GeoTesting express

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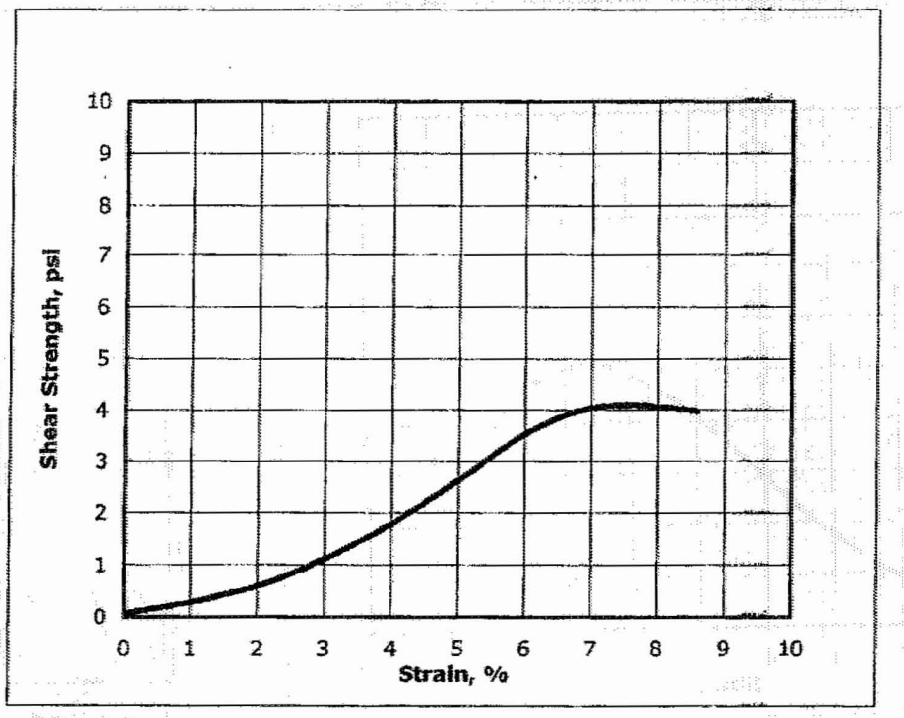
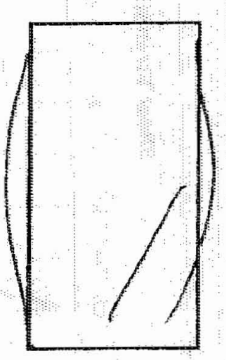
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/23/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-722
Sample ID:	UD-1
Depth, ft:	33.5-35.5
Visual Description:	Moist, brownish yellow silty sand
Test No.:	UC3

Unconfined Compressive Strength of Cohesive Soil by ASTM D 2166-00





Failure Sketch

Initial Diameter, in:	2.87	Shear Strength, psi:	4.1
Initial Height, in:	5.87	Strain Rate, %/min:	1
Height to Diameter Ratio:	2.05	Strain at Failure, %;	7.6
Initial Mass, grams:	1183	Sample Type:	Tube
Initial Bulk Density, pcf:	118.7	Liquid Limit:	---
Initial Moisture Content, %:	29.1	Plastic Limit:	---
Initial Dry Density, pcf:	91.9	Plasticity Index:	Non-Plastic
Initial Degree of Saturation:	91.9	% Passing #200 sieve:	20
Initial Void Ratio:	0.87	Soil Classification:	Silty Sand
Measured Specific Gravity:	2.76	Group Symbol:	SM

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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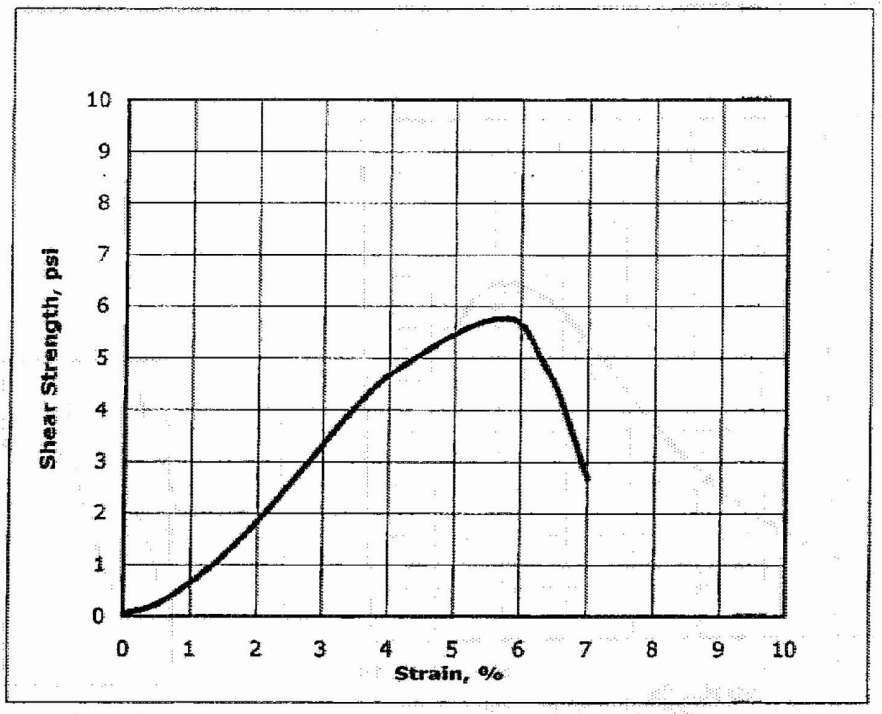
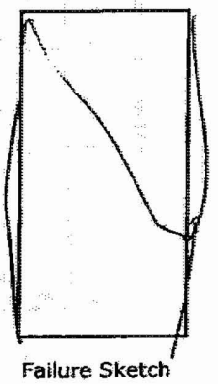
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	11/15/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-723
Sample ID:	UD-2
Depth, ft:	28.5-30.5
Visual Description:	Moist, dark olive gray clay
Test No.:	UC16

Unconfined Compressive Strength of Cohesive Soil by ASTM D 2166-00




Failure Sketch

Initial Diameter, in:	2.87	Shear Strength, psi:	5.8
Initial Height, in:	5.80	Strain Rate, %/min:	1
Height to Diameter Ratio:	2.02	Strain at Failure, %:	5.7
Initial Mass, grams:	1151	Sample Type:	Tube
Initial Bulk Density, pcf:	116.9	Liquid Limit:	56
Initial Moisture Content, %:	27.2	Plastic Limit:	15
Initial Dry Density, pcf:	91.9	Plasticity Index:	41
Initial Degree of Saturation:	87.7	% Passing #200 sieve:	90
Initial Void Ratio:	0.84	Soil Classification:	Fat Clay
Measured Specific Gravity:	2.71	Group Symbol:	CH

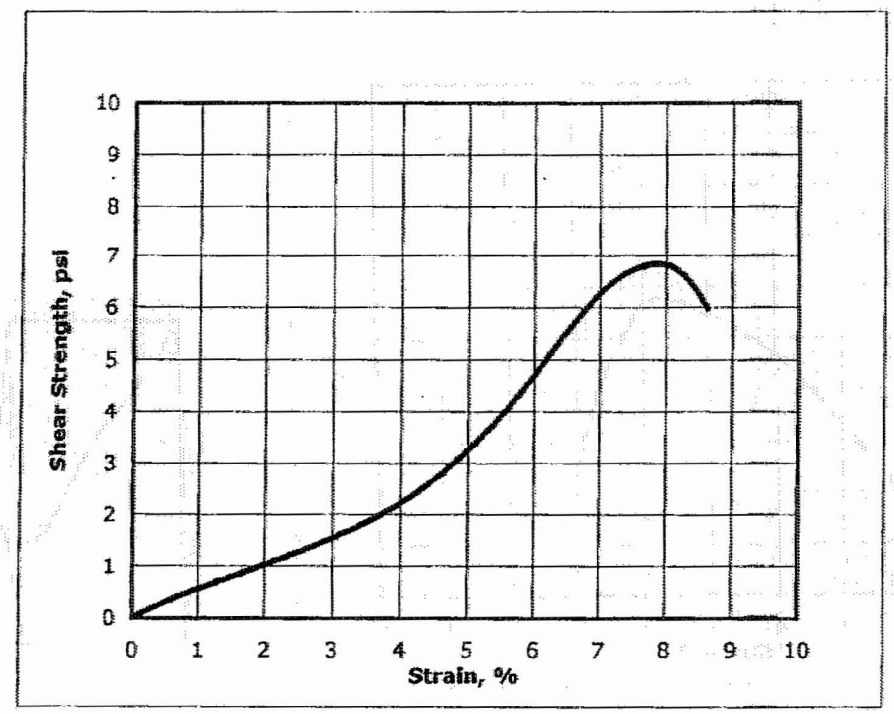
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

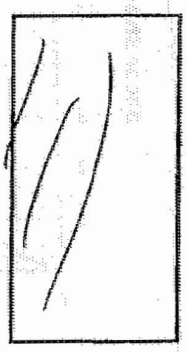
GeoTesting express

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:	9/23/2006
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.:	UC5

Unconfined Compressive Strength of Cohesive Soil by ASTM D 2166-00





Failure Sketch

Initial Diameter, in:	2.87	Shear Strength, psi:	6.9
Initial Height, in:	6.2	Strain Rate, %/min:	1
Height to Diameter Ratio:	2.16	Strain at Failure, %;	7.9
Initial Mass, grams:	1237	Sample Type:	Tube
Initial Bulk Density, pcf:	117.5	Liquid Limit:	26
Initial Moisture Content, %:	21.2	Plastic Limit:	19
Initial Dry Density, pcf:	96.9	Plasticity Index:	7
Initial Degree of Saturation:	75.8	% Passing #200 sieve:	32
Initial Void Ratio:	0.77	Soil Classification:	Clayey Sand
Measured Specific Gravity:	2.75	Group Symbol:	SC

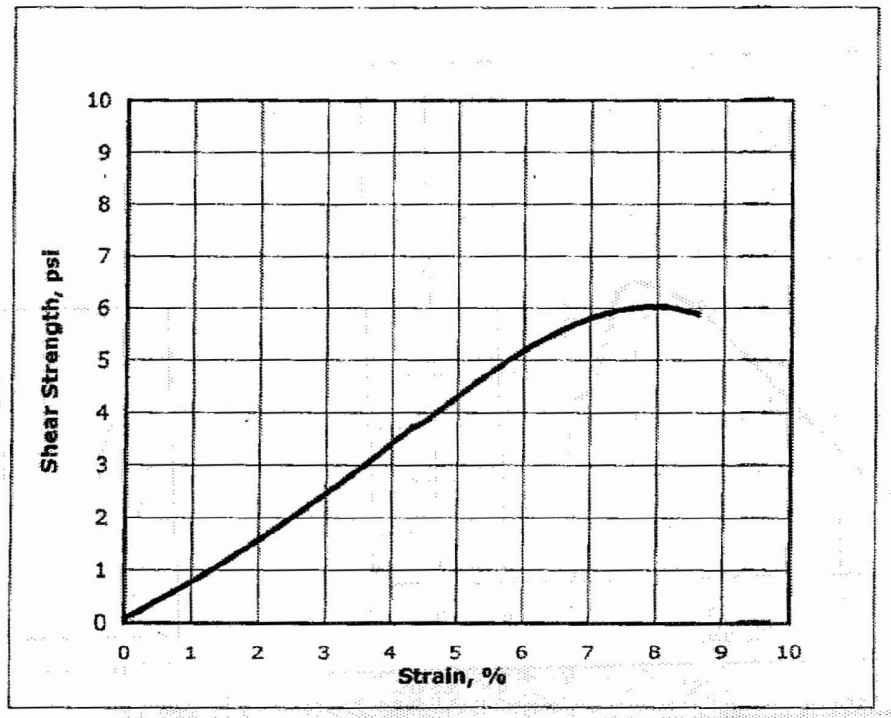
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

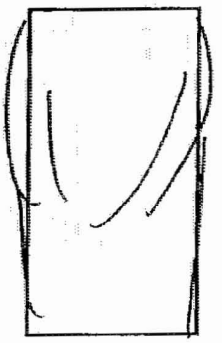
GeoTesting express

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-733
Sample ID:	UD-1
Depth, ft:	23.5-25.5
Visual Description:	Moist, dark olive gray clay with sand
Test No.:	UC4

Unconfined Compressive Strength of Cohesive Soil by ASTM D 2166-00





Failure Sketch

Initial Diameter, in:	2.87	Shear Strength, psi:	6.0
Initial Height, in:	6.1	Strain Rate, %/min:	1
Height to Diameter Ratio:	2.13	Strain at Failure, %;	7.9
Initial Mass, grams:	1245	Sample Type:	Tube
Initial Bulk Density, pcf:	120.2	Liquid Limit:	51
Initial Moisture Content, %:	28.1	Plastic Limit:	15
Initial Dry Density, pcf:	93.8	Plasticity Index:	36
Initial Degree of Saturation:	96.7	% Passing #200 sieve:	78
Initial Void Ratio:	0.78	Soil Classification:	Clay with sand
Measured Specific Gravity:	2.67	Group Symbol:	CH

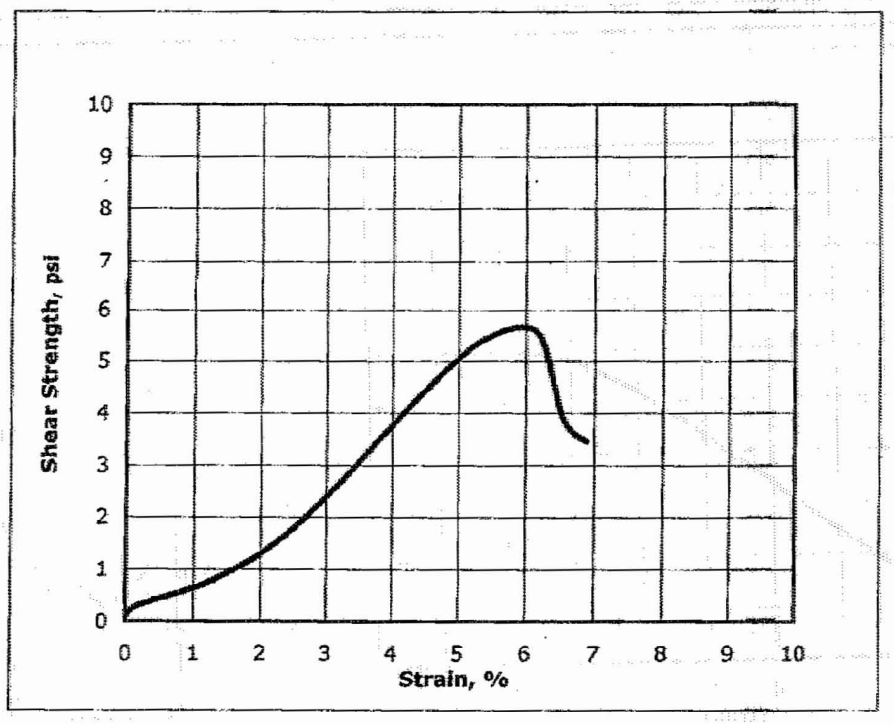
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

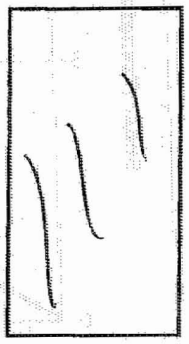
GeoTesting express

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-737
Sample ID:	UD-1
Depth, ft:	35-37
Visual Description:	Moist, dark olive gray silty clayey sand
Test No.:	UC2

Unconfined Compressive Strength of Cohesive Soil by ASTM D 2166-00





Failure Sketch

Initial Diameter, in:	2.87	Shear Strength, psi:	5.7
Initial Height, in:	6.2	Strain Rate, %/min:	1
Height to Diameter Ratio:	2.16	Strain at Failure, %;	5.7
Initial Mass, grams:	1245	Sample Type:	Tube
Initial Bulk Density, pcf:	118.2	Liquid Limit:	26
Initial Moisture Content, %:	26.9	Plastic Limit:	22
Initial Dry Density, pcf:	93.2	Plasticity Index:	4
Initial Degree of Saturation:	91.2	% Passing #200 sieve:	25
Initial Void Ratio:	0.79	Soil Classification:	silty clayey sand
Measured Specific Gravity:	2.67	Group Symbol:	SC

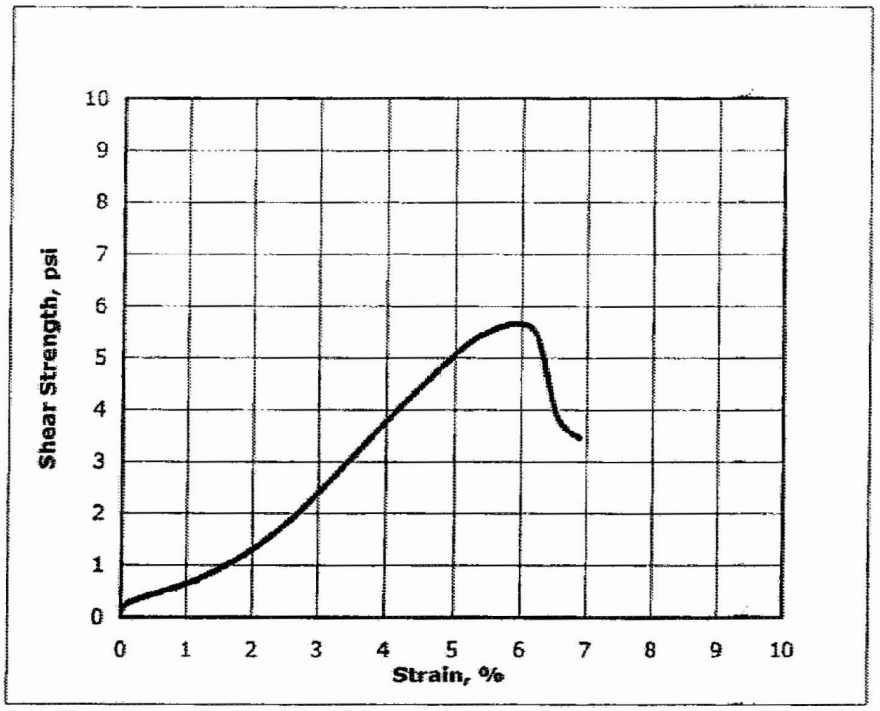
Notes: Moisture content obtained before shear from sample trimmings
Moisture Content determined by ASTM D 2216
Specific Gravity determined by ASTM D 854
Percent passing #200 sieve determined by ASTM D 422

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-738
Sample ID:	UD-1
Depth, ft:	35-37
Visual Description:	Moist, dark olive gray silty clayey sand
Test No.:	UC2

Unconfined Compressive Strength of Cohesive Soil by ASTM D 2166-00



Failure Sketch

Initial Diameter, in:	2.87	Shear Strength, psi:	5.7
Initial Height, in:	6.2	Strain Rate, %/min:	1
Height to Diameter Ratio:	2.16	Strain at Failure, %;	5.7
Initial Mass, grams:	1245	Sample Type:	Tube
Initial Bulk Density, pcf:	118.2	Liquid Limit:	26
Initial Moisture Content, %:	26.9	Plastic Limit:	22
Initial Dry Density, pcf:	93.2	Plasticity Index:	4
Initial Degree of Saturation:	91.2	% Passing #200 sieve:	25
Initial Void Ratio:	0.79	Soil Classification:	silty clayey sand
Measured Specific Gravity:	2.67	Group Symbol:	SC

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

UU TRIAXIAL COMPRESSION RESULTS

Schnabel Engineering

Unconsolidated Undrained Triaxial Compression Test

ASTM D2850

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048*
Boring No.: *B-301*
Depth: *158.5-159.6ft.*
Elevation: *-61.7 to -62.8*
Confining Stress (psi): *70.0*

Date: *10/13/2006*
Reviewed by: *CJS*

Specimen Conditions	
Diameter (in)	2.885
Height (in)	5.629
Area (in^2)	6.45
Moisture (%):	38.1
Weight (lbs)	2.45
ρ_{wet} (pcf)	112.6
ρ_{dry} (pcf)	81.5
Void Ratio	1.05
Saturation, %	97

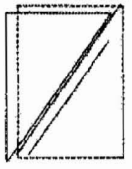
Shear Testing Conditions	
Cell Pressure (psi):	70.0
Rate of Strain (%/min):	1.0

Specimen Type: *Tube Sample*

Axial Strain at Failure (%): *1.01*
Compressive Strength (psi): *122.3*
Major Principal Stress (psi): *192.3*
Minor Principal Stress (psi): *70.0*

Soil Description: *FAT CLAY (CH), contains mica - gray*

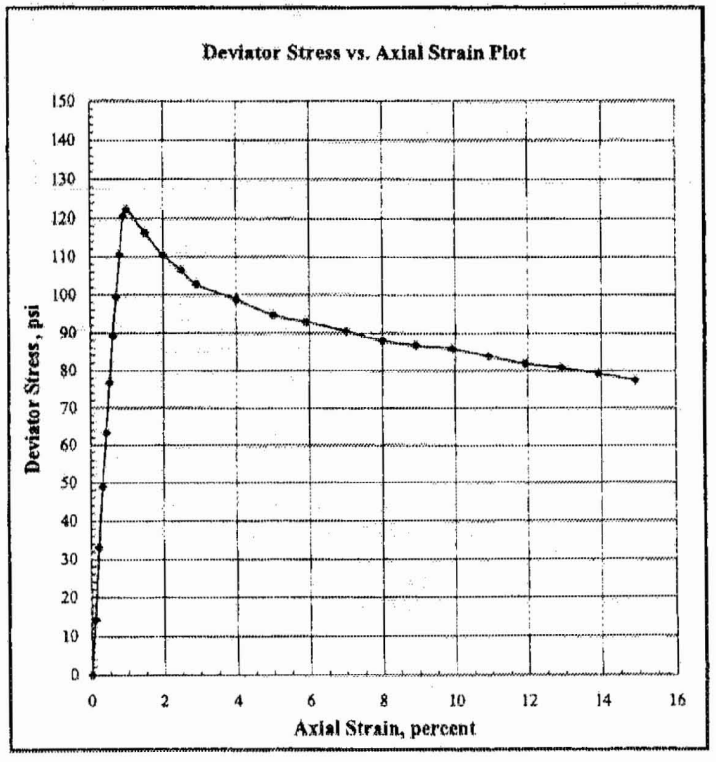
Failure Sketch



Liquid Limit: *76*
Plasticity Index: *46*
% finer that No. 200: *99.5*
Specific Gravity: *2.68*

Remarks:

Reading No.	Deviator Load (lbs)	Corrected Dev. Load[1] (lbs.)	Axial Displacement (in.)	Axial Strain (%)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	Deviator Stress (psi)
Initial	0.0	0.0	0.000	0.00	6.45	70.0	70.0	0.0
1	92.0	92.0	0.006	0.10	6.46	84.2	70.0	14.2
2	213.7	213.7	0.012	0.21	6.46	103.1	70.0	33.1
3	315.7	315.6	0.018	0.31	6.47	118.8	70.0	48.8
4	410.1	410.0	0.025	0.43	6.48	133.3	70.0	63.3
5	497.8	497.7	0.030	0.51	6.48	146.8	70.0	76.8
6	578.2	578.1	0.035	0.60	6.49	159.1	70.0	89.1
7	646.7	646.5	0.041	0.70	6.50	169.5	70.0	99.5
8	719.8	719.4	0.047	0.81	6.50	180.7	70.0	110.7
9	784.3	784.1	0.053	0.91	6.51	190.5	70.0	120.5
10	796.9	796.7	0.059	1.01	6.52	192.3	70.0	122.3
11	761.9	761.6	0.088	1.51	6.55	186.3	70.0	116.3
12	727.1	726.7	0.117	2.01	6.58	180.4	70.0	110.4
13	705.1	704.6	0.146	2.50	6.62	176.5	70.0	106.5
14	683.9	683.3	0.170	2.92	6.64	172.9	70.0	102.9
15	664.5	663.6	0.234	4.01	6.72	168.8	70.0	98.8
16	644.7	643.6	0.292	5.01	6.79	164.8	70.0	94.8
17	638.3	637.0	0.345	5.92	6.86	162.9	70.0	92.9
18	629.1	627.6	0.409	7.02	6.94	160.5	70.0	90.5
19	617.9	616.2	0.467	8.01	7.01	157.9	70.0	87.9
20	615.7	613.8	0.520	8.92	7.08	156.7	70.0	86.7
21	616.5	614.4	0.578	9.92	7.16	155.8	70.0	85.8
22	609.1	606.7	0.637	10.93	7.24	153.8	70.0	83.8
23	602.2	599.6	0.695	11.92	7.32	151.9	70.0	81.9
24	601.9	599.1	0.753	12.92	7.41	150.9	70.0	80.9
25	597.1	594.1	0.812	13.93	7.49	149.3	70.0	79.3
26	590.1	586.9	0.870	14.93	7.58	147.4	70.0	77.4



Notes: 1. Deviator load corrected for membrane effects.
2. Right Cylinder Correction Method

Schnabel Engineering

Unconsolidated Undrained Triaxial Compression Test

ASTM D2850

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048* Date: *11/27/2006*

Boring No.: *B-313*

Depth: *93.5-94.7 ft* Reviewed by: *CJS*

Elevation: *-42.8 to -44.0 ft*

Confining Stress (psi): *40.0*

Specimen Conditions	
Diameter (in)	2.905
Height (in)	5.826
Area (in^2)	6.63
Moisture (%):	35.6
Weight (lbs)	2.52
ρ_{wet} (pcf)	112.6
ρ_{dry} (pcf)	83.1
Void Ratio	1.02
Saturation, %	94

Shear Testing Conditions	
Cell Pressure (psi):	40.0
Rate of Strain (%/min):	1.0

Specimen Type: *Tube Sample*

Axial Strain at Failure (%): *5.29*

Compressive Strength (psi): *77.6*

Major Principal Stress (psi): *117.6*

Minor Principal Stress (psi): *40.0*

Soil Description: *Sandy LEAN CLAY (CL), contains shell fragments - gray*

Failure Sketch

Liquid Limit: *49*

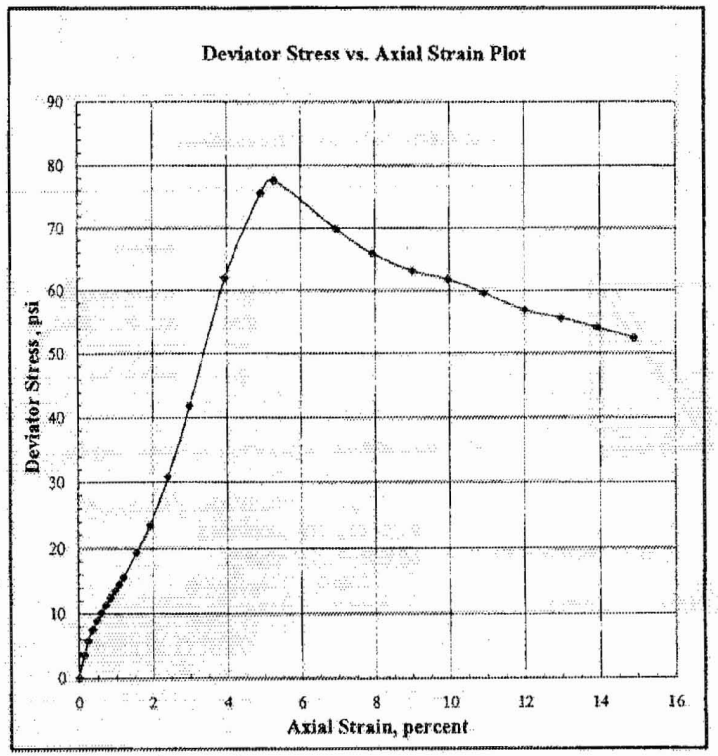
Plasticity Index: *24*

% finer that No. 200: *NA*

Specific Gravity: *2.69*

Remarks:

Reading No.	Deviator Load (lbs)	Corrected Dev. Load[1] (lbs.)	Axial Displacement (in.)	Axial Strain (%)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	Deviator Stress (psi)
Initial	0.0	0.0	0.000	0.00	6.63	40.0	40.0	0.0
1	23.6	23.6	0.008	0.14	6.64	43.6	40.0	3.6
2	38.3	38.2	0.014	0.24	6.64	45.8	40.0	5.8
3	50.0	49.9	0.021	0.36	6.65	47.5	40.0	7.5
4	59.5	59.4	0.028	0.48	6.66	48.9	40.0	8.9
5	67.8	67.7	0.035	0.60	6.67	50.1	40.0	10.1
6	75.7	75.5	0.042	0.72	6.68	51.3	40.0	11.3
7	83.2	83.0	0.049	0.84	6.68	52.4	40.0	12.4
8	90.6	90.4	0.057	0.98	6.69	53.5	40.0	13.5
9	97.7	97.5	0.063	1.08	6.70	54.5	40.0	14.5
10	104.8	104.5	0.070	1.20	6.71	55.6	40.0	15.6
11	130.7	130.4	0.091	1.56	6.73	59.4	40.0	19.4
12	159.4	159.0	0.112	1.92	6.76	63.5	40.0	23.5
13	210.1	209.6	0.141	2.42	6.79	70.9	40.0	30.9
14	286.5	285.8	0.175	3.00	6.83	81.8	40.0	41.8
15	428.7	427.8	0.231	3.97	6.90	102.0	40.0	62.0
16	528.1	527.0	0.287	4.93	6.97	115.6	40.0	75.6
17	544.3	543.1	0.308	5.29	7.00	117.6	40.0	77.6
18	499.7	498.2	0.406	6.97	7.12	109.9	40.0	69.9
19	476.4	474.7	0.462	7.93	7.20	105.9	40.0	65.9
20	461.9	459.9	0.525	9.01	7.28	103.1	40.0	63.1
21	457.1	454.9	0.581	9.97	7.36	101.8	40.0	61.8
22	446.0	443.6	0.637	10.93	7.44	99.6	40.0	59.6
23	431.3	428.7	0.700	12.02	7.53	96.9	40.0	56.9
24	426.2	423.4	0.756	12.98	7.62	95.6	40.0	55.6
25	419.8	416.7	0.812	13.94	7.70	94.1	40.0	54.1
26	411.2	407.9	0.868	14.90	7.79	92.4	40.0	52.4



Notes: 1. Deviator load corrected for membrane effects.

2. Right Cylinder Correction Method

Schnabel
Schnabel Engineering

Unconsolidated Undrained Triaxial Compression Test

ASTM D2850

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048* Date: *11/27/2006*
Boring No.: *B-313*
Depth: *123.5-124.3 ft.* Reviewed by: *CJS*
Elevation: *-72.8 to -73.6*
Confining Stress (psi): *50.0*

Specimen Conditions	
Diameter (in)	2.889
Height (in)	5.838
Area (in^2)	6.58
Moisture (%):	33.1
Weight (lbs)	2.52
ρ_{wet} (pcf)	113.9
ρ_{dry} (pcf)	85.6
Void Ratio	0.95
Saturation, %	93

Shear Testing Conditions	
Cell Pressure (psi):	50.0
Rate of Strain (%/min):	1.0

Specimen Type: *Tube Sample*

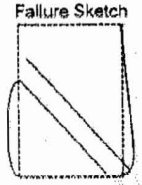
Axial Strain at Failure (%): *5.00*
Compressive Strength (psi): *82.6*
Major Principal Stress (psi): *132.6*
Minor Principal Stress (psi): *50.0*

Soil Description: *Fine clayey SAND (SC) - dark green gray*

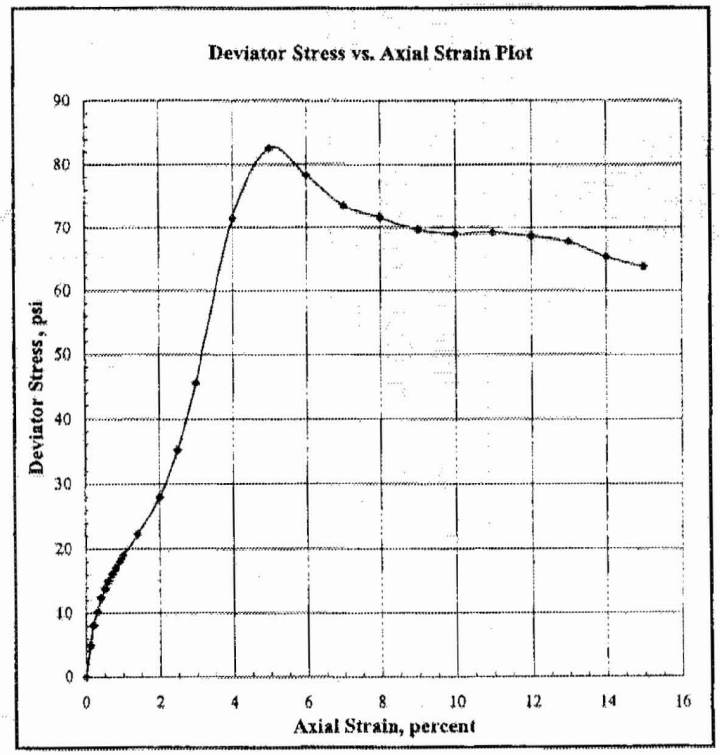
Liquid Limit: *44*
Plasticity Index: *18*
% finer that No. 200: *NA*
Specific Gravity: *2.67*

Remarks:

Failure Sketch



Reading No.	Deviator Load (lbs)	Corrected Dev. Load[1] (lbs.)	Axial Displacement (in.)	Axial Strain (%)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	Deviator Stress (psi)
Initial	0.0	0.0	0.000	0.00	6.56	50.0	50.0	0.0
1	32.0	32.0	0.007	0.12	6.57	54.9	50.0	4.9
2	53.7	53.7	0.012	0.21	6.57	58.2	50.0	8.2
3	67.5	67.4	0.018	0.31	6.58	60.2	50.0	10.2
4	81.7	81.6	0.024	0.41	6.59	62.4	50.0	12.4
5	91.5	91.4	0.030	0.51	6.59	63.9	50.0	13.9
6	99.5	99.4	0.035	0.60	6.60	65.1	50.0	15.1
7	106.8	106.6	0.041	0.70	6.61	66.1	50.0	16.1
8	113.1	112.9	0.047	0.81	6.61	67.1	50.0	17.1
9	119.9	119.7	0.053	0.91	6.62	68.1	50.0	18.1
10	125.5	125.3	0.059	1.01	6.63	68.9	50.0	18.9
11	148.2	147.9	0.082	1.40	6.65	72.2	50.0	22.2
12	187.2	186.8	0.117	2.00	6.69	77.9	50.0	27.9
13	237.3	236.8	0.146	2.50	6.73	85.2	50.0	35.2
14	308.6	307.9	0.175	3.00	6.76	95.5	50.0	45.5
15	489.1	488.2	0.234	4.01	6.83	121.5	50.0	71.5
16	571.2	570.1	0.292	5.00	6.90	132.6	50.0	82.6
17	547.9	546.8	0.351	6.01	6.98	128.3	50.0	78.3
18	519.7	518.2	0.409	7.01	7.05	123.5	50.0	73.5
19	512.4	510.7	0.467	8.00	7.13	121.6	50.0	71.6
20	503.9	501.9	0.526	9.01	7.21	119.6	50.0	69.6
21	505.0	502.8	0.584	10.00	7.29	119.0	50.0	69.0
22	512.2	509.8	0.642	11.00	7.37	119.2	50.0	69.2
23	514.2	511.6	0.701	12.01	7.45	118.6	50.0	68.6
24	513.4	510.6	0.759	13.00	7.54	117.7	50.0	67.7
25	501.0	497.9	0.818	14.01	7.63	115.3	50.0	65.3
26	494.9	491.6	0.876	15.00	7.72	113.7	50.0	63.7



Notes: 1. Deviator load corrected for membrane effects.
2. Right Cylinder Correction Method

UU 8/2006 Rev. 0

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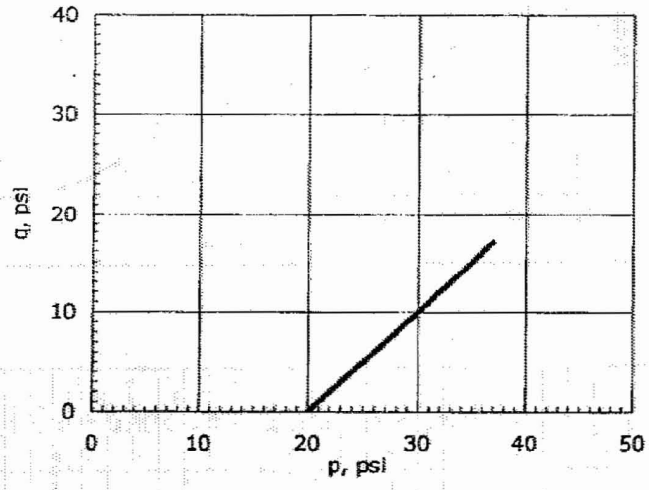
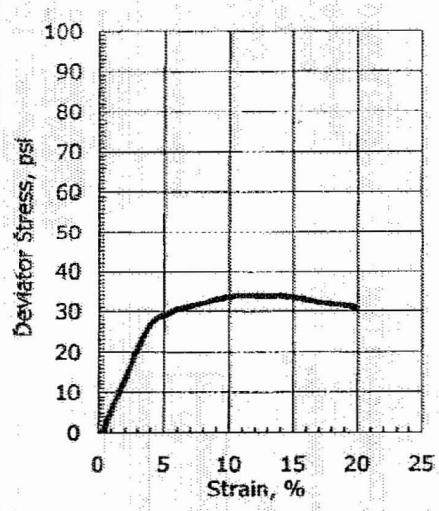
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/5/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-315
Sample ID:	S-8
Depth, ft:	23.5-24.9
Visual Description:	Moist, dark olive gray clayey sand
Test No.:	UU1

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:	6.01	Undrained Shear Strength, psi:	17.0
Height to Diameter Ratio:	2.09	Maximum Deviator Stress, psi:	33.9
Initial Mass, grams:	1285	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	125.9	Strain at Failure, %:	11.5
Initial Moisture Content, %:	24.4		
Initial Dry Density, pcf:	101.2		
Initial Degree of Saturation:	138.2		
Initial Void Ratio:	0.68		
Measured Specific Gravity:	2.73		
Sample Type:	Tube		
Liquid Limit:	41		
Plastic Limit:	11		
Plasticity Index:	30		
% Passing #200 sieve:	35		
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

Schnabel
Schnabel Engineering

Unconsolidated Undrained Triaxial Compression Test

ASTM D2850

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048*
Boring No.: *B-316*
Depth: *43.5-45.5 ft.*
Elevation: *64.6 to 62.6*
Confining Stress (psi): *30.0*

Date: *10/26/2006*
Reviewed by: *CJS*

Specimen Conditions	
Diameter (in)	2.880
Height (in)	5.839
Area (in^2)	6.52
Moisture (%):	32.1
Weight (lbs)	2.62
ρ_{wet} (pcf)	118.9
ρ_{dry} (pcf)	90.0
Void Ratio	0.93
Saturation, %	96

Shear Testing Conditions	
Cell Pressure (psi):	30.0
Rate of Strain (%/min):	1.0

Specimen Type: *Tube Sample*

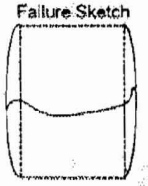
Axial Strain at Failure (%): *9.98*
Compressive Strength (psi): *19.8*
Major Principal Stress (psi): *49.8*
Minor Principal Stress (psi): *30.0*

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

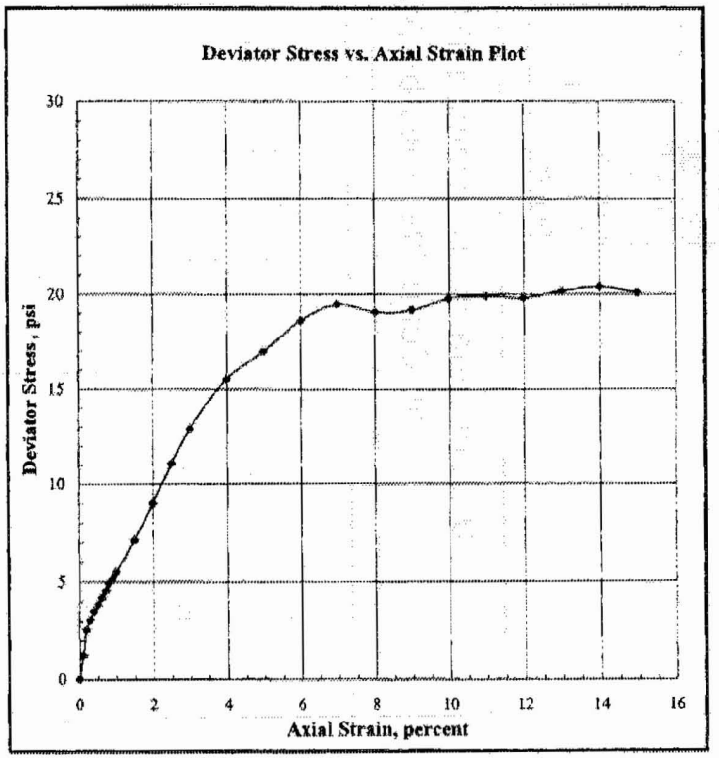
Liquid Limit: *44*
Plasticity Index: *28*
% finer that No. 200: *71.0*
Specific Gravity: *2.79*

Remarks:

Failure Sketch



Reading No.	Deviator Load (lbs)	Corrected Dev. Load[1] (lbs.)	Axial Displacement (in.)	Axial Strain (%)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	Deviator Stress (psi)
Initial	0.0	0.0	0.000	0.00	6.52	30.0	30.0	0.0
1	8.1	8.1	0.006	0.10	6.52	31.2	30.0	1.2
2	16.6	16.6	0.011	0.19	6.53	32.5	30.0	2.5
3	20.1	20.0	0.017	0.29	6.53	33.1	30.0	3.1
4	23.0	22.9	0.023	0.39	6.54	33.5	30.0	3.5
5	25.3	25.2	0.029	0.50	6.55	33.8	30.0	3.8
6	27.6	27.5	0.035	0.60	6.56	34.2	30.0	4.2
7	30.0	29.8	0.041	0.70	6.56	34.5	30.0	4.5
8	32.5	32.3	0.046	0.79	6.57	34.9	30.0	4.9
9	34.2	34.0	0.052	0.89	6.57	35.2	30.0	5.2
10	36.5	36.3	0.058	0.99	6.58	35.5	30.0	5.5
11	47.6	47.3	0.087	1.49	6.61	37.1	30.0	7.1
12	60.4	60.0	0.116	1.99	6.65	39.0	30.0	9.0
13	74.5	74.0	0.146	2.50	6.68	41.1	30.0	11.1
14	87.3	86.6	0.175	3.00	6.72	42.9	30.0	12.9
15	106.3	105.4	0.233	3.99	6.79	45.5	30.0	15.5
16	117.6	116.5	0.292	5.00	6.86	47.0	30.0	17.0
17	130.2	128.9	0.350	5.99	6.93	48.6	30.0	18.6
18	137.8	136.3	0.408	6.99	7.01	49.5	30.0	19.5
19	136.8	135.1	0.467	8.00	7.08	49.1	30.0	19.1
20	139.1	137.1	0.525	8.99	7.16	49.2	30.0	19.2
21	145.2	143.0	0.583	9.98	7.24	49.8	30.0	19.8
22	148.1	145.7	0.642	10.99	7.32	49.9	30.0	19.9
23	149.2	146.6	0.700	11.99	7.40	49.8	30.0	19.8
24	153.9	151.1	0.759	13.00	7.49	50.2	30.0	20.2
25	157.4	154.4	0.817	13.99	7.58	50.4	30.0	20.4
26	157.2	153.9	0.875	14.99	7.66	50.1	30.0	20.1



Notes: 1. Deviator load corrected for membrane effects.
2. Right Cylinder Correction Method

UU 8/2006 Rev. 0

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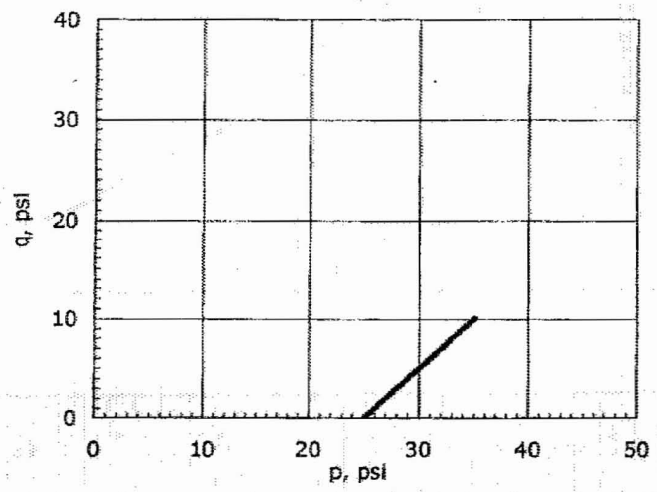
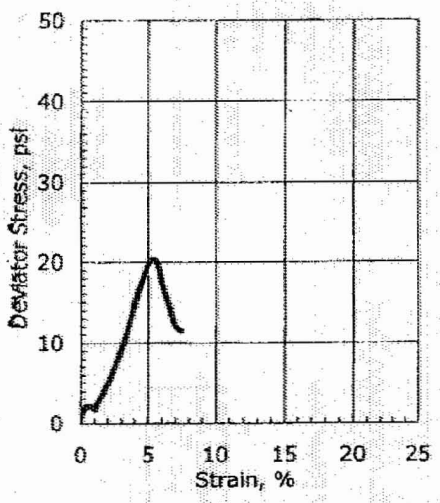
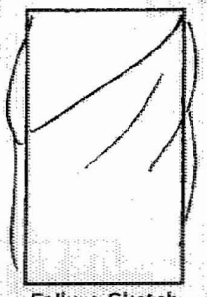
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/12/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-319
Sample ID:	S-10
Depth, ft:	33.5-35.5
Visual Description:	Moist, dark gray clay with sand
Test No.:	UU3

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:	5.88	Undrained Shear Strength, psi:	10.1
Height to Diameter Ratio:	2.05	Maximum Deviator Stress, psi:	20.3
Initial Mass, grams:	1238	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	124.0	Strain at Failure, %:	5.3
Initial Moisture Content, %:	25.0		
Initial Dry Density, pcf:	99.2		
Initial Degree of Saturation:	98.1		
Initial Void Ratio:	0.68		
Measured Specific Gravity:	2.67		
Sample Type:	Tube		
Liquid Limit:	49		
Plastic Limit:	12		
Plasticity Index:	37		
% Passing #200 sieve:	72		
Soil Classification:	Lean Clay		
Group Symbol:	CL		



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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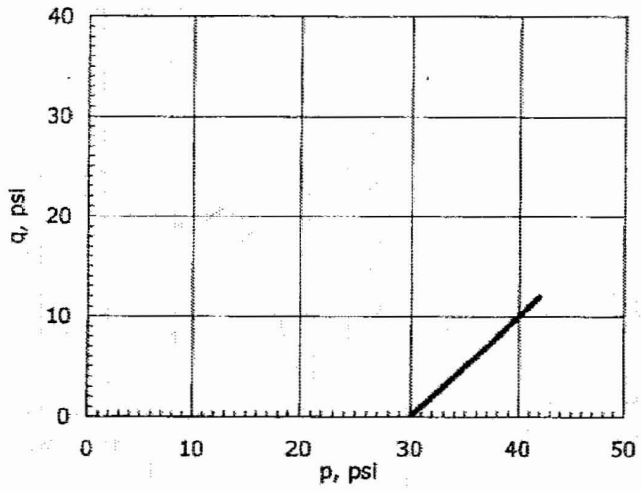
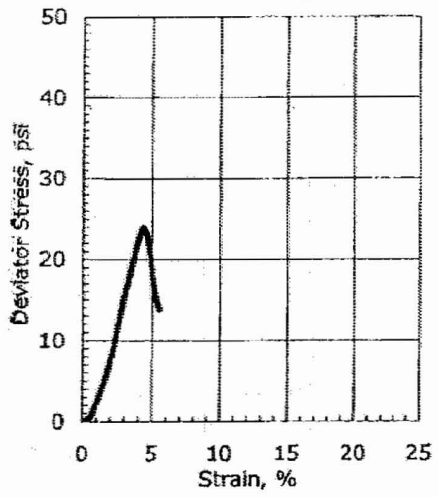
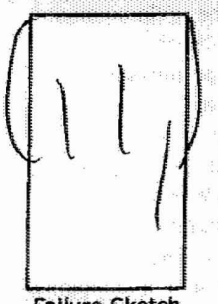
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/12/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-319
Sample ID:	S-12
Depth, ft:	43.5-45.2
Visual Description:	Moist, dark gray clay
Test No.:	U04

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:	5.9	Undrained Shear Strength, psi:	12.0
Height to Diameter Ratio:	2.06	Maximum Deviator Stress, psi:	24.0
Initial Mass, grams:	1212	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	121.0	Strain at Failure, %:	4.3
Initial Moisture Content, %:	32.2		
Initial Dry Density, pcf:	91.5		
Initial Degree of Saturation:	102.0		
Initial Void Ratio:	0.86		
Measured Specific Gravity:	2.73		
Sample Type:	Tube		
Liquid Limit:	58		
Plastic Limit:	13		
Plasticity Index:	45		
% 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

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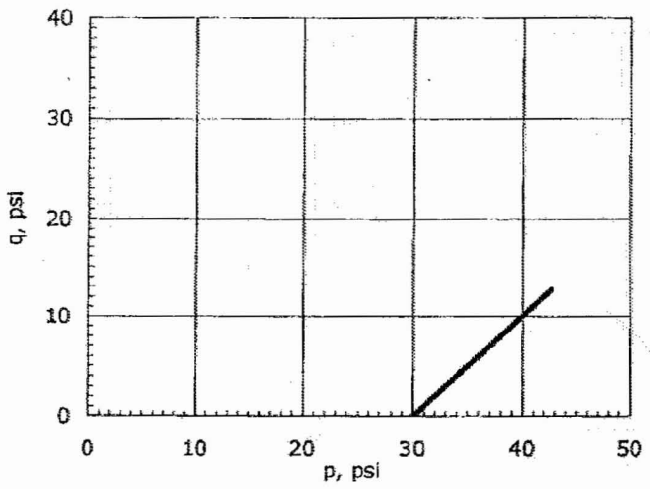
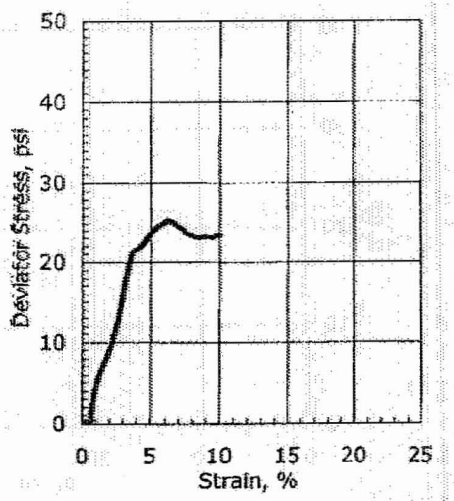
Client:	Schnabel Engineering, Inc.
Project Name:	Subsurface Investigation Calvert Cliffs Nuclear PP
Project Location:	Calvert County, MD
GTX #:	6880
Test Date:	9/20/2006
Tested By:	md
Checked By:	jdt
Boring ID:	B-320
Sample ID:	S-13
Depth, ft:	48.5-50.0
Visual Description:	Moist, dark olive gray clay with sand
Test No.:	UU18

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:	12.7
Height to Diameter Ratio:	2.11	Maximum Deviator Stress, psi:	25.4
Initial Mass, grams:	1171	Strain Rate, %/min:	1
Initial Bulk Density, pcf:	114.0	Strain at Failure, %:	6.3
Initial Moisture Content, %:	30.8		
Initial Dry Density, pcf:	87.1		
Initial Degree of Saturation:	87.7		
Initial Void Ratio:	0.96		
Measured Specific Gravity:	2.74		
Sample Type:	Tube		
Liquid Limit:	59		
Plastic Limit:	19		
Plasticity Index:	40		
% Passing #200 sieve:	82		
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

Schnabel
Schnabel Engineering

Unconsolidated Undrained Triaxial Compression Test

ASTM D2850

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Calvert County, MD*

Schnabel Contract: *06120048*
Boring No.: *B-321*
Depth: *23.5-25.5ft.*
Elevation: *47.2 to 45.2*
Confining Stress (psi): *15.0*

Date: *10/26/2006*
Reviewed by: *CJS*

Specimen Conditions	
Diameter (in)	2.882
Height (in)	5.842
Area (in^2)	6.53
Moisture (%):	29.2
Weight (lbs)	2.57
ρ_{wet} (pcf)	116.7
ρ_{dry} (pcf)	90.3
Void Ratio	0.93
Saturation, %	88

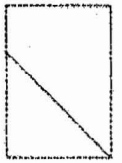
Shear Testing Conditions	
Cell Pressure (psi):	15.0
Rate of Strain (%/min):	1.0

Specimen Type: *Tube Sample*

Axial Strain at Failure (%): *5.99*
Compressive Strength (psi): *64.0*
Major Principal Stress (psi): *79.0*
Minor Principal Stress (psi): *15.0*

Soil Description: *LEAN CLAY (CL) - gray*

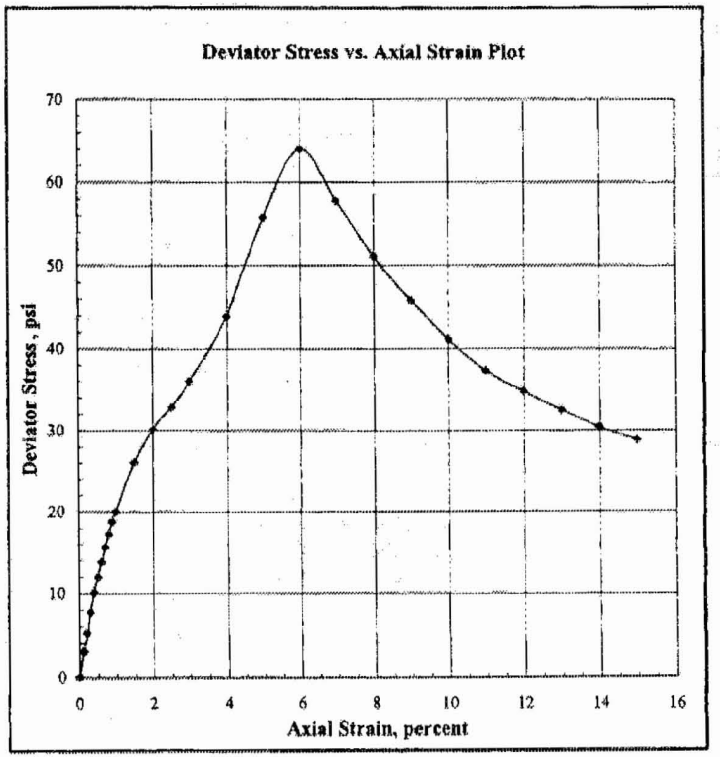
Failure Sketch



Liquid Limit: *45*
Plasticity Index: *27*
% finer that No. 200: *99.7*
Specific Gravity: *2.79*

Remarks:

Reading No.	Deviator Load (lbs)	Corrected Dev. Load[1] (lbs.)	Axial Displacement (in.)	Axial Strain (%)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	Deviator Stress (psi)
Initial	0.0	0.0	0.000	0.00	6.53	15.0	15.0	0.0
1	19.8	19.8	0.006	0.10	6.53	18.0	15.0	3.0
2	34.3	34.3	0.012	0.21	6.54	20.2	15.0	5.2
3	50.5	50.4	0.017	0.29	6.55	22.7	15.0	7.7
4	66.3	66.2	0.023	0.39	6.55	25.1	15.0	10.1
5	78.6	78.5	0.029	0.50	6.56	27.0	15.0	12.0
6	90.8	90.7	0.035	0.60	6.57	28.8	15.0	13.8
7	102.8	102.6	0.041	0.70	6.57	30.6	15.0	15.6
8	113.6	113.4	0.047	0.80	6.58	32.2	15.0	17.2
9	123.9	123.7	0.052	0.89	6.59	33.8	15.0	18.8
10	132.0	131.8	0.058	0.99	6.59	35.0	15.0	20.0
11	172.8	172.5	0.087	1.49	6.63	41.0	15.0	26.0
12	201.3	200.9	0.117	2.00	6.66	45.2	15.0	30.2
13	220.4	219.9	0.146	2.50	6.69	47.8	15.0	32.8
14	242.5	241.8	0.175	3.00	6.73	50.9	15.0	35.9
15	299.2	298.3	0.233	3.99	6.80	58.9	15.0	43.9
16	384.0	382.9	0.292	5.00	6.87	70.7	15.0	55.7
17	445.6	444.3	0.350	5.99	6.94	79.0	15.0	64.0
18	406.9	405.4	0.408	6.98	7.02	72.8	15.0	57.8
19	364.4	362.7	0.467	7.99	7.09	66.1	15.0	51.1
20	330.4	328.4	0.525	8.99	7.17	60.8	15.0	45.8
21	300.3	298.1	0.584	10.00	7.25	56.1	15.0	41.1
22	275.9	273.5	0.642	10.99	7.33	52.3	15.0	37.3
23	260.5	257.9	0.700	11.98	7.42	49.8	15.0	34.8
24	246.4	243.6	0.759	12.99	7.50	47.5	15.0	32.5
25	233.9	230.9	0.817	13.99	7.59	45.4	15.0	30.4
26	224.4	221.1	0.875	14.98	7.68	43.8	15.0	28.8



Notes:
1. Deviator load corrected for membrane effects.
2. Right Cylinder Correction Method

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Schnabel
Schnabel Engineering

Unconsolidated Undrained Triaxial Compression Test

ASTM D2850

Project: *Calvert Cliffs Nuclear Power Plant*

Location: *Clavert County, MD*

Schnabel Contract: *06120048* Date: *11/27/2006*
Boring No.: *B-323*
Depth: *83.5-84.8ft.* Reviewed by: *CJS*
Elevation: *24 to 22.7 ft*
Confining Stress (psi): *40.0*

Specimen Conditions	
Diameter (in)	2.893
Height (in)	5.855
Area (in^2)	6.57
Moisture (%):	36.2
Weight (lbs)	2.56
ρ_{wet} (pcf)	115.0
ρ_{dry} (pcf)	84.4
Void Ratio	1.04
Saturation, %	96

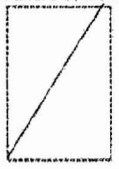
Shear Testing Conditions	
Cell Pressure (psi):	40.0
Rate of Strain (%/min):	1.0

Specimen Type: *Tube Sample*

Axial Strain at Failure (%): *2.99*
Compressive Strength (psi): *79.9*
Major Principal Stress (psi): *119.9*
Minor Principal Stress (psi): *40.0*

Soil Description: *LEAN CLAY (CL), contains shells - gray*

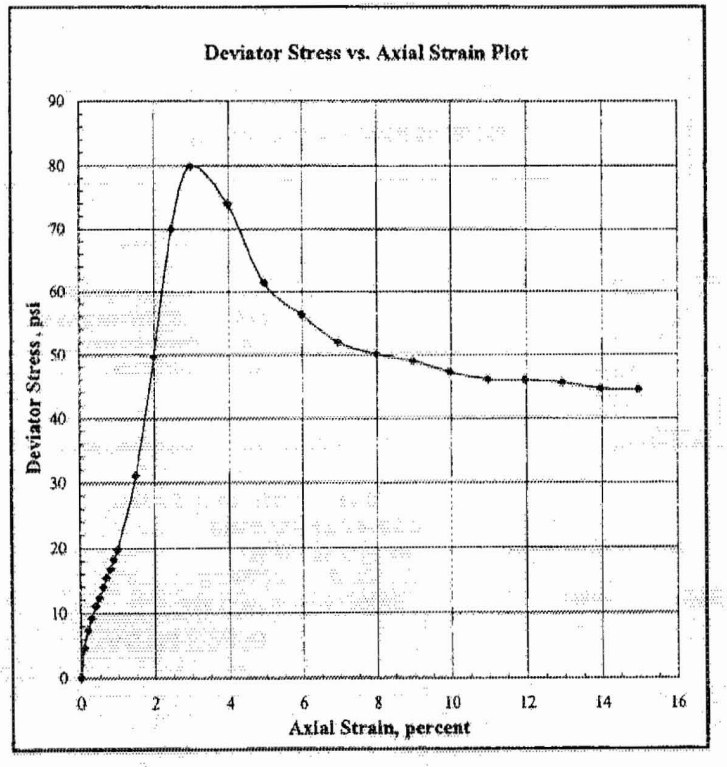
Failure Sketch



Liquid Limit: *42*
Plasticity Index: *22*
% finer that No. 200: *72.7*
Specific Gravity: *2.76*

Remarks:

Reading No.	Deviator Load (lbs)	Corrected Dev. Load[1] (lbs.)	Axial Displacement (in.)	Axial Strain (%)	Corrected Area[2] (in^2)	σ_1 (psi)	σ_3 (psi)	Deviator Stress (psi)
Initial	0.0	0.0	0.000	0.00	6.57	40.0	40.0	0.0
1	30.7	30.7	0.005	0.09	6.58	44.7	40.0	4.7
2	48.5	48.5	0.011	0.19	6.59	47.4	40.0	7.4
3	61.0	60.9	0.017	0.29	6.59	49.2	40.0	9.2
4	73.2	73.1	0.023	0.39	6.60	51.1	40.0	11.1
5	81.8	81.7	0.029	0.50	6.61	52.4	40.0	12.4
6	92.4	92.3	0.035	0.60	6.61	54.0	40.0	14.0
7	102.2	102.1	0.040	0.68	6.62	55.4	40.0	15.4
8	111.4	111.2	0.047	0.80	6.63	56.8	40.0	16.8
9	121.3	121.1	0.052	0.89	6.63	58.3	40.0	18.3
10	131.1	130.9	0.058	0.99	6.64	59.7	40.0	19.7
11	207.4	207.1	0.087	1.49	6.67	71.0	40.0	31.0
12	333.1	332.7	0.116	1.98	6.71	89.6	40.0	49.6
13	472.3	471.8	0.145	2.48	6.74	110.0	40.0	70.0
14	541.9	541.2	0.175	2.99	6.78	119.9	40.0	79.9
15	507.0	506.1	0.233	3.98	6.85	113.9	40.0	73.9
16	425.6	424.5	0.291	4.97	6.92	101.4	40.0	61.4
17	394.7	393.4	0.350	5.98	6.99	96.3	40.0	56.3
18	368.7	367.2	0.408	6.97	7.07	92.0	40.0	52.0
19	359.8	358.1	0.468	7.99	7.14	90.1	40.0	50.1
20	355.7	353.7	0.525	8.97	7.22	89.0	40.0	49.0
21	347.4	345.2	0.583	9.96	7.30	87.3	40.0	47.3
22	342.3	339.9	0.643	10.98	7.38	86.0	40.0	46.0
23	345.7	343.1	0.700	11.95	7.47	86.0	40.0	46.0
24	347.0	344.2	0.758	12.95	7.55	85.6	40.0	45.6
25	344.2	341.2	0.817	13.95	7.64	84.7	40.0	44.7
26	347.3	344.0	0.876	14.96	7.73	84.5	40.0	44.5



Notes: [1] Deviator load corrected for membrane effects.
[2] ight Cylinder Correction Method

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