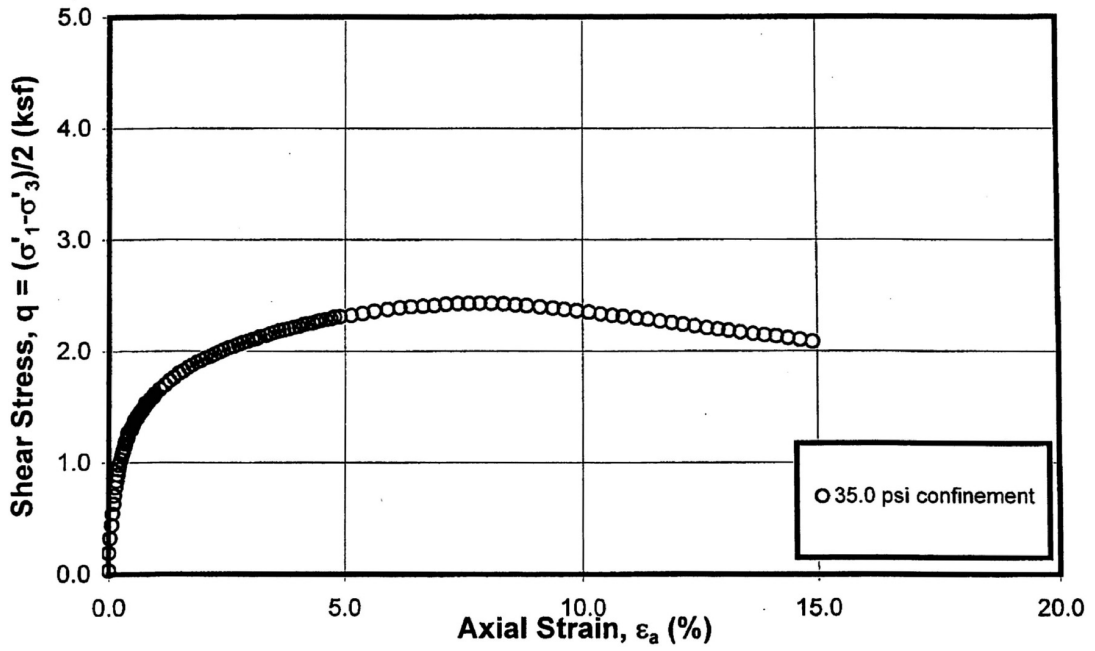
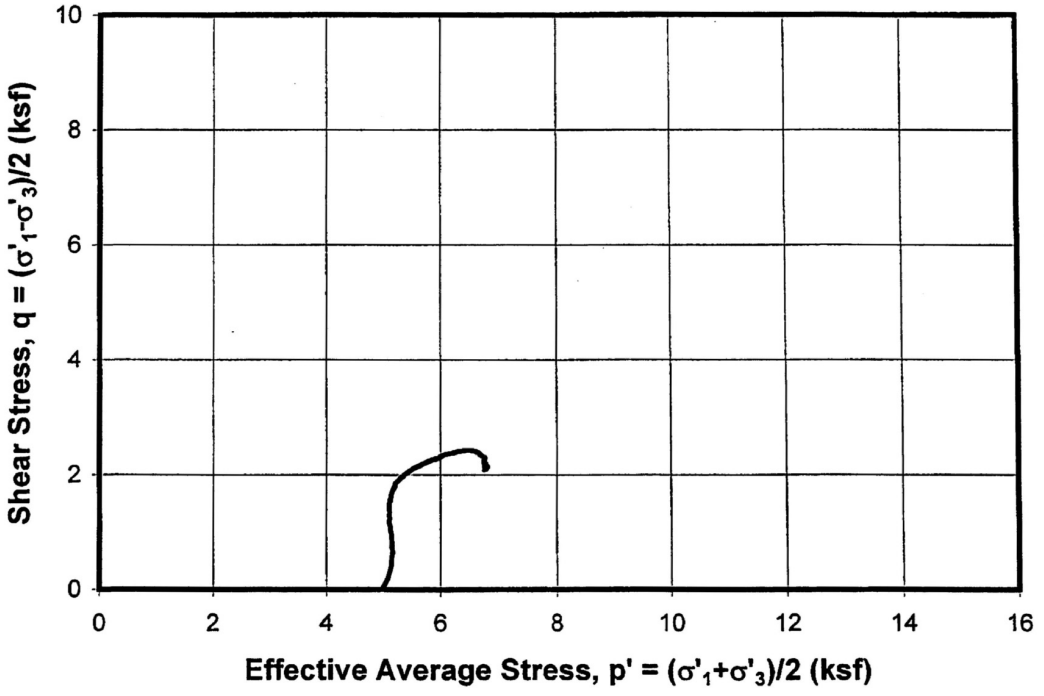
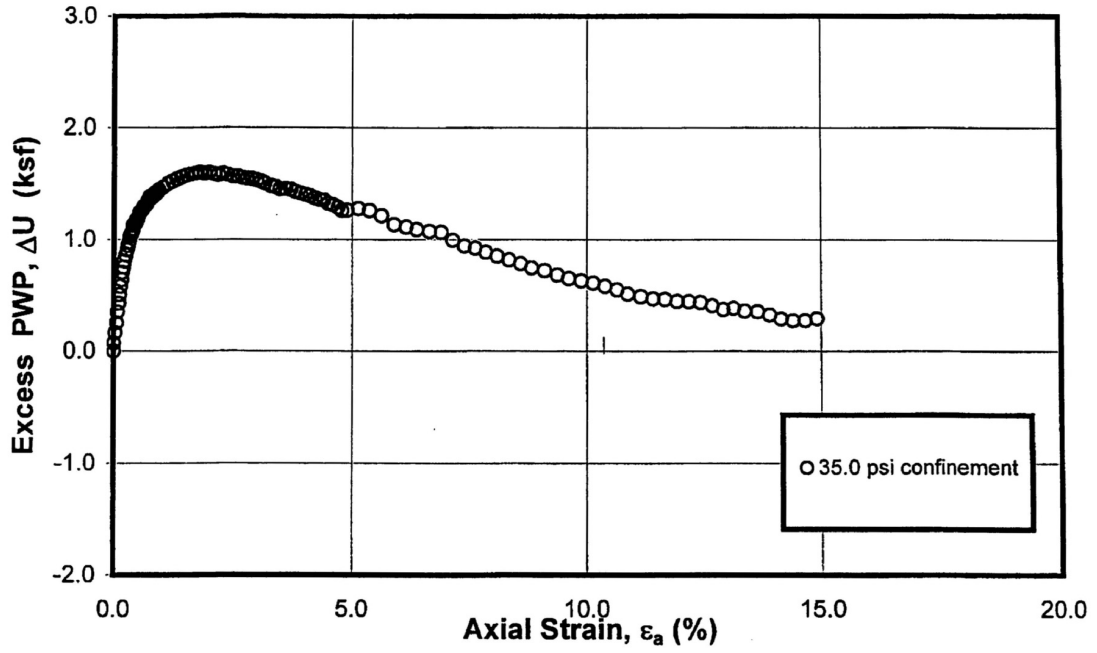
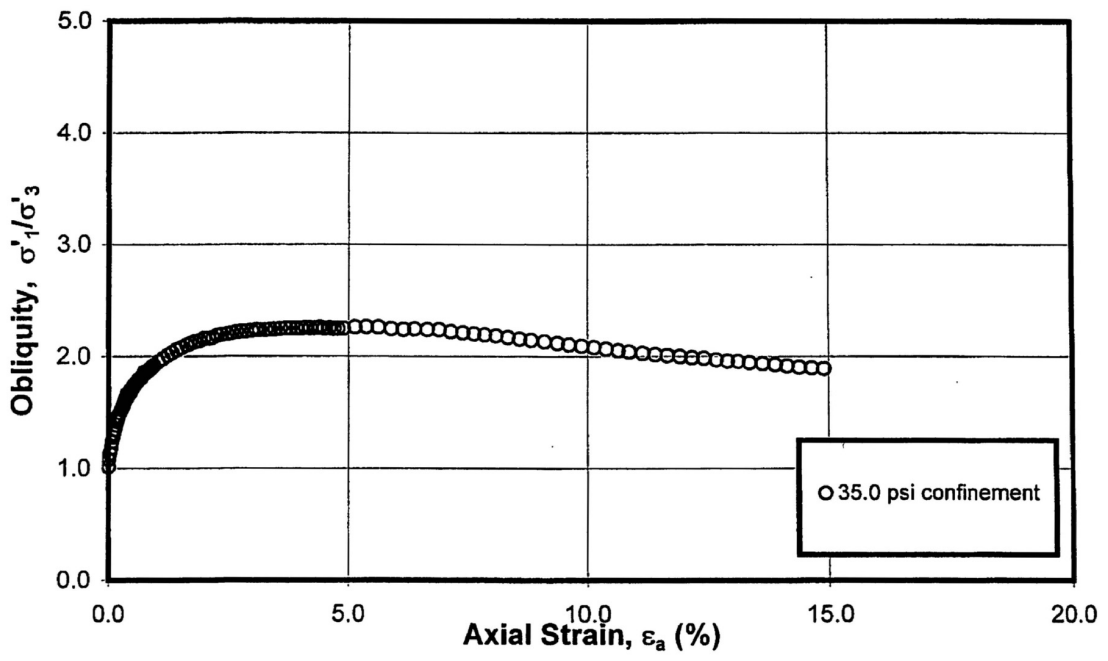




UNDRAINED TRIAXIAL COMPRESSION TEST
Isotropically Consolidated
Sample: UD5c - Depth: 40.0-41.70 ft
Boring B-2359UD

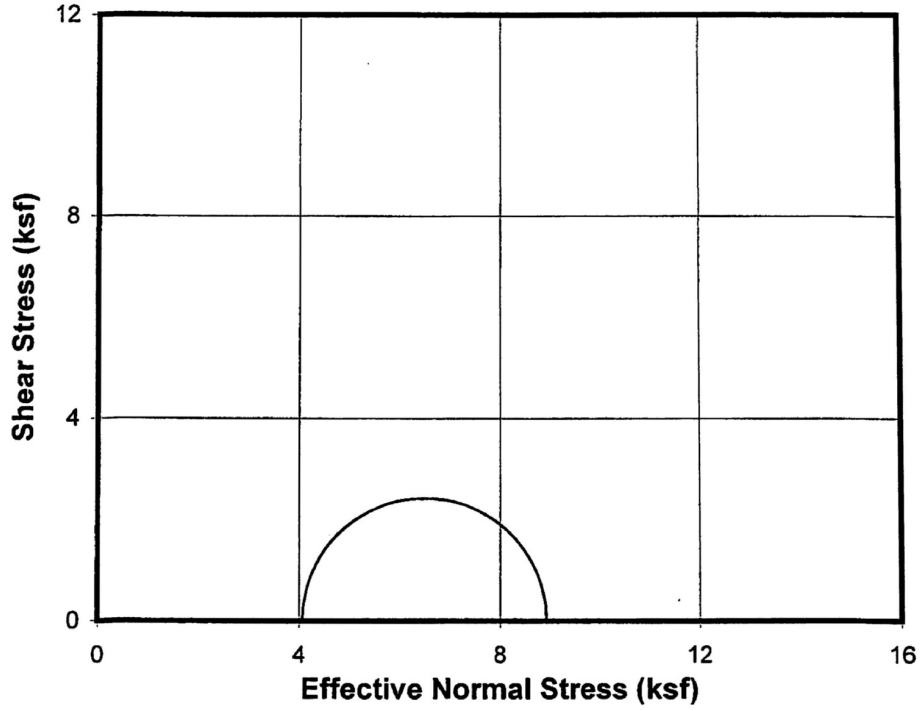
Reviewed By: WTD

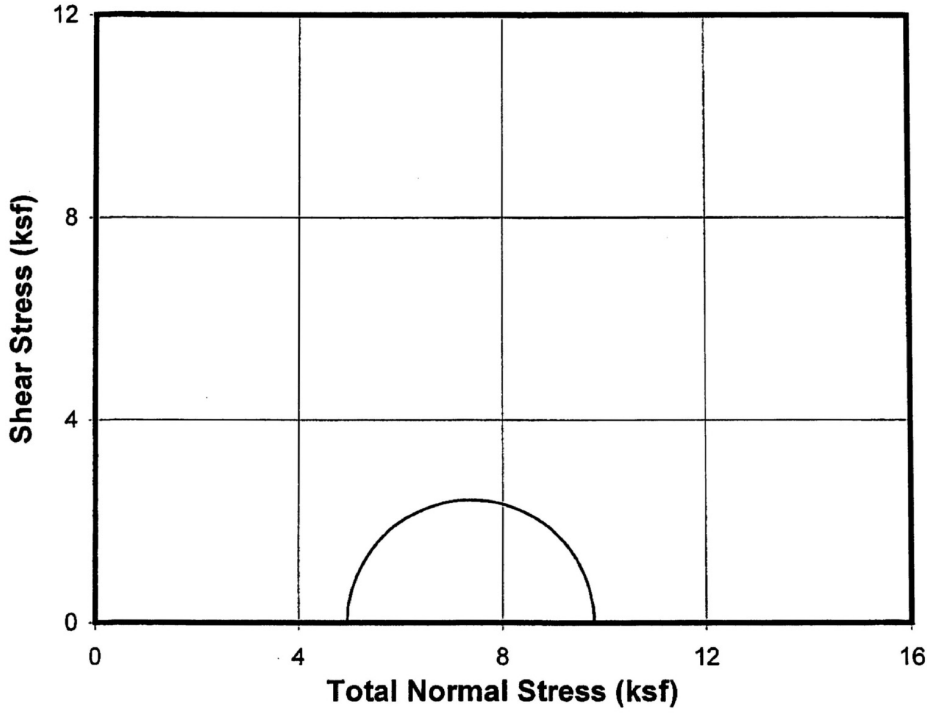




UNDRAINED TRIAXIAL COMPRESSION TEST
Isotropically Consolidated
Sample: UD5c - Depth: 40.0-41.70 ft
Boring B-2359UD

Reviewed By: WTD





UNDRAINED TRIAXIAL COMPRESSION TEST
Isotropically Consolidated- Mohr's Circles
Sample: UD5c - Depth: 40.0-41.70 ft
Boring B-2359UD

Reviewed By: DWD

TRIAXIAL TEST (ASTM D 4767-04): Specimen Setup / Take Down

Project Number: 0411-08-1686 | Test Type: CIU Triaxial | Cell No.: TRX-2 | File Name: 2359UD_UD1

Task No.: NA | Test Stress(es), σ'_c or $\sigma'_{v,c}$ = 7.20 , NA , NA & NA ksf

Project Name: Exelon (Victoria) | k ($\sigma'_{h,c}$ / $\sigma'_{v,c}$) = 1.00 | Induced OCR = 1.00 | K_{ua} ($\sigma_{d,ua}/2\sigma'_{v,c}$) = NA

Assig. Remarks: | Specific Gravity: 2.720 [X] Meas.; [ ] Assumed

[X] Tube [ ] Field Extruded	[ ] Liner [ ] Remolded	[ ] Tamping	[ ] Constant Effort:	Blows/Tamps per Layer =
Boring No.: B-2359UD	[ ] Reconstituted	[ ] Impact/Rammer	Rammer Wgt.(lbf)=	No. Layers =
Sample No.: UD10	Compostite No.:	[ ] Pluviated:	Tamper Force (lbf)=	Drop (in.) =
Depth (ft): 70.0-71.7	Specimen No.: c	[ ] Kneading	[ ] Undercompaction: U_{ni} (%) =	Dia. (in.) =
[ ] Spec. Selection by X-ray;	[ ] Geomarine Sample		Ref. Effort = % Comp. =	± Opt. =

Type Consolidation:	[X] Isotropic [ ] Anistropic	[ ] K_o stress path [ ] 45° stress path	[X] Used automated system:	Drained Axial Strain Rate, $\varepsilon_{a,rate}$ (%/h) = NA
			Remarks:	

Loading Conditions:	[X] Static [ ] Post Cyclic	[X] Undrained [ ] Drained	[X] Comp. [ ] Ext.	[X] Strain [ ] Stress Stress Path	[X] Constant Cell Pressure [ ] Variable Cell Pressure	[ ] Cyclic (Hz) Rate: [ ] 0.1;	[ ] Stress [ ] Strain [ ] 1; Other:

Water Content (WC);	Initial - Trimming Location			Final, W_{at}
	Top ($W_{o,1}$)	Bottom ($W_{o,2}$)	Sides ($W_{o,3}$)	(see below)
Container No	4016	851	968	1102
Mass Moist Soil + Cont. (g)	80.34	76.52	73.54	102.01
Mass Dry Soil + Container (g)	73.13	70.20	67.66	91.64
Mass Container (g)	30.16	31.86	31.91	31.49
Water Content, $W_{o,n}$ (%)	16.78	16.48	16.45	17.24
Avg. Initial WC, $W_{o,avg}$ (%)	16.57	Final (W_{at});	[X] Slice ; [ ]	Whole Spec.

[ ] See attached data sheet(s) for additional water contents

SOIL MASSES:	Initial	Final
Moist + Tare (etc.)(g)	501.30	505.52
Tare (etc.) (g)	0.00	0.00
Mass Moist Spec., M_{tn} (g)	501.30	505.52
Excess Dry Soil (soil not included in final mass measurement)		
Container No.		
Mass Dry Soil + Cont. (g)		
Mass Container (g)		
Mass Excess Dry Soil, $M_{d,es}$ (g)		0.00

Specimen Dimensions, (mm)

	Height			Dia., X indicates with membrane		
	Initial (H_o)	Final (H_{at})		Initial (D_o)	Final (D_{at})	
GB	100.000	100.000	1 T	51.00	58.30	[ ] For
1	14.99	-0.81	2 M	51.00	52.90	Wedge
2	15.07	-0.76	3 B	51.10	51.70	Failure
3	15.11	-1.12	1'T			= d_{max}
4	15.08	-0.86	2'M			= d_{min}
5	15.12	-0.68	3'B			= Δd
Avg.	115.07	99.15	Avg.	51.03	54.30	xxxxx

Measuring Devices:			
Pi Tape: [X] Dia	$A_o = \pi D^2/400$ (cm^2)	20.45
Calipers: [ ] Ht.; [ ] Dia	V_o (cm^3)	235.38
Dial Comparator [X] Ht.; [ ] Dia	$A_{atb,m}=\pi (D^*_{at})^2/400$ (cm^2)	22.86
Remarks: ID# PI-002	$A_{atw,m}=(d_{min}-2\Delta d)d_{max}\pi/400$ (cm^2)	NA
	$D^*_{at}=(D_T+2D_M+D_B)/4$ (mm)	53.95

Estimated Initial Unit Weight

Total, $\gamma_{t,o}$ (lb/ft^3) = 132.95 | Dry, $\gamma_{d,o}$ (lb/ft^3)= 114.06

Membrane / Filter Paper / Apparatus

Membrane (mm):			Top	Bottom
Number: = 1	Thickness:	[ ] Single; [X] Double	0.72	0.61
			0.73	0.60
	Circumference ($C_{rm,o}$)		148.0	149.0
			Total Thickness	Dia.($C_{rm,o}/\pi$)
	Average:		0.33	47.27

Filter Paper: Top + Bottom: [ ] Yes ; [X] No

Filter Strips: [X] Yes ; [ ] No Number = 8

Type of Filter Strips [ ] Vertical: ¼ in. & Whatman #54

[X] Sprial: ¼ in. & Whatman #1

Apparatus: Mass Top Cap, M_{tc} = 65.6 g, 0.14 lbf

Mass Displ. System, M_{ds} (cap, dial, piston, etc.) = NA g, NA lbf

Top Cap Attached: [X] Yes; [ ] No; Piston Dia.(in.) [X] ½; [ ] ¾; [ ] Load Cell: [ ] External [X] Internal

Top Cap - Rotation [X] Fixed,<1°; [ ] Limited,<5°; [ ] Unlimited, >5°

With: [ ] Frictionless End Caps; [ ] Lat. Movement Top Cap

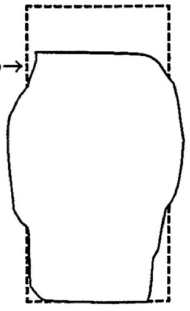
[ ] Internal LVDT Jacket

[ ] Photo Taken.

Failure Sketch

ε_a=

20%→



Failure Mode: [X] Bulge [ ] Wedge [ ] Parabolic

Wedge/Bulge Ht.= NA (mm)

NA - Not Applicable

GB - Gage Block

Other Remarks:

LL=95 PL=34 PI=61

Final Visual Classification: Mottled Light Gray and Yellowish Brown Fat CLAY (CH)

Trimmed / Reconstituted By: AW | Set Up By: TP | Taken Down By: TP

Date: 3/24/2008 | Date: 3/24/2008 | Date: 3/28/2008

Prelim. Calc. By: TP | Final Calc. By: TP | Reviewed By: WFD

[ ] See more detailed sketch on attached sheet. Remarks:

KAW 6/13/08

MULTISTAGE TRIAXIAL TEST: Specimen Calculations & Summary(1)

Project Number: 0411-08-1686 Cell No.: TRX-2 File Name: 2359UD_UD10c

Task Number: NA Specific Gravity: 2.720 [X] Measured; [##] Assumed

Boring No.: B-2359UD Sample No.: UD10 Specimen No.: c Depth (ft): 70.0-71.7

Type Test: CIU Triaxial Specimen: [X] "Undisturbed"; [ ] Reconstituted; [ ]

Calculations Corr. for Salt (dissolved solids): [X] No or, [ ] Yes, with concentration = _____ ppm

	Inital Water Contents (WC), (W_o) over Saturation, (S_o), in (%):						Calculated Mass of Dry Soil (g)	
	Top, $W_{o,1}$	Botttom, $W_{o,2}$	Sides, $W_{o,3}$	Avg., $W_{o,avg}$	Selct., $W_{o,s}$	Back Cal., $W_{o,bc}$	Initial Selected WC, w_o (%)	16.57
W_o	16.78	16.48	16.45	16.57	16.57	16.26	Initial , $M_{d,o}$	430.04
S_o	93.4	92.4	92.3	92.7	92.7	91.7	Final, $M_{d,at}$	431.18
	Measured final mass of moist soil, $M_{t,at}$ (g)					505.52	Selected, M_d	431.18
	Final mass of moist soil corrected for excess dry soil, $M_{tat,c}$ (g)					505.52		

Consolidation Data	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	
Changes in Height (mm) and Volume (cm^3) Within Given Consolidation Stages/Columns	At Initial Seating Stress	During Back-Pressuring	1st Consol. Increment (1)	Column 2 or 3 to **1st Test** Stage (1)	Column 4 to **2nd Test** Stage	Column 5 to **3rd Test** Stage	Column 6 to **4th Test** Stage	
Sign Convention: (+) Deformation in compression or Flow out of spec.; (-) Deformation in extension (swell) or Flow into spec.								
Change in Height, $\Delta H_{c,n}$	-0.11	-0.05		0.84	NA	NA	NA	
Sum of changes in (+ out)	3.15			6.69	NA	NA	NA	
burette readings, $\Delta b_{r,n}$ (- in)		-6.42	NA	15.63	NA	NA	NA	(2)
Theoretical $\Delta V_{ct,n} = (3V_o \times \Delta H_{c,n}/H_o)$	-0.65	-0.33		5.13	NA	NA	NA	
Vol. Factor, $F_v = \Delta b_{r,n} / \Delta V_{t,n}$				1.31	NA	NA	NA	
Corrected $\Delta V_{ct,n} = F_v \times \Delta V_{t,n}$			NA	0.00	NA	NA	NA	(3)
Selected $\Delta V_{c,n}$	3.15	-6.42		6.69	NA	NA	NA	

Summary For Test Stages					
Test Stage:	1st = 1	2nd = 2	3rd = 3	4th = 4	
Cell Pressure, $\sigma_{c,n}$ (psi)	100.01	NA	NA	NA	Number of
Back Pressure, $U_{b,n}$ (psi)	50.23	NA	NA	NA	Test Stages = 1
Axial Force Reading, $P_{r,n}$ (lbf)	1.71	NA	NA	NA	t_{50} = 30 min
Eff. Consol. Stress (σ'_c or $\sigma'_{v,c}$) (4), (ksf)	7.24	NA	NA	NA	
t_c, ON or in [X] days [ ] hrs	1.00	NA	NA	NA	

At Final Test Stress/Stage - Summary of Calculation of ΔV_c (cm^3) by Different Procedures

By Selected Volumes	By Saturation = 100 %	By Change in Mass (5)	For Diff. in Meas. Vol. (V_o-V_{at}), & corr. for ΔH_{td}	For Selected ΔV_c, required
ΔV_c = 3.42	ΔV_c = 2.10	ΔV_c = 2.18	ΔV_c=	G_s for S_c = 100 %: 2.743

At Final Test Stress/Stage - Consolidation Conclusions

$\Delta H_{c,f}$ (mm) = 0.68	$\Delta V_{c,f}$ (cm^3) = 3.42	Back Cal. G_s for S=100% = 2.743	Normalized	Ht. Ch. (%) =	0.33
$\varepsilon_{ac,c}$ (%) = 0.59	$\varepsilon_{vc,f}$ (%) = 1.45		Diff. in:	Vol. Ch. (%) =	

Summary of Specimen Physical Properties

Specific Gravity: G_s = 2.720 Measured Condition:	Height (mm)	Volume (cm^3)	Area (cm^2)	Water Content (%)	Unit Weight Total (pcf)	Unit Weight Dry (pcf)	Saturation (%)	Void Ratio e	Volumetric Water Content	Porosity n	Skempton B parameter %(6)
Initial:	115.07	235.38	20.45	16.26	132.95	114.36	91.7	0.482	0.2984	0.325	97.0
After Consol.: to 1st σ'_c	114.40	231.96	20.28	17.24	136.05	116.04	101.8	0.461	0.3210	0.315	
to 2nd σ'_c											
to 3rd σ'_c											
to 4th σ'_c											

Notes: (1) If the consol. stress in the 1st consol. increment & 1st test stage are equal, log the data in Column 4.

(2) The height changes occuring within each shearing and unloading stage (1 - 4) are recorded in these rows (after Column 3).

(3) The volume changes occuring within each shearing and unloading stage (1 - 4) are calculated/recorded in these rows (after Column 3).

(4) Stresses are corrected for membrane. (5) ~ $M_{t,o}$-($M_{tat,c}$+ρ_{water}x$\Delta V_{in,column1\&2}$)

(6) Initial value is after back pressuring

NA - Not Applicable ON - Over Night WC - Water Content Remarks: Wet Method used in the Saturation Stage

Calculated By: TP Reviewed By: HP

MULTISTAGE TRIAXIAL TEST: Specimen Calculations Summary(2)

Project Number: 0411-08-1686 | Test Type: CIU Triaxial | App. No.: TRX-2 | File Name: 2359UD_UD1(

Project Name: Exelon (Victoria) | Task No.: NA | Test No.: 0 | Test Series for: 0

X Tube ☐ Field Extruded ☐ Liner ☐ Remolded		☐ Tamping	☐ Constant Effort: Blows/Tamps per Layer =
Boring No.: B-2359UD ☐ Reconstituted		☐ Impact/Rammer	Rammer Wgt.(lbf)= ☐ No. Layers =
Sample No.: UD10 Compostite No.:		☐ Pluviated:	Tamper Force (lbf)= ☐ Drop (in.) =
Depth (ft): 70.0-71.7 Specimen No.: c		☐ Kneading	☐ Undercompaction: U_{ni} (%) = Dia. (in.) =
☐ Spec. Selection by X-ray; ☐ Geomarine Sample			Ref. Effort = % Comp. = ± Opt. =

Type	X Isotropic	☐ K_o stress path	X Used automated system	Drained Axial Strain Rate, $\varepsilon_{a,rate}$ (%/hr.)= NA
Consolidation	☐ Anistropic	☐ 45° stress path	Remarks:	

Loading Conditions:	X	Static	X	Undrained	X	Comp.	X	Strain	☐ Stress	X	Constant Cell pressure	☐	Cyclic (Hz)	☐	Stress ☐ Strain
	☐	Post Cyclic	☐	Drained	☐	Ext.	☐	Stress Path		☐	Variable Cell pressure	Rate: ☐	0.1;	☐	1; Other:

Specific Gravity: G_s = 2.720 Measured Condition:	Height (mm)	Volume (cm^3)	Area (cm^2)	Water Content (%)	Unit Weight Total (pcf)	Unit Weight Dry (pcf)	Saturation (%)	Void Ratio e	Skempton B parameter %(1)
Initial:	115.07	235.38	20.45	16.26	132.95	114.36	91.72	0.48	97.0
After Consol.: to 1st σ'_c	114.40	231.96	20.28	17.24	136.05	116.04	101.78	0.46	
to 2nd σ'_c									
to 3rd σ'_c									
to 4th σ'_c									

Unit for Stresses: (ksf)

Consolidation Stress Summary and Loading Summary

Item	Unit	1st Stage	2nd Stage	3rd Stage	4th Stage
Axial Strain during Consol., $\varepsilon_{a,c}$:	%	0.587	NA	NA	NA
Vol. Strain during Consol., $\varepsilon_{v,c}$:	%	1.453	NA	NA	NA
Effective Vertical Stress, σ'_v	(ksf)	7.239	NA	NA	NA
Effective Horizontal Stress, σ'_h:	(ksf)	7.173	NA	NA	NA
Consol. Stress Ratio, k (σ'_h / σ'_v) :	-	0.991			
Induced OCR :	-	1.00	NA	NA	NA
Eff. Average Stress, (σ'_v + σ'_h)/2 :	(ksf)	14.412			
Eff. Mean Stress, (σ'_v + 2*σ'_h)/3 :	(ksf)	7.195			
Undr. Ambient Shear Stress, τ_{ba} :	(ksf)	NA	NA	NA	NA
Undr. Ambient Shear Strain, $\varepsilon_{a,ua}$	%	NA	NA	NA	NA

Notes: See Fugro South, Inc. Notation Listing for definition of symbols and acronyms.

(1) Initial B is after saturation

NA - Not Applicable

Membrane Correction

Type: Bulge

Modulus: 150.0 psi

Diameter: 47.27 mm

Thickness: 0.33 mm

Area Correction

Type: Bulge

Stage	Area Corr. Const.:	Final Area (cm^2):
1st	0.770	22.86
2nd		
3rd		
4th		

Filter Paper Correction

Type: None Type Strips: Sprial #1

Strips: 8

Force: 0.000 lbf/strip

Final Visual Description and Remarks: Mottled Light Gray and Yellowish Brown Fat CLAY (CH)

Loading Summary

Stage	Stress Status	ε_a (%)	q (ksf)	p' (ksf)	ΔU (ksf)	σ_1' (ksf)	σ_3' (ksf)
1st	Max Shear Stress	14.98	6.057	12.204	1.034	18.261	6.147
	Max Obliquity	2.62	5.183	9.703	2.658	14.886	4.521
2nd	Max Shear Stress						
	Max Obliquity						
3rd	Max Shear Stress						
	Max Obliquity						
4th	Max Shear Stress						
	Max Obliquity						

Remarks: Stain Rate (%/min) = 0.0133

STAGE 1

Project: 0411-08-1686 Boring No.: B-2359UD Depth (ft.): 70.0-71.7
Test Type: CIU Triaxial Sample No.: UD10 Stage No.: 1
Specimen No.: c

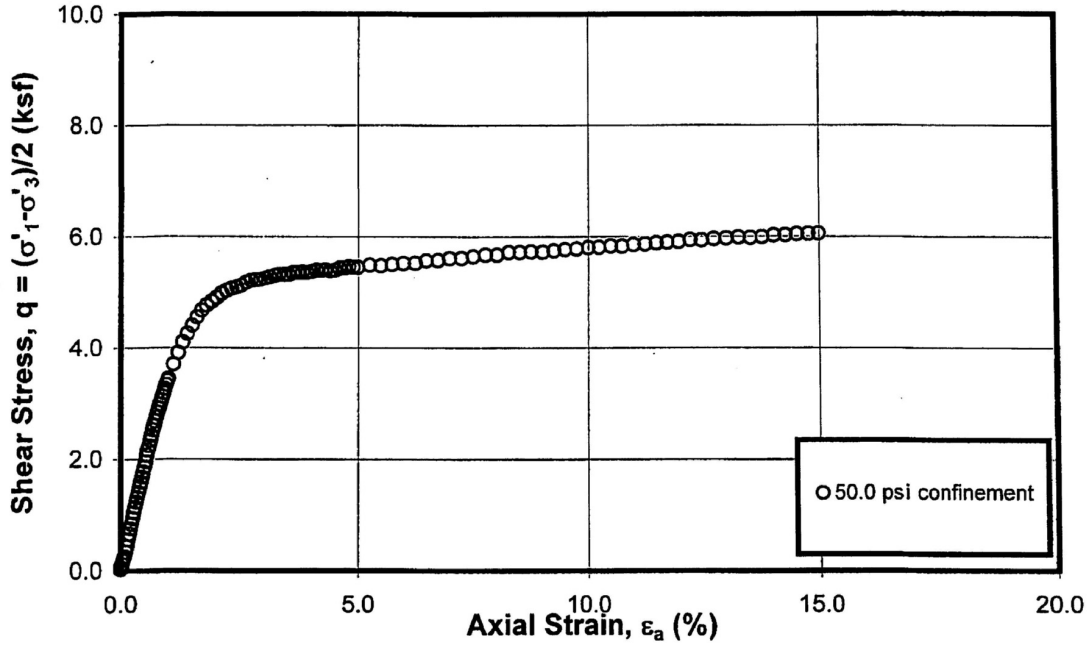
Elapsed Time (min)	Axial Strain ε_a (%)	q (ksf)	p' (ksf)	Excess PWP, ΔU (ksf)	Volume Change (cm^3)	Obliquity σ'_1/σ'_3 -	A_f -	E_S (ksf)	E_T (ksf)
0.0	0.000	0.033	7.206	0.000	0.000	1.009	0.000	-	-
3.0	0.005	0.065	7.237	0.005	0.000	1.018	0.012	1282.3	844.4
6.0	0.033	0.122	7.276	0.015	0.000	1.034	0.109	536.5	499.4
9.0	0.056	0.189	7.343	0.030	0.000	1.053	0.061	559.1	581.0
12.0	0.079	0.256	7.391	0.051	0.000	1.072	0.085	562.2	581.5
15.0	0.108	0.341	7.449	0.073	0.000	1.096	0.105	570.5	681.7
18.0	0.132	0.432	7.508	0.104	0.000	1.122	0.122	606.3	877.8
21.0	0.158	0.564	7.597	0.142	0.000	1.160	0.132	670.3	908.0
24.0	0.183	0.667	7.660	0.188	0.000	1.191	0.142	691.9	833.5
27.0	0.206	0.763	7.712	0.236	0.000	1.219	0.153	708.0	814.8
30.0	0.226	0.843	7.734	0.282	0.000	1.245	0.174	715.6	847.8
33.0	0.249	0.944	7.786	0.336	0.000	1.276	0.182	732.4	885.1
36.0	0.274	1.053	7.839	0.392	0.000	1.310	0.190	744.8	818.6
39.0	0.299	1.149	7.879	0.453	0.000	1.342	0.199	746.9	734.0
42.0	0.324	1.238	7.901	0.518	0.000	1.372	0.212	743.1	729.3
45.0	0.346	1.320	7.920	0.576	0.000	1.400	0.223	744.2	739.6
48.0	0.372	1.412	7.954	0.639	0.000	1.432	0.229	742.4	750.6
51.0	0.398	1.514	7.985	0.706	0.000	1.468	0.237	745.1	732.1
54.0	0.422	1.596	8.004	0.768	0.000	1.498	0.245	741.5	718.6
57.0	0.446	1.689	8.033	0.833	0.000	1.532	0.250	742.2	774.9
60.0	0.468	1.776	8.054	0.901	0.000	1.566	0.257	744.7	725.7
63.0	0.495	1.864	8.075	0.970	0.000	1.600	0.263	739.9	732.9
66.0	0.519	1.963	8.097	1.043	0.000	1.640	0.269	743.1	885.5
69.0	0.543	2.077	8.145	1.115	0.000	1.684	0.270	752.7	890.3
72.0	0.565	2.168	8.159	1.186	0.000	1.724	0.277	755.3	707.5
75.0	0.589	2.240	8.164	1.253	0.000	1.756	0.283	748.9	704.8
78.1	0.614	2.340	8.190	1.326	0.000	1.800	0.287	751.4	811.8
81.1	0.637	2.432	8.213	1.395	0.000	1.841	0.290	753.5	771.9
84.1	0.662	2.526	8.243	1.467	0.000	1.884	0.292	752.7	699.0
87.1	0.686	2.603	8.242	1.531	0.000	1.923	0.298	749.8	666.3
90.1	0.711	2.687	8.268	1.594	0.000	1.963	0.300	746.9	614.3
93.1	0.735	2.756	8.276	1.656	0.000	1.999	0.303	740.7	587.1
96.1	0.762	2.837	8.295	1.720	0.000	2.040	0.306	736.2	665.9
99.1	0.784	2.918	8.313	1.780	0.000	2.082	0.308	735.7	654.0
102.1	0.810	2.995	8.335	1.839	0.000	2.122	0.309	731.0	561.8
105.1	0.837	3.067	8.349	1.894	0.000	2.161	0.312	724.7	509.3
108.1	0.861	3.125	8.357	1.948	0.000	2.195	0.314	718.0	485.7
111.1	0.886	3.186	8.361	2.006	0.000	2.231	0.317	711.5	580.8

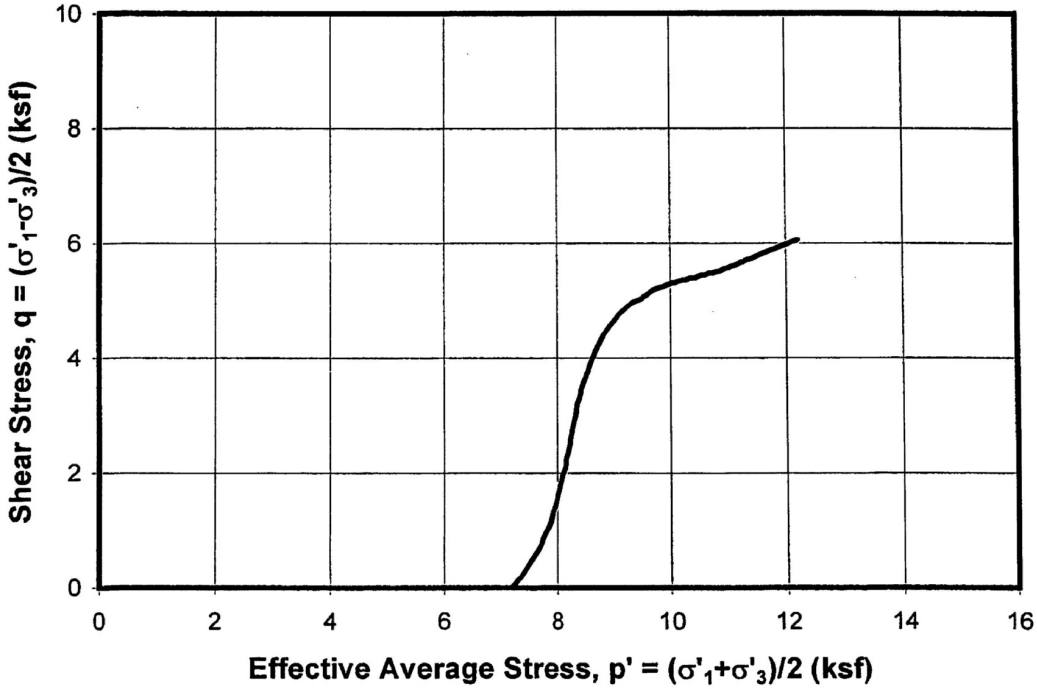
STAGE 1

Elapsed Time (min)	Axial Strain ε_a (%)	q (ksf)	p' (ksf)	Excess PWP, ΔU (ksf)	Volume Change (cm^3)	Obliquity σ'_1/σ'_3 -	A_f -	E_S (ksf)	E_T (ksf)
114.1	0.910	3.265	8.393	2.059	0.000	2.273	0.316	710.5	628.7
117.1	0.935	3.340	8.416	2.106	0.000	2.316	0.317	707.0	544.4
120.1	0.961	3.406	8.432	2.154	0.000	2.355	0.318	701.6	421.8
123.1	0.985	3.446	8.430	2.196	0.000	2.383	0.321	692.9	423.8
135.1	1.086	3.703	8.525	2.358	0.000	2.536	0.320	675.9	472.3
147.1	1.185	3.918	8.608	2.490	0.000	2.671	0.320	655.7	408.7
159.1	1.282	4.104	8.682	2.598	0.000	2.793	0.319	635.0	346.0
171.1	1.383	4.260	8.755	2.682	0.000	2.895	0.317	611.3	291.6
183.1	1.486	4.401	8.829	2.747	0.000	2.988	0.314	587.9	286.8
195.1	1.587	4.552	8.937	2.794	0.000	3.076	0.309	569.6	263.8
207.1	1.690	4.669	9.034	2.819	0.000	3.140	0.303	548.7	209.3
219.1	1.790	4.765	9.107	2.834	0.000	3.195	0.299	528.6	158.3
231.1	1.895	4.831	9.185	2.830	0.000	3.219	0.294	506.4	130.4
243.1	2.000	4.902	9.260	2.821	0.000	3.249	0.289	486.9	142.7
255.1	2.102	4.979	9.352	2.808	0.000	3.277	0.283	470.5	125.4
267.1	2.203	5.030	9.499	2.716	0.000	3.251	0.271	453.5	92.0
279.1	2.307	5.073	9.537	2.712	0.000	3.273	0.269	436.9	59.9
291.1	2.410	5.092	9.585	2.698	0.000	3.267	0.265	419.8	50.0
303.1	2.513	5.125	9.622	2.679	0.000	3.279	0.263	405.2	88.1
315.1	2.616	5.183	9.703	2.658	0.000	3.293	0.258	393.7	87.1
327.1	2.717	5.214	9.764	2.630	0.000	3.292	0.253	381.4	45.4
339.1	2.817	5.228	9.807	2.600	0.000	3.284	0.250	368.9	20.0
351.1	2.917	5.234	9.841	2.570	0.000	3.272	0.247	356.6	19.9
363.1	3.018	5.248	9.894	2.538	0.000	3.259	0.242	345.6	42.4
375.1	3.119	5.277	9.949	2.510	0.000	3.259	0.238	336.2	52.3
387.1	3.220	5.301	10.000	2.480	0.000	3.256	0.235	327.2	42.3
399.1	3.317	5.319	10.047	2.448	0.000	3.250	0.231	318.7	14.2
411.1	3.419	5.315	10.077	2.423	0.000	3.232	0.228	308.9	1.8
423.1	3.517	5.320	10.090	2.393	0.000	3.231	0.227	300.7	37.0
435.1	3.616	5.351	10.169	2.363	0.000	3.221	0.221	294.2	36.8
447.1	3.712	5.356	10.203	2.330	0.000	3.210	0.218	286.8	14.4
459.1	3.810	5.365	10.231	2.311	0.000	3.205	0.216	279.9	-1.6
471.1	3.906	5.355	10.254	2.277	0.000	3.186	0.214	272.5	4.8
483.1	4.004	5.370	10.297	2.252	0.000	3.180	0.210	266.6	44.3
495.1	4.106	5.400	10.335	2.236	0.000	3.188	0.208	261.4	22.0
507.1	4.206	5.393	10.367	2.206	0.000	3.168	0.205	254.8	5.7
519.1	4.303	5.405	10.400	2.183	0.000	3.164	0.203	249.7	-6.9
531.1	4.400	5.386	10.400	2.163	0.000	3.148	0.202	243.3	-8.7
543.1	4.498	5.397	10.434	2.138	0.000	3.143	0.199	238.5	48.4
555.1	4.596	5.434	10.489	2.122	0.000	3.150	0.196	235.0	43.2
567.1	4.699	5.439	10.518	2.099	0.000	3.142	0.194	230.1	25.2
579.1	4.799	5.459	10.560	2.075	0.000	3.140	0.191	226.1	11.5
591.1	4.896	5.451	10.575	2.056	0.000	3.128	0.189	221.3	-10.0

STAGE 1

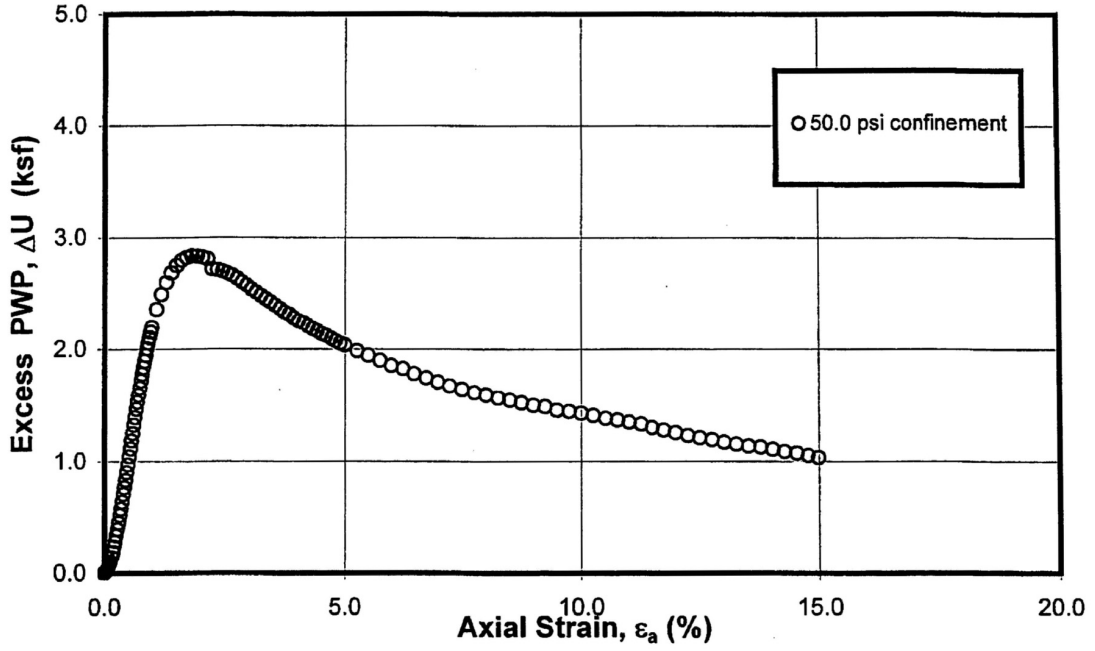
Elapsed Time (min)	Axial Strain ε_a (%)	q (ksf)	p' (ksf)	Excess PWP, ΔU (ksf)	Volume Change (cm^3)	Obliquity σ'_1/σ'_3 -	A_f -	E_S (ksf)	E_T (ksf)
603.1	4.996	5.449	10.588	2.037	0.000	3.121	0.188	216.8	13.0
633.1	5.252	5.488	10.677	1.988	0.000	3.115	0.182	207.7	11.7
663.1	5.494	5.480	10.712	1.948	0.000	3.094	0.178	198.3	4.6
693.1	5.742	5.499	10.777	1.901	0.000	3.084	0.173	190.4	15.9
723.1	5.982	5.519	10.841	1.855	0.000	3.074	0.169	183.4	8.8
753.1	6.237	5.521	10.871	1.828	0.000	3.064	0.166	176.0	20.9
783.1	6.475	5.568	10.954	1.781	0.000	3.068	0.161	171.0	21.5
813.1	6.733	5.572	11.004	1.744	0.000	3.052	0.157	164.5	15.5
843.1	6.980	5.607	11.074	1.708	0.000	3.051	0.153	159.7	16.6
873.1	7.237	5.613	11.120	1.672	0.000	3.039	0.149	154.2	14.6
903.1	7.490	5.644	11.177	1.643	0.000	3.040	0.146	149.8	22.3
933.1	7.752	5.671	11.236	1.614	0.000	3.038	0.143	145.4	10.5
963.1	8.002	5.671	11.258	1.593	0.000	3.030	0.141	140.9	18.1
993.1	8.259	5.717	11.330	1.567	0.000	3.037	0.137	137.6	17.8
1023.1	8.505	5.717	11.345	1.547	0.000	3.032	0.136	133.7	4.6
1053.1	8.749	5.729	11.384	1.524	0.000	3.026	0.133	130.2	3.3
1083.2	8.999	5.725	11.403	1.502	0.000	3.016	0.131	126.5	8.0
1113.2	9.244	5.748	11.438	1.490	0.000	3.020	0.130	123.7	18.8
1143.2	9.491	5.771	11.491	1.459	0.000	3.018	0.127	120.9	13.4
1173.2	9.746	5.782	11.513	1.447	0.000	3.017	0.125	118.0	13.5
1203.2	10.001	5.806	11.551	1.431	0.000	3.021	0.124	115.4	11.3
1233.2	10.251	5.810	11.580	1.410	0.000	3.014	0.121	112.7	10.0
1263.2	10.509	5.831	11.626	1.385	0.000	3.013	0.119	110.3	6.8
1293.2	10.765	5.828	11.636	1.372	0.000	3.007	0.118	107.7	10.0
1323.2	11.012	5.856	11.684	1.352	0.000	3.010	0.115	105.8	14.7
1353.2	11.261	5.864	11.710	1.333	0.000	3.006	0.114	103.6	10.7
1383.2	11.505	5.882	11.751	1.304	0.000	3.005	0.112	101.7	11.7
1413.2	11.748	5.893	11.788	1.280	0.000	2.999	0.109	99.8	10.6
1443.2	11.997	5.908	11.839	1.257	0.000	2.992	0.106	97.9	19.4
1473.2	12.246	5.941	11.896	1.233	0.000	2.995	0.103	96.5	10.9
1503.2	12.494	5.935	11.901	1.212	0.000	2.990	0.102	94.5	7.4
1533.2	12.751	5.960	11.949	1.194	0.000	2.991	0.100	93.0	13.8
1563.2	13.007	5.971	11.980	1.172	0.000	2.987	0.098	91.3	11.0
1593.2	13.266	5.989	12.017	1.154	0.000	2.987	0.096	89.8	4.5
1623.2	13.523	5.983	12.028	1.138	0.000	2.979	0.095	88.0	1.6
1653.2	13.777	5.993	12.045	1.127	0.000	2.980	0.094	86.5	14.2
1683.2	14.028	6.018	12.093	1.109	0.000	2.982	0.092	85.3	13.6
1713.2	14.277	6.027	12.120	1.090	0.000	2.978	0.090	84.0	9.1
1743.2	14.527	6.041	12.150	1.074	0.000	2.978	0.089	82.7	9.2
1773.2	14.768	6.049	12.179	1.054	0.000	2.974	0.087	81.5	7.1
1799.7	14.985	6.057	12.204	1.034	0.000	2.971	0.085	80.4	7.5

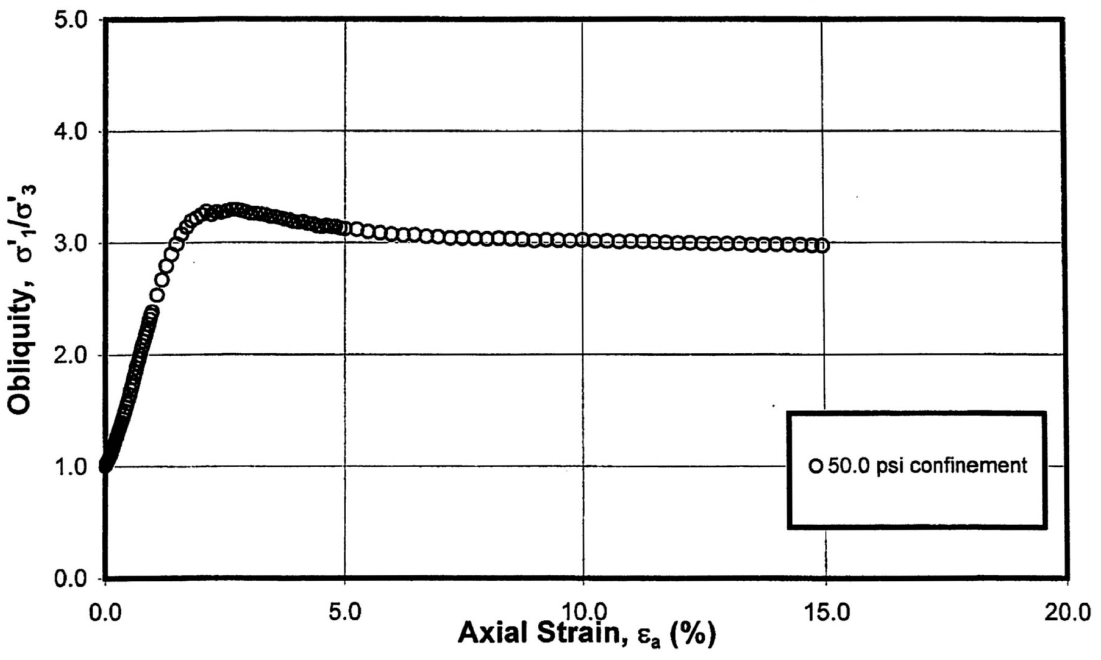




UNDRAINED TRIAXIAL COMPRESSION TEST
Isotropically Consolidated
Sample: UD10c - Depth: 70.0-71.7 ft
Boring B-2359UD

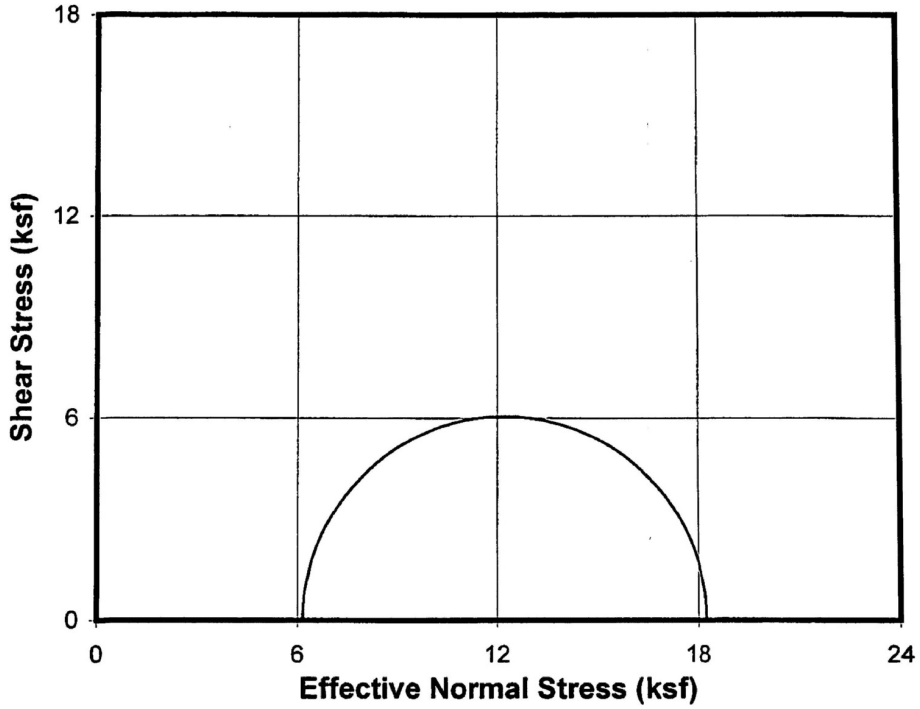
Reviewed By: WTD

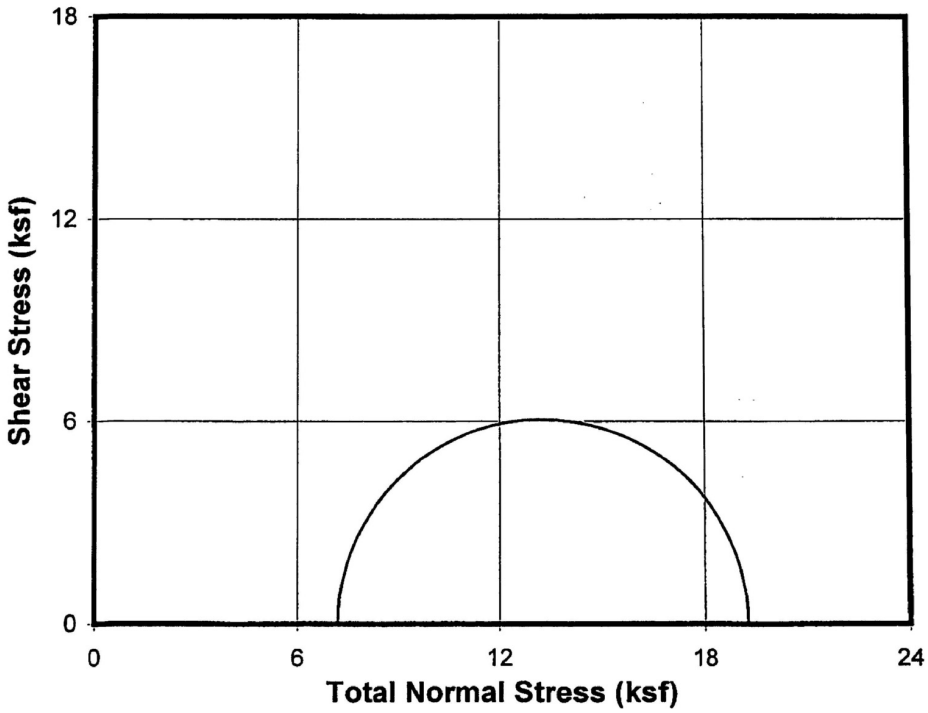




UNDRAINED TRIAXIAL COMPRESSION TEST
Isotropically Consolidated
Sample: UD10c - Depth: 70.0-71.7 ft
Boring B-2359UD

Reviewed By: WFP

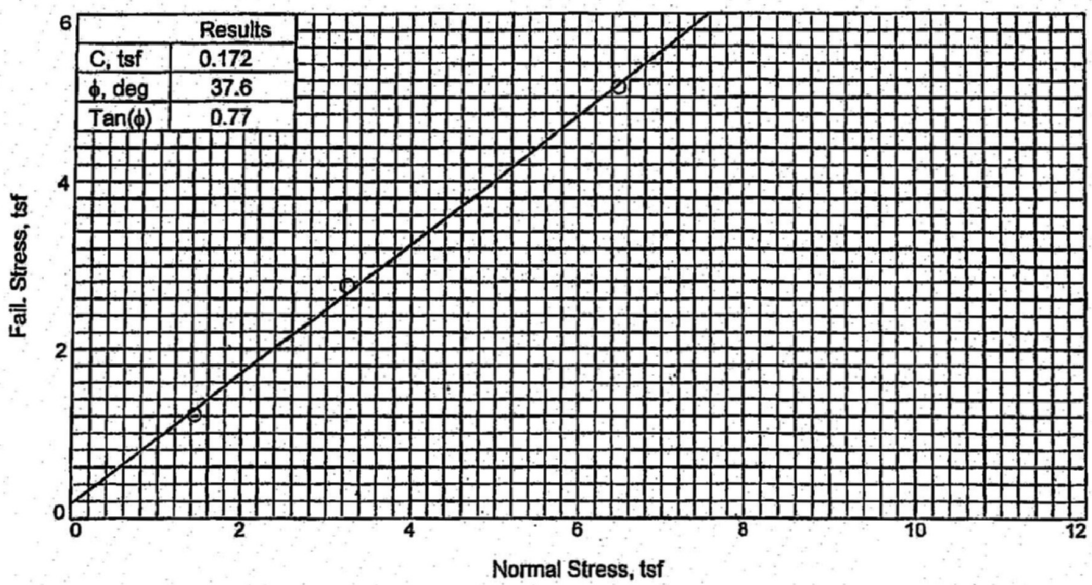


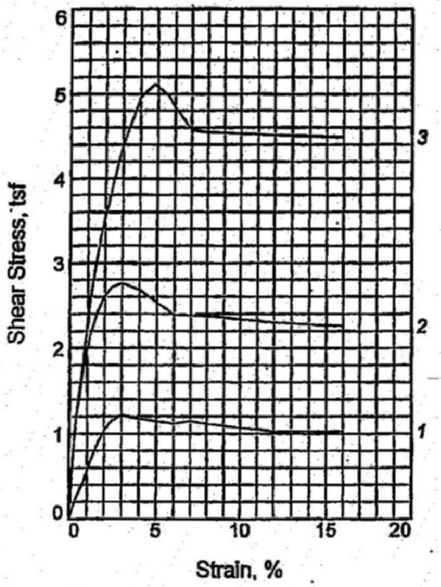


UNDRAINED TRIAXIAL COMPRESSION TEST
Isotropically Consolidated- Mohr's Circles
Sample: UD10c - Depth: 70.0-71.7 ft
Boring B-2359UD

Reviewed By: WFP

Direct Shear Tests





Sample No.		1	2	3
Initial	Water Content, %	21.6	21.8	20.1
	Dry Density, pcf	100.4	102.5	105.3
	Saturation, %	86.8	92.3	91.8
	Void Ratio	0.6663	0.6324	0.5882
	Diameter, in.	2.50	2.50	2.50
	Height, in.	1.01	1.01	1.01
At Test	Water Content, %	23.0	22.6	17.6
	Dry Density, pcf	103.7	104.4	113.8
	Saturation, %	100.6	100.6	100.0
	Void Ratio	0.6134	0.6019	0.4705
	Diameter, in.	2.50	2.50	2.50
	Height, in.	0.98	1.00	0.94
Normal Stress, tsf		1.440	3.240	6.480
Fail. Stress, tsf		1.217	2.758	5.119
Strain, %		3.0	3.0	4.8
Ult. Stress, tsf				
Strain, %				
Strain rate, in./min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Very Pale Brown Poorly Graded SAND with Silt (SP-SM) Visual
LL= ND PL= ND PI= ND
Specific Gravity= 2.68
Remarks: ASTM D 3080-04. ND=Not Determined. Lever arm mechanical shear device was used to perform the test. Samples sheared to the limitation of the machine.
Lab No. 8345

Client: Bechtel
Project: Exelon Texas COL (Victoria)
Location: B-2302UD
Sample Number: UD-9 **Depth:** 63.5-66 Ft
Proj. No.: 6468-07-1777 **Date:** 2/6/08

DIRECT SHEAR TEST REPORT
MACTEC ENGINEERING AND CONSULTING, INC.

Tested By: BM **Checked By:** HJ HJ 4/15/08 KAW 4-15-08

DIRECT SHEAR TEST

4/15/2008

Date:	2/6/08
Client:	Bechtel
Project:	Exelon Texas COL (Victoria)
Project No.:	6468-07-1777
Location:	B-2302UD
Depth:	63.5-66 Ft **Sample Number:** UD-9
Description:	Very Pale Brown Poorly Graded SAND with Silt (SP-SM) Visual
Remarks:	ASTM D 3080-04. ND=Not Determined. Lever arm mechanical shear device was used to perform the test. Samples sheared to the limitation of the machine.
Type of Sample:	Undisturbed

Specific Gravity=2.68 **LL**=ND **PL**= ND **PI**=ND

Parameters for Specimen No. 1

Specimen Parameter	Initial	Consolidated	Final
Moisture content: Moist soil+tare, gms.	112.990		164.920
Moisture content: Dry soil+tare, gms.	94.380		135.580
Moisture content: Tare, gms.	8.180		8.160
Moisture, %	21.6	23.0	23.0
Moist specimen weight, gms.	158.6		
Diameter, in.	2.50	2.50	
Area, in.^{2}	4.91	4.91	
Height, in.	1.01	0.98	
Net decrease in height, in.		0.03	
Wet Density, pcf	122.1	127.6	
Dry density, pcf	100.4	103.7	
Void ratio	0.6663	0.6134	
Saturation, %	86.8	100.6	

Test Readings for Specimen No. 1

Normal stress = 1.44 tsf

Strain rate, in./min. = 0.01

Fail. Stress = 1.217 tsf **at reading no.** 8

No.	Horizontal Def. Dial in.	Load Dial	Load lbs.	Strain %	Shear Stress tsf
0	0.0000	0.00	0.0	0.0	0.000
1	0.0050	10.00	10.0	0.2	0.147
2	0.0100	17.00	17.0	0.4	0.249
3	0.0200	30.00	30.0	0.8	0.440
4	0.0300	46.00	46.0	1.2	0.675
5	0.0400	60.00	60.0	1.6	0.880
6	0.0500	71.00	71.0	2.0	1.041
7	0.0600	78.00	78.0	2.4	1.144
8	0.0750	83.00	83.0	3.0	1.217
9	0.0900	81.00	81.0	3.6	1.188
10	0.1000	80.00	80.0	4.0	1.173
11	0.1500	76.00	76.0	6.0	1.115
12	0.1750	78.00	78.0	7.0	1.144

MACTEC Engineering and Consulting, Inc.