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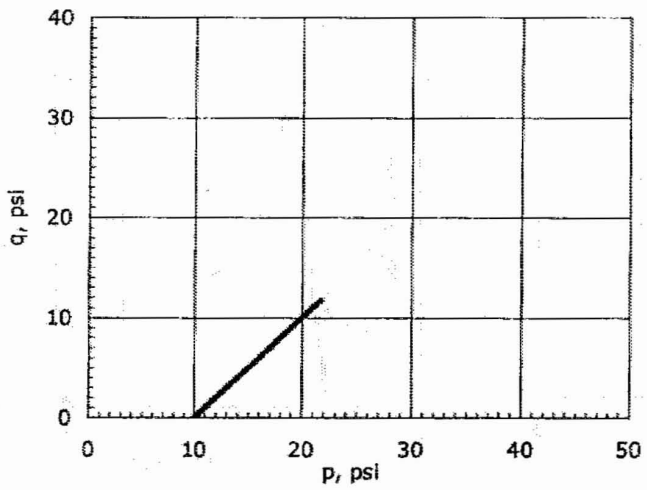
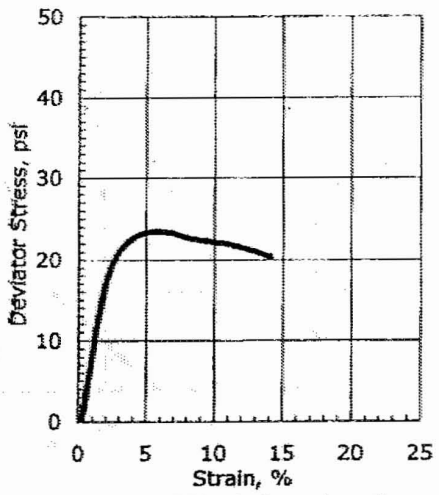
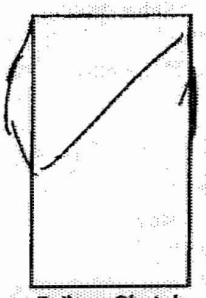
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/19/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-726
Sample ID:	UD-2
Depth, ft:	23.5-25.5
Visual Description:	Moist, black clay
Test No.:	UU13

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	10
Initial Height, in:	6.00	Undrained Shear Strength, psi:	11.8
Height to Diameter Ratio:	2.09	Maximum Deviator Stress, psi:	23.5
Initial Mass, grams:	1193	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	117.1	Strain at Failure, %:	5.7
Initial Moisture Content, %:	34.6		
Initial Dry Density, pcf:	87.0		
Initial Degree of Saturation:	99.7		
Initial Void Ratio:	0.94		
Measured Specific Gravity:	2.70		
Sample Type:	Tube		
Liquid Limit:	69		
Plastic Limit:	22		
Plasticity Index:	47		
% Passing #200 sieve:	96		
Soil Classification:	Fat Clay		
Group Symbol:	CH		



Failure Sketch

Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

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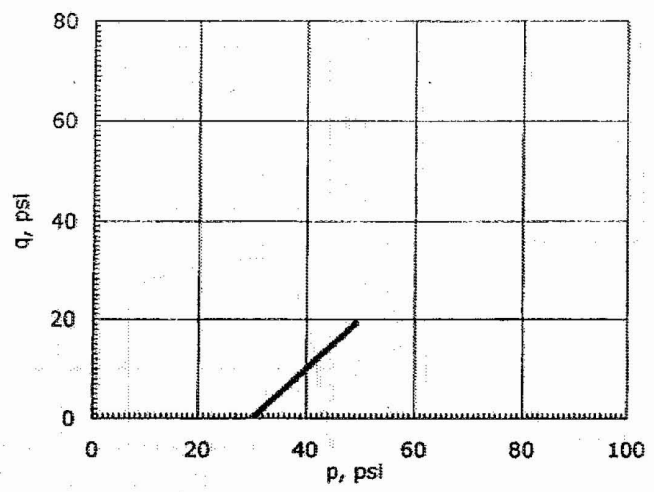
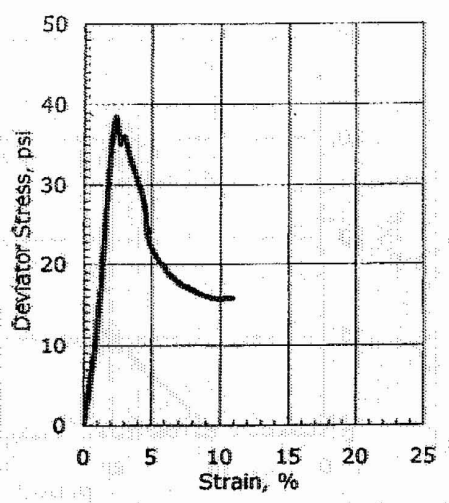
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	11/15/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-729
Sample ID:	UD-1 (S-9)
Depth, ft:	68.5-70
Visual Description:	Moist, dark greenish gray organic clay
Test No.:	UU28

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	30
Initial Height, in:	6.05	Undrained Shear Strength, psi:	19.2
Height to Diameter Ratio:	2.11	Maximum Deviator Stress, psi:	38.4
Initial Mass, grams:	1220	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	118.7	Strain at Failure, %:	2.3
Initial Moisture Content, %:	34.6		
Initial Dry Density, pcf:	88.2		
Initial Degree of Saturation:	99.1		
Initial Void Ratio:	0.97		
Measured Specific Gravity:	2.79		
Sample Type:	Tube		
Liquid Limit:	56		
Plastic Limit:	18		
Plasticity Index:	38		
% Passing #200 sieve:	93		
Soil Classification:	Organic Clay		
Group Symbol:	OH		

Failure Sketch

Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

GeoTesting express

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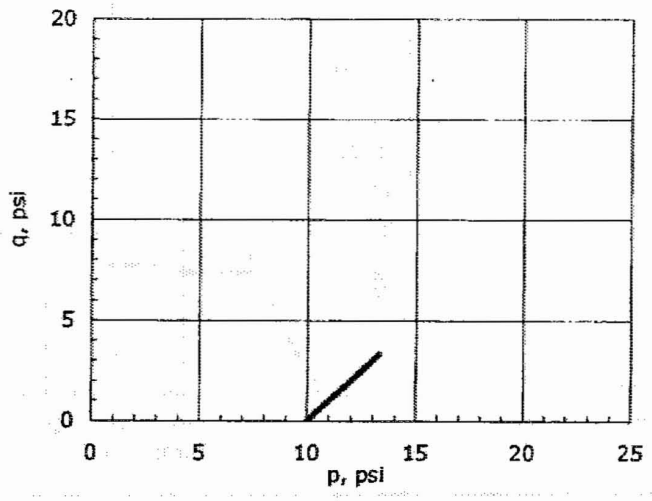
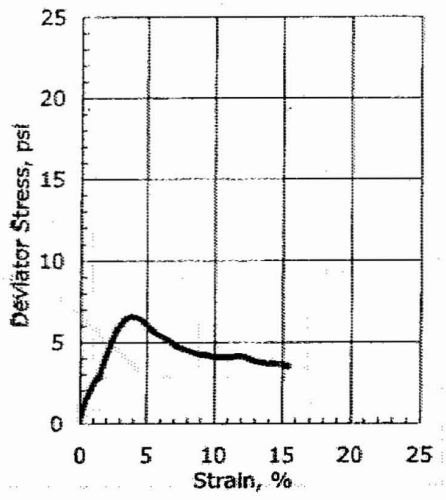
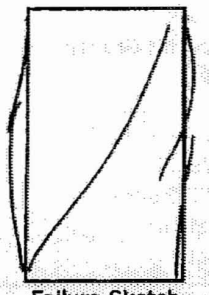
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/21/2005
Tested By:	md
Checked By:	jdt
Boring ID:	B-732
Sample ID:	UD-1
Depth, ft:	15-17
Visual Description:	Moist, mottled pale yellow and brownish yellow clayey sand
Test No.:	UU21

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	10
Initial Height, in:	6.10	Undrained Shear Strength, psi:	3.3
Height to Diameter Ratio:	2.13	Maximum Deviator Stress, psi:	6.6
Initial Mass, grams:	1283	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	123.9	Strain at Failure, %:	3.9
Initial Moisture Content, %:	22.2		
Initial Dry Density, pcf:	101.3		
Initial Degree of Saturation:	88.2		
Initial Void Ratio:	0.69		
Measured Specific Gravity:	2.75		
Sample Type:	Tube		
Liquid Limit:	26		
Plastic Limit:	19		
Plasticity Index:	7		
% Passing #200 sieve:	32		
Soil Classification:	Clayey Sand		
Group Symbol:	SC		



Failure Sketch

Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

GeoTesting express

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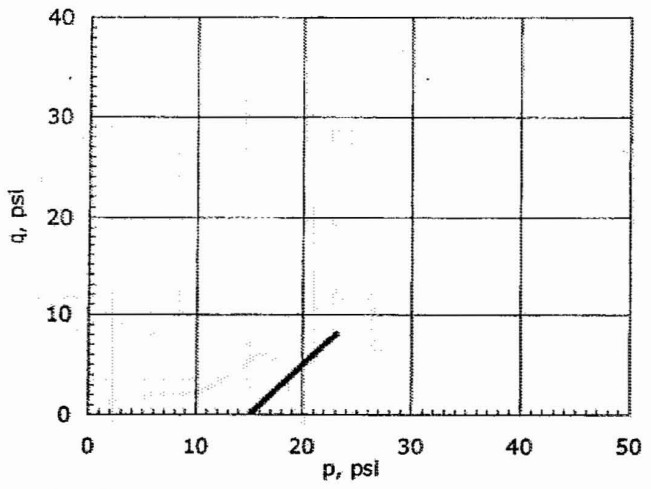
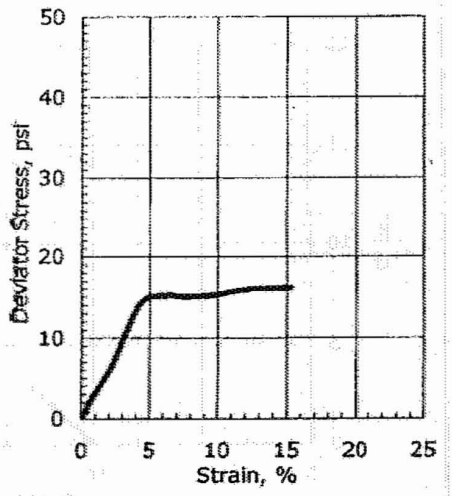
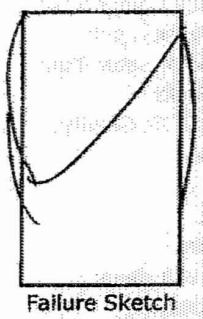
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/19/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-733
Sample ID:	UD-1
Depth, ft:	23.5-25.5
Visual Description:	Moist, dark olive gray clay with sand
Test No.:	UU6

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	10
Initial Height, in:	6.05	Undrained Shear Strength, psi:	8.1
Height to Diameter Ratio:	2.11	Maximum Deviator Stress, psi:	16.1
Initial Mass, grams:	1218	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	118.6	Strain at Failure, %:	15.0
Initial Moisture Content, %:	32.6		
Initial Dry Density, pcf:	89.4		
Initial Degree of Saturation:	98.3		
Initial Void Ratio:	0.91		
Measured Specific Gravity:	2.73		
Sample Type:	Tube		
Liquid Limit:	51		
Plastic Limit:	15		
Plasticity Index:	36		
% Passing #200 sieve:	78		
Soil Classification:	Fat Clay with Sand		
Group Symbol:	CH		



Failure Sketch

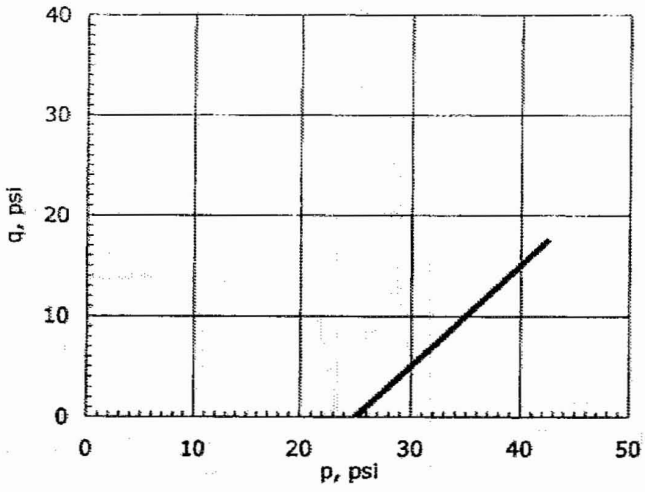
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

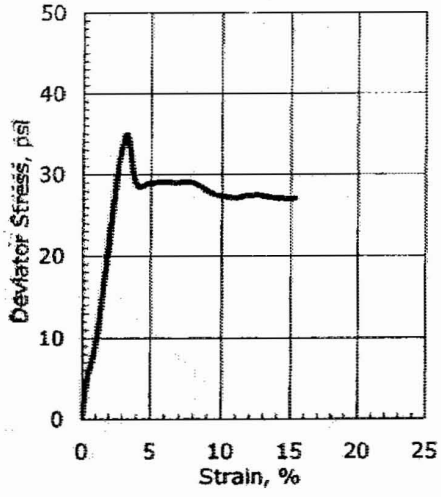
GeoTesting express

a subsidiary of Geocomp Corporation

Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/19/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-735
Sample ID:	S-9
Depth, ft:	28-30
Visual Description:	Moist, dark gray clay
Test No.:	UU7

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	25
Initial Height, in:	6.03	Undrained Shear Strength, psi:	17.5
Height to Diameter Ratio:	2.10	Maximum Deviator Stress, psi:	34.9
Initial Mass, grams:	1222	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	119.3	Strain at Failure, %:	3.2
Initial Moisture Content, %:	31.7		
Initial Dry Density, pcf:	90.6		
Initial Degree of Saturation:	99.6		
Initial Void Ratio:	0.86		
Measured Specific Gravity:	2.73		
Sample Type:	Tube		
Liquid Limit:	51		
Plastic Limit:	16		
Plasticity Index:	35		
% Passing #200 sieve:	87		
Soil Classification:	Fat Clay		
Group Symbol:	CH		

Failure Sketch

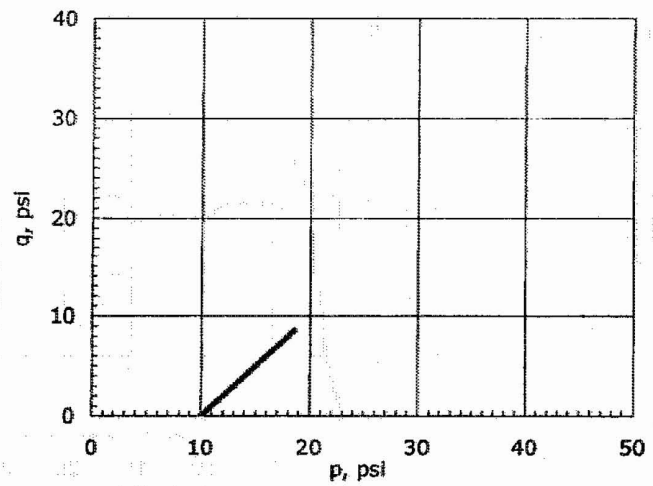
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

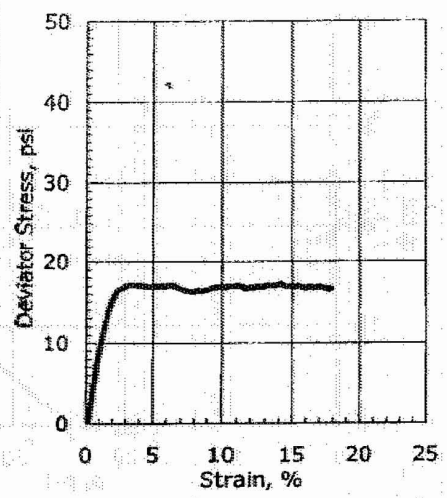
GeoTesting express

a subsidiary of Geocomp Corporation

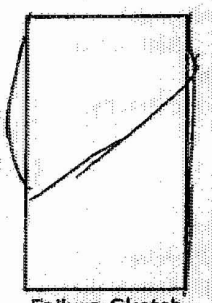
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/19/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-737
Sample ID:	UD-1
Depth, ft:	10.5-12.5
Visual Description:	Moist, very pale brown clay
Test No.:	UU11

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	10
Initial Height, in:	6.03	Undrained Shear Strength, psi:	8.6
Height to Diameter Ratio:	2.10	Maximum Deviator Stress, psi:	17.2
Initial Mass, grams:	1162	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	113.5	Strain at Failure, %:	15.0
Initial Moisture Content, %:	36.2		
Initial Dry Density, pcf:	83.3		
Initial Degree of Saturation:	98.1		
Initial Void Ratio:	0.97		
Measured Specific Gravity:	2.73		
Sample Type:	Tube		
Liquid Limit:	75		
Plastic Limit:	23		
Plasticity Index:	52		
% Passing #200 sieve:	93		
Soil Classification:	Fat Clay		
Group Symbol:	CH		



Failure Sketch

Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

GeoTesting express

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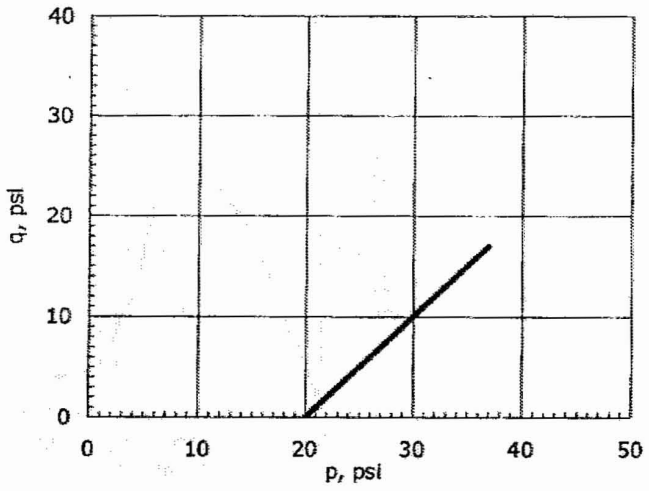
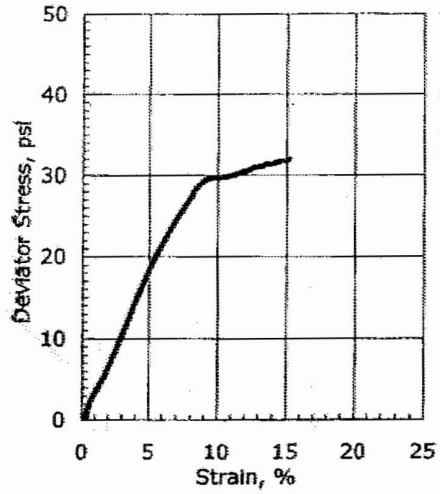
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/19/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-738
Sample ID:	UD-1
Depth, ft:	35-37
Visual Description:	Moist, dark olive gray silty, clayey sand
Test No.:	UU14

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	20
Initial Height, in:	5.85	Undrained Shear Strength, psi:	15.9
Height to Diameter Ratio:	2.04	Maximum Deviator Stress, psi:	31.8
Initial Mass, grams:	1091	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	109.8	Strain at Failure, %:	15.0
Initial Moisture Content, %:	10.7		
Initial Dry Density, pcf:	99.2		
Initial Degree of Saturation:	42.1		
Initial Void Ratio:	0.68		
Measured Specific Gravity:	2.67		
Sample Type:	Tube		
Liquid Limit:	26		
Plastic Limit:	22		
Plasticity Index:	4		
% Passing #200 sieve:	25		
Soil Classification:	Silty Clayey Sand		
Group Symbol:	SC-SM		

Failure Sketch

Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

GeoTesting express

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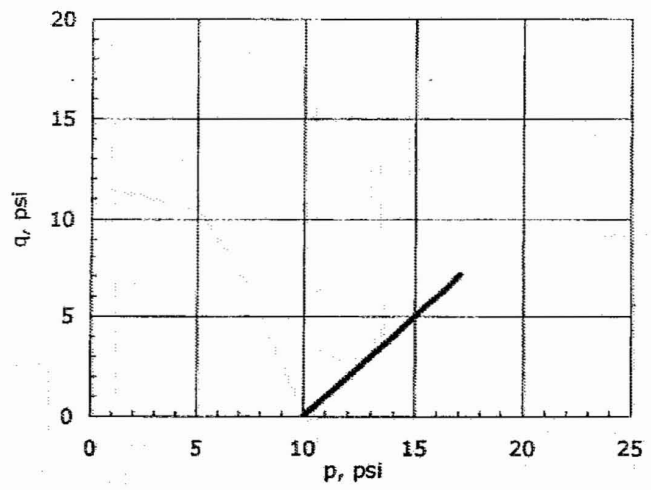
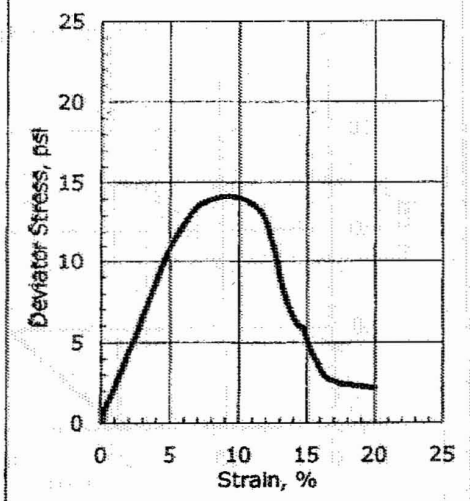
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	11/8/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-746
Sample ID:	S-6
Depth, ft:	13.5-15.5
Visual Description:	Moist, dark olive gray silty, clayey sand
Test No.:	UU27

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	10
Initial Height, in:	5.85	Undrained Shear Strength, psi:	7.1
Height to Diameter Ratio:	2.04	Maximum Deviator Stress, psi:	14.2
Initial Mass, grams:	1201	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	120.9	Strain at Failure, %:	9.3
Initial Moisture Content, %:	27.2		
Initial Dry Density, pcf:	95.0		
Initial Degree of Saturation:	92.5		
Initial Void Ratio:	0.81		
Measured Specific Gravity:	2.76		
Sample Type:	Tube		
Liquid Limit:	25		
Plastic Limit:	21		
Plasticity Index:	4		
% Passing #200 sieve:	29		
Soil Classification:	Silty Clayey Sand		
Group Symbol:	SC-SM		

Failure Sketch

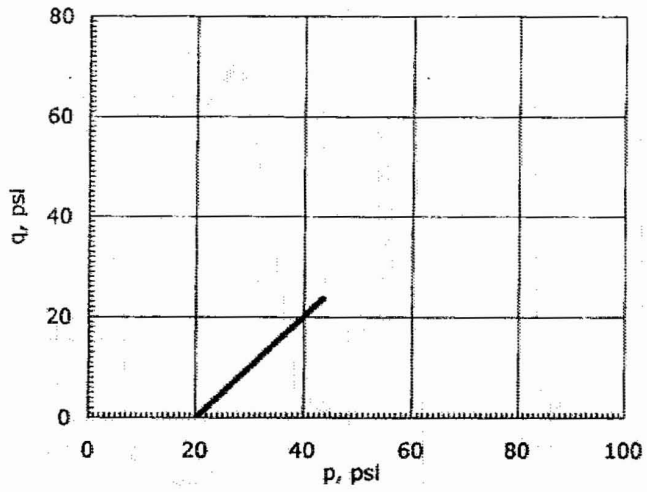
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

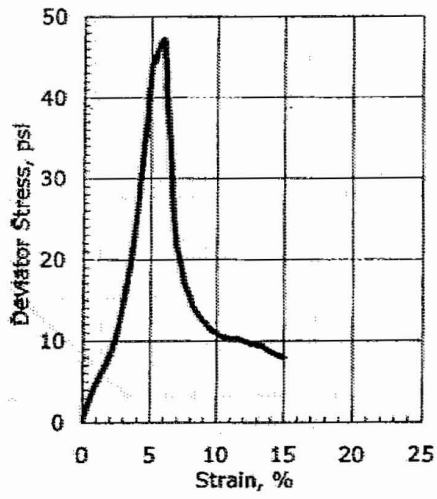
GeoTesting express

a subsidiary of Geocomp Corporation

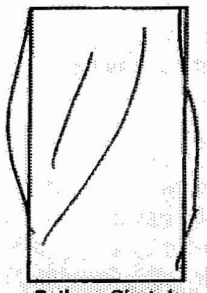
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/18/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-747
Sample ID:	S-15
Depth, ft:	58.5-60
Visual Description:	Moist, dark olive gray clay with sand
Test No.:	UU12

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





Initial Diameter, in:	2.87	Confining Stress, psi:	20
Initial Height, in:	5.75	Undrained Shear Strength, psi:	23.6
Height to Diameter Ratio:	2.00	Maximum Deviator Stress, psi:	47.2
Initial Mass, grams:	1056	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	108.1	Strain at Failure, %:	6.0
Initial Moisture Content, %:	42.3		
Initial Dry Density, pcf:	76.0		
Initial Degree of Saturation:	93.1		
Initial Void Ratio:	1.24		
Measured Specific Gravity:	2.73		
Sample Type:	Tube		
Liquid Limit:	53		
Plastic Limit:	16		
Plasticity Index:	37		
% Passing #200 sieve:	74		
Soil Classification:	Fat Clay with Sand		
Group Symbol:	CH		



Failure Sketch

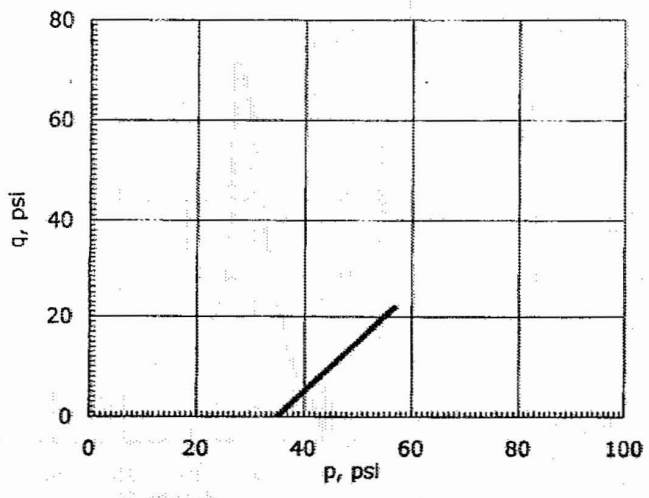
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

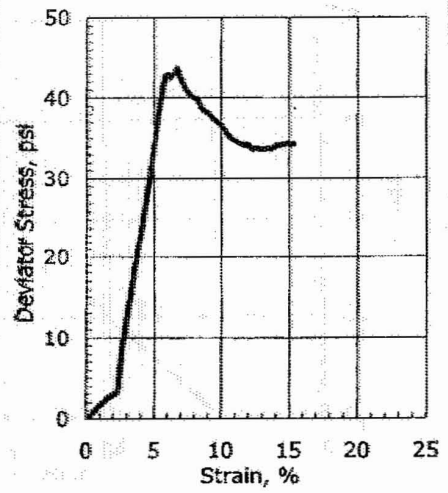
GeoTesting express

a subsidiary of Geocomp Corporation

Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/19/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-752
Sample ID:	S-15
Depth, ft:	58-60
Visual Description:	Moist, dark greenish gray organic clay
Test No.:	UU10

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils by ASTM D 2850-03a





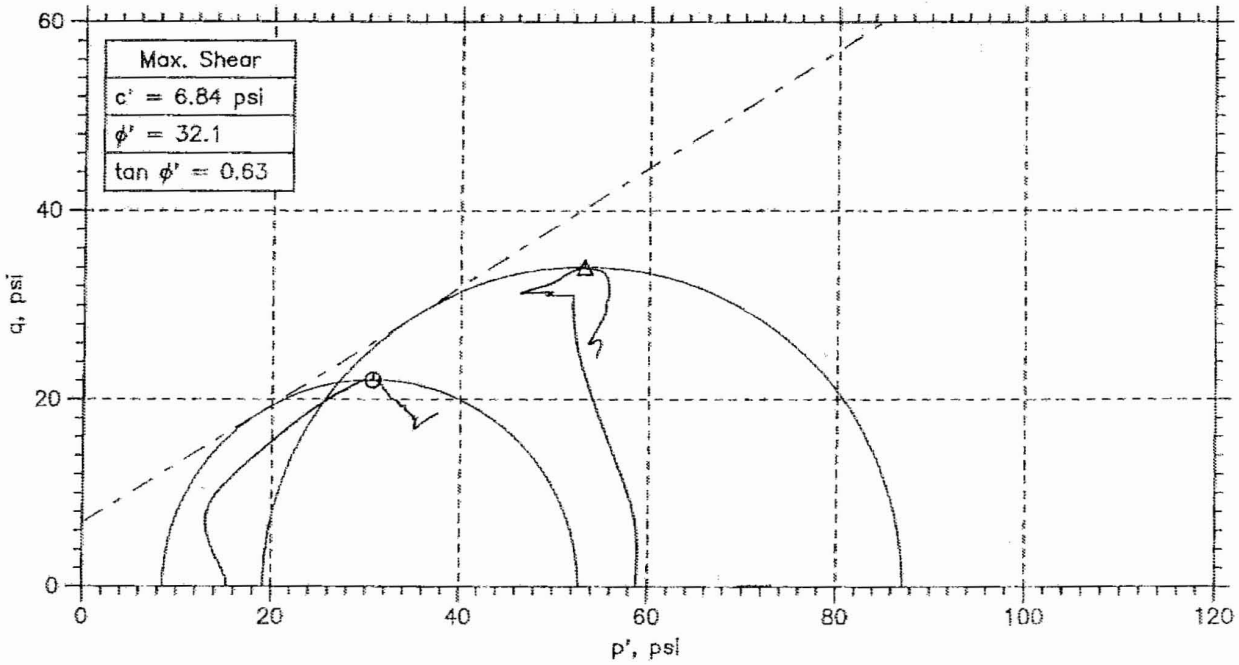
Initial Diameter, in:	2.87	Confining Stress, psi:	35
Initial Height, in:	6.15	Undrained Shear Strength, psi:	21.8
Height to Diameter Ratio:	2.14	Maximum Deviator Stress, psi:	43.7
Initial Mass, grams:	1153	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	110.4	Strain at Failure, %:	6.7
Initial Moisture Content, %:	31.8		
Initial Dry Density, pcf:	83.8		
Initial Degree of Saturation:	82.2		
Initial Void Ratio:	1.08		
Measured Specific Gravity:	2.79		
Sample Type:	Tube		
Liquid Limit:	65		
Plastic Limit:	17		
Plasticity Index:	48		
% Passing #200 sieve:	98		
Soil Classification:	Organic Clay		
Group Symbol:	OH		

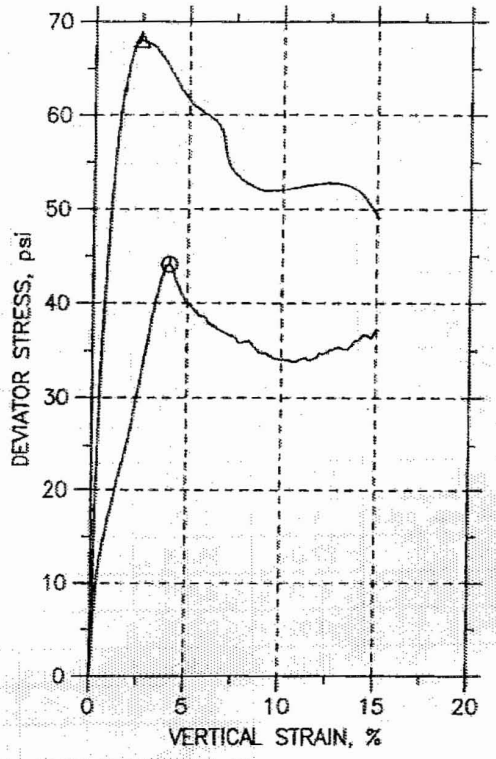
Failure Sketch

Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

CIU-bar TRIAXIAL COMPRESSION RESULTS

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⦶	△		
Sample No.		S-14	S-14		
Test No.		CU1	CU3		
Depth		53.5-55.5	53.5-55.5		
Initial	Diameter, in	2.87	2.86		
	Height, in	6.05	5.99		
	Water Content, %	33.2	34.6		
	Dry Density, pcf	88.41	86.45		
	Saturation, %	96.2	95.7		
	Void Ratio	0.956	1		
Before Shear	Water Content, %	36.7	37.5		
	Dry Density, pcf	85.73	84.83		
	Saturation*, %	100.0	100.0		
	Void Ratio	1.02	1.04		
	Back Press., psi	99.99	57.97		
Ver. Eff. Cons. Stress, psi		15.	60.03		
Shear Strength, psi		22.06	34.04		
Strain at Failure, %		4.04	2.47		
Strain Rate, %/min		0.02	0.02		
B-Value		0.95	0.95		
Measured Specific Gravity		2.77	2.77		
Liquid Limit		33	33		
Plastic Limit		11	11		

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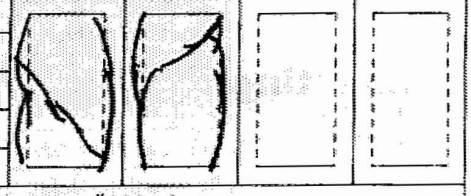
Project: Calvert Cliffs Nuclear PP
Location: Calvert County, MD
Project No.: GTX-6880
Boring No.: B-316
Sample Type: tube

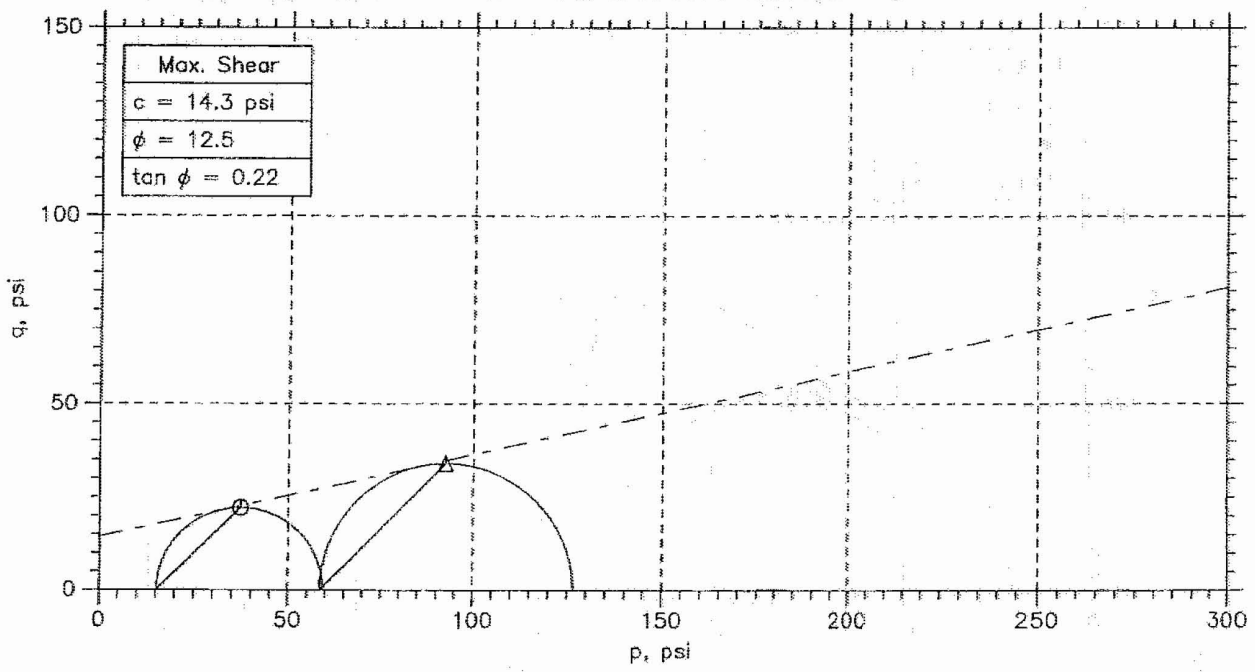


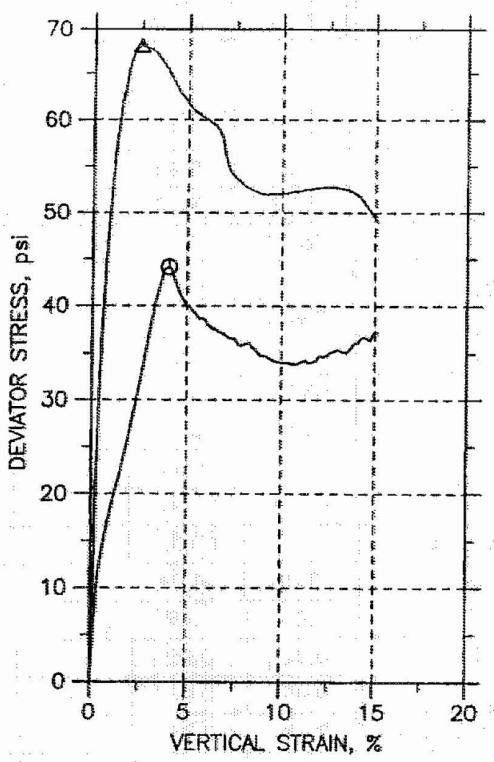
Description: Moist, dark olive gray sandy clay (CL), 50% passing the #200 sieve
Remarks: System E - t50 = 21 min, Triaxial Rev.1.0.6.318

Wed, 15-NOV-2006 14:25:20

Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⦶	△		
Sample No.		S-14	S-14		
Test No.		CU1	CU3		
Depth		53.5-55.5	53.5-55.5		
Initial	Diameter, in	2.87	2.86		
	Height, in	6.05	5.99		
	Water Content, %	33.2	34.6		
	Dry Density, pcf	88.41	86.45		
	Saturation, %	96.2	95.7		
	Void Ratio	0.956	1		
Before Shear	Water Content, %	36.7	37.5		
	Dry Density, pcf	85.73	84.83		
	Saturation*, %	100.0	100.0		
	Void Ratio	1.02	1.04		
	Back Press., psi	99.99	57.97		
Ver. Eff. Cons. Stress, psi		15.	60.03		
Shear Strength, psi		22.06	34.04		
Strain at Failure, %		4.04	2.47		
Strain Rate, %/min		0.02	0.02		
B-Value		0.95	0.95		
Measured Specific Gravity		2.77	2.77		
Liquid Limit		33	33		
Plastic Limit		11	11		

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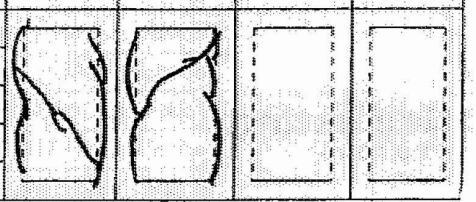
Project: Calvert Cliffs Nuclear PP
Location: Calvert County, MD
Project No.: GTX-6880
Boring No.: B-316
Sample Type: tube

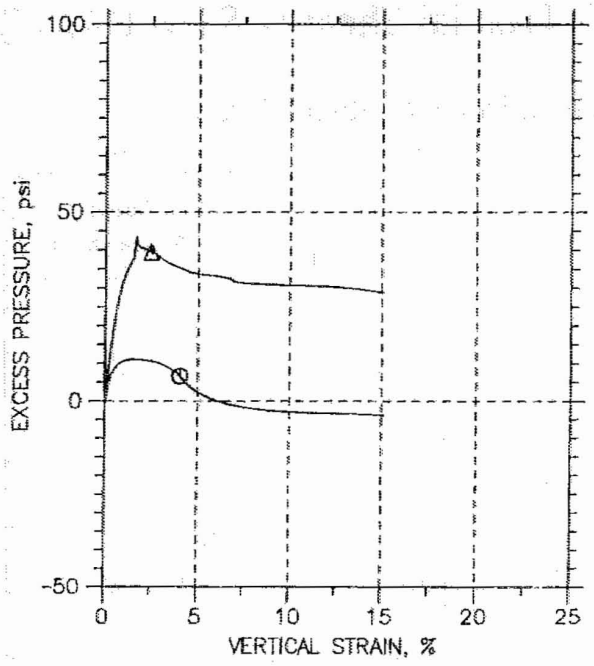


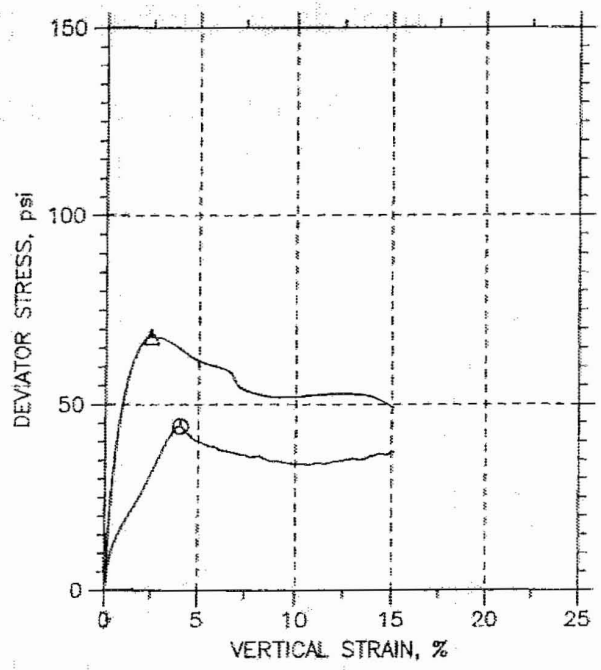
Description: Moist, dark olive gray sandy clay (CL), 50% passing the #200 sieve
Remarks: System E - t50 = 21 min, Triaxial Rev.1.0.6.318

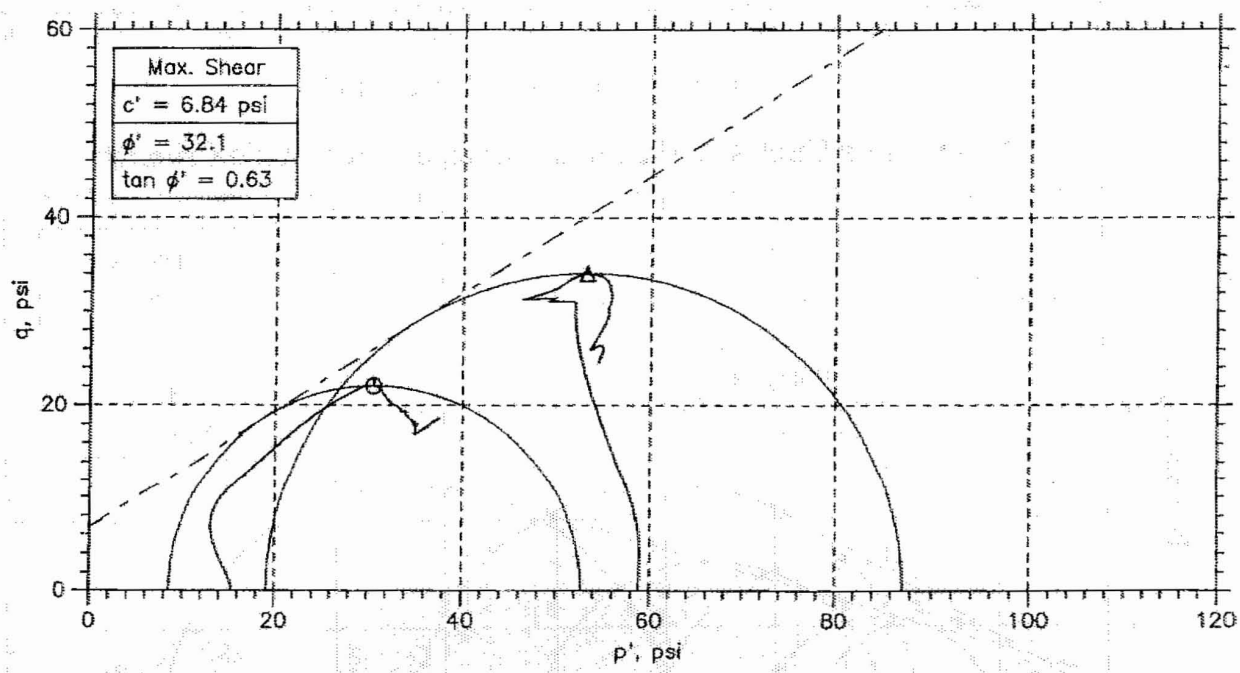
Thu, 16-NOV-2006 14:05:48

Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	S-14	CU1	53.5-55.5	njh	09/18/06	jdt		6880-CU1n.dat
△	S-14	CU3	53.5-55.5	njh	09/18/06	jdt		6880-cu3An.dat

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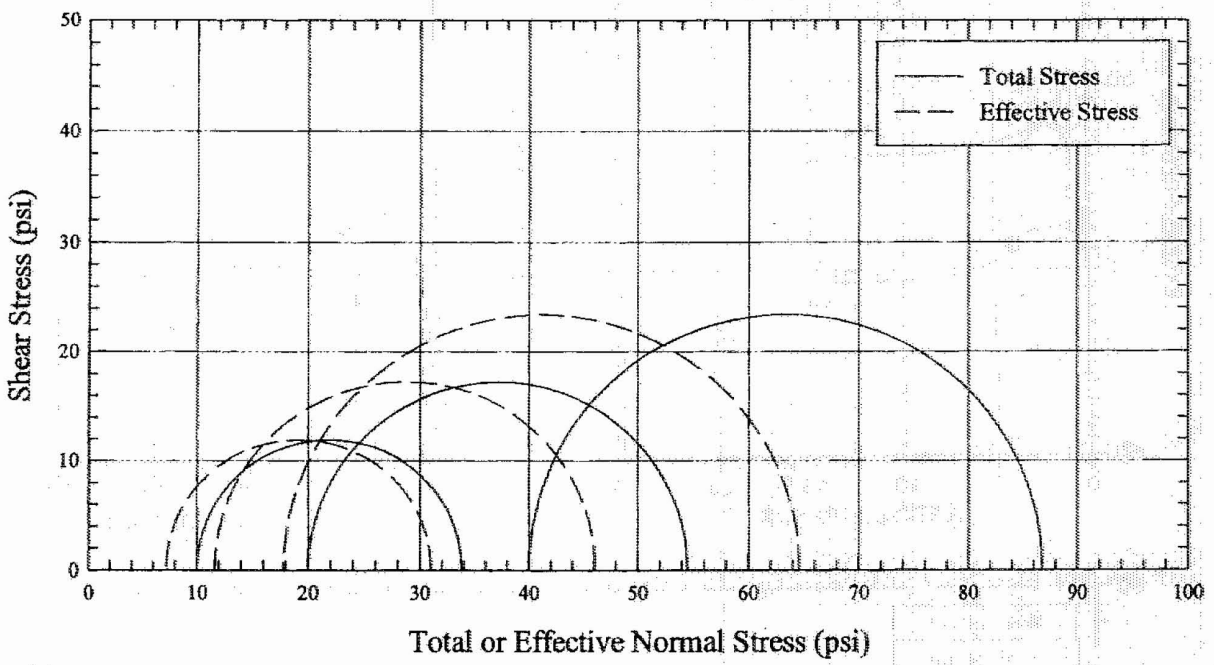
Project: Calvert Cliffs Nuclear PP	Location: Calvert County, MD	Project No.: GTX-6880
Boring No.: B-316	Sample Type: tube	
Description: Moist, dark olive gray sandy clay (CL), 50% passing the #200 sieve		
Remarks: System E - t50 = 21 min, Triaxial Rev.1.0.5.318		

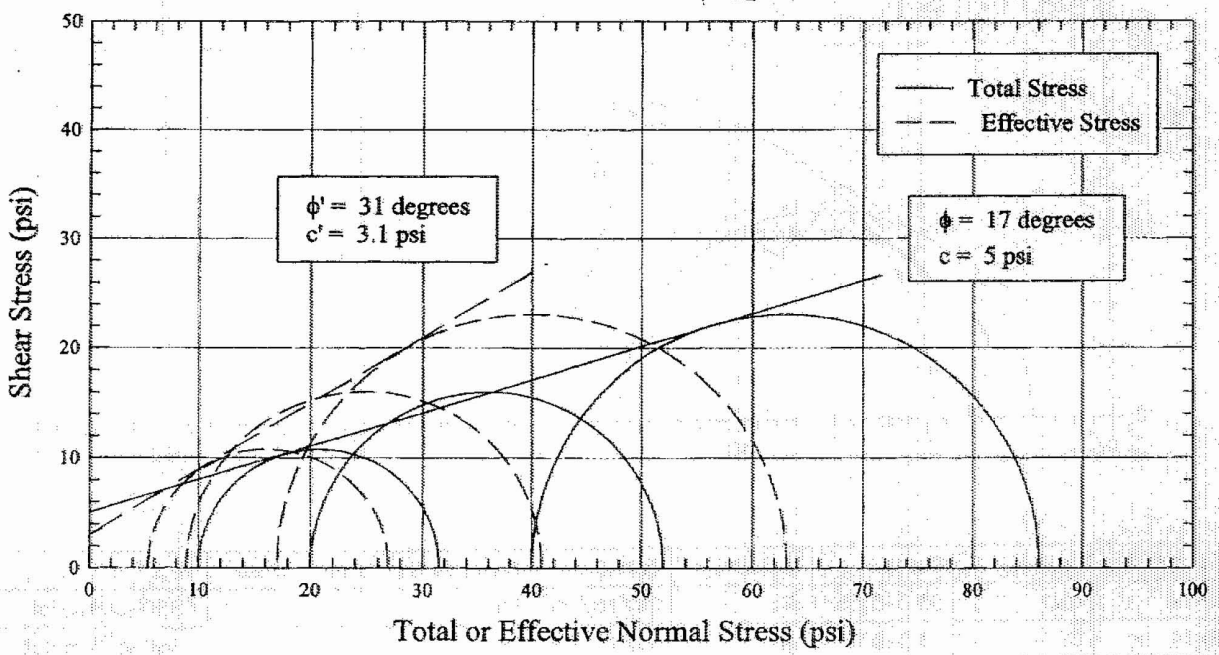
Wed, 15-NOV-2006 14:25:30

Consolidated Undrained (CU) Triaxial Shear (ASTM D4767)

Mohr Stress Circles at Maximum Deviator Stress Criterion



Mohr Stress Circles at Maximum Principal Stress Ratio Criterion



Boring No.: *B-317* Depth: *28.5-30.5 ft* SEI Contract: *06120048* Date: *10/12/06*

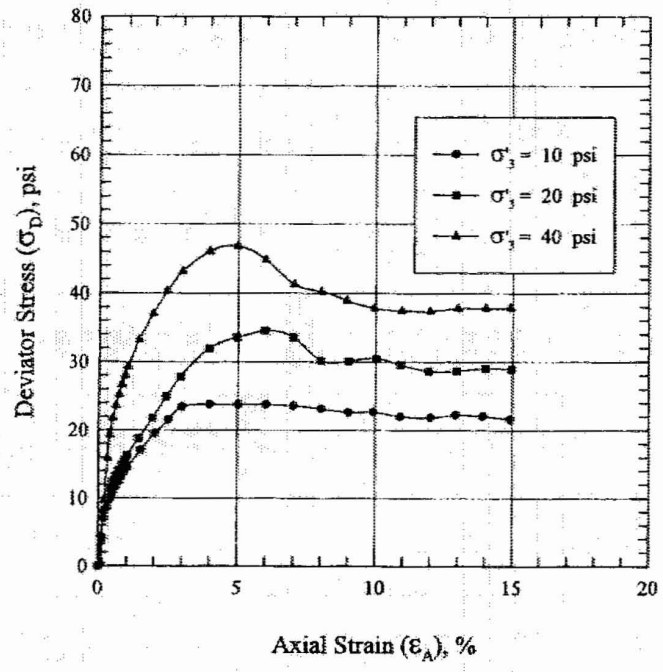
Sample Description: *LEAN CLAY (CL), trace sand - gray* Reviewed By: *CJS*

Specimen Type: *Tube Sample* Specific Gravity: *2.75* LL: *27* PI: *8* %<200: *97.8*

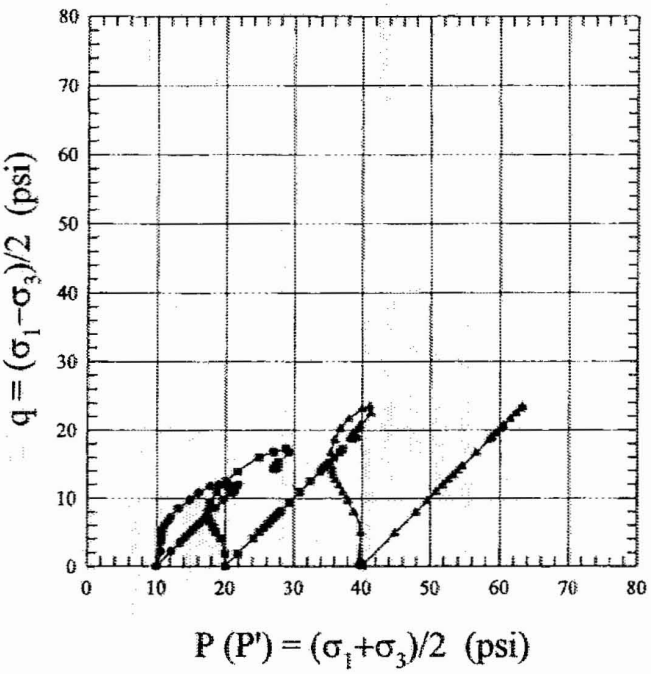
Schnabel Engineering

Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

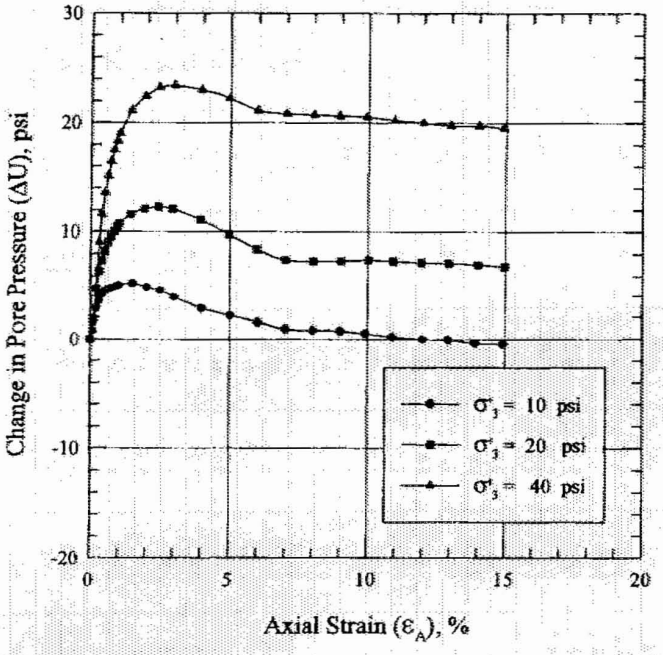
Deviator Stress vs. Axial Strain



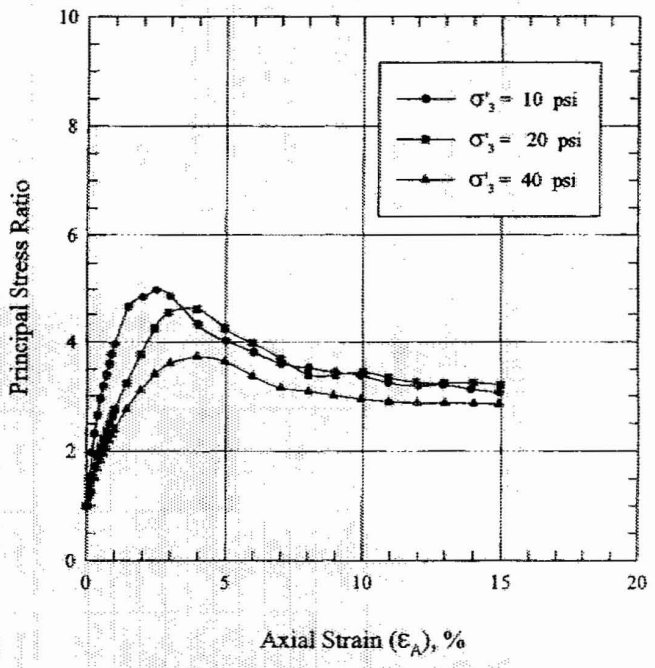
Stress Paths



Change in Pore Pressure vs. Axial Strain



Principal Stress Ratio vs. Axial Strain



Boring No.: *B-317* Depth: *28.5-30.5 ft* SEI Contract: *06120048* Date: *10/12/06*
Sample Description: *LEAN CLAY (CL), trace sand - gray* Reviewed By: *CJS*
Specimen Type: *Tube Sample* *Specific Gravity*: 2.75 LL: *27* PI: *8* %<200: *97.8*

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Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

Schnabel Engineering

Consolidated Undrained Triaxial Compression Test

ASTM D4767

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048.10*
Boring No.: *B-317*
Depth: *28.5-30.5ft.*
Elevation: *65.9 to 63.9*
Confining Stress (psi): *10.0*

Date: *10/12/2006*

Reviewed by: *CJS*

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.897	2.88
Height (in)	5.836	5.83
Area (in^2)	6.59	6.54
Moisture (%)	33.5	
W_{solids} (lbs)	1.99	
ρ_{wet} (pcf)	119.1	
ρ_{dry} (pcf)	89.3	90.2
Void Ratio	0.92	0.90
Saturation, %	100	95

Shear Testing Conditions	
Cell Pressure (psi):	50.0
Back Pressure (psi):	40.0
Eff. Confining Stress (psi):	10.0
Final B check	0.98
t_{50} (min.):	5.1
Rate of Strain (%/min):	0.0232

Filter strips used? *YES*

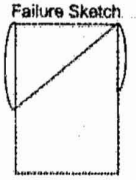
Specimen Type: *Tube Sample*

Soil Description: *LEAN CLAY (CL), trace sand - grey*

Liquid Limit: *27*
Plasticity Index: *8*
% finer that No. 200: *97.8*
Specific Gravity: *2.75*

Remarks:

Failure Sketch



Reading No.	Deviator Load (lbs)	Corrected[1] Dev. Load (lbs.)	Axial Deformation (in.)	Axial Strain (%)	Pore Pressure (psi)	Change in Pore Press. (psi)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	σ'_1 (psi)	σ'_3 (psi)	Deviator Stress (psi)	Principal Stress Ratio	A_{bar}	P (psi)	P' (psi)	q (psi)
Zero	0.0	0.0	0.000	0.00	40.0	0.0	6.54	10.0	10.0	10.0	10.0	0.0	1.00	0.00	10.0	10.0	0.0
1	28.4	28.3	0.006	0.10	41.5	1.5	6.54	14.3	10.0	12.8	8.5	4.3	1.51	0.35	12.2	10.7	2.2
2	46.0	45.8	0.012	0.21	42.8	2.8	6.55	17.0	10.0	14.2	7.2	7.0	1.97	0.40	13.5	10.7	3.5
3	56.2	55.9	0.017	0.29	43.5	3.5	6.56	18.5	10.0	15.0	6.5	8.5	2.31	0.41	14.3	10.8	4.3
4	64.1	63.6	0.023	0.39	44.1	4.1	6.56	19.7	10.0	15.6	5.9	9.7	2.64	0.42	14.8	10.7	4.8
5	70.7	70.1	0.029	0.50	44.5	4.5	6.57	20.7	10.0	16.2	5.5	10.7	2.94	0.42	15.3	10.8	5.3
6	76.6	75.9	0.035	0.60	44.7	4.7	6.58	21.5	10.0	16.8	5.3	11.5	3.18	0.41	15.8	11.1	5.8
7	82.6	81.8	0.041	0.70	44.8	4.8	6.58	22.4	10.0	17.6	5.2	12.4	3.39	0.39	16.2	11.4	6.2
8	87.9	86.9	0.047	0.81	44.9	4.9	6.59	23.2	10.0	18.3	5.1	13.2	3.59	0.37	16.6	11.7	6.6
9	92.1	91.0	0.052	0.89	45.0	5.0	6.60	23.8	10.0	18.8	5.0	13.8	3.76	0.36	16.9	11.9	6.9
10	96.3	95.1	0.058	1.00	45.1	5.1	6.60	24.4	10.0	19.3	4.9	14.4	3.94	0.35	17.2	12.1	7.2
11	115.0	113.2	0.087	1.49	45.3	5.3	6.64	27.1	10.0	21.8	4.7	17.1	4.63	0.31	18.5	13.2	8.5
12	132.5	130.1	0.117	2.01	44.9	4.9	6.67	29.5	10.0	24.6	5.1	19.5	4.82	0.25	19.8	14.9	9.8
13	146.7	144.2	0.146	2.51	44.6	4.6	6.70	31.5	10.0	26.9	5.4	21.5	[illegible]	0.21	20.8	16.2	10.8
14	160.8	158.2	0.175	3.00	43.9	3.9	6.74	33.5	10.0	29.6	6.1	23.5	4.85	0.17	21.7	17.8	11.7
15	165.1	162.3	0.233	4.00	42.8	2.8	6.81	33.8	10.0	31.0	7.2	[illegible]	4.31	0.12	21.9	19.1	11.9
16	166.7	163.7	0.292	5.01	42.1	2.1	6.88	33.8	10.0	31.7	7.9	23.8	4.01	0.09	21.9	19.8	11.9
17	168.6	165.3	0.350	6.01	41.5	1.5	6.95	33.8	10.0	32.3	8.5	23.8	3.80	0.06	21.9	20.4	11.9
18	169.3	165.8	0.408	7.00	40.9	0.9	7.03	33.6	10.0	32.7	9.1	23.6	3.59	0.04	21.8	20.9	11.8
19	168.3	164.6	0.467	8.02	40.8	0.8	7.11	33.2	10.0	32.4	9.2	23.2	3.52	0.03	21.6	20.8	11.6
20	166.5	162.6	0.525	9.01	40.7	0.7	7.18	32.6	10.0	31.9	9.3	22.6	3.43	0.03	21.3	20.6	11.3
21	168.4	164.3	0.578	9.92	40.5	0.5	7.26	32.6	10.0	32.1	9.5	22.6	3.38	0.02	21.3	20.8	11.3
22	165.9	161.6	0.636	10.92	40.2	0.2	7.34	32.0	10.0	31.8	9.8	22.0	3.25	0.01	21.0	20.8	11.0
23	167.0	162.4	0.700	12.01	40.0	0.0	7.43	31.9	10.0	31.9	10.0	21.9	3.19	0.00	20.9	20.9	10.9
24	171.7	166.9	0.753	12.92	39.9	-0.1	7.51	32.2	10.0	32.3	10.1	22.2	3.20	0.00	21.1	21.2	11.1
25	172.5	167.5	0.811	13.92	39.6	-0.4	7.59	32.1	10.0	32.5	10.4	22.1	3.12	-0.02	21.0	21.4	11.0
26	171.2	166.0	0.870	14.93	39.5	-0.5	7.68	31.6	10.0	32.1	10.5	21.6	3.06	-0.02	20.8	21.3	10.8

Notes: Deviator load corrected for membrane and filter cage (if applicable) effects.
Right Cylinder Correction Method

Schnabel
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Consolidated Undrained Triaxial Compression Test

ASTM D4767

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048*
Boring No.: *B-317*
Depth: *28.5-30.5ft.*
Elevation: *65.9 to 63.9*
Confining Stress (psi): *20.0*

Date: *10/12/2006*

Reviewed by: *CJS*

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.890	2.87
Height (in)	5.833	5.77
Area (in^2)	6.58	6.48
Moisture (%)	32.0	
W_{solids} (lbs)	2.02	
ρ_{wet} (pcf)	120.5	
ρ_{dry} (pcf)	91.3	93.5
Void Ratio	0.88	0.84
Saturation, %	100	96

Shear Testing Conditions	
Cell Pressure (psi):	50.0
Back Pressure (psi):	30.0
Eff. Confining Stress (psi):	20.0
Final B check	1.00
t_{50} (min.):	13.8
Rate of Strain (%/min):	0.0119

Filter strips used? *YES*

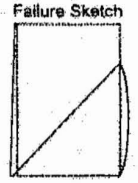
Specimen Type: *Tube Sample*

Soil Description: *LEAN CLAY (CL), trace sand - gray*

Liquid Limit: *27*
Plasticity Index: *8*
% finer that No. 200: *97.8*
Specific Gravity: *2.75*

Remarks:

Failure Sketch



Reading No.	Deviator Load (lbs)	Corrected[1] Dev. Load (lbs.)	Axial Deformation (in.)	Axial Strain (%)	Pore Pressure (psi)	Change in Pore Press. (psi)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	σ'_1 (psi)	σ'_3 (psi)	Deviator Stress (psi)	Principal Stress Ratio	A_{bar}	P (psi)	P' (psi)	q (psi)
Zero	0.0	0.0	0.000	0.00	30.0	0.0	6.48	20.0	20.0	20.0	20.0	0.0	1.00	0.00	20.0	20.0	0.0
1	23.8	23.7	0.006	0.10	31.8	1.8	6.49	23.6	20.0	21.8	18.2	3.6	1.20	0.49	21.8	20.0	1.8
2	53.3	53.1	0.012	0.21	34.8	4.8	6.50	28.2	20.0	23.4	15.2	8.2	1.54	0.59	24.1	19.3	4.1
3	65.4	65.0	0.018	0.31	36.4	6.4	6.50	30.0	20.0	23.6	13.6	10.0	1.74	0.64	25.0	18.6	5.0
4	74.5	74.0	0.023	0.40	37.4	7.4	6.51	31.4	20.0	24.0	12.6	11.4	1.90	0.65	25.7	18.3	5.7
5	81.8	81.2	0.029	0.50	38.2	8.2	6.52	32.5	20.0	24.3	11.8	12.5	2.06	0.66	26.2	18.0	6.2
6	87.8	87.1	0.035	0.61	39.0	9.0	6.52	33.4	20.0	24.4	11.0	13.4	2.21	0.67	26.7	17.7	6.7
7	93.4	92.6	0.041	0.71	39.5	9.5	6.53	34.2	20.0	24.7	10.5	14.2	2.35	0.67	27.1	17.6	7.1
8	98.5	97.5	0.047	0.81	40.0	10.0	6.54	34.9	20.0	24.9	10.0	14.9	2.49	0.67	27.5	17.5	7.5
9	103.4	102.3	0.053	0.92	40.4	10.4	6.54	35.6	20.0	25.2	9.6	15.6	2.63	0.67	27.8	17.4	7.8
10	108.1	106.9	0.058	1.01	40.7	10.7	6.55	36.3	20.0	25.6	9.3	16.3	2.76	0.66	28.2	17.5	8.2
11	125.2	123.5	0.082	1.42	41.6	11.6	6.56	38.8	20.0	27.2	8.4	18.8	3.24	0.62	29.4	17.8	9.4
12	146.3	144.0	0.111	1.92	42.1	12.1	6.61	41.8	20.0	29.7	7.9	21.8	3.76	0.56	30.9	18.8	10.9
13	168.3	165.8	0.140	2.43	42.3	12.3	6.64	45.0	20.0	32.7	7.7	25.0	4.24	0.49	32.5	20.2	12.5
14	188.3	185.7	0.169	2.93	42.1	12.1	6.68	47.8	20.0	35.7	7.9	27.8	4.52	0.44	33.9	21.8	13.9
15	218.6	215.8	0.228	3.95	41.1	11.1	6.75	52.0	20.0	40.9	8.9	32.0		0.35	36.0	24.9	16.0
16	231.7	228.7	0.286	4.96	39.7	9.7	6.82	53.5	20.0	43.8	10.3	33.5	4.25	0.29	36.8	27.1	16.8
17	241.2	238.0	0.344	5.96	38.4	8.4	6.89	54.5	20.0	46.1	11.6		3.98	0.24	37.3	28.9	17.3
18	237.3	233.8	0.403	6.98	37.5	7.5	6.97	53.6	20.0	46.1	12.5	33.6	3.68	0.22	36.8	29.3	16.8
19	216.5	212.8	0.461	7.99	37.4	7.4	7.05	50.2	20.0	42.8	12.6	30.2	3.40	0.24	35.1	27.7	15.1
20	218.4	214.5	0.520	9.01	37.4	7.4	7.12	50.1	20.0	42.7	12.6	30.1	3.39	0.25	35.1	27.7	15.1
21	223.6	219.5	0.578	10.02	37.5	7.5	7.20	50.5	20.0	43.0	12.5	30.5	3.44	0.25	35.2	27.7	15.2
22	219.4	215.1	0.630	10.92	37.4	7.4	7.28	49.6	20.0	42.2	12.6	29.6	3.35	0.25	34.8	27.4	14.8
23	215.6	211.1	0.689	11.94	37.3	7.3	7.36	48.7	20.0	41.4	12.7	28.7	3.26	0.25	34.3	27.0	14.3
24	218.1	213.3	0.747	12.94	37.2	7.2	7.45	48.6	20.0	41.4	12.8	28.6	3.24	0.25	34.3	27.1	14.3
25	223.9	218.9	0.808	14.00	37.1	7.1	7.54	49.0	20.0	41.9	12.9	29.0	3.25	0.24	34.5	27.4	14.5
26	225.8	220.6	0.864	14.97	36.9	6.9	7.62	48.9	20.0	42.0	13.1	28.9	3.21	0.24	34.5	27.6	14.5

Notes: 1. Deviator load corrected for membrane and filter cage (if applicable) effects.
2. Right Cylinder Correction Method