

**APPENDIX F.2**

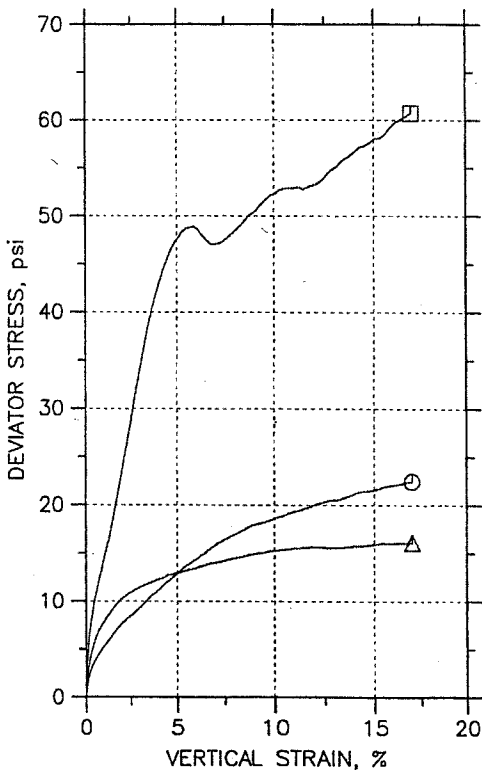
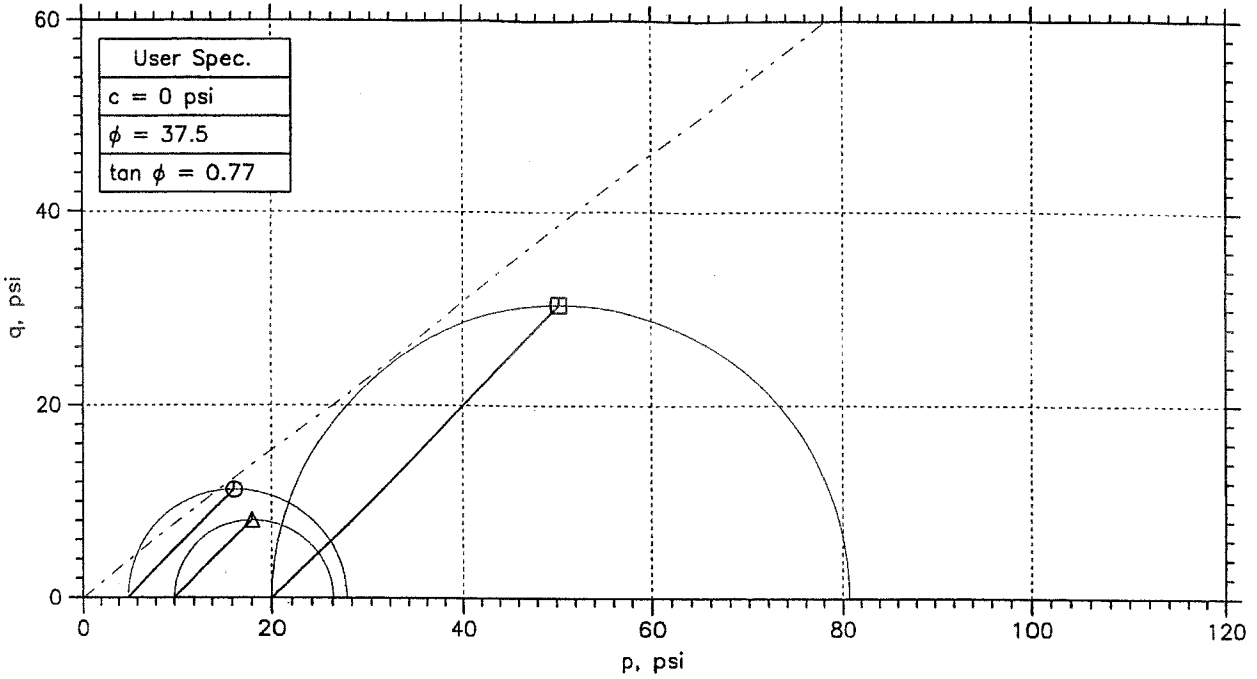
**SOIL STRENGTH TESTS**

**NORTH ANNA COL**

**DATA REPORT REV. 0  
JANUARY 23, 2007**

**MACTEC PROJECT NO. 6468-06-1472**

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△	□	
Sample No.	UD-2	UD-2	UD-2	
Test No.	6765.1	6765.2	6765.3	
Depth	10 ft.	10.5 ft.	11.0 ft.	
Initial	Diameter, in	2.876	2.847	2.841
	Height, in	5.6	6	6
	Water Content, %	17.8	14.7	14.1
	Dry Density, pcf	95.68	90.04	103.9
	Saturation, %	63.0	45.6	61.4
Before Shear	Void Ratio	0.762	0.872	0.622
	Water Content, %	25.7	26.7	20.8
	Dry Density, pcf	99.54	97.95	107.9
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.693	0.721	0.562
Back Press., psi	105.	110.	105.	
Ver. Eff. Cons. Stress, psi	4.999	10.01	20.01	
Shear Strength, psi	11.22	8.036	30.34	
Strain at Failure, %	17	17	17	
Strain Rate, %/min	0.1	0.1	0.1	
B-Value	0.95	0.94	0.92	
Estimated Specific Gravity	2.7	2.7	2.7	
Liquid Limit	---	---	---	
Plastic Limit	---	---	---	

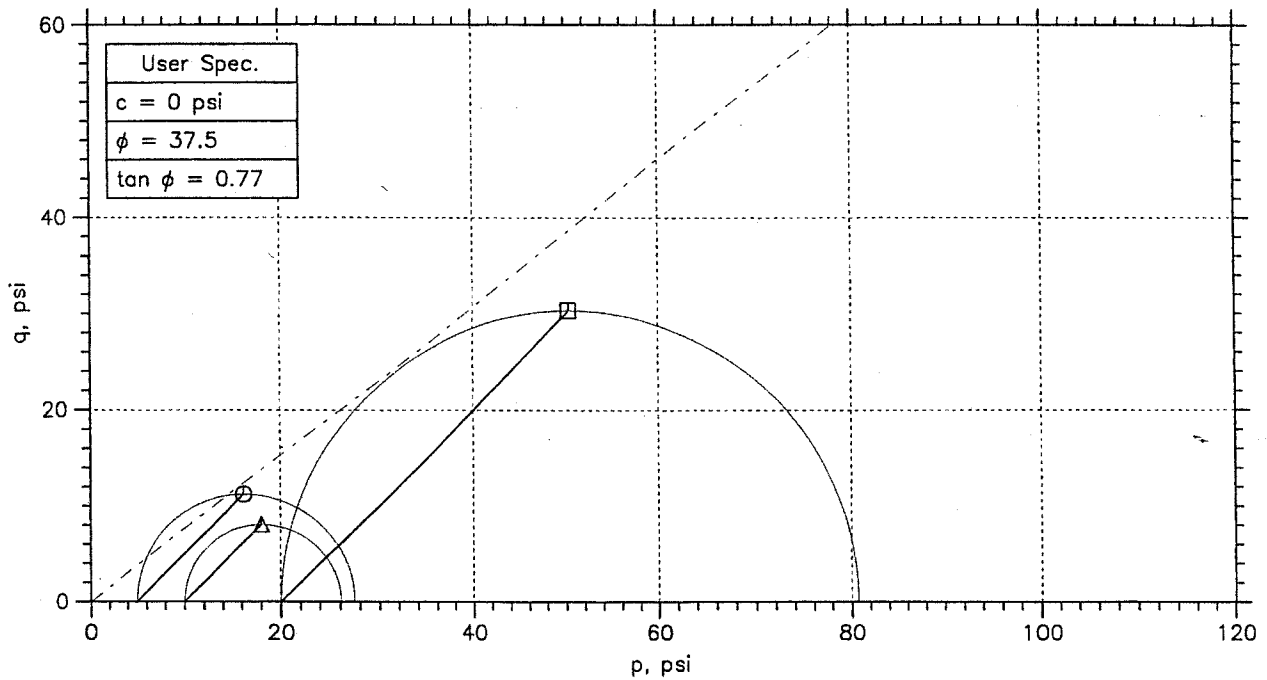
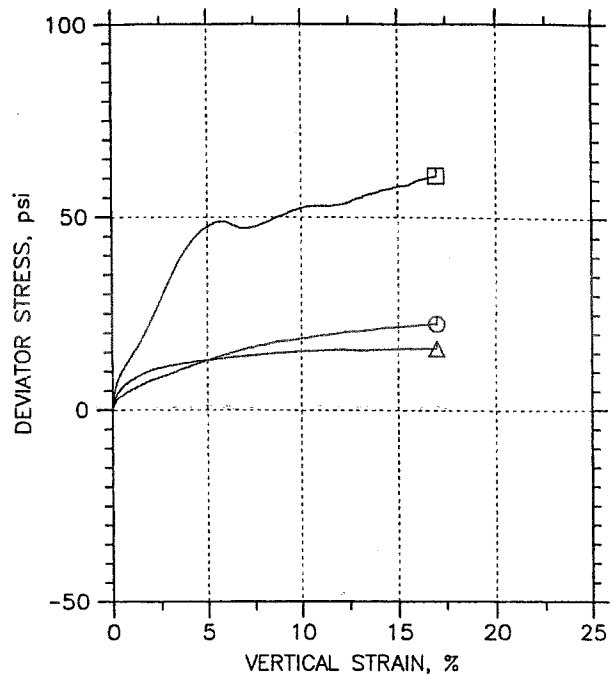
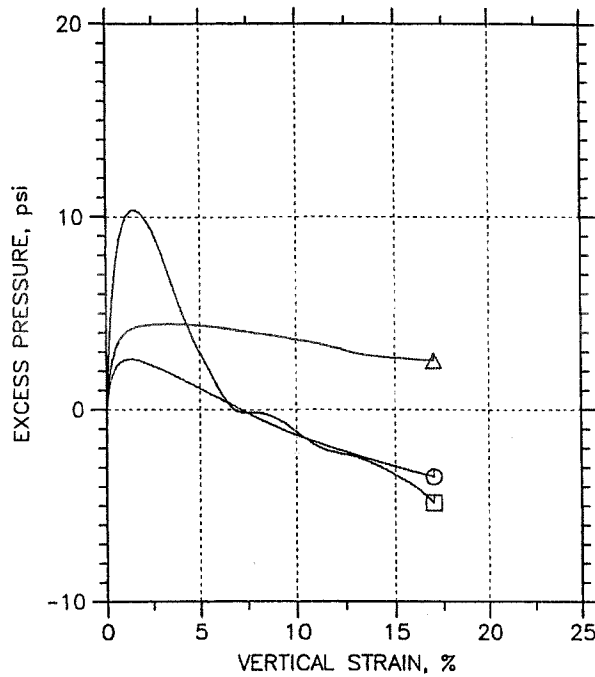
Project: North Anna COL	
Location: B-901 UD-2 @ 9.5-11.5'	
Project No.: 6468061472	
Boring No.: B-901	
Sample Type: Shelby Tube	
Description: Tan Brown Silty Sand	
Remarks: ASTM D 4767-04	

Phase calculations based on start and end of test.

Wed, 03-JAN-2007 14:45:05

\* Saturation is set to 100% for phase calculations.

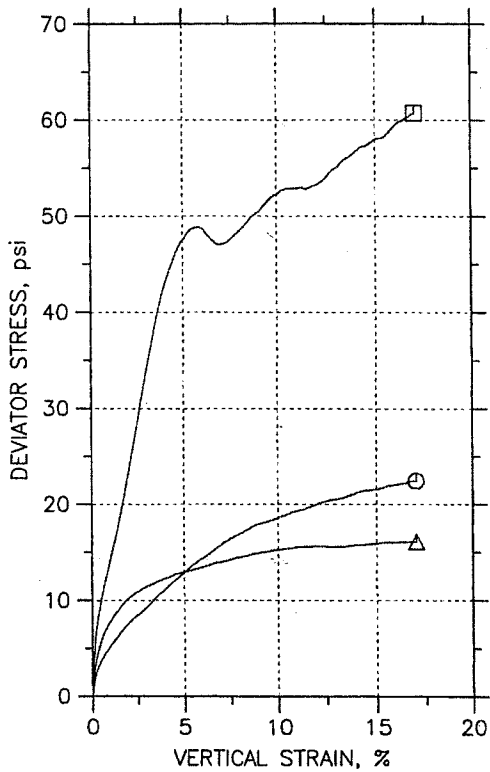
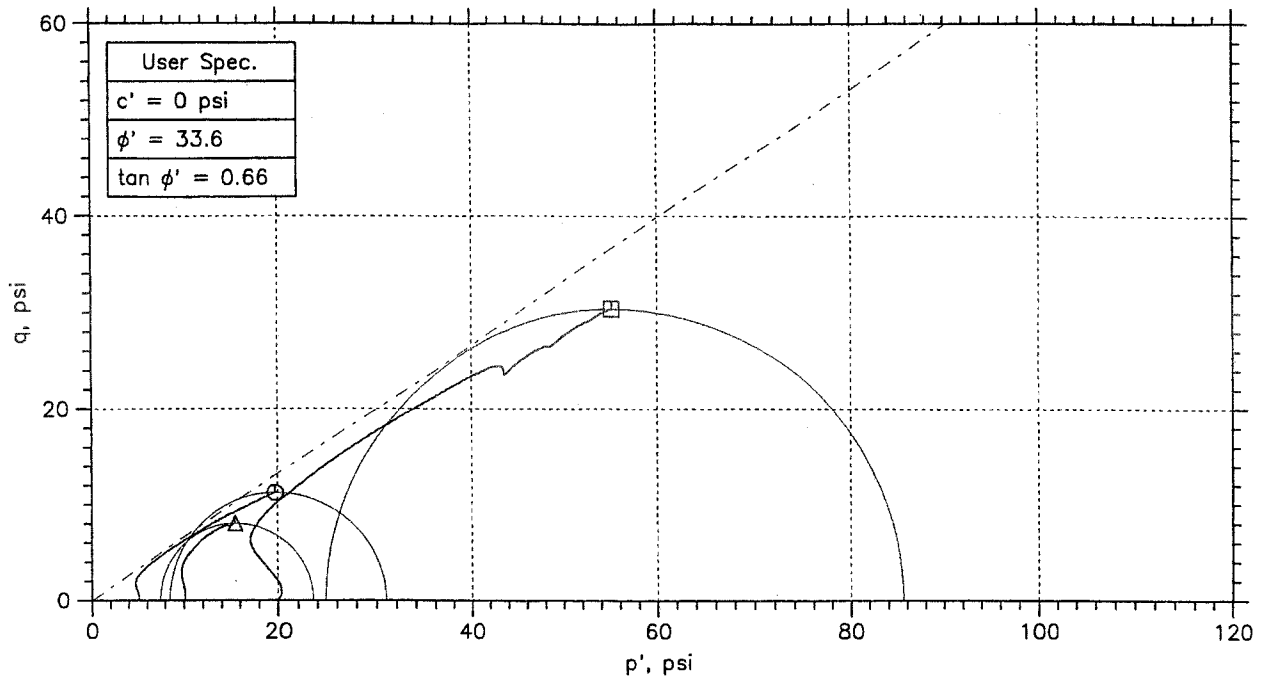
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	UD-2	6765.1	10 ft.	HJ	12/5/06	JL	1/2/07	6765.1_65.dat
△	UD-2	6765.2	10.5 ft.	HJ	12/5/06	JL	1/2/07	6765.2_68.dat
□	UD-2	6765.3	11.0 ft.	HJ	12/5/06	JL	1/2/07	6765.3_71.dat

Project: North Anna COL		Location: B-901 UD-2 @ 9.5-11.5		Project No.: 6468061472	
Boring No.: B-901		Sample Type: Shelby Tube			
Description: Tan Brown Silty Sand					
Remarks: ASTM D 4767-04					

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	○	△	□	
Sample No.	UD-2	UD-2	UD-2	
Test No.	6765.1	6765.2	6765.3	
Depth	10 ft.	10.5 ft.	11.0 ft.	
Initial	Diameter, in	2.876	2.847	2.841
	Height, in	5.6	6	6
	Water Content, %	17.8	14.7	14.1
	Dry Density, pcf	95.68	90.04	103.9
	Saturation, %	63.0	45.6	61.4
Before Shear	Void Ratio	0.762	0.872	0.622
	Water Content, %	25.7	26.7	20.8
	Dry Density, pcf	99.54	97.95	107.9
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.693	0.721	0.562
Back Press., psi	105.	110.	105.	
Ver. Eff. Cons. Stress, psi	4.999	10.01	20.01	
Shear Strength, psi	11.22	8.036	30.34	
Strain at Failure, %	17	17	17	
Strain Rate, %/min	0.1	0.1	0.1	
B-Value	0.95	0.94	0.92	
Estimated Specific Gravity	2.7	2.7	2.7	
Liquid Limit	---	---	---	
Plastic Limit	---	---	---	

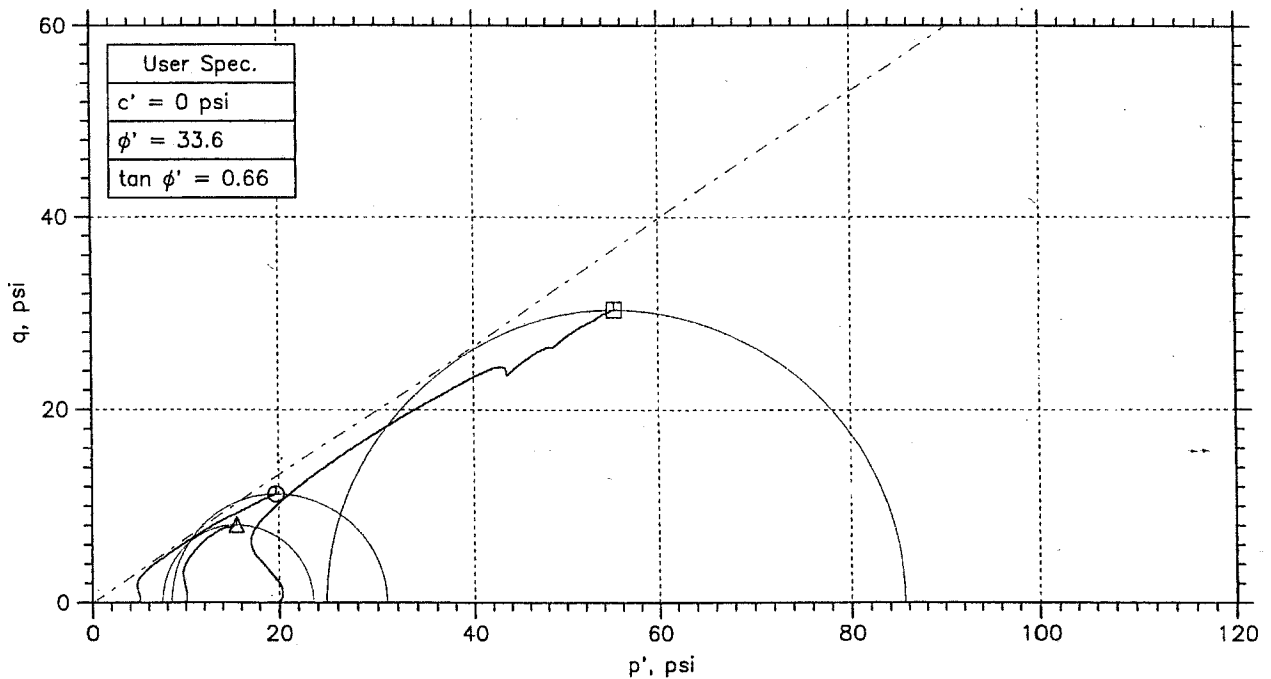
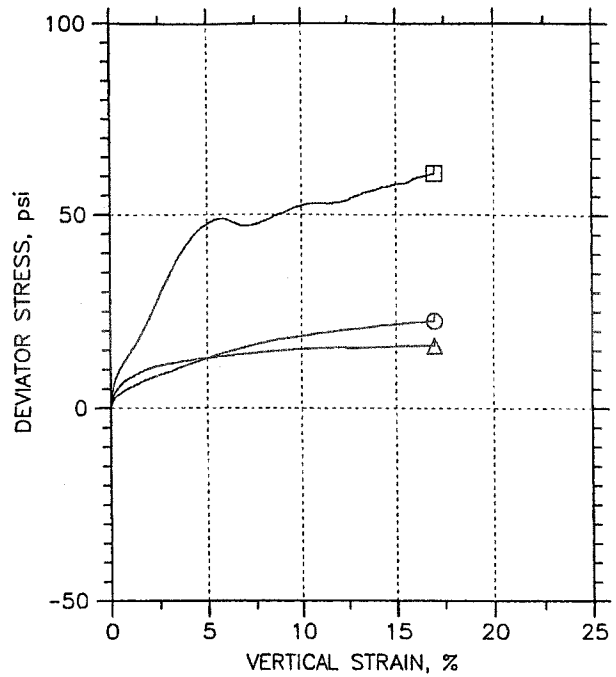
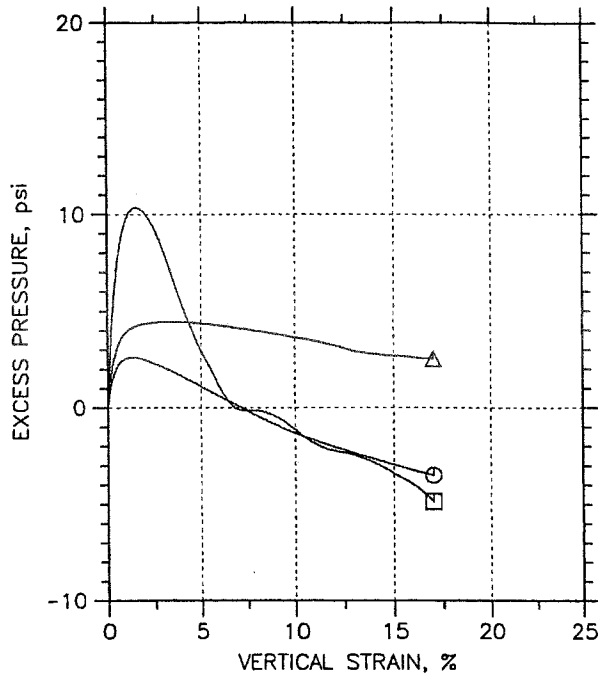
Project: North Anna COL Location: B-901 UD-2 @ 9.5-11.5' Project No.: 6468061472 Boring No.: B-901 Sample Type: Shelby Tube Description: Tan Brown Silty Sand Remarks: ASTM D 4767-04	
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Phase calculations based on start and end of test.

Wed, 03-JAN-2007 14:45:41

\* Saturation is set to 100% for phase calculations.

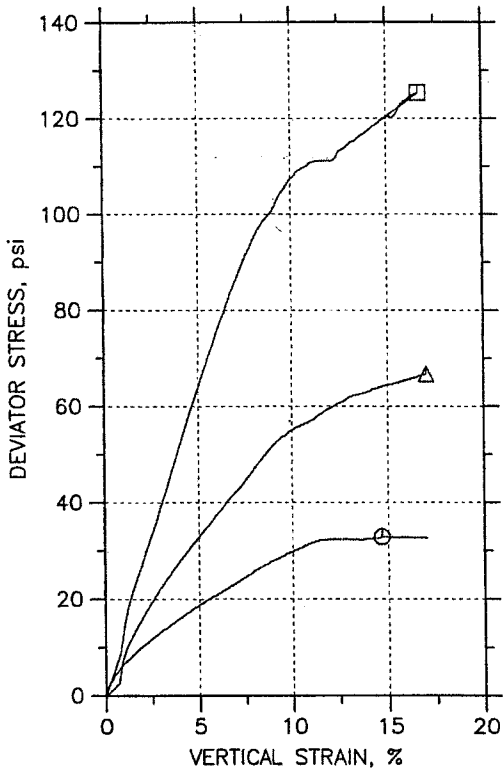
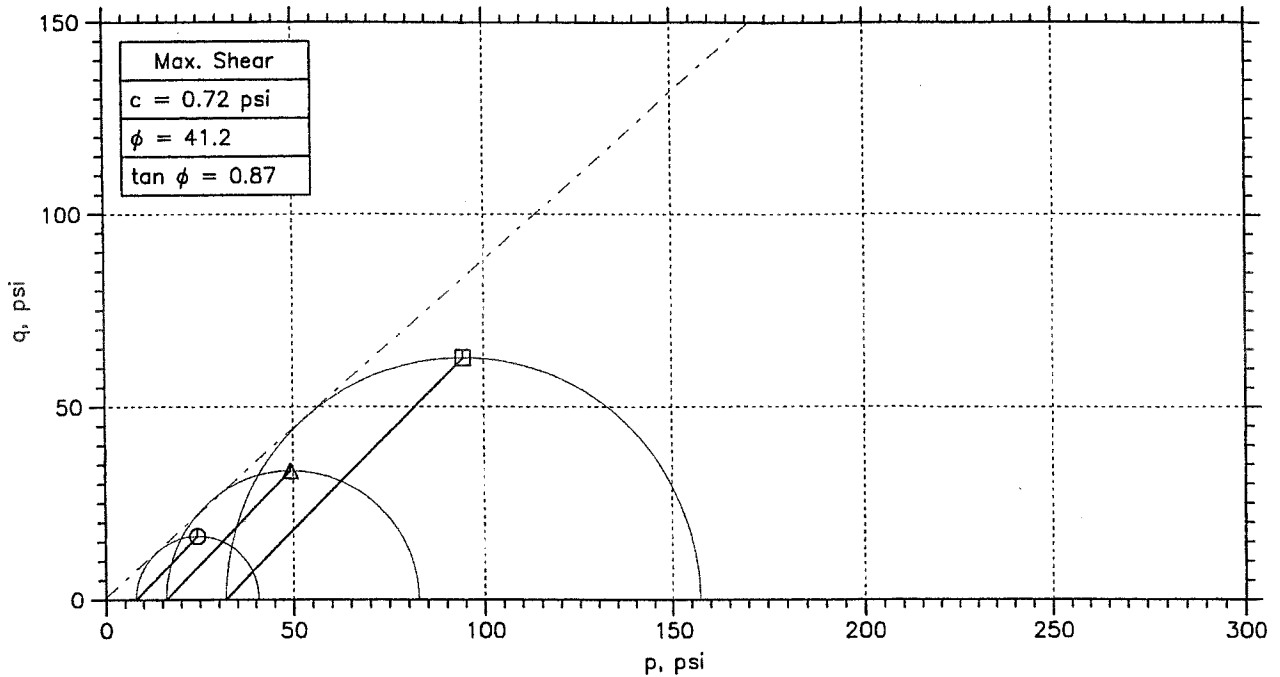
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	UD-2	6765.1	10 ft.	HJ	12/5/06	JL	1/2/07	6765.1_65.dat
△	UD-2	6765.2	10.5 ft.	HJ	12/5/06	JL	1/2/07	6765.2_68.dat
□	UD-2	6765.3	11.0 ft.	HJ	12/5/06	JL	1/2/07	6765.3_71.dat

Project: North Anna COL		Location: B-901 UD-2 @ 9.5-11.5		Project No.: 6468061472	
Boring No.: B-901		Sample Type: Shelby Tube			
Description: Tan Brown Silty Sand					
Remarks: ASTM D 4767-04					

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△	□	
Sample No.	UD-3	UD-3	UD-3	
Test No.	6767.1	6767.2	6767.3	
Depth	20.5 ft.	21 ft.	21.5 ft.	
Initial	Diameter, in	2.869	2.857	2.84
	Height, in	6	6	6
	Water Content, %	18.9	17.0	15.3
	Dry Density, pcf	103.5	106.4	110.9
	Saturation, %	81.2	78.5	79.6
Before Shear	Void Ratio	0.629	0.584	0.52
	Water Content, %	21.3	19.8	17.5
	Dry Density, pcf	107.	109.8	114.5
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.575	0.535	0.472
Back Press., psi	77.	110.	83.99	
Ver. Eff. Cons. Stress, psi	7.998	15.99	32.01	
Shear Strength, psi	16.4	33.3	62.65	
Strain at Failure, %	14.7	17	16.7	
Strain Rate, %/min	0.1	0.1	0.1	
B-Value	0.95	0.98	0.95	
Estimated Specific Gravity	2.7	2.7	2.7	
Liquid Limit	---	---	---	
Plastic Limit	---	---	---	

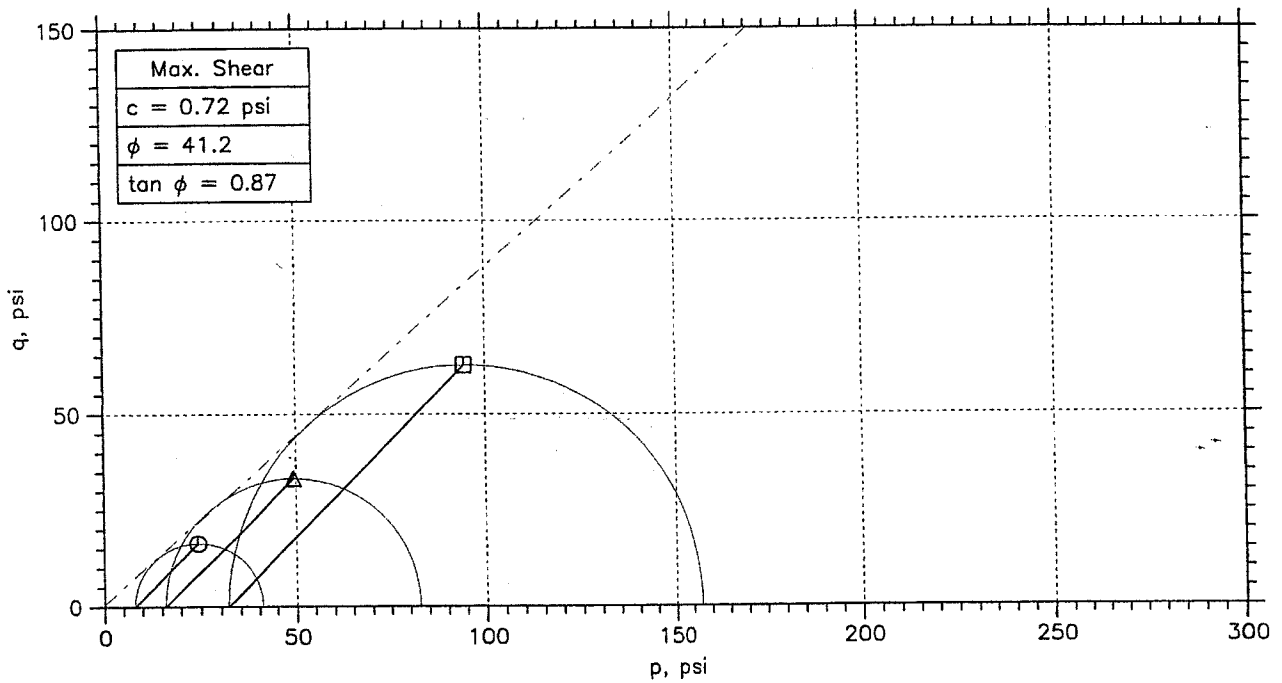
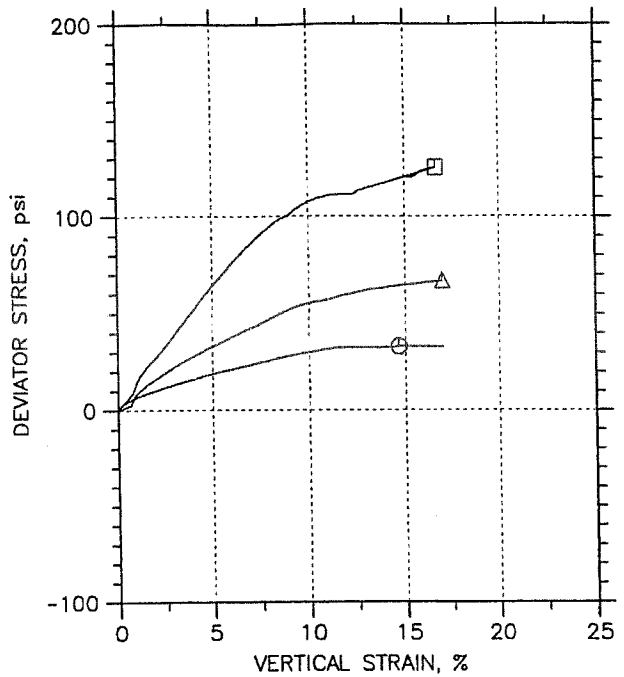
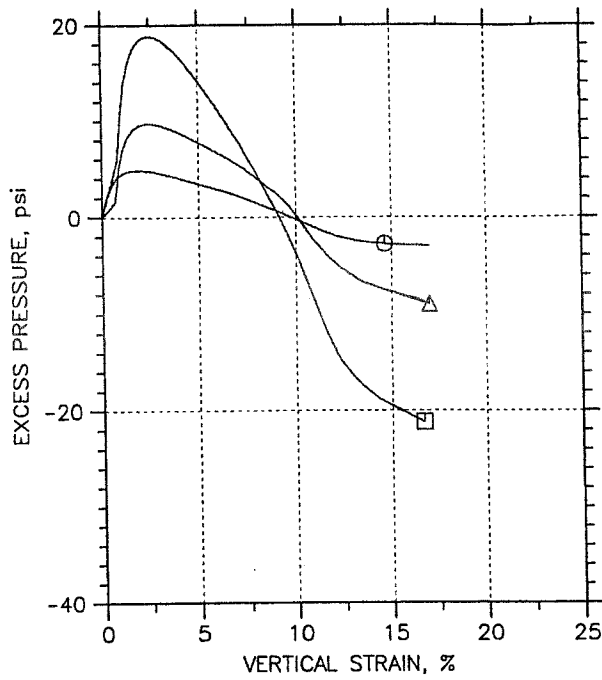
Project: North Anna COL Location: B-928A UD-3 @ 20-22' Project No.: 6468061472 Boring No.: B-928A Sample Type: Shelby Tube Description: Tan Silty Sand Remarks: ASTM D 4767-04	
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Phase calculations based on start and end of test.

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\* Saturation is set to 100% for phase calculations.

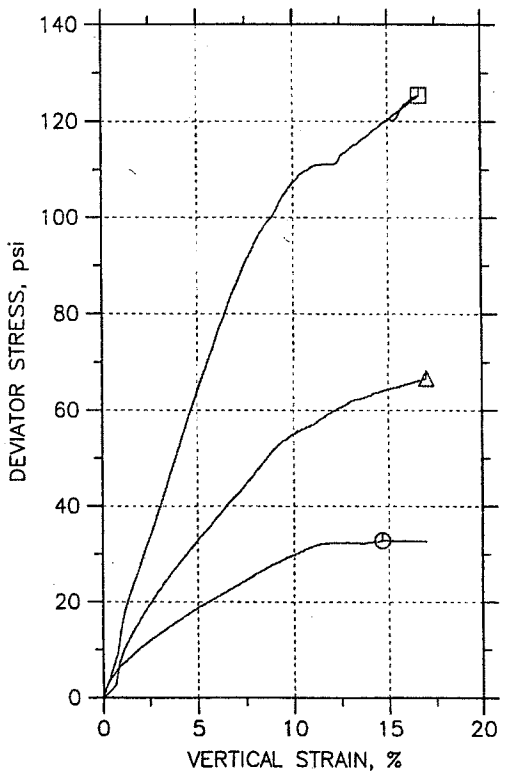
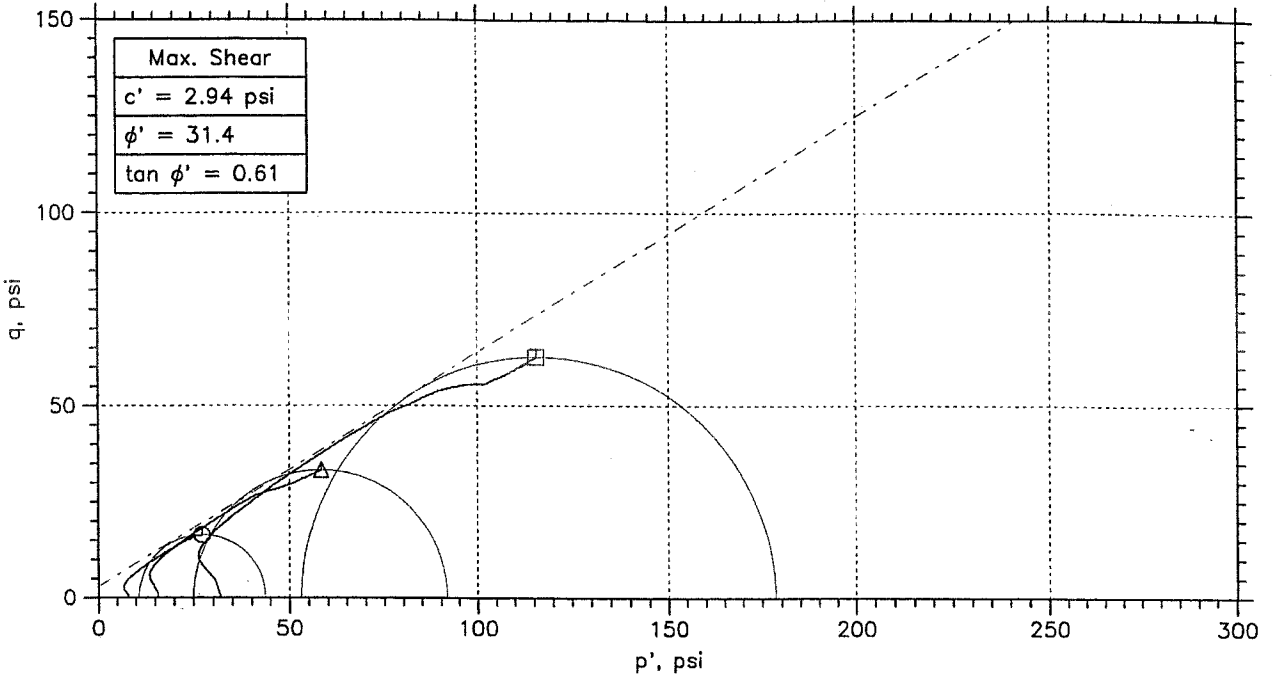
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	UD-3	6767.1	20.5 ft.	HJ	12/6/06	JL	1/2/07 6767.1_65.dat
△	UD-3	6767.2	21 ft.	HJ	12/6/06	JL	1/2/07 6767.2_68.dat
□	UD-3	6767.3	21.5 ft.	HJ	12/6/06	JL	1/2/07 6767.3_71.dat

Project: North Anna COL	Location: B-928A UD-3 @ 20-22	Project No.: 6468061472
Boring No.: B-928A	Sample Type: Shelby Tube	
Description: Tan Silty Sand		
Remarks: ASTM D 4767-04		

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△	□	
Sample No.	UD-3	UD-3	UD-3	
Test No.	6767.1	6767.2	6767.3	
Depth	20.5 ft.	21 ft.	21.5 ft.	
Initial	Diameter, in	2.869	2.857	2.84
	Height, in	6	6	6
	Water Content, %	18.9	17.0	15.3
	Dry Density, pcf	103.5	106.4	110.9
	Saturation, %	81.2	78.5	79.6
Before Shear	Void Ratio	0.629	0.584	0.52
	Water Content, %	21.3	19.8	17.5
	Dry Density, pcf	107.	109.8	114.5
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.575	0.535	0.472
Back Press., psi	77.	110.	83.99	
Ver. Eff. Cons. Stress, psi	7.998	15.99	32.01	
Shear Strength, psi	16.4	33.3	62.65	
Strain at Failure, %	14.7	17	16.7	
Strain Rate, %/min	0.1	0.1	0.1	
B-Value	0.95	0.98	0.95	
Estimated Specific Gravity	2.7	2.7	2.7	
Liquid Limit	---	---	---	
Plastic Limit	---	---	---	

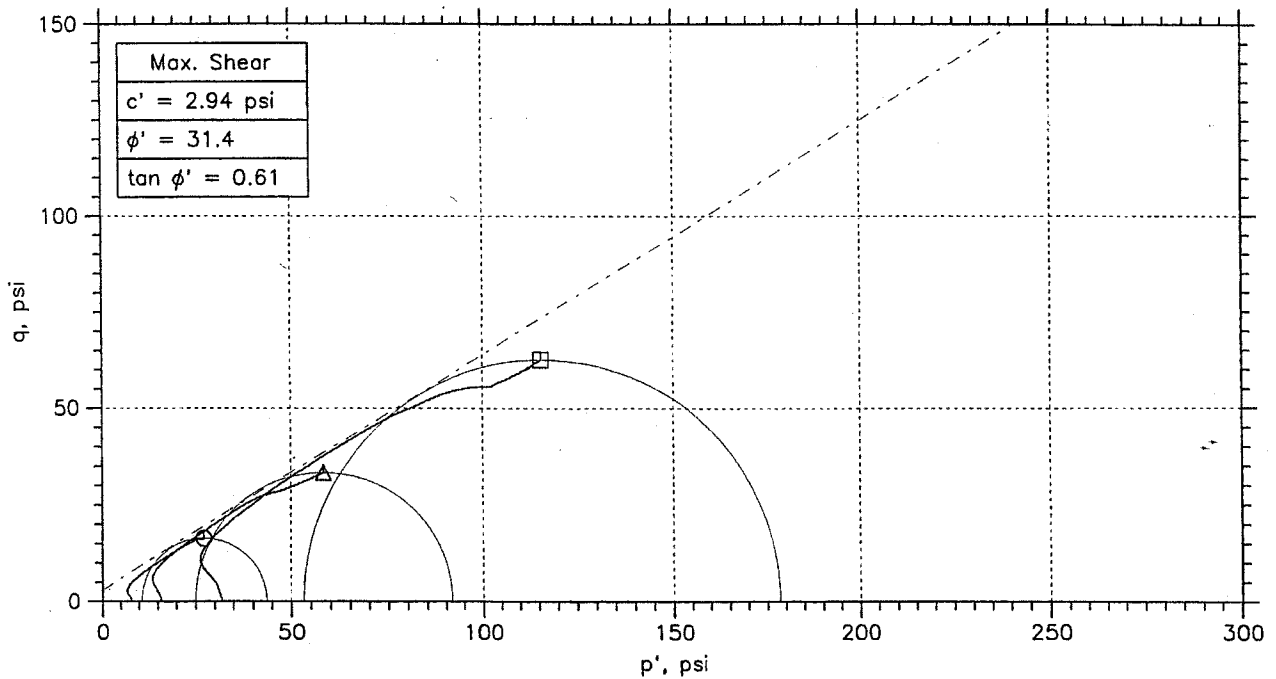
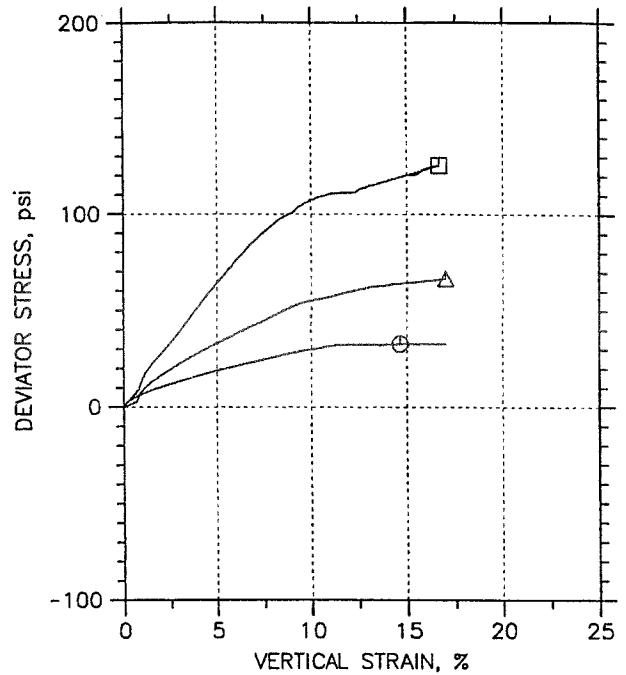
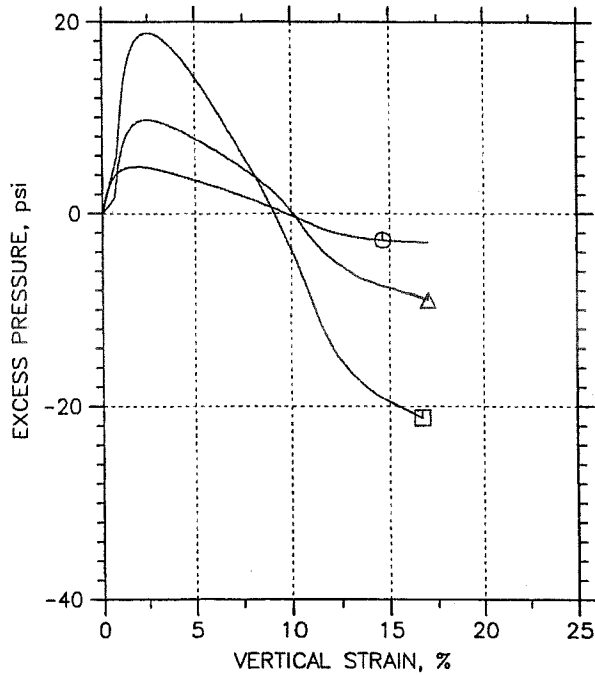
Project: North Anna COL Location: B-928A UD-3 @ 20-22' Project No.: 6468061472 Boring No.: B-928A Sample Type: Shelby Tube Description: Tan Silty Sand Remarks: ASTM D 4767-04	
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Phase calculations based on start and end of test.

\* Saturation is set to 100% for phase calculations.



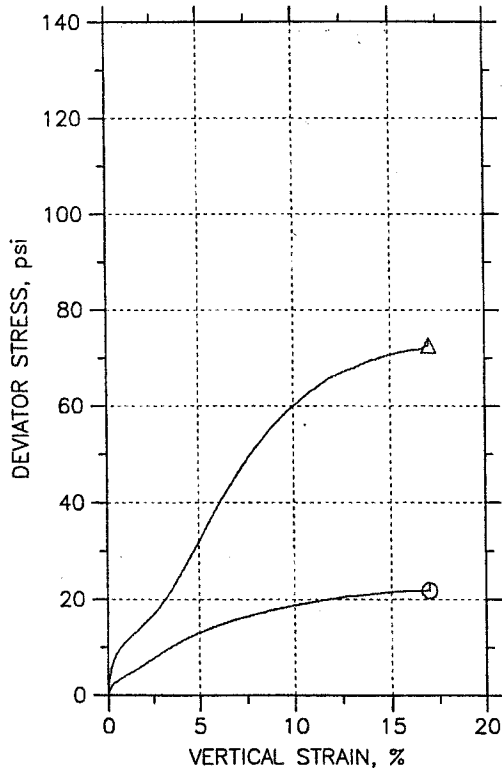
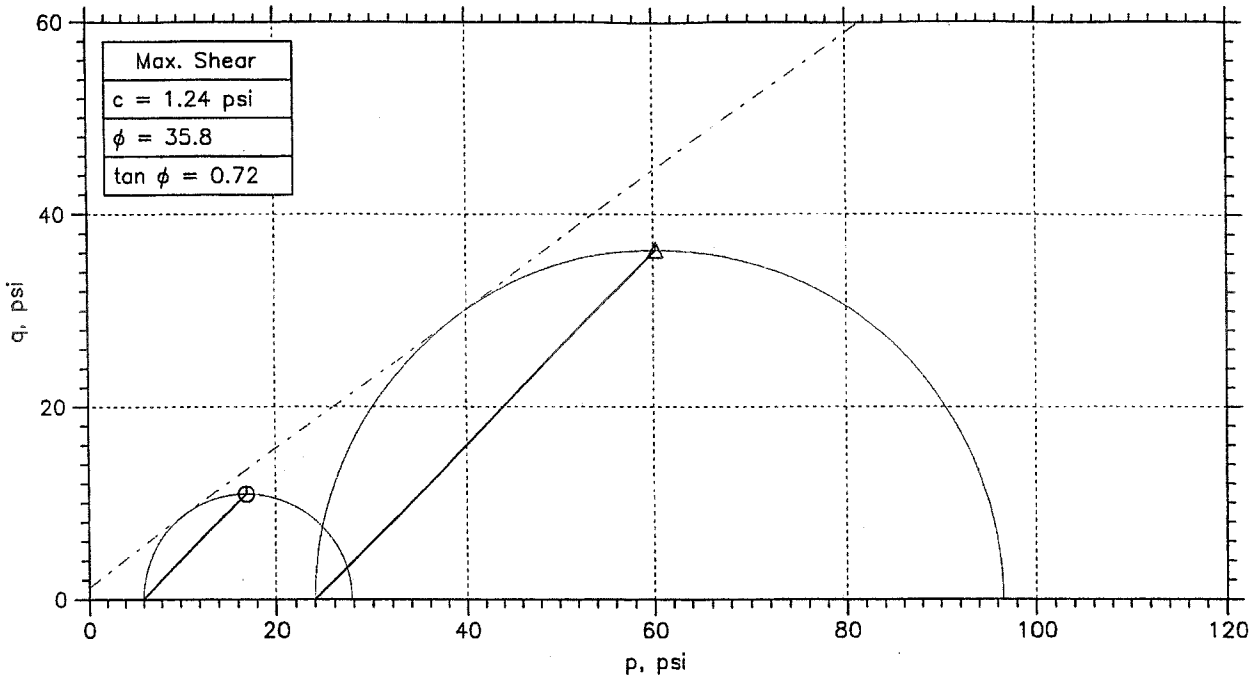
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	UD-3	6767.1	20.5 ft.	HJ	12/6/06	JL	1/2/07	6767.1_65.dat
△	UD-3	6767.2	21 ft.	HJ	12/6/06	JL	1/2/07	6767.2_68.dat
□	UD-3	6767.3	21.5 ft.	HJ	12/6/06	JL	1/2/07	6767.3_71.dat

	Project: North Anna COL		Location: B-928A UD-3 @ 20-22		Project No.: 6468061472	
	Boring No.: B-928A		Sample Type: Shelby Tube			
	Description: Tan Silty Sand					
	Remarks: ASTM D 4767-04					

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	○	△		
Sample No.	UD-1	UD-1		
Test No.	6768.1	6768.2		
Depth	15.5 ft.	16 ft.		
Initial	Diameter, in	2.872	2.853	
	Height, in	5.6	6	
	Water Content, %	13.5	12.4	
	Dry Density, pcf	93.03	99.21	
	Saturation, %	45.0	47.8	
Before Shear	Void Ratio	0.812	0.699	
	Water Content, %	25.1	21.2	
	Dry Density, pcf	100.5	107.2	
	Saturation*, %	100.0	100.0	
	Void Ratio	0.677	0.572	
	Back Press., psi	104.9	109.9	
	Ver. Eff. Cons. Stress, psi	5.997	24.	
	Shear Strength, psi	10.89	36.27	
	Strain at Failure, %	17	17	
	Strain Rate, %/min	0.1	0.1	
	B-Value	0.95	0.95	
	Estimated Specific Gravity	2.7	2.7	
	Liquid Limit	---	---	
	Plastic Limit	---	---	

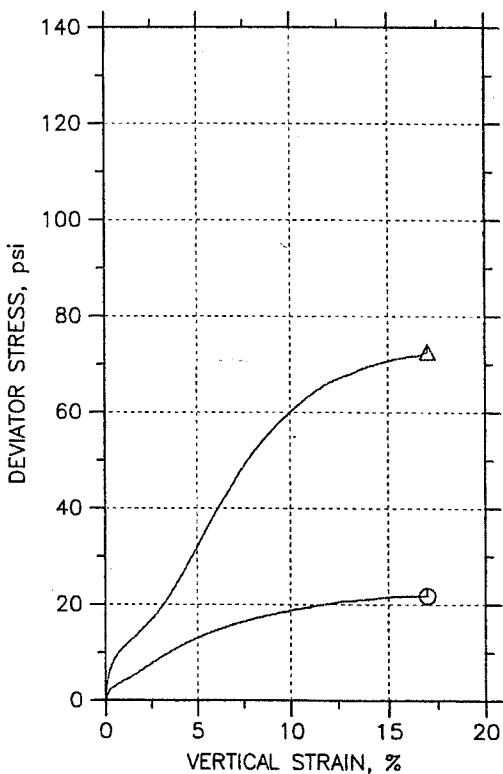
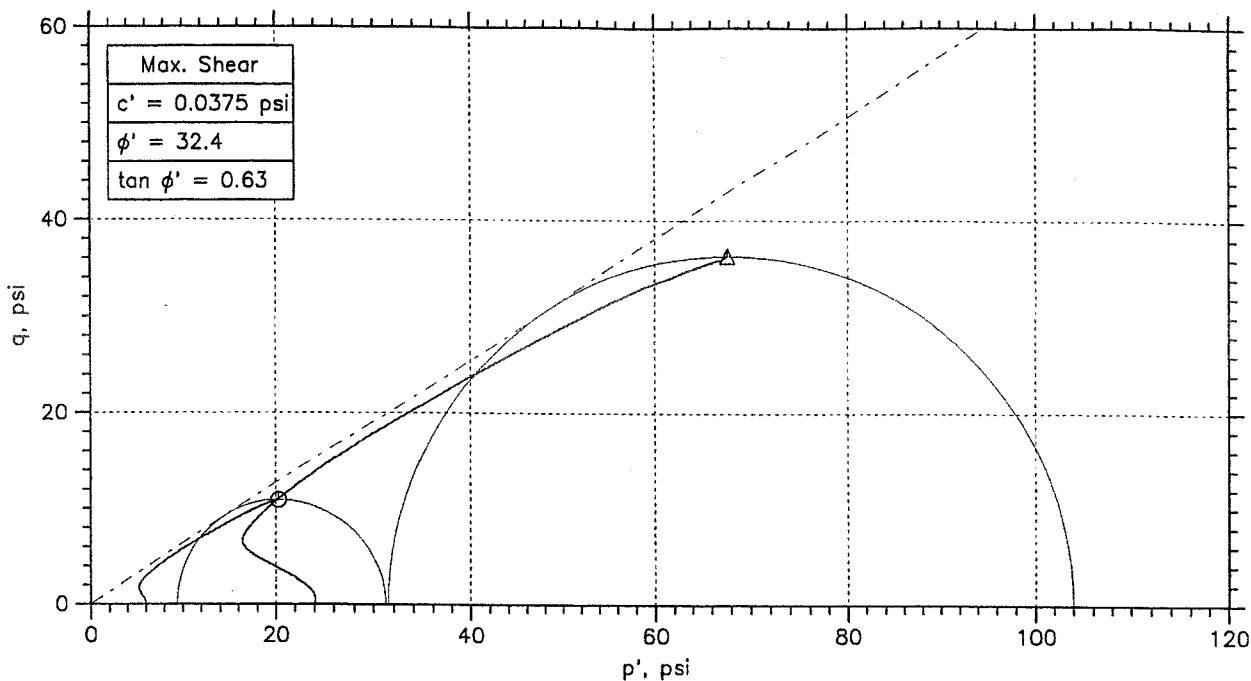
Project: North Anna COL	
Location: B-929A UD-1@ 15-16.75'	
Project No.: 6468061472	
Boring No.: B-929A	
Sample Type: Shelby Tube	
Description: Gray Silty Sand	
Remarks: ASTM D 4767-04	

Phase calculations based on start and end of test.

Wed, 03-JAN-2007 13:32:05

\* Saturation is set to 100% for phase calculations.

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△		
Sample No.	UD-1	UD-1		
Test No.	6768.1	6768.2		
Depth	15.5 ft.	16 ft.		
Initial	Diameter, in	2.872	2.853	
	Height, in	5.6	6	
	Water Content, %	13.5	12.4	
	Dry Density, pcf	93.03	99.21	
	Saturation, %	45.0	47.8	
Before Shear	Void Ratio	0.812	0.699	
	Water Content, %	25.1	21.2	
	Dry Density, pcf	100.5	107.2	
	Saturation*, %	100.0	100.0	
	Void Ratio	0.677	0.572	
Back Press., psi	104.9	109.9		
Ver. Eff. Cons. Stress, psi	5.997	24.		
Shear Strength, psi	10.89	36.27		
Strain at Failure, %	17	17		
Strain Rate, %/min	0.1	0.1		
B-Value	0.95	0.95		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		

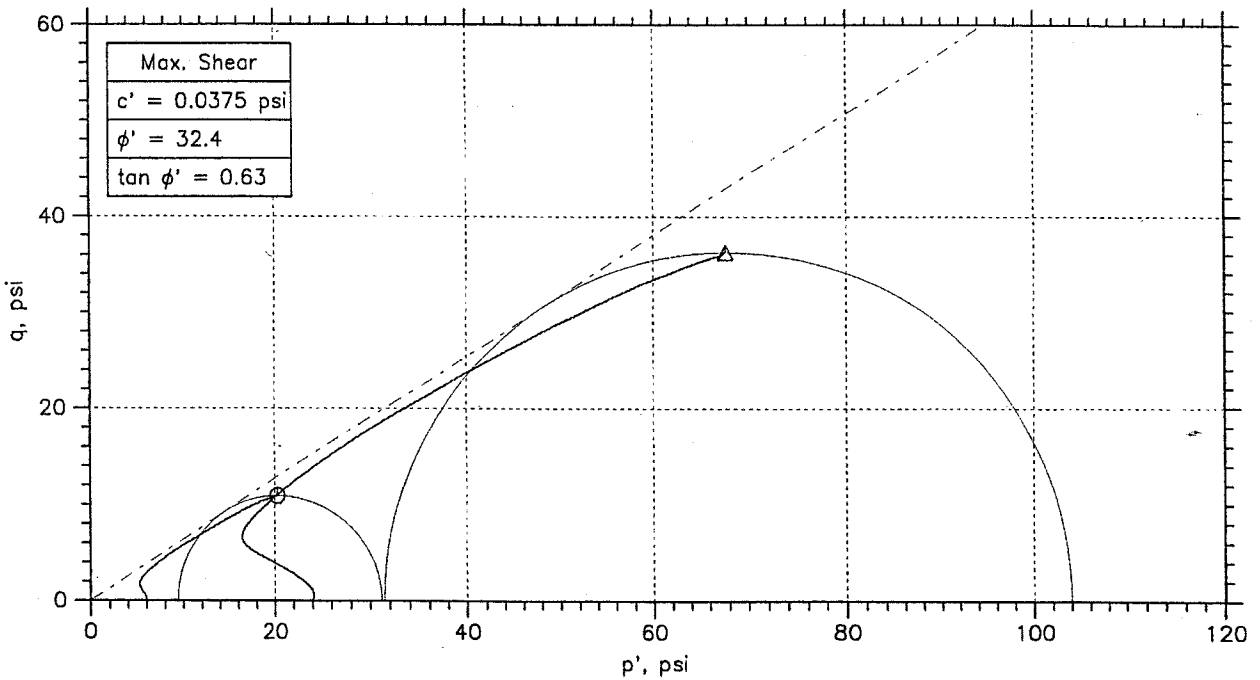
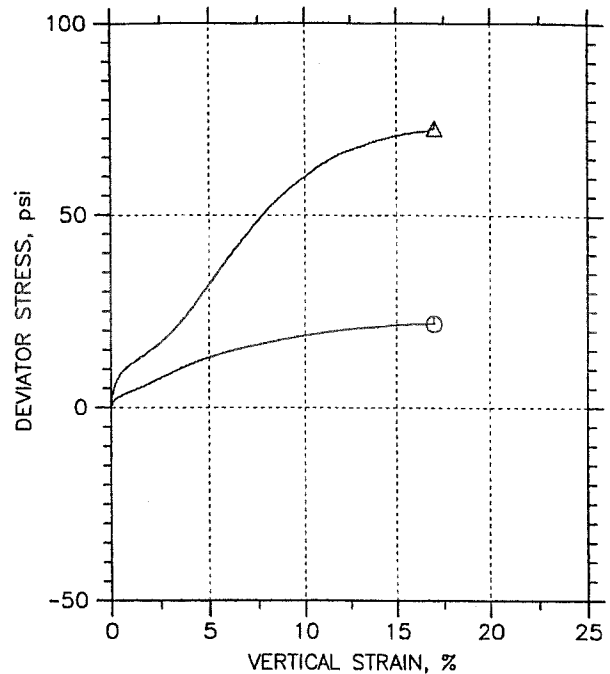
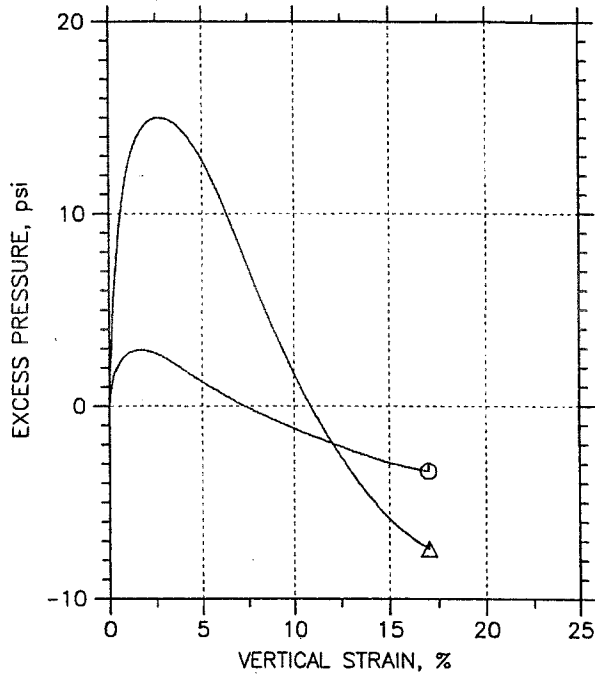
Project: North Anna COL	
Location: B-929A UD-1@ 15-16.75'	
Project No.: 6468061472	
Boring No.: B-929A	
Sample Type: Shelby Tube	
Description: Gray Silty Sand	
Remarks: ASTM D 4767-04	

Phase calculations based on start and end of test.

Wed, 03-JAN-2007 13:32:24

\* Saturation is set to 100% for phase calculations.

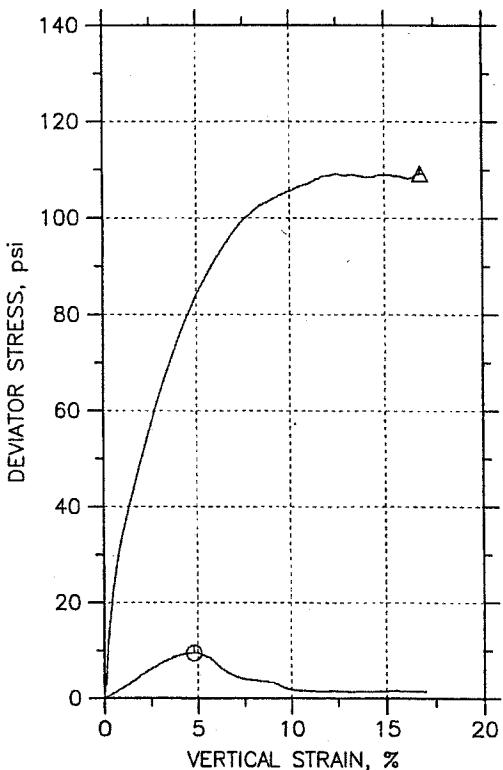
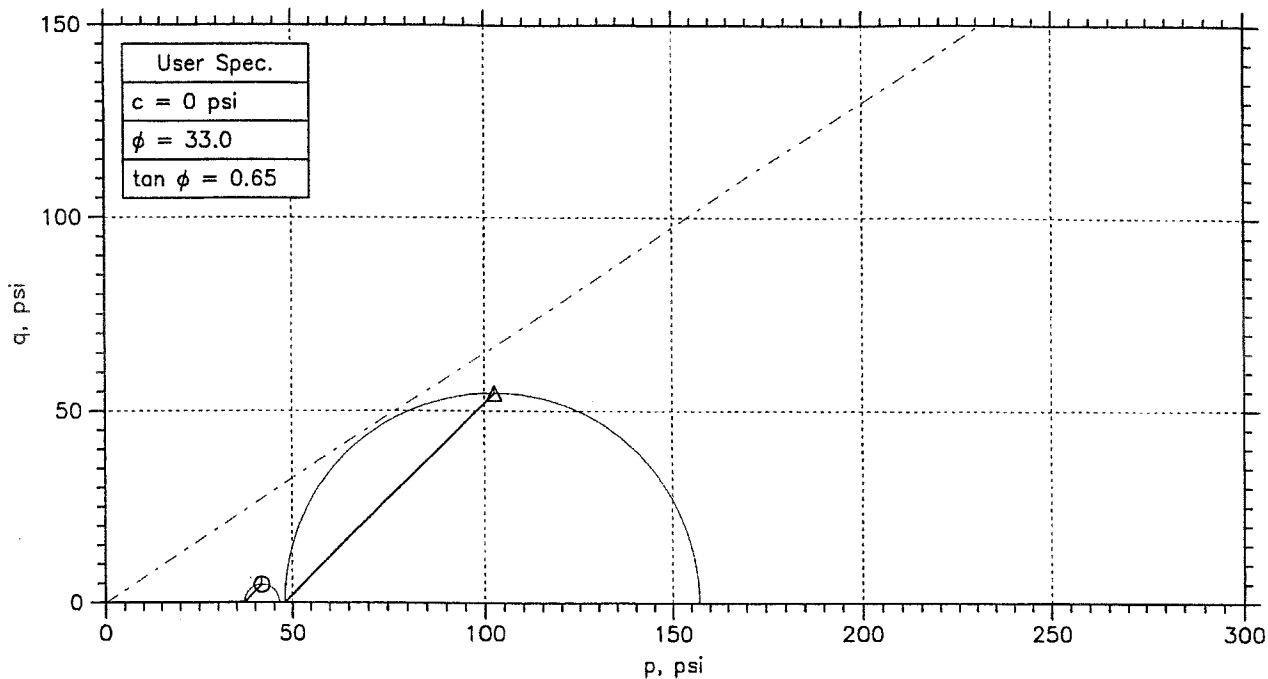
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	UD-1	6768.1	15.5 ft.	HJ	12/7/06	JL	1/2/07	6768.1_65.dat
△	UD-1	6768.2	16 ft.	HJ	12/6/06	JL	1/2/07	6768.2_68.dat

Project: North Anna COL	Location: B-929A UD-1@ 15-16.7
Boring No.: B-929A	Project No.: 6468061472
Sample Type: Shelby Tube	
Description: Gray Silty Sand	
Remarks: ASTM D 4767-04	

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△		
Sample No.	UD-4	UD-4		
Test No.	6769.3	6769.1		
Depth	31 ft.	30.5 ft.		
Initial	Diameter, in	2.89	2.89	
	Height, in	6	6	
	Water Content, %	19.2	16.9	
	Dry Density, pcf	99.37	104.5	
	Saturation, %	74.6	74.7	
Before Shear	Void Ratio	0.696	0.613	
	Water Content, %	28.5	17.4	
	Dry Density, pcf	95.09	114.7	
	Saturation*, %	99.7	100.0	
	Void Ratio	0.773	0.47	
Back Press., psi	1.352	105.		
Ver. Eff. Cons. Stress, psi	27.48	48.		
Shear Strength, psi	4.731	54.58		
Strain at Failure, %	4.79	16.8		
Strain Rate, %/min	0.1	0.1		
B-Value	1.12	0.97		
Estimated Specific Gravity	2.7	2.7		
Liquid Limit	---	---		
Plastic Limit	---	---		

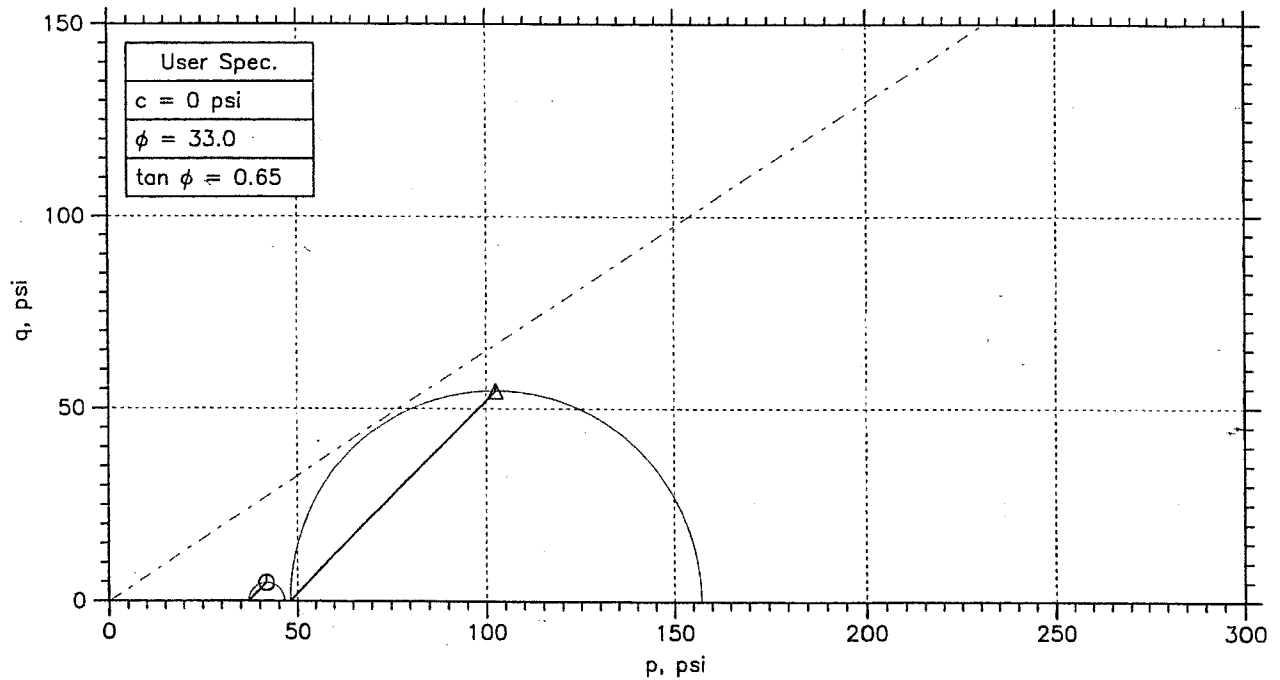
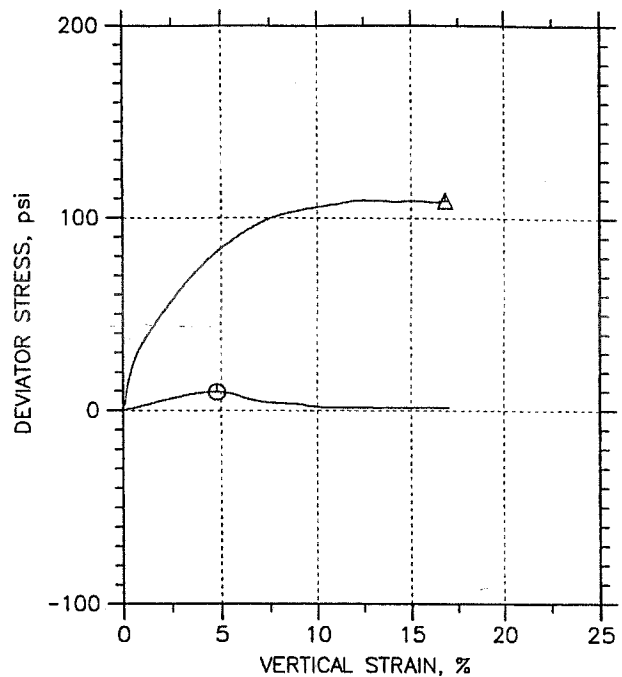
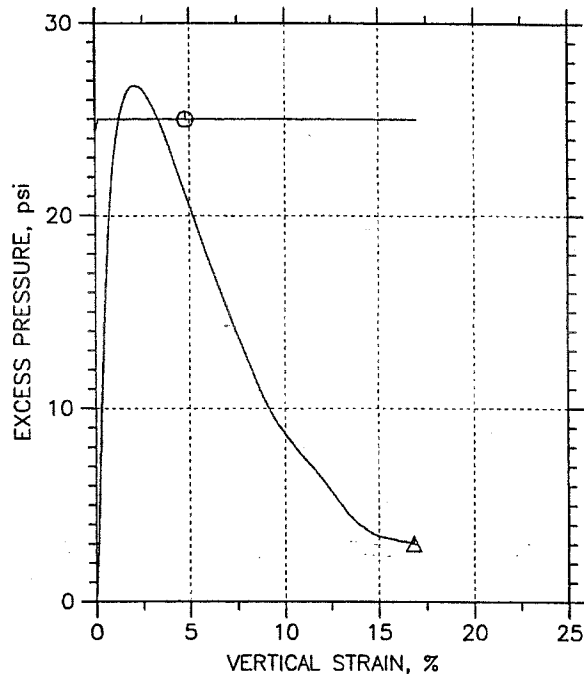
Project: North Anna COL	
Location: B-929A UD-4 @ 30-31.5'	
Project No.: 6468061472	
Boring No.: B-929A	
Sample Type: Shelby Tube	
Description: Light Gray Silty Sand	
Remarks: ASTM D 4767-04	

Phase calculations based on start and end of test.

Wed, 03-JAN-2007 14:35:05

\* Saturation is set to 100% for phase calculations.

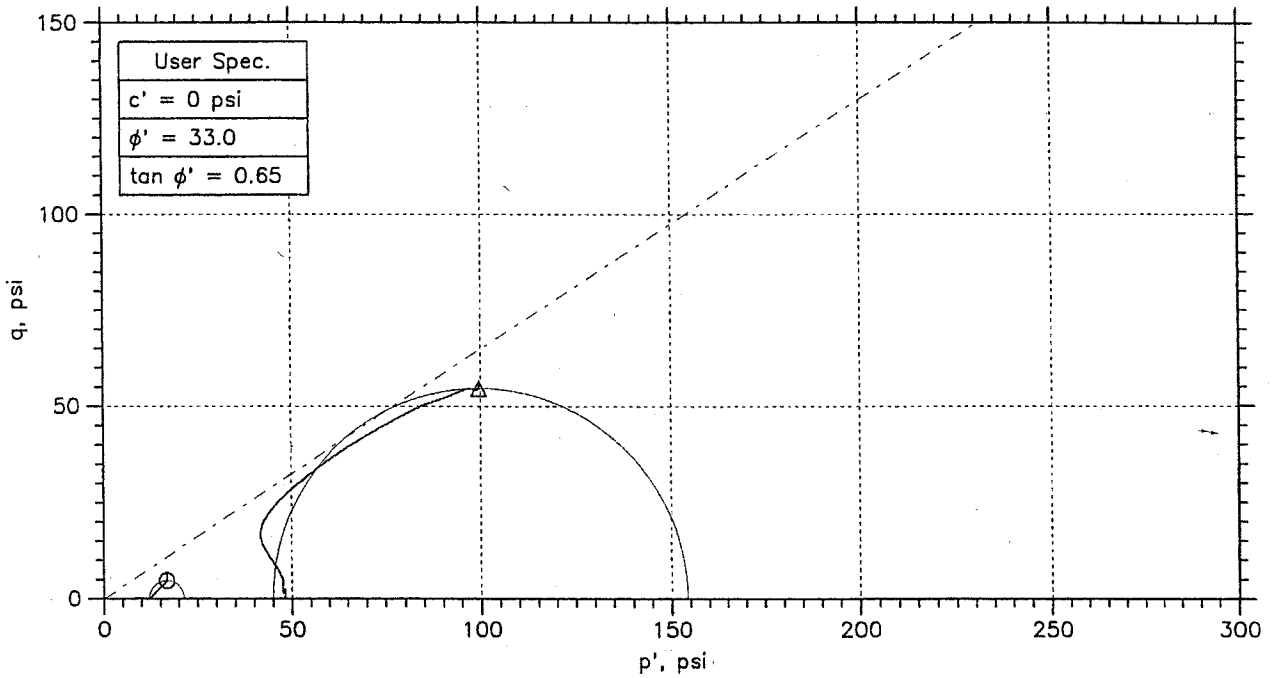
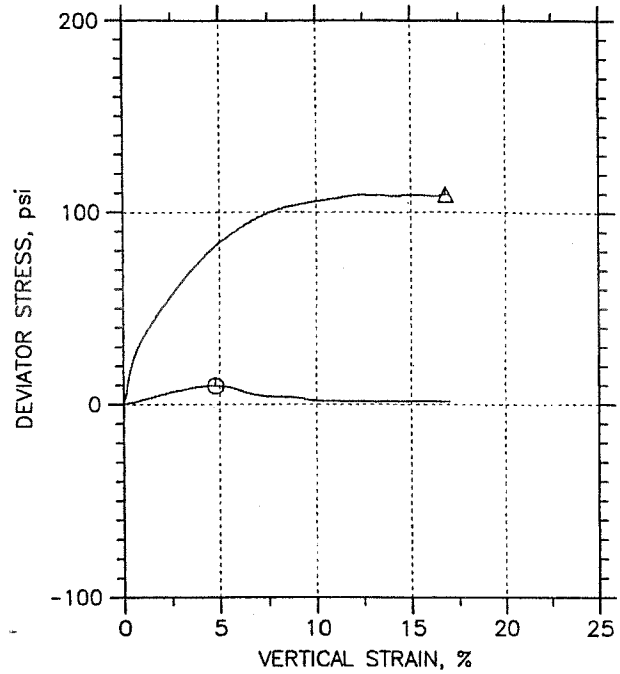
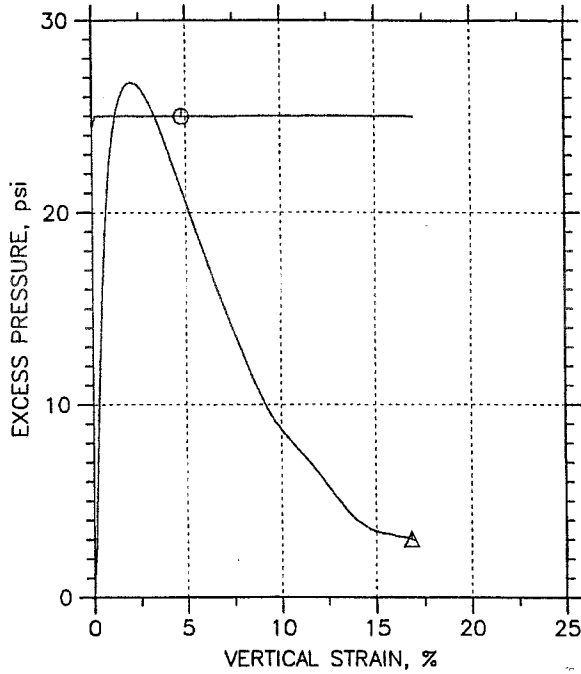
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	UD-4	6769.3	31 ft.	HJ	12/6/06	JL	1/2/07	6769.3_71.dat
Δ	UD-4	6769.1	30.5 ft.	HJ	12/07/06	JL	1/2/07	6769.1_96.dat

	Project: North Anna COL		Location: B-929A UD-4 @ 30-31		Project No.: 6468061472		
	Boring No.: B-929A		Sample Type: Shelby Tube				
	Description: Light Gray Silty Sand						
	Remarks: ASTM D 4767-04						

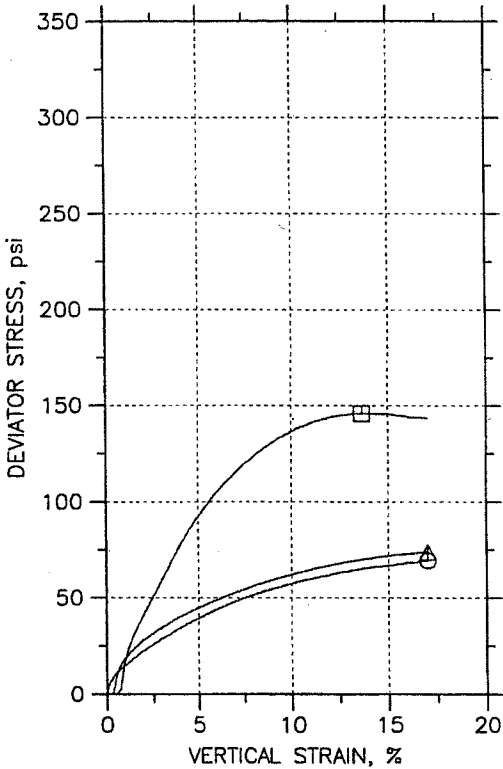
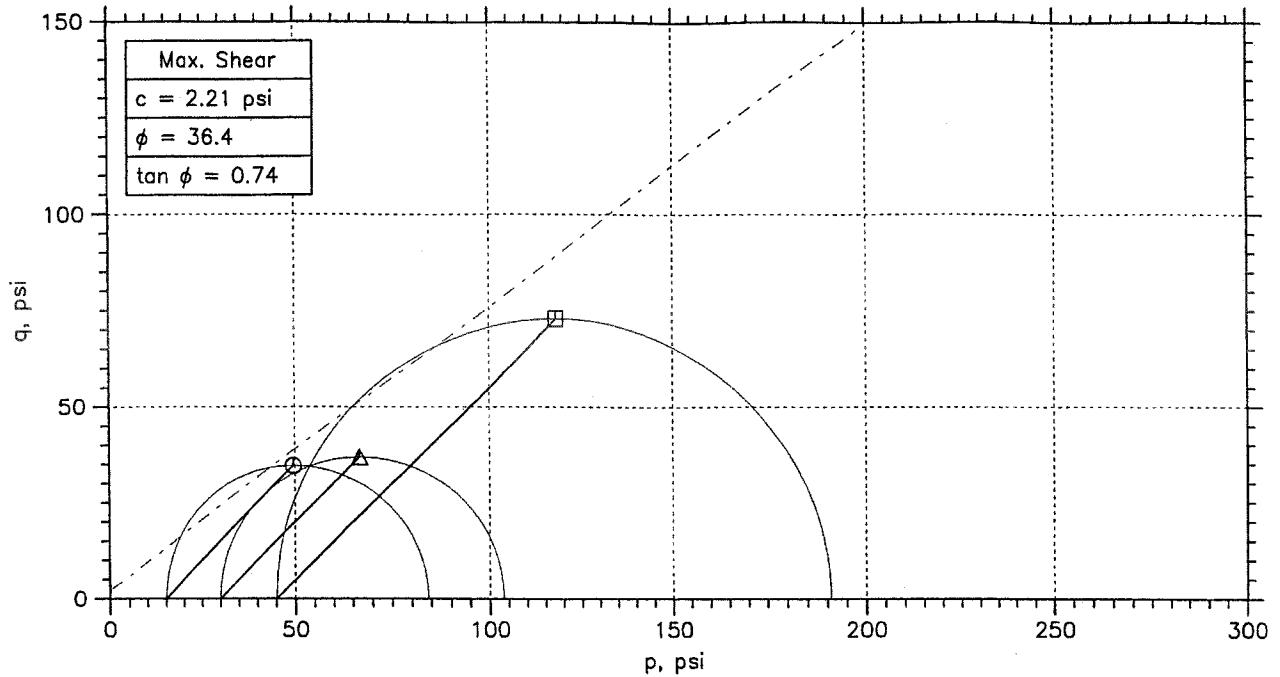
# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	UD-4	6769.3	31 ft.	HJ	12/6/06	JL	1/2/07	6769.3_71.dat
Δ	UD-4	6769.1	30.5 ft.	HJ	12/07/06	JL	1/2/07	6769.1_96.dat

	Project: North Anna COL		Location: B-929A UD-4 @ 30-31		Project No.: 6468061472		
	Boring No.: B-929A		Sample Type: Shelby Tube				
	Description: Light Gray Silty Sand						
	Remarks: ASTM D 4767-04						

# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△	□	
Sample No.	UD-6	UD-6	UD-6	
Test No.	6770.1	6770.1	6770.3	
Depth	40.5 ft.	41 ft	42 ft.	
Initial	Diameter, in	2.875	2.882	2.865
	Height, in	5.6	6	6
	Water Content, %	18.7	19.0	16.5
	Dry Density, pcf	103.5	101.3	107.1
	Saturation, %	80.1	77.5	77.7
Before Shear	Void Ratio	0.629	0.664	0.575
	Water Content, %	21.2	21.1	18.5
	Dry Density, pcf	107.2	107.4	112.3
	Saturation*, %	100.0	100.0	100.0
	Void Ratio	0.572	0.569	0.501
	Back Press., psi	105.	105.	89.99
	Ver. Eff. Cons. Stress, psi	15.	30.01	45.12
	Shear Strength, psi	34.61	36.82	72.89
	Strain at Failure, %	17	17	13.7
	Strain Rate, %/min	0.1	0.1	0.1
	B-Value	0.98	0.98	0.98
	Estimated Specific Gravity	2.7	2.7	2.7
	Liquid Limit	---	---	---
	Plastic Limit	---	---	---

Project: North Anna COL	
Location: B-929A UD-6 @ 40-41.5	
Project No.: 6468061472	
Boring No.: B-929A	
Sample Type: Shelby Tube	
Description: Tan Silty Sand	
Remarks: ASTM D 4767-04	

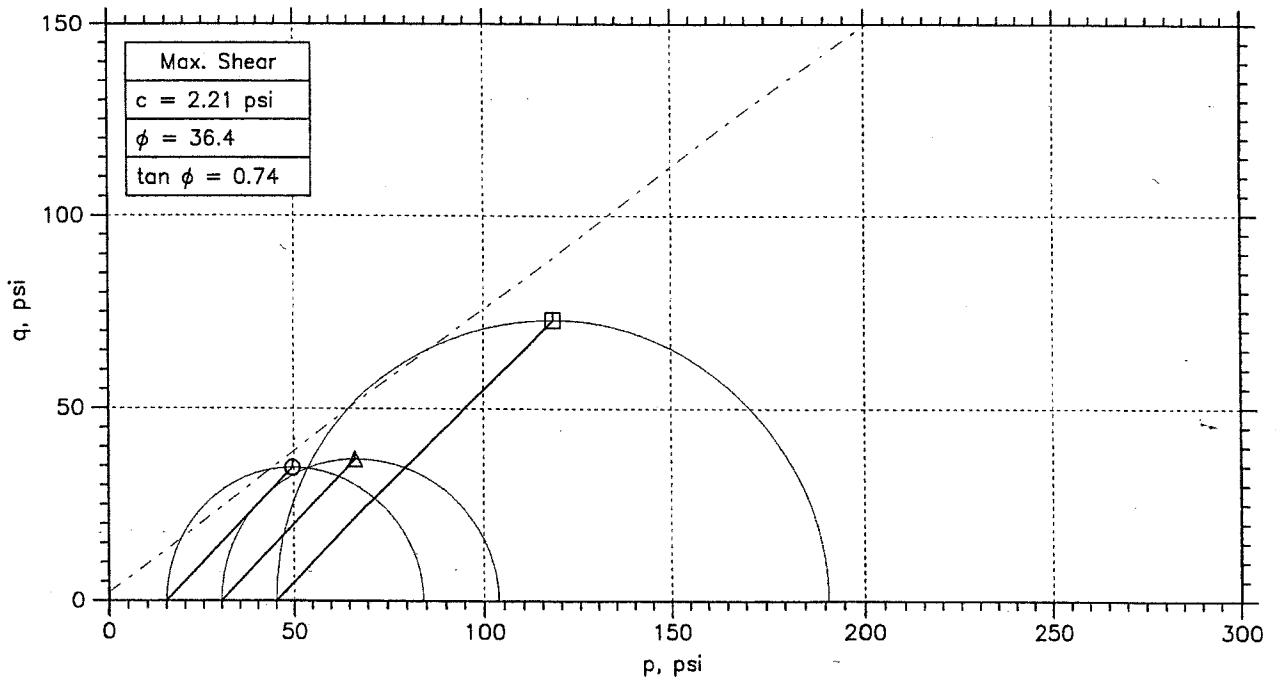
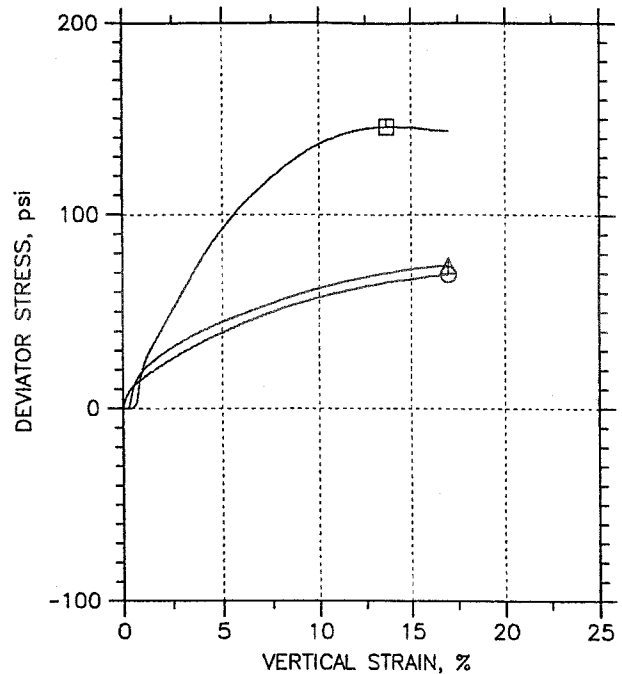
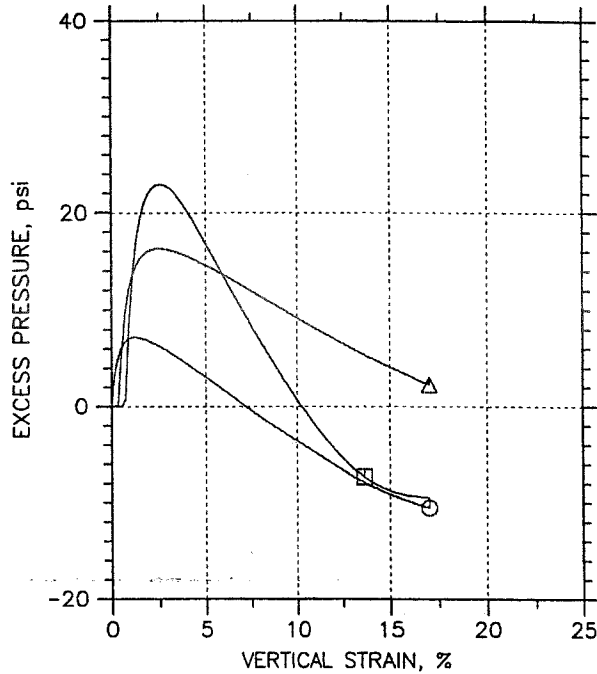
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Phase calculations based on start and end of test.

\* Saturation is set to 100% for phase calculations.



# CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	UD-6	6770.1	40.5 ft.	HJ	12/10/06	JL	1/2/07	6770.1_96.dat
△	UD-6	6770.1	41 ft.	HJ	12/10/06	JL	1/2/07	6770.2_93.dat
□	UD-6	6770.3	42 ft.	HJ	12/10/06	JL	1/2/07	6770.3a_90.dat

Project: North Anna COL	Location: B-929A UD-6 @ 40-41	Project No.: 6468061472
Boring No.: B-929A	Sample Type: Shelby Tube	
Description: Tan Silty Sand		
Remarks: ASTM D 4767-04		