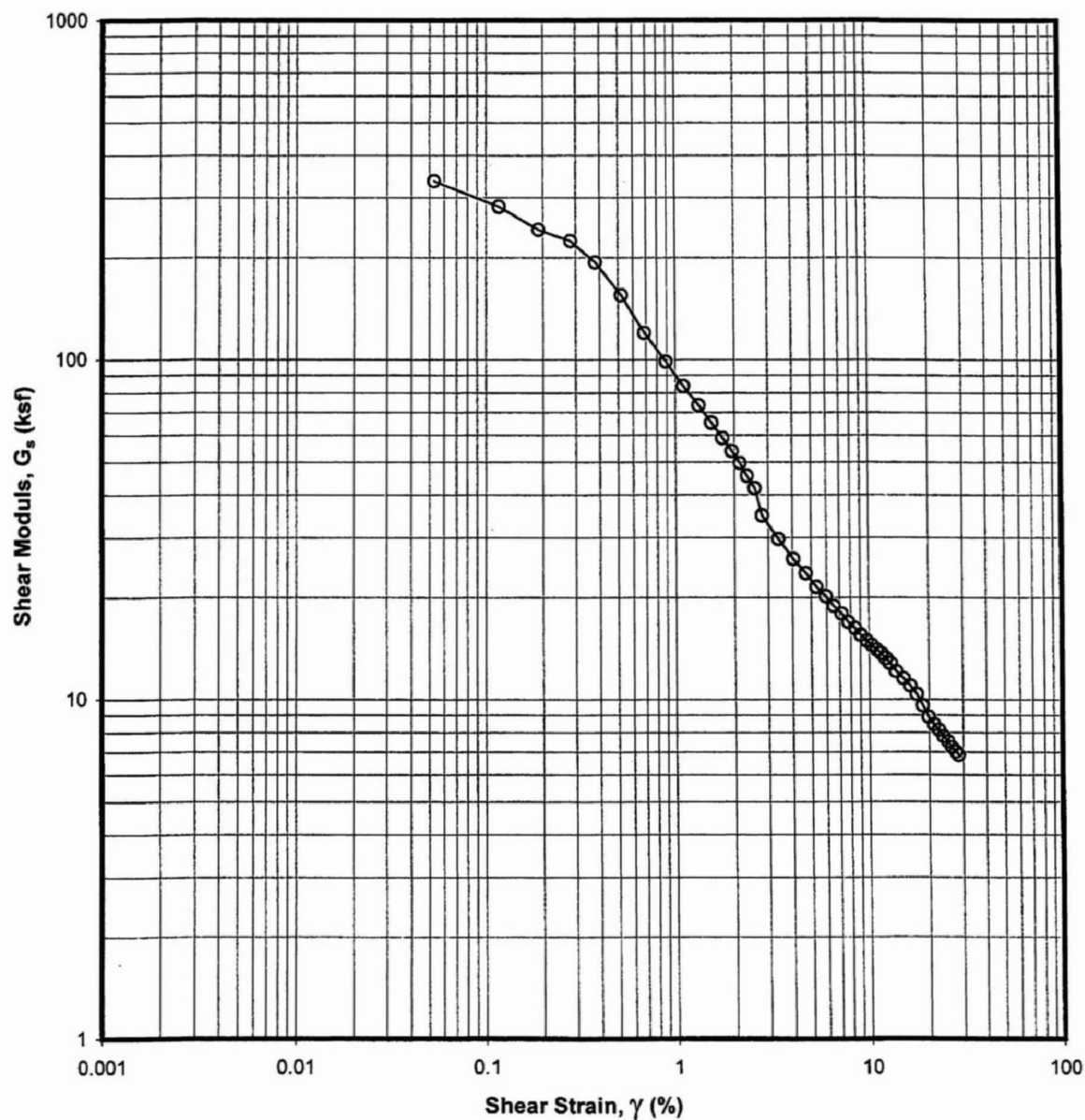




STATIC DSS TEST
 K_0 Consolidation - OCR = NA
 Sample: Comp-AH - Depth: NA ft
 Boring TP2319/TP2334

KAW 7/16/08

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Setup / Take Down

Project Number: 0411-08-1686 Test Type: SDSS Sta. No.: 9G File Name: Comp-Ah
 Task No.: NA Assign, $\sigma'_{v,c}$ = 4.32 ksf $K_{c,DSS} (\tau_{h,c} / \sigma'_{v,c})$ = NA
 Project Name: Exelon (Victoria) Induced OCR = NA $K_{ub,DSS} (\tau_{hu,b} / \sigma'_{v,c})$ = NA
 Test No.: NA Test Series for/on: NA Type Stage: NA = NA, NA, NA & NA
 Assig. Remarks: Specific Gravity: 2.659 ☒ Meas.; ☐ Assumed

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	Constant Effort:	Blows/Tamps per Layer = 11
Boring No.: TP2319/TP2334	☐ LPC Core			Impact/Rammer	Rammer Wgt. (lbf) =	No. Layers = 3.00
Sample No.: Comp-A	Compostite No.:			Pluviated:	Tamper Force (lbf) = 4.00	Drop (in.) = 12.00
Depth (ft): NA	Specimen No.: H			Kneading	☒ Undercompaction: U_{ni} (%) =	Dia. (in.) = 1.40
☐ Spec. Selection by X-ray;	☐ Geomarine Sample				Ref. Effort = MOD	% Comp. = 95.0 $\pm$ Opt. = +4

Type	☒ K_o at:	☒ Incremental	☐ Anisotropic at:	Inclined Stress Path, $K_{c,DSS}$	☐ Used Automated System
Consolidation:		CRS		90° Stress Path	Remarks:
Loading	☒ Static	☒ Strain	☐ Creep	☒ Const. Vol./Ht	☒ Without - Water
Conditions:	Rapid	Stress	Post Cyclic	Drained	With - Bath
					Cyclic (Hz) Rate: 0.1; Strain 1; Other:

Water Content (WC);	Initial - Trimming Location			Final, W_{at} (see below)	Soil and Ring Masses		Initial	Final
	Top ($W_{o,1}$)	Bottom ($W_{o,2}$)	Sides ($W_{o,3}$)		Mass Moist Soil + Tare (g)	Mass Tare (g)		
Container No.	4045			191	Mass Moist Soil, $M_{t,o}$ (g)	186.80	328.12	147.14
Mass Moist Soil + Cont. (g)	103.43			66.35	Mass Moist Soil, $M_{t,o}$ (g)	141.32	186.80	4.85
Mass Dry Soil + Container (g)	94.65			61.52	Excess Dry Soil (soil not included in final mass above)			
Mass Container (g)	30.35			30.76	Container No.			
WATER CONTENT (%)	13.65			15.70	Mass Dry Soil + Container (g)			
Avg. Initial WC, $W_{o,avg}$ (%)	13.65		Final W_{at} : ☒ Slice ; ☐ Whole Spec.		Mass Container (g)			
See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)			
					0.00			

Specimen Trimming:			
☐ Trimming Ring for Fugro Apparatus	NL3	Large-ring ID #	
☒ Trimming Ring for NGI Apparatus		Small-ring ID #	
$H_{s,t}$ (mm):	18.53	$A_{s,t}$ (cm ²):	34.87
$D_{s,t}$ (mm):	66.63	$V_{s,t}$ (cm ³):	64.60
Remarks:			
Free Standing by Wire Saw Lathe or Reconstituted Spec. (mm)			
Height (H_{tr})	Diameter (D_o)	Remarks:	
1 18.540	1-T NA	For Free Standing or Reconstituted Spec.:	
2 18.470	2-M NA		
3 18.550	3-B NA		
4 18.500	1'-T NA		
5 18.530	2'-M NA		
Avg.	3'-B NA	A_{tr} (cm ²):	NA
= 18.525	Avg NA	V_{tr} (cm ³):	NA

Note: NA indicates not applicable.

F or G in the Sta. No. indicates Fugro or GEOTAC apparatus.

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (lb/ft ³) =	136.57
Dry, $\gamma_{d,o}$ (lb/ft ³) =	120.16

Specimen Lateral Confinement by:				
Wire Reinforced, Model:		Thickness (mm) =		
Stress	Dia. by PiTape (mm)	Area, $A_{c,n}$		
Level	Meas.	Corr.	(cm ²)	(in ²)
0				
$\sigma'_{v,c}$				
$\sigma'_{v,max}$				
☒ Regular Membrane with Ring Set No. 9	ID, Rings (mm)			
Thickness (mm):	Top: 0.70	=		67.34
☐ Single	Bottom: 0.72			Corr. for mem.
☒ Double	Membr. Thick. = 0.36			= 66.630
Area Ring with mem., A_o (cm ²) =		34.87	; (in ²) = 5.405	
Mass Top Cap, etc., M_{tc} =		528.7 g,	1.17	lbf
Data corr. for M_{tc} :	☒ Yes;	☐ No	Plattens with Pins:	☐ Yes; ☒ No

Final Visual Description: Light Brown Clayey SAND (SC)

Other Remarks :

Trim./ Recon. By: DBN

Setup By: HC

Take Down By: HC

Date: 5/2/2008

Date: 5/2/2008

Date: 5/5/2008

Prelim. Calc. By: LF

Final Calc. By: LF

Reviewed By: HP

Specimen Take Down: ☒ Spec. removed right after shearing

☐ Spec. unloaded to zero stress with access to water

Remarks:

KAW 6/13/08

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Calculations & Summary

Project Number: 0411-08-1686
Task Number: NA

Test Station No.: 9G
Specific Gravity: 2.659

File Name: Comp-Ah

Type Test: SDSS

Specimen: ☐ "Undisturbed";

☒ Reconstituted;

☒ Remolded

Boring No.: TP2319/TP2334

Calculations Corr. for Salt (dissolved solids): ☒ No or, ☐ Yes, with concentration = ppm

Sample No.: Comp-AH

Consolidation Stress Summary and Loading Summary

Test Stage:	Max. Stress	Pre-Shear	Post Cyclic	X	Static Strain Rate =	NA	(%/hr or)
Nominal Vertical Stress, σ'_v (ksf)	NA	4.32	NA		Cyclic Rate (Hz):	0.1;	1; Other =
Axial/Vertical Force, $P_{w,n}$ (lbf)	NA	NA	NA		During/End of Loading	Static	Cyclic
Horizontal Force, $P_{h,n}$ (lbf)	NA	0	NA		Change in Height, $\Delta H_{L,n}$ (mm)	NA	NA
Nominal OCR	NA	NA	NA		Change in Vol., $\Delta V_{L,n}$ (cm ³)	NA	NA
t_c (ON,days,hrs)	NA	0.70 days	NA		Post Cy.Displ. Reset to Null Position:	Yes;	No
Undrained ambient stress applied: with Delta shear force (lbf) = NA & Duration (min) = NA & Delta disp., $\Delta d_{h,ua}$ (mm) = NA							

Trimmed Specimen (TS) - Initial Water Contents over Saturation (%):

	Top, $W_{o,1}$	Bottom, $W_{o,2}$	Sides, $W_{o,3}$	Avg., $W_{o,avg}$	Selct., $W_{o,s}$	Back Cal.
W_o	13.65			13.65	13.65	14.91
S_o	95.8			95.8	95.8	100.6
Measured final mass of moist soil, $M_{l,at}$ (g)						142.29
Final mass of moist soil corrected for excess dry soil, $M_{l,at,c}$ (g)						142.29

Calculated Mass of Dry Soil (g)

Initial Selected Water Content (%)	13.65
Initial, $M_{d,o}$	124.34
Final, $M_{d,at}$	122.98
Selected, M_d	123.66

Initial Back Cal. Specific Gravity (TS):

Selected S_o (%)	
Selected W_o (%)	
Specific Gravity, $G_{s,bc}$	

Height/Volume Change Summary

Variation in Height & Volume During Consol.	During Initial Consol. to $\sigma'_{v,c}$ or $\sigma'_{v,max}$	During Rebound to $\sigma'_{v,c}$	Specimen Unloaded After Test To
Stress Units (ksf)	4.320	NA	NA
Sign Convention: (+) ΔV out & ΔH down; (-) ΔV in & ΔH up			
Delta Def. Read., $\Delta d_{ar,n}$ (mm)	0.570		
Total Equip. Comp., $\Sigma \Delta d_{alc}$ (mm)	0.000		
Corr. Total Def. $\Delta H_{c,n}$ (mm)	0.570		
ΔV_n using A_o - spec. (cm ³)	1.99		
ΔV_n using $A_{c,n}$ - app. (cm ³)	1.99		
ΔV_n using burette meas. (cm ³)	0.20		
Selected ΔV_n (cm ³)	1.99	NA	NA = ΔV_{uL}
After Test WC Corr. for ΔV during Shear & Unloading, $W_{at,c}$ (%)			NA

Lateral Confinement Area Cal. Approach (LCA); Method 1, 2, 3 or 4: 1

Calculation of ΔV_c by Different Procedures

By Selected Volumes	By Change in Mass
ΔV_c (cm ³)	1.99
	$\sim M_{t,o} - (M_{l,at,c} + \Delta V_L + \Delta V_{uL})$
By Cal. Height & App. Area	ΔV_c (cm ³)
ΔV_c (cm ³)	1.99
	By Saturation = 100% and Spec. Unloaded to 0 Stress
By Cal. Ht. & Init. Spec. Area	ΔV_c (cm ³)
ΔV_c (cm ³)	1.99
	ΔV_c (cm ³)

Back Cal. Water Content During Consol. -

Based on the Consolidation Conclusions Given Below

Assumed Saturation (%)	100.00
Back Cal. WC before Loading, $W_{c,bc}$ (%)	12.93
Back Cal. WC at Max. Stress, $W_{c,max,bc}$ (%)	NA

Consolidation & Preshear	ΔV_c (cm ³) = 1.99	ΔH_c (mm) = 0.570	$\epsilon_{a,c}$ (%) = 3.08	$\Delta V_{c,max}$ (cm ³) = NA
Conclusions	V_c (cm ³) = 62.61	H_c (mm) = 17.955	$\epsilon_{v,c}$ (%) = 3.08	$\epsilon_{ac,max}$ (%) = NA
	A_c (cm ²) = 34.87	$\Delta \gamma_c$ (mm) = NA	γ_c (%) = NA	Preshear: γ_{ub} (%) = NA

Summary of Specimen Physical Properties:

Specific Gravity: $G_s = 2.659$ Measured	Height (mm)	Volume (cm ³)	Area (cm ²)	Water Content (%)	Total Unit Weight (pcf)	Dry Unit Weight (pcf)	Saturation (%)	Void Ratio, e
Condition:								
Initial (as trimmed)	18.525	64.60	34.87	14.3	136.6	119.5	98.2	0.389
After to $\sigma'_{v,c}$	17.955	62.61	34.87	12.9	139.3	123.3	100.0	0.346
Consol.: to $\sigma'_{v,max}$	NA	NA	NA	NA	NA	NA	NA	NA

LCA-Method: 1- Initial measured value remains constant.

4 - Based on change in height & volume.

Calculated By: LF

& Note(s) 2 - Initial measured value corrected for applied stress.

NA - Not Applicable

Reviewed By: HP

3 - Uses measured value at appropriate stress level (NA for rings).

Remarks: t95 for max stress = 1.3 min

Project Number: 0411-08-1686 Test Type: SDSS Test Sta. No.: 9G File Name: _Comp-Ah
Project Name: Exelon (Victoria) Task No.: NA Test No.: NA Test Series for: NA

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	Constant Effort:	Blows/Tamps per Layer =	11
Boring No.: TP2319/TP2334	☐ LPC Core			Impact/Rammer	Rammer Wgt. (lb) =	No. Layers =	3.00
Sample No.: Comp-A	Composited No.: _____			Pluviated:	Tamper Force (lb) =	Drop (in.) =	12.00
Depth (ft): NA	Specimen No.: H			Kneading	☒ Undercompaction: U _{ni} (%) =	Dia. (in.) =	1.40
Spec. Selection by X-ray:	☐ Geomarine Sample				Ref. Effort= MOD	% Comp. =	95.0 ± Opt.= +4

Type Consolidation:	☒ K_0 at:	☐	Incremental CRS	☐ Anisotropic at:	☐	Inclined Stress Path, $K_{c,DSS}$	☐ Used Automated System	Remarks:		
Loading Conditions:	☒ Static	☐ Dynamic	☐ Strain Stress	☐ Creep Post Cyclic	☒ Const. Vol./Ht Drained	☒ Without - Water	☐ With - Bath	☐ Cyclic (Hz)	☐ Rate: 0.1;	☐ Strain 1; Other:

Summary of Specimen Physical Properties										
Specific Gravity: G _s = 2.659 Measured	Height (mm)	Volume (cm ³)	Area (cm ²)	Water Content (%)	Unit Weight		Saturation (%)	LL	-200 %	Void Ratio e
Condition:					Total (pcf)	Dry (pcf)		PL		
Initial	18.53	64.60	34.87	14.28	136.6	119.5	98.2	34	46.4	0.389
After to $\sigma'_{v,c}$	17.96	62.61	34.87	12.93	139.3	123.3	100.0	12	NA	0.346
Consol.: to $\sigma'_{vc,max}$	NA	NA	NA	NA	NA	NA	NA	22	NA	NA

Consolidation Stress Summary and Loading Summary									
Item	Unit	Max. Stress	Pre-Shear	Post Cyclic	X	Static Strain Rate = 4.8 %/hr.			
Vert. Consol. Stress, σ'_{vc}	(ksf)	NA	4.397	NA		Cyclic Rate (Hz):	0.1;	1;	Other =
Induced OCR:	-	NA	NA	NA		During/End of Loading		Static	Cyclic
Axial Strain during Consol., $\epsilon_{a,c}$	%	NA	3.08	NA		Change in Height, $\Delta H_{L,n}$ (mm):		NA	NA
Horiz. Consol. Stress, τ_{hc}	(ksf)	NA	NA	NA		Change in Vol., $\Delta V_{L,n}$ (cm ³):		NA	NA
Consol. Stress Ratio, τ_{hc} / σ'_{vc}	-	NA	NA	NA		Post Cy.Displ. Reset to Null Pos.:	Yes;	No	
Shear Strain during Consol., $\epsilon_{h,c}$	%	NA	NA	NA		Number of Loading Cycles, N = NA			
Undr. Ambient Shear Stress, τ_{hu}	(ksf)	NA	NA	NA		$\pm \tau_h =$ NA (ksf)		$\pm \gamma =$ NA %	
Undr. Ambient Shear Strain, ϵ_{hu}	%	NA	NA	NA		at end of cyclic loading, $\sigma'_{vcy,f} =$ NA (ksf)			

Weight Top Cap, etc., M_{tc} (lb): 1.17										Data Normalization: ☒ Yes ☐ No Value: 4.397 (ksf)									
Data corr. for M_{tc} : ☒ Yes; ☐ No										Plattens with Pins: ☐ Yes; ☒ No									
Wire Reinforced Membrane, Model: _____										Data corr. for Membr. strength ☒ Yes ☒ No									
☒ Regular Membrane with Rings										☐ Pre-Shear Conditions ☐ Post-Cyclic Conditions									
										Maximum Stress during Consol. ☐									

F or G in the Test Sta. No. indicates Fugro or GEOTAC apparatus.

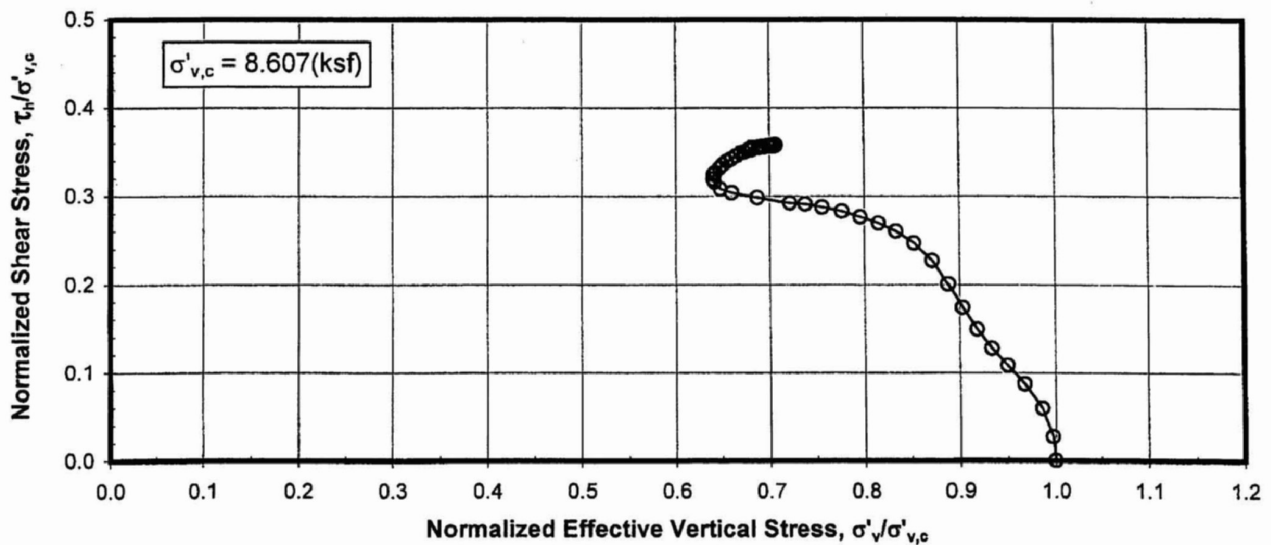
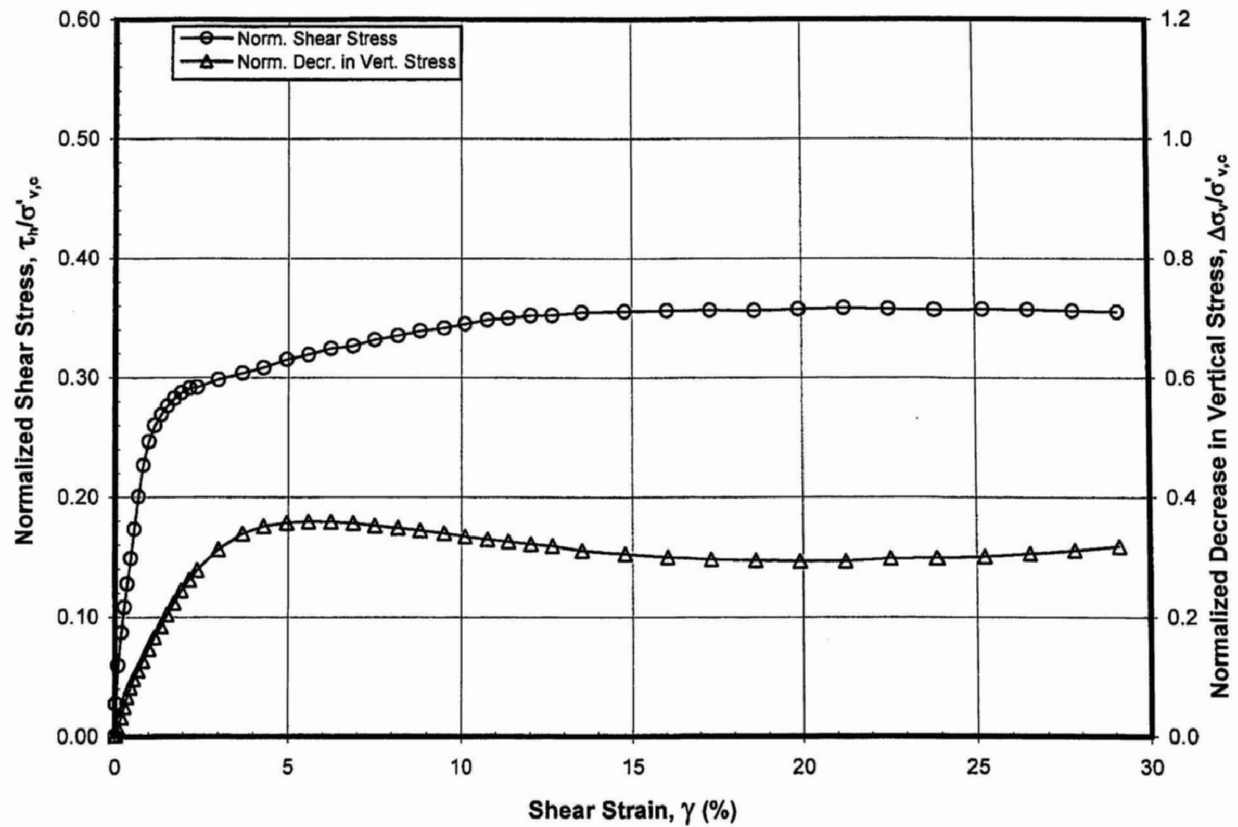
NA - Not Applicable

Final Visual Description and Remarks: Light Brown Clayey SAND (SC)

Loading Summary						
	τ_h (ksf)	γ (%)	σ'_v (ksf)	τ_h/σ'_v -	$\Delta\sigma'/\sigma'_{v,c}$ -	$C_u/\sigma'_{v,c}$ -
at Peak Shear Stress	2.005	29.30	3.413	0.588	0.224	0.456
at Maximum Strain	2.005	29.30	3.413	0.588	0.224	-

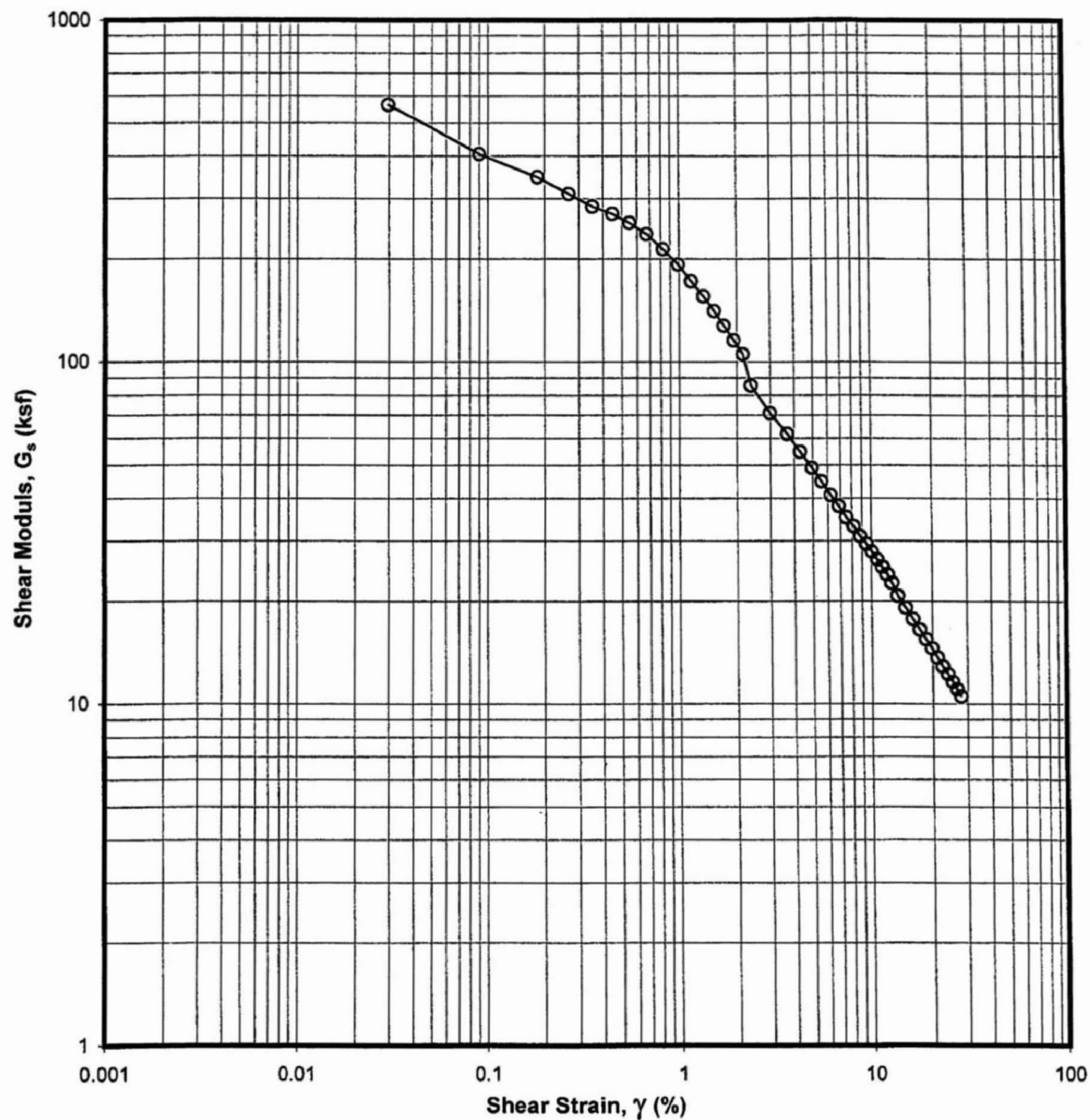
Boring No.: TP2319/TP2334 Sample No.: Comp-AH

Elapsed Time (min)	Shear Strain γ (%)	Shear Stress τ_h (ksf)	Effective Vertical Stress σ'_v (ksf)	Calculated Pore Press. Change $\Delta U = \Delta \sigma'_v$ (ksf)	Secant Shear Modulus G_s (ksf)	Tangent Modulus G_T (ksf)	Norm. Shear Stress $\tau_h/\sigma'_{v,c}$	Norm. Vert. Stress $\sigma'_v/\sigma'_{v,c}$	Norm. Decr. in V. Stress $\Delta \sigma'_v/\sigma'_{v,c}$	Stress Ratio Angle ϕ'_{bss} (°)
0.0	0.00	-0.004	4.397	0.000	-	-	-0.001	1.000	0.000	-0.05
2.5	0.05	0.222	4.316	0.081	427.528	344.541	0.051	0.982	0.018	2.95
5.1	0.12	0.391	4.244	0.152	336.308	229.136	0.089	0.965	0.035	5.26
7.7	0.19	0.535	4.148	0.248	282.731	176.819	0.122	0.943	0.057	7.35
10.2	0.28	0.679	4.094	0.303	241.818	164.807	0.154	0.931	0.069	9.42
12.8	0.38	0.850	3.961	0.436	223.828	141.426	0.193	0.901	0.099	12.11
15.3	0.52	1.003	3.793	0.604	193.473	72.567	0.228	0.863	0.137	14.82
17.9	0.69	1.062	3.521	0.876	154.918	18.707	0.242	0.801	0.199	16.78
20.4	0.89	1.067	3.228	1.169	119.792	4.524	0.243	0.734	0.266	18.29
23.0	1.10	1.081	2.975	1.422	98.591	7.570	0.246	0.677	0.323	19.96
25.6	1.32	1.099	2.813	1.584	83.594	9.126	0.250	0.640	0.360	21.35
28.1	1.53	1.120	2.676	1.721	73.271	8.284	0.255	0.609	0.391	22.71
30.6	1.75	1.135	2.581	1.816	65.149	5.416	0.258	0.587	0.413	23.74
33.2	1.95	1.143	2.524	1.873	58.824	3.829	0.260	0.574	0.426	24.36
35.8	2.15	1.150	2.457	1.940	53.755	4.489	0.262	0.559	0.441	25.09
38.3	2.35	1.161	2.384	2.013	49.623	3.970	0.264	0.542	0.458	25.96
40.9	2.57	1.167	2.345	2.052	45.461	1.337	0.265	0.533	0.467	26.46
43.4	2.80	1.167	2.283	2.114	41.846	1.154	0.265	0.519	0.481	27.07
51.1	3.40	1.181	2.185	2.212	34.793	2.528	0.268	0.497	0.503	28.39
58.7	4.05	1.199	2.047	2.350	29.650	2.721	0.273	0.465	0.535	30.36
66.4	4.71	1.216	2.079	2.318	25.915	4.130	0.277	0.473	0.527	30.32
74.0	5.34	1.252	2.093	2.304	23.498	5.053	0.285	0.476	0.524	30.88
81.7	5.99	1.281	2.132	2.265	21.434	5.583	0.291	0.485	0.515	31.00
89.3	6.58	1.320	2.185	2.212	20.122	5.951	0.300	0.497	0.503	31.13
97.0	7.21	1.353	2.200	2.197	18.817	5.655	0.308	0.500	0.500	31.59
104.6	7.80	1.389	2.273	2.124	17.845	5.805	0.316	0.517	0.483	31.43
112.3	8.47	1.426	2.302	2.095	16.877	5.949	0.324	0.524	0.476	31.78
119.9	9.09	1.465	2.369	2.028	16.164	5.814	0.333	0.539	0.461	31.73
127.6	9.75	1.500	2.400	1.997	15.423	5.737	0.341	0.546	0.454	32.00
135.2	10.37	1.539	2.463	1.934	14.869	6.559	0.350	0.560	0.440	32.00
142.9	10.99	1.581	2.522	1.875	14.423	6.464	0.360	0.574	0.426	32.08
150.5	11.59	1.618	2.581	1.816	13.986	6.356	0.368	0.587	0.413	32.08
158.2	12.18	1.657	2.661	1.736	13.633	5.523	0.377	0.605	0.395	31.91
165.9	12.80	1.684	2.687	1.710	13.186	5.223	0.383	0.611	0.389	32.07
176.0	13.63	1.735	2.713	1.684	12.753	5.436	0.394	0.617	0.383	32.59
191.3	14.87	1.794	2.868	1.528	12.090	4.714	0.408	0.652	0.348	32.02
206.6	16.12	1.852	2.989	1.408	11.512	4.206	0.421	0.680	0.320	31.78
221.9	17.38	1.899	3.092	1.305	10.951	2.846	0.432	0.703	0.297	31.56
237.2	18.62	1.923	3.182	1.215	10.349	0.318	0.437	0.724	0.276	31.15
252.5	19.93	1.906	3.222	1.175	9.581	-1.475	0.434	0.733	0.267	30.61
267.8	21.29	1.884	3.296	1.101	8.866	-0.257	0.428	0.750	0.250	29.75
283.1	22.55	1.898	3.320	1.077	8.432	1.891	0.432	0.755	0.245	29.76
298.4	23.80	1.931	3.331	1.066	8.128	2.124	0.439	0.758	0.242	30.10
313.6	25.07	1.952	3.360	1.037	7.800	1.802	0.444	0.764	0.236	30.15
329.0	26.32	1.977	3.365	1.032	7.522	1.517	0.450	0.765	0.235	30.43
344.2	27.59	1.990	3.379	1.017	7.225	0.703	0.453	0.769	0.231	30.49
354.4	28.45	1.993	3.394	1.003	7.016	0.922	0.453	0.772	0.228	30.42
364.6	29.30	2.005	3.413	0.984	6.856	1.480	0.456	0.776	0.224	30.44



STATIC DSS TEST
 K₀ Consolidation - OCR = NA
 Sample: Comp-AI - Depth: NA ft
 Boring TP2319/TP2334
 Exelon (Victoria)

KAW 7/16/08



STATIC DSS TEST
 K_o Consolidation - OCR = NA
 Sample: Comp-AI - Depth: NA ft
 Boring TP2319/TP2334

KAW 7/16/08

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Setup / Take Down

Project Number: 0411-08-1686 Test Type: SDSS Sta. No.: 10G File Name: Comp-Ai
 Task No.: NA Assign, $\sigma'_{v,c}$ = 8.64 ksf $K_{c,DSS} (\tau_{h,c} / \sigma'_{v,c})$ = NA
 Project Name: Exelon (Victoria) Induced OCR = NA $K_{ub,DSS} (\tau_{hu,b} / \sigma'_{v,c})$ = NA
 Test No.: NA Test Series for/on: NA Type Stage: NA = NA, NA, NA & NA
 Assig. Remarks: Specific Gravity: 2.659 ☒ Meas.; ☐ Assumed

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	Constant Effort:	Blows/Tamps per Layer = 11
Boring No.: TP2319/TP2334	☐ LPC Core			Impact/Rammer	Rammer Wgt. (lb) =	No. Layers = 3.00
Sample No.: Comp-A	Composite No.:			Pluviated:	Tamper Force (lb) = 4.00	Drop (in.) = 12.00
Depth (ft): NA	Specimen No.: I			Kneading	☒ Undercompaction: U_{ni} (%) =	Dia. (in.) = 1.40
Spec. Selection by X-ray;	☐ Geomarine Sample			Ref. Effort= MOD	% Comp. = 95.0	$\pm$ Opt. = +4

Type Consolidation:	☒ K_o at:	☒ Incremental CRS	☐ Anisotropic at:	Inclined Stress Path, $K_{c,DSS}$	☐ Used Automated System
				90° Stress Path	Remarks:
Loading Conditions:	☒ Static	☒ Strain	☐ Creep	☒ Const. Vol./Ht	☒ Without - Water
	☐ Rapid	☐ Stress	☐ Post Cyclic	☐ Drained	☐ With - Bath
					Cyclic (Hz) Rate: 0.1; Strain 1; Stress Other:

Water Content (WC);	Initial - Trimming Location			Final, W_{at} (see below)	Soil and Ring Masses		Initial	Final
	Top ($W_{o,1}$)	Bottom ($W_{o,2}$)	Sides ($W_{o,3}$)		Mass Moist Soil + Tare (g)	Mass Tare (g)		
Container No.	1144			848	Mass Moist Soil, $M_{t,o}$ $M_{t,at}$ (g)	186.79	4.35	
Mass Moist Soil + Cont. (g)	106.03			75.11	Mass Moist Soil, $M_{t,o}$ $M_{t,at}$ (g)	141.32	142.05	
Mass Dry Soil + Container (g)	96.99			69.56	Excess Dry Soil (soil not included in final mass above)			
Mass Container (g)	32.41			32.13	Container No.			
WATER CONTENT (%)	14.00			14.83	Mass Dry Soil + Container (g)			
Avg. Initial WC, $W_{o,avg}$ (%)	14.00	Final W_{at} : ☒ Slice ;		Whole Spec.	Mass Container (g)			
See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)			
					0.00			

Specimen Trimming:				
☐ Trimming Ring for Fugro Apparatus	NL3	Large-ring ID #		
☒ Trimming Ring for NGI Apparatus		Small-ring ID #		
$H_{s,t}$ (mm):	18.53	$A_{s,t}$ (cm ²):	34.87	
$D_{s,t}$ (mm):	66.63	$V_{s,t}$ (cm ³):	64.60	
Remarks:				
☐ Free Standing by Wire Saw Lathe or Reconstituted Spec. (mm)				
Height (H_r)	Diameter (D_o)	Remarks:		
1 18.540	1-T NA	For Free Standing or Reconstituted Spec.:		
2 18.500	2-M NA			
3 18.530	3-B NA			
4 18.530	1'-T NA			
5 18.510	2'-M NA			
Avg.	3'-B NA	A_{tr} (cm ²):	NA	
= 18.525	Avg NA	V_{tr} (cm ³):	NA	

Note: NA indicates not applicable.

F or G in the Sta. No. indicates Fugro or GEOTAC apparatus.

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (lb/ft ³) =	136.57
Dry, $\gamma_{d,o}$ (lb/ft ³) =	119.80

Specimen Lateral Confinement by:				
Wire Reinforced, Model:		Thickness (mm) =		
Stress Level	Dia. by PiTape (mm) Meas.	Corr.	Area, $A_{c,n}$ (cm ²)	(in ²)
0				
$\sigma'_{v,c}$				
$\sigma'_{v,max}$				
☒ Regular Membrane with Ring Set No. 10	ID, Rings (mm)			
Thickness (mm):	Top: 0.61		= 67.25	
☐ Single	Bottom: 0.63		Corr. for mem.	
☒ Double	Membr. Thick. = 0.31		= 66.630	
Area Ring with mem., A_o (cm ²) =		34.87	; (in ²) = 5.405	
Mass Top Cap, etc., M_{tc} =		528.2 g,	1.16 lbf	
Data corr. for M_{tc} :	☒ Yes;	No	Plattens with Pins:	☐ Yes; ☒ No

Final Visual Description: Light Brown Clayey SAND (SC)

Other Remarks :

Trim./ Recon. By: DBN
 Date: 5/7/2008
 Prelim. Calc. By: HC

Setup By: HC
 Date: 5/7/2008
 Final Calc. By: LF

Take Down By: HC
 Date: 5/9/2008
 Reviewed By: HP

Specimen Take Down: ☒ Spec. removed right after shearing
☐ Spec. unloaded to zero stress with access to water

Remarks:

KAW 6/13/08

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Calculations & Summary

Project Number: 0411-08-1686

Test Station No.: 10G

File Name: _Comp-Ai

Task Number: NA

Specific Gravity: 2.659

☒ Measured; ☐ Assumed

Type Test: SDSS

 Specimen: ☐ "Undisturbed"; ☒ Reconstituted; ☒ Remolded

Boring No.: TP2319/TP2334

 Calculations Corr. for Salt (dissolved solids): ☒ No or, ☐ Yes, with concentration = _____ ppm

Sample No.: Comp-AI

Consolidation Stress Summary and Loading Summary

Test Stage:	Max. Stress	Pre-Shear	Post Cyclic	X	Static Strain Rate =	NA	(%/hr or)
Nominal Vertical Stress, σ'_v (ksf)	NA	8.64	NA		Cyclic Rate (Hz):	0.1;	1; Other =
Axial/Vertical Force, $P_{v,n}$ (lbf)	NA	NA	NA		During/End of Loading	Static	Cyclic
Horizontal Force, $P_{h,n}$ (lbf)	NA	0	NA		Change in Height, $\Delta H_{L,n}$ (mm)	NA	NA
Nominal OCR	NA	NA	NA		Change in Vol., $\Delta V_{L,n}$ (cm ³)	NA	NA
t_c (ON, days, hrs)	NA	0.97 days	NA		Post Cy. Displ. Reset to Null Position:	Yes;	No

 Undrained ambient stress applied: with Delta shear force (lbf) = NA & Duration (min) = NA & Delta disp., $\Delta d_{h,ua}$ (mm) = NA

Trimmed Specimen (TS) - Initial Water Contents over Saturation (%):

	Top, $W_{o,1}$	Bottom, $W_{o,2}$	Sides, $W_{o,3}$	Avg., $W_{o,avg}$	Select, $W_{o,s}$	Back Cal.
W_o	14.00			14.00	14.00	14.24
S_o	97.2			97.2	97.2	98.1
Measured final mass of moist soil, $M_{t,at}$ (g)						142.05
Final mass of moist soil corrected for excess dry soil, $M_{t,at,c}$ (g)						142.05

Calculated Mass of Dry Soil (g)

Initial Selected Water Content (%)	14.00
Initial, $M_{d,o}$	123.96
Final, $M_{d,at}$	123.71
Selected, M_d	123.66

Initial Back Cal. Specific Gravity (TS):

Selected S_o (%)	
Selected W_o (%)	
Specific Gravity, $G_{s,bc}$	

Height/Volume Change Summary

Variation in Height & Volume During Consol.	During Initial Consol. to $\sigma'_{v,c}$ or $\sigma'_{v,max}$	During Rebound to $\sigma'_{v,c}$	Specimen Unloaded After Test To
Stress Units (ksf)	8.640	NA	NA
Sign Convention: (+) ΔV out & ΔH down; (-) ΔV in & ΔH up			
Delta Def. Read., $\Delta d_{ar,n}$ (mm)	0.970		
Total Equip. Comp., $\Sigma \Delta d_{af,c}$ (mm)	0.000		
Corr. Total Def. $\Delta H_{c,n}$ (mm)	0.970		
ΔV_n using A_o - spec. (cm ³)	3.38		
ΔV_n using $A_{c,n}$ - app. (cm ³)	3.38		
ΔV_n using burette meas. (cm ³)	0.70		
Selected ΔV_n (cm ³)	3.38	NA	NA = ΔV_{ul}
After Test WC Corr. for ΔV during Shear & Unloading, $W_{a,t,c}$ (%)			NA

Lateral Confinement Area Cal. Approach (LCA); Method 1, 2, 3 or 4: 1

Calculation of ΔV_c by Different Procedures

By Selected Volumes	By Change in Mass
ΔV_c (cm ³)	3.38
By Cal. Height & App. Area	ΔV_c (cm ³)
ΔV_c (cm ³)	3.38
By Cal. Ht. & Init. Spec. Area	ΔV_c (cm ³)
ΔV_c (cm ³)	3.38

Back Cal. Water Content During Consol. -

Based on the Consolidation Conclusions Given Below

Assumed Saturation (%)	100.00
Back Cal. WC before Loading, $W_{c,bc}$ (%)	11.80
Back Cal. WC at Max. Stress, $W_{c,max,bc}$ (%)	NA

Consolidation & Preshear	ΔV_c (cm ³) = 3.39	ΔH_c (mm) = 0.970	$\epsilon_{a,c}$ (%) = 5.24	$\Delta V_{c,max}$ (cm ³) = NA
Conclusions	V_c (cm ³) = 61.21	H_c (mm) = 17.555	$\epsilon_{v,c}$ (%) = 5.24	$\epsilon_{ac,max}$ (%) = NA
	A_c (cm ²) = 34.87	$\Delta \gamma_c$ (mm) = NA	γ_c (%) = NA	Preshear: γ_{ua} (%) = NA

Summary of Specimen Physical Properties:

Specific Gravity: $G_s = 2.659$ Measured	Height (mm)	Volume (cm ³)	Area (cm ²)	Water Content (%)	Total Unit Weight (pcf)	Dry Unit Weight (pcf)	Saturation (%)	Void Ratio, e
Condition:								
Initial (as trimmed)	18.525	64.60	34.87	14.3	136.6	119.5	98.2	0.389
After to $\sigma'_{v,c}$	17.555	61.21	34.87	11.8	141.0	126.1	100.0	0.316
Consol.: to $\sigma'_{v,max}$	NA	NA	NA	NA	NA	NA	NA	NA

LCA-Method: 1- Initial measured value remains constant. 4 - Based on change in height & volume.
 & Note(s) 2 - Initial measured value corrected for applied stress. NA - Not Applicable
 3 - Uses measured value at appropriate stress level (NA for rings).

Calculated By: LF

Reviewed By: HP

Remarks: t95 for max stress = 3.1 min

Project Number: 0411-08-1686 Test Type: SDSS Test Sta. No.: 10G File Name: Comp-Ai
 Project Name: Exelon (Victoria) Task No.: NA Test No.: NA Test Series for: NA

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	☐ Constant Effort:	Blows/Tamps per Layer = 11
Boring No.: TP2319/TP2334	☐ LPC Core	☐ Impact/Rammer			Rammer Wgt. (lb) =	No. Layers = 3.00
Sample No.: Comp-A	Composite No.:	☐ Pluviated:			Tamper Force (lb) = 4.00	Drop (in.) = 12.00
Depth (ft): NA	Specimen No.: I	☐ Kneading		☒ Undercompaction:	U_{ni} (%) =	Dia. (in.) = 1.40
☐ Spec. Selection by X-ray;	☐ Geomarine Sample			Ref. Effort = MOD	% Comp. = 95.0	± Opt. = +4

Type Consolidation:	☒ K_0 at:	☒ Incremental CRS	☐ Anisotropic at:	☐ Inclined Stress Path, $K_{c,SS}$	☐ Used Automated System
Loading Conditions:	☒ Static	☒ Strain Stress	☐ Creep Post Cyclic	☒ Const. Vol./Ht Drained	☒ Without - Water Bath
	☐ Dynamic	☐ Stress		☐ With - Bath	☐ Cyclic (Hz) Rate: 0.1;
					Strain 1; Other:

Summary of Specimen Physical Properties										
Specific Gravity: $G_s = 2.659$ Measured	Height (mm)	Volume (cm ³)	Area (cm ²)	Water Content (%)	Total (pcf)	Dry (pcf)	Saturation (%)	LL PL	-200 %	Void Ratio, e
Condition: Initial	18.53	64.60	34.87	14.28	136.6	119.5	98.2	34	46.4	0.389
After to $\sigma'_{v,c}$	17.56	61.21	34.87	11.80	141.0	126.1	100.0	12	NA	0.316
Consol.: to $\sigma'_{v,c,max}$	NA	NA	NA	NA	NA	NA	NA	22	NA	NA

Consolidation Stress Summary and Loading Summary										
Item	Unit	Max. Stress	Pre-Shear	Post Cyclic	X	Static Strain Rate = 4.8 %/hr.				
Vert. Consol. Stress, $\sigma'_{v,c}$	(ksf)	NA	8.607	NA		Cyclic Rate (Hz):		0.1;		1; Other =
Induced OCR:	-	NA	NA	NA		During/End of Loading			Static	Cyclic
Axial Strain during Consol., $\epsilon_{h,c}$	%	NA	5.24	NA		Change in Height, $\Delta H_{L,n}$ (mm):			NA	NA
Horiz. Consol. Stress, $\tau_{h,c}$	(ksf)	NA	NA	NA		Change in Vol., $\Delta V_{L,n}$ (cm ³):			NA	NA
Consol. Stress Ratio, $\tau_{h,c} / \sigma'_{v,c}$	-	NA	NA	NA		Post Cy.Displ. Reset to Null Pos.:			Yes;	No
Shear Strain during Consol., $\epsilon_{h,c}$	%	NA	NA	NA		Number of Loading Cycles, N = NA				
Undr. Ambient Shear Stress, $\tau_{h,u}$	(ksf)	NA	NA	NA		$\pm \tau_h =$ NA (ksf)		$\pm \gamma =$ NA %		
Undr. Ambient Shear Strain, $\epsilon_{h,u}$	%	NA	NA	NA		at end of cyclic loading, $\sigma'_{v,c}$ = NA (ksf)				

Weight Top Cap, etc., M_{tc} (lb): 1.16	Data Normalization: ☒ Yes ☐ No Value: 8.607 (ksf)
Data corr. for M_{tc} : ☒ Yes; ☐ No	Plattens with Pins: ☐ Yes; ☒ No
Wire Reinforced Membrane, Model:	Data corr. for Membr. strength: ☒ Yes ☐ No
☒ Regular Membrane with Rings	☒ Pre-Shear Conditions ☐ Post-Cyclic Conditions
	☐ Maximum Stress during Consol.

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

F or G in the Test Sta. No. indicates Fugro or GEOTAC apparatus.

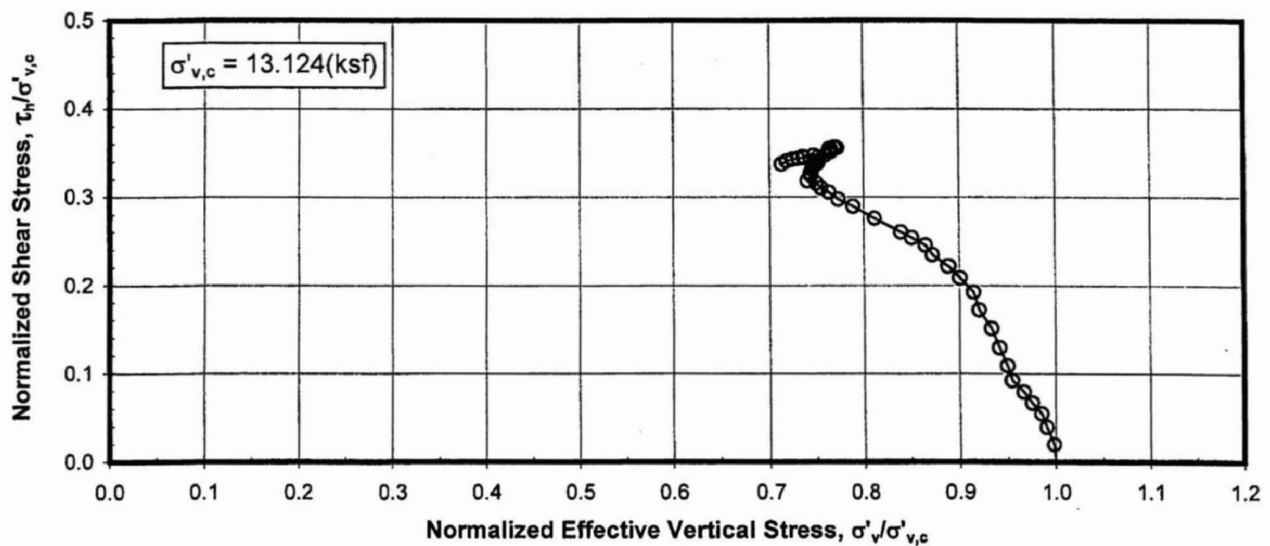
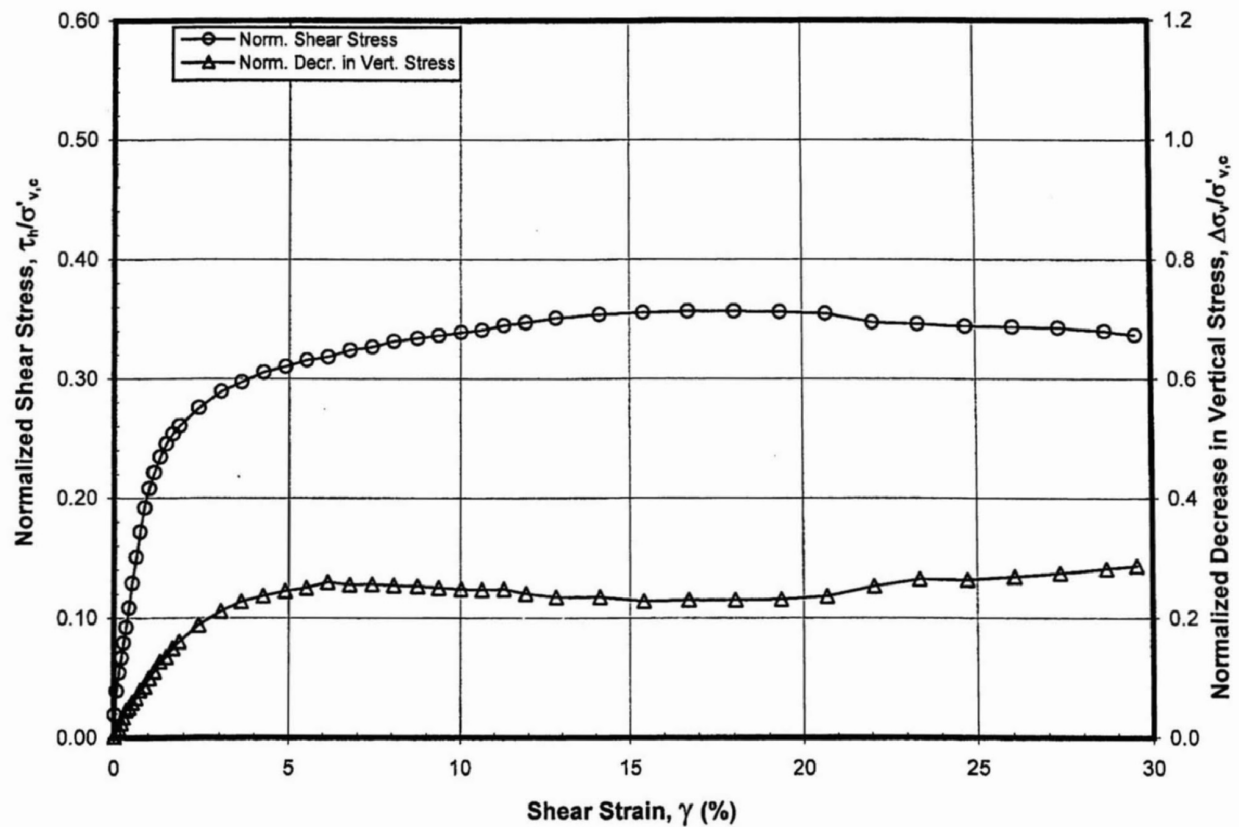
NA - Not Applicable

Final Visual Description and Remarks: Light Brown Clayey SAND (SC)

Loading Summary						
	τ_h (ksf)	γ (%)	σ'_v (ksf)	τ_h / σ'_v -	$\Delta \sigma'_v / \sigma'_{v,c}$ -	$c_u / \sigma'_{v,c}$ -
at Peak Shear Stress	3.085	21.23	6.082	0.507	0.293	0.358
at Maximum Strain	3.057	29.13	5.869	0.521	0.318	-

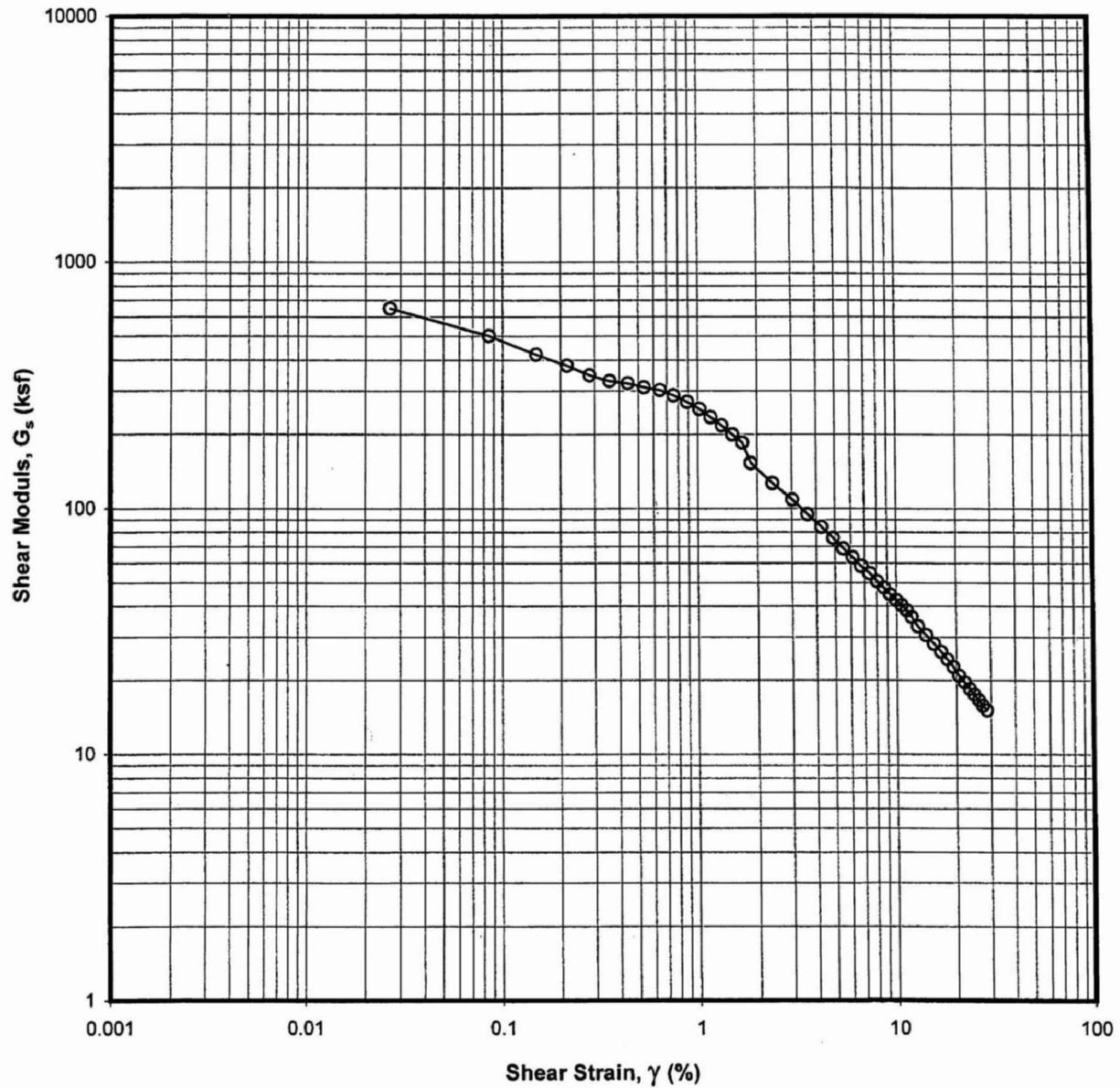
Boring No.: TP2319/TP2334 Sample No.: Comp-AI

Elapsed Time (min)	Shear Strain γ (%)	Shear Stress τ_h (ksf)	Effective Vertical Stress σ'_v (ksf)	Calculated Pore Press. Change $\Delta U = \Delta \sigma'_v$ (ksf)	Secant Shear Modulus G_s (ksf)	Tangent Modulus G_T (ksf)	Norm. Shear Stress $\tau_h/\sigma'_{v,c}$	Norm. Vert. Stress $\sigma'_v/\sigma'_{v,c}$	Norm. Decr. in V. Stress $\Delta \sigma'_v/\sigma'_{v,c}$	Stress Ratio Angle ϕ'_{DSS} (°)
0.0	0.00	0.002	8.607	0.000	-	-	0.000	1.000	0.000	0.02
2.6	0.03	0.237	8.587	0.021	788.268	621.841	0.028	0.998	0.002	1.58
5.2	0.09	0.511	8.490	0.117	565.660	353.570	0.059	0.986	0.014	3.44
7.8	0.18	0.747	8.330	0.277	405.323	235.087	0.087	0.968	0.032	5.13
10.4	0.27	0.930	8.179	0.429	346.811	205.955	0.108	0.950	0.050	6.49
13.1	0.35	1.098	8.036	0.572	309.339	193.412	0.128	0.934	0.066	7.78
15.7	0.45	1.283	7.902	0.705	284.627	201.547	0.149	0.918	0.082	9.22
18.3	0.55	1.494	7.776	0.831	270.955	197.641	0.174	0.903	0.097	10.87
20.9	0.68	1.727	7.652	0.955	255.054	169.013	0.201	0.889	0.111	12.72
23.5	0.82	1.954	7.514	1.093	236.582	126.204	0.227	0.873	0.127	14.57
26.1	0.99	2.123	7.347	1.260	213.250	83.869	0.247	0.854	0.146	16.12
28.7	1.16	2.238	7.179	1.428	192.159	55.467	0.260	0.834	0.166	17.31
31.3	1.35	2.317	7.020	1.588	171.777	38.311	0.269	0.816	0.184	18.27
33.9	1.53	2.378	6.852	1.756	155.274	30.999	0.276	0.796	0.204	19.14
36.5	1.73	2.434	6.684	1.923	140.928	23.575	0.283	0.777	0.223	20.01
39.1	1.94	2.474	6.507	2.100	127.351	16.514	0.287	0.756	0.244	20.82
41.7	2.17	2.507	6.355	2.252	115.438	8.719	0.291	0.738	0.262	21.53
44.3	2.39	2.514	6.212	2.395	105.184	5.913	0.292	0.722	0.278	22.03
52.2	3.00	2.568	5.916	2.691	85.445	7.872	0.298	0.687	0.313	23.46
60.0	3.69	2.615	5.686	2.921	70.882	6.576	0.304	0.661	0.339	24.70
67.8	4.30	2.653	5.579	3.028	61.679	7.569	0.308	0.648	0.352	25.43
75.6	4.96	2.712	5.528	3.079	54.648	7.281	0.315	0.642	0.358	26.13
83.4	5.60	2.748	5.512	3.095	49.068	6.076	0.319	0.640	0.360	26.50
91.3	6.24	2.790	5.516	3.091	44.675	4.829	0.324	0.641	0.359	26.83
99.1	6.88	2.810	5.536	3.072	40.784	5.091	0.326	0.643	0.357	26.91
106.9	7.51	2.855	5.573	3.034	37.957	5.667	0.332	0.647	0.353	27.12
114.7	8.20	2.884	5.603	3.005	35.150	5.006	0.335	0.651	0.349	27.24
122.6	8.82	2.920	5.642	2.965	33.079	4.378	0.339	0.655	0.345	27.36
130.4	9.50	2.940	5.682	2.925	30.927	3.959	0.342	0.660	0.340	27.36
138.2	10.11	2.970	5.729	2.879	29.345	4.630	0.345	0.666	0.334	27.41
146.0	10.77	2.999	5.766	2.841	27.825	3.123	0.348	0.670	0.330	27.48
153.8	11.38	3.010	5.801	2.807	26.436	2.640	0.350	0.674	0.326	27.43
161.6	12.03	3.032	5.839	2.769	25.184	1.581	0.352	0.678	0.322	27.45
169.5	12.66	3.031	5.865	2.742	23.919	1.177	0.352	0.681	0.319	27.33
179.9	13.53	3.053	5.932	2.675	22.553	1.541	0.355	0.689	0.311	27.24
195.5	14.78	3.060	5.982	2.626	20.688	0.536	0.355	0.695	0.305	27.09
211.1	16.05	3.067	6.025	2.582	19.093	0.349	0.356	0.700	0.300	26.98
226.8	17.33	3.069	6.059	2.548	17.692	-0.016	0.357	0.704	0.296	26.86
242.4	18.63	3.066	6.073	2.534	16.449	0.294	0.356	0.706	0.294	26.79
258.0	19.92	3.076	6.085	2.522	15.429	0.715	0.357	0.707	0.293	26.82
273.7	21.23	3.085	6.082	2.525	14.518	0.069	0.358	0.707	0.293	26.89
289.3	22.56	3.078	6.045	2.563	13.634	-0.512	0.358	0.702	0.298	26.99
305.0	23.90	3.071	6.038	2.569	12.840	-0.116	0.357	0.701	0.299	26.96
320.6	25.22	3.075	6.014	2.593	12.181	0.020	0.357	0.699	0.301	27.08
336.2	26.52	3.072	5.975	2.632	11.576	-0.460	0.357	0.694	0.306	27.21
351.9	27.82	3.063	5.929	2.679	11.002	-0.562	0.356	0.689	0.311	27.32
367.5	29.13	3.057	5.869	2.738	10.488	-0.422	0.355	0.682	0.318	27.51



STATIC DSS TEST
 K_0 Consolidation - OCR = NA
 Sample: Comp-AJ - Depth: NA ft
 Boring TP2319/TP2334
 Exelon (Victoria)

KAW 7/16/08



STATIC DSS TEST
 K_o Consolidation - OCR = NA
Sample: Comp-AJ - Depth: NA ft
Boring TP2319/TP2334

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Setup / Take Down

Project Number: 0411-08-1686 Test Type: SDSS Sta. No.: 10G File Name: Comp-Aj
 Task No.: NA Assign, $\sigma'_{v,c}$ = 12.96 ksf $K_{c,DSS} (\tau_{h,c} / \sigma'_{v,c})$ = NA
 Project Name: Exelon (Victoria) Induced OCR = NA $K_{ub,DSS} (\tau_{hu,b} / \sigma'_{v,c})$ = NA
 Test No.: NA Test Series for/on: NA Type Stage: NA = NA NA NA & NA
 Assig. Remarks: Specific Gravity: 2.659 ☒ Meas.; ☐ Assumed

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	Constant Effort:	Blows/Tamps per Layer = 11
Boring No.: TP2319/TP2334	☐ LPC Core			Impact/Rammer	Rammer Wgt. (lb) =	No. Layers = 3.00
Sample No.: Comp-A	Compostite No.:			Pluviated:	Tamper Force (lb) = 4.00	Drop (in.) = 12.00
Depth (ft): NA	Specimen No.: J			Kneading	☒ Undercompaction: U_{ri} (%) =	Dia. (in.) = 1.40
☐ Spec. Selection by X-ray;	☐ Geomarine Sample				Ref. Effort = MOD	% Comp. = 95.0 ± Opt. = +4

Type Consolidation:	☒ K_o at:	☒ Incremental	☐ Anisotropic at:	Inclined Stress Path, $K_{c,DSS}$	☐ Used Automated System
		CRS		90° Stress Path	Remarks:
Loading Conditions:	☒ Static	☒ Strain	☐ Creep	☒ Const. Vol./Ht	☒ Without - Water
	Rapid	Stress	Post Cyclic	Drained	With - Bath
					Cyclic (Hz) Rate: 0.1;
					Strain 1; Other:

Water Content (WC);	Initial - Trimming Location			Final, W_{at} (see below)	Soil and Ring Masses		Initial	Final
	Top ($W_{o,1}$)	Bottom ($W_{o,2}$)	Sides ($W_{o,3}$)		Mass Moist Soil + Tare (g)	Mass Moist Soil, $M_{t,o}$ Mt _{at} (g)		
Container No.	1102			4083	Mass Tare (g)	183.30	4.74	
Mass Moist Soil + Cont. (g)	115.06			77.75	Mass Moist Soil, $M_{t,o}$ Mt _{at} (g)	141.01	140.92	
Mass Dry Soil + Container (g)	104.76			71.95	Excess Dry Soil (soil not included in final mass above)			
Mass Container (g)	31.51			30.19	Container No.			
WATER CONTENT (%)	14.06			13.89	Mass Dry Soil + Container (g)			
Avg. Initial WC, $W_{o,avg}$ (%)	14.06				Mass Container (g)			
			Final W_{at} : ☒ Slice ;	Whole Spec.	Mass Excess Dry Soil (g)			
					0.00			

See attached data sheet(s) for additional water contents

Specimen Trimming:				
☐ Trimming Ring for Fugro Apparatus	NL6	Large-ring ID #		
☒ Trimming Ring for NGI Apparatus		Small-ring ID #		
$H_{s,t}$ (mm):	18.55	$A_{s,t}$ (cm ²):	34.68	
$D_{s,t}$ (mm):	66.45	$V_{s,t}$ (cm ³):	64.32	
Remarks:				
☐ Free Standing by Wire Saw Lathe or Reconstituted Spec. (mm)				
Height (H_r)	Diameter (D_o)	Remarks:		
1 18.530	1-T NA			
2 18.560	2-M NA			
3 18.500	3-B NA			
4 18.540	1'-T NA	For Free Standing		
5 18.560	2'-M NA	or Reconstituted Spec.:		
Avg.	3'-B NA	A_{tr} (cm ²):	NA	
= 18.550	Avg NA	V_{tr} (cm ³):	NA	

Note: NA indicates not applicable.

F or G in the Sta. No. indicates Fugro or GEOTAC apparatus.

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (lb/ft ³) =	136.86
Dry, $\gamma_{d,o}$ (lb/ft ³) =	119.98

Specimen Lateral Confinement by:				
Wire Reinforced, Model:		Thickness (mm) =		
Stress Level	Dia. by PiTape (mm)	Area, $A_{c,n}$		
	Meas.	Corr.	(cm ²)	(in ²)
0				
$\sigma'_{v,c}$				
$\sigma'_{v,max}$				
☒ Regular Membrane with Ring Set No. 9	ID, Rings (mm)			
Thickness (mm):	Top: 0.66	= 67.10		
☐ Single	Bottom: 0.63	Corr. for mem.		
☒ Double	Membr. Thick. = 0.32	= 66.450		
Area Ring with mem., A_o (cm ²) =		34.68	; (in ²) = 5.375	
Mass Top Cap, etc., M_{tc} =		528.7 g,	1.17	lb
Data corr. for M_{tc} :	☒ Yes;	☐ No	Plattens with Pins:	☐ Yes; ☒ No

Final Visual Description: Light Brown Clayey SAND (SC)

Other Remarks :

Trim./ Recon. By: DBN

Setup By: HC

Take Down By: HC

Date: 5/7/2008

Date: 5/7/0/08

Date: 5/9/2008

Prelim. Calc. By: HC

Final Calc. By: LF

Reviewed By: HP **HP**

Specimen Take Down: ☒ Spec. removed right after shearing
☐ Spec. unloaded to zero stress with access to water

KAW 6/13/08

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Calculations & Summary

Project Number: 0411-08-1686 Test Station No.: 10G File Name: Comp-Aj
 Task Number: NA Specific Gravity: 2.659 ☒ Measured; ☐ Assumed
 Type Test: SDSS Specimen: ☐ "Undisturbed"; ☒ Reconstituted; ☒ Remolded Boring No.: TP2319/TP2334
 Calculations Corr. for Salt (dissolved solids): ☒ No or, ☐ Yes, with concentration = _____ ppm Sample No.: Comp-AJ

Consolidation Stress Summary and Loading Summary									
Test Stage:	Max. Stress	Pre-Shear	Post Cyclic	☒	Static Strain Rate =	NA (%/hr or)			
Nominal Vertical Stress, σ'_v (ksf)	NA	12.96	NA		Cyclic Rate (Hz):	0.1;	1;	Other =	
Axial/Vertical Force, $P_{v,n}$ (lbf)	NA	NA	NA		During/End of Loading		Static	Cyclic	
Horizontal Force, $P_{h,n}$ (lbf)	NA	0	NA		Change in Height, $\Delta H_{L,n}$ (mm)		NA	NA	
Nominal OCR	NA	NA	NA		Change in Vol., $\Delta V_{L,n}$ (cm ³)		NA	NA	
t_c (ON,days,hrs)	NA	0.98 days	NA		Post Cy.Displ. Reset to Null Position:		Yes;	No	

Undrained ambient stress applied: with Delta shear force (lbf) = NA & Duration (min) = NA & Delta disp., $\Delta d_{h,ua}$ (mm) = NA

Trimmed Specimen (TS) - Initial Water Contents over Saturation (%):					
	Top, $W_{o,1}$	Bottom, $W_{o,2}$	Sides, $W_{o,3}$	Avg., $W_{o,avg}$	Selct., $W_{o,s}$
W_o	14.06			14.06	14.06
S_o	98.1			98.1	98.1
Measured final mass of moist soil, M_{lat} (g)					140.92
Final mass of moist soil corrected for excess dry soil, $M_{lat,c}$ (g)					140.92

Calculated Mass of Dry Soil (g)	
Initial Selected Water Content (%)	14.06
Initial, $M_{d,o}$	123.63
Final, $M_{d,at}$	123.73
Selected, M_d	123.68

Initial Back Cal. Specific Gravity (TS):

Selected S_o (%)	
Selected W_o (%)	
Specific Gravity, $G_{s,bc}$	

Height/Volume Change Summary			
Variation in Height & Volume During Consol.	During Initial Consol. to $\sigma'_{v,c}$ or $\sigma'_{vc,max}$	During Rebound to $\sigma'_{v,c}$	Specimen Unloaded After Test To
Stress Units (ksf)	12.960	NA	NA
Sign Convention: (+) ΔV out & ΔH down; (-) ΔV in & ΔH up			
Delta Def. Read., $\Delta d_{ar,n}$ (mm)	1.135		
Total Equip. Comp., $\Sigma \Delta d_{afc}$ (mm)	0.000		
Corr. Total Def. $\Delta H_{c,n}$ (mm)	1.135		
ΔV_n using A_o - spec. (cm ³)	3.93		
ΔV_n using $A_{c,n}$ - app. (cm ³)	3.93		
ΔV_n using burette meas. (cm ³)	1.40		
Selected ΔV_n (cm ³)	3.93	NA	NA = ΔV_{UL}
After Test WC Corr. for ΔV during Shear & Unloading, $W_{at,c}$ (%)			

Calculation of ΔV_c by Different Procedures			
By Selected Volumes		By Change in Mass	
ΔV_c (cm ³)	3.93	$\sim M_{t,o} - (M_{lat,c} + \Delta V_L + \Delta V_{UL})$	
By Cal. Height & App. Area		ΔV_c (cm ³)	0.09
ΔV_c (cm ³)	3.93	By Saturation = 100% and Spec. Unloaded to 0 Stress	
By Cal. Ht. & Init. Spec. Area		ΔV_c (cm ³)	NA
ΔV_c (cm ³)	3.93		

Back Cal. Water Content During Consol. -

Based on the Consolidation Conclusions Given Below

Assumed Saturation (%)	100.00
Back Cal. WC before Loading, $W_{c,bc}$ (%)	11.14
Back Cal. WC at Max. Stress, $W_{cmax,bc}$ (%)	NA

Consolidation & Preshear Conclusions	ΔV_c (cm ³) =	3.93	ΔH_c (mm) =	1.135	$\epsilon_{a,c}$ (%) =	6.12	$\Delta V_{c,max}$ (cm ³) =	NA
	V_c (cm ³) =	60.40	H_c (mm) =	17.415	$\epsilon_{v,c}$ (%) =	6.10	$\epsilon_{ac,max}$ (%) =	NA
	A_c (cm ²) =	34.68	$\Delta \gamma_c$ (mm) =	NA	γ_c (%) =	NA	Preshear: γ_{ua} (%) =	NA

Summary of Specimen Physical Properties:

Specific Gravity:	Height	Volume	Area	Water Content	Total Unit Weight	Dry Unit Weight	Saturation	Void Ratio, e
$G_s = 2.659$ Measured	(mm)	(cm ³)	(cm ²)	(%)	(pcf)	(pcf)	(%)	
Condition:								
Initial (as trimmed)	18.550	64.32	34.68	14.0	136.9	120.0	97.9	0.383
After to $\sigma'_{v,c}$	17.415	60.40	34.68	11.1	142.1	127.8	100.0	0.298
Consol.: to $\sigma'_{vc,max}$	NA	NA	NA	NA	NA	NA	NA	NA

LCA-Method: 1- Initial measured value remains constant. 4 - Based on change in height & volume.
 & Note(s) 2 - Initial measured value corrected for applied stress. NA - Not Applicable
 3 - Uses measured value at appropriate stress level (NA for rings).

Calculated By: LF
 Reviewed By: HP

Remarks: t95 for max stress = 4.7 min

Project Number: 0411-08-1686 Test Type: SDSS Test Sta. No.: 10G File Name: Comp-Aj
 Project Name: Exelon (Victoria) Task No.: NA Test No.: NA Test Series for: NA

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	Constant Effort:	Blows/Tamps per Layer = 11
Boring No.: TP2319/TP2334	☐ LPC Core			Impact/Rammer	Rammer Wgt. (lbf) =	No. Layers = 3.00
Sample No.: Comp-A	Composited No.:			Pluviated:	Tamper Force (lbf) = 4.00	Drop (in.) = 12.00
Depth (ft): NA	Specimen No.: J			Kneading	☒ Undercompaction: U_{hi} (%) =	Dia. (in.) = 1.40
☐ Spec. Selection by X-ray;	☐ Geomarine Sample				Ref. Effort= MOD	% Comp. = 95.0 $\pm$ Opt. = +4

Type Consolidation:	☒ K_o at:	☒ Incremental CRS	☐ Anisotropic at:	☐ Inclined Stress Path, $K_{c,DSS}$	☐ Used Automated System	Remarks:
Loading Conditions:	☒ Static	☒ Strain	☐ Creep	☒ Const. Vol./Ht	☒ Without - Water	☐ Cyclic (Hz)
	☐ Dynamic	☐ Stress	☐ Post Cyclic	☐ Drained	☐ With - Bath	Rate: 0.1; 1; Other:

Summary of Specimen Physical Properties										
Specific Gravity: $G_s = 2.659$ Measured	Height (mm)	Volume (cm ³)	Area (cm ²)	Water Content (%)	Unit Weight		Saturation (%)	LL PL	-200 %	Void Ratio, e
Condition:					Total (pcf)	Dry (pcf)		PI		
Initial	18.55	64.32	34.68	14.01	136.9	120.0	97.9	34	46.4	0.383
After to $\sigma'_{v,c}$	17.42	60.40	34.68	11.14	142.1	127.8	100.0	12	NA	0.298
Consol.: to $\sigma'_{vc,max}$	NA	NA	NA	NA	NA	NA	NA	22	NA	NA

Consolidation Stress Summary and Loading Summary										
Item	Unit	Max. Stress	Pre-Shear	Post Cyclic	☒ Static Strain Rate = 4.6 %/hr.					
Vert. Consol. Stress, σ'_{vc}	(ksf)	NA	13.124	NA	Cyclic Rate (Hz):	0.1;	1;	Other =		
Induced OCR:	-	NA	NA	NA	During/End of Loading		Static	Cyclic		
Axial Strain during Consol., $\epsilon_{a,c}$	%	NA	6.12	NA	Change in Height, $\Delta H_{L,n}$ (mm):		NA	NA		
Horiz. Consol. Stress, $\tau_{h,c}$	(ksf)	NA	NA	NA	Change in Vol., $\Delta V_{L,n}$ (cm ³):		NA	NA		
Consol. Stress Ratio, $\tau_{h,c} / \sigma'_{vc}$	-	NA	NA	NA	Post Cy. Displ. Reset to Null Pos.:		Yes;	No		
Shear Strain during Consol., $\epsilon_{h,c}$	%	NA	NA	NA	Number of Loading Cycles, N =		NA			
Undr. Ambient Shear Stress, $\tau_{h,ub}$	(ksf)	NA	NA	NA	$\pm \tau_h =$ NA (ksf)		$\pm \gamma =$ NA %			
Undr. Ambient Shear Strain, $\epsilon_{h,ub}$	%	NA	NA	NA	at end of cyclic loading, $\sigma'_{vc,yf} =$		NA (ksf)			

Weight Top Cap, etc., M_{tc} (lbf): 1.17	Data Normalization: ☒ Yes ☐ No Value: 13.124 (ksf)
Data corr. for M_{tc} : ☒ Yes; ☐ No	Plattens with Pins: ☐ Yes; ☒ No
Wire Reinforced Membrane, Model:	Data corr. for Membr. strength: ☒ Yes ☐ No
☒ Regular Membrane with Rings	☒ Pre-Shear Conditions ☐ Post-Cyclic Conditions
	Maximum Stress during Consol.

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

F or G in the Test Sta. No. indicates Fugro or GEOTAC apparatus.

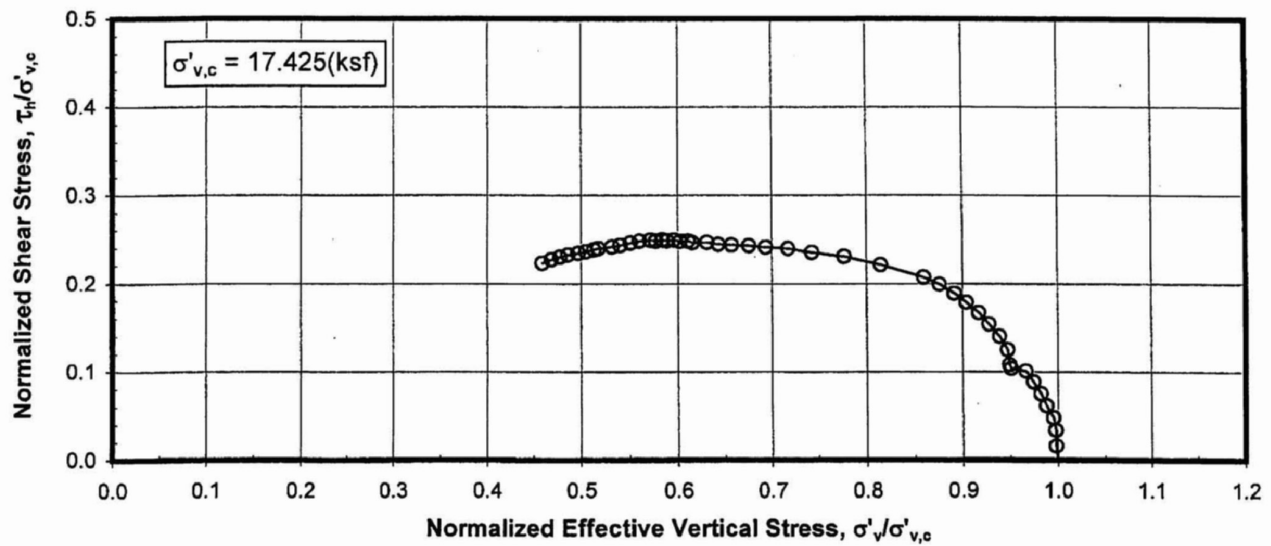
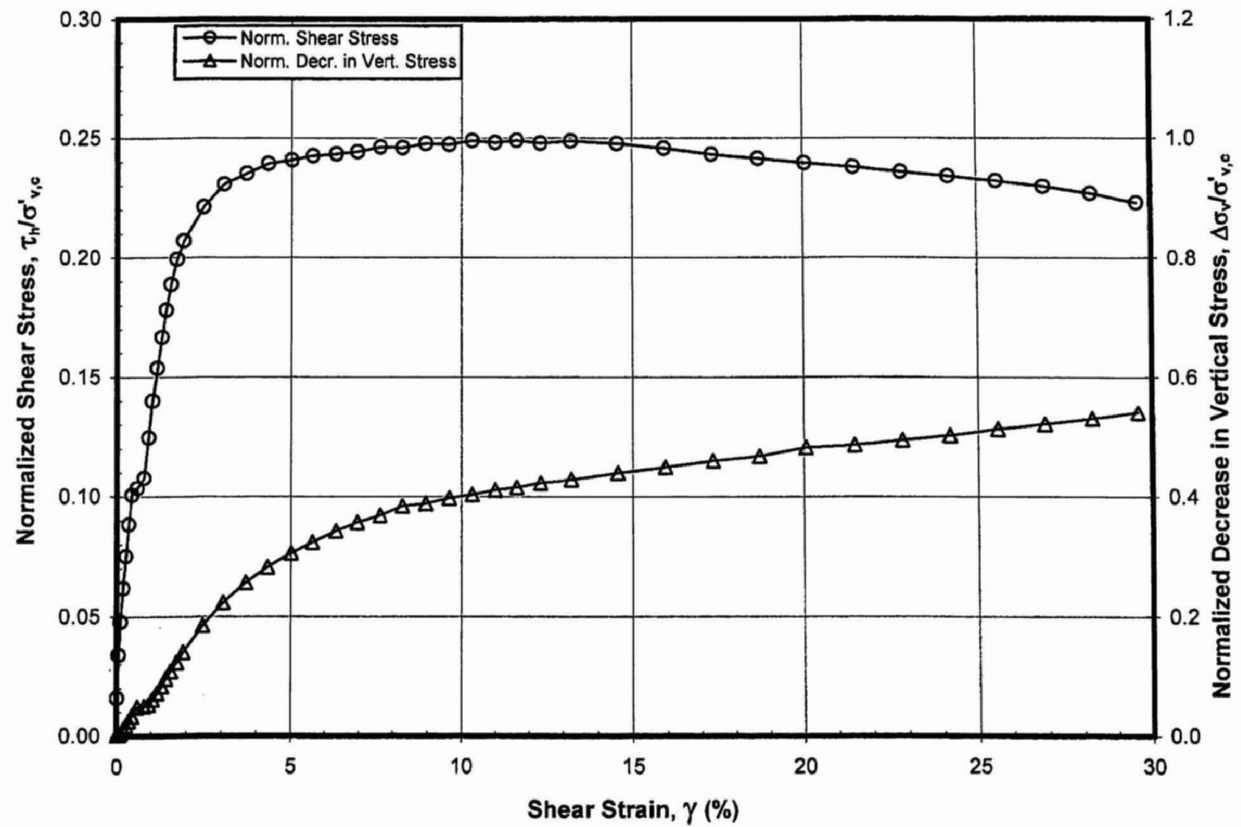
NA - Not Applicable

Final Visual Description and Remarks: Light Brown Clayey SAND (SC)

Loading Summary						
	τ_h (ksf)	γ (%)	σ'_v (ksf)	τ_h / σ'_v -	$\Delta \sigma'_v / \sigma'_{v,c}$ -	$c_u / \sigma'_{v,c}$ -
at Peak Shear Stress	4.679	16.72	10.112	0.463	0.230	0.357
at Maximum Strain	4.420	29.55	9.358	0.472	0.287	-

Boring No.: TP2319/TP2334 Sample No.: Comp-AJ

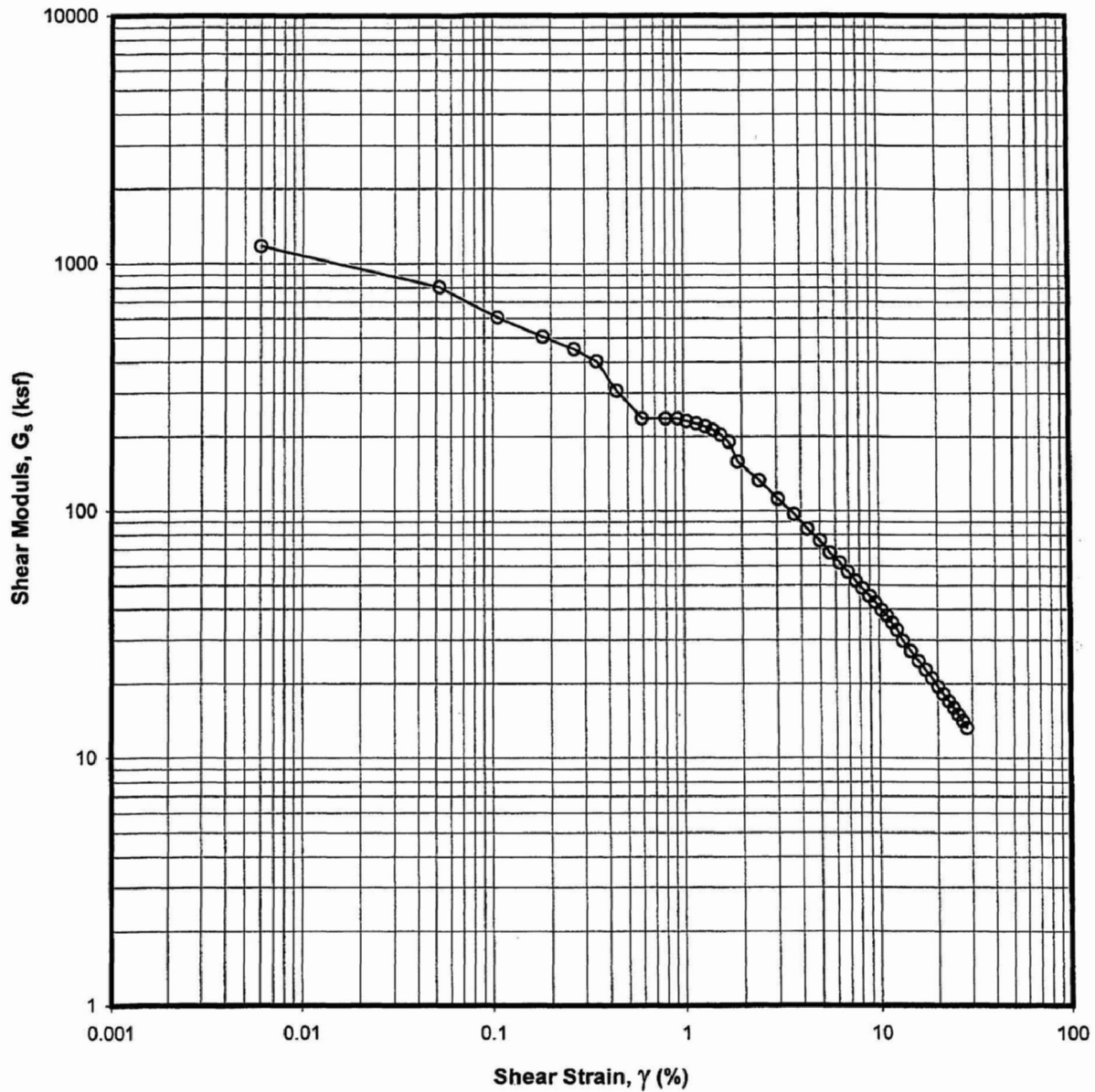
Elapsed Time (min)	Shear Strain γ (%)	Shear Stress τ_h (ksf)	Effective Vertical Stress σ'_v (ksf)	Calculated Pore Press. Change $\Delta U = \Delta \sigma'_v$ (ksf)	Secant Shear Modulus G_s (ksf)	Tangent Modulus G_T (ksf)	Norm. Shear Stress $\tau_h/\sigma'_{v,c}$	Norm. Vert. Stress $\sigma'_v/\sigma'_{v,c}$	Norm. Decr. in V. Stress $\Delta \sigma'_v/\sigma'_{v,c}$	Stress Ratio Angle ϕ'_{DSS} (°)
0.0	0.00	-0.036	13.124	0.000	-	-	-0.003	1.000	0.000	-0.16
2.6	0.03	0.253	13.103	0.021	1086.337	767.251	0.019	0.998	0.002	1.11
5.3	0.09	0.515	12.999	0.124	648.251	377.620	0.039	0.991	0.009	2.27
7.9	0.15	0.713	12.930	0.194	501.427	274.209	0.054	0.985	0.015	3.15
10.6	0.22	0.874	12.801	0.323	421.059	243.810	0.067	0.975	0.025	3.91
13.2	0.28	1.039	12.686	0.437	379.637	235.885	0.079	0.967	0.033	4.68
15.9	0.36	1.209	12.524	0.600	347.339	238.422	0.092	0.954	0.046	5.51
18.5	0.44	1.424	12.466	0.658	328.795	269.951	0.109	0.950	0.050	6.52
21.1	0.54	1.693	12.357	0.767	321.823	271.095	0.129	0.942	0.058	7.80
23.8	0.65	1.978	12.252	0.872	310.021	251.999	0.151	0.934	0.066	9.17
26.4	0.76	2.254	12.080	1.044	301.375	226.605	0.172	0.920	0.080	10.57
29.1	0.89	2.519	12.007	1.117	286.905	180.566	0.192	0.915	0.085	11.85
31.7	1.02	2.730	11.823	1.301	270.142	143.114	0.208	0.901	0.099	13.00
34.3	1.16	2.906	11.678	1.446	253.303	115.659	0.221	0.890	0.110	13.98
37.0	1.33	3.075	11.459	1.665	234.803	93.198	0.234	0.873	0.127	15.02
39.6	1.50	3.221	11.363	1.760	217.089	70.650	0.245	0.866	0.134	15.82
42.3	1.69	3.329	11.175	1.949	199.673	53.163	0.254	0.852	0.148	16.59
44.9	1.86	3.415	11.025	2.099	185.066	42.883	0.260	0.840	0.160	17.21
52.8	2.40	3.616	10.654	2.470	152.291	32.993	0.276	0.812	0.188	18.75
60.7	3.03	3.796	10.352	2.772	126.309	22.732	0.289	0.789	0.211	20.14
68.6	3.63	3.899	10.148	2.976	108.267	17.014	0.297	0.773	0.227	21.02
76.5	4.27	4.006	10.021	3.103	94.637	13.397	0.305	0.764	0.236	21.79
84.4	4.90	4.069	9.913	3.210	83.760	10.640	0.310	0.755	0.245	22.32
92.3	5.52	4.139	9.846	3.277	75.590	8.488	0.315	0.750	0.250	22.80
100.2	6.15	4.175	9.721	3.403	68.499	8.596	0.318	0.741	0.259	23.24
108.1	6.78	4.248	9.773	3.351	63.166	8.562	0.324	0.745	0.255	23.49
116.0	7.43	4.284	9.764	3.359	58.127	7.703	0.326	0.744	0.256	23.69
123.9	8.06	4.346	9.790	3.334	54.343	7.460	0.331	0.746	0.254	23.94
131.8	8.75	4.381	9.809	3.314	50.507	5.053	0.334	0.747	0.253	24.07
139.7	9.36	4.412	9.843	3.281	47.503	5.203	0.336	0.750	0.250	24.14
147.6	10.03	4.448	9.871	3.252	44.718	4.551	0.339	0.752	0.248	24.26
155.5	10.64	4.471	9.885	3.239	42.347	6.035	0.341	0.753	0.247	24.34
163.4	11.29	4.525	9.874	3.250	40.403	6.527	0.345	0.752	0.248	24.62
171.3	11.93	4.555	9.971	3.153	38.483	5.067	0.347	0.760	0.240	24.55
181.9	12.83	4.604	10.048	3.076	36.177	4.234	0.351	0.766	0.234	24.62
197.7	14.12	4.643	10.048	3.075	33.137	2.344	0.354	0.766	0.234	24.80
213.4	15.41	4.664	10.134	2.989	30.499	1.412	0.355	0.772	0.228	24.71
229.2	16.72	4.679	10.112	3.012	28.210	0.542	0.357	0.770	0.230	24.83
245.0	18.04	4.678	10.109	3.014	26.141	-0.240	0.356	0.770	0.230	24.83
260.8	19.35	4.673	10.098	3.026	24.338	-0.914	0.356	0.769	0.231	24.83
276.6	20.70	4.654	10.029	3.095	22.661	-4.257	0.355	0.764	0.236	24.89
292.4	22.08	4.555	9.810	3.313	20.791	-4.252	0.347	0.748	0.252	24.91
308.2	23.40	4.537	9.658	3.466	19.544	-1.393	0.346	0.736	0.264	25.16
324.0	24.72	4.519	9.671	3.452	18.423	-1.042	0.344	0.737	0.263	25.04
339.8	26.04	4.509	9.597	3.527	17.454	-0.721	0.344	0.731	0.269	25.17
355.6	27.35	4.500	9.521	3.603	16.583	-1.781	0.343	0.725	0.275	25.30
371.4	28.67	4.463	9.427	3.697	15.694	-3.824	0.340	0.718	0.282	25.33
381.9	29.55	4.420	9.358	3.766	15.083	-4.822	0.337	0.713	0.287	25.28



STATIC DSS TEST

K_o Consolidation - OCR = NA
 Sample: Comp-AK - Depth: NA ft
 Boring TP2319/TP2334
 Exelon (Victoria)

KAW 7/16/08



STATIC DSS TEST
K_o Consolidation - OCR = NA
Sample: Comp-AK - Depth: NA ft
Boring TP2319/TP2334

KAW 7/16/08

DIRECT SIMPLE SHEAR TEST (ASTM D 6528-07): Specimen Setup / Take Down

Project Number: 0411-08-1686 Test Type: SDSS Sta. No.: 9G File Name: Comp-Ak
 Task No.: NA Assign, $\sigma'_{v,c}$ = 17.28 ksf $K_{c,DSS} (\tau_{h,c} / \sigma'_{v,c})$ = NA
 Project Name: Exelon (Victoria) Induced OCR = NA $K_{ub,DSS} (\tau_{hu,b} / \sigma'_{v,c})$ = NA
 Test No.: NA Test Series for/on: NA Type Stage: NA = NA, NA, NA & NA
 Assig. Remarks: _____ Specific Gravity: 2.659 ☒ Meas.; ☐ Assumed

☐ Tube	☐ Field Extruded	☐ Liner	☒ Remolded	☒ Tamping	☒ Constant Effort:	Blows/Tamps per Layer = <u>11</u>
Boring No.: <u>TP2319/TP2334</u>	☐ LPC Core			Impact/Rammer	Rammer Wgt. (lb) = _____	No. Layers = <u>3.00</u>
Sample No.: <u>Comp-A</u>	Composite No.: _____			Pluviated:	Tamper Force (lb) = <u>4.00</u>	Drop (in.) = <u>12.00</u>
Depth (ft): <u>NA</u>	Specimen No.: <u>K</u>			Kneading	☒ Undercompaction: U_{ni} (%) = _____	Dia. (in.) = <u>1.40</u>
☐ Spec. Selection by X-ray;	☐ Geomarine Sample				Ref. Effort = MOD	% Comp. = <u>95.0</u> $\pm$ Opt. = <u>+4</u>

Type Consolidation:	☒ K_o at:	☒ Incremental CRS	☐ Anisotropic at:	Inclined Stress Path, $K_{c,DSS}$	☐ Used Automated System
				90° Stress Path	Remarks: _____
Loading Conditions:	☒ Static	☒ Strain	☐ Creep	☒ Const. Vol./Ht	☒ Without - Water
	☐ Rapid	☐ Stress	☐ Post Cyclic	☐ Drained	☐ With - Bath
				Cyclic (Hz)	Rate: <u>0.1</u> ; ☐ Strain ☐ Stress

Water Content (WC);	Initial - Trimming Location			Final, W_{at} (see below)	Soil and Ring Masses	Initial	Final
	Top ($W_{o,1}$)	Bottom ($W_{o,2}$)	Sides ($W_{o,3}$)		Mass Moist Soil + Tare (g)	324.60	144.20
Container No.	5045			766	Mass Tare (g)	183.30	4.12
Mass Moist Soil + Cont. (g)	101.80			62.59	Mass Moist Soil, $M_{t,o}$ $M_{t,at}$ (g)	141.30	140.08
Mass Dry Soil + Container (g)	92.19			58.65	Excess Dry Soil (soil not included in final mass above)		
Mass Container (g)	30.77			31.92	Container No.		
WATER CONTENT (%)	15.65			14.74	Mass Dry Soil + Container (g)		
Avg. Initial WC, $W_{o,avg}$ (%)	15.65	Final W_{at} : X Slice ;		Whole Spec.	Mass Container (g)		
See attached data sheet(s) for additional water contents					Mass Excess Dry Soil (g)		0.00

Specimen Trimming:			
☐ Trimming Ring for Fugro Apparatus	NL6	Large-ring ID #	
☒ Trimming Ring for NGI Apparatus		Small-ring ID #	
$H_{s,t}$ (mm):	18.55	$A_{s,t}$ (cm ²):	34.68
$D_{s,t}$ (mm):	66.45	$V_{s,t}$ (cm ³):	64.32
Remarks: _____			
☐ Free Standing by Wire Saw Lathe or Reconstituted Spec. (mm)			
Height (H_t)	Diameter (D_o)	Remarks:	
1 18.580	1-T NA		
2 18.540	2-M NA		
3 18.560	3-B NA		
4 18.510	1'-T NA	For Free Standing	
5 18.540	2'-M NA	or Reconstituted Spec.:	
Avg.	3'-B NA	A_{tr} (cm ²):	NA
= 18.550	Avg NA	V_{tr} (cm ³):	NA

Note: NA indicates not applicable.

F or G in the Sta. No. indicates Fugro or GEOTAC apparatus.

Estimated Initial Unit Weight	
Total, $\gamma_{t,o}$ (lb/ft ³) =	137.14
Dry, $\gamma_{d,o}$ (lb/ft ³) =	118.58

Specimen Lateral Confinement by:				
Wire Reinforced, Model:		Thickness (mm) =		
Stress Level	Dia. by PiTape (mm) Meas.	Corr.	Area, $A_{c,n}$ (cm ²)	(in ²)
0				
$\sigma'_{v,c}$				
$\sigma'_{v,max}$				
☒ Regular Membrane with Ring Set No. <u>9</u>	ID, Rings (mm)			
Thickness (mm):	Top: <u>0.60</u>		= <u>67.02</u>	
☐ Single	Bottom: <u>0.53</u>		Corr. for mem.	
☒ Double	Membr. Thick. = <u>0.28</u>		= <u>66.450</u>	
Area Ring with mem., A_o (cm ²) =		<u>34.68</u>	; (in ²) = <u>5.375</u>	
Mass Top Cap, etc., M_{tc} =		<u>528.7</u> g,	<u>1.17</u> lbf	
Data corr. for M_{tc} : ☒ Yes;		☐ No	Plattens with Pins: ☐ Yes;	☒ No

Final Visual Description: Light Brown Clayey SAND (SC)

Other Remarks: _____

Trim./ Recon. By: DBN

Setup By: PL

Take Down By: PL

Date: 5/50/08

Date: 5/20/2008

Date: 5/23/2008

Prelim. Calc. By: HC

Final Calc. By: LF

Reviewed By: HP

Specimen Take Down: ☒ Spec. removed right after shearing

Remarks: _____

☐ Spec. unloaded to zero stress with access to water

KAW 6/13/08