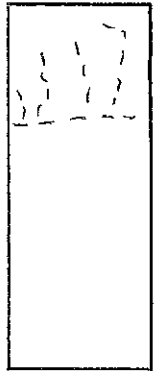
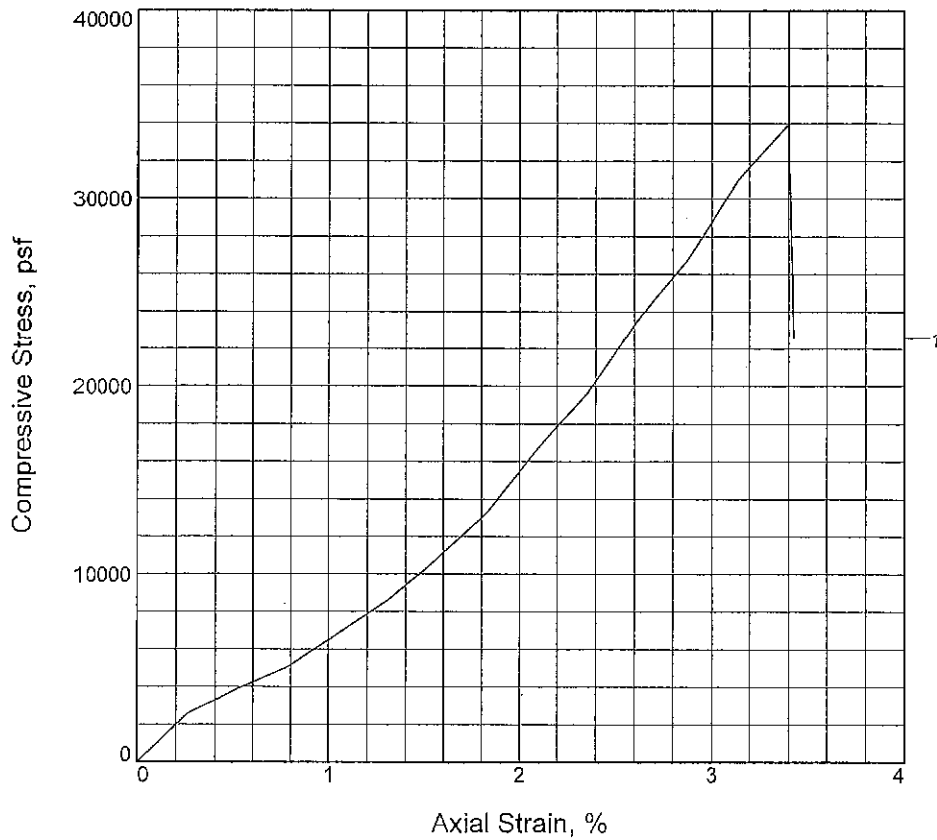
Sample Number: C2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	33972.2			
Undrained shear strength, psf	16986.1			
Failure strain,	3.4			
Strain rate, in./min.	0.038			
Water content, %	8.0			
Wet density, pcf	148.1			
Dry density, pcf	137.2			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.980			
Specimen height, in.	3.820			
Height/diameter ratio	1.93			

Description: SHALE

LL = PL = PI = GS = Type: Shale

Project No.: N1105229
 Date: 1-11-11
 Remarks:
 Lab No. 13,720

Figure _____

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY

Source of Sample: HCN-115 **Depth:** 50.6-60'

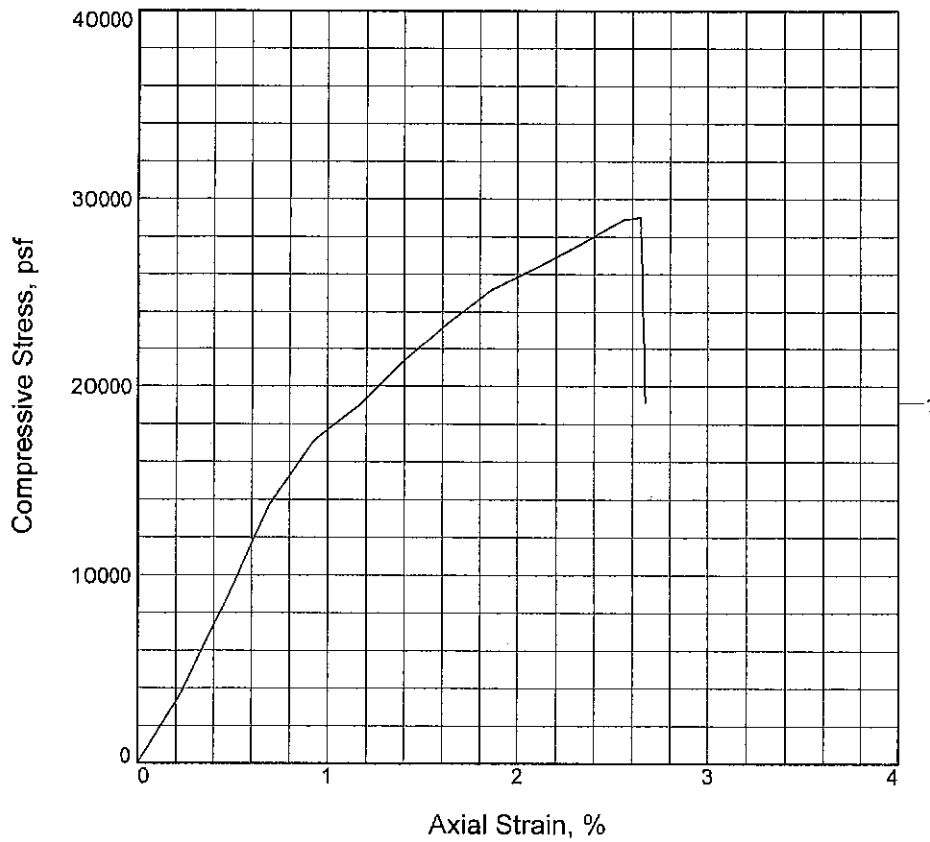
Sample Number: C2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: MRE _____ Checked By: GS _____

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	29039.5			
Undrained shear strength, psf	14519.7			
Failure strain, %	2.6			
Strain rate, in./min.	0.043			
Water content, %	11.8			
Wet density, pcf	148.9			
Dry density, pcf	133.1			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.930			
Specimen height, in.	4.310			
Height/diameter ratio	2.23			

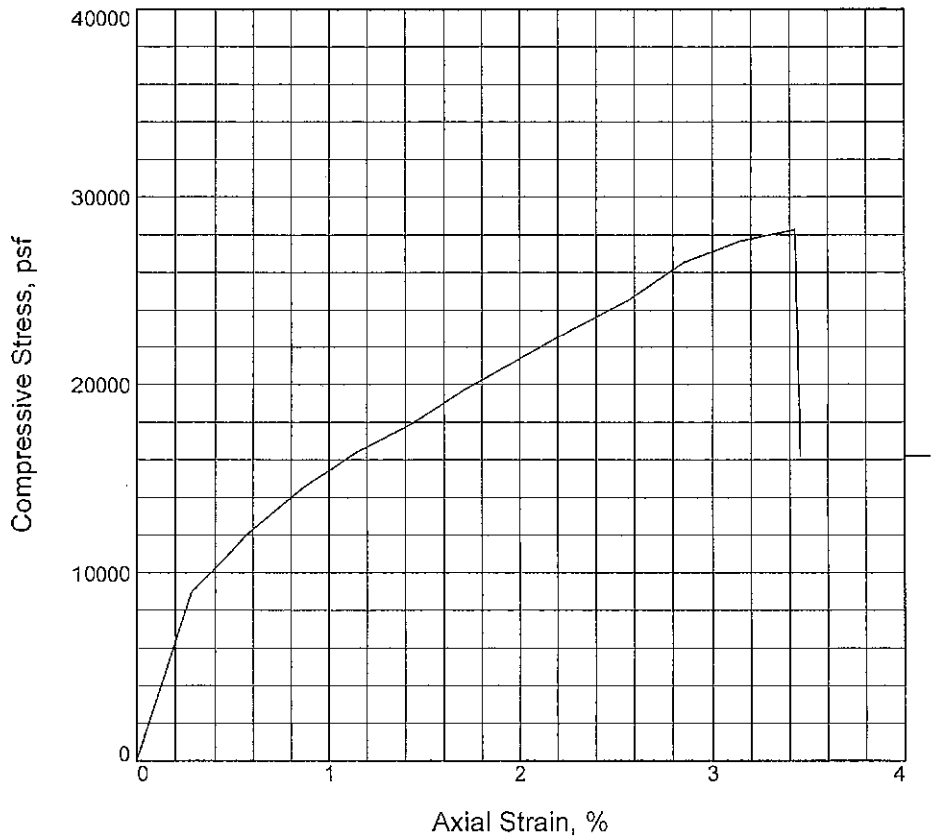
Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

<p>Project No.: N1105229 Date Sampled: 1-6-11 Remarks: Lab No. 13,200</p>	<p>Client: PARSONS BRINCKERHOFF Project: HAM-75-0.22/1.82 BRENT SPENCE BRIDGE RW JUSTIFICATION STUDY Source of Sample: HCN-118 Depth: 42.4-42.8' Sample Number: C1</p>
UNCONFINED COMPRESSION TEST H.C. Nutting A Terracon Company	

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	28266.1			
Undrained shear strength, psf	14133.0			
Failure strain,	3.4			
Strain rate, in./min.	0.035			
Water content, %	10.4			
Wet density, pcf	148.3			
Dry density, pcf	134.3			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.810			
Specimen height, in.	3.500			
Height/diameter ratio	1.93			

Description: SHALE

LL =	PL =	PI =	Assumed GS=	Type: Shale
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Project No.: N1105229
 Date: 1-6-11
 Remarks:
 Lab No. 13,199

Figure _____

Client: PARSONS BRINCKERHOFF

Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY

Source of Sample: HCN-118 **Depth:** 46.2-46.6'

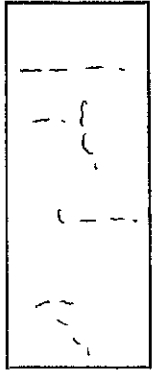
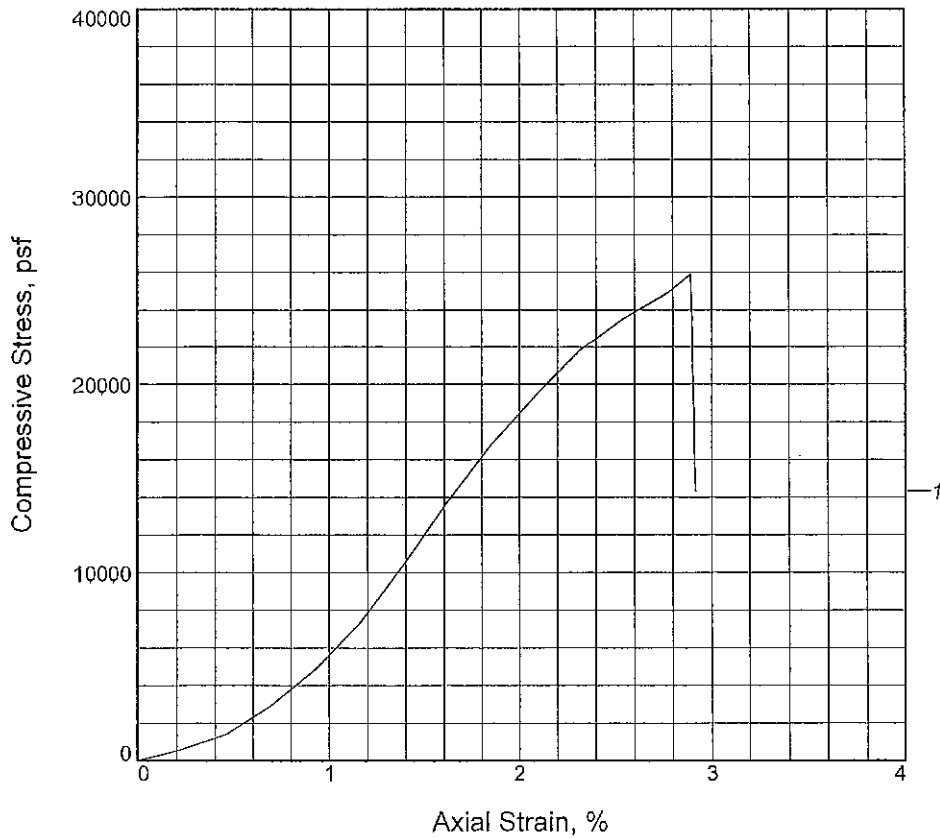
Sample Number: C2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: MRE Checked By: GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psf	25906.3			
Undrained shear strength, psf	12953.2			
Failure strain,	2.9			
Strain rate, in./min.	0.043			
Water content, %	6.8			
Wet density, pcf	149.6			
Dry density, pcf	140.1			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.930			
Specimen height, in.	4.320			
Height/diameter ratio	2.24			

Description: SHALE

LL = PL = PI = Assumed GS= Type: Shale

Project No.: N1105229
Date: 1-5-11
Remarks:
 Lab No. 13,196

Figure _____

Client: PARSONS BRINCKERHOFF
Project: PROJECT ITEM NO. 6-17 BRENT SPENCE BRIDGE RWJS
 KENTON COUNTY, KENTUCKY
Source of Sample: HCN-119 **Depth:** 46-46.5'
Sample Number: C4

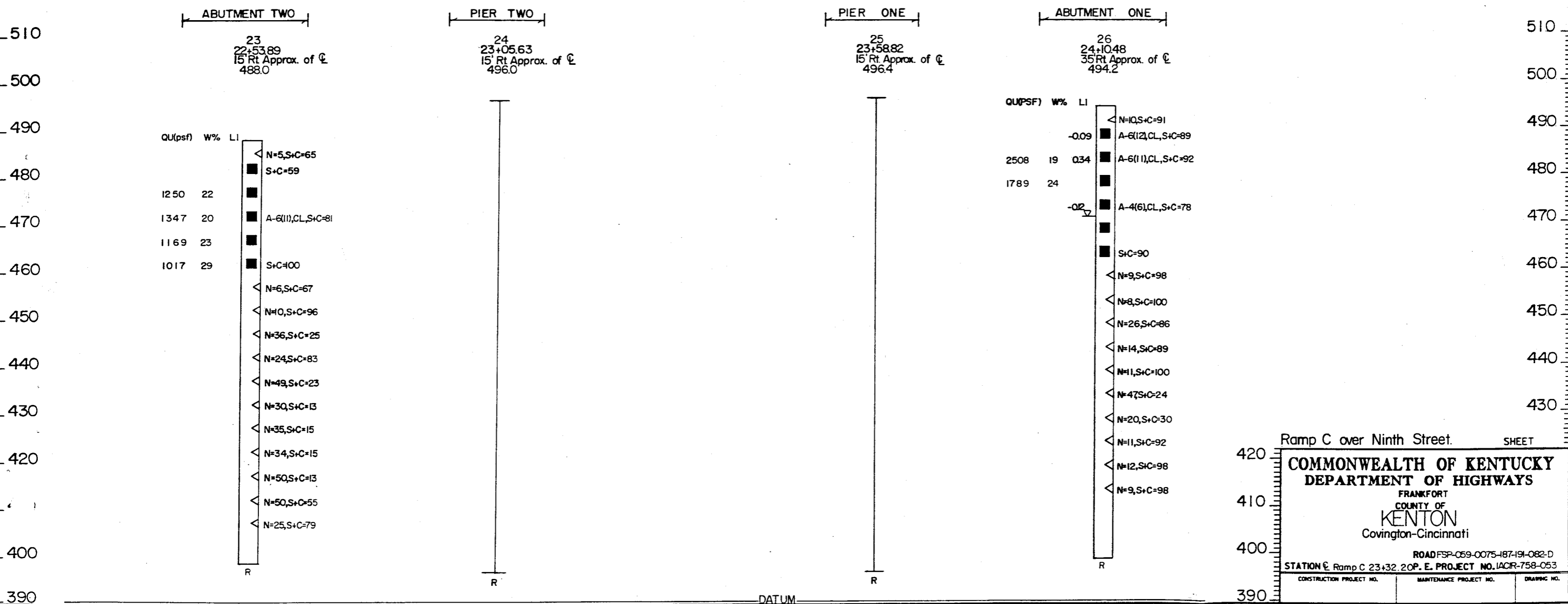
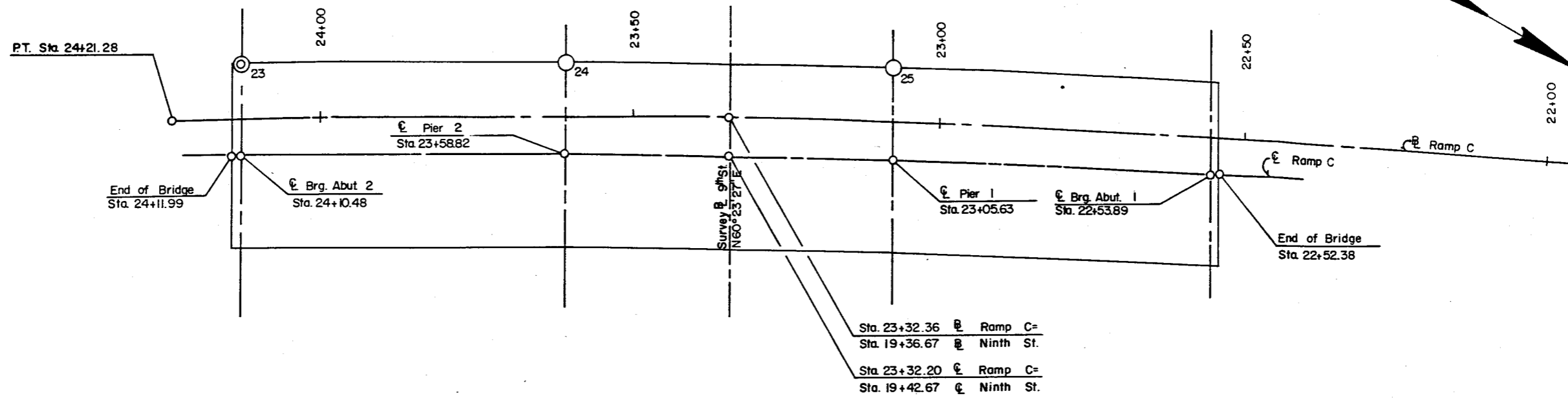
UNCONFINED COMPRESSION TEST
H. C. NUTTING COMPANY

Tested By: MRE Checked By: GS

**Subsurface Data
from prior KYTC
Work**

**(B, H, S, Selected
Numbered
Borings)**

SUBSURFACE DATA



Ramp C over Ninth Street. SHEET

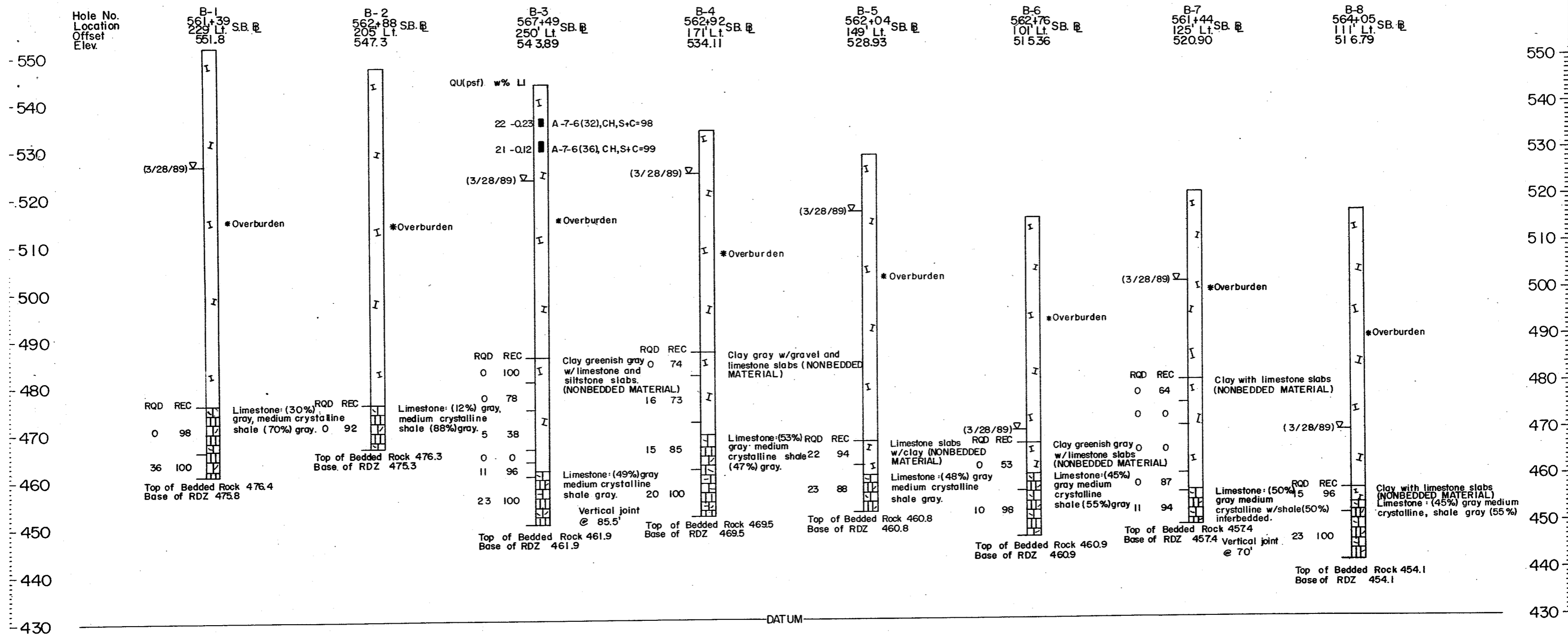
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
 FRANKFORT
 COUNTY OF
KENTON
 Covington-Cincinnati

ROAD FSP-059-0075-187-191-082-D
 STATION \bar{C} Ramp C 23+32.20 P. E. PROJECT NO. IACR-758-053

CONSTRUCTION PROJECT NO.	MAINTENANCE PROJECT NO.	DRAWING NO.
--------------------------	-------------------------	-------------

THIS IS APPROXIMATELY A HALF SIZE REDUCED PRINT

SUBSURFACE DATA



SUMMARY of CONSOLIDATED UNDRAINED TRIAXIAL TEST	
Location	B-3 567+49 250' Lt.
Depth	7.0'-8.5' 120'-14.0'
\bar{c} (psf)	251
$\bar{\phi}$ (deg.)	30.6

*Overburden consists of clay, clay shale, limestone slabs, and boulders (NONBEDDED MATERIAL).

Retaining Wall "CW"

COMMONWEALTH OF KENTUCKY
 DEPARTMENT OF HIGHWAYS
 FRANKFORT
 COUNTY OF
KENTON
 Covington-Cincinnati

ROAD FSP 059 0075 187-191 082D
 I-75 C
 STATION 555+50 to 567+00 P. E. PROJECT NO. IAC1R 758 053

CONSTRUCTION PROJECT NO.	MAINTENANCE PROJECT NO.	DRAWING NO.
--------------------------	-------------------------	-------------

THIS IS APPROXIMATELY A HALF SIZE REDUCED PRINT
SUBSURFACE DATA

ING 44-132 69827

Hole No.
 Location
 Offset
 Elev.

B-9
 562+04 S.B. @
 90' Lt.
 512.9

B-10
 561+56 S.B. @
 95' Lt.
 512.6

B-11
 558+51 S.B. @
 191' Lt.
 541.7

B-12
 558+38 S.B. @
 87' Lt.
 507.7

B-13
 565+95 S.B. @
 141' Lt.
 518.3

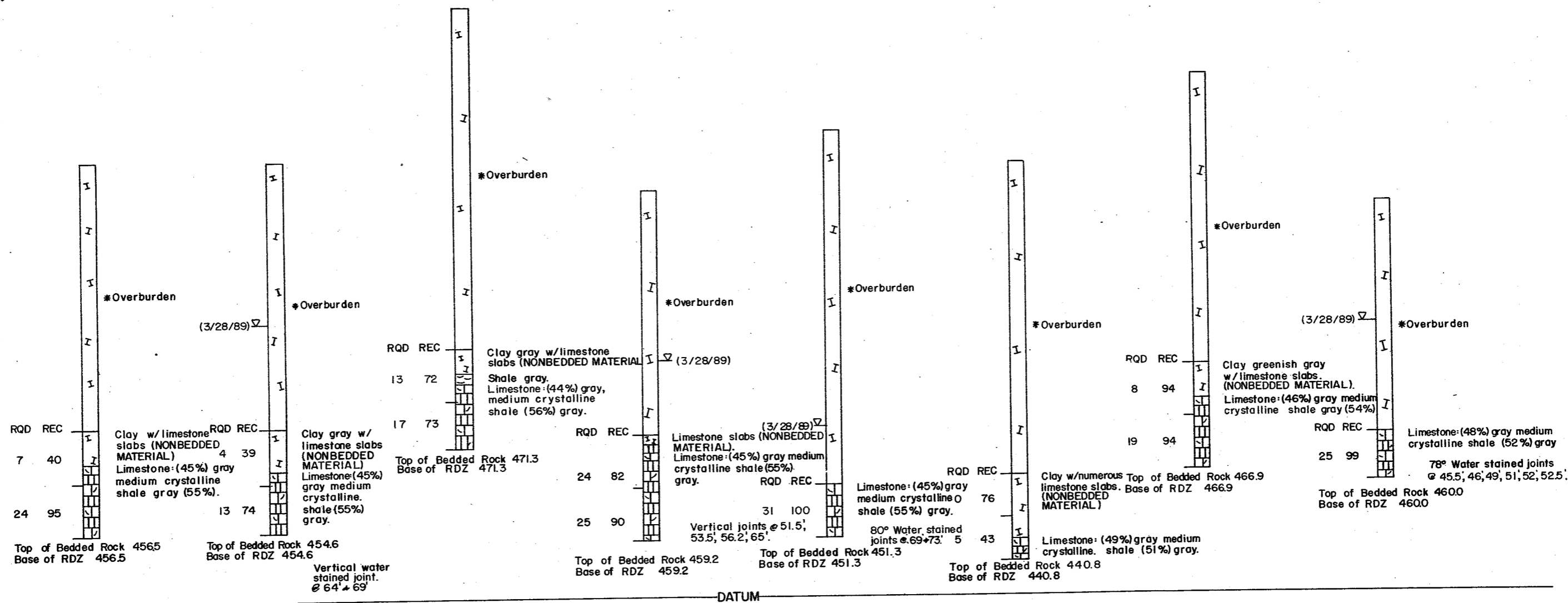
B-14
 567+59 S.B. @
 155' Lt.
 511.8

B-15
 560+49 S.B. @
 143' Lt.
 528.4

B-16
 559+39 S.B. @
 88' Lt.
 504.4

550
540
530
520
510
500
490
480
470
460
450
440
430

550
540
530
520
510
500
490
480
470
460
450
440
430



*Overburden consists of clay, clay shale, limestone slabs, and boulders (NONBEDDED MATERIAL).

Retaining Wall "CW" SHEET

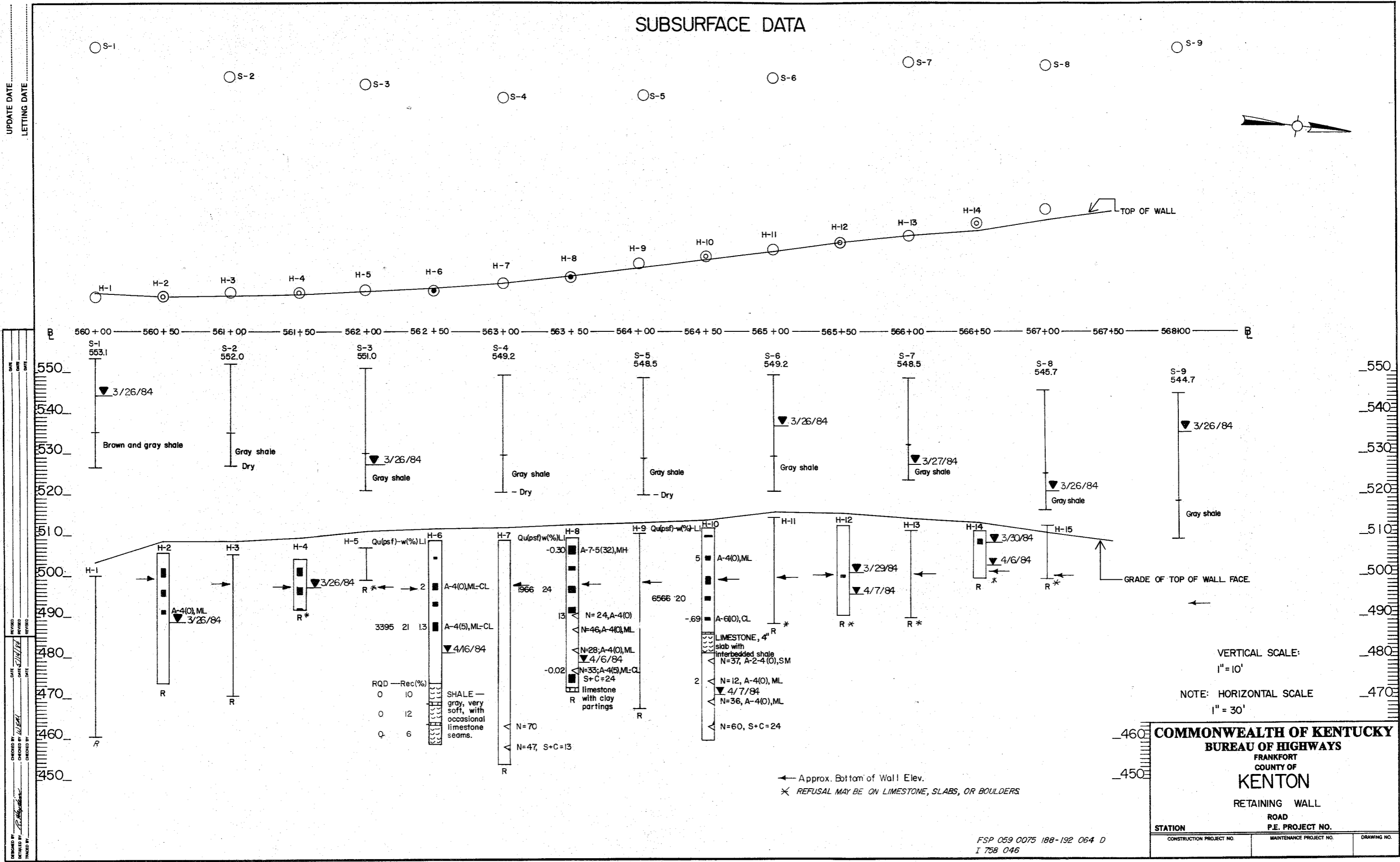
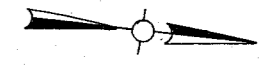
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
 FRANKFORT
 COUNTY OF
KENTON
 Covington-Cincinnati

STATION I-75 @ ROAD FSP 059 0075 187-191 082 D
 P. E. PROJECT NO. IACIR 758 053

CONSTRUCTION PROJECT NO.	MAINTENANCE PROJECT NO.	DRAWING NO.
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SUBSURFACE DATA

UPDATE DATE
LETTING DATE



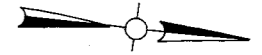
THIS IS A REDUCED SIZE PRINT — NOT TO SCALE

COMMONWEALTH OF KENTUCKY
BUREAU OF HIGHWAYS
 FRANKFORT
 COUNTY OF
KENTON
 RETAINING WALL
 ROAD
 P.E. PROJECT NO.

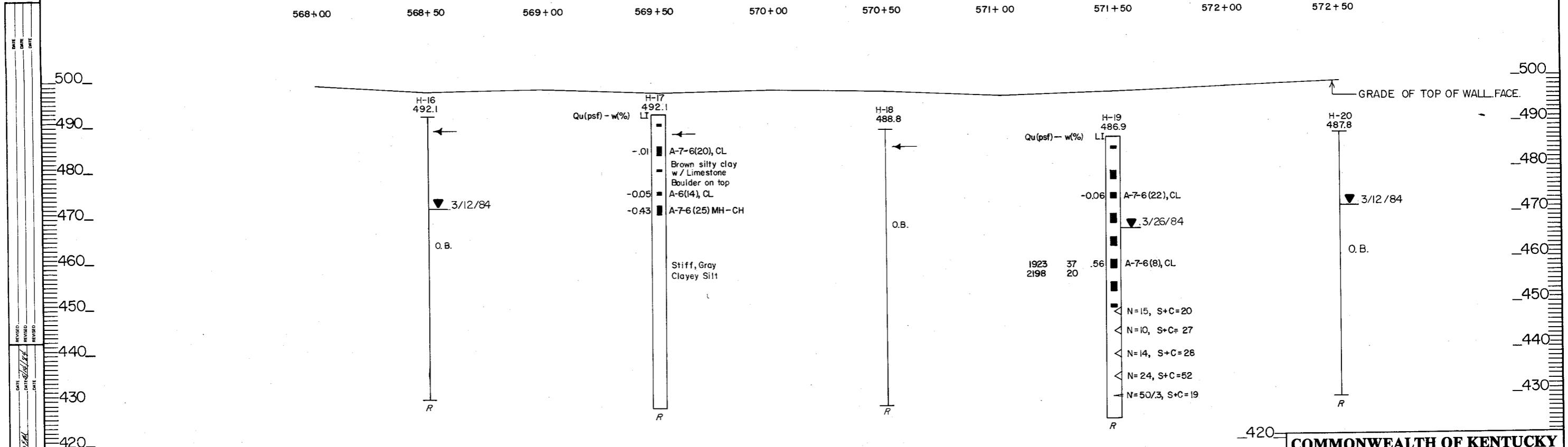
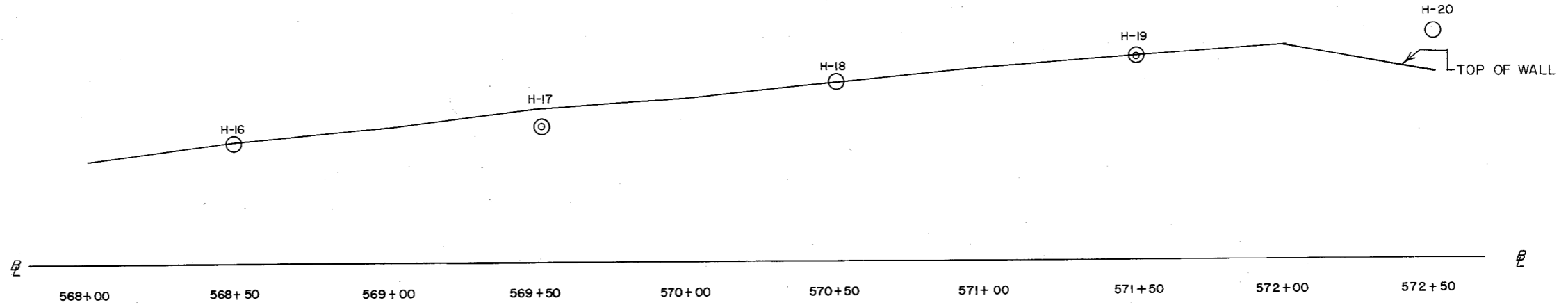
STATION	CONSTRUCTION PROJECT NO.	MAINTENANCE PROJECT NO.	DRAWING NO.
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FSP 059 0075 188-192 064 D
I 758 046

SUBSURFACE DATA



UPDATE DATE
LETTING DATE



NOTE: HORIZONTAL SCALE 1" = 20'
 VERTICAL SCALE: 1" = 10'
 ← : Approx. Bottom of Wall Elev.

FSP 059 0075 188-192 064 D
 I 758 046

COMMONWEALTH OF KENTUCKY
BUREAU OF HIGHWAYS
 FRANKFORT
 COUNTY OF
KENTON
 RETAINING WALL

STATION	P.E. PROJECT NO.
CONSTRUCTION PROJECT NO.	MAINTENANCE PROJECT NO.
	DRAWING NO.

THIS IS A REDUCED SIZE PRINT - NOT TO SCALE