



Consolidated Undrained Triaxial Compression Test

ASTM D4767

Project: Calvert Cliffs Nuclear Power Plant

Schnabel Contract: 06120048

Date: 10/12/2006

Boring No.: B-317

Depth: 28.5-30.5ft.

Elevation: 65.9 to 63.9

Reviewed by: CJS

Location: Calvert County, MD

Confining Stress (psi): 40.0

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.891	2.86
Height (in)	5.835	5.75
Area (in ²)	6.57	6.41
Moisture (%)	31.3	
W _{soil} (lbs)	2.05	
P _{ver} (pcf)	121.2	
P _{dry} (pcf)	92.3	95.9
Void Ratio	0.86	0.79
Saturation, %	100	96

Shear Testing Conditions	
Cell Pressure (psi):	65.0
Back Pressure (psi):	25.0
Eff. Confining Stress (psi):	40.0
Final B check	0.98
t ₉₀ (min.):	10.9
Rate of Strain (%/min):	0.0232

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

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

Failure Sketch



Filter strips used? YES

Specimen Type: Tube Sample

Remarks:

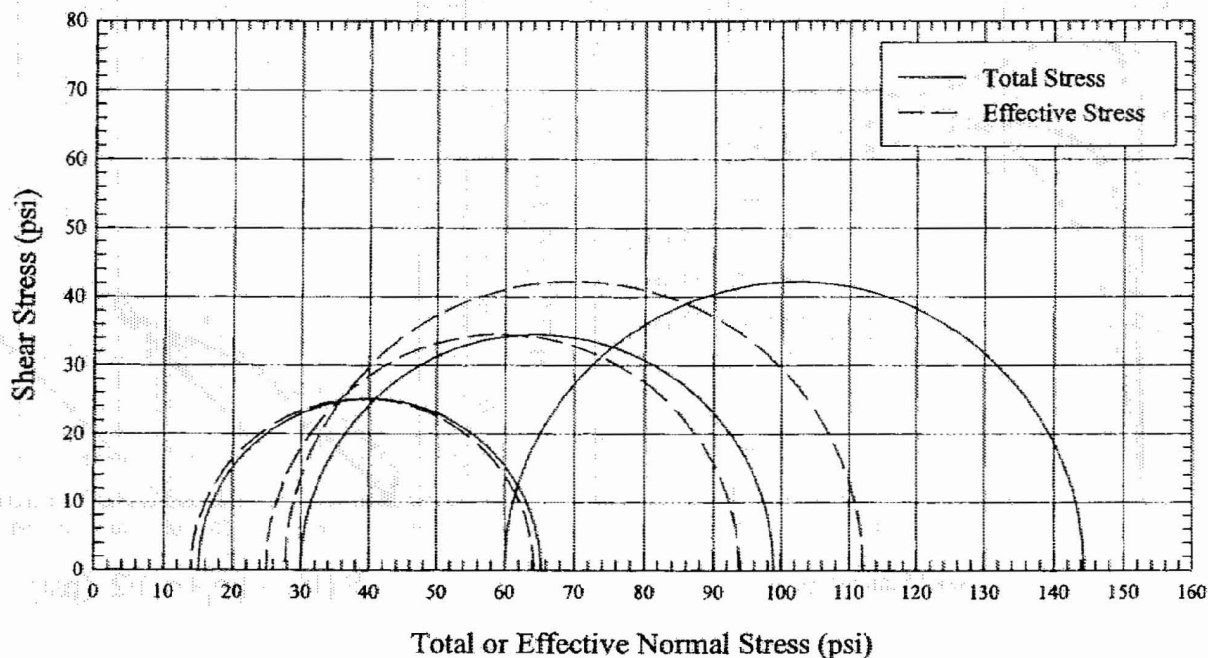
Reading No.	Deviator Load (lbs)	Corrected Dev. Load (lbs.)	Axial Deformation (in.)	Axial Strain (%)	Pore Pressure (psi)	Change in Pore Press. (psi)	Corrected Area ² (in ²)	σ ₁ (psi)	σ ₃ (psi)	σ ₁ ' (psi)	σ ₃ ' (psi)	Deviator Stress (psi)	Principal Stress Ratio	A _{bar}	P (psi)	P' (psi)	q (psi)
Zero	0.0	0.0	0.000	0.00	25.0	0.0	6.41	40.0	40.0	40.0	40.0	0.0	1.00	0.00	40.0	40.0	0.0
1	4.2	4.1	0.006	0.10	25.8	0.8	6.42	40.6	40.0	39.8	39.2	0.8	1.02	1.26	40.3	39.5	0.3
2	62.3	62.1	0.012	0.21	29.9	4.9	6.43	48.7	40.0	44.8	35.1	9.7	1.26	0.51	44.8	39.9	4.8
3	102.5	102.1	0.018	0.31	34.0	9.0	6.43	55.9	40.0	48.9	31.0	15.9	1.51	0.57	47.9	38.9	7.9
4	124.5	124.0	0.023	0.40	36.6	11.6	6.44	58.3	40.0	47.7	28.4	19.3	1.68	0.60	49.6	38.0	9.6
5	140.8	140.2	0.029	0.50	38.6	13.6	6.44	61.8	40.0	48.2	26.4	21.8	1.82	0.63	50.9	37.3	10.9
6	153.3	152.6	0.035	0.61	40.1	15.1	6.45	63.6	40.0	48.5	24.9	23.6	1.95	0.64	51.8	36.7	11.8
7	163.9	163.1	0.041	0.71	41.4	16.4	6.46	65.2	40.0	48.8	23.6	25.2	2.07	0.65	52.6	36.2	12.6
8	173.4	172.4	0.047	0.82	42.5	17.5	6.47	66.7	40.0	49.2	22.5	26.7	2.19	0.66	53.3	35.8	13.3
9	182.1	181.0	0.053	0.92	43.3	18.3	6.47	68.0	40.0	49.7	21.7	28.0	2.29	0.65	54.0	35.7	14.0
10	190.7	189.5	0.058	1.01	44.0	19.0	6.48	69.3	40.0	50.3	21.0	29.3	2.39	0.65	54.6	35.6	14.6
11	217.6	215.9	0.082	1.43	46.1	21.1	6.51	73.2	40.0	52.1	18.9	33.2	2.76	0.64	56.6	35.5	16.6
12	244.6	242.3	0.111	1.93	47.4	22.4	6.54	77.1	40.0	54.7	17.6	37.1	3.11	0.60	58.5	36.1	18.5
13	267.4	264.9	0.140	2.43	48.2	23.2	6.57	80.3	40.0	57.1	16.8	40.3	3.40	0.58	60.2	37.0	20.2
14	287.8	285.2	0.172	2.99	48.4	23.4	6.61	83.1	40.0	59.7	16.6	43.1	3.60	0.54	61.6	38.2	21.6
15	310.8	308.0	0.228	3.96	48.0	23.0	6.68	86.1	40.0	63.1	17.0	46.1	3.80	0.50	63.1	40.1	23.1
16	318.7	315.7	0.288	4.97	47.2	22.2	6.75	88.8	40.0	64.8	17.8	47.0	3.83	0.47	63.4	41.2	23.4
17	309.0	305.8	0.344	5.98	46.1	21.1	6.82	84.8	40.0	63.7	18.9	44.8	3.37	0.47	62.4	41.3	22.4
18	288.0	284.5	0.403	7.00	45.8	20.8	6.90	81.3	40.0	60.5	19.2	41.3	3.15	0.50	60.6	39.8	20.6
19	284.2	280.5	0.461	8.01	45.7	20.7	6.97	80.2	40.0	59.5	19.3	40.2	3.09	0.51	60.1	39.4	20.1
20	278.1	274.2	0.514	8.93	45.8	20.6	7.04	78.9	40.0	58.3	19.4	38.9	3.01	0.53	59.5	38.9	19.5
21	273.6	269.5	0.572	9.94	45.5	20.5	7.12	77.9	40.0	57.4	19.5	37.9	2.94	0.54	58.9	38.4	18.9
22	274.2	269.9	0.630	10.95	45.2	20.2	7.20	77.5	40.0	57.3	19.8	37.5	2.89	0.54	58.7	38.5	18.7
23	277.2	272.7	0.689	11.98	45.0	20.0	7.28	77.4	40.0	57.4	20.0	37.4	2.87	0.53	58.7	38.7	18.7
24	283.6	278.9	0.747	12.98	44.7	19.7	7.37	77.8	40.0	58.1	20.3	37.8	2.86	0.52	58.9	39.2	18.9
25	287.0	282.0	0.806	14.01	44.7	19.7	7.46	77.8	40.0	58.1	20.3	37.8	2.86	0.52	58.9	39.2	18.9
26	290.8	285.6	0.859	14.93	44.5	19.5	7.54	77.9	40.0	58.4	20.5	37.9	2.85	0.51	58.9	39.4	18.9

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

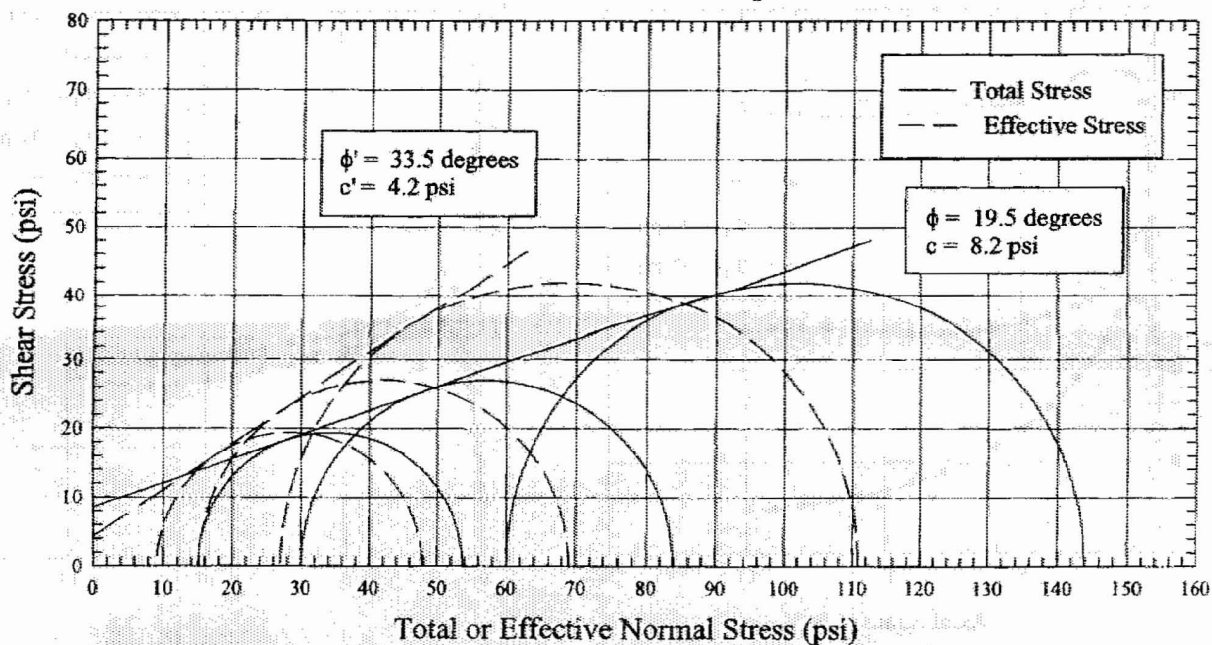
CU 8/2006

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: 48.5-50.5 ft

SEI Contract: 06120048

Date: 10/12/06

Sample Description: Sandy LEAN CLAY (CL) - gray

Reviewed By: CJS

Specimen Type: Tube Sample

Specific Gravity: 2.70

LL: 35

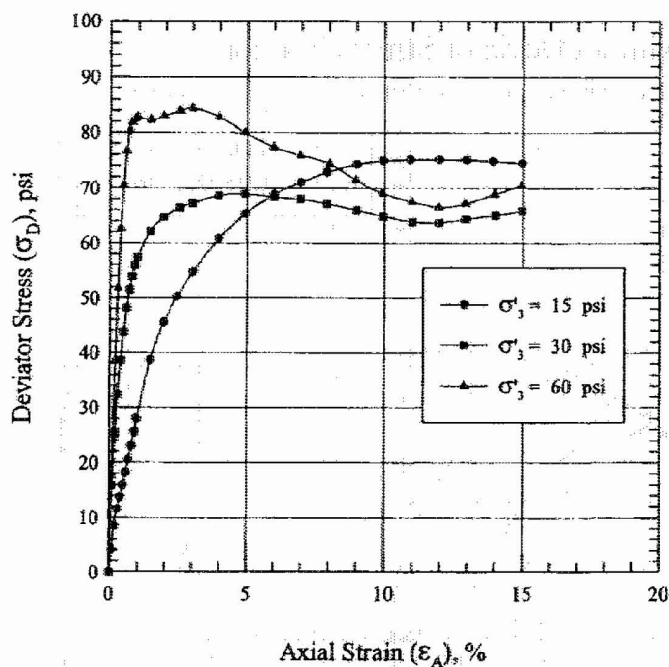
PI: 18

%<200: 69.8

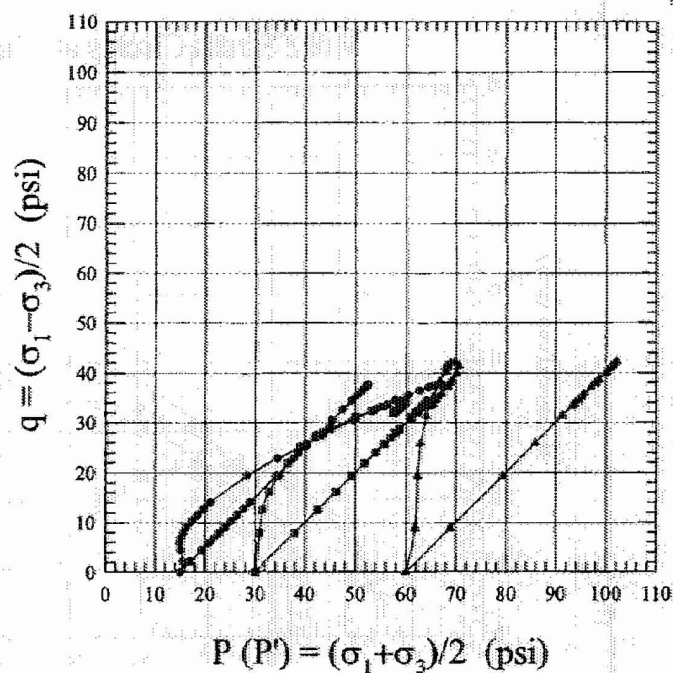


Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

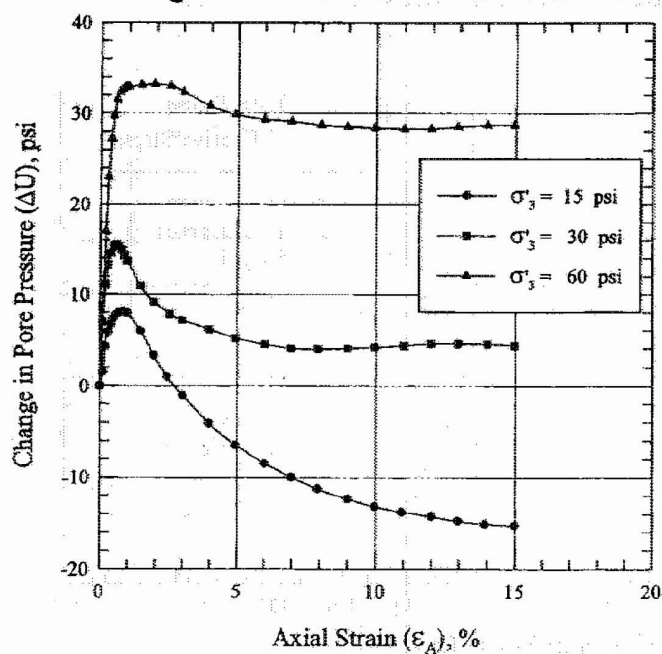
Deviator Stress vs. Axial Strain



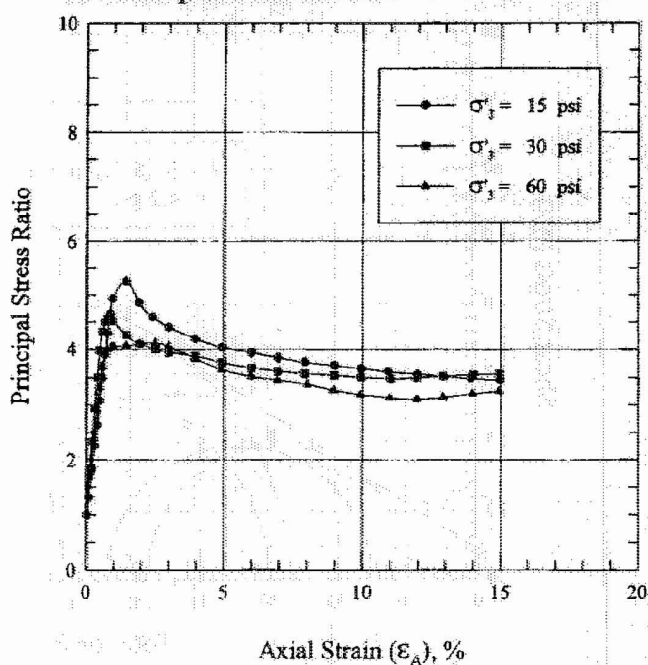
Stress Paths



Change in Pore Pressure vs. Axial Strain



Principal Stress Ratio vs. Axial Strain



Boring No.: B-317

Depth: 48.5-50.5 ft

SEI Contract: 06120048

Date: 10/12/06

Sample Description: Sandy LEAN CLAY (CL) - gray

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Specimen Type: Tube Sample

Specific Gravity: 2.70

LL: 35

PI: 18

%<200: 69.8



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Calvert County, Maryland



Consolidated Undrained Triaxial Compression Test

Project: Calvert Cliffs Nuclear Power Plant

Location: Calvert County, MD

ASTM D4767

Schnabel Contract: 06120048

Boring No.: B-317

Depth: 48.5-50.5ft.

Elevation: 45.9 to 43.9

Confining Stress (psi): 15.0

Date: 10/12/2006

Reviewed by: CJS

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.891	2.88
Height (in)	5.823	5.80
Area (in ²)	6.57	6.53
Moisture (%)	24.1	
W _{soils} (lbs)	2.20	
P _{avg} (pcf)	123.6	
P _{dry} (pcf)	99.6	100.5
Void Ratio	0.69	0.68
Saturation, %	94	95

Shear Testing Conditions	
Cell Pressure (psi)	50.0
Back Pressure (psi)	35.0
Eff. Confining Stress (psi)	15.0
Final B check	0.98
t ₉₀ (min)	0.4
Rate of Strain (%/min)	0.125

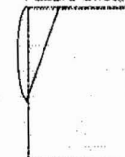
Filter strips used? YES

Specimen Type: Tube Sample

Soil Description: Sandy LEAN CLAY (CL) - grey

Liquid Limit: 35
Plasticity Index: 18
% finer than No. 200: 89.8
Specific Gravity: 2.70

Failure Sketch



Remarks:

Reading No.	Deviator Load (lbs)	Corrected 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	35.0	0.0	6.53	15.0	15.0	15.0	15.0	0.0	1.00	0.00	15.0	15.0	0.0
1	27.2	27.1	0.006	0.10	36.5	1.5	6.54	18.1	15.0	17.6	13.5	4.1	1.31	0.36	17.1	15.6	2.1
2	57.1	56.9	0.011	0.19	39.2	4.2	6.54	23.7	15.0	19.5	10.8	8.7	1.80	0.48	19.3	15.1	4.3
3	75.5	75.2	0.017	0.29	40.8	5.8	6.55	26.5	15.0	20.7	9.2	11.5	2.25	0.51	20.7	14.9	5.7
4	90.1	89.6	0.023	0.40	41.6	6.6	6.56	28.7	15.0	22.1	8.4	13.7	2.63	0.48	21.8	15.2	6.8
5	104.9	104.3	0.028	0.48	42.3	7.3	6.56	30.9	15.0	23.8	7.7	15.9	3.06	0.46	22.9	15.6	7.9
6	120.1	119.4	0.034	0.59	42.7	7.7	6.57	33.2	15.0	25.5	7.3	18.2	3.49	0.42	24.1	16.4	9.1
7	135.9	135.1	0.039	0.67	42.9	7.9	6.58	35.5	15.0	27.8	7.1	20.5	3.89	0.38	25.3	17.4	10.3
8	152.3	151.4	0.045	0.78	43.0	8.0	6.58	38.0	15.0	30.0	7.0	23.0	4.28	0.35	26.5	18.5	11.5
9	169.2	168.2	0.051	0.88	43.0	8.0	6.59	40.5	15.0	32.5	7.0	25.5	4.65	0.31	27.8	19.8	12.8
10	185.6	184.4	0.058	0.97	42.9	7.9	6.60	43.0	15.0	35.1	7.1	28.0	4.94	0.28	29.0	21.1	14.0
11	258.1	258.4	0.084	1.45	40.9	5.9	6.63	53.7	15.0	47.8	9.1	38.7	6.25	0.15	34.3	28.4	19.3
12	305.2	302.9	0.112	1.93	38.2	3.2	6.66	60.5	15.0	57.3	11.8	45.5	4.85	0.07	37.7	34.5	22.7
13	338.6	336.1	0.140	2.41	36.0	1.0	6.69	65.2	15.0	64.2	14.0	49.2	4.59	0.02	40.1	39.1	25.1
14	371.2	368.6	0.174	3.00	33.9	-1.1	6.73	69.7	15.0	70.8	16.1	54.7	4.40	-0.02	42.4	43.5	27.4
15	418.4	413.6	0.230	3.97	30.9	-4.1	6.80	75.8	15.0	79.9	19.1	60.8	4.18	-0.07	45.4	49.5	30.4
16	451.4	448.4	0.286	4.93	28.5	-5.5	6.87	80.3	15.0	86.8	21.5	65.3	4.04	-0.10	47.6	54.1	32.6
17	481.5	478.2	0.348	6.00	26.5	-8.5	6.95	83.8	15.0	92.3	23.5	68.8	3.93	-0.12	49.4	57.9	34.4
18	502.1	498.6	0.404	6.97	25.0	-10.0	7.02	86.0	15.0	96.0	25.0	71.0	3.84	-0.14	50.5	60.5	35.5
19	520.2	516.5	0.480	7.93	23.7	-11.3	7.09	87.8	15.0	99.1	26.3	72.8	3.77	-0.16	51.4	62.7	36.4
20	536.7	532.8	0.522	9.00	22.6	-12.4	7.18	89.2	15.0	101.6	27.4	74.2	3.71	-0.17	52.1	64.5	37.1
21	547.3	543.2	0.578	9.97	21.8	-13.2	7.26	89.9	15.0	103.1	28.2	74.9	3.65	-0.18	52.4	65.6	37.4
22	554.9	550.6	0.634	10.93	21.2	-13.8	7.33	90.1	15.0	103.9	28.8	75.1	3.61	-0.18	52.5	66.3	37.5
23	561.7	557.1	0.695	11.99	20.7	-14.3	7.42	90.1	15.0	104.4	29.3	75.1	3.58	-0.19	52.5	66.8	37.5
24	567.8	563.0	0.751	12.96	20.2	-14.8	7.50	90.0	15.0	104.8	29.8	75.0	3.52	-0.20	52.5	67.3	37.5
25	572.5	567.5	0.807	13.92	19.9	-15.1	7.59	89.8	15.0	104.9	30.1	74.8	3.48	-0.20	52.4	67.5	37.4
26	576.7	571.5	0.869	14.99	19.7	-15.3	7.68	89.4	15.0	104.7	30.3	74.4	3.45	-0.21	52.2	67.5	37.2

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



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Location: Calvert County, MD

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Boring No.: B-317

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Elevation: 45.9 to 43.9

Confining Stress (psi): 30.0

Date: 10/12/2006

Reviewed by: CJS

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.885	2.87
Height (in)	5.826	5.81
Area (in ²)	6.54	6.48
Moisture (%)	24.8	
W _{solid} (lbs)	2.18	
P _{wet} (pcf)	123.7	
P _{dry} (pcf)	99.1	100.4
Void Ratio	0.70	0.68
Saturation, %	96	99

Shear Testing Conditions	
Cell Pressure (psi)	65.0
Back Pressure (psi)	35.0
Eff. Confining Stress (psi)	30.0
Final B check	0.98
t ₉₀ (min.)	0.8
Rate of Strain (%/min)	0.125

Filter strips used? YES

Specimen Type: Tube Sample

Soil Description: Sandy LEAN CLAY (CL) - gray

Liquid Limit: 35
Plasticity Index: 18
% finer than No. 200: 69.8
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Remarks:

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	35.0	0.0	6.48	30.0	30.0	30.0	30.0	0.0	1.00	0.00	30.0	30.0	0.0
1	103.0	103.0	0.006	0.10	42.0	7.0	6.48	45.9	30.0	38.9	23.0	15.9	1.69	0.44	37.9	30.9	7.9
2	164.0	164.0	0.012	0.21	46.1	11.1	6.49	55.3	30.0	44.2	18.9	25.3	2.34	0.44	42.6	31.5	12.6
3	210.4	210.3	0.017	0.29	48.3	13.3	6.50	62.4	30.0	49.1	16.7	32.4	2.94	0.41	46.2	32.9	16.2
4	251.4	251.3	0.023	0.40	49.6	14.6	6.50	68.6	30.0	54.0	15.4	38.6	3.51	0.38	49.3	34.7	19.3
5	284.8	284.7	0.028	0.48	50.3	15.3	6.51	73.7	30.0	58.4	14.7	43.7	3.98	0.35	51.9	36.6	21.9
6	313.9	313.8	0.034	0.59	50.5	15.5	6.52	78.2	30.0	62.7	14.5	48.2	4.32	0.32	54.1	38.6	24.1
7	336.0	335.9	0.040	0.69	50.3	15.3	6.52	81.5	30.0	66.2	14.7	51.5	4.50	0.30	55.7	40.4	25.7
8	351.9	351.7	0.045	0.78	49.9	14.9	6.53	83.9	30.0	69.0	15.1	53.9	4.50	0.28	56.9	42.0	26.9
9	365.7	365.5	0.051	0.88	49.3	14.3	6.53	85.9	30.0	71.6	15.7	55.9	4.56	0.26	58.0	43.7	28.0
10	375.8	375.6	0.056	0.96	48.7	13.7	6.54	87.4	30.0	73.7	16.3	57.4	4.52	0.24	58.7	45.0	28.7
11	408.6	408.3	0.084	1.45	45.9	10.9	6.57	92.1	30.0	81.2	19.1	62.1	4.25	0.18	61.1	50.2	31.1
12	427.8	427.4	0.112	1.93	44.1	9.1	6.60	94.7	30.0	85.6	20.9	64.7	4.10	0.14	62.4	53.3	32.4
13	441.8	441.3	0.146	2.51	42.8	7.8	6.64	98.4	30.0	88.6	22.2	68.4	3.99	0.12	63.2	55.4	33.2
14	449.8	449.2	0.174	3.00	42.1	7.1	6.68	97.3	30.0	90.2	22.9	67.3	3.94	0.11	63.6	56.5	33.6
15	463.8	462.9	0.230	3.96	41.1	6.1	6.74	98.6	30.0	92.5	23.9	68.6	3.87	0.09	64.3	58.2	34.3
16	470.5	469.4	0.286	4.93	40.1	5.1	6.81	98.9	30.0	93.8	24.9	68.9	3.77	0.07	64.5	59.4	34.5
17	472.1	470.8	0.348	5.99	39.4	4.4	6.89	98.3	30.0	93.9	25.6	68.3	3.67	0.06	64.2	59.8	34.2
18	474.5	473.0	0.404	6.96	39.0	4.0	6.96	97.9	30.0	93.9	26.0	67.9	3.61	0.06	64.0	60.0	34.0
19	473.8	472.1	0.460	7.92	38.9	3.9	7.03	97.1	30.0	93.2	26.1	67.1	3.57	0.06	63.6	59.7	33.6
20	471.6	469.7	0.522	8.99	39.0	4.0	7.12	96.0	30.0	92.0	26.0	66.0	3.54	0.06	63.0	59.0	33.0
21	469.2	467.0	0.578	9.98	39.1	4.1	7.19	94.9	30.0	90.8	25.9	64.9	3.51	0.06	62.5	58.4	32.5
22	467.2	464.8	0.639	11.01	39.3	4.3	7.28	93.9	30.0	89.6	25.7	63.9	3.48	0.07	61.9	57.6	31.9
23	471.5	468.9	0.695	11.97	39.5	4.5	7.36	93.7	30.0	89.2	25.5	63.7	3.50	0.07	61.9	57.4	31.9
24	481.7	478.9	0.751	12.94	39.5	4.5	7.44	94.4	30.0	89.9	25.5	64.4	3.52	0.07	62.2	57.7	32.2
25	493.2	490.2	0.813	14.00	39.5	4.5	7.53	95.1	30.0	90.6	25.5	65.1	3.55	0.07	62.5	58.0	32.5
26	505.1	501.9	0.889	14.97	39.3	4.3	7.62	95.9	30.0	91.6	25.7	65.9	3.56	0.07	62.9	58.6	32.9

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



Consolidated Undrained Triaxial Compression Test

Project: Calvert Cliffs Nuclear Power Plant

Location: Calvert County, MD

ASTM D4767

Schnabel Contract: 06120048

Boring No.: B-317

Depth: 48.5-50.5ft.

Elevation: 45.9 to 43.9

Confining Stress (psi): 60.0

Date: 10/12/2006

Reviewed by: CJS

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.882	2.86
Height (in)	5.847	5.81
Area (in ²)	6.53	6.44
Moisture (%)	25.8	
W _{soils} (lbs)	2.11	
P _{wet} (pcf)	119.8	
P _{dry} (pcf)	95.4	97.2
Void Ratio	0.77	0.73
Saturation, %	90	100

Shear Testing Conditions	
Cell Pressure (psi)	95.0
Back Pressure (psi)	35.0
Eff. Confining Stress (psi)	60.0
Final B check	0.96
t ₉₀ (min.)	1.9
Rate of Strain (%/min)	0.125

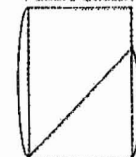
Filter strips used? YES

Specimen Type: Tube Sample

Soil Description: Sandy LEAN CLAY (CL) - gray

Liquid Limit: 36
Plasticity Index: 18
% finer than No. 200: 69.8
Specific Gravity: 2.70

Failure Sketch



Remarks:

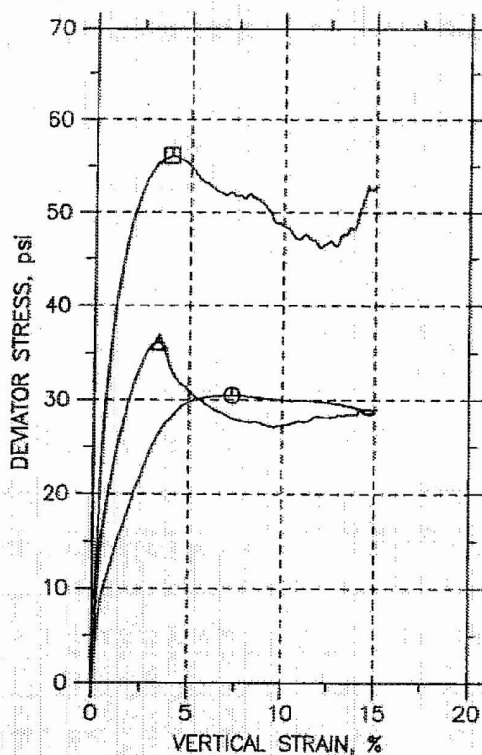
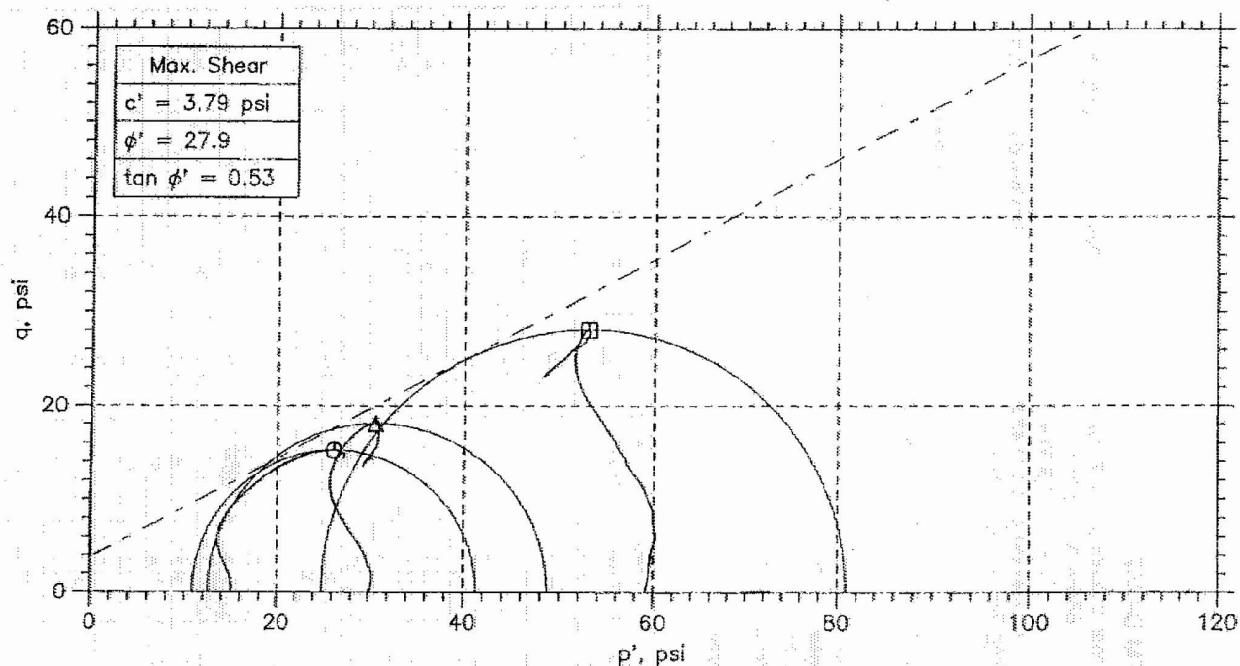
Reading No.	Deviator Load (lbs)	Corrected ¹ Dev. Load (lbs.)	Axial Deformation (in.)	Axial Strain (%)	Pore Pressure (psi)	Change in Pore Press. (psi)	Corrected Area ² (in ²)	σ ₁ (psi)	σ ₃ (psi)	σ' ₁ (psi)	σ' ₃ (psi)	Deviator Stress (psi)	Principal Stress Ratio	A _{bar}	P (psi)	P' (psi)	q (psi)
Zero	0.0	0.0	0.000	0.00	35.0	0.0	6.44	80.0	60.0	60.0	60.0	0.0	1.00	0.00	60.0	60.0	0.0
1	114.1	114.0	0.006	0.10	42.0	7.0	6.45	77.7	60.0	70.7	53.0	17.7	1.33	0.40	68.8	61.8	8.8
2	249.1	248.9	0.012	0.21	52.0	17.0	6.45	98.8	60.0	81.6	43.0	58.6	1.90	0.44	79.3	62.3	19.3
3	334.6	334.3	0.017	0.29	58.0	23.0	6.46	111.7	60.0	88.7	37.0	51.7	2.40	0.44	85.9	62.9	25.9
4	405.5	405.0	0.023	0.40	62.2	27.2	6.47	122.6	60.0	95.4	32.8	62.6	2.91	0.43	91.3	64.1	31.3
5	456.5	455.9	0.028	0.48	64.7	29.7	6.47	130.5	60.0	100.8	30.3	70.5	3.33	0.42	95.2	65.5	35.2
6	496.8	496.1	0.034	0.58	66.5	31.5	6.48	136.8	60.0	105.1	28.5	76.6	3.69	0.41	98.3	66.8	38.3
7	521.8	521.0	0.040	0.89	67.3	32.3	6.48	140.3	60.0	108.0	27.7	80.3	3.90	0.40	100.2	67.9	40.2
8	532.2	531.3	0.045	0.77	67.6	32.6	6.49	141.9	60.0	109.3	27.4	81.9	3.99	0.40	100.9	68.3	40.9
9	536.5	535.5	0.051	0.88	67.8	32.8	6.50	142.4	60.0	109.6	27.2	82.4	4.03	0.40	101.2	68.4	41.2
10	539.0	537.9	0.056	0.96	67.9	32.9	6.50	142.7	60.0	109.8	27.1	82.7	4.05	0.40	101.4	68.5	41.4
11	539.2	537.5	0.064	1.44	68.1	33.1	6.53	142.2	60.0	109.1	26.9	82.2	4.08	0.40	101.1	68.0	41.1
12	547.0	544.7	0.112	1.93	68.2	33.2	6.57	142.9	60.0	109.7	26.8	82.9	4.10	0.40	101.5	68.3	41.5
13	556.6	554.1	0.146	2.51	68.0	33.0	6.61	143.9	60.0	110.9	27.0	83.9	4.12	0.39	101.9	68.9	41.9
14	562.7	560.1	0.174	2.99	67.3	32.3	6.64	144.4	60.0	112.1	27.7	84.8	4.05	0.38	102.2	69.9	42.2
15	568.1	565.3	0.230	3.96	65.8	30.8	6.71	142.8	60.0	112.0	29.2	82.8	3.84	0.37	101.4	70.6	41.4
16	544.0	541.0	0.288	4.82	64.8	29.8	6.77	139.9	60.0	110.1	30.2	79.9	3.64	0.37	99.9	70.1	39.9
17	532.9	529.7	0.348	5.99	64.3	29.3	6.86	137.3	60.0	108.0	30.7	77.3	3.52	0.38	98.7	69.4	38.7
18	528.4	524.9	0.404	6.95	64.1	29.1	6.92	135.8	60.0	106.7	30.9	75.8	3.45	0.38	97.9	68.8	37.9
19	523.9	520.2	0.468	8.02	63.7	28.7	7.00	134.3	60.0	105.6	31.3	74.3	3.37	0.39	97.2	68.5	37.2
20	508.9	505.0	0.522	8.98	63.5	28.5	7.08	131.4	60.0	102.9	31.5	71.4	3.27	0.40	95.7	67.2	35.7
21	497.8	493.7	0.578	9.94	63.4	28.4	7.15	129.0	60.0	100.8	31.6	69.0	3.18	0.41	94.5	66.1	34.5
22	492.4	488.1	0.639	10.99	63.3	28.3	7.24	127.6	60.0	99.2	31.7	67.5	3.13	0.42	93.7	65.4	33.7
23	490.8	486.3	0.695	11.95	63.3	28.3	7.31	126.5	60.0	98.2	31.7	66.5	3.10	0.43	93.2	64.9	33.2
24	501.3	486.6	0.751	12.92	63.5	28.5	7.40	127.1	60.0	98.6	31.5	67.1	3.13	0.42	93.6	65.1	33.6
25	520.7	515.7	0.813	13.98	63.7	28.7	7.49	128.9	60.0	100.2	31.3	68.9	3.20	0.42	94.4	65.7	34.4
26	538.8	533.8	0.869	14.95	63.7	28.7	7.57	130.5	60.0	101.8	31.3	70.5	3.25	0.41	95.2	66.5	35.2

Notes: 1. Deviator load corrected for membrane and filter cage (if applicable) effects.

2. Right Cylinder Correction Method

CU 8/2006 Rev. 0

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



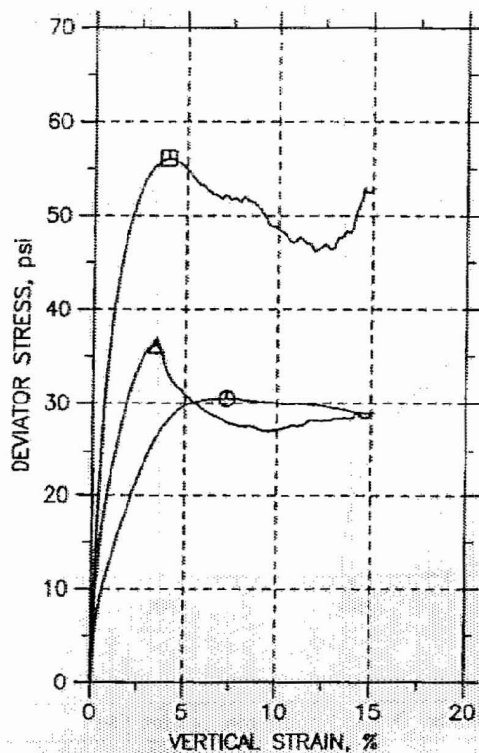
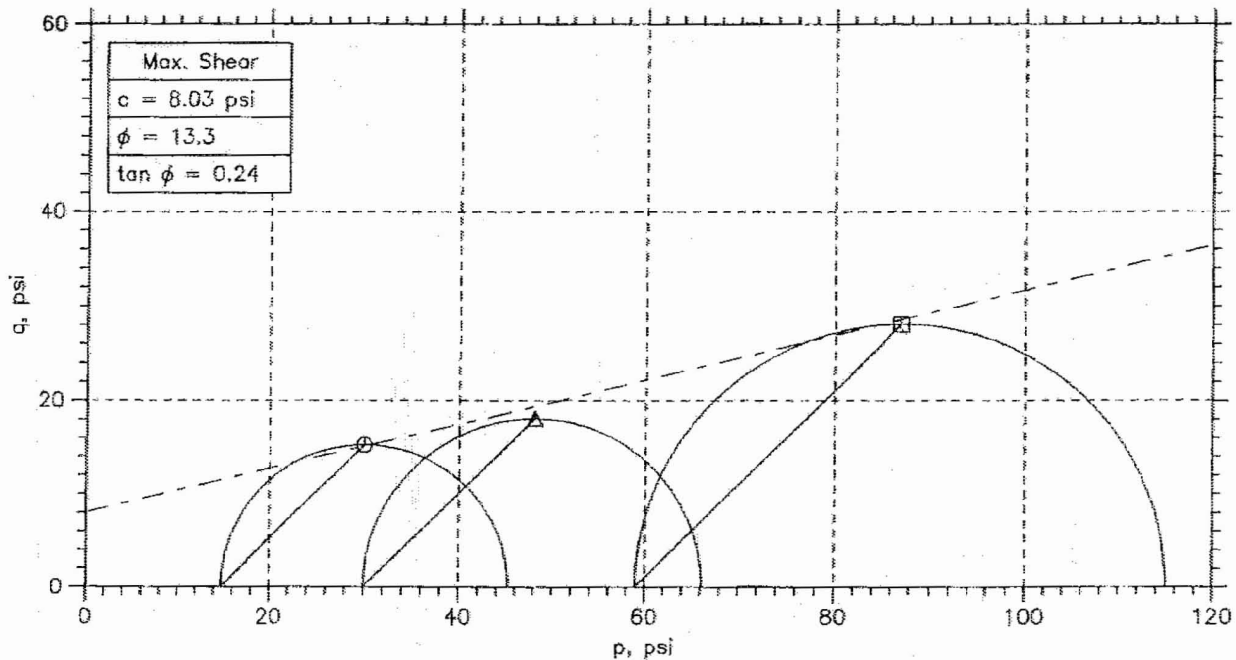
Symbol	○	△	□	
Sample No.	S-11	S-11	S-11	
Test No.	CU7	CU8	CU9	
Depth	38.5-40.5	38.5-40.5	38.5-40.5	
Initial	Diameter, in	2.87	2.87	2.87
	Height, in	5.96	5.85	6.05
	Water Content, %	24.6	28.4	26.6
	Dry Density, pcf	99.56	93.62	95.99
	Saturation, %	99.9	99.0	98.7
Before Shear	Void Ratio	0.649	0.754	0.71
	Water Content, %	28.1	27.2	26.0
	Dry Density, pcf	94.41	95.77	97.51
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.739	0.714	0.684
	Back Press., psi	100.	100.	57.99
	Ver. Eff. Cons. Stress, psi	14.99	30.	60.01
	Shear Strength, psi	15.24	18.08	28.05
	Strain at Failure, %	7.29	3.4	3.99
	Strain Rate, %/min	0.032	0.032	0.032
	B-Value	0.95	0.95	0.96
	Measured Specific Gravity	2.63	2.63	2.63
	Liquid Limit	36	36	36
	Plastic Limit	16	16	16

GeoTesting express a subsidiary of Geocomp Corporation	Project: Calvert Cliffs Nuclear PP	
	Location: Calvert County, MD	
	Project No.: GTX-6880	
	Boring No.: B-320	
	Sample Type: tube	
	Description: Moist, very dark gray clayey sand (SC), 49% passing #200 sieve	
	Remarks: System B - t50 = 12.5 min, Triaxial Rev 1.0.6.318	

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



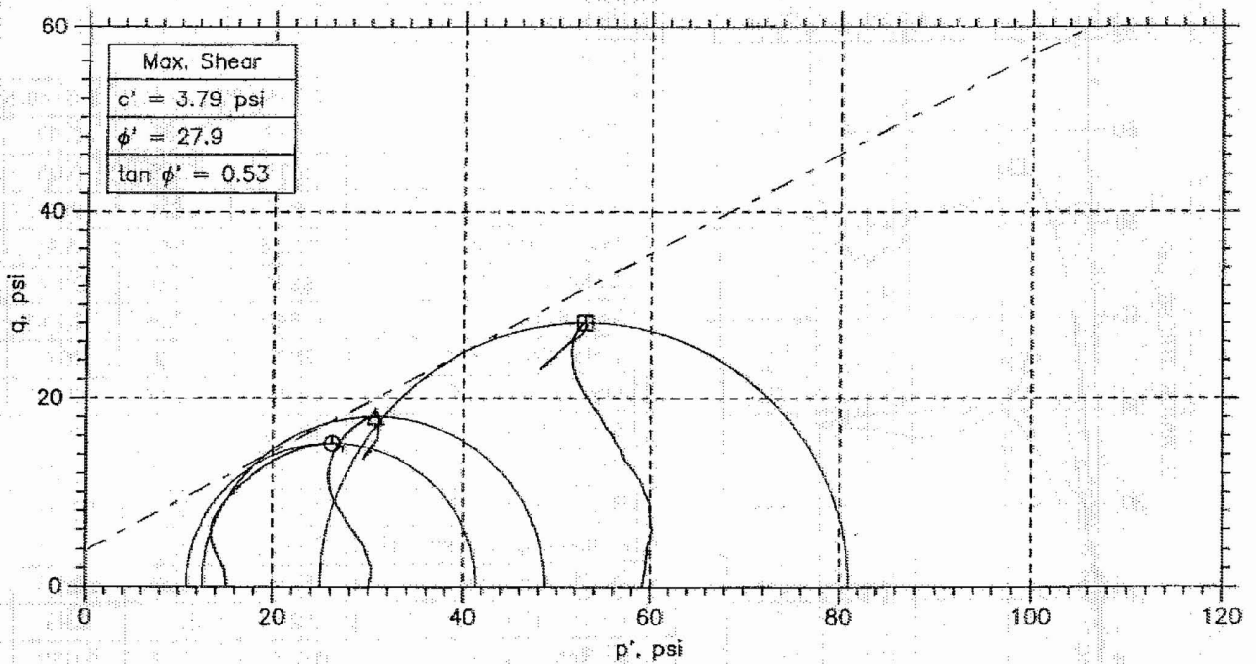
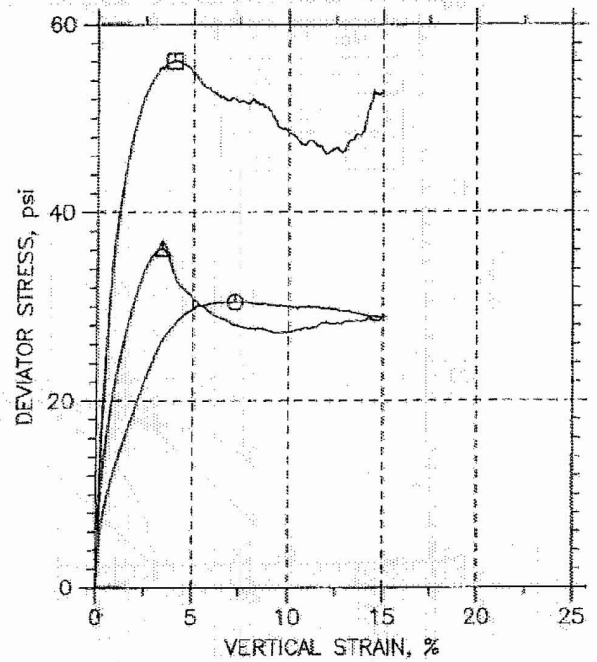
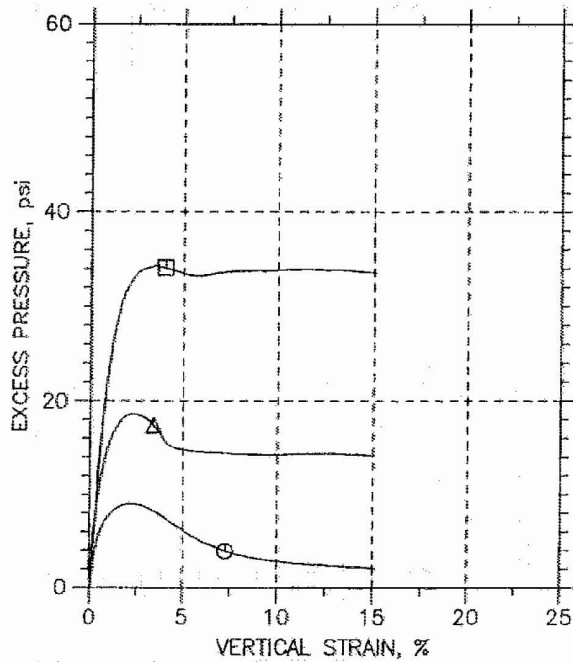
Symbol	⊙	△	□	
Sample No.	S-11	S-11	S-11	
Test No.	CU7	CU8	CU9	
Depth	38.5-40.5	38.5-40.5	38.5-40.5	
Initial	Diameter, in	2.87	2.87	2.87
	Height, in	5.96	5.85	6.05
	Water Content, %	24.6	28.4	26.6
	Dry Density, pcf	99.56	93.62	95.99
	Saturation, %	99.9	99.0	98.7
Before Shear	Void Ratio	0.649	0.754	0.71
	Water Content, %	28.1	27.2	26.0
	Dry Density, pcf	94.41	95.77	97.51
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.739	0.714	0.684
	Back Press., psi	100.	100.	57.99
	Ver. Eff. Cons. Stress, psi	14.99	30.	60.01
	Shear Strength, psi	15.24	18.08	28.05
	Strain at Failure, %	7.29	3.4	3.99
	Strain Rate, %/min	0.032	0.032	0.032
	B-Value	0.95	0.95	0.96
	Measured Specific Gravity	2.63	2.63	2.63
	Liquid Limit	36	36	36
	Plastic Limit	16	16	16

GeoTesting express a subsidiary of Geocomp Corporation	Project: Calvert Cliffs Nuclear PP	
	Location: Calvert County, MD	
	Project No.: GTX-6880	
	Boring No.: B-320	
	Sample Type: tube	
Description: Moist, very dark gray clayey sand (SC), 49% passing #200 sieve		
Remarks: System B - t50 = 12.5 min, Triaxial Rev 1.0.6.318		

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



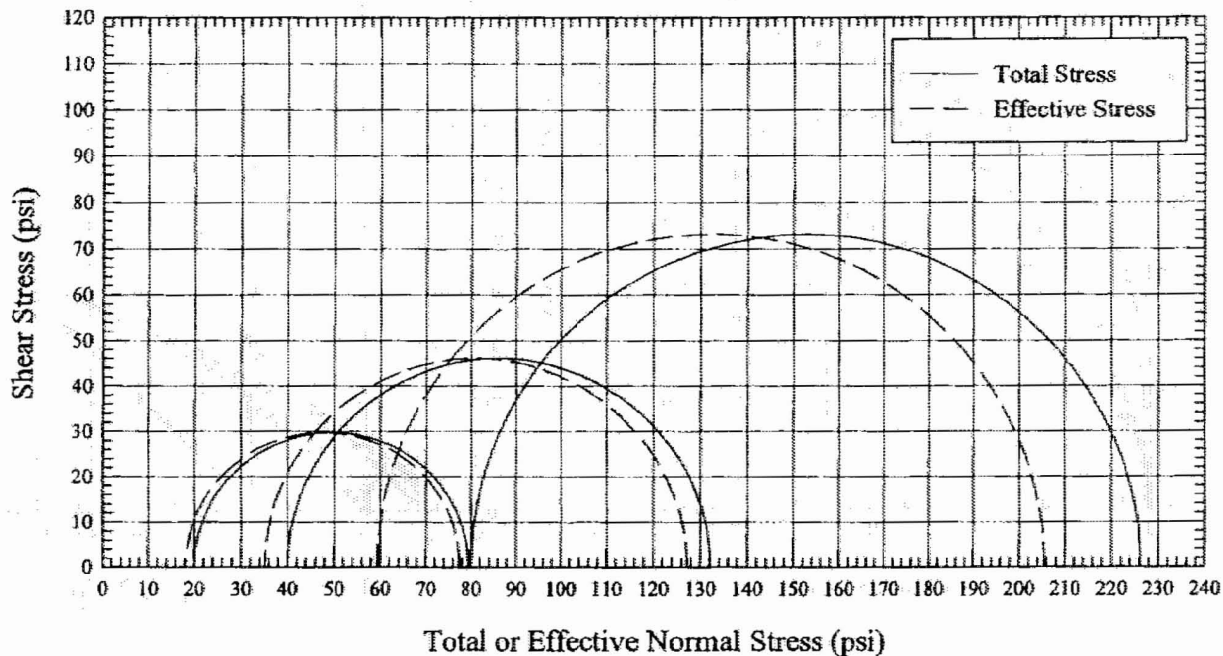
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□	S-11	CU9	38.5-40.5	njh	10/18/06	jdt		6880-CU9n.dat

GeoTesting
express
a subsidiary of Geocomp Corporation

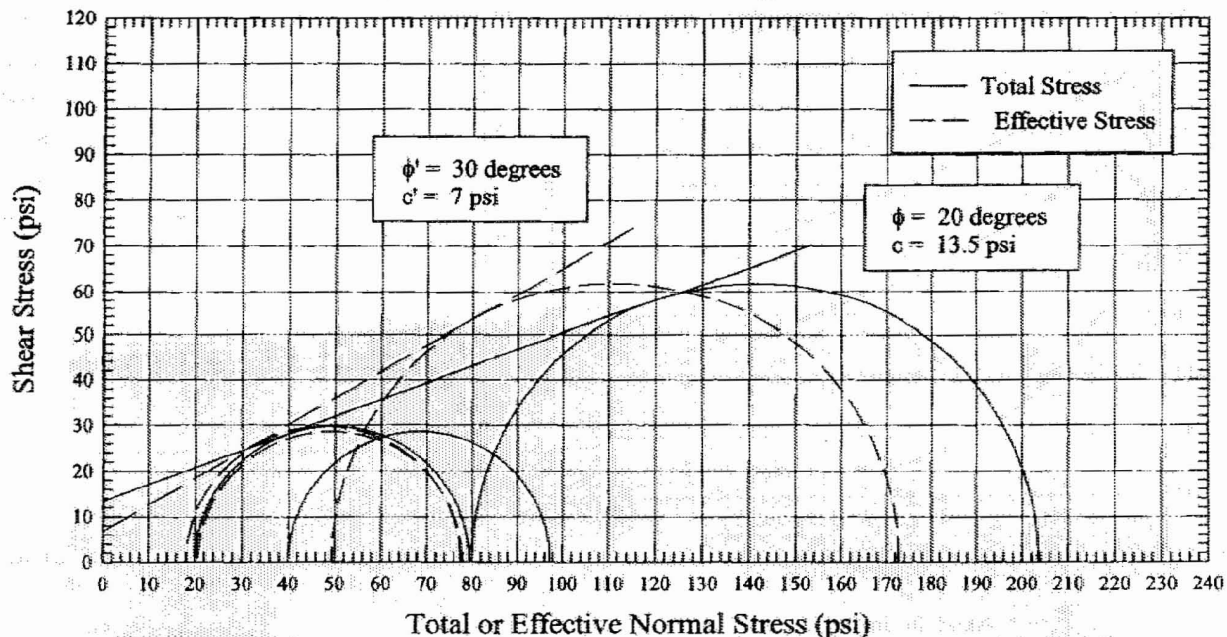
Project: Calvert Cliffs Nuclear PP	Location: Calvert County, MD	Project No.: GTX-6880
Boring No.: B-320	Sample Type: tube	
Description: Moist, very dark gray clayey sand (SC), 49% passing #200 sieve		
Remarks: System B - t50 = 12.5 min, Triaxial Rev 1.0.6.318		

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-321

Depth: 73.5-75.5 ft

SEI Contract: 06120048

Date: 10/20/06

Sample Description: Fine SILTY SAND (SM) - gray

Reviewed By: CJS

Specimen Type: Tube Sample

Specific Gravity: 2.67

LL: ---

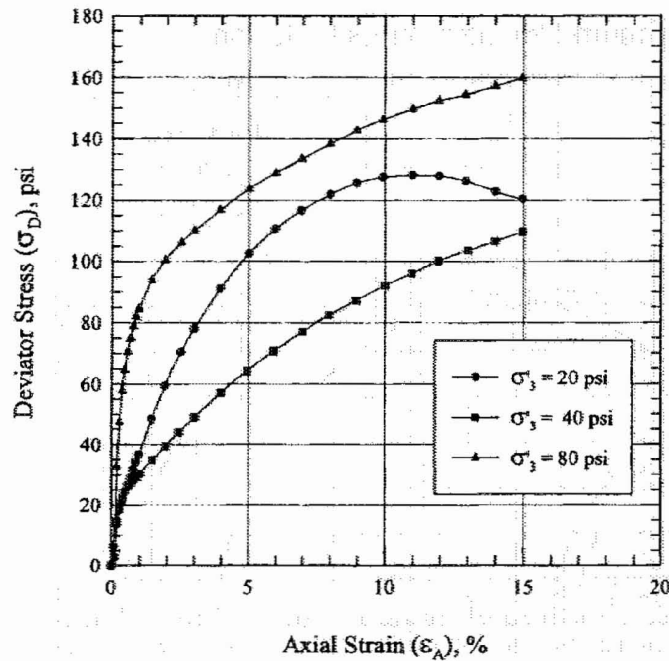
PI: NP

%<200: 15.3

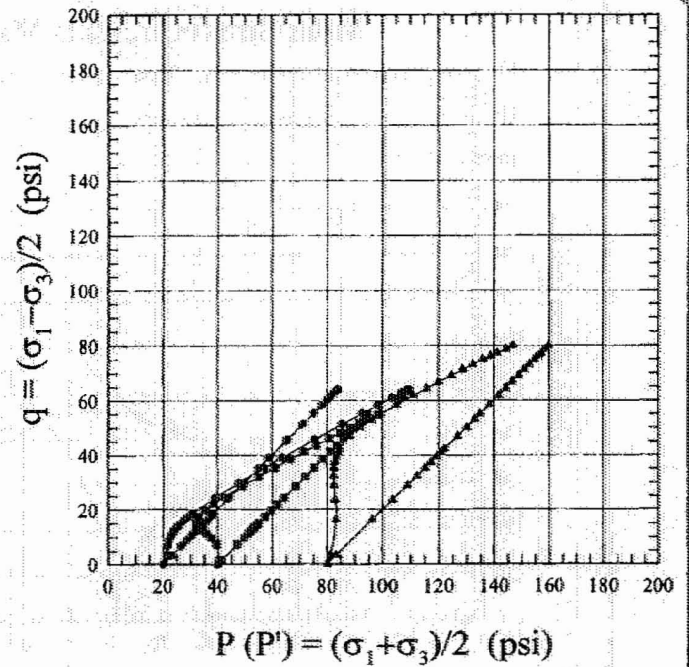


Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

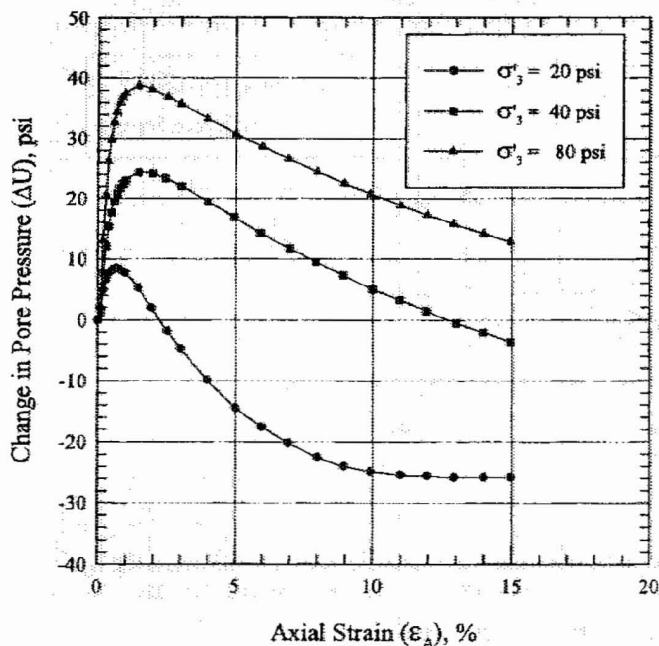
Deviator Stress vs. Axial Strain



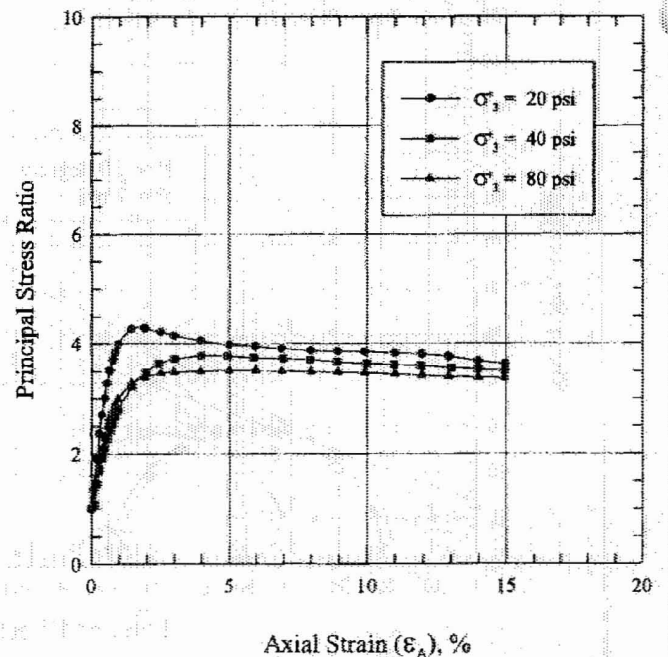
Stress Paths



Change in Pore Pressure vs. Axial Strain



Principal Stress Ratio vs. Axial Strain



Boring No.: B-321

Depth: 73.5-75.5 ft

SEI Contract: 06120048

Date: 10/20/06

Sample Description: Fine SILTY SAND (SM) - gray

Reviewed By: CJS

Specimen Type: Tube Sample

Specific Gravity: 2.67

LL: ---

PI: NP

%<200: 15.3



Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland



Consolidated Undrained Triaxial Compression Test

Project: Calvert Cliffs Nuclear Power Plant

Location: Calvert County, MD

ASTM D4767

Schnabel Contract: 06120048

Boring No.: B-321

Depth: 73.5-75.5ft.

Elevation: -2.8 to -4.8

Confining Stress (psi): 20.0

Date: 10/20/2006

Reviewed by: CJS

	Specimen Conditions	
	Initial	Consolidated
Diameter (in.)	2.896	2.88
Height (in.)	5.833	5.81
Area (in ²)	6.59	6.53
Moisture (%)	21.9	
W _{soils} (lbs)	2.23	
ρ _{wet} (pcf)	122.0	
ρ _{dry} (pcf)	100.1	101.3
Void Ratio	0.66	0.64
Saturation, %	88	100

Shear Testing Conditions	
Cell Pressure (psi):	40.0
Back Pressure (psi):	20.0
Eff. Confining Stress (psi):	20.0
Final B check	0.95
t ₉₀ (min.):	0.1
Rate of Strain (%/min):	0.125

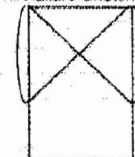
Filter strips used? NO

Specimen Type: Tube Sample

Soil Description: Fine SILTY SAND (SM) - gray

Liquid Limit: ---
Plasticity Index: NP
% finer than No. 200: 16.3
Specific Gravity: 2.67

Failure Sketch



Remarks:

Reading No.	Deviator Load (lbs)	Corrected 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	20.0	0.0	6.53	20.0	20.0	20.0	20.0	0.0	1.00	0.00	20.0	20.0	0.0
1	41.9	41.9	0.005	0.09	22.0	2.0	6.54	26.4	20.0	24.4	18.0	6.4	1.36	0.31	23.2	21.2	3.2
2	89.5	89.5	0.011	0.19	24.9	4.9	6.56	33.7	20.0	28.8	15.1	13.7	1.91	0.36	26.8	21.9	6.8
3	118.7	118.6	0.017	0.29	26.6	6.6	6.55	38.1	20.0	31.5	13.4	18.1	2.36	0.36	29.1	22.5	9.1
4	139.9	139.6	0.022	0.38	27.5	7.5	6.56	41.3	20.0	33.8	12.5	21.3	2.71	0.35	30.7	23.2	10.7
5	157.9	157.6	0.028	0.48	28.0	8.0	6.57	44.0	20.0	36.0	12.0	24.0	3.00	0.33	32.0	24.0	12.0
6	175.2	175.1	0.033	0.57	28.3	8.3	6.57	46.6	20.0	38.3	11.7	26.6	3.28	0.31	33.3	25.0	13.3
7	191.9	191.8	0.039	0.67	28.4	8.4	6.58	49.2	20.0	40.8	11.6	29.2	3.51	0.29	34.6	26.2	14.6
8	208.9	208.7	0.045	0.77	28.3	8.3	6.58	51.7	20.0	43.4	11.7	31.7	3.71	0.26	35.8	27.5	15.8
9	225.0	224.6	0.050	0.86	28.0	8.0	6.59	54.1	20.0	46.1	12.0	34.1	3.84	0.23	37.1	29.1	17.1
10	241.8	241.6	0.056	0.96	27.7	7.7	6.60	56.6	20.0	48.9	12.3	36.6	3.98	0.21	38.3	30.6	18.3
11	320.8	320.5	0.084	1.45	25.2	5.2	6.63	68.3	20.0	83.1	14.8	48.3	4.27	0.11	44.2	39.0	24.2
12	395.9	395.5	0.112	1.93	21.9	1.9	6.66	79.4	20.0	77.5	18.1	59.4	4.23	0.03	49.7	47.8	29.7
13	472.1	471.6	0.146	2.51	18.1	-1.9	6.70	90.4	20.0	92.3	21.9	70.4	4.21	-0.03	55.2	57.1	35.2
14	525.2	524.5	0.174	2.99	15.2	-4.8	6.74	97.9	20.0	102.7	23.8	77.9	4.14	-0.06	58.9	63.7	38.9
15	620.7	619.8	0.230	3.98	10.1	-9.9	6.80	111.1	20.0	121.0	29.9	91.1	4.05	-0.11	65.6	75.5	45.6
16	706.2	705.1	0.291	5.01	5.5	-14.5	6.88	122.5	20.0	137.0	34.5	102.5	3.97	-0.14	71.3	85.6	51.3
17	789.6	788.3	0.347	5.97	2.4	-17.6	6.95	130.8	20.0	148.2	37.6	110.6	3.94	-0.16	75.3	92.9	55.3
18	820.2	818.7	0.403	6.94	-0.2	-20.2	7.02	136.6	20.0	156.8	40.2	116.6	3.90	-0.17	78.3	98.5	58.3
19	868.5	864.6	0.465	8.00	-2.5	-22.5	7.10	141.8	20.0	164.3	42.5	121.8	3.86	-0.18	80.9	103.4	60.9
20	903.4	901.4	0.521	8.97	-4.0	-24.0	7.18	145.6	20.0	169.6	44.0	125.6	3.85	-0.19	82.8	106.8	62.8
21	927.0	924.8	0.577	9.93	-4.8	-24.8	7.25	147.5	20.0	172.3	44.8	127.5	3.85	-0.19	83.7	108.5	63.7
22	942.7	940.3	0.639	11.00	-5.4	-25.4	7.34	148.1	20.0	173.5	45.4	128.1	3.82	-0.20	84.0	109.4	64.0
23	951.5	948.9	0.695	11.86	-5.8	-25.6	7.42	147.9	20.0	173.5	45.6	127.9	3.80	-0.20	83.9	109.5	63.9
24	950.3	947.5	0.761	12.92	-5.8	-25.6	7.50	146.3	20.0	172.1	45.8	126.3	3.76	-0.20	83.1	108.9	63.1
25	935.1	932.1	0.813	13.99	-5.8	-25.8	7.60	142.7	20.0	168.5	45.8	122.7	3.68	-0.21	81.3	107.1	61.3
26	927.1	923.8	0.869	14.95	-5.8	-25.8	7.68	140.2	20.0	166.0	45.8	120.2	3.63	-0.21	80.1	105.9	60.1

Notes: 1. Deviator load corrected for membrane and filter cage (if applicable) effects.

2. Right Cylinder Correction Method

CU 6/2006 Rev. 0



Consolidated Undrained Triaxial Compression Test

Project: Calvert Cliffs Nuclear Power Plant

Location: Calvert County, MD

ASTM D4767

Schnabel Contract: 06120048

Boring No.: B-321

Depth: 73.5-75.5ft.

Elevation: -2.8 to -4.8

Confining Stress (psi): 40.0

Date: 10/20/2006

Reviewed by: CJS

	Specimen Conditions	
	Initial	Consolidated
Diameter (in)	2.881	2.86
Height (in)	5.808	5.78
Area (in ²)	6.52	6.41
Moisture (%)	28.5	
W _{soils} (lbs)	2.04	
ρ _{wet} (pcf)	119.7	
ρ _{dry} (pcf)	93.2	95.3
Void Ratio	0.79	0.75
Saturation, %	97	98

Shear Testing Conditions	
Cell Pressure (psi)	55.0
Back Pressure (psi)	15.0
Eff. Confining Stress (psi)	40.0
Final B check	0.98
t ₅₀ (min.)	0.1
Rate of Strain (%/min)	0.125

Filter strips used? NO

Specimen Type: Tube Sample

Soil Description: Fine SILTY SAND (SM) - gray

Liquid Limit: —
Plasticity Index: NP
% finer than No. 200: 15.3
Specific Gravity: 2.67

Remarks:

Failure Sketch



Reading No.	Deviator Load (lbs)	Corrected 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	15.0	0.0	6.41	40.0	40.0	40.0	40.0	0.0	1.00	0.00	40.0	40.0	0.0
1	18.2	18.2	0.008	0.10	16.2	1.2	6.42	42.8	40.0	41.6	38.8	2.8	1.07	0.42	41.4	40.2	1.4
2	92.8	92.8	0.012	0.21	22.6	7.6	6.42	54.4	40.0	46.8	32.4	14.4	1.45	0.53	47.2	39.6	7.2
3	125.4	125.3	0.017	0.29	27.1	12.1	6.43	59.5	40.0	47.4	27.9	19.5	1.70	0.62	49.7	37.6	9.7
4	145.4	145.3	0.023	0.40	30.3	15.3	6.43	62.8	40.0	47.3	24.7	22.6	1.91	0.68	51.3	36.0	11.3
5	158.4	158.3	0.028	0.48	32.8	17.8	6.44	64.6	40.0	47.0	22.4	24.6	2.10	0.72	52.3	34.7	12.3
6	168.6	168.5	0.034	0.59	34.4	19.4	6.45	66.1	40.0	46.7	20.8	26.1	2.27	0.74	53.1	33.7	13.1
7	177.0	176.9	0.040	0.69	35.7	20.7	6.45	67.4	40.0	46.7	19.3	27.4	2.42	0.76	53.7	33.0	13.7
8	183.8	183.6	0.045	0.76	36.7	21.7	6.46	68.4	40.0	46.7	18.3	28.4	2.55	0.76	54.2	32.5	14.2
9	190.3	190.1	0.051	0.88	37.4	22.4	6.47	69.4	40.0	47.0	17.6	29.4	2.67	0.76	54.7	32.3	14.7
10	198.8	198.6	0.057	0.99	38.0	23.0	6.47	70.4	40.0	47.4	17.0	30.4	2.79	0.76	55.2	32.2	15.2
11	226.8	226.5	0.085	1.47	39.3	24.3	6.50	74.8	40.0	50.5	15.7	34.8	3.22	0.70	57.4	33.1	17.4
12	257.9	257.5	0.113	1.95	39.1	24.1	6.54	79.4	40.0	55.3	15.9	39.4	3.48	0.61	59.7	35.6	19.7
13	289.1	288.6	0.141	2.44	38.3	23.3	6.57	83.9	40.0	60.6	16.7	43.9	3.63	0.53	62.0	38.7	22.0
14	323.8	323.2	0.174	3.01	37.0	22.0	6.61	88.9	40.0	66.9	18.0	48.9	3.72	0.45	64.5	42.5	24.5
15	382.3	381.4	0.230	3.98	34.4	19.4	6.67	97.2	40.0	77.8	20.6	57.2	3.77	0.34	68.6	49.2	28.6
16	434.0	432.9	0.288	4.95	31.8	16.8	6.74	104.2	40.0	87.4	23.2	64.2	3.77	0.26	72.1	55.3	32.1
17	482.8	481.5	0.342	5.92	29.2	14.2	6.81	110.7	40.0	96.5	25.9	70.7	3.74	0.20	75.3	61.1	35.3
18	532.6	531.1	0.404	6.99	28.7	11.7	6.89	117.1	40.0	105.4	28.3	77.1	3.72	0.15	78.5	66.8	38.5
19	575.7	574.0	0.460	7.96	24.5	9.5	6.96	122.4	40.0	112.9	30.5	82.4	3.70	0.12	81.2	71.7	41.2
20	614.8	612.9	0.518	8.93	22.3	7.3	7.04	127.1	40.0	119.8	32.7	87.1	3.66	0.08	83.5	76.2	43.5
21	658.6	656.4	0.578	10.00	20.0	5.0	7.12	132.2	40.0	127.2	35.0	92.2	3.63	0.05	86.1	81.1	46.1
22	694.2	691.8	0.634	10.97	18.2	3.2	7.20	136.1	40.0	132.9	36.8	96.1	3.61	0.03	88.1	84.9	48.1
23	731.3	728.7	0.690	11.94	16.4	1.4	7.28	140.1	40.0	138.7	38.6	100.1	3.59	0.01	90.1	88.7	50.1
24	766.1	763.3	0.752	13.01	14.5	-0.5	7.37	143.6	40.0	144.1	40.5	103.6	3.56	0.00	91.8	92.3	51.8
25	797.0	794.0	0.808	13.98	12.9	-2.1	7.45	146.6	40.0	148.7	42.1	106.6	3.53	-0.02	93.3	95.4	53.3
26	829.2	826.0	0.864	14.95	11.3	-3.7	7.53	149.6	40.0	153.3	43.7	109.6	3.51	-0.03	94.8	98.5	54.8

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