



WESTSIDE SUBWAY EXTENSION PROJECT

Contract No. PS-4350-2000

Preliminary Geotechnical and Environmental Report (Volume 3)

Prepared for:



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VOLUME 3

Summary

As part of PE phase, the following investigations were performed:

- Geotechnical
- Subsurface Gas
- Hydrogeologic
- Environmental Site Assessment
- Oil Well Survey
- Fault Investigation
- Noise and Vibration Studies

Volume 1 of the report provides the summaries of the field investigation programs for geotechnical, subsurface gas, hydrogeologic studies and oil well surveys; summary of laboratory testing program, description of project geology, evaluation of geologic seismic hazards, engineering properties of principal geologic units, results of ground motion study, geotechnical input for tunnel design and recommendations for stations. Only a summary of findings of fault investigation is included in Volume 1. The results of the comprehensive fault investigation are submitted in a separate report and not in this geotechnical and environmental report. Volume 1 includes Sections 1 through 14 along with an executive summary of the findings of PE phase.

Volume 2 of the report presents the results of the field investigation: boring logs, monitoring well diagrams, Cone Penetration Test data, Dilatometer Test data, photographs of continuous core samples from sonic core borings and results of noise/vibration testing. Reports of oil well surveys, results of pump tests and boring logs of observation wells, National Pollution Discharge Elimination System (NPDES) permit are also included. Volume 2 consists of Appendices A through E and a breakdown of the appendices is presented in table of contents.

Volume 3 (this volume) of the report presents the results of the laboratory testing for geotechnical, subsurface gas, hydrogeologic and environmental site assessment studies. Volume 3 consists of Appendices F through I and a breakdown of the appendices is presented in table of contents.

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TABLE F-1.1 - SOIL LABORATORY TESTING SUMMARY
 MTA WESTSIDE SUBWAY EXTENSION
 GEOTECHNICAL DESIGN REPORT
 4953-10-1561

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Equivalent SPT Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	GRAIN SIZE		Atterberg Limits		Specific Gravity	Corrosion				Compression Indices		Void Ratio	Direct Shear		Poisson's Ratio ν
									#4 Sieve (%)	No.200 (%)	LL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r		ϕ (degree)	c (psf)	
G-1	5.5	CR	FILL - SM	FILL	27	25	14.7	110.7															
	10.5	SPT	CL	Qalo	76	76	18.1				39	14											
	15.5	CR	CL	Qalo	18	16	22.6	101.3		89.9													
	20.5	SPT	SM	Qalo	38	38	21.4			34.2													
	25.5	CR	SM	Qalo	17	15	20.2	96.6															
	30.5	SPT	SM	Qalo	63	63	25.5																
	35.5	CR	CL	Qalo	28	26	28.2	95.1															
	40.5	SPT	CL	Qalo	78	78	27.4				48	24		8.1	411.0	21	660				24	700	0.372
	45.5	CR	ML	Qalo	30	28	22.1	105.0													24	1100	0.372
	50.5	SPT	SM	Qalo	81	81	26.6																
	55.5	CR	CL	Qalo	15	14																	
	60.5	SPT	CL	Qalo	80/11"	80/11"	17.3							7.7	955.00	35	780						
	65.5	CR	SP-SM	Qsp	30	28																	
	70.5	SPT	SP-SM	Qsp	50/6"	50/6"	21.4			100.0	9.7												
	75.5	CR	SP-SM	Qsp	68	63	19.3	108.3															
80.5	SPT	SP-SM	Qsp	50/3"	50/3"	--																	
G-2	5.5	CR	ML	Qal	14	11	17.0	108.4															
	10.5	CR	CL	Qal	9	7	18.8	105.3													23	800	0.379
	15.5	SPT	CL	Qalo	36	36																	
	20.5	CR	SC	Qalo	17	14	17.8	106.1		36.2													
	25.5	SPT	CL	Qalo	43	43																	
	30.5	CR	CL	Qalo	20	16	23.5	98.8													24	700	0.372
	35.5	SPT	CL	Qalo	60	60								8.20	115.0	20	1200						
	40.5	CR	SM	Qalo	24	19	32.2	87.6															
	45.5	SPT	ML	Qalo	28	28																	
	50.5	CR	ML	Qalo	23	19																	
	55.5	SPT	SP-SM	Qsp	73	73				9.8													
	60.5	CR	SP-SM	Qsp	67	55	19.1	103.0													33	200	0.313
	65.5	SPT	SP-SM	Qsp	50/3"	50/3"																	
	70.5	CR	SP-SM	Qsp	44	36	26.1	93.3															
	75.5	SPT	Siltstone	Tf	61	61																	
80.5	CR	Siltstone	Tf	62	51	28.6	92.3										0.06	0.036	0.84				
85.5	CR	Siltstone	Tf	45	37	32.5	86.6																
90.5	CR	Siltstone	Tf	55	45	31.4	88.5																
95.5	CR	Siltstone	Tf	56	46	34.5	85.5																
100.5	CR	Siltstone	Tf	43	35	31.2	86.0																
G-3	5.5	CR	FILL - CH	Fill	14	11	17.7	106.4			51	34											
	10.5	SPT	CL	Qalo	8	8																	
	15.5	CR	SM	Qalo	17	14	16.8	109.4													30	400	0.333
	20.5	SPT	ML	Qalo	11	11																	
	25.5	CR	ML	Qalo	24	19	21.2	102.4													24	1300	0.372
	30.5	SPT	ML	Qalo	21	21			98.7	62.2													
	35.5	CR	ML	Qalo	36	29	21.7	103.4		52.4													
	40.5	SPT	CL	Qalo	32	32					43	20		8.4	263.0	11	900						
	45.5	CR	CH	Qalo	29	24	26.5	96.8			53	30									24	1300	0.372
	50.5	SPT	SM	Qalo	35	35																	
	55.5	CR	SP	Qsp	72	59	23.0	99.4										0.033	0.010	0.710			
	60.5	SPT	SP	Qsp	55	55																	
	65.5	CR	SP	Qsp	94/9"	78/9"	21.7	98.7															
	70.5	SPT	SP	Qsp	75	75																	
	75.5	CR	SP	Qsp	75/5"	62/5"	20.1	106.0															
80.5	SPT	SM	Qsp	76	76																		
85.5	CR	SP	Qsp	75/5"	62/5"	25.3	94.6																
90.5	SPT	Siltstone	Tf	41	41																		
95.5	CR	Siltstone	Tf	90/10"	75/10"	37.6	81.0																
100.5	CR	Siltstone	Tf	90/9"	75/9"	56.5	62.0																

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									#4 Sieve (%)	No.200 (%)	LL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r		ϕ (degree)	c (psf)			
G-4	5.5	CR	SC	Qalo	10	9	20.2	105.8																	
	10.5	SPT	SC	Qalo	23	23	16.2				45	24													
	15.5	CR	SC	Qalo	10	9	21.0	104.6		33.4															
	20.5	SPT	CL	Qalo	34	34	30.8							8.1	93.0	7.9	600								
	25.5	CR	CL	Qalo	22	20	28.1	93.0																	
	30.5	SPT	CL	Qalo	39	39	33.6				49	26		8.1	812.0	15	580								
	40.5	CR	CL	Qalo	10	9	25.7	98.6														25	650	0.366	
	45.5	SPT	ML	Qalo	67	67	25.4																		
	50.5	CR	SM	Qsp	21	19	21.9	107.0		40.8												31	100	0.327	
	55.5	SPT	SM	Qsp	50/5"	50/5"	19.4																		
	60.5	CR	SM	Qsp	22	20																			
	70.5	CR	SP-SM	Qsp	23	21	21.3	106.4	100.0	9.8															
	75.5	SPT	SW	Qsp	50/6"	47/6"																			
	80.5	CR	SP	Qsp	26	24	29.2	90.4																	
	85.5	CR	SP	Qsp	50/5"	47/5"																			
G-5	5.5	CR	ML	Qalo	13	10	22.0	100.3		62.2												14	1000	0.431	
	10.5	SPT	ML	Qalo	7	7																			
	15.5	CR	ML	Qalo	18	14	15.3	109.7																	
	20.5	SPT	CL	Qalo	19	19					49	28		8.2	362.0	23	880								
	25.5	CR	CL	Qalo	42	34	20.6	95.1														16	1800	0.420	
	30.5	SPT	CL	Qalo	16	16				67.5	49	26		6.8	1600.0	46	520								
	35.5	CR	CL	Qalo	67	55	16.6	89.0																	
	40.5	SPT	SP	Qsp	77	77																			
	45.5	CR	SP	Qsp	85/11"	71/11"	6.3	108.1															31	100	0.327
	50.5	SPT	SP	Qsp	92	92																			
	55.5	CR	SP	Qsp	87/7"	72/7"																			
	60.5	SPT	SP	Qsp	70	70																			
	65.5	CR	SP	Qsp	75/5"	62/5"	5.0	110.0										0.056	0.010	0.49					
	70.5	SPT	SP	Qsp	92/10"	92/10"																			
	75.5	CR	SP	Qsp	100/4"	83/4"																			
80.5	SPT	SP	Qsp	68	68																				
85.5	CR	Siltstone	Tf	125	103	8.9	113.2										0.052	0.009	0.49						
90.5	SPT	Siltstone	Tf	48	48																				
95.5	CR	Siltstone	Tf	105	87	15.2	104.4																		
100.5	CR	Siltstone	Tf	120	99	20.1	100.0																		
G-6	5.5	CR	ML	Qalo	12	11	25.9	95.5																	
	10.5	SPT	ML	Qalo	44	44				70.5			2.67												
	15.5	CR	ML	Qalo	10	9	17.2	106.7														22	800		
	20.5	SPT	ML	Qalo	46	46				60.0															
	25.5	CR	ML	Qalo	22	20	23.3	94.9															30	700	
	30.5	SPT	ML	Qalo	46	46																			
	35.5	CR	ML	Qalo	39	36	14.0	109.8																	
	40.5	SPT	ML	Qalo	43	43							2.54												
	45.5	CR	SM	Qsp	30	28	10.7	105.9															31	200	
	50.5	SPT	SP	Qsp	50/5"	50/5"								--											
	55.5	CR	SP	Qsp	87	81	4.4	109.8															29	0	
	60.5	SPT	SP	Qsp	50/5"	50/5"																			
65.5	CR	SP	Qsp	78	73	3.7	110.6																		
70.5	SPT	ML	Qsp	87	87					44	16		7.3	1810.0	264	600									
75.5	CR	SP	Qsp	91	85	6.2	115.0																		
80.5	SPT	SP	Qsp	50/5"	50/5"																				

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									#4 Sieve (%)	No.200 (%)	LL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r		ϕ (degree)	c (psf)		
G-7	5.5	CR	CL	Qalo	28	23	16.8	111.9																
	10.5	SPT	ML	Qalo	16	16				51.2														
	15.5	CR	CH	Qalo	10	8	32.7	87.0			59	32									14	1000	0.431	
	20.5	SPT	CH	Qalo	20	20																		
	25.5	CR	ML	Qalo	22	18	25.8	94.4						6.7	74.0	15	760							
	30.5	SPT	MH	Qalo	27	27					55	23										16	1800	0.420
	35.5	CR	MH	Qalo	19	15																		
	40.5	SPT	MH	Qalo	25	25																		
	45.5	CR	MH	Qalo	13	10	38.8	81.1																
	50.5	SPT	SP	Qsp	80	80																		
	55.5	CR	SP	Qsp	22	18																		
	60.5	SPT	SP	Qsp	86/11"	86/11"																		
	65.5	CR	SP	Qsp	38	31	5.8	117.4										0.062	0.011	0.44				
	70.5	SPT	SP	Qsp	88/9"	88/9"																		
	75.5	CR	CH	Qsp	21	17	40.5	78.9																
	80.5	SPT	SP	Qsp	80/9"	80/9"																		
85.5	CR	SP	Qsp	92/9"	76/9"																			
90.5	SPT	SP	Qsp	50/3"	50/3"																			
95.5	CR	SP	Qsp	87/11"	72/5"																			
100.5	SPT	SP	Qsp	50/4"	50/4"																			
G-8	5.5	CR	FILL - CL	Fill	15	14	25.2	95.5																
	10.5	SPT	CL	Qal	47	47	21.0																	
	15.5	CR	CL	Qalo	14	13	21.5	101.0																
	20.5	SPT	CL	Qalo	15	15	26.3							7.7	58.0	16	1000							
	25.5	CR	ML	Qalo	9	8	27.4	90.9																
	30.5	SPT	CL	Qalo	22	22	31.9			73.0	48	24		8.0	93.0	27	1560							
	35.5	CR	CH	Qalo	24	22	37.4	80.7			65	36									15	900	0.426	
	40.5	SPT	CH	Qalo	24	24	34.5																	
	45.5	CR	CH	Qalo	34	31	28.7	94.0																
	50.5	SPT	CL	Qalo	65	65	28.1				40	18												
	55.5	CR	CL	Qalo	25	23	17.4	112.8														24	2000	0.372
	60.5	SPT	ML	Qalo	50/6"	50/6"	15.0																	
	65.5	CR	ML	Qalo	56	52	16.6	110.5																
	70.5	SPT	ML	Qalo	45	45	34.7																	
	75.5	CR	ML	Qalo	25	23	30.0	89.4																
	80.5	SPT	ML	Qalo	38	38	37.6																	
G-9	5.5	CR	CH	Qal	9	8	27.4	93.4			75	45									23	800	0.379	
	10.5	SPT	SM	Qal	26	26				32.0														
	15.5	CR	CL	Qal	6	5	23.1	102.9																
	20.5	SPT	CL	Qalo	37	37					40	21										23	800	0.379
	25.5	CR	CL	Qalo	10	9	22.2	104.7																
	30.5	SPT	CL	Qalo	16	16					38	18		7.8	61.0	21	1500							
	35.5	CR	ML	Qalo	11	10	25.1	100.6														20	1350	0.397
	40.5	SPT	ML	Qalo	30	30					71.1													
	45.5	CR	ML	Qalo	10	9	21.9	100.3																
	50.5	SPT	ML	Qalo	42	42																		
	55.5	CR	ML	Qalo	15	14	32.5	88.7														15	900	0.426
	60.5	SPT	CL	Qalo	43	43					39	18		8.0	69.0	34	1200				0.245	0.054	0.720	
	65.5	CR	CL	Qalo	12	11	30.1	94.6																
	70.5	SPT	SC	Qalo	50/5"	50/5"																		
	75.5	CR	CL	Qalo	32	30																		
	80.5	SPT	SC	Qalo	29	29					38.8													
85.5	CR	SM	Qalo	34	31	24.3	93.1																	
90.5	SPT	CL-ML	Qalo	22	22																			

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Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Equivalent SPT Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	GRAIN SIZE		Atterberg Limits		Specific Gravity	Corrosion				Compression Indices		Void Ratio	Direct Shear		Poisson's Ratio ν	
									#4 Sieve (%)	No.200 (%)	LL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r		ϕ (degree)	c (psf)		
G-10	6.5	CR	CL	Qal	5	4	13.6	97.3																
	10.5	CR	CL	Qal	7	6	16.9	105.0			30	13												
	15.5	SPT	CL	Qalo	39	39					38	19												
	20.5	CR	CL	Qalo	14	13	19.1	107.9																
	25.5	SPT	CL	Qalo	35	35																		
	30.5	CR	SC	Qalo	25	23	9.5	122.2																
	35.5	SPT	SC	Qalo	76	76			81.7	19.5				8.1	97.0	12	2960							
	40.5	CR	SC	Qalo	38	35	10.6	112.1																
	45.5	SPT	SC	Qalo	50/4"	50/4"																		
	50.5	CR	SC	Qalo	19	17	18.0	108.4	97.7	42.0	28	9												
	55.5	SPT	SM	Qalo	27	27			94.8	49.9														
	60.5	CR	CL	Qalo	22	20	24.3	101.3																
	65.5	SPT	CL	Qalo	35	35				86.2				8.0	46.0	6.2	1260							
	70.5	CR	CL	Qalo	41	38	16.1	109.7			40	21												
	75.5	SPT	CL	Qalo	44	44																		
80.5	CR	CL	Qalo	25	23	16.2	113.2																	
G-11	5.5	CR	ML	Qal	3	2	19.8	100.3		65.2											23	800	0.379	
	10.5	SPT	ML	Qal	14	14																		
	15.5	CR	CL	Qal	14	13	20.5	104.9																
	20.5	SPT	CL	Qalo	44	44					40	21		7.7	37.0	3.4	1520							
	25.5	CR	SM	Qalo	16	15	8.6	125.3																
	30.5	SPT	ML	Qalo	11	11			99.8	76.8														
	35.5	CR	SM	Qalo	26	24	7.6	127.8																
	40.5	SPT	SM	Qalo	64	64			82.3	23.8														
	45.5	CR	SM	Qalo	15	14	17.4	101.0														31	0	0.327
	50.5	SPT	SM	Qalo	51	51																		
	55.5	CR	SM	Qalo	16	15	26.9	99.3																
	60.5	SPT	SM	Qalo	61	61																		
	65.5	CR	CL-ML	Qalo	14	13	26.7	96.5																
	70.5	SPT	CL-ML	Qalo	36	36								7.8	79.0	18	1020					14	1800	0.431
	75.5	CR	CL-ML	Qalo	25	23	19.5	108.9																
80.5	SPT	CL-ML	Qalo	74	74																			
85.5	CR	CL	Qalo	32	30	14.4	116.9																	
90.5	SPT	CL	Qalo	45	45																			
G-12	5.5	CR	ML	Qal	5	4	10.2	104.1																
	10.5	SPT	CL	Qal	15	15					47	23												
	15.5	CR	CL	Qal	4	3	16.9	108.5																
	20.5	SPT	CL	Qalo	42	42				67.6														
	25.5	CR	CL	Qalo	14	11	15.8	113.2																
	30.5	SPT	SC	Qalo	26	26				46.2														
	35.5	CR	SC	Qalo	10	8	15.0	114.0														27	800	0.353
	40.5	SPT	SM	Qalo	50/5"	50/5"			80.8	15.7														
	45.5	CR	SM	Qalo	38	31	7.6	113.7																
	50.5	SPT	CL	Qalo	30	30								7.7	56.0	15	1048							
	55.5	CR	CL	Qalo	25	20	14.9	113.9																
	60.5	SPT	CL	Qalo	33	33					35	17												
	65.5	CR	CL	Qalo	18	14	25.1	95.8																
	70.5	SPT	CL	Qalo	36	36								7.7	92.0	18	900							
	75.5	CR	CL	Qalo	30	24	17.0	111.6										0.114	0.034	0.460				
80.5	SPT	CL	Qalo	50/5"	50/5"																			

TABLE F-1.1 - SOIL LABORATORY TESTING SUMMARY
 MTA WESTSIDE SUBWAY EXTENSION
 GEOTECHNICAL DESIGN REPORT
 4953-10-1561

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Equivalent SPT Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	GRAIN SIZE		Atterberg Limits		Specific Gravity	Corrosion				Compression Indices		Void Ratio	Direct Shear		Poisson's Ratio ν
									#4 Sieve (%)	No.200 (%)	LL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r		ϕ (degree)	c (psf)	
G-13	5.5	CR	ML	Qal	9	9	--	--		51.0													
	10.5	SPT	CL	Qal	13	13																	
	15.5	CR	SC	Qal	5	5	13.7	113.9		47.3											23	800	0.379
	20.5	SPT	SC	Qal	45	45			61.0	17.3													
	25.5	CR	SC	Qal	4	4																	
	30.5	SPT	SM	Qalo	63	63																	
	35.5	CR	CH	Qalo	27	27	27.4	94.1										0.199	0.071	0.720	12	1000	0.442
	40.5	SPT	CH	Qalo	31	31					54	28		7.4	108.0	33	760						
	45.5	CR	CH	Qalo	26	26																	
	50.5	SPT	CL	Qalo	42	42				99.7	69.8	42	22										
	55.5	CR	CL	Qalo	27	27																	
	60.5	SPT	SC	Qalo	71	71				97.2	39.8												
	65.5	CR	SC	Qalo	70	70																	
	70.5	SPT	SM	Qalo	90	90						NP	NP										
	75.5	CR	SM	Qalo	30	30																	
80.5	SPT	CL	Qalo	54	54																		
85.5	CR	SM	Qalo	67	67	19.4	107.6																
90.5	SPT	SP	Qalo	92/9"	92/9"																		
95.5	CR	SP	Qalo	100/6"	100/6"	10.0	118.3																
100.5	CR	SP	Qalo	100/9"	100/9"	15.9	112.6																
G-14	5.5	CR	FILL - SM	Fill	8	7	14.4	112.1		39.3													
	10.5	SPT	CL	Qal	12	12	22.0																
	15.5	CR	SM	Qal	7	6	23.4	96.2															
	20.5	SPT	SM	Qal	22	22	17.3																
	25.5	CR	SM	Qal	3	2																	
	30.5	SPT	SM	Qal	5	5	17.3		97.5	32.4													
	35.5	CR	SM	Qal	8	7																	
	40.5	SPT	SM	Qalo	50/5"	50/5"	--	--		--													
	45.5	CR	SM	Qalo	50	47																	
	50.5	SPT	CH	Qalo	38	38	45.8				65	33		7.3	32.0	10	920						
	55.5	CR	CH	Qalo	18	16	18.0	111.8													19	1300	0.403
	60.5	SPT	CH	Qalo	80	80	24.8																
	70.5	CR	SM	Qalo	35	32	14.8	111.6															
	75.5	SPT	CL	Qalo	50/6"	50/6"	21.2		99.3	50.6													
	80.5	CR	SW	Qalo	75	70																	
85.5	SPT	SW	Qalo	50/6"	50/6"																		
G-16	10.5	CR	CL	Qalo	11	9	14.8	114.1															
	15.5	SPT	CL	Qalo	18	18					30	15											
	20.5	CR	SM	Qalo	5	4	19.9	107.7															
	25.5	SPT	ML	Qalo	44	44				82.5													
	30.5	CR	ML	Qalo	18	14	28.7	95.0															
	35.5	SPT	CL-ML	Qalo	30	30			99.5	74.7													
	40.5	CR	SM	Qalo	51	42	11.6	114.6		15.2													
	45.5	SPT	CL	Qalo	64	64			100.0	90.2													
	50.5	CR	ML	Qalo	61	50	26.7	96.7		84.5											22	900	0.385
	55.5	SPT	CL	Qalo	36	36					43	24		7.7	32.0	29	1140						
	60.5	CR	CL	Qalo	49	40	23.6	100.0															
	65.5	CR	CL	Qalo	52	43																	
	70.5	SPT	CL	Qalo	85	85																	
	75.5	CR	CL	Qalo	36	29																	
	80.5	SPT	CL	Qalo	63	63																	
85.5	CR	CL	Qalo	40	33	13.4	121.7																

TABLE F-1.1 - SOIL LABORATORY TESTING SUMMARY
 MTA WESTSIDE SUBWAY EXTENSION
 GEOTECHNICAL DESIGN REPORT
 4953-10-1561

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Equivalent SPT Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	GRAIN SIZE		Atterberg Limits		Specific Gravity	Corrosion				Compression Indices		Void Ratio	Direct Shear		Poisson's Ratio ν		
									#4 Sieve (%)	No.200 (%)	LL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r		ϕ (degree)	c (psf)			
G-20	7.5	CR	CL	Qal	11	10	14.1	107.3			35	15													
	10.5	SPT	CL	Qal	31	31																			
	15.5	CR	GM	Qal	28	26	12.2	119.2	62.5	19.1											33	400	0.313		
	20.5	SPT	CL	Qalo	27	27																			
	25.5	CR	CL	Qalo	19	17	20.4	106.5																	
	30.5	SPT	SM	Qalo	50/6"	50/6"																			
	35.5	CR	ML	Qalo	25	23	25.1	94.7	100	77.4															
	40.5	SPT	SM	Qalo	74	74							2.67												
	45.5	CR	SW	Qalo	49	46	9.8	108.8																	
	50.5	SPT	ML	Qalo	74	74					NP	NP		7.3	37.0	12	1880								
	55.5	CR	ML	Qalo	29	27	17.9	108.2													24	500	0.372		
	60.5	SPT	SM	Qalo	90	90																			
	65.5	CR	CL	Qalo	30	28	29.6	92.1										0.074	0.012	0.50	14	800	0.431		
	70.5	SPT	CL	Qalo	47	47																			
	75.5	CR	CL	Qalo	33	31	25.9	95.6																	
80.5	SPT	CL	Qalo	73	73					42	19														
85.5	CR	SM & SP	Qalo	34	31	20.3	107.9													0.059	0.012	0.57			
90.5	SPT	CL	Qalo	49	49																				
95.5	CR	SC	Qalo	35	32	15.5	106.5																		
100.5	SPT	SM	Qalo	50/5"	50/5"																				
G-23	5.5	CR	SM	Qal	20	18	19.7	102.7		50.6															
	10.5	SPT	SM	Qal	13	13																			
	12.5	SPT	SM	Qal	48	48																			
	15.5	CR	SM	Qal	6	5	32.1	89.0		45.4											22	0	0.385		
	20.5	SPT	SM	Qal	36	36																			
	25.5	CR	SM	Qalo	50/5"	47/5"															--	--	--		
	30.5	SPT	SM	Qalo	30	30			62.3	18.5															
	35.5	CR	SM	Qalo	23	21																			
	40.5	SPT	SM	Qalo	23	23																			
	45.5	CR	CL	Qalo	4	3	26.0	94.7						7.6	69.0	16	1720				14	700	0.431		
	50.5	SPT	CL	Qalo	10	10							33	12	2.69										
	55.5	CR	SM	Qalo	8	7	24.8	100.8													0.128	0.02	0.67		
	60.5	SPT	SM	Qalo	76	76			70	21.3															
	65.5	CR	SM	Qalo	53	49																			
	70.5	SPT	CL-ML	Qalo	72	72					27	7													
75.5	CR	CL-ML	Qalo	47	44	19.1	109.5													0.092	0.009	0.48			
80.5	SPT	CL-ML	Qalo	66	66																				
85.5	CR	CL-ML	Qalo	34	31																				
90.5	SPT	CL	Qalo	63	63																				
95.5	CR	SM	Qalo	30	28	24.1	94.8																		
100.5	SPT	CL	Qalo	46	46																				
G-24	5.5	CR	ML	Qal	8	7	12.9	94.4																	
	10.5	SPT	CL	Qalo	45	45					36	19													
	15.5	CR	CL	Qalo	7	6	17.2	102.8													14	800	0.431		
	20.5	SPT	CL	Qalo	57	57			96.1	50.3				7.3	23.0	11	1920								
	25.5	CR	SW	Qalo	64	60	7.3	125.5																	
	30.5	SPT	CL	Qalo	24	24							2.71												
	35.5	CR	CL	Qalo	42	39																			
	40.5	SPT	ML	Qalo	40	40				51.0															
	45.5	CR	SW	Qalo	75	70	--	--						7.6	46.0	9.2	2120				--	--			
	50.5	SPT	SW	Qalo	50/5"	50/5"																			
	55.5	CR	SM	Qalo	38	35	24.5	92.2																	
60.5	SPT	SM	Qalo	69	69			93.1	41.6																
65.5	CR	SM	Qalo	39	36	13.8	119.9													0.054	0.009	0.37	35	600	0.299
70.5	SPT	SM	Qalo	50/6"	50/6"			92.8	22.6																
75.5	CR	SM	Qalo	22	20	18.8	101.0																		
80.5	SPT	SM	Qalo	84/9"	84/9"																				

-- Insufficient sample size for testing.
 NP Nonplastic

**TABLE F-1.2 - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained			
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)	
G-101	9.5	CR	SM	Lakewood	17	16.4	107															0.557				
	14	SPT	SM	Lakewood	11	24.6	-	0	59	41																
	19.5	CR	SC	Lakewood	15	20.8	103																0.629			
	24	SPT	ML	Lakewood	17	23.3	-	0	35	65																
	29.5	CR	CL	San Pedro	25	20.6	106	0	6	94	40	13	27										0.584			
	34	SPT	CL	San Pedro	23	30.9	-							2.79	8.2	251.0	15	720								
	39.5	CR	CL	San Pedro	35	22.6	103	0	13	87	41	16	25										0.63			
	44	SPT	CH	San Pedro	16	27.3	-				50	15	35	2.81	8.2	664.0	20	600								
	49.5	CR	SC	San Pedro	26	19.9	110	0	55	45													0.517			
	54	SPT	SP-SM	San Pedro	20	13.7	-	0	94	6				2.76												
	59.5	CR	SP-SM	San Pedro	67	16.8	105	0	92	8				0.11%												
	64	SPT	SP-SM	San Pedro	47/10"	21.8	-							2.76	7.1	557.0	71	920								
	69.5	CR	SW-SM	San Pedro	62	8.9	131	17	76	7				0.09%												
	74	SPT	SM	San Pedro	50/8"	25.8	-																			
	79.5	CR	SILTSTONE	Fernando	50	25.3	93																			
	84	SPT	SILTSTONE	Fernando	46	39.0	-																			
G-102	10.5	CR	ML	Lakewood	15	15.4	117																0.424			
	15.5	SPT	SC	Lakewood	26	19.7	-																			
	20.5	CR	MH	Lakewood	6	23.0	100	0	23	77	55	32	23										0.654			
	25.5	SPT	CL	Lakewood	32	22.9	-								7.3	87.0	14	1400								
	30.5	CR	CH	San Pedro	15	33.2	87	0	23	77	74	25	49	2.66										0.919		
	35.5	SPT	CL	San Pedro	24	27.5	-	0	33	67	37	20	17													
	40.5	CR	CL	San Pedro	7	26.6	89							0.21%										0.886		
	45.5	SPT	SC	San Pedro	36	17.6	-	2	85	13				2.61												
	50.5	CR	SM	San Pedro	10	18.5	106	0	51	49	45	30	15										0.572			
	55.5	SPT	SM	San Pedro	35	25.6	-																			
	60.5	CR	SM	San Pedro	20	25.8	103	0	70	30	NP	NP	NP										0.618			
	65.5	SPT	SP	San Pedro	73	18.2	-	0	90	10				2.56												
	70.5	SPT	GW	San Pedro	100	5.9	-																			
	75.5	CR	SILTSTONE	Fernando	19	34.2	87	0	4	96	49	34	15													
	80.5	SPT	SILTSTONE	Fernando	63	39.7	-																			
	85.5	CR	SILTSTONE	Fernando	16	33.7	82																			
G-103	10.5	CR	SP	Lake wood	27	10.4	111																0.501			
	15.5	SPT	CL	San Pedro	11	25.3	-																			
	20.5	CR	CL	San Pedro	33	17.8	110																	0.526		
	25.5	SPT	CL/SM	San Pedro	15	33.8	-				44	25	19													
	28.5	CR	ML	San Pedro	17	38.4	83							0.05%										1.022		
	31.5	SPT	SM	San Pedro	33	18.9	-	2	65	33				2.68												
	34.5	CR	SM	San Pedro	18	28.6	93							0.06%										0.791		
	37.5	SPT	CL	San Pedro	20	31.1	-				45	26	19			7.0	2441.0	20	600							
	40.5	CR	CL	San Pedro	12	24.1	102	1	45	54	38	23	15						0.12016	0.01646				0.646		
	43.5	SPT	SM	San Pedro	41	23.7	-							2.63												
	46.5	CR	SM	San Pedro	33	14.5	116												0.03303	0.00574				0.436		
	49.5	SPT	SC	San Pedro	28	19.7	-	0	72	28	44	21	23			7.8	1044.0	25	560							
	52.5	CR	SP-SM	San Pedro	49	24.8	99	0	91	9																
	55.5	SPT	SP	San Pedro	56	24.5	-																			
	58.5	CR	SP	San Pedro	51	26.1	92							0.07%										0.811		
	61.5	SPT	SM	San Pedro	66	19.6	-	10	78	12				2.65												
	64.5	CR	SP	San Pedro	53	32.0	89																	0.872		
	67.5	SPT	SILTSTONE	Fernando	52	33.1	-				41	34	7													
	70.5	CR	SILTSTONE	Fernando	39	30.4	87																			
	73.5	SPT	SILTSTONE	Fernando	56	39.8	-																			
	76.5	CR	SILTSTONE	Fernando	32	30.0	90																			
	79.5	SPT	SILTSTONE	Fernando	57	35.4	-																			
	82.5	CR	SILTSTONE	Fernando	52	31.2	88																			
	85.5	SPT	SILTSTONE	Fernando	53	32.6	-																			
G-104	10.5	CR	CL	Lakewood	Push	23.7	-	0	15	85					7.4	78.0	217	560								
	15.5	SPT	CL	Lakewood	21/10"	27.1	-				44	17	27													
	20.5	CR	ML	Lakewood	7	22.9	95																0.767			
	25.5	SPT	SM	Lakewood	34	19.3	-	0	70	30																
	35.5	CR	CL	San Pedro	13	22.1	103	0	10	90	43	19	24	2.68									0.624			
	40.5	SPT	CL	San Pedro	70	15.5	-				38	15	23			8.0	208.0	34	1200					0.624		
	45.5	CR	CL	San Pedro	21	23.3	98	0	26	74	46	23	23	2.55										0.624		
	55.5	CR	CL	San Pedro	15	24.0	99	0	33	67				0.01%										0.696		
	56.5	SPT	CL	San Pedro	25	17.9	-				36	16	20													
	65.5	CR	SM	San Pedro	23	17.9	-	0	84	16				2.59												
	75.5	CR	SM	San Pedro	26	13.3	112																	0.488		
	76.5	SPT	SM	San Pedro	68	14.5	-	6	70	24																

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	85.5	SPT	GM/ML	San Pedro	63/9"	10.6	-	59	18	23					7.5	5333.0	142	420							
	90.5	CR	SILTSTONE	Fernando	18	34.7	-	0	6	94	47	35	12												
	95.5	SPT	SILTSTONE	Fernando	61	31.3	80																		
	100.5	SPT	SILTSTONE	Fernando	75	33.0	-				46	27	19												
G-105	5.5	CR	ML	Fill	12	15.2	115																	0.46	
	10.5	SPT	ML	Lakewood	25	21.6	-																		
	15.5	CR	ML	San Pedro	26	22.8	100																	0.679	
	20.5	SPT	ML	San Pedro	22	29.7	-				NP	NP	NP												
	25.5	NR	ML	San Pedro	26	-	-																		
	30.5	SPT	CL	San Pedro	16	21.1	-																		
	35.5	CR	ML	San Pedro	46	16.9	114																	0.472	
	40.5	SPT	SM	San Pedro	31	22.2	-																		
	45.5	CR	SM	San Pedro	44	24.4	100	0	77	23									0.06664	0.01333				0.666	
	50.5	SPT	ML	San Pedro	27	22.4	-							8.0	1438.0	18	560								
	55.5	CR	SM	San Pedro	37	20.1	101	0	80	20	NP	NP	NP												0.65
	60.5	SPT	SP-SM	San Pedro	64	20.7	-	0	90	10				2.55											
	65.5	CR	SM	San Pedro	89	26.3	95							2.57											0.688
	70.5	SPT	SM	San Pedro	79	20.1	-	0	88	12															
	75.5	CR	SILTSTONE	Fernando	59	37.1	85																		
	80.5	SPT	SILTSTONE	Fernando	58	35.3	-	0	3	97	55	32	23	2.51											
	85.5	CR	SILTSTONE	Fernando	53	34.1	84																		
	90.5	SPT	SILTSTONE	Fernando	48	49.9	-								4.0	7382.0	921	228							
	95.5	CR	SILTSTONE	Fernando	74	30.3	90	0	1	99	54	34	20												
	100.5	SPT	SILTSTONE	Fernando	73	40.9	-																		
	105.5	CR	SILTSTONE	Fernando	70	32.9	88																		
	110.5	SPT	SILTSTONE	Fernando	57	36.6	-																		
G-106	5.5	CR	CL	ternary Older Alluv	22	14.8	112																		0.499
	10.5	SPT	CL	Lakewood	26	20.0	-																		
	15.5	CR	ML	Lakewood	18	26.9	92																		0.825
	20.5	SPT	SM	Lakewood	27	23.5	-																		
	25.5	CR	SW-SM	Lakewood	37	9.5	118						0.07%												
	28.5	SPT	SW-SM	Lakewood	40	13.9	-	7	82	11															
	31.5	CR	CH	Lakewood	32	27.9	97				63	32	31												0.73
	34.5	SPT	ML	San Pedro	16	33.2	-							2.76	8.1	252.0	23	640							
	37.5	CR	SC	San Pedro	61	18.6	110	14	39	47	34	20	14						0.07878	0.01212					0.515
	40.5	SPT	ML	San Pedro	31	29.8	-																		
	43.5	CR	ML	San Pedro	22	36.6	90	0	27	73	43	31	12												0.865
	46.5	SPT	ML	San Pedro	37	-	-																		
	49.5	CR	ML	San Pedro	53	35.1	-			91				2.69											
	52.5	SPT	ML	San Pedro	29	32.2	-	0	3	97															
	55.5	CR	SC	San Pedro	23	21.8	104	0	54	46	45	21	24						0.08491	0.02563					0.602
	58.5	SPT	SM	San Pedro	60	23.9	-							8.1	432.0	18	1080								
	61.5	CR	SP	San Pedro	49	25.9	99							0.04%											0.683
	64.5	SPT	SM	San Pedro	60	21.2	-	0	87	13															
	67.5	CR	SP	San Pedro	75/8"	21.6	104							0.10%	2.65										0.59
	72.5	SPT	SM	San Pedro	61	26.9	-																		
	75.5	CR	SM	San Pedro	75/5"	25.8	97																		0.718
	78.5	SPT	SILTSTONE	Fernando	41	37.0	-																		
	81.5	CR	SILTSTONE	Fernando	71/11"	33.7	85	0	2	98	53	37	16	2.69											0.975
	85.5	SPT	SILTSTONE	Fernando	51	41.9	-																		
	89.5	CR	SILTSTONE	Fernando	59	47.5	69																		
G-107	10.5	CR	CL	Fill	Push	21.4	105																		0.587
	15.5	SPT	SM	ternary Older Alluv	46	17.6	-																		
	20.5	CR	SM	ternary Older Alluv	11	24.4	98																		0.7
	25.5	SPT	SM	Lakewood	45	16.0	-	0	85	15															
	30.5	CR	MH	Lakewood	10	27.6	95				66	41	25												0.741
	35.5	SPT	SM	Lakewood	21	22.0	-			47															
	40.5	CR	SM	Lakewood	18	16.5	111																		0.501
	45.5	SPT	ML	San Pedro	31	34.4	-																		
	50.5	CR	CH	San Pedro	12	25.2	95	0	3	97	54	19	35												0.767
	55.5	SPT	SM	San Pedro	65	18.1	-	0	83	17															
	60.5	CR	SM	San Pedro	33	21.9	100																0.01333		0.666
	65.5	SPT	SM	San Pedro	75	20.0	-	0	79	21															
	70.5	CR	SM	San Pedro	44	24.2	95							2.52											0.655
	75.5	SPT	ML	San Pedro	44	40.2	-	0	4	96	45	29	16		5.2	2137.0	139	520							
	80.5	CR	ML	San Pedro	22	34.3	84																		0.998
	85.5	SPT	SILTSTONE	Fernando	68	51.7	-	0	8	92	66	49	17												
	90.5	CR	SILTSTONE	Fernando	25	28.8	91																		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
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Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained						
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)					
	80.5	SPT	SILTSTONE	Fernando	62	45.8	-								7.7	2183.0	197	480												
	85.5	CR	SILTSTONE	Fernando	34	48.6	69							2.69										1.433						
	90.5	SPT	SILTSTONE	Fernando	37	34.7	-								7.6	2055.0	399	368												
	95.5	CR	SILTSTONE	Fernando	50	38.8	79																							
	100.5	SPT	SILTSTONE	Fernando	38	45.7	-								3.1	7712.0	724	216												
	105.5	CR	SILTSTONE	Fernando	46	33.0	86							2.81										1.039						
	110.5	SPT	SILTSTONE	Fernando	31	37.4	-							2.81	3.9	5313.0	901	228												
	115.5	CR	SILTSTONE	Fernando	51	40.5	79																							
	122	CR	SILTSTONE	Fernando	69	37.0	80																							
	125.5	CR	SILTSTONE	Fernando	40	38.0	82																							
	130.5	CR	SILTSTONE	Fernando	48	41.8	78																							
G-111	5.5	CR	ML	Lakewood	25	13.6	103																		0.63					
	10.5	NR	GW	Lakewood	27	-	-																							
	15.5	CR	ML	Lakewood	37	18.7	107																			0.569				
	20.5	SPT	CL	Lakewood	16	20.7	-																							
	25.5	CR	ML	Lakewood	16	25.0	93																			0.805				
	30.5	SPT	ML	Lakewood	35	28.4	-																							
	35.5	CR	SP	Lakewood	37	16.4	106																				0.572			
	40.5	NR	ML	San Pedro	28	52.0	-																							
	45.5	CR	ML	San Pedro	27	25.2	92																				0.825			
	50.5	SPT	CL	San Pedro	32	21.3	-	0	42	58	32	21	11		7.7	146.0	20	1480												
	55.5	CR	SP-SM	San Pedro	54	14.3	110							0.00%																
	60.5	SPT	SP-SM	San Pedro	47	15.7	-																							
	65.5	CR	SP-SM	San Pedro	80	23.3	97	0	91	9	NP	NP	NP		2.54												0.634			
	70.5	SPT	SM	San Pedro	53	21.7	-	1	84	15					7.7	167.0	18	2150												
	75.5	CR	SM	San Pedro	62	28.3	90																				0.851			
	80.5	SPT	SILTSTONE	San Pedro	38	19.3	-	0	7	93	NP	NP	NP																	
	85.5	CR	SILTSTONE	Fernando	26	17.5	86	0	2	98	56	41	15		2.46										0.06605	0.03392	0.785			
	90.5	SPT	SILTSTONE	Fernando	40	59.8	-																							
	95.5	CR	SILTSTONE	Fernando	34	39.4	79																							
	100.5	SPT	SILTSTONE	Fernando	35	46.8	-																							
	105.5	CR	SILTSTONE	Fernando	35	34.8	83																							
G-112	5.5	CR	CL	ernary Younger Alluvium	15	15.9	101																				0.662			
	10.5	SPT	SM	Lakewood	35	16.1	-																							
	15.5	CR	SM	Lakewood	7	20.8	102							0.00%													0.633			
	25.5	SPT	CL	Lakewood	22	29.5	-								2.45	7.4	161.0	19	1000											
	30.5	CR	CL	Lakewood	18	25.2	97																			0.73	250	33		
	35.5	SPT	SM/CL	Lakewood	36	19.2	-																							
	40.5	CR	SM	Lakewood	11	21.0	105	3	50	47	37	25	12														0.587			
	45.5	SPT	CH	San Pedro	68	20.0	-								7.8	107.0	15	1520												
	55.5	CR	ML	San Pedro	12	27.2	97																				0.73	350	31	
	60.5	SPT	ML	San Pedro	27	24.3	-																							
	65.5	CR	SP-SM	San Pedro	27	23.9	100	0	92	8					2.58															
	75.5	SPT	SP-SM	San Pedro	76	20.5	-	0	91	9					7.8	204.0	11	2120									0.61			
	80.5	CR	SP-SM	San Pedro	25	24.3	99																							
	85.5	SPT	SM	San Pedro	72	25.8	-	0	77	23																				
	90.5	CR	SILTSTONE	Fernando	12	28.4	92																							
	95.5	SPT	SILTSTONE	Fernando	43	37.6	-																							
	100.5	CR	SILTSTONE	Fernando	13	42.8	76																							
	105.5	SPT	SILTSTONE	Fernando	55	45.8	-																							
	110.5	CR	SILTSTONE	Fernando	12	36.7	84	0	5	95	59	40	19		2.53															
	115.5	SPT	SILTSTONE	Fernando	57	48.0	-																							
	120.5	CR	SILTSTONE	Fernando	16	57.9	61																							
G-113	6.5	-	CL	Lakewood	-	20.3	-	0	37	63	46	16	30																	
	10.5	CR	CL	Lakewood	21	23.1	99																					0.689		
	15.5	SPT	CL	Lakewood	11	23.6	-																							
	20.5	CR	SM	Lakewood	31	14.6	-	0	69	31																				
	25.5	SPT	CL	Lakewood	35	14.5	-								2.78	6.9	14.0	7	1720											
	30.5	CR	CL	Lakewood	33	25.7	106																					0.591	350	33
	34.5	SPT	ML	Lakewood	30	31.6	-																							
	40.5	CR	CH	San Pedro	33	34.7	-	0	8	92	69	20	49																	
	45.5	SPT	CH	San Pedro	38	24.0	-																							
	50.5	CR	CH	San Pedro	49	26.1	102	0	16	84	52	18	34		2.79													0.712	750	34
	55.5	SPT	SP-SM	San Pedro	50	24.3	-																							
	60.5	CR	SP-SM	San Pedro	97	-	-																							
	65.5	SPT	SP-SM	San Pedro	50/3"	15.9	-																							
	70.5	CR	SW	San Pedro	50/1"	-	-																							
	75.5	SPT	SM	San Pedro	50/5"	-	-																							

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
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Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)
	80.5	CR	SM	San Pedro	50/1"	17.7	112	0	61	39				2.73									0.52	250	45
	85.5	SPT	SILTSTONE	Fernando	33	47.5	-								5.5	3147.0	258	400							
	90.5	CR	SILTSTONE	Fernando	67	34.1	85	0	1	99	51	28	23												
	95.5	SPT	SILTSTONE	Fernando	86	37.0	-																		
	105.5	CR	SILTSTONE	Fernando	70	41.8	81																		
G-114	9.5	CR	CL	Lakewood	12	20.7	101																0.65		
	14	SPT	SM	Lakewood	10	25.6	-																		
	19.5	CR	CH	Lakewood	20	24.6	98				60	15	45										0.713	400	32
	24	SPT	CL-ML	Lakewood	11	37.7	-																		
	29.5	CR	SM	Lakewood	20	21.1	104																0.602		
	34	SPT	CL	Lakewood	29	24.4	-								7.8	94.0	20	1080							
	39.5	CR	SC	Lakewood	29	12.4	114	1	77	22	27	19	8	2.81									0.538	200	35
	42	SPT	SC	Lakewood	25	-	-																		
	45.5	CR	CH	Lakewood	34	23.6	99							-0.05%									0.696		
	48	SPT	CH	Lakewood	29	-	-	0	43	57	52	16	36												
	51.5	CR	CL	San Pedro	35	24.4	98	0	30	70	32	20	12	2.80									0.783		
	54	SPT	CL	San Pedro	21	22.2	-								8.3	171.0	2	1040							
	57.5	CR	CH	San Pedro	28	30.6	91	0	19	81	74	18	56	2.79									0.913		
	60.5	SPT	SM	San Pedro	49	18.7	-	0	83	17															
	63.5	CR	SM	San Pedro	60	-	-																0	39	
	66	SPT	SP	San Pedro	57	19.3	-																		
	69.5	CR	SP	San Pedro	90	11.6	107	0	95	5				2.74									0.598		
	72	SPT	SP-SM	San Pedro	68	17.4	-																		
	75.5	CR	SP-SM	San Pedro	87	-	-																		
	78	SPT	SM	San Pedro	62	20.3	-							2.77	7.9	256.0	13	1760							
	80.5	CR	SM	San Pedro	63	14.2	104	12	75	13															
	83	SPT	SM	San Pedro	58	23.7	-																0.602		
	86.5	NR	SILTSTONE	Fernando	50/1"	-	-																		
	89.5	SPT	SILTSTONE	Fernando	63	49.3	-								5.2	5751.0	285	332							
	92.5	CR	SILTSTONE	Fernando	54	30.0	89	0	2	98	46	24	22												
	95	SPT	SILTSTONE	Fernando	44	35.6	-																		
	98.5	CR	SILTSTONE	Fernando	60	35.3	86																		
	101	SPT	SILTSTONE	Fernando	51	40.4	-								5.9	5688.0	625	248							
	104.5	CR	SILTSTONE	Fernando	38	38.5	81																		
	109	SPT	SILTSTONE	Fernando	40	51.5	-																		
	114.5	CR	SILTSTONE	Fernando	63	31.1	89																		
	119	SPT	SILTSTONE	Fernando	38	36.5	-																		
G-116	10.5	CR	SM	Lakewood	Push	21.4	101	4	50	46													0.65		
	15.5	SPT	ML	Lakewood	18	25.1	-																		
	20.5	CR	CL	San Pedro	25	26.9	96																0.749		
	25.5	SPT	CL	San Pedro	24	32.9	-																		
	30.5	CR	CL	San Pedro	21	20.6	105																0.599		
	35.5	SPT	CL-ML	San Pedro	11	35.6	-								8.2	377.0	11	880							
	40.5	CR	GC	San Pedro	13	27.1	100	30	30	40	50	24	26										0.666		
	45.5	SPT	SC	San Pedro	29	22.9	-	22	45	33	42	21	21												
	50.5	CR	ML	San Pedro	14	19.3	112	0	40	60	NP	NP	NP	2.70									0.504		
	55.5	SPT	SM	San Pedro	12	19.1	-	0	71	29															
	60.5	CR	SP-SM	San Pedro	32	25.8	101	0	91	9				0.01%	2.68								0.656		
	65.5	SPT	SM	San Pedro	49	21.0	-	0	87	13															
	70.5	CR	SP-SM	San Pedro	23	18.7	107																		
	75.5	SPT	SP-SM	San Pedro	55	17.7	-																		
	80.5	CR	SP-SM	San Pedro	35	34.5	91	0	91	9				2.65									0.817		
	85.5	SPT	SP-SM	San Pedro	50/5"	16.7	-																		
	90.5	NR	GP	San Pedro	12	-	-																		
	95.5	SPT	GP	San Pedro	57	2.3	-	71	28	1															
	100.5	CR	GP	San Pedro	29	11.3	107																0.557		
	105.5	SPT	SILTSTONE	Fernando	52	53.4	-	0	10	90															
G-118	10.5	CR	CL	San Pedro	Push	24.3	98																0.713		
	15.5	SPT	CL	San Pedro	23	26.2	-																		
	20.5	CR	SM	San Pedro	11	24.4	100																0.679		
	25.5	SPT	ML	San Pedro	16	25.5	-																		
	28.5	NR	ML	San Pedro	27	-	-																		
	31.5	SPT	SM	San Pedro	63	21.3	-	0	87	13															
	34.5	CR	SM	San Pedro	54	10.2	117							0.07%	7.5	307.0	51	1760					7.9%	0.424	
	37.5	SPT	ML	San Pedro	42	13.6	-	0	41	59	NP	NP	NP										13.6%	0.705	
	40.5	CR	ML	San Pedro	27	14.7	101	0	39	61	NP	NP	NP	2.76					0.15175	0.02046					
	43.5	SPT	ML	San Pedro	44	18.2	-																		
	46.5	CR	ML	San Pedro	26	8.3	115							0.06%									0.46		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
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Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)
	49.5	SPT	SM	San Pedro	87/11"	7.4	-	3	70	27														
	52.5	CR	SP-SM	San Pedro	25	7.0	109	0	93	7	NP	NP	NP								13.6%			
	55.5	SPT	SM	San Pedro	80	-	-																	
	58.5	CR	SM	San Pedro	24	4.1	119							0.21%										
	61.5	SPT	SM	San Pedro	51	6.6	-	1	86	13				2.61	7.3	303.0	275	920			16.9%			
	64.5	CR	SM	San Pedro	29	8.2	101														0.65			
	67.5	SPT	SM	San Pedro	83/11"	2.9	-								7.4	161.0	22	8000						
	70.5	NR	SM	San Pedro	47	-	-																	
	73.5	SPT	SM	San Pedro	50	8.4	-	3	69	28											16.9%			
	76.5	CR	SM	San Pedro	35	10.2	100														0.666			
	79.5	SPT	SILTSTONE	Fernando	51	18.5	-																	
	82.5	CR	SILTSTONE	Fernando	55	21.7	85																	
	85.5	SPT	SILTSTONE	Fernando	54	20.8	-																	
	88.5	CR	SILTSTONE	Fernando	22	28.0	75																	
	91.5	SPT	SILTSTONE	Fernando	40	21.8	-																	
	94.5	CR	SILTSTONE	Fernando	20	18.6	92																	
	97.5	SPT	SILTSTONE	Fernando	52	24.5	-																	
	100.5	CR	SILTSTONE	Fernando	21	25.9	86																	
	103.5	CR	SILTSTONE	Fernando	29	26.0	-																	
	104.5	SPT	SILTSTONE	Fernando	58	23.3	-																	
G-119	5.5	CR	CL	San Pedro	13	27.2	88															0.907		
	10.5	SPT	CL	San Pedro	10	26.1	-				47	25	22											
	15.5	CR	CL	San Pedro	12	16.5	104															0.614		
	20.5	SPT	SP-SM	San Pedro	41	14.4	-																	
	25.5	CR	SP-SM	San Pedro	57	3.1	119	2	92	6											13.6%			
	30.5	SPT	ML/SM	San Pedro	66	12.2	-							2.61							17.4%			
	35.5	CR	SM	San Pedro	17	39.5	74	0	83	17	NP	NP	NP								8.8%	1.251		
	40.5	SPT	SM/SP-SM	San Pedro	28	11.3	-																	
	45.5	CR	SP-SM	San Pedro	47	2.7	111																	
	50.5	SPT	SP-SM	San Pedro	52	6.6	-	1	87	12											16.5%			
	55.5	CR	SP-SM	San Pedro	63	3.0	105																	
	60.5	SPT	SP-SM	San Pedro	50	7.4	-	21	71	8				2.68							14.8%			
	65.5	CR	SP-SM	San Pedro	70	6.5	90																	
	70.5	SPT	SILTSTONE	Fernando	42	21.4	-							0.35%										
	75.5	CR	SILTSTONE	Fernando	38	25.6	84	0	28	72	NP	NP	NP	2.63								0.954		
	80.5	SPT	SILTSTONE	Fernando	52	21.0	-																	
	85.5	CR	SILTSTONE	Fernando	50	18.8	85														17.5%			
	90.5	SPT	SILTSTONE	Fernando	35	23.4	-																	
	95.5	CR	SILTSTONE	Fernando	49	21.1	87	0	22	78	NP	NP	NP	2.65								0.901		
	100.5	SPT	SILTSTONE	Fernando	36	21.5	-																	
	105.5	CR	SILTSTONE	Fernando	55	18.0	89	0	32	68	NP	NP	NP											
G-121	5.5	CR	CL	Fill	Push	24.5	90															0.861		
	10.5	SPT	GP	Lakewood	23	29.0	-	65	32	3														
	15.5	CR	SP-SM	San Pedro	18	18.0	77																	
	20.5	SPT	ML	San Pedro	24	13.6	-	0	41	59	NP	NP	NP											
	25.5	CR	ML	San Pedro	7	29.3	84															1.001		
	30.5	SPT	SP-SM	San Pedro	33	12.1	-																	
	35.5	CR	SP-SM	San Pedro	10	6.9	101	0	93	7				2.63								0.625		
	45.5	SPT	GW	San Pedro	56	8.0	-																	
	50.5	SPT	SP	San Pedro	41	10.2	-																	
	55.5	CR	SP	San Pedro	13	-	-																	
	60.5	CR	GP	San Pedro	15	-	-																	
	65.5	SPT	GP	San Pedro	16	3.4	-	55	43	2														
	70.5	SPT	SW-SM	San Pedro	23	6.8	-	38	54	8														
	75.5	SPT	ML	San Pedro	53	25.5	-																	
	80.5	CR	ML	San Pedro	18	21.5	91	0	23	77	NP	NP	NP	2.77								0.899		
	85.5	SPT	ML	San Pedro	45	22.2	-																	
	90.5	CR	GM	San Pedro	21	21.4	-																	
	95.5	SPT	ML	San Pedro	54	23.5	-	34	33	33														
	100.5	CR	SILTSTONE	Fernando	17	14.0	-																	
	105.5	SPT	SILTSTONE	Fernando	62	24.8	-																	
	110.5	CR	SILTSTONE	Fernando	21	22.3	88																	
G-123	10.5	CR	SM	ternary Younger Alluv	10	15.9	111															0.509		
	15.5	SPT	CL-ML	ternary Older Alluv	16	19.4	-	0	83	17												4.6%		
	20.5	CR	SC	ternary Older Alluv	15	16.5	109															0.524		
	25.5	SPT	CL	ternary Older Alluv	19	19.5	-																	
	30.5	NR	CL	ternary Older Alluv	34	-	-																	
	33.5	SPT	ML	San Pedro	16	30.7	-	0	33	67												4.1%		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	36.5	CR	SM	San Pedro	38	17.2	105							2.44								0.45			
	41.5	SPT	SM	San Pedro	67	10.0									4.9	244.0	1	13200			10.0%	0.461			
	44.5	CR	SW-SM	San Pedro	96/9"	6.4	114	5	87	8															
	47.5	SPT	SW-SM	San Pedro	56	8.5	-								5.5	230.0	5	2680				0.534			
	52.5	CR	SW-SM	San Pedro	98/11"	5.8	109																		
	55.5	SPT	SM	San Pedro	42	9.4	-	3	82	15				2.55							11.4%	0.587			
	58.5	CR	SM	San Pedro	86/9"	7.9	105																		
	63.5	SPT	SM	San Pedro	71	5.5	-								7.0	833.0	49	3640							
	66.5	CR	SM	San Pedro	75/5"	5.1	120																0.391		
	69.5	SPT	SP-SM	San Pedro	50/5"	2.0	-	1	93	6				2.58							16.4%	0.557			
	72.5	CR	SM	San Pedro	75/9"	5.3	107																		
	75.5	SPT	SM	San Pedro	50/4"	3.1	-																0.478		
	78.5	CR	SM	San Pedro	75/5"	1.8	113																		
	81.5	SPT	SM	San Pedro	89	5.9	-																		
	84.5	CR	SM	San Pedro	99/8"	4.7	109																0.529		
	89.5	SPT	SM	San Pedro	74	6.3	-																		
	94.5	CR	SILTSTONE	Fernando	45	20.1	97																		
	99.5	SPT	SILTSTONE	Fernando	53	14.2	-																		
	104.5	SPT	SILTSTONE	Fernando	46	21.2	-																		
	109.5	CR	SILTSTONE	Fernando		16.5	97																		
G-124	10.5	CR	SC	Lakewood	Push	17.1	108																0.548		
	15.5	SPT	SC	San Pedro	16	19.7	-	0	65	35												4.0%	0.686	500	32
	20.5	CR	CH	San Pedro	11	23.1	99				61	14	47												
	25.5	SPT	CH	San Pedro	34	19.9	-																		
	30.5	CR	SC	San Pedro	21	23.0	95	0	68	32				2.68											
	35.5	SPT	SC	San Pedro	42	13.6	-								7.5	544.0	7	1200	0.11616	0.01408	9.6%	0.76			
	40.5	NR	SC	San Pedro	15	-	-																		
	45.5	SPT	SM	San Pedro	52	11.7	-	0	86	14												7.1%			
	50.5	CR	SM	San Pedro	40	-	-				NP	NP	NP										600	40	
	55.5	SPT	SP-SM	San Pedro	97	5.1	-								3.3	1183.0	4	8000							
	60.5	CR	SP-SM	San Pedro	33	6.1	113	13	78	9													12.5%		
	67.5	CR	SP-SM	San Pedro	28	8.2	106																		
	75.5	CR	SP-SM	San Pedro	40	5.6	114																		
	80.5	SPT	SW-SM	San Pedro	97/9"	5.2	-	3	87	10				2.53									11.7%		
	85.5	CR	SW-SM	San Pedro	70	3.4	121				NP	NP	NP										1050	42	
	90.5	SPT	SM	San Pedro	88	5.1	-																		
	95.5	CR	SM	San Pedro	48	8.2	106																0.572		
	100.5	SPT	ML	San Pedro	51	25.4	-															4.9%			
	105.5	NR	ML	San Pedro	85	-	-																		
G-125	5.5	CR	ML	ernary Younger Alluvium	12	14.5	112																0.504		
	10.5	SPT	ML	ernary Younger Alluvium	22	19.0	-																		
	15.5	CR	SM	Lakewood	12	18.4	104																0.605		
	20.5	SPT	SM	Lakewood	24	20.1	-																		
	25.5	CR	SM	Lakewood	33	15.4	107	0	81	19													0.553		
	30.5	SPT	ML	San Pedro	18	36.6	-																		
	35.5	CR	SP	San Pedro	37	27.3	94																0.782		
	38.5	SPT	ML	San Pedro	24	22.8	-																		
	41.5	CR	ML	San Pedro	21	14.1	115																0.463		
	44.5	SPT	SM	San Pedro	36	19.1	-																		
	47.5	CR	ML	San Pedro	23	19.5	107	0	39	61	47	30	17										0.569		
	50.5	SPT	ML	San Pedro	40	18.6	-																		
	53.5	CR	ML	San Pedro	34	22.6	99																0.696		
	56.5	SPT	ML	San Pedro	32	24.1	-								7.6	667.0	9	720							
	59.5	CR	SM	San Pedro	62	16.2	112	9	76	15				2.66									0.485		
	62.5	SPT	MH	San Pedro	42	23.3	-																		
	65.5	CR	MH	San Pedro	37	28.4	96	0	10	90	64	34	30	2.65									0.723		
	68.5	SPT	SP	San Pedro	66	19.6	-																		
	71.5	CR	SP	San Pedro	53	24.7	103																0.618		
	74.5	SPT	SP	San Pedro	83	15.6	-																		
	77.5	CR	SM	San Pedro	95	27.8	96	15	71	14				2.62									0.703		
	80.5	SPT	SP	San Pedro	50/4"	15.7	-																		
	83.5	CR	SP	San Pedro	75/6"	18.3	99																0.691		
	86.5	SPT	SP	San Pedro	74	16.0	-								2.1	8074.0	12	392							
	89.5	CR	SM	San Pedro	80/11"	25.5	93	0	85	15													0.791		
	92.5	SPT	SM	San Pedro	62	25.8	-																		
	95.5	CR	SP-SM	San Pedro	66	23.0	94																		
	99.5	SPT	ML	San Pedro	34	27.1	-																		
	104.5	CR	SM	San Pedro	50	19.5	107																0.564		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained					
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)			
	109.5	SPT	SP	San Pedro	52/6"	16.0	-																					
	114.5	CR	SP	San Pedro	75/5"	19.0	103																0.622					
	119.5	SPT	SP	San Pedro	50/5"	22.3	-																					
G-126	10.5	CR	CL	ternary Younger Alluvium	Push	30.2	88																0.907					
	15.5	SPT	CL	ternary Younger Alluvium	8	25.3	-																					
	20.5	CR	CL	ternary Younger Alluvium	6	30.6	89																	0.886				
	25.5	SPT	CL	ternary Younger Alluvium	13	27.4	-																					
	30.5	CR	MH	San Pedro	9	30.0	90																	0.837				
	35.5	SPT	MH	San Pedro	15	31.8	-																					
	40.5	CR	MH	San Pedro	10	23.6	101																	0.11587	0.02448	0.632		
	45.5	SPT	SC	San Pedro	30	20.5	-																					
	50.5	CR	SC	San Pedro	21	21.0	-																					
	55.5	SPT	SM	San Pedro	44	29.1	94																		0.772			
	60.5	CR	SM	San Pedro	43	34.9	92																		0.811			
	65.5	SPT	ML	San Pedro	49	29.2	-																					
	70.5	CR	SP	San Pedro	79	25.9	98								2.76	7.5	594.0	13	1080					0.0119	0.7			
	75.5	SPT	SM	San Pedro	36	28.3	-																					
	80.5	SPT	SC	San Pedro	29	22.8	-																					
	85.5	SPT	SC	San Pedro	32	18.8	-																					
	90.5	SPT	CL	San Pedro	37	17.2	-																					
	95.5	CR	SM	San Pedro	36	23.3	103																			0.618		
	100.5	SPT	SM	San Pedro	68	18.4	-																					
	105.5	CR	SP	San Pedro	53	18.6	109																			0.529		
	110.5	SPT	ML	San Pedro	45	23.2	-																					
G-127	10.5	CR	CL	ternary Younger Alluvium	Push	22.5	97																		0.725			
	15.5	SPT	CL	ternary Younger Alluvium	8	24.6	-				83																	
	20.5	CR	CL	ternary Younger Alluvium	7	27.0	98																			0.715		
	25.5	SPT	ML	San Pedro	13	21.6	-																					
	30.5	CR	SM	San Pedro	11	23.3	95																			0.759		
	35.5	SPT	ML	San Pedro	24	19.3	-																					
	40.5	CR	ML	San Pedro	11	26.3	97																			0.73		
	45.5	SPT	ML	San Pedro	27	22.2	-																					
	50.5	CR	ML	San Pedro	17	21.9	100																			0.679		
	55.5	SPT	CL	San Pedro	21	25.8	-																					
	60.5	CR	CL	San Pedro	11	28.3	90																			0.08766	0.03357	0.865
	65.5	NR	CL	San Pedro	10	-	-																					
	70.5	CR	SM	San Pedro	24	11.1	-																					
	75.5	SPT	ML	San Pedro	52	-	-																					
	80.5	CR	SP	San Pedro	21	31.5	91																			0.817		
	85.5	SPT	CL	San Pedro	32	29.1	-																					
	90.5	CR	SM	San Pedro	25	16.9	111																			0.506		
	95.5	SPT	CL	San Pedro	37	25.4	-																					
	100.5	CR	CL	San Pedro	15	23.7	97																				0.732	
	105.5	SPT	CL	San Pedro	49	24.6	-																					
	110.5	CR	SM	San Pedro	17	17.7	111																				0.498	
G-128	5.5	CR	CL	ternary Younger Alluvium	15	21.2	101																			0.662		
	10.5	SPT	CL	ternary Younger Alluvium	12	30.4	-																					
	15.5	CR	CH	ternary Older Alluvium	3	34.5	-																					
	20.5	SPT	CL	ternary Older Alluvium	18	25.6	-																					
	25.5	CR	CL	ternary Older Alluvium	7	19.8	107																				0.615	
	30.5	SPT	CL	San Pedro	16	34.0	-																					
	35.5	CR	CH	San Pedro	4	45.7	78																			1.152	300	33
	40.5	SPT	SC	San Pedro	69	20.2	-																					
	45.5	CR	SC	San Pedro	18	19.0	-																					
	50.5	SPT	SC	San Pedro	29	-	-																					
	55.5	CR	CL	San Pedro	13	18.3	111																			0.568	600	35
	65.5	SPT	CL	San Pedro	68	19.2	-																					
	70.5	CR	CL	San Pedro	12	22.5	102																			0.646		
	75.5	SPT	SP-SM	San Pedro	58	23.9	-																					
	80.5	CR	CH	San Pedro	16	25.4	97																			0.73		
	85.5	SPT	SC	San Pedro	39	25.5	-																					
	90.5	CR	SW	San Pedro	15	13.3	108																			0.543		
	95.5	SPT	CH	San Pedro	32	26.4	-																					
	100.5	CR	CH	San Pedro	9	31.7	92																			0.825		
	105.5	SPT	SC	San Pedro	75	21.4	-																					
	110.5	CR	CL	San Pedro	12	28.5	93																				0.801	
G-129	9.5	CR	CL	Fill	11	28.9	90																			0.865		
	14	SPT	CL	San Pedro	10	23.9	-																					

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
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Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)
	19.5	CR	CL	San Pedro	20	19.4	109								7.8	47.0	56	1160				0.54			
	24	SPT	CH	San Pedro	10	28.4	-	0	12	88	59	17	42												
	29.5	CR	CL	San Pedro	21	15.4	114				37	12	24										0.472	650	35
	34	SPT	SC	San Pedro	12	20.6	-	1	52	47	30	12	18												
	39.5	CR	CL	San Pedro	22	-	-				43	19	24												
	44	SPT	SM	San Pedro	53	12.7	-	18	63	19	NP	NP	NP	2.73											
	49.5	CR	CL	San Pedro	23	23.4	104				54	16	36		7.9	274.0	27	560				0.614	300	34	
	54	SPT	CL	San Pedro	24	27.7	-				42	19	23												
	59.5	CR	SM	San Pedro	26	15.0	110	12	73	15				2.78									0.577		
	64	SPT	SM	San Pedro	35	14.7	-	16	68	16															
	69.5	CR	ML	San Pedro	40	26.5	95	1	16	83	NP	NP	NP	2.79	7.8	329.0	67	840				0.829			
	74	SPT	ML	San Pedro	37	32.1	-																		
	79.5	CR	ML	San Pedro	53	29.2	95																0.767		
	84	SPT	CH	San Pedro	11	32.6	-								7.8	807.0	78	560							
	89.5	CR	CH	San Pedro	30	25.8	-	1	23	76	54	16	38												
	94	SPT	CH	San Pedro	55	22.1	-																		
	99.5	CR	CH	San Pedro	42	26.5	92								7.8	1104.0	50	600				0.825			
	104	SPT	SC	San Pedro	28	16.5	-	12	56	32	40	14	26												
	109.5	CR	CL	San Pedro	21	29.6	96																0.749		
	114	SPT	CL	San Pedro	14	28.7	-																		
	119.5	CR	SC	San Pedro	48	22.4	104																0.602		
G-130B	5.5	BULK	CH	Fill	-	-	-				51	20	31												
	10.5	CR	SC	ternary Younger Alluvium	Push	18.4	104																0.602		
	15.5	SPT	CL	ternary Younger Alluvium	8	26.8	-				42	22	20												
	20.5	CR	CL	ternary Younger Alluvium	5	-	-																		
	25.5	SPT	SM	ternary Younger Alluvium	20	26.0	-				NP	NP	NP												
	30.5	CR	CL	San Pedro	6	26.6	99							0.06%									0.683		
	35.5	NR	CL	San Pedro	17	-	-																		
	37.5	NR	CL	San Pedro	15	-	-																		
	40.5	CR	CL	San Pedro	18	23.4	98	0	2	98															
	45.5	SPT	CL	San Pedro	20	24.5	-							2.61	8.0	554.0	40	880				0.646			
	50.5	CR	CH	San Pedro	14	23.1	102				51	26	25												
	55.5	SPT	SC	San Pedro	42	14.5	-	24	46	30															
	60.5	CR	ML	San Pedro	11	28.3	93	0	37	63	48	28	20										0.805		
	65.5	SPT	CL-ML	San Pedro	16	31.7	-							2.70	8.1	684.0	81	560							
	70.5	CR	CL	San Pedro	10	35.0	89				53	19	34										0.886	650	29.5
	75.5	SPT	ML	San Pedro	19	31.4	-				NP	NP	NP												
	80.5	CR	SM	San Pedro	40	28.1	96	0	55	45											0.01215		0.736		
	85.5	SPT	CL-ML	San Pedro	34	34.4	-																		
	90.5	CR	CL	San Pedro	30	43.2	79																1.125		
	95.5	NR	CL	San Pedro	31	-	-																		
	100.5	CR	CL	San Pedro	13	22.9	97	0	45	55											0.01903		0.73		
	105.5	SPT	CL	San Pedro	27	35.7	-																		
	110.5	CR	ML	San Pedro	18	19.7	105																0.599		
	115.5	SPT	CL	San Pedro	24	24.6	-																		
	120.5	CR	SM	San Pedro	47	17.0	110	0	82	18													0.515		
G-131	5.5	CR	CL-ML	ternary Younger Alluvium	12	32.0	87																		
	10.5	SPT	SM	ternary Older Alluvium	16	12.9	-	3	75	22	31	22	9												
	15.5	CR	SW	ternary Older Alluvium	23	10.0	-																		
	20.5	SPT	ML	San Pedro	14	25.9	-							2.72	8.1	153.0	15	1080							
	25.5	CR	ML	San Pedro	20	25.2	99				43	16	27										0.696	300	36
	30.5	SPT	CL	San Pedro	16	38.1	-																		
	35.5	CR	MH	San Pedro	11	32.7	87	0	9	91	61	31	30										0.929		
	40.5	SPT	ML	San Pedro	14	21.6	-																		
	45.5	CR	CL	San Pedro	11	15.1	111				29	18	11										0.519	350	36
	50.5	SPT	CL	San Pedro	46	22.3	-	0	49	51															
	55.5	CR	SM	San Pedro	19	19.3	78	1	53	46				0.02%									1.16		
	60.5	SPT	SM	San Pedro	23	25.1	-																		
	65.5	CR	SC	San Pedro	15	25.3	99	25	33	42	43	26	17								0.01683		0.683		
	70.5	SPT	SC	San Pedro	17	43.3	-																		
	75.5	CR	SC	San Pedro	10	39.7	80																1.083		
	80.5	SPT	SM	San Pedro	72	14.8	-	12	70	18															
	85.5	CR	SM	San Pedro	26	28.8	94							0.00%									0.767		
	90.5	SPT	SM	San Pedro	23	33.9	-							2.74	8.1	1002.0	33	600							
	95.5	CR	SM	San Pedro	24	18.7	110	14	59	27											0.01364		0.515		
	100.5	SPT	SM	San Pedro	30	21.6	-																		
	105.5	CR	MH	San Pedro	21	34.9	85				78	43	35										0.96		
	110.5	SPT	MH	San Pedro	50	20.6	-																		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
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Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)
	115.5	NR	ML	San Pedro	57	32.7	-																	
	120.5	SPT	ML	San Pedro	34	22.0	-																	
G-132	6.5	CR	CL	Fill	27	-	-																	
	10.5	SPT	CL	ternary Younger Alluvium	10	29.4	-							2.65	8.0	108.0	41	1000						
	15.5	CR	CL	ternary Younger Alluvium	8	-	-				33	17	16									250	32	
	20.5	SPT	CL	ternary Younger Alluvium	9	33.3	-																	
	25.5	CR	CL	ternary Older Alluvium	17	19.5	108	0	23	77	42	21	21											0.554
	30.5	SPT	CL	ternary Older Alluvium	22	28.1	-																	
	35.5	CR	MH	San Pedro	14	26.5	89	0	11	89	67	36	31											0.886
	40.5	SPT	MH	San Pedro	13	37.0	-																	
	45.5	CR	MH	San Pedro	27	29.7	91	0	9	91	70	40	30					0.05269	0.02362					0.817
	50.5	SPT	MH	San Pedro	29	25.3	-																	
	55.5	CR	CL	San Pedro	55	33.0	97																	0.73
	60.5	SPT	SM	San Pedro	69	18.4	-	2	82	16	NP	NP	NP											
	65.5	NR	SM	San Pedro	91	-	-																	
	70.5	SPT	CL	San Pedro	41	18.8	-				49	27	22											
	75.5	CR	SP	San Pedro	49	9.7	120							0.11%										0.385
	80.5	SPT	SC	San Pedro	64	10.3	-	1	80	19					2.65									
	85.5	NR	SC	San Pedro	68/9"	-	-																	
	88.5	NR	SC	San Pedro	75/8"	-	-																	
	90.5	SPT	ML	San Pedro	63	23.4	-	0	38	62														
	95.5	CR	ML	San Pedro	86/9"	34.4	91																	0.845
	100.5	SPT	CL	San Pedro	42	27.8	-	0	29	71														
	105.5	CR	CL	San Pedro	46	20.0	107												0.01734					0.576
	110.5	SPT	SC	San Pedro	65	16.8	-																	
G-133	5.5	CR	CL	ternary Younger Alluvium	Push	20.5	101																	0.662
	10.5	SPT	CL	ternary Younger Alluvium	14	20.2	-																	
	15.5	CR	CL	ternary Older Alluvium	11	18.8	107																	0.569
	20.5	SPT	CL	ternary Older Alluvium	9/10"	22.9	-																	
	25.5	CR	CL	San Pedro	9	26.2	95																	0.767
	30.5	SPT	CL	San Pedro	18	23.0	-																	
	35.5	CR	ML	San Pedro	13	25.8	96																	0.749
	38.5	SPT	CL	San Pedro	16	36.6	-																	
	41.5	CR	CL	San Pedro	13	25.9	100							0.03%										0.679
	44.5	SPT	MH	San Pedro	16	35.1	-																	
	47.5	CR	MH	San Pedro	16	32.0	88				72	35	37											0.879
	50.5	SPT	MH	San Pedro	28	28.1	-	0	2	98	65	33	32			7.7	48.0	56	960					0.852
	53.5	CR	CL	San Pedro	27	28.6	93								2.76									0.679
	56.5	SPT	CL	San Pedro	21	33.0	-																	
	59.5	CR	ML	San Pedro	23	25.3	100	0	20	80														0.614
	62.5	SPT	CL	San Pedro	20	28.5	-									8.0	33.0	65	1760					0.614
	65.5	CR	CL	San Pedro	18	23.0	104				38	22	16											0.614
	68.5	SPT	SM	San Pedro	46	14.2	-	19	53	28					2.66									
	71.5	CR	CL	San Pedro	20	21.6	104																	0.614
	74.5	SPT	ML	San Pedro	27	23.4	-	1	42	57						8.0	186.0	37	1080					0.569
	77.5	CR	ML	San Pedro	24	21.4	107				36	25	11											0.388
	80.5	SPT	SM	San Pedro	52	15.6	-																	
	83.5	CR	SC	San Pedro	56	12.6	120	4	76	20														0.683
	86.5	SPT	SM	San Pedro	34	-	-			34														0.805
	89.5	CR	SM	San Pedro	25	21.4	99							0.09%										
	92.5	SPT	SM	San Pedro	29	17.1	-																	
	95.5	CR	ML	San Pedro	18	26.6	93																	0.805
	100.5	CR	SW	San Pedro	30	-	-																	0.683
	105.5	CR	SM	San Pedro	45	22.5	99																	0.412
	110.5	CR	SW	San Pedro	36	10.8	118																	0.696
G-134	5.5	CR	ML	ternary Younger Alluvium	Push	21.6	99																	0.696
	10.5	SPT	CL	ternary Younger Alluvium	9	30.6	-																	
	15.5	NR	CL	ternary Younger Alluvium	4	-	-																	
	20.5	SPT	CL	ternary Older Alluvium	17	23.2	-																	
	25.5	CR	SP/SC	ternary Older Alluvium	13	14.6	109																	0.529
	30.5	SPT	SC/CL	ternary Older Alluvium	16	18.6	-																	
	35.5	CR	ML	ternary Older Alluvium	13	33.5	91			66				0.06%										0.845
	40.5	SPT	CL	ternary Older Alluvium	13	23.6	-																	
	45.5	CR	ML	ternary Older Alluvium	12	27.7	99	0	22	78				0.05%										0.696
	50.5	SPT	ML	ternary Older Alluvium	41	20.0	-								2.63									
	55.5	CR	ML	ternary Older Alluvium	16	23.8	101	0	28	72				0.02%								0.033		0.662
	60.5	SPT	CL	ternary Older Alluvium	20	32.4	-	0	6	94						8.0	53.0	60	800					
	65.5	CR	CL	ternary Older Alluvium	28	32.9	91								2.69									0.845

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained				
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)			
	76.5	SPT	CL	ternary Older Alluv	22	21.5	-	0	32	68						8.1	31.0	31	1840									
	80.5	SPT	CL	ternary Older Alluv	23	-	-																					
	86	SPT	CL	ternary Older Alluv	30	19.0	-			55																		
	90.5	SPT	SC	ternary Older Alluv	49	20.0	-																					
	95.5	CR	SM	ternary Older Alluv	32	14.7	118	4	63	33			0.03%										0.4					
	100.5	SPT	SP	San Pedro	50/2"	13.7	-																					
	105.5	CR	SM/ML	San Pedro	13	21.6	102																	0.633				
	110.5	SPT	ML	San Pedro	62	29.6	-																					
G-135	9.5	CR	CH	ternary Younger Alluv	7	22.7	97				65	27	38												0.738			
	14	SPT	CH/SC	ternary Older Alluv	8	24.3	-																					
	19.5	CR	SC	ternary Older Alluv	10	18.8	107	6	75	19															0.557			
	24	SPT	CL/SC	ternary Older Alluv	13	18.8	-																					
	29.5	CR	CL-ML	ternary Older Alluv	19	15.9	113																					
	34	SPT	SC	ternary Older Alluv	18	17.4	-			59																		
	39.5	CR	CL	ternary Older Alluv	16	28.1	95				45	19	26											0.767				
	44	SPT	SC	ternary Older Alluv	22	17.6	-			45																		
	47.5	CR	CL	ternary Older Alluv	22	24.8	99																		0.702			
	50	SPT	MH	ternary Older Alluv	20	39.5	-				66	36	30															
	53.5	CR	MH	ternary Older Alluv	28	37.9	81																	1.041				
	56	SPT	MH	ternary Older Alluv	18	34.6	-	0	10	90	54	30	24												0.929			
	59.5	CR	CH	ternary Older Alluv	25	35.1	87																					
	62	SPT	CH	ternary Older Alluv	23	34.0	-									7.7	50.0	33	1120							0.826		
	65.5	CR	CH	ternary Older Alluv	26	26.4	94	0	17	83	57	29	28	2.75														
	68	SPT	CH	ternary Older Alluv	24	18.8	-																					
	71.5	CR	CH	ternary Older Alluv	26	19.0	109																		0.54			
	74	SPT	CH	ternary Older Alluv	33	24.6	-	0	18	82	51	17	34															
	77.5	NR	CH	ternary Older Alluv	25	-	-																					
	80	CR	CL	ternary Older Alluv	32	18.3	-																					
	83.5	CR	CL	ternary Older Alluv	33	19.7	107	0	50	50	37	21	16												0.573			
	86	SPT	CL	ternary Older Alluv	29	18.2	-									8.1	35.0	13	2800							0.473		
	89.5	CR	SW	ternary Older Alluv	40	14.0	114							2.70														
	92	SPT	SM	ternary Older Alluv	42	11.3	-	16	71	13					7.8	62.0	23	4400										
	95.5	CR	SM	San Pedro	79/11"	21.0	106																		0.572			
	98	SPT	SM	San Pedro	34	16.8	-	0	67	33				2.75														
	101.5	CR	SM	San Pedro	65	28.1	95							0.02%											0.754			
	104	SPT	SM	San Pedro	38	33.3	-																					
	107.5	CR	SM	San Pedro	52	29.5	93																		0.793			
	110	SPT	MH	San Pedro	31	34.9	-	0	1	99	66	36	30															
	113.5	CR	MH	San Pedro	52	27.1	95							2.72												0.785		
	119	SPT	MH	San Pedro	28	38.4	-				80	37	43															
G-136	10.5	CR	CL-ML	ternary Younger Alluv	Push	25.6	96																					
	15.5	SPT	CL	ternary Younger Alluv	23	18.3	-			53																		
	20.5	CR	CL	ternary Younger Alluv	7	12.4	120																		0.395			
	25.5	SPT	CL	ternary Younger Alluv	9/10"	24.0	-				35	16	19															
	30.5	CR	CL	ternary Older Alluv	8	19.2	104																		0.614			
	35.5	SPT	SC	ternary Older Alluv	33/8"	13.0	-	6	71	23																		
	40.5	CR	CL-ML	ternary Older Alluv	10	21.2	102																					
	45.5	SPT	SC-SM	ternary Older Alluv	54	18.4	-			48																		
	50.5	CR	ML	ternary Older Alluv	10	26.3	97																		0.73			
	55.5	SPT	CL	ternary Older Alluv	16	32.2	-				43	19	24															
	60.5	CR	CL	ternary Older Alluv	20	34.6	86																		0.961			
	65.5	SPT	CH	ternary Older Alluv	28/10"	32.8	-	0	3	97	71	24	47	2.87	7.4	157.0	27	960										
	70.5	CR	CH	ternary Older Alluv	20	30.1	91																	0.03321		0.845		
	75.5	SPT	CL	ternary Older Alluv	20	30.4	-	1	16	83	43	15	28															
	80.5	CR	CL	ternary Older Alluv	13	24.2	101																			0.664		
	85.5	SPT	CL	ternary Older Alluv	20	21.1	-				35	14	21															
	90.5	CR	SC	ternary Older Alluv	52	13.9	117	8	52	40				2.65												0.417		
	95.5	SPT	CL	ternary Older Alluv	28	21.0	-	0	29	71																		
	100.5	CR	ML	ternary Older Alluv	20	20.8	101	0	55	45																		
	105.5	SPT	SM	ternary Older Alluv	60	27.3	-							2.59	7.8	82.0	23	3440										
	110.5	CR	SM	ternary Older Alluv	20	16.6	108																		0.537			
	115.5	SPT	SM	ternary Older Alluv	51	24.0	-																					
	120.5	CR	ML	ternary Older Alluv	23	26.8	95																			0.774		
G-137	12.5	CR	CL	ternary Younger Alluv	9	20.6	97																			0.727		
	14	SPT	CL	ternary Older Alluv	12	16.9	-																					
	19.5	CR	CL	ternary Older Alluv	20	16.9	110																			0.525		
	24	SPT	CL	ternary Older Alluv	11	18.5	-																					
	30.5	NR	CL	ternary Older Alluv	11	-	-																					

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained			
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)		
	39	SPT	CL	ternary Older Alluv	15	16.4	-			57																	
	44.5	CR	SC	ternary Older Alluv	17	20.4	101																				0.654
	49	SPT	SC	ternary Older Alluv	14	17.5	-	4	47	48	32	17	15														
	52.5	CR	SM	ternary Older Alluv	18	18.8	104																				0.596
	55	SPT	SM	ternary Older Alluv	20	21.5	-																				
	58.5	CR	SM	ternary Older Alluv	30	18.0	112	0	62	38																	0.486
	61	SPT	CL	ternary Older Alluv	14	26.2	-								8.3	41.0	20	1680									
	64.5	CR	CH	ternary Older Alluv	34	18.5	102	0	30	70	57	28	29														0.63
	67	SPT	CH	ternary Older Alluv	33	33.1	-																				
	70.5	CR	CH	ternary Older Alluv	26	30.2	92	0	8	92	69	21	48	2.70													0.831
	73	SPT	CH	ternary Older Alluv	25	25.5	-								8.5	31.0	16	1120									
	76.5	CR	CL	ternary Older Alluv	25	22.8	99				32	18	14														0.697
	79	SPT	CL	ternary Older Alluv	32	23.4	-																				
	82.5	CR	CL	ternary Older Alluv	30	17.2	105	0	33	67	32	17	15	2.76													0.64
	85	SPT	CL	ternary Older Alluv	27	21.4	-								8.4	22.0	3	1800									
	88.5	NR	SC	ternary Older Alluv	28	-	-																				
	91	SPT	SC	ternary Older Alluv	34	12.6	-	15	58	27	29	19	10	2.64													
	94.5	CR	SM	San Pedro	38	14.2	117	7	66	27																	0.424
	97	SPT	SC	San Pedro	30	13.4	-																				
	100.5	CR	CH	San Pedro	27	23.2	102	0	14	86	58	19	39														0.646
	103	SPT	CH	San Pedro	26	21.4	-								8.2	18.0	3	1440									
	106.5	CR	CH	San Pedro	23	26.2	93																				0.799
	109	SPT	CH	San Pedro	18	44.1	-	0	3	97	84	27	56														
	114.5	CR	CL	San Pedro	27	35.2	85																				0.972
	119	SPT	CL-ML	San Pedro	16	31.6	-																				
G-138	5.5	CR	SW	ternary Younger Alluv	28	3.9	110																				0.509
	10.5	SPT	ML	ternary Younger Alluv	9	24.4	-																				
	15.5	CR	CL	ternary Older Alluv	49	11.0	123																				0.368
	20.5	SPT	CL	ternary Older Alluv	37	15.3	-																				
	25.5	CR	CL	ternary Older Alluv	25	14.9	109																				0.534
	30.5	SPT	SC	ternary Older Alluv	30	13.8	-	3	53	44	33	16	17														
	35.5	NR	GW	ternary Older Alluv	10	-	-																				
	40.5	SPT	CL	ternary Older Alluv	21	22.1	-																				
	45.5	CR	SM	ternary Older Alluv	41	10.1	117																				0.43
	50.5	SPT	CL	ternary Older Alluv	28	22.9	-																				
	55.5	CR	CL	ternary Older Alluv	26	24.6	99				37	18	19														0.696
	60.5	SPT	CH	ternary Older Alluv	25	31.4	-																				
	65.5	CR	CH	ternary Older Alluv	46	30.0	92	0	18	82	63	22	41														0.825
	70.5	SPT	CL	ternary Older Alluv	23	16.6	-								8.3	8.0	3	1560									
	75.5	CR	CL	ternary Older Alluv	33	32.3	89	0	32	68	47	21	26	2.74													0.921
	80.5	SPT	CL	ternary Older Alluv	36	20.1	-								8.2	18.0	3	1800									
	85.5	CR	CL	ternary Older Alluv	58	14.6	114	2	40	58	36	13	23	2.98													0.631
	90.5	SPT	CL	ternary Older Alluv	49	13.5	-																				
	95.5	CR	SM	ternary Older Alluv	78	14.1	115	2	70	28				2.68													0.454
	100.5	SPT	CL	San Pedro	81	23.8	-	0	28	72	38	18	20														
	105.5	CR	ML	San Pedro	55	32.9	90	2	7	91																	0.857
	110.5	NR	ML	San Pedro	38	-	-																				
	115.5	CR	CH	San Pedro	32	38.6	83																				1.022
G-139	5.5	CR	SM	ternary Younger Alluv	19	8.5	104																				0.6
	10.5	SPT	CL	ternary Older Alluv	29	14.1	-																				
	15.5	CR	CL	ternary Older Alluv	28	13.4	121																				0.383
	20	SPT	CL	ternary Older Alluv	36	10.9	-																				
	25.5	CR	SM	ternary Older Alluv	19	14.2	112																				0.49
	30.5	SPT	CL	ternary Older Alluv	46	12.0	-																				
	35.5	CR	SW-SM	ternary Older Alluv	40	10.0	125																				
	40.5	SPT	SW-SM	ternary Older Alluv	32	12.6	-																				
	45.5	CR	SW-SM	ternary Older Alluv	33	15.3	116							0.06%													
	50.5	SPT	SM	ternary Older Alluv	64	11.7	-	6	63	31				2.74													
	55.5	CR	CL	San Pedro	35	23.1	101	0	14	86	41	15	26	2.83													0.75
	60.5	SPT	CL	San Pedro	21	22.9	-								7.6	17.0	5	1800									
	65.5	CR	CL	San Pedro	24	26.7	100				47	18	29														0.674
	70.5	SPT	CL	San Pedro	39	18.3	-								7.7	14.0	3	1880									
	75.5	CR	SC	San Pedro	44	14.0	114	5	57	38	30	15	15	2.83													0.548
	80.5	SPT	SC	San Pedro	39	18.8	-								7.9	36.0	10	1920									
	85.5	CR	SC	San Pedro	37	13.1	112	2	50	48	35	16	19	2.82													0.572
	90.5	SPT	SC	San Pedro	30	27.0	-																				
	95.5	CR	SM	San Pedro	58	18.7	114	0	70	30				0.17%													0.456
	100.5	SPT	CL	San Pedro	28	23.8	-				47	16	31														

TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)	
	105.5	CR	ML	San Pedro	46	27.5	96																0.745			
	110.5	SPT	ML	San Pedro	93	26.1	-																			
G-140	5.5	CR	SC	ternary Younger Alluvium	Push	10.6	119																	0.4		
	8.5	SPT	SC	ternary Younger Alluvium	24	15.2	-			48																
	11.5	CR	SC	ternary Younger Alluvium	19	12.9	117																	0.424		
	14.5	SPT	SC	ternary Younger Alluvium	22	18.9	-																			
	20.5	CR	SC	ternary Younger Alluvium	9	15.7	98																	0.7		
	25.5	SPT	CL	ternary Younger Alluvium	14	23.2	-																			
	30.5	CR	ML	ternary Younger Alluvium	12	14.6	108																	0.554		
	35.5	SPT	SP	ternary Older Alluvium	54	13.6	-																			
	40.5	CR	SP	ternary Older Alluvium	24	24.5	96																	0.736		
	45.5	SPT	SM	San Pedro	19	15.6	-																			
	50.5	CR	SM	San Pedro	21	18.1	111		64	36														0.501		
	53.5	SPT	CL	San Pedro	23	28.0	-																			
	56.5	CR	ML	San Pedro	12	22.5	104																	0.614		
	59.5	SPT	CL	San Pedro	26	27.5	-						0.11%		2.65	7.9	87.0	26	1280							
	62.5	CR	CL	San Pedro	22	23.8	102	0	52	48	47	24	23										0.023		0.646	
	65.5	SPT	CL	San Pedro	38	16.8	-																			
	68.5	CR	CL	San Pedro	14	19.0	108	9	20	71	32	20	12											0.011		0.554
	71.5	SPT	CL	San Pedro	47	15.5	-										8.0	130.0	22	2360						
	74.5	CR	SC	San Pedro	25	14.4	117			40	33	22	11	0.08%											0.424	
	77.5	SPT	SM	San Pedro	71	14.7	-	3	79	18					2.68											
	80.5	CR	SM	San Pedro	22	23.2	103	0	64	36	NP	NP	NP												0.618	
	83.5	SPT	SM	San Pedro	76	15.5	-																			
	86.5	CR	SP	San Pedro	39	19.5	109							0.01%											0.529	
	89.5	SPT	CL	San Pedro	29	25.6	-	0	25	75	42	25	17													
	92.5	CR	CL	San Pedro	20	17.6	111																		0.512	
	95.5	SPT	SM	San Pedro	69	22.6	-	0	47	53	NP	NP	NP													
	98.5	CR	SM	San Pedro	36	20.1	107							-0.09%											0.557	
	101.5	SPT	SM	San Pedro	77/10"	25.5	-																			
	104.5	CR	SM	San Pedro	20	26.0	94																		0.772	
G-141	5.5	CR	SM	ternary Younger Alluvium	Push	11.4	116																			
	10.5	CR	SC	ternary Older Alluvium	13	13.5	118																			
	15.5	SPT	ML	ternary Older Alluvium	13	18.7	-																			
	20.5	CR	GW-GM	ternary Older Alluvium	15	6.1	105	65	29	6																
	25.5	SPT	ML	ternary Older Alluvium	16	29.0	-																			
	30.5	CR	CL-ML	ternary Older Alluvium	6	21.9	107																			
	35.5	SPT	SM	ternary Older Alluvium	46	8.1	-																			
	40.5	CR	SM	ternary Older Alluvium	16	22.0	90																			
	45.5	SPT	SM	ternary Older Alluvium	41	14.0	-	10	56	34					2.66											
	50.5	CR	ML	San Pedro	17	22.4	102	0	31	69				0.05%												
	55.5	SPT	CL	San Pedro	31	18.9	-									7.4	132.0	13	1280							
	60.5	CR	CL	San Pedro	14	20.8	104	0	28	72	38	23	15		2.62											
	65.5	SPT	CL	San Pedro	32	22.4	-									7.8	48.0	6	1320							
	70.5	CR	CL	San Pedro	18	25.1	105	0	36	64	35	22	13													
	75.5	SPT	CL	San Pedro	53	20.1	-																			
	80.5	CR	CL	San Pedro	24	21.5	100	0	26	74	37	20	17			8.0	132.0	38	1120							
	85.5	SPT	CL-ML	San Pedro	50	21.1	-																			
	90.5	CR	CL	San Pedro	49	20.5	105																			
	95.5	SPT	ML	San Pedro	59	22.4	-																			
	100.5	CR	ML	San Pedro	73	25.8	95																			
	105.5	SPT	ML	San Pedro	54	27.4	-																			
G-142	5.5	CR	SM	ternary Younger Alluvium	11	18.4	104																		0.599	
	10.5	SPT	CL	ternary Older Alluvium	18	16.6	-																			
	15.5	CR	SM	ternary Older Alluvium	31	10.1	111																		0.502	
	20.5	SPT	SM	ternary Older Alluvium	15	18.0	-																			
	25.5	CR	SW	ternary Older Alluvium	26	12.7	120																		0.394	
	30.5	SPT	SM	ternary Older Alluvium	41	10.1	-	29	54	17																
	35.5	CR	SP	ternary Older Alluvium	34	13.9	110								2.61										0.334	
	40.5	SPT	CL	San Pedro	17	29.9	-																			
	45.5	CR	MH	San Pedro	21	26.3	102	0	12	88	54	31	23		2.54											
	50.5	SPT	MH	San Pedro	13	26.9	-									7.6	405.0	15	880							
	55.5	CR	SM	San Pedro	44	18.7	109	18	53	29	NP	NP	NP													
	60.5	SPT	SM	San Pedro	23	19.2	-																			
	65.5	CR	CL	San Pedro	33	25.2	99	0	27	73	48	26	22		2.51											
	70.5	SPT	CL	San Pedro	57	19.2	-									7.8	297.0	23	1520							
	75.5	CR	CL	San Pedro	43	14.8	116																			
	80.5	SPT	CL	San Pedro	35	19.1	-	2	32	66																

TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	85.5	CR	ML	San Pedro	51	6.0	122																		
	90.5	SPT	CL	San Pedro	27	29.0	-																		
	95.5	CR	CL	San Pedro	46	24.5	-				46	27	19												
G-143	5.5	CR	CH	ternary Younger Alluvium	12	18.0	102				52	23	29										0.647		
	10.5	SPT	CL	ternary Younger Alluvium	23	17.9	-																		
	15.5	CR	SC	ternary Younger Alluvium	27	12.5	122																0.366	370	31
	20.5	SPT	CL	ternary Older Alluvium	32	14.8	-								7.6	59.0	8	2600							
	25.5	CR	SM	ternary Older Alluvium	27	10.6	119				NP	NP	NP										0.411		
	30.5	SPT	SM	ternary Older Alluvium	55	14.2	-							2.58											
	35.5	CR	SM	ternary Older Alluvium	34	10.5	110	42	42	16					7.8	104.0	9	4040	0.098	0.007			0.464		
	40.5	SPT	SM	ternary Older Alluvium	41	13.1	-																		
	45.5	CR	CL	ternary Older Alluvium	23	22.6	102																0.646	400	28
	50.5	SPT	CL	ternary Older Alluvium	19	18.8	-																		
	55.5	CR	CL	ternary Older Alluvium	22	22.1	102	0	28	72	38	22	16										0.646		
	60.5	SPT	CL	ternary Older Alluvium	19	22.9	-																		
	65.5	CR	SC	ternary Older Alluvium	45	14.4	120	22	53	25	39	23	16	2.56									0.331		
	70.5	SPT	SC	ternary Older Alluvium	42	14.2	-	15	56	29															
	75.5	CR	CL	ternary Older Alluvium	42	16.7	115								2.49								0.351		
	80.5	SPT	ML	ternary Older Alluvium	28	17.8	-								7.4	119.0	21	1600					0.501		
	85.5	CR	SM	San Pedro	80	10.8	111	1	65	34	NP	NP	NP												
	90.5	SPT	SM	San Pedro	50/4"	11.6	-																		
G-144	5.5	CR	SM	ternary Younger Alluvium	22	21.2	99																0.696		
	10.5	SPT	CL	ternary Younger Alluvium	13	26.8	-				49	17	32		7.6	33.0	2	960							
	15.5	CR	CH	ternary Older Alluvium	20	17.0	113	1	14	85	51	17	34										0.485		
	20.5	SPT	CH	ternary Older Alluvium	28	17.9	-																		
	25.5	CR	GC	ternary Older Alluvium	42	8.7	123	46	42	12	27	18	9	2.86									0.451	400	36
	30.5	SPT	CL-ML	ternary Older Alluvium	15	22.1	-								7.6	12.0	7	1560							
	35.5	CR	CL	ternary Older Alluvium	45	8.4	130				26	18	8											250	43
	40.5	SPT	SM	ternary Older Alluvium	85/10"	9.3	-	19	60	21															
	45.5	CR	SM	ternary Older Alluvium	43	8.8	113	7	66	27				2.79									0.541		
	50.5	SPT	CL	ternary Older Alluvium	19	22.4	-								7.5	56.0	13	1360							
	55.5	CR	CL	ternary Older Alluvium	26	19.8	110				36	15	21										0.526	550	32
	60.5	SPT	CL	ternary Older Alluvium	26	20.7	-								7.5	62.0	15	1360							
	65.5	CR	CL	ternary Older Alluvium	25	21.7	100	0	23	77	38	16	22	2.82									0.76		
	70.5	SPT	CL	ternary Older Alluvium	26	20.1	-																		
	75.5	CR	CL	ternary Older Alluvium	25	16.7	112	1	20	79	37	15	22	2.78									0.549	1400	30
	80.5	SPT	CL	ternary Older Alluvium	39	15.3	-								7.5	49.0	13	1160							
	85.5	CR	SC	ternary Older Alluvium	46	12.1	117	20	47	33				2.85									0.52		
	90.5	SPT	SC	ternary Older Alluvium	75	11.9	-																		
	95.5	CR	CL	ternary Older Alluvium	31	21.6	104	0	28	72	31	16	15										0.614		
	100.5	SPT	SC	ternary Older Alluvium	40	10.4	-								7.6	46.0	11	2440							
	105.5	CR	SC	ternary Older Alluvium	41	13.7	110	19	52	29													0.515		
	110.5	SPT	SC	San Pedro	51	17.6	-																		
	115.5	CR	SM	San Pedro	81	7.9	126																0.322		
	120.5	SPT	SM	San Pedro	50/3"	10.3	-																		
G-145	10.5	CR	CL	ternary Younger Alluvium	push	18.8	104	1	15	84	47	17	30										0.614	350	29
	15.5	SPT	CH	ternary Younger Alluvium	10	13.6	-																		
	20.5	CR	GP-GC	ternary Younger Alluvium	5	18.6	111																0.501		
	25.5	SPT	CL	ternary Older Alluvium	22	16.2	-	3	38	59	33	15	18												
	30.5	NR	CL	ternary Older Alluvium	7	-	-																		
	31.5	SPT	CL	ternary Older Alluvium	10	16.8	-								7.7	12.0	8	1680							
	35.5	SPT	SM	ternary Older Alluvium	33	12.9	-	5	53	42															
	40.5	NR	SM	ternary Older Alluvium	4	-	-																		
	41.5	SPT	SM	ternary Older Alluvium	8	5.6	-	15	65	20															
	45.5	SPT	CL	ternary Older Alluvium	19	16.0	-																		
	50.5	NR	CL	ternary Older Alluvium	4	-	-																		
	51.5	SPT	CL	ternary Older Alluvium	25	19.5	-	6	21	73	39	15	24												
	55.5	NR	CL	ternary Older Alluvium	18	-	-																		
	60.5	NR	CL	ternary Older Alluvium	16	-	-																		
	61.5	SPT	CL	ternary Older Alluvium	15	17.4	-								7.8	57.0	13	1840							
	65.5	CR	CL	ternary Older Alluvium	20	14.8	111	1	38	61	30	15	15										0.512	600	30
	70.5	CR	CL	ternary Older Alluvium	10	-	-																		
	71.5	SPT	CL	ternary Older Alluvium	18	20.4	-	1	29	70	39	15	24												
	75.5	NR	CL	ternary Older Alluvium	28	-	-																		
	80.5	CR	SM	ternary Older Alluvium	69	5.5	115	20	64	16													0.449		
	85.5	SPT	SM	ternary Older Alluvium	74/11"	17.5	-																		
	90.5	CR	SP-SM	ternary Older Alluvium	30	19.2	105																0.587		
	95.5	SPT	SM	ternary Older Alluvium	60	10.5	-								7.8	50.0	15	2840							

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained				
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)		
	100.5	CR	SM	San Pedro	17	20.5	101	1	49	50												0.65					
	105.5	SPT	SM	San Pedro	67	19.0	-																				
	110.5	CR	CL	San Pedro	27	3.5	112	1	21	78	40	14	26											0.499			
	115.5	SPT	CL	San Pedro	37	22.5	-									8.3	122.0	10	1000								
	120.5	CR	CL	San Pedro	26	15.7	118																		0.412		
G-146	5.5	CR	CL-ML	ternary Younger Alluvium	10	20.1	96																		0.737		
	10.5	SPT	CL-ML	ternary Older Alluvium	13	22.4	-																				
	15.5	NR	CL-ML	ternary Older Alluvium	10	-	-																				
	17.5	CR	CL	ternary Older Alluvium	21	-	-																				
	20.5	SPT	CL	ternary Older Alluvium	32	16.0	-																				
	25.5	CR	CL	ternary Older Alluvium	20	16.4	115																			0.763	
	30.5	SPT	SP-SM	ternary Older Alluvium	30	16.5	-																				
	35.5	CR	SP	ternary Older Alluvium	44	13.1	116																				
	40.5	SPT	SM	ternary Older Alluvium	16	19.1	-																				
	45.5	CR	ML	ternary Older Alluvium	22	12.4	118																			0.426	
	48.5	SPT	ML	ternary Older Alluvium	20	16.7	-	3	39	58																	
	51.5	CR	CL-ML	ternary Older Alluvium	13	21.5	101																				
	54.5	SPT	CL	ternary Older Alluvium	23	17.1	-																				
	57.5	CR	CL	ternary Older Alluvium	27	17.0	111	6	30	64	33	18	15						0.095	0.017					0.512		
	60.5	SPT	ML	ternary Older Alluvium	17	21.3	-																				
	63.5	CR	CL	ternary Older Alluvium	24	19.0	107																			0.569	
	66.5	SPT	CL	ternary Older Alluvium	23	29.6	-									7.3	134.0	19	1120								
	69.5	CR	CL	ternary Older Alluvium	19	24.0	101	0	10	90	42	18	24						0.183	0.033					0.662		
	72.5	SPT	ML	ternary Older Alluvium	36	15.7	-																				
	75.5	CR	ML	ternary Older Alluvium	34	20.3	108																			0.554	
	78.5	SPT	ML	ternary Older Alluvium	25	16.7	-									7.0	94.0	11	1840								
	81.5	CR	CL	ternary Older Alluvium	33	17.7	112	0	25	75	43	22	21						0.102	0.025					0.499		
	84.5	SPT	CL	ternary Older Alluvium	49	22.4	-																				
	87.5	CR	CL	ternary Older Alluvium	28	24.7	99																			0.696	
	90.5	SPT	SM	ternary Older Alluvium	75	11.2	-	13	70	17																	
	94.5	CR	SM	ternary Older Alluvium	63	13.7	116																			0.436	
	99.5	SPT	SW-SM	ternary Older Alluvium	53/6"	14.4	-																				
	104.5	CR	SW-SM	ternary Older Alluvium	80/6"	9.4	129																				
G-147	5.5	CR	SM	ternary Younger Alluvium	12	-	-																				
	10.5	SPT	CL	ternary Younger Alluvium	16	18.8	-																				
	15.5	CR	SM	ternary Older Alluvium	23	15.7	104																			0.597	
	20.5	SPT	CL	ternary Older Alluvium	28	11.1	-																				
	25.5	CR	CL	ternary Older Alluvium	23	20.4	106																			0.588	
	30.5	SPT	GM	ternary Older Alluvium	35	6.3	-																				
	35.5	CR	CL	ternary Older Alluvium	22	20.4	100																			0.668	
	40.5	SPT	CL-ML	ternary Older Alluvium	15	23.7	-																				
	45.5	CR	CL-ML	ternary Older Alluvium	38	15.9	112																				
	50.5	SPT	SM	ternary Older Alluvium	94/8"	10.2	-																				
	55.5	CR	CL	ternary Older Alluvium	32	18.5	108																			0.557	
	60.5	SPT	CL	ternary Older Alluvium	23	25.7	-																				
	65.5	CR	CL	ternary Older Alluvium	63	13.3	114																			0.472	
	70.5	SPT	SM	ternary Older Alluvium	90	9.3	-	15	63	22																	
	75.5	CR	CL	ternary Older Alluvium	50	15.8	113	1	40	59	38	16	22						0.085	0.022					0.485		
	80.5	SPT	CL	ternary Older Alluvium	45	18.0	-	0	35	65	31	18	13	2.66													
	85.5	CR	SM	ternary Older Alluvium	65	18.0	113							0.11%													
	90.5	SPT	SM	ternary Older Alluvium	50/3"	7.5	-	20	55	25																	
	95.5	CR	SM	ternary Older Alluvium	42	14.1	119	18	63	19				2.60													
	100.5	SPT	SM	ternary Older Alluvium	50/4"	8.1	-	12	69	20																	
	105.5	CR	CL	ternary Older Alluvium	78	17.6	114																			0.465	
	110.5	SPT	CL	ternary Older Alluvium	43	16.9	-																				
	115.5	CR	ML	ternary Older Alluvium	55	26.0	99	1	18	81	48	28	20														
	120.5	SPT	ML	ternary Older Alluvium	45	18.0	-																				
G-148	5.5	CR	ML	ternary Younger Alluvium	12	23.3	97																			0.73	
	10.5	SPT	CL	ternary Younger Alluvium	10/10"	25.2	-				45	17	28														
	15.5	NR	CL	ternary Younger Alluvium	28	-	-																				
	16.5	CR	CL	ternary Younger Alluvium	13	16.9	114																			0.472	
	20.5	SPT	CL	ternary Older Alluvium	21	18.5	-	0	18	82	39	16	23													0.569	
	25.5	CR	CL	ternary Older Alluvium	20	21.7	107																				
	30.5	SPT	SP-SM	ternary Older Alluvium	25	12.8	-																				
	35.5	CR	ML	ternary Older Alluvium	24	6.5	124	3	35	62																0.354	
	40.5	SPT	CL	ternary Older Alluvium	12	20.8	-				33	15	18														
	45.5	CR	SM	ternary Older Alluvium	32	15.6	119	21	39	40																0.411	
	50.5	SPT	CL	ternary Older Alluvium	14	19.2	-																				

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained								
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)							
	55.5	CR	CL	ternary Older Alluv	22	19.4	111																0.512									
	60.5	SPT	CH	ternary Older Alluv	19	29.4	-				54	18	36																			
	65.5	CR	SC	ternary Older Alluv	44	14.9	117																	0.424								
	70.5	SPT	SC	ternary Older Alluv	40	19.5	-	6	49	45	31	22	9																			
	75.5	CR	CL	ternary Older Alluv	40	14.7	-	2	34	64	32	17	15																			
	80.5	SPT	SM	ternary Older Alluv	66	11.4	-																									
	85.5	CR	SM	ternary Older Alluv	57	13.1	113	6	66	28				0.12%	2.81	8.0	65.0	18	1680						0.552							
	90.5	SPT	CL	ternary Older Alluv	32	13.5	-									7.7	68.0	17	1920													
	95.5	CR	SM	ternary Older Alluv	40	8.5	119	6	68	26	NP	NP	NP		2.75										0.442							
	100.5	SPT	CL	ternary Older Alluv	31	19.5	-	2	33	65	37	22	15		2.79	7.8	43.0	5	1160													
	105.5	CR	CL	ternary Older Alluv	56	11.7	120	2	69	29				0.11%												0.399						
	110.5	SPT	CL	ternary Older Alluv	33	23.6	-																									
	115.5	CR	CL	ternary Older Alluv	34	19.4	108	0	37	63	44	16	28													0.554						
	120.5	SPT	CL	ternary Older Alluv	44	14.0	-									7.7	66.0	3	1440													
	125.5	CR	CL	ternary Older Alluv	64	16.7	110	0	32	68					2.82												0.6					
	130.5	SPT	CL	ternary Older Alluv	44	24.0	-																									
	135.5	CR	CL	ternary Older Alluv	44	18.7	111																				0.512					
	140.5	SPT	CL	ternary Older Alluv	56	-	-	5	41	54	38	14	24																			
G-149	6.5	CR	ML	ernary Younger Alluv	19	14.8	108																				0.554					
	10.5	SPT	SM	ernary Younger Alluv	21	12.3	-																									
	15.5	CR	ML	ernary Younger Alluv	5	18.7	97																					0.73				
	20.5	SPT	SM	ernary Younger Alluv	12	18.6	-			39																						
	25.5	CR	SM	ernary Younger Alluv	14	9.4	106																				0.572					
	30.5	SPT	CL	ternary Older Alluv	37	17.4	-																									
	35.5	CR	ML	ternary Older Alluv	14	27.4	93																					0.805				
	40.5	SPT	ML	ternary Older Alluv	13	23.6	-																									
	45.5	CR	ML/SM	ternary Older Alluv	29	20.8	107																				0.569					
	48	CR	ML	ternary Older Alluv	22	18.1	106																				0.584					
	50.5	SPT	ML	ternary Older Alluv	21	14.9	-																									
	53	CR	ML	ternary Older Alluv	28	20.9	105			62																	0.599					
	55.5	SPT	CL	ternary Older Alluv	28	24.0	-				37	21	16			7.7	78.0	14	920									0.472				
	58	CR	SM	ternary Older Alluv	40	16.4	114	17	48	35					2.66																	
	60.5	SPT	ML/SM	ternary Older Alluv	93	12.9	-																						0.366			
	63.5	CR	SM	ternary Older Alluv	81	12.6	122	10	58	32				0.06%																		
	65.5	SPT	CL	ternary Older Alluv	23	22.2	-		14	86	46	24	22		2.59																	
	68	NR	CL	ternary Older Alluv	45	-	-																									
	70.5	SPT	CL	ternary Older Alluv	24	23.9	-																									
	73.5	CR	SM	ternary Older Alluv	39	24.4	101	2	49	49				0.03%													0.65					
	75.5	SPT	CL	ternary Older Alluv	27	28.4	-				36	20	16			7.8	89.0	14	880													
	78	CR	CL	ternary Older Alluv	40	25.9	97								2.59													0.73				
	80.5	SPT	CL	ternary Older Alluv	43	15.4	-	2	46	52																						
	83.5	CR	CL	ternary Older Alluv	43	17.6	110	2	42	56				0.02%														0.526				
	85.5	SPT	SC/SM	ternary Older Alluv	88	13.5	-																									
	88	CR	SM	ternary Older Alluv	50/6"	15.8	110																					0.515				
	90.5	SPT	ML	ternary Older Alluv	32	28.0	-																									
	93	CR	ML	ternary Older Alluv	46	19.3	100																						0.679			
	95.5	SPT	ML	ternary Older Alluv	34	31.4	-																									
	98	CR	SM	ternary Older Alluv	70/10"	24.0	101																					0.65				
	100.5	SPT	SM	ternary Older Alluv	62	17.9	-																									
	105.5	CR	SM	ternary Older Alluv	73/10"	24.0	101																						0.65			
	110.5	SPT	SM	ternary Older Alluv	92/10"	12.0	-																									
G-150	5.5	CR	CL	ernary Younger Alluv	Push	21.3	102																					0.646				
	10.5	NR	CL	ernary Younger Alluv	7	-	-																									
	15.5	CR	ML	ernary Younger Alluv	8	21.0	98																						0.713			
	20.5	SPT	GP	ernary Younger Alluv	7	10.8	-																									
	25.5	CR	CL	ternary Older Alluv	28	14.9	117	4	42	54																		0.435				
	30.5	SPT	CL	ternary Older Alluv	19	31.7	-																									
	35.5	CR	SP/SC	ternary Older Alluv	20	16.2	109																						0.529			
	40.5	SPT	SC	ternary Older Alluv	20	18.1	-	5	60	35																						
	45.5	CR	CL	ternary Older Alluv	26	21.6	106																						0.584			
	50.5	SPT	CL	ternary Older Alluv	20	23.9	-	0	25	75	43	21	22		2.53	7.9	86.0	18	920													
	60.5	CR	SC	ternary Older Alluv	28	18.4	110	7	52	41	37	20	17															0.515				
	70.5	CR	SM	ternary Older Alluv	53	14.8	113	3	73	24				0.04%														0.474				
	75.5	CR	CH	ternary Older Alluv	27	23.7	102	0	22	78	54	27	27			8.0	64.0	15	800	0.1218	0.0395						0.646					
	90.5	CR	SM	ternary Older Alluv	27	29.5	93	0	74	26																		0.791				
	95.5	SPT	SM	ternary Older Alluv	66	18.3	-								2.60																	
	100.5	CR	SM	ternary Older Alluv	35	19.7	103							0.05%															0.618			
	105.5	CR	SP	ternary Older Alluv	45	18.4	-																									

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	110.5	CR	CL	ternary Older Alluv	75	22.5	103															0.63			
G-152	10.5	CR	CL	ernary Younger Alluv	14	19.6	103																0.63		
	15.5	SPT	CL	ternary Older Alluv	8	22.6	-																		
	20.5	CR	SM	ternary Older Alluv	7	15.5	104																0.602		
	25.5	SPT	SW-SM	ternary Older Alluv	18	10.4	-			12															
	30.5	CR	SM	ternary Older Alluv	25	15.0	110																0.515		
	35.5	SPT	ML/SM	ternary Older Alluv	8	28.3	-																		
	40.5	CR	SW	ternary Older Alluv	57	15.6	107																0.557		
	43.5	NR	SW	ternary Older Alluv	38	-	-																		
	45.5	SPT	SW	ternary Older Alluv	44	8.3	-																		
	48.5	CR	SW	ternary Older Alluv	55	10.8	116						0.35%											0.436	
	50.5	SPT	SM	ternary Older Alluv	50/6"	10.3	-	31	53	16				2.72											
	53	CR	SM	ternary Older Alluv	49	4.9	116				NP	NP	NP										0.436		
	58	CR	SM	ternary Older Alluv	10	30.9	88	3	58	39				2.68					0.1615	0.0247			0.9		
	60.5	SPT	SM	ternary Older Alluv	28	19.2	-																		
	63	CR	CL	ternary Older Alluv	29	18.8	99	5	35	60	34	19	15										0.683		
	68.5	CR	CL	ternary Older Alluv	54	23.9	97							0.01%										0.73	
	70.5	SPT	CH	ternary Older Alluv	22	22.2	-	10	26	64															
	73	CR	CH	ternary Older Alluv	67	27.4	95				55	29	26						0.08835	0.02827			0.767		
	78	CR	CL	ternary Older Alluv	57	15.3	112	2	48	50				2.65									0.476		
	80.5	SPT	SC	ternary Older Alluv	55	14.0	-	22	52	26															
	83.5	CR	SM	ternary Older Alluv	75	11.1	123							0.08%										0.355	
	85.5	SPT	SW	ternary Older Alluv	50/5"	13.3	-																		
	88	CR	MH	ternary Older Alluv	45	20.0	105				52	30	22										0.575		
	90.5	SPT	MH	ternary Older Alluv	41	19.5	-																		
	93	CR	CL	ternary Older Alluv	52	15.0	115																0.438		
	95.5	SPT	CL	ternary Older Alluv	42	17.1	-																		
	100.5	CR	SW/ML	ternary Older Alluv	42	21.8	105																0.599		
	105.5	SPT	SP	ternary Older Alluv	59	15.1	-																		
	110.5	CR	SM	ternary Older Alluv	49	14.5	117																0.424		
G-154	6.5	CR	ML	ernary Younger Alluv	8	16.2	103																0.63		
	10.5	SPT	CL	ernary Younger Alluv	24	16.2	-																		
	15.5	CR	CL	ernary Younger Alluv	16	21.9	100																0.679		
	20.5	SPT	ML	ernary Younger Alluv	14	26.8	-																		
	25.5	CR	ML	ernary Younger Alluv	90/10"	16.6	114																0.472		
	28.5	CR	CL	ternary Older Alluv	88/10"	17.3	110																0.526		
	30.5	SPT	CL	ternary Older Alluv	26	19.1	-																		
	33.5	CR	CL	ternary Older Alluv	55	13.4	113	1	21	78				0.27%	2.66								0.469		
	35.5	SPT	SM	ternary Older Alluv	42	17.1	-			46															
	38	CR	CH	ternary Older Alluv	20	21.6	103				56	28	28						0.08802	0.0326			0.63		
	40.5	SPT	ML	ternary Older Alluv	26	16.9	-									7.8	16.0	5	1480						
	43	CR	SC	ternary Older Alluv	68	12.6	115	26	43	31													0.449		
	45.5	SPT	CL	ternary Older Alluv	37	17.3	-				34	20	14												
	48.5	CR	SM	ternary Older Alluv	85/8"	11.1	118	24	52	24				0.75%									0.412		
	50.5	SPT	GW	ternary Older Alluv	58	9.1	-							2.69											
	53	CR	GC	ternary Older Alluv	68	10.3	129	45	41	14													0.292		
	55.5	SPT	GW	ternary Older Alluv	83	1.7	-																		
	58.5	CR	SM	ternary Older Alluv	87	10.3	119	29	55	16				0.15%					0.098	0.0112			0.4		
	60.5	SPT	ML	ternary Older Alluv	23	30.1	-							2.71	7.8	19.0	14	880							
	63	CR	CL	ternary Older Alluv	36	18.5	110				34	21	13										0.526		
	65.5	SPT	CL	ternary Older Alluv	29	21.6	-																		
	68	CR	CL	ternary Older Alluv	37	26.3	99																		
	70.5	SPT	ML	ternary Older Alluv	25	21.9	-																0.696		
	73	CR	CL	ternary Older Alluv	32	24.0	93																		
	75.5	SPT	ML	ternary Older Alluv	39	27.1	-																0.805		
	78	CR	CL	ternary Older Alluv	32	33.7	87																		
	80.5	SPT	SM	ternary Older Alluv	43	21.4	-																0.929		
	83	CR	CL	ternary Older Alluv	28	33.2	93																		
	85.5	SPT	CL	ternary Older Alluv	36	17.4	-																0.805		
G-156	6	CR	SM	ernary Younger Alluv	12	9.6	-																		
	8	CR	SM	ernary Younger Alluv	17	17.3	106																0.572		
	10	SPT	CL	ernary Younger Alluv	12	15.7	-								7.5	86.0	22	1480					0.554		
	13	CR	SC	ernary Younger Alluv	11	16.1	108																		
	15	SPT	CL-ML	ternary Older Alluv	15	33.5	-																		
	18	CR	SM	ternary Older Alluv	14	15.4	104	5	59	36													0.602		
	20	SPT	ML	ternary Older Alluv	14	14.2	-																		
	23	CR	SM	ternary Older Alluv	28	13.7	117							-0.01%									0.435		
	25	SPT	SM	ternary Older Alluv	20	12.0	-								7.1	70.0	23	1720							

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	28	CR	SM	ternary Older Alluv	26	15.9	112	4	54	42												0.488			
	30	SPT	ML	ternary Older Alluv	20	23.6	-																		
	33	CR	ML	ternary Older Alluv	16	21.8	100																0.679		
	35	SPT	CH	ternary Older Alluv	17	31.2	-	0	10	90	51	21	30		2.54										
	38	CR	CL	ternary Older Alluv	32	-	-				48	14	34										700	30.0	
	40	SPT	CL	ternary Older Alluv	23	26.4	-	0	18	82	45	19	26												
	43	NR	CL	ternary Older Alluv	26	-	-																		
	45	SPT	CL	ternary Older Alluv	25	26.6	-									7.2	120.0	29	800						
	48	CR	CL	ternary Older Alluv	46	16.2	110	0	37	63	38	17	21										0.526		
	50	SPT	CL	ternary Older Alluv	25	18.3	-	1	41	58	33	18	15		2.59										
	53	CR	SM	ternary Older Alluv	51	14.5	113																0.474		
	55	SPT	SM	ternary Older Alluv	92/11"	22.0	-																		
	58	CR	SM	ternary Older Alluv	65/6"	7.2	118																0.412		
	60	SPT	SM	ternary Older Alluv	76	13.0	-	25	54	21															
	63	CR	SM	ternary Older Alluv	75/6"	13.5	112																0.488		
	65	SPT	SM	ternary Older Alluv	81	15.2	-	15	66	19															
	68	CR	GW	ternary Older Alluv	100/10"	9.4	123							0.07%									0.355		
	70	SPT	SM	ternary Older Alluv	65	21.2	-	12	60	28						7.4	81.0	23	2200						
	73	CR	CL-ML	ternary Older Alluv	47	23.5	96																		
	75	SPT	SM	ternary Older Alluv	57/6"	2.1	-																		
	78	CR	ML	ternary Older Alluv	38	15.5	116																0.447		
	80	SPT	CL-ML	ternary Older Alluv	27	17.1	-									7.3	33.0	18	1200						
	83	CR	CL-ML	ternary Older Alluv	60	23.5	101																		
	85	SPT	CL-ML	ternary Older Alluv	41	15.6	-																		
	90	CR	CL	ternary Older Alluv	46	12.9	108																0.554		
	95	NR	NR	ternary Older Alluv	50	-	-																		
	100	CR	SW	ternary Older Alluv	81	6.9	122																0.366		
	105	SPT	CL-ML	ternary Older Alluv	41	21.7	-																		
	110	CR	CL-ML	ternary Older Alluv	50	23.5	100																		
	115	SPT	CL	ternary Older Alluv	28	8.9	-																		
	120	CR	CL	ternary Older Alluv	70	11.2	121																0.387		
G-159	6.5	CR	ML	ternary Older Alluv	8/4"	16.4	100																		
	10.5	SPT	ML	ternary Older Alluv	14	26.0	-																		
	15.5	CR	ML/SM	ternary Older Alluv	11	16.0	103																0.63		
	20.5	SPT	CL	ternary Older Alluv	11	16.9	-																		
	25.5	CR	CL	ternary Older Alluv	31	14.2	116																0.447		
	30.5	SPT	CL	ternary Older Alluv	26	22.9	-																		
	35.5	CR	CL	ternary Older Alluv	27	18.6	109																0.54		
	40.5	SPT	CL	ternary Older Alluv	22	19.3	-																		
	45.5	CR	CL	ternary Older Alluv	29	21.4	103				44	25	19	-0.16%									0.63		
	50.5	SPT	CL	ternary Older Alluv	29	20.8	-								2.66	7.8	18.0	7	1200						
	55.5	CR	MH	ternary Older Alluv	35	19.2	101	0	22	78	59	31	28							0.02619			0.637		
	60.5	SPT	CL	ternary Older Alluv	43	20.0	-																		
	65.5	CR	SM	ternary Older Alluv	71	16.6	112	1	49	50													0.499		
	70.5	SPT	SC	ternary Older Alluv	52	19.4	-	7	54	39	44	23	21	-0.02%	2.69	7.8	22.0	51	1280						
	75.5	CR	CL	ternary Older Alluv	53	36.7	87	0	9	91													0.929		
	80.5	SPT	CH	ternary Older Alluv	74	23.4	-																		
	85.5	CR	CH	ternary Older Alluv	48	16.2	113	1	36	63	50	26	24										0.485		
	90.5	SPT	SC	ternary Older Alluv	90/11"	15.7	-			50															
	95.5	NR	SM	ternary Older Alluv	80/10"	-	-																		
	100.5	SPT	ML	ternary Older Alluv	47	24.5	-																		
	105.5	CR	CL	ternary Older Alluv	44	18.0	111																0.512		
	110.5	SPT	CL	ternary Older Alluv	37	19.4	-																		
	115.5	CR	CL	ternary Older Alluv	51	31.3	87																0.929		
	120.5	SPT	CL	ternary Older Alluv	39	26.8	-																		
G-161	6.5	CR	CL	FILL	Push	15.3	109																0.54		
	10.5	SPT	CL	ernary Younger Alluv	10	25.4	-																		
	15.5	NR	SM	ernary Younger Alluv	18	-	-																		
	20.5	SPT	CL	ernary Younger Alluv	5	23.5	-																		
	25.5	CR	CL	ernary Younger Alluv	4	24.6	94				35	24	11										0.786		
	30.5	SPT	SM/ML	ernary Younger Alluv	10	27.3	-																		
	35.5	NR	SM	ternary Older Alluv	30	-	-																		
	40.5	SPT	SM	ternary Older Alluv	25	18.0	-			19															
	45.5	NR	SM	ternary Older Alluv	30	-	-																		
	50.5	SPT	SM	ternary Older Alluv	62	10.8	-	38	45	17	31	23	8												
	55.5	CR	ML/SP	ternary Older Alluv	11	28.0	93							0.20%									0.791		
	60.5	SPT	ML	ternary Older Alluv	50	16.9	-				39	26	13												
	65.5	CR	CL	ternary Older Alluv	28	23.0	102													0.15024	0.03266		0.633		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained								
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)							
	70.5	SPT	CL	ternary Older Alluv	38	17.9	-							2.65	7.8	82.0	9	1400														
	75.5	CR	CL	ternary Older Alluv	30	24.1	102	0	20	80	39	23	16											0.646								
	80.5	SPT	CL-CH	ternary Older Alluv	24	32.1	-																									
	85.5	CR	CL	ternary Older Alluv	31	17.6	111	0	34	66	34	18	16	-0.03%	2.65					0.09238	0.02533			0.49								
	90.5	SPT	CL	ternary Older Alluv	39	28.2	-																									
	95.5	CR	SP/SC	ternary Older Alluv	36	22.7	106	3	54	43				2.65											0.56							
	100.5	SPT	CL	ternary Older Alluv	46	14.7	-	1	33	66																						
	105.5	CR	CL	ternary Older Alluv	45	15.3	114																			0.472						
	110.5	SPT	CL	ternary Older Alluv	33	26.3	-								7.7	36.0	6	1120														
	115.5	CR	SC	ternary Older Alluv	45	12.8	124																				0.344					
	120.5	SPT	SP	ternary Older Alluv	59	22.2	-																									
G-162	5.5	CR	CL-CH	ernary Younger Alluv	Push	23.3	101																									
	10.5	CR	ML	ernary Younger Alluv	5	18.0	104																					0.614				
	15.5	SPT	ML	ernary Younger Alluv	4	22.2	-																									
	20.5	CR	CL	ernary Younger Alluv	5	27.1	91				33	21	12	0.07%														0.845				
	25.5	SPT	CL	ernary Younger Alluv	Push	30.8	-																									
	30.5	NR	CL	ternary Older Alluv	12	-	-																									
	35.5	SPT	CL	ternary Older Alluv	12	21.7	-																									
	40.5	NR	CL	ternary Older Alluv	65	-	-																									
	45.5	SPT	SC	ternary Older Alluv	38	7.8	-																									
	50.5	NR	SC	ternary Older Alluv	51	-	-																									
	55.5	SPT	SC	ternary Older Alluv	40	13.9	-	14	59	27																						
	60.5	SPT	CL	ternary Older Alluv	30	19.8	-	2	36	62				2.65	7.7	79.0	15	1000														
	70.5	CR	SC	ternary Older Alluv	80/10"	11.6	114	40	46	14																		0.461				
	80.5	CR	CL	ternary Older Alluv	32	19.8	109																						0.54			
	87.5	SPT	SC-SM	ternary Older Alluv	92/9"	16.0	-	19	47	34	29	22	7	2.57																		
	90.5	CR	CH	ternary Older Alluv	45	19.8	108													0.10318	0.02772							0.554				
	93.5	SPT	CH	ternary Older Alluv	30	20.2	-	0	23	77	56	26	30		7.6	30.0	23	1120														
	96.5	CR	CH	ternary Older Alluv	29	19.2	113																						0.485			
	99.5	SPT	CL	ternary Older Alluv	40	20.1	-			58																						
	103.5	CR	CL-CH	ternary Older Alluv	35	20.3	106																									
	105.5	NR	CL-CH	ternary Older Alluv	45	-	-																									
	110.5	CR	CL-CH	ternary Older Alluv	73/9"	26.2	99																									
	115.5	CR	SP	ternary Older Alluv	36	10.8	122																						0.366			
	120.5	CR	SP	ternary Older Alluv	68	15.5	113																						0.474			
G-164	6.5	CR	CL	FILL	12	12.5	116																						0.447			
	10.5	SPT	CL	ernary Younger Alluv	10	19.4	-																									
	15.5	CR	CL	ernary Younger Alluv	8	13.4	104				29	18	11																0.614			
	20.5	NR	CL	ernary Younger Alluv	13	-	-																									
	25.5	CR	ML	ternary Older Alluv	18	16.1	105	0	25	75																			0.599			
	30.5	SPT	ML	ternary Older Alluv	10	21.9	-			59					7.5	62.0	29	1720														
	33.5	CR	ML	ternary Older Alluv	9	32.0	90	0	11	89	36	27	9						0.1865	0.02984								0.865				
	36.5	SPT	SM	ternary Older Alluv	17	18.7	-	5	67	28				2.64																		
	39.5	CR	SM	ternary Older Alluv	24	22.6	103							0.02%															0.618			
	42.5	SPT	SM	ternary Older Alluv	54	11.4	-	31	54	15																						
	48.5	CR	GW-GM	ternary Older Alluv	57	10.3	119	49	41	10				0.07%	2.68														0.405			
	51.5	SPT	CH	ternary Older Alluv	29	26.7	-	0	9	91	50	27	23																			
	54.5	CR	CH	Lakewood	16	27.6	97				61	29	32		7.4	26.0	37	600	0.07785	0.04498								0.73				
	57.5	SPT	CH	Lakewood	27	21.2	-	0	45	55																						
	60.5	CR	SM	Lakewood	70	12.6	109	0	80	20				0.14%															0.529			
	63.5	SPT	SP	Lakewood	50/6"	17.6	-							2.61																		
	66.5	CR	SP	Lakewood	90	19.5	107			12									0.04048	0.00623									0.557			
	69.5	SPT	SM	Lakewood	50/5"	20.1	-	0	88	12																						
	72.5	CR	SP	Lakewood	75	20.1	105							0.06%																0.587		
	75.5	SPT	SP	Lakewood	50/4"	17.3	-			18					7.8	61.0	20	3200														
	78.5	CR	SP	Lakewood	75	19.4	100																							0.666		
	81.5	NR	SP	Lakewood	50/2"	-	-																									
	85.5	CR	SP	Lakewood	80	18.2	101																							0.65		
	90.5	SPT	SM	Lakewood	93/11"	24.0	-	0	78	22																						
	95.5	CR	SP	San Pedro	78	23.8	98																							0.7		
	100.5	SPT	SP	San Pedro	95/10"	31.5	-																									
	105.5	CR	SM	San Pedro	75	16.6	102																							0.633		
	110.5	SPT	SM	San Pedro	87	24.7	-																									
	115.5	CR	SM	San Pedro	100	17.6	111																							0.501		
	120.5	SPT	CL	San Pedro	61	22.0	-																									
	125.5	CR	SP-SM	San Pedro	125	17.6	96																									
	130.5	SPT	SP	San Pedro	50/4"	16.1	-																									
	135.5	CR	SP	San Pedro	100	10.0	118																							0.412		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)
	85.5	CR	SM	San Pedro	75/6"	23.0	89	0	84	16				2.62					0.07899	0.01286		0.837			
	90.5	SPT	SP-SM	San Pedro	50/6"	21.7	-																		
	95.5	CR	SP	San Pedro	75/6"	13.3	92																0.825		
	100.5	SPT	SM	San Pedro	99/10"	20.6	-	0	51	49															
	105.5	CR	SM	San Pedro	80/10"	20.8	103	0	51	49	NP	NP	NP										0.618		
	110	SPT	SP	San Pedro	50/6"	17.8	-																		
	115.5	CR	SC	San Pedro	47	12.8	123	0	54	46	24	13	11	2.72									0.38		
	120	SPT	SP	San Pedro	50/5"	12.2	-																		
	125.5	NR	SW	San Pedro	100/3"	-	-																		
	130.5	SPT	SP	San Pedro	50/4"	18.9	-																		
	135.5	CR	SP	San Pedro	75/6"	15.7	96																0.736		
	140.5	SPT	SM	San Pedro	50/5"	20.9	-	3	63	34															
	145.5	CR	SP	San Pedro	75/6"	20.5	88																0.893		
	150.5	SPT	SP	San Pedro	50/4"	17.9	-																		
G-168	5.5	CR	SC	FILL	30	15.3	118																		
	8.5	SPT	SM	ternary Older Alluv	26	13.7	-																		
	11.5	CR	SM	ternary Older Alluv	13	12.2	113																0.474		
	14.5	SPT	CL	ternary Older Alluv	15	22.1	-																		
	17.5	CR	CL	ternary Older Alluv	19	26.7	95				49	28	21										0.767		
	20.5	SPT	CL	ternary Older Alluv	16	31.5	-																		
	23.5	CR	CL	ternary Older Alluv	34	23.7	-																		
	26.5	SPT	CL	ternary Older Alluv	30	26.6	-				41	20	21												
	29.5	CR	CL	ternary Older Alluv	37	17.3	107																0.569		
	32.5	SPT	CL	ternary Older Alluv	28	29.7	-																		
	35.5	CR	CL	ternary Older Alluv	36	18.7	113																0.485		
	38.5	SPT	CL	ternary Older Alluv	24	17.2	-	0	13	87				7.3	25.0	21	840						0.929		
	41.5	CR	CL	ternary Older Alluv	50	32.1	87																		
	45.5	SPT	ML	Lakewood	68	25.8	-																		
	49.5	CR	SM	Lakewood	75/9"	18.4	105																0.587		
	53.5	SPT	SP	Lakewood	97/9"	17.9	-																		
	57.5	CR	SM	Lakewood	100/5"	12.7	112			15													0.488		
	62.5	SPT	SP	San Pedro	93/9"	10.2	-																		
	67.5	CR	SM	San Pedro	50/5"	22.0	100	0	79	21													0.666		
	72.5	SPT	SP	San Pedro	50/5"	18.0	-								8.2	51.0	13	3040							
	77.5	CR	SP	San Pedro	50/3"	14.4	100						0.14%										0.666		
	82.5	SPT	SM	San Pedro	50/3"	13.1	-	0	77	23				2.69											
	87.5	NR	SM	San Pedro	100/4.5"	-	-																		
	90.5	CR	SP	San Pedro	70/5"	27.2	92																0.811		
	97.5	SPT	CH	San Pedro	43	10.3	-	0	19	81	51	27	24												
	104.5	CR	SM	San Pedro	75/5"	9.9	119																0.4		
	111.5	SPT	SM	San Pedro	50/4"	13.8	-	26	55	19															
G-169	1-5'	BULK	CL-ML	FILL	-	-	-								8.2	27.0	4	1680							
	5.5	CR	CL	FILL	15	25.7	93																0.805		
	8.5	SPT	SM	FILL	14	14.2	-																		
	11.5	CR	CL	FILL	10	17.5	109																0.54		
	14.5	SPT	CL	FILL	4/6"	21.1	-				39	20	19												
	17.5	CR	CL	FILL	11	25.9	101																0.662		
	20.5	SPT	CL	FILL	15	21.2	-																		
	23.5	CR	CL	FILL	17	27.3	97																0.73		
	26.5	SPT	CL	FILL	25	27.2	-								7.9	672.0	99	920							
	29.5	CR	SC	Lakewood	41	13.0	120				26	15	11										0.388		
	32.5	SPT	SM	Lakewood	43	15.7	-			43															
	35.5	CR	SM	Lakewood	72/11"	14.7	109																0.529		
	38.5	SPT	SP-SM	Lakewood	90	14.9	-	0	88	12															
	41.5	CR	SP-SM	Lakewood	94/8"	19.0	101																		
	44.5	SPT	SP-SM	Lakewood	96/11"	18.4	-																		
	47.5	CR	SP-SM	Lakewood	50/5"	12.8	106																		
	52.5	SPT	SM	Lakewood	84	24.2	-																		
	57.5	CR	SP-SM	Lakewood	93/10"	17.7	107			26															
	62.5	SPT	SM	Lakewood	63	21.8	-																		
	67.5	CR	SM	San Pedro	93/10"	18.3	94	0	67	33			0.05%										0.8		
	72.5	SPT	SP-SM	San Pedro	50/6"	22.9	-							2.67	7.8	358.0	58	960							
	77.5	CR	SM	San Pedro	66	30.5	86	0	85	15									0.1	0.0			0.9		
	82.5	SPT	SM	San Pedro	93	14.6	-																		
	85.5	CR	SW-SM	San Pedro	90/11"	19.0	103	22	67	11															
	90.5	SPT	SP	San Pedro	50/4"	29.4	-							2.64											
	95.5	CR	CL	San Pedro	51	17.3	112	1	44	55	36	19	17						0.1	0.0			0.5		
	100.5	SPT	ML	San Pedro	44	13.4	-								7.7	968.0	45	640							

TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	105.5	CR	ML	San Pedro	87/8"	14.6	116															0.4			
	110.5	SPT	SP	San Pedro	50/4"	23.8	-																		
	115.5	NR	SP	San Pedro	91/9"	-	-																		
	120.5	SPT	SM	San Pedro	50/6"	27.1	-																		
	1-6'	BULK	CL-ML	FILL	-	-	-																		
G-171	5.5	CR	ML	Lakewood	17	-	-																		
	10.5	SPT	SM	Lakewood	25	-	-																		
	15.5	CR	SM	Lakewood	39	-	-																		
	20.5	SPT	SP-SM	Lakewood	64	24.5	-																		
	25.5	NR	SP-SM	Lakewood	52	16.4	-																		
	30.5	SPT	SP-SM	Lakewood	71	21.9	-																		
	35.5	CR	SP	Lakewood	69	5.9	106															0.572			
	40.5	SPT	ML	Lakewood	79	-	-																		
	43.5	CR	ML	Lakewood	80/10"	22.3	91															0.845			
	45.5	SPT	SM	Lakewood	98	21.3	-																		
	48.5	CR	SM	Lakewood	81	14.5	101															0.65			
	50.5	SPT	SM	Lakewood	63	12.0	-																		
	53.5	CR	SM	Lakewood	84/10"	18.6	96	0	53	47												0.736			
	55.5	SPT	SM	Lakewood	54	22.5	-																		
	58.5	CR	SM	Lakewood	75/7"	17.9	103					0.00%	2.55									0.602			
	60.5	SPT	ML	Lakewood	70	23.5	-	1	44	55															
	63.5	CR	ML	Lakewood	66	25.8	95	0	16	84					2.61							0.714			
	65.5	SPT	SM	San Pedro	50/5"	18.7	-																		
	68	CR	SM	San Pedro	86/6"	25.6	90					0.05%	2.60									0.803			
	70.5	SPT	SP-SM	San Pedro	53/6"	14.4	-	16	71	13															
	73	CR	SP-SM	San Pedro	75/7"	28.7	96																		
	75.5	SPT	SP-SM	San Pedro	50/5"	19.0	-	1	87	12			2.51												
	78.5	CR	SP-SM	San Pedro	50/6"	22.1	100																		
	80.5	SPT	ML	San Pedro	72/9"	25.2	-	0	19	81	NP	NP	NP												
	83	CR	SP-SM	San Pedro	110/3"	12.9	106						1.03%												
	85.5	SPT	SP-SM	San Pedro	90/6"	11.5	-																		
	88	CR	SP-SM	San Pedro	100/4"	-	-	1	93	6															
	90	SPT	SP-SM	San Pedro	50/5"	17.5	-																		
	93	CR	SP-SM	San Pedro	75/6"	12.4	107																		
	95	SPT	SP-SM	San Pedro	50/6"	15.5	-																		
	97.5	CR	CL-ML	San Pedro	66/10"	16.2	107																		
	100.5	SPT	SM	San Pedro	50/6"	17.3	-																		
	103.5	CR	CL-ML	San Pedro	75	17.9	109																		
	105.5	SPT	CL-ML/SM	San Pedro	90/11"	21.9	-																		
	110	CR	SM	San Pedro	75/6"	11.8	121															0.377			
	115	SPT	SP-SM	San Pedro	50/3"	6.2	-																		
	120.5	CR	SP-SM	San Pedro	100/5"	7.0	-																		
G-173	5.5	CR	CL	ternary Older Alluv	Push	16.5	110															0.526			
	10.5	CR	SC	ternary Older Alluv	9	20.7	103															0.618			
	15.5	SPT	CL	ternary Older Alluv	18	18.7	-																		
	20.5	CR	SC	ternary Older Alluv	14	12.0	114			46												0.461			
	25.5	SPT	CL	ternary Older Alluv	18	22.0	-																		
	30.5	CR	SM/CL	Lakewood	21	23.9	101															0.65			
	35.5	SPT	SM	Lakewood	50	17.0	-			41															
	40.5	NR	SM	Lakewood	26	-	-																		
	41.5	CR	SP	Lakewood	53	3.7	97																		
	45.5	SPT	SP	Lakewood	89/11"	9.0	-															0.718			
	50.5	CR	SM	Lakewood	81	12.3	110	34	53	13												0.515			
	55.5	CR	SP	Lakewood	83/11"	15.1	-																		
	60.5	CR	SM	Lakewood	65	13.8	102	0	73	27												0.633			
	70.5	CR	SM	Lakewood	59	23.5	97															0.718			
	77.5	SPT	ML	San Pedro	73/10"	24.0	-	1	45	54															
	80.5	CR	ML	San Pedro	54	24.2	99	0	15	85	36	30	6		2.68	8.2	27.0	19	3360						
	85.5	SPT	SP-SM	San Pedro	84	22.6	-													0.07462	0.01018		0.696		
	93.5	SPT	SP-SM	San Pedro	66	20.0	-	6	85	9															
	100.5	CR	MH	San Pedro	66	30.7	88	0	22	78	55	31	24						0.06201	0.02067		0.879			
	105.5	CR	SP	San Pedro	50/3"	19.8	-																		
	110.5	CR	ML	San Pedro	37	19.5	105															0.599			
	115.5	SPT	ML	San Pedro	42	29.6	-								7.8	1215.0	19	720							
G-174A	5.5	CR	CL	ternary Older Alluv	Push	15.5	114															0.472			
	10.5	SPT	CL	ternary Older Alluv	18	30.4	-	0	10	90															
	15.5	CR	SP-SM	ternary Older Alluv	30	14.5	101															0.65			
	20.5	SPT	SP-SM	ternary Older Alluv	28	14.4	-																		

TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)
	25.5	CR	CL	ternary Older Alluv	15	23.1	93																0.805		
	30.5	SPT	SC	ternary Older Alluv	23	22.7	-																		
	35.5	CR	SC	ternary Older Alluv	26	13.7	119	0	59	41														0.4	
	40.5	SPT	SP	ternary Older Alluv	32	14.5	-																		
	45.5	CR	SC	ternary Older Alluv	27	19.6	106																	0.572	
	50.5	SPT	SC	ternary Older Alluv	16	19.6	-																		
	55.5	CR	CL	ternary Older Alluv	27	20.0	101																	0.662	
	60.5	SPT	CL	ternary Older Alluv	29	20.3	-				42	21	21												
	65.5	CR	CL	ternary Older Alluv	39	15.5	114								2.68										0.467
	70.5	SPT	CL	ternary Older Alluv	33	24.7	-									7.8	21.0	9	1440						
	75.5	CR	CL	ternary Older Alluv	19	22.8	107																0.01255		0.569
	80.5	SPT	CL	ternary Older Alluv	75/11"	26.9	-	1	28	71	39	21	18												
	85.5	CR	CL	ternary Older Alluv	18	25.8	98																0.02056		0.713
	90.5	SPT	CL	ternary Older Alluv	45	20.7	-	0	35	65						7.8	17.0	15	1360						
	95.5	CR	CL	ternary Older Alluv	85/8"	15.3	114																		0.467
	100.5	SPT	CL	ternary Older Alluv	36	22.0	-				42	23	19		2.66										
	105.5	CR	SC	ternary Older Alluv	48	13.6	112	11	52	37															0.488
	110.5	SPT	CL	ternary Older Alluv	51	16.6	-																		
	115.5	NR	SM	ternary Older Alluv	27	23.3	-																		
	120.5	CR	SM	ternary Older Alluv	29	16.2	113																		0.474
G-175	5.5	CR	ML	ternary Older Alluv	Push	11.9	119																		0.411
	10.5	SPT	SM	ternary Older Alluv	20/8"	8.4	-						22												
	15.5	CR	ML	ternary Older Alluv	27	15.4	111																		0.512
	20.5	SPT	CL	ternary Older Alluv	14	28.7	-																		
	25.5	CR	SP	ternary Older Alluv	37	10.7	111																		0.501
	30.5	SPT	CL	ternary Older Alluv	16	23.2	-																		
	35.5	CR	ML	ternary Older Alluv	19	24.5	103																		0.63
	40.5	SPT	CH/CL	ternary Older Alluv	47	12.4	-																		
	45.5	CR	ML	ternary Older Alluv	27	13.8	120																		0.399
	50.5	NR	ML	ternary Older Alluv	82/10"	-	-																		
	55.5	CR	CL/CH	ternary Older Alluv	26	19.8	107																		
	60.5	SPT	CL/CH	ternary Older Alluv	35	18.5	-																		
	65.5	CR	CL	ternary Older Alluv	46	13.6	106																		0.572
	70.5	SPT	ML	ternary Older Alluv	73/11"	18.9	-																		
	75.5	CR	SM	ternary Older Alluv	39	11.7	115																		0.449
	80.5	SPT	CL/CH	ternary Older Alluv	37	20.6	-																		
	85.5	CR	CL	ternary Older Alluv	33	18.5	105																		0.599
	90.5	SPT	CL	ternary Older Alluv	42	21.5	-																		
	95.5	CR	SP-SM	ternary Older Alluv	58	17.1	113				40				0.02%										
	100.5	SPT	CL	ternary Older Alluv	26	36.0	-																		
	105.5	CR	CH	ternary Older Alluv	52	16.6	114																0.06182	0.02797	0.472
	110	SPT	CL	ternary Older Alluv	83/10"	17.3	-	0	27	73	31	21	10			7.8	15.0	5	1560						0.488
	115.5	CR	CL	ternary Older Alluv	94/5"	19.2	112								2.67										
	117.5	SPT	CL	ternary Older Alluv	42	18.2	-				36	22	14												
	120.5	SPT	CL	ternary Older Alluv	73/9"	15.3	-	3	47	50	34	21	13			8.0	10.0	10	3920						
	123	CR	ML	ternary Older Alluv	39	16.8	115																0.015		0.460
	125.5	SPT	SM	ternary Older Alluv	64/3"	18.9	-	2	70	28															
	128	CR	ML	ternary Older Alluv	33	24.0	101								2.68										0.656
	130.5	SPT	ML	ternary Older Alluv	89/9"	19.8	-	5	41	54															
	135.5	CR	SP-SM	ternary Older Alluv	66	15.1	-	5	71	24															
	140.5	SPT	CL	ternary Older Alluv	50	19.8	-				31	23	8			8.2	13.0	8	6000						
	145.5	CR	CL/CH	ternary Older Alluv	27	23.1	104																		
	150.5	SPT	CL/CH	ternary Older Alluv	46	29.7	-								-0.62%										
G-176	5.5	CR	SM	ternary Younger Alluv	Push	18.1	99																		0.683
	9.5	SPT	ML	ternary Older Alluv	26	32.0	-																		
	14.5	CR	ML	ternary Older Alluv	20	28.8	89																		0.886
	19.5	SPT	CL	ternary Older Alluv	65	12.4	-																		
	24.5	CR	SM	ternary Older Alluv	38	12.0	114																		0.461
	29.5	SPT	CL	ternary Older Alluv	33	20.3	-																		
	34.5	CR	CL	ternary Older Alluv	25	17.5	111																		0.512
	39.5	SPT	CL	ternary Older Alluv	52	16.5	-																		
	44.5	NR	CL	ternary Older Alluv	35	15.7	-																		
	49.5	SPT	CL	ternary Older Alluv	44	14.6	-																		
	54.5	CR	SM	ternary Older Alluv	38	11.0	-				23														
	59.5	SPT	CL/SM	ternary Older Alluv	47	14.4	-																		
	64.5	CR	CL	ternary Older Alluv	38	24.7	100																		0.679
	69.5	SPT	ML/CL	ternary Older Alluv	48	38.0	-																		
	74.5	CR	CL	ternary Older Alluv	37	17.1	112																		0.499

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained			
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)		
	79.5	SPT	CL	ternary Older Alluv	33	24.6	-			67	37	21	16														
	84.5	CR	SM	ternary Older Alluv	41	16.8	115	7	60	33				0.07%	2.69												
	90.5	CR	CL-ML	ternary Older Alluv	39	12.6	124			53	27	20	7							0.03927	0.00812				0.46		
	95.5	CR	CL	ternary Older Alluv	46	17.7	113	1	31	68	40	20	20													0.485	
	102.5	CR	SC	ternary Older Alluv	46	11.3	125	1	62	37	28	20	8		2.65					0.0	0.0				0.3		
	105.5	NR	SC	ternary Older Alluv	67	-	-																				
	112.5	NR	SC	ternary Older Alluv	74	-	-																				
	115.5	SPT	SM	ternary Older Alluv	88	10.6	-	4	61	35																	
	120.5	CR	SC-SM	ternary Older Alluv	40	12.8	114			33	27	20	7	-0.01%													
	125.5	SPT	CL	ternary Older Alluv	87/9"	13.6	-																				
	130.5	CR	CL	ternary Older Alluv	78	12.8	116			36																0.447	
G-177	5.5	CR	CL	ternary Older Alluv	Push	23.5	95																			0.767	
	10.5	SPT	SC	ternary Older Alluv	18	16.7	-			50																	
	15.5	CR	SC	ternary Older Alluv	11	11.2	111																			0.501	
	20.5	SPT	SC/SM	ternary Older Alluv	57	12.0	-																				
	25.5	CR	CL	ternary Older Alluv	36	15.3	117																			0.435	
	30.5	SPT	CL	ternary Older Alluv	26	19.9	-																				
	35.5	CR	ML	ternary Older Alluv	22	14.4	111			60																0.512	
	40.5	SPT	CL/ML	ternary Older Alluv	69	11.1	-																				
	45.5	CR	ML	ternary Older Alluv	42	17.0	111																			0.512	
	50.5	SPT	SM	ternary Older Alluv	45	16.7	-																				
	55.5	CR	SC-SM	ternary Older Alluv	24	15.4	113																				
	60.5	SPT	ML	ternary Older Alluv	23	19.4	-																				
	65.5	CR	SC	ternary Older Alluv	50	16.6	112				33	18	15													0.488	
	70.5	SPT	CL	ternary Older Alluv	40	21.3	-			62																	
	75.5	CR	CH	ternary Older Alluv	24	32.4	90				66	27	39													0.865	
	80.5	SPT	ML	ternary Older Alluv	44	17.3	-																				
	83	CR	CL	ternary Older Alluv	39	16.8	110	0	37	63				-0.01%												0.526	
	85.5	SPT	ML	ternary Older Alluv	51	20.6	-																				
	88	CR	ML	ternary Older Alluv	37	17.4	110																			0.526	
	90.5	SPT	ML	ternary Older Alluv	75	15.2	-			51						7.5	8.5	12	2600								
	93	CR	SC	ternary Older Alluv	34	21.2	105													0.073	0.0365					0.587	
	95.5	SPT	SC	ternary Older Alluv	55	12.6	-	3	48	49	31	17	14		2.69												
	98	CR	SC	ternary Older Alluv	64	13.5	122																			0.366	
	100.5	SPT	SM	ternary Older Alluv	80/10"	13.6	-	1	58	41						7.7	16.0	16	2640								
	103	CR	ML	ternary Older Alluv	36	17.6	111													0.11491	0.02722					0.512	
	105.5	SPT	CL	ternary Older Alluv	74	21.0	-			74	32	19	13														
	108	CR	SP	ternary Older Alluv	71	15.0	115							0.02%												0.449	
	110.5	SPT	SM	ternary Older Alluv	50/5"	11.2	-	7	64	29					2.66												
	113	NR	SM	ternary Older Alluv	32	-	-																				
	115.5	SPT	SM	ternary Older Alluv	50/4"	15.3	-				NP	NP	NP														
	117.5	CR	SM	ternary Older Alluv	55	11.8	113							0.00%												0.474	
	120.5	SPT	SM	ternary Older Alluv	50/5"	-	-	14	52	34																	
	125.5	CR	SM	ternary Older Alluv	107	12.6	118	14	67	19																0.412	
	130.5	SPT	SP-SM	ternary Older Alluv	50/5"	7.0	-																				
	135.5	NR	SP-SM	ternary Older Alluv	45	-	-																				
	140.5	SPT	SM	ternary Older Alluv	55	13.2	118			12																0.41	
G-178	5.5	CR	SW	ternary Older Alluv	28	8.2	119																			0.4	
	10.5	SPT	SW	ternary Older Alluv	27	14.4	-																				
	15.5	CR	CL	ternary Older Alluv	7	18.5	109																			0.54	
	20.5	SPT	CL	ternary Older Alluv	19	17.0	-				28	20	8			7.5	19.0	3	2400								
	25.5	CR	ML	ternary Older Alluv	35	16.9	113			52																0.485	
	30.5	SPT	CL	ternary Older Alluv	45	19.4	-																				
	35.5	CR	SM	ternary Older Alluv	49	14.3	109			45																0.529	
	40.5	SPT	CL	ternary Older Alluv	46	16.1	-				30	20	10			7.4	23.0	5	1800								
	45.5	CR	SW	ternary Older Alluv	65/6"	8.3	118																			0.412	
	50.5	SPT	SC	ternary Older Alluv	47	15.6	-																				
	55.5	CR	SW	ternary Older Alluv	75/5"	12.7	115													0.08114	0.0058					0.449	
	58	CR	ML	ternary Older Alluv	36	18.3	110																			0.526	
	60.5	SPT	SM	ternary Older Alluv	88	12.7	-	13	66	21	NP	NP	NP														
	63	CR	SC	ternary Older Alluv	66	13.1	121			47	28	17	11	0.02%												0.377	
	68	CR	CL	ternary Older Alluv	58	15.3	116	0	41	59	33	21	12		2.59	7.4	26.0	24	1480	0.08915	0.02368				0.393		
	70.5	SPT	SC	ternary Older Alluv	69	16.7	-	3	56	41	28	20	8														
	73	CR	CL	ternary Older Alluv	65/6"	14.6	118	2	47	51																0.412	
	78	CR	SC	ternary Older Alluv	59	20.3	108				30	17	13													0.554	
	80.5	SPT	SC	ternary Older Alluv	62	17.9	-																				
	83	CR	SP-SM	ternary Older Alluv	70/6"	10.9	123	32	56	12					2.63											0.334	
	88	CR	SM	ternary Older Alluv	96	21.0	108							0.07%						0.06635	0.01049					0.543	

TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
	90.5	SPT	SM	ternary Older Alluv	50/4"	11.0	-	31	47	22															
	93.5	CR	CL	ternary Older Alluv	91	19.0	110					37	21	16			7.6	17.0	26	1280				0.557	
	96.5	SPT	SM	ternary Older Alluv	78	17.5	-																		
	99.5	CR	SM	ternary Older Alluv	84	17.6	111																	0.501	
	102.5	SPT	ML	ternary Older Alluv	56	17.9	-																		
	105.5	CR	SM	ternary Older Alluv	84	18.4	110																		0.515
	109	SPT	ML	ternary Older Alluv	81	17.6	-																		
G-179	5.5	CR	ML	ternary Older Alluv	27	14.0	118																		0.423
	10.5	CR	SM	ternary Older Alluv	34	10.8	120																		0.388
	15.5	SPT	SM	ternary Older Alluv	34	13.3	-																		
	20.5	CR	SM	ternary Older Alluv	24	8.9	114																		0.461
	25.5	SPT	SM	ternary Older Alluv	24	14.4	-			19															
	30.5	CR	SM	ternary Older Alluv	68	14.4	117																		0.424
	35.5	SPT	CL	ternary Older Alluv	44	15.9	-																		
	40.5	CR	CL	ternary Older Alluv	29	16.3	115																		0.46
	45.5	SPT	CL	ternary Older Alluv	24	19.5	-					41	21	20											
	50.5	CR	CL	ternary Older Alluv	26	16.5	117																		0.435
	55.5	NR	CL	ternary Older Alluv	31	-	-																		
	60.5	CR	SC	ternary Older Alluv	27	14.2	120	28	45	27	44	24	20												0.399
	65.5	CR	SP	ternary Older Alluv	84	4.5	116							0.48%						0.02441	0.00718				0.436
	70.5	CR	CL	ternary Older Alluv	32	19.7	107	2	46	52															0.569
	77.5	SPT	SC	ternary Older Alluv	49	14.3	-	8	50	42	30	17	13		2.68	7.4	10.0	20	1840						
	80.5	CR	SC	ternary Older Alluv	42	7.7	-	2	56	42															
	95.5	CR	CL	ternary Older Alluv	40	17.8	111	0	40	60	29	21	8		2.64					0.06678	0.01484				0.484
	100.5	SPT	SC	ternary Older Alluv	89/9"	14.4	-	10	51	39						7.6	18.0	25	2280						
	110.5	CR	SM	ternary Older Alluv	84	17.5	-	3	56	41					2.64										
	115.5	CR	SM	ternary Older Alluv	93	12.4	121							0.01%											0.377
	120.5	SPT	CL	ternary Older Alluv	52	17.4	-				40	22	18												
G-180	5.5	CR	CL	FILL	58	11.4	122																		0.378
	10.5	SPT	SC	ternary Older Alluv	28	12.4	-			36															
	15.5	NR	ML	ternary Older Alluv	25	-	-																		
	20.5	SPT	SM	ternary Older Alluv	18	26.6	-																		
	25.5	CR	SP	ternary Older Alluv	30	16.4	94																		0.772
	30.5	SPT	ML	ternary Older Alluv	15	22.3	-																		
	35.5	CR	SC	ternary Older Alluv	55	10.6	121				28	21	7												0.377
	40.5	SPT	CL	ternary Older Alluv	50	15.5	-																		
	45.5	CR	CL	ternary Older Alluv	42	12.1	116																		0.447
	50.5	SPT	CL	ternary Older Alluv	18	23.4	-				39	22	17												
	55.5	CR	CL	ternary Older Alluv	42	10.6	107																		0.569
	60.5	SPT	SP	ternary Older Alluv	57	15.5	-																		
	65.5	CR	CL	ternary Older Alluv	36	21.3	101																		0.662
	70.5	SPT	CL	ternary Older Alluv	18	25.4	-				35	18	17		2.62										
	75.5	CR	CL	ternary Older Alluv	43	15.6	117							0.01%											0.435
	80.5	SPT	CL	ternary Older Alluv	44	16.1	-	2	38	60	35	20	15			7.6	18.0	20	1160						
	83	CR	SC	ternary Older Alluv	91/9"	12.9	120	8	44	48										0.05968	0.00972				0.388
	85.5	SPT	SC	ternary Older Alluv	50/3"	13.0	-	7	64	29															
	88	CR	SC	ternary Older Alluv	65	13.3	114							0.07%											0.461
	90.5	SPT	SC	ternary Older Alluv	55/6"	13.2	-	18	61	22					2.66										
	93	CR	CL	ternary Older Alluv	52	20.9	108				36	20	16							0.08858	0.01709				0.554
	95.5	SPT	ML	ternary Older Alluv	52	18.0	-	1	49	50															
	98	CR	CL	ternary Older Alluv	65	15.2	113				40	22	18			7.6	18.0	26	1640						0.485
	100.5	SPT	SW	ternary Older Alluv	50/5"	11.8	-																		
	103	CR	ML	ternary Older Alluv	65	20.2	108	0	15	85				0.09%	2.66										
	105.5	SPT	SC	ternary Older Alluv	87/11"	15.8	-				28	20	8												0.537
	108	CR	SM	ternary Older Alluv	50/5"	12.9	124																		
	110.5	SPT	SM	ternary Older Alluv	55/6"	14.2	-	12	69	19															0.344
	113	CR	SM	ternary Older Alluv	75/5"	10.5	119							0.07%											
	115.5	SPT	SM	ternary Older Alluv	97/10"	12.5	-																		0.4
	118	CR	SP/SM	ternary Older Alluv	69	21.1	107																		
	120.5	SPT	SP	ternary Older Alluv	89/11"	15.5	-																		0.557
	123	CR	SP	ternary Older Alluv	84/8"	17.4	105																		
	125.5	SPT	ML	ternary Older Alluv	79	14.5	-																		0.587
G-181	5.5	CR	CL	ternary Older Alluv	Push	13.0	120																		0.399
	10.5	SPT	CL	ternary Older Alluv	18	14.7	-																		
	15.5	CR	ML	ternary Older Alluv	12	16.1	107																		0.569
	20.5	SPT	CL	ternary Older Alluv	23	16.2	-																		
	25.5	CR	SC	ternary Older Alluv	56	10.0	118			31															0.412
	30.5	SPT	CL	ternary Older Alluv	35	16.9	-																		

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion				Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained				
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c	C _r			Effective cohesion (psf)	Effective Friction Angle (degrees)			
	35.5	CR	CL	ternary Older Alluv	31	16.3	113			58													0.485					
	40.5	SPT	CL	ternary Older Alluv	27	23.1	-																					
	45.5	CR	SM/SP	ternary Older Alluv	33	11.5	103			39															0.618			
	50.5	SPT	SM/SP	ternary Older Alluv	66	17.7	-																					
	55.5	CR	SP	ternary Older Alluv	70	3.5	116			7			0.44%												0.436			
	60.5	SPT	SM	ternary Older Alluv	91/11"	13.3	-																					
	65.5	CR	SM/ML	ternary Older Alluv	31	25.8	98																			0.7		
	70.5	SPT	SM/ML	ternary Older Alluv	60	19.1	-								2.65													
	75.5	NR	SM	ternary Older Alluv	43	-	-																					
	80.5	SPT	CL	ternary Older Alluv	29	18.6	-	0	29	71	33	19	14															
	85.5	CR	SM	ternary Older Alluv	89	10.8	114	18	63	20	NP	NP	NP													0.472		
	90.5	SPT	CL	ternary Older Alluv	77/11"	20.3	-																					
	95.5	CR	CH	ternary Older Alluv	35	25.0	97	0	11	89	54	29	25							0.11418	0.02941					0.73		
	100.5	SPT	CL	ternary Older Alluv	25	25.9	-							2.54	7.6	21.0	22	960										
	105.5	CR	ML	ternary Older Alluv	41	19.0	101				39	22	17	-0.07%						0.09307	0.02161					0.662		
	110.5	SPT	ML	ternary Older Alluv	45	19.1	-	0	44	56					7.5	16.0	19	2280										
	115.5	CR	SM	ternary Older Alluv	37	15.3	109	0	55	45																0.54		
	120.5	SPT	CL	ternary Older Alluv	60	23.7	-																					
	125.5	CR	SM	ternary Older Alluv	38	20.8	99							0.06%												0.683		
	130.5	SPT	SM	ternary Older Alluv	75/11"	17.9	-																					
G-186	5.5	CR	SC	ternary Younger Alluv	Push	15.3	109	21	39	40	31	17	14													0.529		
	10.5	SPT	SM	ternary Younger Alluv	19	11.0	-	24	59	17																		
	15.5	CR	SM	ternary Younger Alluv	8	12.4	119	6	46	48																0.398	100	37
	20.5	SPT	CL	ternary Younger Alluv	8	20.5	-																					
	25.5	CR	CL	ternary Younger Alluv	3	25.3	98	0	30	70	34	17	17													0.713		
	30.5	SPT	CL	ternary Younger Alluv	8	-	-								8	24.0	2	2,480										
	35.5	CR	CL	ternary Older Alluv	6	16.9	102																			0.644	100	37
	40.5	SPT	SC	ternary Older Alluv	23	19.4	-																					
	45.5	CR	SM	ternary Older Alluv	9	17.1	98	0	69	31																0.707		
	50.5	SPT	SW-SM	ternary Older Alluv	27	11.4	-																					
	55.5	CR	SM	ternary Older Alluv	20	10.3	118	28	59	13																0.412		
	60.5	SPT	CL	ternary Older Alluv	40	23.2	-				40	18	22															
	65.5	CR	CL	ternary Older Alluv	21	15.1	117																			0.43	500	39
	70.5	SPT	CL	ternary Older Alluv	54	26.4	-																					
	75.5	CR	CL	ternary Older Alluv	30	19.1	108	0	16	84	39	15	24		8	51.0	4	1,480	0.05605	0.02803						0.557		
	80.5	SPT	CL	ternary Older Alluv	45	25.8	-	1	26	73	33	17	16															
	85.5	CR	CL	ternary Older Alluv	20	27.5	92								8	62.0	7	1,120								0.825		
	90.5	SPT	SC	ternary Older Alluv	60	17.8	-	0	63	37	30	16	14															
	95.5	CR	CL	ternary Older Alluv	18	23.4	99																				0.697	
	100.5	SPT	CL	ternary Older Alluv	32	34.4	-																					
	105.5	NR	SM	ternary Older Alluv	24	21.3	-																					
	110.5	SPT	SM	ternary Older Alluv	94	19.8	-	0	86	14																		
	115.5	CR	SM	ternary Older Alluv	32	18.5	113																				0.473	
	120.5	SPT	SW	ternary Older Alluv	50/5"	12.2	-																					
G-187	5.5	CR	CL	ternary Older Alluv	13	17.4	111																				0.512	
	10.5	SPT	CL	ternary Older Alluv	22	18.3	-	0	41	59	24	15	9															
	15.5	CR	CL	ternary Older Alluv	25	15.7	114																				0.472	
	20.5	SPT	SM	ternary Older Alluv	26	12.7	-	6	50	44																		
	25.5	CR	SM	ternary Older Alluv	36	19.6	93							0.22%													0.791	
	30.5	SPT	SM	ternary Older Alluv	43	10.4	-			26																		
	35.5	CR	ML	ternary Older Alluv	20	16.7	105	8	27	65																		
	40.5	SPT	SM	ternary Older Alluv	68	10.6	-								8	20.0	11	5,200	0.07661	0.01223						0.63		
	45.5	CR	SP-SM	ternary Older Alluv	61	22.4	99	7	83	11				2.66														
	50.5	SPT	SP-SM	ternary Older Alluv	74	11.1	-																					
	55.5	CR	SP-SM	ternary Older Alluv	80	8.9	106																					
	60.5	SPT	SC	ternary Older Alluv	31	15.9	-	16	51	33	25	14	11	2.65	7	27.0	14	300										
	65.5	CR	SC/SM	ternary Older Alluv	55	19.2	106	0	55	45	26	17	9													0.572		
	70.5	SPT	ML	ternary Older Alluv	27	18.7	-								7	11.0	32	1,720										
	75.5	CR	CL	akewood Formatio	40	19.8	107	0	24	76	35	16	19	2.62													0.569	
	80.5	SPT	CL	akewood Formatio	26	24.1	-																					
	85.5	CR	CH	akewood Formatio	24	28.2	92	0	9	91	62	18	44														0.73	
	90.5	SPT	SM	akewood Formatio	21	26.8	-																					
	95.5	CR	SM	akewood Formatio	39	26.1	97	2	53	45																	0.718	
	100.5	SPT	CL	akewood Formatio	27	17.9	-								7	10.0	31	1,520										
	105.5	NR	CL	akewood Formatio	29	-	-																					
	110.5	SPT	CL/SM	akewood Formatio	78	14.0	-			33				2.66														
	115.5	CR	SP/SW	akewood Formatio	75	12.8	87																				0.915	
	120.5	SPT	SP	akewood Formatio	75	14.2	-																					

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)
	125.5	CR	SM	akewood Formatio	78	16.0	111															0.501		
	130.5	SPT	SM	akewood Formatio	94	14.2	-																	
G-188	5.5	CR	SM	ternary Younger Allu	push	12.2	113																0.471	
	10.5	CR	SM	ternary Younger Allu	push	14.2	120																0.394	
	15.5	SPT	SC	ternary Younger Allu	14	16.7	-																	
	20.5	CR	ML/SM	ternary Younger Allu	5	25.1	117	0	18	82													0.438	
	25.5	SPT	SM	ternary Older Alluv	35	13.1	-																	
	30.5	CR	GP	ternary Older Alluv	3	6.0	115																0.448	
	35.5	SPT	GP	ternary Older Alluv	23	18.8	-																	
	40.5	CR	GC	ternary Older Alluv	19	12.4	128	57	18	25													0.305	
	45.5	SPT	CL	ternary Older Alluv	23	19.3	-	0	41	59	33	15	18											
	50.5	CR	CL/CL-ML	ternary Older Alluv	29	18.0	108												0.06192	0.00929			0.548	
	55.5	SPT	SM	ternary Older Alluv	68	15.7	-	19	53	28					2.70									
	60.5	NR	SM	ternary Older Alluv	93/8"	-	-																	
	65.5	SPT	SM	ternary Older Alluv	50/2"	12.4	-	16	49	35					2.72									
	70.5	CR	CL	ternary Older Alluv	17	19.1	107				41	22	19		2.71				0.06143	0.02678			0.575	
	75.5	SPT	CL	ternary Older Alluv	31	19.8	-	0	27	73	37	16	21		2.70									
	80.5	CR	CL/ML	ternary Older Alluv	22	20.4	104	0	21	79				0.05%									0.608	
	85.5	SPT	SM	ternary Older Alluv	88	14.2	-																	
	90.5	CR	ML	ternary Older Alluv	16	22.1	107																0.569	
	95.5	SPT	CL	ternary Older Alluv	47	16.3	-																	
	100.5	CR	ML	ternary Older Alluv	28	22.7	101																0.658	
G-189	5.5	CR	CH	ternary Younger Allu	11	23.7	89				50	20	30										0.907	
	10.5	SPT	ML	ternary Younger Allu	5	17.4	-									8	14.0	2	1,760					
	15.5	CR	SM	ternary Older Alluv	29	7.1	121				NP	NP	NP										0.377	300 39
	20.5	SPT	SM	ternary Older Alluv	54	13.6	-																	
	25.5	CR	SM	ternary Older Alluv	41	8.3	112	8	68	24					2.76								0.538	
	28.5	SPT	CL	ternary Older Alluv	13	26.4	-																	
	33.5	CR	CL	ternary Older Alluv	14	22.3	103				41	15	26										0.63	
	40.5	SPT	SM	ternary Older Alluv	40/6"	12.5	-									8	19.0	6	4,800					
	45.5	CR	SM	ternary Older Alluv	75	7.4	115	20	59	21					2.81				0.03355	0.0061			0.525	
	50.5	NR	ML	akewood Formatio	37	-	-																	
	55.5	CR	ML	akewood Formatio	23	27.0	98				42	29	13										0.713	550 32
	60.5	SPT	ML/SM	akewood Formatio	50	16.2	-																	
	65.5	CR	CL	akewood Formatio	21	23.5	101	0	22	78	36	16	20		2.80								0.73	
	70.5	SPT	CL/SM	akewood Formatio	53	23.5	-									7	33.0	11	2,280					
	75.5	CR	SM/CL	akewood Formatio	33	21.2	106	0	27	73													0.572	
	80.5	SPT	CL	akewood Formatio	36	25.1	-				41	15	26											
	85.5	CR	CL/CH	akewood Formatio	35	30.7	93	0	1	99	73	20	53		2.83				0.07216	0.02659			0.899	
	90.5	SPT	CH/SM	akewood Formatio	82	18.6	-							0.24%										
	95.5	CR	CH	akewood Formatio	24	30.9	91	0	1	99	56	18	38						0.0738	0.04613			0.845	
	100.5	SPT	CH	akewood Formatio	25	25.9	-									7	54.0	6	1,400					
	105.5	CR	ML	an Pedro Formatio	30	25.7	96	0	17	83													0.749	
	110.5	SPT	CL	an Pedro Formatio	28	30.0	-				45	15	30											
	115.5	CR	SP-SM	an Pedro Formatio	75	14.7	109	5	86	9														
	120.5	SPT	SP-SM	an Pedro Formatio	50/5"	16.8	-																	
G-190	5.5	CR	ML	ternary Younger Allu	5	26.5	93																0.805	
	10.5	SPT	SC	ternary Younger Allu	5	24.4	-	11	48	41	42	18	24		2.68									
	15.5	CR	ML	ternary Younger Allu	10	-	-																	
	20.5	SPT	ML	ternary Younger Allu	11	23.6	-									8	9.2	4	1,000					
	25.5	NR	ML	ternary Younger Allu	39	-	-																	
	30.5	SPT	CL	ternary Older Alluv	31	18.5	-	0	15	85	41	14	27											
	35.5	CR	SC	ternary Older Alluv	28	14.7	117	2	49	49	31	17	14		2.66								0.419	700 34
	40.5	SPT	SM	ternary Older Alluv	41	15.7	-	14	48	38														
	45.5	NR	SM	ternary Older Alluv	50	-	-																	
	47.5	CR	SM	ternary Older Alluv	30	23.4	101	0	56	44													0.65	
	50.5	SPT	SM/ML	ternary Older Alluv	22	24.9	-																	
	55.5	CR	CH	ternary Older Alluv	33	26.2	95	0	11	89	52	18	34		2.73				0.0771	0.01076			0.793	
	60.5	SPT	CL	ternary Older Alluv	17	22.6	-								2.74									
	65.5	CR	CL	ternary Older Alluv	31	18.8	111	0	33	67	29	19	10										0.512	1,200 34
	70.5	SPT	CL	ternary Older Alluv	49	24.9	-									8	52.0	11	1,400					
	75.5	CR	CL	ternary Older Alluv	25	21.9	105	1	29	70	30	19	11		2.67								0.587	1,500 30
	80.5	SPT	ML	ternary Older Alluv	28	25.6	-									8	80.0	7	1,360	0.11744	0.02222			
	85.5	CR	ML	akewood Formatio	38	22.0	101	0	28	72													0.662	
	90.5	SPT	ML/SM	akewood Formatio	77	25.7	-																	
	95.5	CR	CH	akewood Formatio	25	26.9	94	0	7	93	60	19	41						0.10537	0.04822			0.786	
	100.5	SPT	CH	akewood Formatio	25	27.2	-																	
	105.5	CR	ML	akewood Formatio	65	20.2	105	0	49	51													0.599	

TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained	
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)
	110.5	SPT	SP-SM	akewood Formatio	81	13.3	-																	
	115.5	CR	SM	akewood Formatio	88/9"	8.0	126															0.322		
	120.5	SPT	SM	akewood Formatio	50/5"	7.4	-	28	55	17														
G-191	10.5	CR	SC-SM	ternary Younger Allu	push	8.7	120																	
	15.5	SPT	SC-SM	ternary Younger Allu	14	--	--								8	45.0	2	3,680						
	25.5	CR	SC-SM	ternary Younger Allu	22	12.6	118				26	21	5									500	43	
	35.5	CR	SM	ternary Younger Allu	18	7.5	118	10	65	25				2.81					0.04161	0.00446				
	36.5	SPT	SM	ternary Younger Allu	26	6.4	-																	
	45.5	SPT	SM	ternary Younger Allu	54	12.6	-																	
	50.5	CR	SP-SM	ternary Younger Allu	23	12.5	113	34	55	11				2.77										0.53
	55.5	SPT	SC	ternary Older Alluv	54	21.7	-	4	49	47	28	18	10											
	65.5	CR	CL	akewood Formatio	12	23.5	102	0	20	80	48	24	24											0.725
	70.5	SPT	CL	akewood Formatio	35	27.2	-																	
	75.5	CR	CL	akewood Formatio	18	24.3	100	0	12	88	43	17	26						0.07392	0.02816				0.76
	80.5	SPT	CL	akewood Formatio	52	24.4	-				29	17	12											
	85.5	CR	ML	akewood Formatio	50	20.8	-																	
	90.5	CR	SM	akewood Formatio	35	15.2	108	6	62	32				0.24%										0.554
	95.5	SPT	SM	akewood Formatio	24	38.2	-																	
	100.5	CR	CL	akewood Formatio	17	22.8	104	0	26	74	36	14	22											0.686
	105.5	SPT	SM/CL	akewood Formatio	55	31.8	-																	
	110.5	CR	SP	akewood Formatio	68	16.1	106																	0.572
	115.5	SPT	SP	akewood Formatio	97	18.7	-																	
	120.5	CR	SP	akewood Formatio	56	17.1	113																	0.474
G-199	10.5	CR	SP	ternary Younger Allu	push	4.1	114																	0.461
	15.5	SPT	CL	ternary Younger Allu	8	25.2	-																	
	30.5	CR	GW	ternary Older Alluv	5	3.6	-	71	25	5				2.70										
	31.5	SPT	GW	ternary Older Alluv	50/5"	-	-								8	53.0	3	6,400						
	35.5	NR	GW	ternary Older Alluv	23	-	-																	
	40.5	CR	SC-SM	ternary Older Alluv	25	9.5	130	19	48	33	21	16	5											0.301
	50.5	SPT	SC-SM	ternary Older Alluv	36	10.1	-																	300
	60.5	CR	SM	ternary Older Alluv	28	12.0	127																	0.312
	67.5	SPT	CL	ternary Older Alluv	33	19.8	-	12	36	52	30	17	13											600
	75.5	CR	SM	ternary Older Alluv	27	16.6	107	0	57	43	NP	NP	NP						0.0545	0.00856				0.557
	80.5	SPT	ML	ternary Older Alluv	88	18.3	-								8	22.0	7	2,720						0.501
	85.5	CR	SM	ternary Older Alluv	18	18.1	111	1	68	30														0.501
	90.5	SPT	SM/ML	ternary Older Alluv	64	21.8	-																	
	95.5	CR	CH	akewood Formatio	16	19.1	106	0	15	85	51	16	35						0.05403	0.02145				0.589
	100.5	SPT	SP-SM	akewood Formatio	79	17.6	-																	2,000
	105.5	CR	ML	San Pedro Formatio	20	25.4	96																	0.749
	110.5	SPT	ML	San Pedro Formatio	60	30.6	-																	
	115.5	CR	CL-ML	San Pedro Formatio	34	30.3	92																	
	120.5	SPT	SP	San Pedro Formatio	50	17.4	-																	
G-200 Alt	5.5	CR	CL	ternary Older Alluv	7	19.5	105																	0.599
	10.5	SPT	CL	ternary Older Alluv	15	19.0	-	1	30	69	41	13	28											
	15.5	CR	CL	ternary Older Alluv	8	21.5	105																	0.599
	20.5	SPT	CL	ternary Older Alluv	19	20.3	-																	
	25.5	CR	SM	ternary Older Alluv	24	22.2	104	0	51	49	NP	NP	NP						0.05767	0.00801				0.602
	30.5	SPT	CL/SM	ternary Older Alluv	26	26.7	-																	
	35.5	CR	CL	ternary Older Alluv	16	22.0	103																	0.63
	40.5	SPT	CL	ternary Older Alluv	18	23.2	-																	
	45.5	CR	SM	ternary Older Alluv	35	16.0	112	5	75	20														0.488
	50.5	SPT	CH	ternary Older Alluv	14	35.3	-	0	5	95	54	17	37						0.06845	0.00744				0.907
	55.5	CR	CH	ternary Older Alluv	14	36.3	88																	
	60.5	SPT	SM	ternary Older Alluv	50/6"	13.9	-	15	64	21														
	65.5	CR	CL/SC	ternary Older Alluv	30	16.8	106	5	48	47	37	13	24											0.584
	70.5	SPT	SC	ternary Older Alluv	23	23.7	-																	
	75.5	CR	SC/ML	akewood Formatio	36	19.4	103	5	20	75				2.80					0.1289	0.0229				0.696
	80.5	SPT	SC	akewood Formatio	39	18.0	-								8	17.0	4	3,400						
	85.5	CR	CL/SM	akewood Formatio	30	20.7	106	0	32	68	38	14	24											0.584
	90.5	SPT	CL	San Pedro Formatio	26	32.4	-								8	65.0	5	1,760						
	95.5	CR	CL	San Pedro Formatio	37	14.6	108	1	33	66	46	14	32						0.07227	0.02248				0.606
	100.5	SPT	CL	San Pedro Formatio	27	34.9	-								9	504.0	5	640						
	105.5	CR	CH	San Pedro Formatio	31	27.5	95	0	7	93	72	19	53						0.12369	0.05124				0.767
	110.5	SPT	SP	San Pedro Formatio	50/6"	18.3	-																	
	115.5	CR	SP	San Pedro Formatio	87/10"	17.9	112																	0.488
G-203	5.5	CR	CL	ternary Older Alluv	20	16.3	109				39	16	23											0.54
	10.5	SPT	CL/SC	ternary Older Alluv	17	12.1	-	11	46	43	22	14	8											
	15.5	CR	CL	ternary Older Alluv	9	22.5	98				30	19	11											0.713

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained				
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)		
	20.5	SPT	SM	ternary Older Alluv	34	12.5	-	19	54	27																	
	25.5	CR	SM/ML	ternary Older Alluv	11	21.9	95				31	25	6										0.754				
	30.5	SPT	ML	ternary Older Alluv	23	16.8	-								8	150.0	43	1,720									
	35.5	CR	CL	ternary Older Alluv	28	14.4	106				31	15	16										0.584				
	40.5	SPT	ML	ternary Older Alluv	20	16.8	-	2	27	71					8	250.0	242	760									
	45.5	CR	CL	ternary Older Alluv	32	17.8	-																				
	50.5	SPT	CL	ternary Older Alluv	21	22.4	-				40	16	24										700	34			
	55.5	CR	SM	ternary Older Alluv	52	17.1	89	0	70	30				2.61										0.83			
	60.5	SPT	ML/SP-SM	ternary Older Alluv	70	15.0	-																				
	65.5	CR	CL	ternary Older Alluv	29	17.3	107	5	22	73	41	18	23	2.62										0.528	100	31	
	70.5	SPT	SM	ternary Older Alluv	41	18.3	-	4	52	44																	
	75.5	CR	SM	ternary Older Alluv	75/6"	8.4	126	18	65	17														0.322			
	80.5	SPT	CL	ternary Older Alluv	35	17.6	-								8	50.0	16	3,360									
	85.5	CR	CL/SM	ternary Older Alluv	39	23.2	102																	0.646			
	90.5	SPT	SM	ternary Older Alluv	42	10.5	-	9	62	29	NP	NP	NP														
	95.5	CR	CL	ternary Older Alluv	59	21.3	106				32	18	14						0.07128	0.02218				0.584			
	100.5	SPT	CL	ternary Older Alluv	44	18.4	-																				
	105.5	CR	ML	ternary Older Alluv	60	17.5	110	1	18	81														0.526			
	110.5	SPT	ML	ternary Older Alluv	43	16.4	-																				
	115.5	CR	ML	ternary Older Alluv	40	20.5	102																	0.646			
	120.5	SPT	ML	ternary Older Alluv	65	-	-																				
G-204	5.5	CR	CL	ternary Younger Alluv	10	16.5	111				25	16	9											0.512	350	36	
	10.5	SPT	ML	ternary Younger Alluv	10	17.2	-								7	7.3	2	2,400									
	15.5	CR	SM	ternary Older Alluv	45	19.4	100	12	43	45														0.666			
	20.5	SPT	ML	ternary Older Alluv	12	18.1	-																				
	25.5	CR	SM/SW	ternary Older Alluv	28	15.6	122	11	42	47														0.366			
	30.5	SPT	SW	ternary Older Alluv	43	11.3	-																				
	35.5	CR	CL	ternary Older Alluv	21	16.8	112	0	30	70	31	16	15	2.68										0.493	450	34	
	40.5	SPT	CL	ternary Older Alluv	18	18.1	-								7	264.0	115	960									
	45.5	CR	SM	ternary Older Alluv	42	16.0	110	36	41	23														0.515			
	50.5	SPT	SM	ternary Older Alluv	33	22.2	-																				
	55.5	CR	SM	ternary Older Alluv	33	16.4	101	0	32	68				2.59										0.6			
	60.5	SPT	SW-SM	ternary Older Alluv	50/6"	10.0	-																				
	65.5	CR	SW	ternary Older Alluv	75	8.5	-																				
	70.5	SPT	SC-SM	ternary Older Alluv	50/4"	13.3	-	26	41	33	26	20	6	2.74													
	75.5	NR	SC-SM	ternary Older Alluv	75	-	-																				
	80.5	SPT	CL	ternary Older Alluv	26	19.4	-								8	81.0	16	1,400									
	85.5	CR	CL	ternary Older Alluv	41	24.0	-	0	26	74	29	19	10														
	90.5	SPT	CL	ternary Older Alluv	59	16.0	-				28	19	9														
	95.5	CR	SM	ternary Older Alluv	96	18.0	111	36	47	17														0.501			
	100.5	SPT	SM/CL	ternary Older Alluv	39	18.8	-				30	19	11														
	105.5	CR	SM	ternary Older Alluv	54	18.8	111												0.09006	0.01801				0.501			
	110.5	SPT	SM/SW	ternary Older Alluv	60	22.6	-																				
	115.5	CR	SM/ML	ternary Older Alluv	60	17.9	110	1	66	33														0.515			
	120.5	SPT	ML	ternary Older Alluv	43	25.2	-																				
G-205	5.5	CR	CL	ternary Older Alluv	36	14.4	114				35	16	19											0.472			
	10	SPT	CL	ternary Older Alluv	7	14.5	-				33	20	13														
	15.5	CR	CL	ternary Older Alluv	25	27.0	95				26	18	8											0.767	300	34	
	20	SPT	CL	ternary Older Alluv	25	12.3	-																				
	25.5	CR	CL	ternary Older Alluv	44	12.7	119				25	14	11											0.411	600	36	
	30	SPT	CL	ternary Older Alluv	14	17.6	-																				
	35.5	CR	CL	ternary Older Alluv	28	17.4	112	0	26	74	34	19	15		7	559.0	75	760					0.499				
	40.5	SPT	SM	ternary Older Alluv	28	17.1	-																				
	45.5	CR	SM	ternary Older Alluv	31	14.1	114	10	65	25	NP	NP	NP											0.461			
	50	SPT	ML	ternary Older Alluv	58	24.9	-								8	28.0	43	3,560									
	55.5	CR	SM	ternary Older Alluv	28	17.0	95	0	65	35														0.754			
	60.5	SPT	SM	ternary Older Alluv	58	14.9	-																				
	65.5	CR	SM/ML	ternary Older Alluv	33	9.5	111	0	17	83														0.501			
	70	SPT	ML	ternary Older Alluv	28	28.9	-	1	33	66																	
	75.5	CR	ML	ternary Older Alluv	24	34.2	92																		0.825		
	80	SPT	ML	ternary Older Alluv	21	24.6	-	0	29	71																	
	85.5	CR	GW-GM/SM	ternary Older Alluv	80	14.5	112	34	49	17																	
	90	SPT	SM/ML	ternary Older Alluv	38	21.9	-	2	37	61																	
	95.5	CR	GW	ternary Older Alluv	75/8"	11.4	124								8	73.0	15	1,560						0.344			
	100.5	SPT	CL	ternary Older Alluv	33	23.9	-				38	22	16														
	105.5	CR	CL/SM	ternary Older Alluv	40	21.2	106																		0.584		
	110.5	SPT	ML	ternary Older Alluv	39	17.6	-																				
	115.5	CR	GW-GM	ternary Older Alluv	100/5"	9.7	133																				

**TABLE F-1.2 (CONTINUED) - SOIL LABORATORY TESTING SUMMARY (Rotary-Wash Borings)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT**

Boring No.	Sample Depth (ft)	Sample Type	USCS Group Symbol	Geologic Formation	Raw Blow Count (blows/ft)	Moisture Content (%)	Dry Density (pcf)	Grain Size			Atterberg Limits			Expansion / Collapse	Specific Gravity	Corrosion			Compression Indices		Tar Content	Void Ratio	Triaxial Consolidated-Undrained		
								Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI			pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	C _c			C _r	Effective cohesion (psf)	Effective Friction Angle (degrees)
G-206	120.5	SPT	ML	ternary Older Alluv	50/3"	12.1	-																		
	5.5	CR	SM	ternary Older Alluv	push	11.0	112																	0.488	
	10.5	CR	SC	ternary Older Alluv	push	18.2	106																	0.573	
	15.5	SPT	SM	ternary Older Alluv	40	10.3	-	25	59	16															
	20.5	CR	SW-SM	ternary Older Alluv	24	12.7	118																		
	25.5	SPT	SC	ternary Older Alluv	35	13.4	-	7	69	24															
	30.5	CR	ML	akewood Formatio	13	25.1	98												0.09422	0.03083				0.713	
	35.5	SPT	ML	akewood Formatio	36	-	-									8	99.0	13	1,120						
	40.5	CR	ML	an Pedro Formatio	19	24.0	104	0	31	69	NP	NP	NP											0.614	
	45.5	SPT	CH	an Pedro Formatio	34	33.3	-	0	16	84	60	21	39		2.57										
	50.5	CR	SM	an Pedro Formatio	70	11.5	123	27	54	19				0.11%										0.351	
	55.5	SPT	ML	an Pedro Formatio	30	-	-									8	455.0	21	560						
	60.5	CR	SP-SM	an Pedro Formatio	44	19.5	101	0	91	10															
	65.5	SPT	SM	an Pedro Formatio	60	22.4	-																		
	70.5	CR	SP/SW-SM	an Pedro Formatio	36	29.6	96	19	75	6					2.66										0.729
75.5	SPT	SILTSTONE	Fernando Formatio	43	36.2	-									4	3068.0	96	440							
80.5	CR	SILTSTONE	Fernando Formatio	18	70.0	55	0	7	93	66	48	18		2.46										1.791	
85.5	SPT	SILTSTONE	Fernando Formatio	86	41.9	-									4	5799.0	210	312							
90.5	CR	SILTSTONE	Fernando Formatio	18	30.0	90																			
95.5	SPT	SILTSTONE	Fernando Formatio	68	34.7	-																			
100.5	CR	SILTSTONE	Fernando Formatio	23	56.4	68																			
105.5	SPT	SILTSTONE	Fernando Formatio	51	33.4	-																			
110.5	CR	SILTSTONE	Fernando Formatio	25	31.3	87																			
115.5	SPT	SILTSTONE	Fernando Formatio	70	51.7	-																			
120.5	CR	SILTSTONE	Fernando Formatio	26	47.6	73																			
G-207	5.5	CR	CL	Fill	push	18.9	108																	0.554	
	10.5	CR	SC	ternary Older Alluv	push	15.8	106	0	50	50															0.572
	15.5	SPT	SM	ternary Older Alluv	24	9.5	-			22															
	20.5	CR	SM	ternary Older Alluv	6	18.0	105																		0.587
	25.5	SPT	SM/CL	ternary Older Alluv	20	17.1	-			16															
	30.5	CR	CH	an Pedro Formatio	12	27.6	91	0	7	93	53	23	30		2.54										0.742
	35.5	SPT	CL	an Pedro Formatio	26	33.3	-																		
	40.5	CR	SM	an Pedro Formatio	21	17.0	111	0	86	14				1.01%	2.63										0.478
	45.5	SPT	SM	an Pedro Formatio																					0.557
	50.5	CR	SM/CL	an Pedro Formatio	18	17.1	107																		
	51.5	SPT	CL	an Pedro Formatio	29	30.3	-	0	18	82	47	19	28		2.63										
	55.5	CR	SP-SM	an Pedro Formatio	24	25.8	103	0	94	6				0.06%											
	60.5	CR	SP-SM	an Pedro Formatio	42	26.6	101								2.62										0.515
	71.5	CR	SM	an Pedro Formatio	32	8.4	110	37	50	13															
	75.5	SPT	SILTSTONE	Fernando Formatio	90/11"	20.6	-									3	3192.0	222	312						1.117
80.5	CR	SILTSTONE	Fernando Formatio	23	35.6	79	0	17	83	54	42	12		2.68											
85.5	SPT	SILTSTONE	Fernando Formatio	74	35.8	-																			
90.5	CR	SILTSTONE	Fernando Formatio	32	29.7	90																			
95.5	SPT	SILTSTONE	Fernando Formatio	92/10"	34.5	-																			
100.5	CR	SILTSTONE	Fernando Formatio	23	27.4	93																		0.618	

CR Crandall Sample
SPT Standard Penetration Test
"Gravel" Particle size greater than No. 4 sieve
"Sand" Particle size less than No. 4 sieve but greater than No. 200 sieve
"Fines" Particle size less than No. 200 Sieve
NP Nonplastic

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
S-101	19-20	CL	San Pedro	15.3	0	47	53	46	25	21						
	23-24	MH	San Pedro	26.8				55	32	23						
	28.5-29.1	MH	San Pedro	25.5			53									
	30.1-30.9	MH	San Pedro	23.9												
	33.1-33.9	CL	San Pedro	26.1	0	35	65	41	24	17	2.64	8.0	420	47	1,000	
	34.8-35.5	CL	San Pedro	16.2												
	39-40	SC	San Pedro	16.1	12	65	23	32	17	15						
	42.6-43.6	MH	San Pedro	16.9												
	44.4-45.4	MH	San Pedro	34.2	0	8	92	52	29	23	2.60	7.6	2,120	50	480	
	49.5-50.5	SM	San Pedro	15.3	0	79	21									
	53-54	SM	San Pedro	16.0												
	55-56	SM	San Pedro	16.1	6	80	14				2.62					
	60-61	SM	San Pedro	8.2												
	63-64	SM	San Pedro	7.6	31	57	12				2.69					
	65.5-66.5	SM	San Pedro	20.8												
	67-68.2	SM	San Pedro	15.1	34	34	32									
	71-72	SILTSTONE	Fernando	27.8				37	29	8		5.1	2,660	233	440	
76-77	SILTSTONE	Fernando	32.0			99										
77-78	SILTSTONE	Fernando	32.6			98										
82-83	SILTSTONE	Fernando	35.9				52	39	13							
87-88	SILTSTONE	Fernando	25.0													
S-102	27-28	CL	Lakewood	16.4				32	22	10		6.3	87	21	1,400	
	29-30	CL-ML	San Pedro	30.3							2.65					
	31.2-32	ML	San Pedro	18.3	1	35	64	39	26	13						
	33.6-34.6	CL-ML	San Pedro	20.7								7.5	44	23	880	
	38.5-39.5	ML	San Pedro	20.4				52	32	20						
	40.5-41.5	ML	San Pedro	17.9												
	42.7-43.7	ML	San Pedro	21.2	0	33	67	NP	NP	NP						
	45.3-46.3	SM	San Pedro	19.1	0	51	49									
	48.5-49.5	SC	San Pedro	17.8	0	54	46	44	25	19	2.66					
	53.6-54.6	SC	San Pedro	18.6								7.3	1,003	12	880	
	56.1-57.1	MH	San Pedro	29.4	0	13	87	55	31	24						
	60-61	SM	San Pedro	14.7	0	87	13									
	64-65	SM	San Pedro	16.5								7.3	256	12	1,960	
	67-68	SP-SM	San Pedro	13.9	0	93	7				2.68					
	71-72	SP-SM	San Pedro	9.5												
	72.5-73	SP-SM	San Pedro	8.2	25	67	8	NP	NP	NP						
	75-76	SM	San Pedro	24.4												
79-80	SILTSTONE	Fernando	33.6	0	5	95	50	33	17							
84-85	SILTSTONE	Fernando	33.0								7.0	2,230	208	480		
87-88	SILTSTONE	Fernando	36.3	0	4	96	56	38	18							
S-103A	7-8	ML	Lakewood	16.2												
	14-15	MH	Lakewood	27.5	0	26	74	89	41	48						
	17-18	SM	Lakewood	9.8												
	22-23	SM	Lakewood	4.4												
	26-27	SM	Lakewood	5.1	0	87	13	NP	NP	NP						
	28-29	SM	Lakewood	5.3												
	32-33	CH	Lakewood	28.7				75	22	53						
	35-36	CH	Lakewood	28.4												
	38-39	CH	Lakewood	27.4												
	42-43	CH	Lakewood	22.5												
	46-47	CH	San Pedro	24.3	0	2	98	55	21	34	2.68					
	48-49	CH	San Pedro	21.4												
	52-53	SM	San Pedro	16.6												
56-57	SP	San Pedro	19.1													

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
 MTA WESTSIDE SUBWAY EXTENSION
 GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	59-60	SP	San Pedro	19.2	0	96	4	NP	NP	NP						
	62-63	SP	San Pedro	17.3												
	66-67	SP	San Pedro	22.2												
	68-69	SM	San Pedro	27.6	0	85	15	NP	NP	NP	2.63					
	71-72	SM	San Pedro	19.8												
	76-77	SILTSTONE	Fernando	44.7												
	81-82	SILTSTONE	Fernando	42.5	0	11	89	61	41	20	2.57					
	86-87	SILTSTONE	Fernando	36.5								6.9	1,637	349	408	
	91-92	SILTSTONE	Fernando	31.8												
	96-97	SILTSTONE	Fernando	37.7	0	1	99	58	33	25						
	101-102	SILTSTONE	Fernando	39.9												
	106-107	SILTSTONE	Fernando	32.6	0	3	97	51	31	20						
	111-112	SILTSTONE	Fernando	40.1							2.64	5.0	5,384	599	244	
	113-114	SILTSTONE	Fernando	43.4												
	117-118	SILTSTONE	Fernando	34.9												
	121-122	SILTSTONE	Fernando	33.1	0	2	98	58	36	22						
	126-127	SILTSTONE	Fernando	39.3												
S-104	8-9	SM	Lakewood	7.9	2	83	15									
	12.5-13.5	ML	Lakewood	18.8												
	17-18	CH	Lakewood	31.3				79	19	60						
	23-24	CL-ML	San Pedro	31.6	3	32	65									
	30-31	CL-ML	San Pedro	18.1												
	35-36	SC	San Pedro	18.6	26	27	47	45	13	32						
	39.5-40.5	SM	San Pedro	17.7	0	74	26									
	44.5-45	CL-ML	San Pedro	22.7	9	16	76									
	47-48	CL-ML	San Pedro	25.3							2.66	7.8	1,199	11	480	
	54.5-55.5	SP-SM	San Pedro	14.4	0	88	12									
	59.5-60.5	SP-SM	San Pedro	-												
	64.5-65.5	SP-SM	San Pedro	19.5							2.68					
	67-68	SP-SM	San Pedro	17.1	0	90	10									
	73-74	SP-SM	San Pedro	16.0												
	77-78	SM	San Pedro	20.1	0	87	13									
	81-82	SW-SM	San Pedro	-												
	82-83	SM	San Pedro	17.1	0	80	20									
	86-87	SILTSTONE	Fernando	34.2	0	3	97	39	25	14	2.78	3.7	6,721	109	325	
	89-90	SILTSTONE	Fernando	32.8												
	92-93	SILTSTONE	Fernando	33.9	0	1	99	45	25	20						
	97-98	SILTSTONE	Fernando	42.1								5.1	7,926	634	220	
	101.2-102.2	SILTSTONE	Fernando	33.1				49	25	24						
	106.2-107.2	SILTSTONE	Fernando	34.7	0	1	99									
	111.2-110.2	SILTSTONE	Fernando	36.0												
S-105	11-12	SM	San Pedro	8.9	0	87	13								10.5	
	14.5-15.5	ML/SM	San Pedro	4.6												
	17-18	SM	San Pedro	6.7	0	84	16								12.0	
	22-23	ML	San Pedro	17.8												
	26-27	SM	San Pedro	23.4	0	54	46	NP	NP	NP					20.4	
	27-28	SM	San Pedro	23.4												
	32-33	SP-SM	San Pedro	3.4	3	88	9								13.5	
	38-39	SP-SM	San Pedro	2.0												
	42-43	SP-SM	San Pedro	2.1							2.68				16.8	
	46-47	SP-SM	San Pedro	2.4												

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	49-50	SM	San Pedro	2.1												
	52-53	SP-SM/SM	San Pedro	2.3	18	74	8								10.5	
	54.5-55.5	SW	San Pedro	1.5												
	57-58	SW-SM	San Pedro	2.5	1	89	10								12.3	
	61-62	ML	San Pedro	5.8												
	63-64	ML	San Pedro	5.0												
	66-67	SILTSTONE	Fernando	21.5												
	71-72	SILTSTONE	Fernando	20.0							4.6	4,011	2,836	244		
	72-73	SILTSTONE	Fernando	19.8	0	33	67	NP	NP	NP					18.7	
	76-77	SILTSTONE	Fernando	17.6												
	78-79	SILTSTONE	Fernando	19.1												
	82-83	SILTSTONE	Fernando	20.1	0	25	75	NP	NP	NP					18.4	
	86-87	SILTSTONE	Fernando	19.5							5.8	3,907	2,355	320		
	91-92	SILTSTONE	Fernando	22.4												
	96-97	SILTSTONE	Fernando	21.0	0	21	79	NP	NP	NP					19.3	
	101-102	SILTSTONE	Fernando	19.0							5.4	5,897	2,776	276		
S-106	11-12	ML	Quaternary Older Alluvium	17.0												
	16-17	ML	Quaternary Older Alluvium	16.9												
	18-19	SM	Quaternary Older Alluvium	23.1	2	85	13	NP	NP	NP					5.7	
	21-22	SM	Quaternary Older Alluvium	16.4	0	86	14	NP	NP	NP					9.2	
	23-24	ML	Quaternary Older Alluvium	18.6							3.4	8,790	8.1	560		
	26-27	SM	Quaternary Older Alluvium	11.2	0	81	19	NP	NP	NP					3.7	
	29-30	ML	Quaternary Older Alluvium	18.9												
	31-32	ML	Quaternary Older Alluvium	16.3												
	33-34	ML	Quaternary Older Alluvium	13.3							7.4	580	7.4	920		
	36-37	SM	Quaternary Older Alluvium	12.0	0	62	38	NP	NP	NP					9.1	
	37-38	ML	San Pedro	19.4												
	40-41	ML	San Pedro	18.0												
	42-43	SP-SM	San Pedro	8.5	2	87	11				2.69					
	45-46	SP-SM	San Pedro	6.1												
	47-48	SP-SM	San Pedro	7.9							7.7	81	3.3	2,760		
	51-52	SM	San Pedro	6.2	1	87	12								15.1	
	52-53	GM	San Pedro	4.9												
	54-55	SM	San Pedro	5.3							2.66					
	57-58	SM	San Pedro	4.6	0	86	14								16.5	
	61-62	SM	San Pedro	3.9							6.4	83	3.0	26,400		
	63-64	SM	San Pedro	3.6												
	66-67	SM	San Pedro	4.5	0	82	18								18.5	
	67-68	ML	San Pedro	9.1												
	71.5-72.5	SW-SM	San Pedro	32.3	0	90	10								12.9	
	73.5-74.5	ML	San Pedro	4.2												
	77-79	SM	San Pedro	5.1							3.3	111	6.9	14,400		
	81-82	SM	San Pedro	4.4	0	80	20				2.68				17.6	
	83-84	SM	San Pedro	6.5												
	91-92	SM	San Pedro	2.6							2.6	142	6.0	20,000		
	96-97	ML	San Pedro	4.3												
	101-102	ML	San Pedro	20.1												
	106-107	SP-SM	San Pedro	9.5	4	89	7	NP	NP	NP					9.2	
	108-109	SILTSTONE	Fernando	20.5							3.0	530	90	2,560		
	112-113	SILTSTONE	Fernando	7.2												
	117-118	SILTSTONE	Fernando	21.5	0	23	77	NP	NP	NP					6.4	
S-107	18.5-19.5	CL	Quaternary Younger Alluvium	24.7				38	23	15						
	23.5-24.5	CL	San Pedro	21.5							2.62					
	28-29	CL	San Pedro	21.6				41	23	18		8.1	158	47	1,240	
	32-33	CL	San Pedro	27.8												
	33.5-34.5	SC	San Pedro	19.4	6	49	45	46	24	22						

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	37-38	CH	San Pedro	35.0				78	33	45						
	42-43	CL	San Pedro	23.5		38	62	33	19	14		7.9	427	40	960	
	46-47	SM	San Pedro	18.2	1	70	29				2.53					
	48-49	SC	San Pedro	20.0	5	49	46	45	23	22	2.73					
	52-53	SM	San Pedro	17.4	8	58	34									
	57-57.5	SW-SM	San Pedro	12.9	17	72	11				2.69					
	59-60	CL	San Pedro	24.4	1	44	55	43	26	17		8.1	792	49	640	
	64-65	SC-SM	San Pedro	20.9	6	59	35									
	67-68	MH	San Pedro	35.7				73	40	33						
	71-72	MH	San Pedro	25.2												
	72-73	MH	San Pedro	30.8		15	85	63	33	30	2.67	8.0	853	97	480	
	76.1-77	SM	San Pedro	13.4	1	64	35									
	77-78	SM	San Pedro	16.8												
	82-83	ML	San Pedro	27.2												
	85-86	CL	San Pedro	22.4	1	41	58	35	23	12		7.9	696	131	760	
	87-88	ML	San Pedro	24.2												
	90-91	ML	San Pedro	19.6							2.64					
	92-93	ML	San Pedro	14.5												
	96-97	SM	San Pedro	10.5												
	97-98	ML	San Pedro	14.7												
	102-103	ML	San Pedro	15.3								8.0	921	57	480	
	109-110	ML	San Pedro	22.9												
	112-113	ML	San Pedro	-												
	115-116	ML	San Pedro	16.5												
	117-118	ML	San Pedro	12.4												
	121-122	ML	San Pedro	10.4								8.2	318	48	800	
S-108	52.5-53.5	SM	Quaternary Older Alluvium	14.0	7	59	34									
	56-57	CL-ML	Quaternary Older Alluvium	25.7												
	58.5-59.5	CL-ML	Quaternary Older Alluvium	26.4							2.68					
	63-64	MH	Quaternary Older Alluvium	22.4	1	14	85	55	33	22		8.2	27	48	1,040	
	69-70	MH	Quaternary Older Alluvium	21.4												
	72.5-73.5	MH	Quaternary Older Alluvium	25.2	0	19	81	63	35	28						
	75.5-76.5	MH	Quaternary Older Alluvium	24.6								8.0	24	43	1,560	
	78-79	CH	Quaternary Older Alluvium	16.8	0	29	71	50	27	23						
	81-82	CH	Quaternary Older Alluvium	14.9												
	82-83	CL	Quaternary Older Alluvium	17.3	0	34	66	47	24	23		8.0	14	38	1,560	
	86-87	SC	Quaternary Older Alluvium	9.5	25	51	24									
	89.5-90.5	SC	Quaternary Older Alluvium	10.9												
	91-92	SM	Quaternary Older Alluvium	10.7	22	51	27	NP	NP	NP						
	93-94	GW-GM	Quaternary Older Alluvium	7.8	48	45	7				2.72					
	95.5-96.5	GW-GM/CL	Quaternary Older Alluvium/San Pe	14.3												
	97-98	ML	San Pedro	22.7	3	28	69	NP	NP	NP		8.0	11	39	1,800	
	104.5-105.5	CL-ML	San Pedro	29.0												
	106-107	CL-ML	San Pedro	32.5												
S-109	10-11	CL	Quaternary Younger Alluvium	22.3				47	16	31						
	15-16	CL	Quaternary Younger Alluvium	17.2												
	18-19	CL	Quaternary Younger Alluvium	20.1												
	22-23	CL	Quaternary Younger Alluvium	12.6	2	47	51	31	13	18						
	30-31	CL/CL-ML	Quaternary Younger Alluvium	21.5								6.7	53	15	1,480	
	33-34	SM	Quaternary Older Alluvium	8.4	17	52	31									

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	36-37	SM	Quaternary Older Alluvium	5.2												
	41-42	SM	Quaternary Older Alluvium	3.9	18	54	28									
	42.5-43.5	SP	Quaternary Older Alluvium	4.5							2.78					
	45-46	SM	Quaternary Older Alluvium	9.2	16	50	34									
	51-52	CL	Quaternary Older Alluvium	17.7				35	14	21						
	53-54	CL-ML	Quaternary Older Alluvium	24.4							2.79	7.1	49	9	1,200	
	56-57	CL	Quaternary Older Alluvium	16.4	8	35	57	38	14	24						
	58-59	CL	Quaternary Older Alluvium	15.3												
	61-62	CL	Quaternary Older Alluvium	19.2												
	62-63	CL	Quaternary Older Alluvium	18.1	5	42	53	35	17	18	2.74					
	65-66	CL	Quaternary Older Alluvium	24.0								7.0	84	17	1,160	
	68-69	CL	Quaternary Older Alluvium	24.9												
	74-75	CL	Quaternary Older Alluvium	16.6												
	77-78	SC	Quaternary Older Alluvium	13.6	3	56	41	30	16	14		7.2	56	12	2,520	
	80-81	SC	Quaternary Older Alluvium	-												
	82-83	ML	Quaternary Older Alluvium	16.7												
	86-87	SM	Quaternary Older Alluvium	11.8	10	44	46				2.75					
	88.5-89.5	CL	Quaternary Older Alluvium	20.7	3	16	81	37	21	16						
	92-93	CL	Quaternary Older Alluvium	18.7								4.0	79	20	2,400	
	96-97	SM	Quaternary Older Alluvium	9.8	7	57	36									
	97-98	SM	Quaternary Older Alluvium	9.1												
	101-102	CL	San Pedro	23.3				39	16	23						
	106-107	CL	San Pedro	16.9												
	112-113	CL	San Pedro	21.6				38	16	22						
	119-120	CL	San Pedro	13.1												
S-110	33-34	ML	Quaternary Older Alluvium	22.2	0	41	59	29	23	6		7.8	70	27	1,480	
	34.5-35.5	ML	Quaternary Older Alluvium	21.3												
	40.5-41.5	GC-GM	Quaternary Older Alluvium	9.7	52	35	13	25	21	4	2.68					
	44-45	CL	Quaternary Older Alluvium	17.8				45	20	25		7.5	43	12	1,040	
	49-50	CL	Quaternary Older Alluvium	38.0	0	1	99									
	54-55	CL	Quaternary Older Alluvium	20.0				49	21	28	2.64					
	60-61	CL	Quaternary Older Alluvium	17.1	0	32	68					7.7	39	12	1,000	
	66-66.6	CL/SM	Quaternary Older Alluvium	16.7	12	51	37									
	66.6-67	SM	Quaternary Older Alluvium	14.0	28	53	19	32	25	7						
	71-71.8	SM	Quaternary Older Alluvium	6.3	28	43	29									
	73-74	SM	Quaternary Older Alluvium	16.7												
	74.5-75.5	SM	Quaternary Older Alluvium	11.6												
	78-79	SW-SC	Quaternary Older Alluvium	12.1	31	59	10									
	81-82	SM	Quaternary Older Alluvium	9.9	14	48	38									
	85.5-86.5	CL-ML	Quaternary Older Alluvium	18.9												
S-111	38-39	SM	Quaternary Older Alluvium	12.7	19	65	16									
	41-42	SM	Quaternary Older Alluvium	8.4	34	46	20				2.65					
	45-46	GP-GC	Quaternary Older Alluvium	8.2	45	43	12	36	19	17						
	49-50	GC-GM	Quaternary Older Alluvium	8.5	54	33	13									
	52-53	CL	Lakewood	22.7	0	11	89	47	26	21	2.67	7.6	39	45	760	
	59-60	SM	Lakewood	5.0	0	84	16									
	65-66	SP-SM	Lakewood	15.8												
	70-71	SP-SM	Lakewood	16.9	0	90	10									
	74.5-75.5	SM	Lakewood	13.3												

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	78.5-79.5	GP-GM	Lakewood	8.2	51	38	11									
	81-82	SM	Lakewood	19.6							2.63	7.9	50	32	3,280	
	83-84	SM	Lakewood	21.6	0	86	14									
	86-87	SM	Lakewood	15.6												
	88-89	SM	Lakewood	17.1	1	86	13									
	94-95	SP-SM	Lakewood	22.1												
S-113	62-63	SC	Quaternary Older Alluvium	10.6												
	66-67	SC	Quaternary Older Alluvium	12.4												
	67-68	SC	Quaternary Older Alluvium	9.7	11	43	46	27	14	13	2.68					
	68-69	SC	Quaternary Older Alluvium	11.7												
	72-73	ML	Quaternary Older Alluvium	14.3												
	77-78	ML	Quaternary Older Alluvium	20.9												
	83-84	ML	Quaternary Older Alluvium	12.8	7	51	42	27	14	13	2.73					
	86-87	ML	Quaternary Older Alluvium	11.7												
	87-88	SW-SM	Quaternary Older Alluvium	10.7	32	58	11				2.62					
	91-92	SW-SM	Quaternary Older Alluvium	12.4												
	96-97	SW-SM	Quaternary Older Alluvium	16.4												
	98.5-99.5	SC	Quaternary Older Alluvium	12.5	5	50	46	28	14	14		6.9	26	13	1,480	
	101-102	GC-GM	Quaternary Older Alluvium	9.5												
	102-103	SM	Quaternary Older Alluvium	11.8	5	79	16									
	106-107	SC	Quaternary Older Alluvium	7.9	12	41	46	24	16	8	2.74					
	107-108	SM	Quaternary Older Alluvium	9.2	13	46	41									
	110.3-111.3	SC-SM	Quaternary Older Alluvium	15.3	0	50	49	22	18	4						
	114.3-115.3	SC-SM	Quaternary Older Alluvium	18.1								7.3	27	3.7	1,120	
	117-118	CL	Quaternary Older Alluvium	17.9	0	19	80	48	13	35	2.68					
S-114	9-10	SM	Quaternary Younger Alluvium	3.5												
	13-14	SM	Quaternary Younger Alluvium	5.1												
	17-18	SW-SM	Quaternary Younger Alluvium	3.3	45	48	7									
	21-22	SC-SM	Quaternary Younger Alluvium	15.7	13	40	47	25	18	7						
	27-28	SM	Quaternary Younger Alluvium	4.0								7.7	20	3.4	22,400	
	34-35	SM	Quaternary Younger Alluvium	6.1	23	53	25				2.74					
	38-39	SM/ML	Quaternary Older Alluvium	-												
	42-43	ML	Quaternary Older Alluvium	12.9												
	47-48	CL	Quaternary Older Alluvium	23.6	1	37	62	31	18	13						
	49-50	CL	Quaternary Older Alluvium	25.5								7.3	83	22	1,680	
	53-54	CL	Quaternary Older Alluvium	27.2							2.70					
	57-58	ML	Quaternary Older Alluvium	18.7												
	59-60	CL	Quaternary Older Alluvium	21.7	3	34	63	33	14	19						
	61-62	CL-ML	Quaternary Older Alluvium	18.8								7.3	72	13	1,880	
	66-67	ML	Quaternary Older Alluvium	9.0							2.62					
	68-69	CL	Lakewood	18.2	0	30	70	33	16	17						
	73-74	CL	Lakewood	19.6												
	77-78	CL	Lakewood	20.0	0	18	82	39	15	24						
	78-79	CH	Lakewood	23.5												
	83-84	CH	Lakewood	24.5							2.74	7.6	94	9.2	1,160	
	87-88	CH	Lakewood	28.1	0	8	92	57	18	39						
	88-89	ML	Lakewood	18.1												
	93-94	CH	Lakewood	28.2	0	5	95	62	20	42						
	97-98	ML	Lakewood	24.5												
	100-101	ML	Lakewood	23.2												
	105-106	CH	Lakewood	24.8							2.68					
	107-108	CH	Lakewood	22.9												
	108-109	CL	Lakewood	19.5												
	113-114	SP	Lakewood	21.0							2.72					
	115-116	SP	Lakewood	20.3												

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	118-119	SP	Lakewood	20.5												
S-115	11-12	CL-ML	Quaternary Older Alluvium	16.6												
	16-17	CL-ML	Quaternary Older Alluvium	15.7	2	37	62	22	16	6						
	19-20	CL-ML	Quaternary Older Alluvium	15.7								7.1	14	3.8	1,600	
	26-27	CL-ML	Quaternary Older Alluvium	11.6												
	30-31	CL	Quaternary Older Alluvium	15.8	0	22	78	39	13	26						
	35-36	SM	Quaternary Older Alluvium	5.6												
	39-40	SM	Quaternary Older Alluvium	6.1								7.2	19	3.1	5,600	
	43-44	SM	Quaternary Older Alluvium	4.9												
	47-48	SM	Quaternary Older Alluvium	4.5							2.74					
	52-53	SM	Quaternary Older Alluvium	3.9	39	45	17									
	57-58	GM	Quaternary Older Alluvium	4.0	39	38	23									
	62-63	GM	Quaternary Older Alluvium	6.2												
	68-69	ML	Quaternary Older Alluvium	25.4								7.3	47	11	1,280	
	71-72	CL	Quaternary Older Alluvium	26.2	0	8	92	41	17	24	2.75					
	74-75	ML	Quaternary Older Alluvium	16.4												
	78-79	CL	Quaternary Older Alluvium	17.6				30	17	13						
	82-83	SM	Quaternary Older Alluvium	7.2	23	55	22				2.62					
	86-87	CL	Quaternary Older Alluvium	17.2				33	15	18						
	87-88	GP-GM	Quaternary Older Alluvium	8.5	46	42	12									
89-90	GP-GM	Quaternary Older Alluvium	-													
94-95	GP-GM	Quaternary Older Alluvium	7.6													
96-97	ML	Quaternary Older Alluvium	16.3								7.3	85	16	1,880		
98.5-99.5	SM	Quaternary Older Alluvium	11.7													
102-103	CL	Quaternary Older Alluvium	20.4				33	17	16							
106-107	SM	Quaternary Older Alluvium	9.8	30	44	26										
108-109	ML	Quaternary Older Alluvium	20.7													
116-117	ML	Quaternary Older Alluvium	15.2								7.4	68	8.3	1,760		
118-119	ML	Quaternary Older Alluvium	12.1													
S-116	16-17	ML	San Pedro	13.1												
	18-19	SP-SM	San Pedro	3.3				NP	NP	NP						18.5
	22-23	ML	San Pedro	15.2												
	29-30	SP-SM	San Pedro	5.3												
	36-37	SP-SM	San Pedro	3.1												
	39-40	SP-SM	San Pedro	2.3	0	94	6				2.63					17.1
	44-45	SP-SM	San Pedro	3.9												
	48-49	SP-SM	San Pedro	5.2	1	83	16									17.7
	51-52	SP-SM	San Pedro	4.1							2.69					
	52-53	SP-SM	San Pedro	5.9												
	56-57	SP-SM	San Pedro	1.5												
	57-58	SM	San Pedro	1.1	16	71	13									12.2
	61-62	ML	San Pedro	4.8												
	62-63	ML	San Pedro	5.1				NP	NP	NP						18.0
	64-65	ML	San Pedro	4.4								4.8	492	82	1,280	
	67-68	SILTSTONE	Fernando	15.0												
	71-72	SILTSTONE	Fernando	19.1												
	76-77	SILTSTONE	Fernando	12.1	0	22	78	47	38	9	2.73					20.2
	79-80	SILTSTONE	Fernando	19.6								6.4	5,459	1,364	1,760	
81-82	SILTSTONE	Fernando	16.1	1	22	77	51	45	6							
86-87	SILTSTONE	Fernando	13.8													
89-90	SILTSTONE	Fernando	9.9								7.6	3,218	1,452	760		
91-92	SILTSTONE	Fernando	15.4	0	20	80	55	37	18	2.70					17.9	
93-94	SILTSTONE	Fernando	20.5													

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

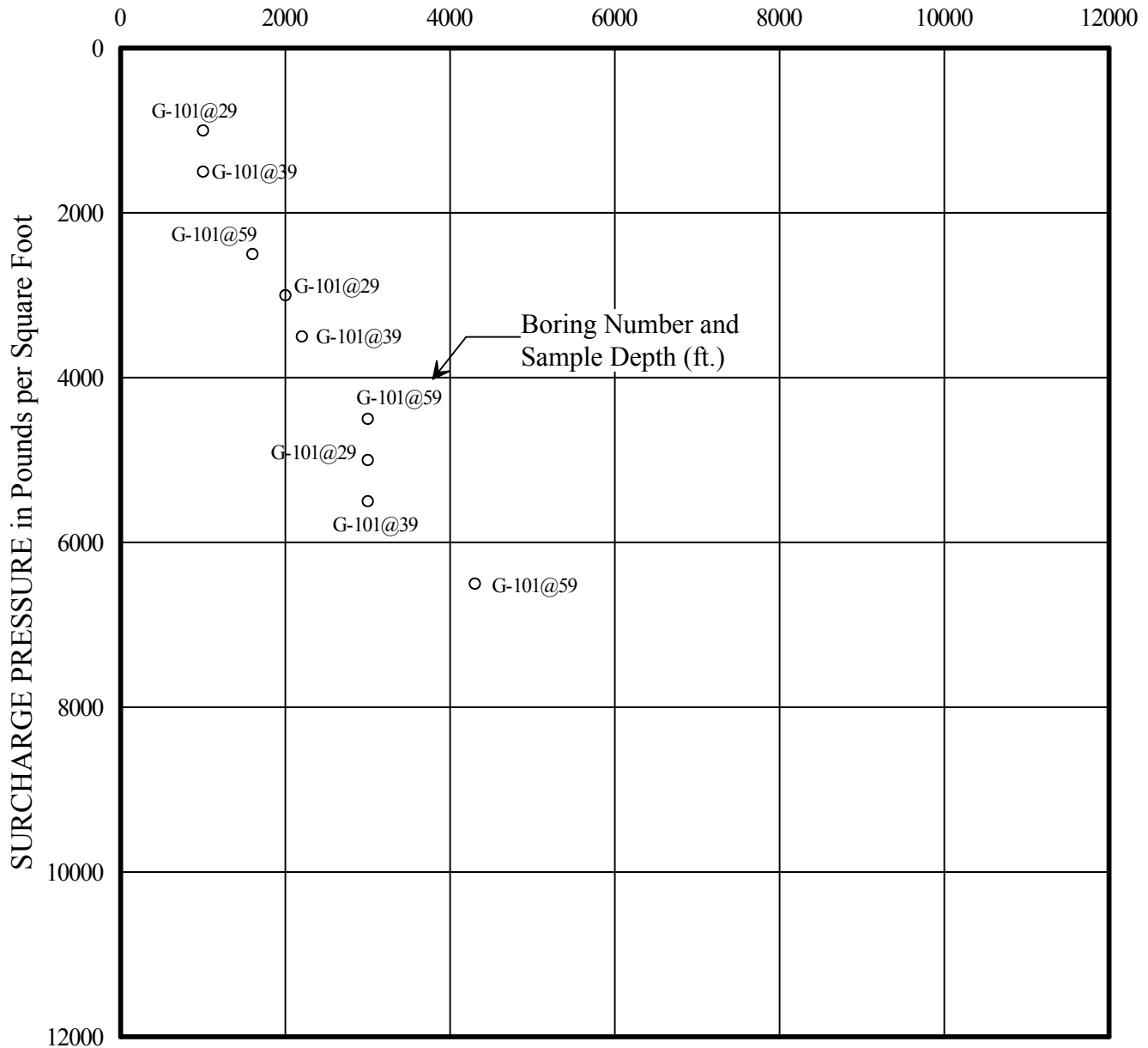
Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	96-97	SILTSTONE	Fernando	25.5												
	98-99	SILTSTONE	Fernando	11.3												16.9
	101-102	SILTSTONE	Fernando	17.1	0	24	76	47	42	5						
	104-105	SILTSTONE	Fernando	20.8								6.3	3,479	2,210	396	
	106-107	SILTSTONE	Fernando	19.2	0	23	77									
S-117	11-12	ML	Lakewood	20.8				NP	NP	NP						
	13-14	ML	Lakewood	22.3												
	16-17	ML	Lakewood	14.5								3.7	3,596	21	1,560	13.1
	19-20	SM	Lakewood	6.8												
	24-25	SM	Lakewood	5.8	0	87	13	NP	NP	NP						16.0
	30-31	SP-SM	San Pedro	2.4												
	36-37	SP-SM	San Pedro	2.8	1	88	11									16.1
	37-38	SP-SM	San Pedro	2.0												
	39-40	SM	San Pedro	5.4	0	85	15	NP	NP	NP	2.64					17.8
	44-45	SM	San Pedro	4.8												
	47-48	SP-SM	San Pedro	3.1	0	89	11									13.9
	51-52	SP-SM	San Pedro	2.2								3.5	55	7.2	220,000	
	54-55	SP-SM	San Pedro	2.9												
	55-56	SP-SM	San Pedro	2.1	4	87	9									13.4
	59-60	SM	San Pedro	-												
	62-63	SM	San Pedro	5.4	0	59	41	NP	NP	NP						17.6
	64-65	SP	San Pedro	4.1							2.68					
	67-68	SILTSTONE	Fernando	10.2	0	6	94	NP	NP	NP						19.7
	72-73	SILTSTONE	Fernando	14.0								6.9	7,151	1,154	520	
	77-78	SILTSTONE	Fernando	11.7												
	82-83	SILTSTONE	Fernando	12.0												
	87-88	SILTSTONE	Fernando	25.7												
	92-93	SILTSTONE	Fernando	25.6	0	4	96	NP	NP	NP	2.72					18.2
	97-98	SILTSTONE	Fernando	21.0								3.2	6,437	1,557	680	
S-118	7-8	ML	Lakewood	22.6				47	31	16						
	10-11	SM	Lakewood	13.7	0	71	29									
	12-13	ML	Lakewood	28.9												
	16-17	CH	San Pedro	28.2				87	33	54						
	18-19	CH	San Pedro	36.2												
	22-23	CH	San Pedro	25.0												
	27-28	CL	San Pedro	20.7				31	14	17						
	31-32	ML	San Pedro	27.3												
	34-35	CH	San Pedro	31.1				69	32	37						
	40-41	CH	San Pedro	26.7												4.0
	42-43	ML	San Pedro	14.1												
	46-47	SM	San Pedro	6.8	0	87	13									12.2
	49-50	SM	San Pedro	3.5												11.2
	54-55	SM	San Pedro	2.6												
	60-61	SM/SP-SM	San Pedro	3.2	2	89	9									15.4
	64-65	SP-SM	San Pedro	2.3												
	69-70	SP-SM	San Pedro	2.7							2.65					12.0
	72-73	SP-SM	San Pedro	2.1	4	89	7									17.4
	75-76	SP-SM	San Pedro	5.4												

TABLE F-1.3- SOIL LABORATORY TESTING SUMMARY (SONIC CORES)
MTA WESTSIDE SUBWAY EXTENSION
GEOTECHNICAL DESIGN REPORT

Boring No.	Sample Depth (ft)	USCS Group Symbol	Geologic Formation	Moisture Content (%)	GRAIN SIZE			Atterberg Limits			Specific Gravity	Corrosion				Tar Content (%)
					Gravel (%)	Sand (%)	Fines (%)	LL	PL	PI		pH	Sulfate (ppm)	Chloride (ppm)	Minimum Resistivity (ohm-cm)	
	79-80	SM	San Pedro	23.3	0	60	40									18.4
	84-85	SILTSTONE	Fernando	23.2	0	3	97	NP	NP	NP	2.70					18.7
	89-90	SILTSTONE	Fernando	-												
	94-95	SILTSTONE	Fernando	25.3	0	2	98									29.5
	99-100	SILTSTONE	Fernando	22.1												
		"Gravel"	Particle size greater than No. 4 sieve													
		"Sand"	Particle size less than No. 4 sieve but greater than No. 200 sieve													
		"Fines"	Particle size less than No. 200 Sieve													
		NP	Nonplastic													

**FIGURES F-1.1 THROUGH F-1.67
DIRECT SHEAR TEST DATA (ACE & PE PHASES)**

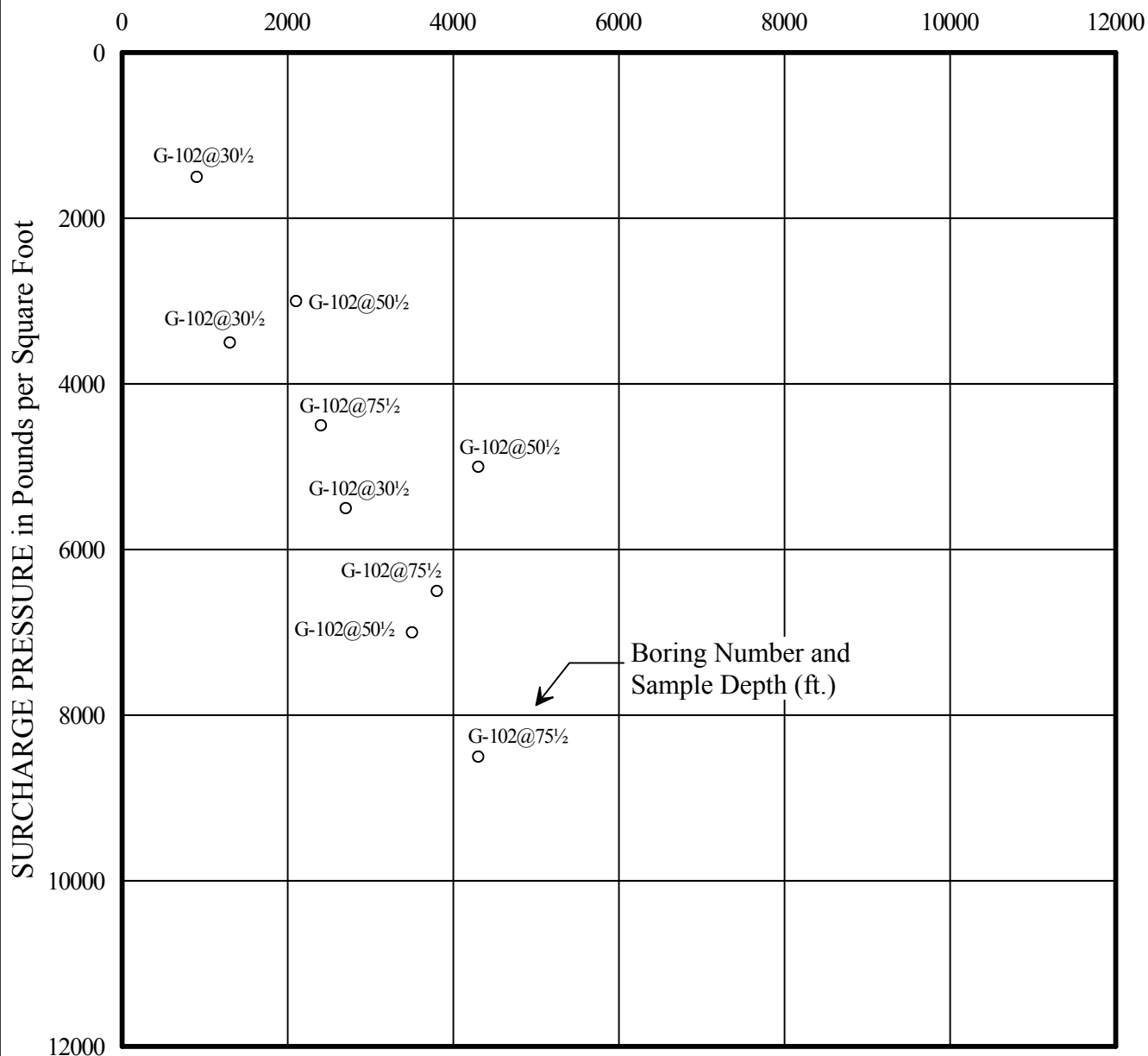
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/5/11
 Checked/Date: LT 10/6/11

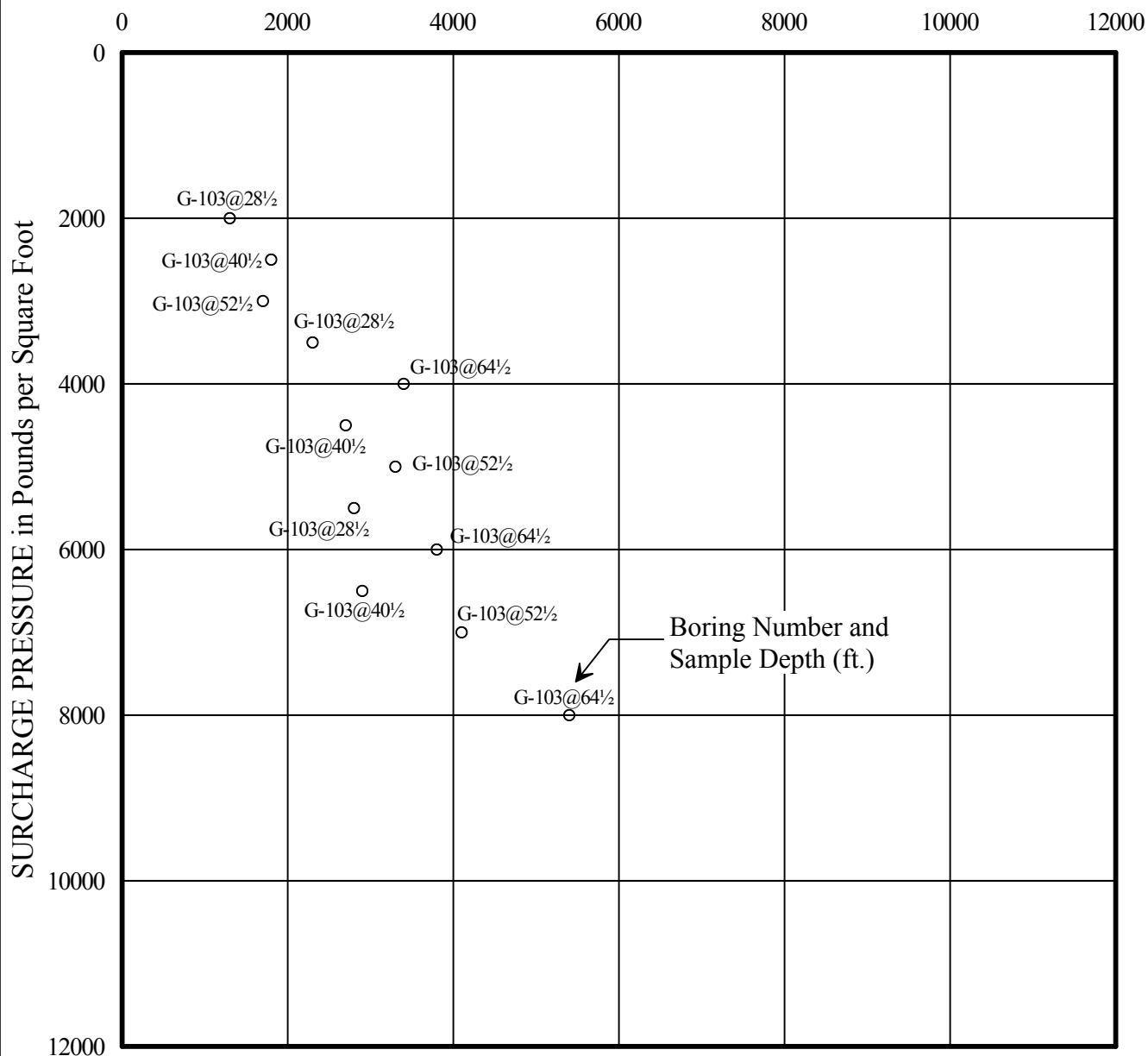
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

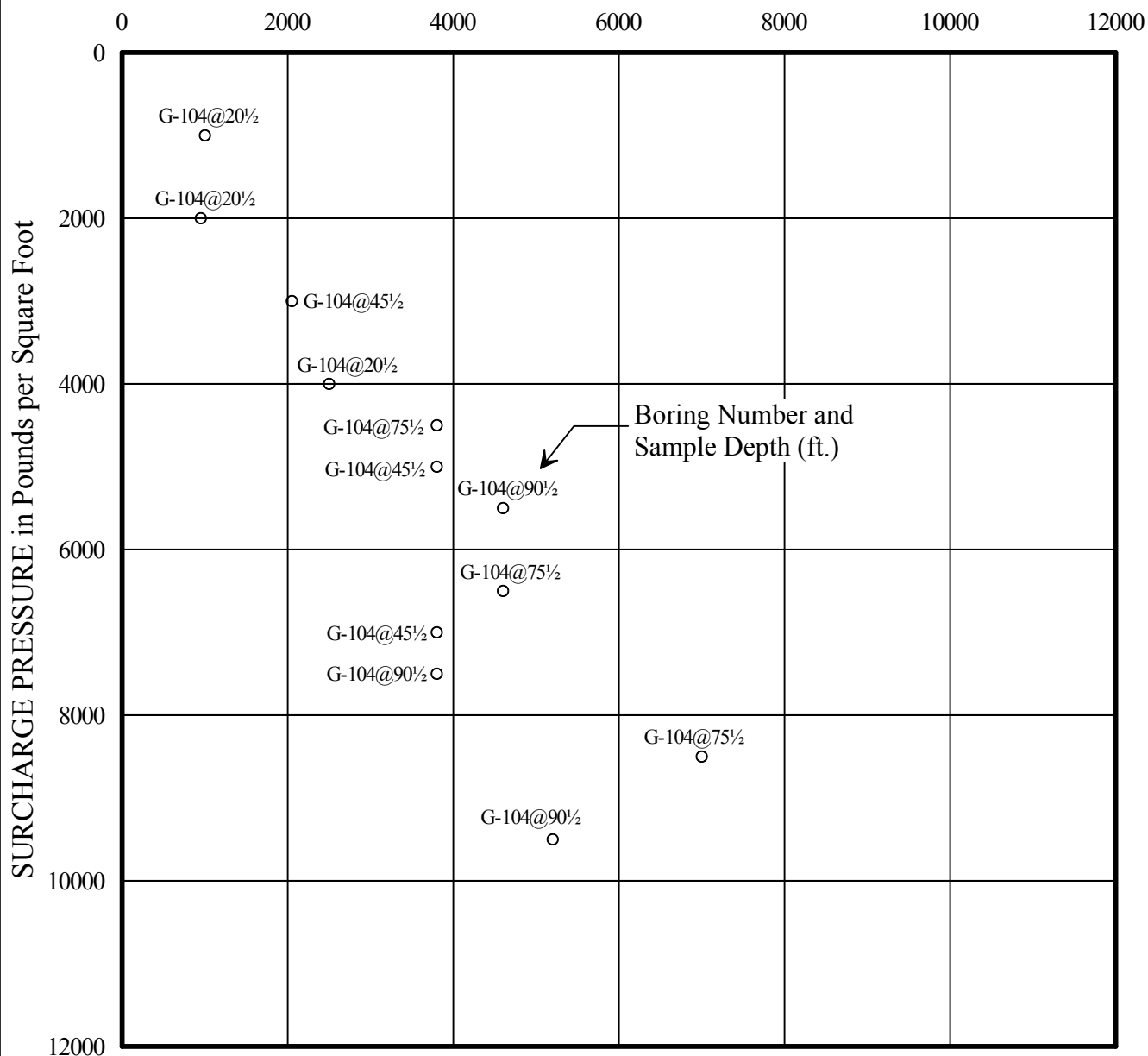
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/2/11
 Checked/Date: LT 10/3/11

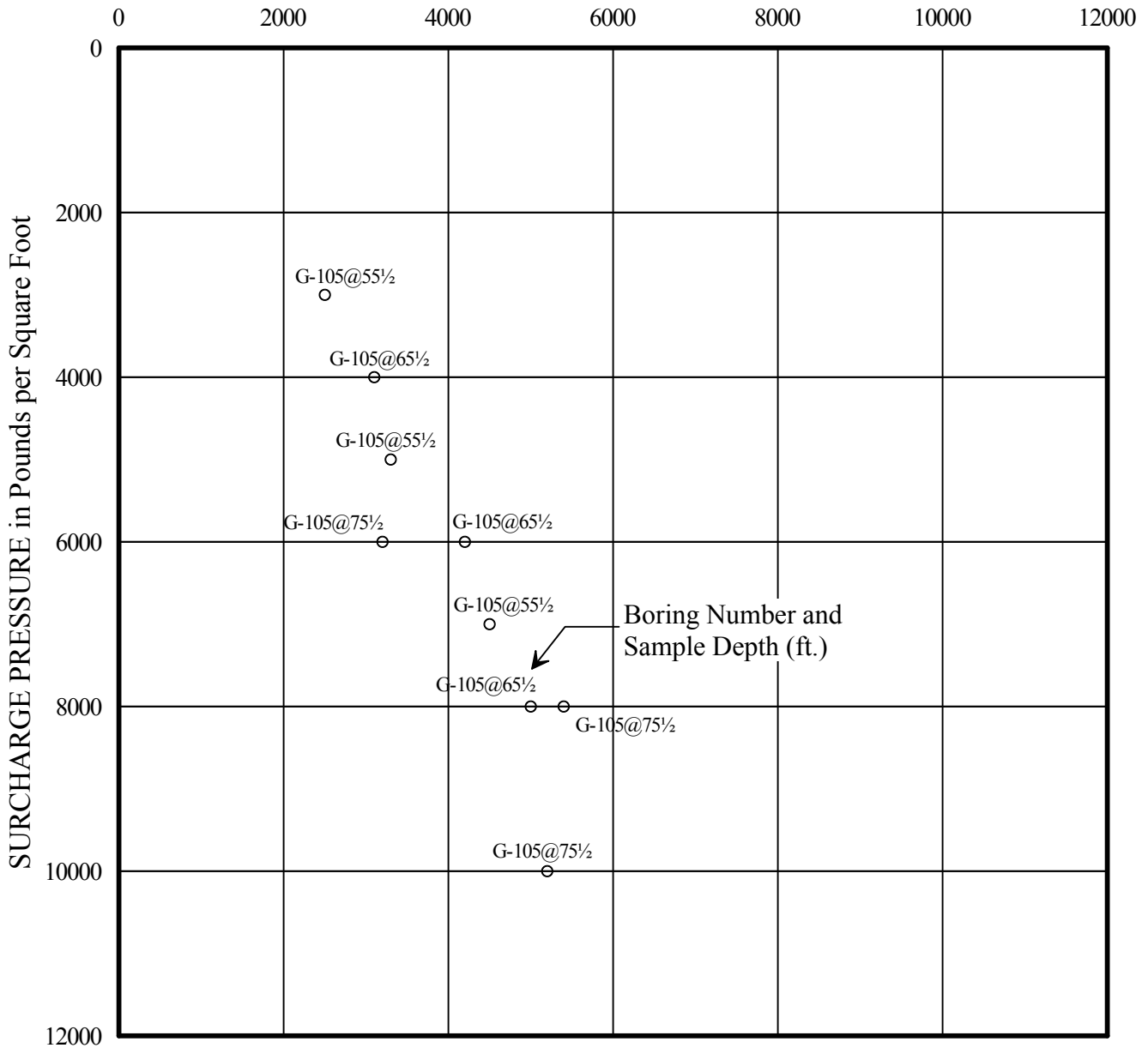
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/2/11
 Checked/Date: LT 10/3/11

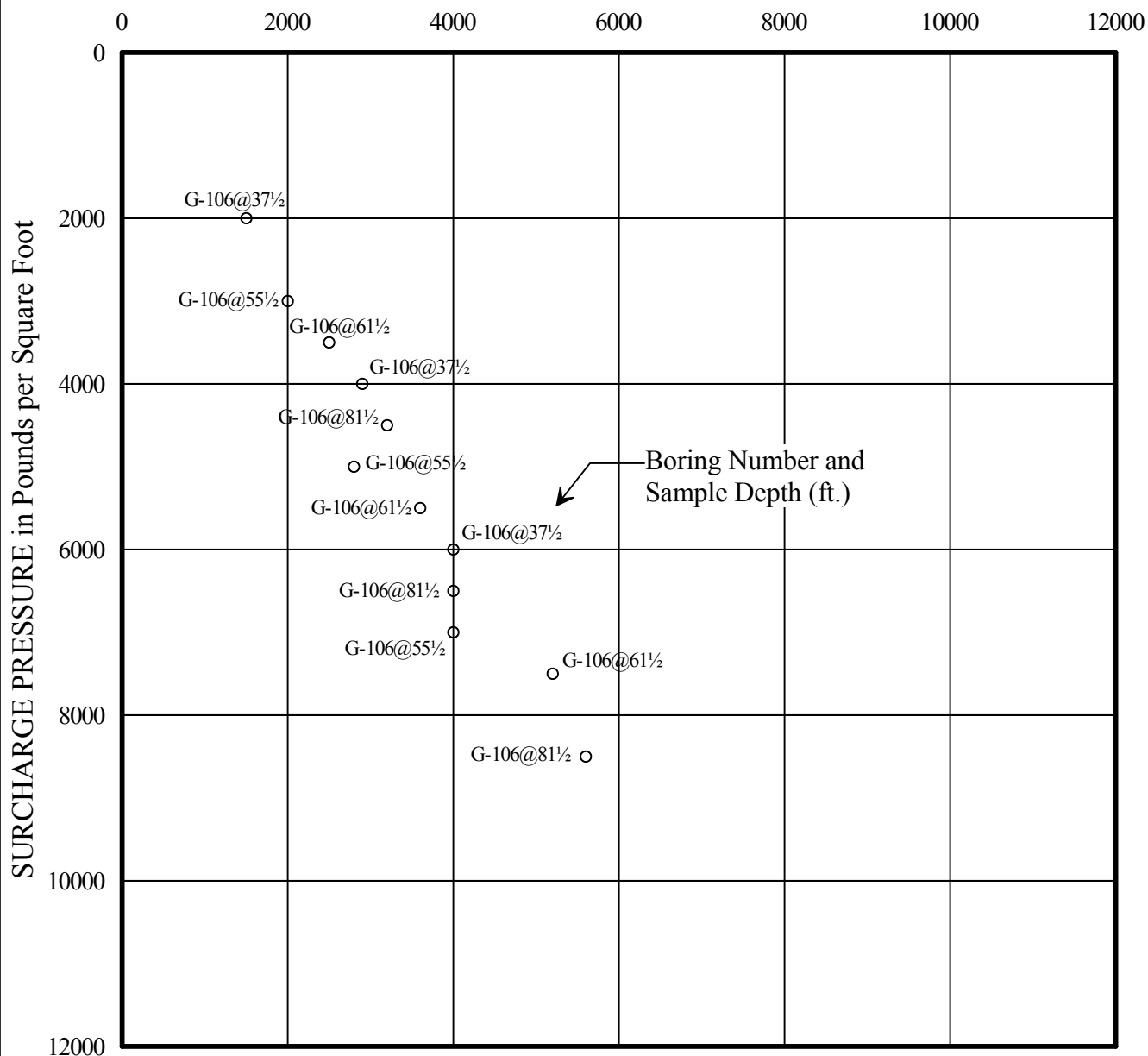
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

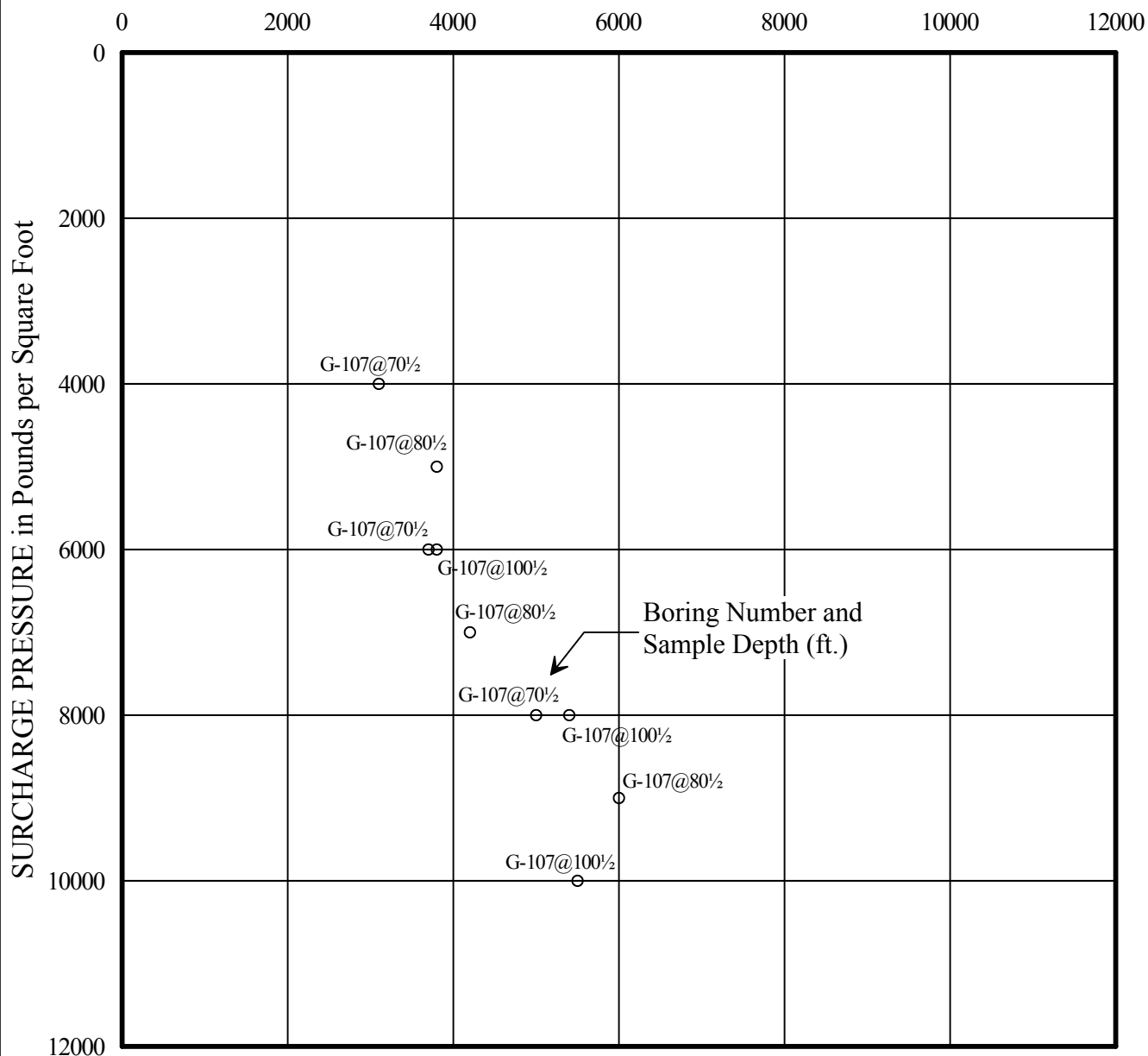
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: JF 10/4/11
 Checked/Date: LT10/4/11

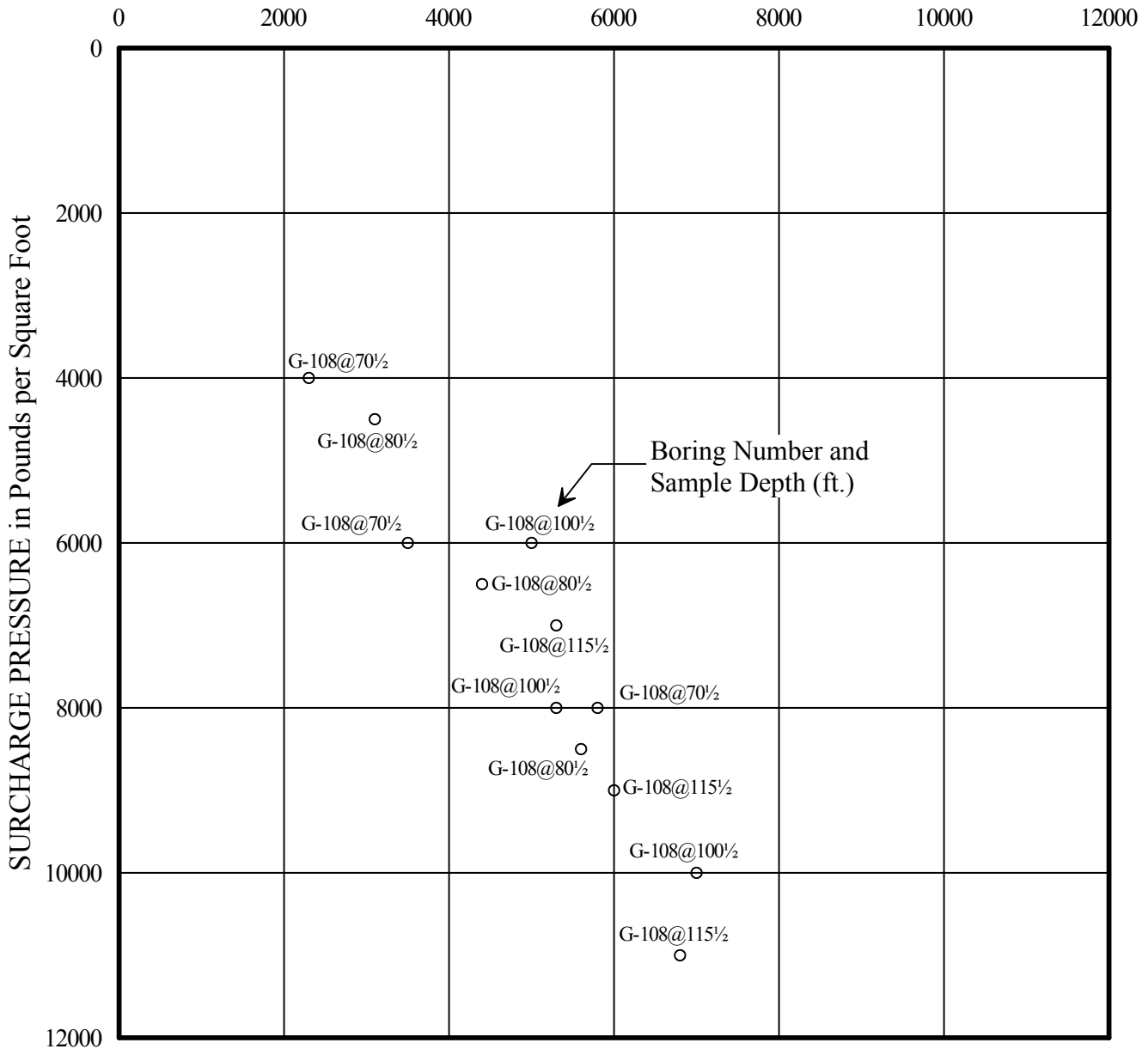
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

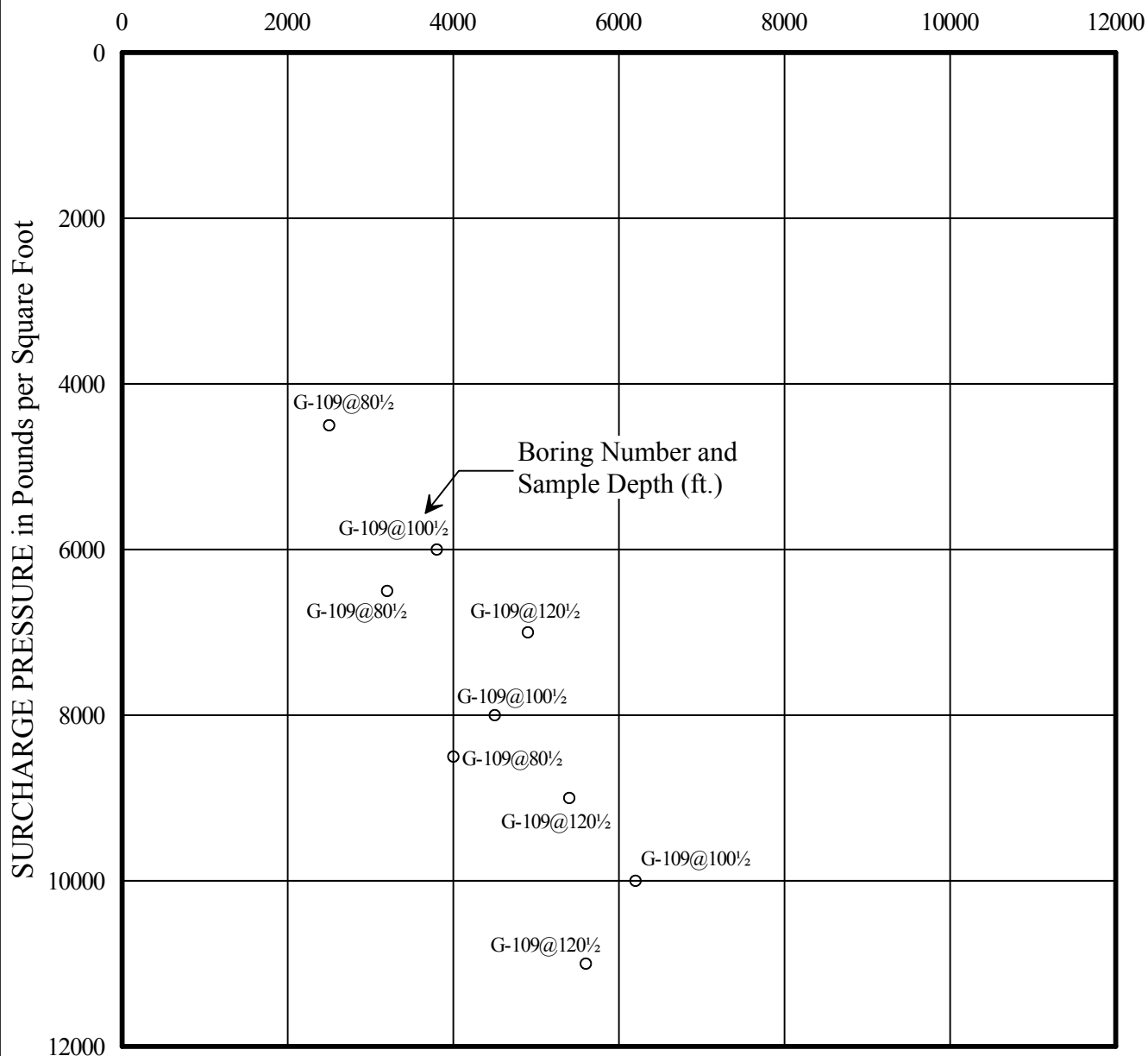
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

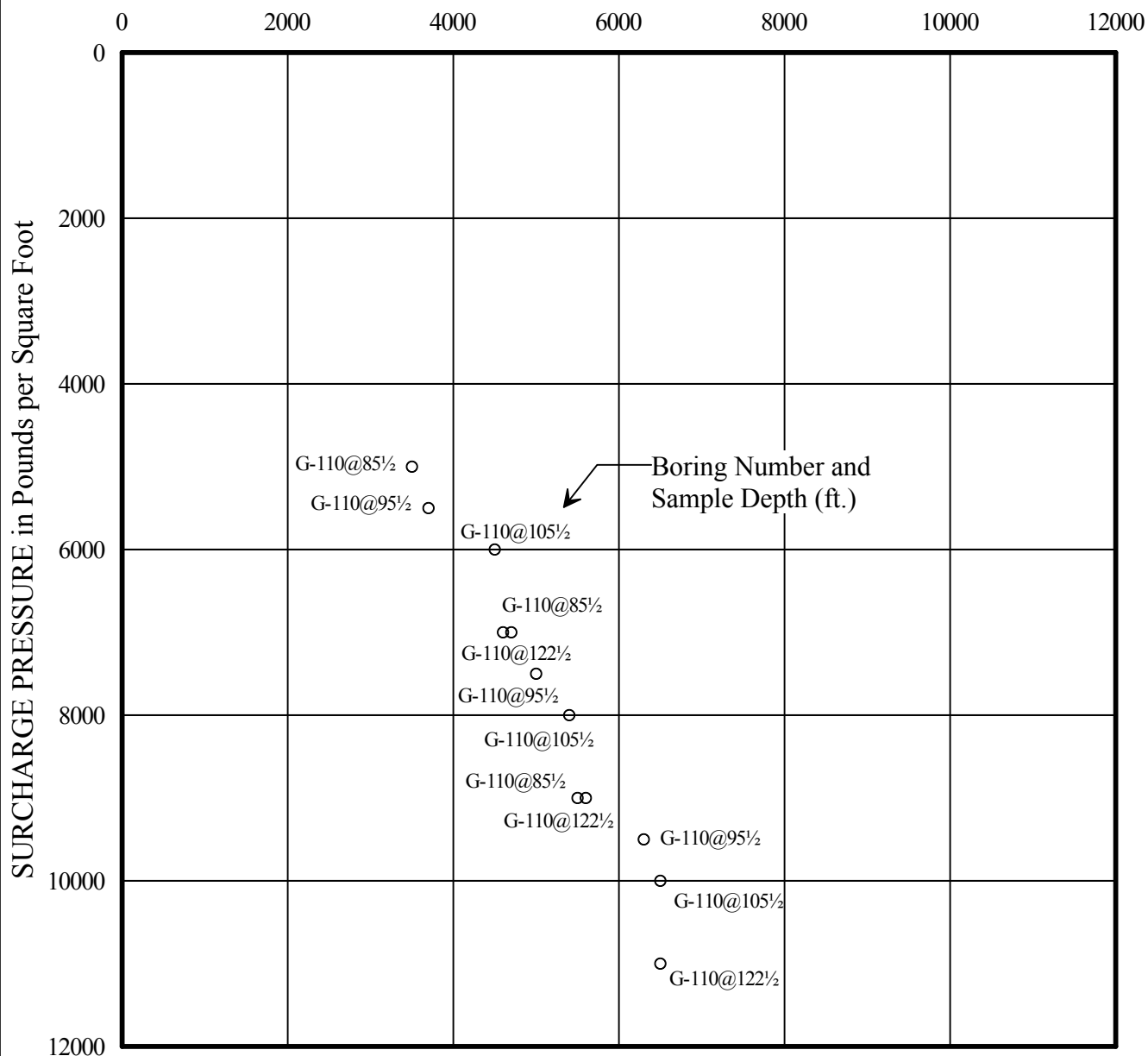
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

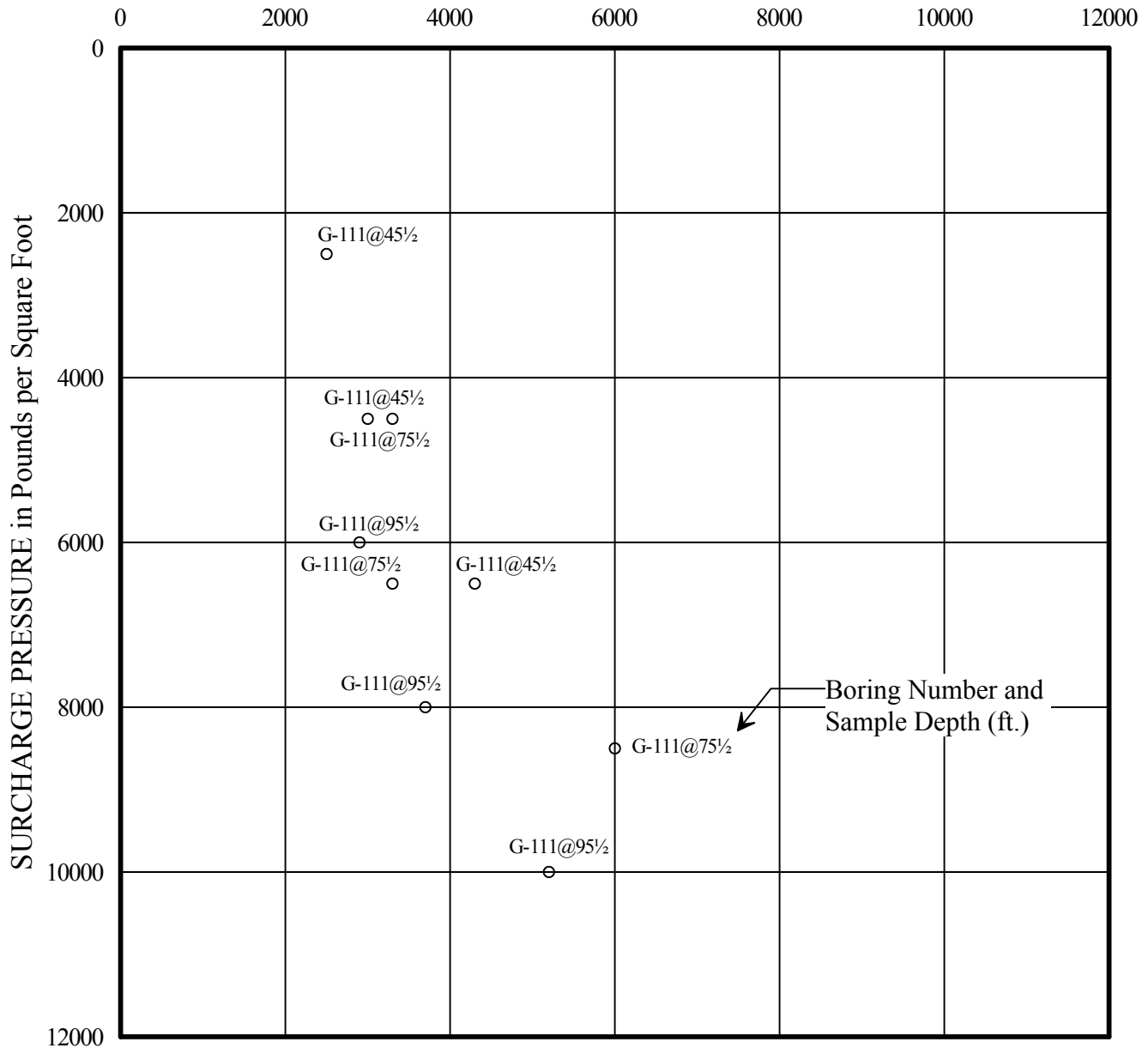
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/5/11
 Checked/Date: LT 10/5/11

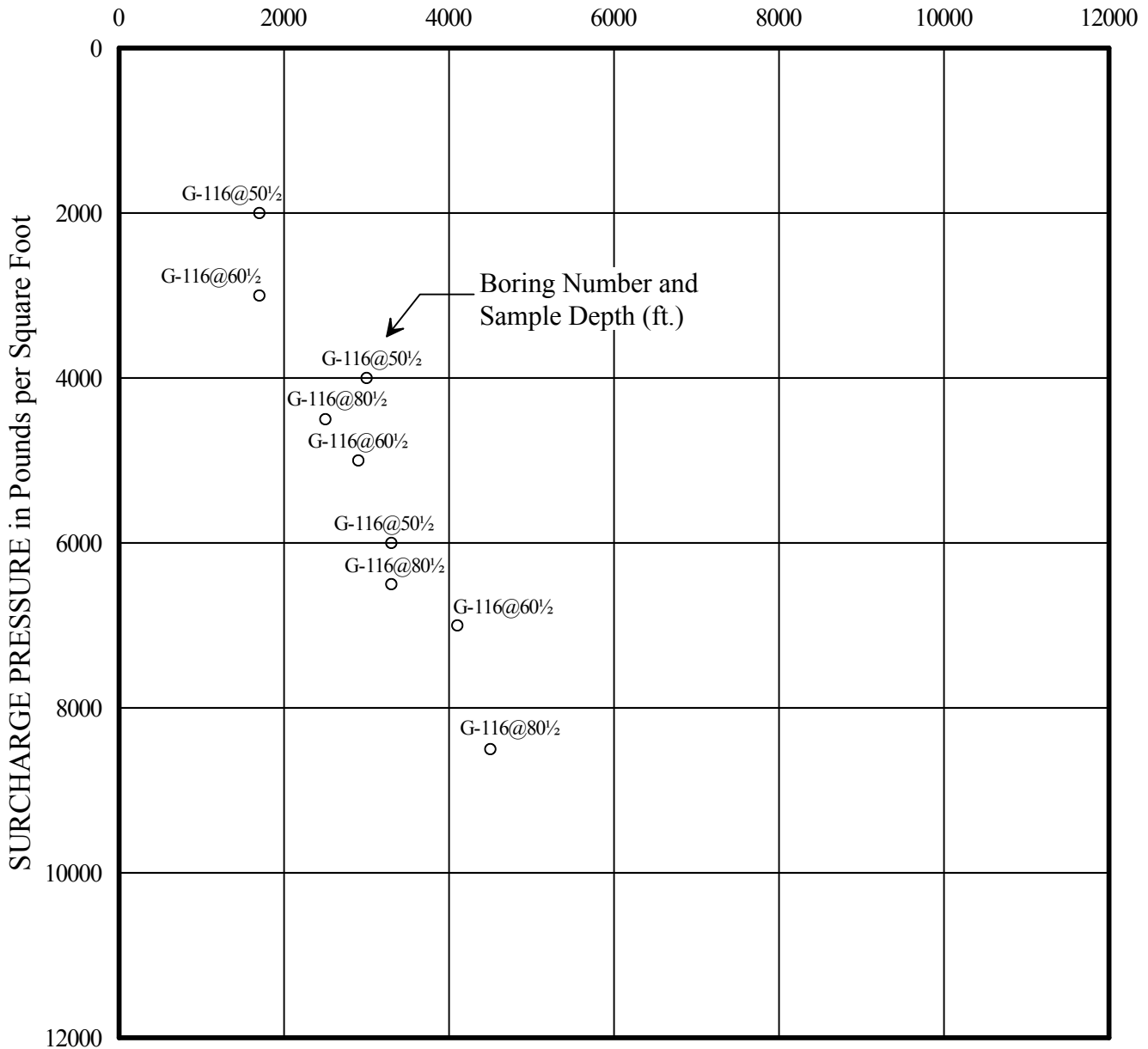
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

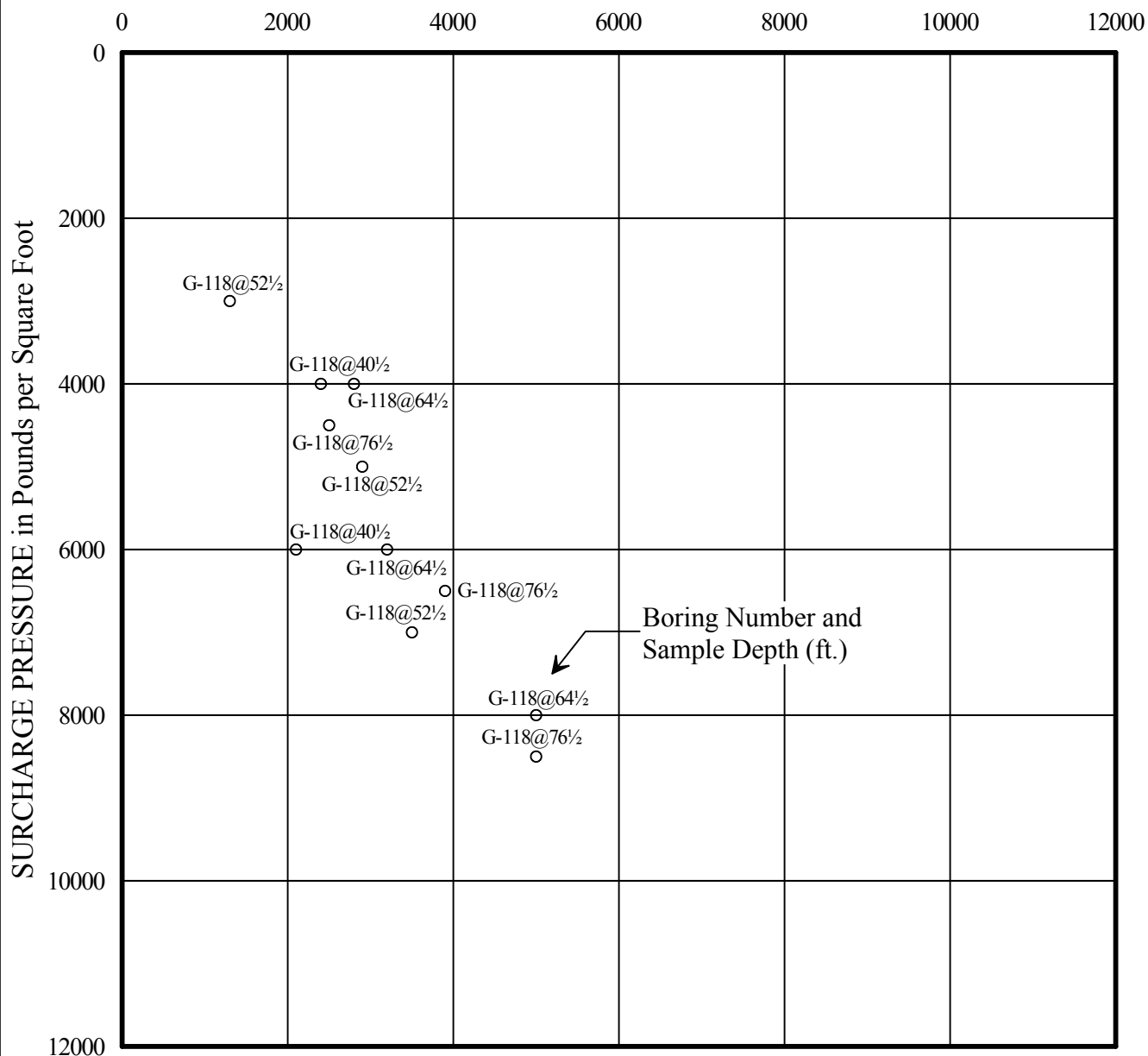
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

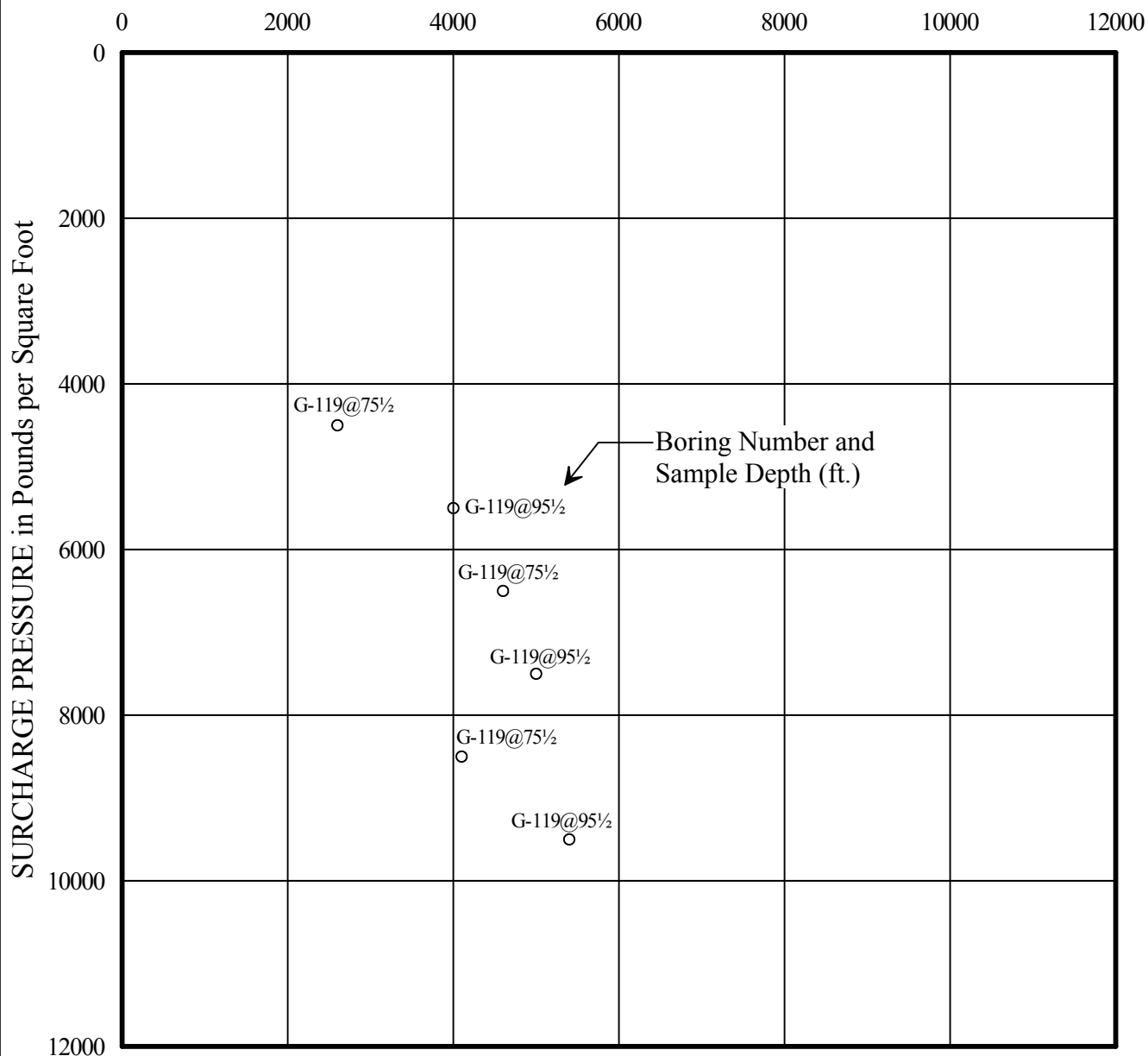
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/4/11

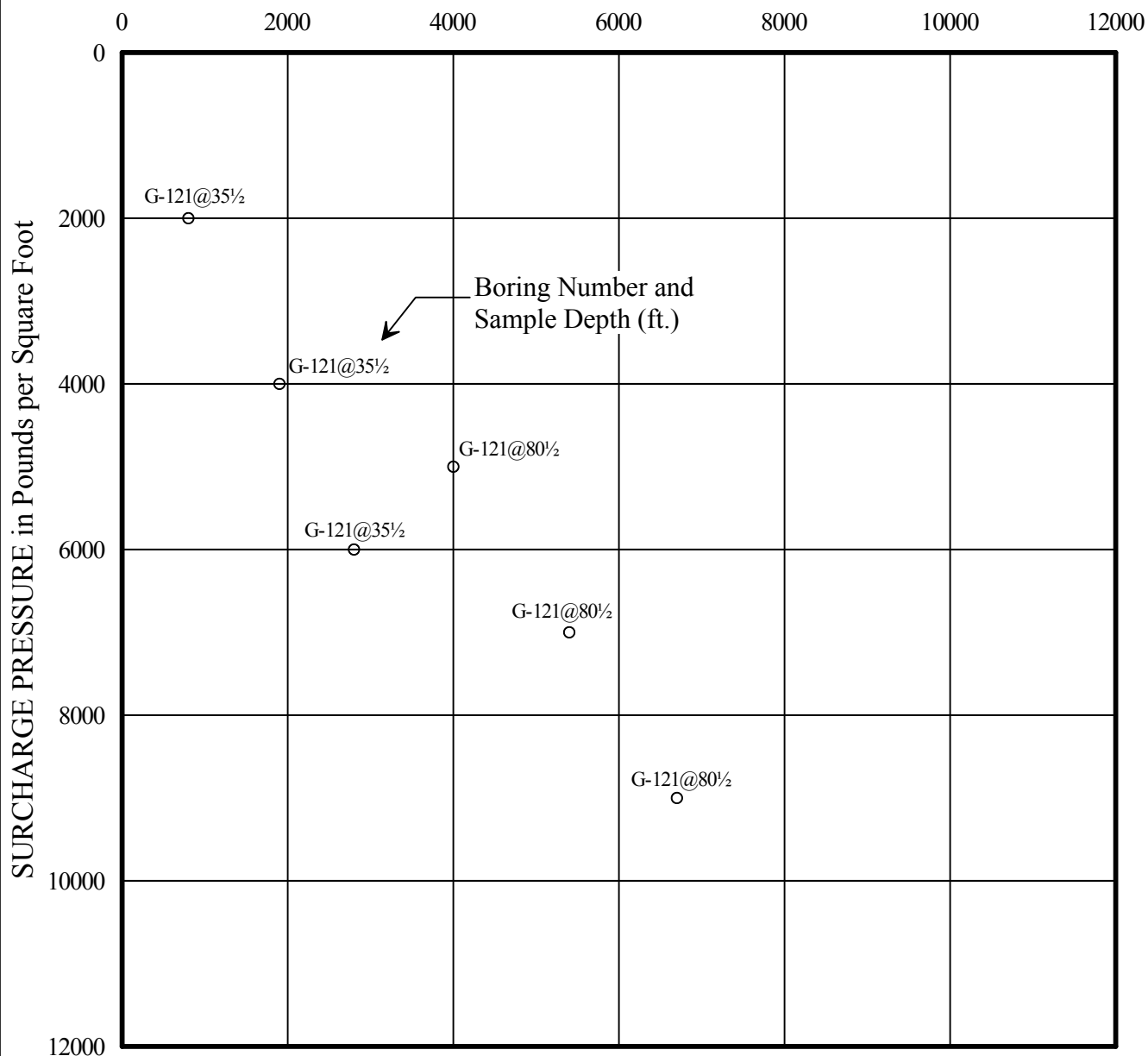
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

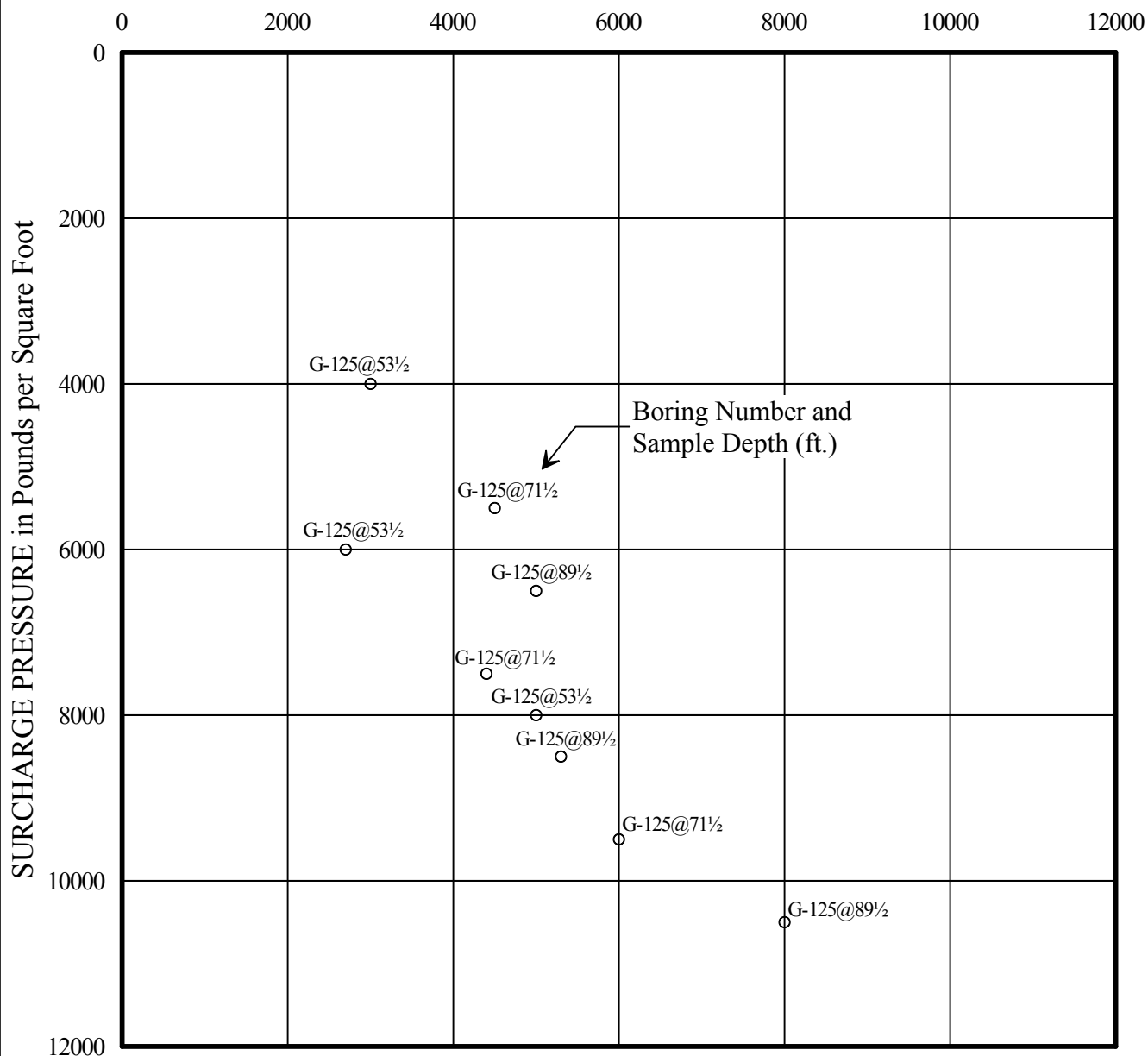
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

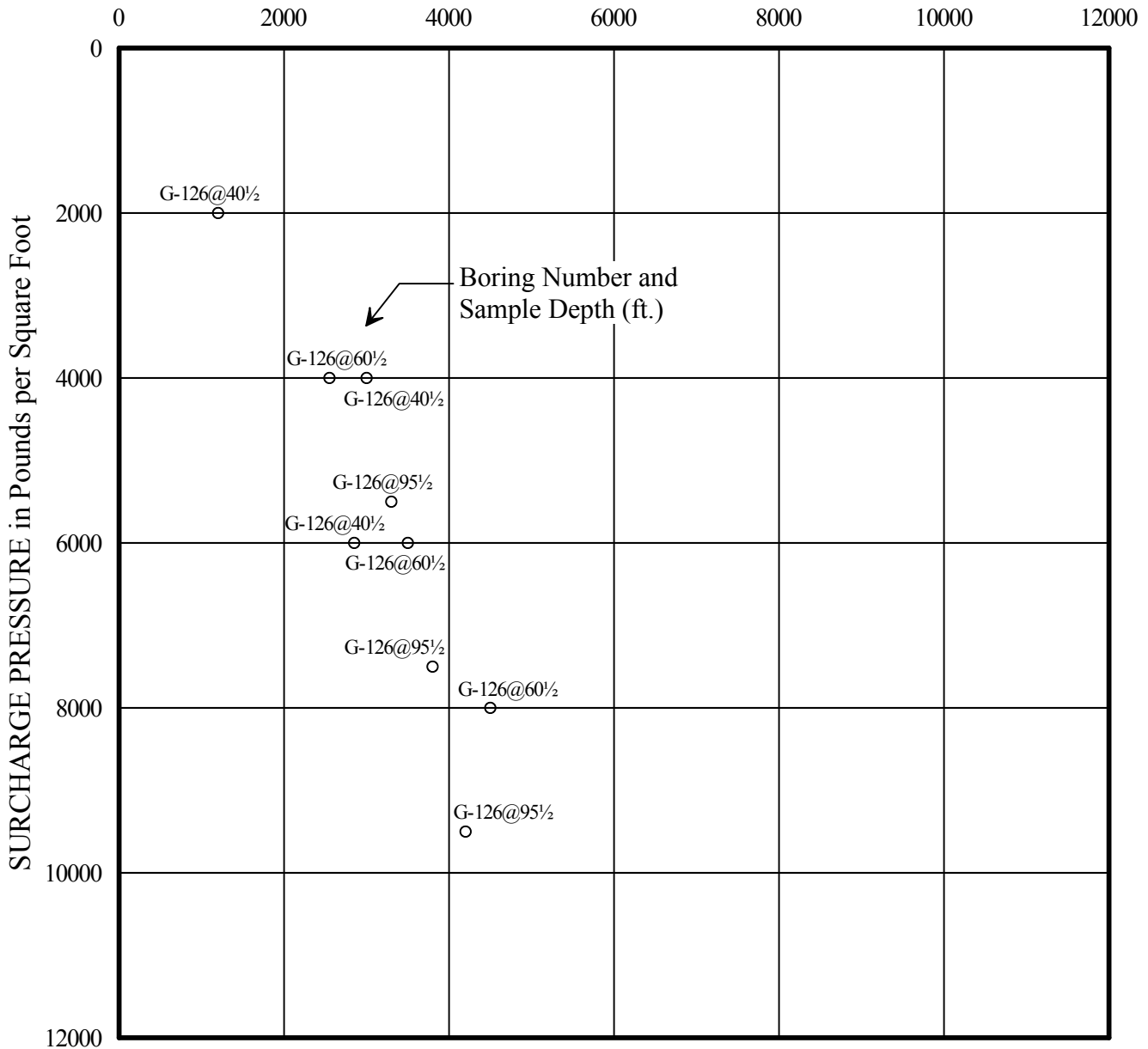
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

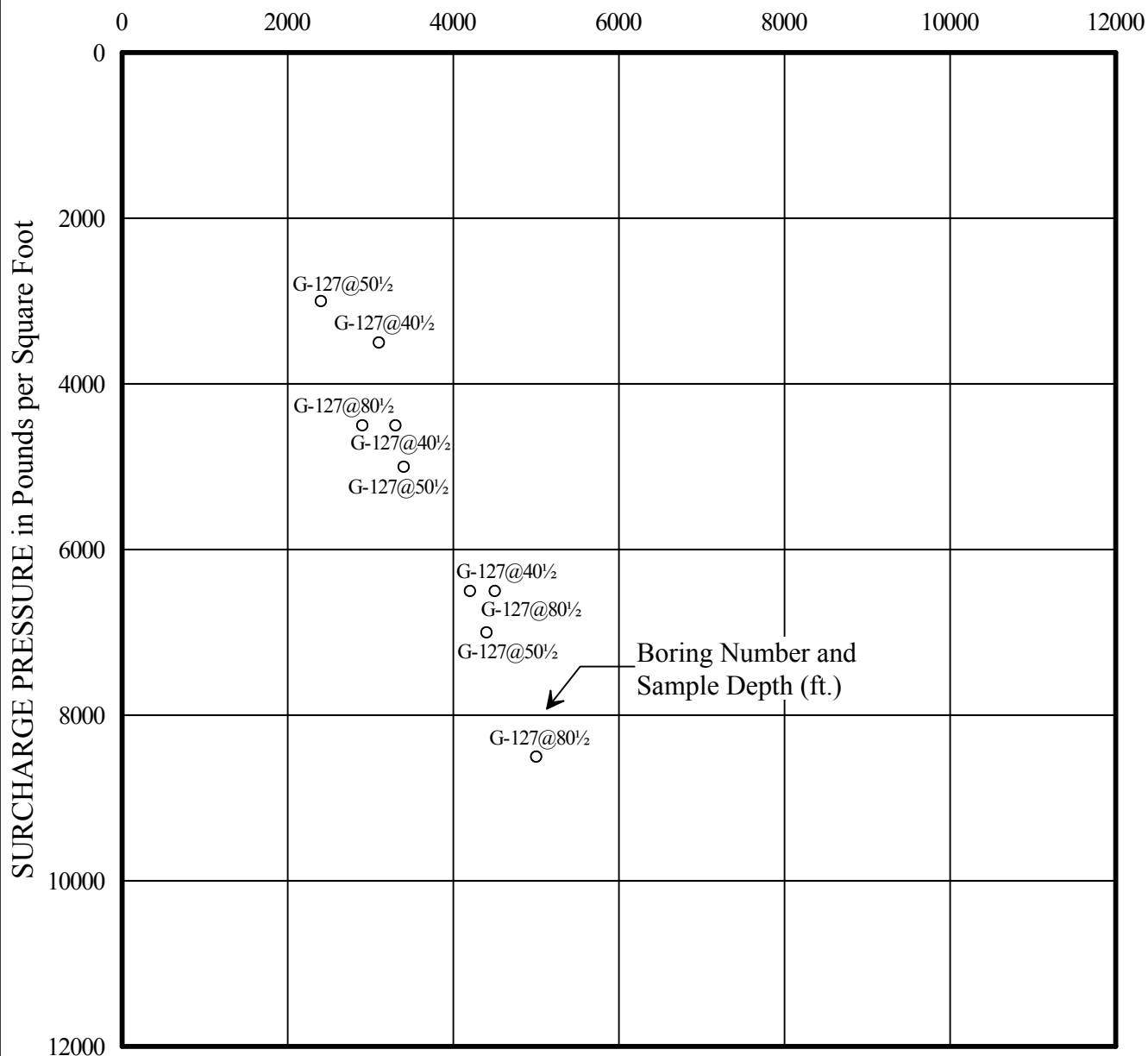
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

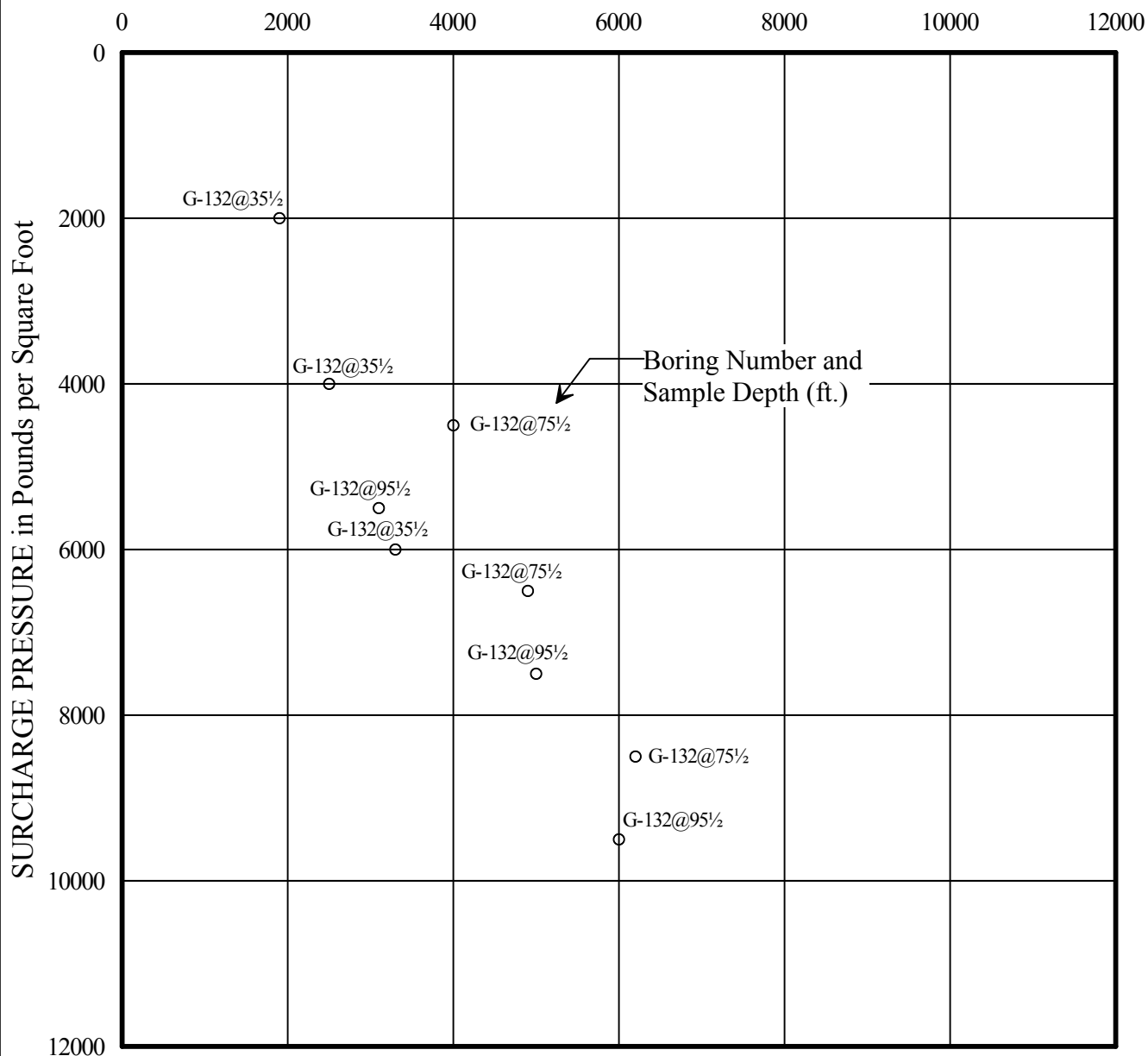
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

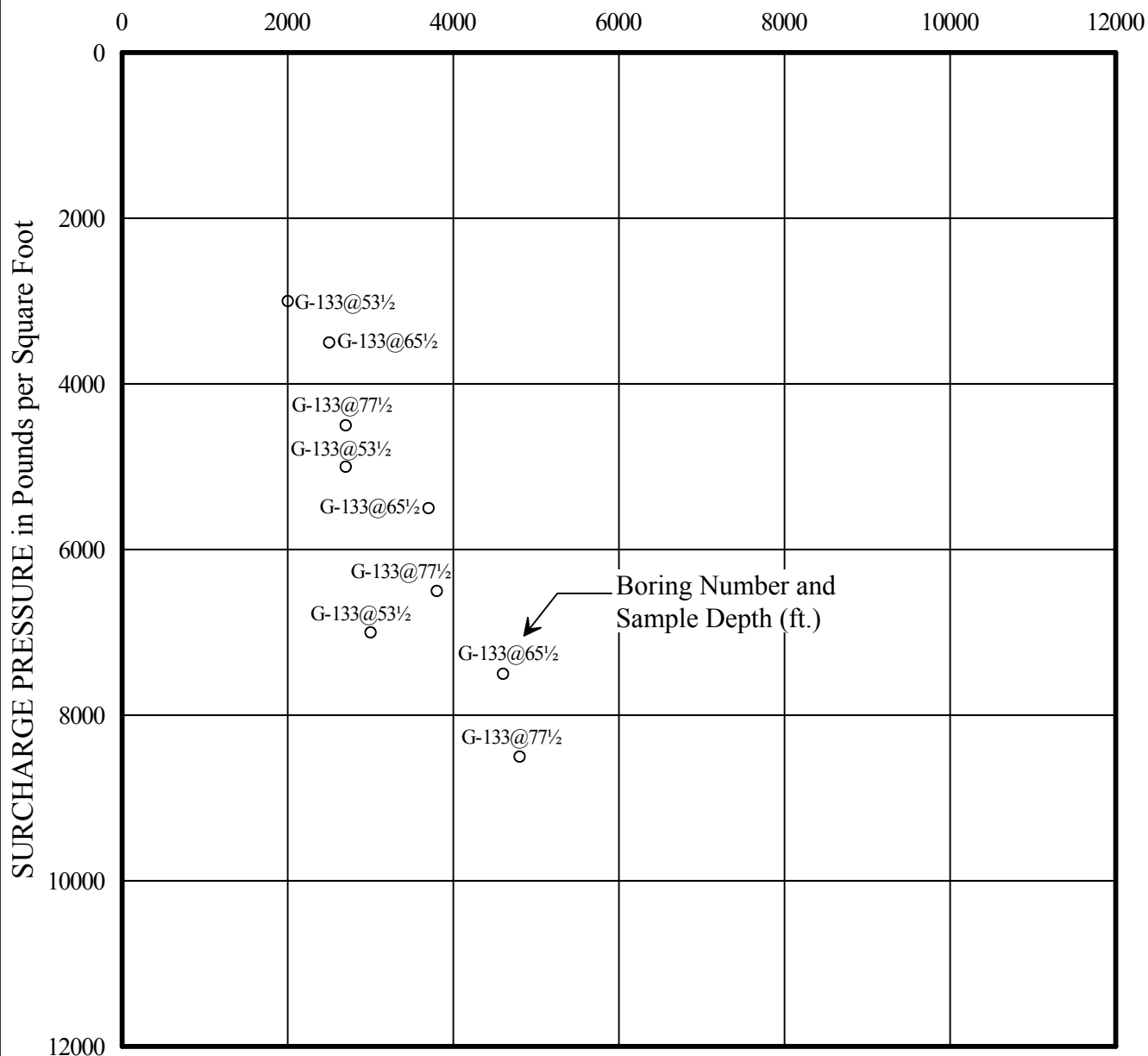
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

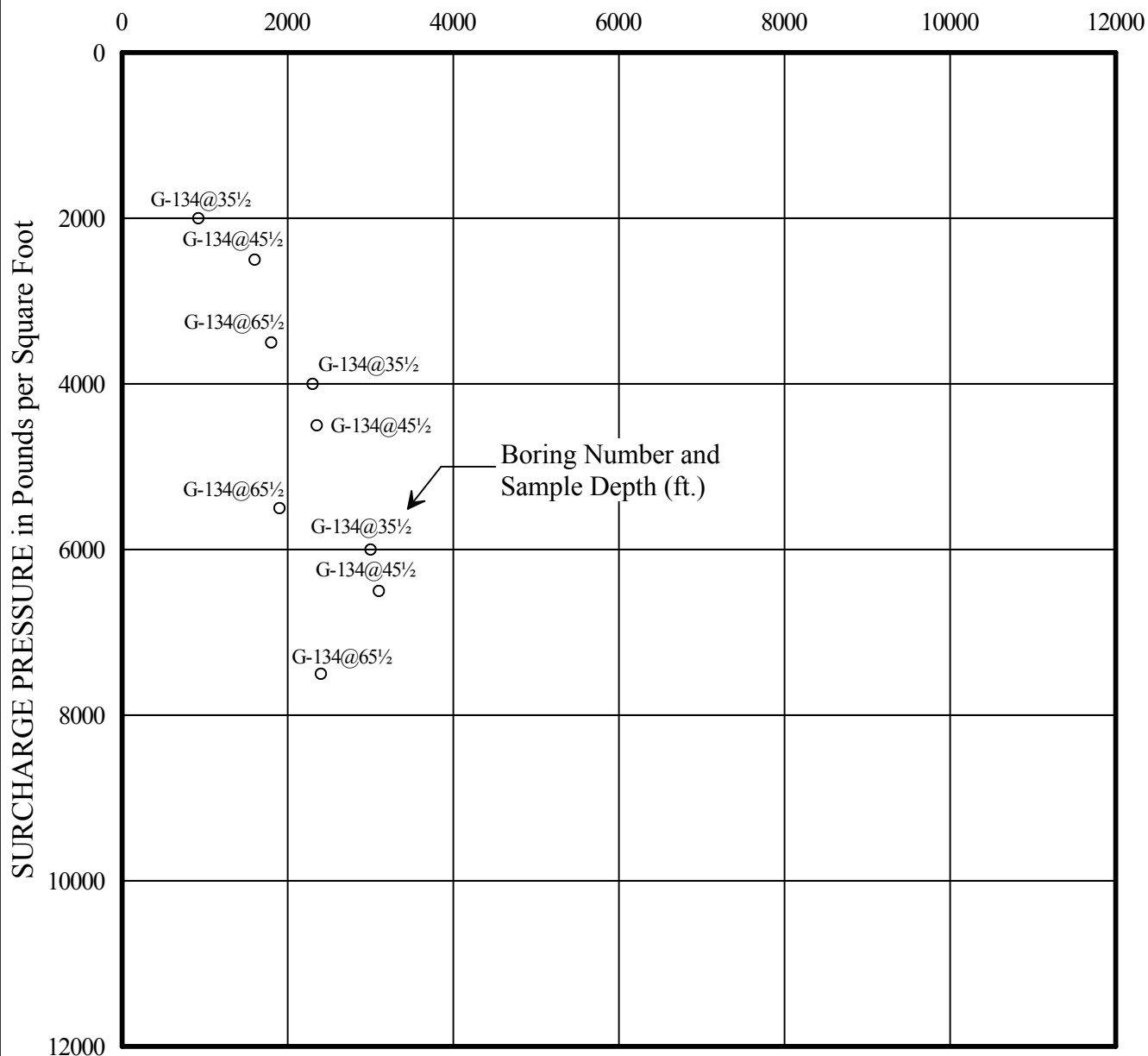
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: JF 9/29/11
 Checked/Date: LT 9/29/11

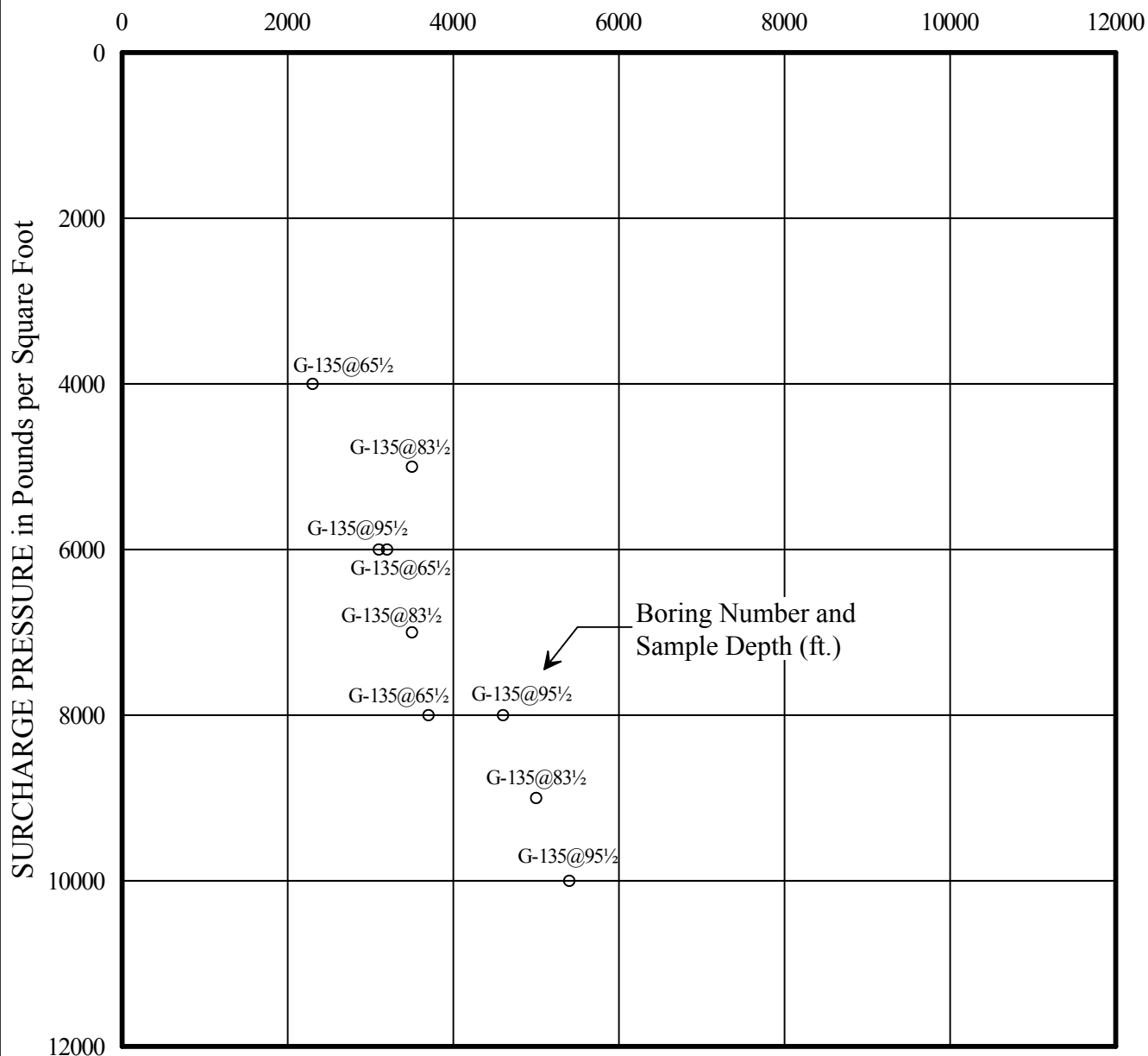
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

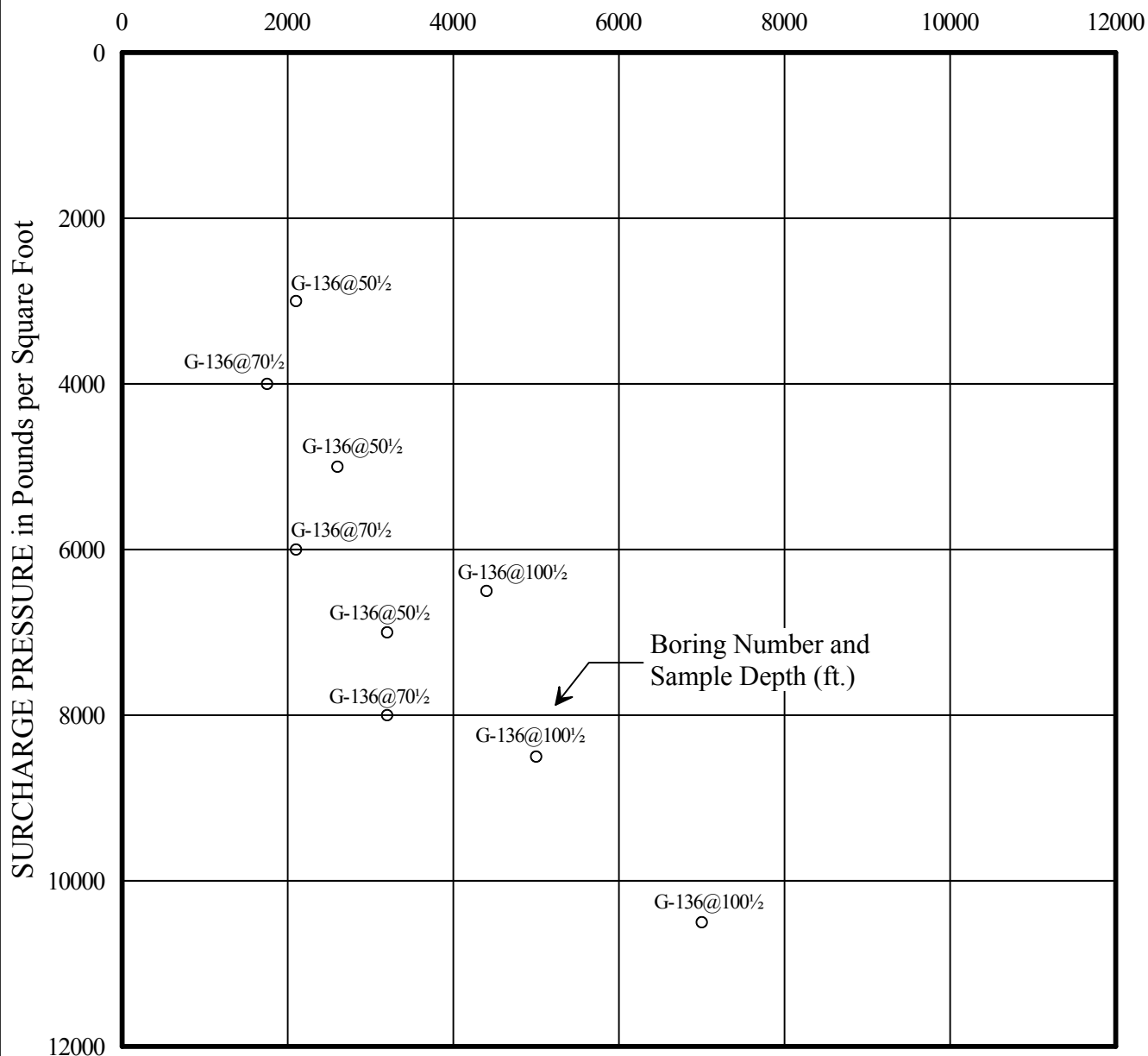
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

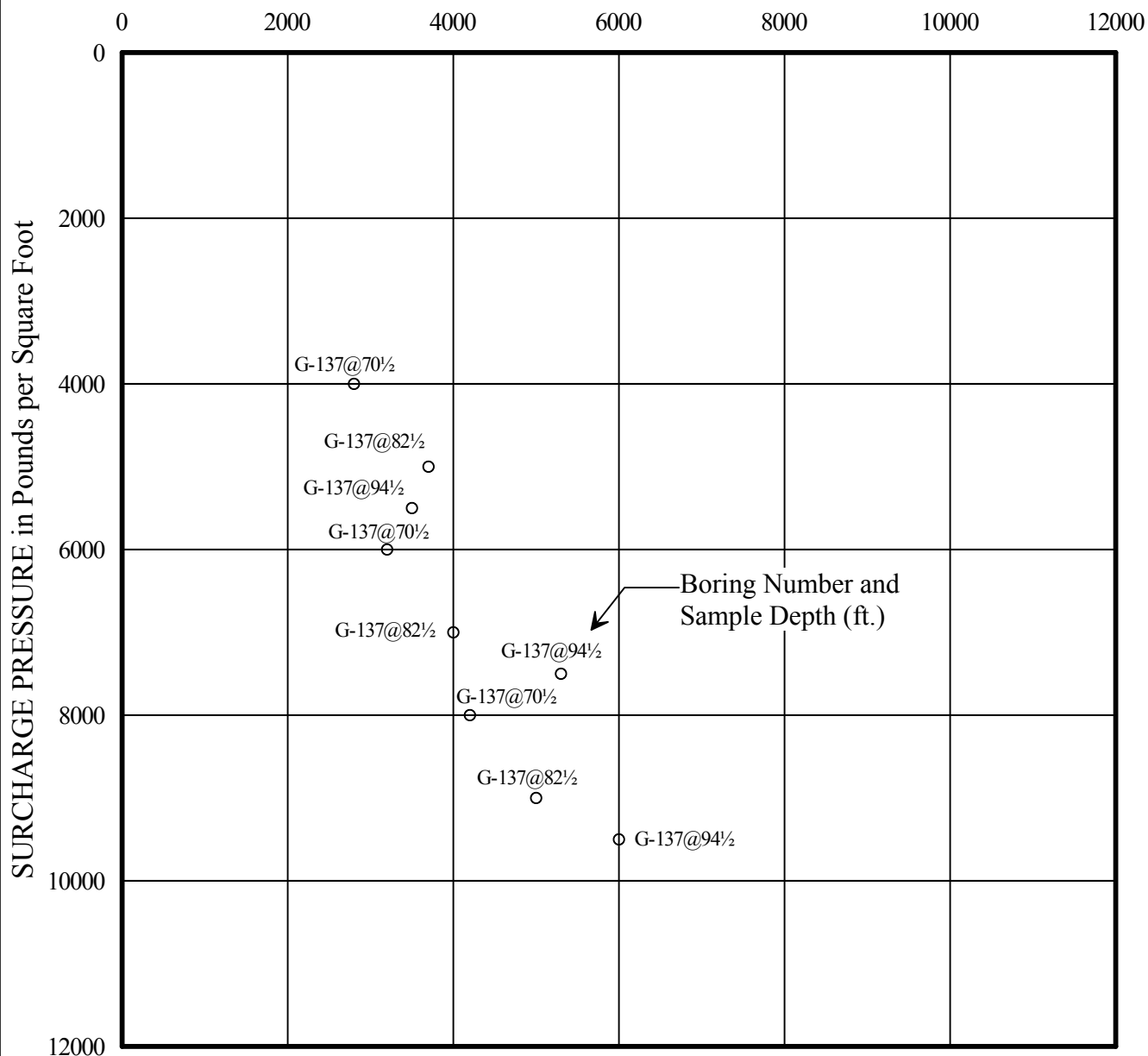
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

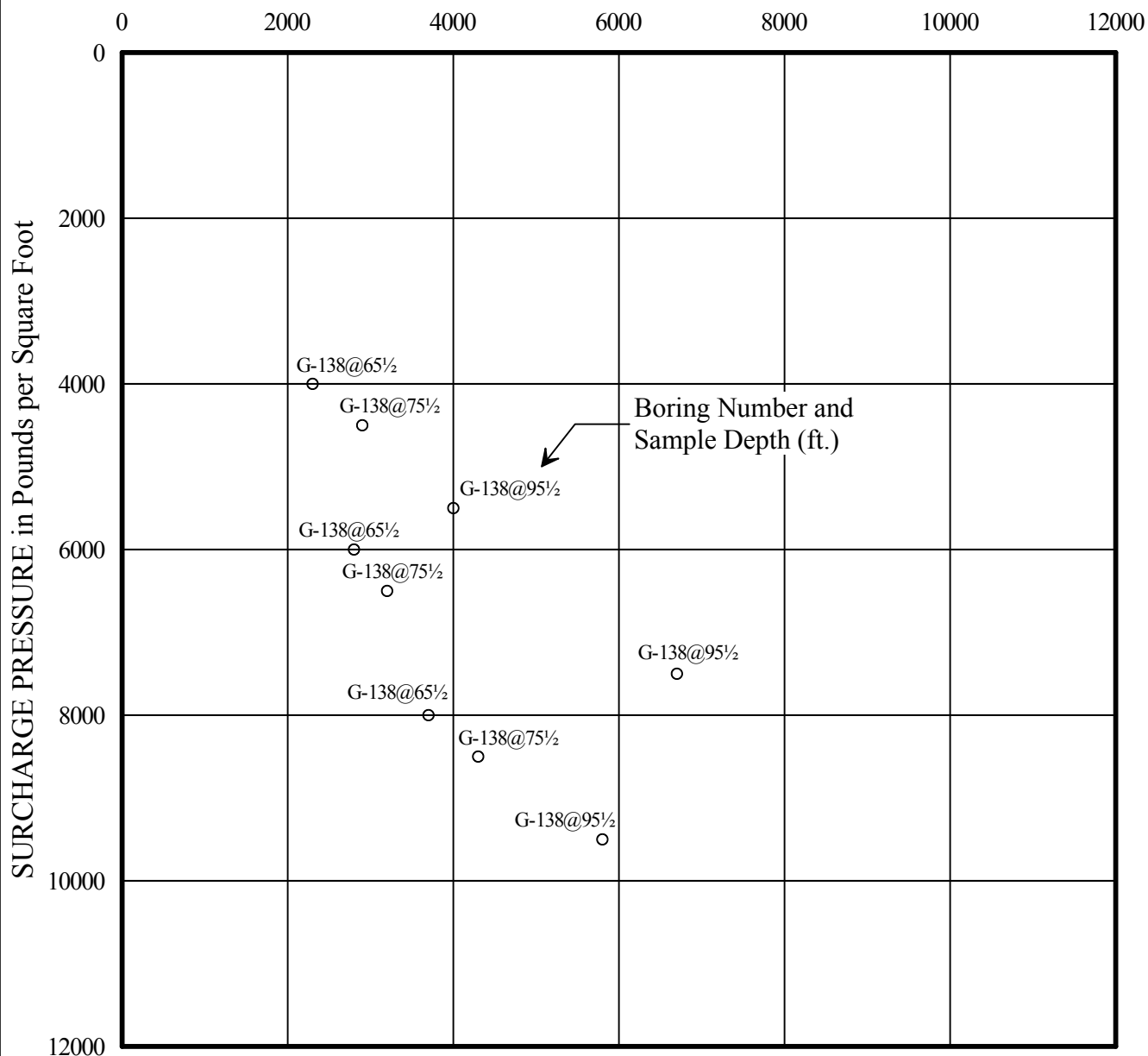
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: JF 10/4/11
 Checked/Date: LT 10/4/11

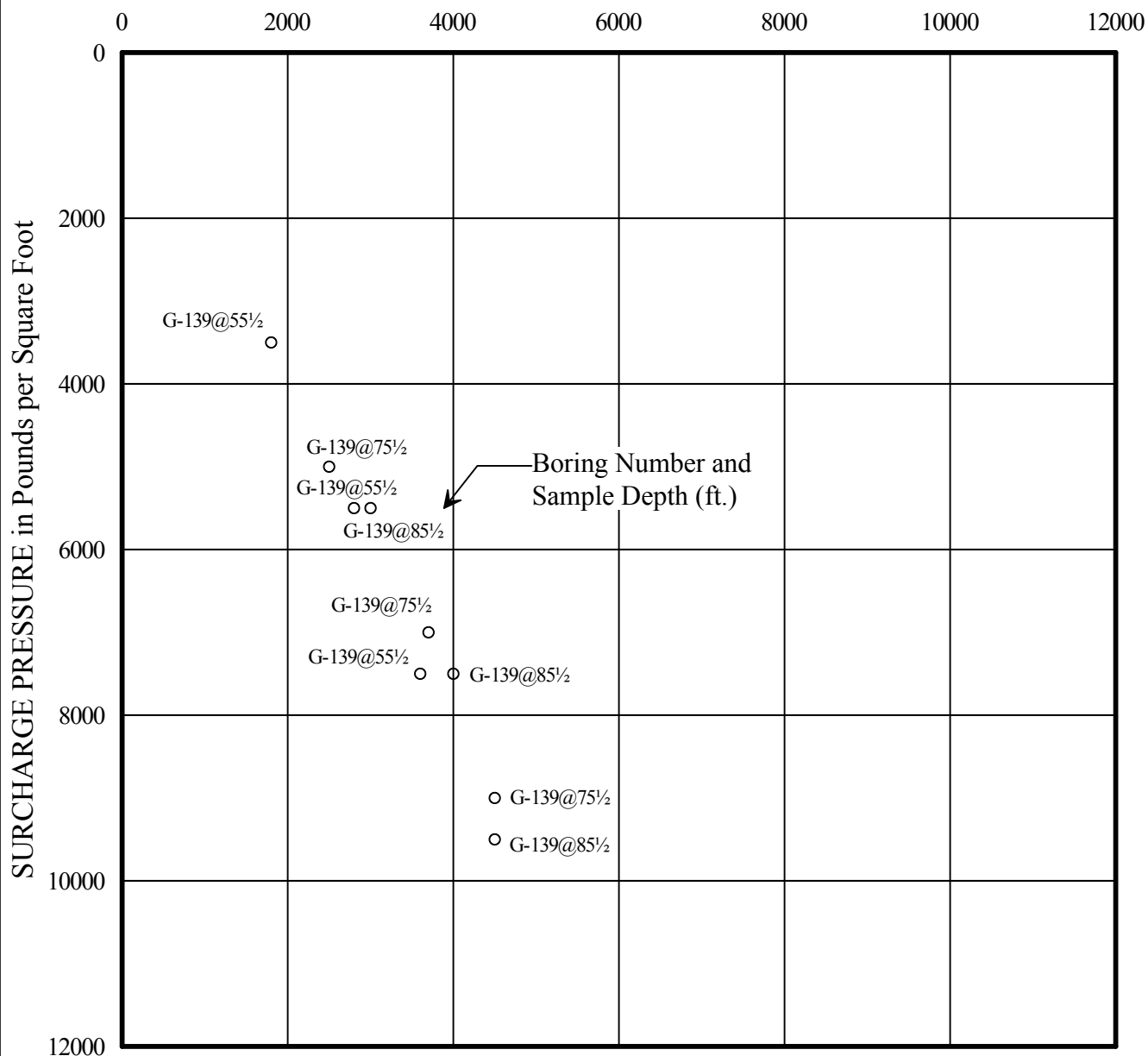
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

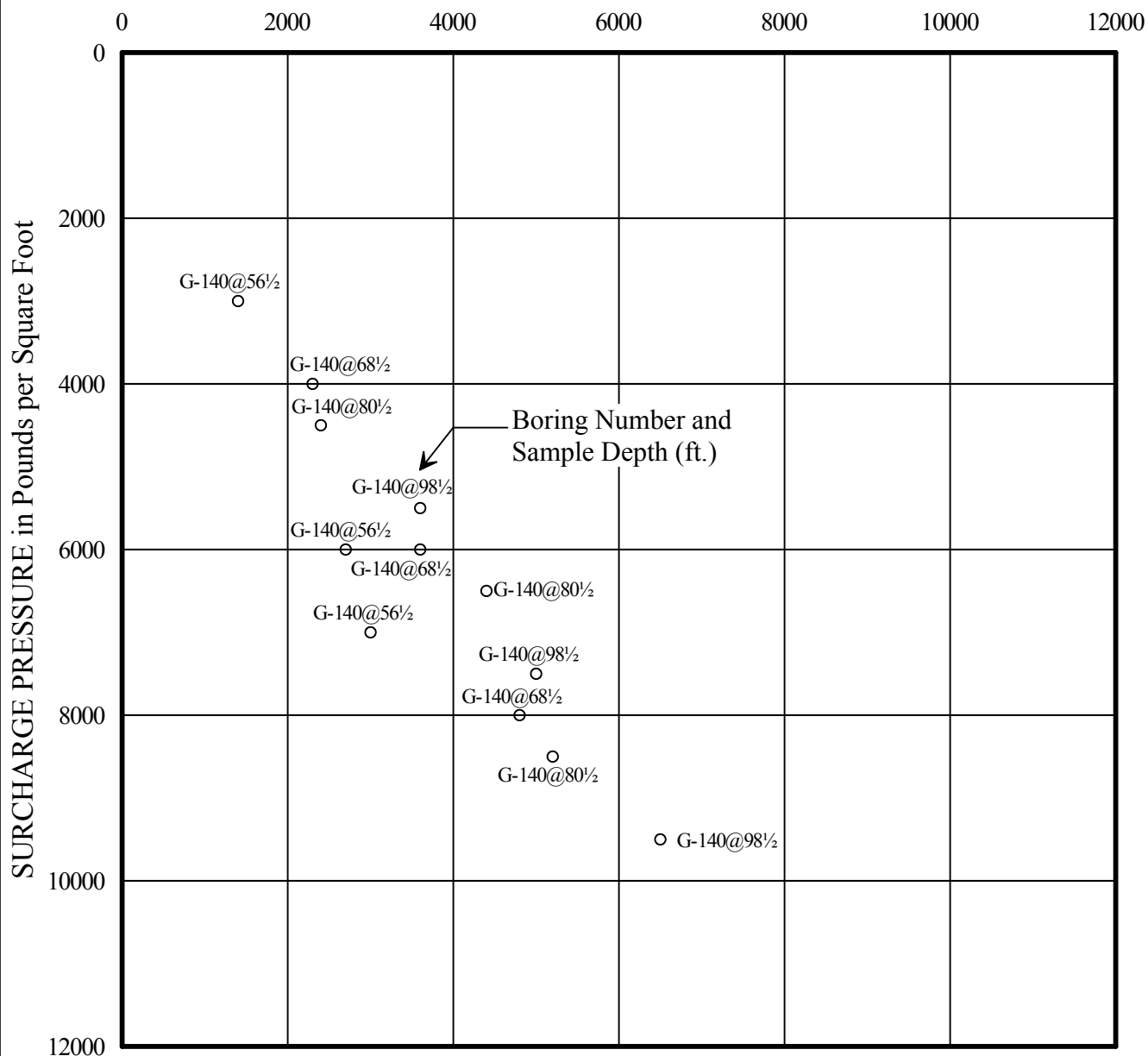
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/5/11
 Checked/Date: LT 10/6/11

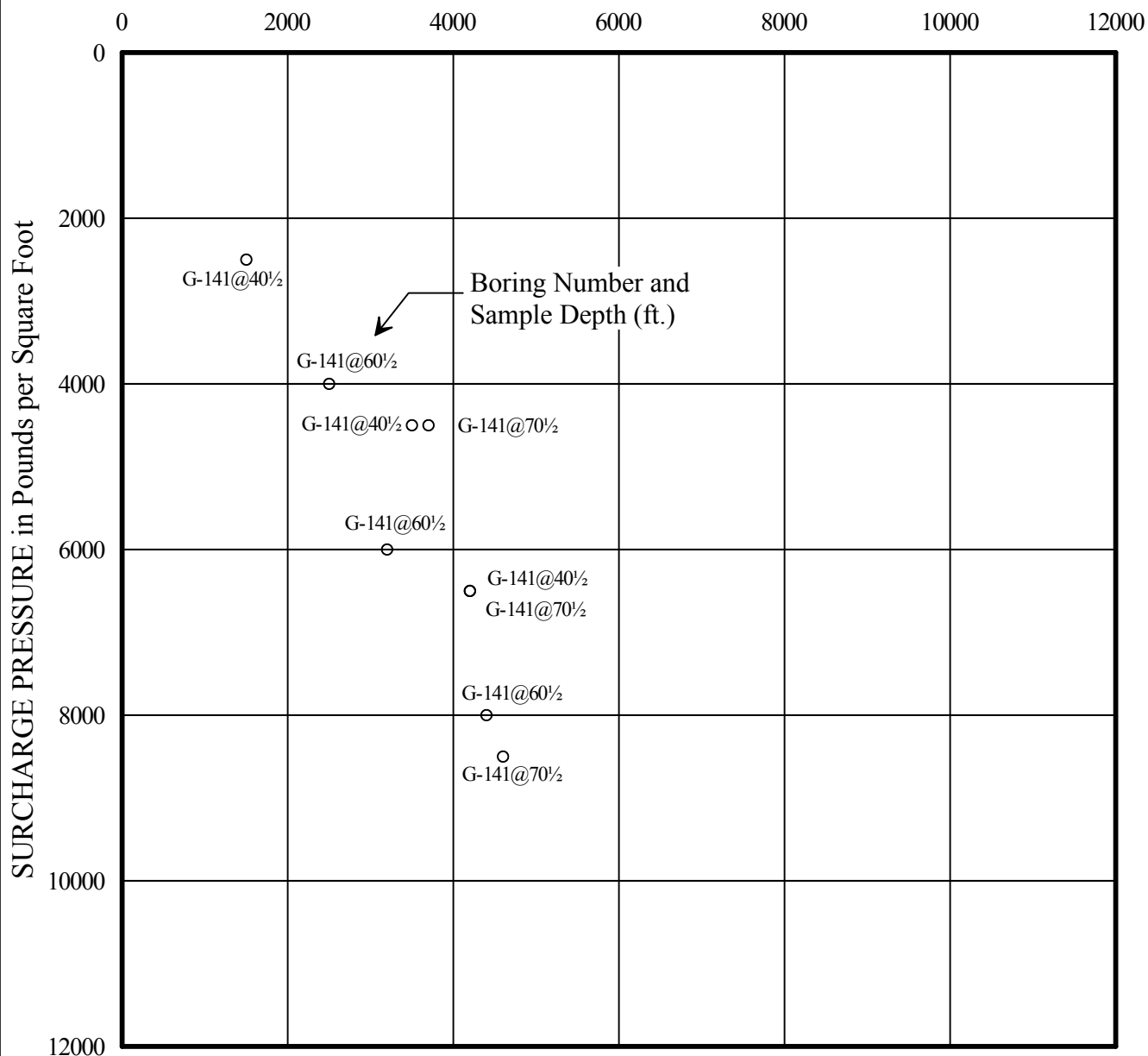
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: JF 10/4/11
 Checked/Date: LT10/4/11

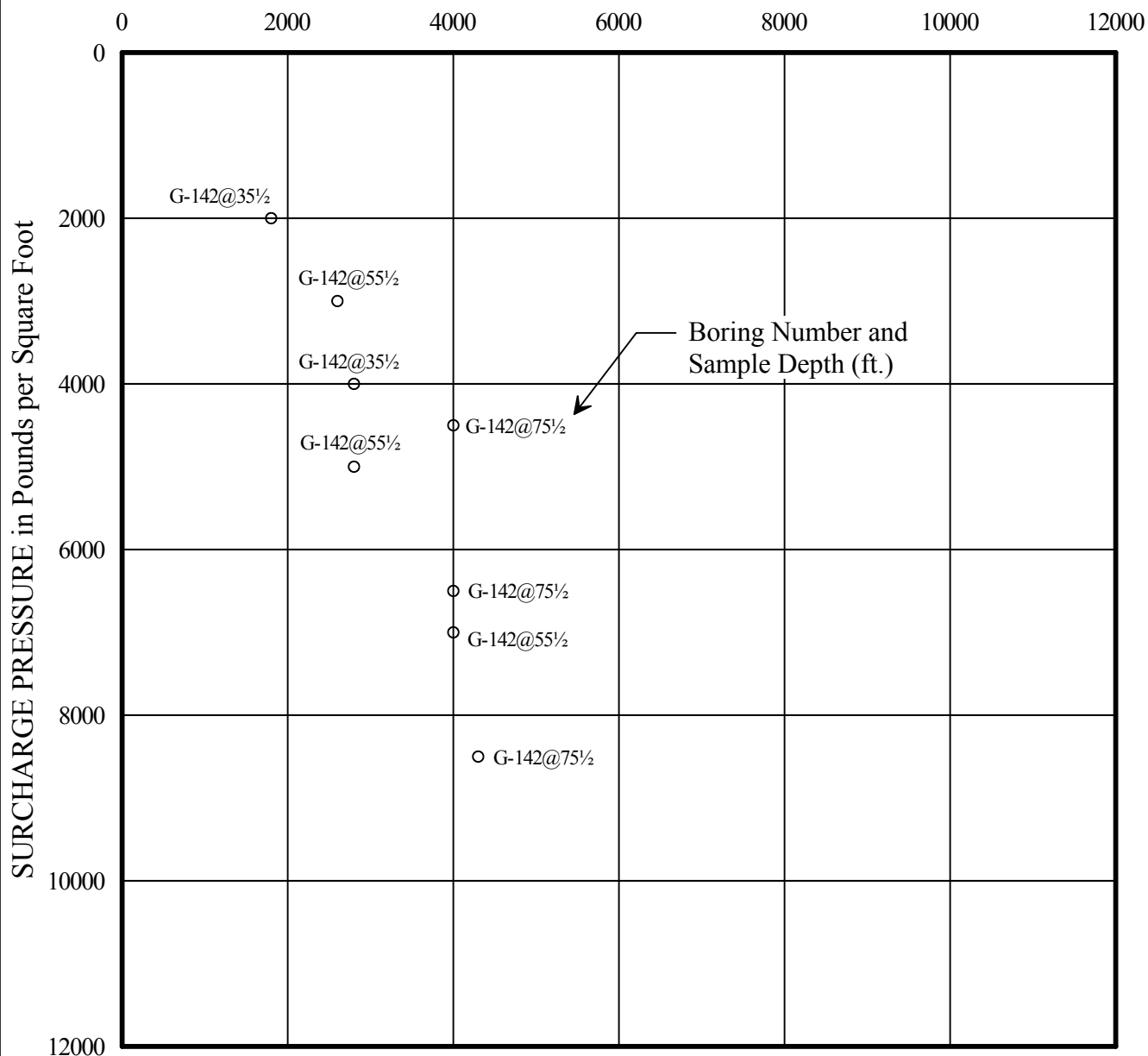
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

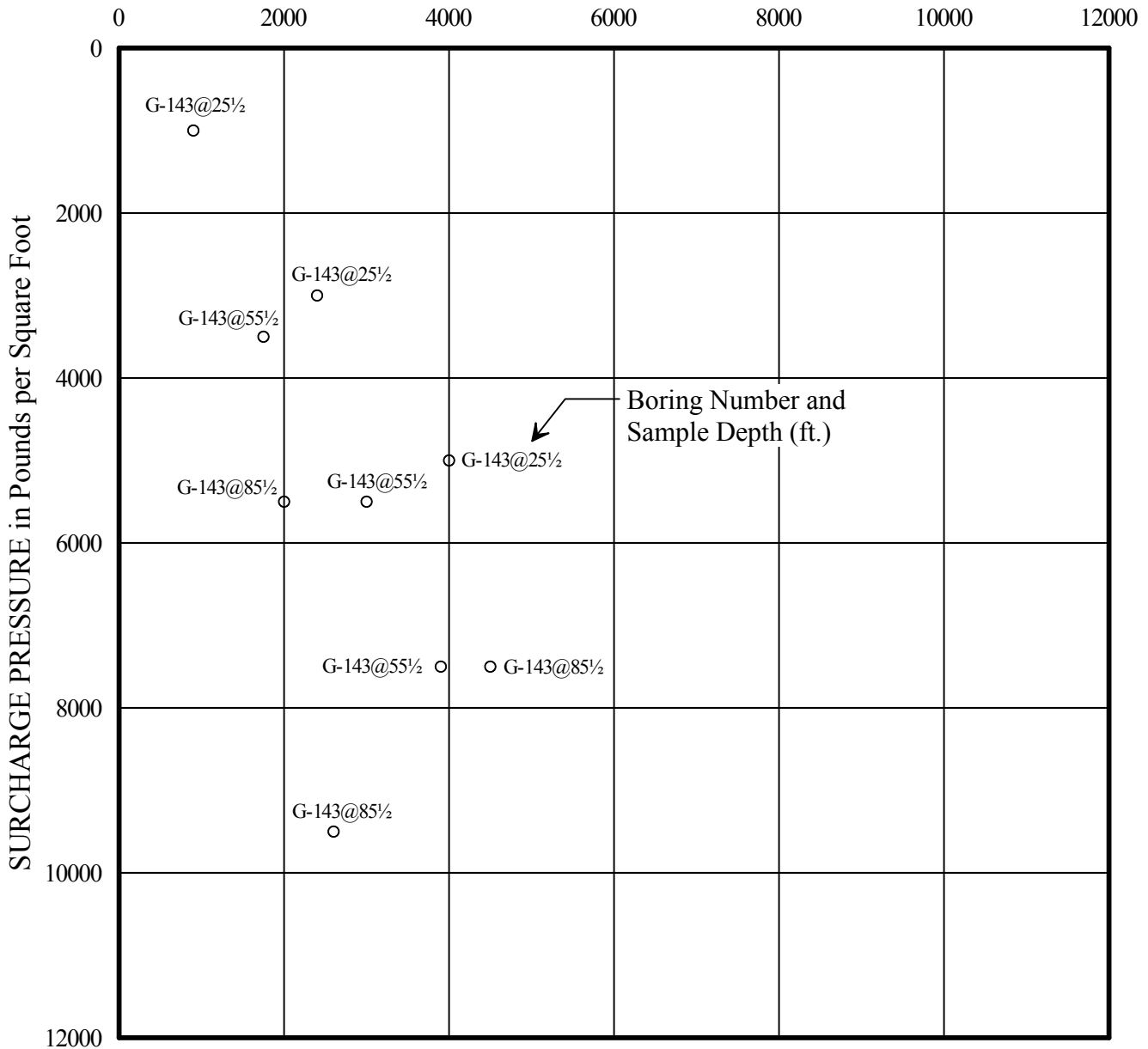
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/6/11
 Checked/Date: LT 10/6/11

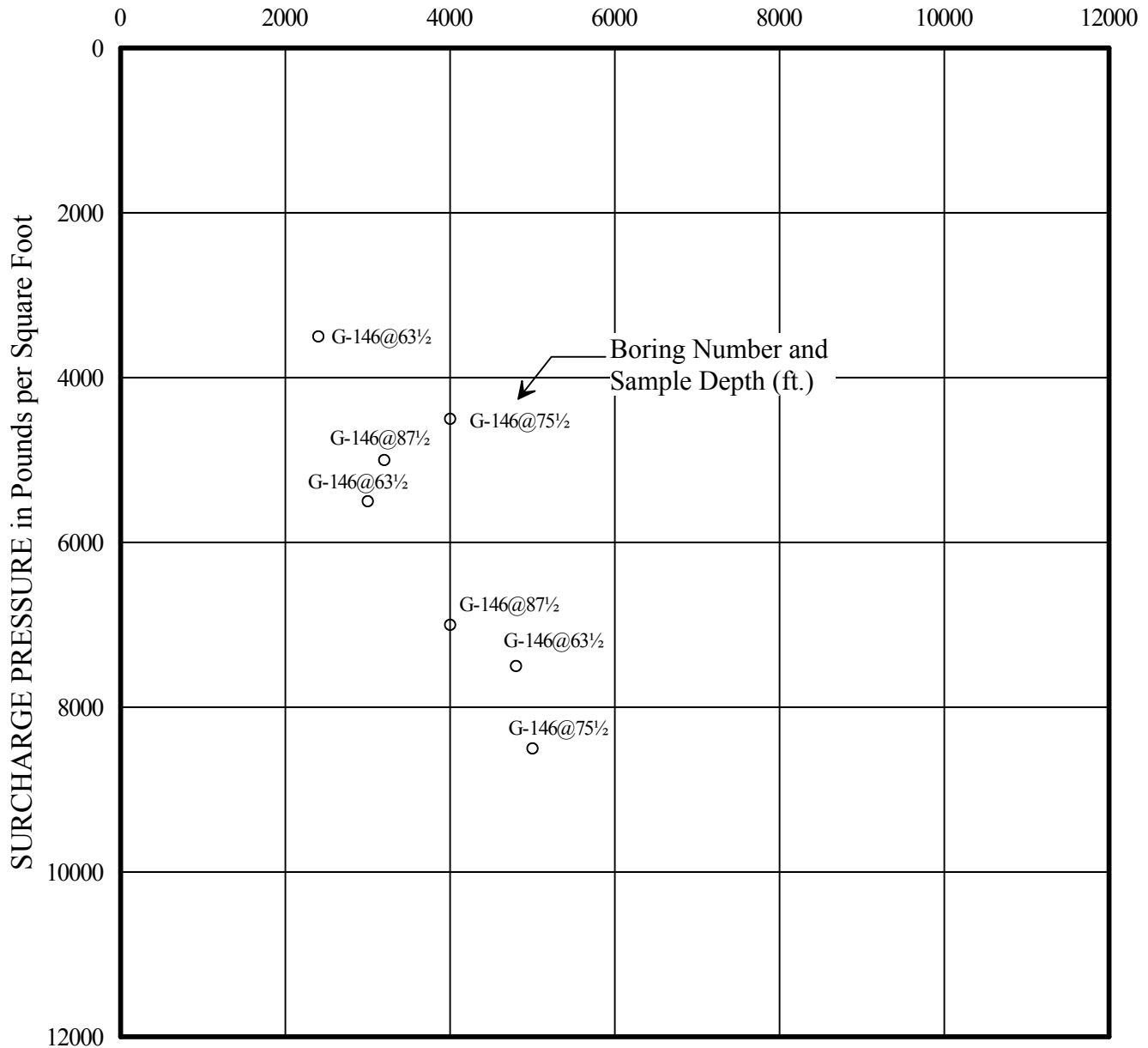
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/2/11
 Checked/Date: LT 10/3/11

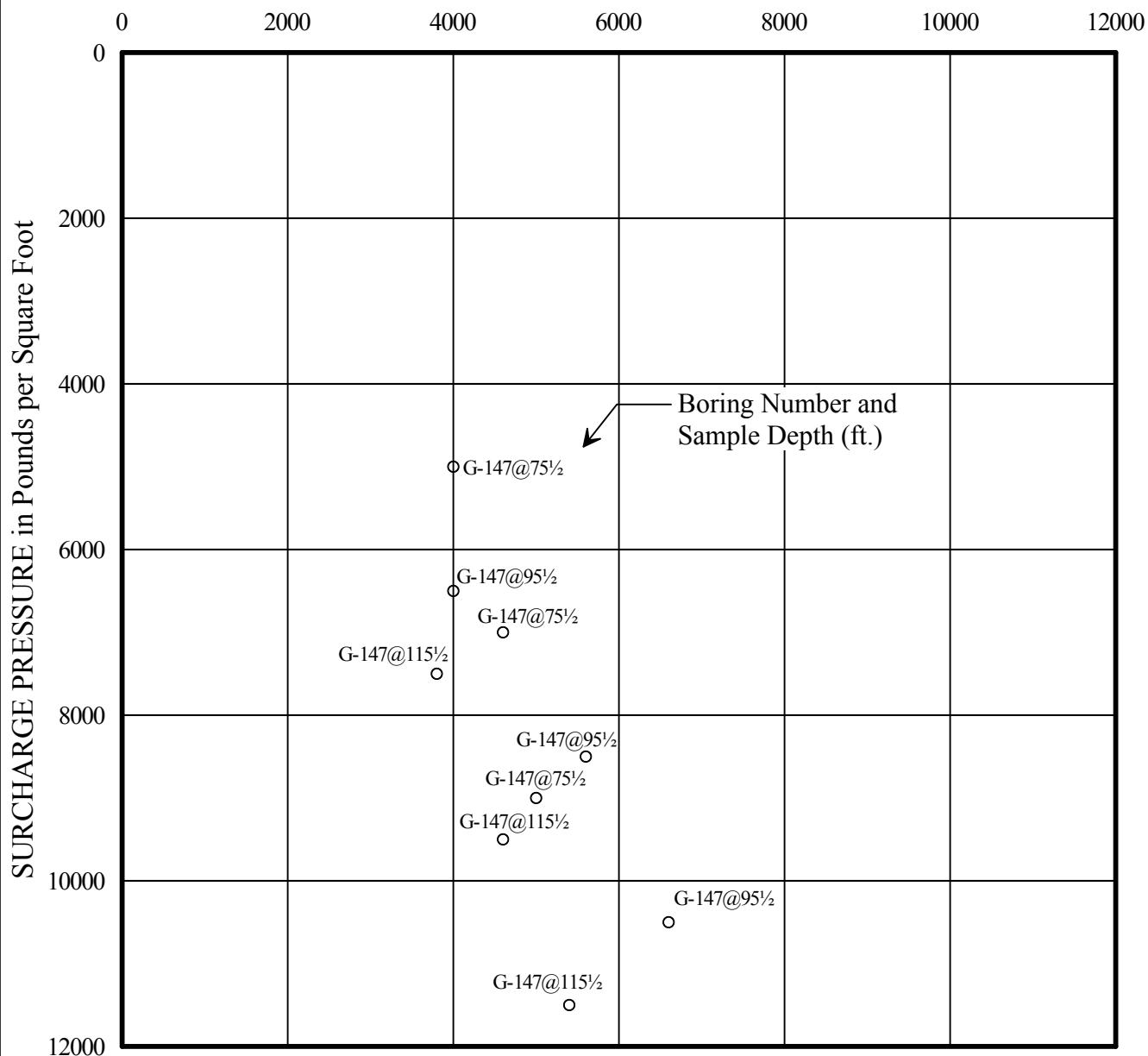
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: JF 10/4/11
 Checked/Date: LT 10/4/11

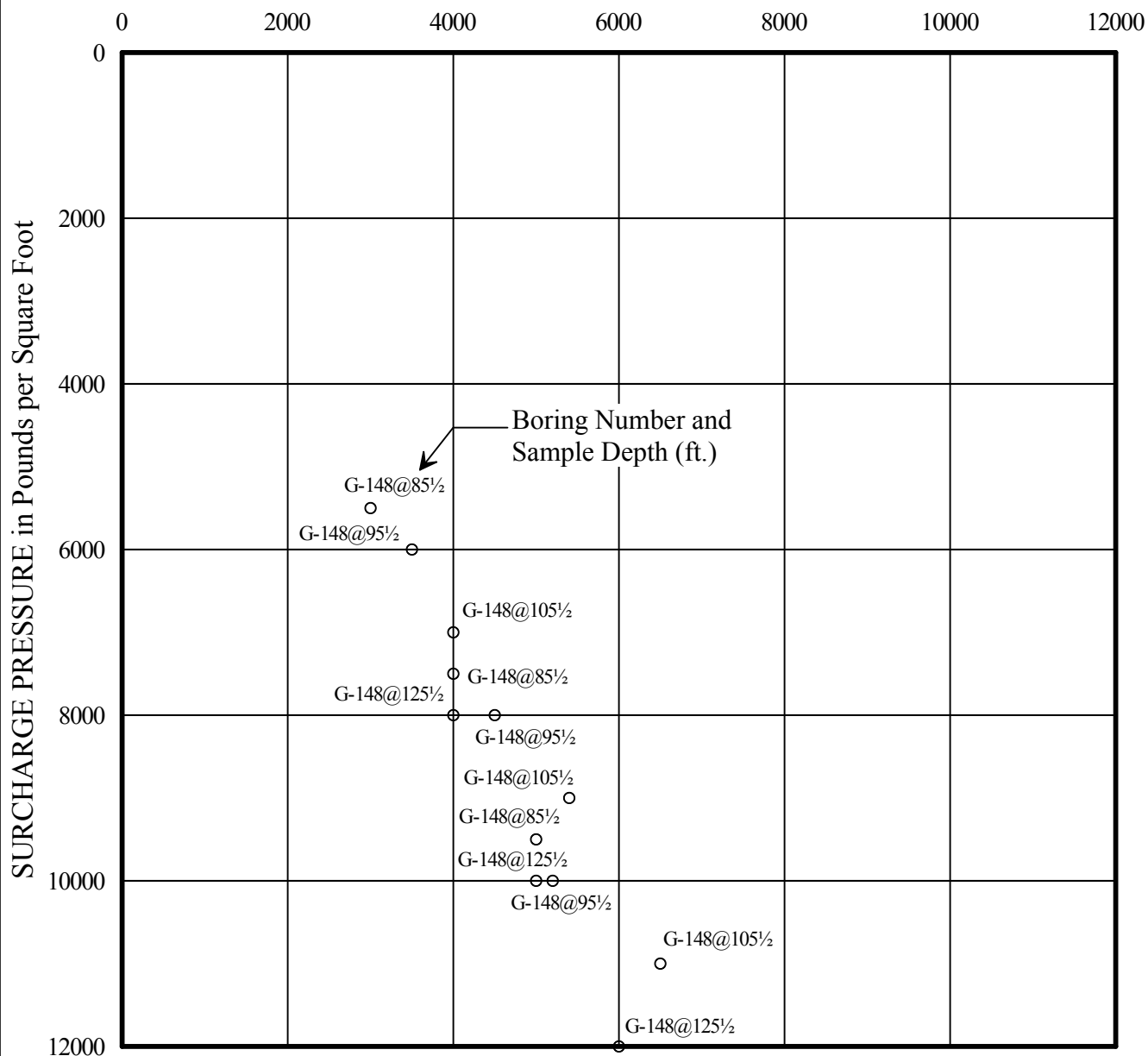
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/2/11
 Checked/Date: LT 10/3/11

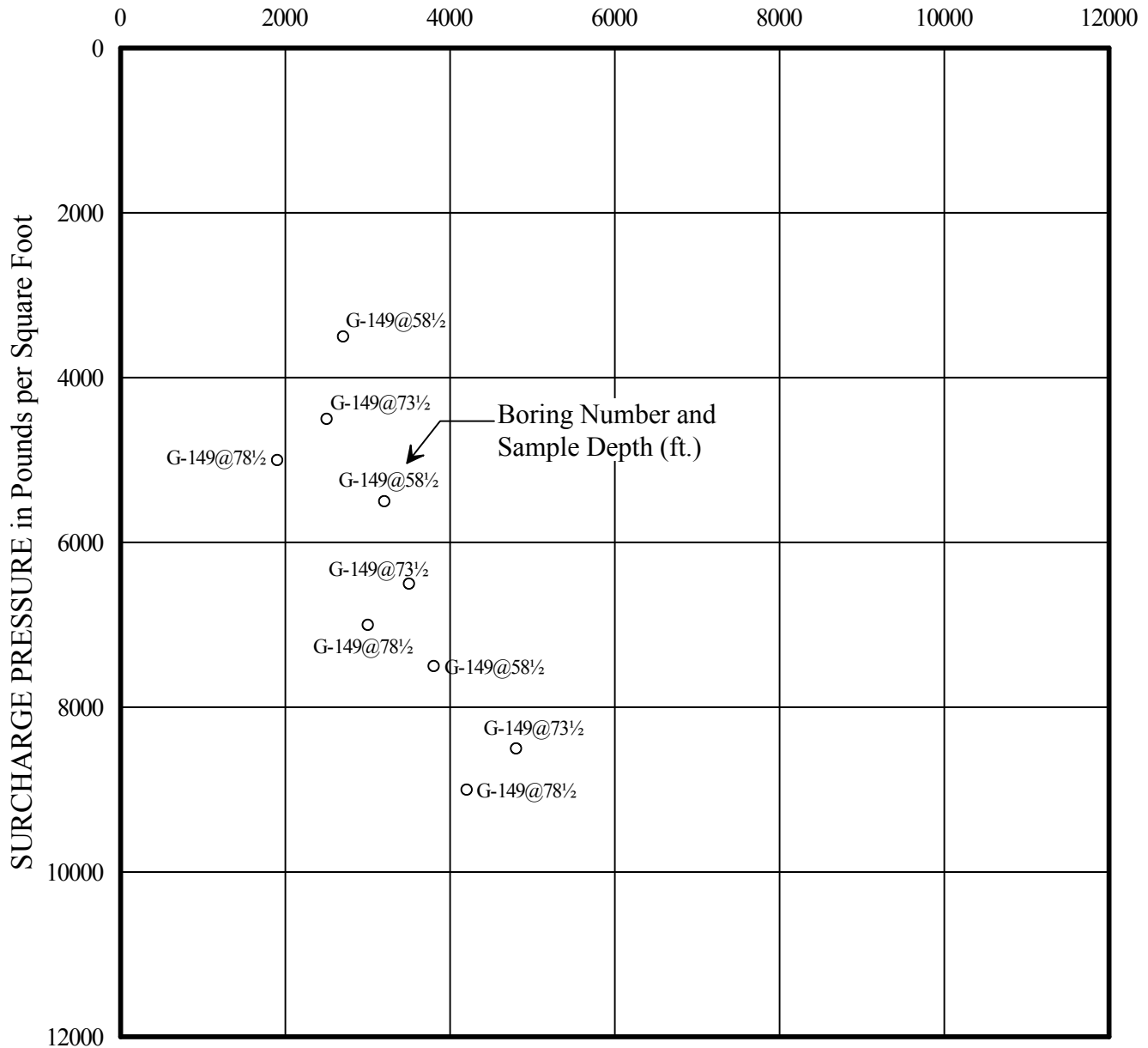
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/5/11
 Checked/Date: LT 10/6/11

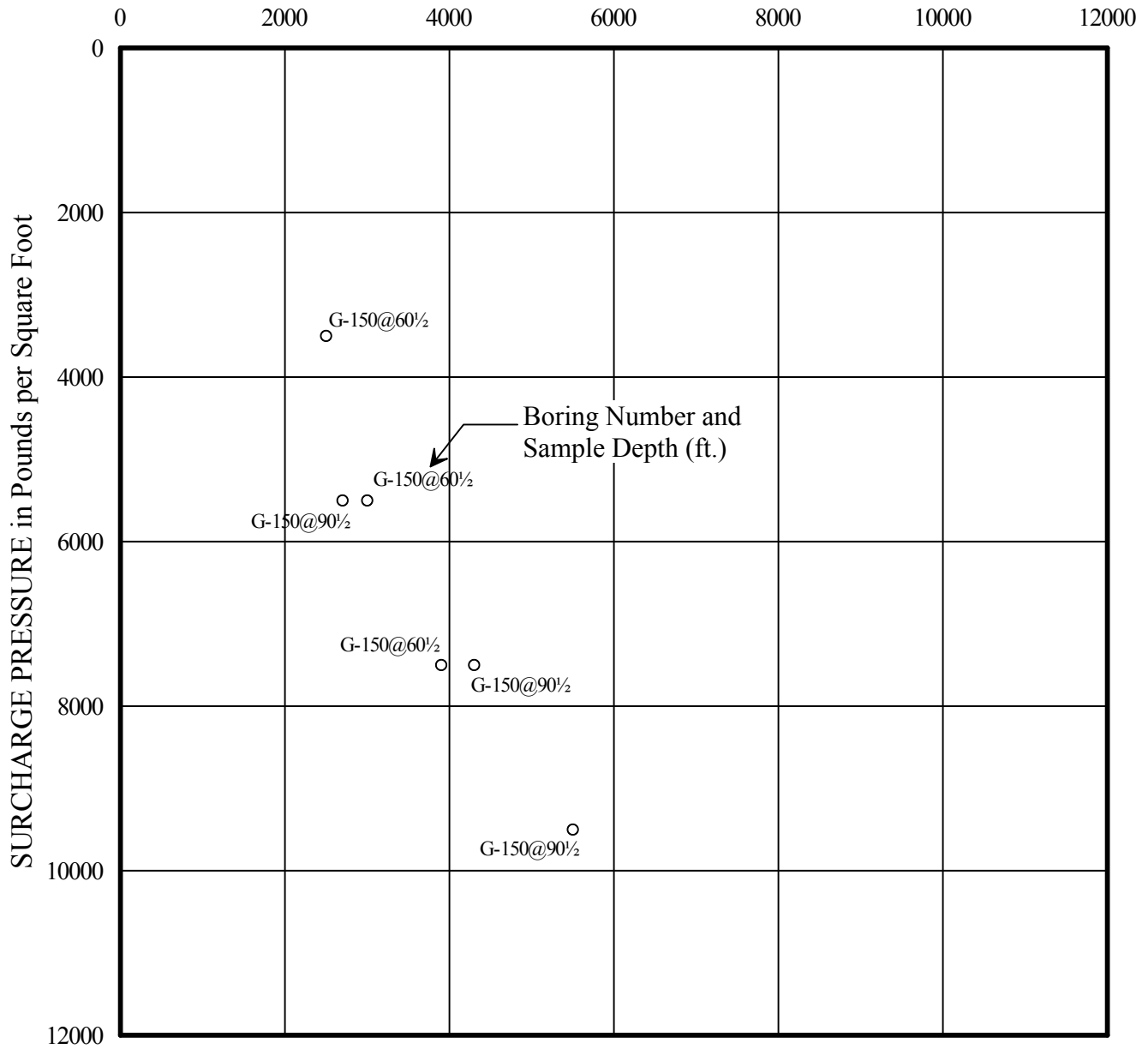
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

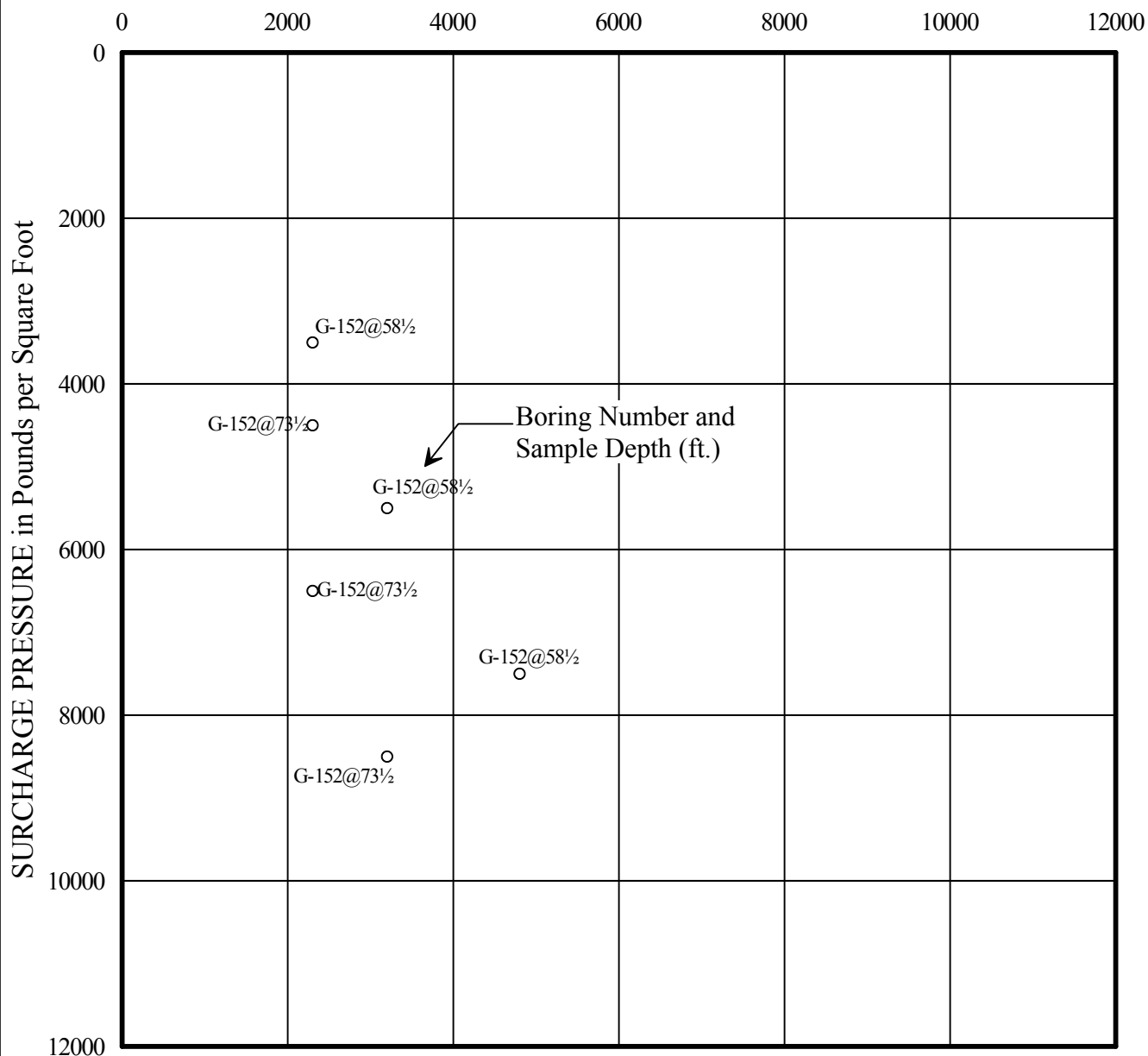
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

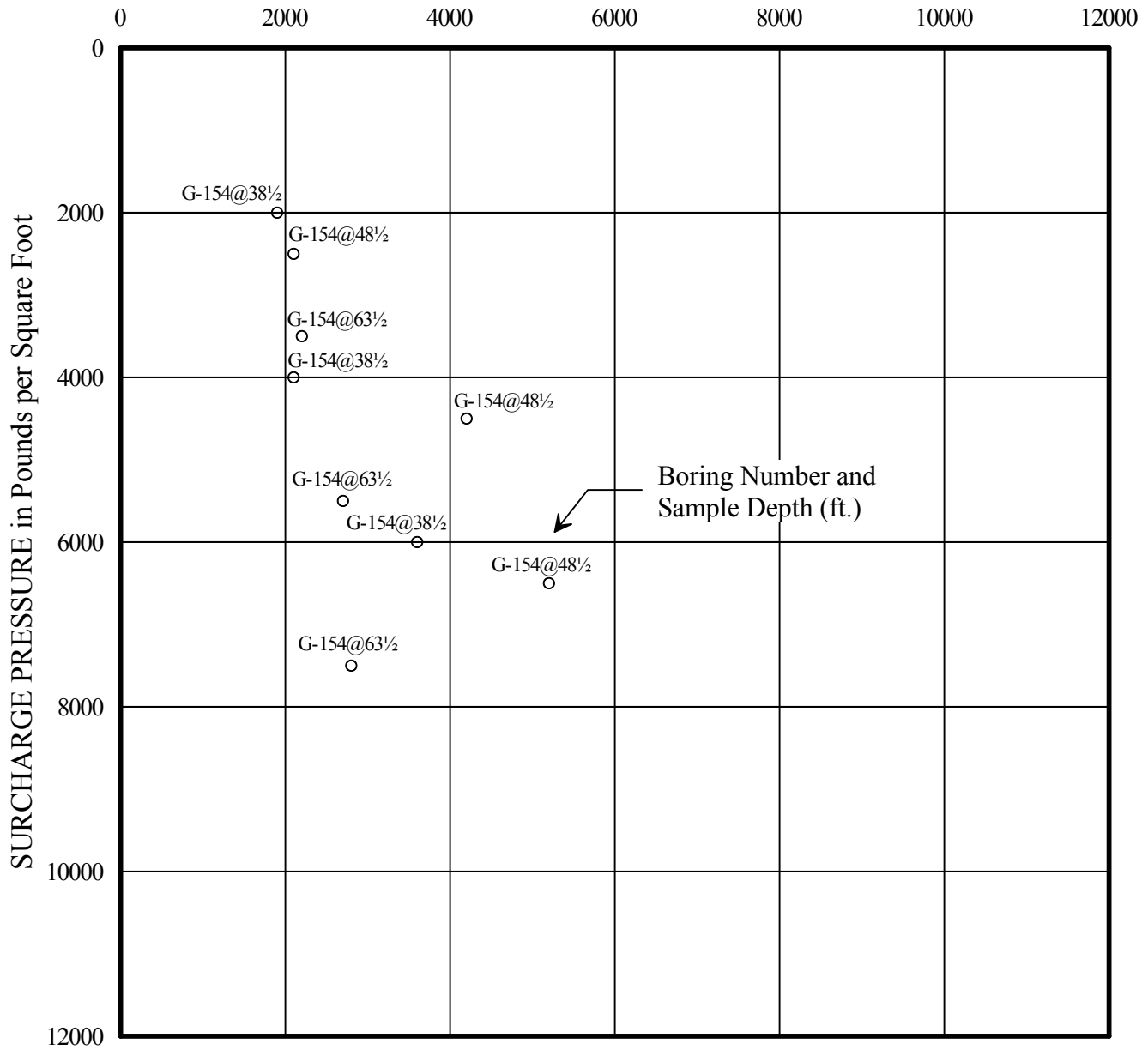
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/5/11

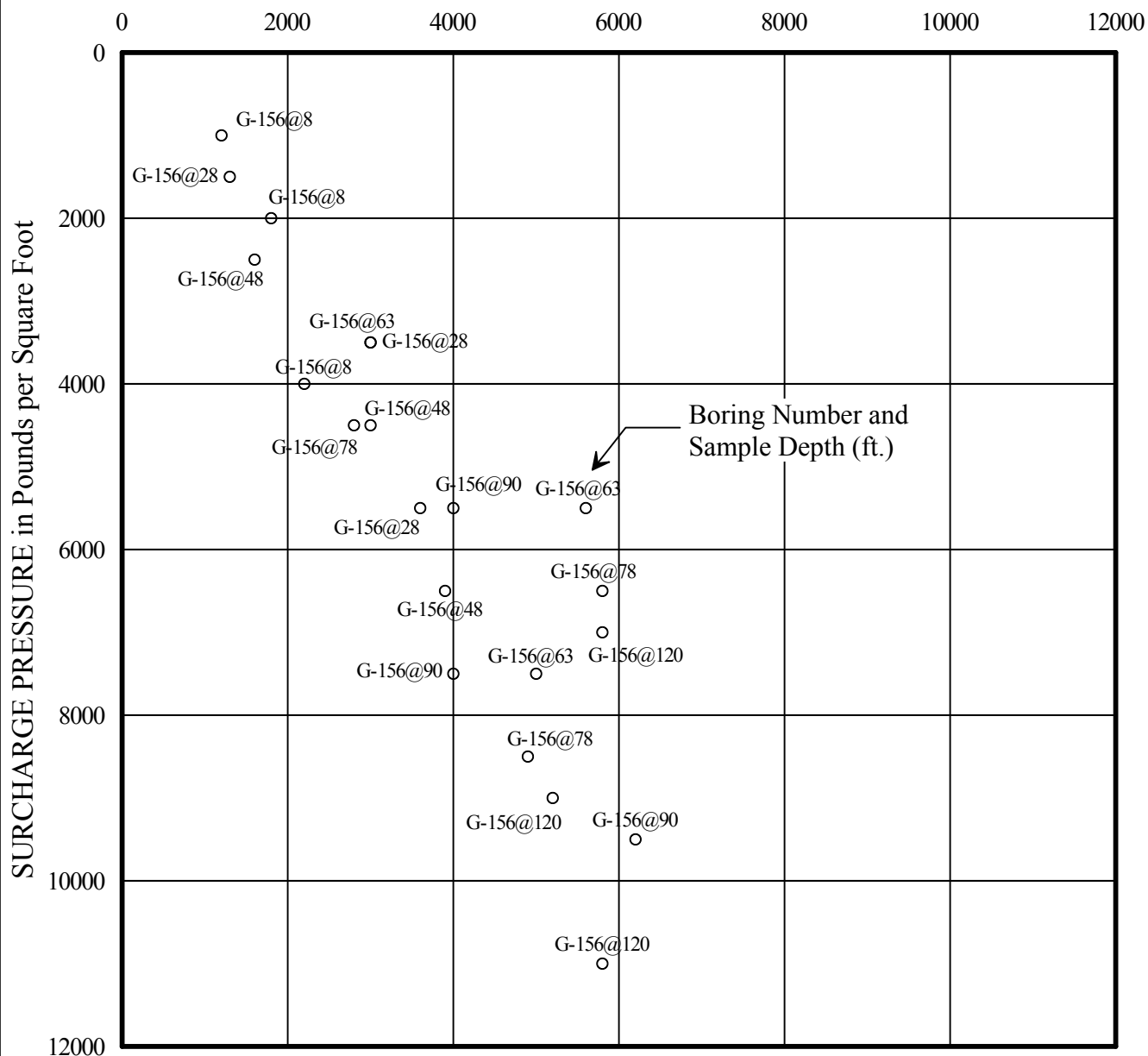
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

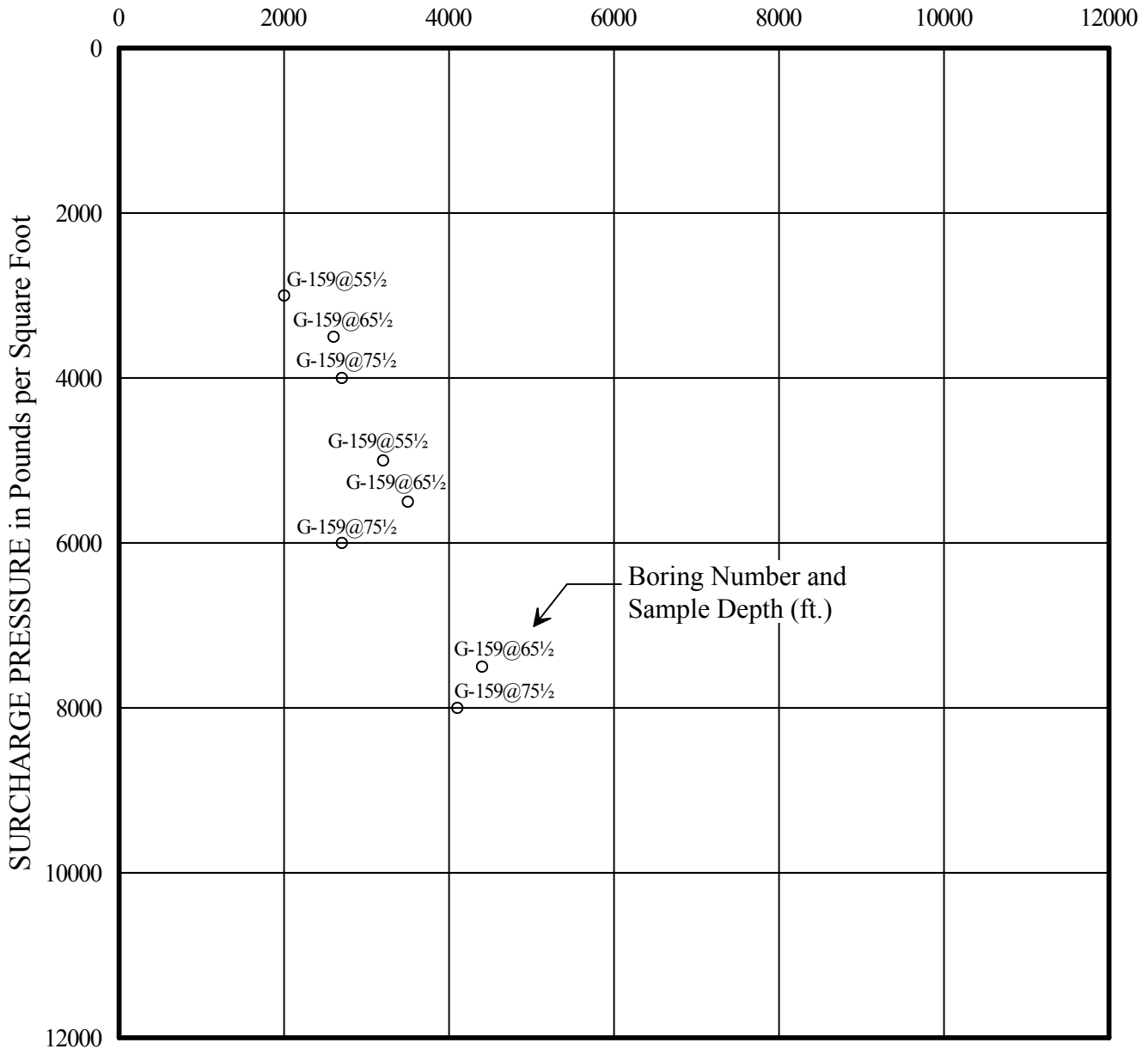
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

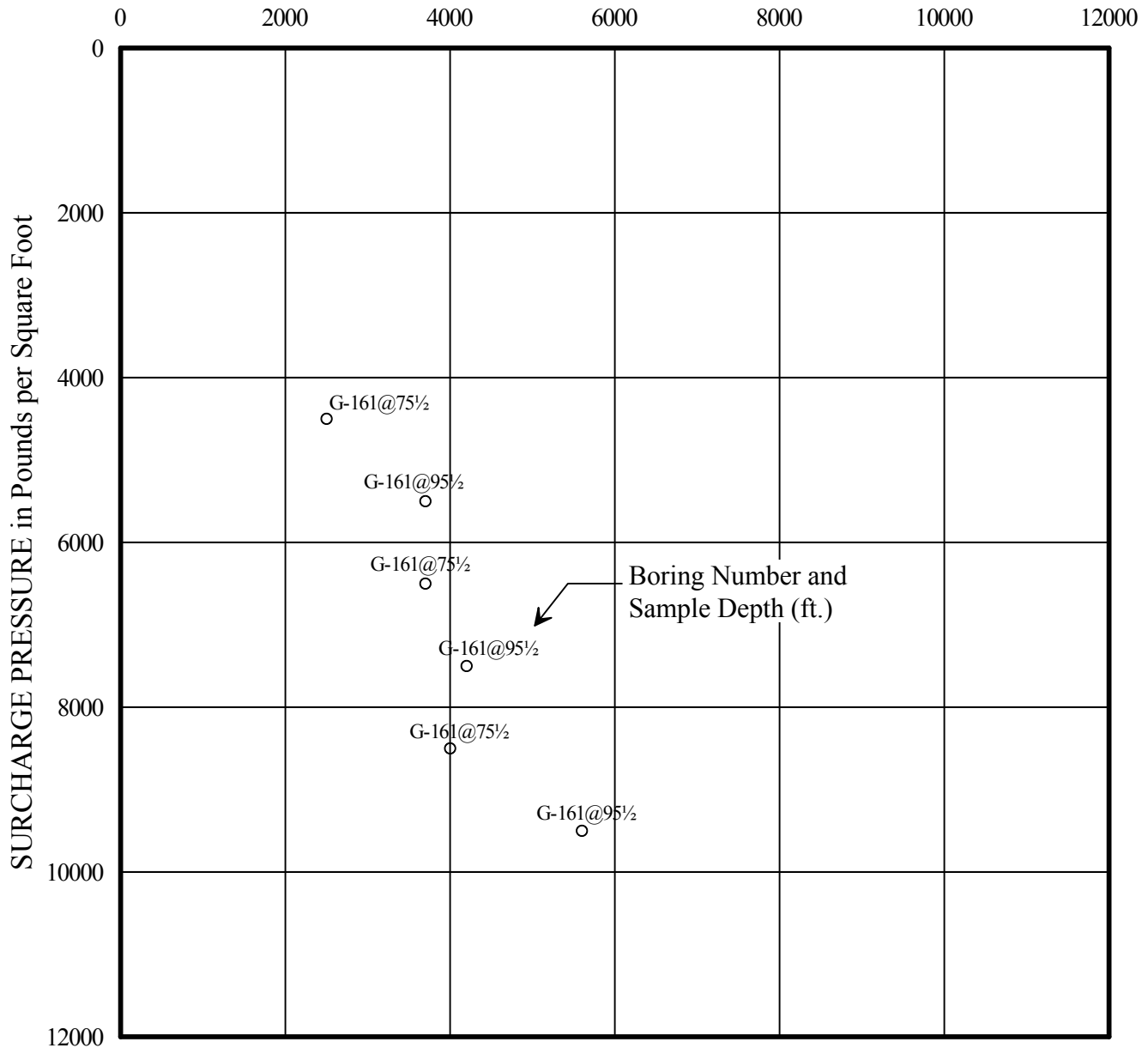
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

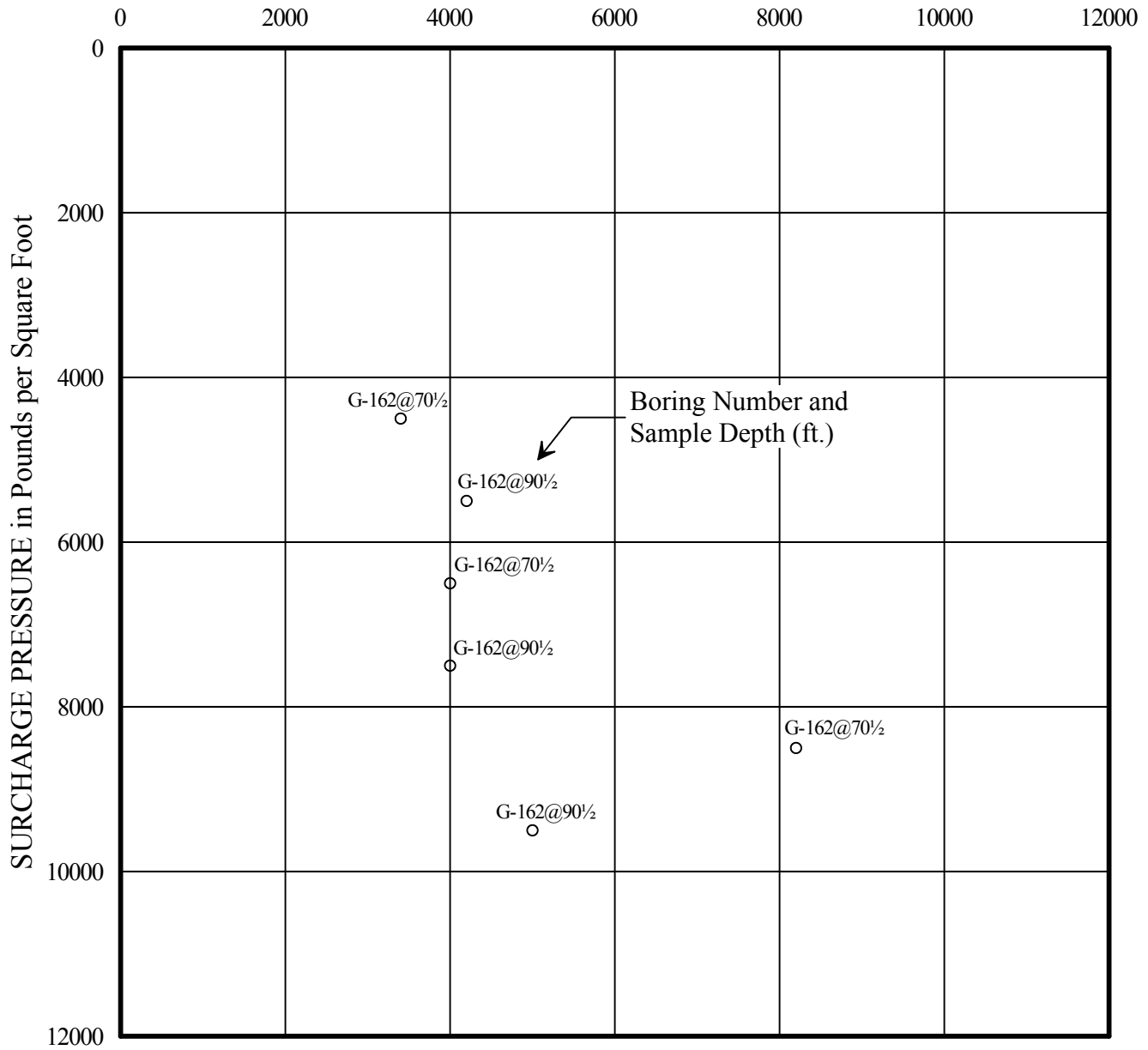
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

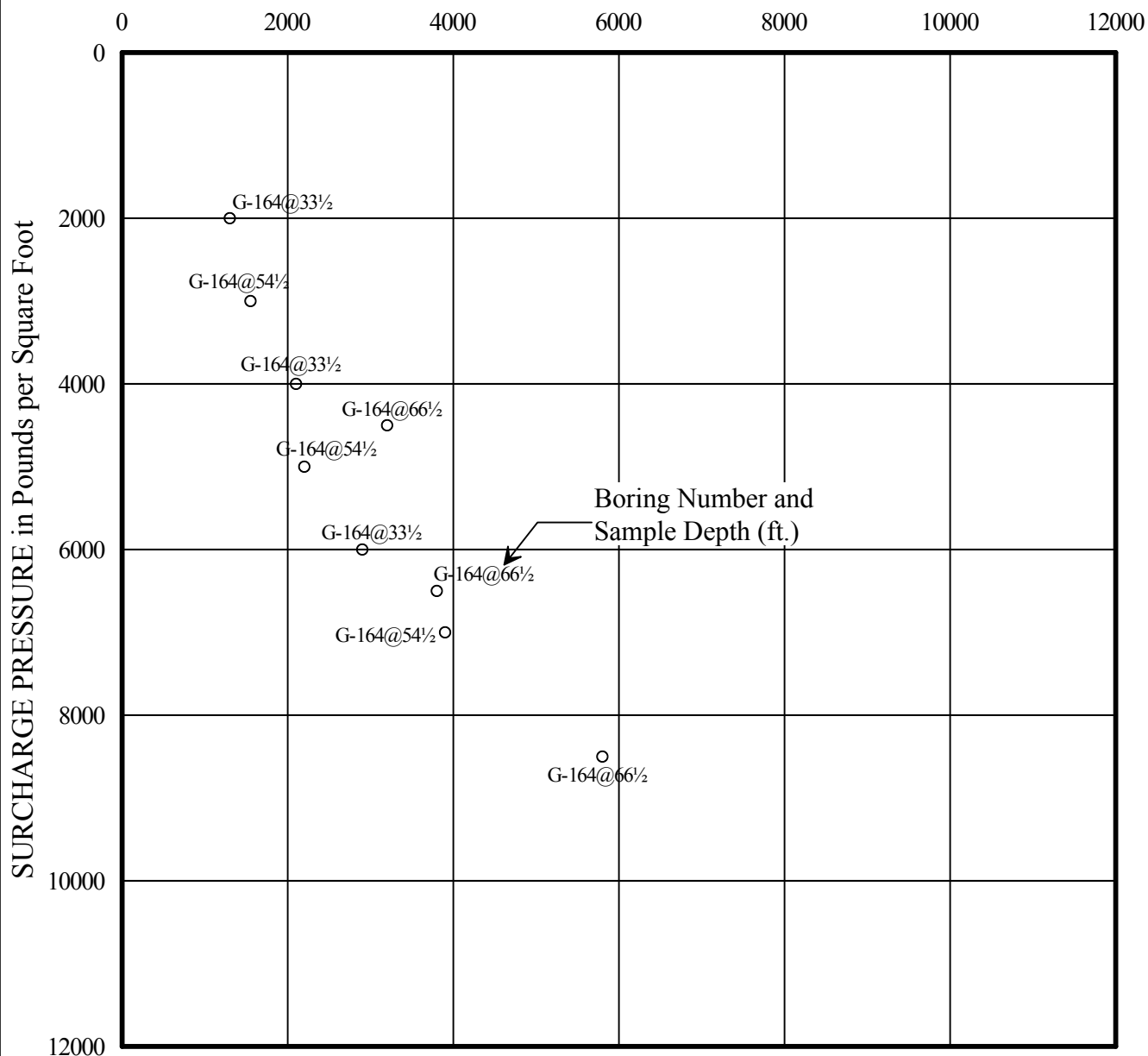
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

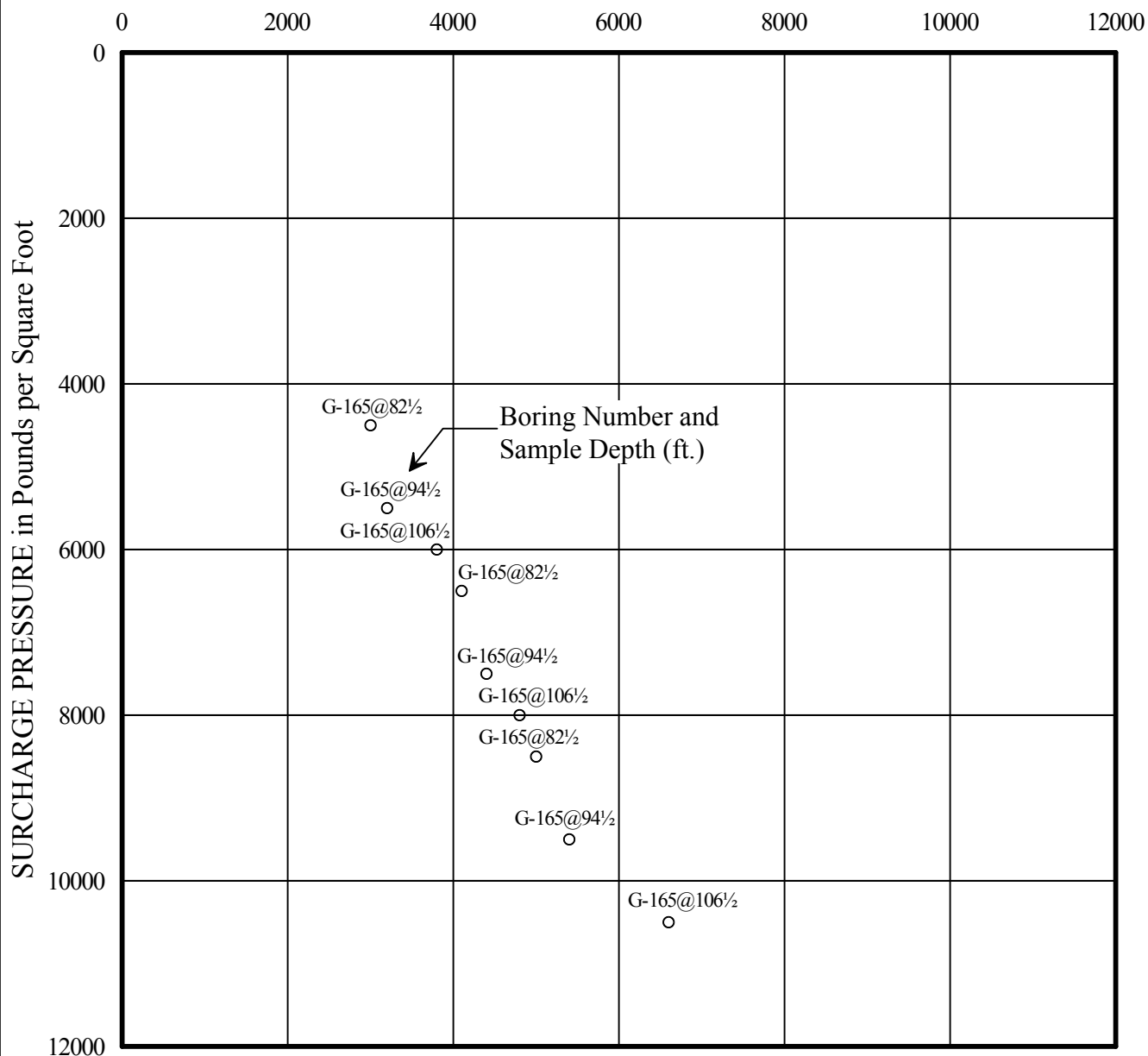
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

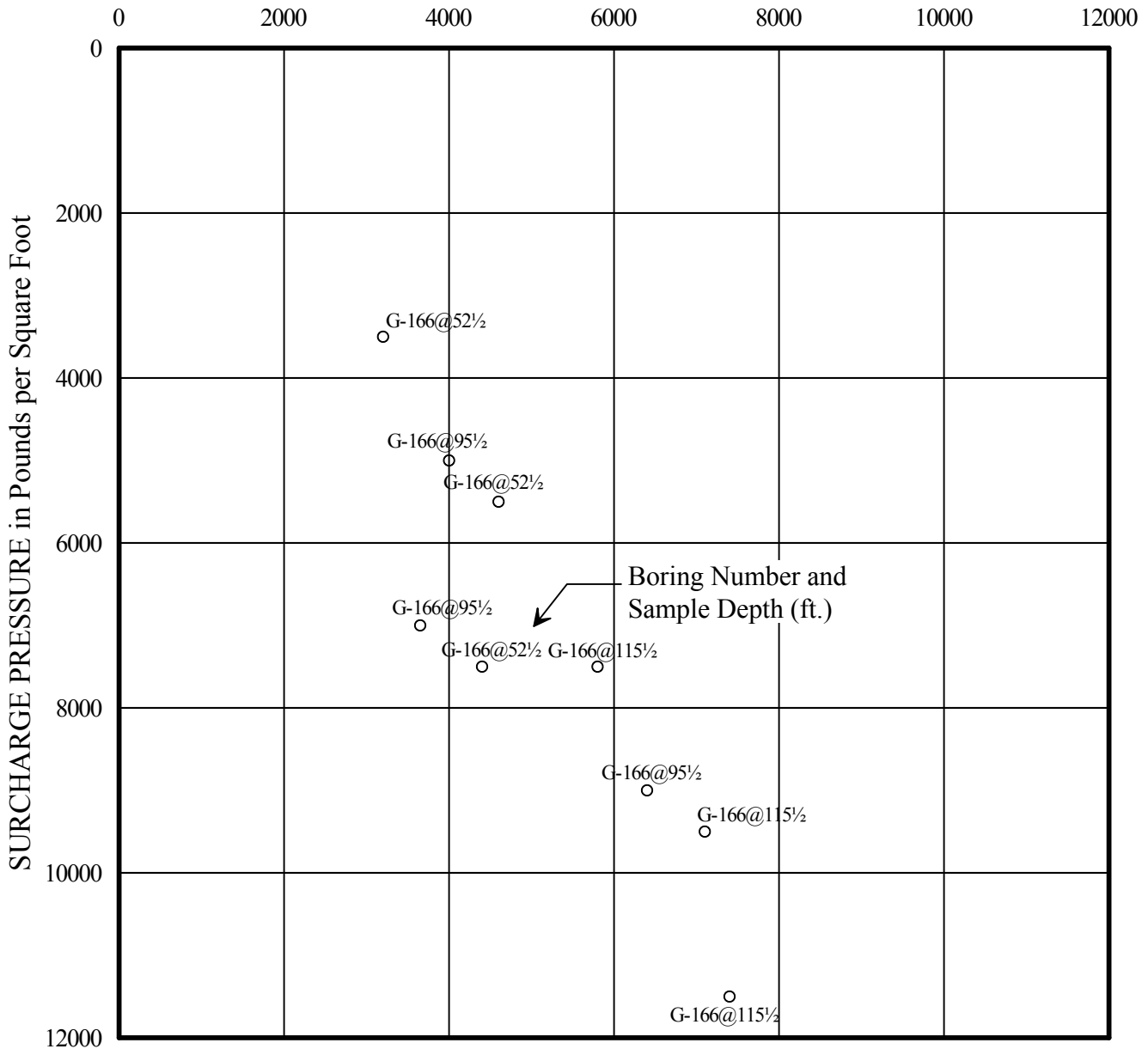
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

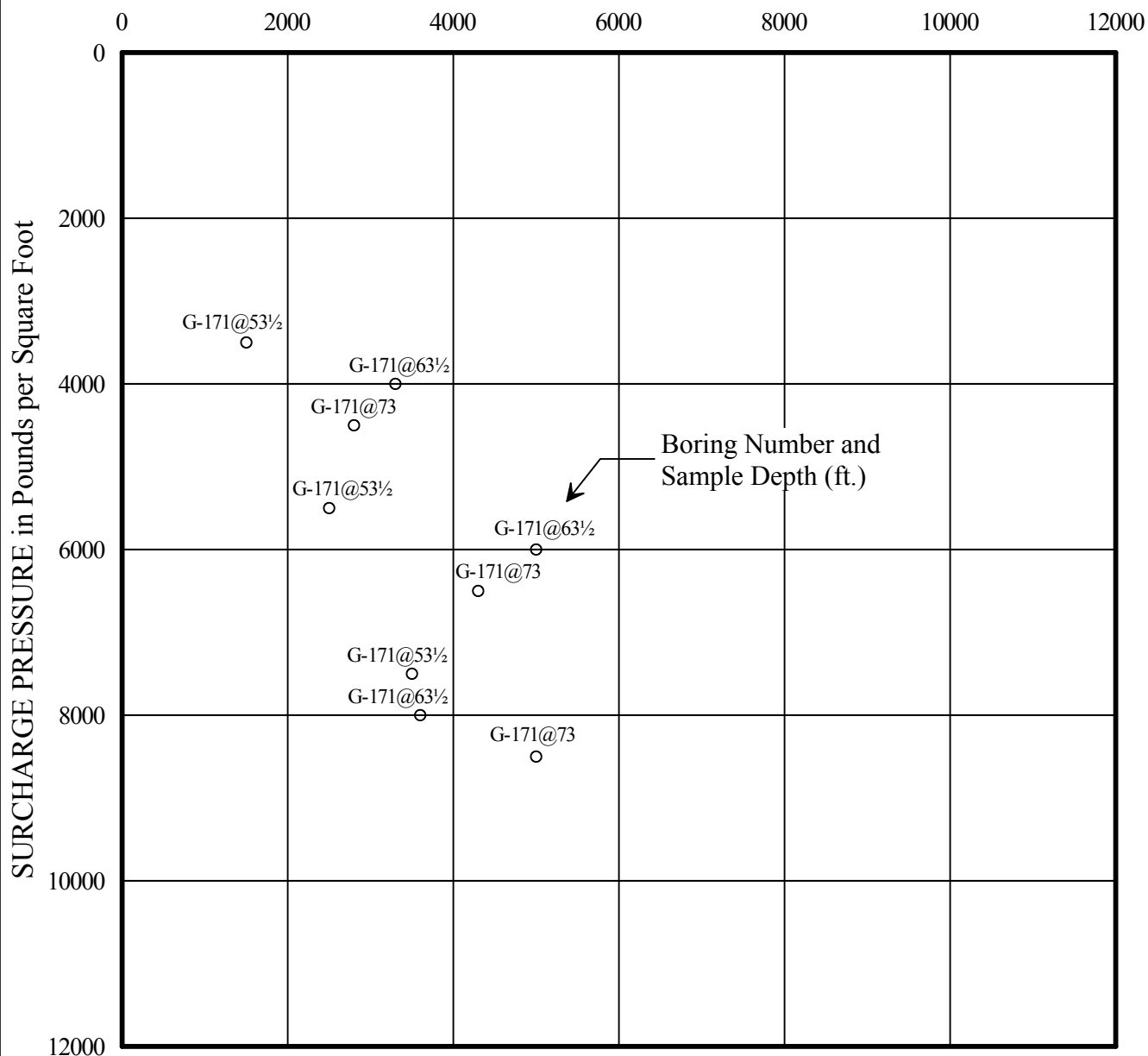
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

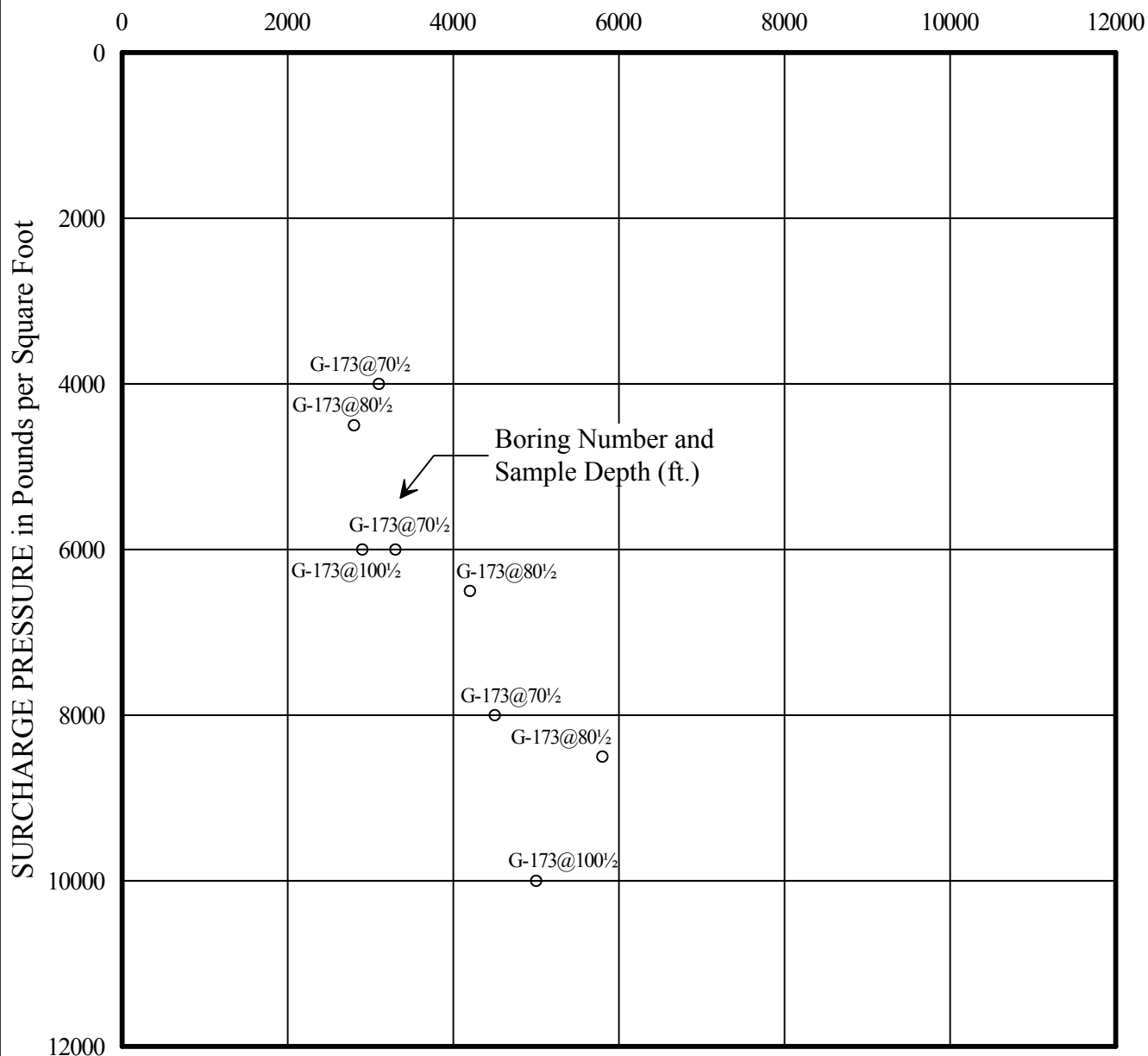
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

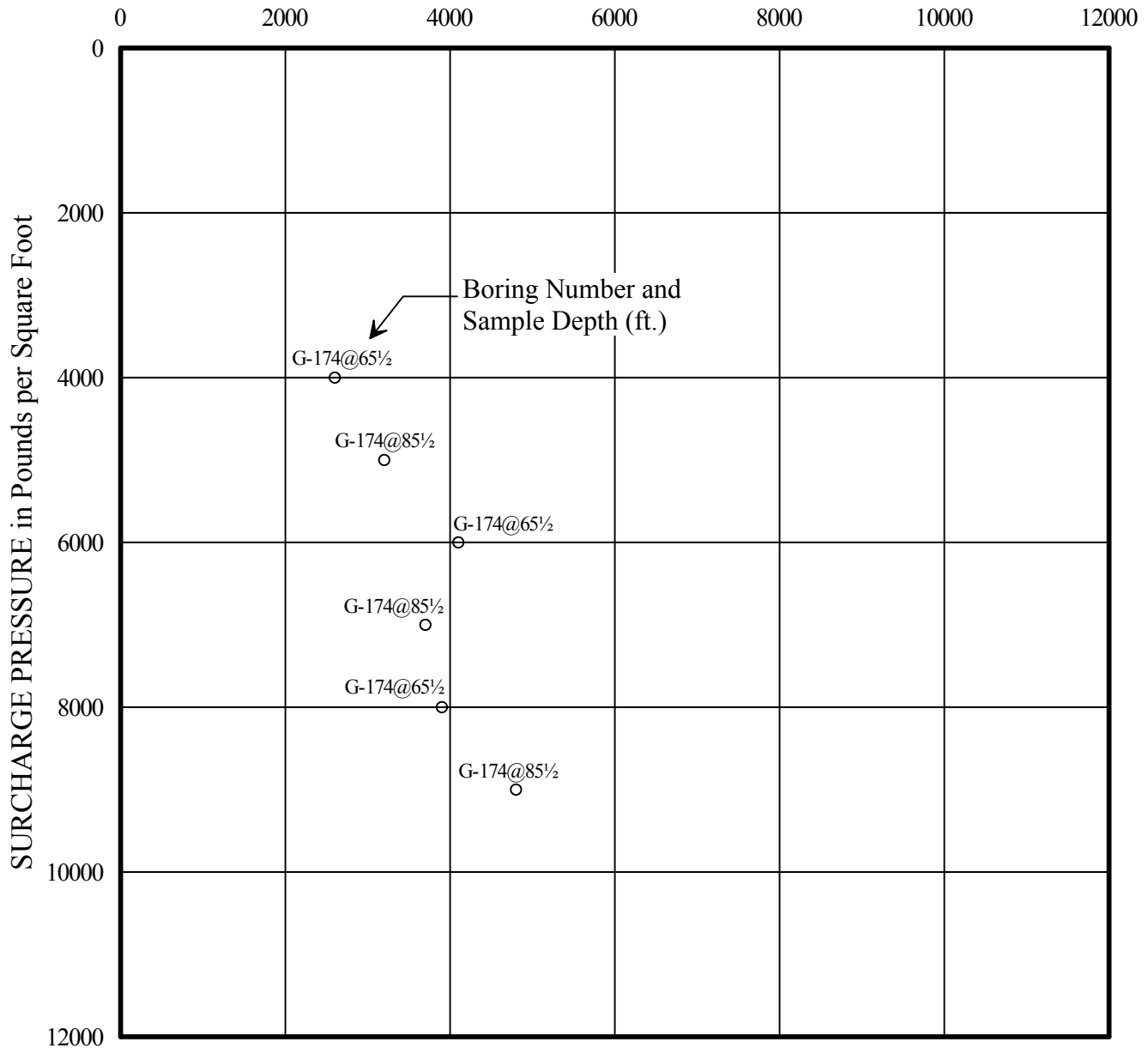
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 9/30/11
 Checked/Date: LT 9/30/11

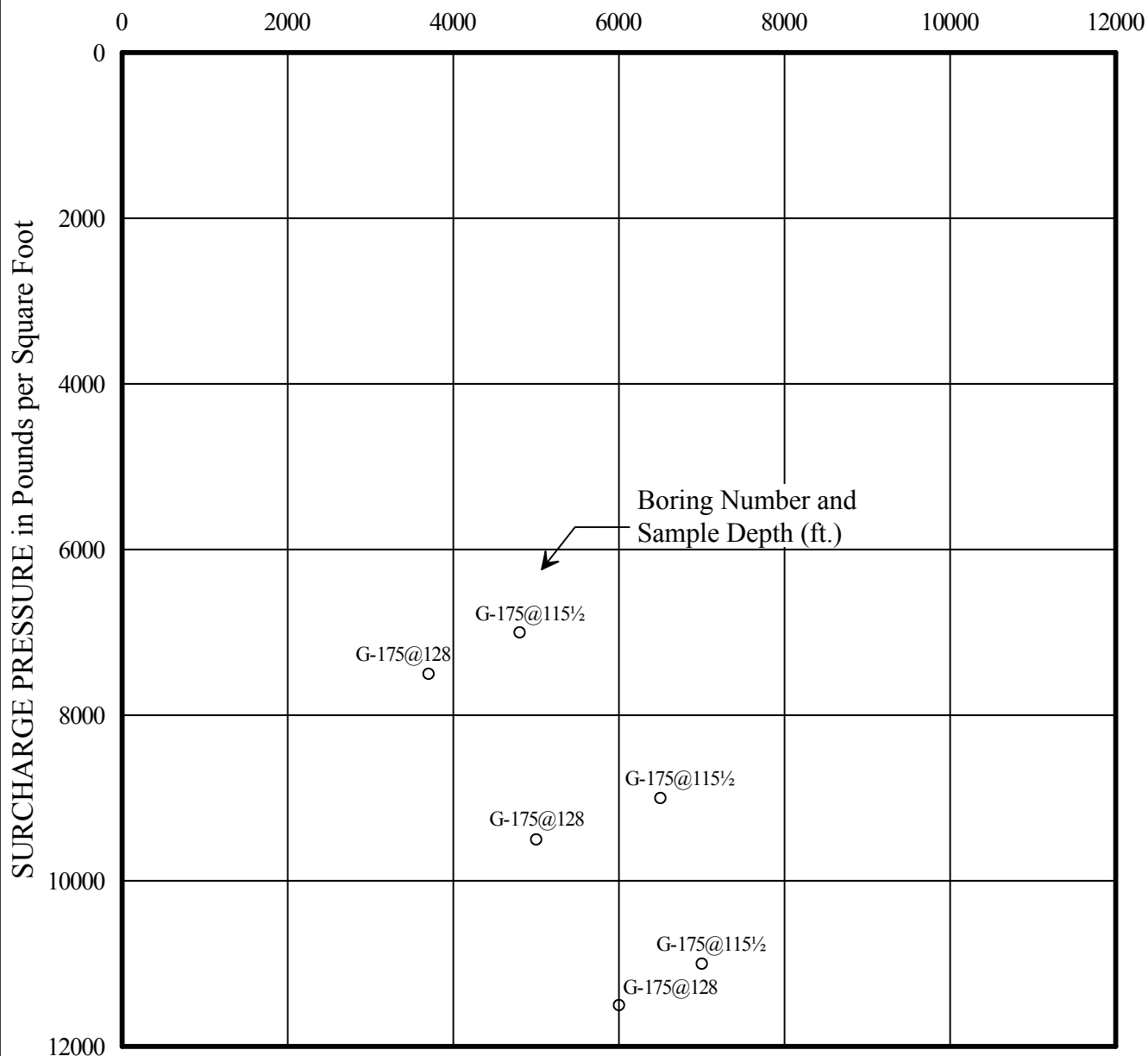
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/3/11

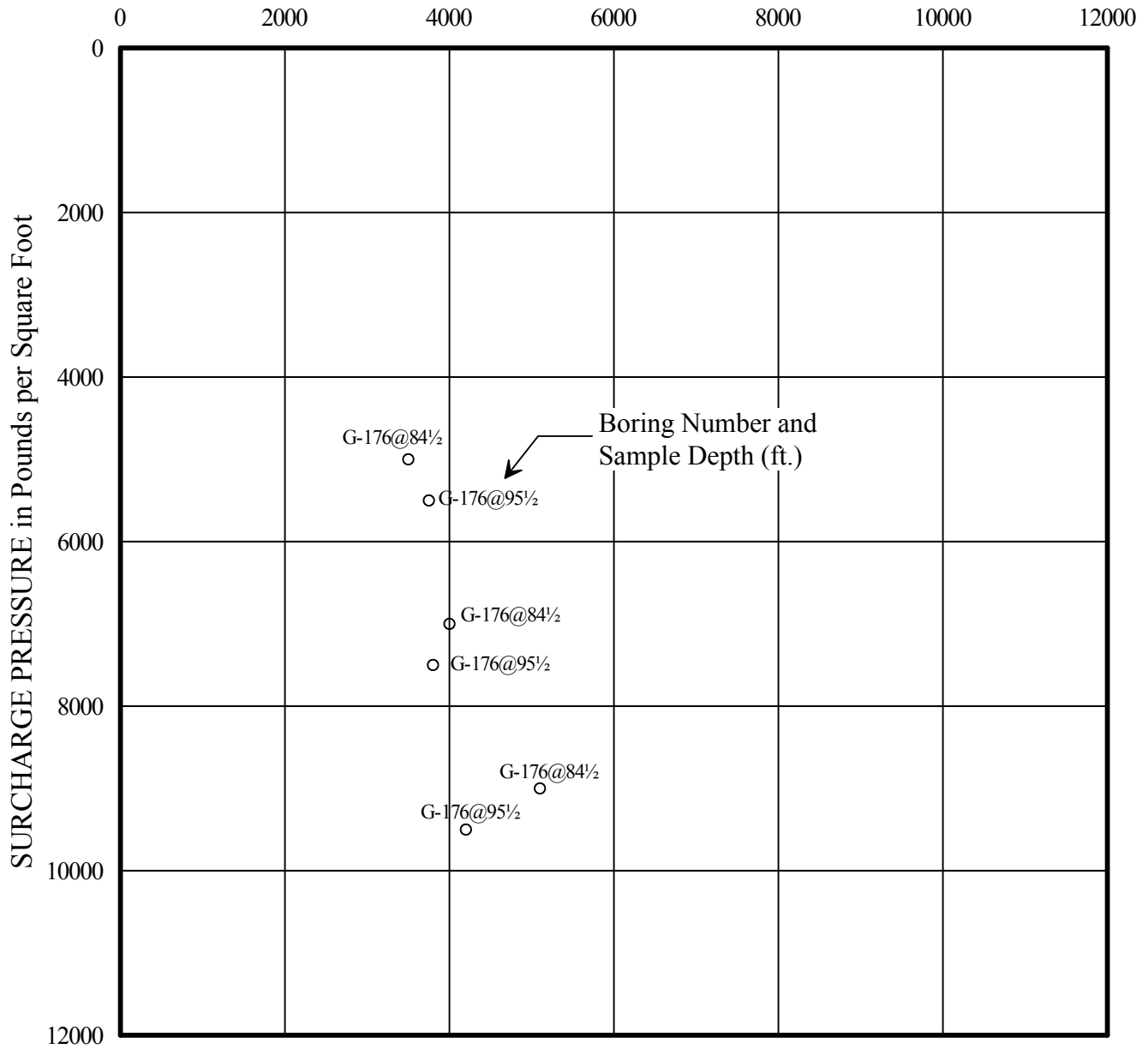
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: YN 9/30/11
 Checked/Date: LT 9/30/11

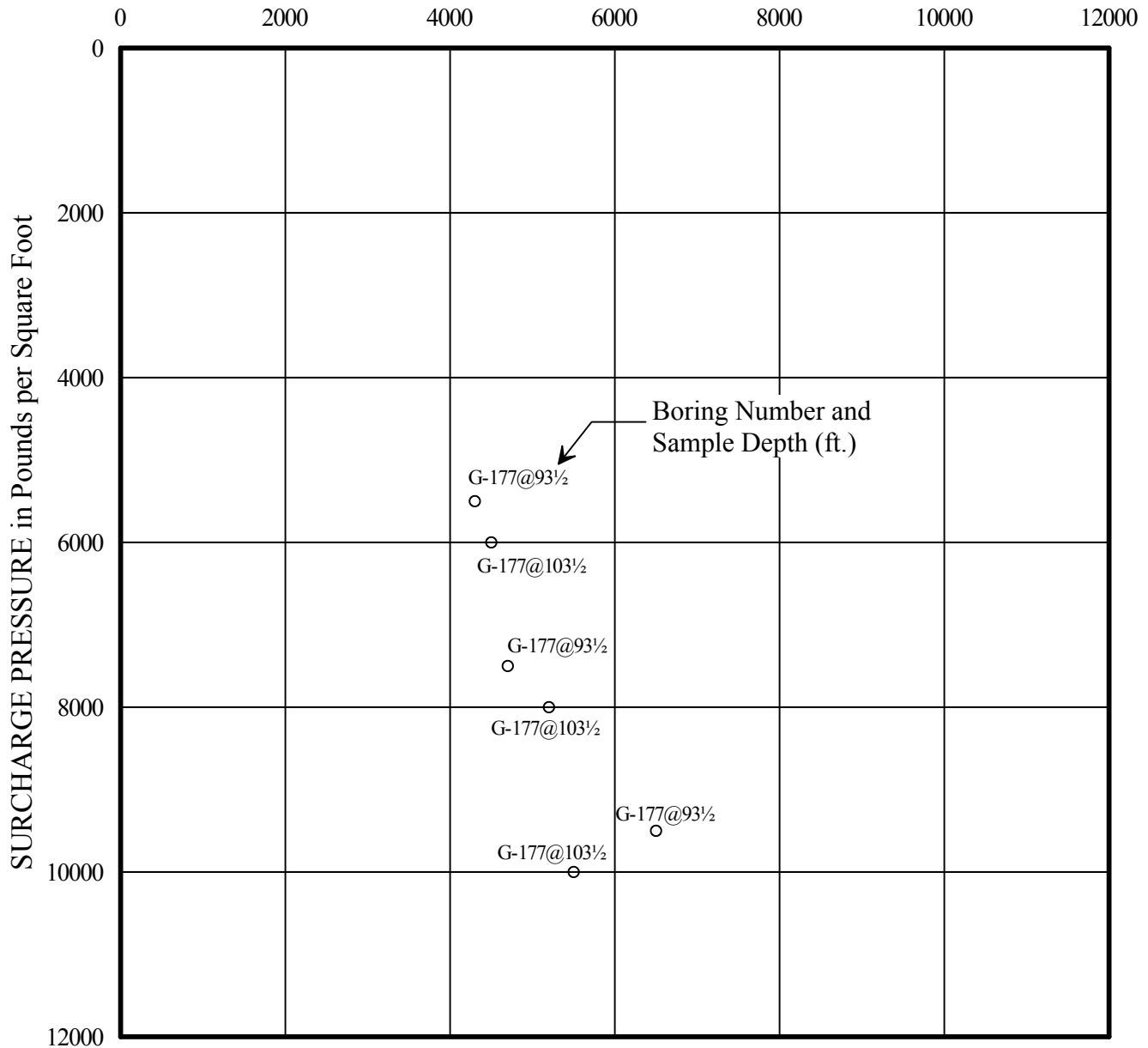
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

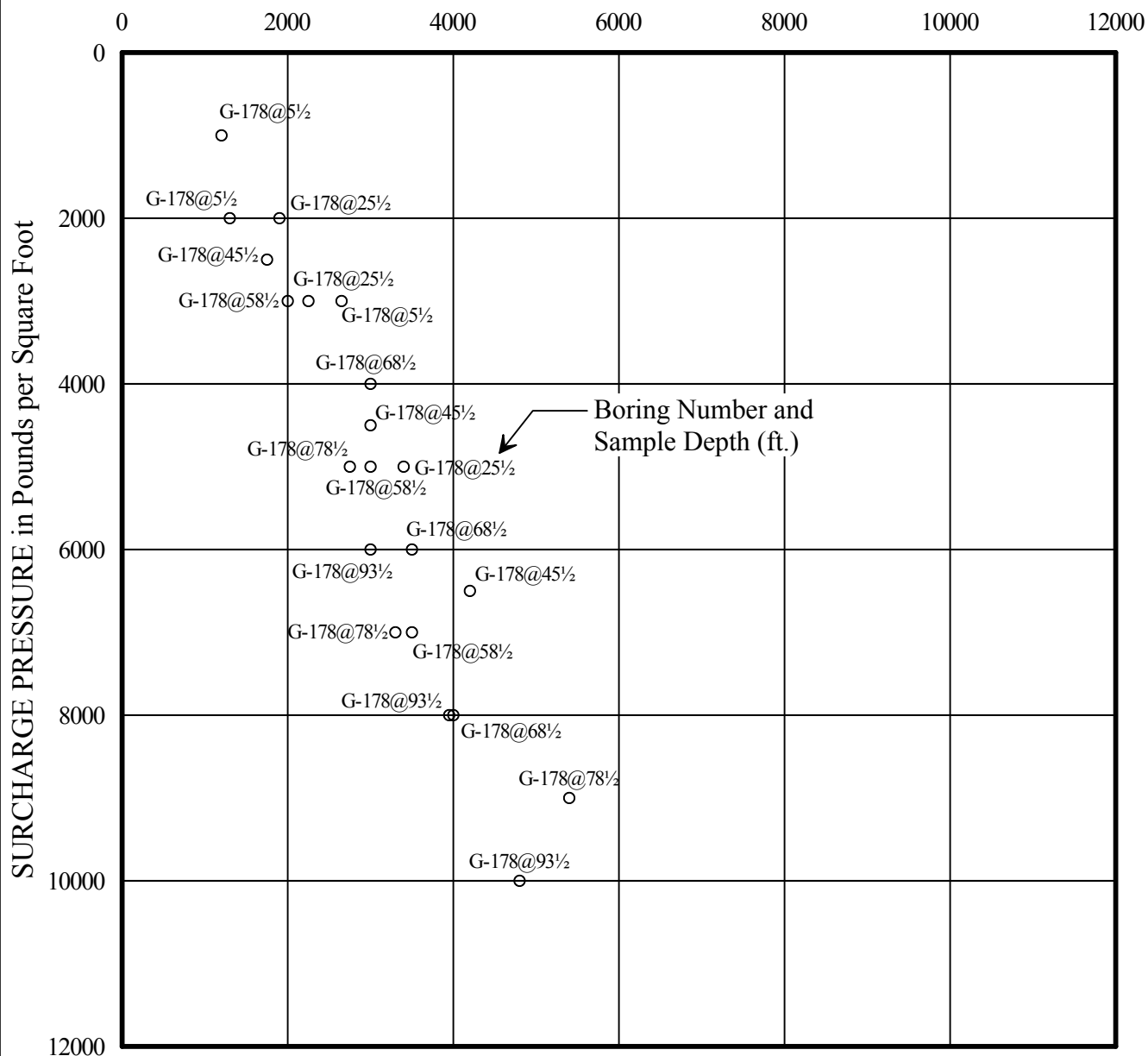
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/5/11

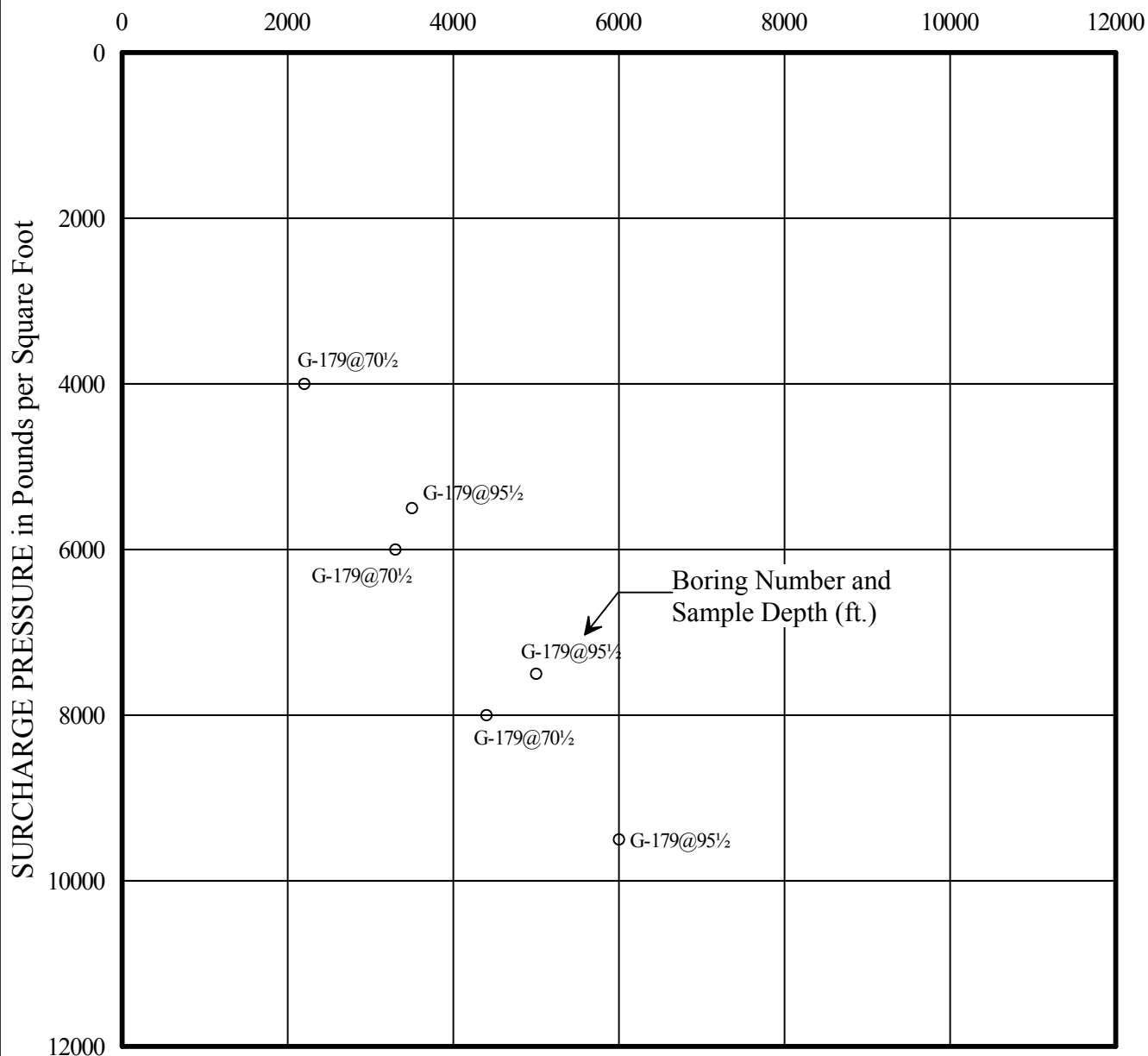
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

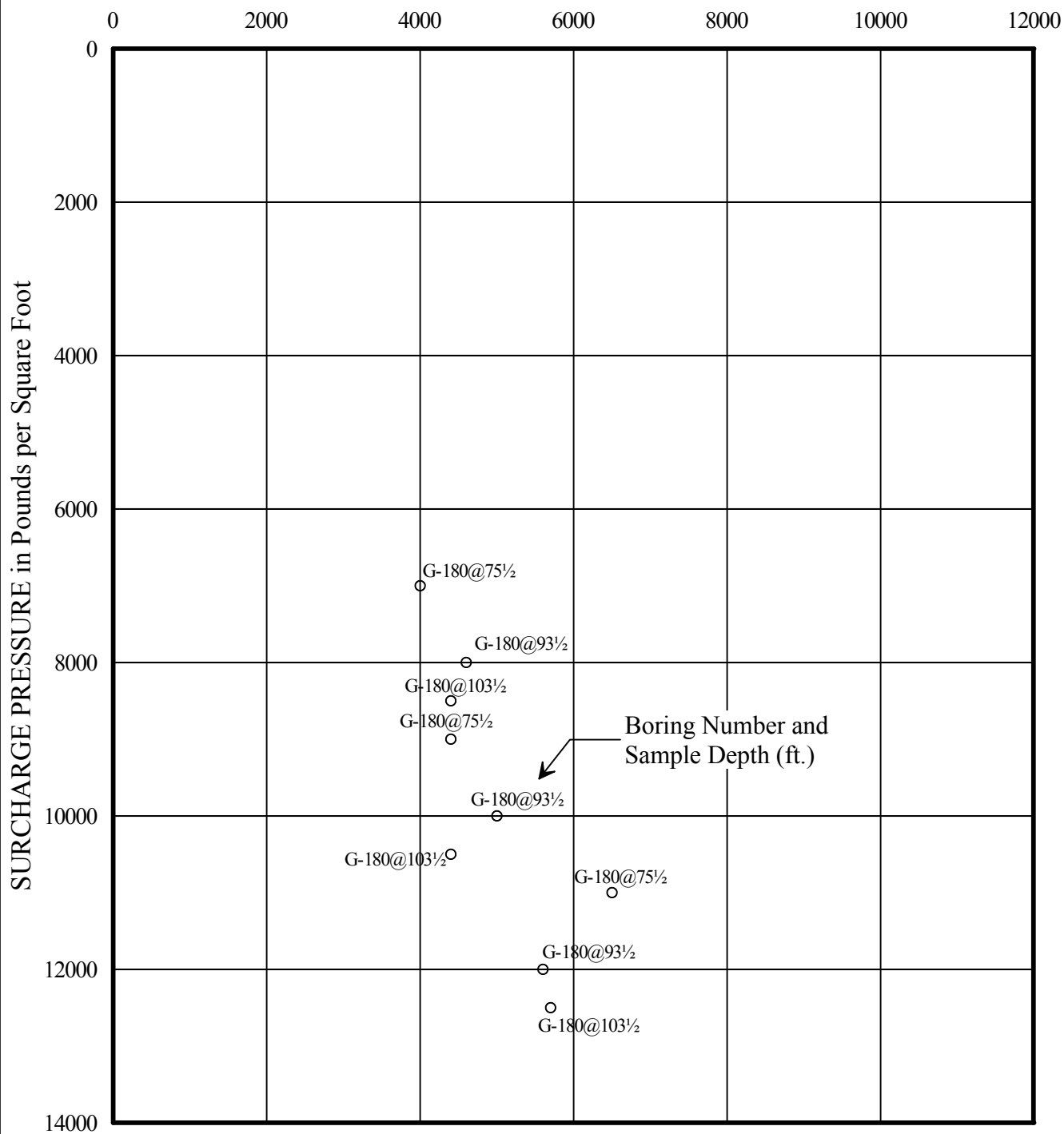
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

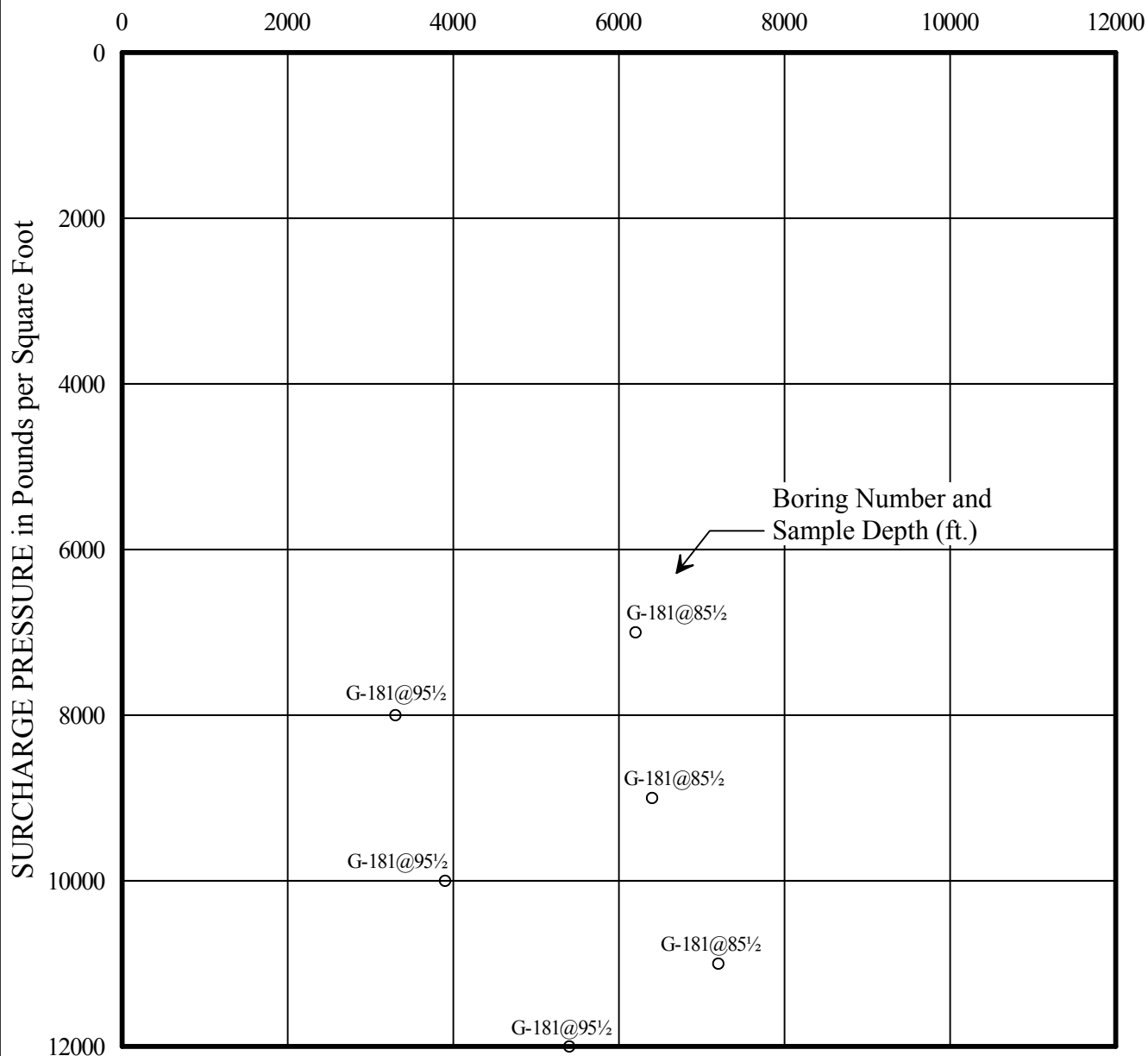
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 10/4/11
 Checked/Date: LT 10/4/11

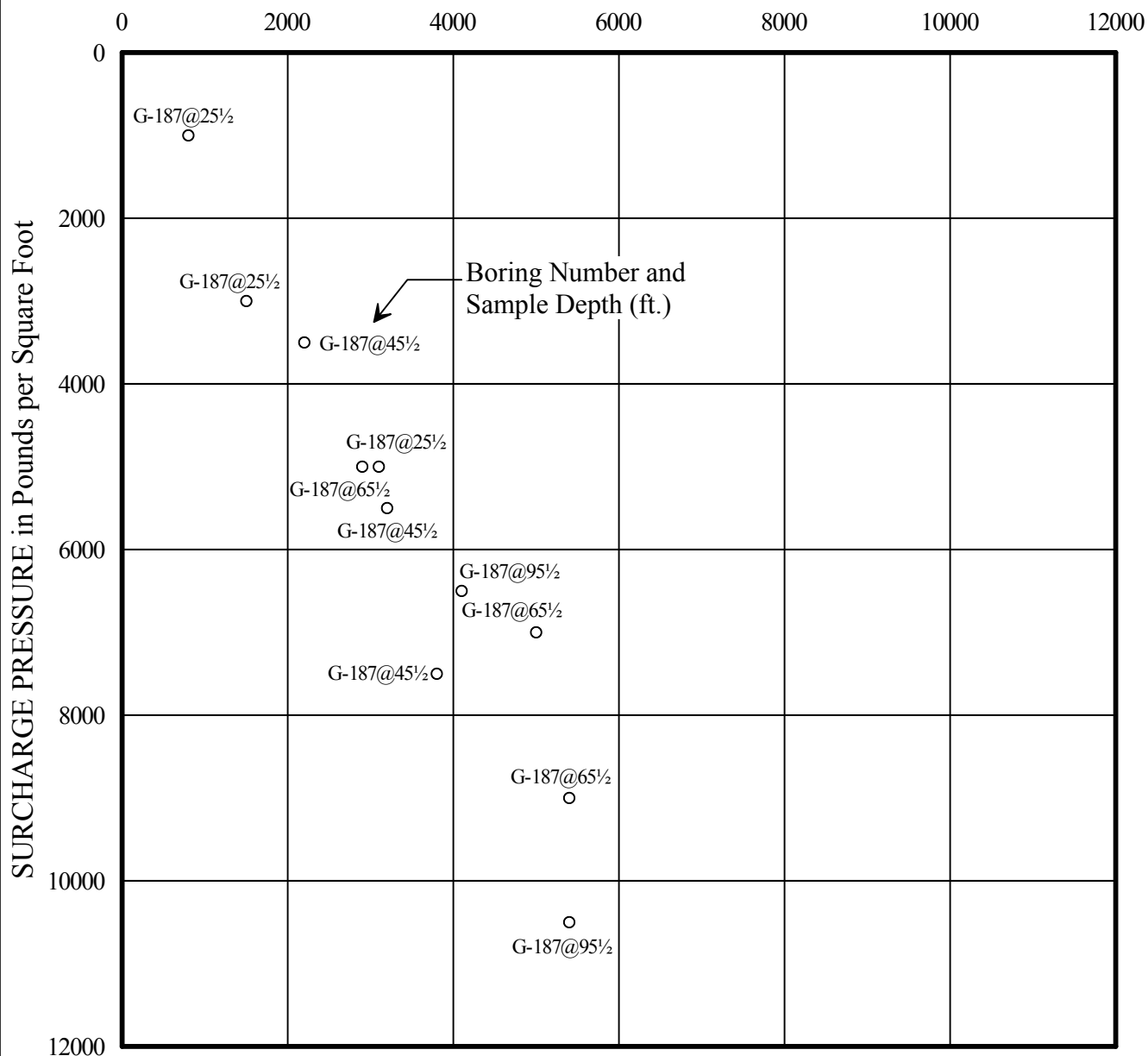
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: YN 9/30/11
 Checked/Date: LT 9/30/11

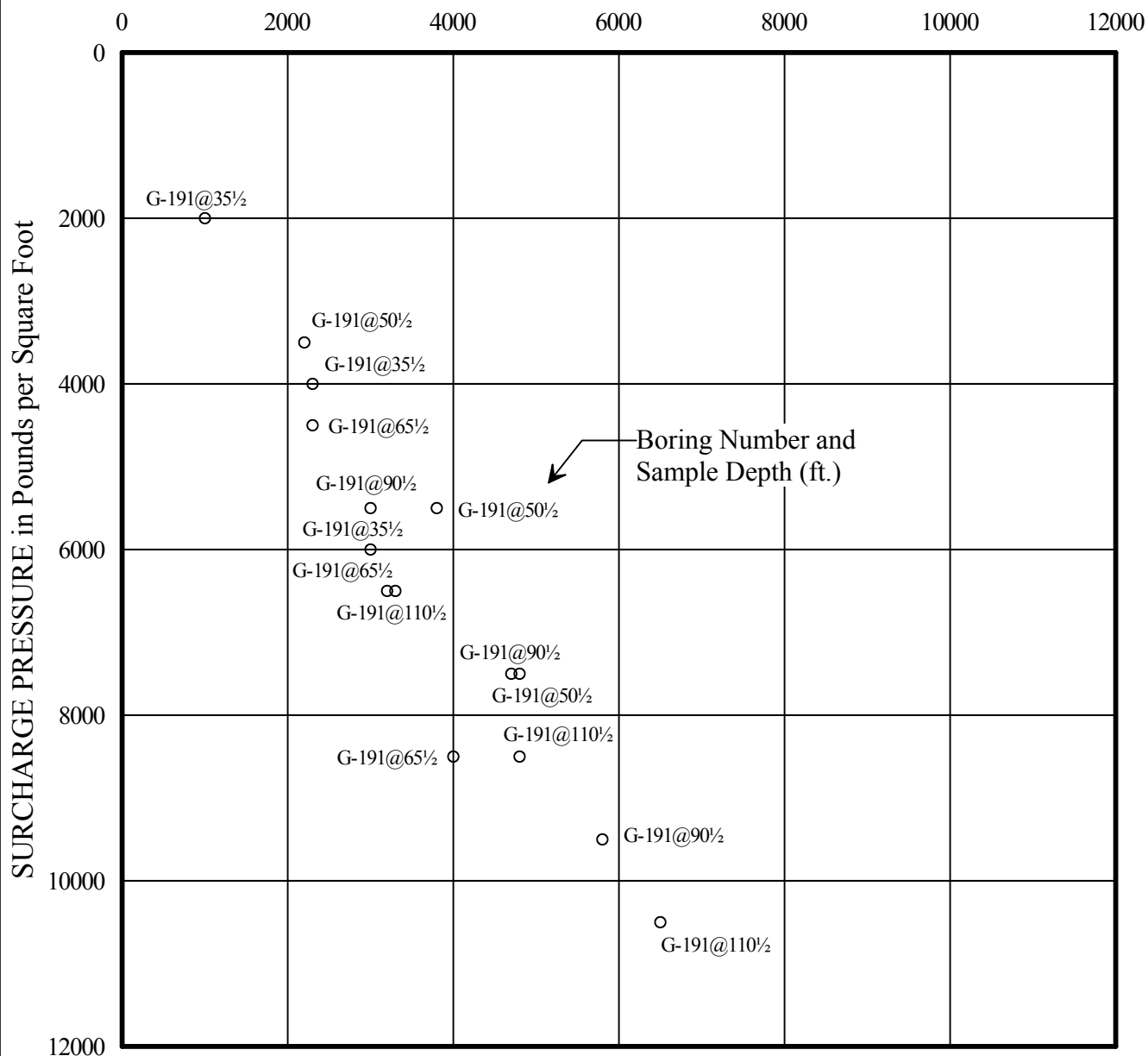
SHEAR STRENGTH in Pounds per Square Foot



KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

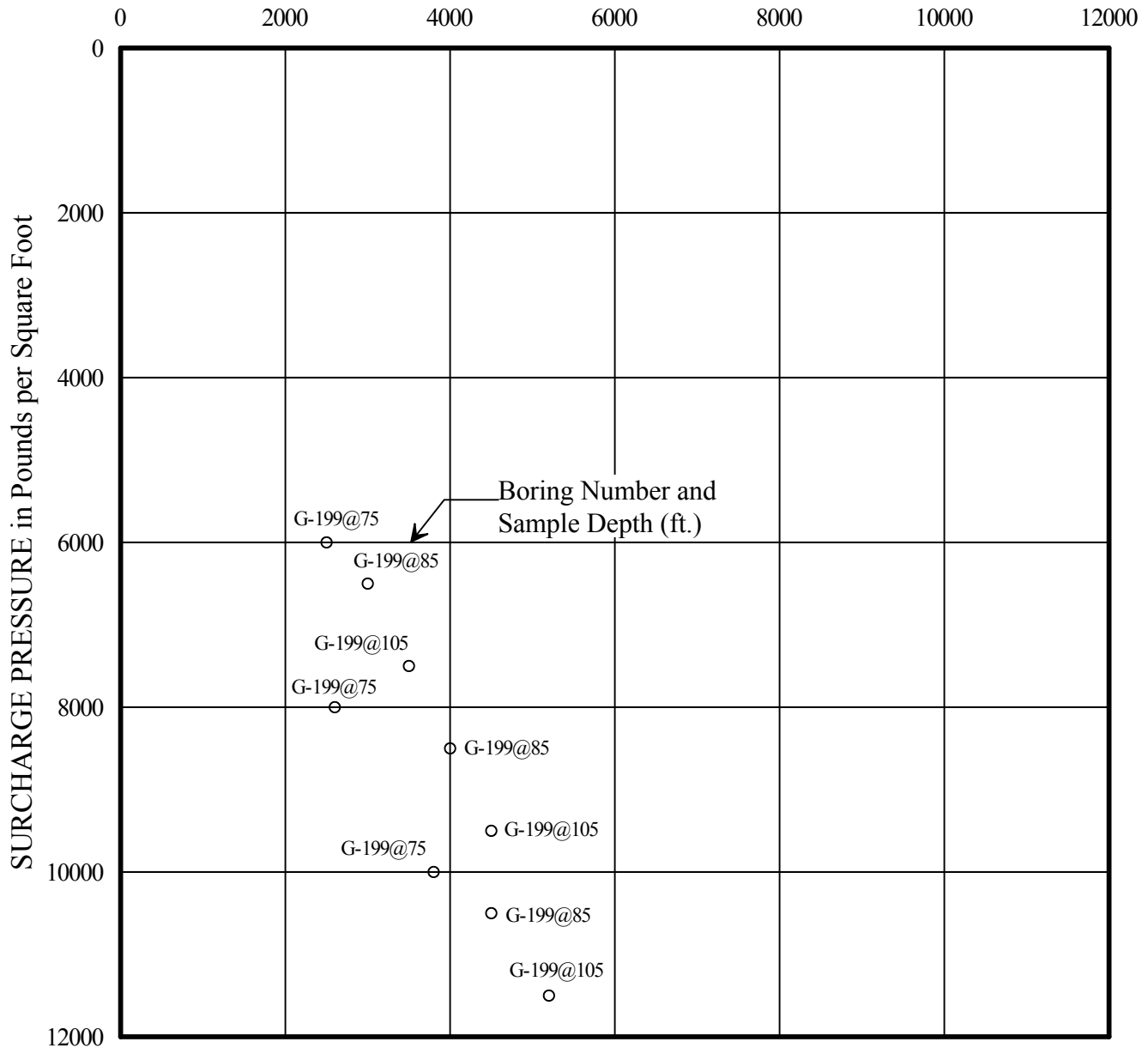
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/5/11
 Checked/Date: LT 10/6/11

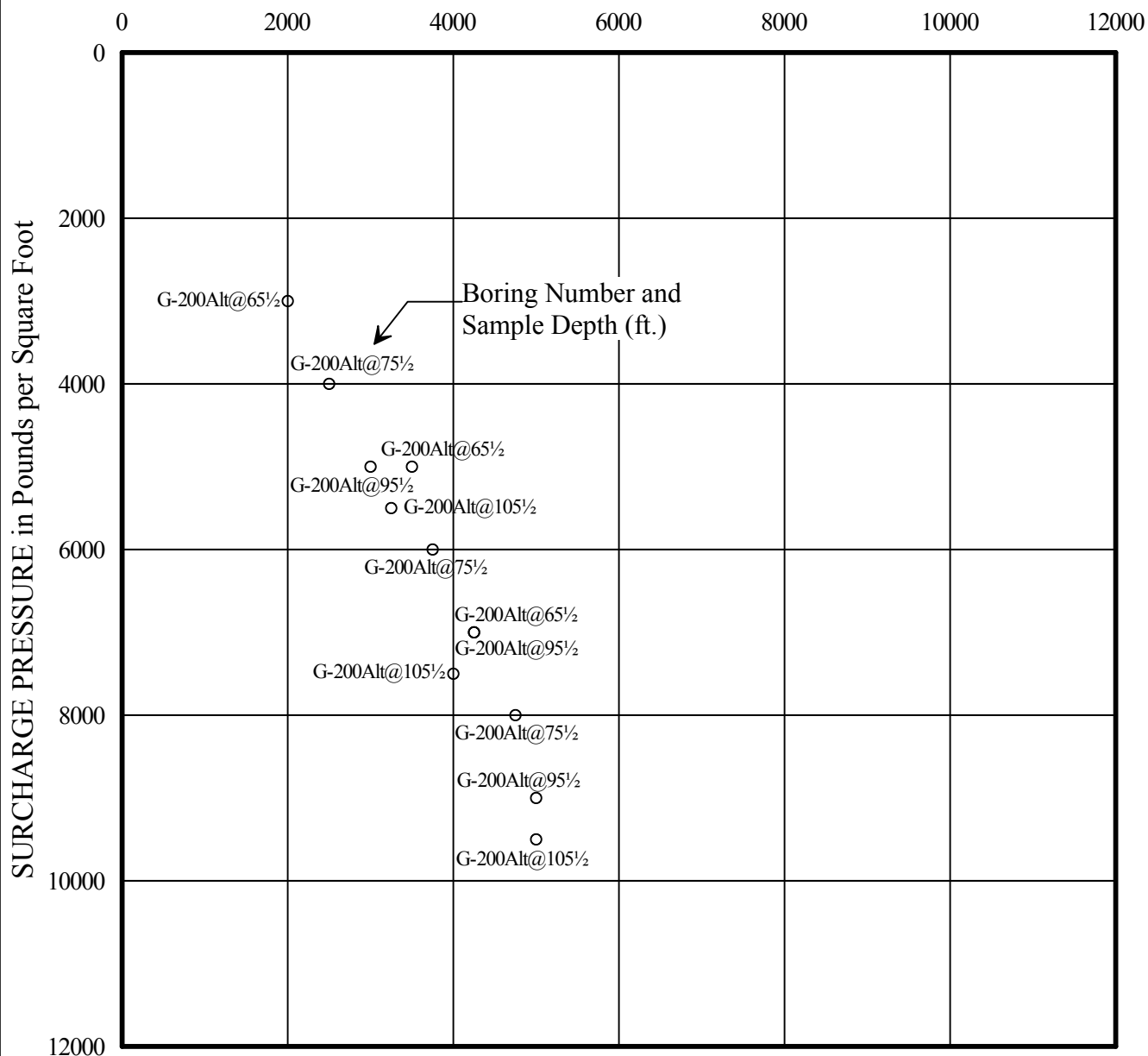
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/5/11
 Checked/Date: LT 10/6/11

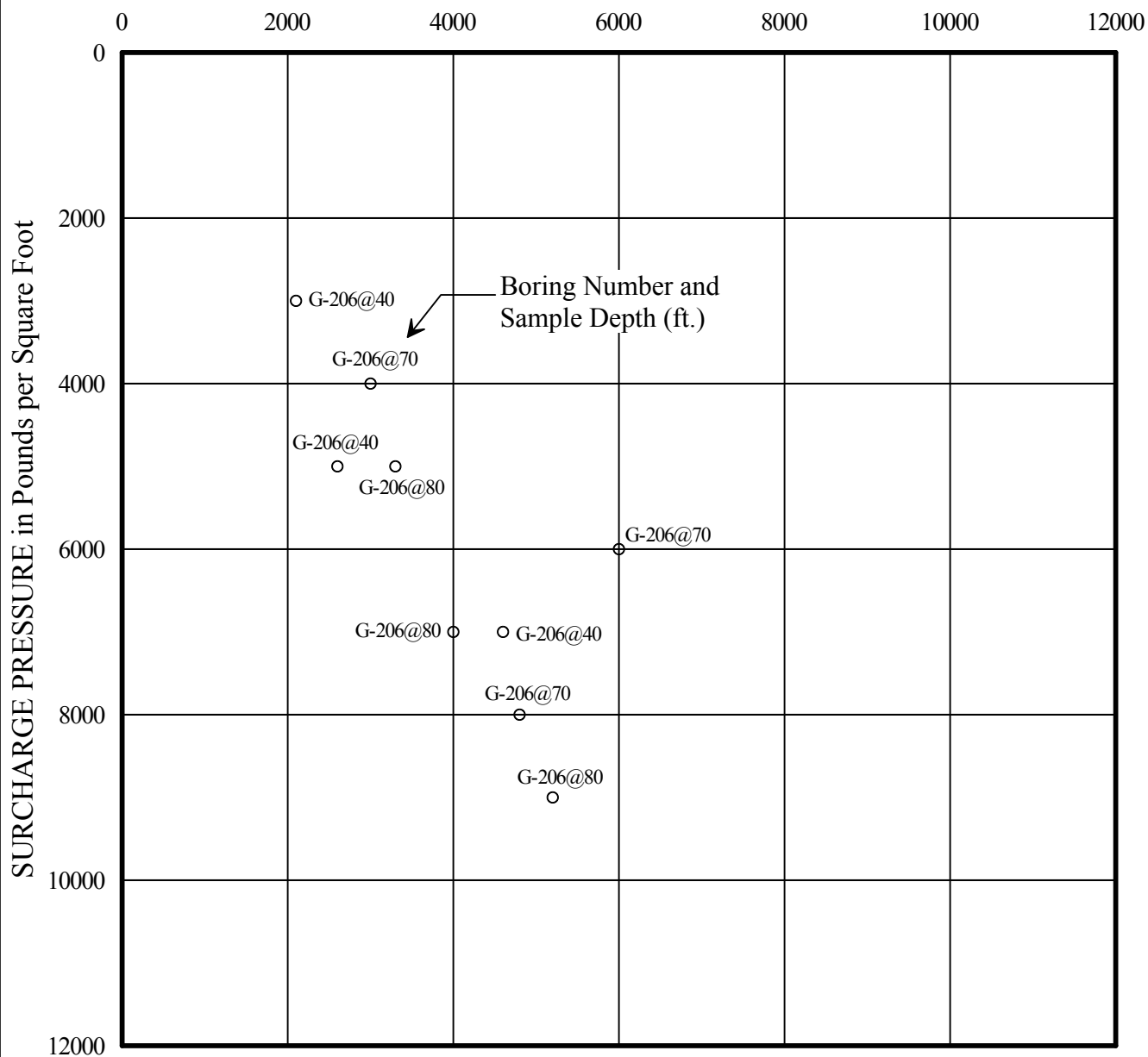
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: JF 10/19/11
 Checked/Date: HP 10/20/11

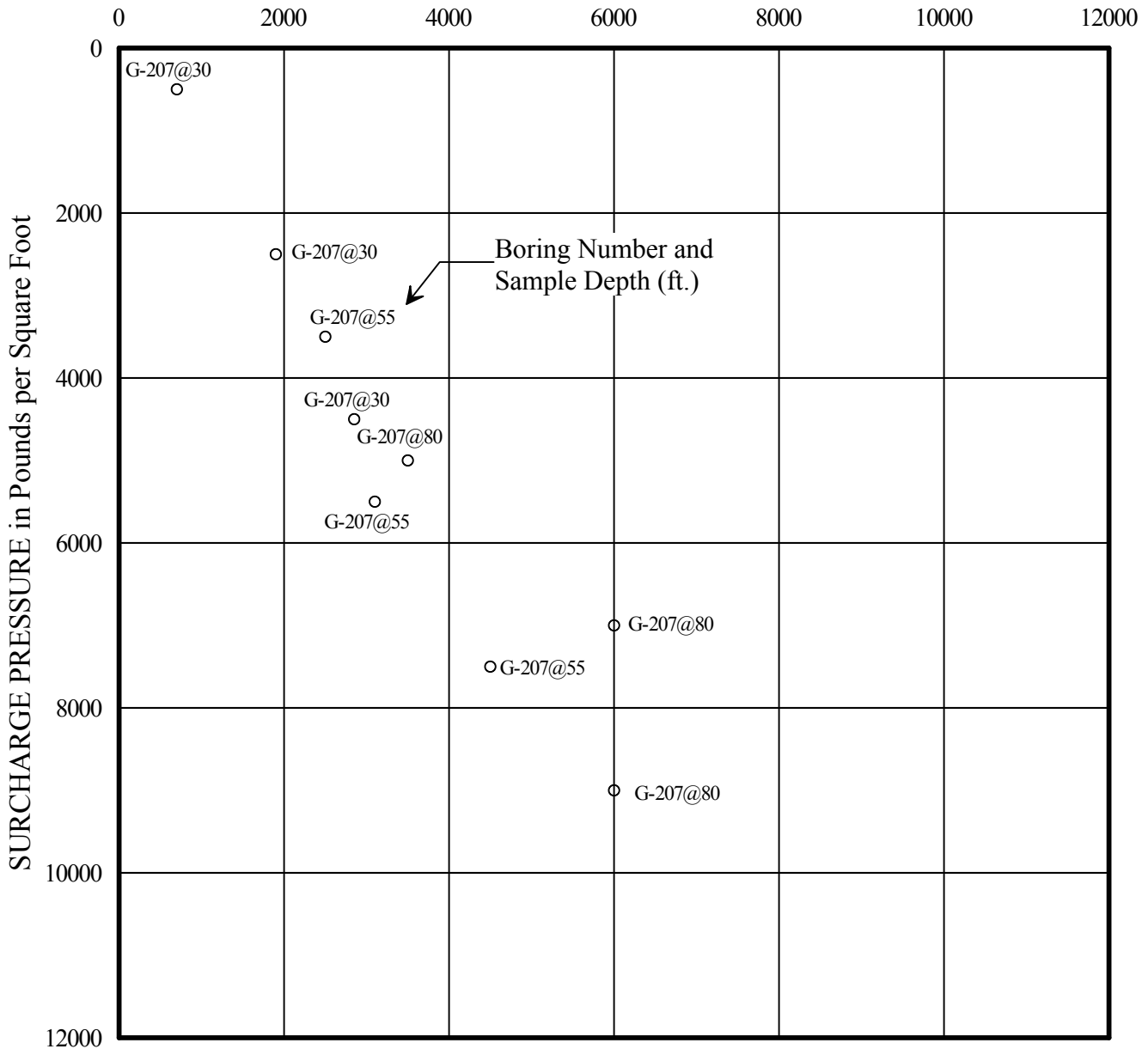
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/3/11
 Checked/Date: LT 10/3/11

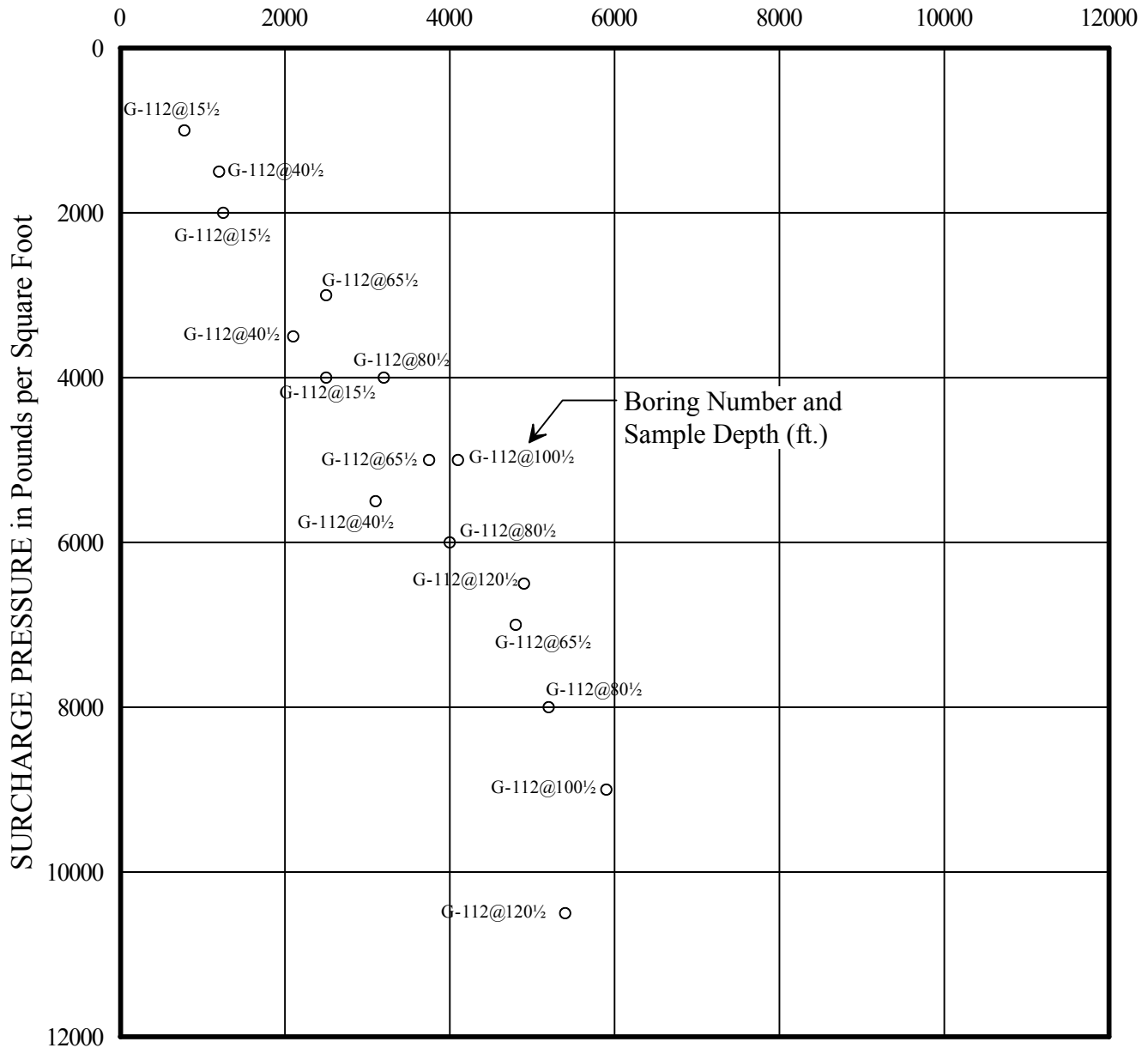
SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Prepared/Date: WL 10/4/11
 Checked/Date: LT 10/4/11

SHEAR STRENGTH in Pounds per Square Foot

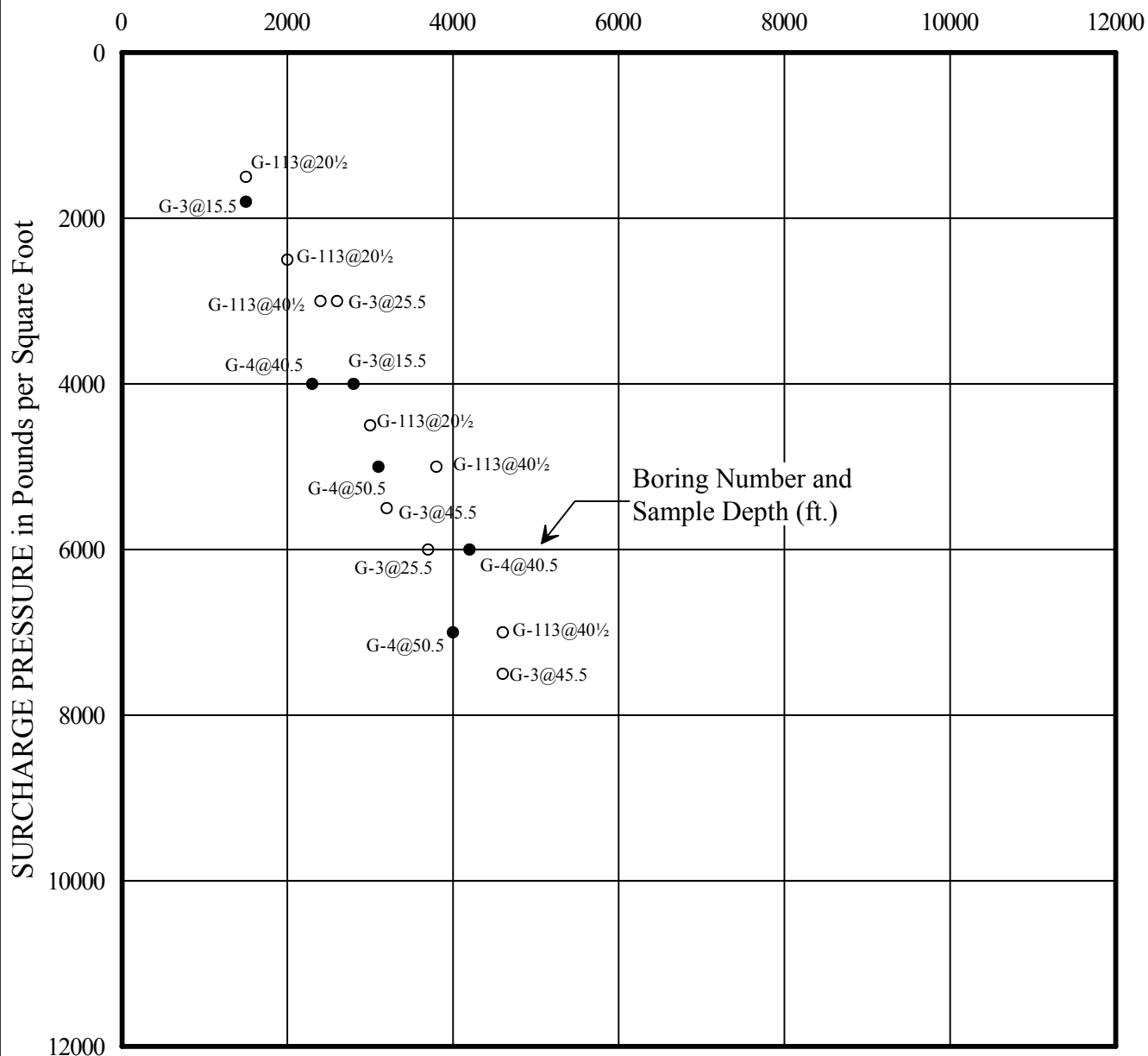


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/La Brea Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

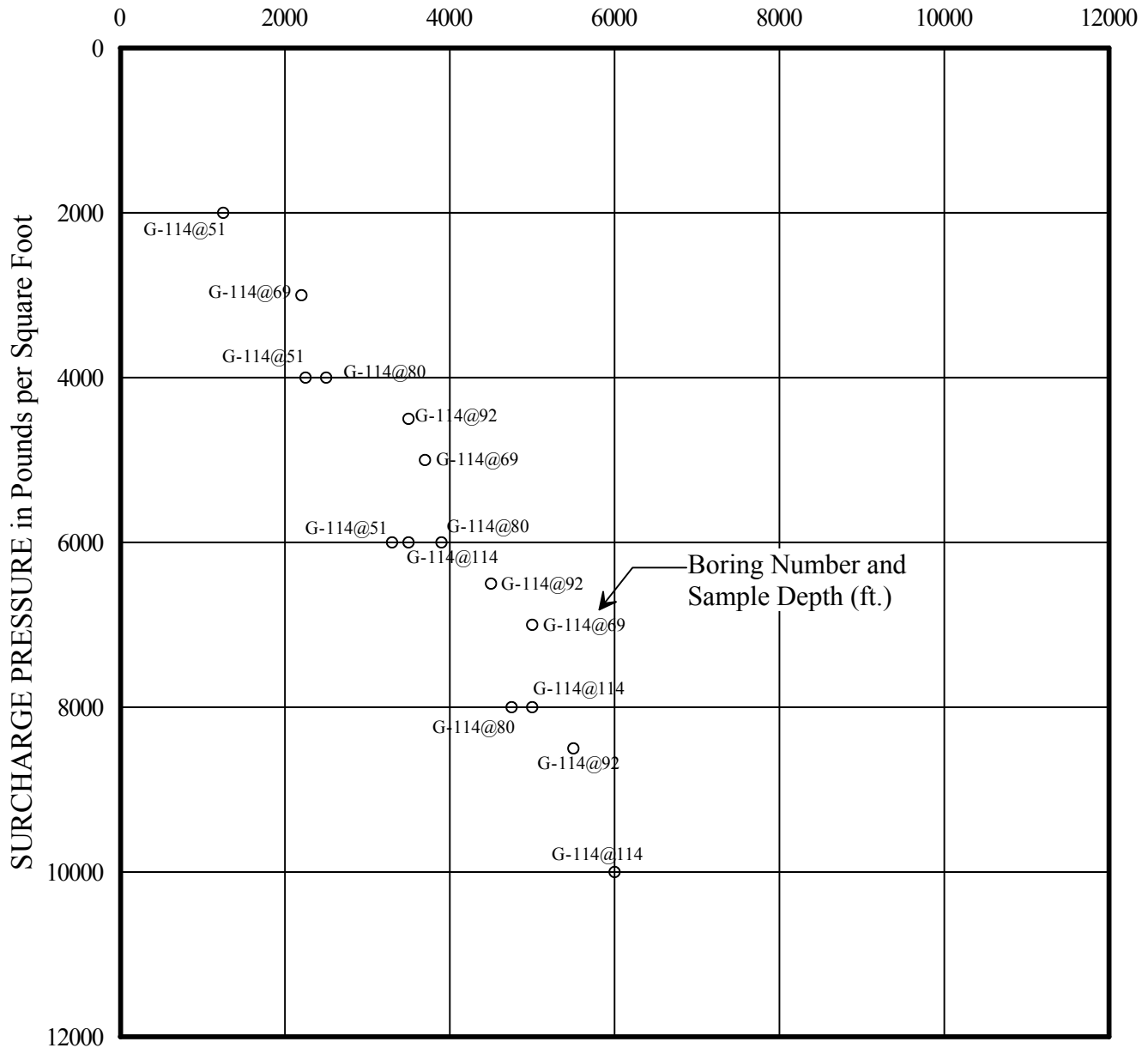


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/La Brea Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

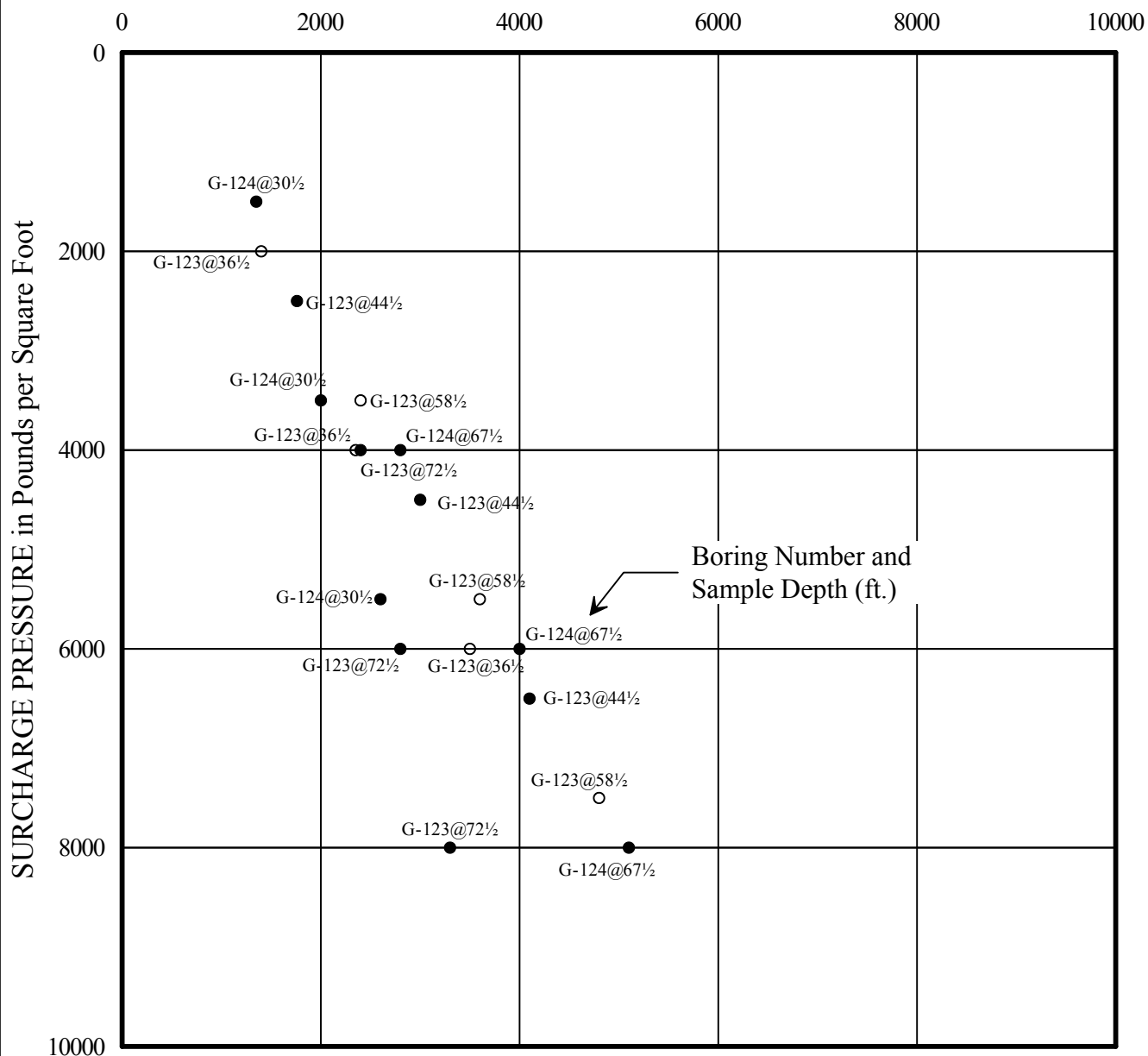


KEY: • Samples tested at field moisture content
 ◦ Samples soaked to a moisture content near saturation

Wilshire/La Brea Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

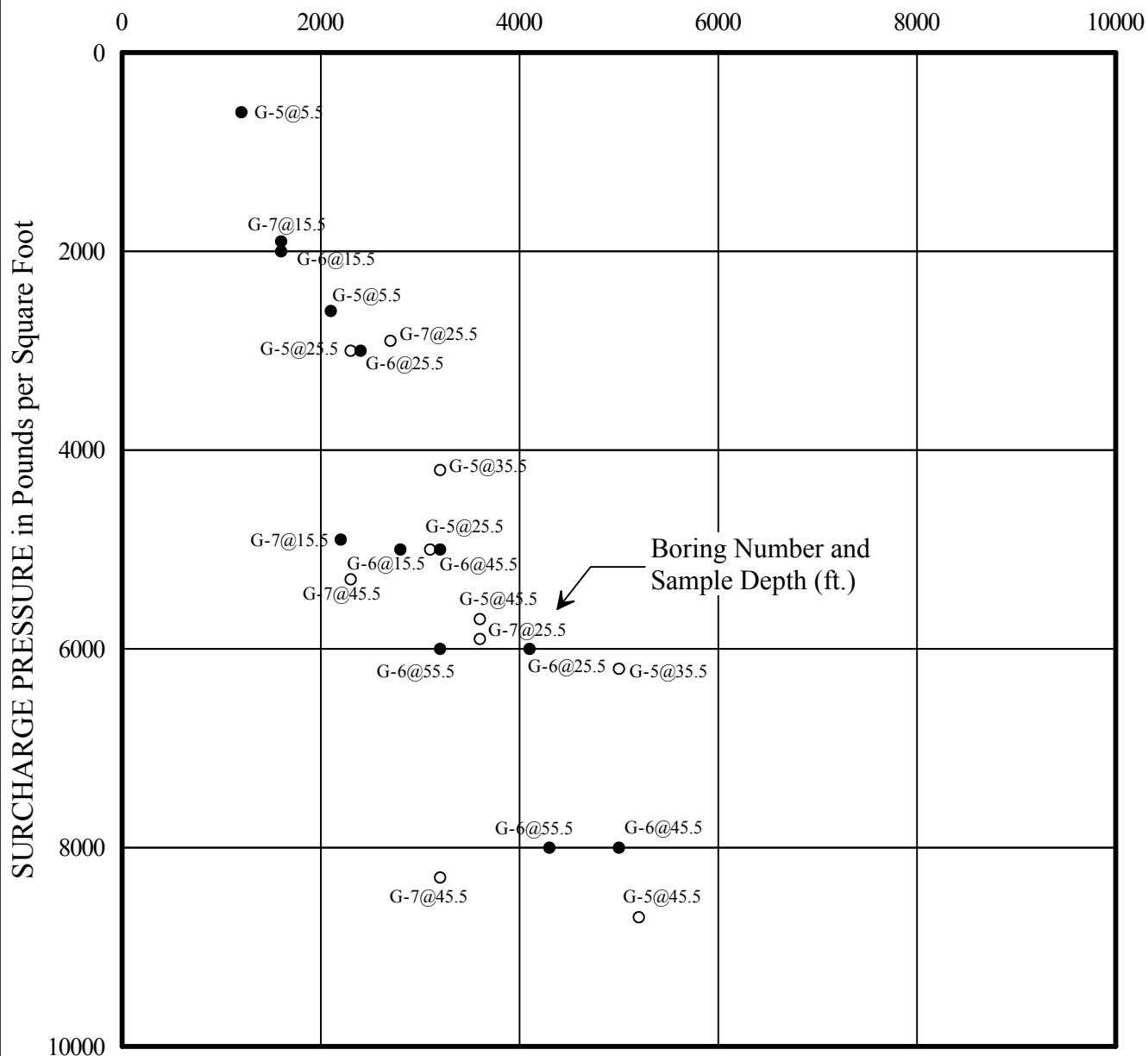


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/Fairfax Station

Prepared/Date: JF 8/3/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

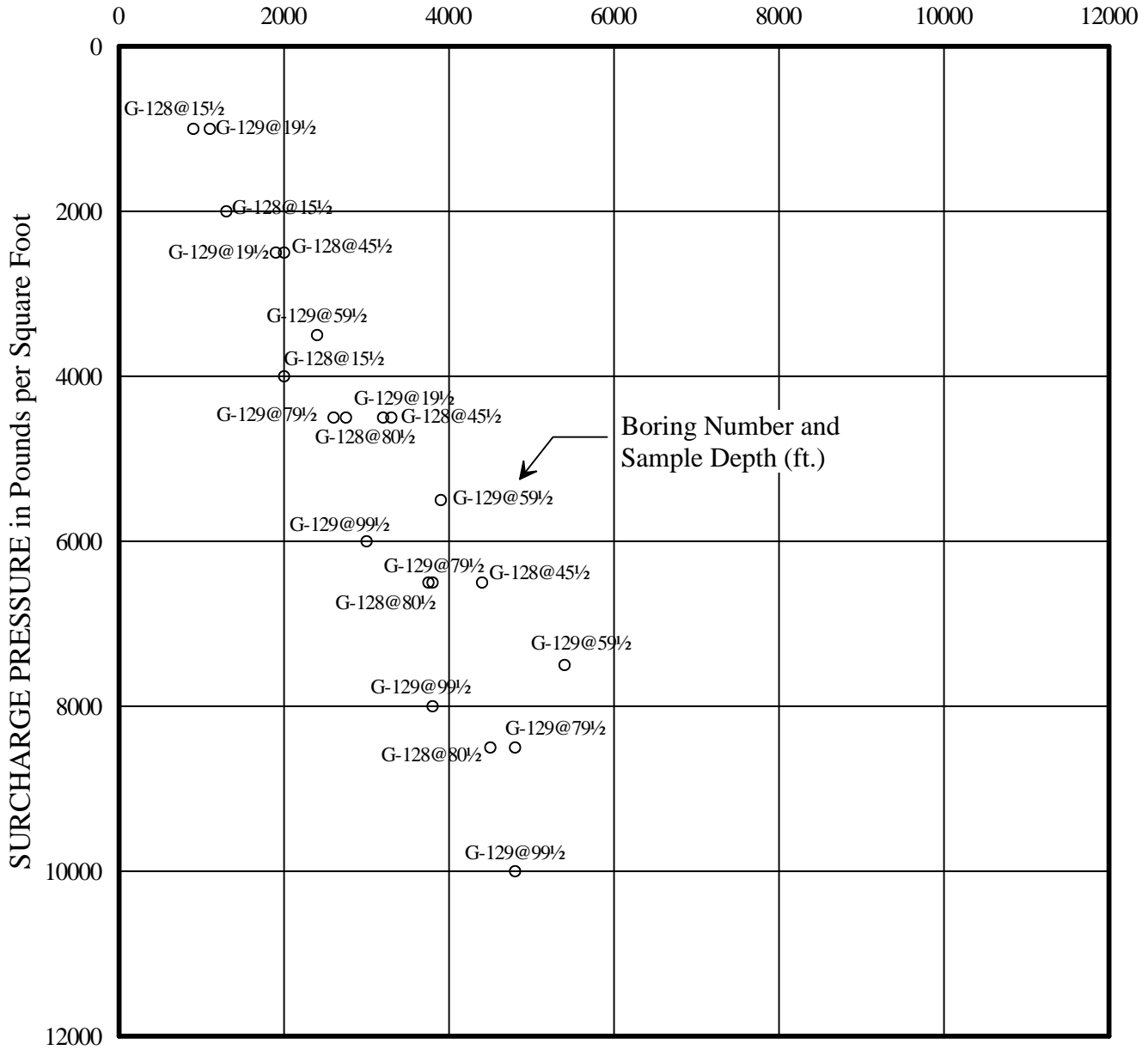


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/Fairfax Station

Prepared/Date: JF 8/3/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

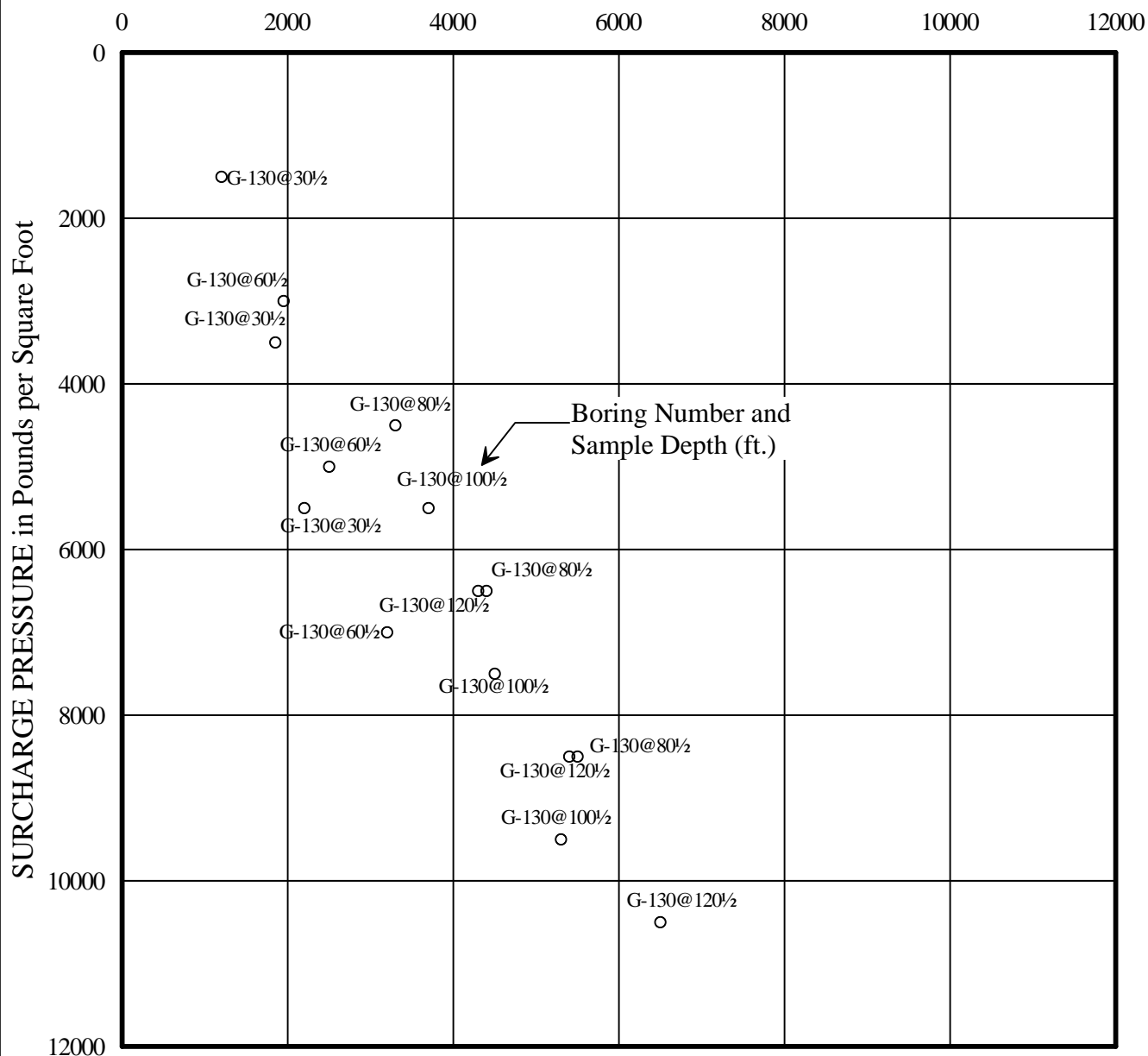


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/La Cienega Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

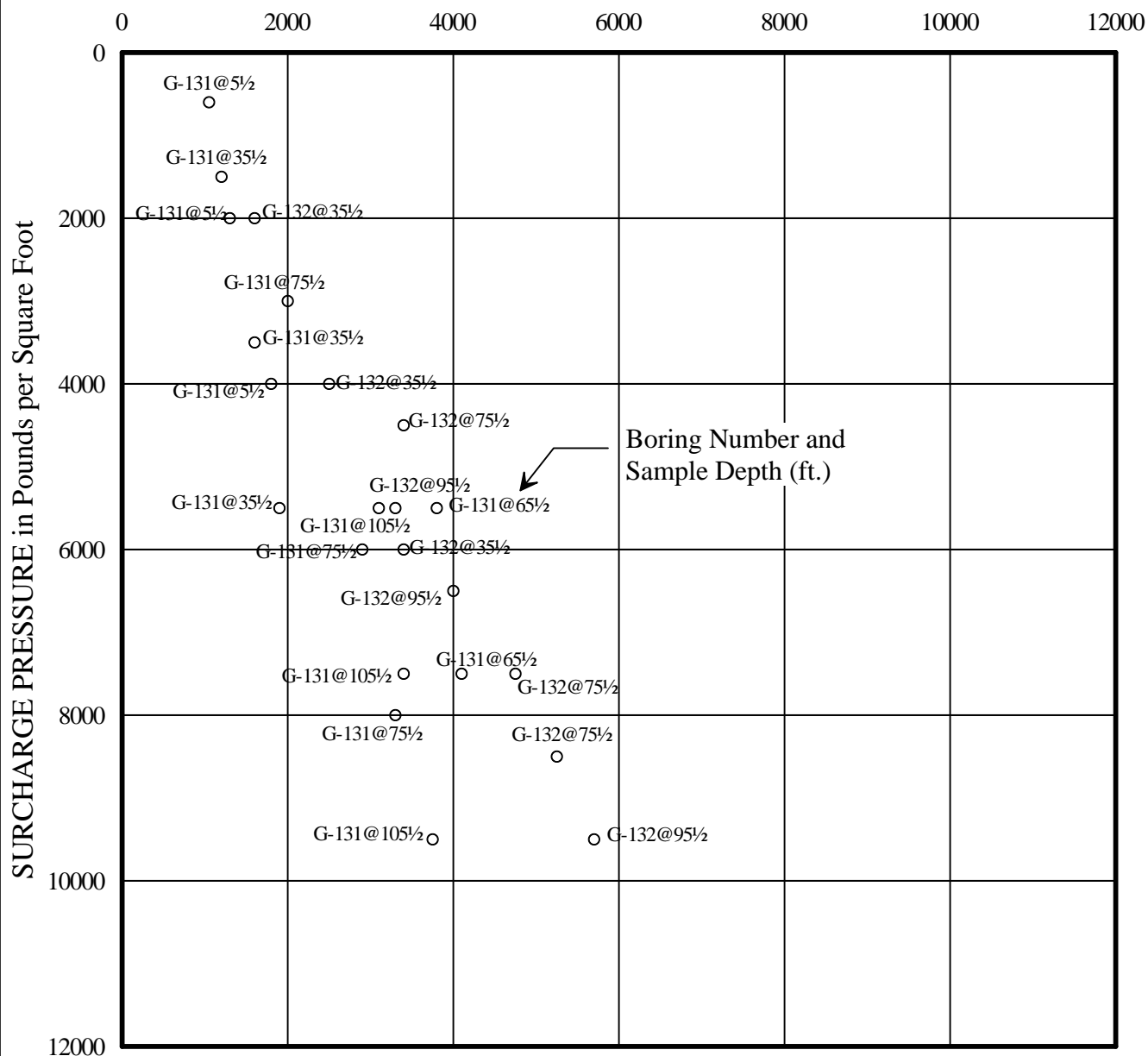


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/La Cienega Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

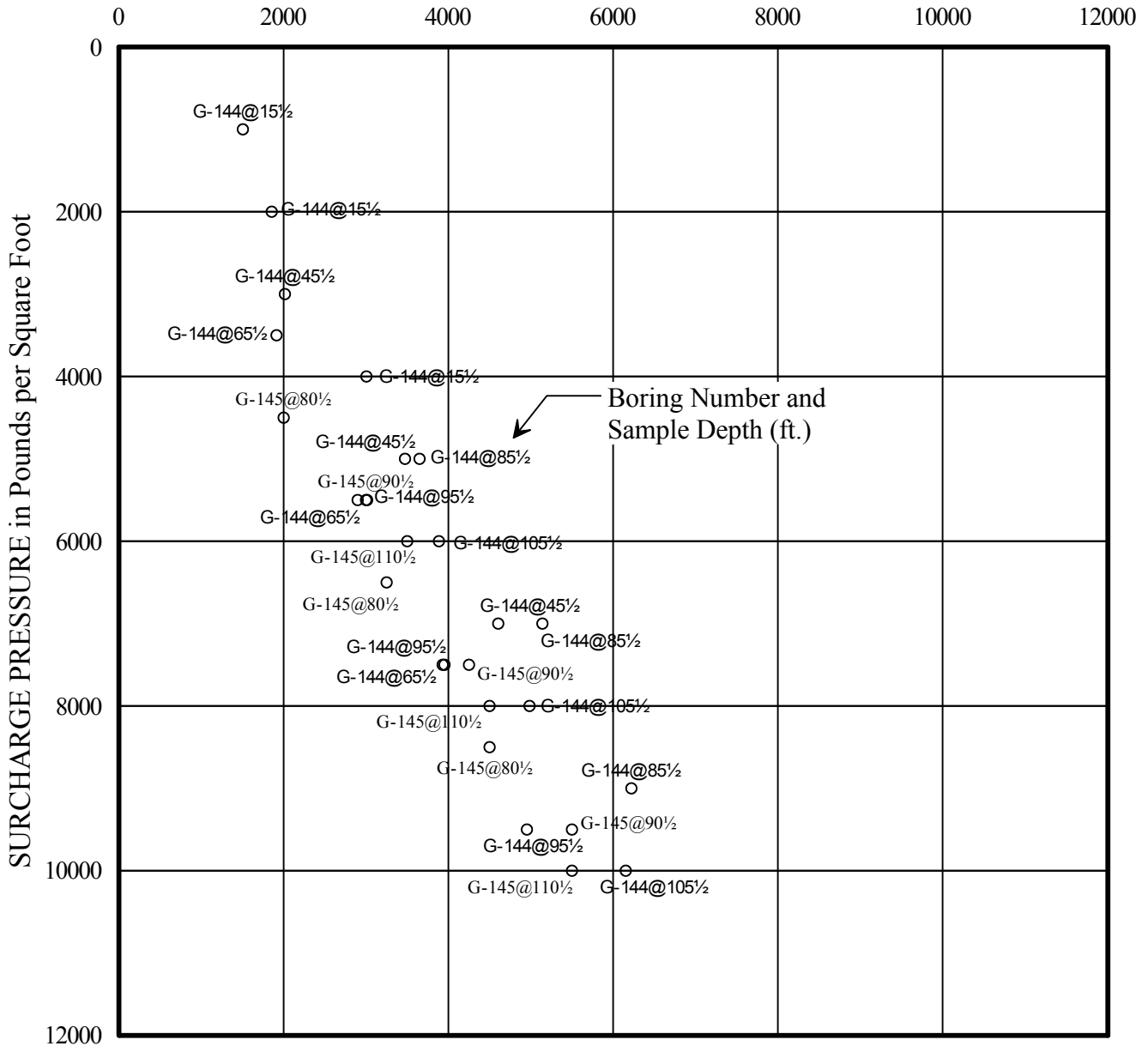


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/La Cienega Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

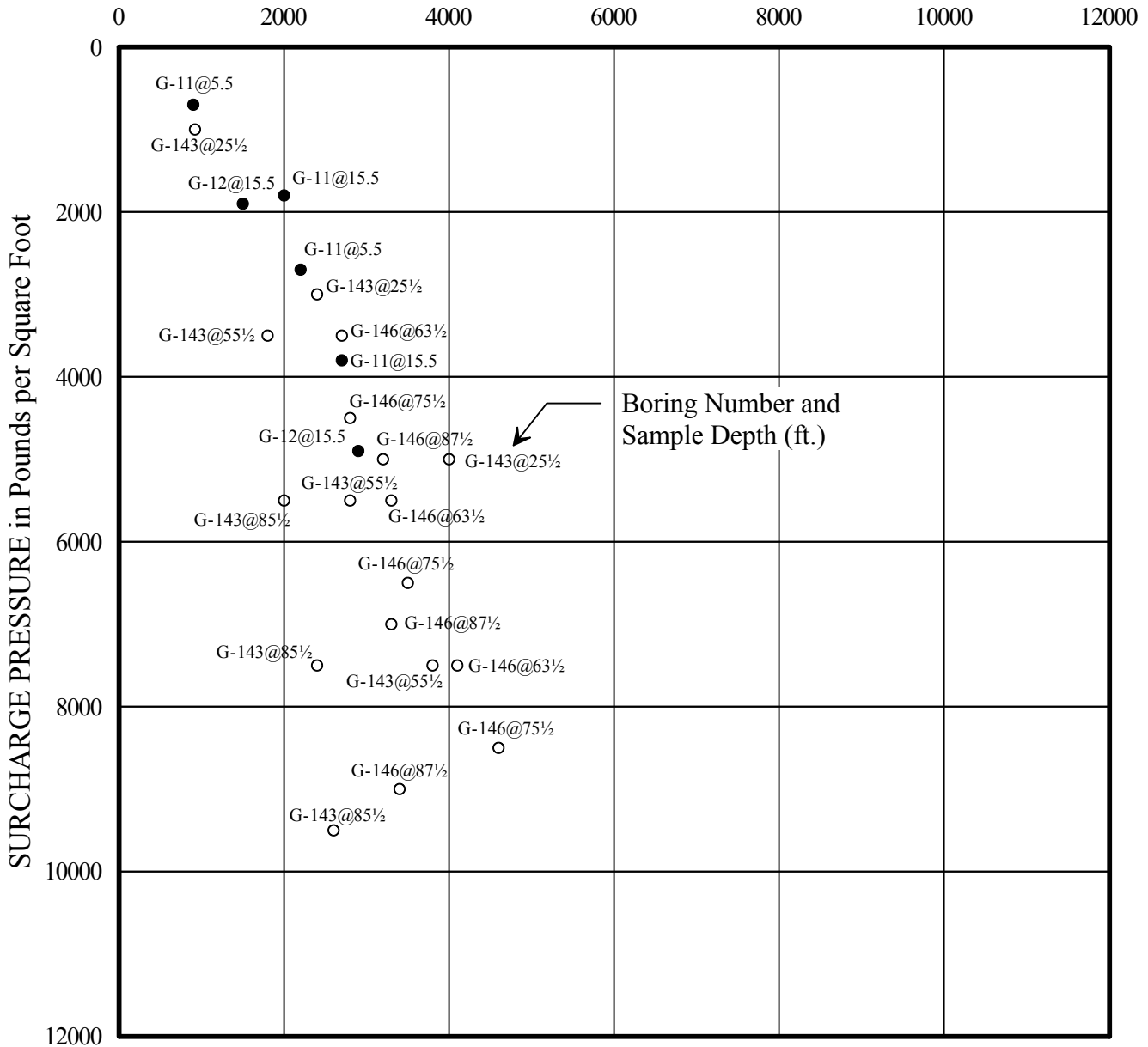


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/Rodeo Station

Prepared/Date: LH 9/22/11
 Checked/Date: LT 10/4/11

SHEAR STRENGTH in Pounds per Square Foot

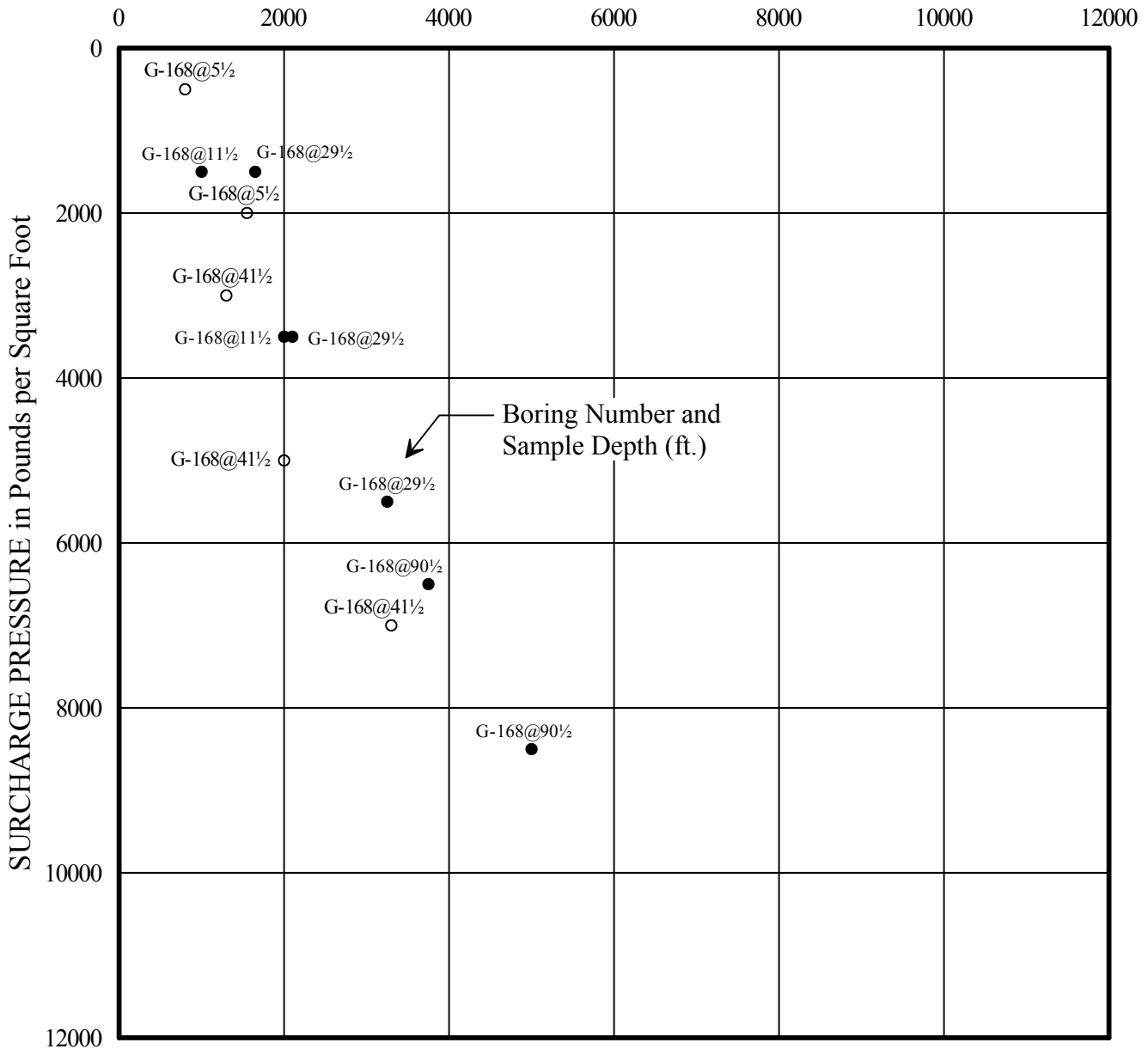


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Wilshire/Rodeo Station

Prepared/Date: LH 9/22/11
 Checked/Date:

SHEAR STRENGTH in Pounds per Square Foot

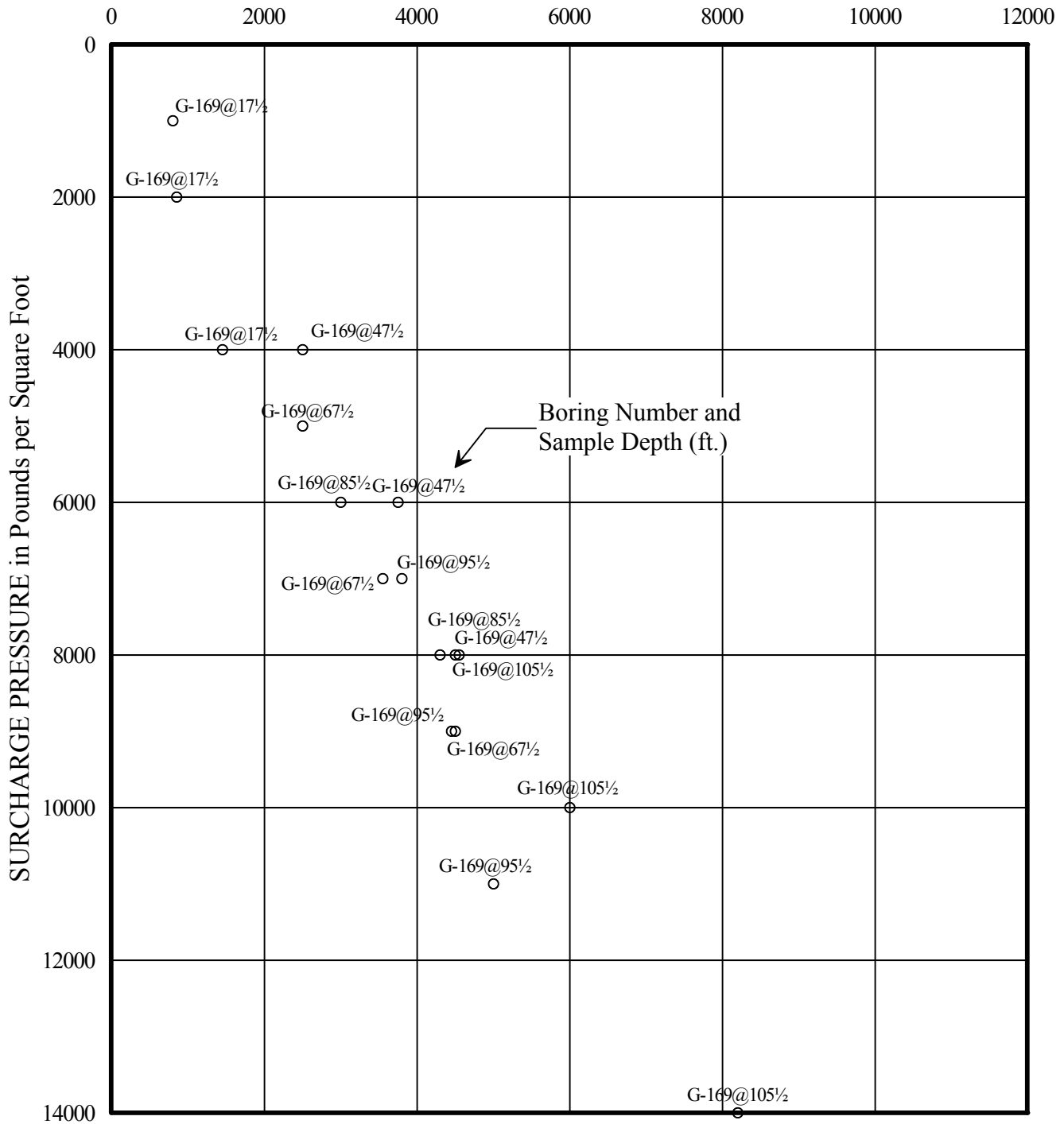


KEY: ● Samples tested at field moisture content
○ Samples soaked to a moisture content near saturation

Century City/ Constellation Station

Prepared/Date: YN 10/2/11
Checked/Date: LT 10/4/11

SHEAR STRENGTH in Pounds per Square Foot

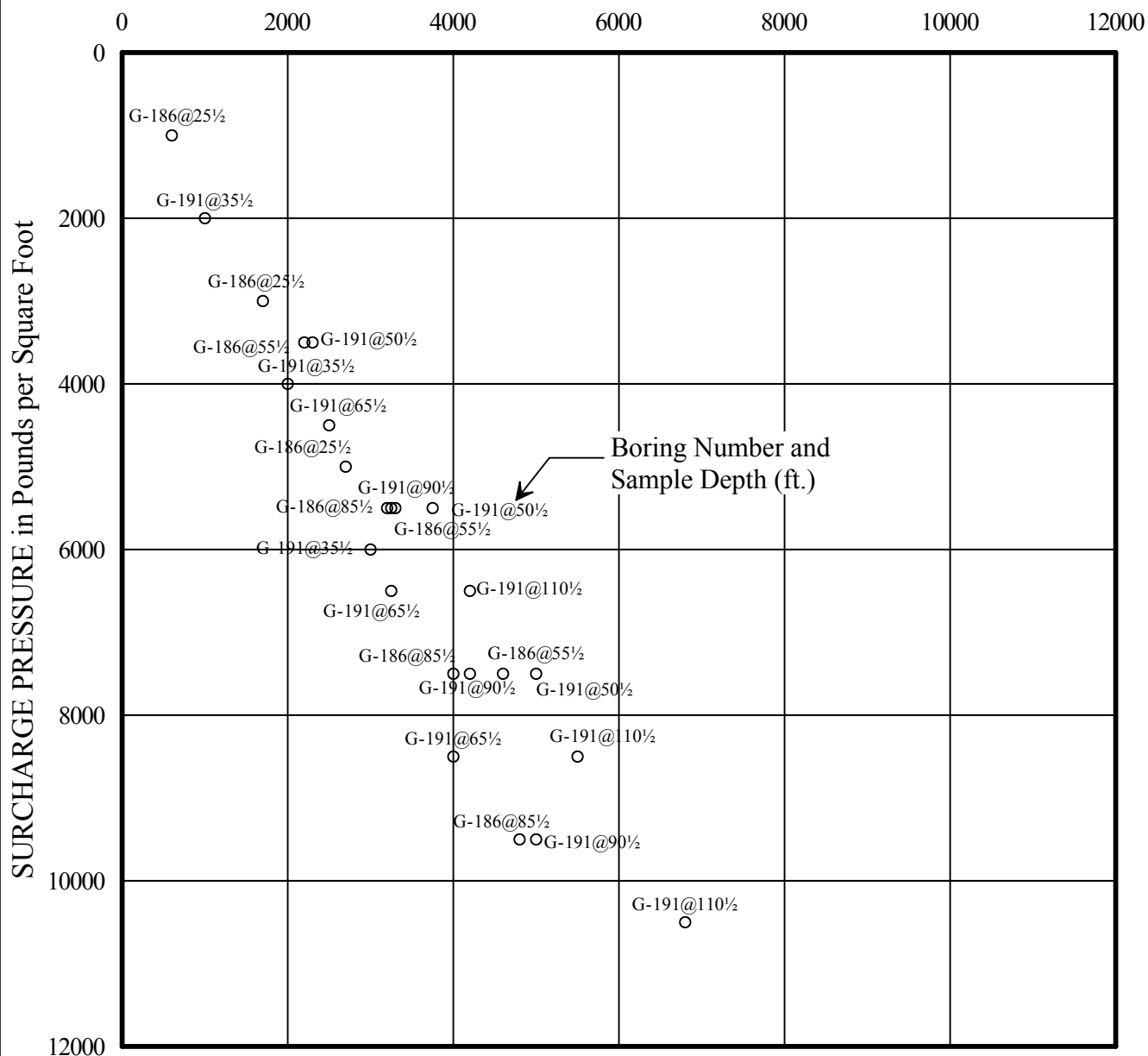


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Century City/ Constellation Station

Prepared/Date: YN 10/3/11
 Checked/Date: LT 10/4/11

SHEAR STRENGTH in Pounds per Square Foot

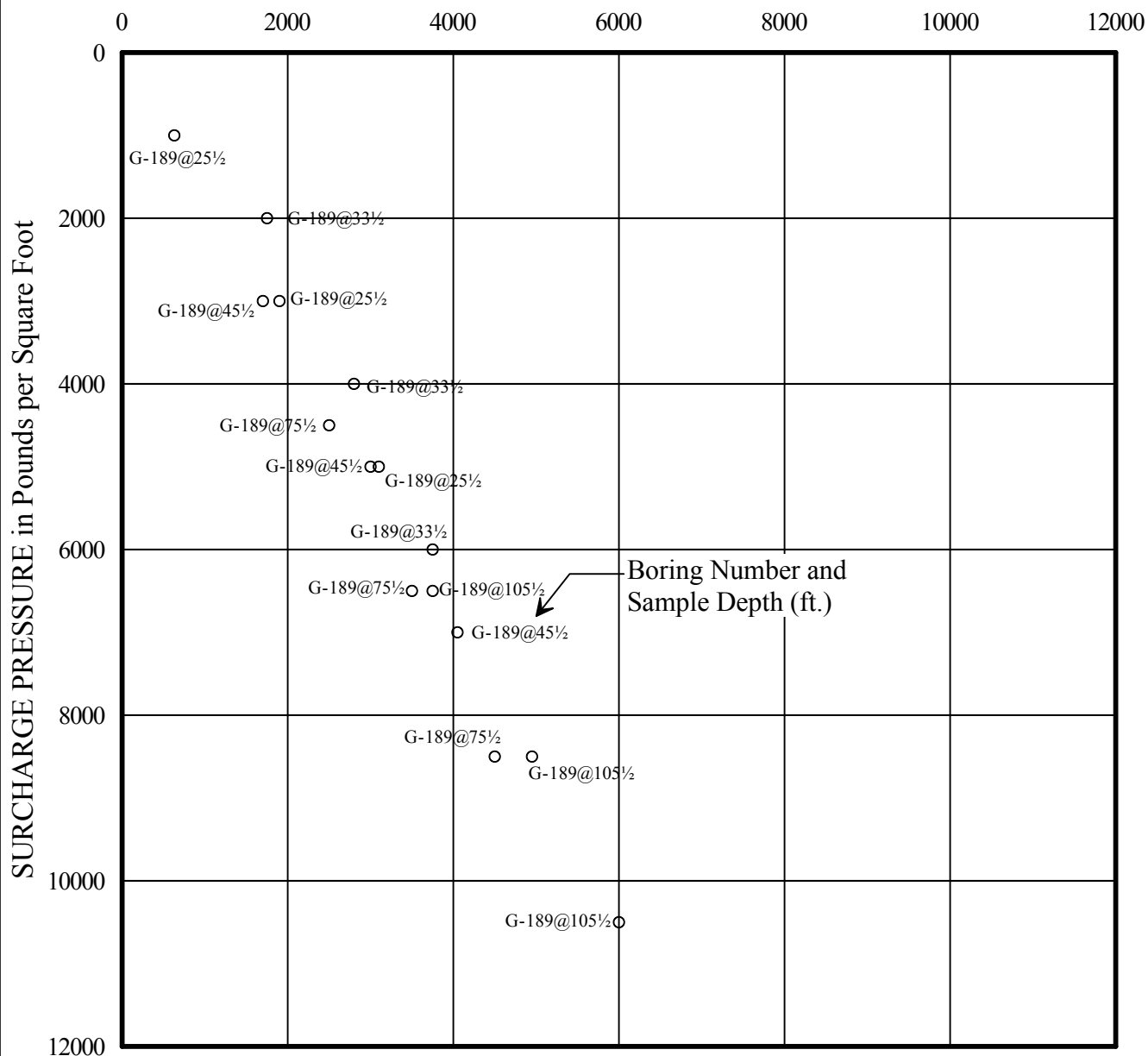


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Westwood/UCLA Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

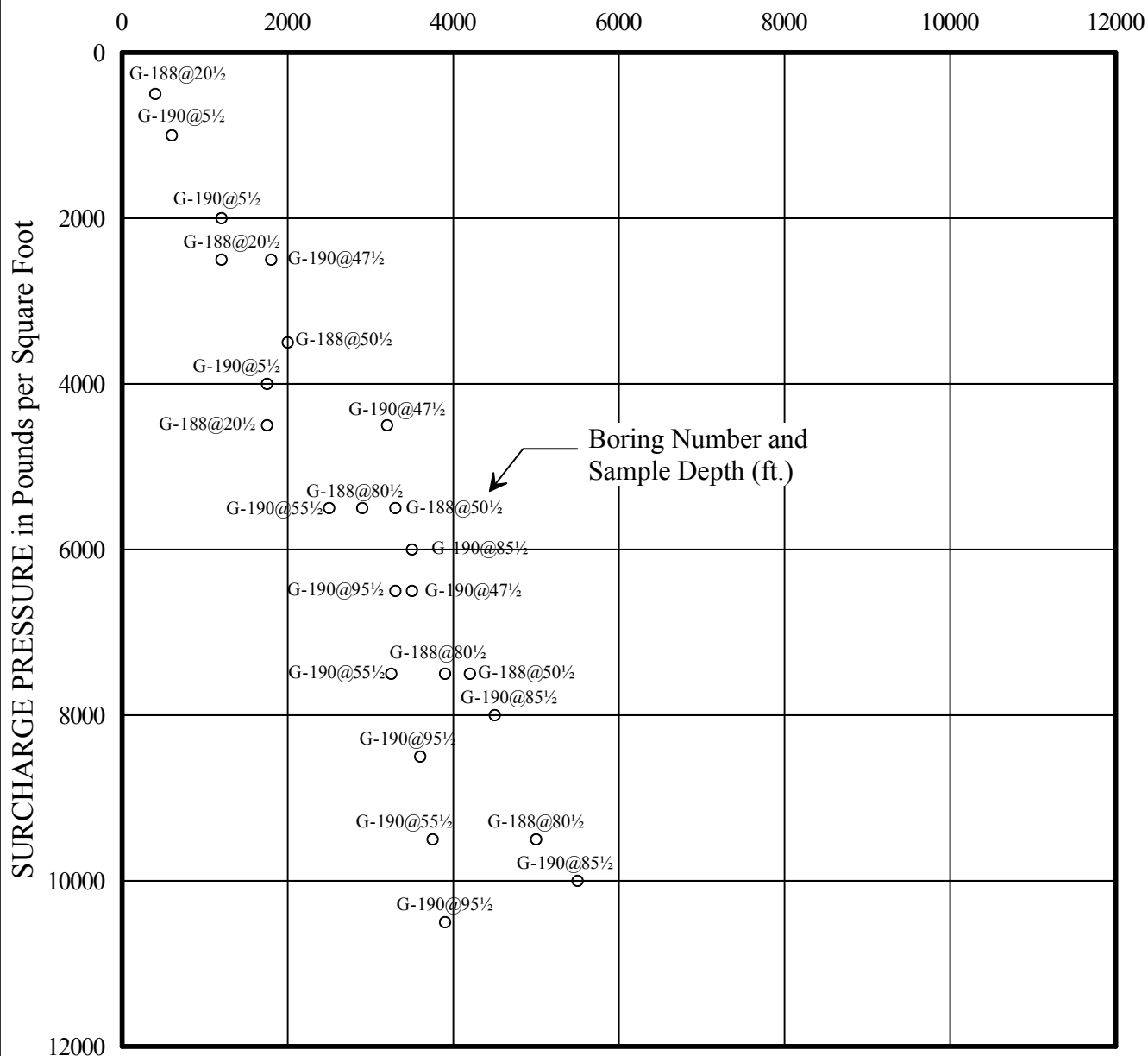


KEY: ● Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Westwood/UCLA Station

Prepared/Date: JF 8/4/11
 Checked/Date: LH 8/8/11

SHEAR STRENGTH in Pounds per Square Foot

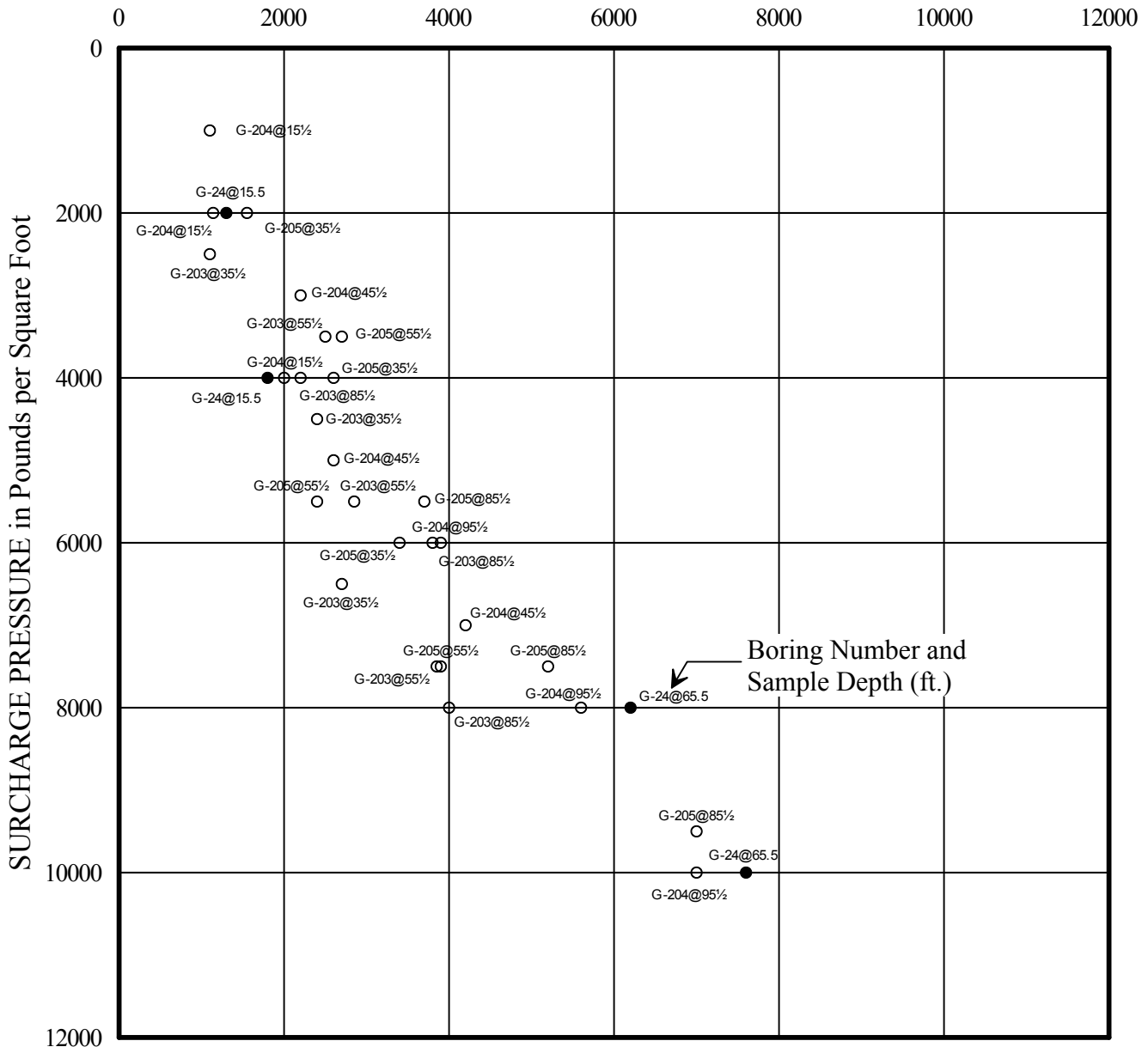


KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Westwood/UCLA Station

Prepared/Date: JF 9/22/11
 Checked/Date: LT 9/22/11

SHEAR STRENGTH in Pounds per Square Foot



KEY: • Samples tested at field moisture content
 ○ Samples soaked to a moisture content near saturation

Westwood/VA Hospital Station

Prepared/Date: WL 9/18/11
 Checked/Date: JAG 9/30/11

**FIGURES F-2.1 THROUGH F-2.422
TRIAxIAL TEST DATA (PE PHASE)**




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Lt Olive Brn Sandy Clay		
Depth(ft):	30.5				
Sample Type:	Mod. Cal.	Confining Pressure =	10.0 psi		

Diameter (in)	<u>2.592</u>	<u>2.592</u>	<u>2.592</u>	Avg. =	2.592
Height (in)	<u>5.462</u>	<u>5.462</u>	<u>5.462</u>	Avg. =	5.462

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.277	5.264
Moisture Content (%)	25.22	25.79
Wet Weight (gms)	77.04	1054.53
Dry Weight (gms)	71.54	868.33
Container Weight (gms)	49.73	146.27
Density and Saturation		
Wet Weight (gms)	921.96	
Container Weight (gms)	0.00	
Wet Density (pcf)	121.9	
Dry Density (pcf)	97.3	
Initial Void Ratio	0.731	
% Saturation	93.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	95.9
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	91.5
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	5.424
Induced OCR =	1.0	Initial Volume (cu.in)=	28.821
Change in Ht. of Specimen (in) =	0.0381	Final Volume (cu.in) =	28.553

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	2.96
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	0.81
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.77
		Axial Strain (%) =	5.09



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **AP** Date: **06-15-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-28-11**
 Test Pit: **G-112** Reviewed by: **AP** Date: **06-28-11**
 Sample No.: **-** Sample Description: **Lt Olive Brn Sandy Clay**
 Depth(ft): **30.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.592</u>	<u>2.592</u>	<u>2.592</u>	Avg. =	2.592
Height (in)	<u>5.462</u>	<u>5.462</u>	<u>5.462</u>	Avg. =	5.462

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.277	5.154
Moisture Content (%)	25.22	25.79
Wet Weight (gms)	77.04	1054.53
Dry Weight (gms)	71.54	868.33
Container Weight (gms)	49.73	146.27
Density and Saturation		
Wet Weight (gms)	921.96	
Container Weight (gms)	0.00	
Wet Density (pcf)	121.9	
Dry Density (pcf)	97.3	
Initial Void Ratio	0.731	
% Saturation	93.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	91.5
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	80.5
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.462
Induced OCR=	1.0	Initial Volume (cu.in)=	28.821
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	28.150

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.38
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	1.74
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.12
		Axial Strain (%) =	5.63



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Lt Olive Brn Sandy Clay		
Depth(ft):	30.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.592</u>	<u>2.592</u>	<u>2.592</u>	Avg. =	2.592
Height (in)	<u>5.462</u>	<u>5.462</u>	<u>5.462</u>	Avg. =	5.462

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.277	5.178
Moisture Content (%)	25.22	25.79
Wet Weight (gms)	77.04	1054.53
Dry Weight (gms)	71.54	868.33
Container Weight (gms)	49.73	146.27
Density and Saturation		
Wet Weight (gms)	921.96	
Container Weight (gms)	0.00	
Wet Density (pcf)	121.9	
Dry Density (pcf)	97.3	
Initial Void Ratio	0.731	
% Saturation	93.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)= 80.5
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)= 71.7
Eff. Consol. Stress (psi) =	30.0	Final Height (in)= 5.462
Induced OCR =	1.0	Initial Volume (cu.in)= 28.821
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 28.284

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) = 8.18
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) = 3.08
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 11.26
		Axial Strain (%) = 10.84



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-112	Consolidation Pressure :	10.0 psi
Depth(ft):	30.5	Initial Sample Height:	5.462 in
Sample No.:	-	Initial Area of Sample:	5.277 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.424 in
Sample Description:	Lt Olive Brn Sandy Clay	Final Sample Area (A)*:	5.264 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1+S3)/2 (ksf)
50.0	0	0.000	40.0	0.00	0.00	0.00	0.00	1.44
50.0	28	0.004	41.4	0.75	0.07	0.20	0.38	1.62
50.0	46	0.017	42.9	1.25	0.32	0.41	0.63	1.65
50.0	55	0.031	43.8	1.50	0.56	0.54	0.75	1.66
50.0	62	0.044	44.3	1.68	0.82	0.61	0.84	1.67
50.0	68	0.058	44.6	1.84	1.07	0.66	0.92	1.70
50.0	74	0.072	44.8	1.99	1.32	0.69	0.99	1.75
50.0	78	0.085	44.9	2.11	1.57	0.70	1.05	1.79
50.0	79	0.100	45.0	2.13	1.84	0.71	1.07	1.79
50.0	83	0.115	45.0	2.22	2.13	0.72	1.11	1.83
50.0	86	0.130	45.0	2.30	2.40	0.72	1.15	1.87
50.0	90	0.144	45.0	2.39	2.65	0.72	1.19	1.92
50.0	93	0.158	45.0	2.47	2.90	0.71	1.24	1.96
50.0	97	0.172	45.0	2.56	3.17	0.71	1.28	2.01
50.0	100	0.187	44.9	2.64	3.44	0.70	1.32	2.06
50.0	102	0.201	44.8	2.70	3.70	0.69	1.35	2.10
50.0	105	0.216	44.8	2.75	3.98	0.68	1.37	2.13
50.0	107	0.231	44.7	2.80	4.26	0.67	1.40	2.17
50.0	109	0.247	44.6	2.85	4.56	0.66	1.43	2.21
50.0	112	0.261	44.5	2.90	4.82	0.64	1.45	2.25
50.0	114	0.276	44.4	2.96	5.09	0.63	1.48	2.29



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-112	Consolidation Pressure :	20.0 psi
Depth(ft):	30.5	Initial Sample Height:	5.462 in
Sample No.:	-	Initial Area of Sample:	5.277 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.462 in
Sample Description:	Lt Olive Brn Sandy Clay	Final Sample Area (A)*:	5.154 sq. in.
		Induced OCR=	1.0

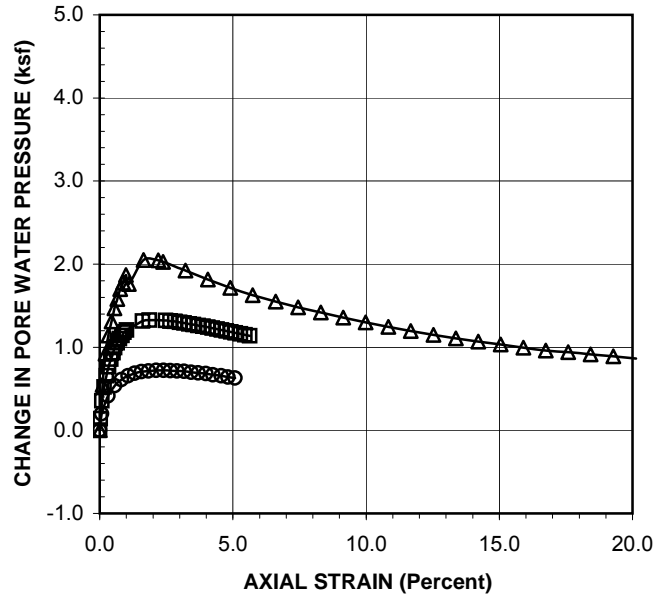
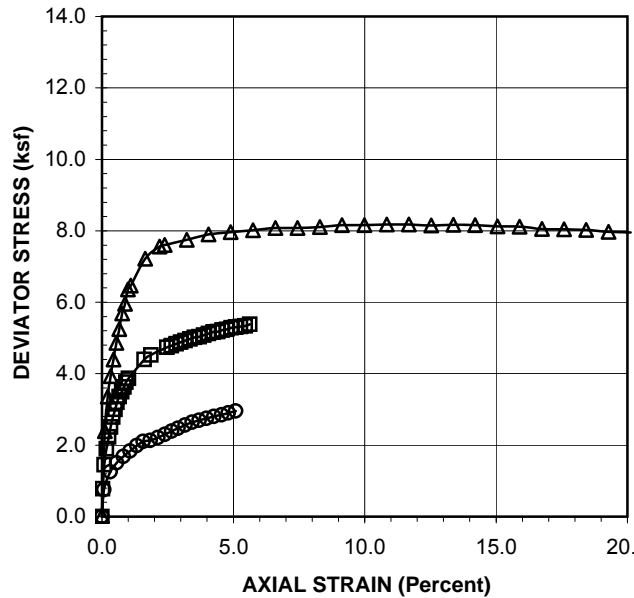
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	28	0.001	41.0	0.78	0.02	0.14	0.39	3.13
60.0	52	0.005	42.5	1.45	0.09	0.36	0.73	3.25
60.0	68	0.009	43.6	1.90	0.17	0.52	0.95	3.31
60.0	80	0.014	44.6	2.23	0.25	0.66	1.11	3.34
60.0	90	0.018	45.3	2.51	0.33	0.76	1.25	3.37
60.0	100	0.023	45.9	2.78	0.42	0.86	1.39	3.42
60.0	108	0.027	46.5	3.00	0.50	0.93	1.50	3.45
60.0	115	0.031	46.9	3.19	0.57	1.00	1.60	3.48
60.0	121	0.036	47.3	3.36	0.66	1.05	1.68	3.51
60.0	126	0.041	47.7	3.49	0.75	1.10	1.75	3.53
60.0	131	0.046	47.9	3.63	0.83	1.14	1.81	3.55
60.0	136	0.050	48.2	3.77	0.91	1.18	1.88	3.58
60.0	140	0.055	48.4	3.87	1.01	1.21	1.94	3.61
60.0	160	0.088	49.1	4.40	1.61	1.31	2.20	3.76
60.0	165	0.102	49.2	4.52	1.87	1.33	2.26	3.81
60.0	174	0.135	49.2	4.74	2.47	1.32	2.37	3.93
60.0	176	0.145	49.1	4.79	2.65	1.32	2.39	3.96
60.0	178	0.155	49.1	4.83	2.83	1.31	2.42	3.99
60.0	180	0.164	49.0	4.88	3.00	1.30	2.44	4.02
60.0	182	0.173	49.0	4.92	3.17	1.29	2.46	4.05
60.0	184	0.183	48.9	4.97	3.35	1.28	2.48	4.08
60.0	186	0.192	48.8	5.01	3.52	1.27	2.51	4.12
60.0	187	0.202	48.8	5.03	3.70	1.26	2.52	4.13
60.0	189	0.212	48.7	5.08	3.88	1.25	2.54	4.17
60.0	191	0.222	48.6	5.12	4.06	1.24	2.56	4.20
60.0	193	0.231	48.6	5.16	4.23	1.23	2.58	4.23
60.0	194	0.241	48.5	5.18	4.40	1.22	2.59	4.25
60.0	196	0.250	48.4	5.23	4.58	1.21	2.61	4.28
60.0	197	0.260	48.3	5.24	4.75	1.20	2.62	4.30
60.0	199	0.269	48.2	5.29	4.92	1.18	2.64	4.34
60.0	200	0.278	48.1	5.30	5.10	1.17	2.65	4.36
60.0	201	0.288	48.1	5.32	5.28	1.16	2.66	4.38
60.0	202	0.298	48.0	5.34	5.45	1.15	2.67	4.40
60.0	204	0.308	47.9	5.38	5.63	1.14	2.69	4.43



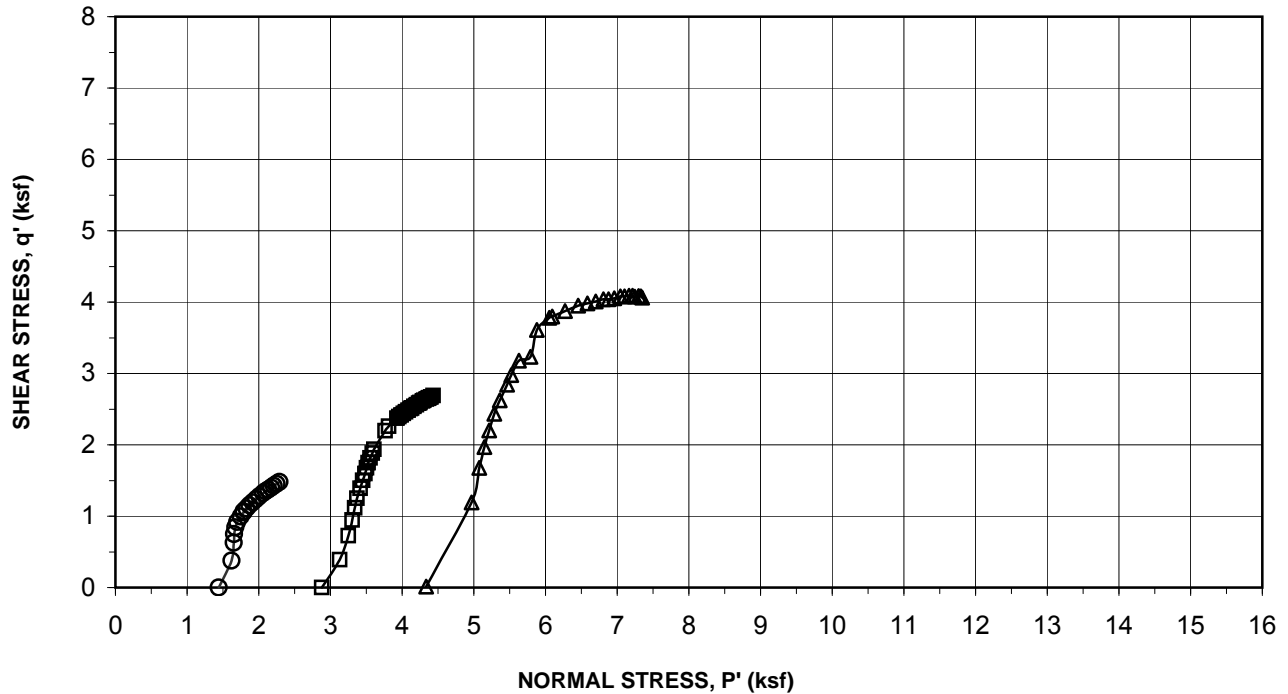
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-112	Consolidation Pressure :	30.0 psi
Depth(ft):	30.5	Initial Sample Height:	5.462 in
Sample No.:	-	Initial Area of Sample:	5.277 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.462 in
Sample Description:	Lt Olive Brn Sandy Clay	Final Sample Area (A)*:	5.178 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress (S1-S3)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2	Normal Stress p' (S1'+S3')/2
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(ksf)	(ksf)
70.0	1	0.000	40.0	0.03	0.00	0.00	0.01	4.33
70.0	86	0.006	43.8	2.39	0.11	0.55	1.19	4.97
70.0	121	0.012	46.4	3.36	0.22	0.92	1.68	5.08
70.0	142	0.018	47.9	3.94	0.33	1.14	1.97	5.15
70.0	159	0.024	49.1	4.40	0.44	1.31	2.20	5.21
70.0	176	0.030	50.2	4.87	0.55	1.47	2.43	5.29
70.0	190	0.036	51.0	5.25	0.66	1.58	2.62	5.36
70.0	206	0.042	51.8	5.68	0.77	1.70	2.84	5.46
70.0	216	0.048	52.3	5.95	0.88	1.78	2.98	5.52
70.0	231	0.054	53.0	6.36	0.99	1.87	3.18	5.63
70.0	235	0.060	52.2	6.46	1.10	1.76	3.23	5.79
70.0	264	0.090	54.2	7.22	1.65	2.05	3.61	5.88
70.0	278	0.120	54.2	7.56	2.20	2.04	3.78	6.06
70.0	280	0.130	54.1	7.60	2.38	2.03	3.80	6.09
70.0	288	0.176	53.4	7.75	3.22	1.92	3.88	6.27
70.0	296	0.222	52.6	7.90	4.06	1.81	3.95	6.45
70.0	301	0.268	51.9	7.96	4.90	1.71	3.98	6.59
70.0	306	0.314	51.3	8.02	5.75	1.63	4.01	6.70
70.0	311	0.361	50.8	8.08	6.60	1.55	4.04	6.81
70.0	314	0.407	50.3	8.08	7.44	1.48	4.04	6.88
70.0	318	0.453	49.8	8.11	8.30	1.42	4.05	6.96
70.0	323	0.499	49.4	8.16	9.14	1.36	4.08	7.05
70.0	326	0.545	49.0	8.16	9.98	1.30	4.08	7.10
70.0	330	0.592	48.6	8.18	10.84	1.24	4.09	7.17
70.0	333	0.638	48.3	8.18	11.68	1.20	4.09	7.21
70.0	335	0.684	48.0	8.15	12.53	1.15	4.07	7.25
70.0	339	0.730	47.7	8.17	13.37	1.11	4.08	7.30
70.0	342	0.776	47.4	8.16	14.21	1.07	4.08	7.33
70.0	344	0.822	47.2	8.13	15.05	1.03	4.06	7.35
70.0	347	0.869	46.9	8.12	15.90	1.00	4.06	7.38
70.0	348	0.915	46.7	8.06	16.75	0.96	4.03	7.39
70.0	351	0.961	46.5	8.04	17.59	0.94	4.02	7.40
70.0	354	1.007	46.4	8.03	18.43	0.91	4.01	7.42
70.0	355	1.053	46.2	7.97	19.28	0.89	3.98	7.41
70.0	358	1.099	46.0	7.95	20.13	0.86	3.98	7.43

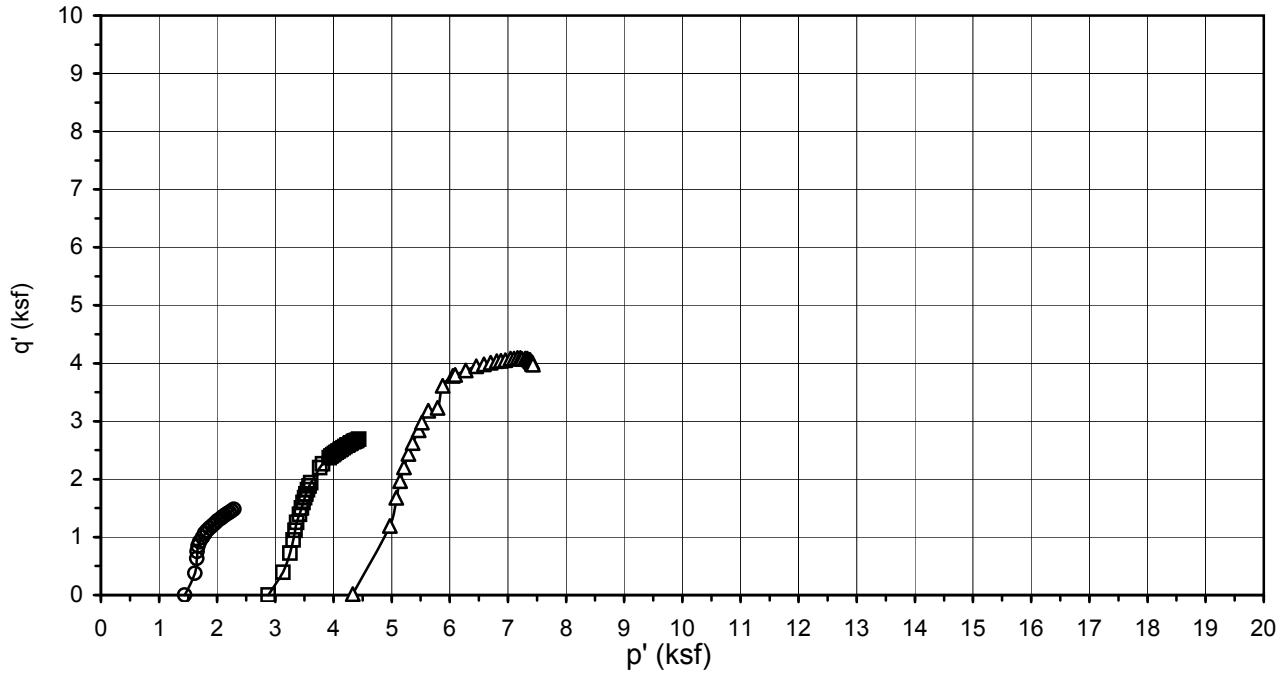


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi

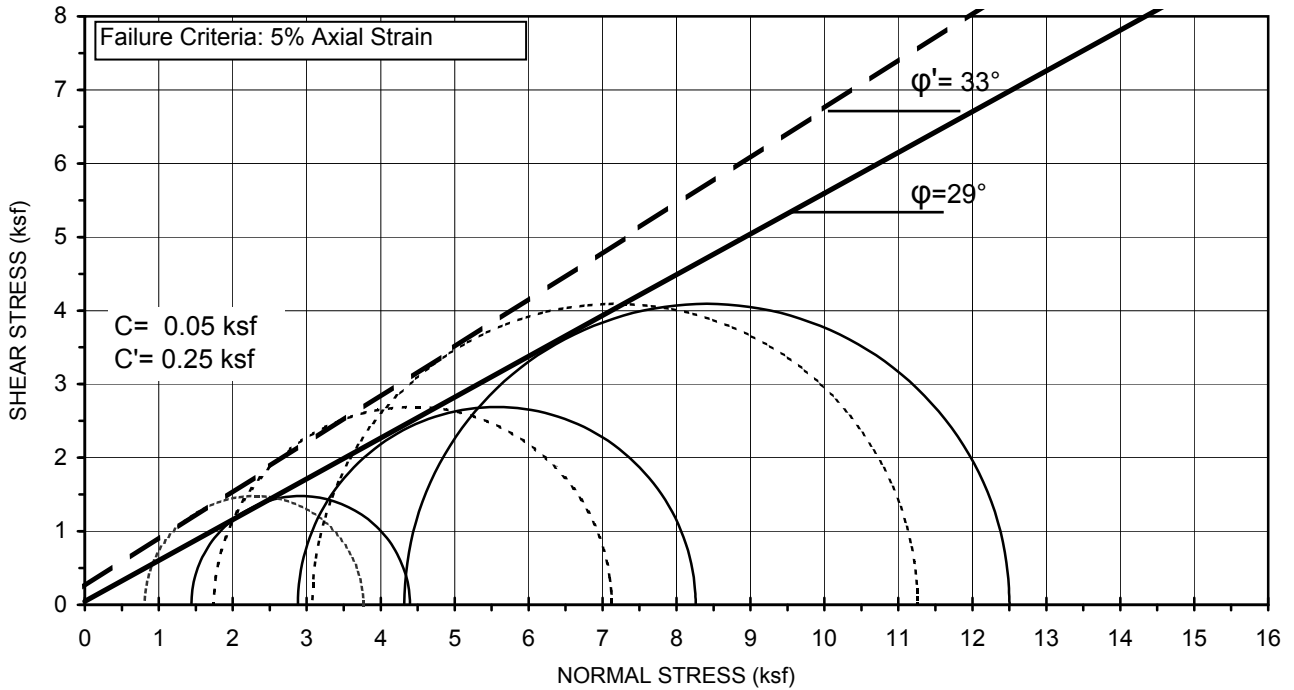


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Lt Olive Brn Sandy Clay
Test Pit:	G-112	Avg. Dry Unit Weight (pcf):	97.3
Sample No.:	-	Avg. Initial Moisture Content (%):	25.2
Depth (ft):	30.5	Confining Pressure:	10.0, 20.0, 30.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

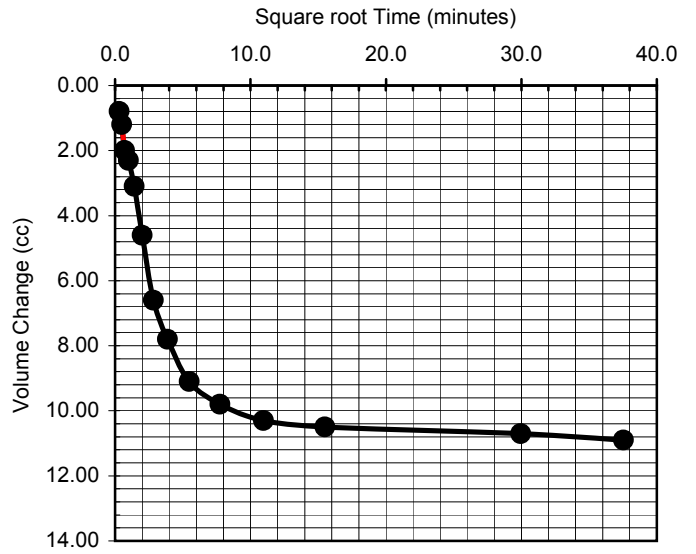
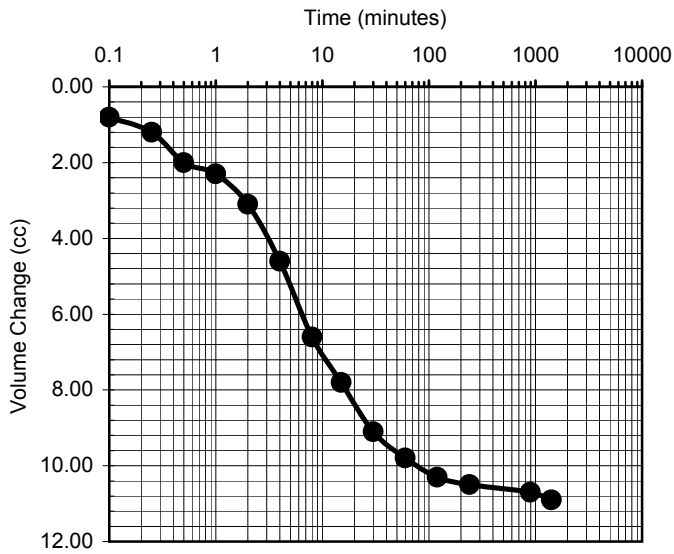


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Lt Olive Brn Sandy Clay
Test Pit:	G-112	Avg. Dry Unit Weight (pcf):	97.3
Sample No.:	-	Avg. Initial Moisture Content (%):	25.2
Depth (ft):	30.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-112	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Lt Olive Brn Sandy Clay
Depth (feet):	30.5	Eff. Confining Pressure (psi):	20.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.8000
0.25	1.2000
0.5	2.0000
1	2.3000
2	3.1000
4	4.6000
8	6.6000
15	7.8000
30	9.1000
60	9.8000
120	10.3000
240	10.5000
898	10.7000
1410	10.9000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.8000
0.5000	1.2000
0.7071	2.0000
1.0000	2.3000
1.4142	3.1000
2.0000	4.6000
2.8284	6.6000
3.8730	7.8000
5.4772	9.1000
7.7460	9.8000
10.9545	10.3000
15.4919	10.5000
29.9666	10.7000
37.5500	10.9000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	06/15/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	ST	Date:	06-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Gray Silt		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.605</u>	<u>2.605</u>	<u>2.605</u>	Avg. =	2.605
Height (in)	<u>5.583</u>	<u>5.583</u>	<u>5.583</u>	Avg. =	5.583

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.330	5.790
Moisture Content (%)	27.22	29.45
Wet Weight (gms)	<u>91.62</u>	<u>1105.50</u>
Dry Weight (gms)	<u>82.79</u>	<u>889.03</u>
Container Weight (gms)	<u>50.35</u>	<u>154.04</u>
Density and Saturation		
Wet Weight (gms)	<u>962.45</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	123.2	
Dry Density (pcf)	96.9	
Initial Void Ratio	0.740	
% Saturation	99.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation			
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)=	0

Consolidation			
Cell Pressure (psi) =	<u>45.0</u>	Initial Burette Ht.(cm)=	<u>67.3</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>60.2</u>
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	<u>5.064</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>29.756</u>
Change in Ht. of Specimen (in) =	0.5190	Final Volume (cu.in) =	<u>29.323</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	4.00
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.19
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	5.19
		Axial Strain (%) =	5.16



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	ST	Date:	06-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Gray Silt		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.605</u>	<u>2.605</u>	<u>2.605</u>	Avg. =	2.605
Height (in)	<u>5.583</u>	<u>5.583</u>	<u>5.583</u>	Avg. =	5.583

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.330	5.178
Moisture Content (%)	27.22	29.45
Wet Weight (gms)	91.62	1105.50
Dry Weight (gms)	82.79	889.03
Container Weight (gms)	50.35	154.04
Density and Saturation		
Wet Weight (gms)	962.45	
Container Weight (gms)	0.00	
Wet Density (pcf)	123.2	
Dry Density (pcf)	96.9	
Initial Void Ratio	0.740	
% Saturation	99.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	64.0
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	50.0
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.581
Induced OCR=	1.0	Initial Volume (cu.in)=	29.756
Change in Ht. of Specimen (in) =	0.0018	Final Volume (cu.in) =	28.902

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	8.30
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.06
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.36
		Axial Strain (%) =	5.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	ST	Date:	06-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Gray Silt		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.605</u>	<u>2.605</u>	<u>2.605</u>	Avg. =	2.605
Height (in)	<u>5.583</u>	<u>5.583</u>	<u>5.583</u>	Avg. =	5.583

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.330	5.262
Moisture Content (%)	27.22	29.45
Wet Weight (gms)	<u>91.62</u>	<u>1105.50</u>
Dry Weight (gms)	<u>82.79</u>	<u>889.03</u>
Container Weight (gms)	<u>50.35</u>	<u>154.04</u>
Density and Saturation		
Wet Weight (gms)	<u>962.45</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	123.2	
Dry Density (pcf)	96.9	
Initial Void Ratio	0.740	
% Saturation	99.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>75.0</u>	Initial Burette Ht.(cm)=	<u>52.5</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>46.2</u>
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	<u>5.582</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>29.756</u>
Change in Ht. of Specimen (in) =	0.0012	Final Volume (cu.in) =	<u>29.372</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	12.11
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.95
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.07
		Axial Strain (%) =	4.70



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-112	Consolidation Pressure :	15.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.583 in
Sample No.:	-	Initial Area of Sample:	5.330 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.064 in
Sample Description:	Gray Silt	Final Sample Area (A)*:	5.790 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	24	0.001	31.1	0.60	0.03	0.16	0.30	2.30
45.0	51	0.011	33.3	1.27	0.22	0.47	0.63	2.32
45.0	65	0.021	34.6	1.60	0.40	0.66	0.80	2.30
45.0	72	0.030	35.4	1.78	0.58	0.78	0.89	2.27
45.0	78	0.039	36.0	1.92	0.77	0.87	0.96	2.25
45.0	84	0.049	36.5	2.07	0.96	0.93	1.03	2.26
45.0	87	0.059	36.8	2.14	1.16	0.98	1.07	2.25
45.0	92	0.069	37.0	2.24	1.35	1.01	1.12	2.27
45.0	96	0.078	37.2	2.35	1.54	1.04	1.18	2.30
45.0	99	0.088	37.4	2.42	1.73	1.06	1.21	2.31
45.0	104	0.097	37.5	2.52	1.91	1.07	1.26	2.35
45.0	107	0.106	37.5	2.59	2.10	1.08	1.30	2.37
45.0	111	0.116	37.6	2.70	2.29	1.09	1.35	2.42
45.0	114	0.126	37.6	2.76	2.48	1.09	1.38	2.45
45.0	117	0.136	37.6	2.83	2.69	1.09	1.42	2.48
45.0	122	0.145	37.6	2.93	2.87	1.09	1.47	2.53
45.0	125	0.155	37.6	3.00	3.06	1.09	1.50	2.57
45.0	129	0.165	37.5	3.10	3.25	1.09	1.55	2.63
45.0	132	0.174	37.5	3.17	3.44	1.08	1.58	2.66
45.0	137	0.184	37.5	3.27	3.63	1.07	1.64	2.72
45.0	140	0.194	37.4	3.34	3.83	1.06	1.67	2.76
45.0	144	0.204	37.3	3.44	4.02	1.05	1.72	2.82
45.0	149	0.212	37.2	3.54	4.19	1.04	1.77	2.89
45.0	152	0.222	37.2	3.60	4.38	1.03	1.80	2.93
45.0	156	0.232	37.1	3.70	4.58	1.02	1.85	2.99
45.0	161	0.242	37.0	3.80	4.78	1.00	1.90	3.06
45.0	165	0.252	36.9	3.90	4.97	0.99	1.95	3.12
45.0	170	0.261	36.8	4.00	5.16	0.97	2.00	3.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-112	Consolidation Pressure :	30.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.583 in
Sample No.:	-	Initial Area of Sample:	5.330 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.581 in
Sample Description:	Gray Silt	Final Sample Area (A)*:	5.178 sq. in.
		Induced OCR=	1.0

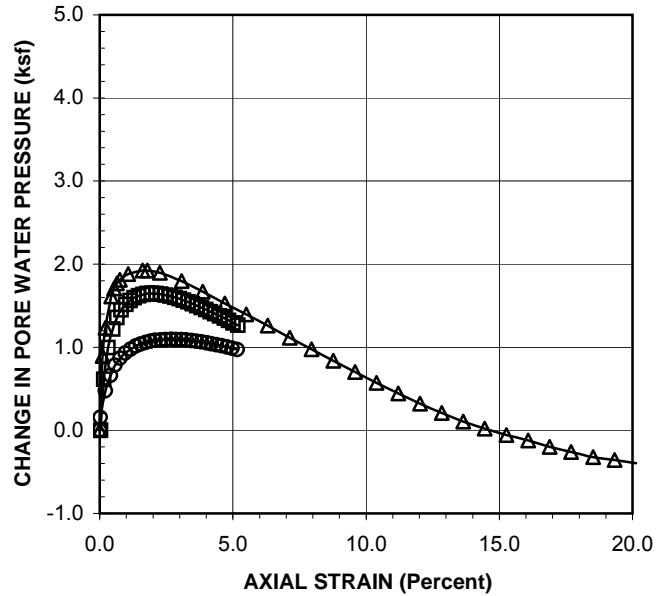
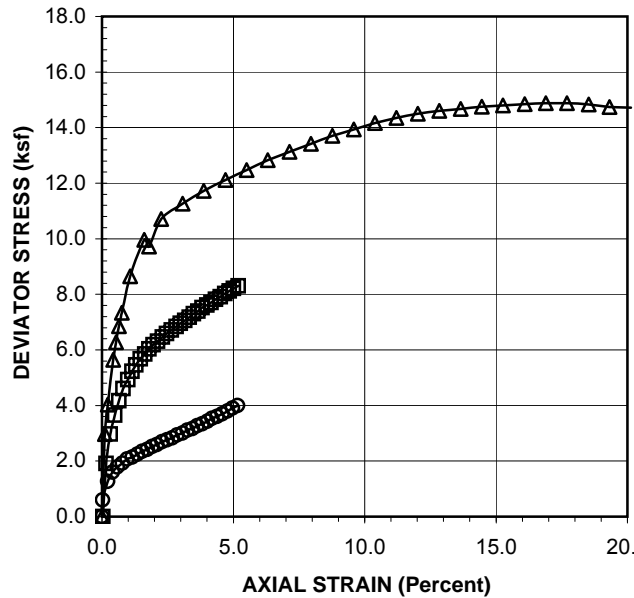
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.002	30.0	0.00	0.03	0.00	0.00	4.32
60.0	69	0.009	34.3	1.92	0.16	0.61	0.96	4.67
60.0	107	0.017	36.9	2.97	0.31	1.00	1.48	4.81
60.0	132	0.027	38.5	3.65	0.49	1.22	1.83	4.93
60.0	151	0.036	39.4	4.17	0.65	1.36	2.09	5.05
60.0	167	0.045	40.1	4.61	0.81	1.45	2.30	5.17
60.0	179	0.055	40.5	4.93	0.99	1.51	2.46	5.27
60.0	190	0.064	40.9	5.22	1.14	1.56	2.61	5.37
60.0	199	0.072	41.1	5.46	1.30	1.60	2.73	5.45
60.0	207	0.082	41.3	5.67	1.46	1.62	2.84	5.54
60.0	214	0.091	41.4	5.85	1.63	1.64	2.93	5.61
60.0	221	0.100	41.4	6.04	1.79	1.64	3.02	5.69
60.0	227	0.109	41.4	6.19	1.95	1.65	3.09	5.77
60.0	232	0.118	41.4	6.31	2.12	1.64	3.16	5.83
60.0	238	0.128	41.4	6.47	2.30	1.64	3.23	5.92
60.0	243	0.138	41.3	6.59	2.46	1.63	3.30	5.99
60.0	248	0.147	41.2	6.71	2.64	1.61	3.36	6.06
60.0	253	0.157	41.1	6.84	2.82	1.60	3.42	6.14
60.0	258	0.167	41.0	6.96	2.99	1.58	3.48	6.22
60.0	262	0.176	40.9	7.06	3.15	1.56	3.53	6.28
60.0	267	0.185	40.7	7.18	3.32	1.54	3.59	6.37
60.0	272	0.194	40.6	7.30	3.48	1.52	3.65	6.45
60.0	276	0.204	40.4	7.39	3.65	1.50	3.70	6.52
60.0	281	0.213	40.3	7.52	3.82	1.48	3.76	6.60
60.0	285	0.223	40.1	7.61	3.99	1.45	3.80	6.67
60.0	289	0.232	39.9	7.70	4.16	1.43	3.85	6.74
60.0	294	0.242	39.7	7.82	4.33	1.40	3.91	6.83
60.0	298	0.251	39.6	7.91	4.50	1.38	3.96	6.90
60.0	303	0.261	39.4	8.03	4.68	1.35	4.02	6.99
60.0	307	0.270	39.2	8.12	4.84	1.32	4.06	7.06
60.0	311	0.280	39.0	8.22	5.01	1.29	4.11	7.13
60.0	315	0.290	38.8	8.30	5.19	1.26	4.15	7.21



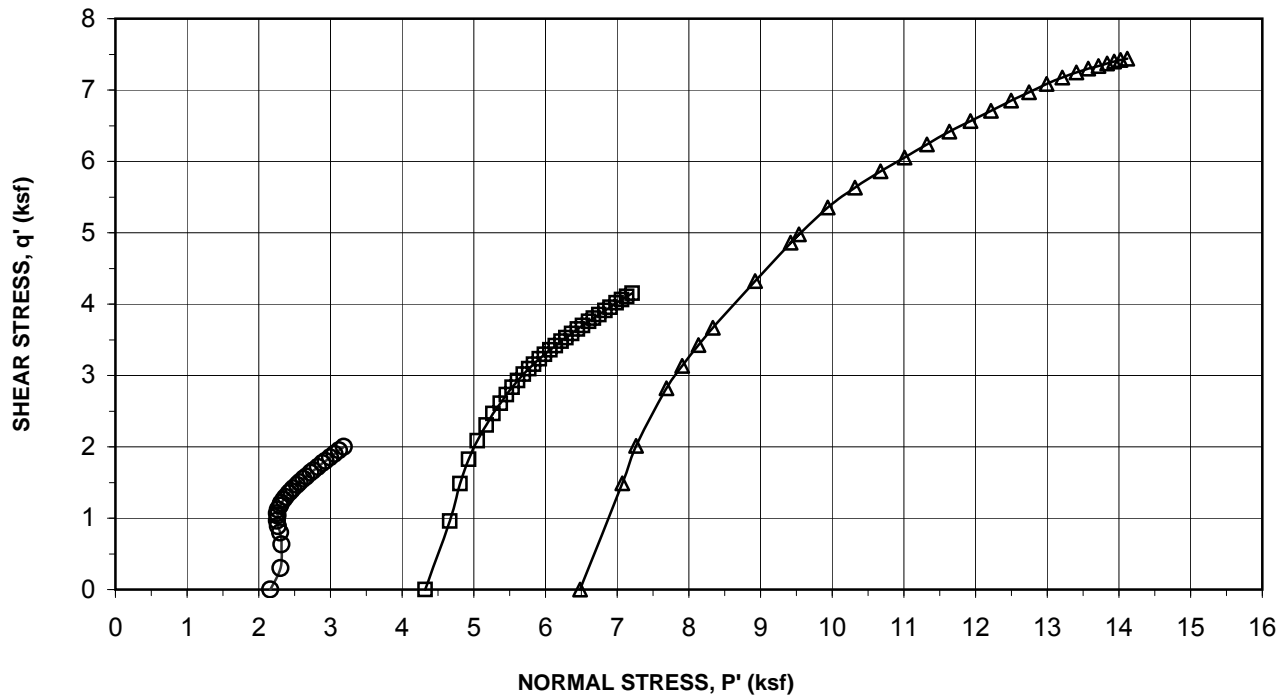
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-112	Consolidation Pressure :	45.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.583 in
Sample No.:	-	Initial Area of Sample:	5.330 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.582 in
Sample Description:	Gray Silt	Final Sample Area (A)*:	5.262 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	109	0.006	36.2	2.98	0.11	0.90	1.49	7.07
75.0	148	0.012	38.6	4.03	0.21	1.23	2.02	7.26
75.0	207	0.024	41.2	5.64	0.43	1.61	2.82	7.69
75.0	230	0.030	41.9	6.27	0.54	1.71	3.14	7.91
75.0	252	0.036	42.3	6.85	0.64	1.77	3.43	8.14
75.0	270	0.042	42.6	7.33	0.75	1.81	3.67	8.34
75.0	320	0.060	43.1	8.65	1.07	1.88	4.32	8.93
75.0	370	0.090	43.4	9.96	1.61	1.92	4.98	9.54
75.0	362	0.100	43.4	9.72	1.79	1.92	4.86	9.42
75.0	401	0.126	43.2	10.71	2.26	1.90	5.36	9.94
75.0	425	0.171	42.5	11.27	3.07	1.80	5.63	10.32
75.0	446	0.216	41.6	11.72	3.87	1.67	5.86	10.67
75.0	464	0.262	40.6	12.11	4.70	1.53	6.06	11.01
75.0	482	0.307	39.7	12.48	5.50	1.40	6.24	11.32
75.0	500	0.352	38.8	12.83	6.31	1.26	6.41	11.63
75.0	517	0.398	37.8	13.13	7.14	1.12	6.56	11.93
75.0	533	0.444	36.8	13.42	7.95	0.98	6.71	12.21
75.0	549	0.489	35.8	13.71	8.77	0.84	6.85	12.50
75.0	563	0.535	34.9	13.94	9.58	0.70	6.97	12.75
75.0	578	0.580	34.0	14.17	10.39	0.57	7.08	12.99
75.0	590	0.626	33.1	14.35	11.21	0.44	7.17	13.21
75.0	602	0.671	32.2	14.50	12.02	0.32	7.25	13.41
75.0	612	0.717	31.4	14.60	12.84	0.21	7.30	13.57
75.0	621	0.762	30.7	14.67	13.65	0.11	7.34	13.71
75.0	630	0.807	30.1	14.75	14.46	0.02	7.37	13.83
75.0	638	0.852	29.6	14.80	15.26	-0.05	7.40	13.93
75.0	646	0.898	29.2	14.84	16.09	-0.12	7.42	14.02
75.0	654	0.943	28.6	14.88	16.89	-0.20	7.44	14.12
75.0	661	0.988	28.2	14.88	17.70	-0.26	7.44	14.18
75.0	665	1.034	27.8	14.83	18.52	-0.32	7.41	14.22
75.0	668	1.079	27.5	14.74	19.32	-0.36	7.37	14.21
75.0	673	1.124	27.3	14.71	20.14	-0.39	7.36	14.23



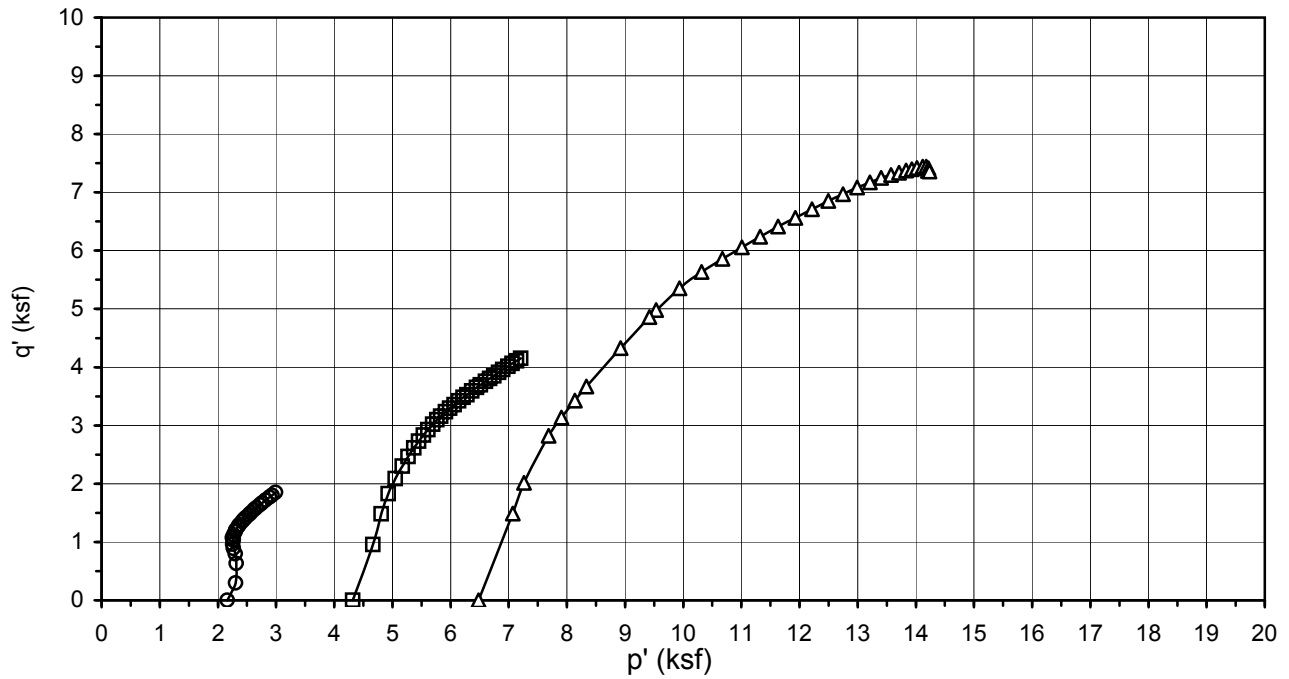
LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



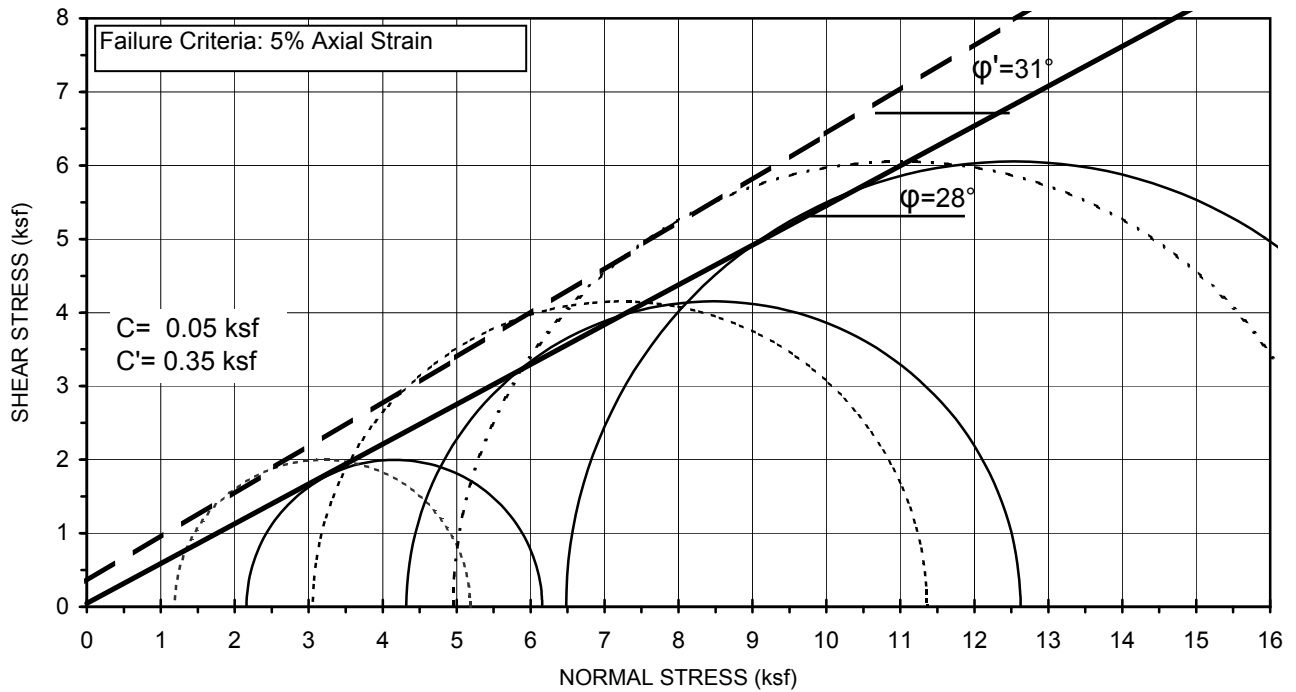
Project Name: West Subway Extension
Project No.: 4953-10-1561
Test Pit: G-112
Sample No.: -
Depth (ft): 55.5

Sample Type: Mod. Cal.
Sample Description: Gray Silt
Avg. Dry Unit Weight (pcf): 96.9
Avg. Initial Moisture Content (%): 27.2
Confining Pressure: 15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



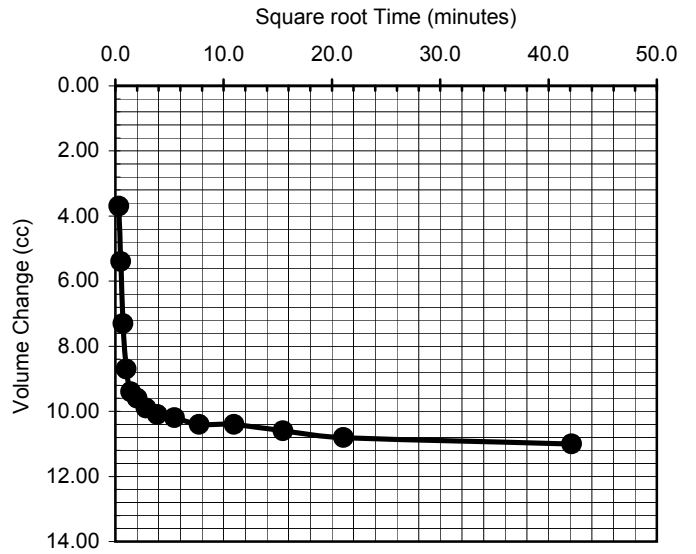
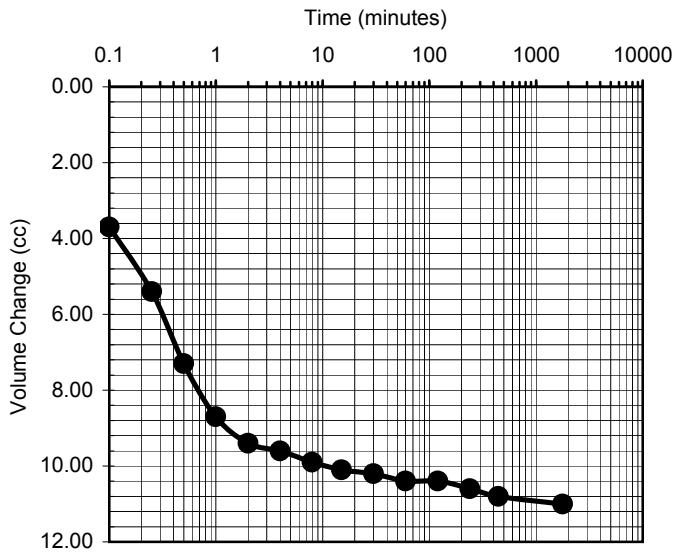
LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-112
 Sample No.: -
 Depth (ft): 55.5

Sample Type: Mod. Cal.
 Sample Description: Gray Silt
 Avg. Dry Unit Weight (pcf): 96.9
 Avg. Initial Moisture Content (%): 27.2
 Confining Pressure: 15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-112	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Gray Silt
Depth (feet):	55.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	3.7000
0.25	5.4000
0.5	7.3000
1	8.7000
2	9.4000
4	9.6000
8	9.9000
15	10.1000
30	10.2000
60	10.4000
120	10.4000
240	10.6000
444	10.8000
1775	11.0000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	3.7000
0.5000	5.4000
0.7071	7.3000
1.0000	8.7000
1.4142	9.4000
2.0000	9.6000
2.8284	9.9000
3.8730	10.1000
5.4772	10.2000
7.7460	10.4000
10.9545	10.4000
15.4919	10.6000
21.0713	10.8000
42.1307	11.0000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Date: 06/21/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	06-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Dark Olive Silt		
Depth(ft):	90.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.623</u>	<u>2.623</u>	<u>2.623</u>	Avg. =	2.623
Height (in)	<u>5.509</u>	<u>5.509</u>	<u>5.509</u>	Avg. =	5.509

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.404	5.333
Moisture Content (%)	28.37	33.72
Wet Weight (gms)	95.55	1117.77
Dry Weight (gms)	85.48	884.71
Container Weight (gms)	49.98	193.56
Density and Saturation		
Wet Weight (gms)	918.24	
Container Weight (gms)	0.00	
Wet Density (pcf)	117.5	
Dry Density (pcf)	91.5	
Initial Void Ratio	0.840	
% Saturation	91.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	93.3
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	77.0
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.395
Induced OCR =	1.0	Initial Volume (cu.in)=	29.769
Change in Ht. of Specimen (in) =	0.1138	Final Volume (cu.in) =	28.774

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.11
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.78
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	12.89
		Axial Strain (%) =	4.95



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	06-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-112	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Dark Olive Silt		
Depth(ft):	90.5				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.623</u>	<u>2.623</u>	<u>2.623</u>	Avg. =	2.623
Height (in)	<u>5.509</u>	<u>5.509</u>	<u>5.509</u>	Avg. =	5.509

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.404	5.352
Moisture Content (%)	28.37	33.72
Wet Weight (gms)	95.55	1117.77
Dry Weight (gms)	85.48	884.71
Container Weight (gms)	49.98	193.56
Density and Saturation		
Wet Weight (gms)	918.24	
Container Weight (gms)	0.00	
Wet Density (pcf)	117.5	
Dry Density (pcf)	91.5	
Initial Void Ratio	0.840	
% Saturation	91.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	76.9
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	71.2
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.497
Induced OCR=	1.0	Initial Volume (cu.in)=	29.769
Change in Ht. of Specimen (in) =	0.0122	Final Volume (cu.in) =	29.421

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	17.23
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.61
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	21.84
		Axial Strain (%) =	4.88



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-21-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-28-11**
 Test Pit: **G-112** Reviewed by: **AP** Date: **06-28-11**
 Sample No.: **-** Sample Description: **Dark Olive Silt**
 Depth(ft): **90.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **60.0 psi**

Diameter (in)	<u>2.623</u>	<u>2.623</u>	<u>2.623</u>	Avg. =	2.623
Height (in)	<u>5.509</u>	<u>5.509</u>	<u>5.509</u>	Avg. =	5.509

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.404	5.394
Moisture Content (%)	28.37	33.72
Wet Weight (gms)	95.55	1117.77
Dry Weight (gms)	85.48	884.71
Container Weight (gms)	49.98	193.56
Density and Saturation		
Wet Weight (gms)	918.24	
Container Weight (gms)	0.00	
Wet Density (pcf)	117.5	
Dry Density (pcf)	91.5	
Initial Void Ratio	0.840	
% Saturation	91.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	71.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	67.8
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	5.482
Induced OCR =	1.0	Initial Volume (cu.in)=	29.769
Change in Ht. of Specimen (in) =	0.0274	Final Volume (cu.in) =	29.567

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	20.61
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	6.29
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	26.89
		Axial Strain (%) =	6.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-112	Consolidation Pressure :	30.0 psi
Depth(ft):	90.5	Initial Sample Height:	5.509 in
Sample No.:	-	Initial Area of Sample:	5.404 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.395 in
Sample Description:	Dark Olive Silt	Final Sample Area (A)*:	5.333 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	1	0.000	30.0	0.03	0.00	0.00	0.01	4.33
60.0	27	0.001	31.4	0.73	0.02	0.19	0.36	4.49
60.0	69	0.009	35.3	1.86	0.17	0.77	0.93	4.48
60.0	90	0.019	38.0	2.42	0.36	1.16	1.21	4.37
60.0	104	0.028	39.9	2.79	0.52	1.43	1.40	4.29
60.0	116	0.037	41.4	3.11	0.69	1.64	1.56	4.24
60.0	127	0.047	42.5	3.40	0.88	1.80	1.70	4.22
60.0	136	0.057	43.5	3.63	1.05	1.94	1.82	4.19
60.0	145	0.066	44.3	3.87	1.22	2.06	1.93	4.19
60.0	155	0.075	45.0	4.13	1.39	2.16	2.06	4.22
60.0	164	0.085	45.7	4.36	1.57	2.26	2.18	4.24
60.0	175	0.094	46.2	4.64	1.74	2.34	2.32	4.30
60.0	186	0.104	46.8	4.93	1.93	2.41	2.46	4.37
60.0	197	0.114	47.2	5.21	2.11	2.48	2.60	4.44
60.0	208	0.123	47.6	5.49	2.29	2.54	2.74	4.53
60.0	221	0.133	48.0	5.82	2.47	2.59	2.91	4.64
60.0	233	0.143	48.3	6.12	2.66	2.63	3.06	4.75
60.0	245	0.152	48.5	6.43	2.82	2.67	3.21	4.86
60.0	259	0.162	48.7	6.78	3.00	2.70	3.39	5.01
60.0	274	0.172	48.9	7.16	3.18	2.72	3.58	5.18
60.0	289	0.180	49.0	7.54	3.34	2.73	3.77	5.36
60.0	304	0.189	49.0	7.92	3.50	2.74	3.96	5.54
60.0	320	0.198	49.0	8.32	3.68	2.74	4.16	5.74
60.0	336	0.208	49.0	8.72	3.85	2.73	4.36	5.95
60.0	352	0.217	48.8	9.12	4.02	2.71	4.56	6.17
60.0	369	0.227	48.7	9.54	4.20	2.69	4.77	6.40
60.0	385	0.237	48.5	9.94	4.39	2.66	4.97	6.63
60.0	401	0.247	48.3	10.33	4.58	2.63	5.17	6.86
60.0	417	0.257	48.0	10.72	4.76	2.59	5.36	7.09
60.0	433	0.267	47.7	11.11	4.95	2.54	5.56	7.33



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-112	Consolidation Pressure :	45.0 psi
Depth(ft):	90.5	Initial Sample Height:	5.509 in
Sample No.:	-	Initial Area of Sample:	5.404 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.497 in
Sample Description:	Dark Olive Silt	Final Sample Area (A)*:	5.352 sq. in.
		Induced OCR=	1.0

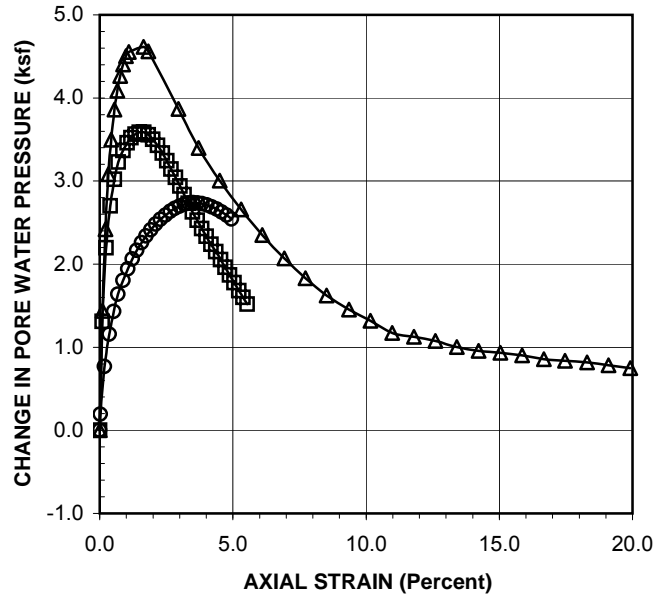
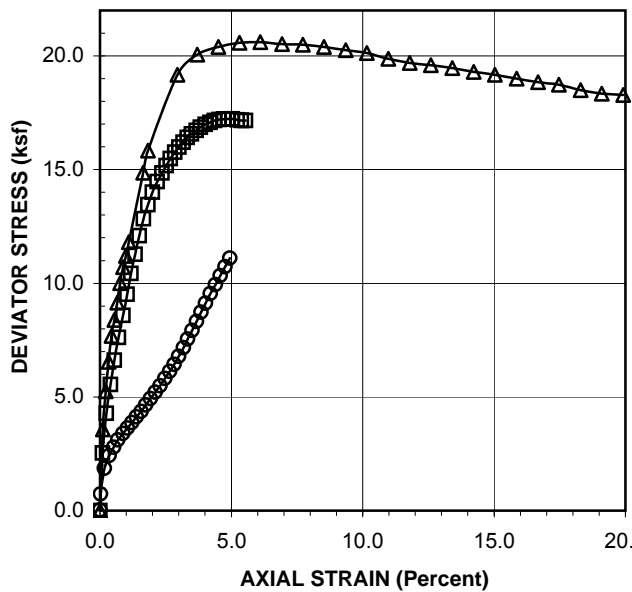
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	95	0.005	39.1	2.54	0.10	1.31	1.27	6.44
75.0	159	0.013	45.2	4.28	0.24	2.19	2.14	6.42
75.0	207	0.022	48.8	5.55	0.40	2.70	2.77	6.55
75.0	248	0.030	51.0	6.62	0.55	3.02	3.31	6.77
75.0	285	0.039	52.4	7.62	0.70	3.23	3.81	7.06
75.0	322	0.048	53.4	8.59	0.88	3.37	4.30	7.41
75.0	357	0.057	54.0	9.51	1.04	3.46	4.76	7.78
75.0	392	0.065	54.5	10.43	1.18	3.52	5.22	8.18
75.0	425	0.074	54.8	11.28	1.34	3.57	5.64	8.55
75.0	456	0.082	54.9	12.09	1.49	3.59	6.05	8.94
75.0	485	0.091	54.9	12.84	1.65	3.59	6.42	9.31
75.0	509	0.100	54.7	13.46	1.82	3.56	6.73	9.65
75.0	531	0.110	54.3	14.00	2.00	3.50	7.00	9.98
75.0	550	0.120	53.8	14.47	2.18	3.43	7.24	10.29
75.0	565	0.130	53.2	14.85	2.36	3.34	7.42	10.57
75.0	579	0.139	52.5	15.18	2.52	3.24	7.59	10.83
75.0	591	0.147	51.8	15.48	2.68	3.14	7.74	11.08
75.0	603	0.157	51.1	15.76	2.85	3.04	7.88	11.32
75.0	613	0.165	50.4	15.99	3.01	2.94	8.00	11.54
75.0	622	0.174	49.7	16.20	3.17	2.84	8.10	11.74
75.0	631	0.183	49.0	16.41	3.33	2.73	8.20	11.95
75.0	638	0.192	48.3	16.57	3.49	2.63	8.28	12.14
75.0	645	0.201	47.6	16.73	3.66	2.53	8.36	12.31
75.0	652	0.211	46.9	16.86	3.83	2.43	8.43	12.48
75.0	658	0.220	46.2	16.99	4.00	2.33	8.50	12.64
75.0	662	0.230	45.6	17.08	4.18	2.24	8.54	12.78
75.0	667	0.240	44.9	17.16	4.36	2.15	8.58	12.91
75.0	670	0.250	44.3	17.20	4.54	2.05	8.60	13.03
75.0	671	0.259	43.6	17.21	4.71	1.96	8.61	13.12
75.0	673	0.268	43.0	17.23	4.88	1.87	8.61	13.23
75.0	674	0.277	42.3	17.22	5.04	1.78	8.61	13.32
75.0	674	0.287	41.7	17.19	5.22	1.68	8.59	13.39
75.0	674	0.296	41.1	17.16	5.38	1.60	8.58	13.46
75.0	675	0.305	40.6	17.15	5.54	1.52	8.58	13.54



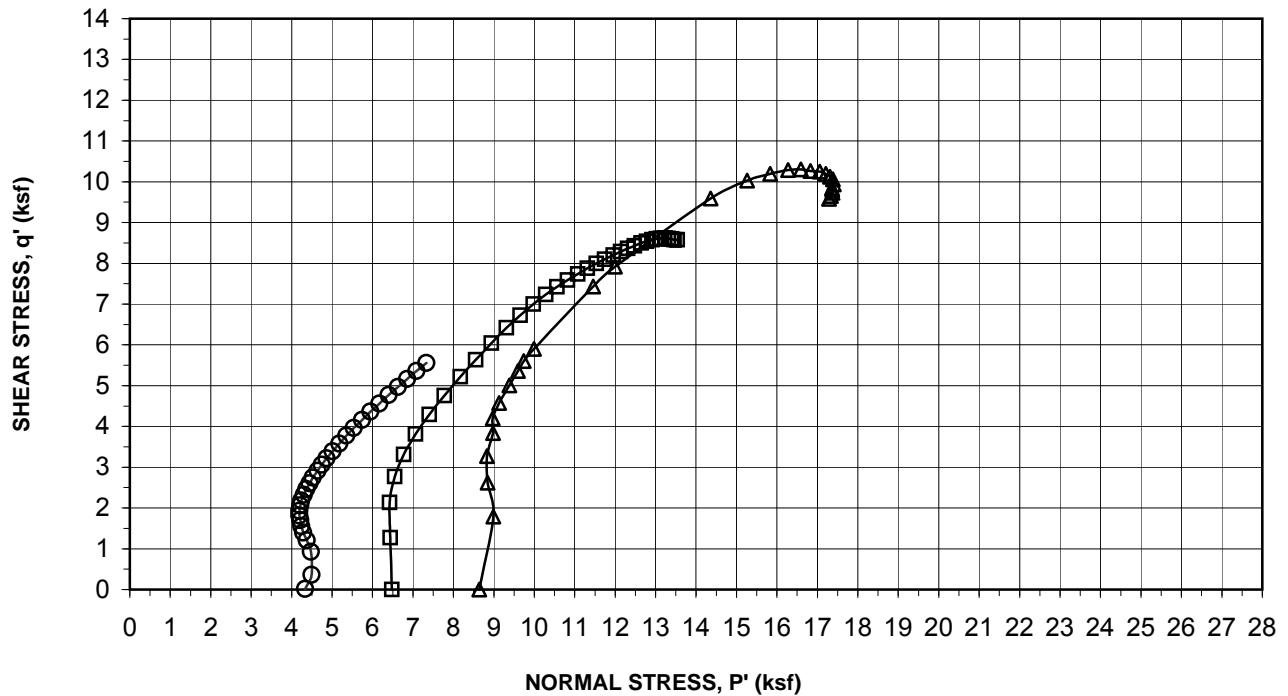
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-112	Consolidation Pressure :	60.0 psi
Depth(ft):	90.5	Initial Sample Height:	5.509 in
Sample No.:	-	Initial Area of Sample:	5.404 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.482 in
Sample Description:	Dark Olive Silt	Final Sample Area (A)*:	5.394 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	134	0.006	40.0	3.57	0.11	1.44	1.79	8.99
90.0	197	0.012	46.8	5.25	0.22	2.42	2.62	8.84
90.0	246	0.018	51.4	6.55	0.33	3.08	3.27	8.83
90.0	289	0.024	54.3	7.68	0.44	3.50	3.84	8.98
90.0	316	0.030	56.8	8.39	0.55	3.86	4.19	8.97
90.0	345	0.036	58.4	9.15	0.66	4.09	4.57	9.13
90.0	378	0.042	59.6	10.01	0.77	4.27	5.01	9.38
90.0	405	0.048	60.6	10.72	0.88	4.40	5.36	9.60
90.0	424	0.054	61.3	11.21	0.99	4.50	5.60	9.74
90.0	447	0.060	61.6	11.80	1.09	4.55	5.90	9.99
90.0	566	0.090	62.0	14.86	1.64	4.61	7.43	11.46
90.0	604	0.100	61.7	15.83	1.82	4.56	7.92	11.99
90.0	740	0.162	56.9	19.17	2.95	3.87	9.59	14.36
90.0	780	0.203	53.6	20.05	3.71	3.40	10.03	15.27
90.0	800	0.247	50.9	20.40	4.51	3.01	10.20	15.83
90.0	814	0.291	48.5	20.58	5.31	2.66	10.29	16.27
90.0	822	0.335	46.3	20.61	6.10	2.35	10.30	16.59
90.0	826	0.380	44.4	20.52	6.93	2.07	10.26	16.83
90.0	832	0.423	42.7	20.50	7.72	1.83	10.25	17.06
90.0	835	0.467	41.3	20.39	8.52	1.62	10.20	17.21
90.0	837	0.513	40.1	20.25	9.36	1.45	10.13	17.31
90.0	839	0.557	39.2	20.12	10.16	1.32	10.06	17.38
90.0	836	0.602	38.1	19.87	10.97	1.17	9.93	17.40
90.0	836	0.646	37.8	19.69	11.79	1.13	9.84	17.36
90.0	840	0.691	37.5	19.60	12.60	1.08	9.80	17.36
90.0	842	0.735	37.0	19.46	13.41	1.00	9.73	17.37
90.0	843	0.780	36.6	19.30	14.23	0.96	9.65	17.34
90.0	845	0.824	36.5	19.17	15.04	0.93	9.58	17.29
90.0	846	0.869	36.3	19.00	15.85	0.90	9.50	17.24
90.0	847	0.914	36.0	18.84	16.67	0.86	9.42	17.20
90.0	850	0.958	35.8	18.73	17.47	0.84	9.36	17.17
90.0	848	1.003	35.7	18.50	18.29	0.82	9.25	17.07
90.0	849	1.047	35.4	18.34	19.10	0.78	9.17	17.03
90.0	855	1.092	35.2	18.28	19.92	0.75	9.14	17.03

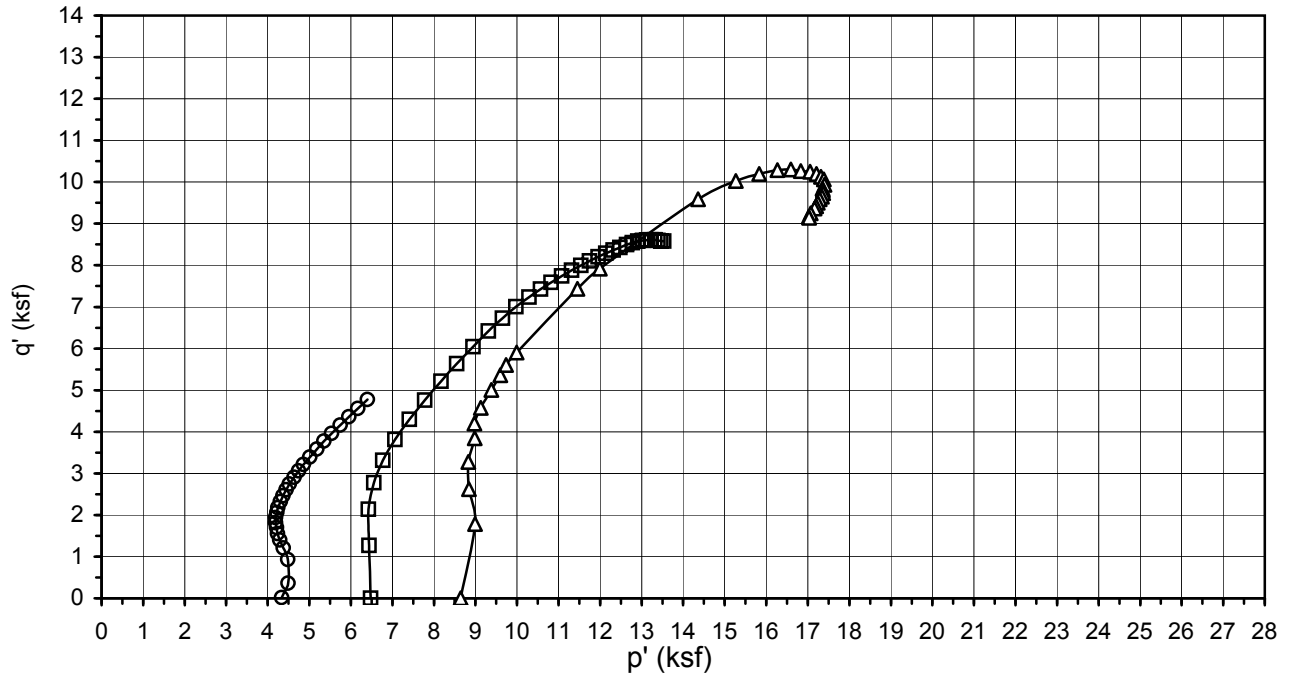


LEGEND: CONFINING PRESSURES= ○ 30 psi □ 45 psi △ 60 psi

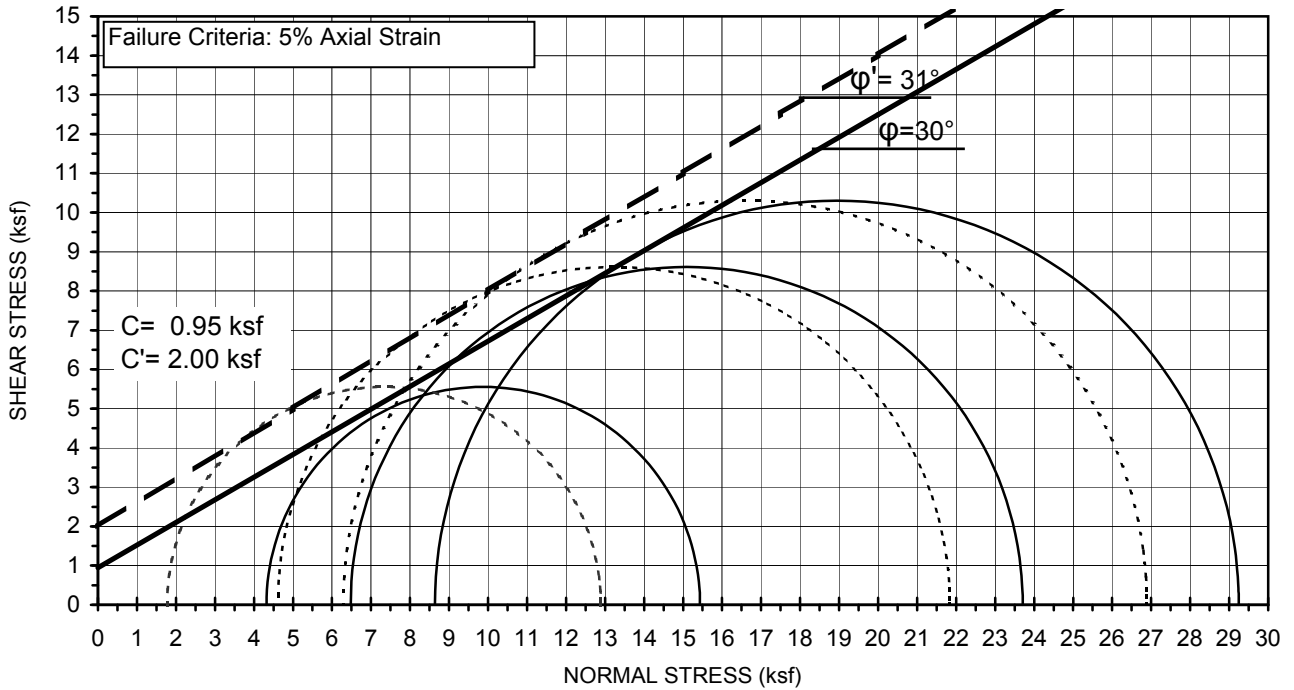


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Olive Silt
Test Pit:	G-112	Avg. Dry Unit Weight (pcf):	91.5
Sample No.:	-	Avg. Initial Moisture Content (%):	28.4
Depth (ft):	90.5	Confining Pressure:	30.0, 45.0, 60.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

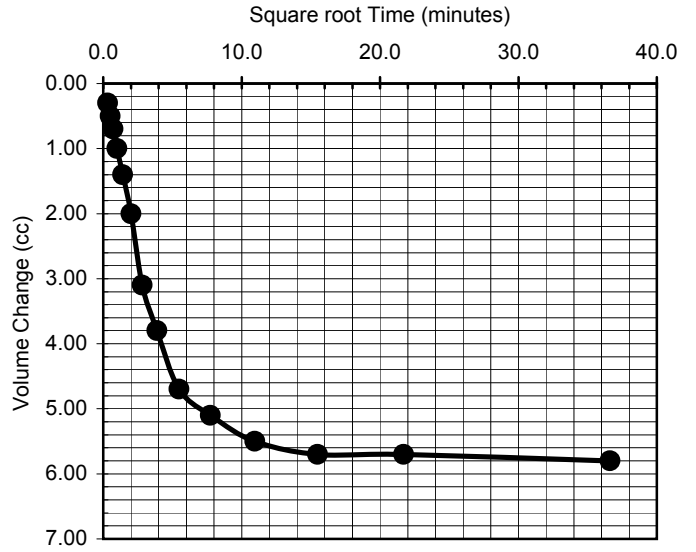
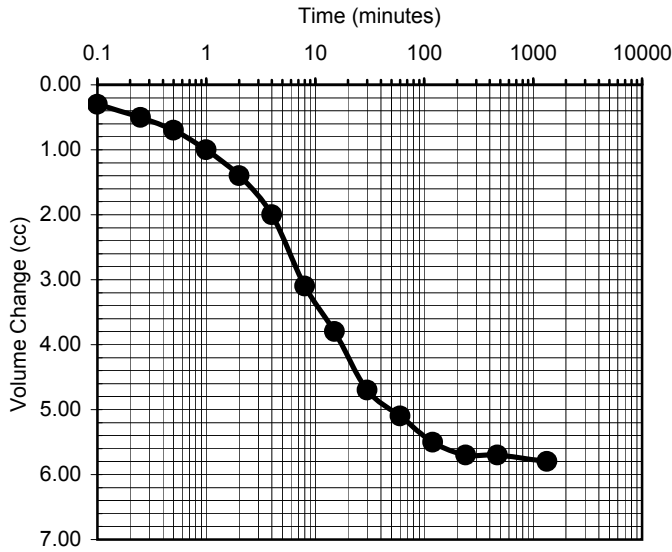


LEGEND: CONFINING PRESSURES= ○ 30 psi □ 45 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Olive Silt
Test Pit:	G-112	Avg. Dry Unit Weight (pcf):	91.5
Sample No.:	-	Avg. Initial Moisture Content (%):	28.4
Depth (ft):	90.5	Confining Pressure:	30.0, 45.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-112	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Dark Olive Silt
Depth (feet):	90.5	Eff. Confining Pressure (psi):	45.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.3000
0.25	0.5000
0.5	0.7000
1	1.0000
2	1.4000
4	2.0000
8	3.1000
15	3.8000
30	4.7000
60	5.1000
120	5.5000
240	5.7000
471	5.7000
1342	5.8000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.3000
0.5000	0.5000
0.7071	0.7000
1.0000	1.0000
1.4142	1.4000
2.0000	2.0000
2.8284	3.1000
3.8730	3.8000
5.4772	4.7000
7.7460	5.1000
10.9545	5.5000
15.4919	5.7000
21.7025	5.7000
36.6333	5.8000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 06/21/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-08-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-19-11
Test Pit:	G-113	Reviewed by:	AP	Date:	07-19-11
Sample No.:	7	Sample Description:	Gray Lean Clay		
Depth(ft):	30.5				
Sample Type:	Mod. Cal.	Confining Pressure =	10.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.960</u>	<u>5.960</u>	<u>5.960</u>	Avg. =	5.960

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.464
Moisture Content (%)	18.25	18.06
Wet Weight (gms)	1115.22	1263.10
Dry Weight (gms)	943.12	1092.80
Container Weight (gms)	0.00	149.68
Density and Saturation		
Wet Weight (gms)	1115.22	
Container Weight (gms)	0.00	
Wet Density (pcf)	132.7	
Dry Density (pcf)	112.2	
Initial Void Ratio	0.501	
% Saturation	98.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	65.4
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	60.0
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	5.798
Induced OCR =	1.0	Initial Volume (cu.in)=	32.010
Change in Ht. of Specimen (in) =	0.1620	Final Volume (cu.in) =	31.680

Shear		At Failure	
Rate of Deformation (in/min)=	0.007	Deviator Stress (ksf) =	3.50
Time to 50% primary Consolidation (min) =	3.5	Eff. Minor Principal stress (ksf) =	0.89
Failure Mode: Shear Failure		Eff. Major Principal stress (ksf) =	4.39
		Axial Strain (%) =	5.14



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-08-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-113** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **7** Sample Description: **Gray Lean Clay**
 Depth(ft): **30.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.960</u>	<u>5.960</u>	<u>5.960</u>	Avg. =	5.960

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.283
Moisture Content (%)	18.25	18.06
Wet Weight (gms)	1115.22	1263.10
Dry Weight (gms)	943.12	1092.80
Container Weight (gms)	0.00	149.68
Density and Saturation		
Wet Weight (gms)	1115.22	
Container Weight (gms)	0.00	
Wet Density (pcf)	132.7	
Dry Density (pcf)	112.2	
Initial Void Ratio	0.501	
% Saturation	98.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	60.0
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	50.5
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.949
Induced OCR=	1.0	Initial Volume (cu.in)=	32.010
Change in Ht. of Specimen (in) =	0.0106	Final Volume (cu.in) =	31.430

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.007	Deviator Stress (ksf) =	6.47
Time to 50% primary Consolidation =	3.5	Eff. Minor Principal stress (ksf) =	2.03
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.50
		Axial Strain (%) =	5.05



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-08-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-113** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **7** Sample Description: **Gray Lean Clay**
 Depth(ft): **30.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **30.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.960</u>	<u>5.960</u>	<u>5.960</u>	Avg. =	5.960

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.320
Moisture Content (%)	18.25	18.06
Wet Weight (gms)	1115.22	1263.10
Dry Weight (gms)	943.12	1092.80
Container Weight (gms)	0.00	149.68
Density and Saturation		
Wet Weight (gms)	1115.22	
Container Weight (gms)	0.00	
Wet Density (pcf)	132.7	
Dry Density (pcf)	112.2	
Initial Void Ratio	0.501	
% Saturation	98.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	53.9
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	48.9
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.960
Induced OCR =	1.0	Initial Volume (cu.in)=	32.010
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.704

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.007	Deviator Stress (ksf) =	8.94
Time to 50% primary Consolidation =	3.5	Eff. Minor Principal stress (ksf) =	3.10
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	12.04
		Axial Strain (%) =	4.55



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	10.0 psi
Depth(ft):	30.5	Initial Sample Height:	5.960 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.798 in
Sample Description:	Gray Lean Clay	Final Sample Area (A)*:	5.464 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	1	0.000	40.1	0.03	0.00	0.00	0.01	1.45
50.0	24	0.004	41.1	0.63	0.07	0.16	0.32	1.60
50.0	37	0.009	42.0	0.97	0.16	0.28	0.49	1.65
50.0	45	0.014	42.6	1.18	0.24	0.37	0.59	1.66
50.0	51	0.020	43.1	1.34	0.34	0.44	0.67	1.67
50.0	56	0.026	43.5	1.47	0.44	0.50	0.73	1.68
50.0	60	0.032	43.8	1.57	0.55	0.55	0.79	1.68
50.0	64	0.037	44.1	1.68	0.65	0.58	0.84	1.69
50.0	67	0.044	44.3	1.75	0.75	0.61	0.88	1.70
50.0	73	0.055	44.6	1.91	0.95	0.66	0.95	1.73
50.0	79	0.067	44.9	2.06	1.16	0.69	1.03	1.78
50.0	83	0.079	45.0	2.16	1.36	0.71	1.08	1.81
50.0	88	0.091	45.1	2.28	1.56	0.72	1.14	1.86
50.0	92	0.103	45.1	2.38	1.77	0.73	1.19	1.90
50.0	95	0.115	45.1	2.45	1.98	0.73	1.23	1.93
50.0	99	0.127	45.1	2.55	2.20	0.73	1.28	1.98
50.0	102	0.140	45.1	2.62	2.41	0.73	1.31	2.03
50.0	106	0.151	45.0	2.72	2.61	0.72	1.36	2.08
50.0	108	0.164	45.0	2.77	2.82	0.71	1.38	2.11
50.0	111	0.176	44.9	2.84	3.04	0.70	1.42	2.16
50.0	114	0.188	44.8	2.91	3.25	0.69	1.45	2.21
50.0	117	0.200	44.7	2.98	3.44	0.68	1.49	2.25
50.0	120	0.211	44.7	3.05	3.64	0.67	1.52	2.30
50.0	123	0.223	44.6	3.12	3.85	0.66	1.56	2.34
50.0	126	0.235	44.5	3.19	4.05	0.64	1.59	2.39
50.0	128	0.248	44.4	3.23	4.27	0.63	1.61	2.43
50.0	131	0.261	44.3	3.30	4.50	0.61	1.65	2.48
50.0	134	0.273	44.1	3.37	4.71	0.59	1.68	2.53
50.0	137	0.286	44.0	3.43	4.93	0.57	1.72	2.59
50.0	140	0.298	43.9	3.50	5.14	0.55	1.75	2.64



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	20.0 psi
Depth(ft):	30.5	Initial Sample Height:	5.960 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.949 in
Sample Description:	Gray Lean Clay	Final Sample Area (A)*:	5.283 sq. in.
		Induced OCR=	1.0

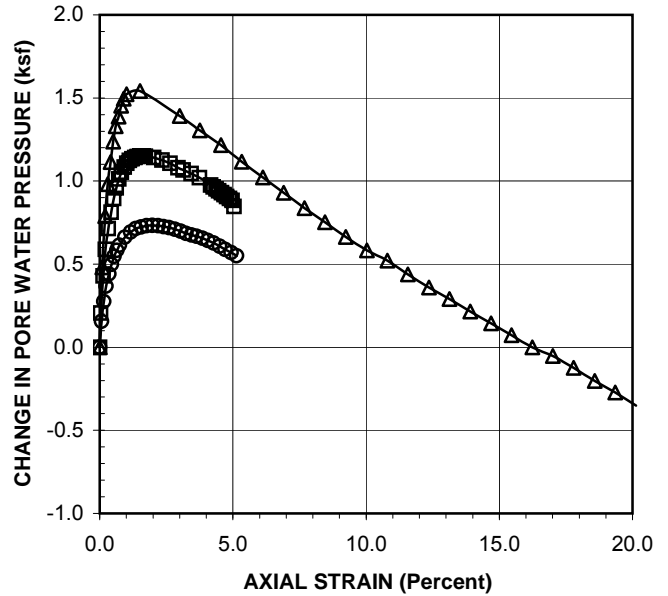
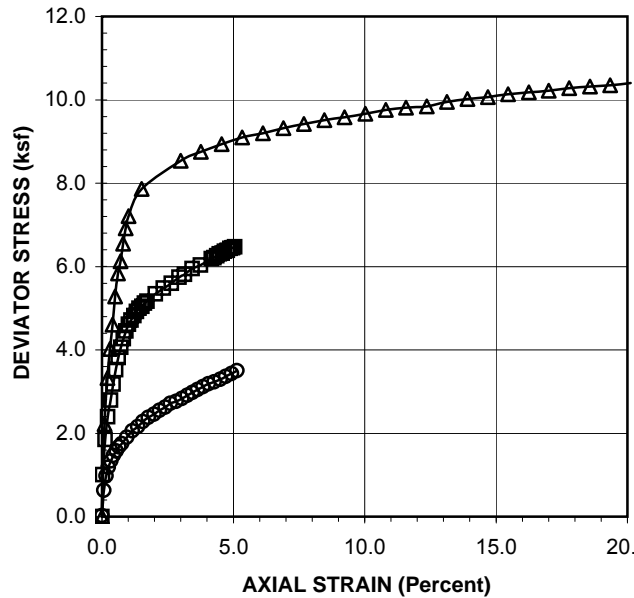
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	40.1	0.00	0.00	0.00	0.00	2.88
60.0	37	0.002	41.5	1.01	0.03	0.20	0.50	3.18
60.0	68	0.008	43.0	1.85	0.13	0.43	0.93	3.38
60.0	88	0.013	44.1	2.39	0.22	0.59	1.20	3.49
60.0	103	0.020	45.0	2.80	0.33	0.71	1.40	3.57
60.0	117	0.026	45.7	3.18	0.43	0.81	1.59	3.66
60.0	130	0.032	46.3	3.52	0.53	0.89	1.76	3.75
60.0	141	0.037	46.7	3.82	0.62	0.96	1.91	3.83
60.0	150	0.043	47.1	4.06	0.72	1.01	2.03	3.90
60.0	158	0.048	47.4	4.27	0.81	1.05	2.14	3.96
60.0	165	0.055	47.6	4.46	0.92	1.08	2.23	4.02
60.0	171	0.060	47.7	4.61	1.02	1.11	2.31	4.08
60.0	175	0.066	47.9	4.72	1.11	1.12	2.36	4.12
60.0	179	0.072	47.9	4.82	1.22	1.13	2.41	4.16
60.0	183	0.078	48.0	4.92	1.32	1.14	2.46	4.20
60.0	186	0.084	48.0	5.00	1.41	1.15	2.50	4.23
60.0	188	0.090	48.0	5.05	1.52	1.15	2.52	4.25
60.0	191	0.097	48.0	5.12	1.62	1.15	2.56	4.29
60.0	193	0.103	48.0	5.17	1.72	1.15	2.59	4.32
60.0	200	0.121	48.0	5.34	2.03	1.14	2.67	4.41
60.0	206	0.139	47.9	5.48	2.34	1.13	2.74	4.50
60.0	211	0.157	47.7	5.60	2.65	1.11	2.80	4.57
60.0	217	0.175	47.6	5.74	2.94	1.08	2.87	4.67
60.0	220	0.187	47.5	5.81	3.14	1.07	2.90	4.72
60.0	226	0.205	47.3	5.95	3.44	1.04	2.97	4.81
60.0	230	0.223	47.1	6.03	3.75	1.02	3.02	4.88
60.0	237	0.248	46.8	6.19	4.17	0.98	3.10	5.00
60.0	238	0.254	46.8	6.21	4.27	0.96	3.11	5.02
60.0	240	0.260	46.7	6.26	4.37	0.95	3.13	5.05
60.0	242	0.266	46.6	6.30	4.47	0.94	3.15	5.09
60.0	243	0.272	46.5	6.32	4.58	0.93	3.16	5.11
60.0	245	0.278	46.4	6.37	4.67	0.92	3.18	5.14
60.0	246	0.284	46.3	6.39	4.77	0.91	3.19	5.17
60.0	248	0.290	46.3	6.43	4.87	0.89	3.22	5.20
60.0	249	0.296	46.2	6.45	4.97	0.88	3.22	5.22
60.0	250	0.300	45.9	6.47	5.05	0.85	3.24	5.27



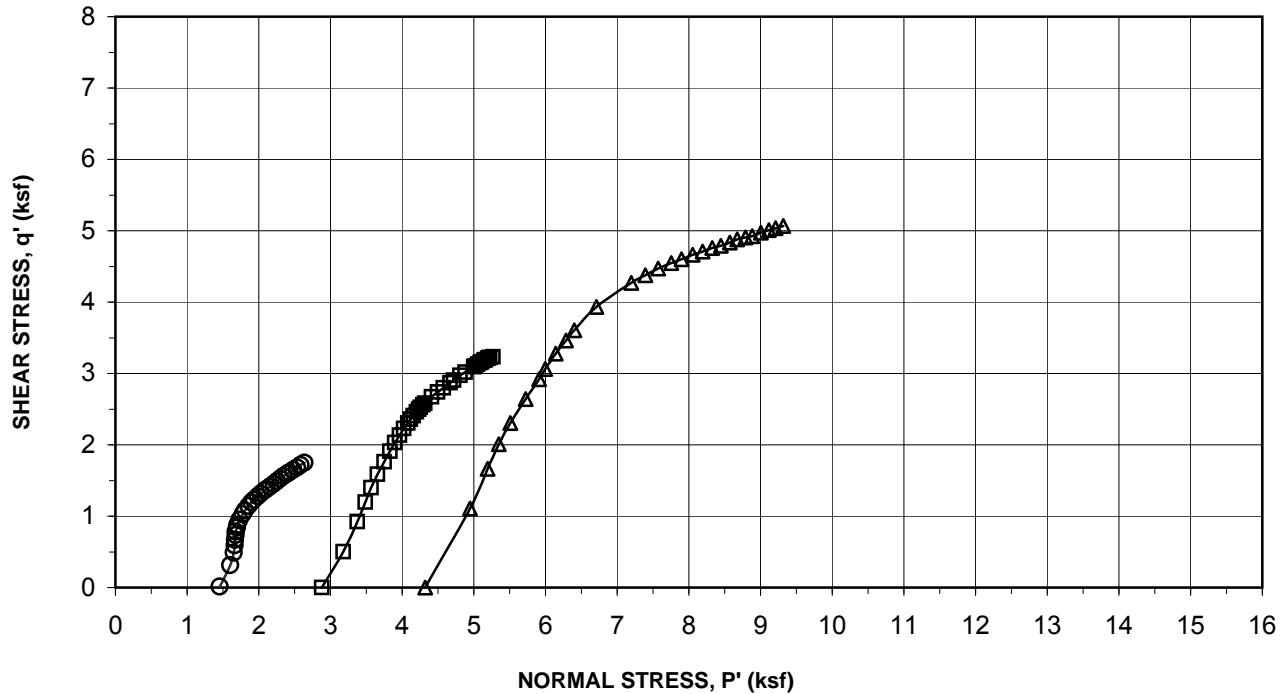
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	30.0 psi
Depth(ft):	30.5	Initial Sample Height:	5.960 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.*(L):	5.960 in
Sample Description:	Gray Lean Clay	Final Sample Area (A)*:	5.320 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	40.1	0.00	0.00	0.00	0.00	4.32
70.0	82	0.006	43.4	2.22	0.10	0.48	1.11	4.95
70.0	123	0.012	45.5	3.32	0.20	0.79	1.66	5.19
70.0	149	0.018	46.9	4.02	0.30	0.98	2.01	5.35
70.0	171	0.024	47.8	4.61	0.40	1.11	2.31	5.51
70.0	196	0.030	48.6	5.28	0.50	1.24	2.64	5.72
70.0	217	0.036	49.3	5.84	0.60	1.33	2.92	5.91
70.0	228	0.042	49.7	6.13	0.70	1.39	3.06	6.00
70.0	244	0.048	50.1	6.55	0.81	1.45	3.28	6.14
70.0	258	0.054	50.4	6.92	0.91	1.50	3.46	6.28
70.0	269	0.060	50.6	7.21	1.01	1.52	3.60	6.40
70.0	295	0.090	50.8	7.87	1.51	1.54	3.93	6.71
70.0	325	0.179	49.7	8.53	3.00	1.39	4.27	7.20
70.0	336	0.224	49.1	8.75	3.76	1.30	4.38	7.39
70.0	346	0.271	48.5	8.94	4.55	1.22	4.47	7.57
70.0	355	0.318	47.8	9.10	5.34	1.12	4.55	7.75
70.0	362	0.365	47.1	9.20	6.13	1.02	4.60	7.90
70.0	370	0.412	46.5	9.32	6.90	0.93	4.66	8.05
70.0	377	0.458	45.9	9.42	7.68	0.84	4.71	8.19
70.0	384	0.504	45.3	9.52	8.46	0.75	4.76	8.33
70.0	390	0.551	44.7	9.58	9.24	0.66	4.79	8.45
70.0	397	0.598	44.1	9.67	10.03	0.58	4.83	8.57
70.0	404	0.644	43.7	9.75	10.80	0.52	4.88	8.68
70.0	410	0.689	43.1	9.81	11.57	0.44	4.91	8.79
70.0	415	0.737	42.5	9.85	12.36	0.36	4.92	8.88
70.0	423	0.783	42.1	9.95	13.13	0.29	4.97	9.00
70.0	430	0.829	41.5	10.02	13.91	0.21	5.01	9.12
70.0	436	0.875	41.1	10.07	14.69	0.14	5.03	9.21
70.0	443	0.921	40.6	10.14	15.46	0.07	5.07	9.32
70.0	449	0.968	40.1	10.18	16.24	0.00	5.09	9.41
70.0	455	1.014	39.7	10.22	17.01	-0.05	5.11	9.48
70.0	462	1.060	39.2	10.28	17.79	-0.12	5.14	9.58
70.0	468	1.107	38.6	10.32	18.58	-0.20	5.16	9.68
70.0	474	1.153	38.2	10.35	19.35	-0.27	5.17	9.77
70.0	481	1.200	37.6	10.40	20.13	-0.35	5.20	9.87



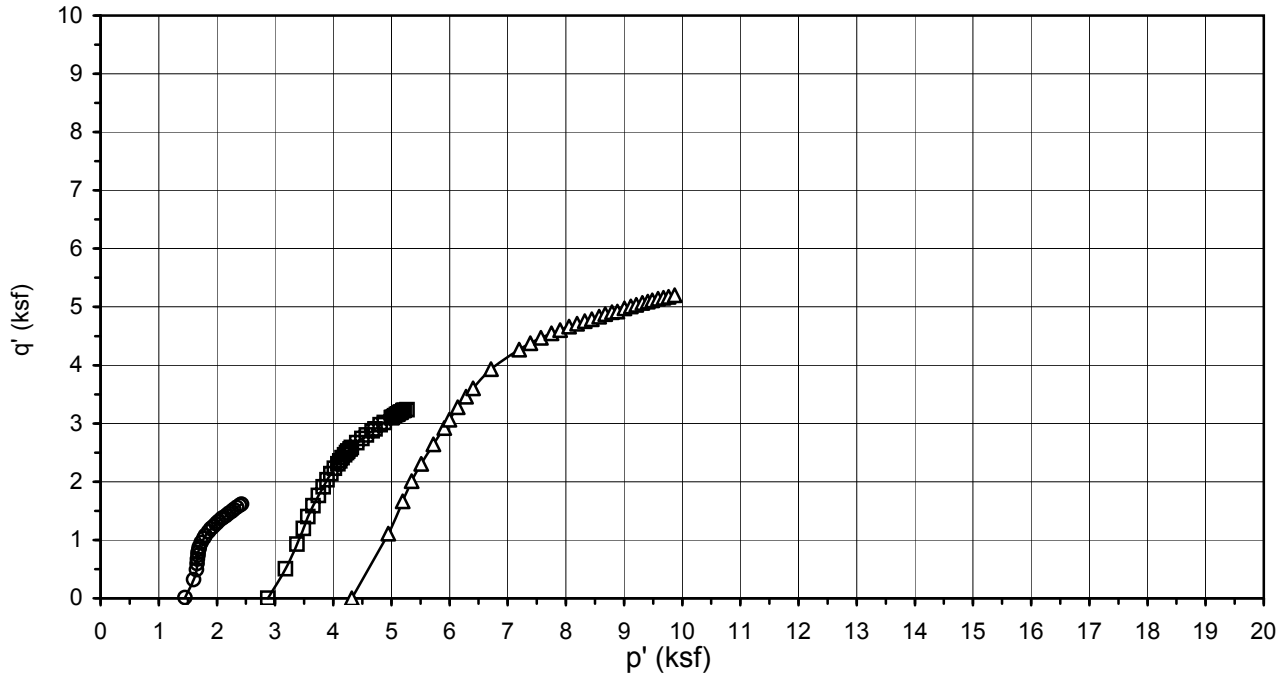
LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



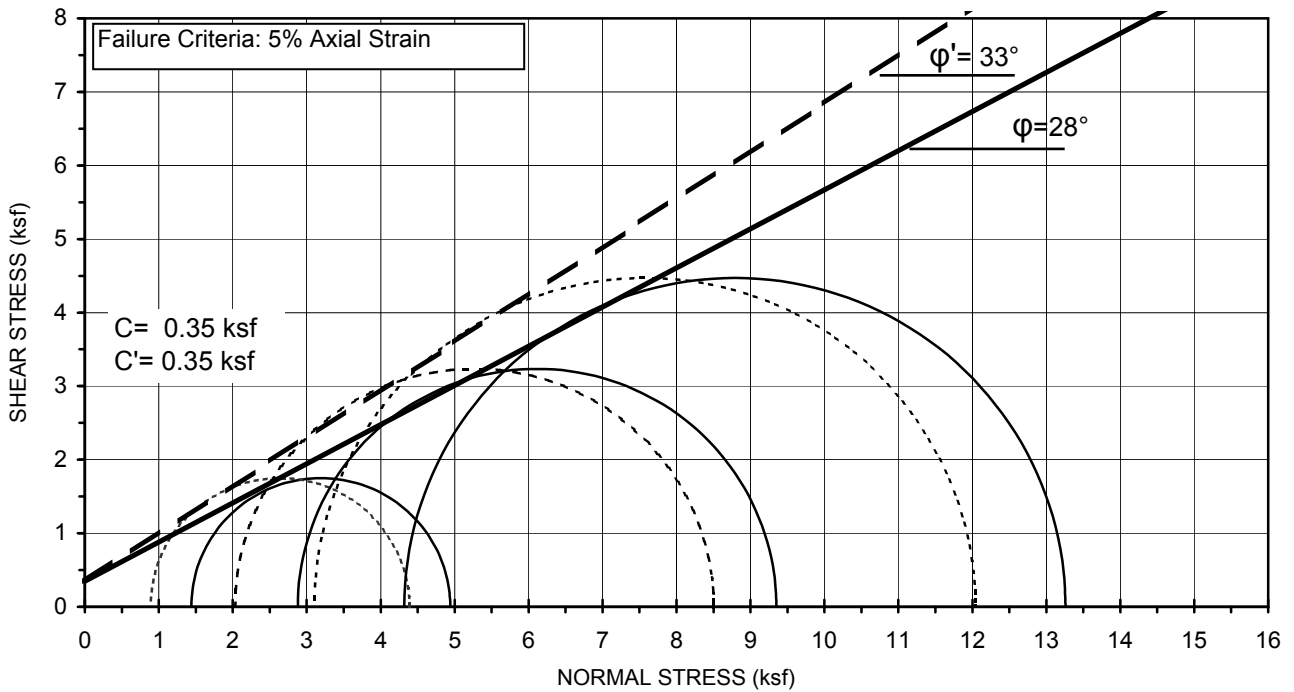
Project Name: Westside Subway Extension
Project No.: 4953-10-1561
Test Pit: G-113
Sample No.: 7
Depth (ft): 30.5

Sample Type: Mod. Cal.
Sample Description: Gray Lean Clay
Avg. Dry Unit Weight (pcf): 112.2
Avg. Initial Moisture Content (%): 18.2
Confining Pressure: 10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

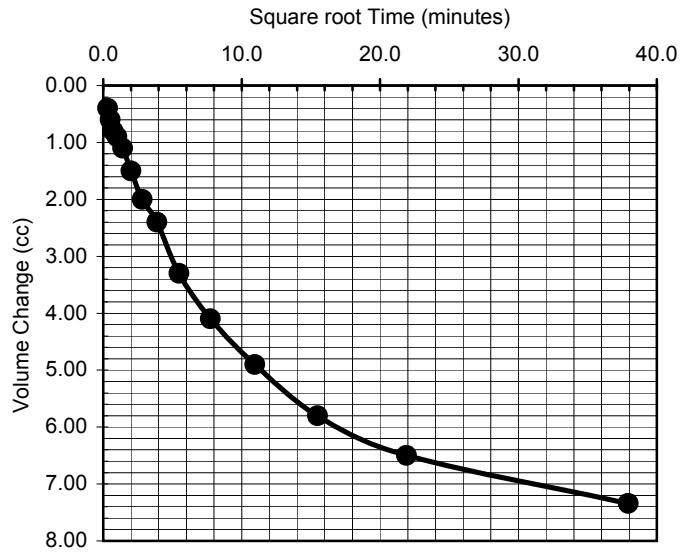
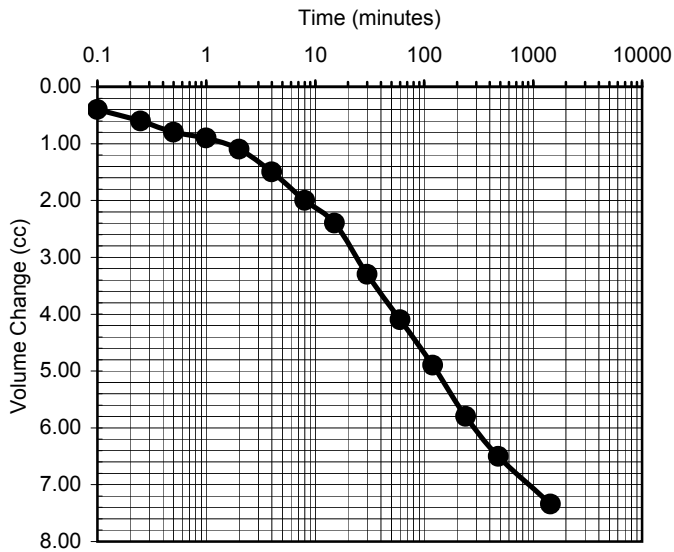


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gray Lean Clay
Test Pit:	G-113	Avg. Dry Unit Weight (pcf):	112.2
Sample No.:	7	Avg. Initial Moisture Content (%):	18.2
Depth (ft):	30.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-113	Sample Type:	Mod. Cal.
Sample No.:	7	Soil Description:	Gray Lean Clay
Depth (feet):	30.5	Eff. Confining Pressure (psi):	20.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.4000
0.25	0.6000
0.5	0.8000
1	0.9000
2	1.1000
4	1.5000
8	2.0000
15	2.4000
30	3.3000
60	4.1000
120	4.9000
240	5.8000
480	6.5000
1440	7.3400

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.4000
0.5000	0.6000
0.7071	0.8000
1.0000	0.9000
1.4142	1.1000
2.0000	1.5000
2.8284	2.0000
3.8730	2.4000
5.4772	3.3000
7.7460	4.1000
10.9545	4.9000
15.4919	5.8000
21.9089	6.5000
37.9473	7.3400

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	07/08/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-08-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-19-11
Test Pit:	G-113	Reviewed by:	AP	Date:	07-19-11
Sample No.:	13	Sample Description:	Gray Fat Clay		
Depth(ft):	50.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.619</u>	<u>2.619</u>	<u>2.619</u>	Avg. =	2.619
Height (in)	<u>5.036</u>	<u>5.036</u>	<u>5.036</u>	Avg. =	5.036

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.387	5.354
Moisture Content (%)	23.09	23.05
Wet Weight (gms)	911.74	1062.43
Dry Weight (gms)	740.69	891.70
Container Weight (gms)	0.00	151.01
Density and Saturation		
Wet Weight (gms)	911.74	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.0	
Dry Density (pcf)	104.0	
Initial Void Ratio	0.620	
% Saturation	100.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	72.7
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	66.6
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	4.998
Induced OCR =	1.0	Initial Volume (cu.in)=	27.130
Change in Ht. of Specimen (in) =	0.0385	Final Volume (cu.in) =	26.758

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	6.87
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.57
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.44
		Axial Strain (%) =	5.09



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-08-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-113** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **13** Sample Description: **Gray Fat Clay**
 Depth(ft): **50.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **30.0 psi**

Diameter (in)	<u>2.619</u>	<u>2.619</u>	<u>2.619</u>	Avg. =	2.619
Height (in)	<u>5.036</u>	<u>5.036</u>	<u>5.036</u>	Avg. =	5.036

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.387	5.325
Moisture Content (%)	23.09	23.05
Wet Weight (gms)	911.74	1062.43
Dry Weight (gms)	740.69	891.70
Container Weight (gms)	0.00	151.01
Density and Saturation		
Wet Weight (gms)	911.74	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.0	
Dry Density (pcf)	104.0	
Initial Void Ratio	0.620	
% Saturation	100.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	66.6
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	61.5
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.036
Induced OCR=	1.0	Initial Volume (cu.in)=	27.130
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.819

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.30
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.39
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.69
		Axial Strain (%) =	4.99



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-08-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-19-11
Test Pit:	G-113	Reviewed by:	AP	Date:	07-19-11
Sample No.:	13	Sample Description:	Gray Fat Clay		
Depth(ft):	50.5				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.619</u>	<u>2.619</u>	<u>2.619</u>	Avg. =	2.619
Height (in)	<u>5.036</u>	<u>5.036</u>	<u>5.036</u>	Avg. =	5.036

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.387	5.340
Moisture Content (%)	23.09	23.05
Wet Weight (gms)	911.74	1062.43
Dry Weight (gms)	740.69	891.70
Container Weight (gms)	0.00	151.01
Density and Saturation		
Wet Weight (gms)	911.74	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.0	
Dry Density (pcf)	104.0	
Initial Void Ratio	0.620	
% Saturation	100.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	85.0	Initial Burette Ht.(cm)=	61.6
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	57.7
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.036
Induced OCR =	1.0	Initial Volume (cu.in)=	27.130
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.892

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	16.30
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.16
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	21.46
		Axial Strain (%) =	5.29



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	15.0 psi
Depth(ft):	50.5	Initial Sample Height:	5.036 in
Sample No.:	13	Initial Area of Sample:	5.387 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.998 in
Sample Description:	Gray Fat Clay	Final Sample Area (A)*:	5.354 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	1	0.000	40.2	0.03	0.00	0.00	0.01	2.17
55.0	39	0.002	42.1	1.05	0.04	0.27	0.52	2.41
55.0	73	0.012	45.3	1.96	0.25	0.74	0.98	2.40
55.0	93	0.024	46.9	2.49	0.47	0.97	1.24	2.43
55.0	110	0.034	48.0	2.94	0.69	1.12	1.47	2.51
55.0	126	0.046	48.6	3.36	0.92	1.22	1.68	2.62
55.0	141	0.058	49.0	3.75	1.15	1.27	1.87	2.77
55.0	155	0.069	49.2	4.11	1.37	1.29	2.06	2.92
55.0	168	0.080	49.2	4.45	1.60	1.30	2.22	3.08
55.0	181	0.092	49.1	4.78	1.83	1.29	2.39	3.26
55.0	192	0.104	49.0	5.06	2.08	1.26	2.53	3.42
55.0	202	0.116	48.7	5.31	2.32	1.23	2.65	3.58
55.0	210	0.129	48.5	5.50	2.57	1.19	2.75	3.72
55.0	217	0.141	48.1	5.67	2.81	1.14	2.84	3.85
55.0	223	0.152	47.8	5.81	3.05	1.09	2.91	3.97
55.0	229	0.165	47.4	5.96	3.29	1.04	2.98	4.10
55.0	235	0.177	47.0	6.10	3.53	0.98	3.05	4.23
55.0	241	0.189	46.6	6.24	3.77	0.92	3.12	4.36
55.0	246	0.200	46.1	6.35	4.01	0.86	3.18	4.48
55.0	252	0.211	45.7	6.49	4.23	0.79	3.25	4.61
55.0	258	0.223	45.3	6.63	4.46	0.73	3.31	4.74
55.0	262	0.235	44.9	6.71	4.71	0.67	3.36	4.84
55.0	267	0.248	44.5	6.82	4.97	0.62	3.41	4.95
55.0	269	0.254	44.3	6.87	5.09	0.59	3.43	5.00



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No.:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	30.0 psi
Depth(ft):	50.5	Initial Sample Height:	5.036 in
Sample No.:	13	Initial Area of Sample:	5.387 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.036 in
Sample Description:	Gray Fat Clay	Final Sample Area (A)*:	5.325 sq. in.
		Induced OCR=	1.0

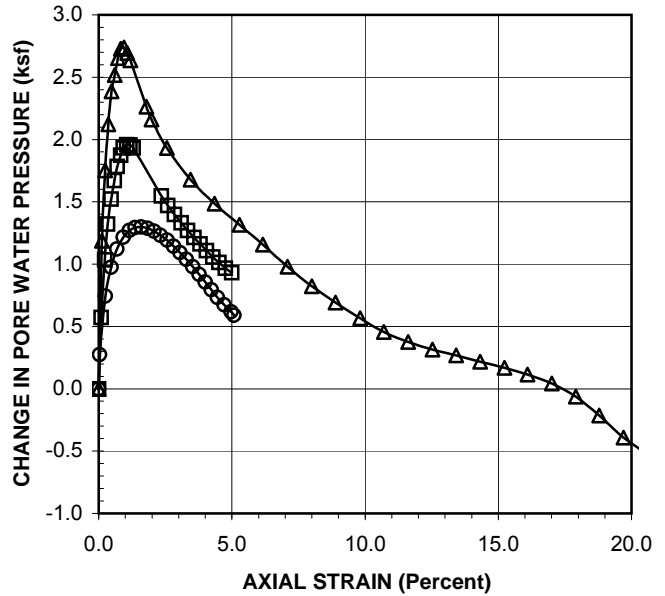
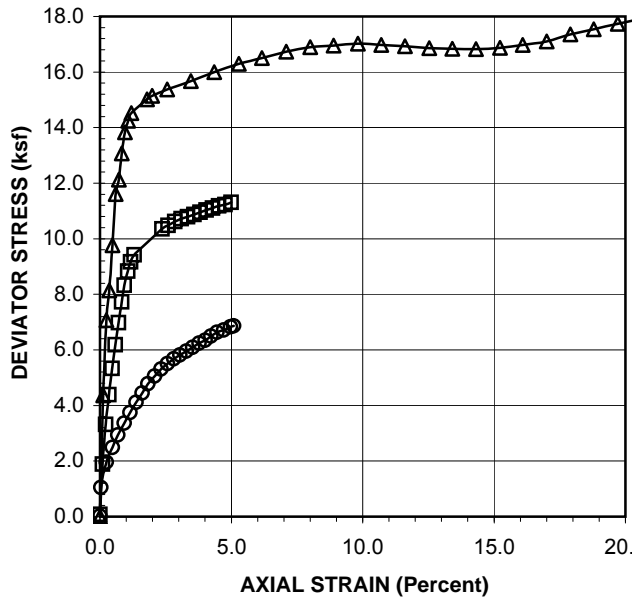
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	3	0.000	40.0	0.08	0.00	0.00	0.04	4.36
70.0	70	0.005	44.0	1.89	0.10	0.57	0.95	4.69
70.0	123	0.011	47.2	3.32	0.22	1.03	1.66	4.95
70.0	163	0.017	49.2	4.39	0.34	1.32	2.20	5.19
70.0	198	0.023	50.5	5.33	0.46	1.52	2.66	5.46
70.0	230	0.030	51.6	6.18	0.59	1.67	3.09	5.74
70.0	260	0.035	52.4	6.98	0.70	1.78	3.49	6.03
70.0	288	0.042	53.0	7.72	0.82	1.87	3.86	6.31
70.0	311	0.047	53.4	8.33	0.93	1.93	4.17	6.55
70.0	330	0.053	53.6	8.83	1.06	1.96	4.41	6.78
70.0	343	0.059	53.6	9.17	1.17	1.95	4.58	6.95
70.0	353	0.065	53.4	9.42	1.30	1.93	4.71	7.10
70.0	392	0.119	50.7	10.35	2.36	1.55	5.17	7.95
70.0	398	0.131	50.2	10.48	2.60	1.47	5.24	8.09
70.0	404	0.143	49.7	10.61	2.85	1.40	5.31	8.23
70.0	409	0.156	49.2	10.72	3.10	1.33	5.36	8.35
70.0	413	0.168	48.8	10.80	3.34	1.27	5.40	8.45
70.0	417	0.180	48.4	10.87	3.58	1.21	5.44	8.54
70.0	421	0.192	48.0	10.95	3.81	1.16	5.48	8.63
70.0	425	0.204	47.7	11.03	4.04	1.11	5.51	8.73
70.0	429	0.216	47.3	11.10	4.28	1.06	5.55	8.81
70.0	433	0.227	47.0	11.18	4.52	1.01	5.59	8.90
70.0	436	0.240	46.7	11.23	4.76	0.97	5.61	8.97
70.0	440	0.252	46.4	11.30	4.99	0.93	5.65	9.04



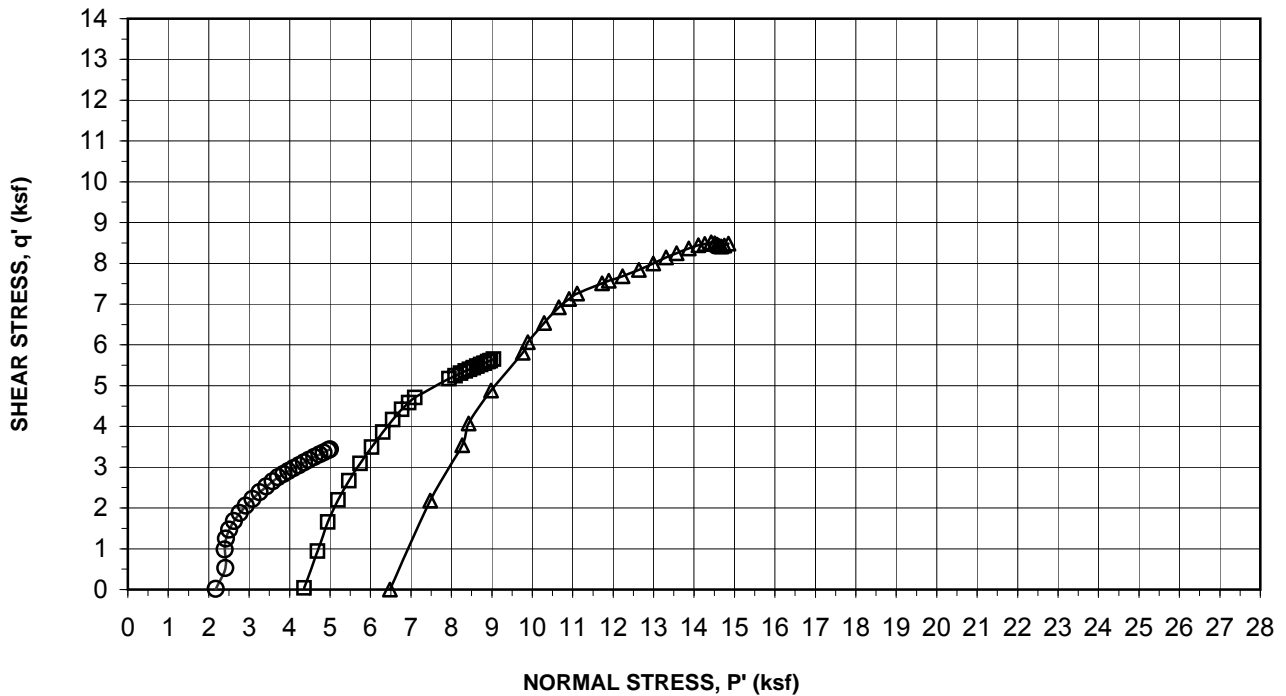
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	85.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	45.0 psi
Depth(ft):	50.5	Initial Sample Height:	5.036 in
Sample No.:	13	Initial Area of Sample:	5.387 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.036 in
Sample Description:	Gray Fat Clay	Final Sample Area (A)*:	5.340 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
85.0	0	0.000	40.0	0.00	0.00	0.00	0.00	6.48
85.0	162	0.006	48.2	4.36	0.12	1.19	2.18	7.48
85.0	263	0.012	52.2	7.08	0.24	1.75	3.54	8.27
85.0	303	0.018	54.7	8.14	0.36	2.12	4.07	8.43
85.0	364	0.024	56.6	9.77	0.48	2.39	4.88	8.98
85.0	433	0.030	57.5	11.61	0.60	2.52	5.80	9.76
85.0	453	0.036	58.4	12.13	0.71	2.65	6.06	9.89
85.0	489	0.042	58.9	13.08	0.83	2.73	6.54	10.29
85.0	518	0.048	59.0	13.84	0.95	2.74	6.92	10.66
85.0	534	0.054	58.7	14.25	1.07	2.70	7.12	10.91
85.0	545	0.060	58.3	14.52	1.19	2.64	7.26	11.11
85.0	567	0.090	55.7	15.02	1.79	2.26	7.51	11.72
85.0	573	0.100	55.0	15.15	1.99	2.16	7.57	11.89
85.0	585	0.129	53.4	15.37	2.56	1.93	7.69	12.23
85.0	602	0.174	51.7	15.67	3.45	1.68	7.84	12.64
85.0	620	0.219	50.3	15.99	4.35	1.48	8.00	12.99
85.0	638	0.266	49.1	16.30	5.29	1.32	8.15	13.31
85.0	652	0.311	48.0	16.50	6.17	1.16	8.25	13.57
85.0	668	0.357	46.8	16.74	7.09	0.98	8.37	13.87
85.0	681	0.403	45.7	16.89	8.00	0.82	8.45	14.10
85.0	690	0.448	44.8	16.95	8.89	0.69	8.48	14.26
85.0	700	0.494	43.9	17.02	9.82	0.57	8.51	14.42
85.0	705	0.539	43.2	16.98	10.70	0.46	8.49	14.51
85.0	710	0.585	42.6	16.92	11.61	0.38	8.46	14.57
85.0	715	0.631	42.2	16.87	12.53	0.32	8.43	14.60
85.0	721	0.676	41.9	16.83	13.42	0.27	8.42	14.63
85.0	728	0.721	41.5	16.82	14.31	0.22	8.41	14.67
85.0	738	0.767	41.2	16.87	15.23	0.17	8.44	14.75
85.0	750	0.811	40.8	16.97	16.10	0.12	8.48	14.85
85.0	764	0.857	40.3	17.10	17.01	0.04	8.55	14.99
85.0	784	0.902	39.6	17.36	17.91	-0.06	8.68	15.22
85.0	801	0.946	38.5	17.54	18.79	-0.21	8.77	15.47
85.0	819	0.992	37.3	17.73	19.70	-0.39	8.87	15.74
85.0	837	1.037	36.4	17.92	20.60	-0.52	8.96	15.96



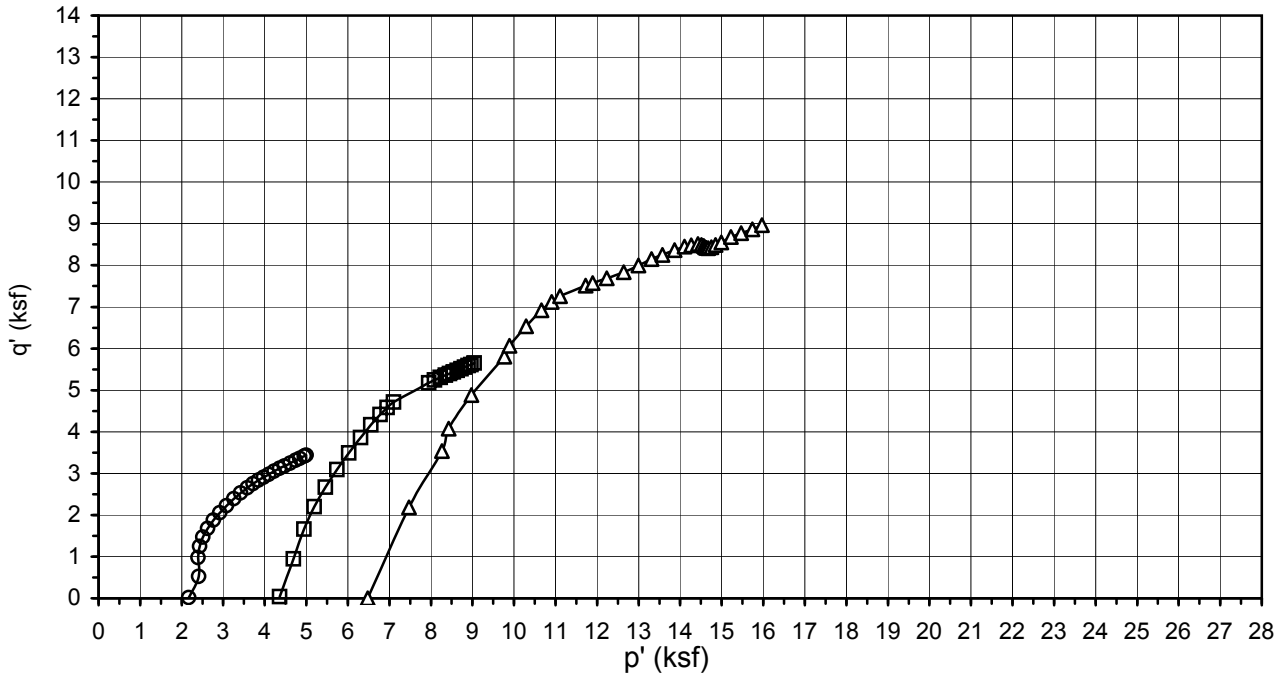
LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



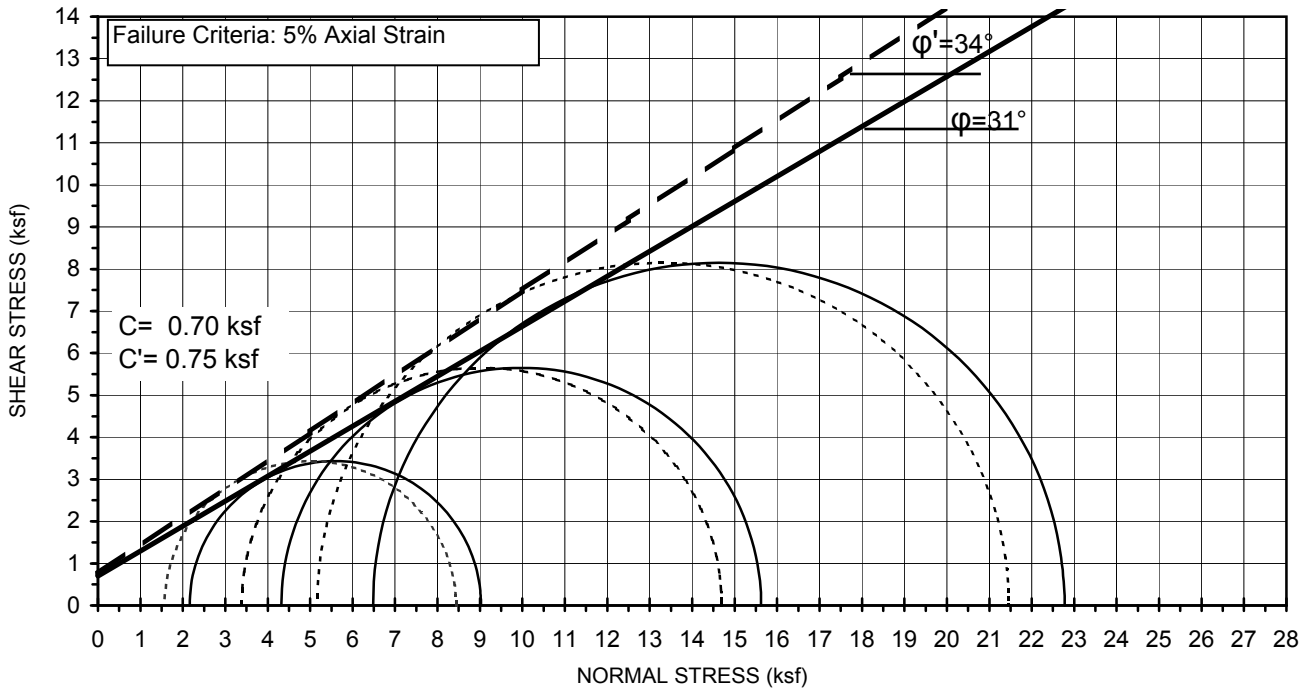
Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-113
 Sample No.: 13
 Depth (ft): 50.5

Sample Type: Mod. Cal.
 Sample Description: Gray Fat Clay
 Avg. Dry Unit Weight (pcf): 104.0
 Avg. Initial Moisture Content (%): 23.1
 Confining Pressure: 15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**



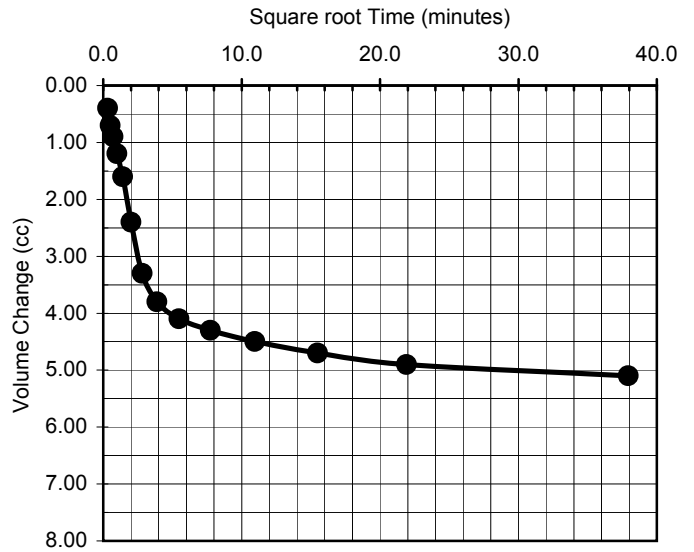
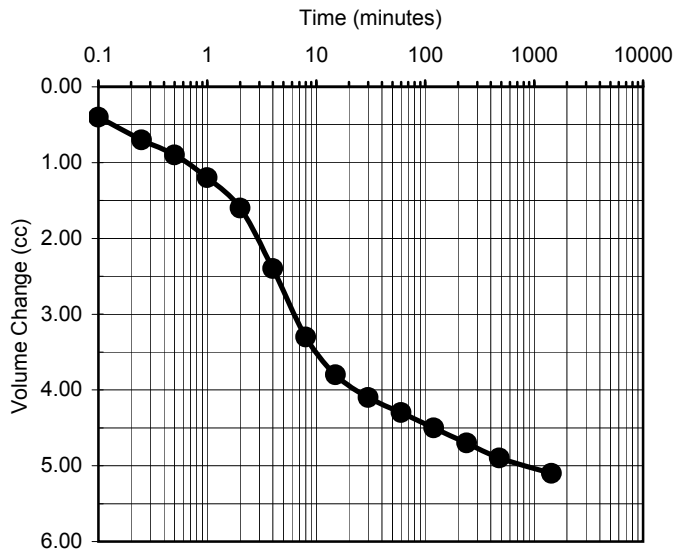
LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-113
 Sample No.: 13
 Depth (ft): 50.5

Sample Type: Mod. Cal.
 Sample Description: Gray Fat Clay
 Avg. Dry Unit Weight (pcf): 104.0
 Avg. Initial Moisture Content (%): 23.1
 Confining Pressure: 15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-113	Sample Type:	Mod. Cal.
Sample No.:	13	Soil Description:	Gray Fat Clay
Depth (feet):	50.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.4000
0.25	0.7000
0.5	0.9000
1	1.2000
2	1.6000
4	2.4000
8	3.3000
15	3.8000
30	4.1000
60	4.3000
120	4.5000
240	4.7000
480	4.9000
1440	5.1000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.4000
0.5000	0.7000
0.7071	0.9000
1.0000	1.2000
1.4142	1.6000
2.0000	2.4000
2.8284	3.3000
3.8730	3.8000
5.4772	4.1000
7.7460	4.3000
10.9545	4.5000
15.4919	4.7000
21.9089	4.9000
37.9473	5.1000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/08/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-13-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-113** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **20** Sample Description: **Gray Silty Sand**
 Depth(ft): **80.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.828</u>	<u>4.828</u>	<u>4.828</u>	Avg. =	4.828

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.349
Moisture Content (%)	17.70	17.97
Wet Weight (gms)	65.09	1059.19
Dry Weight (gms)	62.80	920.58
Container Weight (gms)	49.86	149.44
Density and Saturation		
Wet Weight (gms)	899.33	
Container Weight (gms)	0.00	
Wet Density (pcf)	132.1	
Dry Density (pcf)	112.3	
Initial Void Ratio	0.501	
% Saturation	95.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	63.6
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	60.2
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	4.809
Induced OCR =	1.0	Initial Volume (cu.in)=	25.930
Change in Ht. of Specimen (in) =	0.0195	Final Volume (cu.in) =	25.722

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	15.97
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	4.03
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	20.00
		Axial Strain (%) =	5.06



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-13-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-19-11
Test Pit:	G-113	Reviewed by:	AP	Date:	07-19-11
Sample No.:	20	Sample Description:	Gray Silty Sand		
Depth(ft):	80.5				
Sample Type:	Mod. Cal.	Confining Pressure =	40.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.828</u>	<u>4.828</u>	<u>4.828</u>	Avg. =	4.828

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.308
Moisture Content (%)	17.70	17.97
Wet Weight (gms)	65.09	1059.19
Dry Weight (gms)	62.80	920.58
Container Weight (gms)	49.86	149.44
Density and Saturation		
Wet Weight (gms)	899.33	
Container Weight (gms)	0.00	
Wet Density (pcf)	132.1	
Dry Density (pcf)	112.3	
Initial Void Ratio	0.501	
% Saturation	95.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	66.6
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	61.6
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	4.828
Induced OCR=	1.0	Initial Volume (cu.in)=	25.930
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	25.625

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	34.28
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	9.32
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	43.60
		Axial Strain (%) =	5.06



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-13-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-113** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **20** Sample Description: **Gray Silty Sand**
 Depth(ft): **80.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **60.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.828</u>	<u>4.828</u>	<u>4.828</u>	Avg. =	4.828

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.343
Moisture Content (%)	17.70	17.97
Wet Weight (gms)	65.09	1059.19
Dry Weight (gms)	62.80	920.58
Container Weight (gms)	49.86	149.44
Density and Saturation		
Wet Weight (gms)	899.33	
Container Weight (gms)	0.00	
Wet Density (pcf)	132.1	
Dry Density (pcf)	112.3	
Initial Void Ratio	0.501	
% Saturation	95.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	100.0	Initial Burette Ht.(cm)=	56.7
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	54.7
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	4.830
Induced OCR =	1.0	Initial Volume (cu.in)=	25.930
Change in Ht. of Specimen (in) =	-0.0022	Final Volume (cu.in) =	25.808

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	46.00
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	12.74
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	58.74
		Axial Strain (%) =	5.18



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	20.0 psi
Depth(ft):	80.5	Initial Sample Height:	4.828 in
Sample No.:	20	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.809 in
Sample Description:	Gray Silty Sand	Final Sample Area (A)*:	5.349 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1+S3)/2 (ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	51	0.006	41.4	1.37	0.12	0.20	0.69	3.37
60.0	86	0.013	43.5	2.31	0.26	0.50	1.15	3.53
60.0	126	0.024	46.5	3.38	0.49	0.94	1.69	3.63
60.0	154	0.035	48.1	4.12	0.72	1.16	2.06	3.78
60.0	177	0.046	48.6	4.72	0.96	1.23	2.36	4.01
60.0	201	0.058	48.4	5.35	1.20	1.22	2.67	4.34
60.0	225	0.069	48.0	5.97	1.43	1.15	2.99	4.71
60.0	250	0.081	47.4	6.62	1.67	1.06	3.31	5.13
60.0	277	0.092	46.6	7.31	1.92	0.95	3.66	5.59
60.0	304	0.105	45.7	8.01	2.17	0.82	4.00	6.07
60.0	331	0.116	44.7	8.70	2.41	0.68	4.35	6.55
60.0	359	0.128	43.8	9.41	2.66	0.54	4.70	7.04
60.0	387	0.139	42.7	10.12	2.89	0.39	5.06	7.55
60.0	413	0.151	41.6	10.77	3.15	0.23	5.38	8.03
60.0	442	0.162	40.4	11.50	3.38	0.06	5.75	8.57
60.0	467	0.174	39.3	12.12	3.61	-0.10	6.06	9.04
60.0	494	0.185	38.1	12.79	3.84	-0.28	6.39	9.55
60.0	521	0.195	36.9	13.46	4.06	-0.45	6.73	10.06
60.0	547	0.208	35.6	14.09	4.32	-0.63	7.04	10.55
60.0	573	0.219	34.5	14.72	4.55	-0.80	7.36	11.04
60.0	599	0.231	33.3	15.35	4.81	-0.97	7.67	11.53
60.0	625	0.243	32.0	15.97	5.06	-1.15	7.99	12.01



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	40.0 psi
Depth(ft):	80.5	Initial Sample Height:	4.828 in
Sample No.:	20	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.828 in
Sample Description:	Gray Silty Sand	Final Sample Area (A)*:	5.308 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	40.0	0.00	0.00	0.00	0.00	5.76
80.0	157	0.006	42.9	4.25	0.12	0.42	2.13	7.47
80.0	259	0.012	44.2	7.01	0.24	0.60	3.51	8.66
80.0	352	0.018	44.0	9.52	0.37	0.58	4.76	9.94
80.0	444	0.024	42.9	11.99	0.49	0.42	5.99	11.33
80.0	536	0.030	41.4	14.45	0.62	0.21	7.23	12.78
80.0	625	0.036	39.9	16.83	0.75	-0.01	8.42	14.19
80.0	706	0.043	38.4	18.99	0.88	-0.22	9.49	15.48
80.0	776	0.049	37.1	20.84	1.02	-0.41	10.42	16.59
80.0	834	0.056	35.9	22.36	1.17	-0.58	11.18	17.52
80.0	881	0.063	34.8	23.59	1.30	-0.74	11.80	18.29
80.0	916	0.070	33.8	24.49	1.45	-0.89	12.25	18.90
80.0	950	0.078	32.8	25.36	1.61	-1.03	12.68	19.47
80.0	981	0.084	31.8	26.15	1.74	-1.18	13.08	20.01
80.0	1006	0.091	30.8	26.78	1.88	-1.32	13.39	20.47
80.0	1030	0.097	29.9	27.38	2.01	-1.46	13.69	20.91
80.0	1052	0.104	29.0	27.93	2.14	-1.58	13.97	21.31
80.0	1072	0.110	28.1	28.42	2.28	-1.71	14.21	21.68
80.0	1091	0.117	27.3	28.88	2.42	-1.82	14.44	22.02
80.0	1109	0.123	26.5	29.32	2.54	-1.95	14.66	22.37
80.0	1129	0.129	25.6	29.81	2.68	-2.07	14.91	22.73
80.0	1147	0.135	24.8	30.25	2.80	-2.19	15.12	23.07
80.0	1159	0.142	24.1	30.52	2.94	-2.29	15.26	23.31
80.0	1173	0.149	23.4	30.84	3.09	-2.39	15.42	23.57
80.0	1189	0.155	22.6	31.22	3.22	-2.50	15.61	23.87
80.0	1203	0.162	21.8	31.54	3.35	-2.61	15.77	24.14
80.0	1215	0.169	21.2	31.81	3.50	-2.71	15.90	24.37
80.0	1224	0.176	20.5	32.00	3.65	-2.80	16.00	24.56
80.0	1239	0.184	20.0	32.34	3.80	-2.88	16.17	24.81
80.0	1248	0.191	19.4	32.52	3.95	-2.97	16.26	24.99
80.0	1260	0.198	18.8	32.78	4.11	-3.05	16.39	25.20
80.0	1271	0.205	18.3	33.02	4.24	-3.13	16.51	25.40
80.0	1299	0.225	16.7	33.60	4.65	-3.35	16.80	25.91
80.0	1309	0.232	16.3	33.81	4.80	-3.42	16.91	26.08
80.0	1331	0.244	15.3	34.28	5.06	-3.56	17.14	26.46
80.0	1304	0.251	15.0	33.54	5.19	-3.59	16.77	26.12

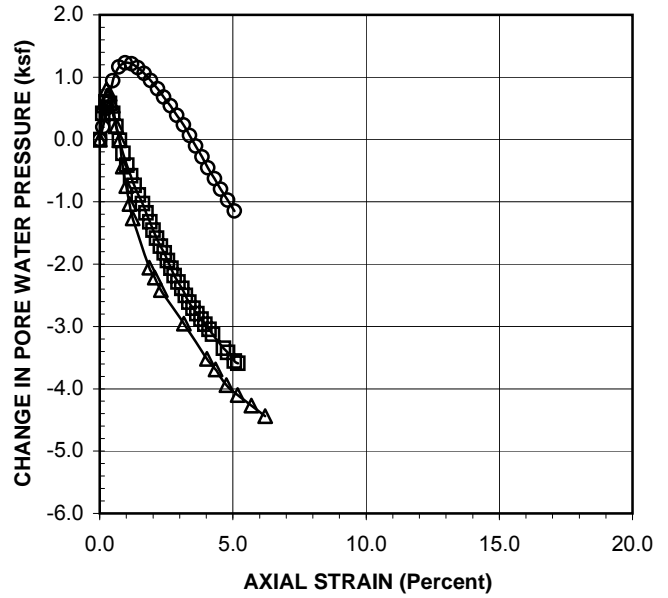
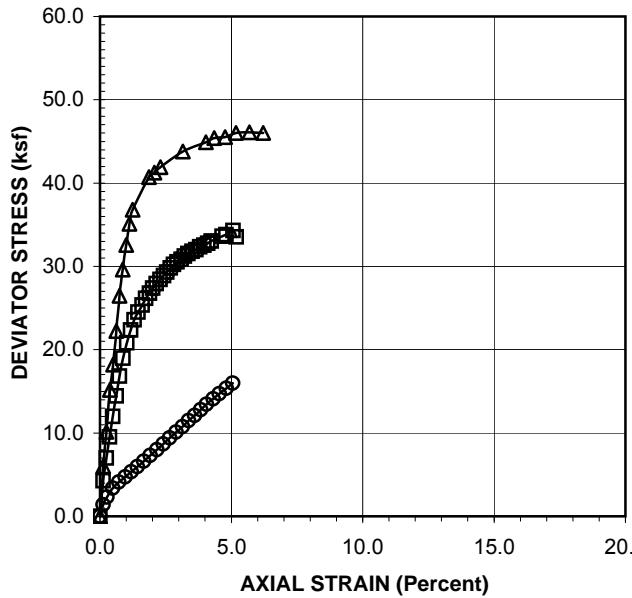


CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

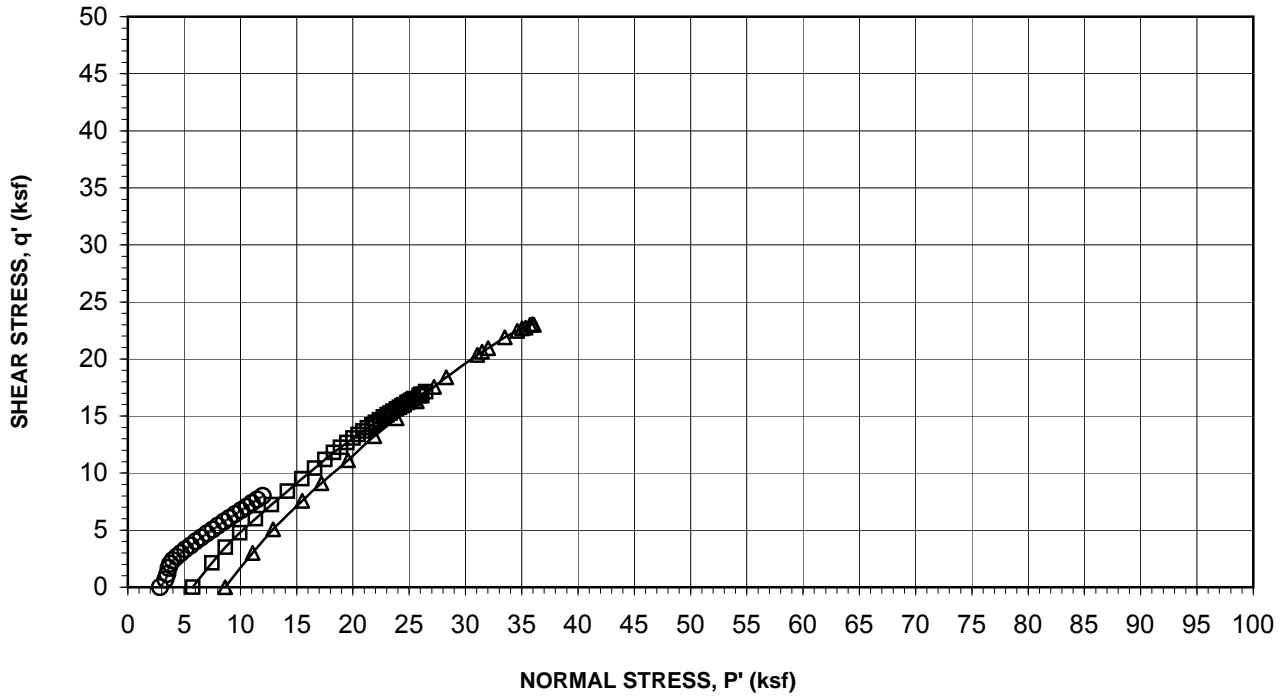
Project Name:	Westside Subway Extension	Cell Pressure:	100.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-113	Consolidation Pressure :	60.0 psi
Depth(ft):	80.5	Initial Sample Height:	4.828 in
Sample No.:	20	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.830 in
Sample Description:	Gray Silty Sand	Final Sample Area (A)*:	5.343 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
100.0	0	0.000	40.0	0.00	0.00	0.00	0.00	8.64
100.0	223	0.006	43.8	6.00	0.12	0.54	3.00	11.10
100.0	377	0.012	45.6	10.14	0.25	0.80	5.07	12.90
100.0	565	0.018	45.1	15.17	0.37	0.73	7.59	15.49
100.0	679	0.024	43.8	18.21	0.50	0.54	9.10	17.20
100.0	831	0.030	41.5	22.26	0.62	0.22	11.13	19.55
100.0	989	0.036	39.9	26.46	0.75	-0.01	13.23	21.88
100.0	1108	0.042	37.0	29.60	0.87	-0.43	14.80	23.87
100.0	1221	0.048	34.8	32.58	0.99	-0.75	16.29	25.68
100.0	1317	0.054	32.8	35.10	1.12	-1.04	17.55	27.22
100.0	1382	0.060	31.2	36.78	1.24	-1.27	18.39	28.30
100.0	1540	0.090	25.7	40.73	1.86	-2.06	20.37	31.06
100.0	1563	0.100	24.6	41.25	2.07	-2.22	20.63	31.48
100.0	1591	0.111	23.2	41.90	2.30	-2.41	20.95	32.00
100.0	1678	0.153	19.5	43.80	3.16	-2.95	21.90	33.49
100.0	1736	0.195	15.6	44.90	4.03	-3.52	22.45	34.61
100.0	1761	0.210	14.4	45.40	4.35	-3.69	22.70	35.03
100.0	1773	0.230	12.6	45.50	4.76	-3.94	22.75	35.33
100.0	1800	0.250	11.5	46.00	5.18	-4.10	23.00	35.74
100.0	1814	0.275	10.3	46.10	5.69	-4.27	23.05	35.96
100.0	1820	0.300	9.2	46.00	6.21	-4.44	23.00	36.08

Note: The membrane ruptured due to negative pore pressure change and high effective confining stress pushing it on sand grains.

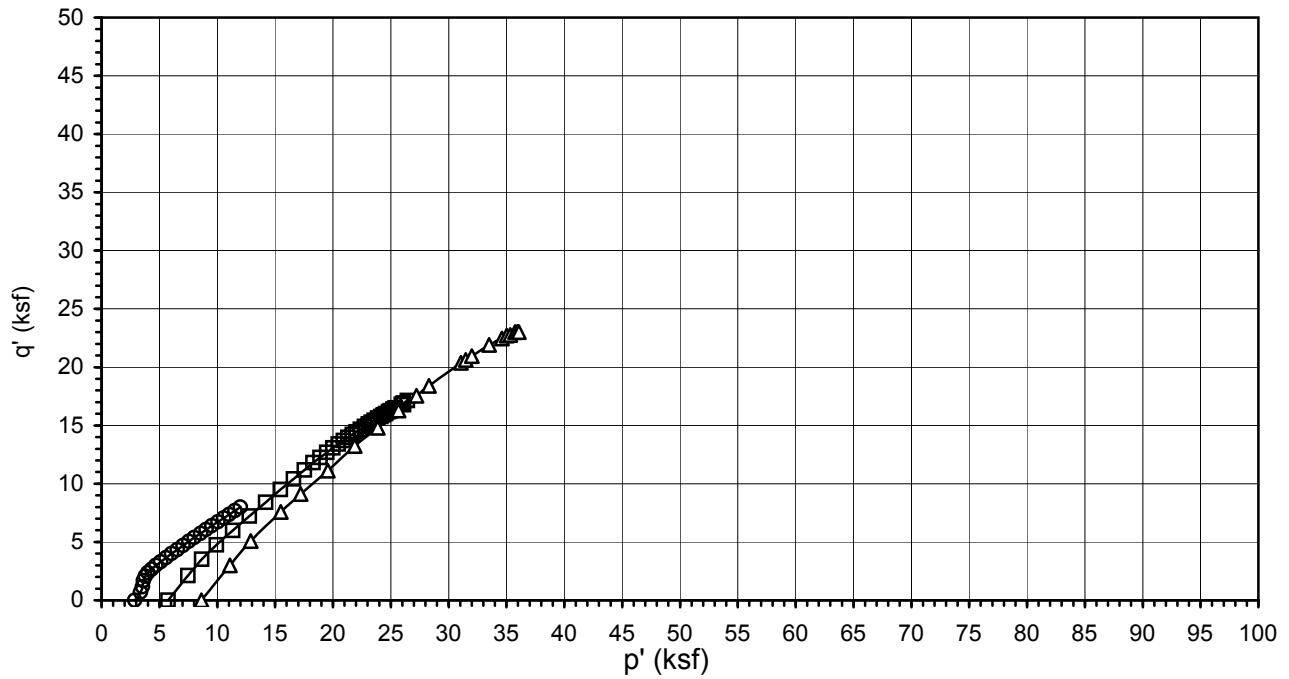


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi

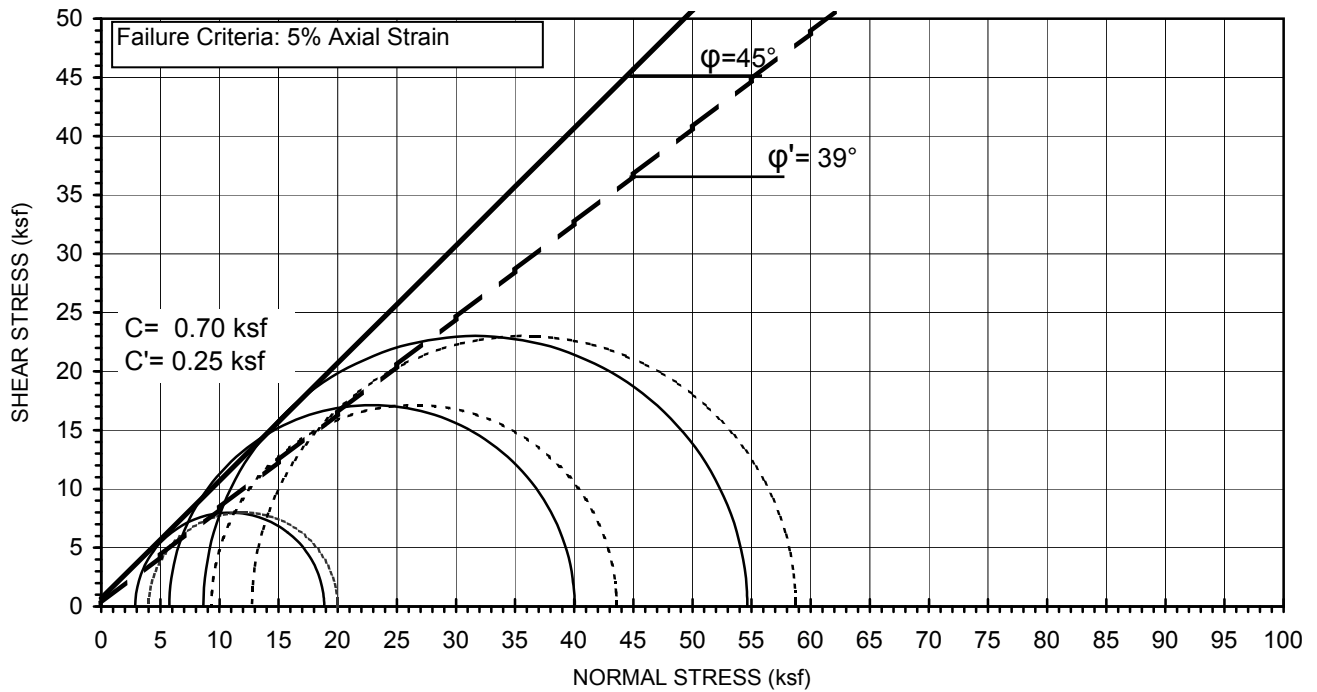


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gray Silty Sand
Test Pit:	G-113	Avg. Dry Unit Weight (pcf):	112.3
Sample No.:	20	Avg. Initial Moisture Content (%):	17.7
Depth (ft):	80.5	Confining Pressure:	20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

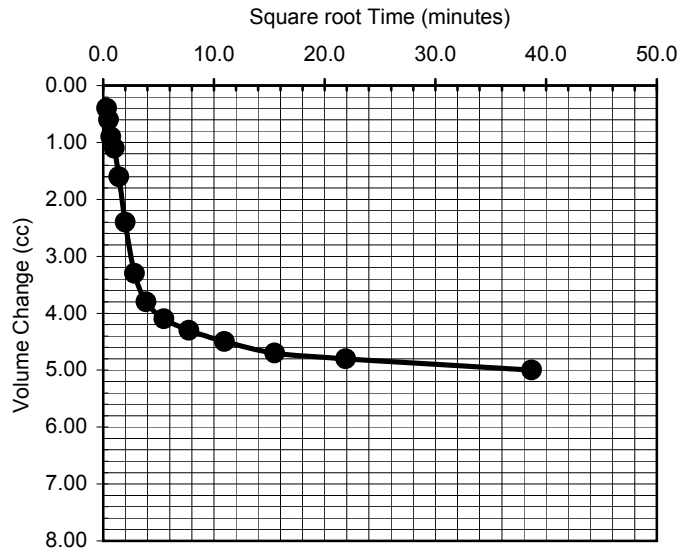
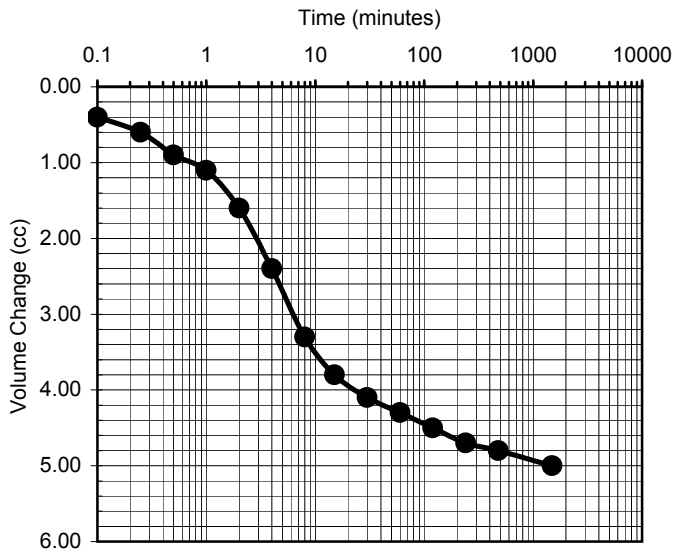


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gray Silty Sand
Test Pit:	G-113	Avg. Dry Unit Weight (pcf):	112.3
Sample No.:	20	Avg. Initial Moisture Content (%):	17.7
Depth (ft):	80.5	Confining Pressure:	20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-113	Sample Type:	Mod. Cal.
Sample No.:	20	Soil Description:	Gray Silty Sand
Depth (feet):	80.5	Eff. Confining Pressure (psi):	40.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.4000
0.25	0.6000
0.5	0.9000
1	1.1000
2	1.6000
4	2.4000
8	3.3000
15	3.8000
30	4.1000
60	4.3000
120	4.5000
240	4.7000
480	4.8000
1497	5.0000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.4000
0.5000	0.6000
0.7071	0.9000
1.0000	1.1000
1.4142	1.6000
2.0000	2.4000
2.8284	3.3000
3.8730	3.8000
5.4772	4.1000
7.7460	4.3000
10.9545	4.5000
15.4919	4.7000
21.9089	4.8000
38.6911	5.0000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/13/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-22-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-114	Reviewed by:	AP	Date:	07-28-11
Sample No.:	3	Sample Description:	Light Olive Fat Clay		
Depth(ft):	19				
Sample Type:	Mod. Cal.	Confining Pressure =	5.0 psi		

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	5.974	5.974	5.974	Avg. =	5.974

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.401
Moisture Content (%)	24.63	26.64
Wet Weight (gms)	1029.54	1227.42
Dry Weight (gms)	826.07	1007.39
Container Weight (gms)	0.00	181.32
Density and Saturation		
Wet Weight (gms)	1029.54	
Container Weight (gms)	0.00	
Wet Density (pcf)	122.2	
Dry Density (pcf)	98.1	
Initial Void Ratio	0.718	
% Saturation	92.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	73.7
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	73.0
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	5.933
Induced OCR =	1.0	Initial Volume (cu.in)=	32.085
Change in Ht. of Specimen (in) =	0.0414	Final Volume (cu.in) =	32.042

Shear		At Failure	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	3.21
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	0.74
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.95
		Axial Strain (%) =	5.15



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-22-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-114** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **3** Sample Description: **Light Olive Fat Clay**
 Depth(ft): **19**
 Sample Type: **Mod. Cal.** **Confining Pressure = 15.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.974</u>	<u>5.974</u>	<u>5.974</u>	Avg. =	5.974

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.288
Moisture Content (%)	24.63	26.64
Wet Weight (gms)	1029.54	1227.42
Dry Weight (gms)	826.07	1007.39
Container Weight (gms)	0.00	181.32
Density and Saturation		
Wet Weight (gms)	1029.54	
Container Weight (gms)	0.00	
Wet Density (pcf)	122.2	
Dry Density (pcf)	98.1	
Initial Void Ratio	0.718	
% Saturation	92.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	73.8
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	65.6
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.973
Induced OCR=	1.0	Initial Volume (cu.in)=	32.085
Change in Ht. of Specimen (in) =	0.0014	Final Volume (cu.in) =	31.584

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	5.76
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	1.81
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.57
		Axial Strain (%) =	5.12



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-22-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-114** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **3** Sample Description: **Light Olive Fat Clay**
 Depth(ft): **19**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.974</u>	<u>5.974</u>	<u>5.974</u>	Avg. =	5.974

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.325
Moisture Content (%)	24.63	26.64
Wet Weight (gms)	1029.54	1227.42
Dry Weight (gms)	826.07	1007.39
Container Weight (gms)	0.00	181.32
Density and Saturation		
Wet Weight (gms)	1029.54	
Container Weight (gms)	0.00	
Wet Density (pcf)	122.2	
Dry Density (pcf)	98.1	
Initial Void Ratio	0.718	
% Saturation	92.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	65.1
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	60.2
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.969
Induced OCR =	1.0	Initial Volume (cu.in)=	32.085
Change in Ht. of Specimen (in) =	0.0047	Final Volume (cu.in) =	31.786

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	7.45
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	2.75
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	10.20
		Axial Strain (%) =	5.31



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-114	Consolidation Pressure :	5.0 psi
Depth(ft):	19	Initial Sample Height:	5.974 in
Sample No.:	3	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.933 in
Sample Description:	Light Olive Fat Clay	Final Sample Area (A)*:	5.401 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	40.2	0.00	0.00	0.00	0.00	0.72
45.0	18	0.006	41.1	0.48	0.10	0.14	0.24	0.82
45.0	29	0.013	41.8	0.77	0.22	0.24	0.39	0.87
45.0	35	0.021	42.2	0.93	0.36	0.30	0.46	0.89
45.0	40	0.028	42.5	1.06	0.48	0.34	0.53	0.91
45.0	45	0.036	42.7	1.19	0.61	0.36	0.60	0.95
45.0	48	0.044	42.8	1.27	0.73	0.38	0.64	0.98
45.0	51	0.050	42.8	1.35	0.85	0.39	0.67	1.01
45.0	55	0.058	42.9	1.45	0.97	0.39	0.73	1.06
45.0	57	0.065	42.9	1.50	1.09	0.39	0.75	1.08
45.0	60	0.072	42.9	1.58	1.22	0.39	0.79	1.12
45.0	63	0.079	42.8	1.66	1.33	0.38	0.83	1.16
45.0	66	0.086	42.8	1.73	1.45	0.38	0.87	1.21
45.0	69	0.093	42.7	1.81	1.57	0.37	0.91	1.26
45.0	71	0.100	42.7	1.86	1.69	0.36	0.93	1.29
45.0	76	0.114	42.5	1.99	1.92	0.34	0.99	1.38
45.0	80	0.129	42.3	2.09	2.18	0.31	1.04	1.45
45.0	82	0.136	42.3	2.14	2.30	0.30	1.07	1.49
45.0	84	0.145	42.2	2.18	2.44	0.29	1.09	1.52
45.0	87	0.152	42.1	2.26	2.56	0.27	1.13	1.58
45.0	89	0.160	42.0	2.31	2.69	0.26	1.15	1.61
45.0	91	0.167	41.9	2.36	2.81	0.25	1.18	1.65
45.0	93	0.174	41.8	2.41	2.93	0.23	1.20	1.69
45.0	97	0.188	41.6	2.50	3.17	0.20	1.25	1.77
45.0	100	0.195	41.5	2.58	3.28	0.19	1.29	1.82
45.0	102	0.203	41.4	2.63	3.42	0.18	1.31	1.86
45.0	106	0.216	41.2	2.72	3.64	0.16	1.36	1.93
45.0	108	0.223	41.2	2.77	3.76	0.14	1.39	1.96
45.0	112	0.238	41.0	2.87	4.02	0.12	1.43	2.03
45.0	113	0.245	40.9	2.89	4.13	0.11	1.44	2.06
45.0	115	0.253	40.8	2.94	4.26	0.09	1.47	2.10
45.0	118	0.269	40.6	3.00	4.53	0.06	1.50	2.16
45.0	120	0.276	40.5	3.05	4.65	0.04	1.53	2.20
45.0	122	0.283	40.4	3.10	4.77	0.03	1.55	2.24
45.0	125	0.298	40.1	3.17	5.02	0.00	1.58	2.31
45.0	127	0.305	40.0	3.21	5.15	-0.02	1.61	2.34



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-114	Consolidation Pressure :	15.0 psi
Depth(ft):	19	Initial Sample Height:	5.974 in
Sample No.:	3	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.973 in
Sample Description:	Light Olive Fat Clay	Final Sample Area (A)*:	5.288 sq. in.
		Induced OCR=	1.0

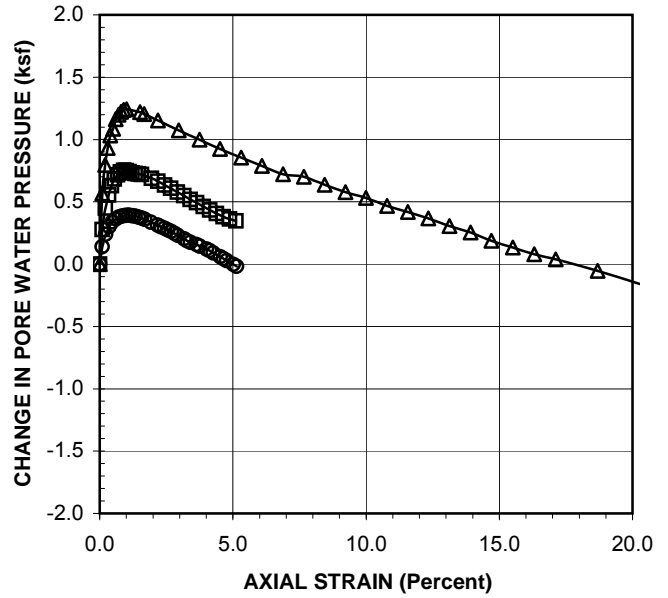
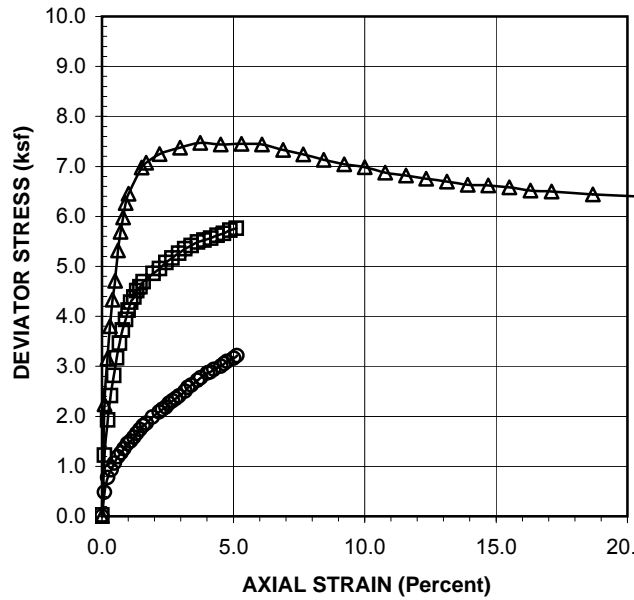
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	1	0.000	40.0	0.03	0.00	0.00	0.01	2.17
55.0	45	0.006	41.9	1.22	0.10	0.28	0.61	2.49
55.0	71	0.013	43.1	1.93	0.22	0.45	0.96	2.68
55.0	89	0.020	43.8	2.42	0.33	0.56	1.21	2.81
55.0	104	0.027	44.4	2.82	0.45	0.63	1.41	2.94
55.0	117	0.033	44.7	3.17	0.56	0.68	1.58	3.06
55.0	128	0.040	45.0	3.46	0.67	0.72	1.73	3.17
55.0	138	0.047	45.1	3.73	0.79	0.74	1.86	3.28
55.0	146	0.054	45.2	3.94	0.90	0.75	1.97	3.38
55.0	153	0.060	45.2	4.12	1.00	0.75	2.06	3.47
55.0	159	0.066	45.1	4.28	1.10	0.74	2.14	3.56
55.0	163	0.073	45.1	4.38	1.21	0.73	2.19	3.62
55.0	168	0.080	45.0	4.51	1.33	0.73	2.26	3.69
55.0	171	0.087	45.0	4.59	1.45	0.72	2.29	3.73
55.0	175	0.094	45.0	4.69	1.58	0.72	2.35	3.79
55.0	182	0.116	44.8	4.86	1.95	0.69	2.43	3.90
55.0	186	0.131	44.6	4.95	2.19	0.66	2.48	3.97
55.0	191	0.146	44.4	5.07	2.44	0.64	2.54	4.06
55.0	195	0.160	44.2	5.17	2.67	0.61	2.58	4.14
55.0	199	0.174	44.0	5.26	2.92	0.58	2.63	4.21
55.0	203	0.189	43.8	5.35	3.16	0.55	2.68	4.29
55.0	206	0.203	43.6	5.42	3.40	0.52	2.71	4.35
55.0	209	0.217	43.4	5.48	3.64	0.49	2.74	4.41
55.0	211	0.232	43.2	5.52	3.89	0.46	2.76	4.46
55.0	213	0.247	43.0	5.56	4.14	0.43	2.78	4.51
55.0	216	0.262	42.8	5.62	4.39	0.40	2.81	4.57
55.0	218	0.277	42.6	5.66	4.63	0.38	2.83	4.61
55.0	221	0.291	42.5	5.72	4.87	0.36	2.86	4.66
55.0	223	0.306	42.4	5.76	5.12	0.35	2.88	4.69



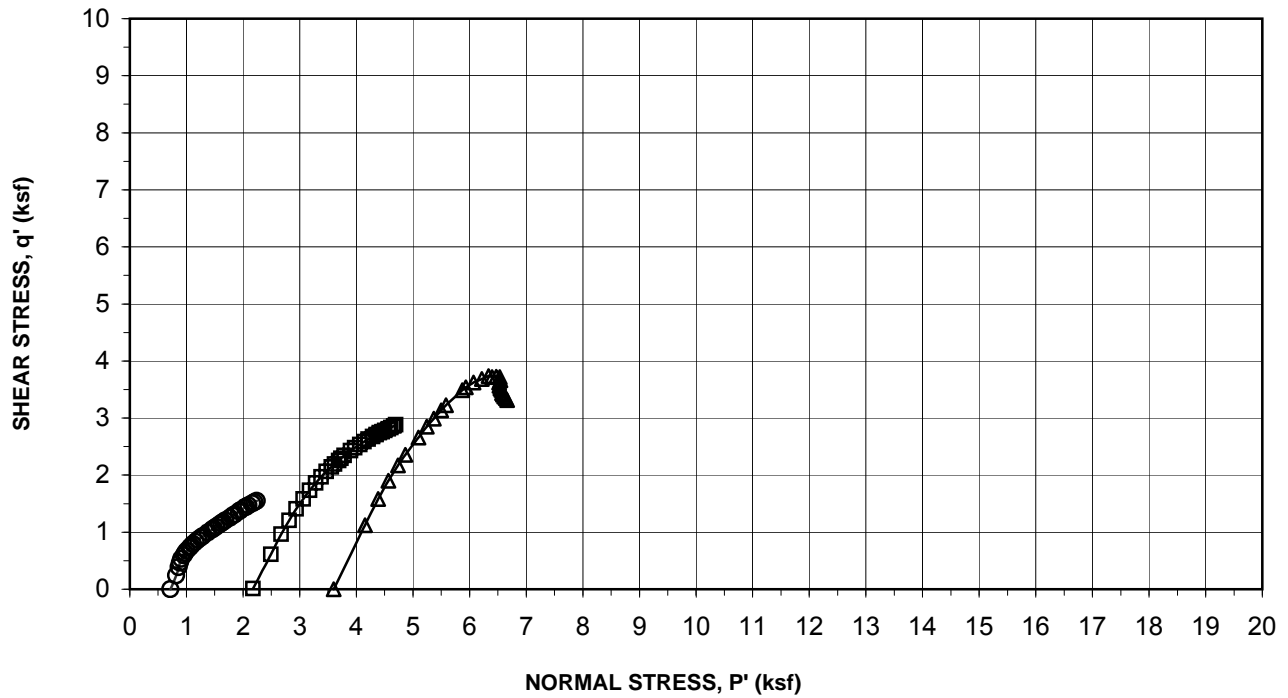
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-114	Consolidation Pressure :	25.0 psi
Depth(ft):	19	Initial Sample Height:	5.974 in
Sample No.:	3	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.969 in
Sample Description:	Light Olive Fat Clay	Final Sample Area (A)*:	5.325 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	40.0	0.00	0.00	0.00	0.00	3.60
65.0	83	0.006	43.9	2.24	0.10	0.57	1.12	4.15
65.0	117	0.012	45.5	3.16	0.20	0.79	1.58	4.38
65.0	141	0.018	46.5	3.80	0.30	0.93	1.90	4.57
65.0	161	0.024	47.2	4.34	0.40	1.03	2.17	4.74
65.0	175	0.030	47.5	4.71	0.50	1.09	2.35	4.87
65.0	198	0.036	48.1	5.32	0.60	1.16	2.66	5.10
65.0	212	0.042	48.3	5.69	0.70	1.20	2.85	5.25
65.0	223	0.048	48.5	5.98	0.80	1.22	2.99	5.37
65.0	234	0.054	48.6	6.27	0.90	1.24	3.14	5.50
65.0	241	0.060	48.6	6.45	1.01	1.24	3.23	5.58
65.0	262	0.090	48.5	6.98	1.51	1.22	3.49	5.87
65.0	266	0.100	48.4	7.07	1.68	1.21	3.54	5.93
65.0	274	0.131	48.0	7.25	2.19	1.15	3.62	6.07
65.0	281	0.177	47.5	7.37	2.97	1.07	3.69	6.21
65.0	287	0.223	46.9	7.47	3.74	1.00	3.74	6.34
65.0	288	0.270	46.4	7.44	4.52	0.92	3.72	6.40
65.0	291	0.317	45.9	7.45	5.31	0.85	3.73	6.47
65.0	293	0.364	45.5	7.44	6.09	0.79	3.72	6.53
65.0	291	0.411	45.0	7.33	6.89	0.72	3.66	6.54
65.0	290	0.457	44.9	7.24	7.66	0.70	3.62	6.52
65.0	288	0.504	44.4	7.13	8.44	0.64	3.57	6.53
65.0	287	0.551	44.0	7.05	9.22	0.58	3.52	6.54
65.0	287	0.597	43.7	6.99	10.00	0.53	3.49	6.56
65.0	285	0.644	43.3	6.88	10.79	0.47	3.44	6.57
65.0	285	0.691	42.9	6.82	11.57	0.42	3.41	6.59
65.0	285	0.737	42.6	6.76	12.34	0.37	3.38	6.61
65.0	285	0.784	42.1	6.69	13.13	0.31	3.35	6.64
65.0	285	0.831	41.8	6.63	13.92	0.25	3.32	6.66
65.0	287	0.877	41.3	6.62	14.70	0.19	3.31	6.72
65.0	288	0.926	40.9	6.58	15.50	0.13	3.29	6.76
65.0	288	0.974	40.6	6.52	16.31	0.08	3.26	6.78
65.0	290	1.022	40.3	6.50	17.11	0.04	3.25	6.81
65.0	293	1.116	39.6	6.44	18.69	-0.05	3.22	6.88
65.0	297	1.211	38.9	6.40	20.28	-0.16	3.20	6.96



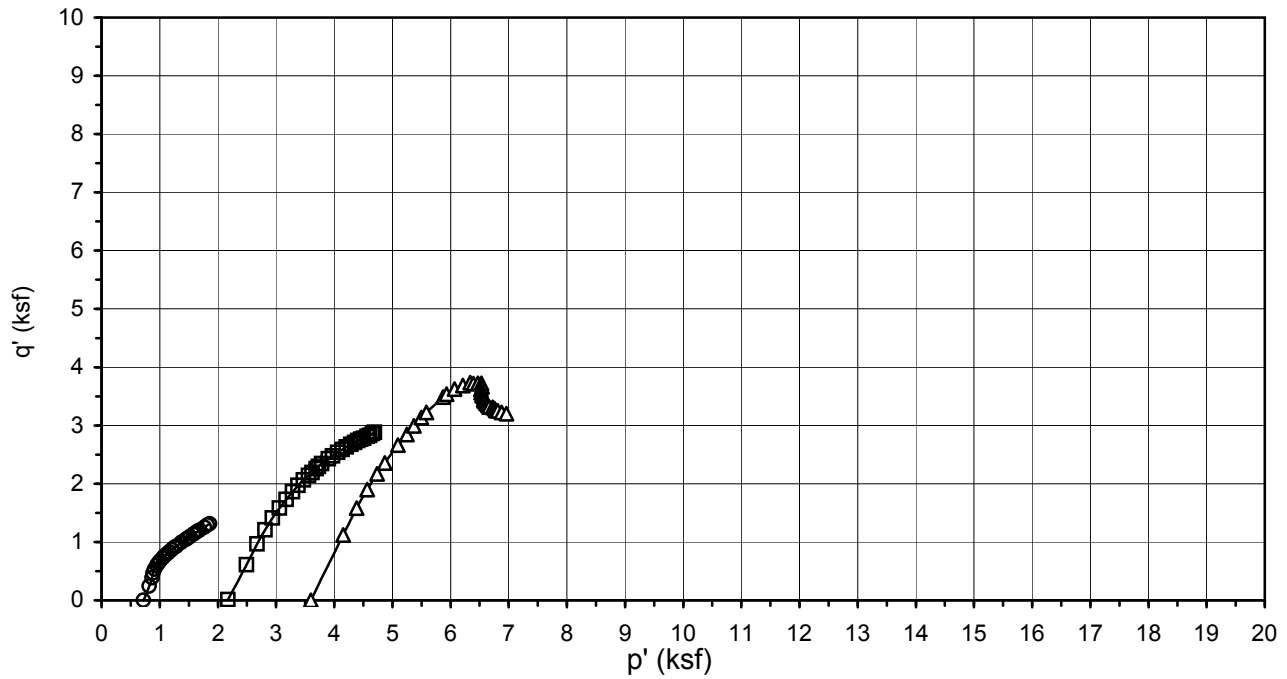
LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi



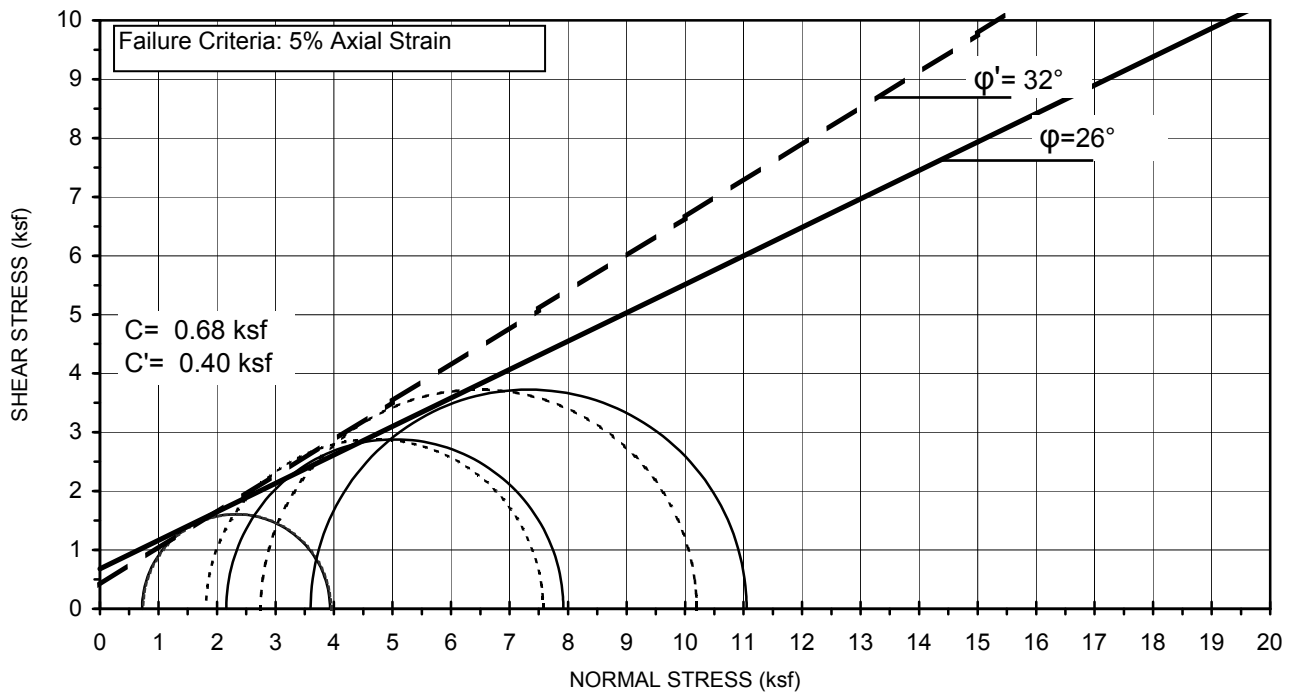
Project Name: Westside Subway Extension
Project No.: 4953-10-1561
Test Pit: G-114
Sample No.: 3
Depth (ft): 19

Sample Type: Mod. Cal.
Sample Description: Light Olive Fat Clay
Avg. Dry Unit Weight (pcf): 98.1
Avg. Initial Moisture Content (%): 24.6
Confining Pressure: 5.0, 15.0, 25.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

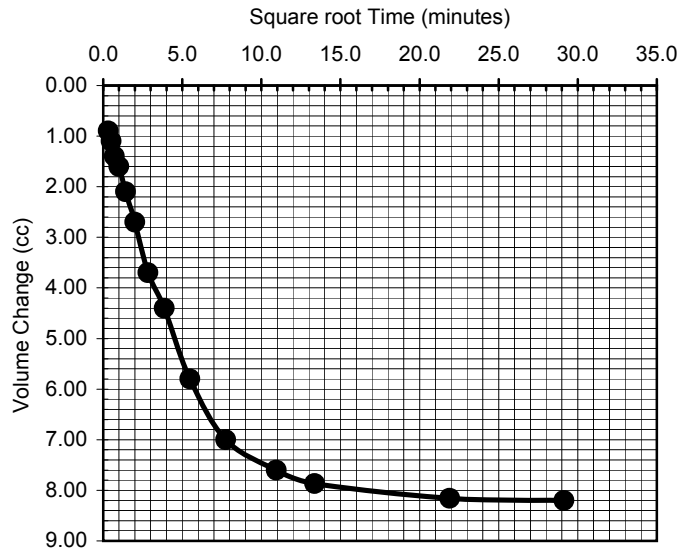
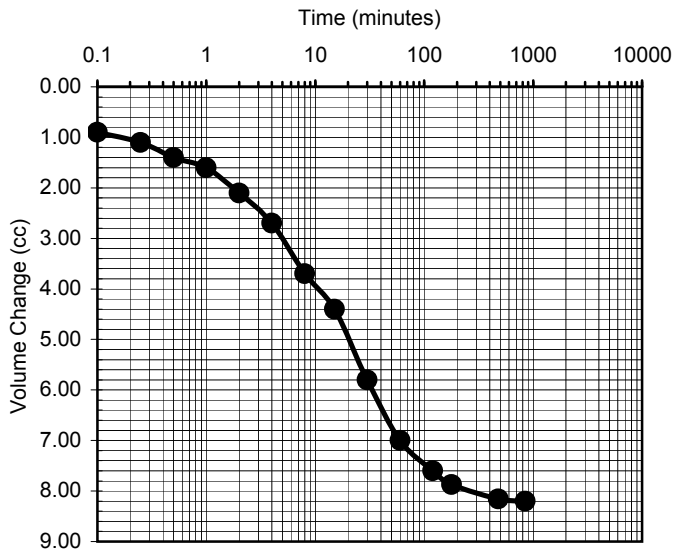


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Light Olive Fat Clay
Test Pit:	G-114	Avg. Dry Unit Weight (pcf):	98.1
Sample No.:	3	Avg. Initial Moisture Content (%):	24.6
Depth (ft):	19	Confining Pressure:	5.0, 15.0, 25.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-114	Sample Type:	Mod. Cal.
Sample No.:	3	Soil Description:	Light Olive Fat Clay
Depth (feet):	19	Eff. Confining Pressure (psi):	15.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.9000
0.25	1.1000
0.5	1.4000
1	1.6000
2	2.1000
4	2.7000
8	3.7000
15	4.4000
30	5.8000
60	7.0000
120	7.6000
179	7.8700
480	8.1600
849	8.2000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.9000
0.5000	1.1000
0.7071	1.4000
1.0000	1.6000
1.4142	2.1000
2.0000	2.7000
2.8284	3.7000
3.8730	4.4000
5.4772	5.8000
7.7460	7.0000
10.9545	7.6000
13.3791	7.8700
21.9089	8.1600
29.1376	8.2000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/22/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-27-11
Test Pit:	G-114	Reviewed by:	AP	Date:	07-27-11
Sample No.:	7	Sample Description:	Clayey Sand		
Depth(ft):	39				
Sample Type:	Mod. Cal.	Confining Pressure =	10.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.950</u>	<u>4.950</u>	<u>4.950</u>	Avg. =	4.950

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.355
Moisture Content (%)	12.42	18.36
Wet Weight (gms)	94.74	1041.74
Dry Weight (gms)	89.79	903.25
Container Weight (gms)	49.95	148.88
Density and Saturation		
Wet Weight (gms)	892.84	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.9	
Dry Density (pcf)	113.8	
Initial Void Ratio	0.480	
% Saturation	69.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	40.0	Initial Burette Ht.(cm)=	77.0
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	74.5
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	4.936
Induced OCR =	1.0	Initial Volume (cu.in)=	26.585
Change in Ht. of Specimen (in) =	0.0136	Final Volume (cu.in) =	26.433

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.00
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.48
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.48
		Axial Strain (%) =	5.12



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-27-11
Test Pit:	G-114	Reviewed by:	AP	Date:	07-27-11
Sample No.:	7	Sample Description:	Clayey Sand		
Depth(ft):	39				
Sample Type:	Mod. Cal.	Confining Pressure =	25.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.950</u>	<u>4.950</u>	<u>4.950</u>	Avg. =	4.950

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.293
Moisture Content (%)	12.42	18.36
Wet Weight (gms)	94.74	1041.74
Dry Weight (gms)	89.79	903.25
Container Weight (gms)	49.95	148.88
Density and Saturation		
Wet Weight (gms)	892.84	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.9	
Dry Density (pcf)	113.8	
Initial Void Ratio	0.480	
% Saturation	69.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	74.5
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	68.2
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	4.950
Induced OCR=	1.0	Initial Volume (cu.in)=	26.585
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.201

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	13.01
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.05
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.06
		Axial Strain (%) =	4.90



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-21-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-27-11
Test Pit:	G-114	Reviewed by:	AP	Date:	07-27-11
Sample No.:	7	Sample Description:	Clayey Sand		
Depth(ft):	39				
Sample Type:	Mod. Cal.	Confining Pressure =	40.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.950</u>	<u>4.950</u>	<u>4.950</u>	Avg. =	4.950

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.331
Moisture Content (%)	12.42	18.36
Wet Weight (gms)	94.74	1041.74
Dry Weight (gms)	89.79	903.25
Container Weight (gms)	49.95	148.88
Density and Saturation		
Wet Weight (gms)	892.84	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.9	
Dry Density (pcf)	113.8	
Initial Void Ratio	0.480	
% Saturation	69.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	68.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	65.6
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	4.950
Induced OCR =	1.0	Initial Volume (cu.in)=	26.585
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.390

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	19.40
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	6.73
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	26.13
		Axial Strain (%) =	5.22



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	40.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-114	Consolidation Pressure :	10.0 psi
Depth(ft):	39	Initial Sample Height:	4.950 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.936 in
Sample Description:	Clayey Sand	Final Sample Area (A)*:	5.355 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
40.0	1	0.000	30.1	0.03	0.00	0.00	0.01	1.45
40.0	27	0.005	31.7	0.73	0.10	0.22	0.36	1.58
40.0	41	0.012	33.1	1.10	0.23	0.42	0.55	1.57
40.0	49	0.019	33.8	1.31	0.38	0.54	0.66	1.56
40.0	56	0.027	34.3	1.50	0.54	0.60	0.75	1.59
40.0	61	0.034	34.5	1.63	0.70	0.63	0.81	1.62
40.0	66	0.041	34.6	1.76	0.83	0.65	0.88	1.67
40.0	70	0.048	34.7	1.86	0.97	0.65	0.93	1.72
40.0	74	0.055	34.7	1.97	1.12	0.65	0.98	1.77
40.0	78	0.063	34.6	2.07	1.27	0.65	1.04	1.83
40.0	82	0.070	34.5	2.17	1.42	0.64	1.09	1.89
40.0	86	0.077	34.4	2.28	1.55	0.62	1.14	1.96
40.0	90	0.084	34.3	2.38	1.70	0.60	1.19	2.02
40.0	94	0.091	34.2	2.48	1.85	0.59	1.24	2.09
40.0	98	0.099	34.1	2.58	2.00	0.57	1.29	2.16
40.0	102	0.106	33.9	2.68	2.14	0.55	1.34	2.23
40.0	107	0.113	33.8	2.81	2.30	0.52	1.41	2.32
40.0	111	0.122	33.6	2.91	2.47	0.50	1.46	2.40
40.0	115	0.129	33.4	3.01	2.62	0.48	1.51	2.47
40.0	119	0.136	33.2	3.11	2.75	0.45	1.56	2.55
40.0	124	0.143	33.1	3.24	2.90	0.42	1.62	2.64
40.0	128	0.151	32.9	3.34	3.06	0.40	1.67	2.71
40.0	132	0.158	32.7	3.44	3.21	0.37	1.72	2.79
40.0	137	0.165	32.5	3.56	3.34	0.34	1.78	2.88
40.0	141	0.173	32.3	3.66	3.50	0.31	1.83	2.96
40.0	146	0.180	32.1	3.78	3.64	0.29	1.89	3.05
40.0	151	0.187	31.9	3.91	3.79	0.26	1.95	3.14
40.0	155	0.194	31.7	4.00	3.93	0.23	2.00	3.21
40.0	160	0.201	31.5	4.13	4.07	0.20	2.06	3.31
40.0	165	0.208	31.3	4.25	4.22	0.17	2.13	3.40
40.0	171	0.215	31.1	4.40	4.36	0.14	2.20	3.50
40.0	175	0.223	30.8	4.49	4.52	0.10	2.25	3.58
40.0	181	0.230	30.6	4.64	4.66	0.07	2.32	3.69
40.0	186	0.238	30.3	4.76	4.82	0.03	2.38	3.79
40.0	191	0.245	30.1	4.88	4.97	0.00	2.44	3.88
40.0	196	0.253	29.8	5.00	5.12	-0.04	2.50	3.98



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-114	Consolidation Pressure :	25.0 psi
Depth(ft):	39	Initial Sample Height:	4.950 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.950 in
Sample Description:	Clayey Sand	Final Sample Area (A)*:	5.293 sq. in.
		Induced OCR=	1.0

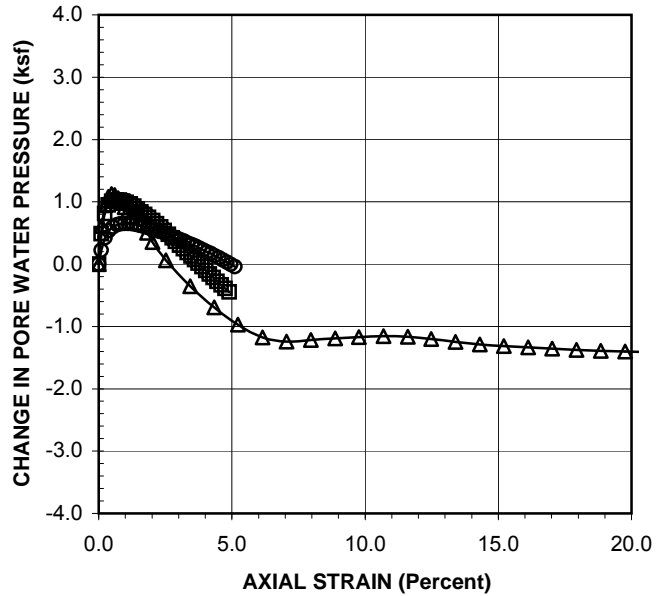
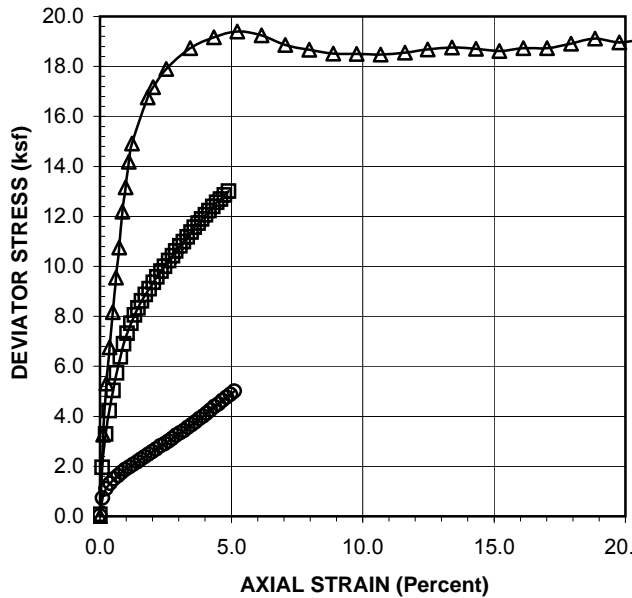
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	3	0.000	30.1	0.08	0.00	0.00	0.04	3.64
55.0	72	0.005	33.5	1.96	0.09	0.49	0.98	4.09
55.0	121	0.011	35.7	3.28	0.22	0.81	1.64	4.43
55.0	156	0.018	36.7	4.23	0.36	0.95	2.11	4.76
55.0	186	0.025	37.1	5.04	0.50	1.01	2.52	5.11
55.0	212	0.031	37.2	5.73	0.63	1.03	2.87	5.44
55.0	236	0.038	37.2	6.37	0.78	1.03	3.19	5.76
55.0	256	0.044	37.1	6.90	0.90	1.01	3.45	6.04
55.0	272	0.051	37.0	7.32	1.04	0.99	3.66	6.27
55.0	287	0.059	36.8	7.72	1.18	0.96	3.86	6.49
55.0	300	0.065	36.5	8.05	1.32	0.93	4.03	6.70
55.0	311	0.072	36.2	8.34	1.45	0.88	4.17	6.88
55.0	322	0.079	35.9	8.62	1.59	0.84	4.31	7.07
55.0	332	0.086	35.6	8.88	1.74	0.80	4.44	7.24
55.0	341	0.093	35.3	9.10	1.87	0.75	4.55	7.40
55.0	351	0.100	35.0	9.36	2.03	0.70	4.68	7.58
55.0	360	0.107	34.6	9.58	2.17	0.65	4.79	7.74
55.0	369	0.115	34.2	9.80	2.33	0.59	4.90	7.91
55.0	377	0.122	33.8	10.00	2.46	0.54	5.00	8.06
55.0	386	0.129	33.4	10.23	2.61	0.48	5.11	8.23
55.0	394	0.137	33.0	10.42	2.76	0.42	5.21	8.39
55.0	402	0.143	32.6	10.62	2.89	0.36	5.31	8.55
55.0	410	0.151	32.2	10.81	3.04	0.30	5.41	8.70
55.0	417	0.158	31.8	10.98	3.18	0.24	5.49	8.85
55.0	425	0.165	31.4	11.18	3.33	0.19	5.59	9.00
55.0	433	0.172	31.0	11.37	3.47	0.13	5.69	9.16
55.0	441	0.178	30.6	11.57	3.60	0.07	5.78	9.31
55.0	448	0.185	30.2	11.73	3.74	0.01	5.87	9.45
55.0	455	0.192	29.8	11.90	3.88	-0.04	5.95	9.59
55.0	462	0.199	29.4	12.06	4.02	-0.10	6.03	9.73
55.0	469	0.206	29.0	12.23	4.16	-0.16	6.11	9.87
55.0	476	0.213	28.6	12.39	4.29	-0.22	6.20	10.01
55.0	483	0.220	28.2	12.56	4.45	-0.28	6.28	10.15
55.0	489	0.228	27.8	12.69	4.60	-0.33	6.35	10.28
55.0	496	0.235	27.4	12.85	4.74	-0.39	6.43	10.42
55.0	503	0.242	27.0	13.01	4.90	-0.45	6.51	10.55



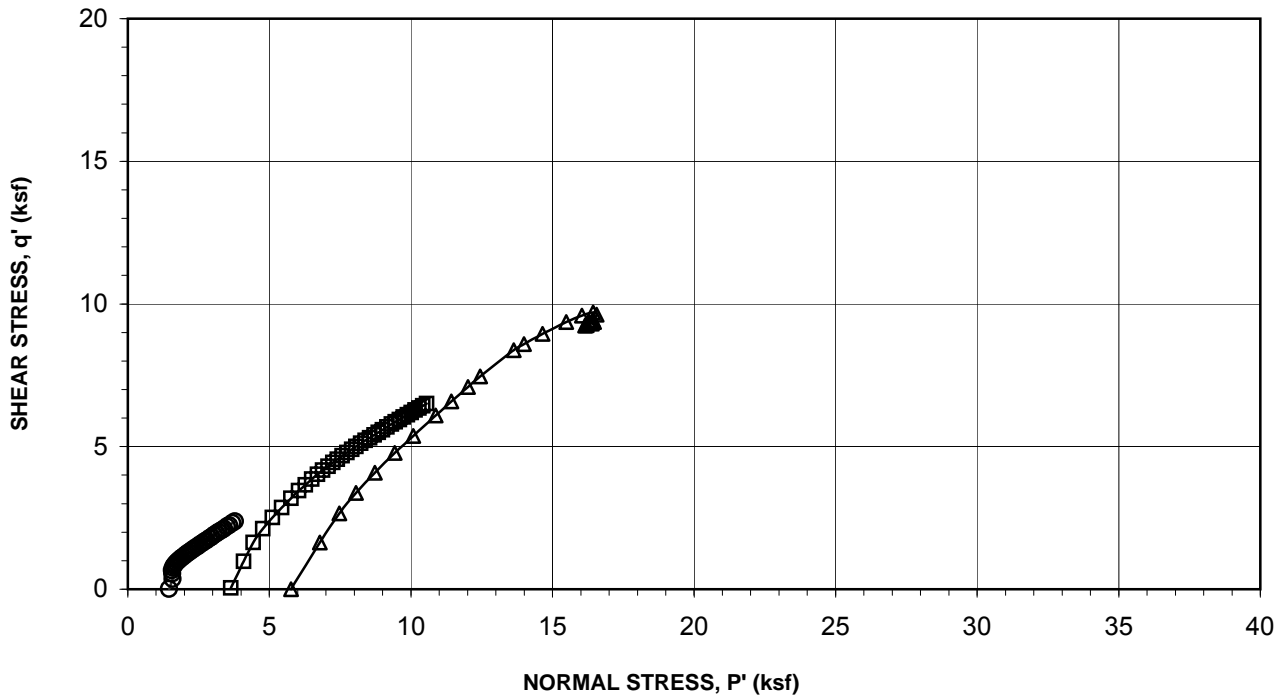
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-114	Consolidation Pressure :	40.0 psi
Depth(ft):	39	Initial Sample Height:	4.950 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.950 in
Sample Description:	Clayey Sand	Final Sample Area (A)*:	5.331 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
70.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.76
70.0	121	0.006	34.2	3.26	0.12	0.61	1.63	6.78
70.0	197	0.012	36.6	5.31	0.24	0.94	2.65	7.47
70.0	251	0.018	37.5	6.75	0.36	1.08	3.38	8.06
70.0	304	0.024	37.8	8.17	0.48	1.12	4.09	8.72
70.0	356	0.030	37.7	9.56	0.61	1.11	4.78	9.43
70.0	401	0.036	37.4	10.75	0.73	1.06	5.38	10.08
70.0	455	0.042	36.8	12.19	0.85	0.98	6.09	10.87
70.0	492	0.048	36.4	13.16	0.97	0.92	6.58	11.42
70.0	531	0.054	35.8	14.19	1.09	0.84	7.09	12.01
70.0	559	0.060	35.4	14.92	1.21	0.77	7.46	12.45
70.0	632	0.090	33.5	16.76	1.82	0.50	8.38	13.64
70.0	649	0.100	32.5	17.18	2.02	0.35	8.59	13.99
70.0	680	0.125	30.4	17.90	2.52	0.06	8.95	14.65
70.0	718	0.170	27.5	18.73	3.43	-0.36	9.36	15.48
70.0	742	0.215	25.2	19.17	4.34	-0.69	9.59	16.04
70.0	758	0.259	23.3	19.40	5.22	-0.97	9.70	16.43
70.0	759	0.305	21.8	19.24	6.15	-1.18	9.62	16.56
70.0	751	0.349	21.4	18.85	7.05	-1.24	9.43	16.43
70.0	751	0.395	21.6	18.67	7.97	-1.22	9.33	16.31
70.0	752	0.439	21.7	18.51	8.87	-1.19	9.25	16.21
70.0	759	0.484	21.9	18.50	9.77	-1.17	9.25	16.18
70.0	766	0.529	22.0	18.48	10.68	-1.15	9.24	16.15
70.0	777	0.574	21.9	18.55	11.60	-1.17	9.28	16.20
70.0	790	0.618	21.6	18.68	12.48	-1.20	9.34	16.30
70.0	802	0.663	21.4	18.76	13.40	-1.25	9.38	16.39
70.0	808	0.708	21.1	18.70	14.31	-1.29	9.35	16.40
70.0	813	0.753	20.9	18.62	15.21	-1.31	9.31	16.38
70.0	827	0.798	20.7	18.74	16.12	-1.33	9.37	16.46
70.0	836	0.843	20.6	18.74	17.02	-1.36	9.37	16.48
70.0	853	0.888	20.4	18.91	17.93	-1.38	9.45	16.59
70.0	872	0.933	20.3	19.11	18.84	-1.39	9.56	16.71
70.0	875	0.978	20.3	18.96	19.76	-1.40	9.48	16.65
70.0	891	1.024	20.2	19.09	20.69	-1.42	9.54	16.72

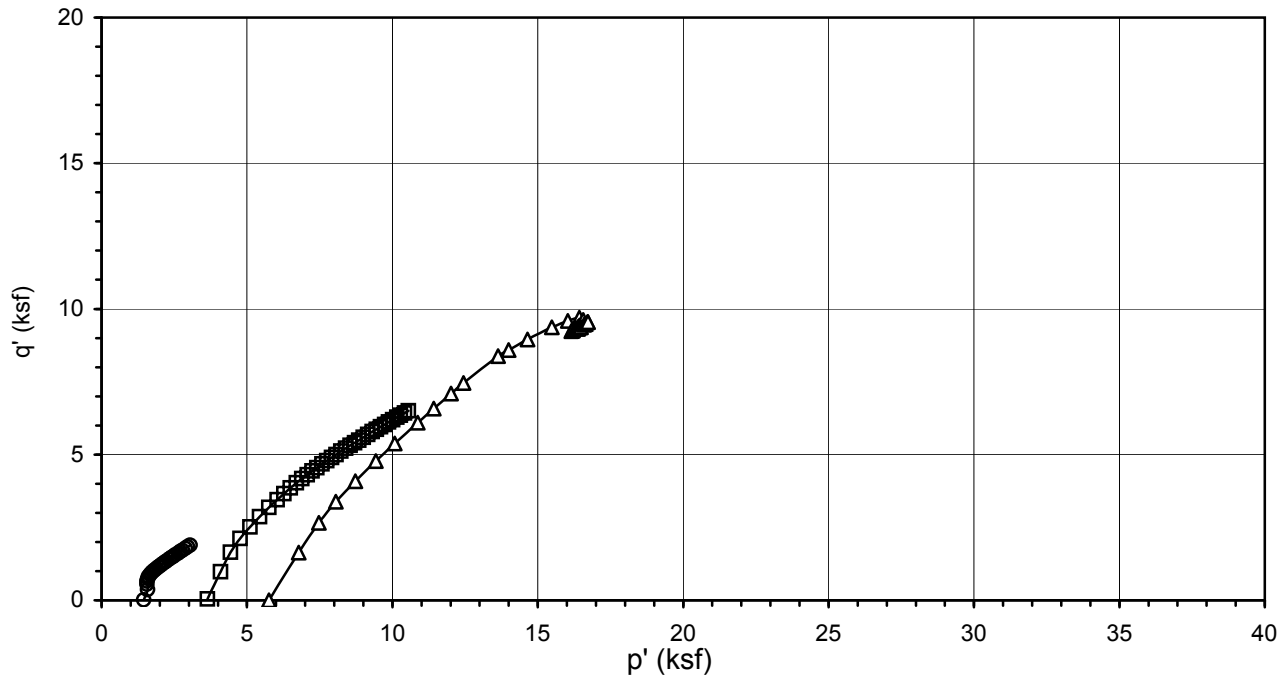


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi

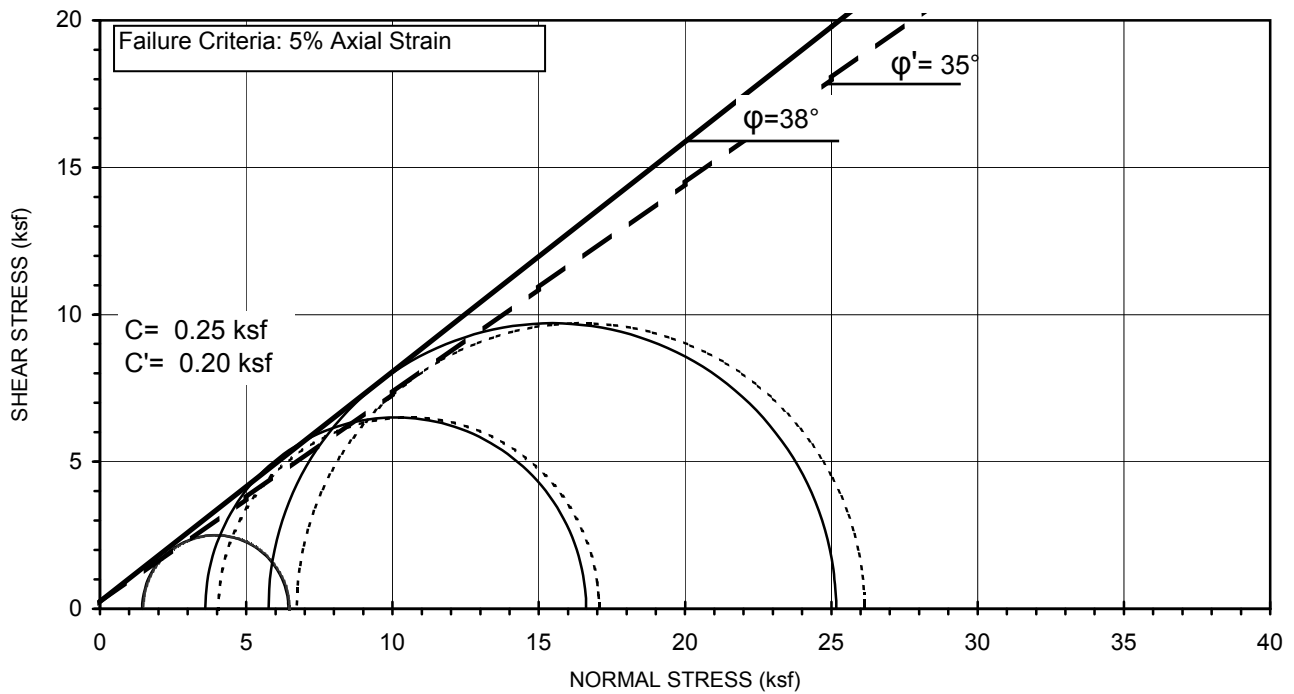


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Sand
Test Pit:	G-114	Avg. Dry Unit Weight (pcf):	113.8
Sample No.:	7	Avg. Initial Moisture Content (%):	12.4
Depth (ft):	39	Confining Pressure:	10.0, 25.0, 40.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



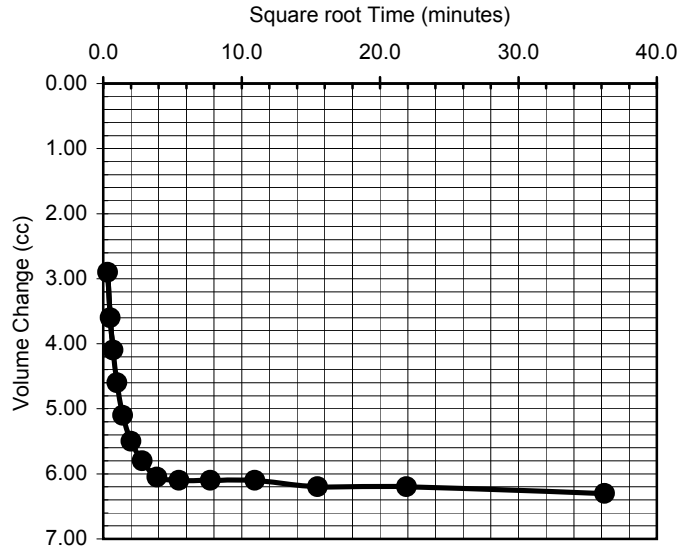
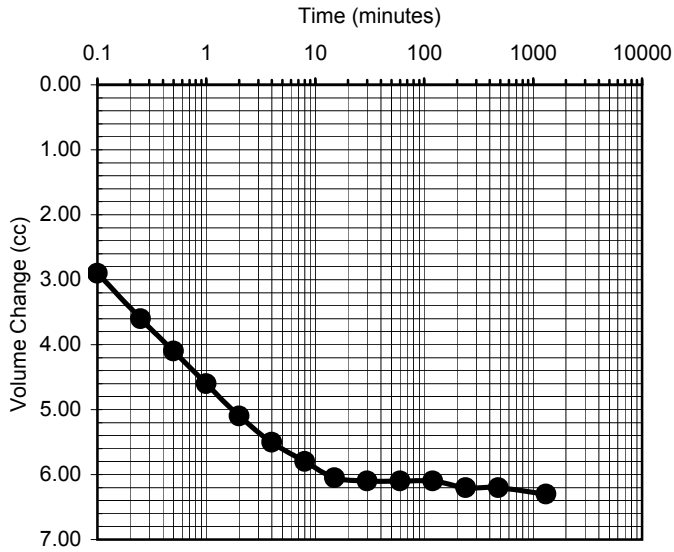
LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-114
 Sample No.: 7
 Depth (ft): 39

Sample Type: Mod. Cal.
 Sample Description: Clayey Sand
 Avg. Dry Unit Weight (pcf): 113.8
 Avg. Initial Moisture Content (%): 12.4
 Confining Pressure: 10.0, 25.0, 40.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-114	Sample Type:	Mod. Cal.
Sample No.:	7	Soil Description:	Clayey Sand
Depth (feet):	39	Eff. Confining Pressure (psi):	25.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	2.9000
0.25	3.6000
0.5	4.1000
1	4.6000
2	5.1000
4	5.5000
8	5.8000
15	6.0500
30	6.1000
60	6.1000
120	6.1000
240	6.2000
480	6.2000
1313	6.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	2.9000
0.5000	3.6000
0.7071	4.1000
1.0000	4.6000
1.4142	5.1000
2.0000	5.5000
2.8284	5.8000
3.8730	6.0500
5.4772	6.1000
7.7460	6.1000
10.9545	6.1000
15.4919	6.2000
21.9089	6.2000
36.2353	6.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/21/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-22-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-114	Reviewed by:	AP	Date:	07-28-11
Sample No.:	15	Sample Description:	Olive Gray Sand w/silt		
Depth(ft):	63				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.526</u>	<u>5.526</u>	<u>5.526</u>	Avg. =	5.526

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.339
Moisture Content (%)	12.18	19.59
Wet Weight (gms)	91.39	1152.80
Dry Weight (gms)	86.52	988.51
Container Weight (gms)	46.53	150.03
Density and Saturation		
Wet Weight (gms)	1005.05	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.0	
Dry Density (pcf)	115.0	
Initial Void Ratio	0.465	
% Saturation	70.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	75.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	70.8
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.507
Induced OCR =	1.0	Initial Volume (cu.in)=	29.679
Change in Ht. of Specimen (in) =	0.0193	Final Volume (cu.in) =	29.398

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	24.55
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	7.48
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	32.03
		Axial Strain (%) =	5.50



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-22-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-114** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **15** Sample Description: **Olive Gray Sand w/silt**
 Depth(ft): **63**
 Sample Type: **Mod. Cal.** **Confining Pressure = 40.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.526</u>	<u>5.526</u>	<u>5.526</u>	Avg. =	5.526

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.364
Moisture Content (%)	12.18	19.59
Wet Weight (gms)	<u>91.39</u>	<u>1152.80</u>
Dry Weight (gms)	<u>86.52</u>	<u>988.51</u>
Container Weight (gms)	<u>46.53</u>	<u>150.03</u>
Density and Saturation		
Wet Weight (gms)	<u>1005.05</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	129.0	
Dry Density (pcf)	115.0	
Initial Void Ratio	0.465	
% Saturation	70.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>95</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>70.0</u>	Initial Burette Ht.(cm)=	<u>70.6</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>69.9</u>
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	<u>5.525</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>29.679</u>
Change in Ht. of Specimen (in) =	0.0014	Final Volume (cu.in) =	<u>29.636</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	37.13
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	10.69
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	47.83
		Axial Strain (%) =	3.67



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-22-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-114** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **15** Sample Description: **Olive Gray Sand w/silt**
 Depth(ft): **63**
 Sample Type: **Mod. Cal.** **Confining Pressure = 60.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.526</u>	<u>5.526</u>	<u>5.526</u>	Avg. =	5.526

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.366
Moisture Content (%)	12.18	19.59
Wet Weight (gms)	<u>91.39</u>	<u>1152.80</u>
Dry Weight (gms)	<u>86.52</u>	<u>988.51</u>
Container Weight (gms)	<u>46.53</u>	<u>150.03</u>
Density and Saturation		
Wet Weight (gms)	<u>1005.05</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	129.0	
Dry Density (pcf)	115.0	
Initial Void Ratio	0.465	
% Saturation	70.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>95</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>90.0</u>	Initial Burette Ht.(cm)=	<u>69.8</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>69.2</u>
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	<u>5.524</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>29.679</u>
Change in Ht. of Specimen (in) =	0.0021	Final Volume (cu.in) =	<u>29.642</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	42.36
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	12.37
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	54.73
		Axial Strain (%) =	4.96



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-114	Consolidation Pressure :	20.0 psi
Depth(ft):	63	Initial Sample Height:	5.526 in
Sample No.:	15	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.507 in
Sample Description:	Olive Gray Sand w/silt	Final Sample Area (A)*:	5.339 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.88
50.0	60	0.005	33.5	1.62	0.10	0.50	0.81	3.18
50.0	96	0.013	36.3	2.58	0.24	0.90	1.29	3.27
50.0	118	0.020	37.5	3.17	0.35	1.09	1.59	3.38
50.0	136	0.027	38.0	3.65	0.48	1.15	1.83	3.56
50.0	152	0.034	37.9	4.07	0.62	1.14	2.04	3.78
50.0	168	0.041	37.6	4.50	0.75	1.09	2.25	4.04
50.0	184	0.048	37.1	4.92	0.88	1.02	2.46	4.32
50.0	200	0.055	36.5	5.34	0.99	0.93	2.67	4.62
50.0	217	0.062	35.7	5.79	1.12	0.82	2.89	4.95
50.0	234	0.069	34.9	6.23	1.25	0.71	3.12	5.29
50.0	252	0.076	34.0	6.70	1.37	0.58	3.35	5.65
50.0	271	0.083	33.1	7.20	1.50	0.45	3.60	6.03
50.0	290	0.089	32.1	7.70	1.61	0.31	3.85	6.42
50.0	309	0.096	31.1	8.19	1.74	0.16	4.09	6.81
50.0	460	0.145	23.2	12.08	2.63	-0.98	6.04	9.90
50.0	507	0.159	20.7	13.28	2.88	-1.33	6.64	10.85
50.0	555	0.173	18.2	14.50	3.14	-1.69	7.25	11.82
50.0	603	0.186	15.7	15.71	3.38	-2.06	7.86	12.80
50.0	650	0.200	13.2	16.90	3.62	-2.42	8.45	13.75
50.0	698	0.213	10.7	18.10	3.86	-2.78	9.05	14.71
50.0	745	0.226	8.3	19.27	4.10	-3.13	9.64	15.64
50.0	790	0.241	6.0	20.38	4.37	-3.46	10.19	16.53
50.0	834	0.255	3.9	21.45	4.63	-3.77	10.73	17.37
50.0	875	0.269	1.9	22.45	4.89	-4.04	11.22	18.15
50.0	913	0.283	0.2	23.36	5.14	-4.29	11.68	18.85
50.0	947	0.296	-1.3	24.17	5.38	-4.50	12.08	19.47
50.0	963	0.303	-2.0	24.55	5.50	-4.60	12.27	19.75



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-114	Consolidation Pressure :	40.0 psi
Depth(ft):	63	Initial Sample Height:	5.526 in
Sample No.:	15	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.525 in
Sample Description:	Olive Gray Sand w/silt	Final Sample Area (A)*:	5.364 sq. in.
		Induced OCR=	1.0

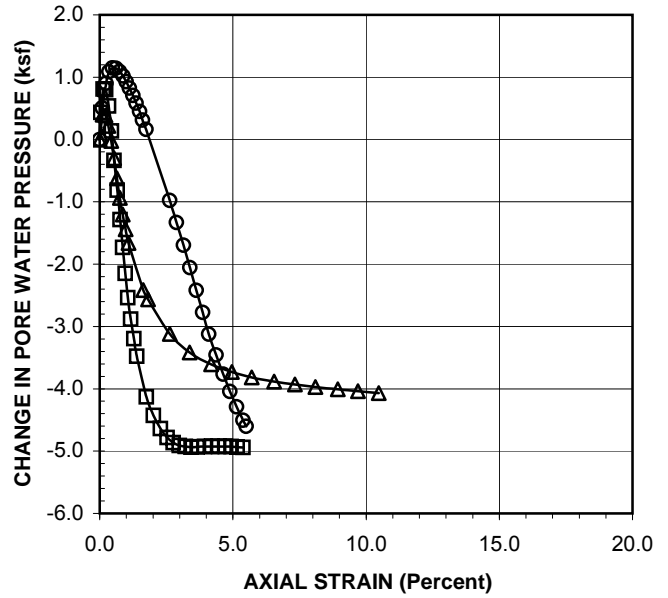
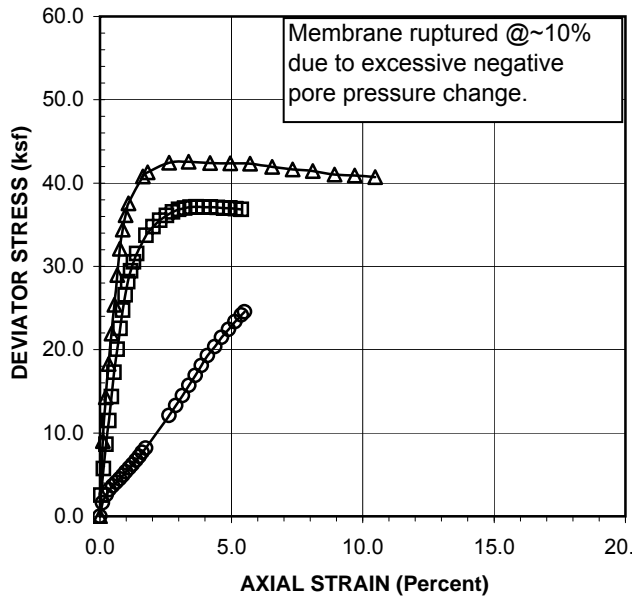
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	30.0	0.00	-0.01	0.00	0.00	5.76
70.0	95	0.002	33.0	2.55	0.04	0.43	1.27	6.60
70.0	214	0.007	35.6	5.74	0.13	0.81	2.87	7.82
70.0	323	0.013	35.6	8.65	0.23	0.80	4.33	9.29
70.0	429	0.019	33.7	11.48	0.34	0.54	5.74	10.96
70.0	538	0.025	31.0	14.38	0.44	0.14	7.19	12.81
70.0	648	0.030	27.7	17.30	0.54	-0.34	8.65	14.75
70.0	752	0.036	24.4	20.05	0.66	-0.81	10.03	16.60
70.0	847	0.042	21.1	22.56	0.77	-1.29	11.28	18.33
70.0	930	0.048	18.0	24.75	0.87	-1.73	12.37	19.87
70.0	1000	0.053	15.1	26.58	0.96	-2.15	13.29	21.20
70.0	1060	0.059	12.4	28.15	1.06	-2.54	14.08	22.37
70.0	1110	0.065	10.0	29.45	1.17	-2.88	14.72	23.37
70.0	1153	0.071	7.8	30.55	1.28	-3.20	15.28	24.24
70.0	1191	0.077	5.8	31.52	1.40	-3.48	15.76	25.00
70.0	1279	0.097	1.3	33.73	1.75	-4.13	16.87	26.76
70.0	1321	0.112	-0.8	34.75	2.02	-4.43	17.37	27.56
70.0	1354	0.126	-2.2	35.52	2.28	-4.64	17.76	28.16
70.0	1380	0.140	-3.2	36.11	2.54	-4.78	18.05	28.59
70.0	1400	0.153	-3.8	36.54	2.76	-4.87	18.27	28.90
70.0	1414	0.165	-4.1	36.82	2.99	-4.91	18.41	29.08
70.0	1424	0.178	-4.2	36.99	3.22	-4.93	18.50	29.19
70.0	1432	0.190	-4.3	37.12	3.43	-4.93	18.56	29.26
70.0	1436	0.203	-4.3	37.13	3.67	-4.93	18.57	29.26
70.0	1439	0.218	-4.2	37.11	3.94	-4.93	18.55	29.24
70.0	1443	0.232	-4.2	37.11	4.21	-4.93	18.55	29.24
70.0	1445	0.247	-4.2	37.06	4.47	-4.92	18.53	29.21
70.0	1446	0.261	-4.2	36.98	4.72	-4.93	18.49	29.18
70.0	1449	0.273	-4.2	36.98	4.94	-4.93	18.49	29.18
70.0	1450	0.286	-4.3	36.91	5.17	-4.94	18.46	29.15
70.0	1451	0.298	-4.3	36.85	5.39	-4.94	18.43	29.13



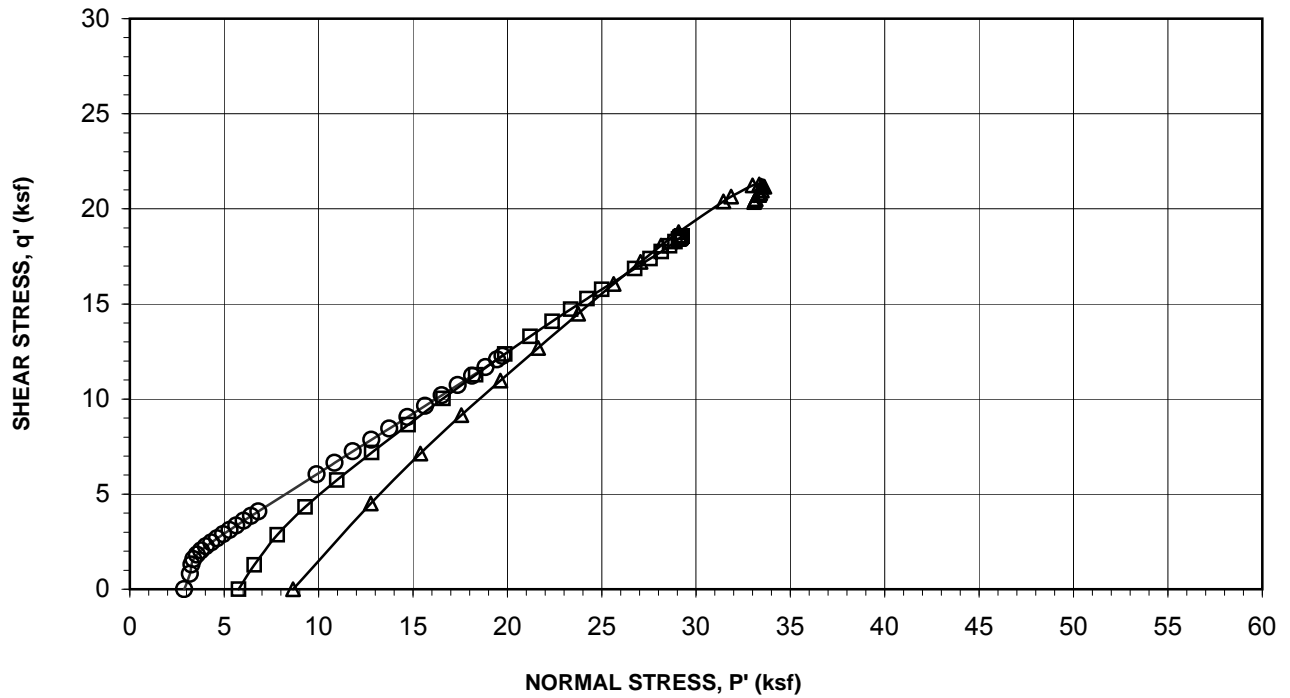
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-114	Consolidation Pressure :	60.0 psi
Depth(ft):	63	Initial Sample Height:	5.526 in
Sample No.:	15	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.524 in
Sample Description:	Olive Gray Sand w/silt	Final Sample Area (A)*:	5.366 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	337	0.006	32.8	9.03	0.11	0.40	4.52	12.76
90.0	533	0.012	32.7	14.27	0.22	0.39	7.14	15.39
90.0	684	0.018	31.5	18.30	0.33	0.22	9.15	17.57
90.0	821	0.024	29.8	21.94	0.43	-0.02	10.97	19.63
90.0	951	0.030	27.9	25.38	0.54	-0.30	12.69	21.63
90.0	1087	0.036	25.7	28.98	0.65	-0.62	14.49	23.75
90.0	1206	0.042	23.5	32.12	0.76	-0.94	16.06	25.64
90.0	1294	0.048	21.6	34.42	0.87	-1.20	17.21	27.06
90.0	1360	0.054	20.0	36.14	0.98	-1.44	18.07	28.15
90.0	1415	0.060	18.5	37.56	1.09	-1.66	18.78	29.08
90.0	1545	0.090	13.2	40.78	1.63	-2.41	20.39	31.45
90.0	1567	0.100	12.2	41.29	1.81	-2.56	20.64	31.85
90.0	1625	0.145	8.4	42.46	2.63	-3.12	21.23	32.99
90.0	1642	0.186	6.3	42.58	3.37	-3.42	21.29	33.35
90.0	1650	0.231	5.0	42.42	4.19	-3.61	21.21	33.46
90.0	1661	0.274	4.1	42.36	4.96	-3.73	21.18	33.55
90.0	1673	0.315	3.5	42.33	5.71	-3.82	21.17	33.62
90.0	1672	0.362	3.0	41.93	6.55	-3.88	20.96	33.49
90.0	1675	0.405	2.7	41.65	7.33	-3.93	20.83	33.40
90.0	1681	0.447	2.4	41.46	8.10	-3.97	20.73	33.34
90.0	1679	0.494	2.2	41.03	8.93	-4.01	20.52	33.16
90.0	1688	0.536	1.9	40.90	9.70	-4.04	20.45	33.13
90.0	1695	0.579	1.7	40.72	10.48	-4.07	20.36	33.07

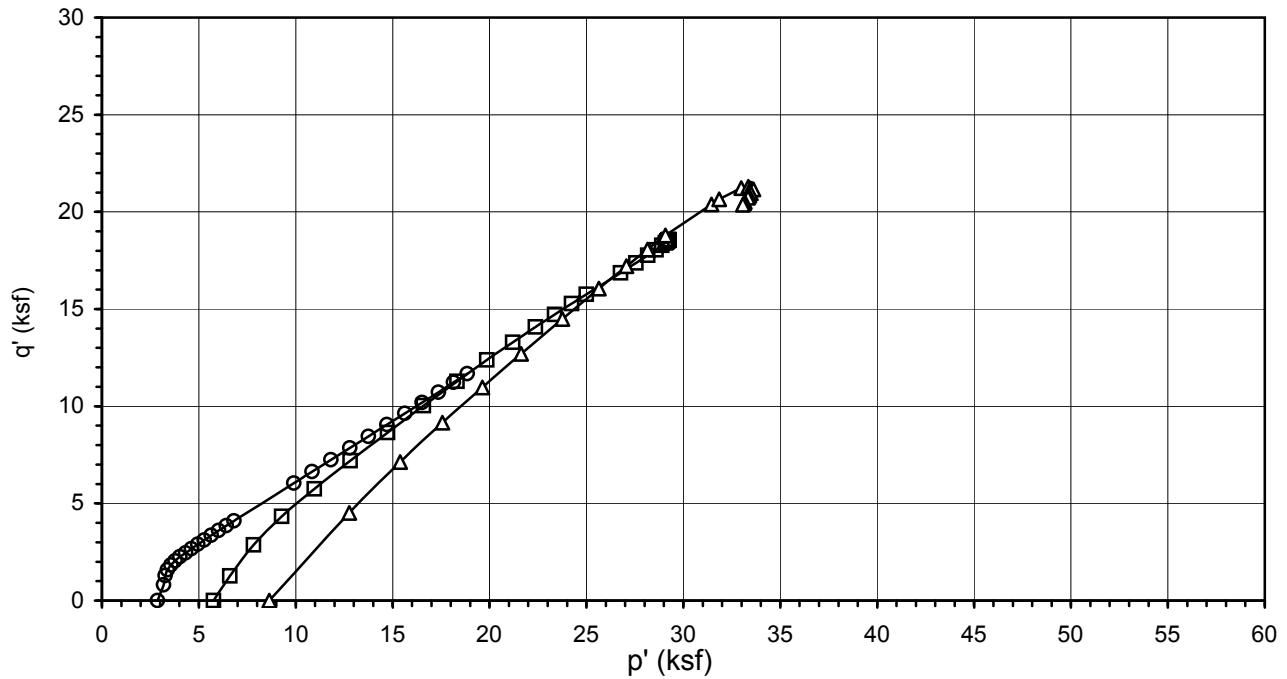


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi

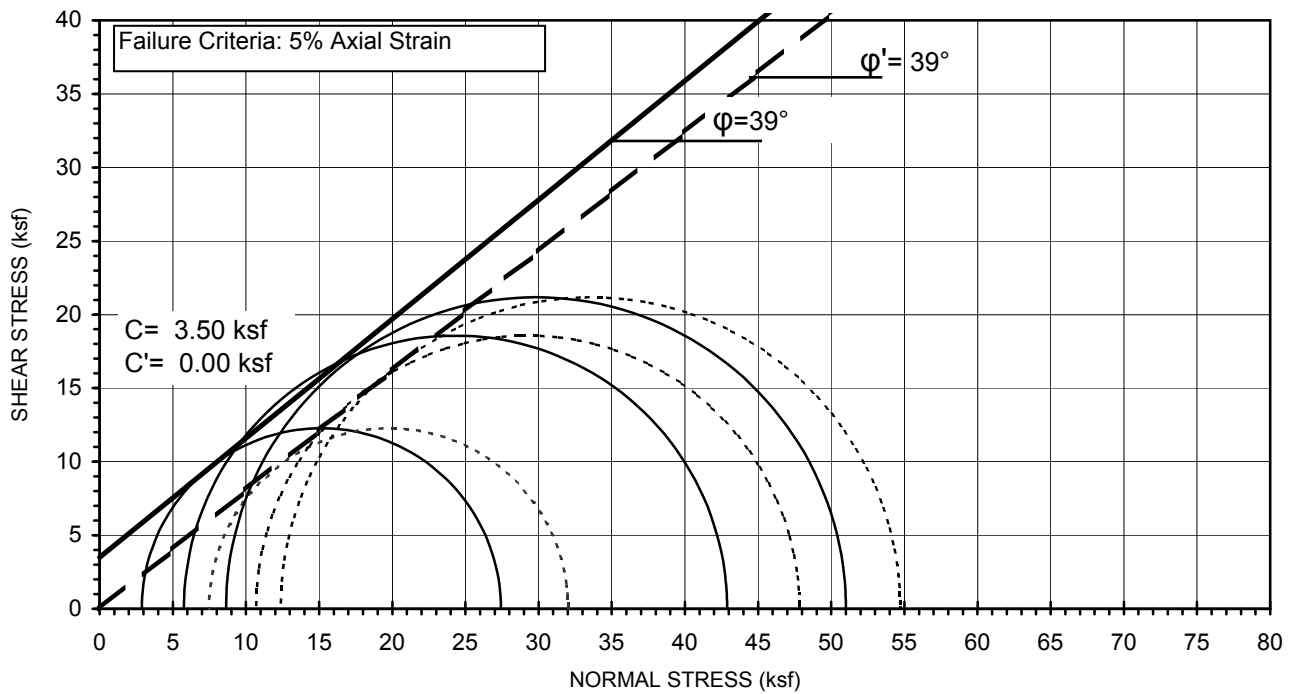


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Gray Sand w/silt
Test Pit:	G-114	Avg. Dry Unit Weight (pcf):	115.0
Sample No.:	15	Avg. Initial Moisture Content (%):	12.2
Depth (ft):	63	Confining Pressure:	20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



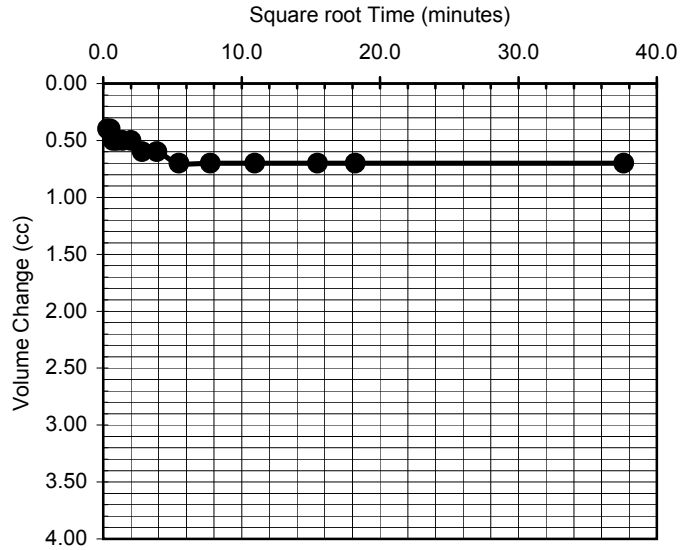
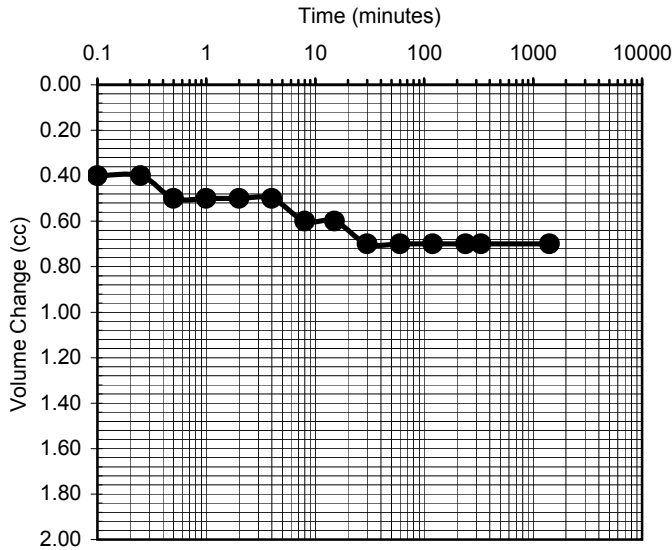
LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-114
 Sample No.: 15
 Depth (ft): 63

Sample Type: Mod. Cal.
 Sample Description: Olive Gray Sand w/silt
 Avg. Dry Unit Weight (pcf): 115.0
 Avg. Initial Moisture Content (%): 12.2
 Confining Pressure: 20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-114	Sample Type:	Mod. Cal.
Sample No.:	15	Soil Description:	Olive Gray Sand w/silt
Depth (feet):	63	Eff. Confining Pressure (psi):	40.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.4000
0.25	0.4000
0.5	0.5000
1	0.5000
2	0.5000
4	0.5000
8	0.6000
15	0.6000
30	0.7000
60	0.7000
120	0.7000
240	0.7000
332	0.7000
1415	0.7000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.4000
0.5000	0.4000
0.7071	0.5000
1.0000	0.5000
1.4142	0.5000
2.0000	0.5000
2.8284	0.6000
3.8730	0.6000
5.4772	0.7000
7.7460	0.7000
10.9545	0.7000
15.4919	0.7000
18.2209	0.7000
37.6165	0.7000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/22/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	06-24-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-29-11
Test Pit:	G-124	Reviewed by:	AP	Date:	06-29-11
Sample No.:	-	Sample Description:	Olive Gray Sandy Clay		
Depth(ft):	20.5				
Sample Type:	Mod. Cal.	Confining Pressure =	5.0 psi		

Diameter (in)	<u>2.609</u>	<u>2.609</u>	<u>2.609</u>	Avg. =	2.609
Height (in)	<u>4.989</u>	<u>4.989</u>	<u>4.989</u>	Avg. =	4.989

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.346	5.359
Moisture Content (%)	23.84	24.91
Wet Weight (gms)	867.88	1023.07
Dry Weight (gms)	700.82	848.49
Container Weight (gms)	0.00	147.67
Density and Saturation		
Wet Weight (gms)	867.88	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.0	
Dry Density (pcf)	100.1	
Initial Void Ratio	0.683	
% Saturation	94.2	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	35.0	Initial Burette Ht.(cm)=	55.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	55.7
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	4.978
Induced OCR =	1.0	Initial Volume (cu.in)=	26.672
Change in Ht. of Specimen (in) =	0.0111	Final Volume (cu.in) =	26.678

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	3.06
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	0.56
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.62
		Axial Strain (%) =	5.03



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Olive Gray Sandy Clay**
 Depth(ft): **20.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 15.0 psi**

Diameter (in)	<u>2.609</u>	<u>2.609</u>	<u>2.609</u>	Avg. =	2.609
Height (in)	<u>4.989</u>	<u>4.989</u>	<u>4.989</u>	Avg. =	4.989

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.346	5.284
Moisture Content (%)	23.84	24.91
Wet Weight (gms)	867.88	1023.07
Dry Weight (gms)	700.82	848.49
Container Weight (gms)	0.00	147.67
Density and Saturation		
Wet Weight (gms)	867.88	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.0	
Dry Density (pcf)	100.1	
Initial Void Ratio	0.683	
% Saturation	94.2	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>45.0</u>	Initial Burette Ht.(cm)=	<u>55.6</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>50.5</u>
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	<u>4.989</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.672</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>26.361</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.15
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	1.41
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.56
		Axial Strain (%) =	5.04



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Olive Gray Sandy Clay**
 Depth(ft): **20.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.609</u>	<u>2.609</u>	<u>2.609</u>	Avg. =	2.609
Height (in)	<u>4.989</u>	<u>4.989</u>	<u>4.989</u>	Avg. =	4.989

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.346	5.292
Moisture Content (%)	23.84	24.91
Wet Weight (gms)	867.88	1023.07
Dry Weight (gms)	700.82	848.49
Container Weight (gms)	0.00	147.67
Density and Saturation		
Wet Weight (gms)	867.88	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.0	
Dry Density (pcf)	100.1	
Initial Void Ratio	0.683	
% Saturation	94.2	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	50.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	46.0
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	4.989
Induced OCR =	1.0	Initial Volume (cu.in)=	26.672
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.403

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	7.02
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.43
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	9.45
		Axial Strain (%) =	5.43



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	35.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	5.0 psi
Depth(ft):	20.5	Initial Sample Height:	4.989 in
Sample No.:	-	Initial Area of Sample:	5.346 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.978 in
Sample Description:	Olive Gray Sandy Clay	Final Sample Area (A)*:	5.359 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
35.0	1	0.000	30.1	0.03	0.00	0.00	0.01	0.73
35.0	22	0.003	31.2	0.59	0.06	0.15	0.30	0.86
35.0	41	0.014	32.6	1.10	0.29	0.35	0.55	0.92
35.0	51	0.026	33.0	1.36	0.53	0.42	0.68	0.98
35.0	57	0.038	33.3	1.52	0.77	0.45	0.76	1.03
35.0	63	0.051	33.3	1.68	1.02	0.46	0.84	1.10
35.0	68	0.063	33.3	1.80	1.26	0.46	0.90	1.16
35.0	73	0.074	33.3	1.93	1.49	0.46	0.97	1.23
35.0	77	0.086	33.2	2.03	1.73	0.45	1.02	1.29
35.0	81	0.098	33.2	2.13	1.96	0.43	1.07	1.35
35.0	85	0.110	33.0	2.23	2.22	0.42	1.12	1.42
35.0	88	0.123	32.9	2.31	2.46	0.40	1.15	1.47
35.0	92	0.134	32.8	2.41	2.69	0.38	1.20	1.54
35.0	95	0.147	32.6	2.48	2.95	0.36	1.24	1.60
35.0	98	0.159	32.4	2.55	3.19	0.33	1.27	1.66
35.0	101	0.171	32.3	2.62	3.44	0.31	1.31	1.72
35.0	104	0.183	32.1	2.69	3.68	0.29	1.35	1.78
35.0	107	0.195	31.9	2.76	3.92	0.26	1.38	1.84
35.0	110	0.208	31.8	2.83	4.17	0.24	1.42	1.90
35.0	113	0.219	31.6	2.90	4.40	0.22	1.45	1.95
35.0	116	0.232	31.5	2.97	4.65	0.20	1.49	2.01
35.0	119	0.244	31.3	3.04	4.90	0.17	1.52	2.07
35.0	120	0.251	31.2	3.06	5.03	0.16	1.53	2.09



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	15.0 psi
Depth(ft):	20.5	Initial Sample Height:	4.989 in
Sample No.:	-	Initial Area of Sample:	5.346 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.989 in
Sample Description:	Olive Gray Sandy Clay	Final Sample Area (A)*:	5.284 sq. in.
		Induced OCR=	1.0

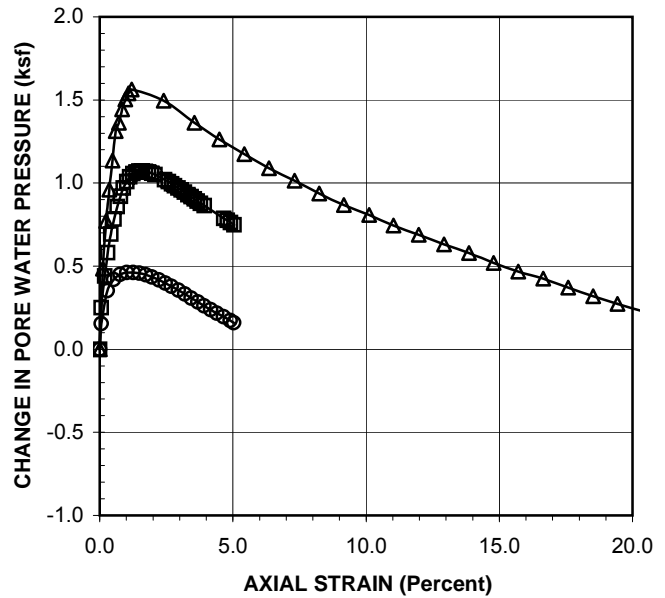
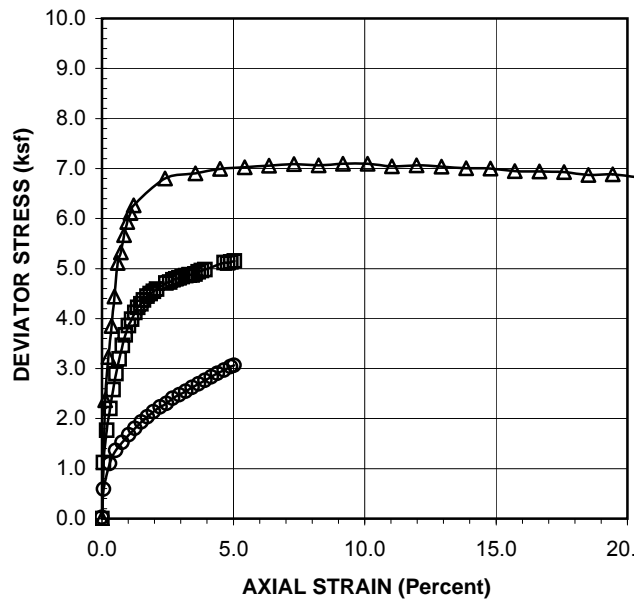
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	41	0.003	31.7	1.12	0.06	0.25	0.56	2.47
45.0	65	0.009	33.1	1.77	0.19	0.44	0.88	2.60
45.0	81	0.015	34.0	2.20	0.30	0.58	1.10	2.68
45.0	95	0.021	34.8	2.58	0.42	0.69	1.29	2.76
45.0	107	0.027	35.4	2.90	0.54	0.78	1.45	2.83
45.0	118	0.033	36.0	3.19	0.66	0.86	1.60	2.90
45.0	128	0.039	36.4	3.46	0.78	0.92	1.73	2.97
45.0	136	0.044	36.7	3.67	0.89	0.97	1.84	3.03
45.0	143	0.051	37.0	3.86	1.02	1.01	1.93	3.08
45.0	148	0.057	37.2	3.99	1.13	1.04	1.99	3.12
45.0	153	0.062	37.3	4.12	1.25	1.06	2.06	3.16
45.0	157	0.068	37.4	4.22	1.37	1.07	2.11	3.20
45.0	160	0.074	37.4	4.30	1.48	1.07	2.15	3.24
45.0	163	0.079	37.5	4.37	1.59	1.07	2.19	3.27
45.0	166	0.085	37.4	4.45	1.71	1.07	2.22	3.31
45.0	168	0.092	37.4	4.49	1.83	1.07	2.25	3.34
45.0	170	0.098	37.4	4.54	1.96	1.06	2.27	3.37
45.0	172	0.104	37.3	4.59	2.08	1.05	2.29	3.41
45.0	177	0.122	37.1	4.71	2.44	1.02	2.35	3.49
45.0	178	0.129	37.0	4.73	2.58	1.01	2.36	3.52
45.0	180	0.135	36.9	4.77	2.70	1.00	2.39	3.55
45.0	181	0.141	36.8	4.79	2.82	0.98	2.40	3.57
45.0	182	0.147	36.7	4.81	2.94	0.97	2.41	3.60
45.0	183	0.153	36.7	4.83	3.06	0.96	2.42	3.62
45.0	184	0.159	36.6	4.85	3.19	0.94	2.43	3.64
45.0	185	0.166	36.5	4.87	3.32	0.93	2.44	3.67
45.0	185	0.172	36.4	4.87	3.44	0.92	2.43	3.68
45.0	186	0.177	36.3	4.89	3.55	0.90	2.44	3.70
45.0	188	0.183	36.2	4.94	3.67	0.89	2.47	3.74
45.0	189	0.189	36.1	4.96	3.79	0.88	2.48	3.76
45.0	190	0.196	36.0	4.98	3.92	0.86	2.49	3.78
45.0	197	0.232	35.5	5.12	4.66	0.79	2.56	3.93
45.0	197	0.239	35.4	5.11	4.79	0.77	2.56	3.94
45.0	198	0.245	35.3	5.13	4.91	0.76	2.57	3.96
45.0	199	0.251	35.2	5.15	5.04	0.75	2.58	3.99



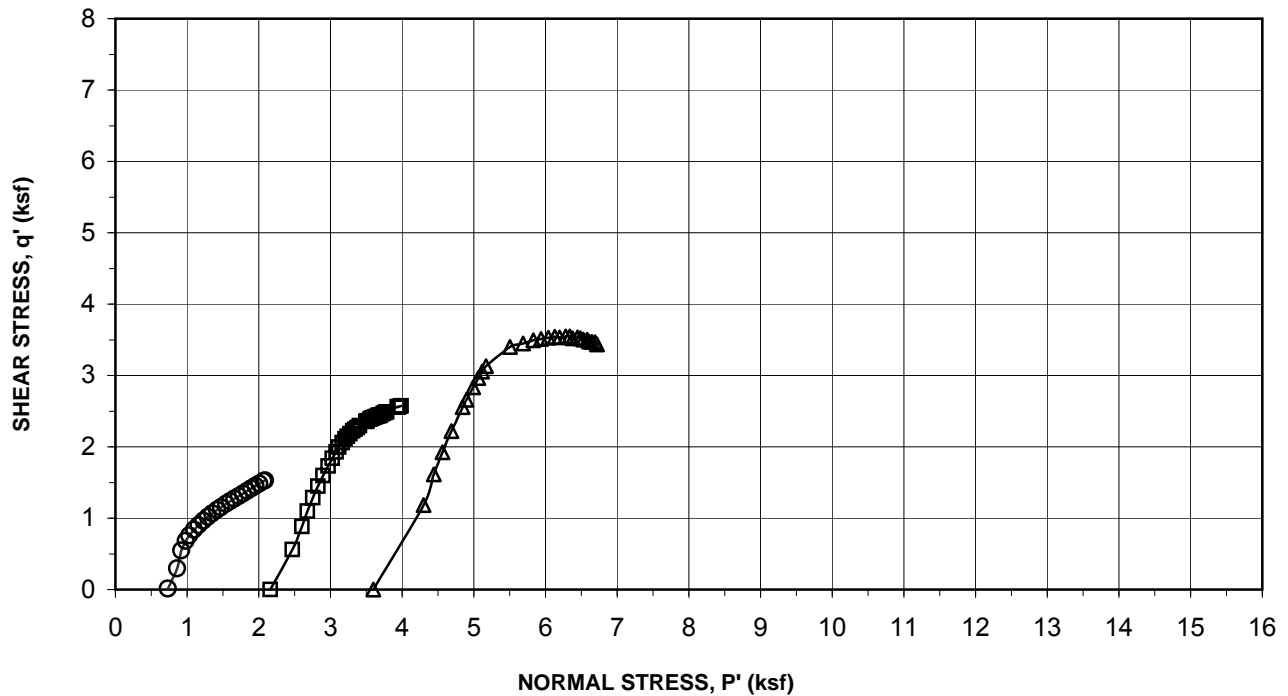
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	25.0 psi
Depth(ft):	20.5	Initial Sample Height:	4.989 in
Sample No.:	-	Initial Area of Sample:	5.346 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.989 in
Sample Description:	Olive Gray Sandy Clay	Final Sample Area (A)*:	5.292 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress (S1-S3)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(ksf)	(ksf)
55.0	0	0.000	30.0	0.00	0.00	0.00	0.00	3.60
55.0	87	0.006	33.4	2.36	0.12	0.48	1.18	4.30
55.0	119	0.012	35.4	3.23	0.24	0.77	1.62	4.44
55.0	142	0.018	36.7	3.85	0.36	0.96	1.92	4.56
55.0	164	0.024	37.9	4.44	0.48	1.13	2.22	4.69
55.0	189	0.030	39.1	5.11	0.60	1.31	2.56	4.84
55.0	197	0.036	39.5	5.32	0.72	1.36	2.66	4.90
55.0	210	0.042	40.0	5.67	0.84	1.44	2.83	4.99
55.0	220	0.048	40.4	5.93	0.96	1.50	2.96	5.06
55.0	227	0.054	40.7	6.11	1.08	1.54	3.05	5.12
55.0	233	0.060	40.9	6.26	1.20	1.56	3.13	5.17
55.0	256	0.120	40.4	6.80	2.41	1.50	3.40	5.50
55.0	263	0.178	39.5	6.90	3.56	1.36	3.45	5.69
55.0	269	0.224	38.8	6.99	4.49	1.26	3.50	5.83
55.0	273	0.271	38.2	7.02	5.43	1.17	3.51	5.94
55.0	277	0.317	37.6	7.06	6.36	1.09	3.53	6.04
55.0	281	0.365	37.0	7.09	7.31	1.01	3.54	6.13
55.0	283	0.411	36.5	7.07	8.24	0.94	3.53	6.20
55.0	287	0.457	36.0	7.09	9.17	0.87	3.55	6.28
55.0	290	0.504	35.6	7.09	10.11	0.81	3.55	6.34
55.0	291	0.550	35.2	7.04	11.03	0.74	3.52	6.38
55.0	295	0.597	34.8	7.07	11.97	0.69	3.53	6.44
55.0	297	0.645	34.4	7.04	12.92	0.63	3.52	6.49
55.0	299	0.691	34.0	7.01	13.86	0.58	3.50	6.53
55.0	302	0.738	33.6	7.00	14.79	0.52	3.50	6.58
55.0	303	0.784	33.2	6.95	15.72	0.47	3.47	6.61
55.0	306	0.831	33.0	6.94	16.65	0.42	3.47	6.65
55.0	309	0.877	32.6	6.93	17.59	0.37	3.46	6.69
55.0	310	0.924	32.2	6.87	18.52	0.32	3.44	6.72
55.0	314	0.970	31.9	6.88	19.43	0.27	3.44	6.77
55.0	315	1.017	31.6	6.82	20.38	0.23	3.41	6.78
55.0	317	1.062	31.4	6.79	21.29	0.20	3.39	6.80
55.0	320	1.109	31.0	6.77	22.23	0.15	3.39	6.84
55.0	322	1.155	30.7	6.73	23.16	0.10	3.37	6.87
55.0	325	1.202	30.3	6.71	24.10	0.05	3.36	6.91

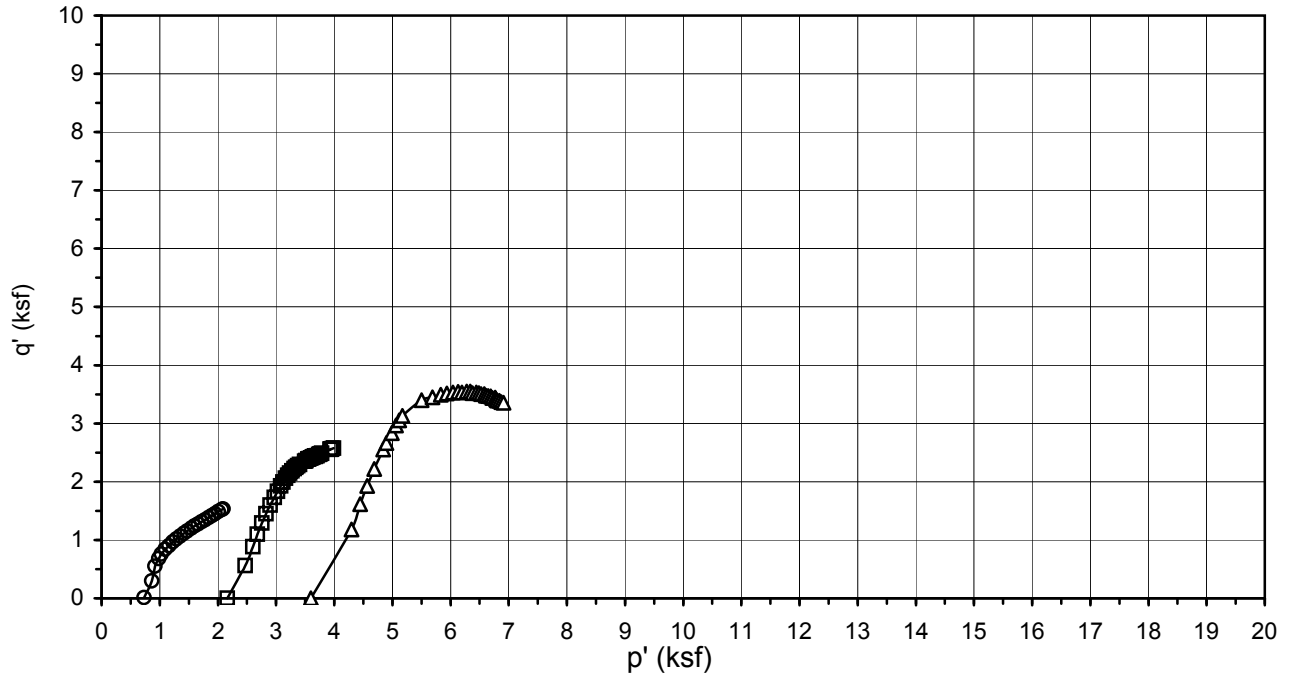


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi

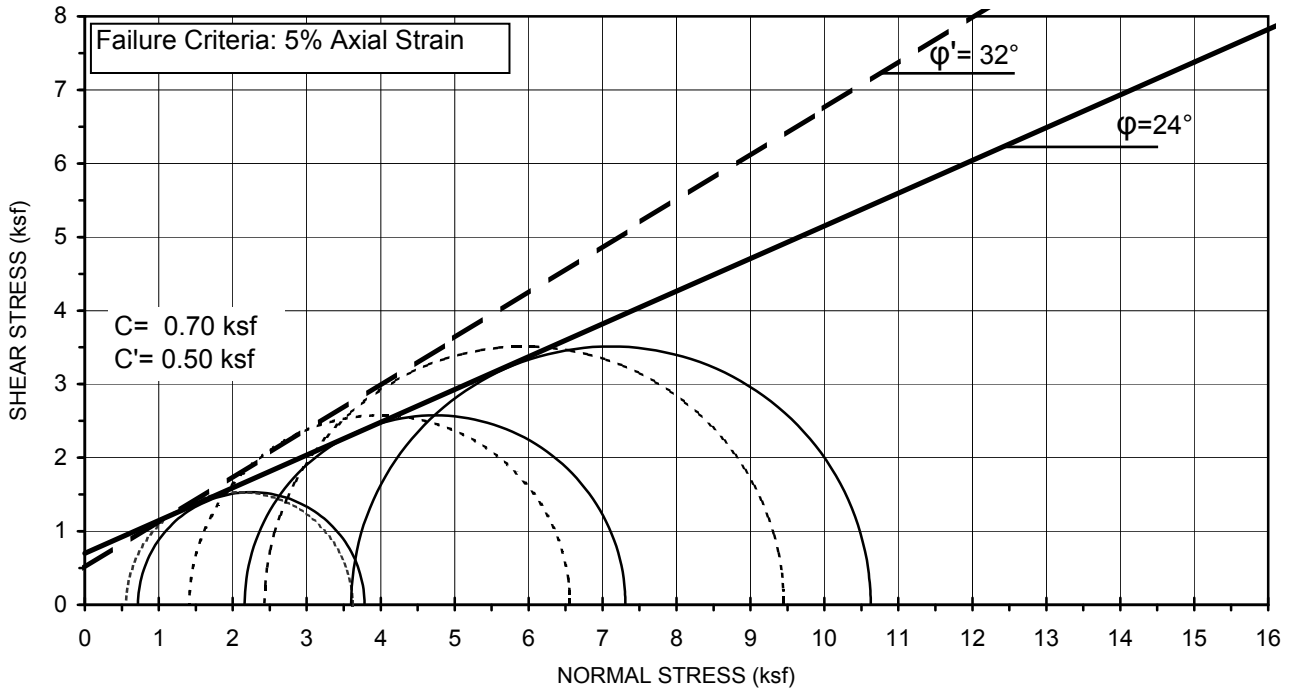


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Gray Sandy Clay
Test Pit:	G-124	Avg. Dry Unit Weight (pcf):	100.1
Sample No.:	-	Avg. Initial Moisture Content (%):	23.8
Depth (ft):	20.5	Confining Pressure:	5.0, 15.0, 25.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



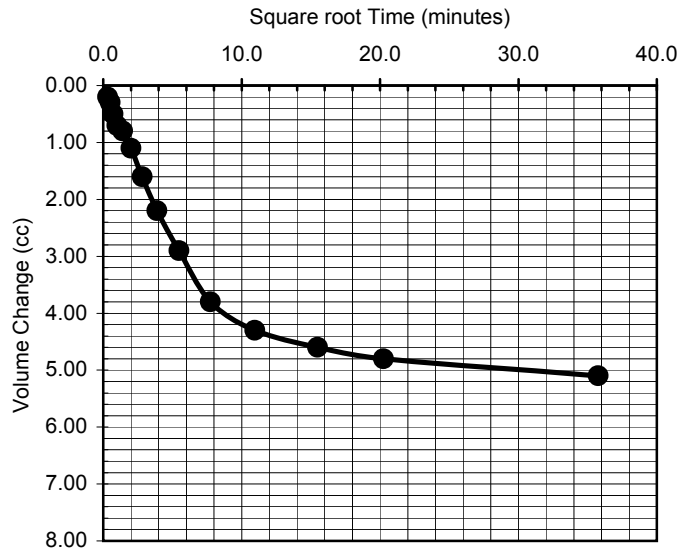
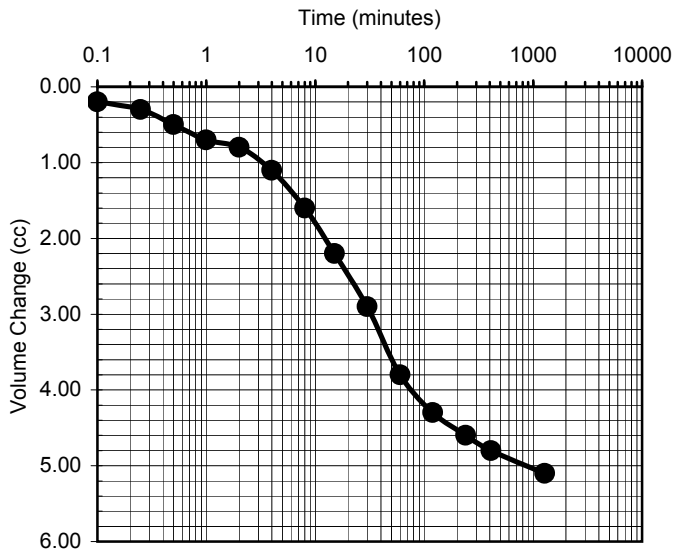
LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-124
 Sample No.: -
 Depth (ft): 20.5

Sample Type: Mod. Cal.
 Sample Description: Olive Gray Sandy Clay
 Avg. Dry Unit Weight (pcf): 100.1
 Avg. Initial Moisture Content (%): 23.8
 Confining Pressure: 5.0, 15.0, 25.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-124	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Olive Gray Sandy Clay
Depth (feet):	20.5	Eff. Confining Pressure (psi):	15.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.2000
0.25	0.3000
0.5	0.5000
1	0.7000
2	0.8000
4	1.1000
8	1.6000
15	2.2000
30	2.9000
60	3.8000
120	4.3000
240	4.6000
410	4.8000
1279	5.1000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.2000
0.5000	0.3000
0.7071	0.5000
1.0000	0.7000
1.4142	0.8000
2.0000	1.1000
2.8284	1.6000
3.8730	2.2000
5.4772	2.9000
7.7460	3.8000
10.9545	4.3000
15.4919	4.6000
20.2485	4.8000
35.7631	5.1000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	06/24/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Dk Gray Silty Sand with tar**
 Depth(ft): **50.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.612</u>	<u>2.612</u>	<u>2.612</u>	Avg. =	2.612
Height (in)	<u>5.524</u>	<u>5.524</u>	<u>5.524</u>	Avg. =	5.524

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.358	5.355
Moisture Content (%)	5.11	6.76
Wet Weight (gms)	94.88	1132.58
Dry Weight (gms)	92.69	1070.46
Container Weight (gms)	49.81	151.08
Density and Saturation		
Wet Weight (gms)	964.99	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.2	
Dry Density (pcf)	118.2	
Initial Void Ratio	0.426	
% Saturation	32.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	90	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	68.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	62.7
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.466
Induced OCR =	1.0	Initial Volume (cu.in)=	29.600
Change in Ht. of Specimen (in) =	0.0577	Final Volume (cu.in) =	29.270

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.19
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.61
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.79
		Axial Strain (%) =	4.99



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Dk Gray Silty Sand with tar**
 Depth(ft): **50.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 35.0 psi**

Diameter (in)	<u>2.612</u>	<u>2.612</u>	<u>2.612</u>	Avg. =	2.612
Height (in)	<u>5.524</u>	<u>5.524</u>	<u>5.524</u>	Avg. =	5.524

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.358	5.256
Moisture Content (%)	5.11	6.76
Wet Weight (gms)	94.88	1132.58
Dry Weight (gms)	92.69	1070.46
Container Weight (gms)	49.81	151.08
Density and Saturation		
Wet Weight (gms)	964.99	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.2	
Dry Density (pcf)	118.2	
Initial Void Ratio	0.426	
% Saturation	32.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	90	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	67.7
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	58.4
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	5.524
Induced OCR=	1.0	Initial Volume (cu.in)=	29.600
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	29.032

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	23.51
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.53
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	29.04
		Axial Strain (%) =	5.08



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Dk Gray Silty Sand with tar**
 Depth(ft): **50.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 50.0 psi**

Diameter (in)	<u>2.612</u>	<u>2.612</u>	<u>2.612</u>	Avg. =	2.612
Height (in)	<u>5.524</u>	<u>5.524</u>	<u>5.524</u>	Avg. =	5.524

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.358	5.331
Moisture Content (%)	5.11	6.76
Wet Weight (gms)	94.88	1132.58
Dry Weight (gms)	92.69	1070.46
Container Weight (gms)	49.81	151.08
Density and Saturation		
Wet Weight (gms)	964.99	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.2	
Dry Density (pcf)	118.2	
Initial Void Ratio	0.426	
% Saturation	32.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	90	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	58.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	55.9
Eff. Consol. Stress (psi) =	50.0	Final Height (in)=	5.524
Induced OCR =	1.0	Initial Volume (cu.in)=	29.600
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	29.447

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	35.43
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	9.08
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	44.51
		Axial Strain (%) =	5.31



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	20.0 psi
Depth(ft):	50.5	Initial Sample Height:	5.524 in
Sample No.:	-	Initial Area of Sample:	5.358 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.466 in
Sample Description:	Dk Gray Silty Sand with tar	Final Sample Area (A)*:	5.355 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1+S3)/2 (ksf)
50.0	0	0.000	30.1	0.00	0.00	0.00	0.00	2.88
50.0	38	0.004	32.1	1.02	0.07	0.30	0.51	3.09
50.0	49	0.016	32.7	1.31	0.29	0.38	0.66	3.15
50.0	56	0.028	33.3	1.50	0.51	0.46	0.75	3.17
50.0	66	0.040	34.1	1.76	0.73	0.58	0.88	3.18
50.0	75	0.051	35.0	2.00	0.94	0.71	1.00	3.17
50.0	79	0.063	35.5	2.10	1.16	0.77	1.05	3.16
50.0	81	0.076	35.8	2.15	1.38	0.83	1.07	3.13
50.0	85	0.088	36.2	2.25	1.60	0.88	1.12	3.12
50.0	92	0.099	36.8	2.43	1.82	0.96	1.21	3.13
50.0	97	0.111	37.3	2.56	2.04	1.04	1.28	3.12
50.0	102	0.124	37.8	2.68	2.26	1.11	1.34	3.11
50.0	110	0.136	37.8	2.88	2.48	1.11	1.44	3.21
50.0	115	0.148	37.9	3.01	2.70	1.13	1.50	3.26
50.0	120	0.159	38.0	3.13	2.92	1.13	1.57	3.31
50.0	120	0.172	38.0	3.13	3.15	1.14	1.57	3.31
50.0	126	0.185	37.8	3.28	3.38	1.11	1.64	3.41
50.0	128	0.196	38.7	3.32	3.59	1.24	1.66	3.30
50.0	135	0.208	39.6	3.48	3.81	1.37	1.74	3.25
50.0	140	0.219	40.0	3.61	4.01	1.43	1.81	3.26
50.0	153	0.232	40.1	3.94	4.24	1.44	1.97	3.41
50.0	167	0.243	39.9	4.29	4.45	1.42	2.15	3.61
50.0	203	0.273	38.9	5.19	4.99	1.27	2.59	4.20



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	35.0 psi
Depth(ft):	50.5	Initial Sample Height:	5.524 in
Sample No.:	-	Initial Area of Sample:	5.358 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.524 in
Sample Description:	Dk Gray Silty Sand with tar	Final Sample Area (A)*:	5.256 sq. in.
		Induced OCR=	1.0

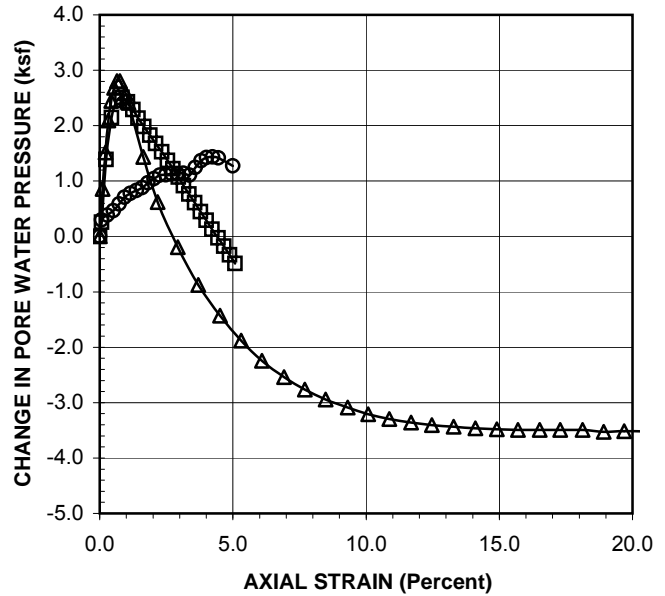
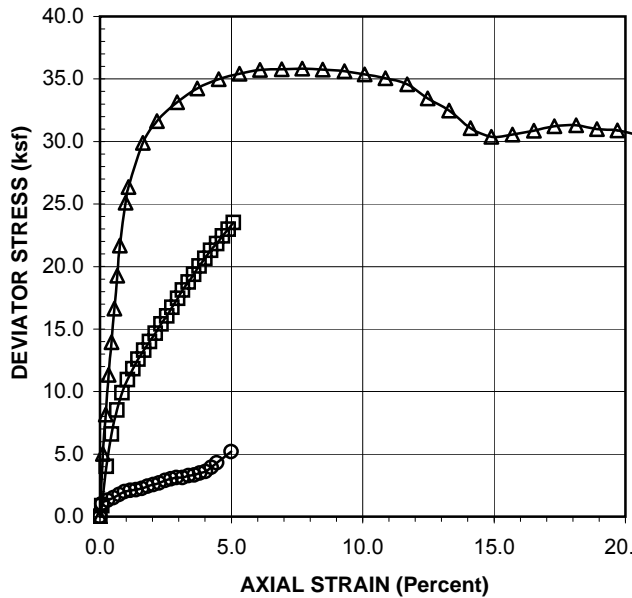
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	1	0.000	30.0	0.03	0.00	0.00	0.01	5.05
65.0	32	0.004	31.8	0.88	0.07	0.26	0.44	5.22
65.0	147	0.014	39.7	4.02	0.24	1.39	2.01	5.66
65.0	242	0.024	44.9	6.60	0.44	2.15	3.30	6.20
65.0	313	0.036	47.1	8.52	0.64	2.46	4.26	6.84
65.0	365	0.047	47.4	9.92	0.84	2.51	4.96	7.49
65.0	404	0.058	46.9	10.95	1.04	2.43	5.48	8.09
65.0	437	0.069	45.9	11.82	1.25	2.29	5.91	8.66
65.0	466	0.080	44.9	12.58	1.45	2.14	6.29	9.20
65.0	494	0.092	43.8	13.31	1.66	1.98	6.65	9.71
65.0	521	0.104	42.7	14.01	1.88	1.83	7.00	10.21
65.0	547	0.116	41.7	14.67	2.10	1.68	7.34	10.70
65.0	576	0.128	40.6	15.41	2.32	1.52	7.71	11.22
65.0	601	0.140	39.6	16.05	2.54	1.37	8.02	11.69
65.0	628	0.152	38.5	16.73	2.75	1.22	8.37	12.19
65.0	656	0.163	37.5	17.44	2.96	1.07	8.72	12.69
65.0	683	0.174	36.4	18.12	3.15	0.92	9.06	13.18
65.0	708	0.185	35.3	18.75	3.36	0.76	9.37	13.65
65.0	733	0.197	34.2	19.37	3.57	0.61	9.68	14.12
65.0	760	0.209	33.2	20.04	3.78	0.45	10.02	14.61
65.0	785	0.221	32.1	20.65	4.00	0.29	10.32	15.07
65.0	811	0.233	31.0	21.28	4.22	0.13	10.64	15.55
65.0	834	0.246	29.9	21.84	4.44	-0.03	10.92	15.98
65.0	859	0.258	28.8	22.44	4.66	-0.18	11.22	16.43
65.0	882	0.270	27.7	22.99	4.88	-0.33	11.49	16.87
65.0	904	0.281	26.6	23.51	5.08	-0.49	11.76	17.28



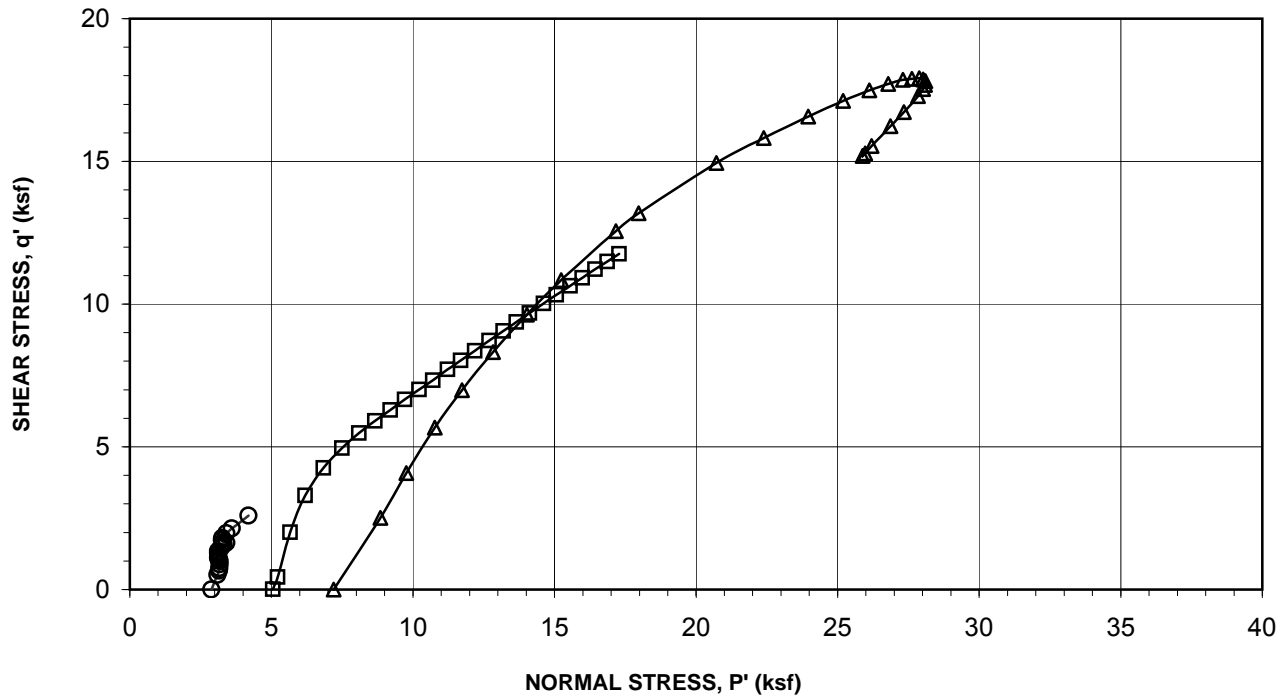
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	50.0 psi
Depth(ft):	50.5	Initial Sample Height:	5.524 in
Sample No.:	-	Initial Area of Sample:	5.358 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.524 in
Sample Description:	Dk Gray Silty Sand with tar	Final Sample Area (A)*:	5.331 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
80.0	0	0.000	30.0	0.00	0.00	0.00	0.00	7.20
80.0	186	0.006	36.0	5.02	0.11	0.86	2.51	8.85
80.0	303	0.012	40.6	8.17	0.22	1.52	4.08	9.77
80.0	421	0.018	44.6	11.34	0.33	2.09	5.67	10.78
80.0	519	0.024	47.0	13.96	0.43	2.44	6.98	11.74
80.0	619	0.030	48.7	16.63	0.54	2.69	8.32	12.83
80.0	718	0.036	49.5	19.27	0.65	2.81	9.63	14.03
80.0	809	0.042	49.5	21.69	0.76	2.80	10.84	15.24
80.0	939	0.054	48.0	25.12	0.98	2.59	12.56	17.17
80.0	987	0.060	46.8	26.37	1.09	2.41	13.19	17.97
80.0	1125	0.090	40.0	29.89	1.63	1.43	14.95	20.71
80.0	1197	0.120	34.4	31.63	2.17	0.62	15.82	22.39
80.0	1264	0.162	28.7	33.14	2.94	-0.19	16.57	23.96
80.0	1316	0.205	24.0	34.23	3.70	-0.88	17.12	25.19
80.0	1356	0.249	20.1	34.98	4.51	-1.43	17.49	26.12
80.0	1385	0.293	17.0	35.43	5.31	-1.88	17.71	26.79
80.0	1408	0.337	14.5	35.72	6.09	-2.24	17.86	27.30
80.0	1423	0.382	12.4	35.78	6.92	-2.54	17.89	27.63
80.0	1437	0.426	10.8	35.83	7.70	-2.76	17.91	27.88
80.0	1446	0.468	9.6	35.75	8.48	-2.94	17.87	28.02
80.0	1454	0.514	8.6	35.62	9.31	-3.09	17.81	28.10
80.0	1456	0.557	7.8	35.37	10.08	-3.21	17.68	28.09
80.0	1456	0.600	7.2	35.06	10.87	-3.29	17.53	28.02
80.0	1449	0.646	6.7	34.56	11.69	-3.36	17.28	27.84
80.0	1415	0.689	6.4	33.46	12.47	-3.41	16.73	27.34
80.0	1386	0.734	6.2	32.47	13.29	-3.44	16.23	26.87
80.0	1339	0.779	6.0	31.07	14.10	-3.46	15.53	26.20
80.0	1322	0.823	5.9	30.39	14.90	-3.48	15.19	25.88
80.0	1342	0.867	5.8	30.56	15.70	-3.49	15.28	25.97
80.0	1369	0.912	5.8	30.87	16.51	-3.49	15.44	26.13
80.0	1398	0.955	5.8	31.23	17.29	-3.49	15.62	26.31
80.0	1415	1.001	5.8	31.30	18.12	-3.49	15.65	26.34
80.0	1415	1.045	5.6	31.00	18.92	-3.53	15.50	26.23
80.0	1424	1.088	5.6	30.90	19.69	-3.52	15.45	26.17
80.0	1420	1.135	5.6	30.48	20.54	-3.52	15.24	25.96

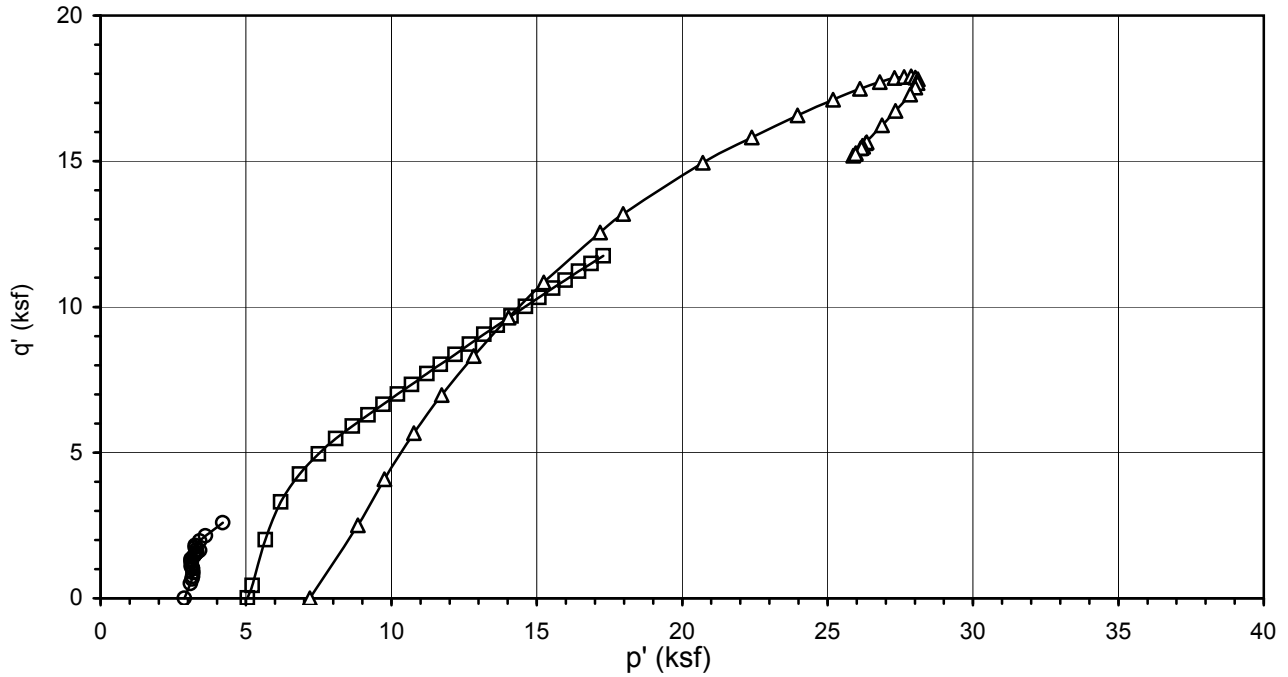


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi

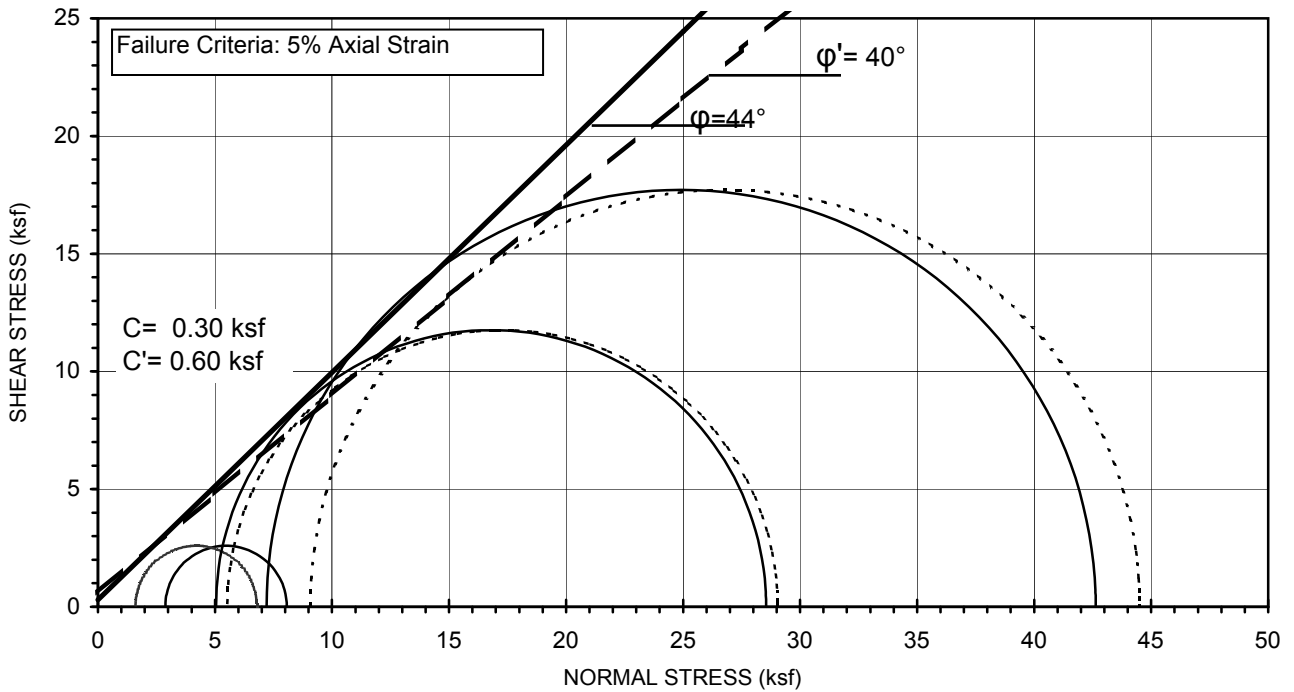


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dk Gray Silty Sand with tar
Test Pit:	G-124	Avg. Dry Unit Weight (pcf):	118.2
Sample No.:	-	Avg. Initial Moisture Content (%):	5.1
Depth (ft):	50.5	Confining Pressure:	20.0, 35.0, 50.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

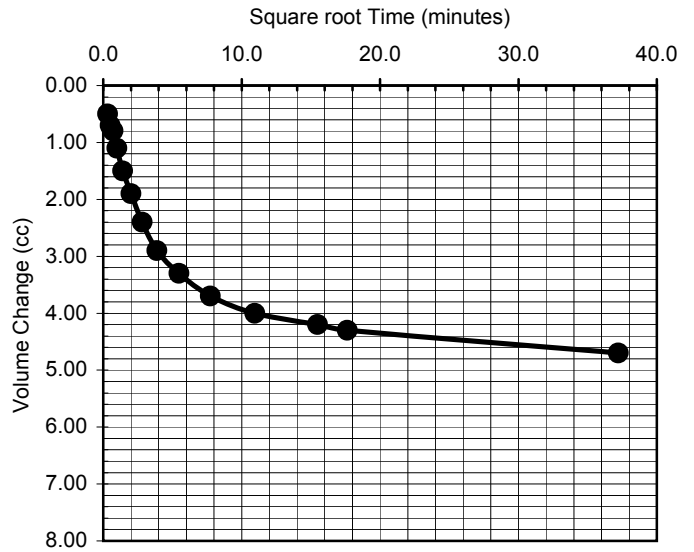
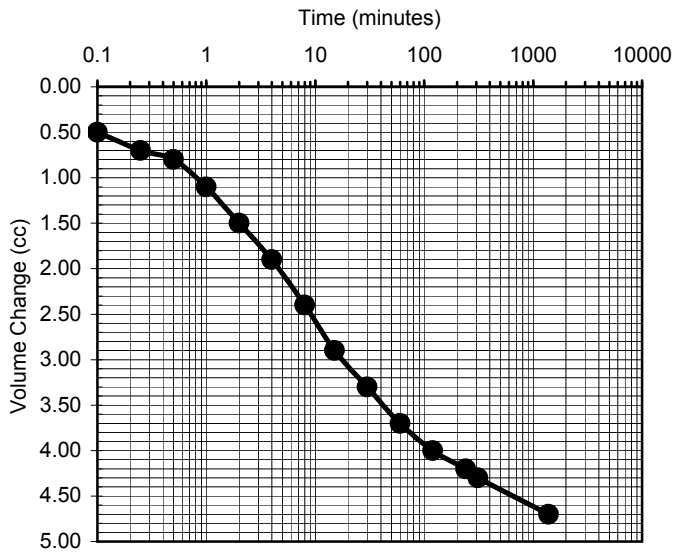


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dk Gray Silty Sand with tar
Test Pit:	G-124	Avg. Dry Unit Weight (pcf):	118.2
Sample No.:	-	Avg. Initial Moisture Content (%):	5.1
Depth (ft):	50.5	Confining Pressure:	20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-124	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Dk Gray Silty Sand with tar
Depth (feet):	50.5	Eff. Confining Pressure (psi):	35.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.5000
0.25	0.7000
0.5	0.8000
1	1.1000
2	1.5000
4	1.9000
8	2.4000
15	2.9000
30	3.3000
60	3.7000
120	4.0000
240	4.2000
311	4.3000
1386	4.7000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.5000
0.5000	0.7000
0.7071	0.8000
1.0000	1.1000
1.4142	1.5000
2.0000	1.9000
2.8284	2.4000
3.8730	2.9000
5.4772	3.3000
7.7460	3.7000
10.9545	4.0000
15.4919	4.2000
17.6352	4.3000
37.2290	4.7000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 06/24/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [06-24-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [06-29-11](#)
 Test Pit: [G-124](#) Reviewed by: [AP](#) Date: [06-29-11](#)
 Sample No.: - Sample Description: [Black Tar Sand](#)
 Depth(ft): [85.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 35.0 psi](#)

Diameter (in)	2.603	2.603	2.603	Avg. =	2.603
Height (in)	5.006	5.006	5.006	Avg. =	5.006

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.322	5.079
Moisture Content (%)	3.00	5.05
Wet Weight (gms)	889.11	1056.74
Dry Weight (gms)	863.20	1013.16
Container Weight (gms)	0.00	149.96
Density and Saturation		
Wet Weight (gms)	889.11	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.1	
Dry Density (pcf)	123.4	
Initial Void Ratio	0.365	
% Saturation	22.2	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	90	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	59.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	37.2
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	4.974
Induced OCR =	1.0	Initial Volume (cu.in)=	26.640
Change in Ht. of Specimen (in) =	0.0321	Final Volume (cu.in) =	25.261

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	20.04
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	3.65
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	23.69
		Axial Strain (%) =	5.12



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Black Tar Sand**
 Depth(ft): **85.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **50.0 psi**

Diameter (in)	<u>2.603</u>	<u>2.603</u>	<u>2.603</u>	Avg. =	2.603
Height (in)	<u>5.006</u>	<u>5.006</u>	<u>5.006</u>	Avg. =	5.006

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.322	5.217
Moisture Content (%)	3.00	5.05
Wet Weight (gms)	889.11	1056.74
Dry Weight (gms)	863.20	1013.16
Container Weight (gms)	0.00	149.96
Density and Saturation		
Wet Weight (gms)	889.11	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.1	
Dry Density (pcf)	123.4	
Initial Void Ratio	0.365	
% Saturation	22.2	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	90	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	36.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	28.2
Eff. Consol. Stress (psi) =	50.0	Final Height (in)=	5.006
Induced OCR=	1.0	Initial Volume (cu.in)=	26.640
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.115

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	39.75
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	9.42
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	49.17
		Axial Strain (%) =	4.44



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **06-24-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-29-11**
 Test Pit: **G-124** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **-** Sample Description: **Black Tar Sand**
 Depth(ft): **85.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 65.0 psi**

Diameter (in)	<u>2.603</u>	<u>2.603</u>	<u>2.603</u>	Avg. =	2.603
Height (in)	<u>5.006</u>	<u>5.006</u>	<u>5.006</u>	Avg. =	5.006

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.322	5.257
Moisture Content (%)	3.00	5.05
Wet Weight (gms)	889.11	1056.74
Dry Weight (gms)	863.20	1013.16
Container Weight (gms)	0.00	149.96
Density and Saturation		
Wet Weight (gms)	889.11	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.1	
Dry Density (pcf)	123.4	
Initial Void Ratio	0.365	
% Saturation	22.2	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	90	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	95.0	Initial Burette Ht.(cm)=	28.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	22.9
Eff. Consol. Stress (psi) =	65.0	Final Height (in)=	5.006
Induced OCR =	1.0	Initial Volume (cu.in)=	26.640
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	26.316

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	47.92
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	10.02
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	57.94
		Axial Strain (%) =	4.94



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	35.0 psi
Depth(ft):	85.5	Initial Sample Height:	5.006 in
Sample No.:	-	Initial Area of Sample:	5.322 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.974 in
Sample Description:	Black Tar Sand	Final Sample Area (A)*:	5.079 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
65.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.04
65.0	62	0.003	33.1	1.76	0.07	0.45	0.88	5.47
65.0	129	0.015	40.1	3.65	0.29	1.45	1.82	5.41
65.0	159	0.027	44.4	4.48	0.55	2.07	2.24	5.22
65.0	182	0.041	47.0	5.12	0.82	2.45	2.56	5.15
65.0	203	0.052	48.8	5.70	1.05	2.71	2.85	5.18
65.0	225	0.065	50.1	6.30	1.31	2.90	3.15	5.29
65.0	248	0.077	51.1	6.92	1.54	3.03	3.46	5.47
65.0	273	0.088	51.7	7.60	1.78	3.13	3.80	5.71
65.0	299	0.101	52.0	8.31	2.03	3.17	4.15	6.03
65.0	327	0.112	52.0	9.06	2.25	3.17	4.53	6.40
65.0	357	0.124	51.8	9.87	2.50	3.14	4.93	6.84
65.0	387	0.137	51.3	10.67	2.74	3.07	5.34	7.30
65.0	419	0.149	50.7	11.52	3.00	2.98	5.76	7.82
65.0	451	0.161	50.0	12.37	3.24	2.87	6.19	8.35
65.0	484	0.174	49.0	13.24	3.50	2.74	6.62	8.92
65.0	519	0.185	47.9	14.17	3.72	2.58	7.08	9.54
65.0	555	0.197	46.7	15.11	3.95	2.41	7.56	10.19
65.0	591	0.208	45.5	16.06	4.18	2.23	8.03	10.84
65.0	629	0.219	44.2	17.05	4.41	2.04	8.52	11.52
65.0	668	0.231	42.8	18.06	4.64	1.84	9.03	12.23
65.0	706	0.243	41.2	19.04	4.88	1.62	9.52	12.94
65.0	745	0.255	39.7	20.04	5.12	1.39	10.02	13.67



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	50.0 psi
Depth(ft):	85.5	Initial Sample Height:	5.006 in
Sample No.:	-	Initial Area of Sample:	5.322 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.006 in
Sample Description:	Black Tar Sand	Final Sample Area (A)*:	5.217 sq. in.
		Induced OCR=	1.0

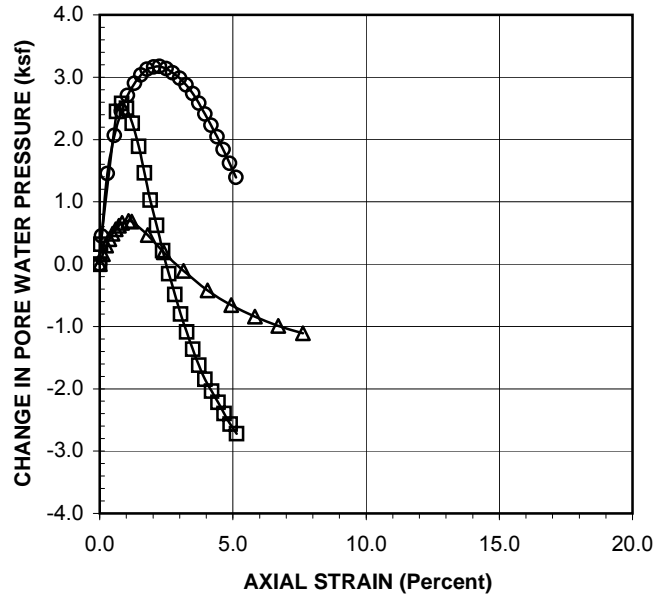
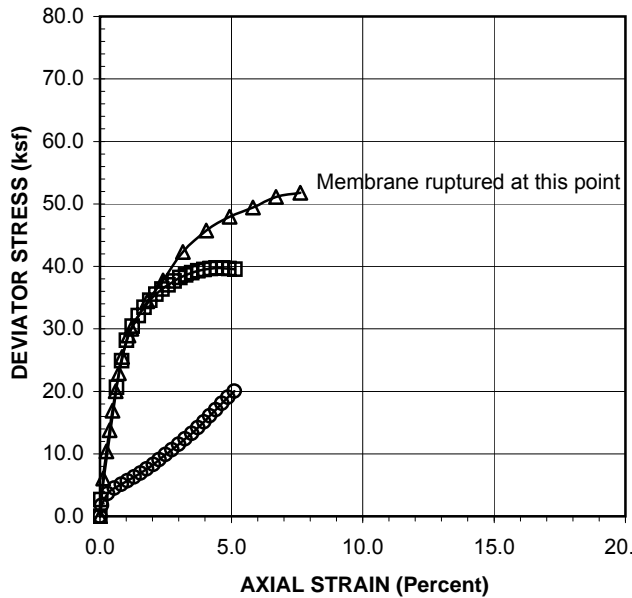
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	30.0	0.00	0.00	0.00	0.00	7.20
80.0	96	0.002	32.2	2.65	0.03	0.32	1.32	8.21
80.0	753	0.032	47.0	20.65	0.63	2.45	10.33	15.08
80.0	910	0.041	47.9	24.91	0.83	2.58	12.46	17.08
80.0	1030	0.051	47.4	28.14	1.01	2.50	14.07	18.77
80.0	1116	0.061	45.7	30.43	1.23	2.26	15.21	20.15
80.0	1181	0.073	43.1	32.12	1.46	1.89	16.06	21.37
80.0	1233	0.084	40.2	33.46	1.68	1.46	16.73	22.47
80.0	1276	0.095	37.1	34.55	1.90	1.03	17.28	23.45
80.0	1315	0.107	34.3	35.52	2.14	0.62	17.76	24.34
80.0	1349	0.119	31.5	36.36	2.37	0.22	18.18	25.16
80.0	1378	0.130	28.9	37.05	2.59	-0.16	18.53	25.88
80.0	1403	0.142	26.6	37.63	2.83	-0.49	18.82	26.50
80.0	1427	0.152	24.4	38.19	3.04	-0.80	19.10	27.10
80.0	1447	0.164	22.4	38.64	3.27	-1.09	19.32	27.61
80.0	1464	0.175	20.5	39.00	3.49	-1.36	19.50	28.06
80.0	1478	0.186	18.7	39.28	3.72	-1.62	19.64	28.46
80.0	1490	0.198	17.2	39.50	3.96	-1.85	19.75	28.80
80.0	1500	0.210	15.8	39.67	4.20	-2.04	19.83	29.07
80.0	1507	0.222	14.6	39.75	4.44	-2.22	19.88	29.30
80.0	1509	0.234	13.3	39.71	4.67	-2.40	19.85	29.45
80.0	1511	0.246	12.2	39.66	4.91	-2.57	19.83	29.60
80.0	1511	0.258	11.1	39.56	5.14	-2.72	19.78	29.70



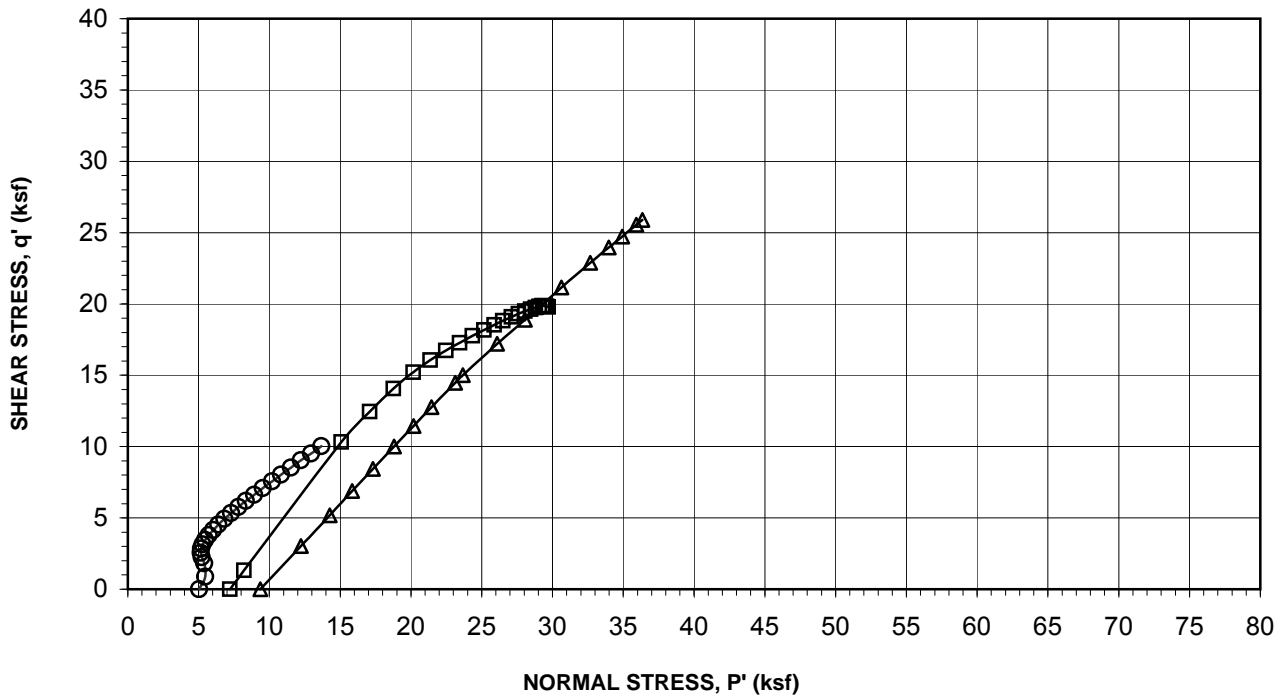
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	95.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-124	Consolidation Pressure :	65.0 psi
Depth(ft):	85.5	Initial Sample Height:	5.006 in
Sample No.:	-	Initial Area of Sample:	5.322 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.006 in
Sample Description:	Black Tar Sand	Final Sample Area (A)*:	5.257 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
95.0	0	0.000	30.0	0.00	0.00	0.00	0.00	9.36
95.0	222	0.006	31.1	6.06	0.12	0.16	3.03	12.23
95.0	380	0.012	32.1	10.38	0.24	0.30	5.19	14.26
95.0	504	0.018	32.8	13.76	0.36	0.40	6.88	15.84
95.0	619	0.024	33.4	16.88	0.48	0.49	8.44	17.31
95.0	735	0.030	33.9	20.02	0.60	0.56	10.01	18.81
95.0	842	0.036	34.3	22.89	0.72	0.62	11.44	20.19
95.0	939	0.042	34.6	25.51	0.84	0.66	12.76	21.45
95.0	1067	0.054	34.8	28.92	1.08	0.69	14.46	23.12
95.0	1109	0.060	34.8	30.01	1.20	0.69	15.00	23.68
95.0	1279	0.090	33.3	34.40	1.80	0.47	17.20	26.09
95.0	1412	0.120	31.3	37.76	2.40	0.19	18.88	28.05
95.0	1595	0.158	29.3	42.32	3.15	-0.11	21.16	30.63
95.0	1741	0.202	27.1	45.76	4.04	-0.42	22.88	32.66
95.0	1840	0.247	25.4	47.92	4.94	-0.66	23.96	33.98
95.0	1917	0.292	24.2	49.44	5.83	-0.84	24.72	34.92
95.0	2000	0.335	23.1	51.12	6.70	-0.99	25.56	35.91
95.0	2046	0.382	22.3	51.76	7.63	-1.11	25.88	36.35

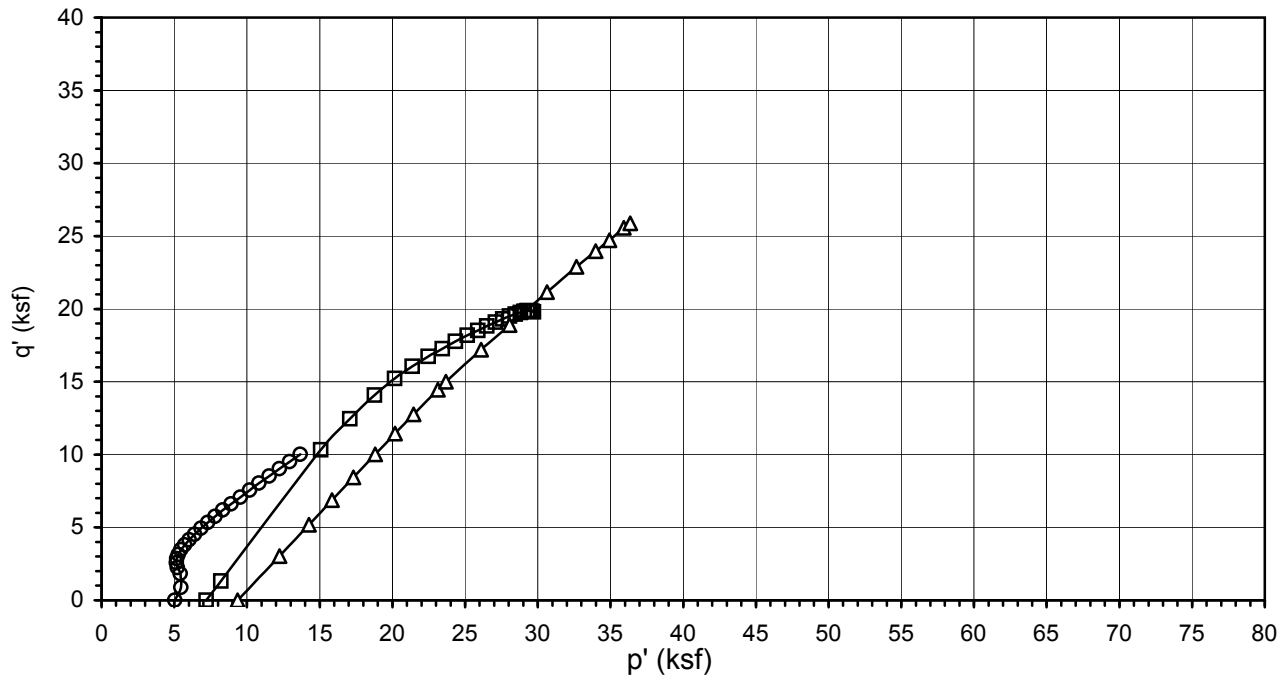


LEGEND: CONFINING PRESSURES= ○ 35 psi □ 50 psi △ 65 psi

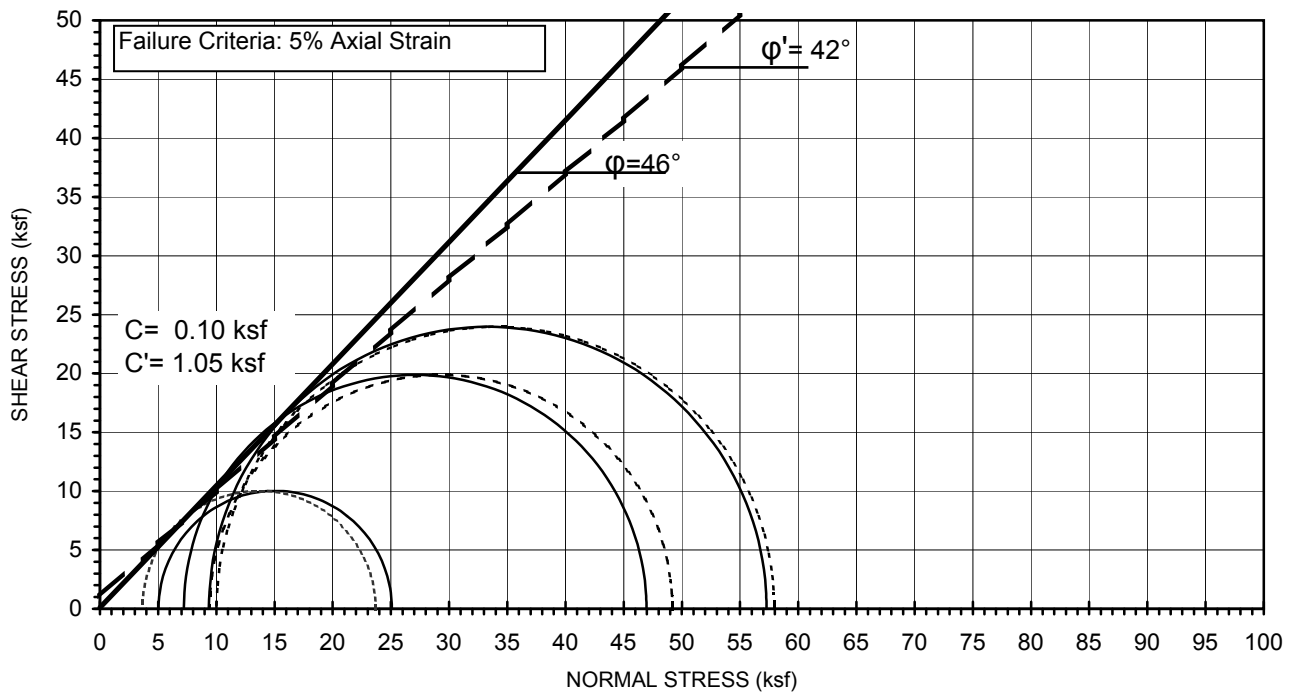


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Black Tar Sand
Test Pit:	G-124	Avg. Dry Unit Weight (pcf):	123.4
Sample No.:	-	Avg. Initial Moisture Content (%):	3.0
Depth (ft):	85.5	Confining Pressure:	35.0, 50.0, 65.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



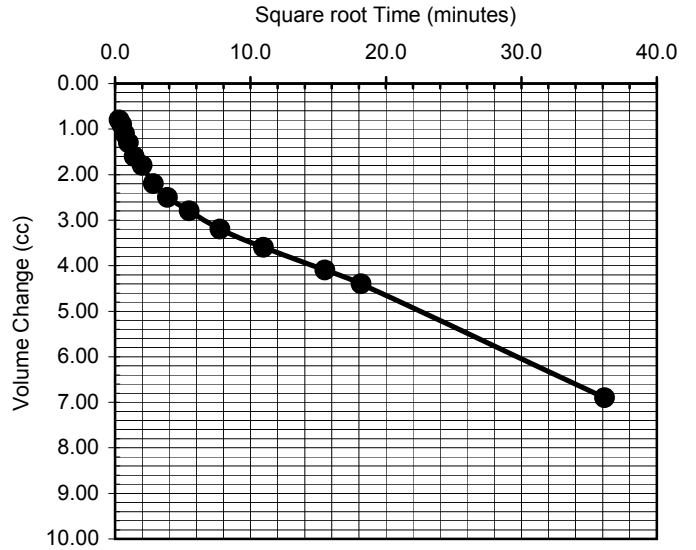
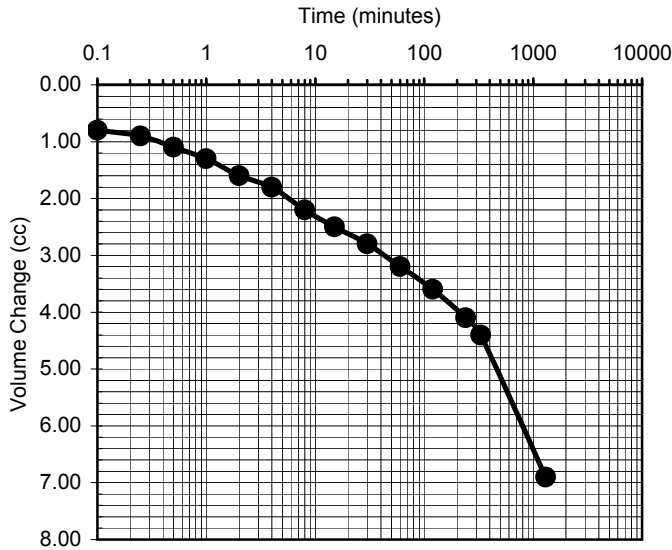
LEGEND: CONFINING PRESSURES= ○ 35 psi □ 50 psi △ 65 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-124
 Sample No.: -
 Depth (ft): 85.5

Sample Type: Mod. Cal.
 Sample Description: Black Tar Sand
 Avg. Dry Unit Weight (pcf): 123.4
 Avg. Initial Moisture Content (%): 3.0
 Confining Pressure: 35.0, 50.0, 65.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**



Test Pit:	G-124	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Black Tar Sand
Depth (feet):	85.5	Eff. Confining Pressure (psi):	50.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.8000
0.25	0.9000
0.5	1.1000
1	1.3000
2	1.6000
4	1.8000
8	2.2000
15	2.5000
30	2.8000
60	3.2000
120	3.6000
240	4.1000
330	4.4000
1307	6.9000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.8000
0.5000	0.9000
0.7071	1.1000
1.0000	1.3000
1.4142	1.6000
2.0000	1.8000
2.8284	2.2000
3.8730	2.5000
5.4772	2.8000
7.7460	3.2000
10.9545	3.6000
15.4919	4.1000
18.1659	4.4000
36.1525	6.9000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 06/24/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-08-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-128** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **-** Sample Description: **Olive Gray Sandy Lean Clay**
 Depth(ft): **35.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 10.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.900</u>	<u>5.900</u>	<u>5.900</u>	Avg. =	5.900

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.371
Moisture Content (%)	41.57	39.70
Wet Weight (gms)	946.54	1114.05
Dry Weight (gms)	668.61	848.59
Container Weight (gms)	0.00	179.98
Density and Saturation		
Wet Weight (gms)	946.54	
Container Weight (gms)	0.00	
Wet Density (pcf)	113.8	
Dry Density (pcf)	80.4	
Initial Void Ratio	1.096	
% Saturation	102.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	40.0	Initial Burette Ht.(cm)=	66.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	64.1
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	5.871
Induced OCR =	1.0	Initial Volume (cu.in)=	31.687
Change in Ht. of Specimen (in) =	0.0291	Final Volume (cu.in) =	31.535

Shear		At Failure	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	2.62
Time to 50% primary Consolidation (min) =	4	Eff. Minor Principal stress (ksf) =	0.70
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.32
		Axial Strain (%) =	4.99



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-08-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-128** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **-** Sample Description: **Olive Gray Sandy Lean Clay**
 Depth(ft): **35.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.900</u>	<u>5.900</u>	<u>5.900</u>	Avg. =	5.900

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.286
Moisture Content (%)	41.57	39.70
Wet Weight (gms)	946.54	1114.05
Dry Weight (gms)	668.61	848.59
Container Weight (gms)	0.00	179.98
Density and Saturation		
Wet Weight (gms)	946.54	
Container Weight (gms)	0.00	
Wet Density (pcf)	113.8	
Dry Density (pcf)	80.4	
Initial Void Ratio	1.096	
% Saturation	102.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	64.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	52.5
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.859
Induced OCR=	1.0	Initial Volume (cu.in)=	31.687
Change in Ht. of Specimen (in) =	0.0406	Final Volume (cu.in) =	30.973

Shear		At Failure	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	6.04
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	1.96
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.99
		Axial Strain (%) =	5.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-08-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-19-11**
 Test Pit: **G-128** Reviewed by: **AP** Date: **07-19-11**
 Sample No.: **-** Sample Description: **Olive Gray Sandy Lean Clay**
 Depth(ft): **35.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 40.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.900</u>	<u>5.900</u>	<u>5.900</u>	Avg. =	5.900

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.293
Moisture Content (%)	41.57	39.70
Wet Weight (gms)	946.54	1114.05
Dry Weight (gms)	668.61	848.59
Container Weight (gms)	0.00	179.98
Density and Saturation		
Wet Weight (gms)	946.54	
Container Weight (gms)	0.00	
Wet Density (pcf)	113.8	
Dry Density (pcf)	80.4	
Initial Void Ratio	1.096	
% Saturation	102.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	54.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	46.0
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	5.888
Induced OCR =	1.0	Initial Volume (cu.in)=	31.687
Change in Ht. of Specimen (in) =	0.0122	Final Volume (cu.in) =	31.163

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	8.77
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	3.12
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.89
		Axial Strain (%) =	3.80



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	40.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-128	Consolidation Pressure :	10.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.900 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.871 in
Sample Description:	Olive Gray Sandy Lean Clay	Final Sample Area (A)*:	5.371 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
40.0	0	0.000	30.0	0.00	0.00	0.00	0.00	1.44
40.0	18	0.003	31.4	0.48	0.06	0.19	0.24	1.49
40.0	32	0.015	33.0	0.86	0.26	0.43	0.43	1.44
40.0	40	0.027	33.8	1.07	0.45	0.55	0.53	1.43
40.0	45	0.038	34.3	1.20	0.65	0.61	0.60	1.42
40.0	49	0.050	34.6	1.30	0.85	0.66	0.65	1.43
40.0	53	0.062	34.9	1.41	1.05	0.70	0.70	1.45
40.0	56	0.074	35.0	1.48	1.26	0.72	0.74	1.46
40.0	59	0.085	35.2	1.56	1.45	0.75	0.78	1.47
40.0	61	0.099	35.4	1.61	1.69	0.77	0.80	1.47
40.0	64	0.112	35.5	1.68	1.90	0.78	0.84	1.50
40.0	67	0.124	35.5	1.76	2.11	0.79	0.88	1.53
40.0	69	0.136	35.6	1.81	2.32	0.79	0.90	1.55
40.0	71	0.148	35.6	1.86	2.52	0.80	0.93	1.57
40.0	74	0.160	35.6	1.93	2.73	0.80	0.96	1.61
40.0	76	0.172	35.6	1.98	2.93	0.79	0.99	1.63
40.0	79	0.184	35.5	2.05	3.13	0.79	1.03	1.67
40.0	82	0.196	35.5	2.13	3.34	0.79	1.06	1.71
40.0	84	0.207	35.5	2.17	3.53	0.79	1.09	1.74
40.0	86	0.220	35.5	2.22	3.74	0.78	1.11	1.77
40.0	89	0.233	35.4	2.29	3.96	0.78	1.15	1.81
40.0	92	0.245	35.4	2.36	4.17	0.77	1.18	1.85
40.0	99	0.275	35.3	2.53	4.69	0.75	1.26	1.95
40.0	103	0.293	35.2	2.62	4.99	0.74	1.31	2.01



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-128	Consolidation Pressure :	25.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.900 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.859 in
Sample Description:	Olive Gray Sandy Lean Clay	Final Sample Area (A)*:	5.286 sq. in.
		Induced OCR=	1.0

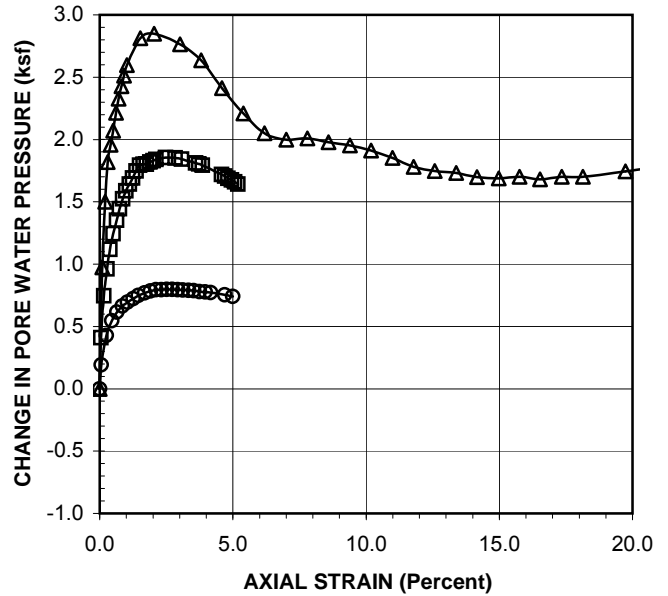
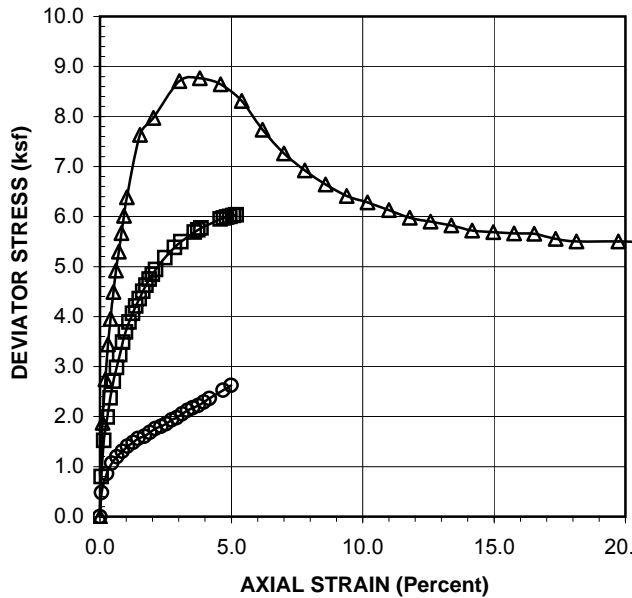
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	0	-0.001	30.0	0.00	-0.01	0.00	0.00	3.60
55.0	29	0.003	32.8	0.80	0.04	0.41	0.40	3.59
55.0	56	0.009	35.2	1.52	0.15	0.75	0.76	3.62
55.0	73	0.016	36.7	1.99	0.28	0.96	0.99	3.63
55.0	87	0.023	37.8	2.37	0.39	1.12	1.19	3.67
55.0	100	0.030	38.6	2.70	0.51	1.24	1.35	3.71
55.0	110	0.037	39.4	2.98	0.63	1.35	1.49	3.74
55.0	120	0.044	40.0	3.24	0.75	1.44	1.62	3.77
55.0	129	0.051	40.6	3.49	0.87	1.52	1.74	3.82
55.0	137	0.057	41.0	3.69	0.98	1.59	1.85	3.86
55.0	144	0.065	41.4	3.89	1.11	1.64	1.94	3.90
55.0	151	0.073	41.7	4.06	1.24	1.69	2.03	3.94
55.0	157	0.080	42.1	4.21	1.37	1.75	2.11	3.96
55.0	162	0.088	42.4	4.36	1.50	1.79	2.18	3.99
55.0	168	0.096	42.5	4.51	1.63	1.80	2.25	4.05
55.0	173	0.103	42.5	4.63	1.76	1.80	2.31	4.11
55.0	178	0.110	42.6	4.75	1.88	1.82	2.37	4.16
55.0	181	0.117	42.7	4.84	2.00	1.83	2.42	4.19
55.0	185	0.124	42.8	4.94	2.12	1.84	2.47	4.23
55.0	195	0.145	42.9	5.17	2.47	1.85	2.59	4.33
55.0	203	0.166	42.8	5.38	2.84	1.85	2.69	4.44
55.0	208	0.180	42.8	5.49	3.08	1.84	2.75	4.50
55.0	217	0.211	42.6	5.69	3.60	1.81	2.84	4.63
55.0	219	0.218	42.5	5.73	3.72	1.80	2.87	4.66
55.0	220	0.226	42.4	5.77	3.85	1.79	2.89	4.69
55.0	229	0.268	41.9	5.95	4.58	1.72	2.98	4.86
55.0	230	0.275	41.8	5.97	4.70	1.70	2.98	4.88
55.0	231	0.282	41.7	5.99	4.82	1.69	2.99	4.90
55.0	232	0.290	41.6	6.00	4.95	1.67	3.00	4.93
55.0	233	0.297	41.5	6.02	5.07	1.66	3.01	4.95
55.0	234	0.304	41.4	6.04	5.19	1.64	3.02	4.97



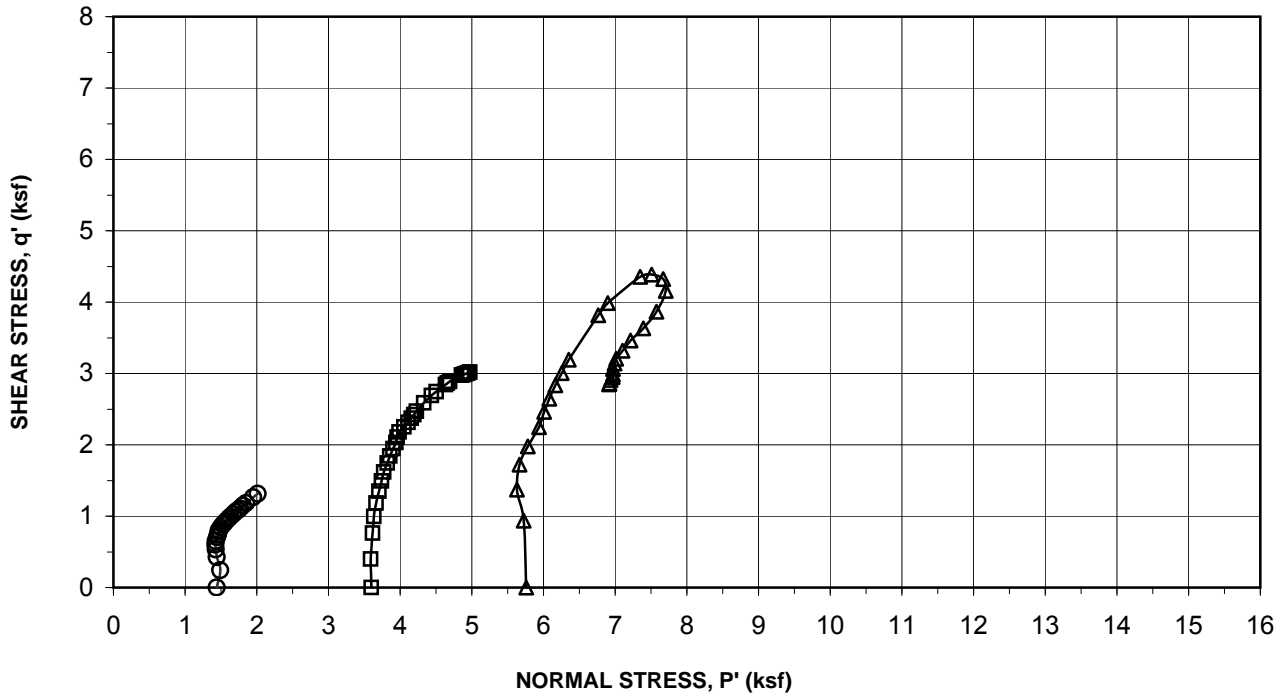
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-128	Consolidation Pressure :	40.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.900 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.888 in
Sample Description:	Olive Gray Sandy Lean Clay	Final Sample Area (A)*:	5.293 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress (S1-S3)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(ksf)	(ksf)
70.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.76
70.0	69	0.006	36.8	1.88	0.10	0.97	0.94	5.72
70.0	101	0.012	40.4	2.74	0.20	1.50	1.37	5.63
70.0	127	0.018	42.6	3.44	0.31	1.82	1.72	5.66
70.0	146	0.024	43.6	3.96	0.41	1.96	1.98	5.78
70.0	166	0.030	44.4	4.49	0.51	2.07	2.25	5.94
70.0	182	0.036	45.4	4.92	0.61	2.21	2.46	6.01
70.0	196	0.042	46.2	5.29	0.71	2.33	2.65	6.08
70.0	210	0.048	46.9	5.67	0.82	2.43	2.83	6.17
70.0	223	0.054	47.5	6.01	0.92	2.51	3.01	6.25
70.0	237	0.060	48.1	6.38	1.02	2.60	3.19	6.35
70.0	285	0.090	49.6	7.64	1.53	2.81	3.82	6.76
70.0	299	0.120	49.8	7.97	2.04	2.85	3.98	6.90
70.0	330	0.178	49.2	8.71	3.01	2.76	4.35	7.35
70.0	335	0.224	48.3	8.77	3.80	2.64	4.38	7.51
70.0	333	0.271	46.8	8.64	4.59	2.41	4.32	7.67
70.0	323	0.318	45.4	8.31	5.40	2.21	4.16	7.71
70.0	303	0.364	44.3	7.73	6.19	2.05	3.87	7.58
70.0	287	0.412	43.9	7.26	7.00	2.00	3.63	7.39
70.0	276	0.459	44.0	6.92	7.80	2.01	3.46	7.21
70.0	267	0.506	43.8	6.64	8.59	1.98	3.32	7.10
70.0	260	0.553	43.6	6.41	9.39	1.95	3.20	7.01
70.0	257	0.600	43.3	6.28	10.19	1.91	3.14	6.99
70.0	253	0.647	42.9	6.13	11.00	1.85	3.06	6.97
70.0	249	0.694	42.4	5.98	11.79	1.78	2.99	6.97
70.0	248	0.741	42.1	5.90	12.58	1.75	2.95	6.96
70.0	247	0.788	42.0	5.82	13.38	1.73	2.91	6.94
70.0	245	0.834	41.8	5.72	14.16	1.70	2.86	6.92
70.0	246	0.882	41.7	5.69	14.97	1.69	2.85	6.92
70.0	247	0.928	41.8	5.66	15.76	1.70	2.83	6.89
70.0	249	0.973	41.7	5.65	16.53	1.68	2.83	6.91
70.0	247	1.021	41.8	5.55	17.34	1.70	2.78	6.84
70.0	247	1.068	41.8	5.50	18.14	1.70	2.75	6.81
70.0	252	1.162	42.1	5.50	19.73	1.75	2.75	6.77
70.0	254	1.209	42.3	5.49	20.53	1.77	2.75	6.74

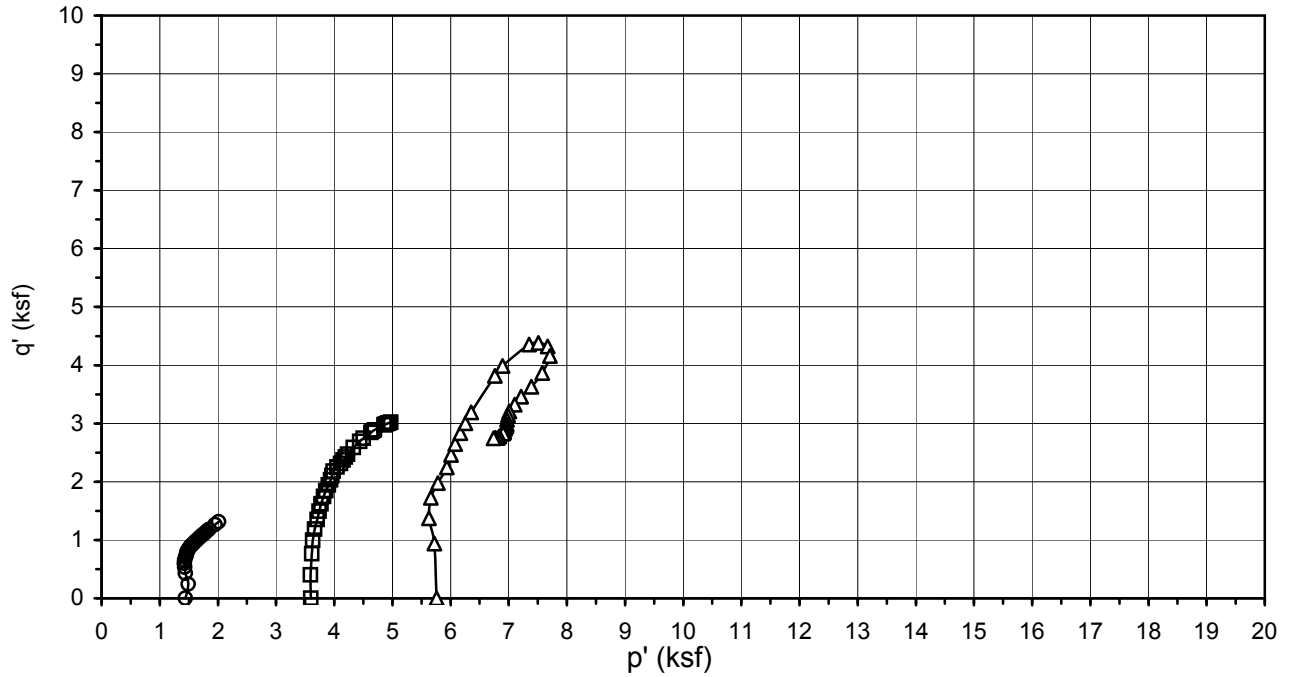


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi

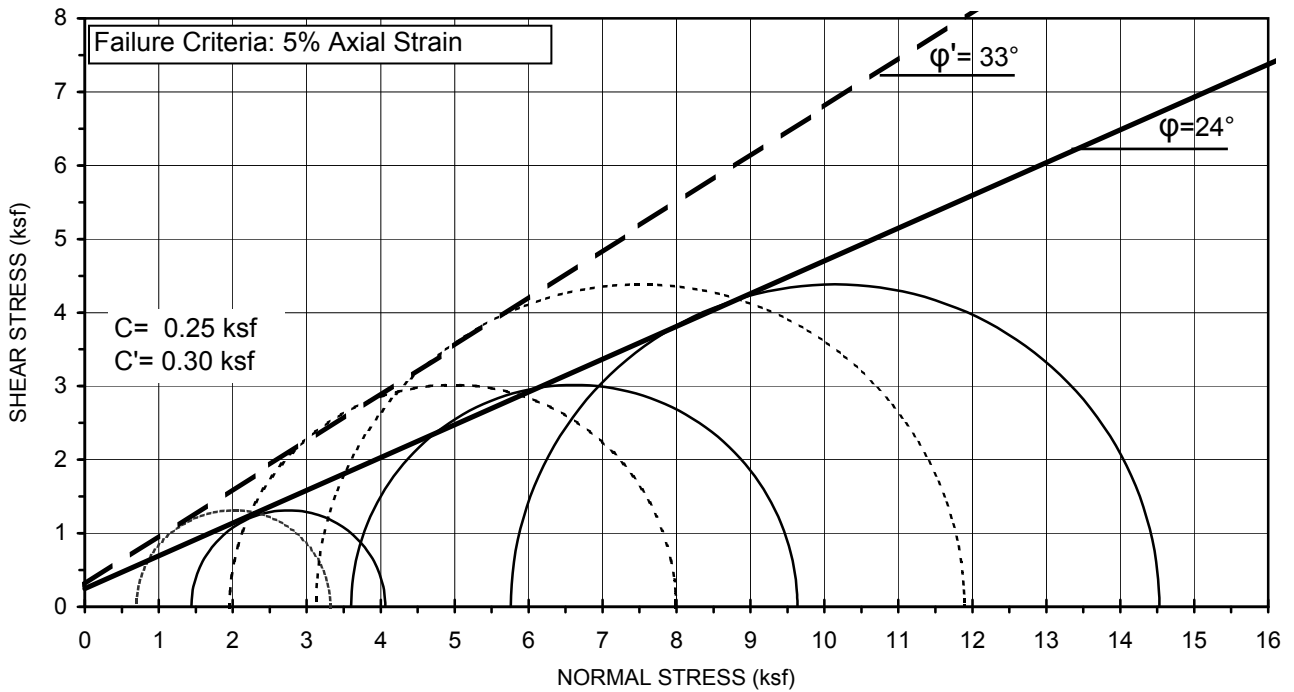


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Gray Sandy Lean Clay
Test Pit:	G-128	Avg. Dry Unit Weight (pcf):	80.4
Sample No.:	-	Avg. Initial Moisture Content (%):	41.6
Depth (ft):	35.5	Confining Pressure:	10.0, 25.0, 40.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

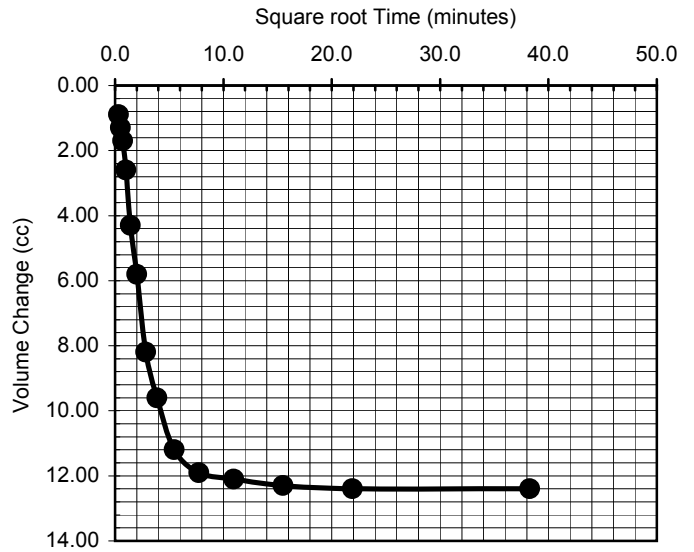
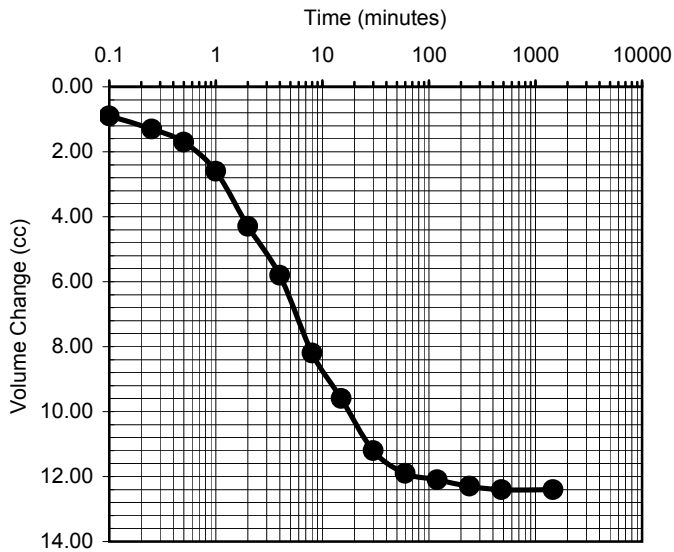


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Gray Sandy Lean Clay
Test Pit:	G-128	Avg. Dry Unit Weight (pcf):	80.4
Sample No.:	-	Avg. Initial Moisture Content (%):	41.6
Depth (ft):	35.5	Confining Pressure:	10.0, 25.0, 40.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-128	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Olive Gray Sandy Lean Clay
Depth (feet):	35.5	Eff. Confining Pressure (psi):	25.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.9000
0.25	1.3000
0.5	1.7000
1	2.6000
2	4.3000
4	5.8000
8	8.2000
15	9.6000
30	11.2000
60	11.9000
120	12.1000
240	12.3000
480	12.4000
1466	12.4000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.9000
0.5000	1.3000
0.7071	1.7000
1.0000	2.6000
1.4142	4.3000
2.0000	5.8000
2.8284	8.2000
3.8730	9.6000
5.4772	11.2000
7.7460	11.9000
10.9545	12.1000
15.4919	12.3000
21.9089	12.4000
38.2884	12.4000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
Project No.: 4953-10-1561
Date: 07/08/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-08-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [07-19-11](#)
 Test Pit: [G-128](#) Reviewed by: [AP](#) Date: [07-19-11](#)
 Sample No.: - Sample Description: [Gray Sandy Lean Clay](#)
 Depth(ft): [55.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 15.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	4.703	4.703	4.703	Avg. =	4.703

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.371
Moisture Content (%)	15.36	18.70
Wet Weight (gms)	71.85	1009.12
Dry Weight (gms)	68.97	873.65
Container Weight (gms)	50.22	149.31
Density and Saturation		
Wet Weight (gms)	869.83	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.2	
Dry Density (pcf)	113.7	
Initial Void Ratio	0.482	
% Saturation	86.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	67.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	62.8
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	4.653
Induced OCR =	1.0	Initial Volume (cu.in)=	25.259
Change in Ht. of Specimen (in) =	0.0504	Final Volume (cu.in) =	24.990

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	8.55
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	2.01
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	10.55
		Axial Strain (%) =	5.18



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-08-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-19-11
Test Pit:	G-128	Reviewed by:	AP	Date:	07-19-11
Sample No.:	-	Sample Description:	Gray Sandy Lean Clay		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.703</u>	<u>4.703</u>	<u>4.703</u>	Avg. =	4.703

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.326
Moisture Content (%)	15.36	18.70
Wet Weight (gms)	71.85	1009.12
Dry Weight (gms)	68.97	873.65
Container Weight (gms)	50.22	149.31
Density and Saturation		
Wet Weight (gms)	869.83	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.2	
Dry Density (pcf)	113.7	
Initial Void Ratio	0.482	
% Saturation	86.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	60.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	56.7
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	4.702
Induced OCR=	1.0	Initial Volume (cu.in)=	25.259
Change in Ht. of Specimen (in) =	0.0008	Final Volume (cu.in) =	25.045

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	14.89
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.91
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	19.81
		Axial Strain (%) =	5.03



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-08-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [07-19-11](#)
 Test Pit: [G-128](#) Reviewed by: [AP](#) Date: [07-19-11](#)
 Sample No.: - Sample Description: [Gray Sandy Lean Clay](#)
 Depth(ft): [55.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 45.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	4.703	4.703	4.703	Avg. =	4.703

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.314
Moisture Content (%)	15.36	18.70
Wet Weight (gms)	71.85	1009.12
Dry Weight (gms)	68.97	873.65
Container Weight (gms)	50.22	149.31
Density and Saturation		
Wet Weight (gms)	869.83	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.2	
Dry Density (pcf)	113.7	
Initial Void Ratio	0.482	
% Saturation	86.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	57.7
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	53.3
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	4.703
Induced OCR =	1.0	Initial Volume (cu.in)=	25.259
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	24.990

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	22.30
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	7.42
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	29.72
		Axial Strain (%) =	5.53



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-128	Consolidation Pressure :	15.0 psi
Depth(ft):	55.5	Initial Sample Height:	4.703 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.653 in
Sample Description:	Gray Sandy Lean Clay	Final Sample Area (A)*:	5.371 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	46	0.004	32.7	1.24	0.09	0.38	0.62	2.40
45.0	68	0.010	34.7	1.81	0.21	0.67	0.90	2.39
45.0	81	0.016	35.9	2.17	0.35	0.84	1.09	2.40
45.0	91	0.022	36.6	2.43	0.47	0.95	1.22	2.43
45.0	100	0.028	37.1	2.66	0.60	1.02	1.33	2.47
45.0	106	0.034	37.4	2.83	0.72	1.07	1.41	2.50
45.0	114	0.039	37.8	3.02	0.83	1.12	1.51	2.55
45.0	121	0.045	37.9	3.22	0.97	1.14	1.61	2.63
45.0	128	0.050	37.8	3.38	1.08	1.12	1.69	2.73
45.0	134	0.057	37.8	3.54	1.22	1.12	1.77	2.81
45.0	140	0.062	37.8	3.70	1.33	1.12	1.85	2.90
45.0	145	0.068	37.7	3.83	1.46	1.11	1.92	2.97
45.0	153	0.074	37.6	4.02	1.59	1.10	2.01	3.08
45.0	159	0.080	37.5	4.18	1.71	1.08	2.09	3.17
45.0	206	0.122	36.4	5.39	2.61	0.93	2.69	3.93
45.0	221	0.134	36.0	5.76	2.88	0.86	2.88	4.18
45.0	234	0.146	35.5	6.07	3.14	0.80	3.03	4.40
45.0	248	0.158	35.1	6.41	3.39	0.73	3.21	4.64
45.0	261	0.170	34.5	6.75	3.65	0.65	3.37	4.89
45.0	274	0.182	34.0	7.05	3.91	0.57	3.53	5.12
45.0	286	0.194	33.4	7.35	4.16	0.49	3.68	5.35
45.0	300	0.206	32.8	7.69	4.42	0.40	3.84	5.60
45.0	313	0.217	32.2	7.99	4.67	0.32	3.99	5.83
45.0	324	0.229	31.7	8.25	4.92	0.24	4.13	6.05
45.0	336	0.241	31.1	8.55	5.18	0.15	4.27	6.28



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-128	Consolidation Pressure :	30.0 psi
Depth(ft):	55.5	Initial Sample Height:	4.703 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.702 in
Sample Description:	Gray Sandy Lean Clay	Final Sample Area (A)*:	5.326 sq. in.
		Induced OCR=	1.0

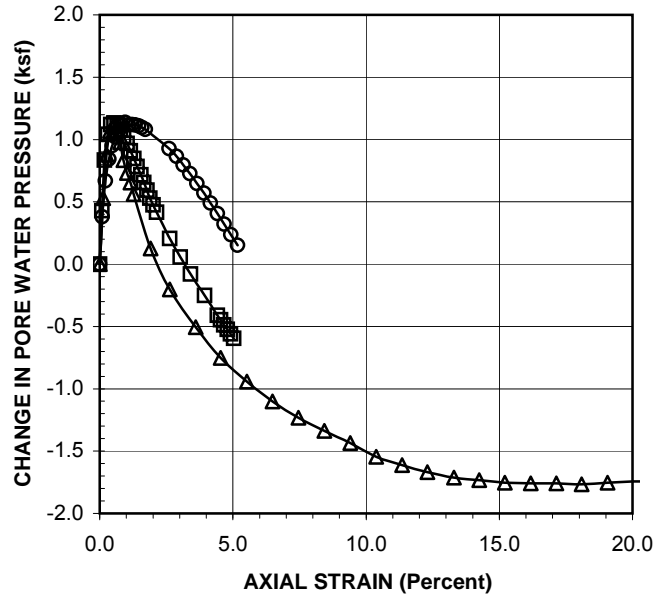
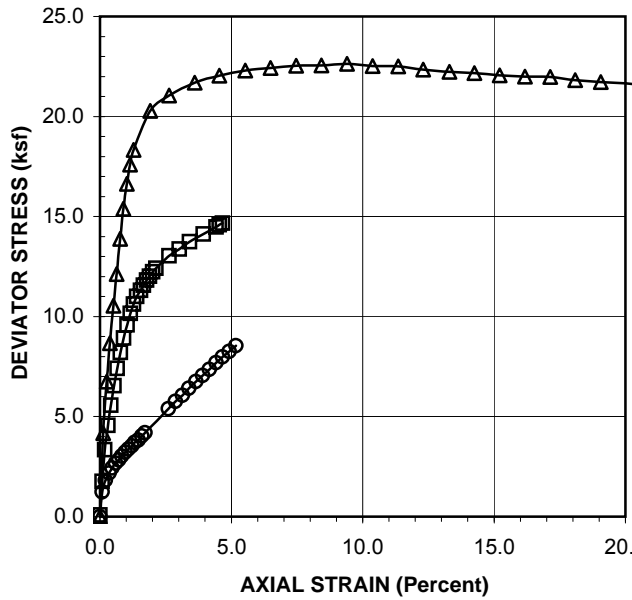
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	3	0.000	30.1	0.08	0.00	0.00	0.04	4.36
60.0	65	0.004	33.1	1.76	0.08	0.43	0.88	4.77
60.0	124	0.008	35.9	3.35	0.18	0.84	1.67	5.16
60.0	169	0.014	37.3	4.56	0.30	1.04	2.28	5.56
60.0	207	0.020	37.9	5.57	0.41	1.12	2.79	5.99
60.0	243	0.025	38.0	6.53	0.54	1.13	3.27	6.45
60.0	276	0.031	37.8	7.41	0.66	1.11	3.71	6.91
60.0	306	0.037	37.5	8.21	0.78	1.07	4.10	7.35
60.0	333	0.043	37.2	8.92	0.91	1.02	4.46	7.76
60.0	358	0.049	36.8	9.58	1.04	0.97	4.79	8.14
60.0	380	0.055	36.4	10.15	1.16	0.91	5.08	8.49
60.0	398	0.060	36.0	10.62	1.28	0.85	5.31	8.78
60.0	413	0.066	35.5	11.01	1.40	0.78	5.50	9.04
60.0	425	0.073	35.1	11.31	1.55	0.72	5.66	9.26
60.0	435	0.078	34.6	11.57	1.65	0.65	5.78	9.45
60.0	445	0.084	34.2	11.82	1.78	0.59	5.91	9.64
60.0	453	0.089	33.8	12.02	1.89	0.53	6.01	9.80
60.0	462	0.095	33.4	12.24	2.01	0.47	6.12	9.97
60.0	469	0.101	33.0	12.41	2.14	0.42	6.20	10.11
60.0	495	0.124	31.5	13.03	2.63	0.20	6.52	10.63
60.0	510	0.142	30.5	13.37	3.02	0.06	6.69	10.95
60.0	526	0.160	29.5	13.74	3.41	-0.08	6.87	11.27
60.0	544	0.185	28.3	14.13	3.93	-0.25	7.06	11.64
60.0	560	0.208	27.2	14.47	4.42	-0.41	7.24	11.97
60.0	565	0.214	27.0	14.58	4.54	-0.45	7.29	12.06
60.0	569	0.219	26.7	14.67	4.66	-0.49	7.33	12.14
60.0	573	0.225	26.4	14.75	4.79	-0.52	7.37	12.22
60.0	577	0.231	26.2	14.83	4.92	-0.56	7.42	12.30
60.0	580	0.236	26.0	14.89	5.03	-0.59	7.45	12.36



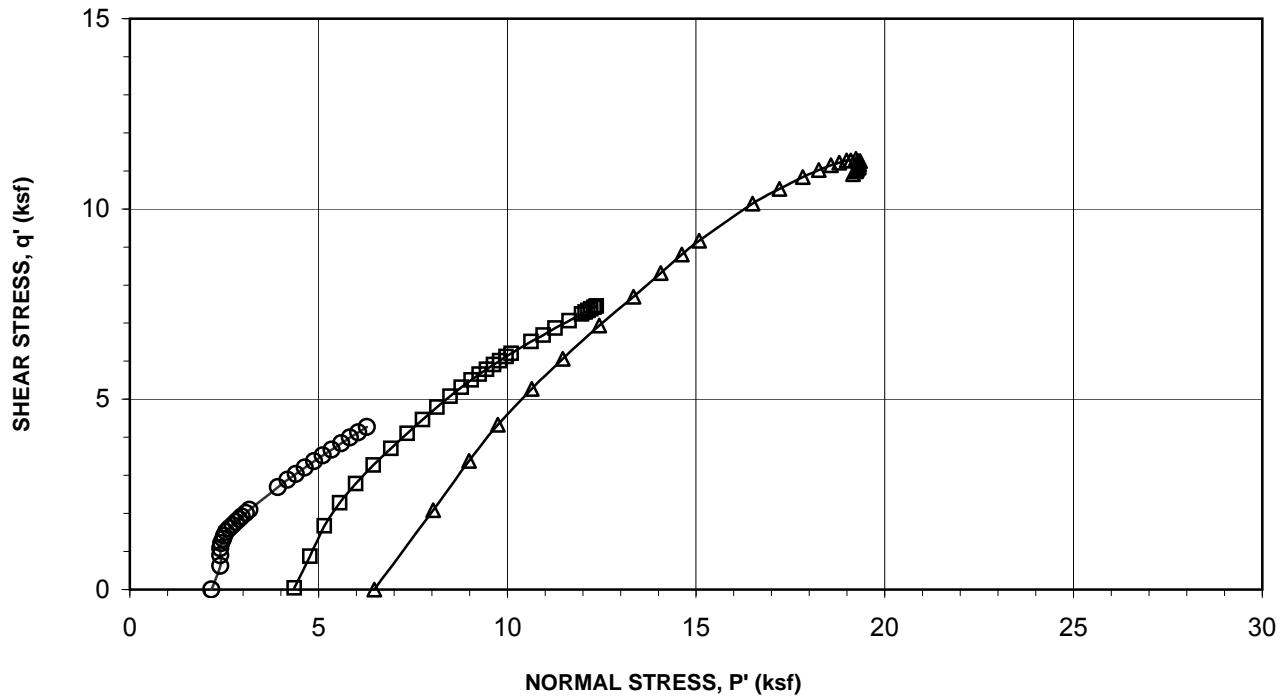
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-128	Consolidation Pressure :	45.0 psi
Depth(ft):	55.5	Initial Sample Height:	4.703 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.703 in
Sample Description:	Gray Sandy Lean Clay	Final Sample Area (A)*:	5.314 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	154	0.006	33.7	4.17	0.13	0.53	2.08	8.04
75.0	250	0.012	36.1	6.76	0.26	0.88	3.38	8.98
75.0	321	0.018	37.4	8.67	0.38	1.07	4.33	9.74
75.0	391	0.024	37.7	10.54	0.51	1.11	5.27	10.64
75.0	450	0.030	37.4	12.12	0.64	1.07	6.06	11.47
75.0	516	0.036	36.8	13.88	0.77	0.98	6.94	12.44
75.0	573	0.042	35.8	15.39	0.89	0.84	7.69	13.34
75.0	620	0.048	35.1	16.63	1.02	0.73	8.32	14.06
75.0	657	0.054	34.5	17.60	1.15	0.65	8.80	14.63
75.0	685	0.060	33.9	18.33	1.28	0.56	9.16	15.08
75.0	763	0.090	30.9	20.28	1.91	0.13	10.14	16.50
75.0	798	0.124	28.6	21.06	2.63	-0.20	10.53	17.21
75.0	830	0.169	26.5	21.68	3.60	-0.51	10.84	17.83
75.0	852	0.214	24.8	22.04	4.55	-0.75	11.02	18.25
75.0	871	0.260	23.5	22.30	5.53	-0.94	11.15	18.57
75.0	885	0.305	22.4	22.43	6.49	-1.10	11.21	18.79
75.0	899	0.351	21.4	22.54	7.47	-1.23	11.27	18.98
75.0	909	0.397	20.7	22.56	8.43	-1.34	11.28	19.10
75.0	922	0.442	20.0	22.64	9.41	-1.44	11.32	19.23
75.0	927	0.488	19.3	22.51	10.38	-1.55	11.26	19.28
75.0	937	0.534	18.8	22.51	11.35	-1.61	11.26	19.35
75.0	940	0.579	18.4	22.34	12.30	-1.67	11.17	19.32
75.0	946	0.626	18.1	22.23	13.30	-1.71	11.11	19.31
75.0	954	0.670	18.0	22.17	14.25	-1.73	11.08	19.30
75.0	960	0.715	17.8	22.06	15.21	-1.75	11.03	19.26
75.0	968	0.761	17.8	21.99	16.18	-1.76	10.99	19.23
75.0	979	0.806	17.8	21.98	17.14	-1.76	10.99	19.23
75.0	983	0.851	17.7	21.82	18.09	-1.77	10.91	19.16
75.0	990	0.897	17.8	21.71	19.06	-1.75	10.86	19.09
75.0	999	0.941	17.9	21.65	20.01	-1.74	10.83	19.05
75.0	1005	0.987	17.9	21.52	20.98	-1.75	10.76	18.99
75.0	1016	1.032	17.9	21.49	21.94	-1.74	10.75	18.96
75.0	1032	1.122	18.2	21.30	23.85	-1.70	10.65	18.83
75.0	1039	1.167	18.3	21.17	24.82	-1.68	10.58	18.75

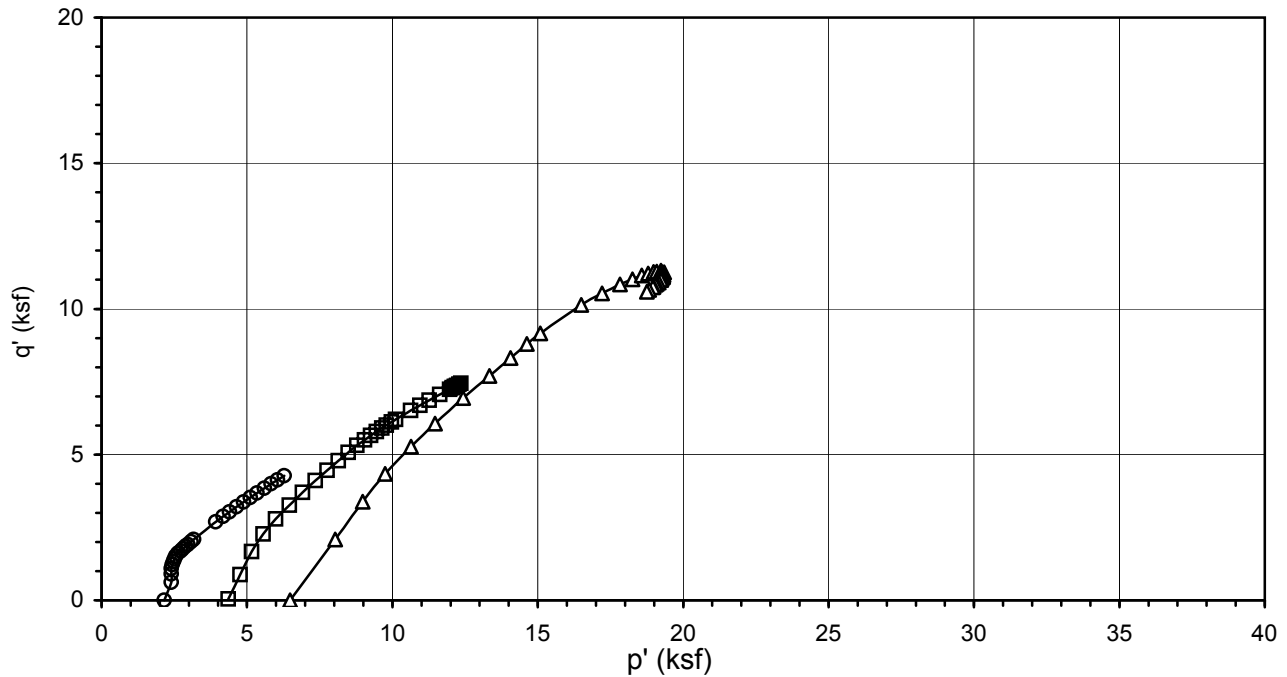


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi

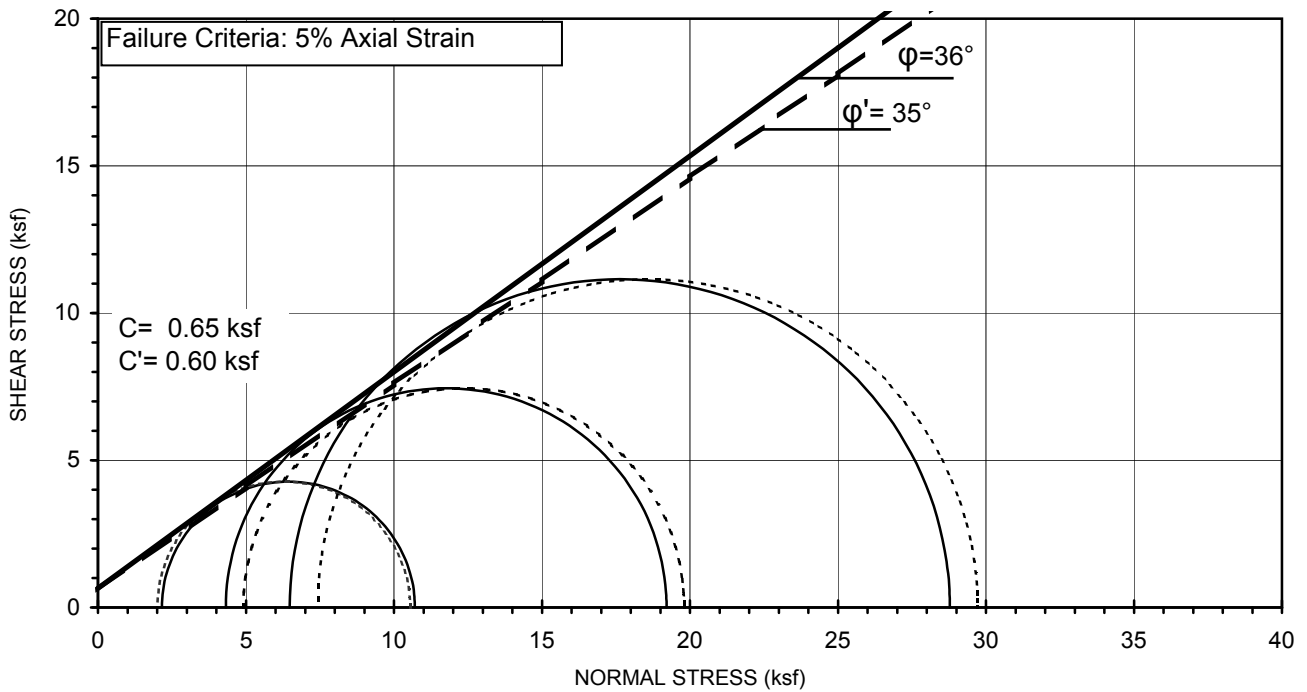


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gray Sandy Lean Clay
Test Pit:	G-128	Avg. Dry Unit Weight (pcf):	113.7
Sample No.:	-	Avg. Initial Moisture Content (%):	15.4
Depth (ft):	55.5	Confining Pressure:	15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



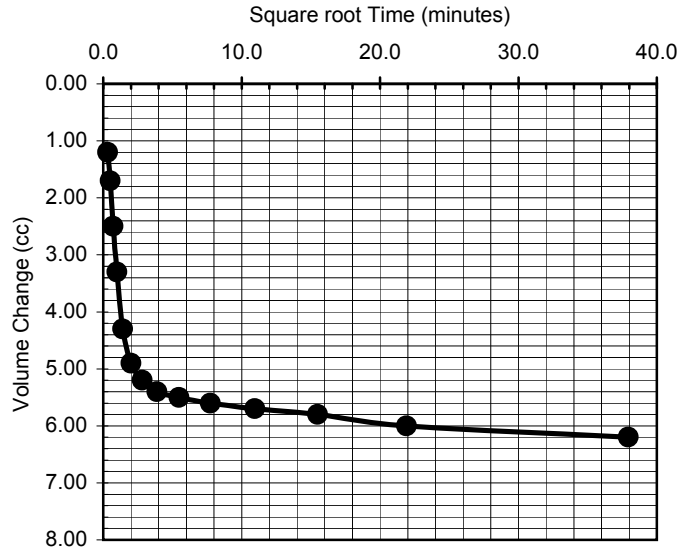
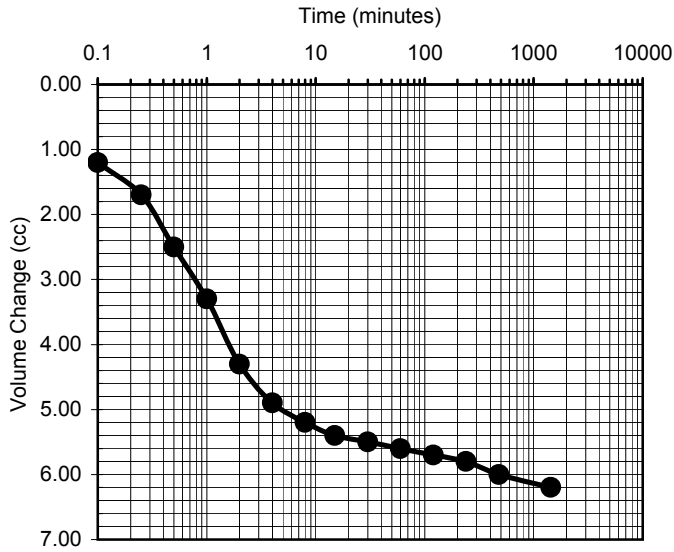
LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-128
 Sample No.: -
 Depth (ft): 55.5

Sample Type: Mod. Cal.
 Sample Description: Gray Sandy Lean Clay
 Avg. Dry Unit Weight (pcf): 113.7
 Avg. Initial Moisture Content (%): 15.4
 Confining Pressure: 15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**



Test Pit:	G-128	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Gray Sandy Lean Clay
Depth (feet):	55.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.2000
0.25	1.7000
0.5	2.5000
1	3.3000
2	4.3000
4	4.9000
8	5.2000
15	5.4000
30	5.5000
60	5.6000
120	5.7000
240	5.8000
480	6.0000
1440	6.2000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.2000
0.5000	1.7000
0.7071	2.5000
1.0000	3.3000
1.4142	4.3000
2.0000	4.9000
2.8284	5.2000
3.8730	5.4000
5.4772	5.5000
7.7460	5.6000
10.9545	5.7000
15.4919	5.8000
21.9089	6.0000
37.9473	6.2000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/08/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-22-11**
 Test Pit: **G-129** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **7** Sample Description: **Greenish Gray Sandy Clay**
 Depth(ft): **29-30**
 Sample Type: **Mod. Cal.** Confining Pressure = **10.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.861</u>	<u>4.861</u>	<u>4.861</u>	Avg. =	4.861

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.367
Moisture Content (%)	16.65	17.95
Wet Weight (gms)	<u>265.62</u>	<u>1052.23</u>
Dry Weight (gms)	<u>234.73</u>	<u>914.95</u>
Container Weight (gms)	<u>49.20</u>	<u>150.34</u>
Density and Saturation		
Wet Weight (gms)	<u>906.57</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	132.3	
Dry Density (pcf)	113.4	
Initial Void Ratio	0.486	
% Saturation	92.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>40.0</u>	Initial Burette Ht.(cm)=	<u>61.5</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>58.5</u>
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	<u>4.831</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.107</u>
Change in Ht. of Specimen (in) =	0.0304	Final Volume (cu.in) =	<u>25.924</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	5.08
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	0.85
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	5.93
		Axial Strain (%) =	5.31



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-22-11**
 Test Pit: **G-129** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **7** Sample Description: **Greenish Gray Sandy Clay**
 Depth(ft): **29-30**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.861</u>	<u>4.861</u>	<u>4.861</u>	Avg. =	4.861

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.264
Moisture Content (%)	16.65	17.95
Wet Weight (gms)	<u>265.62</u>	<u>1052.23</u>
Dry Weight (gms)	<u>234.73</u>	<u>914.95</u>
Container Weight (gms)	<u>49.20</u>	<u>150.34</u>
Density and Saturation		
Wet Weight (gms)	<u>906.57</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	132.3	
Dry Density (pcf)	113.4	
Initial Void Ratio	0.486	
% Saturation	92.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>55.0</u>	Initial Burette Ht.(cm)=	<u>36.8</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>28.2</u>
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	<u>4.860</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.107</u>
Change in Ht. of Specimen (in) =	0.0008	Final Volume (cu.in) =	<u>25.582</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	9.50
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	2.43
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.93
		Axial Strain (%) =	4.84



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-22-11**
 Test Pit: **G-129** Reviewed by: **AP** Date: **06-29-11**
 Sample No.: **7** Sample Description: **Greenish Gray Sandy Clay**
 Depth(ft): **29-30**
 Sample Type: **Mod. Cal.** **Confining Pressure = 40.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.861</u>	<u>4.861</u>	<u>4.861</u>	Avg. =	4.861

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.337
Moisture Content (%)	16.65	17.95
Wet Weight (gms)	<u>265.62</u>	<u>1052.23</u>
Dry Weight (gms)	<u>234.73</u>	<u>914.95</u>
Container Weight (gms)	<u>49.20</u>	<u>150.34</u>
Density and Saturation		
Wet Weight (gms)	<u>906.57</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	132.3	
Dry Density (pcf)	113.4	
Initial Void Ratio	0.486	
% Saturation	92.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>70.0</u>	Initial Burette Ht.(cm)=	<u>51.1</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>48.4</u>
Eff. Consol. Stress (psi) =	<u>40.0</u>	Final Height (in)=	<u>4.861</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.107</u>
Change in Ht. of Specimen (in) =	<u>0.0005</u>	Final Volume (cu.in) =	<u>25.942</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	<u>0.005</u>	Deviator Stress (ksf) =	<u>12.98</u>
Time to 50% primary Consolidation =	<u>5</u>	Eff. Minor Principal stress (ksf) =	<u>3.98</u>
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	<u>16.96</u>
		Axial Strain (%) =	<u>5.32</u>



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	40.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-129	Consolidation Pressure :	10.0 psi
Depth(ft):	29-30	Initial Sample Height:	4.861 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.831 in
Sample Description:	Greenish Gray Sandy Clay	Final Sample Area (A)*:	5.367 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
40.0	0	0.000	30.1	0.00	-0.01	0.00	0.00	1.44
40.0	32	0.005	31.5	0.86	0.10	0.20	0.43	1.67
40.0	43	0.012	32.7	1.15	0.25	0.37	0.58	1.64
40.0	51	0.019	33.5	1.36	0.40	0.49	0.68	1.63
40.0	57	0.026	34.1	1.52	0.54	0.58	0.76	1.62
40.0	62	0.033	34.5	1.65	0.69	0.64	0.83	1.63
40.0	67	0.041	34.9	1.78	0.84	0.69	0.89	1.64
40.0	72	0.047	35.1	1.91	0.97	0.72	0.96	1.67
40.0	77	0.054	35.3	2.04	1.12	0.75	1.02	1.71
40.0	81	0.061	35.5	2.15	1.27	0.77	1.07	1.74
40.0	86	0.068	35.6	2.28	1.40	0.79	1.14	1.79
40.0	91	0.075	35.7	2.40	1.55	0.80	1.20	1.84
40.0	95	0.082	35.7	2.51	1.70	0.82	1.25	1.88
40.0	100	0.090	35.8	2.63	1.85	0.82	1.32	1.93
40.0	105	0.097	35.8	2.76	2.01	0.83	1.38	1.99
40.0	115	0.112	35.9	3.01	2.32	0.83	1.51	2.11
40.0	124	0.127	35.9	3.24	2.63	0.83	1.62	2.23
40.0	137	0.149	35.8	3.56	3.08	0.82	1.78	2.40
40.0	144	0.158	35.7	3.74	3.27	0.80	1.87	2.51
40.0	153	0.172	35.5	3.96	3.55	0.78	1.98	2.64
40.0	162	0.185	35.4	4.18	3.82	0.76	2.09	2.77
40.0	170	0.197	35.2	4.38	4.09	0.73	2.19	2.89
40.0	178	0.211	35.0	4.57	4.37	0.70	2.28	3.02
40.0	186	0.226	34.7	4.76	4.68	0.67	2.38	3.15
40.0	193	0.241	34.5	4.92	4.99	0.63	2.46	3.27
40.0	200	0.256	34.2	5.08	5.31	0.59	2.54	3.39



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-129	Consolidation Pressure :	25.0 psi
Depth(ft):	29-30	Initial Sample Height:	4.861 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.860 in
Sample Description:	Greenish Gray Sandy Clay	Final Sample Area (A)*:	5.264 sq. in.
		Induced OCR=	1.0

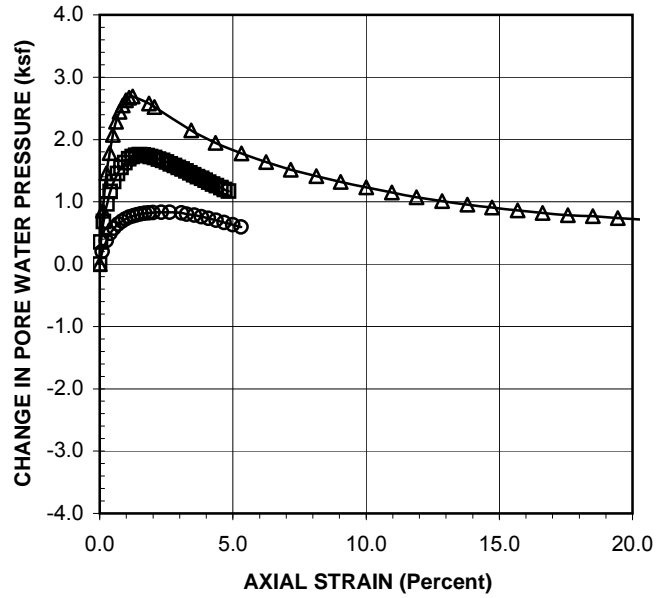
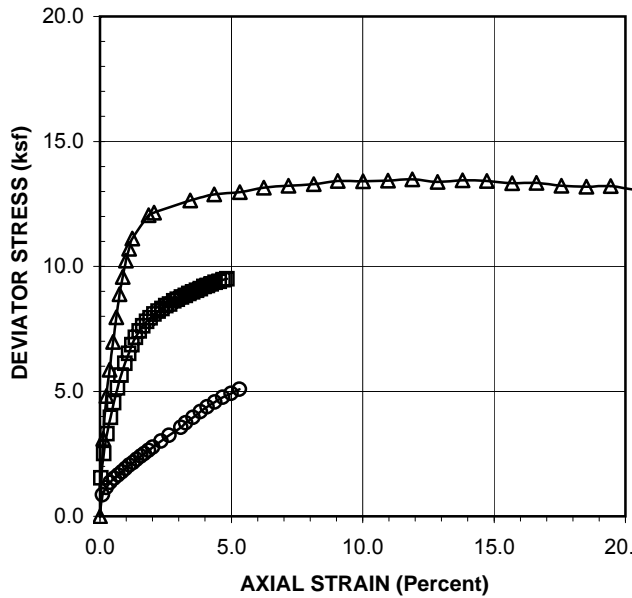
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	-1	0.000	30.1	-0.03	0.00	0.00	-0.01	3.59
55.0	56	0.002	32.5	1.53	0.04	0.35	0.77	4.01
55.0	92	0.007	34.8	2.51	0.14	0.69	1.26	4.17
55.0	121	0.013	36.8	3.30	0.27	0.96	1.65	4.29
55.0	145	0.019	38.2	3.95	0.40	1.17	1.98	4.41
55.0	167	0.026	39.3	4.54	0.53	1.33	2.27	4.55
55.0	189	0.033	40.2	5.14	0.67	1.45	2.57	4.72
55.0	208	0.039	40.8	5.64	0.81	1.55	2.82	4.87
55.0	226	0.046	41.4	6.12	0.95	1.63	3.06	5.03
55.0	241	0.053	41.8	6.52	1.09	1.69	3.26	5.17
55.0	254	0.059	42.0	6.86	1.22	1.72	3.43	5.31
55.0	265	0.066	42.2	7.15	1.36	1.75	3.58	5.43
55.0	275	0.073	42.2	7.41	1.50	1.75	3.71	5.55
55.0	283	0.079	42.2	7.62	1.63	1.75	3.81	5.66
55.0	290	0.086	42.2	7.79	1.78	1.74	3.90	5.75
55.0	296	0.093	42.1	7.94	1.91	1.73	3.97	5.84
55.0	302	0.100	41.9	8.09	2.06	1.71	4.05	5.94
55.0	307	0.108	41.8	8.21	2.21	1.68	4.11	6.02
55.0	311	0.115	41.6	8.31	2.37	1.66	4.15	6.09
55.0	316	0.122	41.4	8.43	2.51	1.64	4.21	6.18
55.0	319	0.129	41.2	8.50	2.66	1.61	4.25	6.24
55.0	324	0.137	41.0	8.61	2.81	1.58	4.31	6.33
55.0	327	0.144	40.8	8.68	2.95	1.55	4.34	6.39
55.0	331	0.151	40.6	8.77	3.10	1.52	4.39	6.46
55.0	334	0.158	40.4	8.84	3.25	1.49	4.42	6.53
55.0	337	0.165	40.2	8.91	3.38	1.46	4.45	6.59
55.0	340	0.172	40.0	8.97	3.54	1.43	4.49	6.65
55.0	343	0.179	39.8	9.04	3.67	1.40	4.52	6.72
55.0	346	0.186	39.6	9.10	3.83	1.37	4.55	6.78
55.0	350	0.192	39.4	9.20	3.96	1.34	4.60	6.85
55.0	352	0.199	39.2	9.24	4.09	1.31	4.62	6.90
55.0	355	0.206	39.0	9.30	4.24	1.28	4.65	6.97
55.0	358	0.213	38.8	9.36	4.38	1.26	4.68	7.03
55.0	360	0.221	38.6	9.40	4.55	1.23	4.70	7.07
55.0	363	0.228	38.4	9.47	4.69	1.20	4.73	7.13
55.0	365	0.235	38.2	9.50	4.84	1.17	4.75	7.18



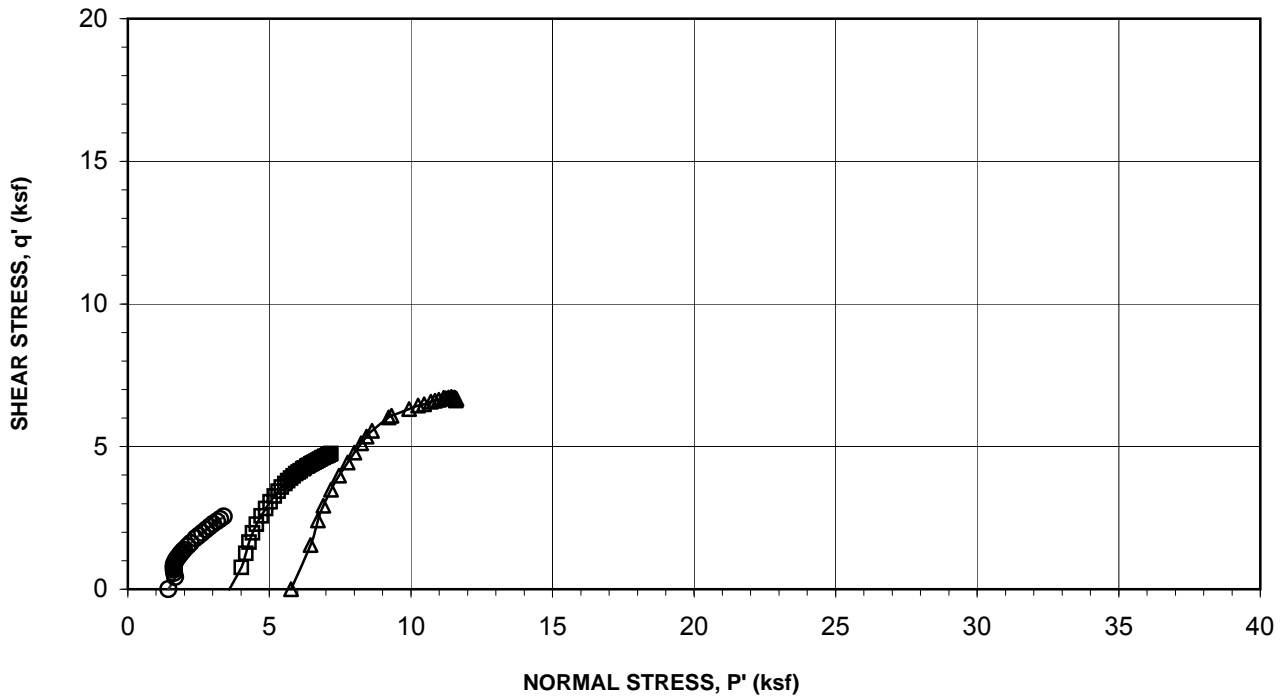
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-129	Consolidation Pressure :	40.0 psi
Depth(ft):	29-30	Initial Sample Height:	4.861 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.861 in
Sample Description:	Greenish Gray Sandy Clay	Final Sample Area (A)*:	5.337 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(ksf)	(ksf)
70.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.76
70.0	115	0.006	35.9	3.10	0.12	0.86	1.55	6.45
70.0	179	0.012	40.1	4.82	0.25	1.46	2.41	6.71
70.0	218	0.018	42.4	5.86	0.37	1.78	2.93	6.91
70.0	260	0.024	44.4	6.98	0.49	2.08	3.49	7.17
70.0	297	0.030	45.9	7.96	0.62	2.28	3.98	7.46
70.0	332	0.036	47.0	8.89	0.74	2.45	4.45	7.76
70.0	358	0.042	47.7	9.58	0.86	2.55	4.79	8.00
70.0	383	0.048	48.3	10.23	0.99	2.63	5.12	8.24
70.0	401	0.054	48.6	10.70	1.11	2.67	5.35	8.44
70.0	417	0.060	48.7	11.11	1.23	2.69	5.56	8.62
70.0	455	0.090	47.9	12.05	1.85	2.58	6.02	9.21
70.0	460	0.100	47.5	12.16	2.06	2.52	6.08	9.31
70.0	485	0.167	44.9	12.64	3.43	2.15	6.32	9.93
70.0	499	0.211	43.5	12.88	4.35	1.95	6.44	10.25
70.0	508	0.259	42.4	12.98	5.32	1.78	6.49	10.47
70.0	520	0.303	41.4	13.15	6.24	1.64	6.58	10.70
70.0	528	0.349	40.5	13.22	7.18	1.52	6.61	10.86
70.0	536	0.395	39.8	13.28	8.13	1.41	6.64	10.99
70.0	547	0.440	39.2	13.42	9.05	1.32	6.71	11.15
70.0	552	0.487	38.6	13.40	10.01	1.23	6.70	11.23
70.0	559	0.533	38.0	13.43	10.97	1.15	6.71	11.32
70.0	567	0.578	37.5	13.48	11.89	1.08	6.74	11.42
70.0	569	0.625	37.0	13.38	12.85	1.01	6.69	11.44
70.0	578	0.671	36.6	13.44	13.80	0.95	6.72	11.53
70.0	583	0.716	36.3	13.41	14.73	0.91	6.71	11.56
70.0	586	0.763	36.0	13.33	15.69	0.86	6.66	11.56
70.0	593	0.808	35.7	13.34	16.62	0.82	6.67	11.61
70.0	595	0.854	35.5	13.23	17.57	0.79	6.62	11.59
70.0	600	0.900	35.3	13.19	18.51	0.77	6.60	11.59
70.0	608	0.945	35.1	13.21	19.44	0.74	6.61	11.63
70.0	608	0.991	35.0	13.06	20.40	0.71	6.53	11.58
70.0	614	1.038	34.8	13.03	21.35	0.69	6.51	11.59

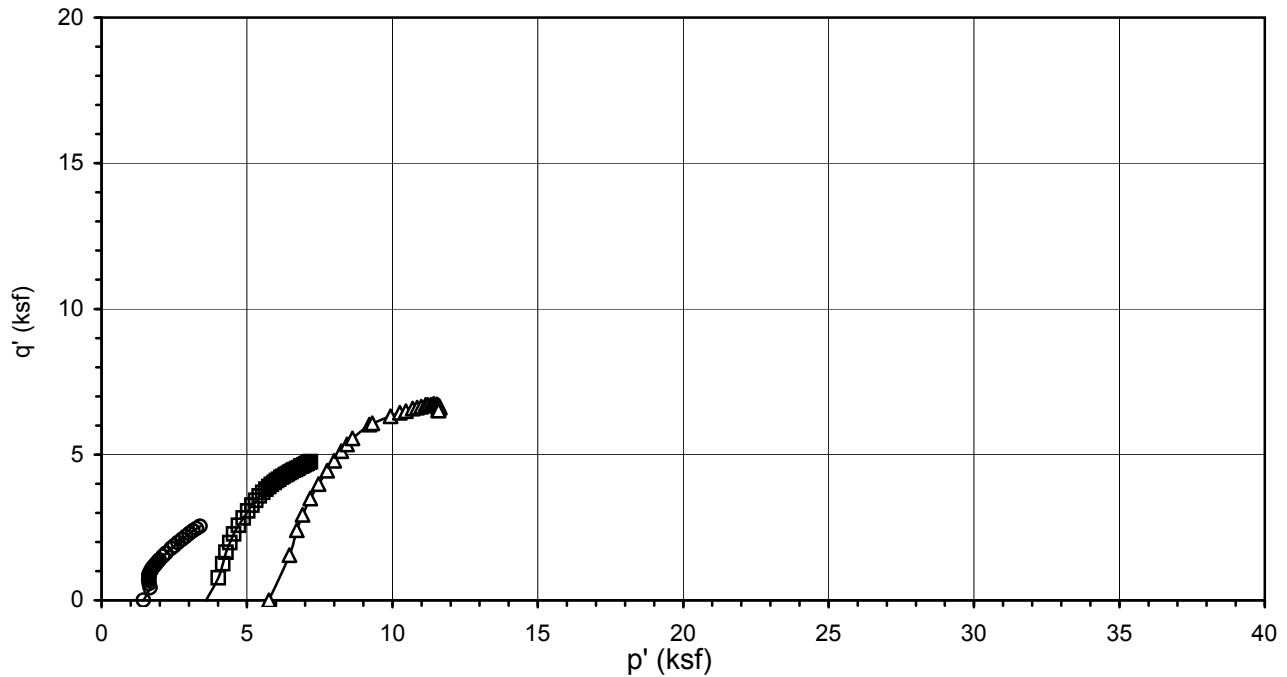


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi

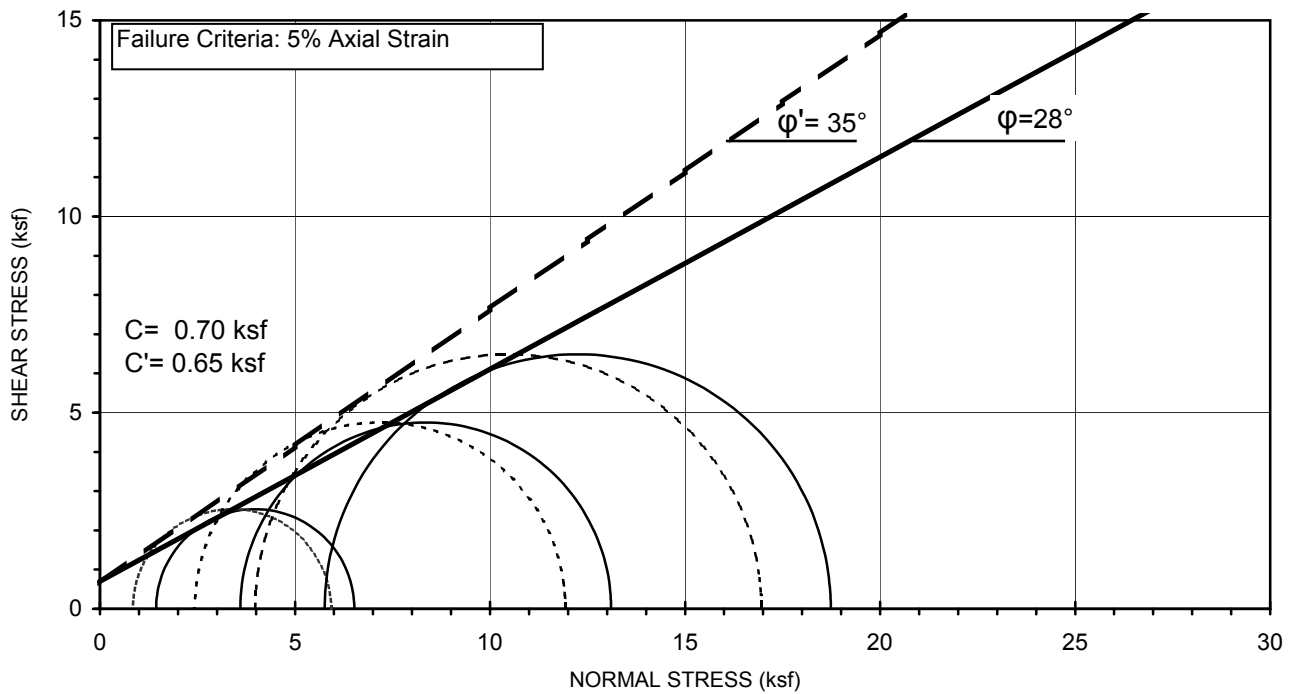


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Greenish Gray Sandy Clay
Test Pit:	G-129	Avg. Dry Unit Weight (pcf):	113.4
Sample No.:	7	Avg. Initial Moisture Content (%):	16.6
Depth (ft):	29-30	Confining Pressure:	10.0, 25.0, 40.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

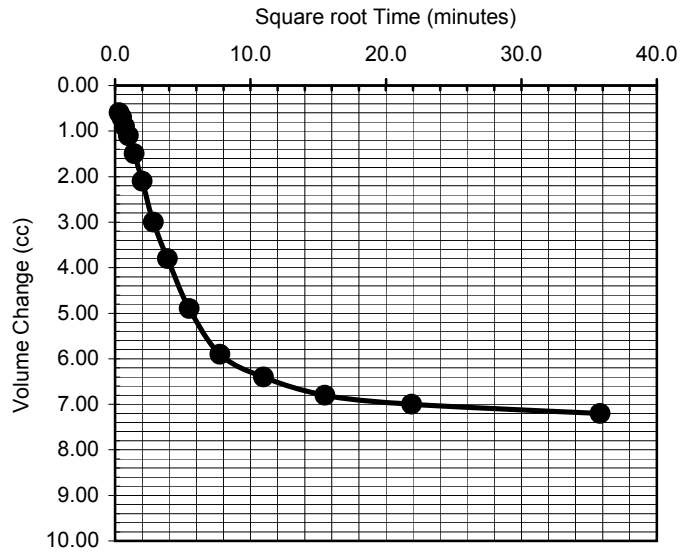
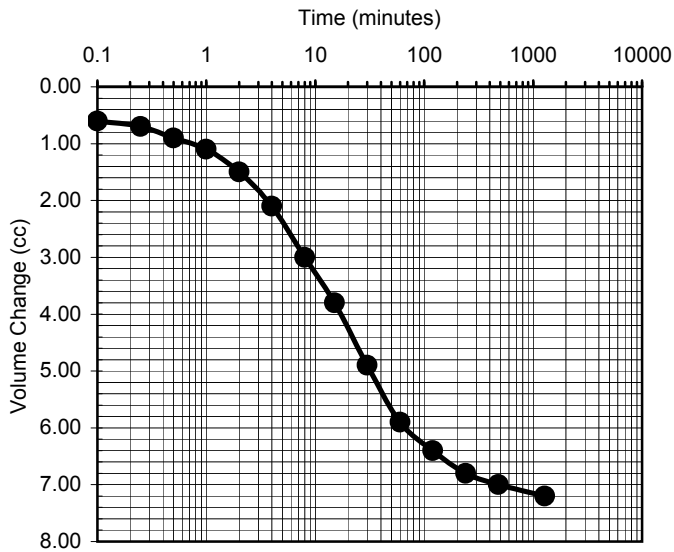


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 25 psi △ 40 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Greenish Gray Sandy Clay
Test Pit:	G-129	Avg. Dry Unit Weight (pcf):	113.4
Sample No.:	7	Avg. Initial Moisture Content (%):	16.6
Depth (ft):	29-30	Confining Pressure:	10.0, 25.0, 40.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-129	Sample Type:	Mod. Cal.
Sample No.:	7	Soil Description:	Greenish Gray Sandy Clay
Depth (feet):	29-30	Eff. Confining Pressure (psi):	25.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.6000
0.25	0.7000
0.5	0.9000
1	1.1000
2	1.5000
4	2.1000
8	3.0000
15	3.8000
30	4.9000
60	5.9000
120	6.4000
240	6.8000
480	7.0000
1283	7.2000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.6000
0.5000	0.7000
0.7071	0.9000
1.0000	1.1000
1.4142	1.5000
2.0000	2.1000
2.8284	3.0000
3.8730	3.8000
5.4772	4.9000
7.7460	5.9000
10.9545	6.4000
15.4919	6.8000
21.9089	7.0000
35.8190	7.2000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/14/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-22-11**
 Test Pit: **G-129** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **13** Sample Description: **Olive Gray Sandy Fat Clay**
 Depth(ft): **49-50**
 Sample Type: **Mod. Cal.** **Confining Pressure = 15.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.710</u>	<u>5.710</u>	<u>5.710</u>	Avg. =	5.710

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.326
Moisture Content (%)	23.41	22.02
Wet Weight (gms)	<u>81.20</u>	<u>1175.11</u>
Dry Weight (gms)	<u>75.35</u>	<u>989.82</u>
Container Weight (gms)	<u>50.36</u>	<u>148.54</u>
Density and Saturation		
Wet Weight (gms)	<u>1035.03</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	128.6	
Dry Density (pcf)	104.2	
Initial Void Ratio	0.617	
% Saturation	102.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>95</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>45.0</u>	Initial Burette Ht.(cm)=	<u>74.4</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>66.9</u>
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	<u>5.672</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.667</u>
Change in Ht. of Specimen (in) =	<u>0.0380</u>	Final Volume (cu.in) =	<u>30.209</u>

Shear		At Failure	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	4.69
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	1.36
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.05
		Axial Strain (%) =	5.22



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-14-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-22-11
Test Pit:	G-129	Reviewed by:	AP	Date:	07-28-11
Sample No.:	13	Sample Description:	Olive Gray Sandy Fat Clay		
Depth(ft):	49-50				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.710</u>	<u>5.710</u>	<u>5.710</u>	Avg. =	5.710

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.312
Moisture Content (%)	23.41	22.02
Wet Weight (gms)	81.20	1175.11
Dry Weight (gms)	75.35	989.82
Container Weight (gms)	50.36	148.54
Density and Saturation		
Wet Weight (gms)	1035.03	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.6	
Dry Density (pcf)	104.2	
Initial Void Ratio	0.617	
% Saturation	102.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	66.9
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	58.4
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.675
Induced OCR=	1.0	Initial Volume (cu.in)=	30.667
Change in Ht. of Specimen (in) =	0.0350	Final Volume (cu.in) =	30.148

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	8.75
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	2.84
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.59
		Axial Strain (%) =	5.07



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-14-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-22-11
Test Pit:	G-129	Reviewed by:	AP	Date:	07-28-11
Sample No.:	13	Sample Description:	Olive Gray Sandy Fat Clay		
Depth(ft):	49-50				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.710</u>	<u>5.710</u>	<u>5.710</u>	Avg. =	5.710

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.316
Moisture Content (%)	23.41	22.02
Wet Weight (gms)	81.20	1175.11
Dry Weight (gms)	75.35	989.82
Container Weight (gms)	50.36	148.54
Density and Saturation		
Wet Weight (gms)	1035.03	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.6	
Dry Density (pcf)	104.2	
Initial Void Ratio	0.617	
% Saturation	102.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	58.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	52.2
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.693
Induced OCR =	1.0	Initial Volume (cu.in)=	30.667
Change in Ht. of Specimen (in) =	0.0171	Final Volume (cu.in) =	30.264

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	12.46
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	4.30
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	16.76
		Axial Strain (%) =	4.74



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-129	Consolidation Pressure :	15.0 psi
Depth(ft):	49-50	Initial Sample Height:	5.710 in
Sample No.:	13	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.672 in
Sample Description:	Olive Gray Sandy Fat Clay	Final Sample Area (A)*:	5.326 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
45.0	0	0.000	30.5	0.00	0.00	0.00	0.00	2.16
45.0	38	0.005	32.3	1.03	0.08	0.27	0.51	2.41
45.0	53	0.012	33.7	1.43	0.21	0.47	0.71	2.41
45.0	64	0.019	34.7	1.72	0.34	0.61	0.86	2.41
45.0	72	0.026	35.5	1.94	0.45	0.72	0.97	2.41
45.0	79	0.033	36.0	2.12	0.57	0.80	1.06	2.42
45.0	85	0.040	36.5	2.28	0.71	0.87	1.14	2.43
45.0	90	0.047	36.8	2.41	0.83	0.92	1.21	2.45
45.0	94	0.055	37.1	2.52	0.96	0.95	1.26	2.46
45.0	98	0.061	37.3	2.62	1.08	0.98	1.31	2.49
45.0	102	0.068	37.4	2.72	1.20	1.01	1.36	2.52
45.0	106	0.075	37.6	2.83	1.32	1.02	1.41	2.55
45.0	109	0.082	37.7	2.90	1.44	1.04	1.45	2.58
45.0	112	0.088	37.7	2.98	1.55	1.04	1.49	2.61
45.0	115	0.096	37.7	3.06	1.69	1.05	1.53	2.64
45.0	134	0.149	37.7	3.53	2.63	1.04	1.76	2.88
45.0	139	0.164	37.6	3.65	2.89	1.03	1.82	2.96
45.0	144	0.179	37.5	3.77	3.15	1.01	1.89	3.03
45.0	149	0.192	37.3	3.89	3.39	0.99	1.95	3.12
45.0	154	0.206	37.2	4.01	3.63	0.97	2.01	3.20
45.0	159	0.220	37.0	4.13	3.88	0.94	2.07	3.28
45.0	163	0.235	36.8	4.22	4.15	0.91	2.11	3.36
45.0	169	0.252	36.6	4.37	4.43	0.89	2.18	3.46
45.0	173	0.266	36.4	4.46	4.70	0.86	2.23	3.53
45.0	178	0.282	36.2	4.57	4.97	0.83	2.29	3.62
45.0	183	0.296	36.0	4.69	5.22	0.80	2.34	3.71



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-129	Consolidation Pressure :	30.0 psi
Depth(ft):	49-50	Initial Sample Height:	5.710 in
Sample No.:	13	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.675 in
Sample Description:	Olive Gray Sandy Fat Clay	Final Sample Area (A)*:	5.312 sq. in.
		Induced OCR=	1.0

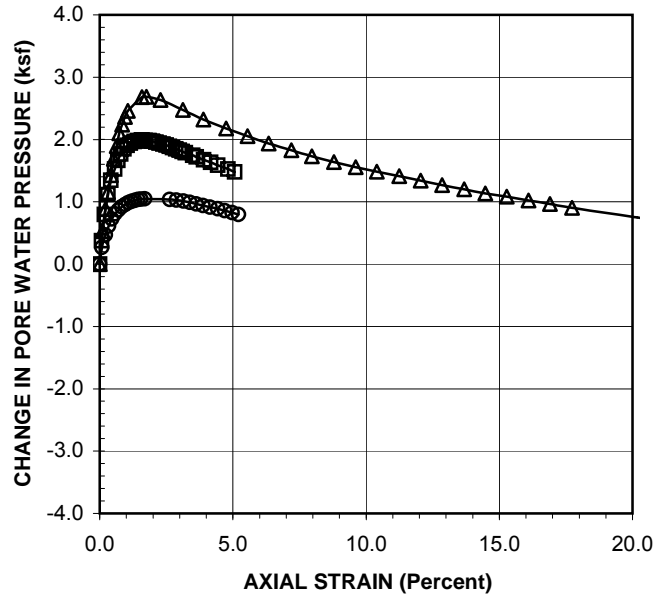
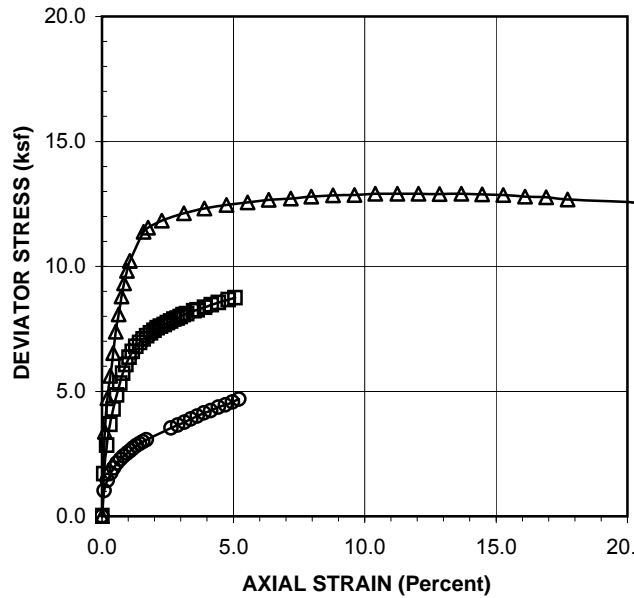
Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	1	0.000	30.1	0.03	0.00	0.00	0.01	4.33
60.0	63	0.004	32.7	1.71	0.08	0.37	0.85	4.80
60.0	105	0.010	35.6	2.84	0.18	0.79	1.42	4.95
60.0	136	0.018	37.8	3.67	0.31	1.11	1.84	5.04
60.0	159	0.024	39.4	4.29	0.42	1.35	2.15	5.12
60.0	180	0.032	40.7	4.85	0.56	1.53	2.43	5.22
60.0	198	0.039	41.6	5.33	0.69	1.66	2.67	5.32
60.0	213	0.045	42.3	5.73	0.79	1.77	2.86	5.42
60.0	226	0.052	42.9	6.07	0.91	1.85	3.04	5.51
60.0	237	0.059	43.3	6.36	1.03	1.90	3.18	5.60
60.0	246	0.066	43.6	6.59	1.16	1.94	3.30	5.67
60.0	254	0.074	43.7	6.80	1.30	1.97	3.40	5.75
60.0	260	0.081	43.8	6.95	1.43	1.98	3.47	5.81
60.0	266	0.089	43.9	7.10	1.57	1.99	3.55	5.88
60.0	271	0.097	43.8	7.22	1.70	1.98	3.61	5.95
60.0	276	0.105	43.8	7.34	1.85	1.98	3.67	6.01
60.0	280	0.113	43.7	7.44	1.98	1.97	3.72	6.07
60.0	284	0.120	43.7	7.54	2.11	1.96	3.77	6.13
60.0	287	0.127	43.6	7.61	2.23	1.94	3.80	6.18
60.0	290	0.135	43.4	7.67	2.37	1.93	3.84	6.23
60.0	293	0.142	43.3	7.74	2.50	1.91	3.87	6.28
60.0	296	0.149	43.2	7.81	2.62	1.89	3.91	6.34
60.0	299	0.156	43.0	7.88	2.74	1.87	3.94	6.39
60.0	301	0.162	42.9	7.93	2.86	1.85	3.96	6.43
60.0	304	0.169	42.8	7.99	2.99	1.83	4.00	6.49
60.0	307	0.176	42.6	8.06	3.10	1.81	4.03	6.54
60.0	309	0.183	42.5	8.11	3.22	1.79	4.05	6.58
60.0	314	0.198	42.2	8.21	3.49	1.74	4.11	6.68
60.0	316	0.206	42.0	8.25	3.63	1.72	4.13	6.73
60.0	321	0.222	41.7	8.36	3.91	1.68	4.18	6.82
60.0	326	0.237	41.4	8.47	4.17	1.63	4.23	6.92
60.0	330	0.252	41.1	8.55	4.44	1.59	4.27	7.01
60.0	336	0.273	40.6	8.67	4.82	1.52	4.33	7.13
60.0	340	0.288	40.3	8.75	5.07	1.48	4.37	7.21



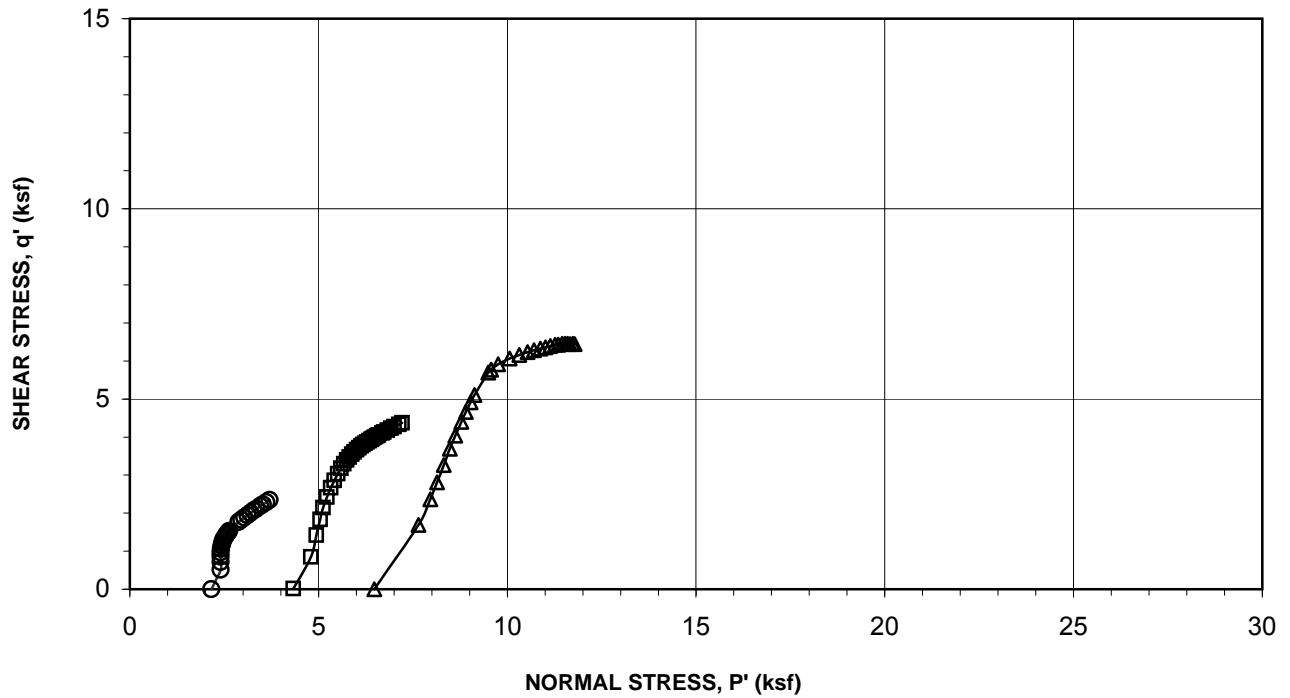
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-129	Consolidation Pressure :	45.0 psi
Depth(ft):	49-50	Initial Sample Height:	5.710 in
Sample No.:	13	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.693 in
Sample Description:	Olive Gray Sandy Fat Clay	Final Sample Area (A)*:	5.316 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	125	0.006	33.7	3.38	0.11	0.53	1.69	7.64
75.0	175	0.012	36.1	4.73	0.21	0.88	2.37	7.96
75.0	208	0.018	38.0	5.62	0.32	1.15	2.81	8.13
75.0	242	0.024	39.9	6.53	0.42	1.43	3.26	8.31
75.0	274	0.030	41.7	7.38	0.53	1.69	3.69	8.48
75.0	300	0.036	43.2	8.07	0.63	1.89	4.04	8.62
75.0	327	0.042	44.6	8.79	0.74	2.10	4.40	8.78
75.0	347	0.048	45.5	9.32	0.84	2.24	4.66	8.90
75.0	366	0.054	46.4	9.82	0.95	2.36	4.91	9.03
75.0	381	0.060	47.1	10.21	1.05	2.46	5.11	9.13
75.0	427	0.090	48.6	11.38	1.58	2.68	5.69	9.49
75.0	434	0.100	48.7	11.55	1.76	2.69	5.77	9.57
75.0	447	0.130	48.3	11.83	2.28	2.64	5.92	9.76
75.0	462	0.178	47.2	12.12	3.12	2.48	6.06	10.06
75.0	473	0.222	46.1	12.31	3.89	2.32	6.16	10.32
75.0	483	0.270	45.1	12.46	4.74	2.18	6.23	10.53
75.0	491	0.316	44.3	12.56	5.55	2.05	6.28	10.71
75.0	499	0.361	43.4	12.66	6.35	1.94	6.33	10.87
75.0	506	0.409	42.7	12.72	7.19	1.83	6.36	11.01
75.0	513	0.453	42.0	12.79	7.96	1.73	6.39	11.14
75.0	520	0.501	41.4	12.85	8.79	1.64	6.42	11.26
75.0	525	0.547	40.8	12.85	9.61	1.55	6.43	11.35
75.0	532	0.592	40.3	12.91	10.41	1.49	6.46	11.45
75.0	537	0.640	39.8	12.91	11.25	1.41	6.46	11.53
75.0	542	0.686	39.3	12.91	12.05	1.34	6.46	11.60
75.0	546	0.731	38.8	12.89	12.85	1.27	6.44	11.66
75.0	552	0.779	38.3	12.91	13.68	1.20	6.45	11.73
75.0	556	0.824	37.9	12.88	14.47	1.14	6.44	11.78
75.0	560	0.870	37.5	12.85	15.27	1.08	6.43	11.82
75.0	563	0.917	37.1	12.80	16.10	1.02	6.40	11.86
75.0	567	0.962	36.7	12.76	16.91	0.96	6.38	11.90
75.0	569	1.009	36.3	12.68	17.73	0.90	6.34	11.92
75.0	581	1.149	35.2	12.56	20.18	0.75	6.28	12.01
75.0	581	1.195	34.9	12.44	20.98	0.70	6.22	11.99

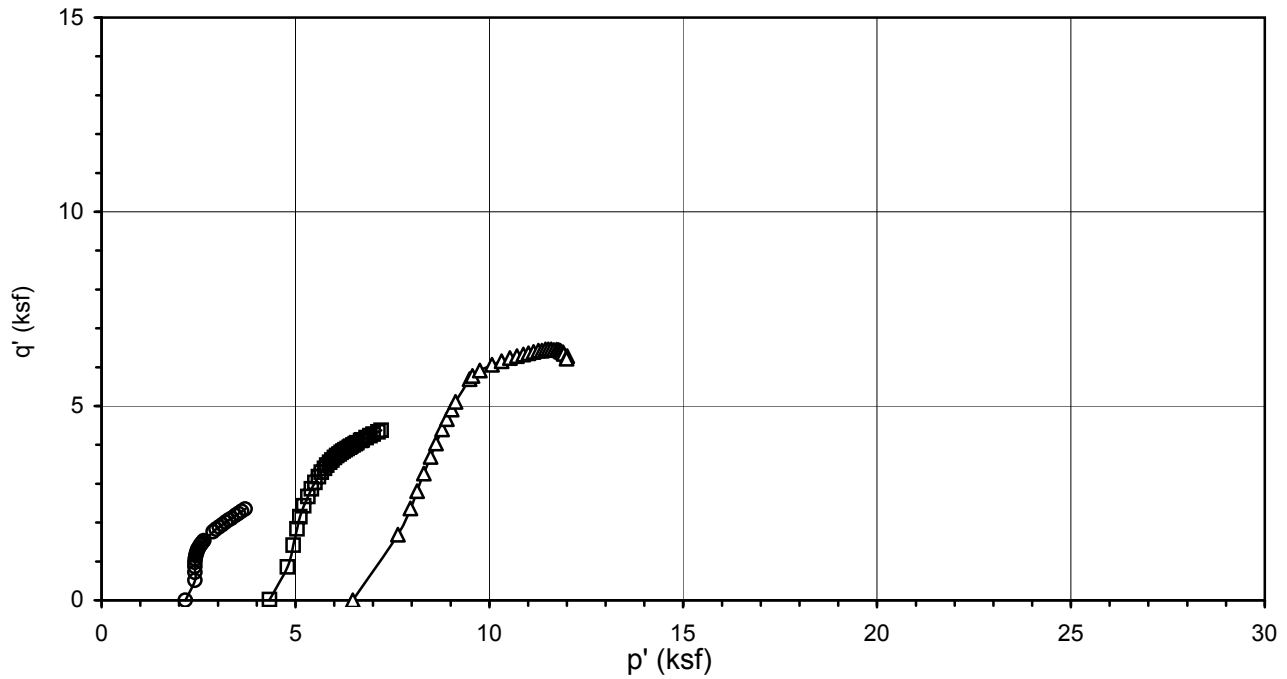


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi

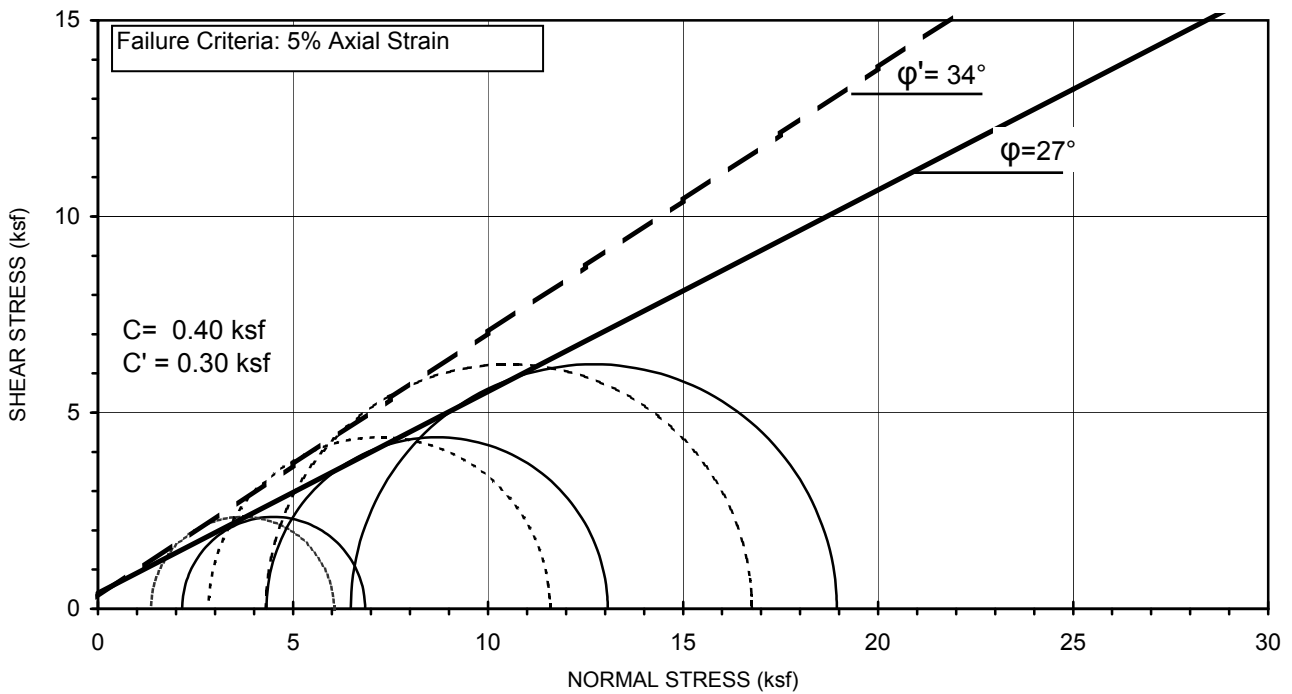


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Gray Sandy Fat Clay
Test Pit:	G-129	Avg. Dry Unit Weight (pcf):	104.2
Sample No.:	13	Avg. Initial Moisture Content (%):	23.4
Depth (ft):	49-50	Confining Pressure:	15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

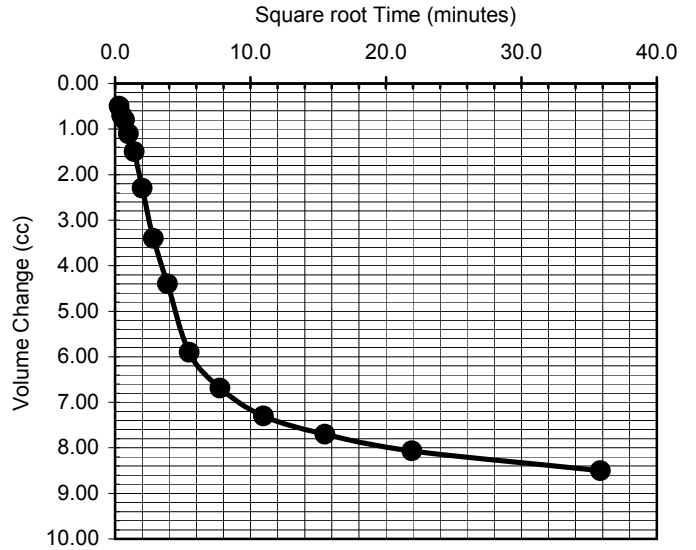
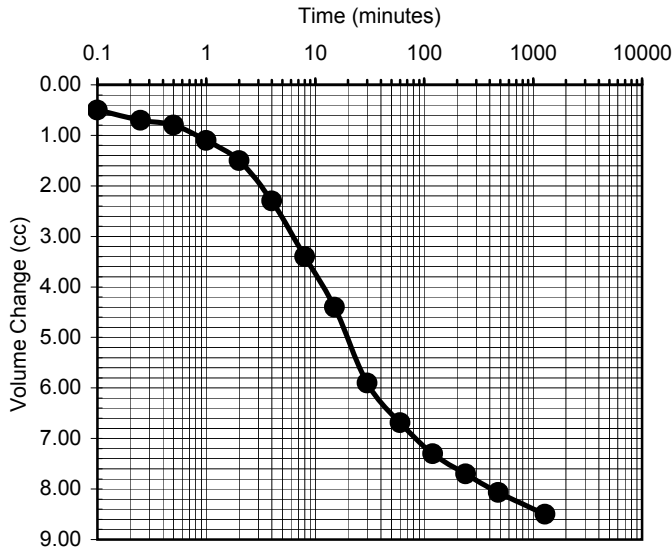


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Gray Sandy Fat Clay
Test Pit:	G-129	Avg. Dry Unit Weight (pcf):	104.2
Sample No.:	13	Avg. Initial Moisture Content (%):	23.4
Depth (ft):	49-50	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-129	Sample Type:	Mod. Cal.
Sample No.:	13	Soil Description:	Olive Gray Sandy Fat Clay
Depth (feet):	49-50	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.5000
0.25	0.7000
0.5	0.8000
1	1.1000
2	1.5000
4	2.3000
8	3.4000
15	4.4000
30	5.9000
60	6.6900
120	7.3000
240	7.7000
481	8.0700
1284	8.5000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.5000
0.5000	0.7000
0.7071	0.8000
1.0000	1.1000
1.4142	1.5000
2.0000	2.3000
2.8284	3.4000
3.8730	4.4000
5.4772	5.9000
7.7460	6.6900
10.9545	7.3000
15.4919	7.7000
21.9317	8.0700
35.8329	8.5000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	07/14/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-06-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-130B	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Gray Clay		
Depth(ft):	70.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.611</u>	<u>2.611</u>	<u>2.611</u>	Avg. =	2.611
Height (in)	<u>5.594</u>	<u>5.594</u>	<u>5.594</u>	Avg. =	5.594

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.354	5.300
Moisture Content (%)	35.04	30.70
Wet Weight (gms)	98.58	1076.73
Dry Weight (gms)	86.00	858.81
Container Weight (gms)	50.10	148.86
Density and Saturation		
Wet Weight (gms)	942.62	
Container Weight (gms)	0.00	
Wet Density (pcf)	119.9	
Dry Density (pcf)	88.8	
Initial Void Ratio	0.898	
% Saturation	105.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	34.7
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	26.7
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.559
Induced OCR =	1.0	Initial Volume (cu.in)=	29.952
Change in Ht. of Specimen (in) =	0.0347	Final Volume (cu.in) =	29.464

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	4.70
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.41
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.11
		Axial Strain (%) =	5.76



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-06-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-130B	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Gray Clay		
Depth(ft):	70.5				
Sample Type:	Mod. Cal.	Confining Pressure =	40.0 psi		

Diameter (in)	<u>2.611</u>	<u>2.611</u>	<u>2.611</u>	Avg. =	2.611
Height (in)	<u>5.594</u>	<u>5.594</u>	<u>5.594</u>	Avg. =	5.594

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.354	5.279
Moisture Content (%)	35.04	30.70
Wet Weight (gms)	98.58	1076.73
Dry Weight (gms)	86.00	858.81
Container Weight (gms)	50.10	148.86
Density and Saturation		
Wet Weight (gms)	942.62	
Container Weight (gms)	0.00	
Wet Density (pcf)	119.9	
Dry Density (pcf)	88.8	
Initial Void Ratio	0.898	
% Saturation	105.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	44.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	33.6
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	5.549
Induced OCR=	1.0	Initial Volume (cu.in)=	29.952
Change in Ht. of Specimen (in) =	0.0454	Final Volume (cu.in) =	29.293

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	8.64
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.02
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.67
		Axial Strain (%) =	5.41



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-06-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-130B	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Gray Clay		
Depth(ft):	70.5				
Sample Type:	Mod. Cal.	Confining Pressure =	60.0 psi		

Diameter (in)	<u>2.611</u>	<u>2.611</u>	<u>2.611</u>	Avg. =	2.611
Height (in)	<u>5.594</u>	<u>5.594</u>	<u>5.594</u>	Avg. =	5.594

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.354	5.289
Moisture Content (%)	35.04	30.70
Wet Weight (gms)	98.58	1076.73
Dry Weight (gms)	86.00	858.81
Container Weight (gms)	50.10	148.86
Density and Saturation		
Wet Weight (gms)	942.62	
Container Weight (gms)	0.00	
Wet Density (pcf)	119.9	
Dry Density (pcf)	88.8	
Initial Void Ratio	0.898	
% Saturation	105.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	33.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	23.5
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	5.549
Induced OCR =	1.0	Initial Volume (cu.in)=	29.952
Change in Ht. of Specimen (in) =	0.0454	Final Volume (cu.in) =	29.348

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	12.58
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.36
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.95
		Axial Strain (%) =	2.48



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-130B	Consolidation Pressure :	20.0 psi
Depth(ft):	70.5	Initial Sample Height:	5.594 in
Sample No.:	-	Initial Area of Sample:	5.354 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.559 in
Sample Description:	Gray Clay	Final Sample Area (A)*:	5.300 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.88
50.0	2	0.001	30.0	0.05	0.02	0.00	0.03	2.91
50.0	32	0.005	32.2	0.87	0.09	0.31	0.43	3.00
50.0	65	0.017	35.2	1.76	0.31	0.74	0.88	3.02
50.0	81	0.029	37.0	2.19	0.52	1.01	1.09	2.97
50.0	92	0.040	38.2	2.48	0.72	1.18	1.24	2.94
50.0	100	0.052	39.0	2.69	0.93	1.29	1.35	2.93
50.0	106	0.064	39.6	2.85	1.15	1.38	1.42	2.93
50.0	111	0.075	40.0	2.98	1.35	1.44	1.49	2.93
50.0	115	0.086	40.3	3.08	1.55	1.49	1.54	2.93
50.0	119	0.098	40.6	3.18	1.77	1.52	1.59	2.95
50.0	123	0.110	40.7	3.28	1.98	1.55	1.64	2.97
50.0	127	0.122	40.9	3.37	2.19	1.57	1.69	3.00
50.0	130	0.134	41.0	3.45	2.41	1.58	1.72	3.02
50.0	134	0.146	41.1	3.54	2.63	1.59	1.77	3.06
50.0	137	0.159	41.1	3.62	2.85	1.60	1.81	3.09
50.0	140	0.170	41.2	3.69	3.07	1.61	1.84	3.12
50.0	144	0.182	41.2	3.78	3.27	1.61	1.89	3.16
50.0	147	0.193	41.2	3.86	3.47	1.61	1.93	3.19
50.0	151	0.205	41.2	3.95	3.69	1.61	1.98	3.24
50.0	154	0.217	41.2	4.02	3.90	1.61	2.01	3.28
50.0	157	0.229	41.2	4.09	4.11	1.61	2.05	3.32
50.0	161	0.240	41.2	4.19	4.32	1.61	2.09	3.37
50.0	165	0.253	41.1	4.28	4.54	1.60	2.14	3.42
50.0	168	0.265	41.1	4.35	4.76	1.59	2.17	3.46
50.0	172	0.276	41.0	4.44	4.97	1.58	2.22	3.52
50.0	175	0.289	40.9	4.51	5.20	1.57	2.25	3.56
50.0	178	0.301	40.5	4.57	5.41	1.51	2.29	3.66
50.0	184	0.320	40.2	4.70	5.76	1.47	2.35	3.76



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-130B	Consolidation Pressure :	40.0 psi
Depth(ft):	70.5	Initial Sample Height:	5.594 in
Sample No.:	-	Initial Area of Sample:	5.354 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.549 in
Sample Description:	Gray Clay	Final Sample Area (A)*:	5.279 sq. in.
		Induced OCR=	1.0

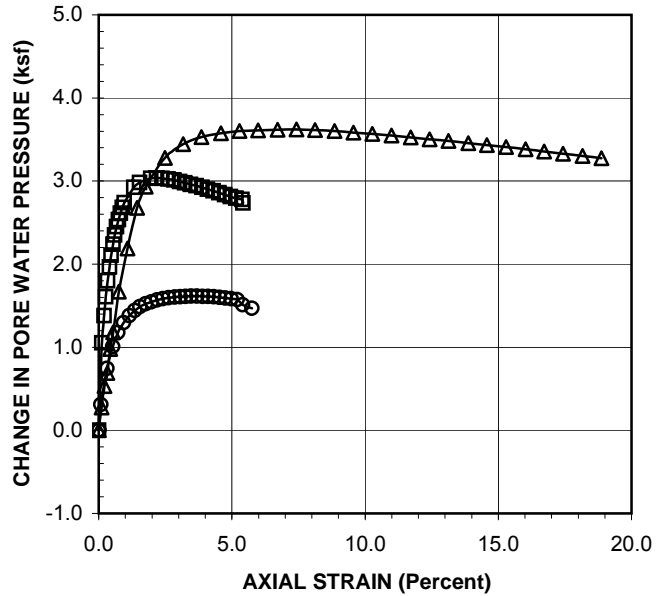
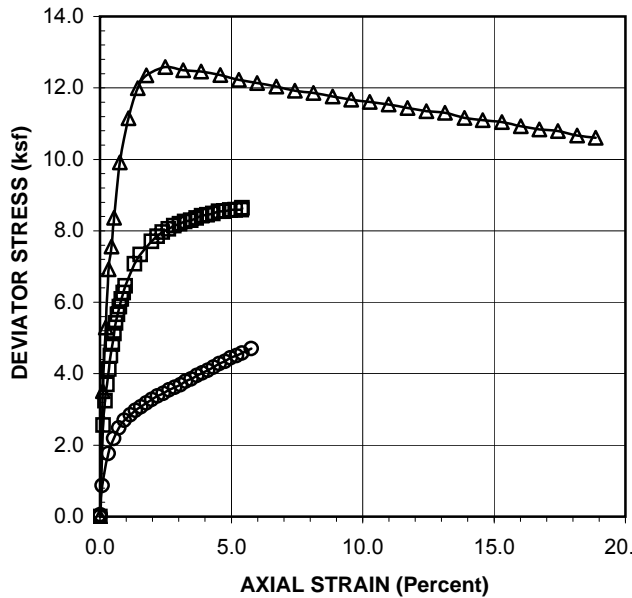
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.76
70.0	94	0.007	37.3	2.56	0.12	1.05	1.28	5.99
70.0	119	0.011	39.6	3.24	0.20	1.38	1.62	6.00
70.0	136	0.015	41.2	3.70	0.27	1.61	1.85	6.00
70.0	152	0.019	42.5	4.13	0.34	1.80	2.07	6.03
70.0	166	0.023	43.6	4.51	0.41	1.96	2.25	6.05
70.0	178	0.026	44.7	4.83	0.47	2.11	2.42	6.07
70.0	189	0.030	45.5	5.13	0.54	2.24	2.56	6.09
70.0	200	0.033	46.3	5.42	0.60	2.35	2.71	6.12
70.0	209	0.037	47.0	5.66	0.67	2.45	2.83	6.14
70.0	217	0.041	47.6	5.87	0.75	2.54	2.94	6.16
70.0	225	0.045	48.1	6.09	0.82	2.61	3.04	6.19
70.0	232	0.049	48.6	6.27	0.89	2.68	3.14	6.22
70.0	239	0.054	49.0	6.46	0.96	2.74	3.23	6.25
70.0	263	0.073	50.3	7.08	1.32	2.92	3.54	6.38
70.0	273	0.085	50.7	7.33	1.53	2.98	3.67	6.45
70.0	288	0.109	51.1	7.70	1.96	3.03	3.85	6.58
70.0	294	0.121	51.1	7.84	2.18	3.04	3.92	6.65
70.0	299	0.132	51.1	7.96	2.38	3.03	3.98	6.71
70.0	303	0.144	51.0	8.05	2.60	3.02	4.02	6.76
70.0	307	0.156	50.9	8.14	2.82	3.01	4.07	6.82
70.0	310	0.168	50.8	8.20	3.03	3.00	4.10	6.86
70.0	313	0.179	50.7	8.26	3.23	2.98	4.13	6.91
70.0	315	0.192	50.6	8.30	3.45	2.96	4.15	6.95
70.0	318	0.203	50.4	8.36	3.66	2.94	4.18	7.00
70.0	321	0.215	50.3	8.42	3.87	2.92	4.21	7.04
70.0	323	0.227	50.2	8.45	4.09	2.90	4.23	7.08
70.0	325	0.239	50.0	8.48	4.30	2.88	4.24	7.12
70.0	328	0.250	49.9	8.54	4.51	2.86	4.27	7.17
70.0	329	0.263	49.7	8.55	4.73	2.84	4.27	7.20
70.0	331	0.275	49.5	8.58	4.95	2.81	4.29	7.24
70.0	332	0.286	49.4	8.59	5.16	2.79	4.29	7.26
70.0	333	0.299	49.3	8.59	5.38	2.78	4.30	7.28
70.0	335	0.300	49.0	8.64	5.41	2.74	4.32	7.35



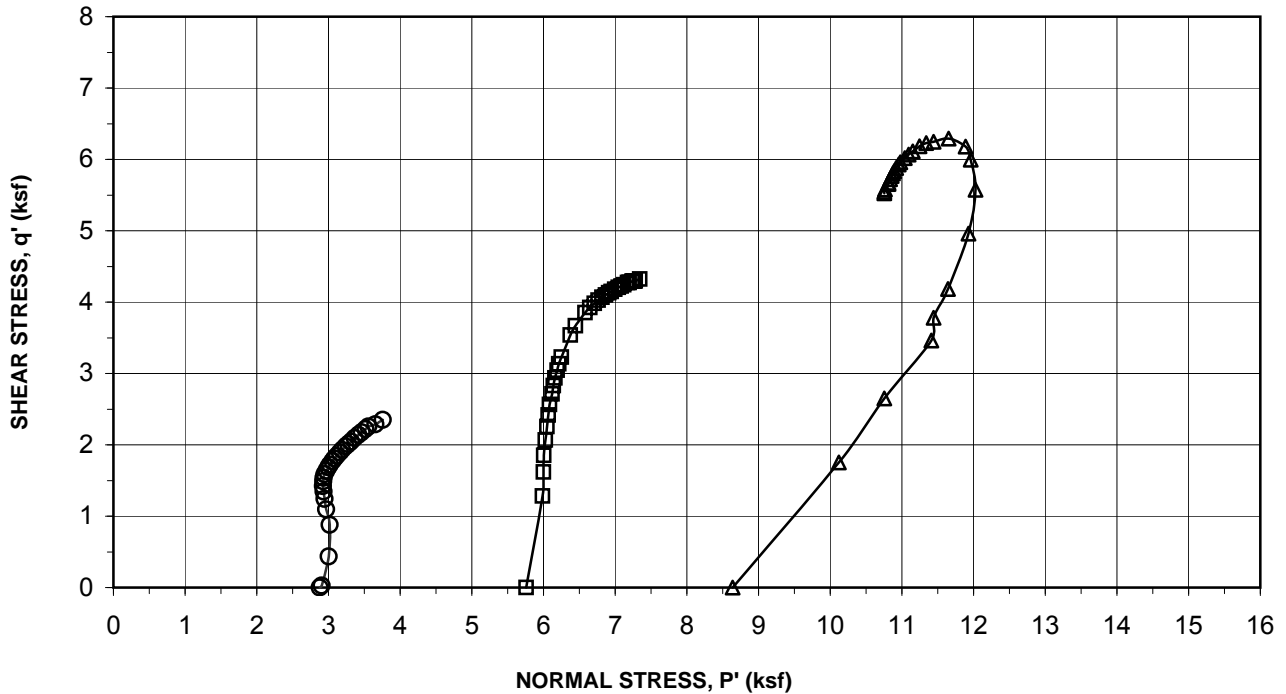
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-130B	Consolidation Pressure :	60.0 psi
Depth(ft):	70.5	Initial Sample Height:	5.594 in
Sample No.:	-	Initial Area of Sample:	5.354 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.549 in
Sample Description:	Gray Clay	Final Sample Area (A)*:	5.289 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	129	0.006	31.9	3.51	0.11	0.27	1.75	10.12
90.0	195	0.012	33.7	5.30	0.22	0.53	2.65	10.76
90.0	255	0.018	34.8	6.92	0.32	0.69	3.46	11.41
90.0	279	0.024	36.8	7.56	0.43	0.98	3.78	11.44
90.0	309	0.030	38.2	8.37	0.54	1.18	4.18	11.64
90.0	367	0.042	41.6	9.92	0.76	1.67	4.96	11.93
90.0	414	0.060	45.2	11.15	1.08	2.19	5.57	12.03
90.0	447	0.080	48.6	11.99	1.44	2.68	6.00	11.96
90.0	462	0.098	50.4	12.36	1.76	2.93	6.18	11.89
90.0	474	0.138	52.8	12.58	2.48	3.28	6.29	11.65
90.0	474	0.176	53.9	12.50	3.17	3.44	6.25	11.44
90.0	476	0.214	54.5	12.46	3.86	3.53	6.23	11.34
90.0	476	0.254	54.8	12.37	4.58	3.58	6.18	11.25
90.0	474	0.294	55.0	12.22	5.29	3.60	6.11	11.15
90.0	474	0.332	55.1	12.13	5.98	3.61	6.07	11.09
90.0	474	0.372	55.1	12.04	6.71	3.62	6.02	11.04
90.0	473	0.412	55.2	11.92	7.42	3.62	5.96	10.98
90.0	474	0.451	55.1	11.86	8.12	3.61	5.93	10.95
90.0	474	0.491	55.0	11.76	8.86	3.60	5.88	10.92
90.0	474	0.531	54.9	11.67	9.57	3.58	5.84	10.89
90.0	475	0.570	54.8	11.60	10.27	3.57	5.80	10.88
90.0	476	0.610	54.6	11.53	10.99	3.55	5.77	10.86
90.0	476	0.650	54.5	11.44	11.71	3.53	5.72	10.83
90.0	476	0.689	54.3	11.35	12.42	3.50	5.67	10.81
90.0	478	0.729	54.2	11.30	13.13	3.48	5.65	10.81
90.0	476	0.770	54.0	11.16	13.87	3.46	5.58	10.76
90.0	477	0.808	53.8	11.09	14.57	3.43	5.55	10.75
90.0	479	0.849	53.7	11.05	15.29	3.41	5.52	10.75
90.0	478	0.889	53.5	10.93	16.02	3.38	5.46	10.72
90.0	478	0.928	53.3	10.84	16.72	3.36	5.42	10.70
90.0	480	0.967	53.1	10.79	17.44	3.33	5.39	10.71
90.0	479	1.008	52.9	10.67	18.17	3.30	5.34	10.68
90.0	480	1.047	52.7	10.60	18.87	3.27	5.30	10.67



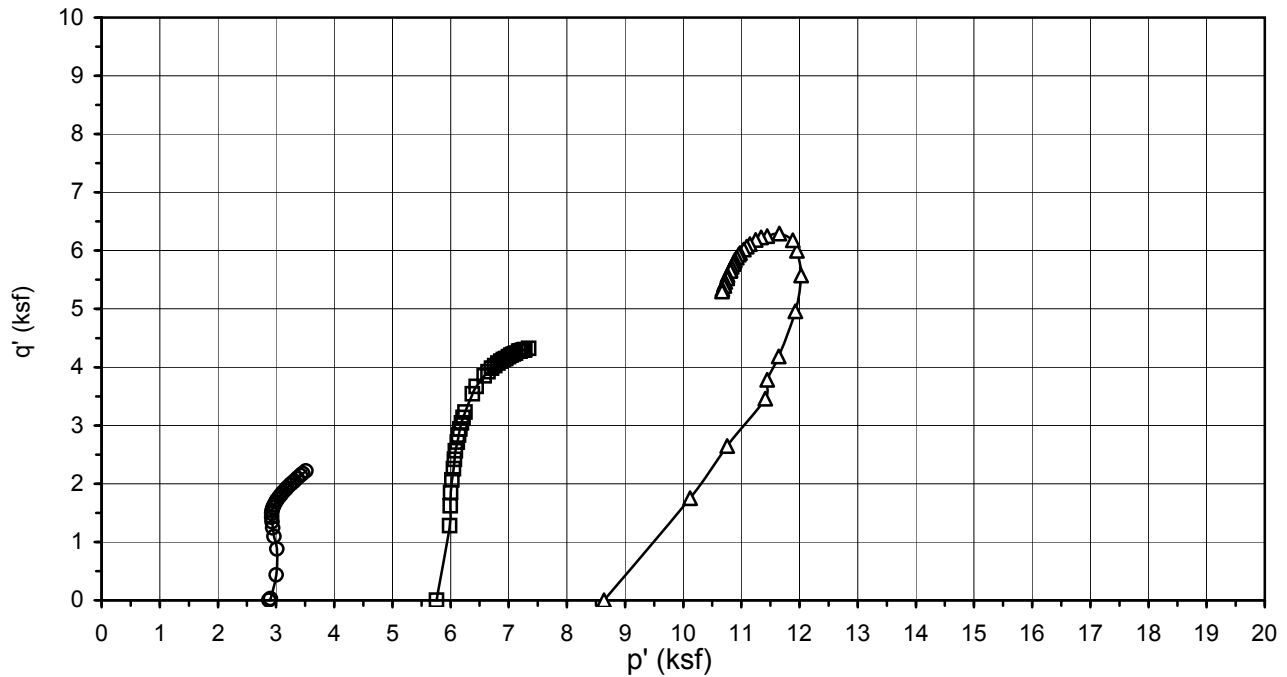
LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



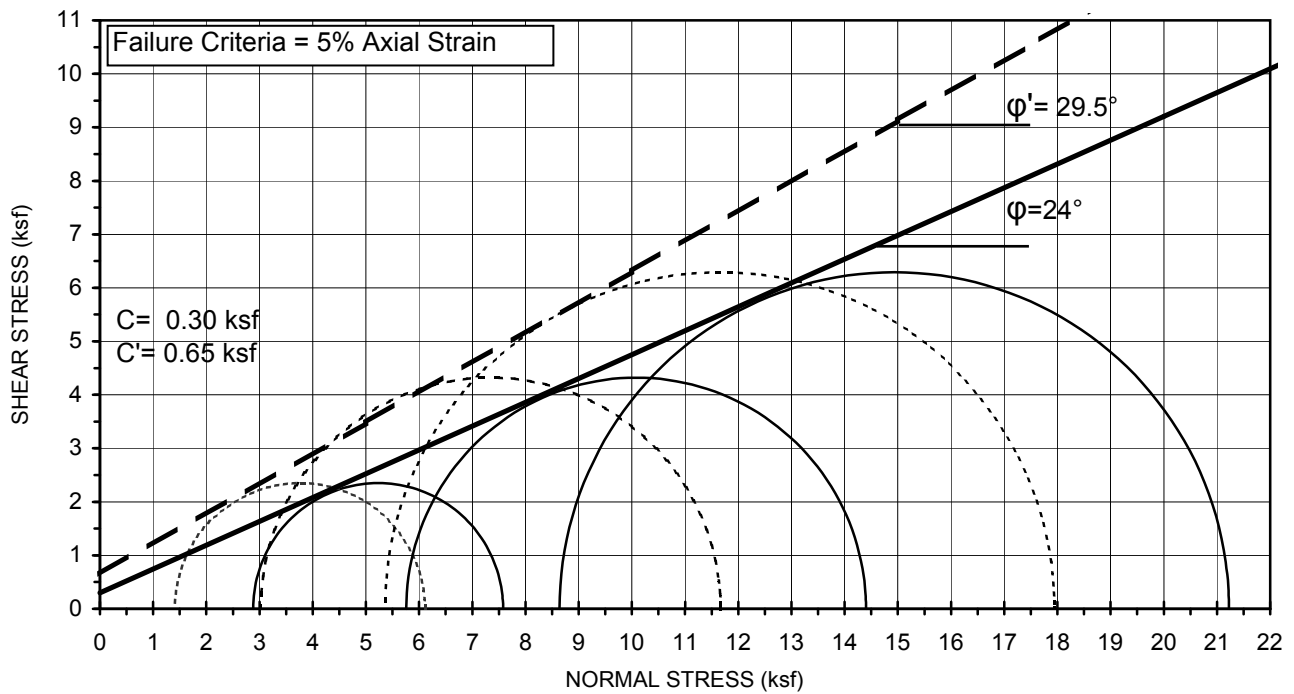
Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-130B
 Sample No.: -
 Depth (ft): 70.5

Sample Type: Mod. Cal.
 Sample Description: Gray Clay
 Avg. Dry Unit Weight (pcf): 88.8
 Avg. Initial Moisture Content (%): 35.0
 Confining Pressure: 20.0, 40.0, 60.0, psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**

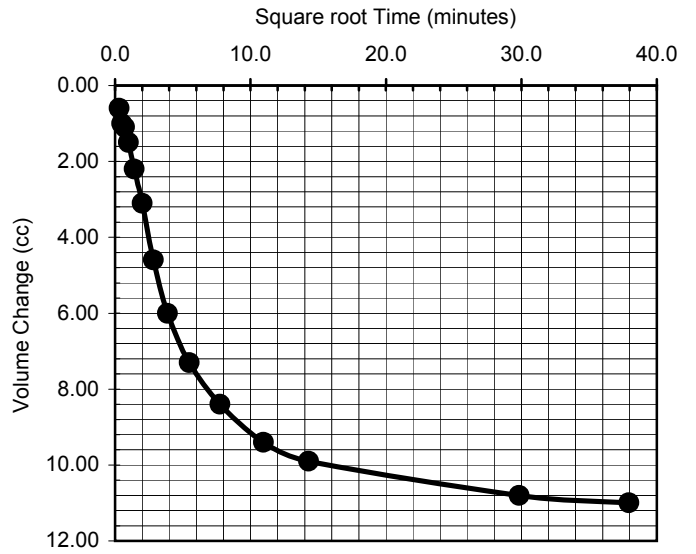
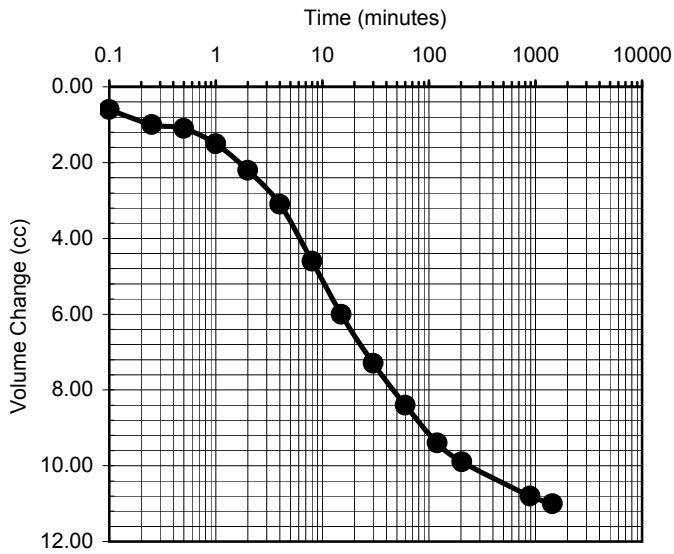


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gray Clay
Test Pit:	G-130B	Avg. Dry Unit Weight (pcf):	88.8
Sample No.:	-	Avg. Initial Moisture Content (%):	35.0
Depth (ft):	70.5	Confining Pressure:	20.0, 40.0, 60.0, psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-130B	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Gray Clay
Depth (feet):	70.5	Eff. Confining Pressure (psi):	40.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.6000
0.25	1.0000
0.5	1.1000
1	1.5000
2	2.2000
4	3.1000
8	4.6000
15	6.0000
30	7.3000
60	8.4000
120	9.4000
204	9.9000
891	10.8000
1440	11.0000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.6000
0.5000	1.0000
0.7071	1.1000
1.0000	1.5000
1.4142	2.2000
2.0000	3.1000
2.8284	4.6000
3.8730	6.0000
5.4772	7.3000
7.7460	8.4000
10.9545	9.4000
14.2829	9.9000
29.8496	10.8000
37.9473	11.0000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	West Subway Extension
Project No.:	4953-10-1561
Date:	06/06/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-01-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-131	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Olive Brown Clay		
Depth(ft):	25				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.614</u>	<u>2.614</u>	<u>2.614</u>	Avg. =	2.614
Height (in)	<u>5.725</u>	<u>5.725</u>	<u>5.725</u>	Avg. =	5.725

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.367	5.369
Moisture Content (%)	25.15	24.26
Wet Weight (gms)	89.04	1134.07
Dry Weight (gms)	81.37	941.86
Container Weight (gms)	50.87	149.52
Density and Saturation		
Wet Weight (gms)	999.09	
Container Weight (gms)	0.00	
Wet Density (pcf)	123.9	
Dry Density (pcf)	99.0	
Initial Void Ratio	0.702	
% Saturation	96.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	64.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	57.4
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.638
Induced OCR =	1.0	Initial Volume (cu.in)=	30.724
Change in Ht. of Specimen (in) =	0.0867	Final Volume (cu.in) =	30.272

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	4.22
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	0.94
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	5.15
		Axial Strain (%) =	5.32



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **West Subway Extension** Tested by: **AP** Date: **06-01-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-15-11**
 Test Pit: **G-131** Reviewed by: **AP** Date: **06-15-11**
 Sample No.: **-** Sample Description: **Olive Brown Clay**
 Depth(ft): **25**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.614</u>	<u>2.614</u>	<u>2.614</u>	Avg. =	2.614
Height (in)	<u>5.725</u>	<u>5.725</u>	<u>5.725</u>	Avg. =	5.725

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.367	5.352
Moisture Content (%)	25.15	24.26
Wet Weight (gms)	89.04	1134.07
Dry Weight (gms)	81.37	941.86
Container Weight (gms)	50.87	149.52
Density and Saturation		
Wet Weight (gms)	999.09	
Container Weight (gms)	0.00	
Wet Density (pcf)	123.9	
Dry Density (pcf)	99.0	
Initial Void Ratio	0.702	
% Saturation	96.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	61.0
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	51.5
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.631
Induced OCR=	1.0	Initial Volume (cu.in)=	30.724
Change in Ht. of Specimen (in) =	0.0937	Final Volume (cu.in) =	30.141

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	6.78
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	1.96
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.74
		Axial Strain (%) =	5.21



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **West Subway Extension** Tested by: **AP** Date: **06-01-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-15-11**
 Test Pit: **G-131** Reviewed by: **AP** Date: **06-15-11**
 Sample No.: **-** Sample Description: **Olive Brown Clay**
 Depth(ft): **25**
 Sample Type: **Mod. Cal.** **Confining Pressure = 35.0 psi**

Diameter (in)	<u>2.614</u>	<u>2.614</u>	<u>2.614</u>	Avg. =	2.614
Height (in)	<u>5.725</u>	<u>5.725</u>	<u>5.725</u>	Avg. =	5.725

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.367	5.392
Moisture Content (%)	25.15	24.26
Wet Weight (gms)	89.04	1134.07
Dry Weight (gms)	81.37	941.86
Container Weight (gms)	50.87	149.52
Density and Saturation		
Wet Weight (gms)	999.09	
Container Weight (gms)	0.00	
Wet Density (pcf)	123.9	
Dry Density (pcf)	99.0	
Initial Void Ratio	0.702	
% Saturation	96.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	51.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	43.6
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	5.610
Induced OCR =	1.0	Initial Volume (cu.in)=	30.724
Change in Ht. of Specimen (in) =	0.1147	Final Volume (cu.in) =	30.248

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	9.56
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.91
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	12.46
		Axial Strain (%) =	8.23



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-131	Consolidation Pressure :	15.0 psi
Depth(ft):	25	Initial Sample Height:	5.725 in
Sample No.:	-	Initial Area of Sample:	5.367 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.638 in
Sample Description:	Olive Brown Clay	Final Sample Area (A)*:	5.369 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress	Normal Stress
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	q' (S1-S3)/2 (ksf)	p' (S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	44	0.006	32.5	1.18	0.11	0.36	0.59	2.39
45.0	50	0.012	33.3	1.32	0.21	0.48	0.66	2.35
45.0	56	0.018	33.9	1.50	0.32	0.56	0.75	2.35
45.0	62	0.024	34.4	1.65	0.43	0.63	0.82	2.35
45.0	66	0.030	34.9	1.76	0.53	0.70	0.88	2.34
45.0	77	0.042	36.0	2.05	0.74	0.86	1.02	2.32
45.0	81	0.054	36.4	2.16	0.96	0.92	1.08	2.32
45.0	85	0.060	36.7	2.25	1.06	0.96	1.12	2.32
45.0	94	0.080	37.4	2.47	1.42	1.07	1.24	2.33
45.0	101	0.100	37.9	2.67	1.77	1.14	1.33	2.36
45.0	120	0.150	38.6	3.13	2.66	1.24	1.57	2.49
45.0	136	0.200	38.8	3.53	3.55	1.27	1.76	2.66
45.0	152	0.250	38.7	3.89	4.43	1.25	1.95	2.85
45.0	166	0.300	38.5	4.22	5.32	1.22	2.11	3.04



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-131	Consolidation Pressure :	25.0 psi
Depth(ft):	25	Initial Sample Height:	5.725 in
Sample No.:	-	Initial Area of Sample:	5.367 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.631 in
Sample Description:	Olive Brown Clay	Final Sample Area (A)*:	5.352 sq. in.
		Induced OCR=	1.0

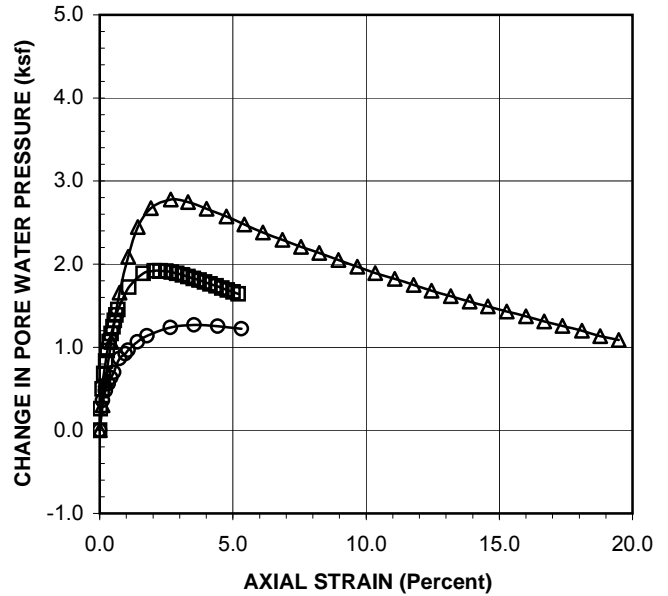
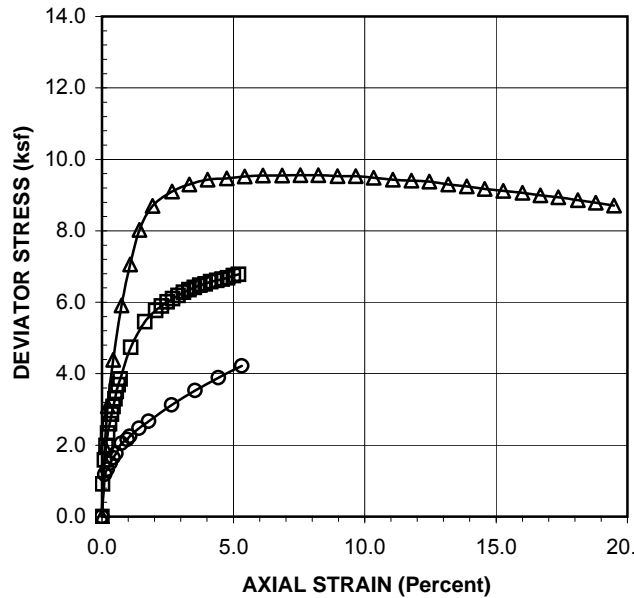
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	0	0.000	30.0	0.00	0.00	0.00	0.00	3.60
55.0	34	0.002	31.8	0.91	0.03	0.26	0.46	3.80
55.0	59	0.005	33.5	1.59	0.09	0.50	0.79	3.89
55.0	74	0.009	34.7	1.99	0.16	0.68	0.99	3.91
55.0	87	0.013	35.8	2.34	0.22	0.83	1.17	3.93
55.0	97	0.017	36.7	2.60	0.29	0.96	1.30	3.94
55.0	107	0.021	37.4	2.87	0.37	1.07	1.43	3.97
55.0	115	0.024	38.1	3.08	0.43	1.16	1.54	3.98
55.0	123	0.028	38.7	3.29	0.50	1.25	1.65	4.00
55.0	131	0.031	39.2	3.50	0.55	1.32	1.75	4.03
55.0	138	0.035	39.7	3.69	0.62	1.39	1.84	4.06
55.0	144	0.039	40.1	3.85	0.69	1.45	1.92	4.07
55.0	178	0.062	42.0	4.74	1.10	1.72	2.37	4.25
55.0	206	0.092	43.1	5.45	1.64	1.89	2.73	4.44
55.0	219	0.115	43.3	5.77	2.05	1.92	2.89	4.57
55.0	224	0.128	43.3	5.89	2.27	1.92	2.94	4.62
55.0	229	0.140	43.3	6.01	2.48	1.92	3.00	4.69
55.0	233	0.152	43.2	6.10	2.69	1.90	3.05	4.75
55.0	237	0.163	43.1	6.19	2.90	1.89	3.10	4.81
55.0	241	0.175	43.0	6.28	3.11	1.87	3.14	4.87
55.0	244	0.187	42.8	6.35	3.32	1.85	3.17	4.92
55.0	247	0.199	42.7	6.41	3.52	1.83	3.21	4.98
55.0	250	0.210	42.5	6.47	3.73	1.81	3.24	5.03
55.0	252	0.222	42.4	6.51	3.94	1.78	3.26	5.07
55.0	255	0.234	42.2	6.58	4.15	1.76	3.29	5.13
55.0	257	0.246	42.1	6.61	4.37	1.74	3.31	5.17
55.0	259	0.258	41.9	6.65	4.58	1.71	3.32	5.21
55.0	261	0.270	41.7	6.69	4.79	1.69	3.34	5.25
55.0	264	0.282	41.6	6.75	5.00	1.66	3.37	5.31
55.0	266	0.293	41.4	6.78	5.21	1.64	3.39	5.35



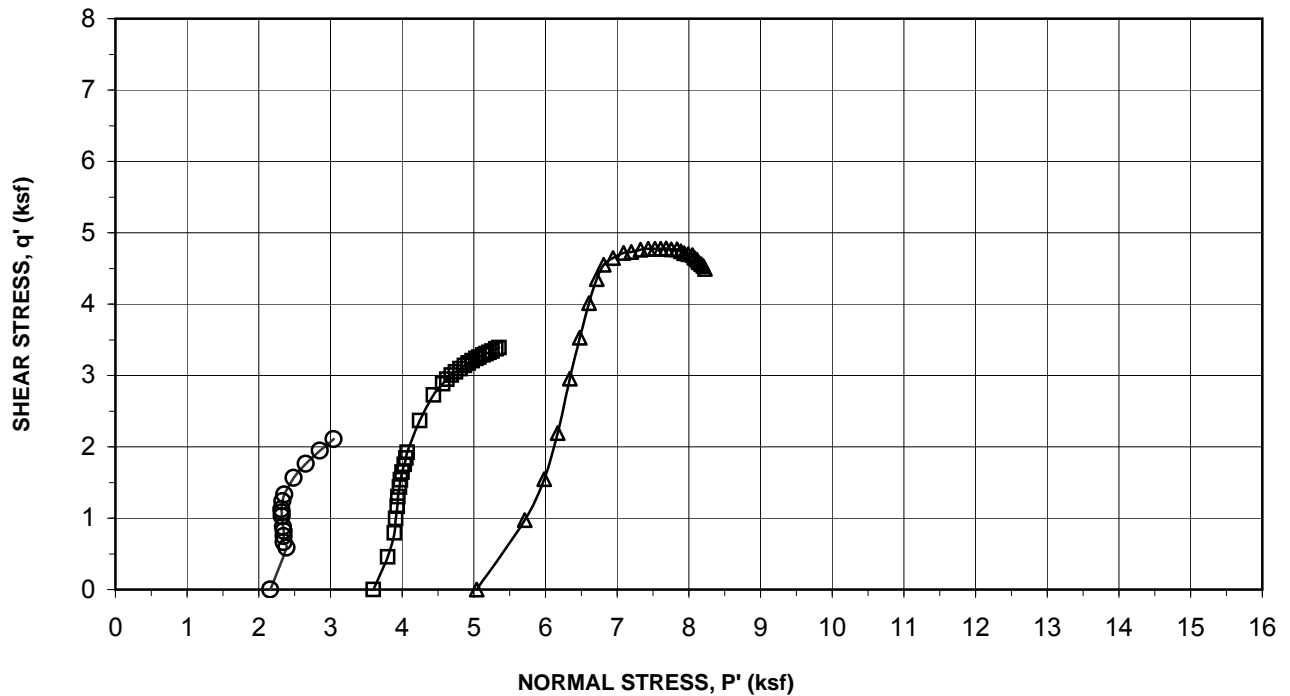
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-131	Consolidation Pressure :	35.0 psi
Depth(ft):	25	Initial Sample Height:	5.725 in
Sample No.:	-	Initial Area of Sample:	5.367 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.610 in
Sample Description:	Olive Brown Clay	Final Sample Area (A)*:	5.392 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.04
65.0	73	0.006	32.1	1.95	0.11	0.30	0.97	5.71
65.0	116	0.012	34.2	3.09	0.21	0.60	1.55	5.98
65.0	165	0.024	37.4	4.39	0.43	1.07	2.19	6.17
65.0	223	0.042	41.5	5.91	0.75	1.66	2.96	6.34
65.0	267	0.060	44.5	7.05	1.07	2.09	3.53	6.48
65.0	305	0.080	47.0	8.03	1.43	2.45	4.01	6.61
65.0	332	0.108	48.6	8.70	1.92	2.67	4.35	6.72
65.0	350	0.150	49.3	9.10	2.66	2.78	4.55	6.81
65.0	360	0.186	49.1	9.30	3.32	2.75	4.65	6.94
65.0	368	0.225	48.5	9.43	4.02	2.67	4.72	7.09
65.0	372	0.267	47.9	9.46	4.75	2.57	4.73	7.20
65.0	377	0.305	47.2	9.52	5.43	2.48	4.76	7.32
65.0	381	0.344	46.5	9.55	6.13	2.38	4.78	7.43
65.0	384	0.385	45.9	9.55	6.86	2.29	4.78	7.53
65.0	387	0.424	45.3	9.56	7.56	2.21	4.78	7.61
65.0	390	0.462	44.8	9.56	8.23	2.13	4.78	7.69
65.0	392	0.503	44.2	9.53	8.97	2.05	4.77	7.75
65.0	395	0.542	43.7	9.53	9.66	1.97	4.77	7.84
65.0	396	0.580	43.1	9.48	10.35	1.89	4.74	7.89
65.0	397	0.621	42.7	9.43	11.07	1.82	4.71	7.93
65.0	399	0.661	42.2	9.40	11.78	1.75	4.70	7.99
65.0	401	0.699	41.7	9.38	12.46	1.68	4.69	8.05
65.0	401	0.739	41.2	9.30	13.17	1.62	4.65	8.07
65.0	402	0.779	40.8	9.25	13.89	1.55	4.62	8.11
65.0	402	0.818	40.4	9.17	14.57	1.49	4.59	8.14
65.0	403	0.857	39.9	9.12	15.27	1.43	4.56	8.17
65.0	404	0.898	39.5	9.06	16.00	1.37	4.53	8.20
65.0	404	0.936	39.1	8.99	16.68	1.31	4.50	8.22
65.0	405	0.974	38.7	8.94	17.37	1.26	4.47	8.25
65.0	405	1.016	38.3	8.86	18.11	1.20	4.43	8.27
65.0	405	1.054	37.9	8.78	18.79	1.13	4.39	8.30
65.0	405	1.093	37.6	8.71	19.49	1.09	4.35	8.31



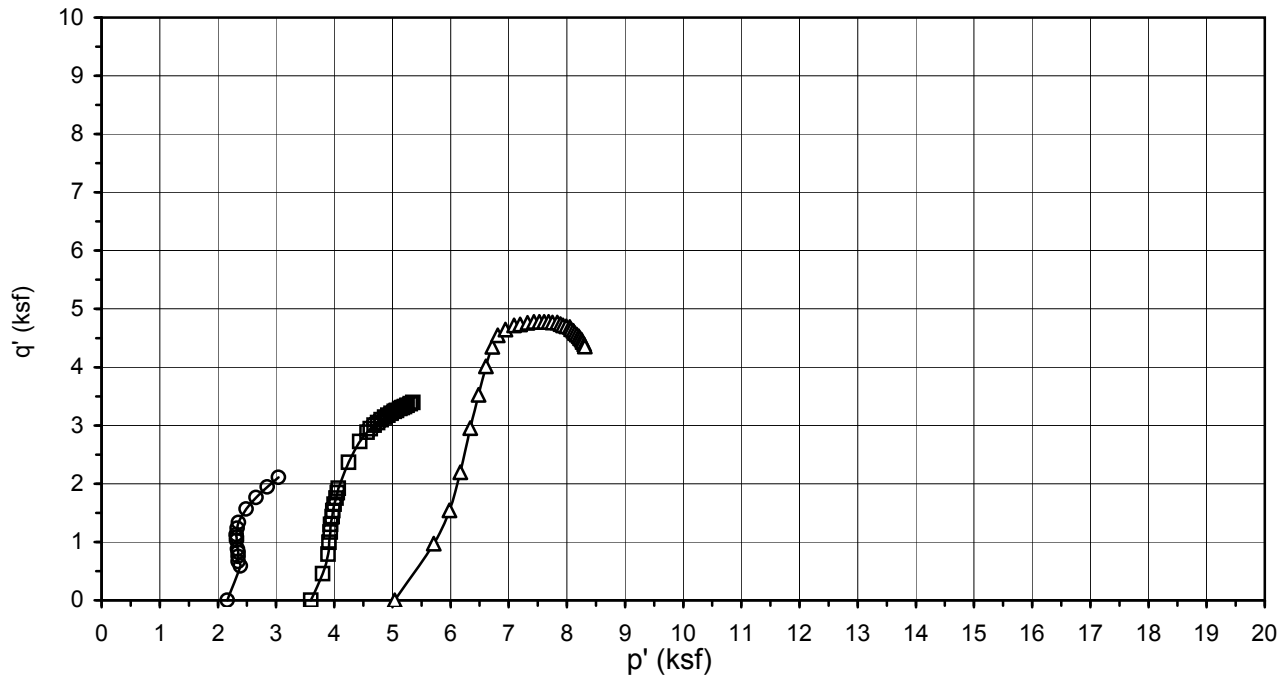
LEGEND: CONFINING PRESSURES= ○ 15 psi □ 25 psi △ 35 psi



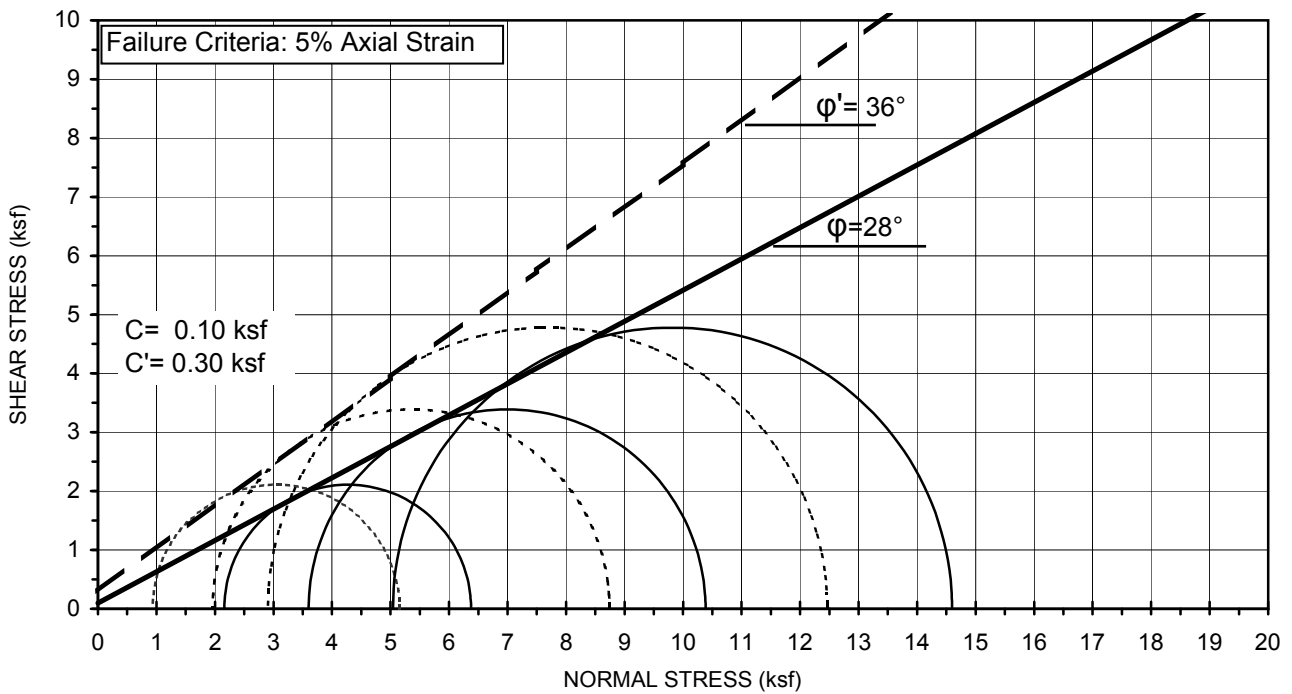
Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-131
 Sample No.: -
 Depth (ft): 25

Sample Type: Mod. Cal.
 Sample Description: Olive Brown Clay
 Avg. Dry Unit Weight (pcf): 99.0
 Avg. Initial Moisture Content (%): 25.1
 Confining Pressure: 15.0, 25.0, 35.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**

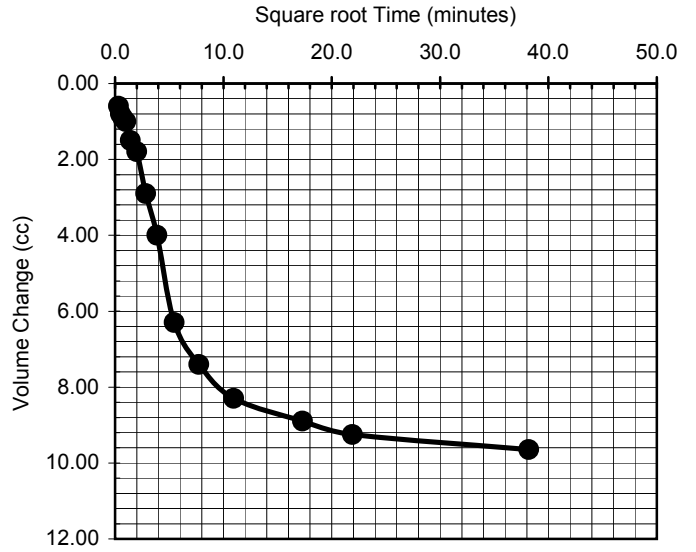
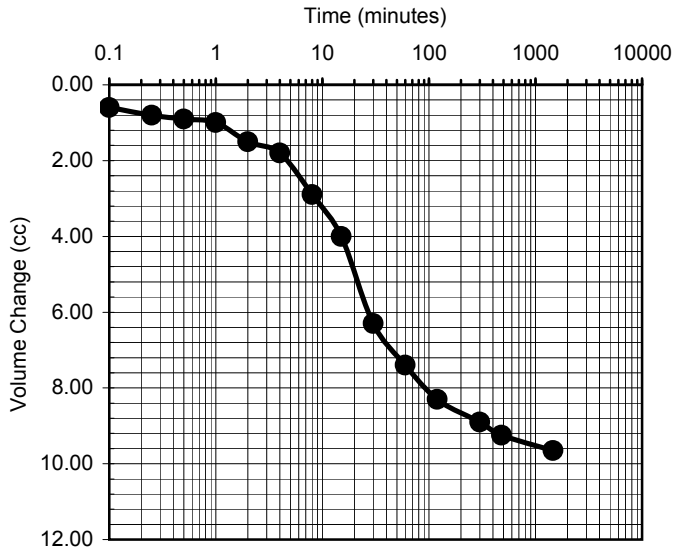


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 25 psi △ 35 psi



Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Brown Clay
Test Pit:	G-131	Avg. Dry Unit Weight (pcf):	99.0
Sample No.:	-	Avg. Initial Moisture Content (%):	25.1
Depth (ft):	25	Confining Pressure:	15.0, 25.0, 35.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-131	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Olive Brown Clay
Depth (feet):	25	Eff. Confining Pressure (psi):	25.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.6000
0.25	0.8000
0.5	0.9000
1	1.0000
2	1.5000
4	1.8000
8	2.9000
15	4.0000
30	6.3000
60	7.4000
120	8.3000
300	8.9000
480	9.2500
1459	9.6500

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.6000
0.5000	0.8000
0.7071	0.9000
1.0000	1.0000
1.4142	1.5000
2.0000	1.8000
2.8284	2.9000
3.8730	4.0000
5.4772	6.3000
7.7460	7.4000
10.9545	8.3000
17.3205	8.9000
21.9089	9.2500
38.1969	9.6500

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	West Subway Extension
Project No.:	4953-10-1561
Date:	06/01/11



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-01-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-131	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Olive Clayey Sand		
Depth(ft):	45.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.777</u>	<u>5.777</u>	<u>5.777</u>	Avg. =	5.777

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.344
Moisture Content (%)	15.10	20.89
Wet Weight (gms)	72.04	1171.54
Dry Weight (gms)	69.21	995.30
Container Weight (gms)	50.47	151.47
Density and Saturation		
Wet Weight (gms)	1035.88	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.2	
Dry Density (pcf)	110.5	
Initial Void Ratio	0.525	
% Saturation	77.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	63.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	56.2
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.723
Induced OCR =	1.0	Initial Volume (cu.in)=	31.027
Change in Ht. of Specimen (in) =	0.0538	Final Volume (cu.in) =	30.587

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	4.09
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.05
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	5.14
		Axial Strain (%) =	5.24



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-01-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-131	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Olive Clayey Sand		
Depth(ft):	45.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.777</u>	<u>5.777</u>	<u>5.777</u>	Avg. =	5.777

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.371
Moisture Content (%)	15.10	20.89
Wet Weight (gms)	72.04	1171.54
Dry Weight (gms)	69.21	995.30
Container Weight (gms)	50.47	151.47
Density and Saturation		
Wet Weight (gms)	1035.88	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.2	
Dry Density (pcf)	110.5	
Initial Void Ratio	0.525	
% Saturation	77.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	56.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	44.9
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.648
Induced OCR=	1.0	Initial Volume (cu.in)=	31.027
Change in Ht. of Specimen (in) =	0.1288	Final Volume (cu.in) =	30.337

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	8.92
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.59
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.51
		Axial Strain (%) =	6.03



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **West Subway Extension** Tested by: **AP** Date: **06-01-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-15-11**
 Test Pit: **G-131** Reviewed by: **AP** Date: **06-15-11**
 Sample No.: **-** Sample Description: **Olive Clayey Sand**
 Depth(ft): **45.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 45.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.777</u>	<u>5.777</u>	<u>5.777</u>	Avg. =	5.777

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.382
Moisture Content (%)	15.10	20.89
Wet Weight (gms)	72.04	1171.54
Dry Weight (gms)	69.21	995.30
Container Weight (gms)	50.47	151.47
Density and Saturation		
Wet Weight (gms)	1035.88	
Container Weight (gms)	0.00	
Wet Density (pcf)	127.2	
Dry Density (pcf)	110.5	
Initial Void Ratio	0.525	
% Saturation	77.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	45.0
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	34.5
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.646
Induced OCR =	1.0	Initial Volume (cu.in)=	31.027
Change in Ht. of Specimen (in) =	0.1308	Final Volume (cu.in) =	30.386

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	13.14
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.13
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.27
		Axial Strain (%) =	6.65



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-131	Consolidation Pressure :	15.0 psi
Depth(ft):	45.5	Initial Sample Height:	5.777 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.723 in
Sample Description:	Olive Clayey Sand	Final Sample Area (A)*:	5.344 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	36	0.006	32.5	0.97	0.10	0.36	0.48	2.28
45.0	48	0.012	33.7	1.29	0.21	0.53	0.65	2.27
45.0	56	0.018	34.7	1.50	0.31	0.68	0.75	2.24
45.0	62	0.024	35.5	1.66	0.42	0.79	0.83	2.20
45.0	66	0.030	36.1	1.77	0.52	0.88	0.88	2.17
45.0	70	0.036	36.6	1.87	0.63	0.95	0.94	2.15
45.0	73	0.042	37.0	1.95	0.73	1.01	0.98	2.13
45.0	75	0.048	37.3	2.00	0.84	1.05	1.00	2.11
45.0	78	0.054	37.6	2.08	0.94	1.09	1.04	2.11
45.0	81	0.060	37.8	2.16	1.05	1.12	1.08	2.12
45.0	87	0.080	38.3	2.31	1.40	1.20	1.16	2.12
45.0	93	0.100	38.7	2.46	1.75	1.25	1.23	2.14
45.0	107	0.150	39.0	2.81	2.62	1.30	1.40	2.27
45.0	125	0.200	38.9	3.25	3.49	1.28	1.63	2.50
45.0	142	0.250	38.0	3.66	4.37	1.15	1.83	2.84
45.0	160	0.300	37.7	4.09	5.24	1.11	2.04	3.09



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-131	Consolidation Pressure :	30.0 psi
Depth(ft):	45.5	Initial Sample Height:	5.777 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.648 in
Sample Description:	Olive Clayey Sand	Final Sample Area (A)*:	5.371 sq. in.
		Induced OCR=	1.0

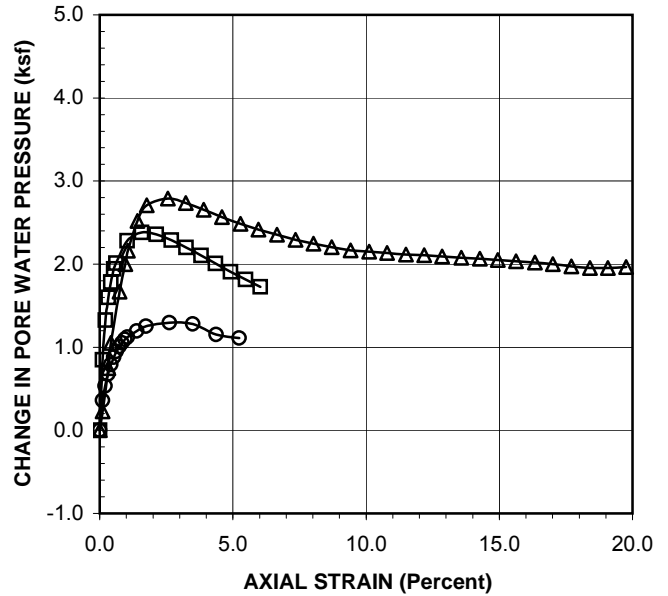
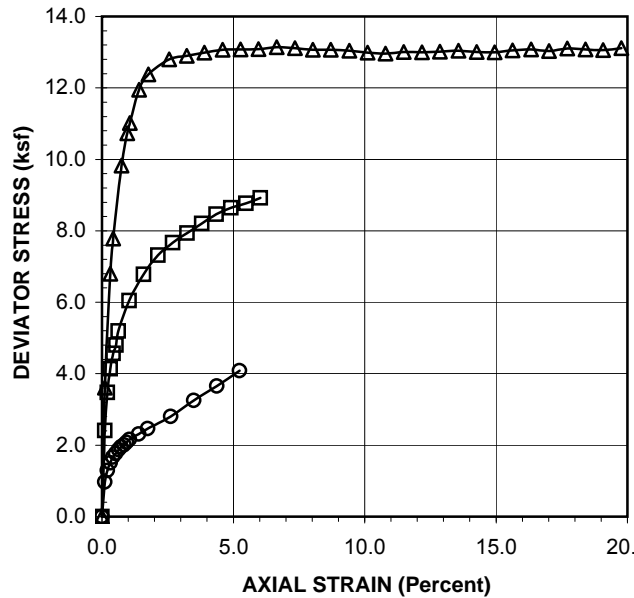
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	30.0	0.00	0.00	0.00	0.00	4.32
60.0	90	0.006	35.9	2.41	0.11	0.85	1.21	4.68
60.0	130	0.012	39.2	3.48	0.21	1.32	1.74	4.73
60.0	155	0.018	41.1	4.14	0.32	1.60	2.07	4.79
60.0	171	0.024	42.4	4.57	0.42	1.79	2.28	4.82
60.0	180	0.030	43.5	4.80	0.53	1.94	2.40	4.78
60.0	195	0.035	44.0	5.20	0.62	2.01	2.60	4.90
60.0	228	0.059	45.8	6.05	1.04	2.28	3.02	5.06
60.0	257	0.089	46.5	6.78	1.58	2.38	3.39	5.33
60.0	279	0.120	46.4	7.32	2.13	2.36	3.66	5.62
60.0	294	0.152	45.9	7.67	2.69	2.29	3.84	5.87
60.0	306	0.183	45.3	7.94	3.25	2.20	3.97	6.09
60.0	318	0.215	44.6	8.20	3.80	2.11	4.10	6.32
60.0	330	0.246	43.9	8.46	4.35	2.01	4.23	6.55
60.0	339	0.277	43.3	8.64	4.91	1.91	4.32	6.73
60.0	346	0.309	42.6	8.77	5.48	1.82	4.38	6.89
60.0	354	0.341	42.0	8.92	6.03	1.73	4.46	7.05



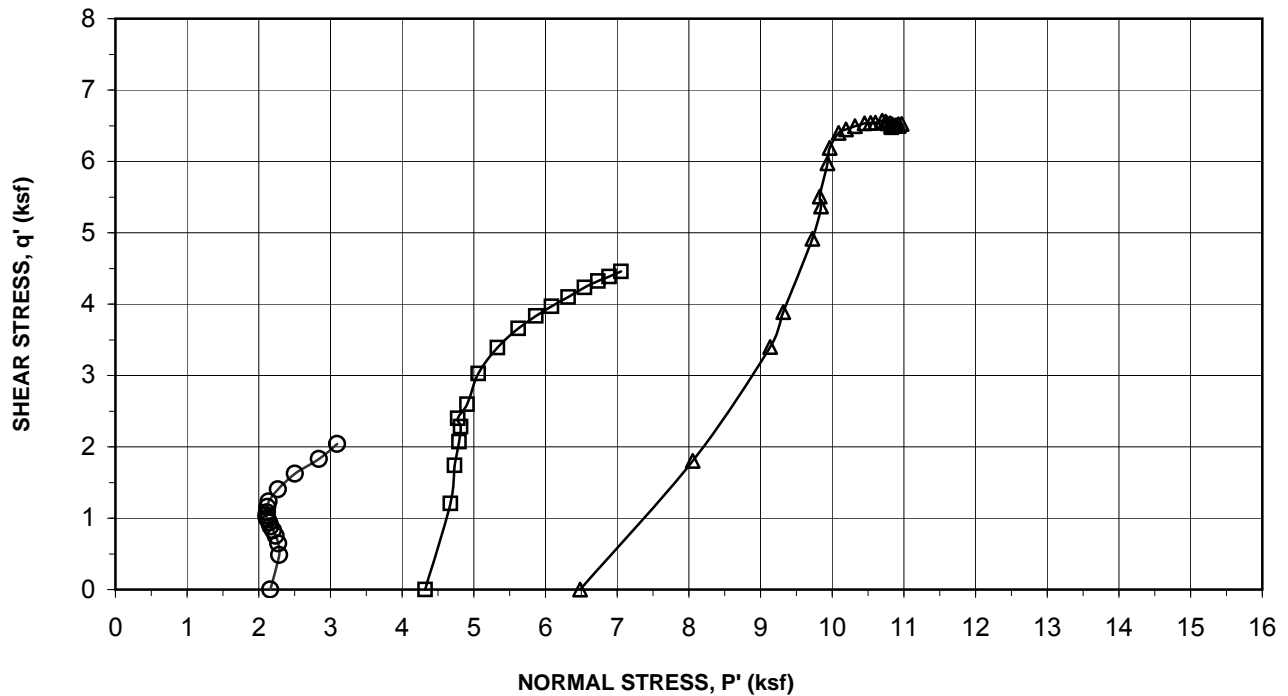
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-131	Consolidation Pressure :	45.0 psi
Depth(ft):	45.5	Initial Sample Height:	5.777 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.646 in
Sample Description:	Olive Clayey Sand	Final Sample Area (A)*:	5.382 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	135	0.006	31.6	3.61	0.11	0.23	1.80	8.05
75.0	255	0.018	35.2	6.80	0.32	0.75	3.40	9.13
75.0	292	0.024	37.3	7.78	0.43	1.05	3.89	9.32
75.0	370	0.042	41.6	9.83	0.74	1.67	4.91	9.72
75.0	405	0.054	43.9	10.73	0.96	2.00	5.37	9.84
75.0	416	0.060	45.0	11.01	1.06	2.16	5.51	9.83
75.0	453	0.080	47.5	11.95	1.42	2.52	5.97	9.93
75.0	471	0.100	48.8	12.38	1.77	2.71	6.19	9.96
75.0	491	0.144	49.4	12.80	2.55	2.79	6.40	10.09
75.0	498	0.182	49.0	12.89	3.23	2.74	6.45	10.19
75.0	505	0.220	48.4	12.99	3.90	2.66	6.49	10.32
75.0	512	0.259	47.8	13.07	4.59	2.57	6.54	10.45
75.0	516	0.298	47.3	13.08	5.28	2.48	6.54	10.53
75.0	520	0.336	46.8	13.09	5.96	2.42	6.54	10.60
75.0	526	0.376	46.3	13.14	6.65	2.35	6.57	10.70
75.0	529	0.415	45.9	13.11	7.35	2.29	6.56	10.74
75.0	531	0.453	45.6	13.07	8.02	2.25	6.53	10.77
75.0	535	0.492	45.3	13.07	8.71	2.20	6.53	10.81
75.0	538	0.532	45.0	13.04	9.42	2.17	6.52	10.83
75.0	540	0.571	44.9	12.99	10.11	2.15	6.49	10.82
75.0	543	0.609	44.8	12.96	10.79	2.13	6.48	10.83
75.0	549	0.649	44.7	13.00	11.49	2.12	6.50	10.86
75.0	553	0.688	44.6	13.00	12.18	2.11	6.50	10.87
75.0	558	0.726	44.5	13.01	12.86	2.09	6.51	10.89
75.0	564	0.766	44.4	13.04	13.57	2.08	6.52	10.92
75.0	567	0.806	44.3	13.01	14.27	2.06	6.50	10.92
75.0	571	0.844	44.2	13.00	14.94	2.05	6.50	10.93
75.0	578	0.883	44.1	13.05	15.63	2.03	6.52	10.97
75.0	584	0.922	44.0	13.07	16.34	2.02	6.54	11.00
75.0	587	0.961	43.9	13.03	17.01	2.00	6.52	11.00
75.0	595	1.000	43.7	13.10	17.71	1.97	6.55	11.06
75.0	599	1.039	43.6	13.08	18.40	1.96	6.54	11.06
75.0	603	1.077	43.6	13.06	19.08	1.96	6.53	11.05
75.0	611	1.116	43.7	13.12	19.77	1.97	6.56	11.07



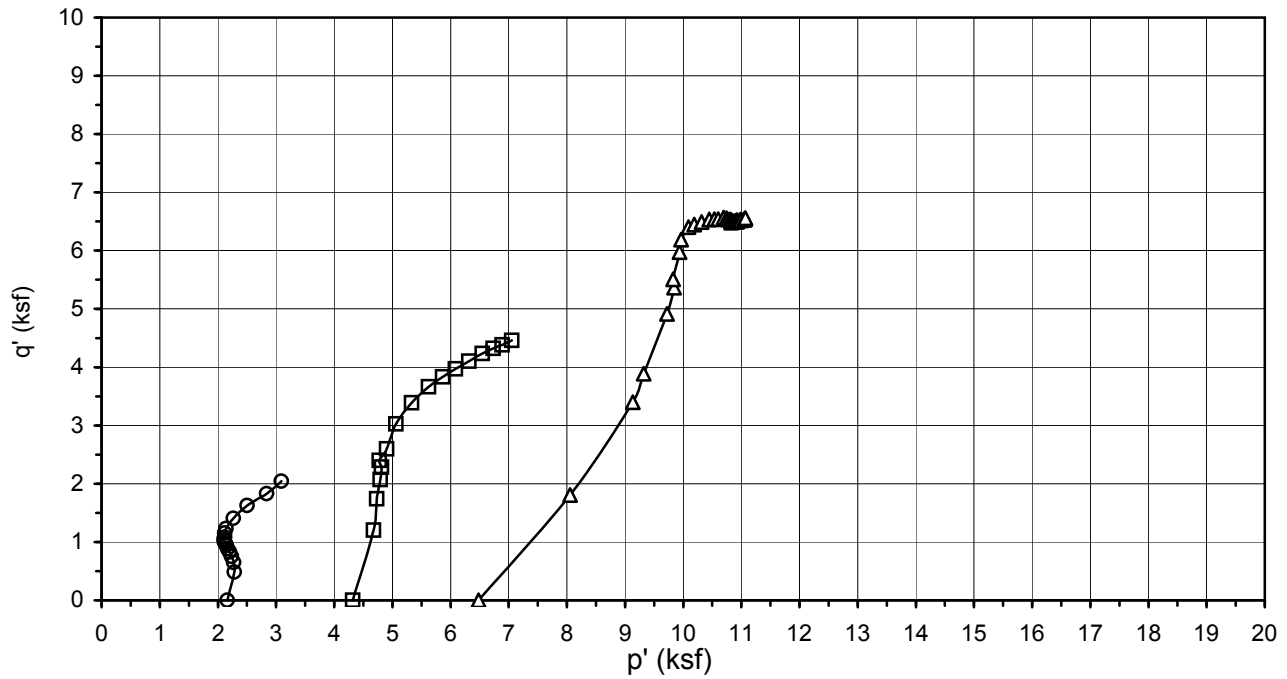
LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



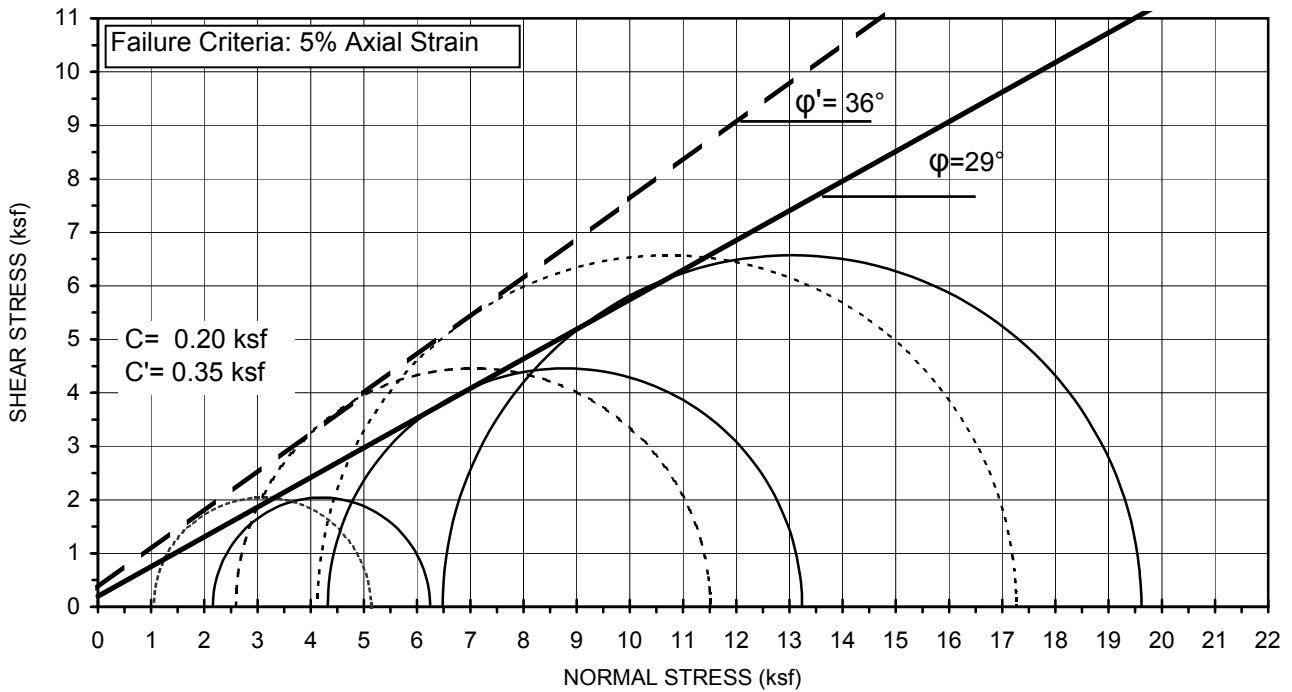
Project Name: West Subway Extension
Project No.: 4953-10-1561
Test Pit: G-131
Sample No.: -
Depth (ft): 45.5

Sample Type: Mod. Cal.
Sample Description: Olive Clayey Sand
Avg. Dry Unit Weight (pcf): 110.5
Avg. Initial Moisture Content (%): 15.1
Confining Pressure: 15.0, 30.0, 45.0, psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

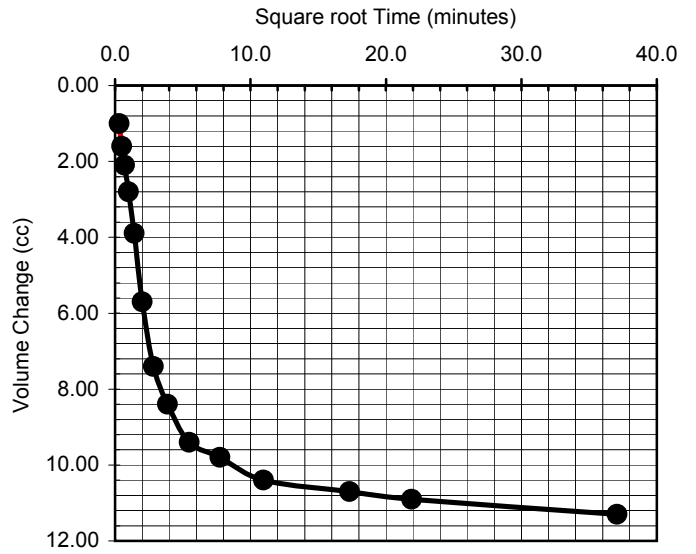
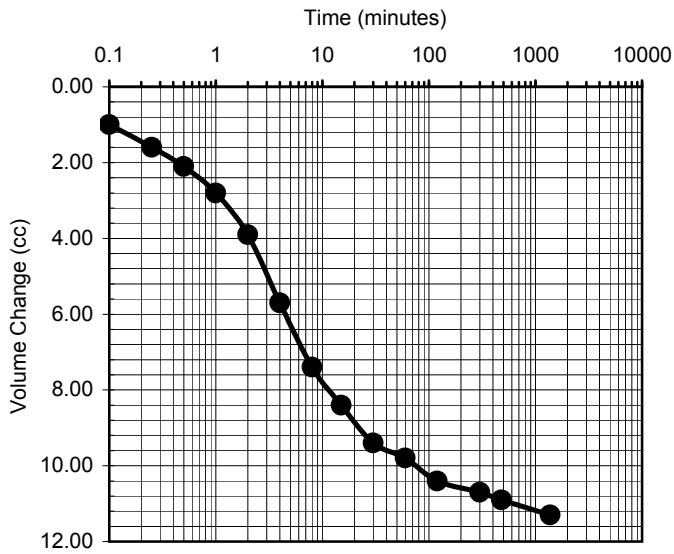


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Clayey Sand
Test Pit:	G-131	Avg. Dry Unit Weight (pcf):	110.5
Sample No.:	-	Avg. Initial Moisture Content (%):	15.1
Depth (ft):	45.5	Confining Pressure:	15.0, 30.0, 45.0, psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-131	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Olive Clayey Sand
Depth (feet):	45.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.0000
0.25	1.6000
0.5	2.1000
1	2.8000
2	3.9000
4	5.7000
8	7.4000
15	8.4000
30	9.4000
60	9.8000
120	10.4000
300	10.7000
480	10.9000
1374	11.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.0000
0.5000	1.6000
0.7071	2.1000
1.0000	2.8000
1.4142	3.9000
2.0000	5.7000
2.8284	7.4000
3.8730	8.4000
5.4772	9.4000
7.7460	9.8000
10.9545	10.4000
17.3205	10.7000
21.9089	10.9000
37.0675	11.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Date: 06/01/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **West Subway Extension** Tested by: **AP** Date: **06-01-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-15-11**
 Test Pit: **G-132** Reviewed by: **AP** Date: **06-15-11**
 Sample No.: **-** Sample Description: **Olive Brown Clayey Sand**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 10.0 psi**

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.458</u>	<u>5.458</u>	<u>5.458</u>	Avg. =	5.458

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.364
Moisture Content (%)	20.88	22.79
Wet Weight (gms)	126.95	1080.45
Dry Weight (gms)	116.96	907.49
Container Weight (gms)	69.11	148.59
Density and Saturation		
Wet Weight (gms)	945.50	
Container Weight (gms)	0.00	
Wet Density (pcf)	123.3	
Dry Density (pcf)	102.0	
Initial Void Ratio	0.651	
% Saturation	86.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	53.1
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	49.8
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	5.407
Induced OCR =	1.0	Initial Volume (cu.in)=	29.201
Change in Ht. of Specimen (in) =	0.0515	Final Volume (cu.in) =	29.000

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	3.06
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	0.86
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.92
		Axial Strain (%) =	5.46



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **West Subway Extension** Tested by: **AP** Date: **06-01-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-15-11**
 Test Pit: **G-132** Reviewed by: **AP** Date: **06-15-11**
 Sample No.: **-** Sample Description: **Olive Brown Clayey Sand**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.458</u>	<u>5.458</u>	<u>5.458</u>	Avg. =	5.458

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.268
Moisture Content (%)	20.88	22.79
Wet Weight (gms)	<u>126.95</u>	<u>1080.45</u>
Dry Weight (gms)	<u>116.96</u>	<u>907.49</u>
Container Weight (gms)	<u>69.11</u>	<u>148.59</u>
Density and Saturation		
Wet Weight (gms)	<u>945.50</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	123.3	
Dry Density (pcf)	102.0	
Initial Void Ratio	0.651	
% Saturation	86.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>92</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>60.0</u>	Initial Burette Ht.(cm)=	<u>49.7</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>37.8</u>
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	<u>5.406</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>29.201</u>
Change in Ht. of Specimen (in) =	<u>0.0525</u>	Final Volume (cu.in) =	<u>28.475</u>

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.50
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	1.89
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.40
		Axial Strain (%) =	5.46



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **West Subway Extension** Tested by: **AP** Date: **06-01-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **06-15-11**
 Test Pit: **G-132** Reviewed by: **AP** Date: **06-15-11**
 Sample No.: **-** Sample Description: **Olive Brown Clayey Sand**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 30.0 psi**

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.458</u>	<u>5.458</u>	<u>5.458</u>	Avg. =	5.458

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.305
Moisture Content (%)	20.88	22.79
Wet Weight (gms)	<u>126.95</u>	<u>1080.45</u>
Dry Weight (gms)	<u>116.96</u>	<u>907.49</u>
Container Weight (gms)	<u>69.11</u>	<u>148.59</u>
Density and Saturation		
Wet Weight (gms)	<u>945.50</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	123.3	
Dry Density (pcf)	102.0	
Initial Void Ratio	0.651	
% Saturation	86.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>92</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>70.0</u>	Initial Burette Ht.(cm)=	<u>38.6</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>29.9</u>
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	<u>5.404</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>29.201</u>
Change in Ht. of Specimen (in) =	<u>0.0539</u>	Final Volume (cu.in) =	<u>28.671</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	8.68
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.39
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	12.07
		Axial Strain (%) =	10.65



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-132	Consolidation Pressure :	10.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.458 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.407 in
Sample Description:	Olive Brown Clayey Sand	Final Sample Area (A)*:	5.364 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	40.0	0.00	0.00	0.00	0.00	1.44
50.0	16	0.002	40.8	0.43	0.03	0.11	0.22	1.55
50.0	29	0.006	41.5	0.77	0.10	0.21	0.39	1.62
50.0	36	0.010	42.0	0.96	0.18	0.29	0.48	1.63
50.0	39	0.013	42.5	1.05	0.25	0.35	0.52	1.61
50.0	44	0.017	42.9	1.17	0.31	0.41	0.58	1.61
50.0	46	0.021	43.2	1.23	0.38	0.46	0.62	1.60
50.0	49	0.025	43.5	1.32	0.45	0.50	0.66	1.60
50.0	52	0.028	43.7	1.38	0.52	0.53	0.69	1.60
50.0	54	0.032	43.9	1.44	0.60	0.56	0.72	1.60
50.0	55	0.036	44.1	1.47	0.67	0.59	0.74	1.59
50.0	58	0.039	44.2	1.53	0.73	0.61	0.77	1.60
50.0	61	0.047	44.5	1.62	0.87	0.65	0.81	1.61
50.0	66	0.058	44.8	1.74	1.07	0.68	0.87	1.63
50.0	70	0.070	44.9	1.86	1.29	0.71	0.93	1.66
50.0	74	0.082	45.1	1.95	1.52	0.73	0.97	1.69
50.0	77	0.093	45.1	2.03	1.73	0.74	1.02	1.72
50.0	81	0.106	45.2	2.12	1.96	0.74	1.06	1.76
50.0	84	0.118	45.2	2.20	2.18	0.74	1.10	1.80
50.0	86	0.129	45.2	2.26	2.39	0.74	1.13	1.83
50.0	90	0.142	45.1	2.35	2.62	0.74	1.17	1.87
50.0	92	0.153	45.1	2.40	2.82	0.73	1.20	1.91
50.0	95	0.164	45.0	2.48	3.04	0.73	1.24	1.96
50.0	98	0.176	45.0	2.54	3.25	0.72	1.27	1.99
50.0	100	0.188	44.9	2.59	3.47	0.70	1.30	2.03
50.0	104	0.200	44.8	2.68	3.70	0.69	1.34	2.09
50.0	106	0.212	44.7	2.73	3.92	0.68	1.36	2.12
50.0	108	0.224	44.6	2.78	4.14	0.67	1.39	2.16
50.0	110	0.236	44.5	2.83	4.37	0.65	1.42	2.20
50.0	113	0.248	44.4	2.89	4.59	0.64	1.44	2.24
50.0	114	0.260	44.4	2.91	4.81	0.63	1.45	2.27
50.0	116.15	0.272	44.3	2.96	5.02	0.61	1.48	2.31
50.0	118.45	0.283	44.2	3.01	5.24	0.60	1.51	2.35
50.0	120.75	0.295	44.1	3.06	5.46	0.58	1.53	2.39



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-132	Consolidation Pressure :	20.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.458 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.406 in
Sample Description:	Olive Brown Clayey Sand	Final Sample Area (A)*:	5.268 sq. in.
		Induced OCR=	1.0

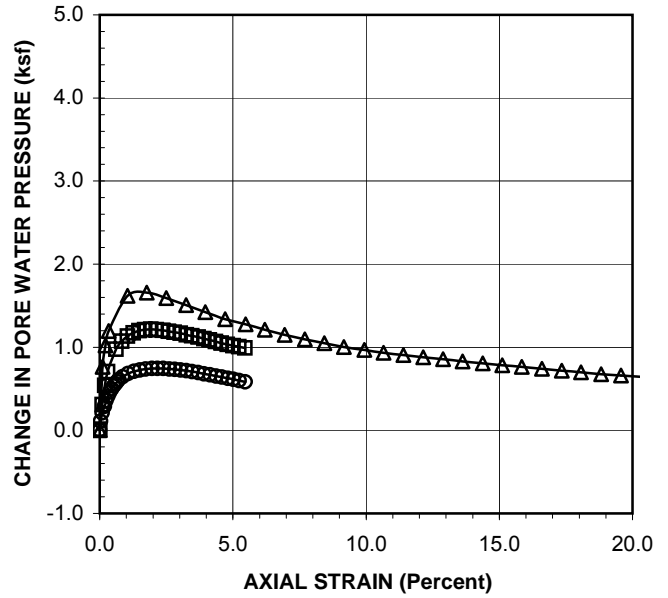
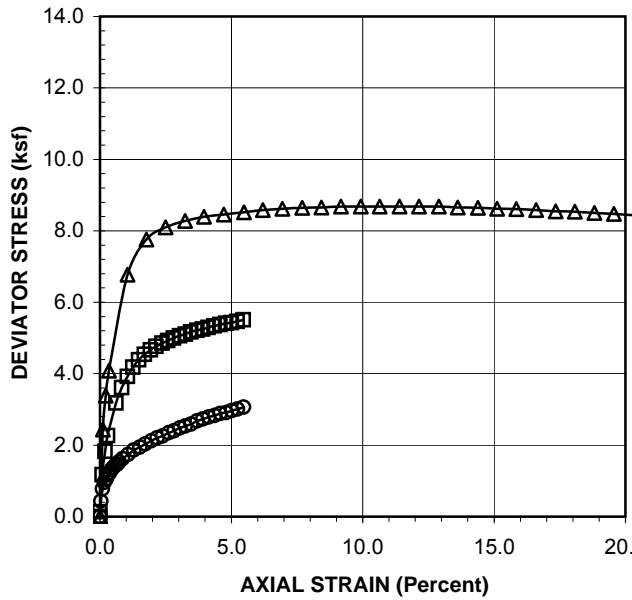
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	5	0.000	40.1	0.14	0.00	0.01	0.07	2.94
60.0	43	0.005	42.1	1.17	0.09	0.31	0.59	3.16
60.0	67	0.010	43.8	1.83	0.19	0.54	0.91	3.25
60.0	83	0.016	44.9	2.26	0.30	0.70	1.13	3.31
60.0	117	0.033	46.8	3.18	0.61	0.97	1.59	3.49
60.0	133	0.045	47.4	3.61	0.83	1.07	1.80	3.61
60.0	145	0.057	47.9	3.92	1.05	1.13	1.96	3.71
60.0	155	0.068	48.2	4.18	1.26	1.17	2.09	3.80
60.0	163	0.080	48.3	4.39	1.48	1.20	2.19	3.88
60.0	169	0.092	48.4	4.54	1.69	1.21	2.27	3.94
60.0	174	0.104	48.4	4.67	1.92	1.21	2.33	4.00
60.0	178	0.115	48.4	4.76	2.13	1.21	2.38	4.05
60.0	182	0.128	48.4	4.86	2.37	1.20	2.43	4.11
60.0	185	0.140	48.3	4.93	2.59	1.19	2.46	4.15
60.0	188	0.152	48.2	4.99	2.80	1.18	2.50	4.20
60.0	191	0.164	48.1	5.06	3.03	1.17	2.53	4.25
60.0	193	0.176	48.0	5.10	3.25	1.15	2.55	4.28
60.0	196	0.187	47.9	5.17	3.46	1.14	2.59	4.33
60.0	198	0.200	47.8	5.21	3.70	1.12	2.61	4.37
60.0	200	0.211	47.7	5.25	3.91	1.10	2.63	4.40
60.0	202	0.223	47.5	5.29	4.12	1.09	2.65	4.44
60.0	204	0.235	47.4	5.33	4.34	1.07	2.67	4.48
60.0	206	0.247	47.3	5.37	4.56	1.05	2.69	4.52
60.0	208	0.259	47.2	5.41	4.79	1.03	2.71	4.55
60.0	209	0.271	47.1	5.43	5.00	1.02	2.71	4.57
60.0	211	0.282	47.0	5.47	5.22	1.01	2.73	4.61
60.0	213	0.295	46.9	5.50	5.46	0.99	2.75	4.64



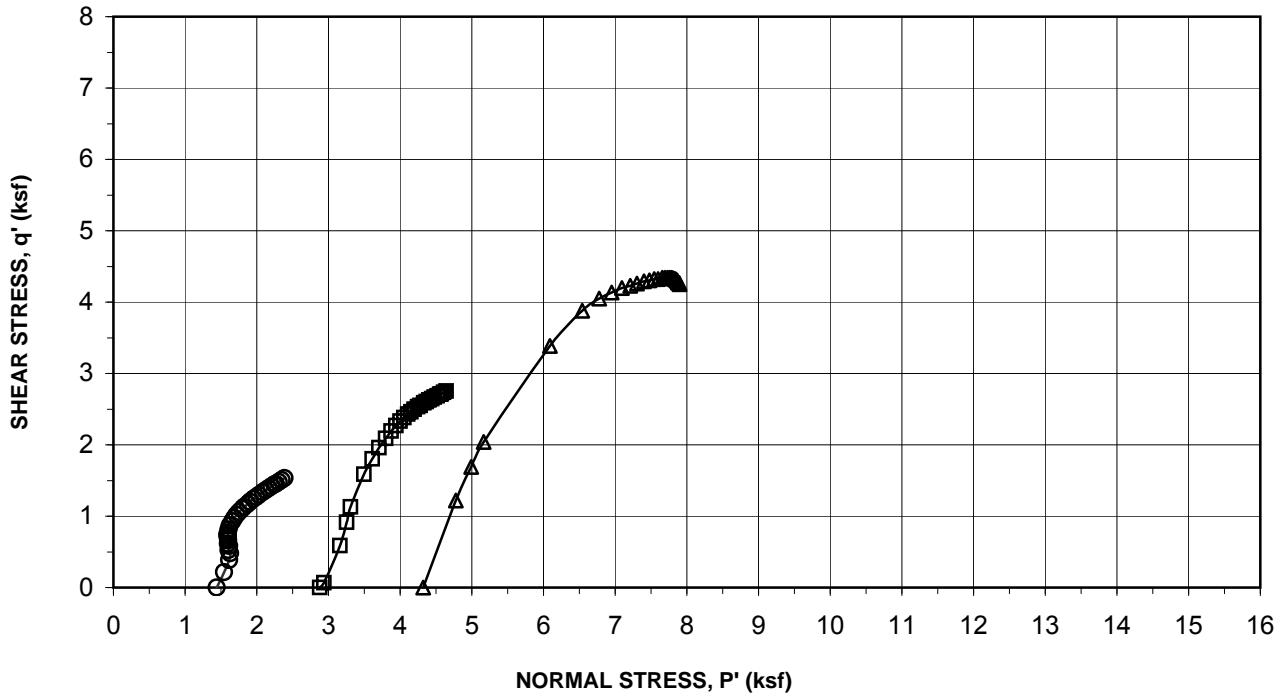
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-132	Consolidation Pressure :	30.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.458 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.404 in
Sample Description:	Olive Brown Clayey Sand	Final Sample Area (A)*:	5.305 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	40.0	0.00	0.00	0.00	0.00	4.32
70.0	90	0.006	45.3	2.44	0.11	0.76	1.22	4.78
70.0	125	0.012	47.1	3.39	0.22	1.02	1.69	4.99
70.0	151	0.018	48.3	4.08	0.34	1.20	2.04	5.17
70.0	252	0.057	51.2	6.77	1.05	1.62	3.38	6.09
70.0	291	0.095	51.5	7.76	1.77	1.66	3.88	6.54
70.0	306	0.135	51.1	8.10	2.50	1.59	4.05	6.78
70.0	315	0.175	50.5	8.27	3.25	1.51	4.14	6.95
70.0	322	0.214	49.9	8.39	3.96	1.42	4.20	7.10
70.0	327	0.255	49.3	8.46	4.71	1.34	4.23	7.21
70.0	332	0.296	48.9	8.52	5.48	1.27	4.26	7.30
70.0	337	0.335	48.4	8.58	6.20	1.21	4.29	7.40
70.0	341	0.375	48.0	8.61	6.95	1.15	4.31	7.48
70.0	345	0.416	47.6	8.64	7.70	1.10	4.32	7.55
70.0	348	0.456	47.3	8.65	8.43	1.05	4.32	7.60
70.0	352	0.495	47.0	8.68	9.17	1.00	4.34	7.66
70.0	355	0.537	46.7	8.68	9.93	0.97	4.34	7.69
70.0	358	0.576	46.5	8.68	10.65	0.93	4.34	7.73
70.0	361	0.616	46.3	8.68	11.40	0.91	4.34	7.76
70.0	364	0.657	46.1	8.68	12.15	0.88	4.34	7.78
70.0	367	0.697	45.9	8.68	12.89	0.86	4.34	7.80
70.0	369	0.736	45.8	8.65	13.62	0.83	4.33	7.82
70.0	372	0.777	45.6	8.65	14.38	0.80	4.32	7.84
70.0	374	0.817	45.4	8.62	15.11	0.78	4.31	7.85
70.0	377	0.856	45.3	8.61	15.85	0.76	4.31	7.86
70.0	379	0.897	45.2	8.58	16.61	0.74	4.29	7.87
70.0	381	0.938	45.0	8.55	17.35	0.72	4.27	7.87
70.0	384	0.977	44.8	8.54	18.07	0.70	4.27	7.89
70.0	386	1.017	44.7	8.50	18.82	0.68	4.25	7.90
70.0	388	1.057	44.6	8.47	19.57	0.66	4.24	7.90
70.0	390	1.097	44.5	8.44	20.30	0.64	4.22	7.89

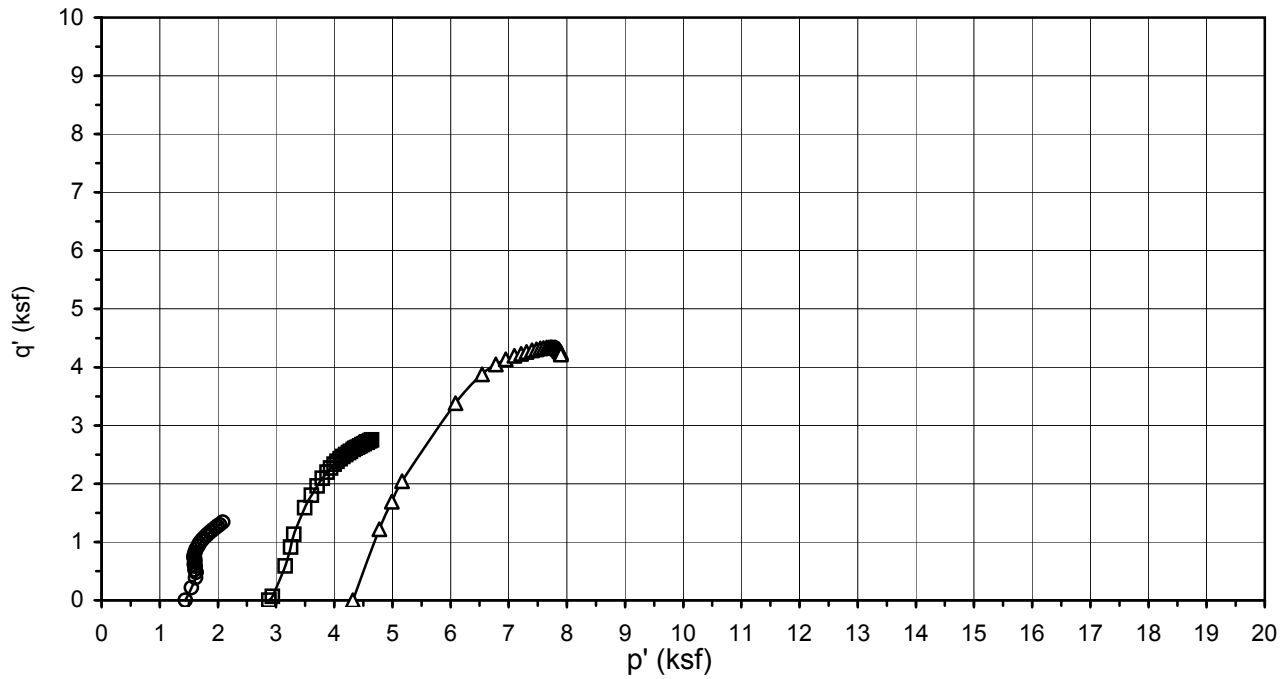


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi

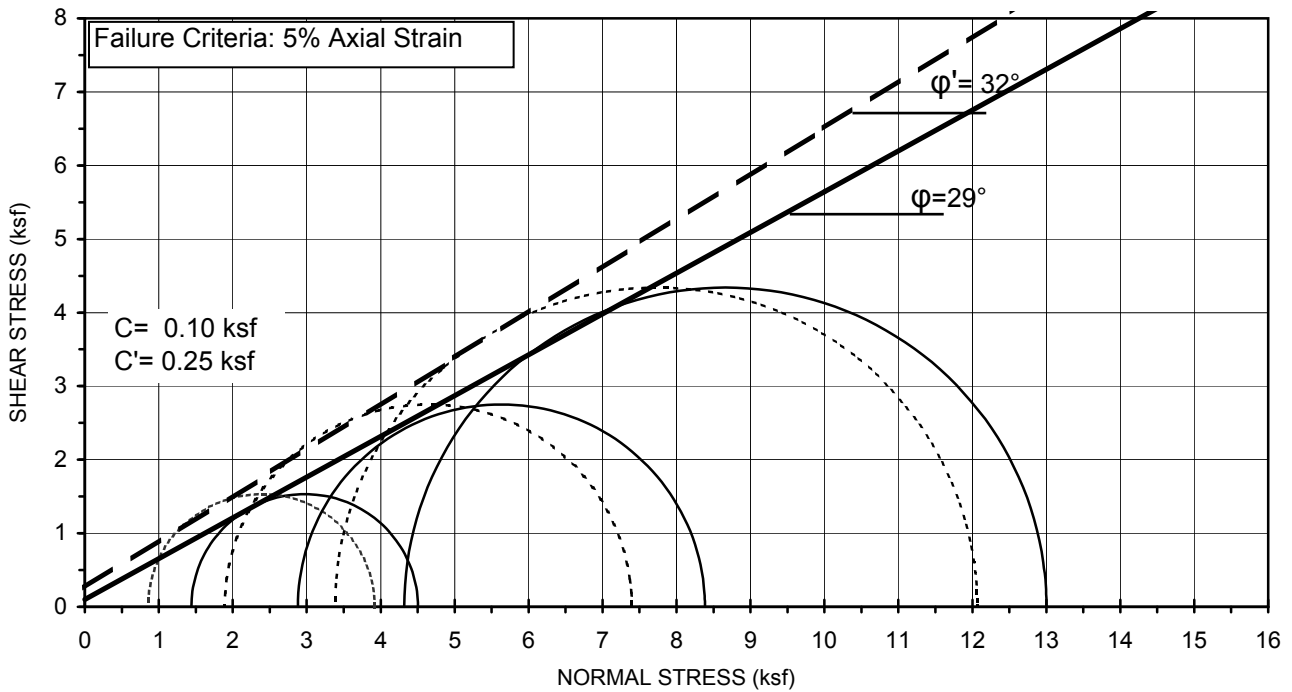


Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Brown Clayey Sand
Test Pit:	G-132	Avg. Dry Unit Weight (pcf):	102.0
Sample No.:	-	Avg. Initial Moisture Content (%):	20.9
Depth (ft):	15.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

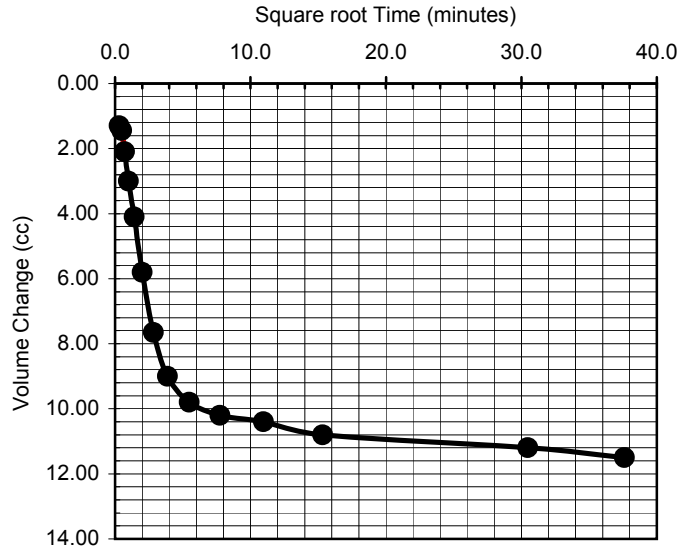
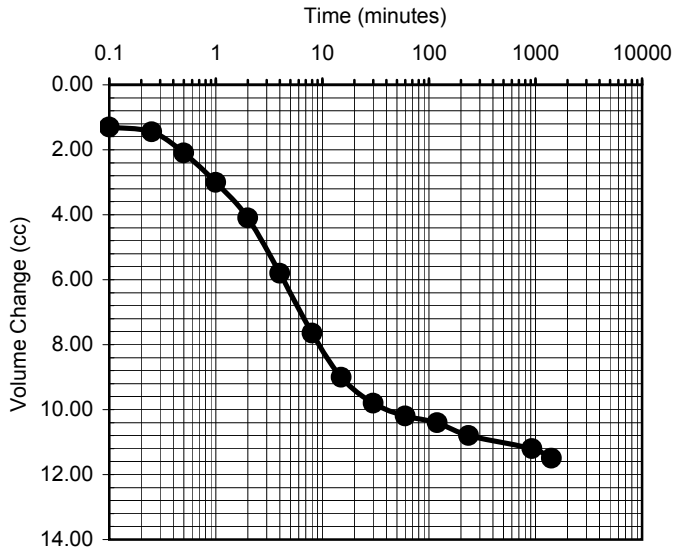


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Brown Clayey Sand
Test Pit:	G-132	Avg. Dry Unit Weight (pcf):	102.0
Sample No.:	-	Avg. Initial Moisture Content (%):	20.9
Depth (ft):	15.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-132	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Olive Brown Clayey Sand
Depth (feet):	15.5	Eff. Confining Pressure (psi):	20.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.3000
0.25	1.4500
0.5	2.1000
1	3.0000
2	4.1000
4	5.8000
8	7.6500
15	9.0000
30	9.8000
60	10.2000
120	10.4000
235	10.8000
929	11.2000
1415	11.5000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.3000
0.5000	1.4500
0.7071	2.1000
1.0000	3.0000
1.4142	4.1000
2.0000	5.8000
2.8284	7.6500
3.8730	9.0000
5.4772	9.8000
7.7460	10.2000
10.9545	10.4000
15.3297	10.8000
30.4795	11.2000
37.6165	11.5000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	West Subway Extension
Project No.:	4953-10-1561
Date:	06/01/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-143	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Sandy Clay w/gravel		
Depth(ft):	15.5				
Sample Type:	Mod. Cal.	Confining Pressure =	5.0 psi		

Diameter (in)	<u>2.611</u>	<u>2.611</u>	<u>2.611</u>	Avg. =	2.611
Height (in)	<u>5.685</u>	<u>5.685</u>	<u>5.685</u>	Avg. =	5.685

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.354	5.354
Moisture Content (%)	12.52	14.90
Wet Weight (gms)	113.82	1264.02
Dry Weight (gms)	106.80	1119.85
Container Weight (gms)	50.71	152.01
Density and Saturation		
Wet Weight (gms)	1093.82	
Container Weight (gms)	0.00	
Wet Density (pcf)	136.9	
Dry Density (pcf)	121.7	
Initial Void Ratio	0.385	
% Saturation	87.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	0.0
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	0.0
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	5.685
Induced OCR =	1.0	Initial Volume (cu.in)=	30.439
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	30.439

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	3.70
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	0.90
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	4.60
		Axial Strain (%) =	5.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-143	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Sandy Clay w/gravel		
Depth(ft):	15.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.611</u>	<u>2.611</u>	<u>2.611</u>	Avg. =	2.611
Height (in)	<u>5.685</u>	<u>5.685</u>	<u>5.685</u>	Avg. =	5.685

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.354	5.319
Moisture Content (%)	12.52	14.90
Wet Weight (gms)	113.82	1264.02
Dry Weight (gms)	106.80	1119.85
Container Weight (gms)	50.71	152.01
Density and Saturation		
Wet Weight (gms)	1093.82	
Container Weight (gms)	0.00	
Wet Density (pcf)	136.9	
Dry Density (pcf)	121.7	
Initial Void Ratio	0.385	
% Saturation	87.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	59.8
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	56.2
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.681
Induced OCR=	1.0	Initial Volume (cu.in)=	30.439
Change in Ht. of Specimen (in) =	0.0040	Final Volume (cu.in) =	30.220

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	6.79
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.07
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.86
		Axial Strain (%) =	5.01



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [West Subway Extension](#) Tested by: [AP](#) Date: [06-15-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [06-28-11](#)
 Test Pit: [G-143](#) Reviewed by: [AP](#) Date: [06-28-11](#)
 Sample No.: - Sample Description: [Sandy Clay w/gravel](#)
 Depth(ft): [15.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 25.0 psi](#)

Diameter (in)	2.611	2.611	2.611	Avg. =	2.611
Height (in)	5.685	5.685	5.685	Avg. =	5.685

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.354	5.331
Moisture Content (%)	12.52	14.90
Wet Weight (gms)	113.82	1264.02
Dry Weight (gms)	106.80	1119.85
Container Weight (gms)	50.71	152.01
Density and Saturation		
Wet Weight (gms)	1093.82	
Container Weight (gms)	0.00	
Wet Density (pcf)	136.9	
Dry Density (pcf)	121.7	
Initial Void Ratio	0.385	
% Saturation	87.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	56.2
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	53.2
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.676
Induced OCR =	1.0	Initial Volume (cu.in)=	30.439
Change in Ht. of Specimen (in) =	0.0092	Final Volume (cu.in) =	30.256

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	9.80
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.30
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	13.10
		Axial Strain (%) =	5.32



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-143	Consolidation Pressure :	5.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.685 in
Sample No.:	-	Initial Area of Sample:	5.354 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.685 in
Sample Description:	Sandy Clay w/gravel	Final Sample Area (A)*:	5.354 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1+S3)/2 (ksf)
55.0	0	0.000	50.0	0.00	0.00	0.00	0.00	0.72
55.0	9	0.023	50.3	0.24	0.40	0.04	0.12	0.80
55.0	37	0.037	51.6	0.99	0.65	0.23	0.49	0.98
55.0	51	0.050	52.2	1.36	0.88	0.32	0.68	1.08
55.0	62	0.064	52.4	1.65	1.12	0.34	0.82	1.20
55.0	71	0.077	52.3	1.88	1.36	0.33	0.94	1.33
55.0	78	0.091	52.2	2.06	1.61	0.31	1.03	1.44
55.0	85	0.106	52.0	2.24	1.86	0.28	1.12	1.56
55.0	90	0.121	51.7	2.37	2.12	0.25	1.18	1.66
55.0	95	0.135	51.5	2.49	2.37	0.21	1.25	1.75
55.0	99	0.150	51.2	2.59	2.63	0.18	1.30	1.84
55.0	104	0.164	51.0	2.72	2.89	0.14	1.36	1.94
55.0	108	0.179	50.7	2.81	3.14	0.11	1.41	2.02
55.0	113	0.193	50.5	2.94	3.39	0.07	1.47	2.12
55.0	117	0.207	50.2	3.03	3.63	0.03	1.52	2.20
55.0	122	0.221	50.0	3.15	3.89	0.00	1.58	2.30
55.0	127	0.237	49.7	3.27	4.16	-0.04	1.64	2.40
55.0	131	0.251	49.5	3.37	4.41	-0.07	1.68	2.48
55.0	136	0.265	49.2	3.49	4.66	-0.11	1.74	2.57
55.0	140	0.281	49.0	3.58	4.93	-0.14	1.79	2.65
55.0	145	0.295	48.7	3.70	5.19	-0.18	1.85	2.75



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-143	Consolidation Pressure :	15.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.685 in
Sample No.:	-	Initial Area of Sample:	5.354 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.681 in
Sample Description:	Sandy Clay w/gravel	Final Sample Area (A)*:	5.319 sq. in.
		Induced OCR=	1.0

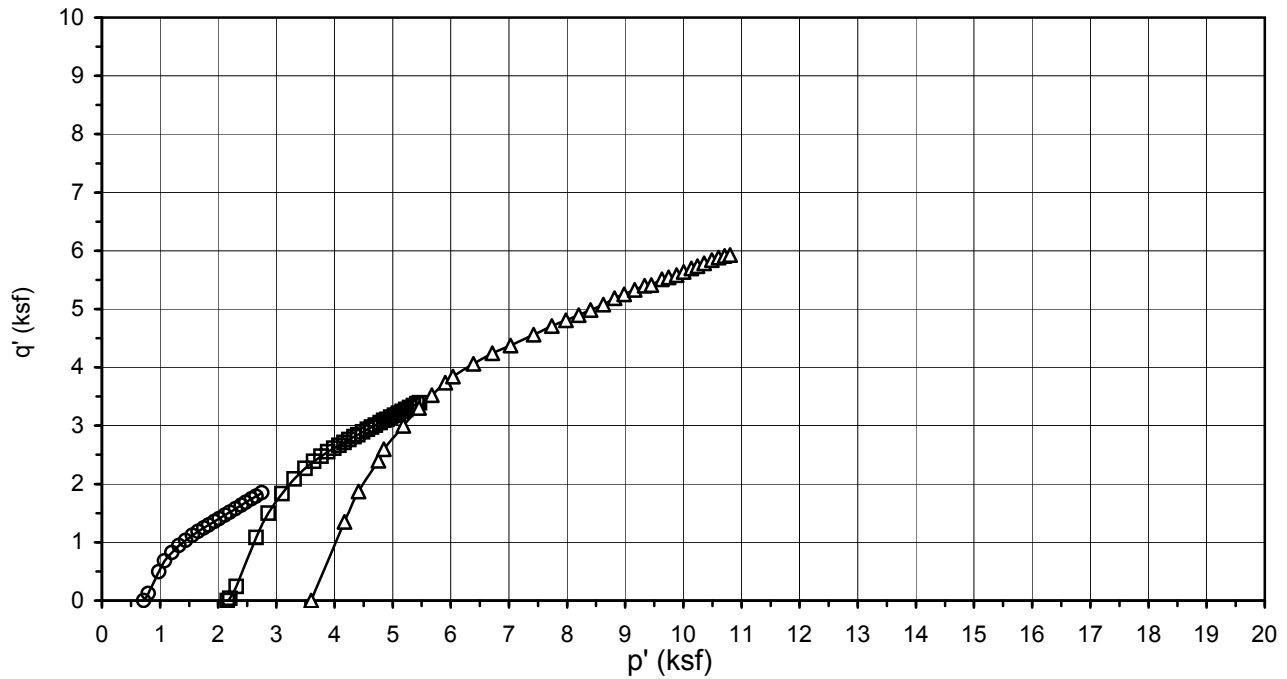
Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
65.0	0	0.000	50.0	0.00	0.00	0.00	0.00	2.16
65.0	3	0.001	50.0	0.08	0.01	0.00	0.04	2.20
65.0	18	0.002	50.6	0.49	0.03	0.09	0.24	2.31
65.0	80	0.010	54.1	2.16	0.18	0.59	1.08	2.65
65.0	111	0.020	55.5	2.99	0.35	0.80	1.50	2.86
65.0	136	0.028	56.2	3.66	0.49	0.90	1.83	3.10
65.0	155	0.037	56.5	4.17	0.65	0.93	2.08	3.31
65.0	169	0.046	56.5	4.54	0.81	0.93	2.27	3.50
65.0	178	0.056	56.3	4.77	0.99	0.90	2.39	3.64
65.0	185	0.065	56.0	4.95	1.14	0.87	2.48	3.77
65.0	191	0.075	55.7	5.10	1.31	0.83	2.55	3.88
65.0	196	0.084	55.5	5.23	1.48	0.78	2.61	3.99
65.0	200	0.094	55.2	5.32	1.65	0.75	2.66	4.08
65.0	204	0.103	54.9	5.42	1.81	0.71	2.71	4.16
65.0	208	0.112	54.7	5.52	1.98	0.67	2.76	4.25
65.0	212	0.122	54.4	5.62	2.15	0.63	2.81	4.33
65.0	215	0.132	54.2	5.69	2.31	0.60	2.84	4.41
65.0	219	0.141	53.9	5.78	2.48	0.56	2.89	4.49
65.0	223	0.151	53.7	5.88	2.65	0.53	2.94	4.57
65.0	226	0.160	53.4	5.95	2.82	0.50	2.97	4.64
65.0	229	0.169	53.2	6.01	2.98	0.46	3.01	4.70
65.0	233	0.179	53.0	6.11	3.15	0.43	3.05	4.79
65.0	236	0.189	52.8	6.18	3.33	0.40	3.09	4.85
65.0	238	0.198	52.6	6.22	3.49	0.37	3.11	4.90
65.0	241	0.208	52.3	6.28	3.66	0.33	3.14	4.97
65.0	244	0.218	52.1	6.35	3.84	0.30	3.18	5.03
65.0	247	0.227	51.9	6.42	4.00	0.27	3.21	5.10
65.0	250	0.237	51.7	6.49	4.16	0.24	3.24	5.17
65.0	253	0.247	51.4	6.55	4.34	0.21	3.28	5.23
65.0	256	0.256	51.2	6.62	4.50	0.18	3.31	5.29
65.0	259	0.266	51.0	6.68	4.68	0.14	3.34	5.36
65.0	262	0.275	50.8	6.75	4.85	0.11	3.37	5.42
65.0	264	0.284	50.6	6.79	5.01	0.09	3.39	5.47



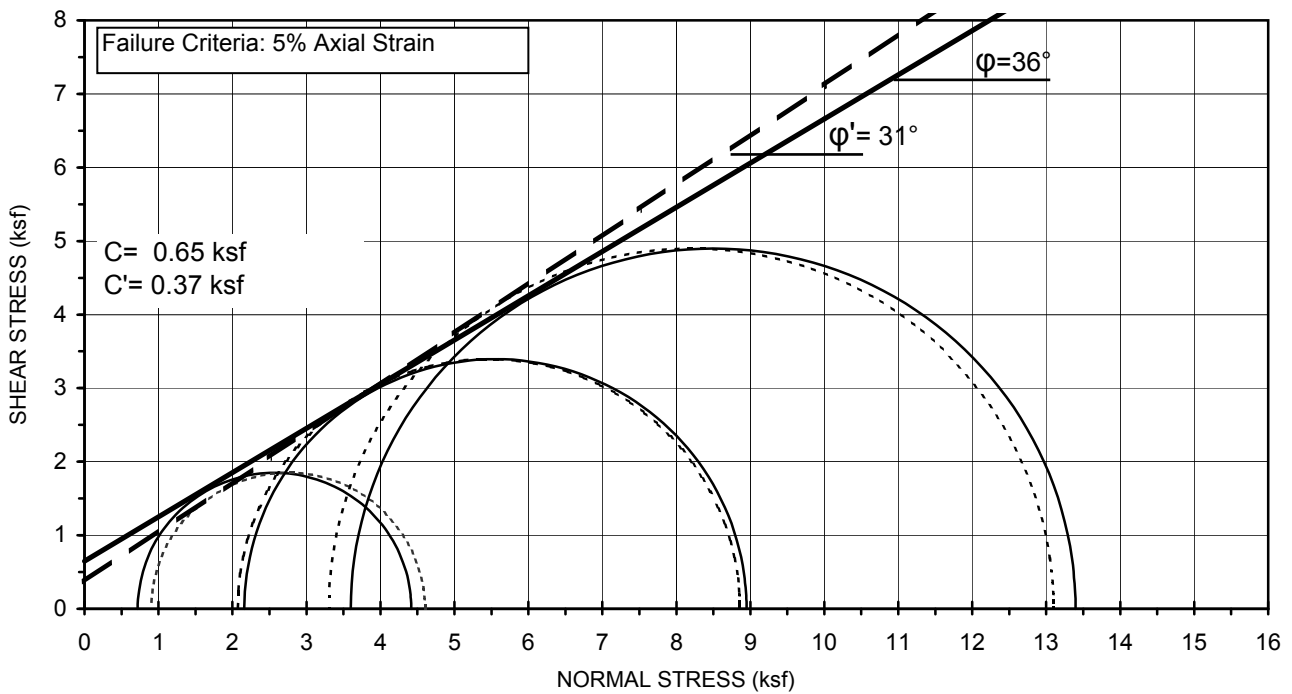
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-143	Consolidation Pressure :	25.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.685 in
Sample No.:	-	Initial Area of Sample:	5.354 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.676 in
Sample Description:	Sandy Clay w/gravel	Final Sample Area (A)*:	5.331 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	50.0	0.00	0.00	0.00	0.00	3.60
75.0	100	0.006	55.4	2.70	0.11	0.78	1.35	4.17
75.0	139	0.012	57.3	3.75	0.21	1.06	1.87	4.42
75.0	178	0.018	58.6	4.79	0.32	1.24	2.40	4.75
75.0	193	0.024	59.3	5.19	0.42	1.34	2.60	4.85
75.0	223	0.030	59.8	5.99	0.53	1.41	3.00	5.18
75.0	246	0.036	60.1	6.60	0.63	1.45	3.30	5.45
75.0	263	0.042	60.1	7.05	0.74	1.45	3.53	5.67
75.0	279	0.048	59.9	7.47	0.85	1.43	3.74	5.91
75.0	287	0.054	59.7	7.68	0.95	1.40	3.84	6.04
75.0	305	0.080	58.8	8.12	1.41	1.27	4.06	6.39
75.0	319	0.090	57.8	8.48	1.59	1.12	4.24	6.72
75.0	331	0.120	56.6	8.75	2.11	0.95	4.38	7.03
75.0	348	0.167	55.1	9.12	2.95	0.74	4.56	7.42
75.0	362	0.212	54.0	9.41	3.73	0.57	4.71	7.74
75.0	373	0.257	53.0	9.62	4.54	0.43	4.81	7.98
75.0	383	0.302	52.1	9.80	5.32	0.30	4.90	8.20
75.0	393	0.347	51.2	9.97	6.12	0.18	4.98	8.41
75.0	404	0.393	50.4	10.16	6.92	0.06	5.08	8.62
75.0	416	0.438	49.8	10.37	7.72	-0.03	5.18	8.82
75.0	425	0.484	49.1	10.50	8.53	-0.13	5.25	8.98
75.0	435	0.529	48.4	10.65	9.33	-0.24	5.33	9.16
75.0	445	0.574	47.7	10.80	10.12	-0.33	5.40	9.33
75.0	450	0.621	47.0	10.83	10.93	-0.43	5.41	9.45
75.0	462	0.666	46.4	11.02	11.73	-0.52	5.51	9.63
75.0	469	0.710	45.8	11.08	12.52	-0.61	5.54	9.75
75.0	477	0.756	45.1	11.17	13.32	-0.70	5.58	9.88
75.0	486	0.802	44.7	11.27	14.13	-0.77	5.64	10.01
75.0	496	0.847	44.2	11.40	14.92	-0.84	5.70	10.14
75.0	504	0.893	43.7	11.47	15.73	-0.91	5.74	10.24
75.0	513	0.938	43.2	11.57	16.53	-0.98	5.78	10.36
75.0	523	0.984	42.7	11.68	17.34	-1.05	5.84	10.49
75.0	532	1.029	42.2	11.77	18.13	-1.12	5.88	10.61
75.0	540	1.075	41.7	11.83	18.93	-1.20	5.91	10.71
75.0	547	1.120	41.2	11.86	19.74	-1.27	5.93	10.80



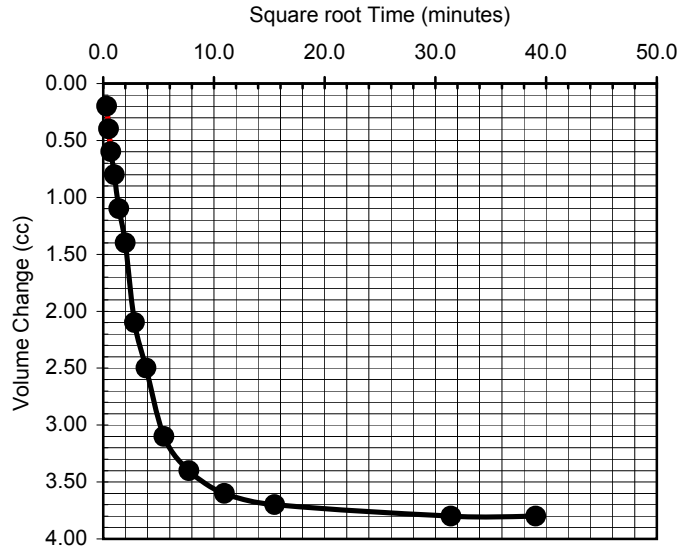
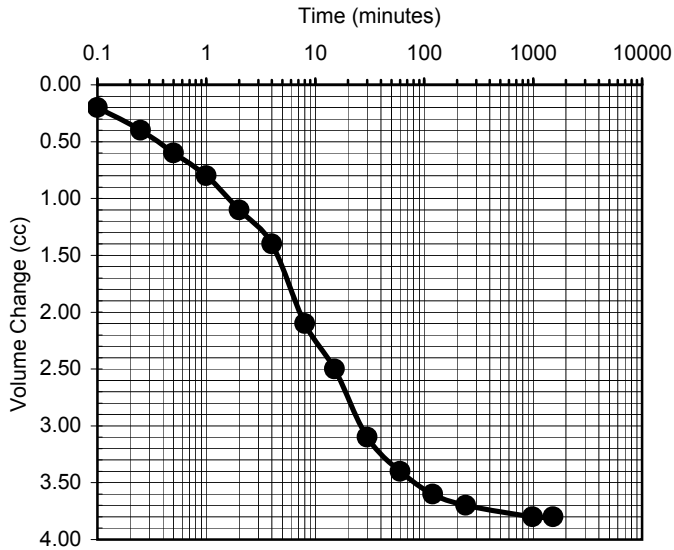
LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi



Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-143
 Sample No.: -
 Depth (ft): 15.5

Sample Type: Mod. Cal.
 Sample Description: Sandy Clay w/gravel
 Avg. Dry Unit Weight (pcf): 121.7
 Avg. Initial Moisture Content (%): 12.5
 Confining Pressure: 5.0, 15.0, 25.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-143	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Sandy Clay w/gravel
Depth (feet):	15.5	Eff. Confining Pressure (ksf):	15.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.2000
0.25	0.4000
0.5	0.6000
1	0.8000
2	1.1000
4	1.4000
8	2.1000
15	2.5000
30	3.1000
60	3.4000
120	3.6000
240	3.7000
987	3.8000
1527	3.8000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.2000
0.5000	0.4000
0.7071	0.6000
1.0000	0.8000
1.4142	1.1000
2.0000	1.4000
2.8284	2.1000
3.8730	2.5000
5.4772	3.1000
7.7460	3.4000
10.9545	3.6000
15.4919	3.7000
31.4166	3.8000
39.0768	3.8000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	West Subway Extension
Project No.:	4953-10-1561
Date:	06/15/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-143	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Yell. Brown Clay w/sand		
Depth(ft):	45.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.599</u>	<u>2.599</u>	<u>2.599</u>	Avg. =	2.599
Height (in)	<u>5.584</u>	<u>5.584</u>	<u>5.584</u>	Avg. =	5.584

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.305	5.334
Moisture Content (%)	22.62	24.92
Wet Weight (gms)	103.70	1109.64
Dry Weight (gms)	93.75	918.08
Container Weight (gms)	49.77	149.44
Density and Saturation		
Wet Weight (gms)	975.32	
Container Weight (gms)	0.00	
Wet Density (pcf)	125.4	
Dry Density (pcf)	102.3	
Initial Void Ratio	0.647	
% Saturation	94.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	65.5
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	63.1
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.526
Induced OCR =	1.0	Initial Volume (cu.in)=	29.624
Change in Ht. of Specimen (in) =	0.0578	Final Volume (cu.in) =	29.478

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	2.91
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.01
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.91
		Axial Strain (%) =	4.69



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-143	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Yell. Brown Clay w/sand		
Depth(ft):	45.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.599</u>	<u>2.599</u>	<u>2.599</u>	Avg. =	2.599
Height (in)	<u>5.584</u>	<u>5.584</u>	<u>5.584</u>	Avg. =	5.584

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.305	5.289
Moisture Content (%)	22.62	24.92
Wet Weight (gms)	103.70	1109.64
Dry Weight (gms)	93.75	918.08
Container Weight (gms)	49.77	149.44
Density and Saturation		
Wet Weight (gms)	975.32	
Container Weight (gms)	0.00	
Wet Density (pcf)	125.4	
Dry Density (pcf)	102.3	
Initial Void Ratio	0.647	
% Saturation	94.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation			
B Value (%) =	96	Change in Ht. of the Specimen (in)=	0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	63.3
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	58.9
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.551
Induced OCR=	1.0	Initial Volume (cu.in)=	29.624
Change in Ht. of Specimen (in) =	0.0333	Final Volume (cu.in) =	29.356

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	6.22
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.37
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.60
		Axial Strain (%) =	5.29



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-15-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-28-11
Test Pit:	G-143	Reviewed by:	AP	Date:	06-28-11
Sample No.:	-	Sample Description:	Yell. Brown Clay w/sand		
Depth(ft):	45.5				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.599</u>	<u>2.599</u>	<u>2.599</u>	Avg. =	2.599
Height (in)	<u>5.584</u>	<u>5.584</u>	<u>5.584</u>	Avg. =	5.584

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.305	5.197
Moisture Content (%)	22.62	24.92
Wet Weight (gms)	103.70	1109.64
Dry Weight (gms)	93.75	918.08
Container Weight (gms)	49.77	149.44
Density and Saturation		
Wet Weight (gms)	975.32	
Container Weight (gms)	0.00	
Wet Density (pcf)	125.4	
Dry Density (pcf)	102.3	
Initial Void Ratio	0.647	
% Saturation	94.4	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	55.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	45.0
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.582
Induced OCR =	1.0	Initial Volume (cu.in)=	29.624
Change in Ht. of Specimen (in) =	0.0018	Final Volume (cu.in) =	29.008

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	10.66
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.93
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	15.58
		Axial Strain (%) =	4.81



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-143	Consolidation Pressure :	15.0 psi
Depth(ft):	45.5	Initial Sample Height:	5.584 in
Sample No.:	-	Initial Area of Sample:	5.305 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.526 in
Sample Description:	Yell. Brown Clay w/sand	Final Sample Area (A)*:	5.334 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	36	0.011	32.7	0.97	0.20	0.38	0.48	2.26
45.0	49	0.025	34.4	1.32	0.44	0.62	0.66	2.19
45.0	57	0.039	35.4	1.53	0.70	0.77	0.76	2.15
45.0	63	0.053	36.1	1.68	0.95	0.88	0.84	2.13
45.0	68	0.067	36.6	1.81	1.21	0.95	0.91	2.11
45.0	73	0.081	37.0	1.94	1.47	1.01	0.97	2.12
45.0	77	0.097	37.4	2.04	1.75	1.05	1.02	2.13
45.0	81	0.112	37.6	2.14	2.02	1.09	1.07	2.14
45.0	85	0.127	37.8	2.24	2.29	1.12	1.12	2.17
45.0	88	0.142	37.9	2.31	2.56	1.14	1.16	2.18
45.0	91	0.155	38.0	2.39	2.80	1.15	1.19	2.20
45.0	95	0.170	38.1	2.49	3.07	1.16	1.24	2.24
45.0	98	0.184	38.1	2.56	3.32	1.17	1.28	2.27
45.0	101	0.198	38.2	2.63	3.59	1.17	1.31	2.31
45.0	104	0.213	38.2	2.70	3.86	1.17	1.35	2.34
45.0	107	0.228	38.1	2.77	4.12	1.17	1.38	2.38
45.0	110	0.244	38.1	2.84	4.41	1.16	1.42	2.42
45.0	113	0.259	38.0	2.91	4.69	1.15	1.45	2.46



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	60.0 psi
Project No.:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-143	Consolidation Pressure :	30.0 psi
Depth(ft):	45.5	Initial Sample Height:	5.584 in
Sample No.:	-	Initial Area of Sample:	5.305 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.551 in
Sample Description:	Yell. Brown Clay w/sand	Final Sample Area (A)*:	5.289 sq. in.
		Induced OCR=	1.0

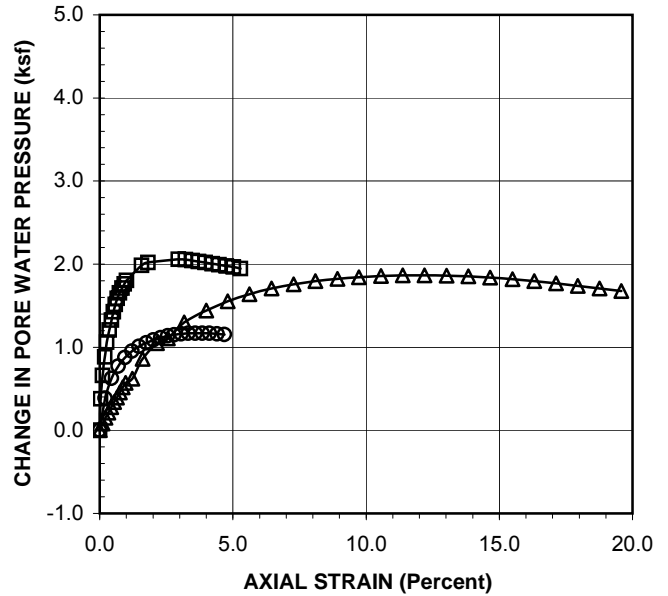
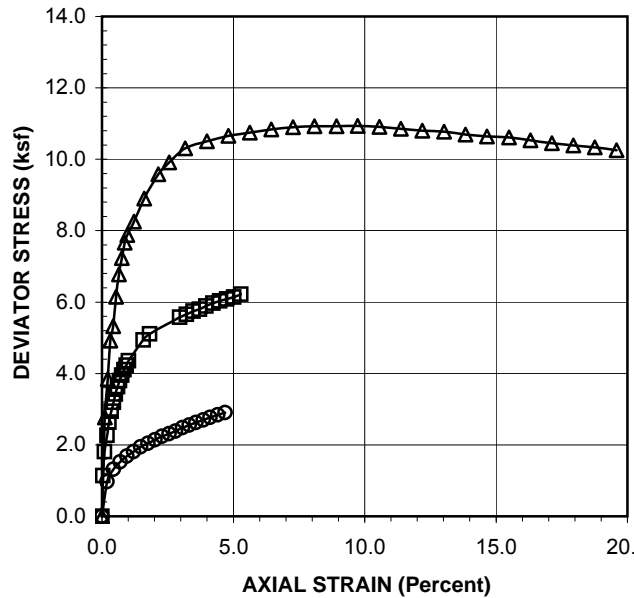
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	30.0	0.00	0.00	0.00	0.00	4.32
60.0	42	0.002	32.6	1.14	0.04	0.38	0.57	4.51
60.0	67	0.006	34.6	1.81	0.10	0.66	0.90	4.57
60.0	84	0.011	36.1	2.27	0.19	0.88	1.14	4.57
60.0	97	0.015	37.4	2.63	0.26	1.06	1.32	4.57
60.0	108	0.020	38.4	2.94	0.35	1.21	1.47	4.58
60.0	118	0.025	39.2	3.19	0.44	1.33	1.60	4.59
60.0	126	0.029	39.9	3.42	0.52	1.43	1.71	4.60
60.0	134	0.033	40.5	3.63	0.59	1.51	1.81	4.62
60.0	141	0.037	41.1	3.80	0.67	1.59	1.90	4.63
60.0	146	0.042	41.5	3.95	0.75	1.65	1.98	4.65
60.0	152	0.046	41.9	4.10	0.84	1.71	2.05	4.66
60.0	157	0.051	42.2	4.23	0.92	1.76	2.11	4.67
60.0	162	0.056	42.5	4.35	1.01	1.80	2.18	4.69
60.0	184	0.087	43.8	4.94	1.57	1.98	2.47	4.81
60.0	191	0.101	44.1	5.10	1.82	2.02	2.55	4.85
60.0	211	0.164	44.3	5.57	2.96	2.06	2.79	5.05
60.0	215	0.179	44.3	5.66	3.22	2.05	2.83	5.10
60.0	219	0.193	44.2	5.74	3.47	2.04	2.87	5.15
60.0	221	0.206	44.1	5.80	3.71	2.03	2.90	5.19
60.0	225	0.220	44.0	5.89	3.96	2.02	2.94	5.24
60.0	229	0.235	43.9	5.97	4.22	2.00	2.99	5.30
60.0	232	0.249	43.9	6.03	4.48	1.99	3.01	5.34
60.0	235	0.264	43.8	6.09	4.75	1.98	3.04	5.38
60.0	238	0.279	43.7	6.14	5.02	1.96	3.07	5.43
60.0	241	0.294	43.5	6.22	5.29	1.95	3.11	5.48



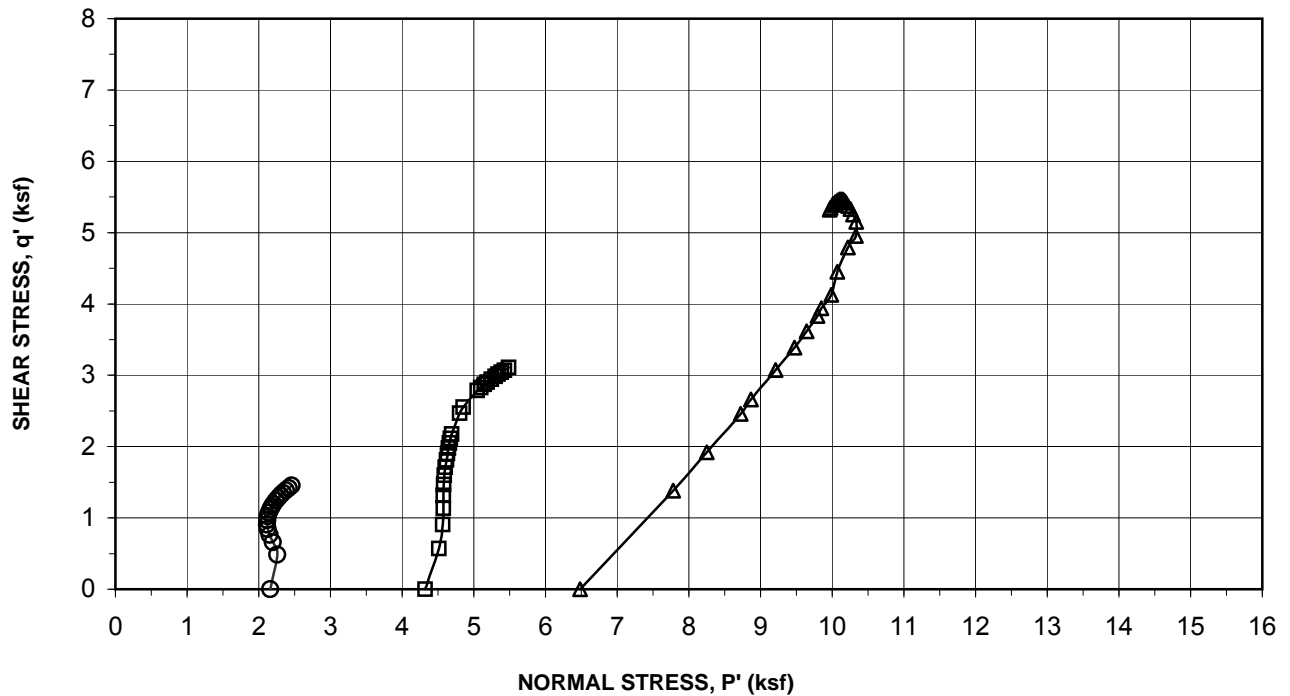
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-143	Consolidation Pressure :	45.0 psi
Depth(ft):	45.5	Initial Sample Height:	5.584 in
Sample No.:	-	Initial Area of Sample:	5.305 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.582 in
Sample Description:	Yell. Brown Clay w/sand	Final Sample Area (A)*:	5.197 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	100	0.006	30.6	2.77	0.11	0.08	1.38	7.78
75.0	139	0.012	31.0	3.84	0.21	0.15	1.92	8.25
75.0	178	0.018	31.5	4.92	0.32	0.21	2.46	8.72
75.0	193	0.024	31.9	5.33	0.43	0.28	2.66	8.86
75.0	223	0.030	32.4	6.15	0.54	0.34	3.07	9.21
75.0	246	0.036	32.7	6.77	0.64	0.39	3.39	9.47
75.0	263	0.042	33.2	7.23	0.75	0.46	3.62	9.64
75.0	279	0.048	33.6	7.66	0.86	0.52	3.83	9.80
75.0	287	0.054	34.0	7.88	0.97	0.57	3.94	9.85
75.0	302	0.068	34.3	8.26	1.22	0.62	4.13	9.99
75.0	327	0.090	36.0	8.90	1.61	0.86	4.45	10.07
75.0	353	0.120	37.3	9.58	2.15	1.05	4.79	10.22
75.0	367	0.143	37.7	9.91	2.56	1.11	4.95	10.33
75.0	384	0.177	39.0	10.30	3.17	1.30	5.15	10.33
75.0	395	0.223	40.0	10.51	3.99	1.44	5.25	10.29
75.0	404	0.268	40.8	10.66	4.81	1.55	5.33	10.26
75.0	411	0.314	41.4	10.75	5.63	1.64	5.37	10.22
75.0	418	0.360	41.9	10.84	6.45	1.71	5.42	10.19
75.0	424	0.406	42.2	10.89	7.27	1.76	5.45	10.17
75.0	429	0.452	42.5	10.93	8.09	1.79	5.46	10.15
75.0	433	0.498	42.7	10.93	8.92	1.82	5.46	10.12
75.0	437	0.543	42.8	10.93	9.73	1.84	5.47	10.10
75.0	440	0.589	42.9	10.91	10.56	1.86	5.45	10.08
75.0	442	0.635	43.0	10.85	11.38	1.86	5.43	10.04
75.0	444	0.681	43.0	10.80	12.19	1.86	5.40	10.02
75.0	447	0.727	42.9	10.77	13.03	1.86	5.39	10.00
75.0	448	0.773	42.9	10.70	13.84	1.85	5.35	9.98
75.0	450	0.818	42.8	10.64	14.66	1.84	5.32	9.96
75.0	453	0.865	42.6	10.61	15.49	1.82	5.30	9.97
75.0	454	0.910	42.5	10.53	16.31	1.79	5.26	9.95
75.0	455	0.956	42.3	10.45	17.12	1.77	5.22	9.94
75.0	457	1.002	42.1	10.39	17.94	1.74	5.20	9.94
75.0	459	1.047	41.9	10.33	18.76	1.71	5.17	9.94
75.0	460	1.093	41.7	10.25	19.58	1.68	5.13	9.93

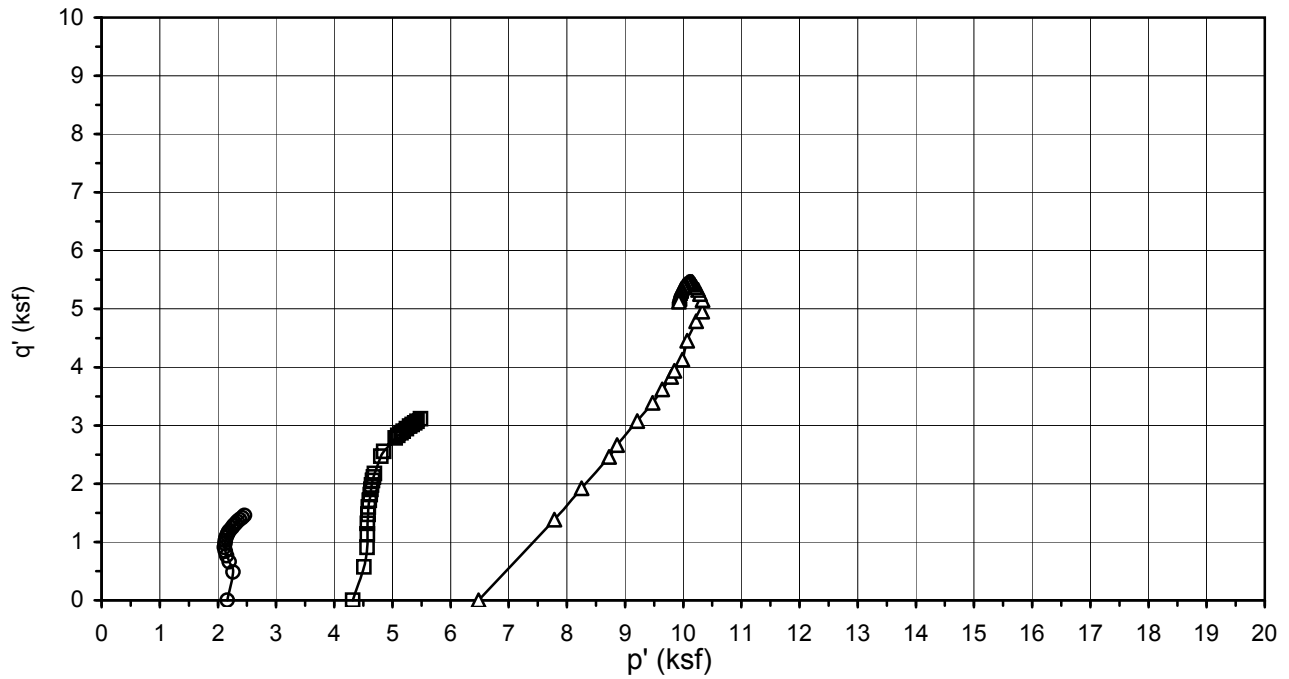


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi

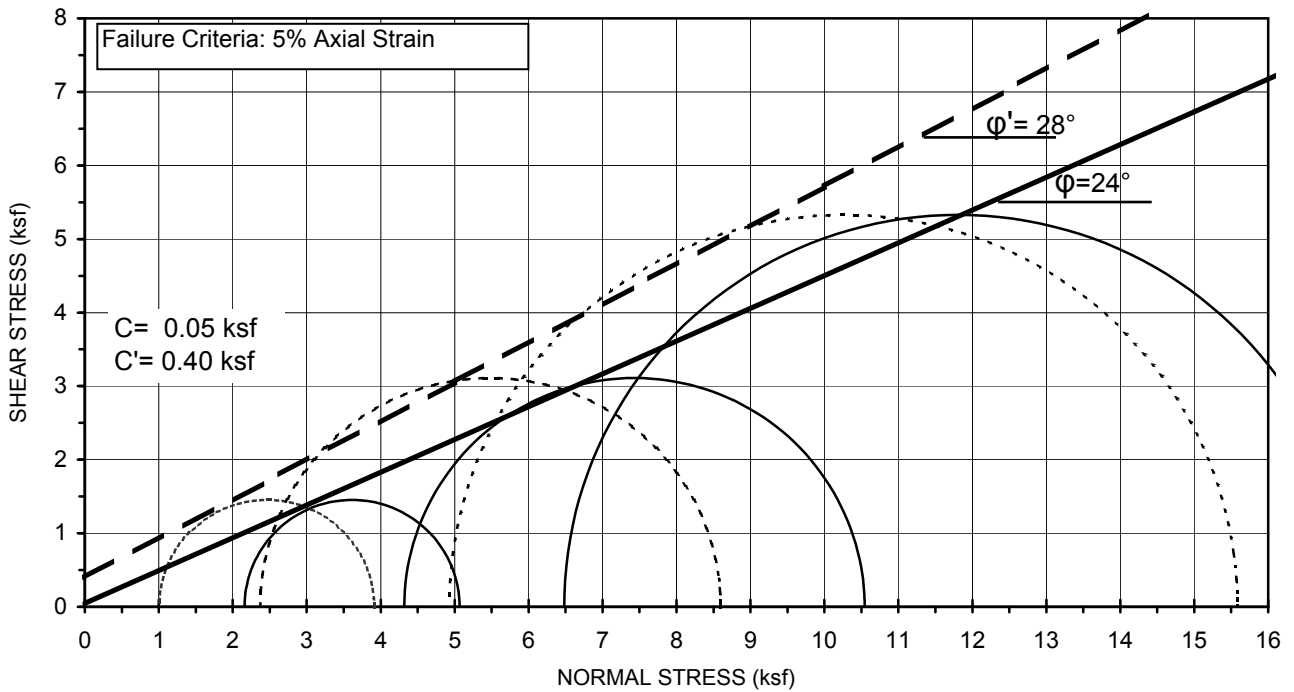


Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Yell. Brown Clay w/sand
Test Pit:	G-143	Avg. Dry Unit Weight (pcf):	102.3
Sample No.:	-	Avg. Initial Moisture Content (%):	22.6
Depth (ft):	45.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

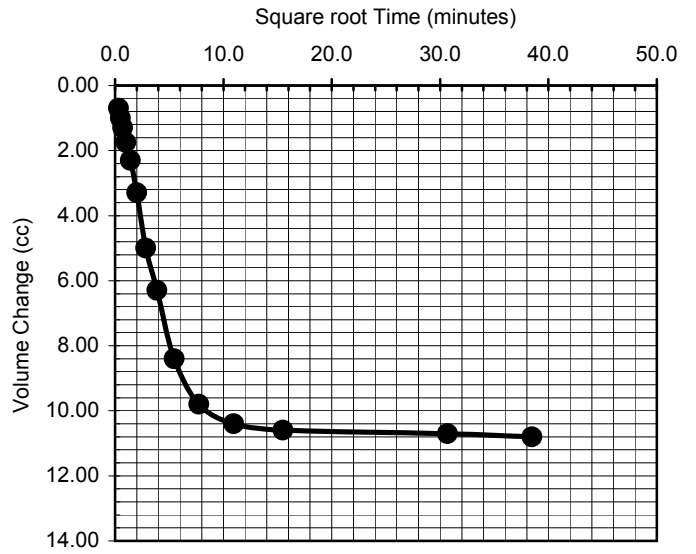
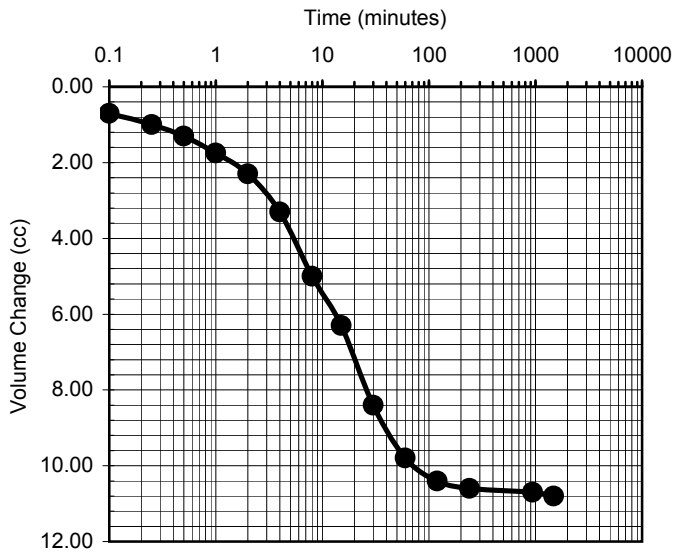


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Yell. Brown Clay w/sand
Test Pit:	G-143	Avg. Dry Unit Weight (pcf):	102.3
Sample No.:	-	Avg. Initial Moisture Content (%):	22.6
Depth (ft):	45.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-143	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Yell. Brown Clay w/sand
Depth (feet):	45.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.7000
0.25	1.0000
0.5	1.3000
1	1.7500
2	2.3000
4	3.3000
8	5.0000
15	6.3000
30	8.4000
60	9.8000
120	10.4000
240	10.6000
941	10.7000
1481	10.8000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.7000
0.5000	1.0000
0.7071	1.3000
1.0000	1.7500
1.4142	2.3000
2.0000	3.3000
2.8284	5.0000
3.8730	6.3000
5.4772	8.4000
7.7460	9.8000
10.9545	10.4000
15.4919	10.6000
30.6757	10.7000
38.4838	10.8000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: West Subway Extension
 Project No.: 4953-10-1561
 Date: 06/15/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-26-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-02-11**
 Test Pit: **G-144** Reviewed by: **AP** Date: **08-02-11**
 Sample No.: **7** Sample Description: **Dk Yell Brown Clayey Sand**
 Depth(ft): **25.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 10.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.882</u>	<u>5.882</u>	<u>5.882</u>	Avg. =	5.882

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.376
Moisture Content (%)	8.70	13.57
Wet Weight (gms)	<u>21.85</u>	<u>1299.45</u>
Dry Weight (gms)	<u>20.95</u>	<u>1162.38</u>
Container Weight (gms)	<u>10.60</u>	<u>151.97</u>
Density and Saturation		
Wet Weight (gms)	<u>1104.44</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	133.2	
Dry Density (pcf)	122.5	
Initial Void Ratio	0.375	
% Saturation	62.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in) = <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>60.0</u>	Initial Burette Ht.(cm)=	<u>88.0</u>
Back Pressure(psi) =	<u>50.0</u>	Final Burette Ht.(cm)=	<u>85.8</u>
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	<u>5.851</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>31.591</u>
Change in Ht. of Specimen (in) =	0.0307	Final Volume (cu.in) =	<u>31.456</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.00
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	3.35
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.35
		Axial Strain (%) =	5.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-26-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-02-11
Test Pit:	G-144	Reviewed by:	AP	Date:	08-02-11
Sample No.:	7	Sample Description:	Dk Yell Brown Clayey Sand		
Depth(ft):	25.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.882</u>	<u>5.882</u>	<u>5.882</u>	Avg. =	5.882

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.366
Moisture Content (%)	8.70	13.57
Wet Weight (gms)	21.85	1299.45
Dry Weight (gms)	20.95	1162.38
Container Weight (gms)	10.60	151.97
Density and Saturation		
Wet Weight (gms)	1104.44	
Container Weight (gms)	0.00	
Wet Density (pcf)	133.2	
Dry Density (pcf)	122.5	
Initial Void Ratio	0.375	
% Saturation	62.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	85.8
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	85.2
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.880
Induced OCR=	1.0	Initial Volume (cu.in)=	31.591
Change in Ht. of Specimen (in) =	0.0016	Final Volume (cu.in) =	31.554

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	14.68
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.69
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	19.37
		Axial Strain (%) =	5.06



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-26-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-02-11**
 Test Pit: **G-144** Reviewed by: **AP** Date: **08-02-11**
 Sample No.: **7** Sample Description: **Dk Yell Brown Clayey Sand**
 Depth(ft): **25.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 30.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.882</u>	<u>5.882</u>	<u>5.882</u>	Avg. =	5.882

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.358
Moisture Content (%)	8.70	13.57
Wet Weight (gms)	21.85	1299.45
Dry Weight (gms)	20.95	1162.38
Container Weight (gms)	10.60	151.97
Density and Saturation		
Wet Weight (gms)	1104.44	
Container Weight (gms)	0.00	
Wet Density (pcf)	133.2	
Dry Density (pcf)	122.5	
Initial Void Ratio	0.375	
% Saturation	62.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	85.2
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	84.0
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.882
Induced OCR =	1.0	Initial Volume (cu.in)=	31.591
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.517

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	18.44
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.89
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	24.33
		Axial Strain (%) =	5.21



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-144	Consolidation Pressure :	10.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.882 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.851 in
Sample Description:	Dk Yell Brown Clayey Sand	Final Sample Area (A)*:	5.376 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	0	0.000	50.0	0.00	0.00	0.00	0.00	1.44
60.0	49	0.005	51.7	1.31	0.08	0.24	0.66	1.85
60.0	67	0.012	52.6	1.79	0.21	0.38	0.90	1.96
60.0	83	0.019	53.1	2.22	0.32	0.45	1.11	2.10
60.0	100	0.025	53.4	2.67	0.43	0.49	1.33	2.29
60.0	119	0.033	53.5	3.17	0.56	0.50	1.58	2.53
60.0	139	0.040	53.4	3.70	0.68	0.49	1.85	2.80
60.0	160	0.047	53.3	4.25	0.79	0.47	2.13	3.10
60.0	181	0.053	53.0	4.80	0.91	0.43	2.40	3.41
60.0	201	0.060	52.7	5.33	1.02	0.38	2.66	3.72
60.0	220	0.067	52.2	5.83	1.14	0.32	2.91	4.03
60.0	237	0.074	51.7	6.27	1.26	0.24	3.13	4.33
60.0	254	0.080	51.1	6.71	1.37	0.16	3.36	4.64
60.0	268	0.087	50.5	7.07	1.49	0.07	3.54	4.91
60.0	281	0.095	49.8	7.41	1.62	-0.03	3.70	5.17
60.0	344	0.145	45.2	8.99	2.48	-0.69	4.49	6.63
60.0	356	0.159	44.1	9.28	2.72	-0.86	4.64	6.93
60.0	367	0.174	43.0	9.54	2.97	-1.01	4.77	7.22
60.0	377	0.188	42.1	9.77	3.20	-1.14	4.89	7.47
60.0	387	0.201	41.2	10.01	3.44	-1.27	5.00	7.71
60.0	395	0.216	40.4	10.19	3.69	-1.39	5.09	7.92
60.0	403	0.231	39.7	10.37	3.94	-1.49	5.18	8.11
60.0	411	0.246	39.0	10.55	4.21	-1.59	5.27	8.30
60.0	417	0.260	38.4	10.67	4.45	-1.68	5.34	8.45
60.0	423	0.276	37.8	10.80	4.71	-1.76	5.40	8.60
60.0	428	0.290	37.2	10.90	4.95	-1.84	5.45	8.73
60.0	433	0.304	36.7	11.00	5.19	-1.91	5.50	8.85



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-144	Consolidation Pressure :	20.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.882 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.880 in
Sample Description:	Dk Yell Brown Clayey Sand	Final Sample Area (A)*:	5.366 sq. in.
		Induced OCR=	1.0

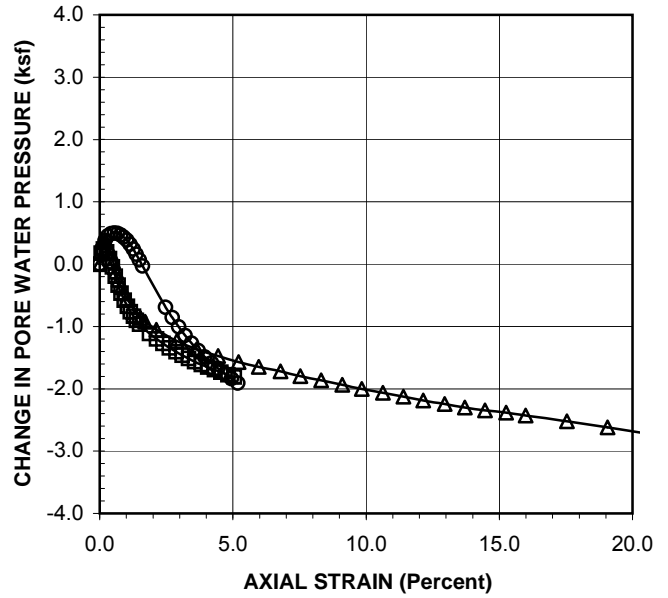
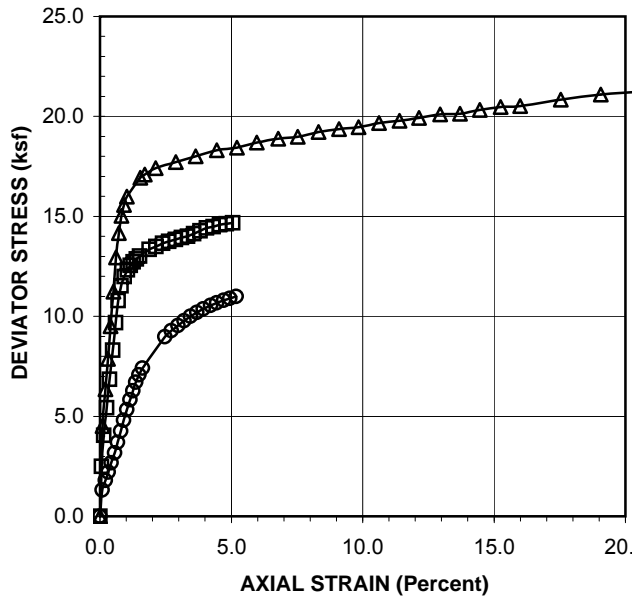
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	50.0	0.00	0.00	0.00	0.00	2.88
70.0	93	0.003	51.3	2.49	0.06	0.18	1.25	3.95
70.0	151	0.009	51.7	4.05	0.15	0.24	2.02	4.66
70.0	203	0.015	51.4	5.43	0.26	0.20	2.72	5.40
70.0	256	0.022	50.7	6.84	0.37	0.09	3.42	6.21
70.0	311	0.028	49.7	8.31	0.48	-0.05	4.15	7.08
70.0	363	0.035	48.7	9.68	0.59	-0.19	4.84	7.92
70.0	405	0.041	47.7	10.79	0.70	-0.34	5.40	8.61
70.0	433	0.047	46.8	11.53	0.80	-0.47	5.76	9.11
70.0	451	0.054	46.0	11.99	0.92	-0.58	6.00	9.45
70.0	464	0.061	45.3	12.32	1.04	-0.68	6.16	9.72
70.0	473	0.068	44.7	12.55	1.16	-0.76	6.27	9.92
70.0	480	0.075	44.2	12.72	1.27	-0.84	6.36	10.08
70.0	486	0.082	43.8	12.86	1.39	-0.90	6.43	10.22
70.0	492	0.089	43.3	13.00	1.51	-0.96	6.50	10.35
70.0	507	0.110	42.3	13.35	1.88	-1.12	6.68	10.67
70.0	514	0.126	41.7	13.50	2.13	-1.20	6.75	10.83
70.0	521	0.140	41.2	13.65	2.38	-1.28	6.82	10.98
70.0	526	0.154	40.7	13.75	2.62	-1.35	6.87	11.10
70.0	531	0.169	40.3	13.84	2.87	-1.41	6.92	11.21
70.0	536	0.182	39.9	13.94	3.10	-1.47	6.97	11.31
70.0	540	0.196	39.5	14.01	3.34	-1.52	7.00	11.40
70.0	546	0.210	39.2	14.13	3.57	-1.56	7.06	11.51
70.0	553	0.224	38.9	14.27	3.81	-1.61	7.14	11.63
70.0	560	0.239	38.6	14.42	4.06	-1.65	7.21	11.74
70.0	564	0.254	38.3	14.48	4.32	-1.69	7.24	11.82
70.0	569	0.268	38.0	14.57	4.56	-1.74	7.29	11.90
70.0	573	0.283	37.7	14.64	4.82	-1.78	7.32	11.97
70.0	576	0.298	37.5	14.68	5.06	-1.81	7.34	12.03



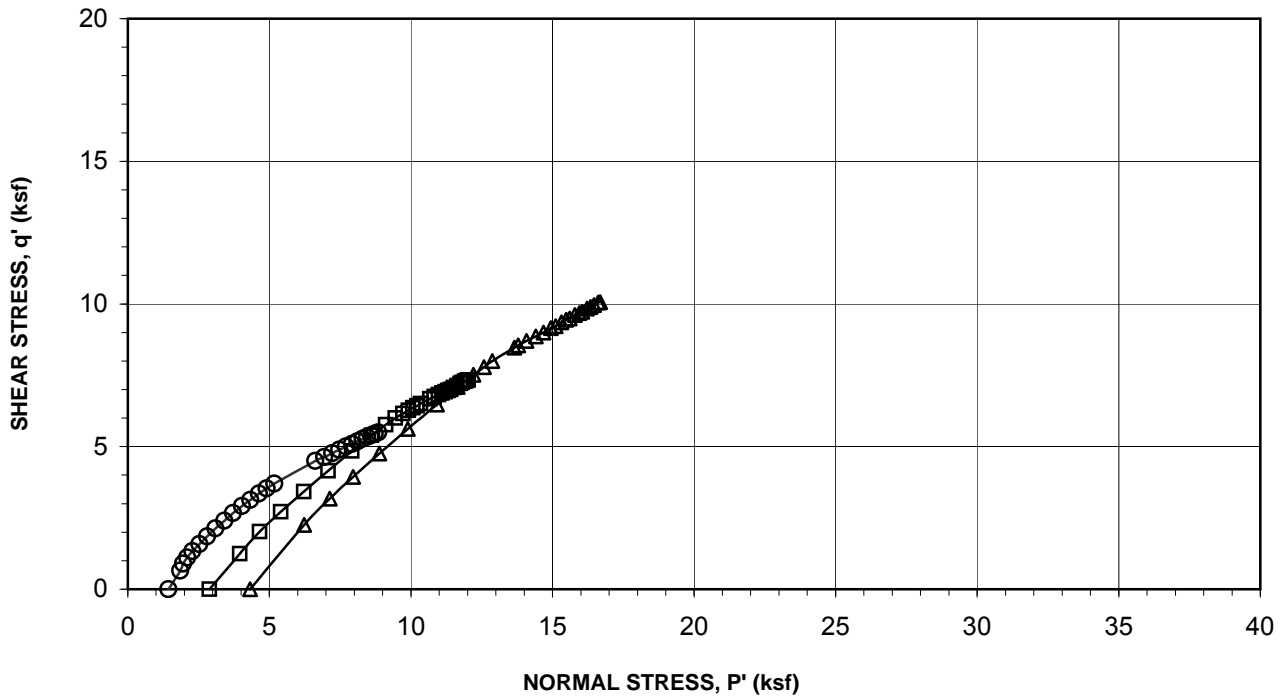
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-144	Consolidation Pressure :	30.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.882 in
Sample No.:	7	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.882 in
Sample Description:	Dk Yell Brown Clayey Sand	Final Sample Area (A)*:	5.358 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	50.0	0.00	0.00	0.00	0.00	4.32
80.0	168	0.006	52.5	4.51	0.10	0.35	2.26	6.22
80.0	237	0.012	52.5	6.36	0.20	0.36	3.18	7.14
80.0	294	0.018	52.1	7.88	0.31	0.30	3.94	7.96
80.0	355	0.024	51.3	9.50	0.41	0.18	4.75	8.89
80.0	420	0.030	50.3	11.23	0.51	0.04	5.61	9.89
80.0	485	0.036	49.2	12.95	0.61	-0.12	6.48	10.92
80.0	531	0.042	48.3	14.17	0.71	-0.25	7.08	11.65
80.0	564	0.048	47.5	15.03	0.82	-0.37	7.52	12.20
80.0	585	0.054	46.8	15.58	0.92	-0.47	7.79	12.58
80.0	601	0.060	46.1	15.99	1.02	-0.56	7.99	12.87
80.0	640	0.090	44.0	16.94	1.53	-0.86	8.47	13.65
80.0	647	0.100	43.6	17.09	1.70	-0.92	8.55	13.79
80.0	662	0.125	42.7	17.41	2.12	-1.05	8.71	14.08
80.0	679	0.170	41.4	17.72	2.89	-1.23	8.86	14.41
80.0	695	0.214	40.5	18.00	3.64	-1.36	9.00	14.68
80.0	713	0.262	39.8	18.31	4.45	-1.47	9.15	14.95
80.0	724	0.306	39.1	18.44	5.21	-1.57	9.22	15.11
80.0	740	0.351	38.6	18.70	5.97	-1.65	9.35	15.32
80.0	754	0.399	38.0	18.89	6.79	-1.72	9.44	15.49
80.0	764	0.443	37.5	18.99	7.53	-1.80	9.49	15.61
80.0	780	0.489	37.1	19.22	8.32	-1.86	9.61	15.79
80.0	793	0.535	36.5	19.37	9.10	-1.94	9.69	15.94
80.0	803	0.579	36.1	19.46	9.84	-2.00	9.73	16.05
80.0	819	0.625	35.7	19.67	10.63	-2.06	9.84	16.22
80.0	831	0.670	35.2	19.79	11.40	-2.13	9.89	16.34
80.0	844	0.715	34.8	19.93	12.15	-2.19	9.96	16.47
80.0	859	0.762	34.4	20.10	12.95	-2.24	10.05	16.61
80.0	868	0.806	34.0	20.13	13.70	-2.30	10.07	16.69
80.0	884	0.850	33.7	20.32	14.46	-2.35	10.16	16.83
80.0	899	0.897	33.5	20.47	15.25	-2.38	10.24	16.94
80.0	909	0.941	33.1	20.52	15.99	-2.43	10.26	17.01
80.0	940	1.032	32.5	20.83	17.54	-2.52	10.42	17.26
80.0	970	1.121	31.8	21.10	19.06	-2.62	10.55	17.49
80.0	995	1.211	31.1	21.24	20.58	-2.72	10.62	17.66

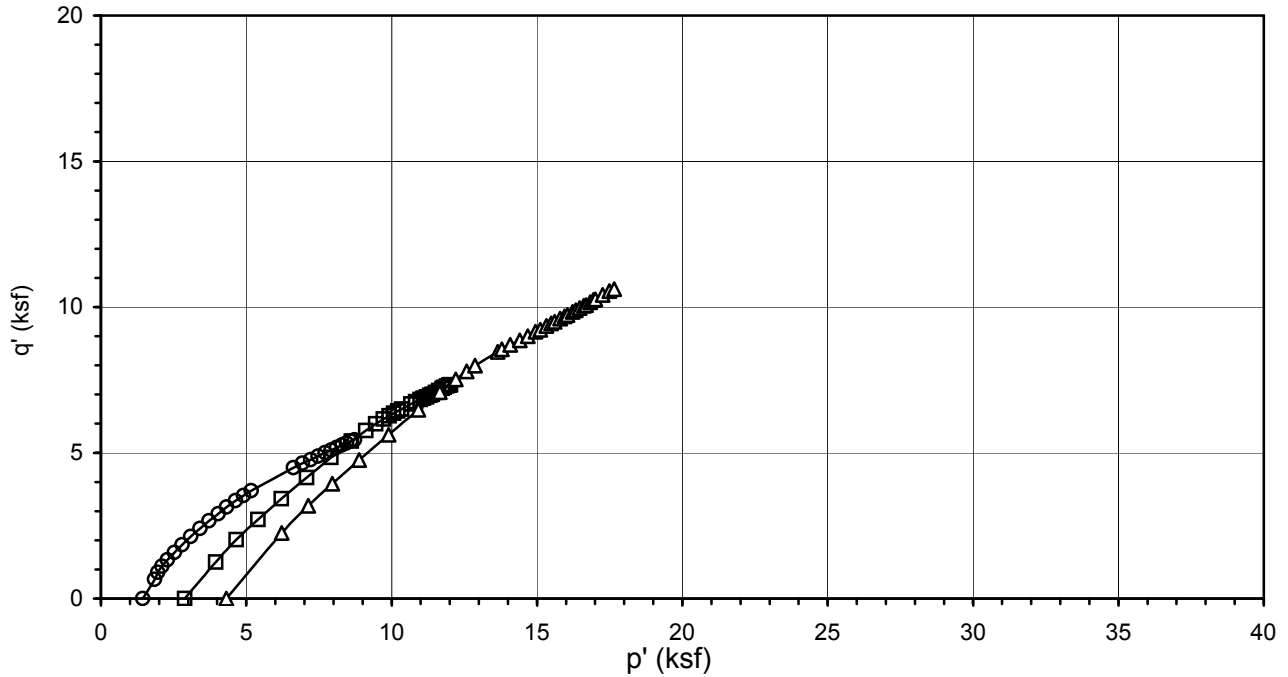


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi

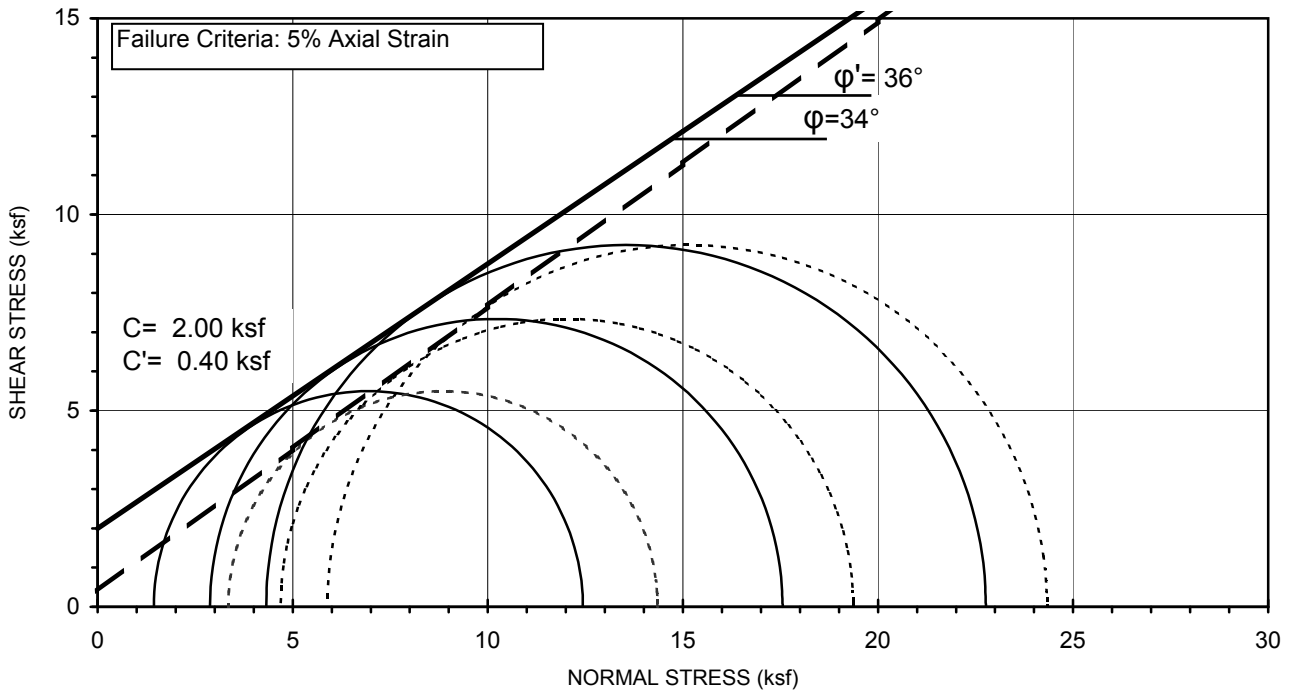


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dk Yell Brown Clayey Sand
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	122.5
Sample No.:	7	Avg. Initial Moisture Content (%):	8.7
Depth (ft):	25.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

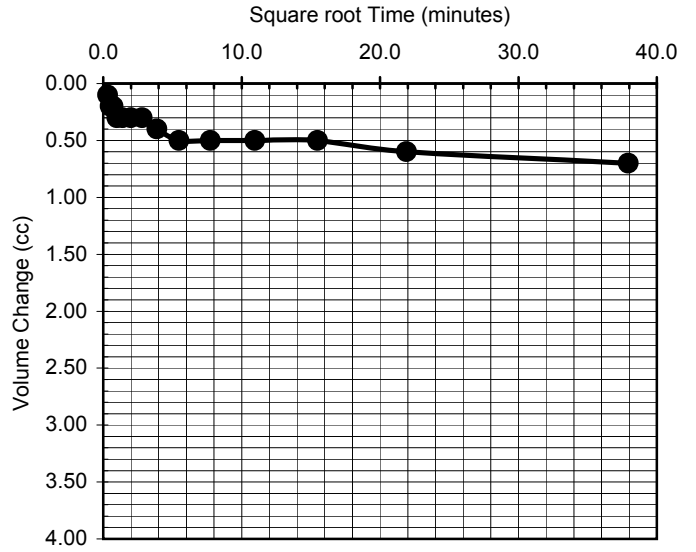
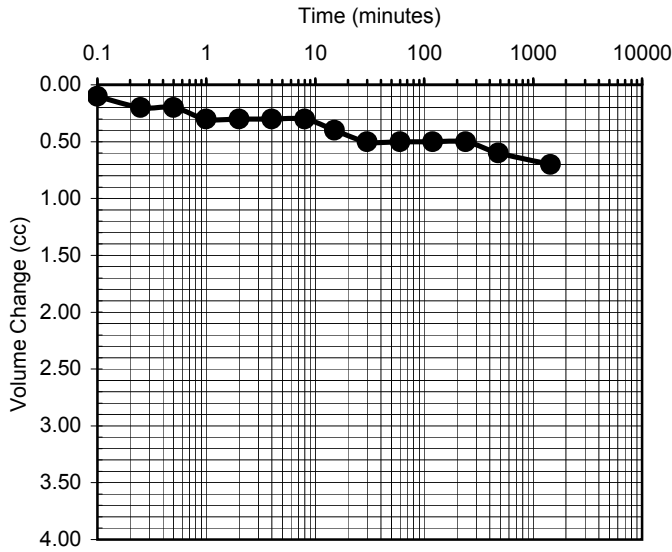


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dk Yell Brown Clayey Sand
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	122.5
Sample No.:	7	Avg. Initial Moisture Content (%):	8.7
Depth (ft):	25.5	Confining Pressure:	10.0, 20.0, 30.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-144	Sample Type:	Mod. Cal.
Sample No.:	7	Soil Description:	Dk Yell Brown Clayey Sand
Depth (feet):	25.5	Eff. Confining Pressure (psi):	20.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.1000
0.25	0.2000
0.5	0.2000
1	0.3000
2	0.3000
4	0.3000
8	0.3000
15	0.4000
30	0.5000
60	0.5000
120	0.5000
240	0.5000
480	0.6000
1440	0.7000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.1000
0.5000	0.2000
0.7071	0.2000
1.0000	0.3000
1.4142	0.3000
2.0000	0.3000
2.8284	0.3000
3.8730	0.4000
5.4772	0.5000
7.7460	0.5000
10.9545	0.5000
15.4919	0.5000
21.9089	0.6000
37.9473	0.7000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/26/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-27-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-02-11](#)
 Test Pit: [G-144](#) Reviewed by: [AP](#) Date: [08-02-11](#)
 Sample No.: [10](#) Sample Description: [Clayey Sand w/ gravel](#)
 Depth(ft): [35.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 15.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	5.975	5.975	5.975	Avg. =	5.975

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.379
Moisture Content (%)	8.44	11.69
Wet Weight (gms)	1186.48	1371.71
Dry Weight (gms)	1094.10	1243.76
Container Weight (gms)	0.00	149.66
Density and Saturation		
Wet Weight (gms)	1186.48	
Container Weight (gms)	0.00	
Wet Density (pcf)	140.9	
Dry Density (pcf)	129.9	
Initial Void Ratio	0.297	
% Saturation	76.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	65.4
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	61.9
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.926
Induced OCR =	1.0	Initial Volume (cu.in)=	32.090
Change in Ht. of Specimen (in) =	0.0489	Final Volume (cu.in) =	31.877

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.76
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	2.37
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.13
		Axial Strain (%) =	5.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-27-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-02-11
Test Pit:	G-144	Reviewed by:	AP	Date:	08-02-11
Sample No.:	10	Sample Description:	Clayey Sand w/ gravel		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.975</u>	<u>5.975</u>	<u>5.975</u>	Avg. =	5.975

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.326
Moisture Content (%)	8.44	11.69
Wet Weight (gms)	1186.48	1371.71
Dry Weight (gms)	1094.10	1243.76
Container Weight (gms)	0.00	149.66
Density and Saturation		
Wet Weight (gms)	1186.48	
Container Weight (gms)	0.00	
Wet Density (pcf)	140.9	
Dry Density (pcf)	129.9	
Initial Void Ratio	0.297	
% Saturation	76.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	62.0
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	57.6
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.975
Induced OCR=	1.0	Initial Volume (cu.in)=	32.090
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.822

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	23.07
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.01
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	28.08
		Axial Strain (%) =	5.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-27-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-02-11](#)
 Test Pit: [G-144](#) Reviewed by: [AP](#) Date: [08-02-11](#)
 Sample No.: [10](#) Sample Description: [Clayey Sand w/ gravel](#)
 Depth(ft): [35.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 45.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	5.975	5.975	5.975	Avg. =	5.975

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.343
Moisture Content (%)	8.44	11.69
Wet Weight (gms)	1186.48	1371.71
Dry Weight (gms)	1094.10	1243.76
Container Weight (gms)	0.00	149.66
Density and Saturation		
Wet Weight (gms)	1186.48	
Container Weight (gms)	0.00	
Wet Density (pcf)	140.9	
Dry Density (pcf)	129.9	
Initial Void Ratio	0.297	
% Saturation	76.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	95.0	Initial Burette Ht.(cm)=	57.6
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	54.9
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.975
Induced OCR =	1.0	Initial Volume (cu.in)=	32.090
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.925

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	34.89
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	7.56
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	42.44
		Axial Strain (%) =	4.89



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-144	Consolidation Pressure :	15.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.975 in
Sample No.:	10	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.926 in
Sample Description:	Clayey Sand w/ gravel	Final Sample Area (A)*:	5.379 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
65.0	0	0.000	50.2	0.00	0.00	0.00	0.00	2.16
65.0	48	0.005	52.6	1.28	0.08	0.35	0.64	2.45
65.0	69	0.011	55.0	1.84	0.18	0.70	0.92	2.38
65.0	84	0.018	56.5	2.24	0.31	0.91	1.12	2.37
65.0	98	0.025	57.3	2.61	0.42	1.04	1.31	2.43
65.0	112	0.032	57.9	2.98	0.54	1.11	1.49	2.54
65.0	126	0.039	58.2	3.35	0.65	1.15	1.68	2.68
65.0	140	0.045	58.3	3.72	0.76	1.17	1.86	2.85
65.0	154	0.053	58.4	4.09	0.89	1.18	2.04	3.02
65.0	168	0.060	58.3	4.45	1.01	1.18	2.23	3.21
65.0	182	0.066	58.2	4.82	1.12	1.16	2.41	3.41
65.0	196	0.073	58.1	5.18	1.23	1.14	2.59	3.61
65.0	209	0.080	57.9	5.52	1.35	1.11	2.76	3.81
65.0	221	0.087	57.7	5.83	1.47	1.08	2.91	3.99
65.0	233	0.095	57.4	6.14	1.60	1.05	3.07	4.18
65.0	309	0.146	55.3	8.07	2.47	0.74	4.03	5.45
65.0	324	0.160	54.6	8.44	2.70	0.64	4.22	5.74
65.0	341	0.174	54.0	8.86	2.93	0.55	4.43	6.04
65.0	357	0.188	53.4	9.25	3.16	0.46	4.63	6.33
65.0	369	0.201	52.7	9.54	3.39	0.37	4.77	6.56
65.0	384	0.215	52.3	9.91	3.63	0.30	4.95	6.81
65.0	399	0.230	51.7	10.27	3.88	0.22	5.13	7.08
65.0	414	0.245	51.0	10.62	4.14	0.13	5.31	7.35
65.0	428	0.260	50.4	10.96	4.39	0.04	5.48	7.60
65.0	441	0.274	49.9	11.26	4.63	-0.04	5.63	7.83
65.0	453	0.288	49.2	11.54	4.86	-0.13	5.77	8.06
65.0	463	0.302	48.7	11.76	5.10	-0.21	5.88	8.25



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-144	Consolidation Pressure :	30.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.975 in
Sample No.:	10	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.975 in
Sample Description:	Clayey Sand w/ gravel	Final Sample Area (A)*:	5.326 sq. in.
		Induced OCR=	1.0

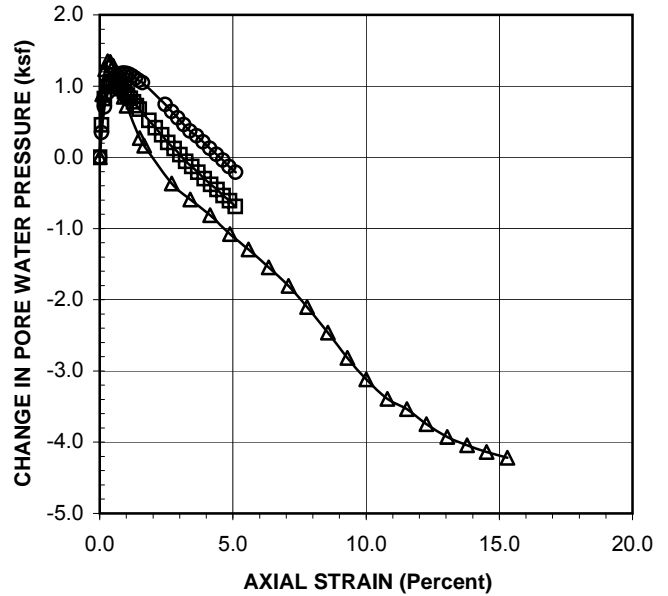
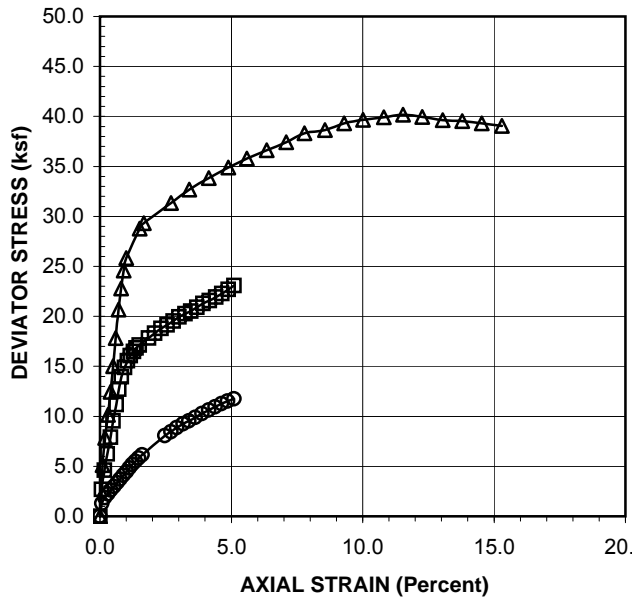
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	50.1	0.00	0.00	0.00	0.00	4.32
80.0	99	0.004	53.2	2.67	0.07	0.45	1.34	5.20
80.0	171	0.011	55.8	4.62	0.18	0.82	2.31	5.81
80.0	232	0.017	57.0	6.26	0.28	0.99	3.13	6.45
80.0	293	0.024	57.4	7.89	0.40	1.05	3.95	7.21
80.0	355	0.030	57.4	9.55	0.51	1.05	4.78	8.04
80.0	416	0.037	57.2	11.18	0.62	1.03	5.59	8.88
80.0	473	0.043	57.0	12.70	0.71	1.00	6.35	9.67
80.0	520	0.049	56.8	13.94	0.82	0.96	6.97	10.33
80.0	556	0.056	56.5	14.89	0.93	0.92	7.45	10.84
80.0	582	0.063	56.2	15.57	1.05	0.87	7.79	11.23
80.0	601	0.069	55.8	16.06	1.15	0.83	8.03	11.53
80.0	617	0.076	55.5	16.47	1.27	0.78	8.24	11.78
80.0	631	0.083	55.1	16.83	1.38	0.73	8.41	12.01
80.0	643	0.089	54.8	17.13	1.49	0.67	8.56	12.21
80.0	672	0.111	53.7	17.83	1.85	0.52	8.92	12.72
80.0	692	0.125	53.0	18.32	2.09	0.41	9.16	13.07
80.0	711	0.139	52.3	18.78	2.32	0.31	9.39	13.39
80.0	727	0.153	51.5	19.15	2.56	0.21	9.58	13.69
80.0	743	0.167	51.0	19.53	2.79	0.12	9.76	13.96
80.0	760	0.180	50.3	19.93	3.01	0.04	9.96	14.25
80.0	775	0.193	49.7	20.28	3.24	-0.06	10.14	14.52
80.0	786	0.207	49.2	20.52	3.46	-0.13	10.26	14.71
80.0	803	0.221	48.6	20.91	3.69	-0.21	10.46	14.99
80.0	820	0.235	48.0	21.30	3.93	-0.30	10.65	15.27
80.0	833	0.249	47.4	21.58	4.17	-0.38	10.79	15.49
80.0	848	0.263	46.9	21.92	4.41	-0.46	10.96	15.73
80.0	864	0.277	46.4	22.28	4.64	-0.54	11.14	16.00
80.0	882	0.292	45.9	22.68	4.88	-0.61	11.34	16.27
80.0	899	0.305	45.3	23.07	5.10	-0.69	11.53	16.54



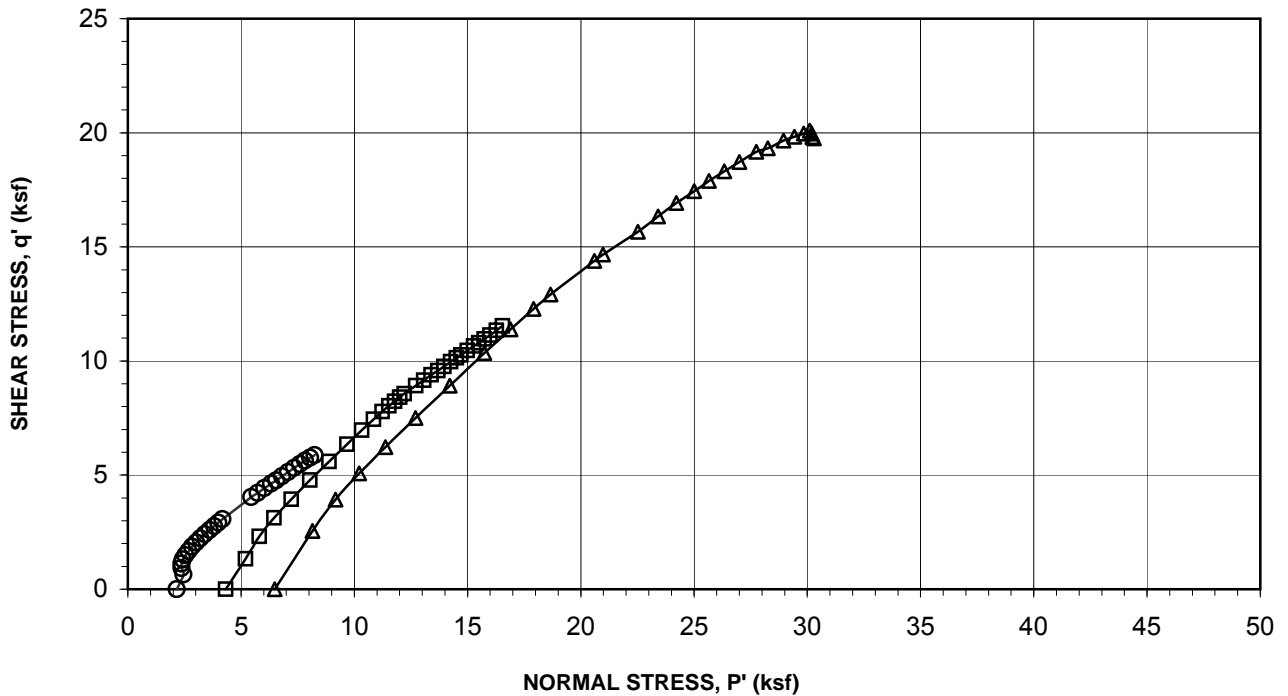
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	95.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-144	Consolidation Pressure :	45.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.975 in
Sample No.:	10	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.975 in
Sample Description:	Clayey Sand w/ gravel	Final Sample Area (A)*:	5.343 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
95.0	0	0.000	50.0	0.00	0.00	0.00	0.00	6.48
95.0	190	0.006	56.2	5.12	0.10	0.89	2.56	8.15
95.0	292	0.012	58.6	7.85	0.20	1.23	3.93	9.17
95.0	378	0.018	59.4	10.16	0.30	1.35	5.08	10.21
95.0	464	0.024	59.3	12.45	0.40	1.34	6.23	11.37
95.0	560	0.030	58.9	15.02	0.50	1.29	7.51	12.70
95.0	666	0.036	58.3	17.84	0.60	1.19	8.92	14.21
95.0	773	0.042	57.5	20.69	0.70	1.08	10.34	15.75
95.0	852	0.048	56.8	22.78	0.80	0.97	11.39	16.90
95.0	920	0.054	55.9	24.57	0.90	0.85	12.29	17.92
95.0	968	0.060	55.0	25.83	1.00	0.72	12.91	18.67
95.0	1084	0.090	51.9	28.77	1.51	0.27	14.39	20.59
95.0	1107	0.100	51.1	29.33	1.67	0.16	14.67	20.98
95.0	1195	0.162	47.4	31.34	2.70	-0.37	15.67	22.52
95.0	1255	0.203	45.9	32.67	3.40	-0.59	16.34	23.41
95.0	1310	0.248	44.4	33.84	4.14	-0.81	16.92	24.21
95.0	1361	0.292	42.5	34.89	4.89	-1.08	17.44	25.00
95.0	1406	0.334	41.0	35.78	5.58	-1.29	17.89	25.66
95.0	1451	0.379	39.3	36.62	6.35	-1.54	18.31	26.33
95.0	1495	0.423	37.5	37.44	7.09	-1.81	18.72	27.01
95.0	1542	0.465	35.4	38.32	7.79	-2.10	19.16	27.74
95.0	1568	0.512	32.9	38.64	8.56	-2.46	19.32	28.26
95.0	1608	0.556	30.4	39.31	9.30	-2.82	19.65	28.95
95.0	1635	0.598	28.4	39.65	10.01	-3.12	19.83	29.42
95.0	1661	0.645	26.4	39.93	10.80	-3.39	19.96	29.84
95.0	1685	0.689	25.5	40.17	11.53	-3.53	20.09	30.10
95.0	1689	0.733	24.0	39.94	12.27	-3.75	19.97	30.20
95.0	1691	0.780	22.8	39.63	13.05	-3.92	19.81	30.22
95.0	1701	0.824	21.9	39.52	13.79	-4.04	19.76	30.29
95.0	1707	0.868	21.3	39.32	14.53	-4.14	19.66	30.28
95.0	1711	0.914	20.7	39.06	15.30	-4.22	19.53	30.23

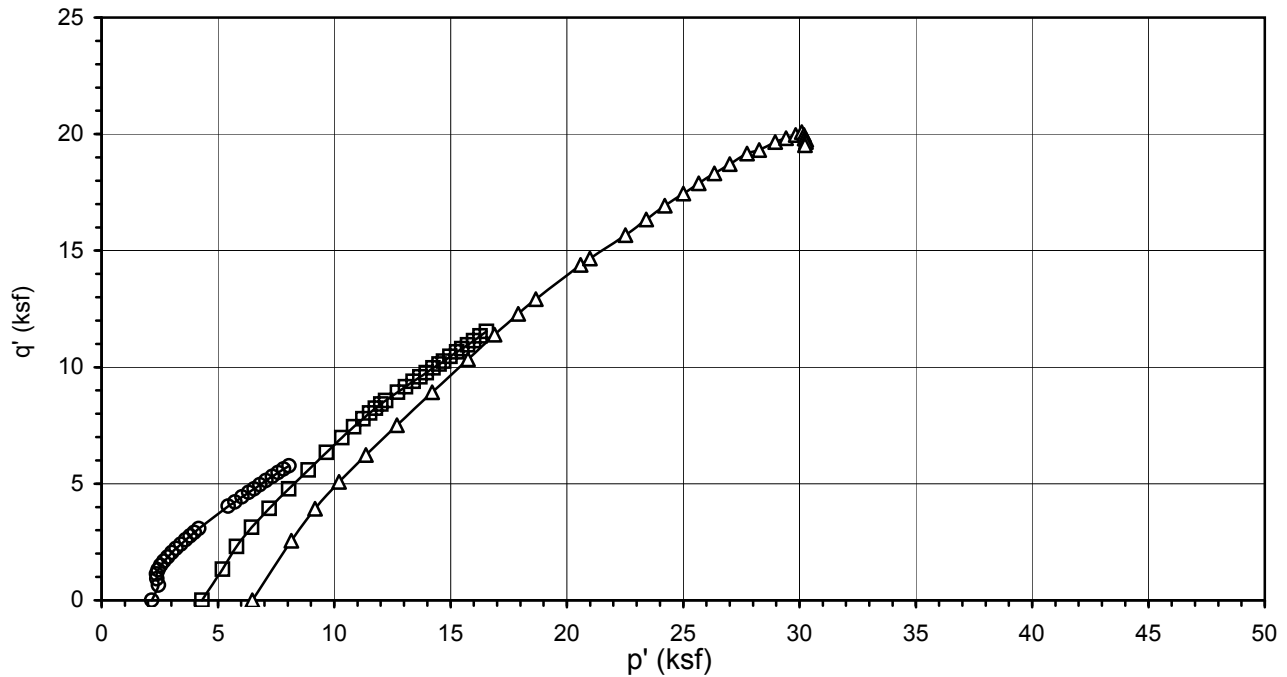


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi

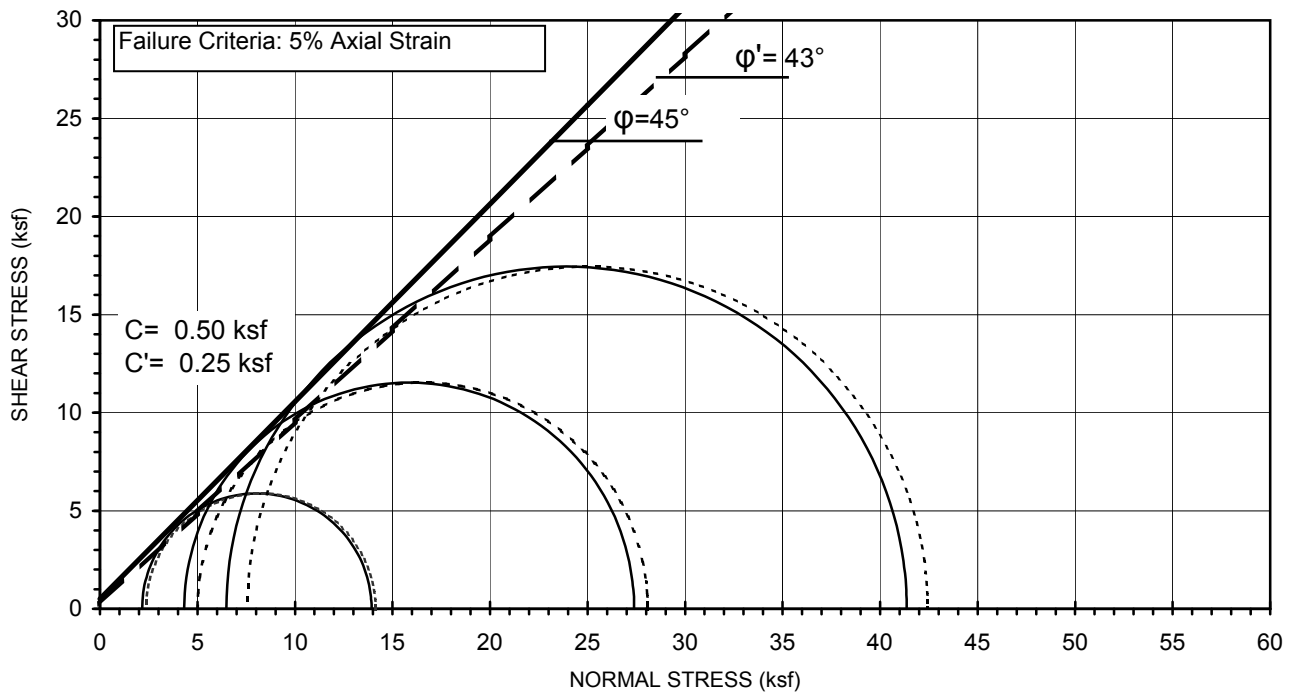


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Sand w/ gravel
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	129.9
Sample No.:	10	Avg. Initial Moisture Content (%):	8.4
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

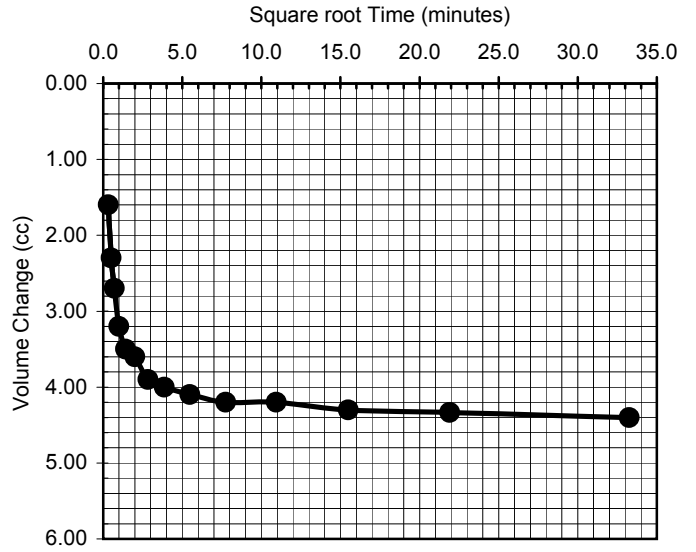
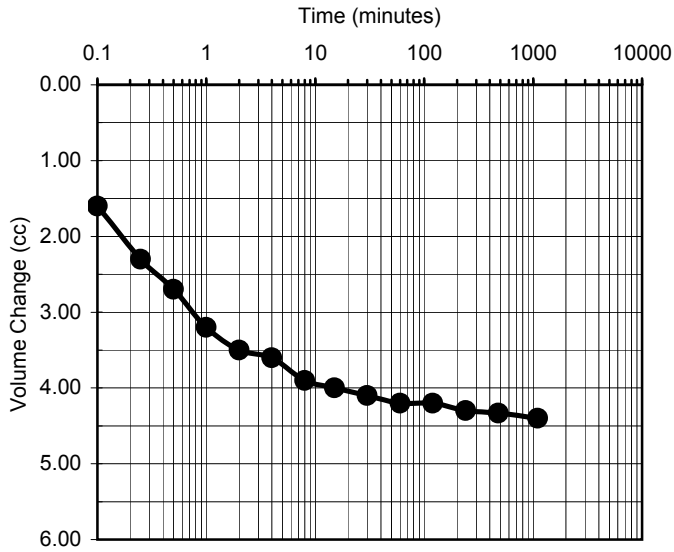


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Sand w/ gravel
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	129.9
Sample No.:	10	Avg. Initial Moisture Content (%):	8.4
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-144	Sample Type:	Mod. Cal.
Sample No.:	10	Soil Description:	Clayey Sand w/ gravel
Depth (feet):	35.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.6000
0.25	2.3000
0.5	2.7000
1	3.2000
2	3.5000
4	3.6000
8	3.9000
15	4.0000
30	4.1000
60	4.2000
120	4.2000
240	4.3000
480	4.3333
1106	4.4000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.6000
0.5000	2.3000
0.7071	2.7000
1.0000	3.2000
1.4142	3.5000
2.0000	3.6000
2.8284	3.9000
3.8730	4.0000
5.4772	4.1000
7.7460	4.2000
10.9545	4.2000
15.4919	4.3000
21.9089	4.3333
33.2566	4.4000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/27/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-27-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-02-11**
 Test Pit: **G-144** Reviewed by: **AP** Date: **08-02-11**
 Sample No.: **16** Sample Description: **Dk Yell Brown Lean Clay**
 Depth(ft): **55.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **20.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.872</u>	<u>5.872</u>	<u>5.872</u>	Avg. =	5.872

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.329
Moisture Content (%)	19.79	18.81
Wet Weight (gms)	1088.11	1228.27
Dry Weight (gms)	908.37	1057.37
Container Weight (gms)	0.00	149.00
Density and Saturation		
Wet Weight (gms)	1088.11	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.4	
Dry Density (pcf)	109.7	
Initial Void Ratio	0.535	
% Saturation	99.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	69.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	59.1
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.803
Induced OCR =	1.0	Initial Volume (cu.in)=	31.537
Change in Ht. of Specimen (in) =	0.0694	Final Volume (cu.in) =	30.921

Shear		At Failure	
Rate of Deformation (in/min)=	0.003	Deviator Stress (ksf) =	4.93
Time to 50% primary Consolidation (min) =	7	Eff. Minor Principal stress (ksf) =	1.07
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.00
		Axial Strain (%) =	5.06



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-27-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-02-11**
 Test Pit: **G-144** Reviewed by: **AP** Date: **08-02-11**
 Sample No.: **16** Sample Description: **Dk Yell Brown Lean Clay**
 Depth(ft): **55.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 35.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.872</u>	<u>5.872</u>	<u>5.872</u>	Avg. =	5.872

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.645
Moisture Content (%)	19.79	18.81
Wet Weight (gms)	1088.11	1228.27
Dry Weight (gms)	908.37	1057.37
Container Weight (gms)	0.00	149.00
Density and Saturation		
Wet Weight (gms)	1088.11	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.4	
Dry Density (pcf)	109.7	
Initial Void Ratio	0.535	
% Saturation	99.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	59.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	85.2
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	5.869
Induced OCR=	1.0	Initial Volume (cu.in)=	31.537
Change in Ht. of Specimen (in) =	0.0032	Final Volume (cu.in) =	33.129

Shear		At Failure	
Rate of Deformation (in/min)=	0.003	Deviator Stress (ksf) =	8.25
Time to 50% primary Consolidation =	7	Eff. Minor Principal stress (ksf) =	2.50
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	10.75
		Axial Strain (%) =	5.18



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-27-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-02-11
Test Pit:	G-144	Reviewed by:	AP	Date:	08-02-11
Sample No.:	16	Sample Description:	Dk Yell Brown Lean Clay		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	50.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.872</u>	<u>5.872</u>	<u>5.872</u>	Avg. =	5.872

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.300
Moisture Content (%)	19.79	18.81
Wet Weight (gms)	1088.11	1228.27
Dry Weight (gms)	908.37	1057.37
Container Weight (gms)	0.00	149.00
Density and Saturation		
Wet Weight (gms)	1088.11	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.4	
Dry Density (pcf)	109.7	
Initial Void Ratio	0.535	
% Saturation	99.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	49.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	43.0
Eff. Consol. Stress (psi) =	50.0	Final Height (in)=	5.872
Induced OCR =	1.0	Initial Volume (cu.in)=	31.537
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.122

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.003	Deviator Stress (ksf) =	11.73
Time to 50% primary Consolidation =	7	Eff. Minor Principal stress (ksf) =	4.22
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	15.95
		Axial Strain (%) =	5.39



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-144	Consolidation Pressure :	20.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.872 in
Sample No.:	16	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.803 in
Sample Description:	Dk Yell Brown Lean Clay	Final Sample Area (A)*:	5.329 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
50.0	0	-0.001	30.1	0.00	-0.01	0.00	0.00	2.88
50.0	46	0.005	32.4	1.24	0.08	0.33	0.62	3.17
50.0	62	0.012	34.1	1.67	0.21	0.58	0.84	3.13
50.0	72	0.019	35.5	1.95	0.32	0.77	0.98	3.08
50.0	81	0.025	36.5	2.17	0.44	0.92	1.08	3.04
50.0	86	0.033	37.3	2.32	0.57	1.04	1.16	3.00
50.0	92	0.041	38.0	2.47	0.70	1.14	1.23	2.97
50.0	97	0.047	38.6	2.59	0.82	1.22	1.29	2.95
50.0	101	0.055	39.0	2.71	0.95	1.29	1.35	2.94
50.0	105	0.062	39.5	2.80	1.07	1.35	1.40	2.93
50.0	108	0.069	39.8	2.89	1.19	1.40	1.44	2.93
50.0	112	0.075	40.1	2.98	1.30	1.44	1.49	2.93
50.0	115	0.083	40.4	3.06	1.42	1.48	1.53	2.93
50.0	118	0.090	40.6	3.15	1.54	1.51	1.58	2.94
50.0	121	0.097	40.8	3.21	1.67	1.55	1.60	2.94
50.0	140	0.148	41.9	3.69	2.55	1.70	1.85	3.02
50.0	146	0.162	42.1	3.84	2.80	1.73	1.92	3.07
50.0	151	0.177	42.3	3.95	3.05	1.76	1.97	3.10
50.0	155	0.191	42.4	4.06	3.30	1.77	2.03	3.14
50.0	161	0.206	42.5	4.20	3.55	1.79	2.10	3.19
50.0	167	0.220	42.6	4.34	3.79	1.80	2.17	3.25
50.0	173	0.235	42.6	4.47	4.05	1.80	2.24	3.31
50.0	177	0.250	42.6	4.58	4.31	1.81	2.29	3.36
50.0	183	0.265	42.6	4.72	4.56	1.80	2.36	3.43
50.0	187	0.279	42.7	4.82	4.81	1.81	2.41	3.48
50.0	192	0.294	42.7	4.93	5.06	1.81	2.46	3.53
	106							
	108							
	110							
	113							
	114							
	116.15							
	118.45							
	120.75							



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-144	Consolidation Pressure :	35.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.872 in
Sample No.:	16	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.869 in
Sample Description:	Dk Yell Brown Lean Clay	Final Sample Area (A)*:	5.645 sq. in.
		Induced OCR=	1.0

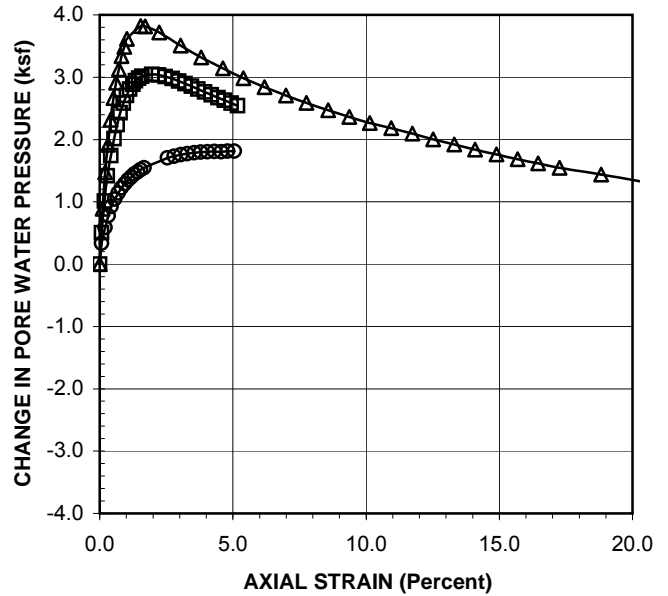
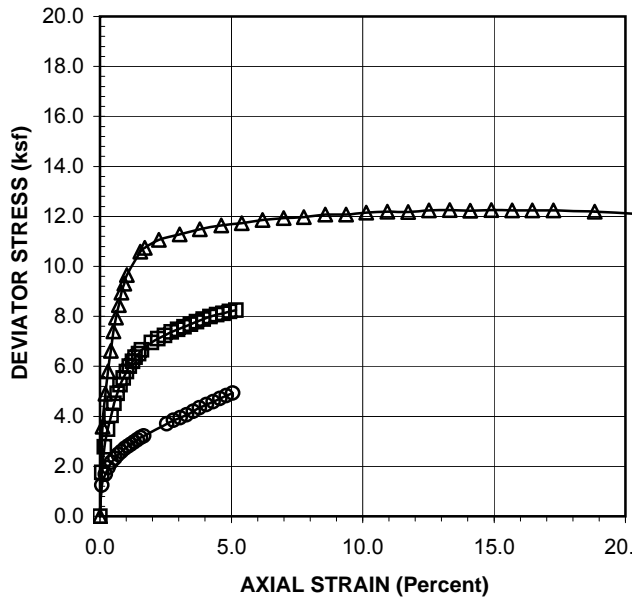
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	30.1	0.00	0.00	0.00	0.00	5.04
65.0	69	0.004	33.5	1.76	0.07	0.50	0.88	5.42
65.0	109	0.010	37.1	2.78	0.18	1.01	1.39	5.42
65.0	137	0.017	39.9	3.48	0.29	1.42	1.74	5.37
65.0	159	0.025	42.1	4.04	0.42	1.74	2.02	5.32
65.0	178	0.032	44.0	4.52	0.54	2.01	2.26	5.28
65.0	194	0.039	45.6	4.92	0.66	2.24	2.46	5.26
65.0	208	0.045	46.9	5.27	0.77	2.43	2.63	5.25
65.0	219	0.052	48.0	5.54	0.89	2.58	2.77	5.23
65.0	229	0.059	48.8	5.78	1.01	2.70	2.89	5.23
65.0	238	0.066	49.6	6.00	1.12	2.81	3.00	5.23
65.0	246	0.073	50.1	6.20	1.24	2.88	3.10	5.25
65.0	253	0.079	50.5	6.37	1.34	2.94	3.18	5.28
65.0	259	0.086	50.8	6.51	1.47	2.99	3.25	5.31
65.0	265	0.093	51.0	6.65	1.58	3.02	3.33	5.35
65.0	278	0.115	51.2	6.95	1.96	3.05	3.48	5.47
65.0	285	0.130	51.1	7.11	2.21	3.03	3.55	5.56
65.0	291	0.145	50.9	7.24	2.46	3.01	3.62	5.65
65.0	297	0.160	50.7	7.37	2.72	2.98	3.69	5.75
65.0	302	0.174	50.5	7.48	2.96	2.94	3.74	5.84
65.0	307	0.188	50.2	7.58	3.20	2.90	3.79	5.93
65.0	312	0.202	49.9	7.68	3.45	2.85	3.84	6.03
65.0	317	0.216	49.6	7.79	3.68	2.81	3.89	6.12
65.0	322	0.231	49.2	7.89	3.94	2.76	3.95	6.22
65.0	327	0.246	48.9	7.99	4.19	2.72	4.00	6.32
65.0	331	0.261	48.6	8.07	4.44	2.67	4.03	6.40
65.0	334	0.275	48.3	8.12	4.69	2.63	4.06	6.47
65.0	338	0.290	48.0	8.20	4.93	2.58	4.10	6.55
65.0	341	0.304	47.7	8.25	5.18	2.54	4.12	6.62



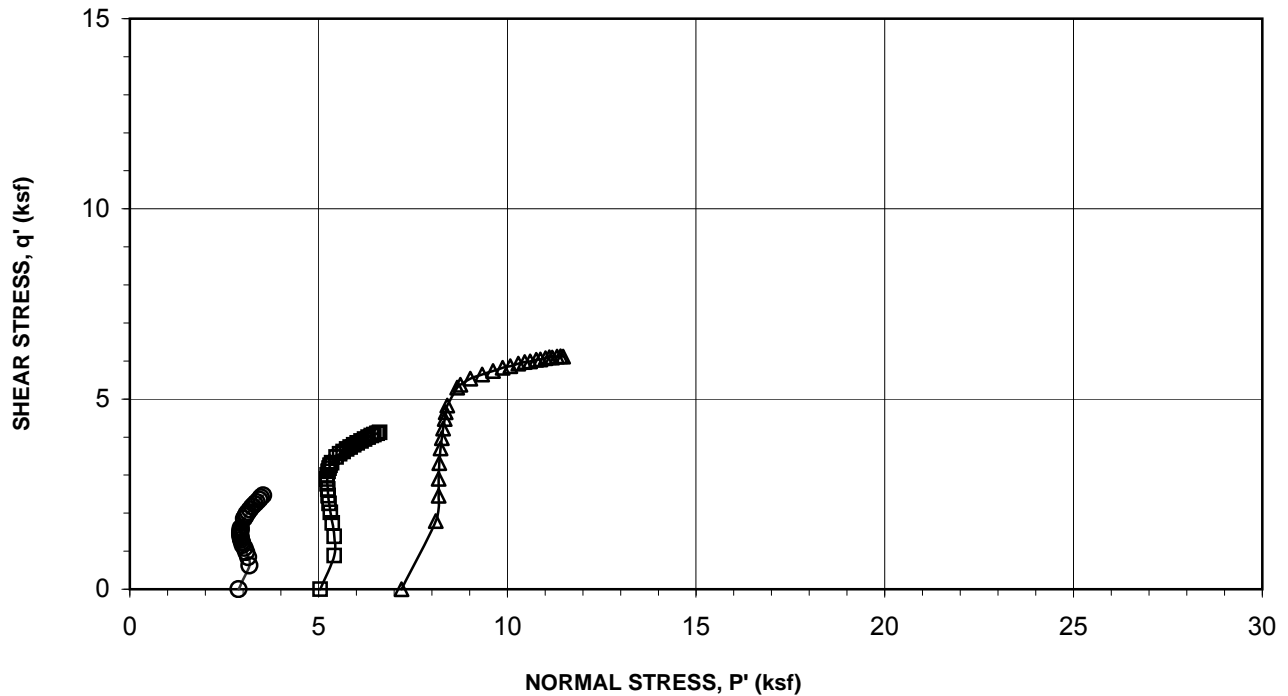
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-144	Consolidation Pressure :	50.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.872 in
Sample No.:	16	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.872 in
Sample Description:	Dk Yell Brown Lean Clay	Final Sample Area (A)*:	5.300 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
80.0	0	0.000	30.0	0.00	0.00	0.00	0.00	7.20
80.0	132	0.006	36.2	3.59	0.10	0.89	1.80	8.11
80.0	181	0.012	40.3	4.90	0.20	1.48	2.45	8.18
80.0	214	0.018	43.3	5.80	0.31	1.92	2.90	8.18
80.0	245	0.024	46.1	6.62	0.41	2.32	3.31	8.20
80.0	274	0.030	48.5	7.40	0.51	2.67	3.70	8.23
80.0	294	0.036	50.2	7.95	0.61	2.91	3.97	8.26
80.0	313	0.042	51.7	8.45	0.72	3.13	4.22	8.30
80.0	332	0.048	53.2	8.95	0.82	3.34	4.47	8.34
80.0	346	0.054	54.2	9.30	0.92	3.48	4.65	8.37
80.0	359	0.060	55.1	9.66	1.02	3.62	4.83	8.41
80.0	396	0.090	56.5	10.59	1.53	3.82	5.30	8.68
80.0	402	0.100	56.5	10.74	1.70	3.81	5.37	8.76
80.0	417	0.131	55.8	11.07	2.24	3.72	5.53	9.02
80.0	428	0.178	54.4	11.29	3.03	3.51	5.64	9.33
80.0	439	0.223	53.1	11.48	3.80	3.32	5.74	9.62
80.0	449	0.271	51.8	11.64	4.62	3.14	5.82	9.88
80.0	456	0.317	50.7	11.73	5.39	2.98	5.86	10.08
80.0	465	0.363	49.7	11.86	6.18	2.84	5.93	10.29
80.0	473	0.411	48.8	11.94	6.99	2.71	5.97	10.46
80.0	478	0.456	48.0	11.98	7.76	2.59	5.99	10.60
80.0	486	0.504	47.2	12.07	8.58	2.47	6.04	10.76
80.0	491	0.550	46.4	12.08	9.36	2.36	6.04	10.87
80.0	498	0.595	45.7	12.15	10.14	2.27	6.08	11.01
80.0	504	0.642	45.2	12.20	10.94	2.18	6.10	11.11
80.0	508	0.689	44.5	12.17	11.73	2.09	6.09	11.19
80.0	515	0.735	43.9	12.24	12.52	2.00	6.12	11.32
80.0	520	0.782	43.3	12.25	13.31	1.92	6.13	11.41
80.0	524	0.827	42.8	12.23	14.09	1.84	6.11	11.48
80.0	530	0.874	42.2	12.26	14.89	1.76	6.13	11.57
80.0	535	0.921	41.7	12.25	15.69	1.69	6.12	11.64
80.0	539	0.966	41.2	12.24	16.46	1.62	6.12	11.70
80.0	545	1.013	40.7	12.24	17.26	1.55	6.12	11.78
80.0	553	1.105	40.0	12.19	18.82	1.44	6.09	11.85
80.0	560	1.199	39.2	12.10	20.41	1.32	6.05	11.93

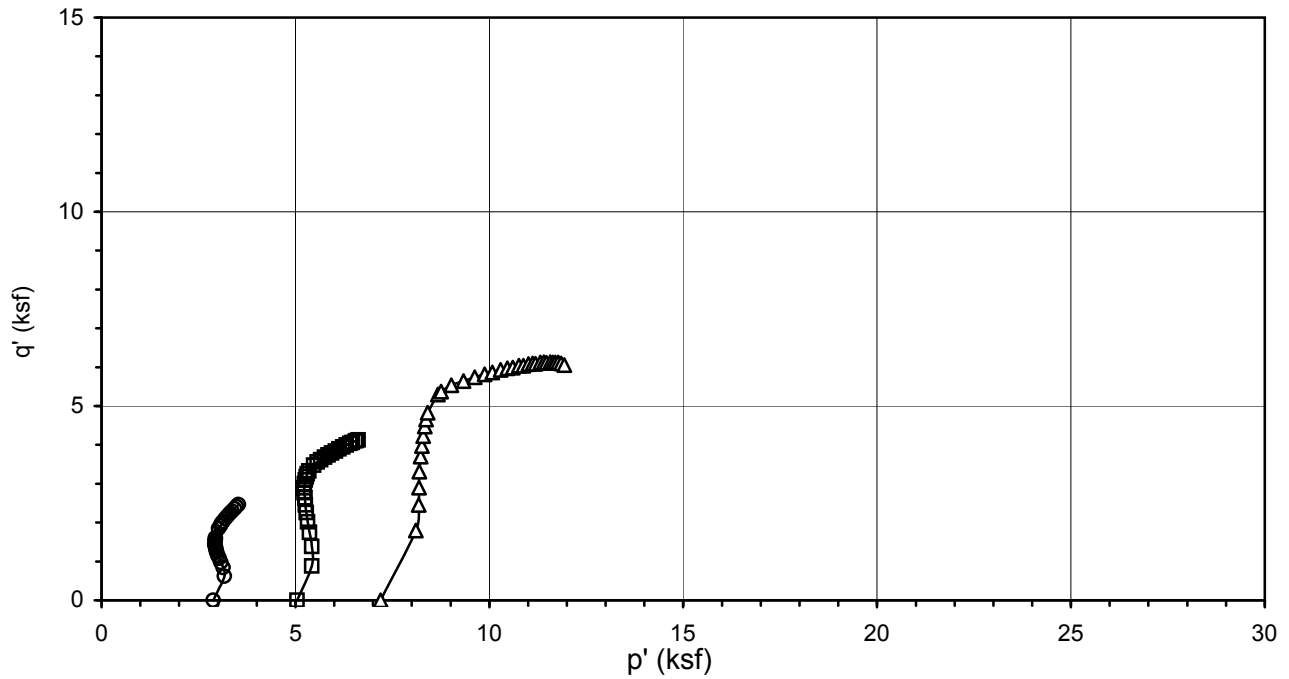


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi

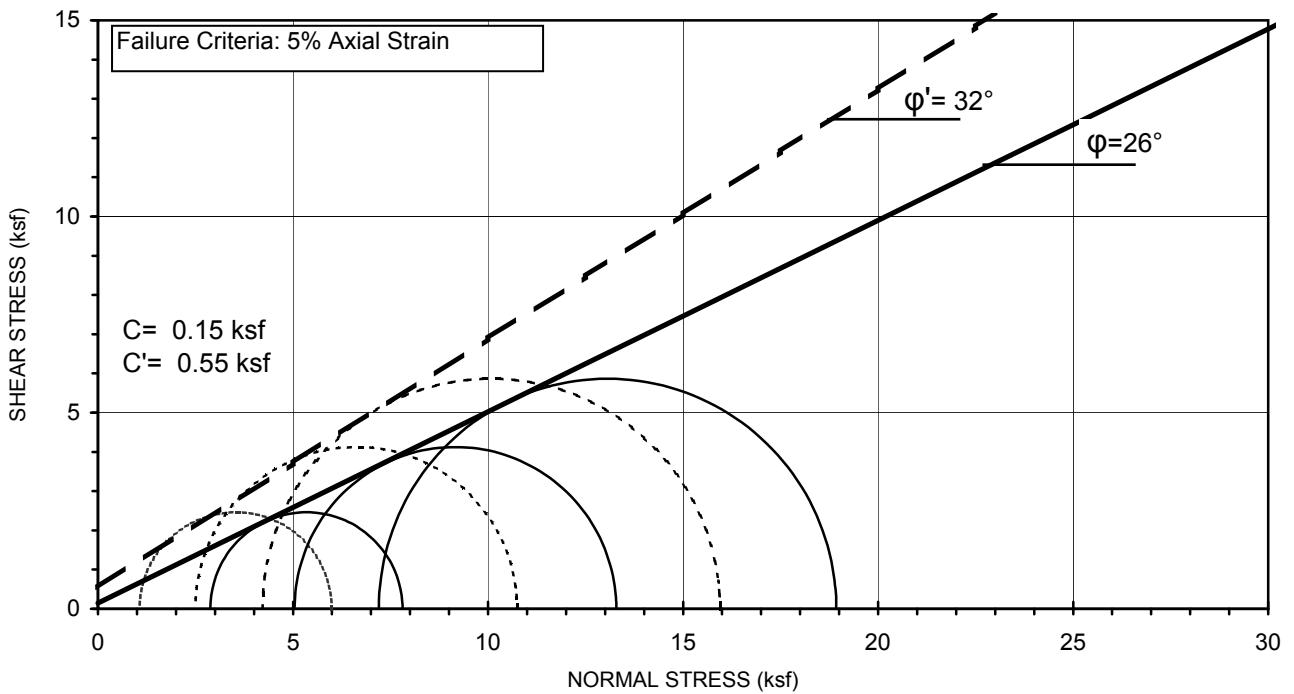


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dk Yell Brown Lean Clay
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	109.7
Sample No.:	16	Avg. Initial Moisture Content (%):	19.8
Depth (ft):	55.5	Confining Pressure:	20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

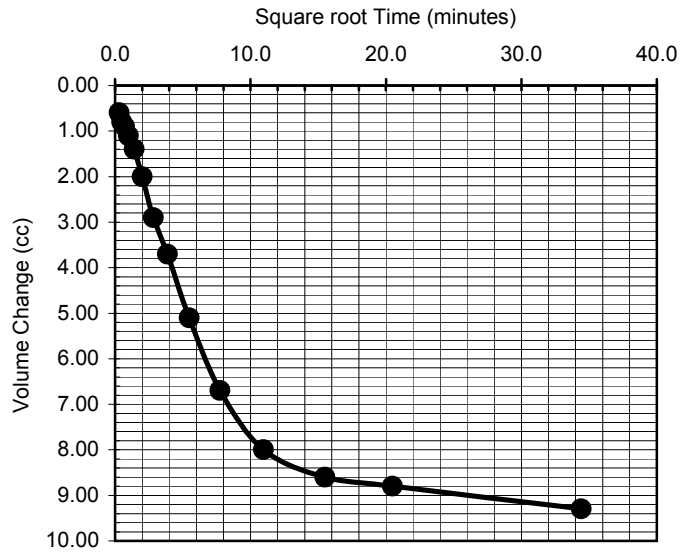
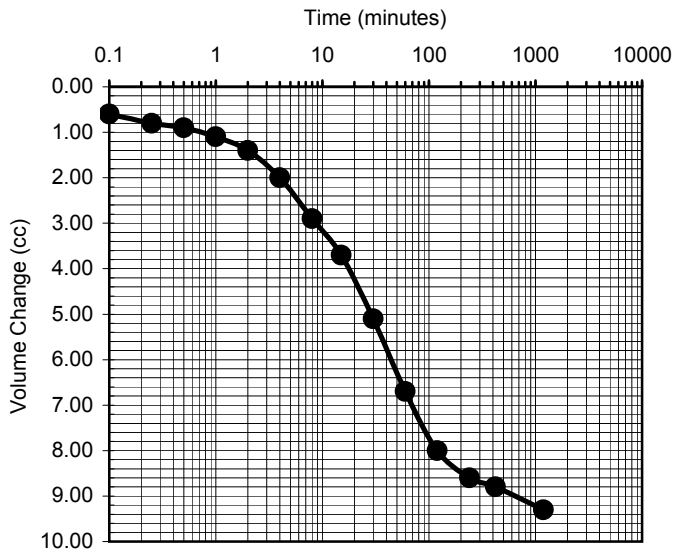


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dk Yell Brown Lean Clay
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	109.7
Sample No.:	16	Avg. Initial Moisture Content (%):	19.8
Depth (ft):	55.5	Confining Pressure:	20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-144	Sample Type:	Mod. Cal.
Sample No.:	16	Soil Description:	Dk Yell Brown Lean Clay
Depth (feet):	55.5	Eff. Confining Pressure (psi):	35.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.6000
0.25	0.8000
0.5	0.9000
1	1.1000
2	1.4000
4	2.0000
8	2.9000
15	3.7000
30	5.1000
60	6.7000
120	8.0000
240	8.6000
420	8.8000
1185	9.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.6000
0.5000	0.8000
0.7071	0.9000
1.0000	1.1000
1.4142	1.4000
2.0000	2.0000
2.8284	2.9000
3.8730	3.7000
5.4772	5.1000
7.7460	6.7000
10.9545	8.0000
15.4919	8.6000
20.4939	8.8000
34.4238	9.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/27/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-27-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-02-11](#)
 Test Pit: [G-144](#) Reviewed by: [AP](#) Date: [08-02-11](#)
 Sample No.: [22](#) Sample Description: [Brown Lean Clay w/ sand](#)
 Depth(ft): [75.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 30.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	4.667	4.667	4.667	Avg. =	4.667

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.328
Moisture Content (%)	16.66	17.98
Wet Weight (gms)	268.26	1002.39
Dry Weight (gms)	255.75	872.39
Container Weight (gms)	180.64	149.35
Density and Saturation		
Wet Weight (gms)	862.13	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.0	
Dry Density (pcf)	112.3	
Initial Void Ratio	0.500	
% Saturation	89.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	75.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	68.7
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	4.628
Induced OCR =	1.0	Initial Volume (cu.in)=	25.065
Change in Ht. of Specimen (in) =	0.0393	Final Volume (cu.in) =	24.656

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	8.54
Time to 50% primary Consolidation (min) =	6	Eff. Minor Principal stress (ksf) =	1.78
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	10.32
		Axial Strain (%) =	4.95



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-27-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-02-11**
 Test Pit: **G-144** Reviewed by: **AP** Date: **08-02-11**
 Sample No.: **22** Sample Description: **Brown Lean Clay w/ sand**
 Depth(ft): **75.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 45.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.667</u>	<u>4.667</u>	<u>4.667</u>	Avg. =	4.667

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.300
Moisture Content (%)	16.66	17.98
Wet Weight (gms)	<u>268.26</u>	<u>1002.39</u>
Dry Weight (gms)	<u>255.75</u>	<u>872.39</u>
Container Weight (gms)	<u>180.64</u>	<u>149.35</u>
Density and Saturation		
Wet Weight (gms)	<u>862.13</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	131.0	
Dry Density (pcf)	112.3	
Initial Void Ratio	0.500	
% Saturation	89.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>75.0</u>	Initial Burette Ht.(cm)=	<u>68.8</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>63.3</u>
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	<u>4.666</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>25.065</u>
Change in Ht. of Specimen (in) =	0.0009	Final Volume (cu.in) =	<u>24.730</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	12.50
Time to 50% primary Consolidation =	6	Eff. Minor Principal stress (ksf) =	3.50
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	16.01
		Axial Strain (%) =	4.71



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-27-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-02-11**
 Test Pit: **G-144** Reviewed by: **AP** Date: **08-02-11**
 Sample No.: **22** Sample Description: **Brown Lean Clay w/ sand**
 Depth(ft): **75.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 60.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.667</u>	<u>4.667</u>	<u>4.667</u>	Avg. =	4.667

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.335
Moisture Content (%)	16.66	17.98
Wet Weight (gms)	268.26	1002.39
Dry Weight (gms)	255.75	872.39
Container Weight (gms)	180.64	149.35
Density and Saturation		
Wet Weight (gms)	862.13	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.0	
Dry Density (pcf)	112.3	
Initial Void Ratio	0.500	
% Saturation	89.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	66.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	63.4
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	4.664
Induced OCR =	1.0	Initial Volume (cu.in)=	25.065
Change in Ht. of Specimen (in) =	0.0033	Final Volume (cu.in) =	24.882

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	16.00
Time to 50% primary Consolidation =	6	Eff. Minor Principal stress (ksf) =	5.44
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	21.44
		Axial Strain (%) =	4.72



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-144	Consolidation Pressure :	30.0 psi
Depth(ft):	75.5	Initial Sample Height:	4.667 in
Sample No.:	22	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.628 in
Sample Description:	Brown Lean Clay w/ sand	Final Sample Area (A)*:	5.328 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	30.1	0.00	0.00	0.00	0.00	4.32
60.0	73	0.005	34.9	1.96	0.11	0.69	0.98	4.61
60.0	106	0.011	38.0	2.86	0.25	1.13	1.43	4.62
60.0	128	0.018	40.1	3.43	0.39	1.44	1.72	4.59
60.0	144	0.026	41.7	3.86	0.55	1.67	1.93	4.58
60.0	158	0.033	42.9	4.23	0.72	1.85	2.11	4.58
60.0	168	0.040	43.9	4.49	0.87	1.98	2.24	4.58
60.0	178	0.047	44.6	4.75	1.02	2.09	2.37	4.60
60.0	186	0.054	45.2	4.97	1.17	2.18	2.49	4.63
60.0	194	0.062	45.7	5.17	1.33	2.25	2.58	4.65
60.0	201	0.069	46.2	5.36	1.49	2.31	2.68	4.69
60.0	209	0.076	46.5	5.55	1.64	2.36	2.77	4.73
60.0	215	0.083	46.8	5.71	1.80	2.41	2.85	4.77
60.0	221	0.090	47.1	5.86	1.95	2.44	2.93	4.81
60.0	228	0.098	47.3	6.02	2.11	2.47	3.01	4.86
60.0	234	0.105	47.4	6.17	2.27	2.50	3.09	4.91
60.0	240	0.113	47.6	6.33	2.44	2.52	3.16	4.97
60.0	246	0.120	47.7	6.48	2.59	2.54	3.24	5.03
60.0	251	0.127	47.8	6.60	2.75	2.55	3.30	5.07
60.0	258	0.134	47.9	6.76	2.90	2.56	3.38	5.14
60.0	264	0.142	48.0	6.91	3.07	2.57	3.45	5.20
60.0	270	0.149	48.0	7.06	3.23	2.58	3.53	5.27
60.0	275	0.156	48.0	7.18	3.38	2.58	3.59	5.33
60.0	281	0.164	48.1	7.33	3.54	2.59	3.67	5.40
60.0	286	0.171	48.1	7.45	3.70	2.59	3.73	5.46
60.0	293	0.178	48.1	7.60	3.85	2.59	3.80	5.53
60.0	299	0.185	48.1	7.75	4.01	2.59	3.88	5.61
60.0	304	0.193	48.0	7.87	4.16	2.58	3.93	5.67
60.0	309	0.200	48.0	7.98	4.32	2.58	3.99	5.73
60.0	315	0.207	48.0	8.13	4.46	2.57	4.07	5.81
60.0	321	0.214	47.9	8.28	4.62	2.56	4.14	5.90
60.0	326.25	0.221	47.8	8.40	4.78	2.55	4.20	5.96
60.0	332.5	0.229	47.8	8.54	4.95	2.54	4.27	6.05
	131.25							



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-144	Consolidation Pressure :	45.0 psi
Depth(ft):	75.5	Initial Sample Height:	4.667 in
Sample No.:	22	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.666 in
Sample Description:	Brown Lean Clay w/ sand	Final Sample Area (A)*:	5.300 sq. in.
		Induced OCR=	1.0

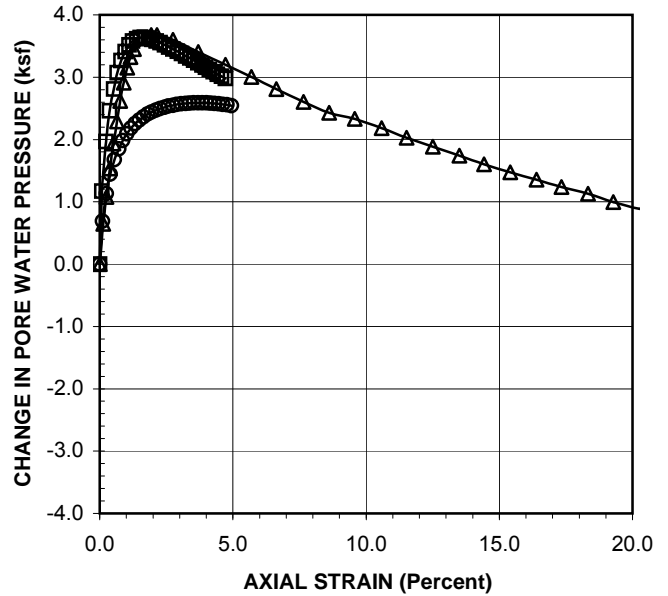
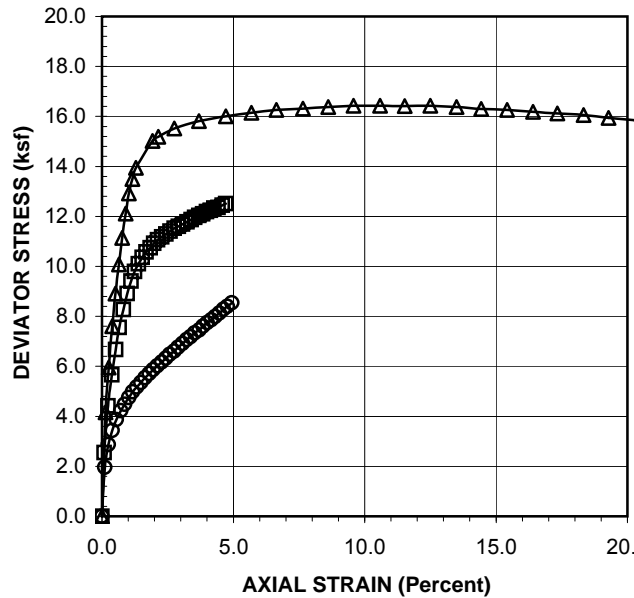
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.1	0.00	0.00	0.00	0.00	6.48
75.0	94	0.004	38.2	2.55	0.09	1.17	1.28	6.59
75.0	163	0.011	43.7	4.42	0.24	1.97	2.21	6.72
75.0	209	0.018	47.2	5.66	0.38	2.46	2.83	6.85
75.0	247	0.025	49.6	6.68	0.53	2.81	3.34	7.01
75.0	280	0.031	51.4	7.56	0.66	3.07	3.78	7.19
75.0	307	0.038	52.7	8.27	0.81	3.26	4.14	7.35
75.0	331	0.045	53.8	8.91	0.96	3.41	4.45	7.52
75.0	350	0.052	54.5	9.40	1.10	3.52	4.70	7.67
75.0	365	0.058	54.9	9.79	1.24	3.58	4.90	7.80
75.0	377	0.065	55.2	10.10	1.39	3.62	5.05	7.91
75.0	387	0.071	55.3	10.35	1.53	3.63	5.18	8.02
75.0	396	0.078	55.3	10.58	1.68	3.63	5.29	8.14
75.0	403	0.086	55.2	10.75	1.83	3.63	5.37	8.23
75.0	410	0.092	55.1	10.92	1.98	3.61	5.46	8.33
75.0	416	0.099	54.9	11.06	2.12	3.58	5.53	8.43
75.0	421	0.106	54.7	11.18	2.27	3.55	5.59	8.52
75.0	426	0.114	54.5	11.29	2.43	3.52	5.65	8.61
75.0	431	0.121	54.3	11.41	2.59	3.48	5.70	8.70
75.0	436	0.128	54.0	11.52	2.75	3.45	5.76	8.79
75.0	440	0.136	53.8	11.61	2.92	3.41	5.80	8.87
75.0	444	0.143	53.5	11.69	3.07	3.38	5.85	8.95
75.0	448	0.151	53.3	11.78	3.24	3.34	5.89	9.03
75.0	452	0.158	53.0	11.86	3.39	3.30	5.93	9.11
75.0	456	0.165	52.8	11.95	3.53	3.27	5.98	9.19
75.0	460	0.172	52.5	12.04	3.69	3.23	6.02	9.27
75.0	463	0.179	52.2	12.10	3.84	3.19	6.05	9.33
75.0	467	0.186	52.0	12.18	3.98	3.16	6.09	9.42
75.0	470	0.192	51.7	12.24	4.12	3.12	6.12	9.48
75.0	474	0.199	51.5	12.33	4.27	3.09	6.16	9.56
75.0	476	0.206	51.2	12.36	4.42	3.05	6.18	9.61
75.0	480	0.214	51.0	12.44	4.58	3.01	6.22	9.69
75.0	483	0.220	50.7	12.50	4.71	2.98	6.25	9.75



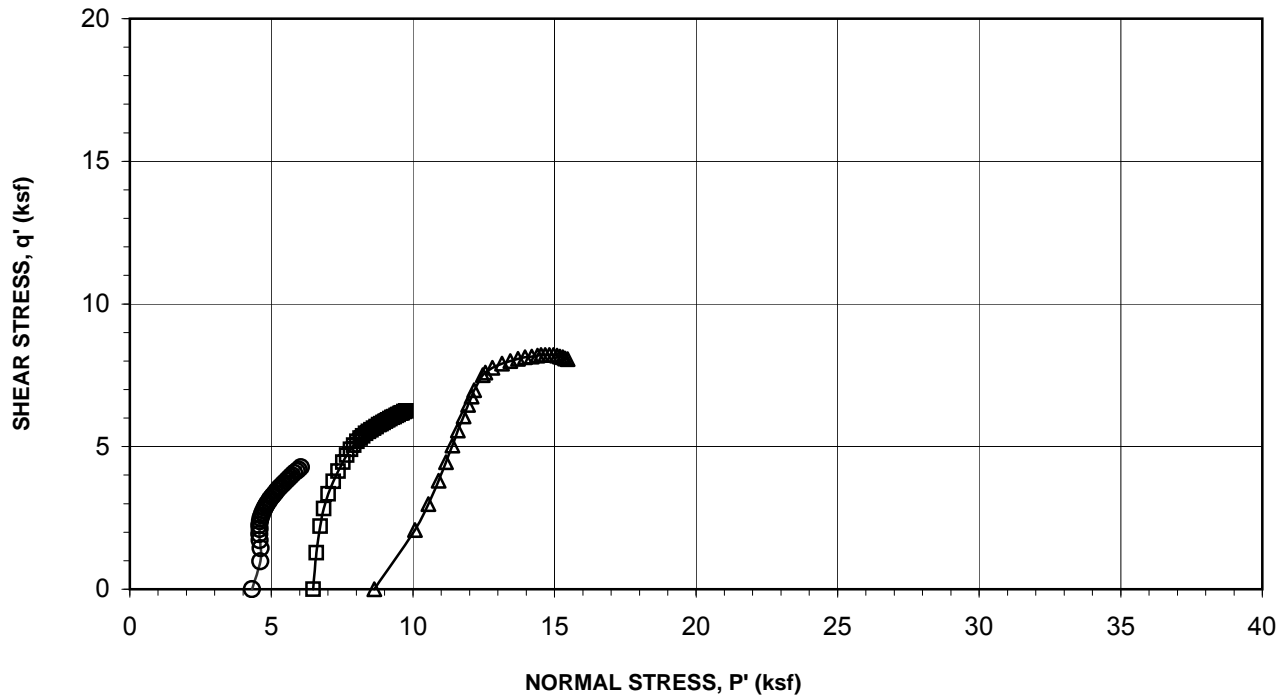
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-144	Consolidation Pressure :	60.0 psi
Depth(ft):	75.5	Initial Sample Height:	4.667 in
Sample No.:	22	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.664 in
Sample Description:	Brown Lean Clay w/ sand	Final Sample Area (A)*:	5.335 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	154	0.006	34.5	4.16	0.13	0.65	2.08	10.07
90.0	221	0.012	37.5	5.96	0.26	1.08	2.98	10.54
90.0	283	0.018	40.7	7.60	0.39	1.54	3.80	10.90
90.0	332	0.024	43.4	8.91	0.51	1.93	4.46	11.16
90.0	376	0.030	45.9	10.08	0.64	2.29	5.04	11.39
90.0	416	0.036	48.2	11.13	0.77	2.62	5.57	11.59
90.0	453	0.042	50.2	12.11	0.90	2.91	6.06	11.78
90.0	484	0.048	51.9	12.92	1.03	3.15	6.46	11.95
90.0	506	0.054	53.1	13.50	1.16	3.32	6.75	12.07
90.0	524	0.060	54.0	13.95	1.29	3.45	6.97	12.16
90.0	567	0.090	55.5	15.02	1.93	3.68	7.51	12.47
90.0	575	0.100	55.5	15.18	2.14	3.68	7.59	12.55
90.0	591	0.128	55.0	15.52	2.75	3.60	7.76	12.80
90.0	608	0.172	53.6	15.81	3.69	3.40	7.90	13.14
90.0	622	0.220	52.2	16.00	4.72	3.20	8.00	13.44
90.0	634	0.265	50.9	16.14	5.69	3.00	8.07	13.71
90.0	645	0.310	49.5	16.26	6.64	2.81	8.13	13.96
90.0	655	0.357	48.1	16.32	7.65	2.60	8.16	14.19
90.0	664	0.402	46.9	16.38	8.62	2.43	8.19	14.40
90.0	673	0.447	46.2	16.43	9.58	2.33	8.22	14.53
90.0	681	0.494	45.2	16.43	10.59	2.18	8.21	14.67
90.0	687	0.537	44.1	16.41	11.52	2.03	8.21	14.82
90.0	696	0.583	43.1	16.43	12.50	1.88	8.21	14.97
90.0	701	0.629	42.1	16.37	13.50	1.74	8.19	15.09
90.0	706	0.673	41.1	16.30	14.43	1.60	8.15	15.19
90.0	712	0.719	40.3	16.26	15.42	1.48	8.13	15.30
90.0	717	0.765	39.4	16.18	16.40	1.36	8.09	15.37
90.0	723	0.808	38.6	16.12	17.33	1.24	8.06	15.46
90.0	728	0.855	37.8	16.05	18.33	1.13	8.03	15.54
90.0	732	0.899	36.9	15.94	19.29	1.00	7.97	15.61
90.0	737	0.945	36.2	15.85	20.25	0.89	7.93	15.68
90.0	742	0.991	35.8	15.77	21.25	0.83	7.89	15.70
90.0	746	1.035	35.2	15.66	22.19	0.75	7.83	15.72

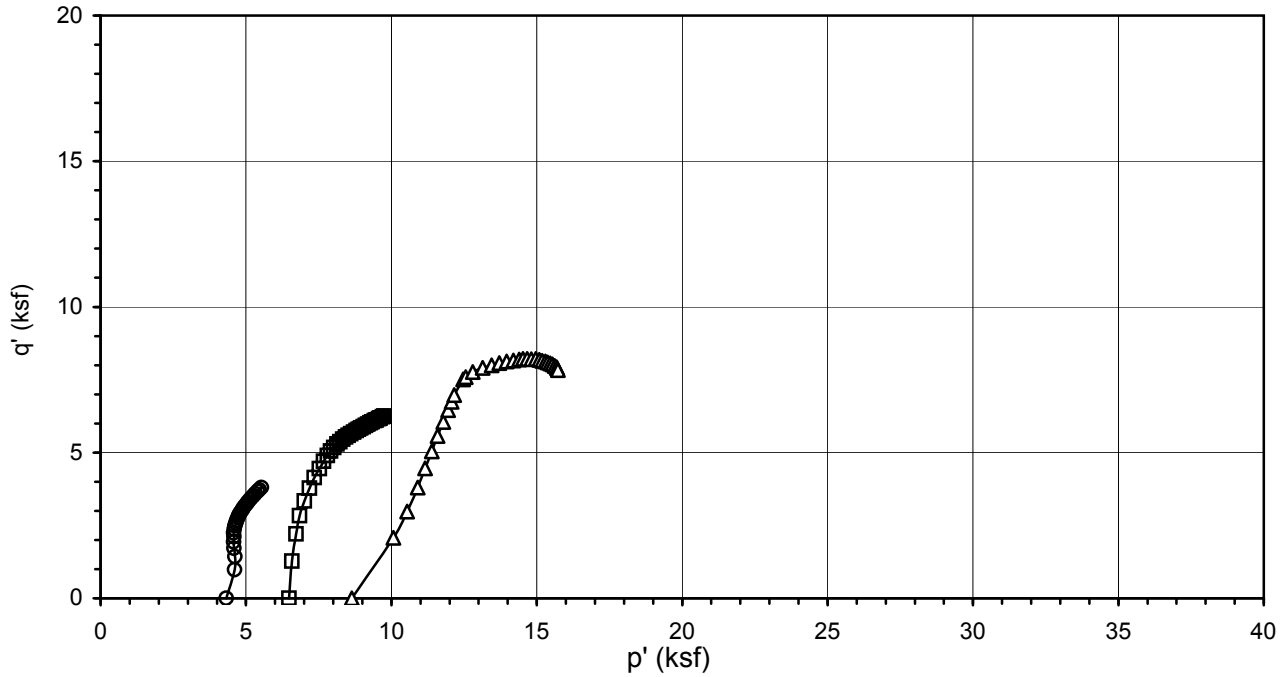


LEGEND: CONFINING PRESSURES= ○ 30 psi □ 45 psi △ 60 psi

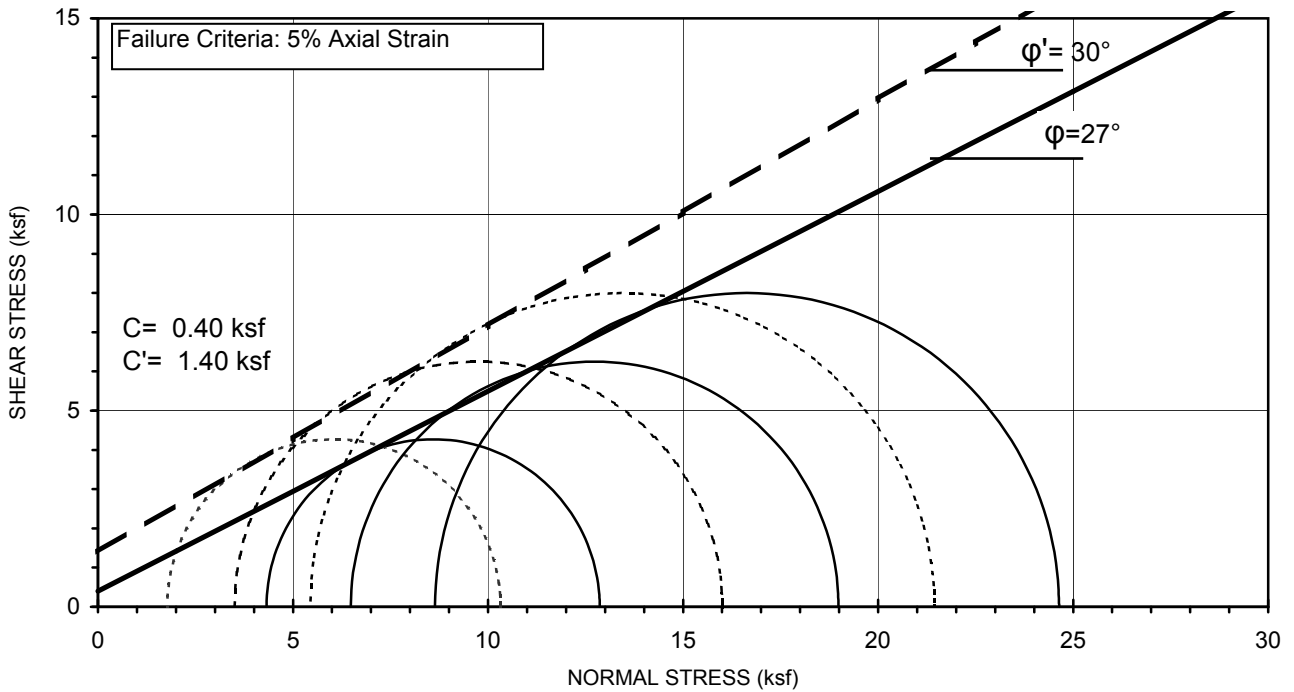


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Brown Lean Clay w/ sand
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	112.3
Sample No.:	22	Avg. Initial Moisture Content (%):	16.7
Depth (ft):	75.5	Confining Pressure:	30.0, 45.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

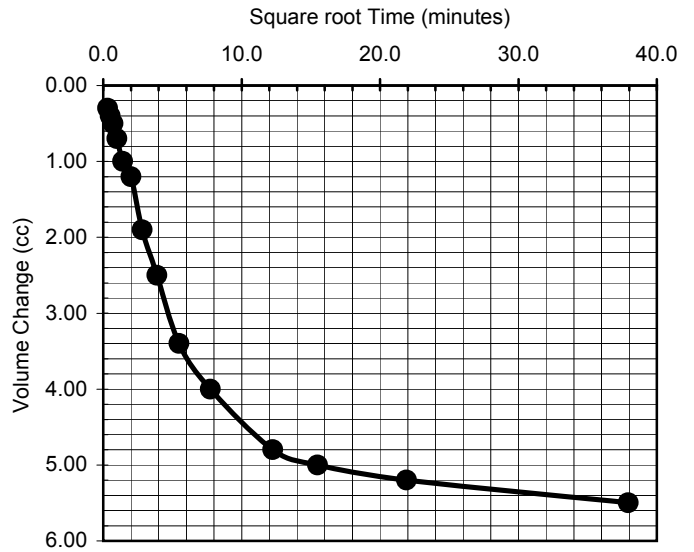
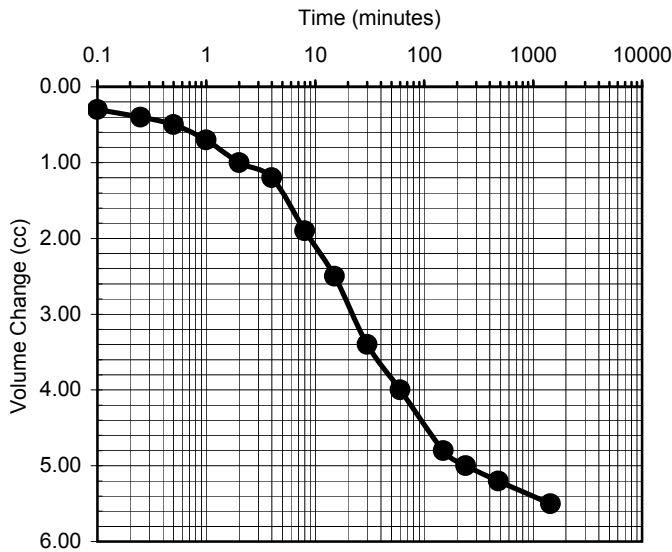


LEGEND: CONFINING PRESSURES= ○ 30 psi □ 45 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Brown Lean Clay w/ sand
Test Pit:	G-144	Avg. Dry Unit Weight (pcf):	112.3
Sample No.:	22	Avg. Initial Moisture Content (%):	16.7
Depth (ft):	75.5	Confining Pressure:	30.0, 45.0, 60.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-144	Sample Type:	Mod. Cal.
Sample No.:	22	Soil Description:	Brown Lean Clay w/ sand
Depth (feet):	75.5	Eff. Confining Pressure (psi):	45.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.3000
0.25	0.4000
0.5	0.5000
1	0.7000
2	1.0000
4	1.2000
8	1.9000
15	2.5000
30	3.4000
60	4.0000
150	4.8000
240	5.0000
480	5.2000
1440	5.5000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.3000
0.5000	0.4000
0.7071	0.5000
1.0000	0.7000
1.4142	1.0000
2.0000	1.2000
2.8284	1.9000
3.8730	2.5000
5.4772	3.4000
7.7460	4.0000
12.2474	4.8000
15.4919	5.0000
21.9089	5.2000
37.9473	5.5000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/27/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-22-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-03-11
Test Pit:	G-145	Reviewed by:	AP	Date:	08-03-11
Sample No.:	1	Sample Description:	Sandy Clay		
Depth(ft):	10.5				
Sample Type:	Mod. Cal.	Confining Pressure =	5.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.746</u>	<u>4.746</u>	<u>4.746</u>	Avg. =	4.746

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.405
Moisture Content (%)	18.84	23.48
Wet Weight (gms)	294.10	1003.62
Dry Weight (gms)	271.20	841.62
Container Weight (gms)	149.67	151.61
Density and Saturation		
Wet Weight (gms)	830.48	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.1	
Dry Density (pcf)	104.4	
Initial Void Ratio	0.613	
% Saturation	83.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	74.1
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	73.0
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	4.704
Induced OCR =	1.0	Initial Volume (cu.in)=	25.489
Change in Ht. of Specimen (in) =	0.0424	Final Volume (cu.in) =	25.422

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	2.07
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	0.42
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	2.49
		Axial Strain (%) =	5.34



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-22-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-03-11
Test Pit:	G-145	Reviewed by:	AP	Date:	08-03-11
Sample No.:	1	Sample Description:	Sandy Clay		
Depth(ft):	10.5				
Sample Type:	Mod. Cal.	Confining Pressure =	10.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.746</u>	<u>4.746</u>	<u>4.746</u>	Avg. =	4.746

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.285
Moisture Content (%)	18.84	23.48
Wet Weight (gms)	294.10	1003.62
Dry Weight (gms)	271.20	841.62
Container Weight (gms)	149.67	151.61
Density and Saturation		
Wet Weight (gms)	830.48	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.1	
Dry Density (pcf)	104.4	
Initial Void Ratio	0.613	
% Saturation	83.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)= 73.0
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)= 66.3
Eff. Consol. Stress (psi) =	10.0	Final Height (in)= 4.746
Induced OCR=	1.0	Initial Volume (cu.in)= 25.489
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 25.081

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) = 3.18
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) = 1.02
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 4.20
		Axial Strain (%) = 5.28



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-22-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-03-11
Test Pit:	G-145	Reviewed by:	AP	Date:	08-03-11
Sample No.:	1	Sample Description:	Sandy Clay		
Depth(ft):	10.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.746</u>	<u>4.746</u>	<u>4.746</u>	Avg. =	4.746

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	8.747
Moisture Content (%)	18.84	23.48
Wet Weight (gms)	294.10	1003.62
Dry Weight (gms)	271.20	841.62
Container Weight (gms)	149.67	151.61
Density and Saturation		
Wet Weight (gms)	830.48	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.1	
Dry Density (pcf)	104.4	
Initial Void Ratio	0.613	
% Saturation	83.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	66.3
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	328.9
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	4.746
Induced OCR =	1.0	Initial Volume (cu.in)=	25.489
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	41.511

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	4.92
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	1.99
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.91
		Axial Strain (%) =	5.64



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-145	Consolidation Pressure :	5.0 psi
Depth(ft):	10.5	Initial Sample Height:	4.746 in
Sample No.:	1	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.704 in
Sample Description:	Sandy Clay	Final Sample Area (A)*:	5.405 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	40.0	0.00	0.00	0.00	0.00	0.72
45.0	18	0.004	41.0	0.48	0.08	0.14	0.24	0.82
45.0	28	0.009	41.8	0.74	0.19	0.26	0.37	0.83
45.0	34	0.016	42.3	0.90	0.35	0.33	0.45	0.84
45.0	38	0.024	42.7	1.01	0.50	0.38	0.50	0.84
45.0	41	0.030	42.9	1.09	0.64	0.42	0.54	0.84
45.0	44	0.038	43.1	1.16	0.80	0.44	0.58	0.86
45.0	46	0.045	43.2	1.21	0.95	0.46	0.61	0.87
45.0	48	0.052	43.2	1.26	1.11	0.47	0.63	0.88
45.0	50	0.059	43.3	1.32	1.25	0.47	0.66	0.90
45.0	52	0.066	43.3	1.37	1.39	0.48	0.68	0.93
45.0	54	0.073	43.3	1.42	1.55	0.48	0.71	0.95
45.0	55	0.080	43.3	1.44	1.70	0.47	0.72	0.97
45.0	57	0.087	43.3	1.49	1.85	0.47	0.75	0.99
45.0	59	0.094	43.2	1.54	2.00	0.47	0.77	1.02
45.0	60	0.102	43.2	1.56	2.17	0.46	0.78	1.04
45.0	62	0.110	43.2	1.61	2.34	0.46	0.81	1.07
45.0	63	0.117	43.1	1.64	2.49	0.45	0.82	1.09
45.0	64	0.125	43.1	1.66	2.67	0.44	0.83	1.11
45.0	66	0.132	43.0	1.71	2.81	0.43	0.85	1.14
45.0	67	0.140	43.0	1.73	2.98	0.43	0.87	1.16
45.0	68	0.148	42.9	1.75	3.14	0.42	0.88	1.18
45.0	69	0.155	42.8	1.78	3.30	0.41	0.89	1.20
45.0	70	0.162	42.8	1.80	3.45	0.40	0.90	1.22
45.0	71	0.170	42.7	1.82	3.61	0.40	0.91	1.24
45.0	72	0.177	42.7	1.85	3.76	0.39	0.92	1.26
45.0	73	0.184	42.6	1.87	3.92	0.38	0.93	1.28
45.0	74	0.191	42.6	1.89	4.05	0.37	0.95	1.29
45.0	75	0.198	42.5	1.91	4.20	0.36	0.96	1.31
45.0	76	0.205	42.4	1.94	4.36	0.35	0.97	1.33
45.0	77	0.213	42.4	1.96	4.52	0.35	0.98	1.35
45.0	79	0.220	42.3	2.01	4.68	0.34	1.00	1.39
45.0	81	0.235	42.2	2.05	5.00	0.32	1.03	1.43
45.0	82	0.251	42.1	2.07	5.34	0.30	1.03	1.45
45.0	81	0.258	42.0	2.04	5.48	0.29	1.02	1.45



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-145	Consolidation Pressure :	10.0 psi
Depth(ft):	10.5	Initial Sample Height:	4.746 in
Sample No.:	1	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.746 in
Sample Description:	Sandy Clay	Final Sample Area (A)*:	5.285 sq. in.
		Induced OCR=	1.0

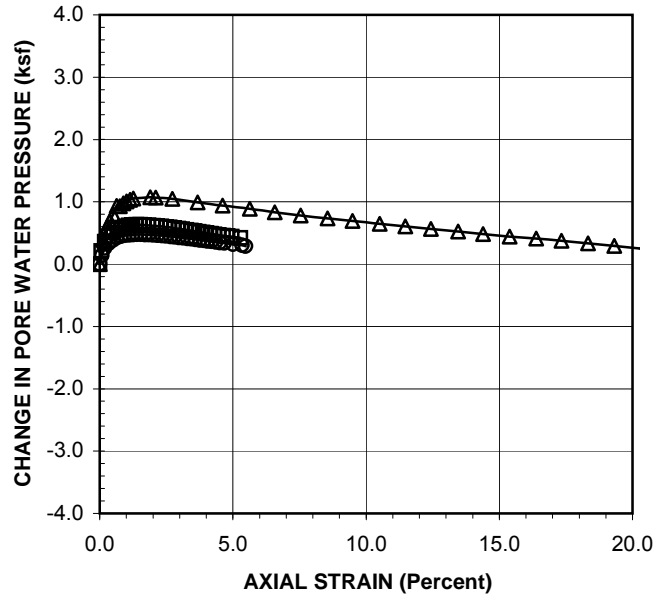
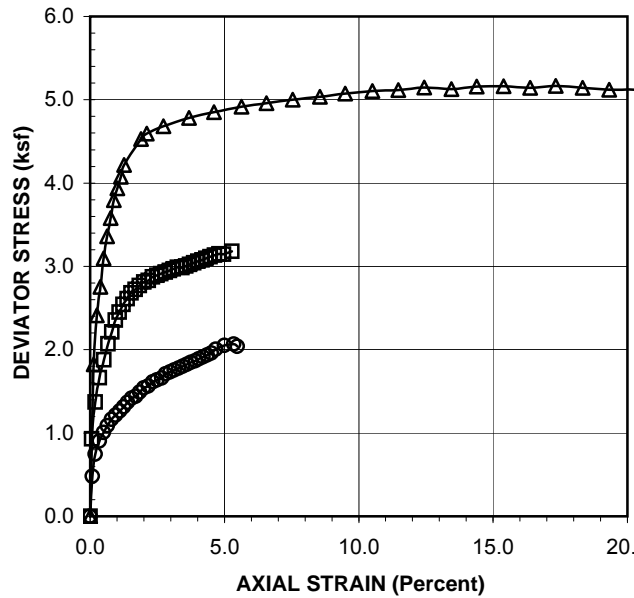
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	40.0	0.00	0.00	0.00	0.00	1.44
50.0	34	0.003	41.4	0.93	0.06	0.21	0.47	1.70
50.0	50	0.009	42.5	1.37	0.19	0.36	0.69	1.77
50.0	61	0.017	43.1	1.66	0.35	0.45	0.83	1.82
50.0	69	0.024	43.5	1.88	0.51	0.51	0.94	1.87
50.0	77	0.031	43.8	2.07	0.66	0.55	1.04	1.92
50.0	82	0.038	44.0	2.21	0.81	0.59	1.11	1.96
50.0	87	0.045	44.2	2.36	0.95	0.61	1.18	2.01
50.0	91	0.052	44.3	2.45	1.09	0.62	1.22	2.04
50.0	95	0.058	44.3	2.54	1.23	0.63	1.27	2.08
50.0	97	0.065	44.4	2.61	1.38	0.63	1.31	2.12
50.0	100	0.072	44.3	2.68	1.53	0.63	1.34	2.15
50.0	102	0.080	44.3	2.72	1.68	0.63	1.36	2.18
50.0	104	0.087	44.3	2.77	1.84	0.62	1.38	2.20
50.0	105	0.095	44.3	2.81	2.01	0.62	1.41	2.23
50.0	106	0.103	44.2	2.83	2.17	0.61	1.42	2.24
50.0	108	0.110	44.2	2.87	2.32	0.60	1.44	2.27
50.0	109	0.118	44.1	2.89	2.49	0.60	1.45	2.29
50.0	110	0.125	44.1	2.91	2.63	0.59	1.46	2.31
50.0	111	0.133	44.0	2.93	2.80	0.58	1.47	2.33
50.0	112	0.140	43.9	2.95	2.95	0.57	1.48	2.35
50.0	113	0.147	43.9	2.97	3.10	0.56	1.49	2.37
50.0	113	0.155	43.8	2.99	3.26	0.55	1.49	2.39
50.0	113	0.162	43.7	2.98	3.42	0.54	1.49	2.39
50.0	114	0.169	43.6	3.00	3.57	0.53	1.50	2.41
50.0	115	0.176	43.6	3.02	3.71	0.52	1.51	2.43
50.0	116	0.183	43.5	3.04	3.86	0.51	1.52	2.45
50.0	117	0.191	43.4	3.06	4.02	0.50	1.53	2.47
50.0	118	0.198	43.4	3.08	4.17	0.49	1.54	2.49
50.0	119	0.205	43.3	3.10	4.31	0.48	1.55	2.51
50.0	120	0.212	43.2	3.12	4.47	0.47	1.56	2.53
50.0	121	0.220	43.2	3.13	4.64	0.46	1.57	2.55
50.0	122	0.228	43.1	3.15	4.81	0.45	1.58	2.57
50.0	122	0.236	43.0	3.15	4.96	0.44	1.57	2.57
50.0	123	0.251	42.9	3.18	5.28	0.42	1.59	2.61
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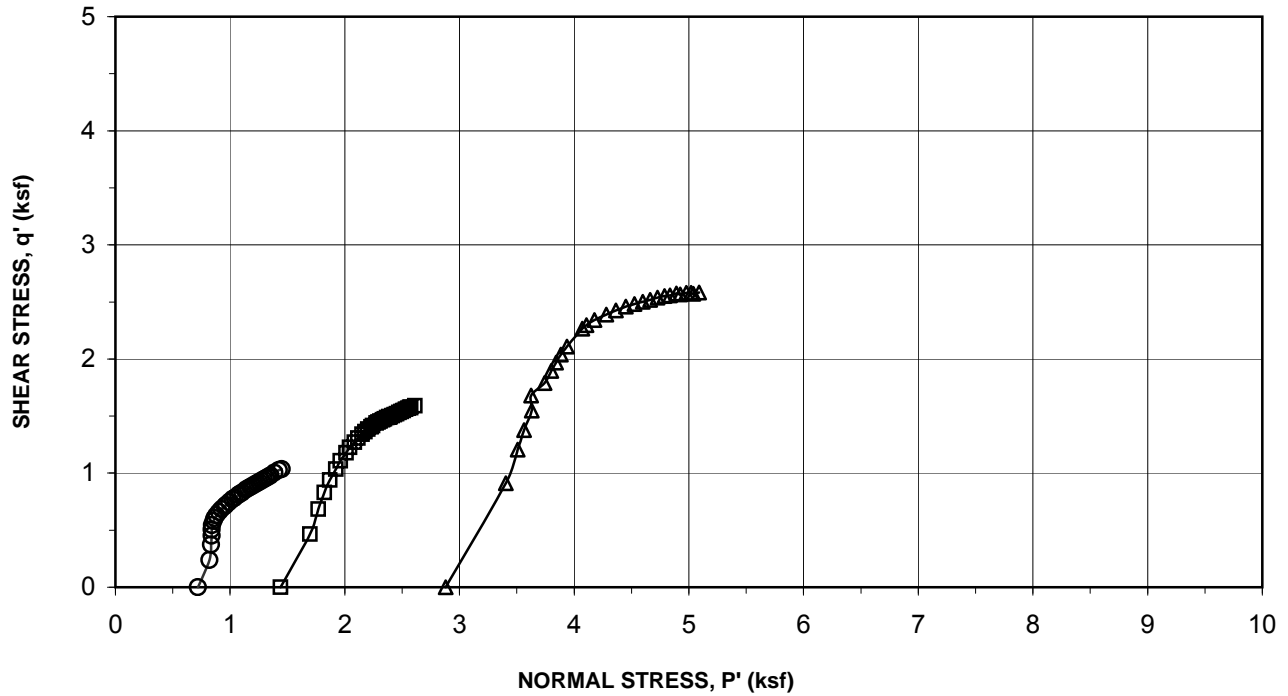
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-145	Consolidation Pressure :	20.0 psi
Depth(ft):	10.5	Initial Sample Height:	4.746 in
Sample No.:	1	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.746 in
Sample Description:	Sandy Clay	Final Sample Area (A)*:	8.747 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress (S1-S3)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2	Normal Stress p' (S1'+S3')/2
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(ksf)	(ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	111	0.006	42.7	1.83	0.13	0.39	0.91	3.40
60.0	147	0.012	44.0	2.41	0.25	0.58	1.21	3.51
60.0	168	0.018	44.8	2.76	0.38	0.69	1.38	3.56
60.0	189	0.024	45.5	3.10	0.51	0.80	1.55	3.63
60.0	206	0.030	46.5	3.36	0.63	0.94	1.68	3.62
60.0	219	0.036	46.4	3.58	0.76	0.93	1.79	3.74
60.0	233	0.042	46.8	3.79	0.88	0.98	1.90	3.80
60.0	242	0.048	47.0	3.94	1.01	1.01	1.97	3.84
60.0	251	0.054	47.2	4.08	1.14	1.03	2.04	3.88
60.0	260	0.060	47.3	4.22	1.26	1.05	2.11	3.94
60.0	281	0.090	47.5	4.53	1.90	1.07	2.27	4.07
60.0	285	0.100	47.4	4.59	2.11	1.07	2.30	4.11
60.0	293	0.129	47.3	4.68	2.73	1.05	2.34	4.18
60.0	302	0.175	46.9	4.78	3.68	0.99	2.39	4.28
60.0	309	0.219	46.5	4.85	4.61	0.94	2.43	4.36
60.0	317	0.268	46.2	4.92	5.64	0.89	2.46	4.45
60.0	323	0.312	45.8	4.96	6.57	0.83	2.48	4.53
60.0	329	0.358	45.4	5.00	7.55	0.78	2.50	4.60
60.0	335	0.406	45.1	5.04	8.56	0.73	2.52	4.66
60.0	341	0.450	44.8	5.07	9.49	0.69	2.54	4.73
60.0	347	0.499	44.5	5.10	10.51	0.65	2.55	4.79
60.0	351	0.544	44.2	5.12	11.47	0.60	2.56	4.83
60.0	357	0.590	43.9	5.15	12.43	0.56	2.57	4.89
60.0	360	0.638	43.6	5.13	13.45	0.52	2.56	4.92
60.0	366	0.683	43.4	5.16	14.39	0.48	2.58	4.98
60.0	371	0.731	43.1	5.16	15.39	0.44	2.58	5.02
60.0	374	0.778	42.9	5.14	16.38	0.41	2.57	5.04
60.0	380	0.822	42.6	5.17	17.33	0.37	2.58	5.09
60.0	383	0.870	42.3	5.14	18.34	0.33	2.57	5.12
60.0	386	0.917	42.0	5.12	19.32	0.29	2.56	5.15
60.0	390	0.962	41.8	5.12	20.27	0.25	2.56	5.19
60.0	392	1.010	41.5	5.07	21.28	0.21	2.54	5.20

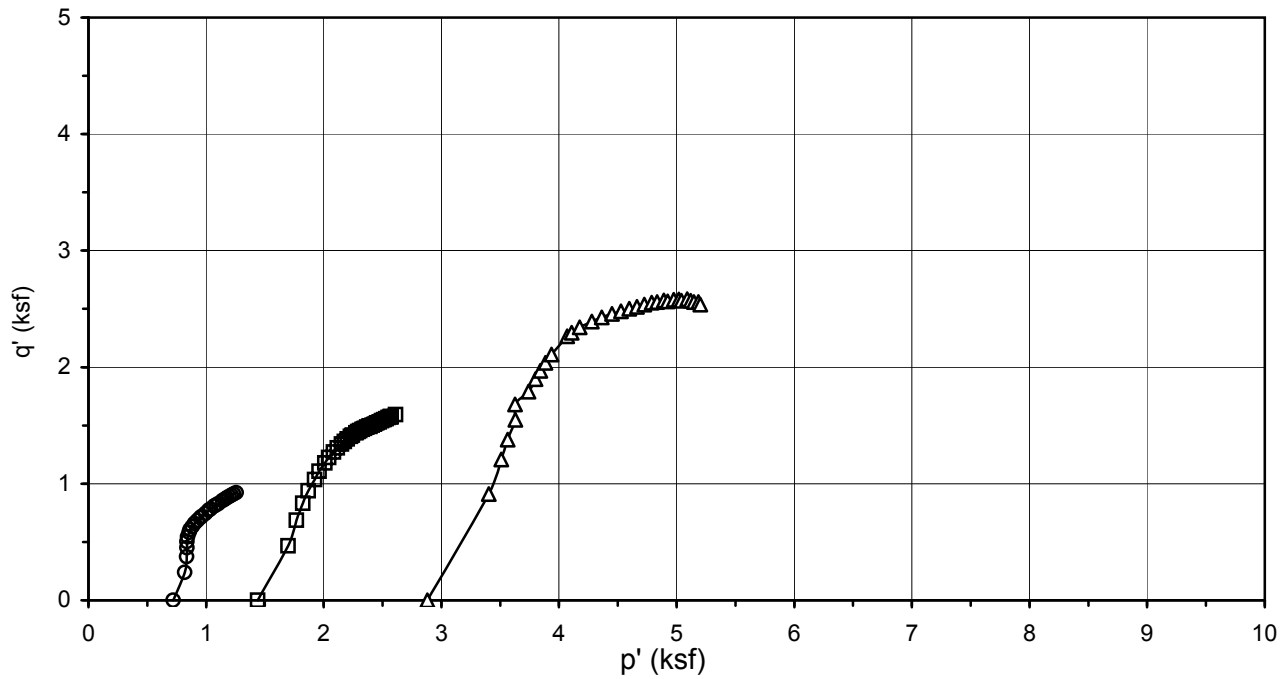


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 10 psi △ 20 psi

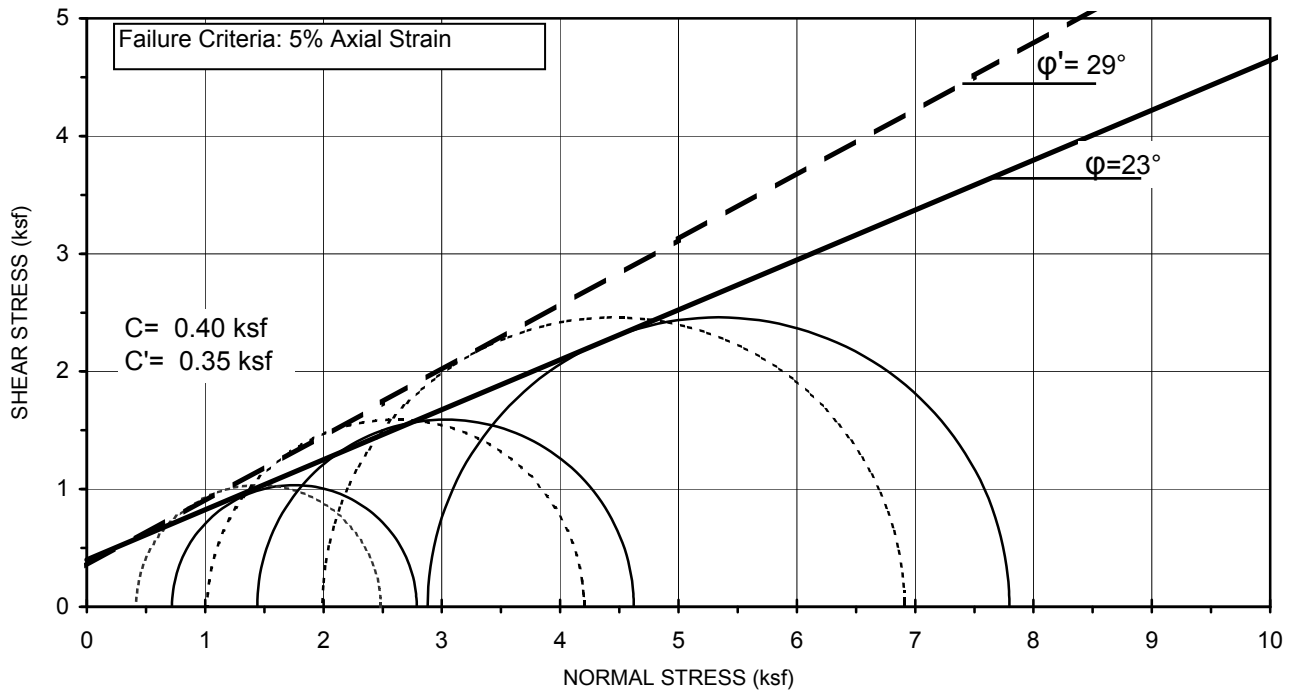


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Sandy Clay
Test Pit:	G-145	Avg. Dry Unit Weight (pcf):	104.4
Sample No.:	1	Avg. Initial Moisture Content (%):	18.8
Depth (ft):	10.5	Confining Pressure:	5.0, 10.0, 20.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

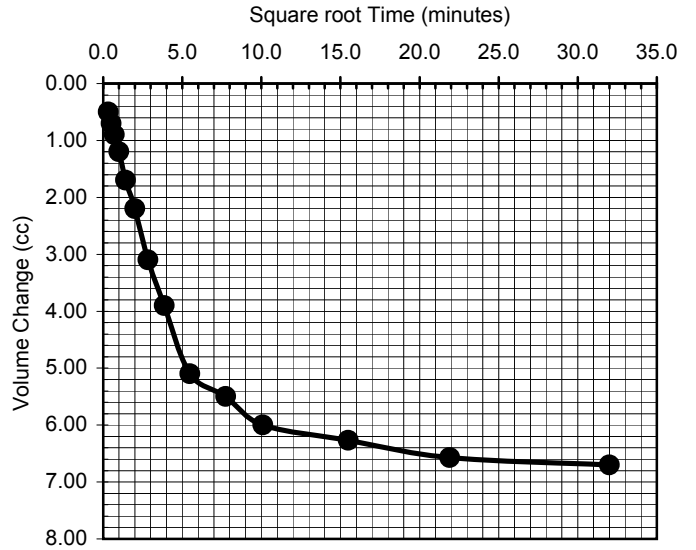
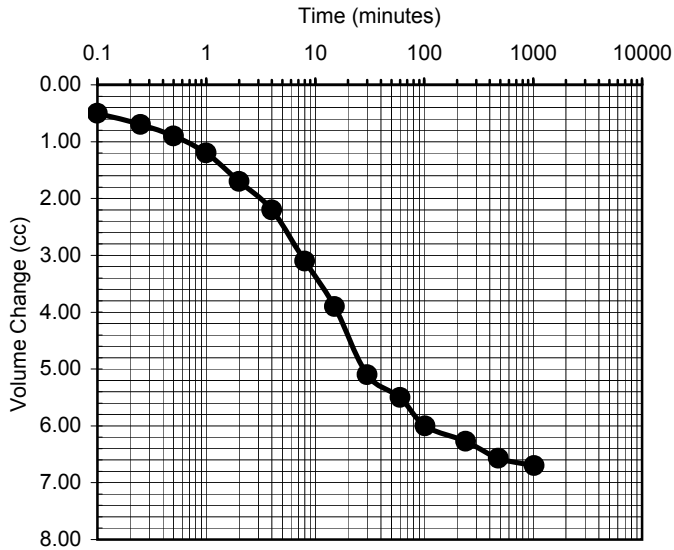


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 10 psi △ 20 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Sandy Clay
Test Pit:	G-145	Avg. Dry Unit Weight (pcf):	104.4
Sample No.:	1	Avg. Initial Moisture Content (%):	18.8
Depth (ft):	10.5	Confining Pressure:	5.0, 10.0, 20.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-145	Sample Type:	Mod. Cal.
Sample No.:	1	Soil Description:	Sandy Clay
Depth (feet):	10.5	Eff. Confining Pressure (psi):	10.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.5000
0.25	0.7000
0.5	0.9000
1	1.2000
2	1.7000
4	2.2000
8	3.1000
15	3.9000
30	5.1000
60	5.5000
102	6.0000
240	6.2712
480	6.5700
1024	6.7000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.5000
0.5000	0.7000
0.7071	0.9000
1.0000	1.2000
1.4142	1.7000
2.0000	2.2000
2.8284	3.1000
3.8730	3.9000
5.4772	5.1000
7.7460	5.5000
10.0995	6.0000
15.4919	6.2712
21.9089	6.5700
32.0000	6.7000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/22/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-24-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-03-11
Test Pit:	G-145	Reviewed by:	AP	Date:	08-03-11
Sample No.:	12	Sample Description:	Sandy Clay		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.020</u>	<u>5.020</u>	<u>5.020</u>	Avg. =	5.020

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.295
Moisture Content (%)	14.84	19.68
Wet Weight (gms)	<u>23.62</u>	<u>1057.61</u>
Dry Weight (gms)	<u>21.95</u>	<u>908.61</u>
Container Weight (gms)	<u>10.70</u>	<u>151.66</u>
Density and Saturation		
Wet Weight (gms)	<u>905.91</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	128.0	
Dry Density (pcf)	111.5	
Initial Void Ratio	0.512	
% Saturation	78.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in) = <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>60.0</u>	Initial Burette Ht.(cm)=	<u>76.3</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>63.2</u>
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	<u>4.941</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.961</u>
Change in Ht. of Specimen (in) =	<u>0.0787</u>	Final Volume (cu.in) =	<u>26.162</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	4.84
Time to 50% primary Consolidation (min) =	4	Eff. Minor Principal stress (ksf) =	1.36
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.19
		Axial Strain (%) =	5.18



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-24-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-03-11
Test Pit:	G-145	Reviewed by:	AP	Date:	08-03-11
Sample No.:	12	Sample Description:	Sandy Clay		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	40.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.020</u>	<u>5.020</u>	<u>5.020</u>	Avg. =	5.020

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.331
Moisture Content (%)	14.84	19.68
Wet Weight (gms)	<u>23.62</u>	<u>1057.61</u>
Dry Weight (gms)	<u>21.95</u>	<u>908.61</u>
Container Weight (gms)	<u>10.70</u>	<u>151.66</u>
Density and Saturation		
Wet Weight (gms)	<u>905.91</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	128.0	
Dry Density (pcf)	111.5	
Initial Void Ratio	0.512	
% Saturation	78.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>80.0</u>	Initial Burette Ht.(cm)=	<u>60.0</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>56.7</u>
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	<u>5.020</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.961</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>26.760</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	9.84
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	3.58
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	13.42
		Axial Strain (%) =	5.11



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-24-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-03-11
Test Pit:	G-145	Reviewed by:	AP	Date:	08-03-11
Sample No.:	12	Sample Description:	Sandy Clay		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	60.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.020</u>	<u>5.020</u>	<u>5.020</u>	Avg. =	5.020

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.271
Moisture Content (%)	14.84	19.68
Wet Weight (gms)	<u>23.62</u>	<u>1057.61</u>
Dry Weight (gms)	<u>21.95</u>	<u>908.61</u>
Container Weight (gms)	<u>10.70</u>	<u>151.66</u>
Density and Saturation		
Wet Weight (gms)	<u>905.91</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	128.0	
Dry Density (pcf)	111.5	
Initial Void Ratio	0.512	
% Saturation	78.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>100.0</u>	Initial Burette Ht.(cm)=	<u>53.5</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>45.3</u>
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	<u>5.020</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>26.961</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>26.461</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	15.45
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	6.59
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	22.04
		Axial Strain (%) =	4.20



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-145	Consolidation Pressure :	20.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.020 in
Sample No.:	12	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.941 in
Sample Description:	Sandy Clay	Final Sample Area (A)*:	5.295 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	48	0.006	40.9	1.29	0.12	0.12	0.65	3.40
60.0	68	0.013	42.0	1.83	0.26	0.28	0.92	3.51
60.0	78	0.021	43.1	2.10	0.42	0.44	1.05	3.48
60.0	86	0.028	44.2	2.33	0.57	0.60	1.17	3.45
60.0	93	0.035	45.1	2.50	0.70	0.73	1.25	3.39
60.0	98	0.042	46.0	2.63	0.86	0.86	1.31	3.34
60.0	101	0.049	46.7	2.73	1.00	0.96	1.36	3.28
60.0	105	0.058	47.4	2.82	1.16	1.06	1.41	3.23
60.0	109	0.065	47.9	2.92	1.31	1.14	1.46	3.20
60.0	113	0.071	48.4	3.02	1.44	1.21	1.51	3.18
60.0	115	0.079	48.8	3.08	1.60	1.27	1.54	3.15
60.0	119	0.086	49.2	3.17	1.74	1.32	1.59	3.15
60.0	123	0.093	49.5	3.27	1.89	1.37	1.63	3.15
60.0	126	0.101	49.8	3.36	2.04	1.40	1.68	3.16
60.0	129	0.108	50.0	3.43	2.19	1.44	1.71	3.16
60.0	131	0.115	50.2	3.49	2.34	1.46	1.74	3.16
60.0	135	0.123	50.4	3.58	2.49	1.49	1.79	3.18
60.0	138	0.131	50.5	3.64	2.65	1.50	1.82	3.20
60.0	141	0.138	50.6	3.73	2.79	1.52	1.87	3.23
60.0	143	0.145	50.7	3.76	2.93	1.53	1.88	3.23
60.0	146	0.153	50.7	3.85	3.10	1.54	1.93	3.27
60.0	149	0.160	50.8	3.91	3.25	1.55	1.96	3.29
60.0	151	0.168	50.8	3.97	3.39	1.56	1.99	3.31
60.0	154	0.175	50.9	4.03	3.54	1.56	2.02	3.34
60.0	156	0.183	50.9	4.09	3.70	1.56	2.05	3.37
60.0	159	0.190	50.9	4.15	3.84	1.56	2.08	3.39
60.0	161	0.197	50.9	4.21	3.98	1.56	2.11	3.42
60.0	165	0.204	50.9	4.30	4.13	1.56	2.15	3.47
60.0	168	0.212	50.8	4.36	4.28	1.56	2.18	3.50
60.0	171	0.219	50.8	4.45	4.42	1.55	2.23	3.55
60.0	175	0.226	50.8	4.54	4.58	1.55	2.27	3.60
60.0	178	0.234	50.7	4.60	4.73	1.54	2.30	3.64
60.0	181	0.241	50.7	4.69	4.87	1.54	2.34	3.69
60.0	188	0.256	50.6	4.84	5.18	1.52	2.42	3.78



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-145	Consolidation Pressure :	40.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.020 in
Sample No.:	12	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.020 in
Sample Description:	Sandy Clay	Final Sample Area (A)*:	5.331 sq. in.
		Induced OCR=	1.0

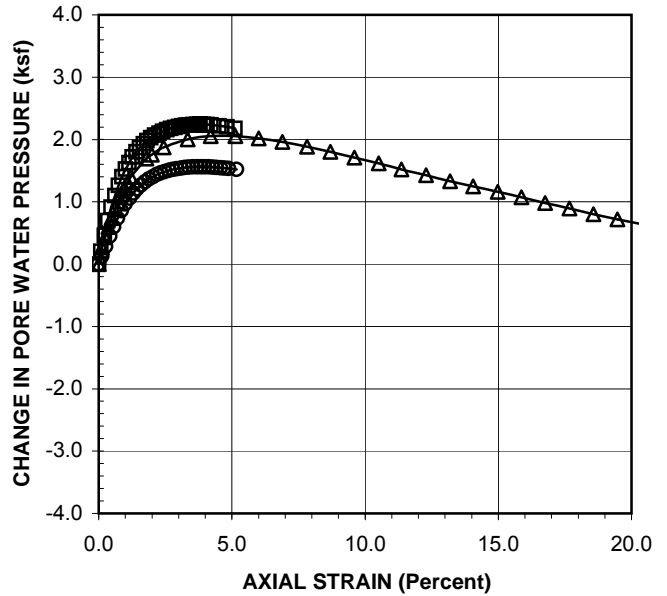
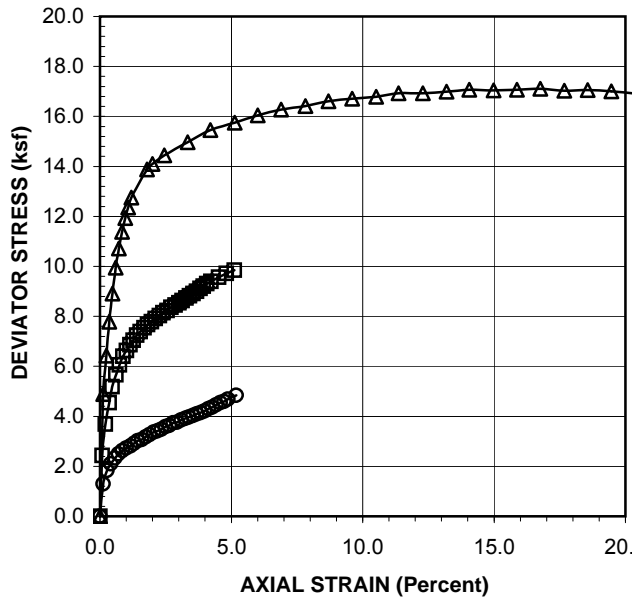
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	40.0	0.00	0.00	0.00	0.00	5.76
80.0	90	0.004	41.4	2.43	0.09	0.21	1.21	6.77
80.0	137	0.011	43.2	3.69	0.21	0.46	1.85	7.14
80.0	169	0.018	44.9	4.55	0.35	0.70	2.27	7.33
80.0	193	0.024	46.3	5.19	0.47	0.91	2.59	7.44
80.0	211	0.031	47.6	5.67	0.61	1.10	2.83	7.49
80.0	226	0.038	48.8	6.06	0.75	1.26	3.03	7.53
80.0	239	0.044	49.7	6.40	0.87	1.40	3.20	7.56
80.0	248	0.051	50.6	6.63	1.01	1.52	3.32	7.55
80.0	257	0.058	51.3	6.86	1.15	1.63	3.43	7.56
80.0	264	0.064	52.0	7.04	1.27	1.72	3.52	7.56
80.0	272	0.070	52.5	7.24	1.40	1.80	3.62	7.58
80.0	278	0.077	53.0	7.39	1.54	1.87	3.70	7.59
80.0	284	0.084	53.4	7.54	1.68	1.93	3.77	7.60
80.0	289	0.091	53.8	7.67	1.81	1.98	3.83	7.61
80.0	294	0.098	54.1	7.79	1.96	2.03	3.89	7.63
80.0	299	0.106	54.4	7.91	2.11	2.07	3.95	7.65
80.0	304	0.114	54.6	8.03	2.27	2.10	4.01	7.67
80.0	309	0.121	54.8	8.15	2.40	2.13	4.07	7.70
80.0	313	0.129	55.0	8.24	2.56	2.16	4.12	7.72
80.0	318	0.136	55.1	8.36	2.71	2.18	4.18	7.76
80.0	322	0.144	55.2	8.45	2.86	2.19	4.22	7.79
80.0	326	0.151	55.3	8.54	3.01	2.21	4.27	7.82
80.0	330	0.157	55.4	8.64	3.13	2.22	4.32	7.86
80.0	334	0.164	55.5	8.73	3.27	2.23	4.36	7.90
80.0	338	0.171	55.5	8.82	3.41	2.23	4.41	7.93
80.0	342	0.178	55.5	8.91	3.55	2.24	4.46	7.98
80.0	346	0.184	55.6	9.00	3.67	2.24	4.50	8.02
80.0	351	0.191	55.6	9.12	3.81	2.24	4.56	8.08
80.0	355	0.198	55.6	9.21	3.94	2.24	4.61	8.13
80.0	359	0.204	55.5	9.30	4.07	2.24	4.65	8.17
80.0	363	0.212	55.5	9.39	4.22	2.23	4.70	8.22
80.0	371	0.227	55.4	9.57	4.52	2.22	4.78	8.33
80.0	378	0.242	55.3	9.72	4.82	2.20	4.86	8.42
80.0	384	0.257	55.1	9.84	5.11	2.18	4.92	8.50



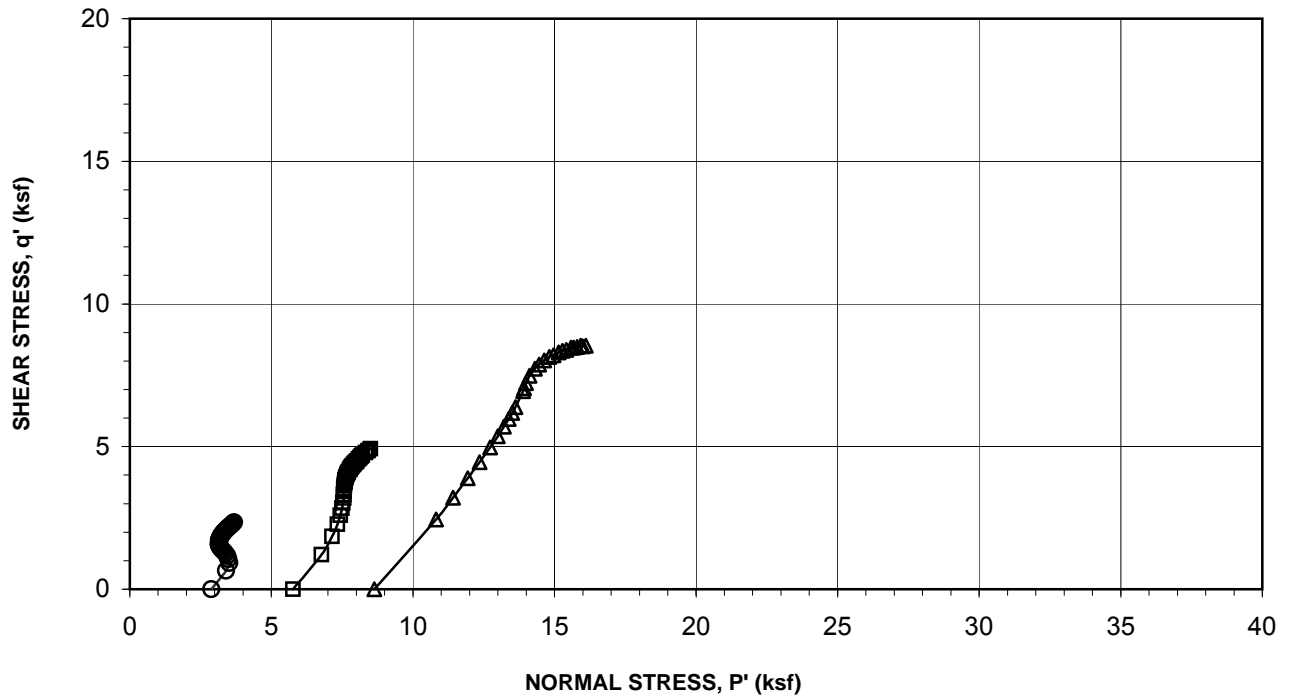
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	100.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-145	Consolidation Pressure :	60.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.020 in
Sample No.:	12	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.020 in
Sample Description:	Sandy Clay	Final Sample Area (A)*:	5.271 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
100.0	0	0.000	40.0	0.00	0.00	0.00	0.00	8.64
100.0	179	0.006	41.9	4.89	0.12	0.27	2.44	10.81
100.0	236	0.012	43.0	6.43	0.24	0.43	3.21	11.42
100.0	286	0.018	44.1	7.79	0.36	0.60	3.90	11.94
100.0	328	0.024	45.1	8.91	0.48	0.74	4.45	12.35
100.0	366	0.030	46.2	9.95	0.60	0.89	4.97	12.73
100.0	395	0.036	47.0	10.72	0.72	1.01	5.36	12.99
100.0	420	0.042	47.8	11.39	0.84	1.12	5.69	13.21
100.0	441	0.048	48.5	11.93	0.96	1.22	5.97	13.38
100.0	457	0.054	49.1	12.36	1.08	1.31	6.18	13.51
100.0	473	0.060	49.7	12.75	1.20	1.40	6.38	13.62
100.0	518	0.090	51.8	13.88	1.79	1.69	6.94	13.89
100.0	527	0.100	52.2	14.10	1.99	1.76	7.05	13.93
100.0	542	0.123	53.0	14.44	2.44	1.87	7.22	13.99
100.0	567	0.168	53.9	14.97	3.34	2.00	7.49	14.12
100.0	590	0.211	54.3	15.45	4.20	2.05	7.73	14.31
100.0	608	0.258	54.3	15.74	5.13	2.05	7.87	14.46
100.0	625	0.301	54.0	16.04	6.00	2.02	8.02	14.64
100.0	640	0.346	53.6	16.28	6.89	1.96	8.14	14.82
100.0	652	0.392	53.1	16.41	7.81	1.88	8.20	14.96
100.0	666	0.437	52.5	16.61	8.70	1.80	8.31	15.14
100.0	677	0.482	51.9	16.71	9.60	1.71	8.36	15.29
100.0	687	0.527	51.2	16.79	10.51	1.62	8.39	15.42
100.0	699	0.571	50.6	16.93	11.37	1.52	8.47	15.58
100.0	707	0.617	49.9	16.93	12.29	1.43	8.46	15.68
100.0	716	0.662	49.2	16.99	13.19	1.33	8.50	15.80
100.0	727	0.706	48.7	17.07	14.06	1.25	8.54	15.93
100.0	734	0.752	48.1	17.04	14.98	1.16	8.52	16.00
100.0	743	0.797	47.4	17.07	15.87	1.07	8.53	16.10
100.0	752	0.841	46.8	17.11	16.76	0.98	8.55	16.21
100.0	757	0.887	46.2	17.02	17.67	0.89	8.51	16.26
100.0	767	0.932	45.6	17.06	18.57	0.80	8.53	16.37
100.0	773	0.977	45.0	17.01	19.47	0.72	8.50	16.43
100.0	778	1.023	44.4	16.91	20.38	0.64	8.46	16.46

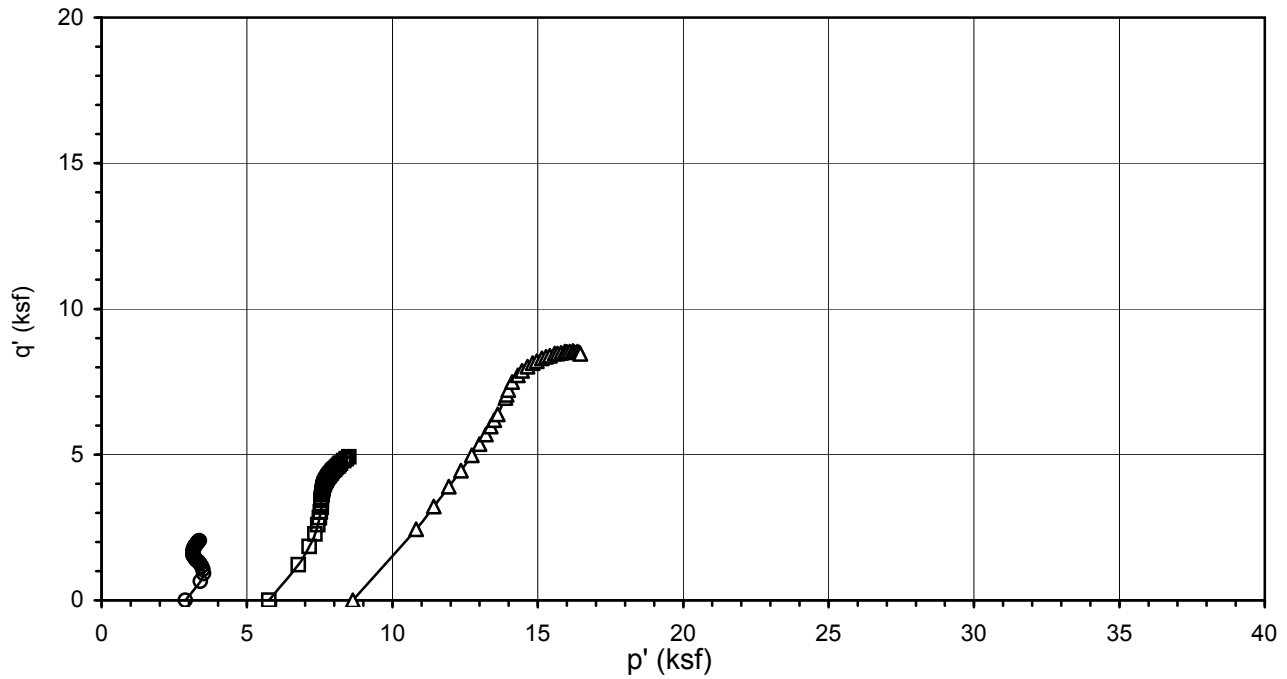


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi

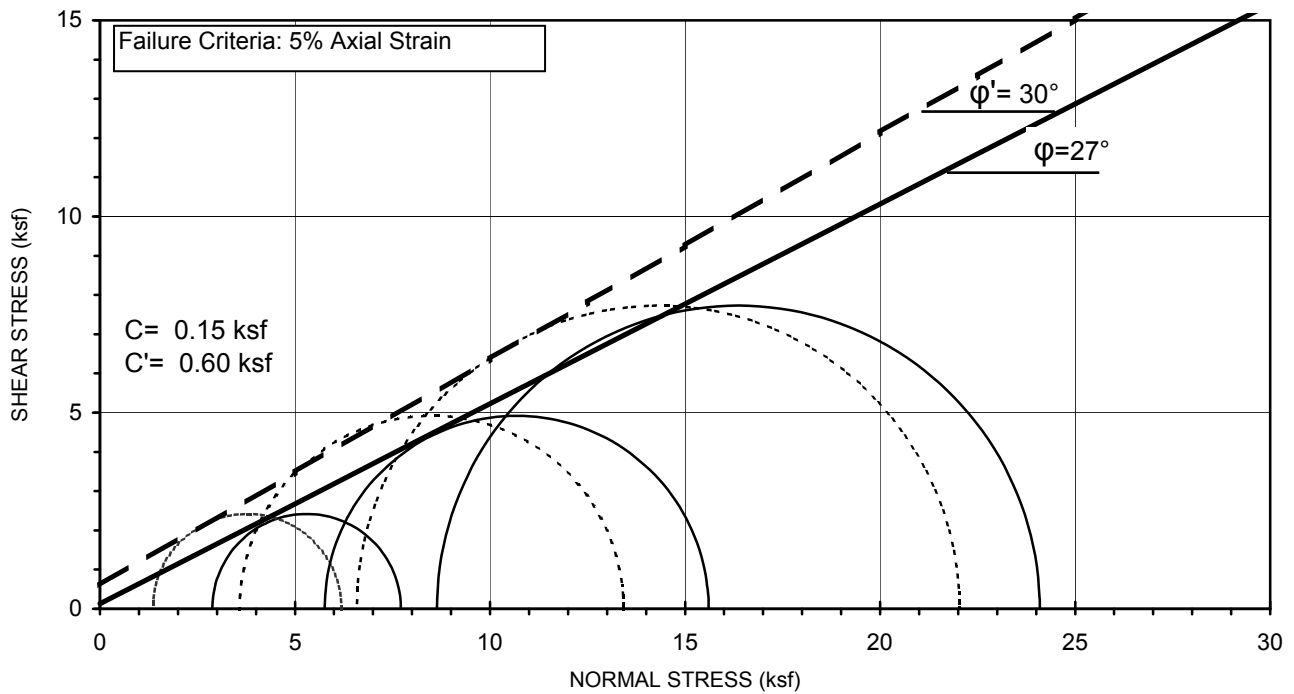


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Sandy Clay
Test Pit:	G-145	Avg. Dry Unit Weight (pcf):	111.5
Sample No.:	12	Avg. Initial Moisture Content (%):	14.8
Depth (ft):	65.5	Confining Pressure:	20.0, 40.0, 60.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

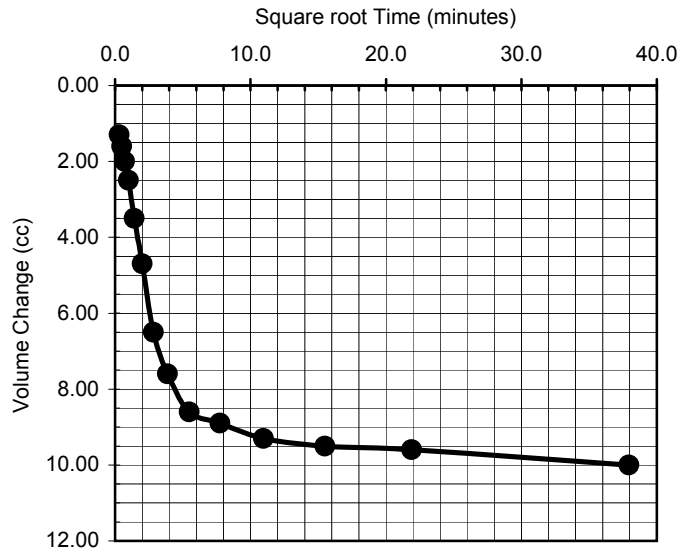
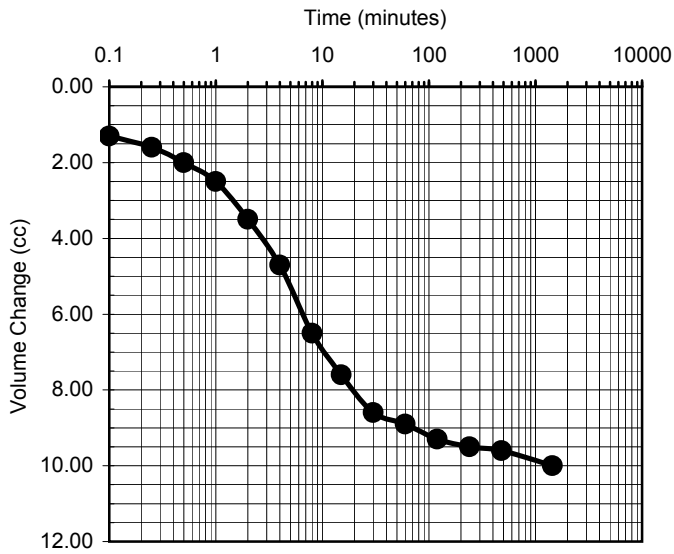


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Sandy Clay
Test Pit:	G-145	Avg. Dry Unit Weight (pcf):	111.5
Sample No.:	12	Avg. Initial Moisture Content (%):	14.8
Depth (ft):	65.5	Confining Pressure:	20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-145	Sample Type:	Mod. Cal.
Sample No.:	12	Soil Description:	Sandy Clay
Depth (feet):	65.5	Eff. Confining Pressure (psi):	40.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.3000
0.25	1.6000
0.5	2.0000
1	2.5000
2	3.5000
4	4.7000
8	6.5000
15	7.6000
30	8.6000
60	8.9000
120	9.3000
240	9.5000
480	9.6000
1440	10.0000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.3000
0.5000	1.6000
0.7071	2.0000
1.0000	2.5000
1.4142	3.5000
2.0000	4.7000
2.8284	6.5000
3.8730	7.6000
5.4772	8.6000
7.7460	8.9000
10.9545	9.3000
15.4919	9.5000
21.9089	9.6000
37.9473	10.0000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/24/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [West Subway Extension](#) Tested by: [AP](#) Date: [06-01-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [06-15-11](#)
 Test Pit: [G-156](#) Reviewed by: [AP](#) Date: [06-15-11](#)
 Sample No.: - Sample Description: [Dark Yellowish Brown Clay](#)
 Depth(ft): [38](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 15.0 psi](#)

Diameter (in)	2.610	2.610	2.610	Avg. =	2.610
Height (in)	5.725	5.725	5.725	Avg. =	5.725

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.297
Moisture Content (%)	17.33	20.93
Wet Weight (gms)	87.11	1198.75
Dry Weight (gms)	81.73	1016.64
Container Weight (gms)	50.68	146.46
Density and Saturation		
Wet Weight (gms)	1030.66	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.2	
Dry Density (pcf)	109.3	
Initial Void Ratio	0.542	
% Saturation	86.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	70.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	63.4
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.700
Induced OCR =	1.0	Initial Volume (cu.in)=	30.630
Change in Ht. of Specimen (in) =	0.0249	Final Volume (cu.in) =	30.191

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	4.98
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.15
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.13
		Axial Strain (%) =	5.26



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-01-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-156	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Dark Yellowish Brown Clay		
Depth(ft):	38				
Sample Type:	Mod. Cal.	Confining Pressure =	25.0 psi		

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.725</u>	<u>5.725</u>	<u>5.725</u>	Avg. =	5.725

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.321
Moisture Content (%)	17.33	20.93
Wet Weight (gms)	87.11	1198.75
Dry Weight (gms)	81.73	1016.64
Container Weight (gms)	50.68	146.46
Density and Saturation		
Wet Weight (gms)	1030.66	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.2	
Dry Density (pcf)	109.3	
Initial Void Ratio	0.542	
% Saturation	86.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	63.3
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	58.0
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.696
Induced OCR=	1.0	Initial Volume (cu.in)=	30.630
Change in Ht. of Specimen (in) =	0.0294	Final Volume (cu.in) =	30.307

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	7.37
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.16
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	9.54
		Axial Strain (%) =	5.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	West Subway Extension	Tested by:	AP	Date:	06-01-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	06-15-11
Test Pit:	G-156	Reviewed by:	AP	Date:	06-15-11
Sample No.:	-	Sample Description:	Dark Yellowish Brown Clay		
Depth(ft):	38				
Sample Type:	Mod. Cal.	Confining Pressure =	35.0 psi		

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.725</u>	<u>5.725</u>	<u>5.725</u>	Avg. =	5.725

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.323
Moisture Content (%)	17.33	20.93
Wet Weight (gms)	87.11	1198.75
Dry Weight (gms)	81.73	1016.64
Container Weight (gms)	50.68	146.46
Density and Saturation		
Wet Weight (gms)	1030.66	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.2	
Dry Density (pcf)	109.3	
Initial Void Ratio	0.542	
% Saturation	86.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	58.0
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	54.5
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	5.714
Induced OCR =	1.0	Initial Volume (cu.in)=	30.630
Change in Ht. of Specimen (in) =	0.0110	Final Volume (cu.in) =	30.416

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	10.70
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.25
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.95
		Axial Strain (%) =	16.37



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-156	Consolidation Pressure :	15.0 psi
Depth(ft):	38	Initial Sample Height:	5.725 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.700 in
Sample Description:	Dark Yellowish Brown Clay	Final Sample Area (A)*:	5.297 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress	Normal Stress
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	q' (S1-S3)/2 (ksf)	p' (S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	24	0.006	31.2	0.66	0.11	0.17	0.33	2.32
45.0	45	0.012	32.3	1.22	0.21	0.33	0.61	2.44
45.0	59	0.018	33.2	1.59	0.32	0.46	0.79	2.49
45.0	69	0.024	33.9	1.87	0.42	0.56	0.93	2.53
45.0	77	0.030	34.5	2.08	0.53	0.65	1.04	2.55
45.0	85	0.036	35.1	2.30	0.63	0.73	1.15	2.58
45.0	93	0.042	35.6	2.51	0.74	0.81	1.26	2.61
45.0	98	0.048	35.8	2.64	0.84	0.84	1.32	2.64
45.0	102	0.054	36.1	2.76	0.95	0.88	1.38	2.66
45.0	108	0.060	36.5	2.91	1.05	0.94	1.45	2.68
45.0	114	0.080	36.8	3.05	1.40	0.98	1.53	2.71
45.0	124	0.100	37.3	3.32	1.75	1.05	1.66	2.77
45.0	145	0.150	37.7	3.84	2.63	1.11	1.92	2.97
45.0	162	0.200	37.5	4.25	3.51	1.08	2.13	3.21
45.0	179	0.250	37.2	4.66	4.39	1.04	2.33	3.45
45.0	193	0.300	37.0	4.98	5.26	1.01	2.49	3.64



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-156	Consolidation Pressure :	25.0 psi
Depth(ft):	38	Initial Sample Height:	5.725 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.696 in
Sample Description:	Dark Yellowish Brown Clay	Final Sample Area (A)*:	5.321 sq. in.
		Induced OCR=	1.0

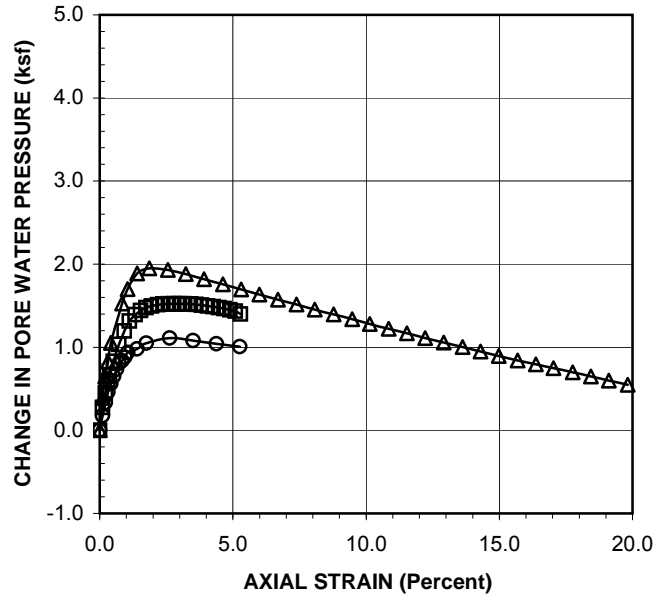
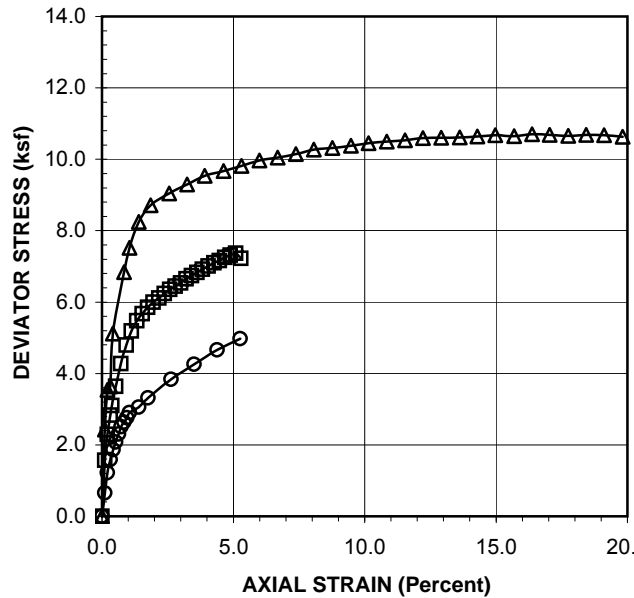
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	0	0.000	30.0	0.00	0.00	0.00	0.00	3.60
55.0	58	0.006	31.9	1.57	0.11	0.27	0.78	4.11
55.0	85	0.012	33.1	2.30	0.21	0.45	1.15	4.30
55.0	105	0.018	34.1	2.83	0.32	0.59	1.42	4.43
55.0	115	0.022	34.6	3.10	0.38	0.66	1.55	4.49
55.0	135	0.030	35.8	3.63	0.52	0.83	1.82	4.59
55.0	159	0.041	37.2	4.27	0.72	1.03	2.14	4.70
55.0	179	0.053	38.3	4.80	0.93	1.20	2.40	4.80
55.0	194	0.064	39.1	5.19	1.11	1.31	2.60	4.88
55.0	205	0.076	39.7	5.47	1.33	1.39	2.74	4.94
55.0	213	0.087	40.0	5.68	1.53	1.44	2.84	5.00
55.0	220	0.099	40.3	5.85	1.74	1.48	2.93	5.05
55.0	226	0.111	40.4	6.00	1.95	1.50	3.00	5.10
55.0	231	0.124	40.5	6.12	2.17	1.51	3.06	5.15
55.0	236	0.135	40.5	6.23	2.38	1.52	3.12	5.20
55.0	241	0.147	40.6	6.35	2.58	1.52	3.18	5.26
55.0	245	0.159	40.6	6.45	2.79	1.52	3.22	5.30
55.0	249	0.171	40.6	6.54	3.00	1.52	3.27	5.35
55.0	254	0.182	40.6	6.65	3.20	1.52	3.33	5.41
55.0	258	0.194	40.5	6.74	3.41	1.52	3.37	5.45
55.0	262	0.206	40.5	6.83	3.62	1.51	3.42	5.50
55.0	266	0.218	40.5	6.92	3.82	1.51	3.46	5.56
55.0	270	0.231	40.4	7.01	4.05	1.50	3.51	5.61
55.0	274	0.243	40.3	7.10	4.26	1.49	3.55	5.66
55.0	277	0.255	40.2	7.16	4.47	1.47	3.58	5.71
55.0	281	0.266	40.2	7.25	4.68	1.46	3.62	5.76
55.0	284	0.278	40.1	7.31	4.89	1.45	3.66	5.80
55.0	287	0.290	40.0	7.37	5.10	1.44	3.69	5.85
55.0	282	0.301	39.7	7.23	5.28	1.40	3.61	5.81



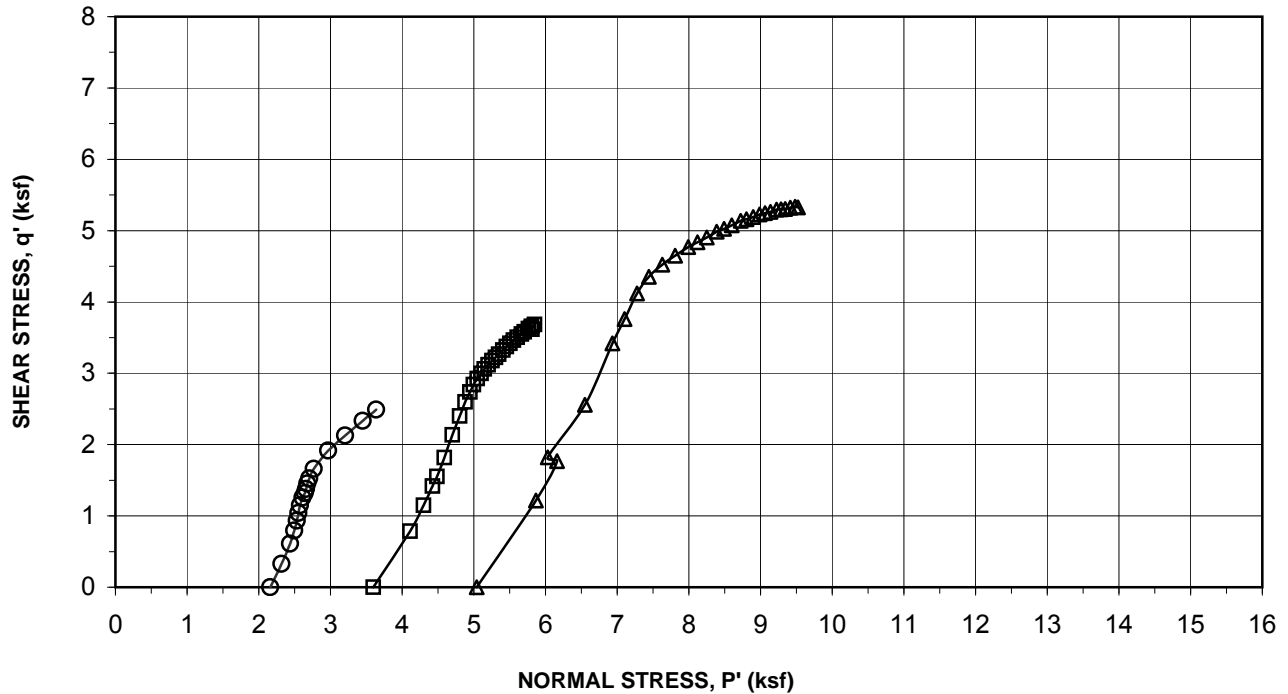
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	West Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-156	Consolidation Pressure :	35.0 psi
Depth(ft):	38	Initial Sample Height:	5.725 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.714 in
Sample Description:	Dark Yellowish Brown Clay	Final Sample Area (A)*:	5.323 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.04
65.0	90	0.006	32.7	2.43	0.11	0.39	1.22	5.87
65.0	131	0.012	34.5	3.54	0.21	0.65	1.77	6.16
65.0	135	0.018	35.8	3.64	0.32	0.83	1.82	6.03
65.0	190	0.024	37.3	5.12	0.42	1.05	2.56	6.55
65.0	255	0.048	40.6	6.84	0.84	1.53	3.42	6.93
65.0	281	0.060	41.8	7.52	1.05	1.70	3.76	7.10
65.0	309	0.080	43.1	8.24	1.40	1.89	4.12	7.27
65.0	328	0.106	43.6	8.71	1.86	1.95	4.35	7.44
65.0	343	0.146	43.4	9.04	2.56	1.93	4.52	7.63
65.0	355	0.185	43.1	9.29	3.23	1.88	4.65	7.81
65.0	367	0.224	42.6	9.54	3.91	1.82	4.77	7.99
65.0	375	0.264	42.2	9.68	4.63	1.76	4.84	8.12
65.0	383	0.304	41.8	9.81	5.31	1.70	4.91	8.25
65.0	392	0.342	41.4	9.97	5.99	1.63	4.98	8.39
65.0	398	0.382	40.9	10.05	6.69	1.57	5.02	8.49
65.0	405	0.422	40.5	10.15	7.38	1.51	5.07	8.60
65.0	413	0.461	40.1	10.27	8.07	1.45	5.14	8.72
65.0	418	0.501	39.7	10.32	8.77	1.39	5.16	8.80
65.0	424	0.541	39.3	10.38	9.47	1.34	5.19	8.90
65.0	430	0.580	38.9	10.45	10.14	1.28	5.23	8.99
65.0	435	0.620	38.5	10.49	10.84	1.22	5.25	9.06
65.0	440	0.659	38.1	10.53	11.54	1.17	5.26	9.14
65.0	446	0.698	37.7	10.59	12.22	1.11	5.30	9.22
65.0	450	0.738	37.3	10.60	12.91	1.06	5.30	9.29
65.0	454	0.778	37.0	10.61	13.62	1.00	5.30	9.34
65.0	459	0.817	36.6	10.64	14.29	0.95	5.32	9.41
65.0	464	0.856	36.2	10.67	14.98	0.89	5.34	9.48
65.0	467	0.897	35.9	10.65	15.69	0.84	5.33	9.52
65.0	473	0.935	35.5	10.70	16.37	0.79	5.35	9.60
65.0	476	0.974	35.2	10.68	17.04	0.75	5.34	9.63
65.0	479	1.014	34.9	10.66	17.75	0.70	5.33	9.67
65.0	484	1.053	34.5	10.68	18.43	0.65	5.34	9.73
65.0	488	1.092	34.2	10.68	19.12	0.60	5.34	9.78
65.0	490	1.133	33.8	10.63	19.82	0.55	5.31	9.81



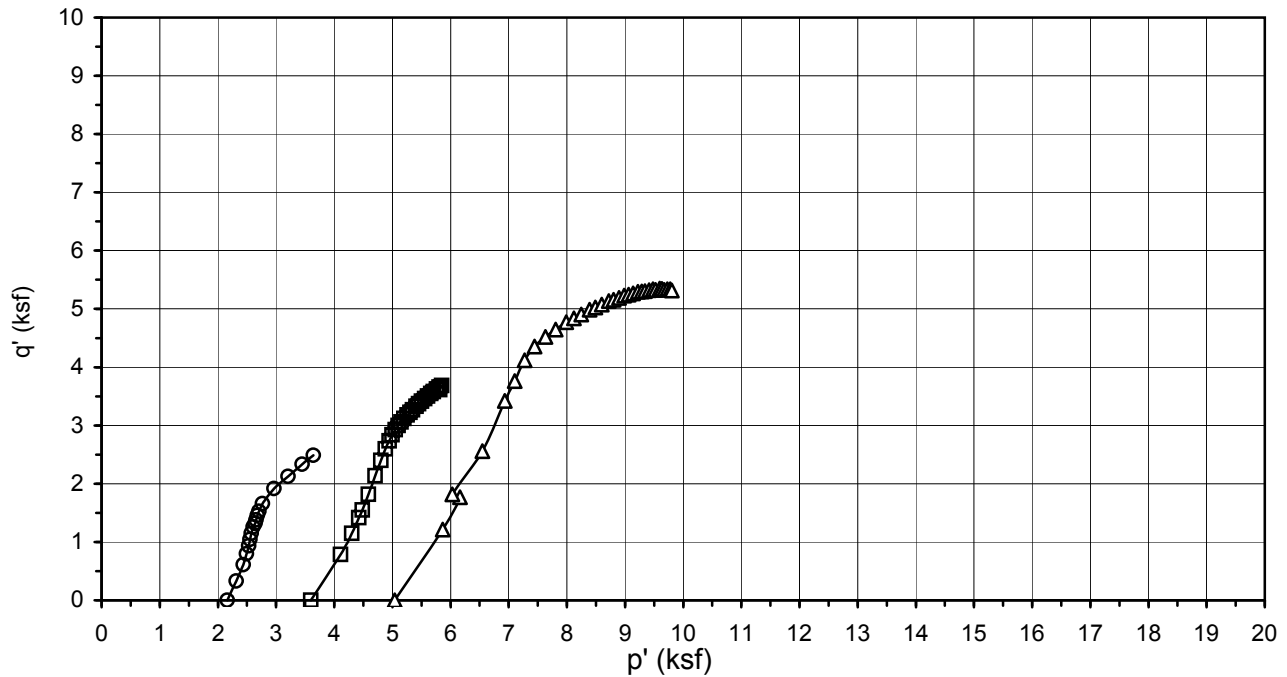
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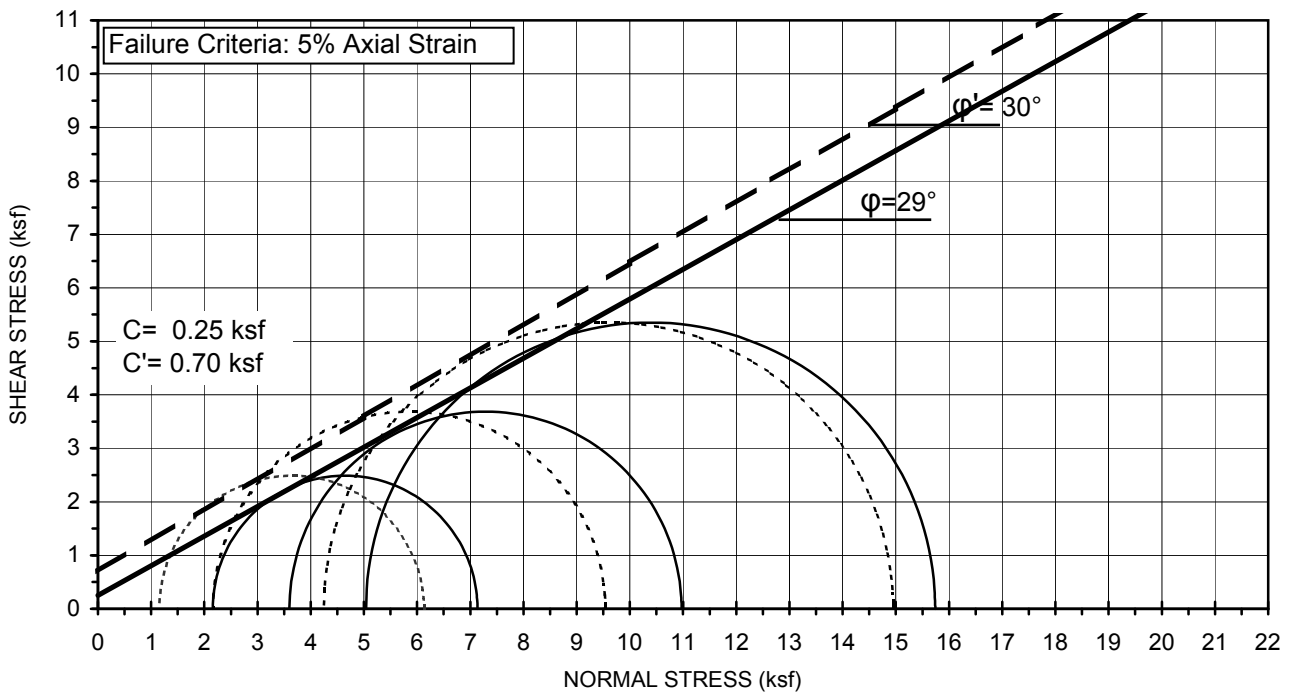
Project Name: West Subway Extension
Project No.: 4953-10-1561
Test Pit: G-156
Sample No.: -
Depth (ft): 38

Sample Type: Mod. Cal.
Sample Description: Dark Yellowish Brown Clay
Avg. Dry Unit Weight (pcf): 109.3
Avg. Initial Moisture Content (%): 17.3
Confining Pressure: 15.0, 25.0, 35.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

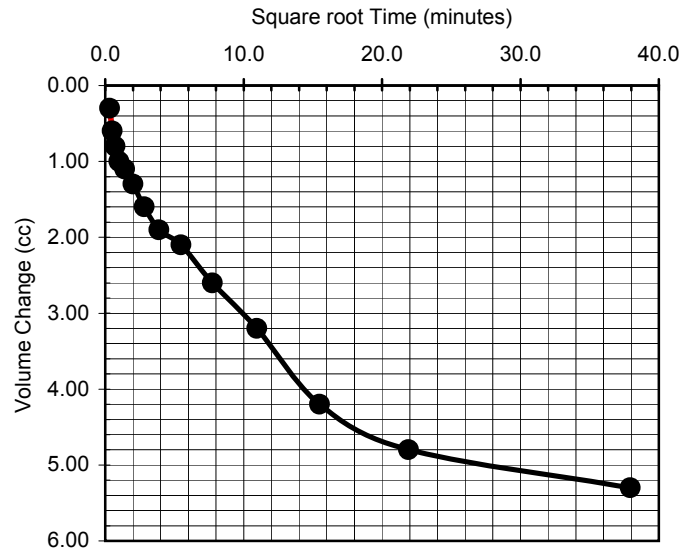
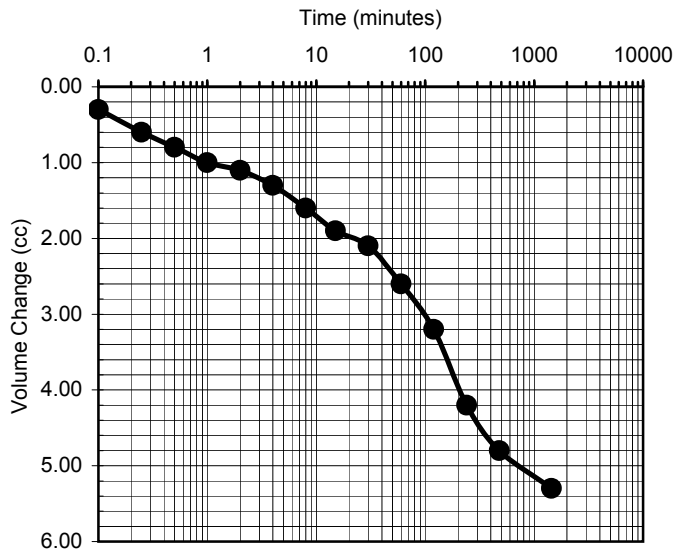


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 25 psi △ 35 psi



Project Name:	West Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Yellowish Brown Clay
Test Pit:	G-156	Avg. Dry Unit Weight (pcf):	109.3
Sample No.:	-	Avg. Initial Moisture Content (%):	17.3
Depth (ft):	38	Confining Pressure:	15.0, 25.0, 35.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-156	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Dark Yellowish Brown Clay
Depth (feet):	38	Eff. Confining Pressure (psi):	25.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.3000
0.25	0.6000
0.5	0.8000
1	1.0000
2	1.1000
4	1.3000
8	1.6000
15	1.9000
30	2.1000
60	2.6000
120	3.2000
240	4.2000
480	4.8000
1440	5.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.3000
0.5000	0.6000
0.7071	0.8000
1.0000	1.0000
1.4142	1.1000
2.0000	1.3000
2.8284	1.6000
3.8730	1.9000
5.4772	2.1000
7.7460	2.6000
10.9545	3.2000
15.4919	4.2000
21.9089	4.8000
37.9473	5.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	West Subway Extension
Project No.:	4953-10-1561
Date:	06/01/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-15-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-25-11**
 Test Pit: **G-186** Reviewed by: **AP** Date: **07-25-11**
 Sample No.: **4** Sample Description: **Gryish Brn Silty-Clayey Sand**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 5.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.840</u>	<u>4.840</u>	<u>4.840</u>	Avg. =	4.840

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.382
Moisture Content (%)	12.37	15.45
Wet Weight (gms)	365.28	1069.75
Dry Weight (gms)	341.45	946.35
Container Weight (gms)	148.79	147.89
Density and Saturation		
Wet Weight (gms)	915.65	
Container Weight (gms)	0.00	
Wet Density (pcf)	134.2	
Dry Density (pcf)	119.4	
Initial Void Ratio	0.411	
% Saturation	81.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	75.2
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	74.7
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	4.825
Induced OCR =	1.0	Initial Volume (cu.in)=	25.994
Change in Ht. of Specimen (in) =	0.0154	Final Volume (cu.in) =	25.964

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.76
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.71
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.47
		Axial Strain (%) =	5.13



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-15-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-25-11**
 Test Pit: **G-186** Reviewed by: **AP** Date: **07-25-11**
 Sample No.: **4** Sample Description: **Gryish Brn Silty-Clayey Sand**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 15.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.840</u>	<u>4.840</u>	<u>4.840</u>	Avg. =	4.840

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.324
Moisture Content (%)	12.37	15.45
Wet Weight (gms)	365.28	1069.75
Dry Weight (gms)	341.45	946.35
Container Weight (gms)	148.79	147.89
Density and Saturation		
Wet Weight (gms)	915.65	
Container Weight (gms)	0.00	
Wet Density (pcf)	134.2	
Dry Density (pcf)	119.4	
Initial Void Ratio	0.411	
% Saturation	81.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)= 74.7
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)= 71.0
Eff. Consol. Stress (psi) =	15.0	Final Height (in)= 4.840
Induced OCR=	1.0	Initial Volume (cu.in)= 25.994
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 25.769

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) = 10.98
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) = 3.39
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 14.37
		Axial Strain (%) = 5.15



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-15-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-25-11**
 Test Pit: **G-186** Reviewed by: **AP** Date: **07-25-11**
 Sample No.: **4** Sample Description: **Gryish Brn Silty-Clayey Sand**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.840</u>	<u>4.840</u>	<u>4.840</u>	Avg. =	4.840

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.333
Moisture Content (%)	12.37	15.45
Wet Weight (gms)	365.28	1069.75
Dry Weight (gms)	341.45	946.35
Container Weight (gms)	148.79	147.89
Density and Saturation		
Wet Weight (gms)	915.65	
Container Weight (gms)	0.00	
Wet Density (pcf)	134.2	
Dry Density (pcf)	119.4	
Initial Void Ratio	0.411	
% Saturation	81.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	70.9
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	67.9
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	4.840
Induced OCR =	1.0	Initial Volume (cu.in)=	25.994
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	25.811

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	16.10
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.88
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	20.98
		Axial Strain (%) =	5.07



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-186	Consolidation Pressure :	5.0 psi
Depth(ft):	15.5	Initial Sample Height:	4.840 in
Sample No.:	4	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.825 in
Sample Description:	Gryish Brn Silty-Clayey Sand	Final Sample Area (A)*:	5.382 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	1	0.000	40.0	0.03	0.00	0.00	0.01	0.73
45.0	25	0.004	40.9	0.67	0.08	0.14	0.33	0.92
45.0	35	0.011	41.3	0.93	0.23	0.18	0.47	1.00
45.0	44	0.019	41.4	1.17	0.38	0.20	0.59	1.10
45.0	51	0.026	41.4	1.36	0.53	0.20	0.68	1.20
45.0	59	0.033	41.3	1.57	0.68	0.19	0.78	1.32
45.0	67	0.040	41.2	1.78	0.82	0.17	0.89	1.44
45.0	75	0.046	41.0	1.99	0.96	0.14	0.99	1.57
45.0	83	0.053	40.8	2.20	1.10	0.11	1.10	1.71
45.0	91	0.060	40.5	2.40	1.25	0.08	1.20	1.85
45.0	100	0.067	40.3	2.64	1.39	0.04	1.32	2.00
45.0	108	0.074	40.0	2.85	1.52	-0.01	1.42	2.15
45.0	116	0.080	39.7	3.05	1.66	-0.05	1.53	2.30
45.0	124	0.088	39.3	3.26	1.81	-0.10	1.63	2.45
45.0	131	0.095	39.0	3.44	1.96	-0.15	1.72	2.59
45.0	138	0.101	38.6	3.62	2.10	-0.20	1.81	2.72
45.0	144	0.108	38.3	3.77	2.25	-0.25	1.88	2.85
45.0	150	0.116	38.0	3.92	2.40	-0.30	1.96	2.97
45.0	156	0.123	37.6	4.07	2.55	-0.34	2.03	3.10
45.0	161	0.131	37.3	4.19	2.71	-0.39	2.10	3.20
45.0	167	0.138	37.0	4.34	2.87	-0.43	2.17	3.32
45.0	172	0.145	36.7	4.46	3.01	-0.48	2.23	3.43
45.0	177	0.153	36.4	4.59	3.16	-0.52	2.29	3.53
45.0	181	0.161	36.1	4.68	3.33	-0.56	2.34	3.62
45.0	186	0.168	35.8	4.80	3.48	-0.60	2.40	3.72
45.0	191	0.175	35.6	4.93	3.62	-0.64	2.46	3.82
45.0	195	0.182	35.3	5.02	3.77	-0.68	2.51	3.91
45.0	199	0.189	35.0	5.12	3.92	-0.72	2.56	3.99
45.0	203	0.197	34.8	5.21	4.07	-0.75	2.61	4.08
45.0	207	0.204	34.5	5.31	4.22	-0.79	2.65	4.16
45.0	211	0.211	34.3	5.40	4.37	-0.82	2.70	4.24
45.0	214	0.218	34.1	5.47	4.51	-0.86	2.73	4.31
45.0	217	0.225	33.8	5.54	4.67	-0.89	2.77	4.38
45.0	220	0.233	33.6	5.60	4.82	-0.92	2.80	4.44
45.0	223	0.240	33.4	5.67	4.98	-0.95	2.83	4.51
45.0	227	0.248	33.2	5.76	5.13	-0.99	2.88	4.59



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-186	Consolidation Pressure :	15.0 psi
Depth(ft):	15.5	Initial Sample Height:	4.840 in
Sample No.:	4	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.840 in
Sample Description:	Gryish Brn Silty-Clayey Sand	Final Sample Area (A)*:	5.324 sq. in.
		Induced OCR=	1.0

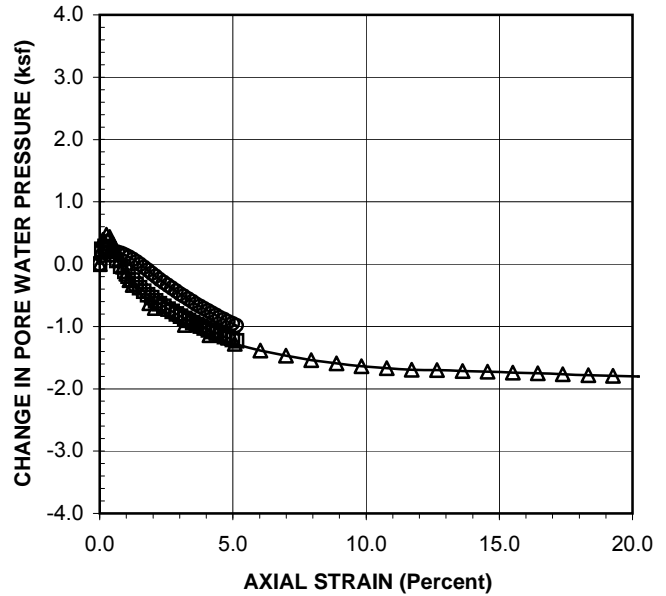
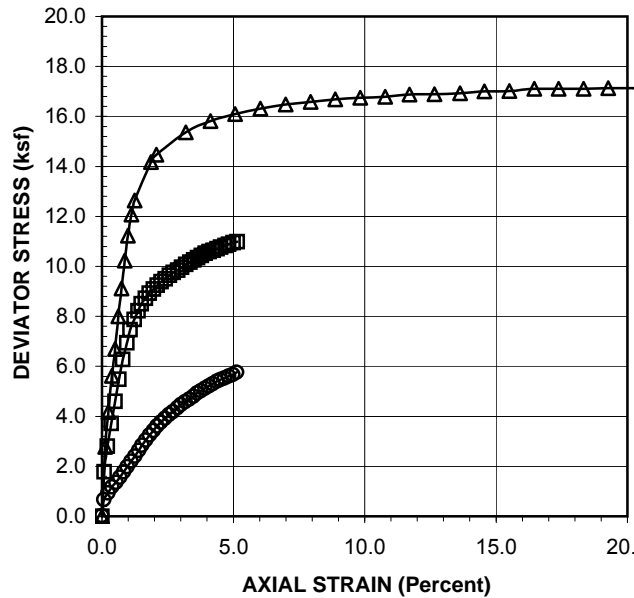
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	0	0.000	40.1	0.00	0.00	0.00	0.00	2.16
55.0	66	0.004	41.8	1.78	0.08	0.23	0.89	2.82
55.0	104	0.010	42.1	2.81	0.20	0.28	1.40	3.28
55.0	138	0.017	41.8	3.72	0.36	0.24	1.86	3.78
55.0	171	0.024	41.2	4.60	0.50	0.15	2.30	4.31
55.0	204	0.031	40.5	5.48	0.64	0.06	2.74	4.84
55.0	234	0.038	39.9	6.28	0.79	-0.04	3.14	5.34
55.0	259	0.046	39.3	6.94	0.95	-0.12	3.47	5.75
55.0	279	0.052	38.8	7.47	1.07	-0.19	3.73	6.09
55.0	295	0.060	38.3	7.88	1.23	-0.26	3.94	6.36
55.0	308	0.067	37.9	8.22	1.37	-0.32	4.11	6.59
55.0	319	0.073	37.5	8.50	1.50	-0.38	4.25	6.79
55.0	328	0.080	37.1	8.72	1.66	-0.44	4.36	6.96
55.0	336	0.087	36.7	8.92	1.80	-0.49	4.46	7.11
55.0	343	0.095	36.4	9.10	1.96	-0.54	4.55	7.25
55.0	349	0.102	36.0	9.24	2.11	-0.59	4.62	7.37
55.0	355	0.109	35.7	9.39	2.25	-0.64	4.69	7.49
55.0	360	0.117	35.4	9.50	2.42	-0.68	4.75	7.59
55.0	366	0.125	35.1	9.64	2.57	-0.72	4.82	7.70
55.0	371	0.132	34.8	9.76	2.72	-0.76	4.88	7.80
55.0	375	0.140	34.6	9.85	2.89	-0.80	4.92	7.88
55.0	380	0.147	34.3	9.97	3.04	-0.84	4.98	7.98
55.0	385	0.155	34.1	10.08	3.19	-0.87	5.04	8.07
55.0	389	0.162	33.8	10.17	3.35	-0.90	5.08	8.15
55.0	393	0.169	33.6	10.26	3.50	-0.94	5.13	8.23
55.0	397	0.176	33.4	10.35	3.64	-0.97	5.17	8.30
55.0	401	0.183	33.2	10.44	3.78	-1.00	5.22	8.38
55.0	405	0.190	33.0	10.52	3.93	-1.03	5.26	8.45
55.0	408	0.198	32.8	10.58	4.08	-1.06	5.29	8.51
55.0	411	0.205	32.6	10.65	4.24	-1.08	5.32	8.57
55.0	414	0.212	32.4	10.71	4.38	-1.11	5.35	8.62
55.0	417	0.219	32.2	10.77	4.52	-1.14	5.38	8.68
55.0	420	0.227	32.0	10.83	4.69	-1.16	5.41	8.74
55.0	423	0.234	31.9	10.89	4.83	-1.19	5.44	8.79
55.0	426	0.242	31.7	10.95	4.99	-1.21	5.47	8.84
55.0	428	0.249	31.6	10.98	5.15	-1.23	5.49	8.88



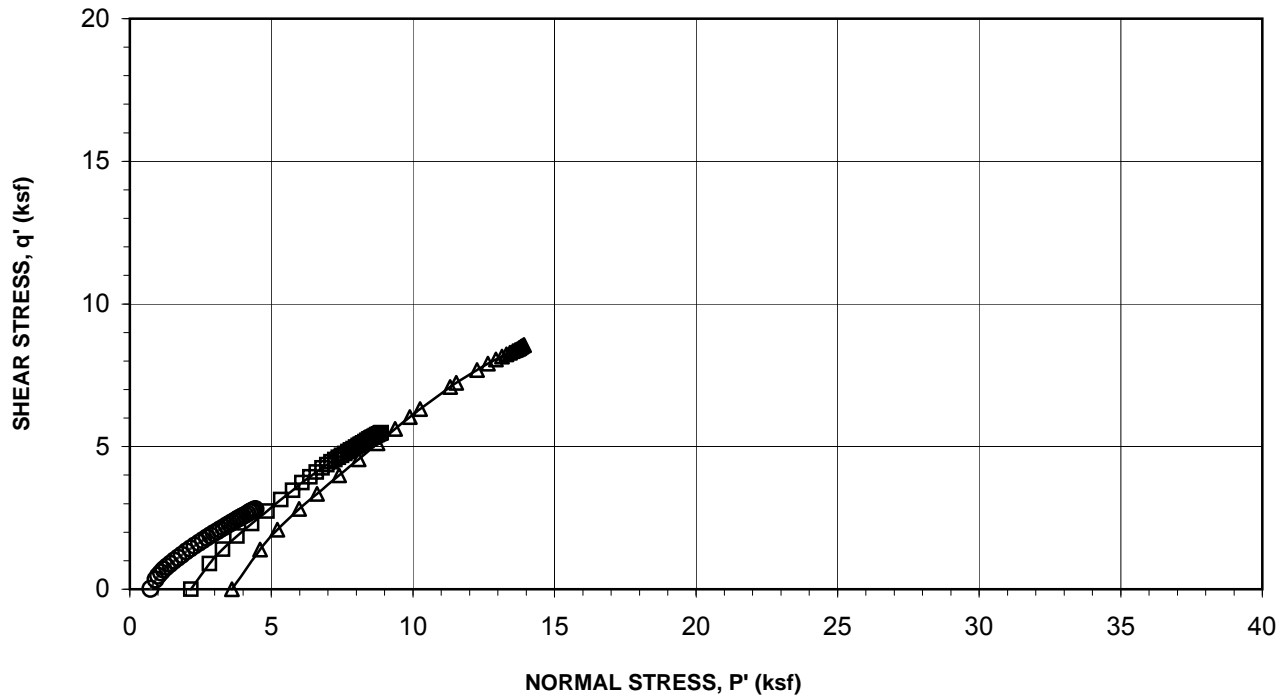
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-186	Consolidation Pressure :	25.0 psi
Depth(ft):	15.5	Initial Sample Height:	4.840 in
Sample No.:	4	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.840 in
Sample Description:	Gryish Brn Silty-Clayey Sand	Final Sample Area (A)*:	5.333 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	40.0	0.00	0.00	0.00	0.00	3.60
65.0	103	0.006	42.7	2.78	0.12	0.39	1.39	4.60
65.0	155	0.012	43.3	4.17	0.25	0.47	2.09	5.21
65.0	209	0.018	43.0	5.62	0.37	0.43	2.81	5.98
65.0	249	0.024	42.3	6.69	0.50	0.33	3.35	6.62
65.0	298	0.030	41.5	8.00	0.62	0.21	4.00	7.39
65.0	340	0.036	40.5	9.11	0.74	0.08	4.56	8.08
65.0	382	0.042	39.7	10.23	0.87	-0.04	5.11	8.75
65.0	420	0.048	38.9	11.23	0.99	-0.16	5.61	9.37
65.0	452	0.054	38.2	12.07	1.12	-0.26	6.03	9.89
65.0	474	0.060	37.7	12.64	1.24	-0.33	6.32	10.25
65.0	535	0.090	35.6	14.18	1.86	-0.62	7.09	11.31
65.0	547	0.100	35.1	14.46	2.07	-0.70	7.23	11.53
65.0	588	0.154	33.2	15.37	3.19	-0.97	7.69	12.26
65.0	611	0.200	32.1	15.82	4.12	-1.14	7.91	12.65
65.0	628	0.246	31.1	16.10	5.07	-1.28	8.05	12.93
65.0	643	0.292	30.4	16.32	6.03	-1.38	8.16	13.14
65.0	656	0.338	29.8	16.48	6.99	-1.47	8.24	13.31
65.0	667	0.384	29.3	16.58	7.94	-1.54	8.29	13.43
65.0	678	0.430	28.9	16.68	8.88	-1.59	8.34	13.53
65.0	688	0.476	28.6	16.75	9.83	-1.64	8.38	13.61
65.0	697	0.522	28.4	16.79	10.78	-1.67	8.40	13.66
65.0	708	0.567	28.2	16.88	11.71	-1.69	8.44	13.73
65.0	716	0.613	28.2	16.89	12.66	-1.70	8.44	13.74
65.0	726	0.659	28.1	16.93	13.62	-1.72	8.47	13.78
65.0	737	0.705	28.0	17.00	14.56	-1.73	8.50	13.83
65.0	746	0.751	27.9	17.02	15.51	-1.74	8.51	13.85
65.0	758	0.796	27.8	17.10	16.45	-1.75	8.55	13.90
65.0	767	0.841	27.7	17.11	17.38	-1.77	8.56	13.92
65.0	776	0.888	27.6	17.11	18.34	-1.78	8.56	13.94
65.0	786	0.933	27.5	17.13	19.27	-1.79	8.57	13.96
65.0	795	0.978	27.5	17.13	20.20	-1.80	8.56	13.97
65.0	804	1.024	27.4	17.12	21.15	-1.81	8.56	13.97

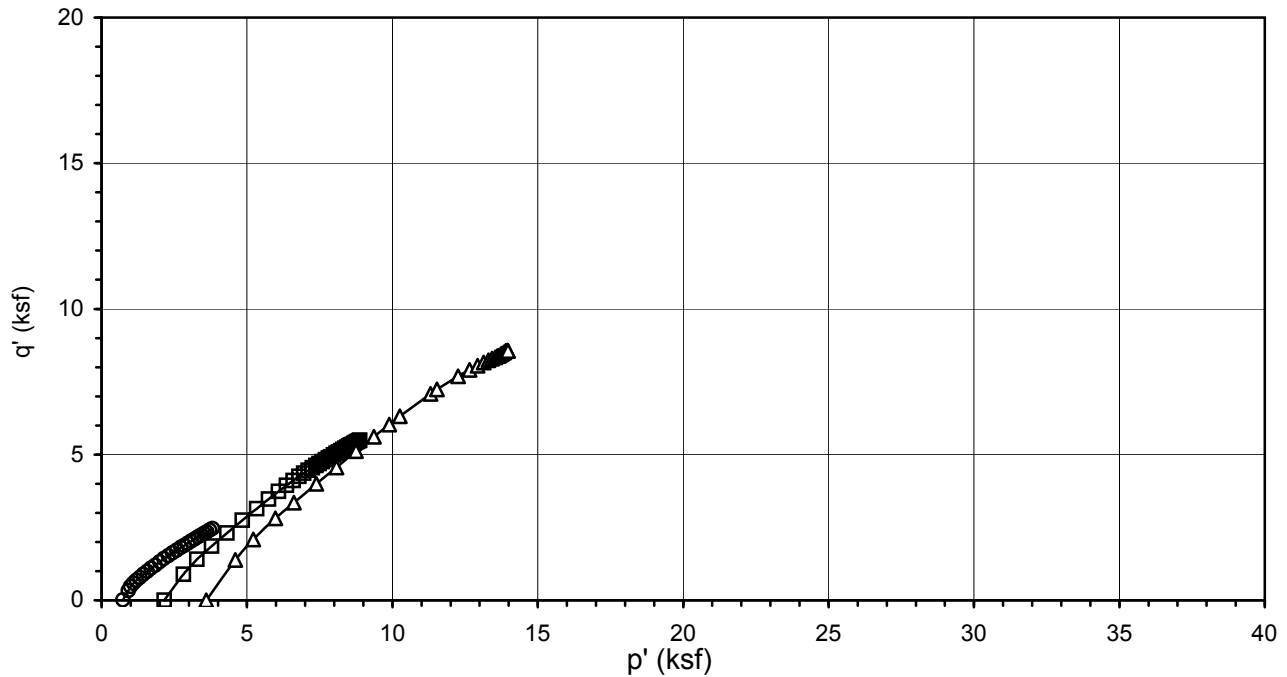


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi

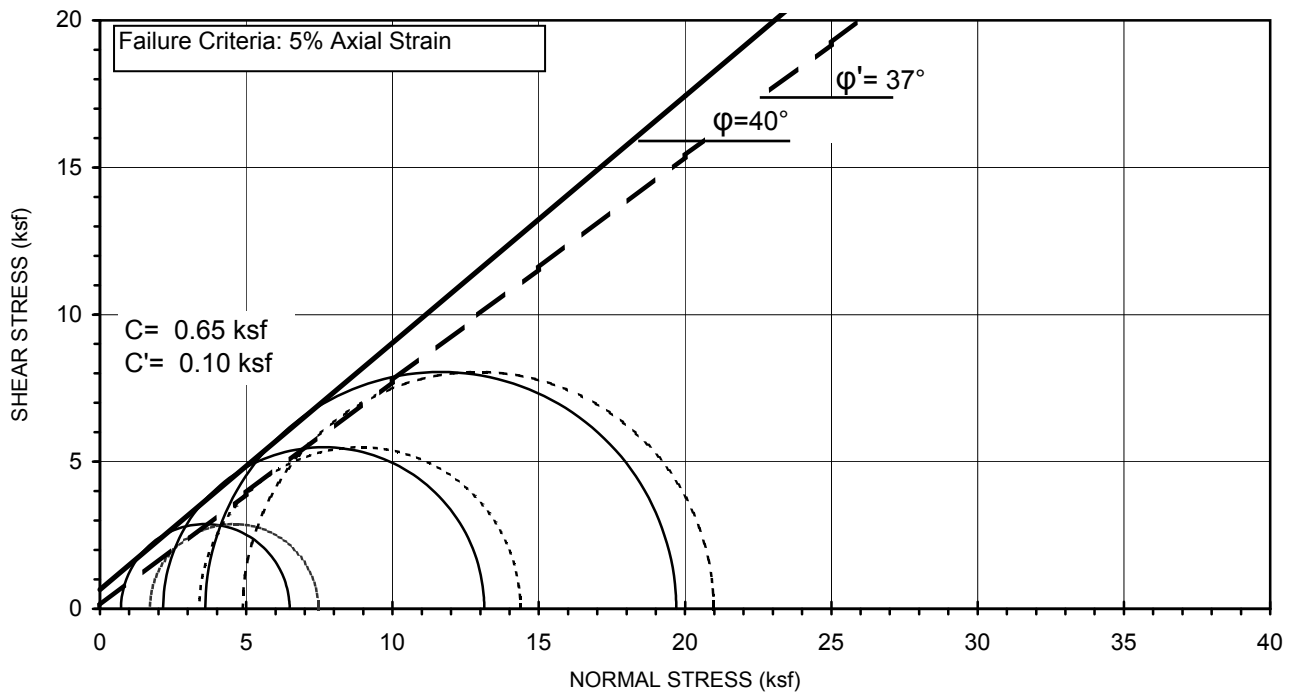


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gryish Brn Silty-Clayey Sand
Test Pit:	G-186	Avg. Dry Unit Weight (pcf):	119.4
Sample No.:	4	Avg. Initial Moisture Content (%):	12.4
Depth (ft):	15.5	Confining Pressure:	5.0, 15.0, 25.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

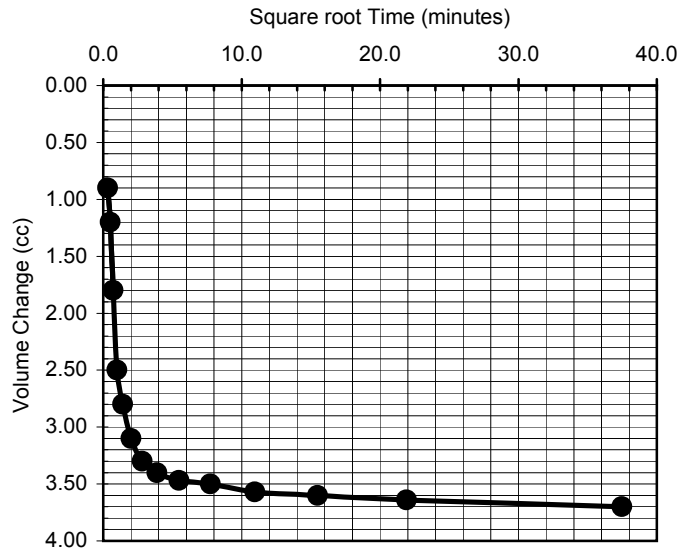
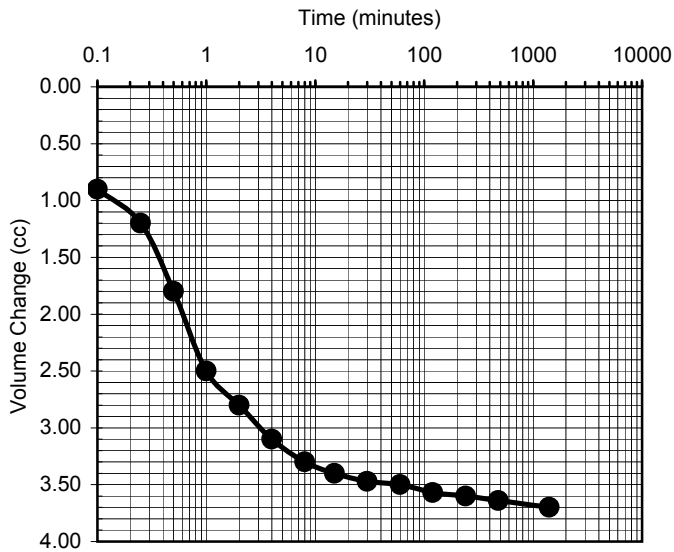


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Gryish Brn Silty-Clayey Sand
Test Pit:	G-186	Avg. Dry Unit Weight (pcf):	119.4
Sample No.:	4	Avg. Initial Moisture Content (%):	12.4
Depth (ft):	15.5	Confining Pressure:	5.0, 15.0, 25.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-186	Sample Type:	Mod. Cal.
Sample No.:	4	Soil Description:	Gryish Brn Silty-Clayey Sand
Depth (feet):	15.5	Eff. Confining Pressure (psi):	15.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.9000
0.25	1.2000
0.5	1.8000
1	2.5000
2	2.8000
4	3.1000
8	3.3000
15	3.4000
30	3.4700
60	3.5000
120	3.5700
240	3.6000
480	3.6400
1404	3.7000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.9000
0.5000	1.2000
0.7071	1.8000
1.0000	2.5000
1.4142	2.8000
2.0000	3.1000
2.8284	3.3000
3.8730	3.4000
5.4772	3.4700
7.7460	3.5000
10.9545	3.5700
15.4919	3.6000
21.9089	3.6400
37.4700	3.7000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/15/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-16-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-25-11
Test Pit:	G-186	Reviewed by:	AP	Date:	07-25-11
Sample No.:	10	Sample Description:	Olive Sandy Silt		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.690</u>	<u>5.690</u>	<u>5.690</u>	Avg. =	5.690

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.334
Moisture Content (%)	16.90	19.67
Wet Weight (gms)	75.36	1143.92
Dry Weight (gms)	71.69	980.52
Container Weight (gms)	49.97	149.81
Density and Saturation		
Wet Weight (gms)	959.28	
Container Weight (gms)	0.00	
Wet Density (pcf)	119.6	
Dry Density (pcf)	102.3	
Initial Void Ratio	0.647	
% Saturation	70.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	77.0
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	70.8
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.658
Induced OCR =	1.0	Initial Volume (cu.in)=	30.559
Change in Ht. of Specimen (in) =	0.0318	Final Volume (cu.in) =	30.181

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.78
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.91
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.69
		Axial Strain (%) =	5.32



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-16-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-25-11**
 Test Pit: **G-186** Reviewed by: **AP** Date: **07-25-11**
 Sample No.: **10** Sample Description: **Olive Sandy Silt**
 Depth(ft): **35.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 30.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.690</u>	<u>5.690</u>	<u>5.690</u>	Avg. =	5.690

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.281
Moisture Content (%)	16.90	19.67
Wet Weight (gms)	<u>75.36</u>	<u>1143.92</u>
Dry Weight (gms)	<u>71.69</u>	<u>980.52</u>
Container Weight (gms)	<u>49.97</u>	<u>149.81</u>
Density and Saturation		
Wet Weight (gms)	<u>959.28</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	119.6	
Dry Density (pcf)	102.3	
Initial Void Ratio	0.647	
% Saturation	70.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>80.0</u>	Initial Burette Ht.(cm)=	<u>70.7</u>
Back Pressure(psi) =	<u>50.0</u>	Final Burette Ht.(cm)=	<u>62.3</u>
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	<u>5.690</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.559</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>30.047</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	13.52
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.45
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.98
		Axial Strain (%) =	5.37



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-16-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-25-11**
 Test Pit: **G-186** Reviewed by: **AP** Date: **07-25-11**
 Sample No.: **10** Sample Description: **Olive Sandy Silt**
 Depth(ft): **35.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 45.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.690</u>	<u>5.690</u>	<u>5.690</u>	Avg. =	5.690

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.309
Moisture Content (%)	16.90	19.67
Wet Weight (gms)	<u>75.36</u>	<u>1143.92</u>
Dry Weight (gms)	<u>71.69</u>	<u>980.52</u>
Container Weight (gms)	<u>49.97</u>	<u>149.81</u>
Density and Saturation		
Wet Weight (gms)	<u>959.28</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	119.6	
Dry Density (pcf)	102.3	
Initial Void Ratio	0.647	
% Saturation	70.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>95.0</u>	Initial Burette Ht.(cm)=	<u>62.4</u>
Back Pressure(psi) =	<u>50.0</u>	Final Burette Ht.(cm)=	<u>56.6</u>
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	<u>5.690</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.559</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>30.206</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	21.22
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	6.87
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	28.09
		Axial Strain (%) =	5.31



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-186	Consolidation Pressure :	15.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.690 in
Sample No.:	10	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.658 in
Sample Description:	Olive Sandy Silt	Final Sample Area (A)*:	5.334 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
65.0	0	0.000	50.0	0.00	0.00	0.00	0.00	2.16
65.0	37	0.004	51.8	1.00	0.08	0.25	0.50	2.41
65.0	54	0.011	53.6	1.45	0.19	0.51	0.73	2.38
65.0	65	0.018	54.8	1.75	0.31	0.69	0.87	2.35
65.0	73	0.025	55.6	1.96	0.45	0.80	0.98	2.34
65.0	79	0.032	56.1	2.12	0.57	0.88	1.06	2.34
65.0	85	0.039	56.5	2.28	0.69	0.93	1.14	2.37
65.0	91	0.047	56.7	2.44	0.83	0.96	1.22	2.42
65.0	96	0.054	56.8	2.57	0.95	0.97	1.28	2.47
65.0	101	0.061	56.9	2.70	1.08	0.98	1.35	2.53
65.0	105	0.068	56.9	2.80	1.20	0.98	1.40	2.58
65.0	110	0.075	56.9	2.93	1.32	0.98	1.47	2.64
65.0	115	0.082	56.8	3.06	1.45	0.97	1.53	2.72
65.0	124	0.096	56.6	3.29	1.69	0.95	1.65	2.86
65.0	128	0.103	56.5	3.39	1.82	0.93	1.70	2.92
65.0	138	0.118	56.3	3.65	2.09	0.90	1.82	3.09
65.0	143	0.126	56.1	3.77	2.23	0.87	1.89	3.17
65.0	147	0.134	55.9	3.87	2.36	0.85	1.94	3.25
65.0	155	0.148	55.6	4.07	2.62	0.80	2.04	3.40
65.0	159	0.156	55.4	4.17	2.75	0.77	2.09	3.48
65.0	163	0.163	55.2	4.27	2.88	0.74	2.14	3.55
65.0	166	0.170	55.0	4.35	3.00	0.72	2.17	3.61
65.0	170	0.177	54.8	4.45	3.13	0.69	2.22	3.69
65.0	173	0.184	54.7	4.52	3.25	0.66	2.26	3.76
65.0	180	0.198	54.3	4.69	3.49	0.61	2.34	3.89
65.0	184	0.204	54.1	4.79	3.61	0.58	2.39	3.97
65.0	191	0.219	53.7	4.96	3.87	0.53	2.48	4.11
65.0	195	0.226	53.5	5.05	4.00	0.50	2.53	4.18
65.0	199	0.234	53.3	5.15	4.13	0.48	2.58	4.26
65.0	206	0.250	53.0	5.32	4.42	0.42	2.66	4.39
65.0	209	0.258	52.8	5.38	4.56	0.40	2.69	4.46
65.0	212	0.265	52.6	5.46	4.68	0.37	2.73	4.52
65.0	218	0.280	52.3	5.59	4.95	0.32	2.80	4.64
65.0	221	0.287	52.1	5.66	5.07	0.30	2.83	4.70
65.0	224	0.294	51.9	5.73	5.19	0.27	2.87	4.76
65.0	226	0.301	51.8	5.78	5.32	0.25	2.89	4.80



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-186	Consolidation Pressure :	30.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.690 in
Sample No.:	10	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.690 in
Sample Description:	Olive Sandy Silt	Final Sample Area (A)*:	5.281 sq. in.
		Induced OCR=	1.0

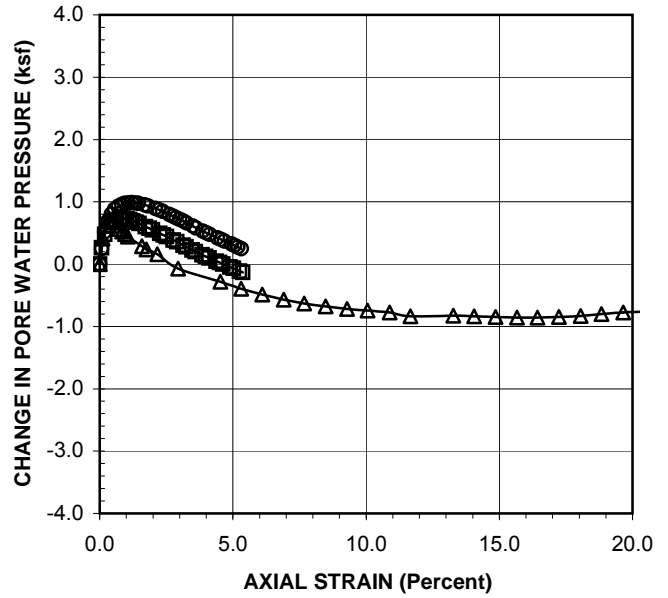
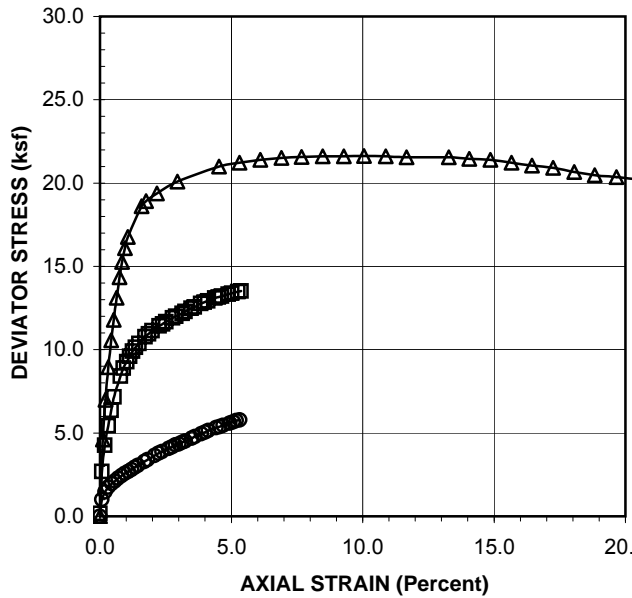
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	6	0.000	50.0	0.16	0.00	0.00	0.08	4.40
80.0	99	0.004	51.8	2.70	0.08	0.26	1.35	5.41
80.0	157	0.011	53.4	4.27	0.19	0.48	2.14	5.98
80.0	200	0.018	54.3	5.44	0.31	0.61	2.72	6.43
80.0	234	0.024	54.7	6.35	0.42	0.68	3.18	6.82
80.0	264	0.031	55.0	7.16	0.54	0.71	3.58	7.19
80.0	311	0.044	55.1	8.42	0.78	0.73	4.21	7.79
80.0	329	0.051	55.1	8.89	0.89	0.73	4.45	8.03
80.0	344	0.058	55.1	9.28	1.02	0.72	4.64	8.24
80.0	356	0.064	55.0	9.60	1.13	0.71	4.80	8.41
80.0	368	0.071	54.8	9.91	1.24	0.69	4.96	8.58
80.0	377	0.077	54.7	10.14	1.36	0.67	5.07	8.72
80.0	386	0.084	54.5	10.37	1.48	0.65	5.19	8.85
80.0	402	0.098	54.2	10.77	1.72	0.60	5.39	9.11
80.0	409	0.106	54.0	10.95	1.86	0.57	5.47	9.22
80.0	417	0.113	53.8	11.15	1.99	0.55	5.57	9.35
80.0	429	0.128	53.4	11.43	2.25	0.49	5.72	9.55
80.0	434	0.136	53.3	11.55	2.39	0.47	5.78	9.63
80.0	439	0.143	53.1	11.67	2.51	0.44	5.84	9.72
80.0	449	0.157	52.7	11.91	2.77	0.39	5.95	9.89
80.0	453	0.165	52.5	12.00	2.89	0.36	6.00	9.96
80.0	461	0.178	52.1	12.18	3.13	0.31	6.09	10.10
80.0	466	0.184	52.0	12.30	3.24	0.28	6.15	10.19
80.0	474	0.197	51.6	12.48	3.47	0.22	6.24	10.33
80.0	478	0.204	51.4	12.57	3.59	0.20	6.28	10.40
80.0	487	0.219	51.0	12.77	3.84	0.15	6.38	10.56
80.0	491	0.226	50.9	12.86	3.98	0.12	6.43	10.63
80.0	494	0.234	50.7	12.92	4.11	0.10	6.46	10.68
80.0	502	0.249	50.4	13.09	4.38	0.05	6.55	10.82
80.0	505	0.256	50.2	13.15	4.50	0.02	6.58	10.87
80.0	508	0.263	50.0	13.21	4.63	0.00	6.61	10.93
80.0	514	0.278	49.7	13.33	4.89	-0.05	6.67	11.03
80.0	517	0.285	49.5	13.39	5.02	-0.07	6.70	11.08
80.0	522	0.298	49.2	13.49	5.24	-0.11	6.74	11.18
80.0	524	0.305	49.1	13.52	5.37	-0.13	6.76	11.22



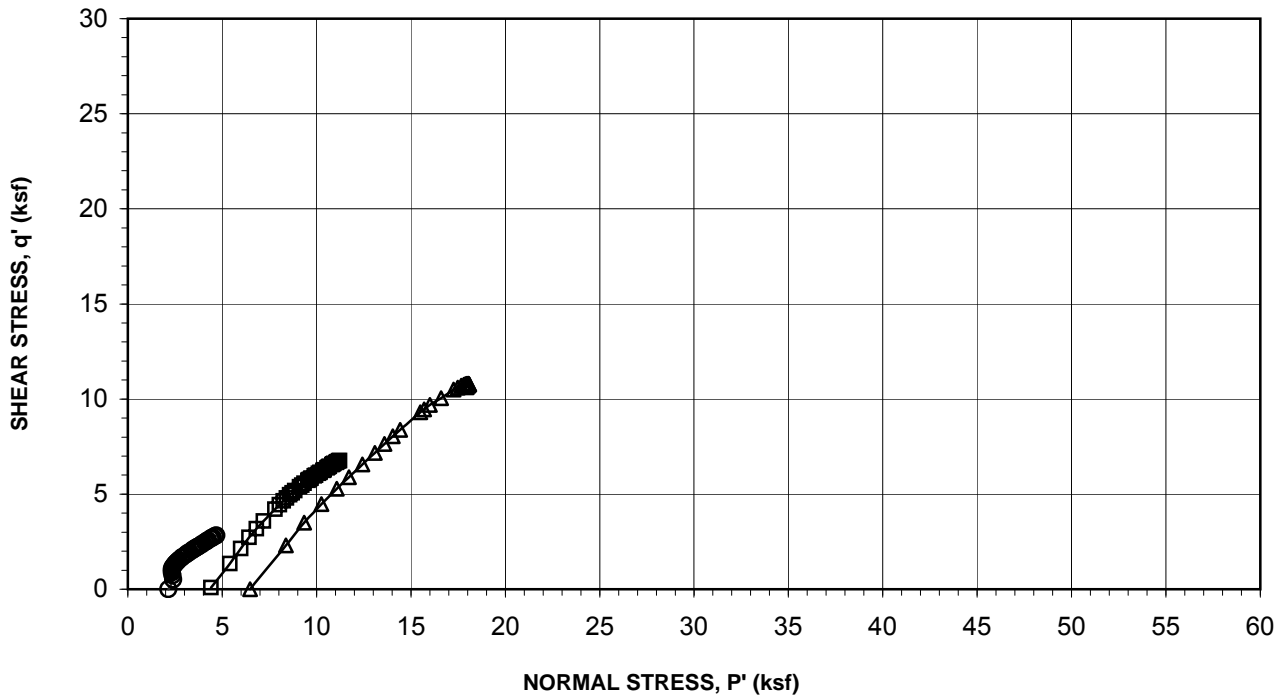
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	95.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-186	Consolidation Pressure :	45.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.690 in
Sample No.:	10	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.690 in
Sample Description:	Olive Sandy Silt	Final Sample Area (A)*:	5.309 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
95.0	0	0.000	50.0	0.00	0.00	0.00	0.00	6.48
95.0	170	0.006	52.9	4.61	0.11	0.41	2.30	8.37
95.0	258	0.012	54.3	6.98	0.21	0.62	3.49	9.35
95.0	331	0.018	54.9	8.95	0.32	0.70	4.48	10.26
95.0	391	0.024	54.8	10.56	0.42	0.70	5.28	11.07
95.0	437	0.030	54.6	11.79	0.53	0.67	5.90	11.71
95.0	487	0.036	54.3	13.13	0.63	0.62	6.56	12.43
95.0	533	0.042	53.9	14.35	0.74	0.56	7.18	13.09
95.0	568	0.048	53.6	15.28	0.84	0.52	7.64	13.60
95.0	599	0.054	53.3	16.09	0.95	0.48	8.05	14.05
95.0	625	0.060	53.1	16.78	1.05	0.44	8.39	14.42
95.0	697	0.090	52.0	18.61	1.58	0.29	9.30	15.50
95.0	710	0.100	51.7	18.92	1.76	0.24	9.46	15.70
95.0	730	0.123	51.1	19.37	2.16	0.16	9.69	16.01
95.0	763	0.168	49.5	20.09	2.95	-0.07	10.04	16.60
95.0	811	0.258	48.1	21.00	4.53	-0.28	10.50	17.26
95.0	826	0.302	47.3	21.22	5.31	-0.39	10.61	17.48
95.0	840	0.347	46.6	21.40	6.10	-0.49	10.70	17.67
95.0	852	0.393	46.1	21.51	6.91	-0.57	10.76	17.81
95.0	861	0.437	45.6	21.56	7.67	-0.63	10.78	17.89
95.0	870	0.483	45.3	21.60	8.48	-0.68	10.80	17.96
95.0	878	0.528	45.0	21.61	9.28	-0.72	10.80	18.00
95.0	886	0.572	44.8	21.62	10.05	-0.74	10.81	18.03
95.0	894	0.619	44.6	21.61	10.88	-0.78	10.81	18.06
95.0	899	0.664	44.2	21.54	11.67	-0.84	10.77	18.09
95.0	916	0.755	44.3	21.55	13.27	-0.83	10.77	18.08
95.0	920	0.800	44.2	21.45	14.06	-0.84	10.72	18.04
95.0	926	0.845	44.1	21.39	14.85	-0.85	10.69	18.02
95.0	928	0.891	44.1	21.23	15.67	-0.86	10.61	17.95
95.0	929	0.935	44.1	21.06	16.44	-0.86	10.53	17.86
95.0	932	0.981	44.1	20.92	17.24	-0.85	10.46	17.79
95.0	930	1.027	44.2	20.67	18.05	-0.83	10.34	17.65
95.0	930	1.072	44.4	20.48	18.83	-0.80	10.24	17.52
95.0	934	1.119	44.6	20.36	19.66	-0.78	10.18	17.43
95.0	940	1.209	44.8	20.08	21.24	-0.75	10.04	17.28

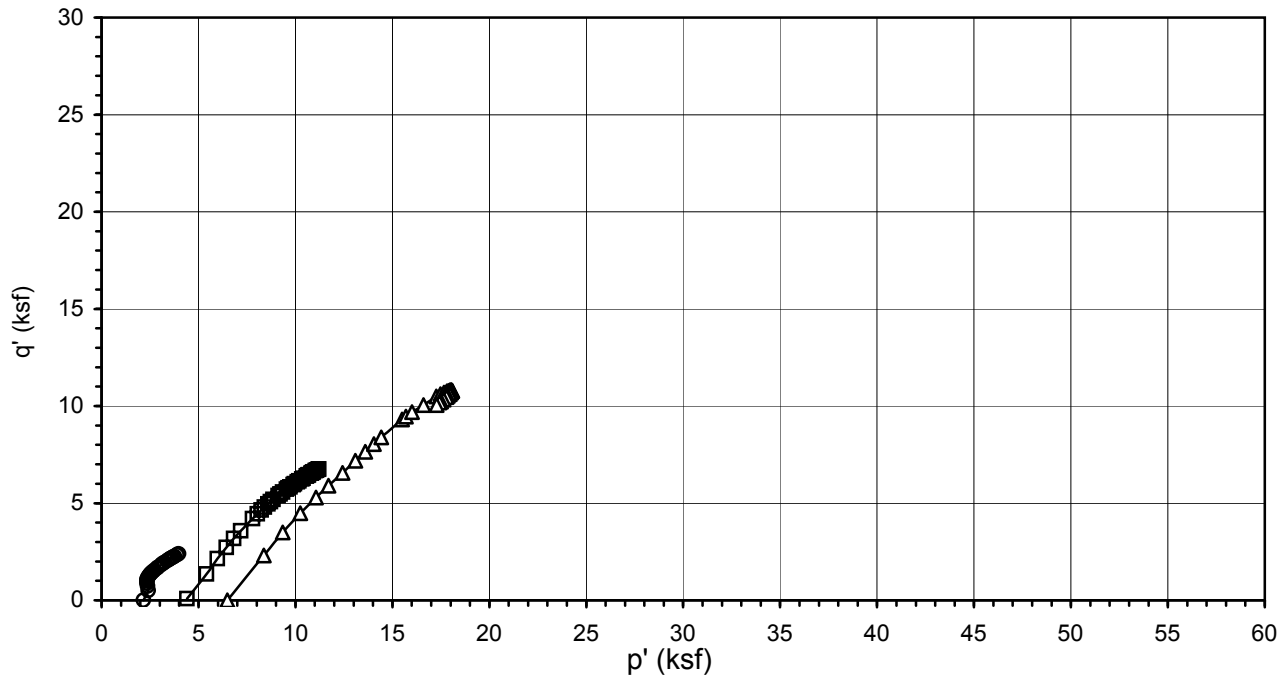


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi

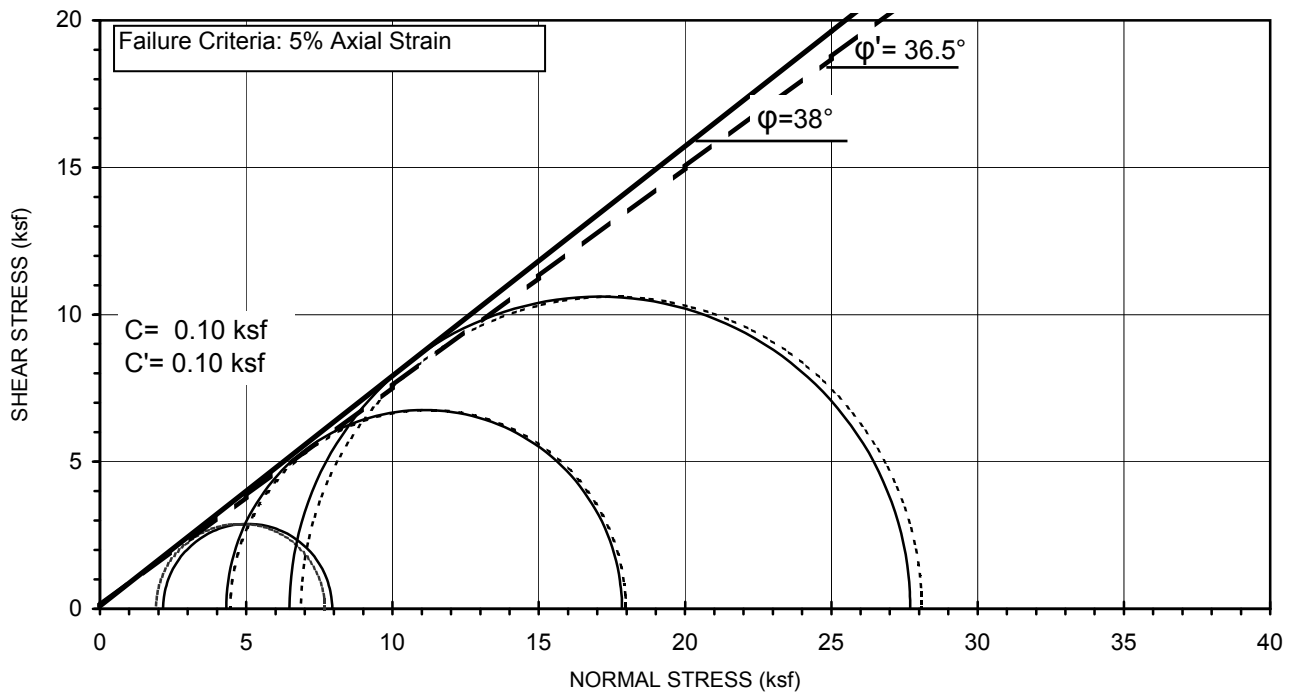


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Sandy Silt
Test Pit:	G-186	Avg. Dry Unit Weight (pcf):	102.3
Sample No.:	10	Avg. Initial Moisture Content (%):	16.9
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

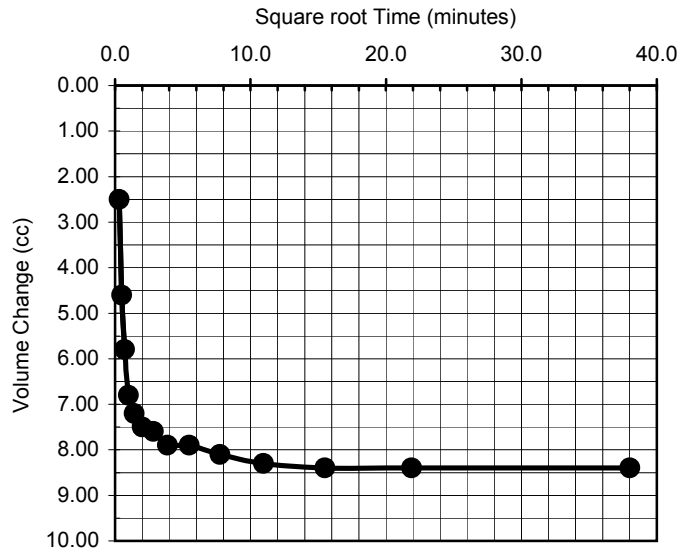
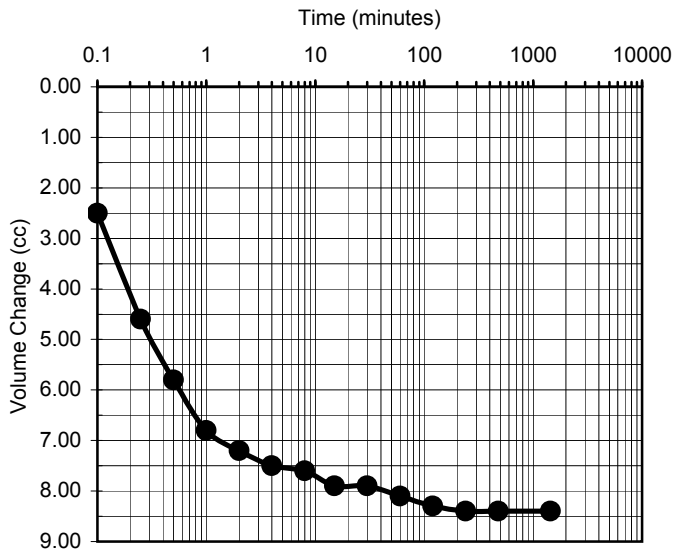


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Olive Sandy Silt
Test Pit:	G-186	Avg. Dry Unit Weight (pcf):	102.3
Sample No.:	10	Avg. Initial Moisture Content (%):	16.9
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-186	Sample Type:	Mod. Cal.
Sample No.:	10	Soil Description:	Olive Sandy Silt
Depth (feet):	35.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	2.5000
0.25	4.6000
0.5	5.8000
1	6.8000
2	7.2000
4	7.5000
8	7.6000
15	7.9000
30	7.9000
60	8.1000
120	8.3000
240	8.4000
480	8.4000
1445	8.4000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	2.5000
0.5000	4.6000
0.7071	5.8000
1.0000	6.8000
1.4142	7.2000
2.0000	7.5000
2.8284	7.6000
3.8730	7.9000
5.4772	7.9000
7.7460	8.1000
10.9545	8.3000
15.4919	8.4000
21.9089	8.4000
38.0132	8.4000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/16/11



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-17-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-25-11**
 Test Pit: **G-186** Reviewed by: **AP** Date: **07-25-11**
 Sample No.: **17** Sample Description: **Strong Brown Clayey Sand**
 Depth(ft): **65.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>6.024</u>	<u>6.024</u>	<u>6.024</u>	Avg. =	6.024

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.337
Moisture Content (%)	15.06	15.46
Wet Weight (gms)	397.48	1295.70
Dry Weight (gms)	379.33	1142.00
Container Weight (gms)	258.83	147.83
Density and Saturation		
Wet Weight (gms)	1149.30	
Container Weight (gms)	0.00	
Wet Density (pcf)	135.3	
Dry Density (pcf)	117.6	
Initial Void Ratio	0.433	
% Saturation	94.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	83.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	76.3
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.984
Induced OCR =	1.0	Initial Volume (cu.in)=	32.353
Change in Ht. of Specimen (in) =	0.0397	Final Volume (cu.in) =	31.938

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	10.80
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	2.35
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	13.16
		Axial Strain (%) =	5.11



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-17-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-25-11
Test Pit:	G-186	Reviewed by:	AP	Date:	07-25-11
Sample No.:	17	Sample Description:	Strong Brown Clayey Sand		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	40.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>6.024</u>	<u>6.024</u>	<u>6.024</u>	Avg. =	6.024

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.310
Moisture Content (%)	15.06	15.46
Wet Weight (gms)	397.48	1295.70
Dry Weight (gms)	379.33	1142.00
Container Weight (gms)	258.83	147.83
Density and Saturation		
Wet Weight (gms)	1149.30	
Container Weight (gms)	0.00	
Wet Density (pcf)	135.3	
Dry Density (pcf)	117.6	
Initial Void Ratio	0.433	
% Saturation	94.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)= 76.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)= 70.2
Eff. Consol. Stress (psi) =	40.0	Final Height (in)= 6.024
Induced OCR=	1.0	Initial Volume (cu.in)= 32.353
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 31.987

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) = 22.62
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) = 6.20
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 28.82
		Axial Strain (%) = 5.00



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-17-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-25-11
Test Pit:	G-186	Reviewed by:	AP	Date:	07-25-11
Sample No.:	17	Sample Description:	Strong Brown Clayey Sand		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	60.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>6.024</u>	<u>6.024</u>	<u>6.024</u>	Avg. =	6.024

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.304
Moisture Content (%)	15.06	15.46
Wet Weight (gms)	397.48	1295.70
Dry Weight (gms)	379.33	1142.00
Container Weight (gms)	258.83	147.83
Density and Saturation		
Wet Weight (gms)	1149.30	
Container Weight (gms)	0.00	
Wet Density (pcf)	135.3	
Dry Density (pcf)	117.6	
Initial Void Ratio	0.433	
% Saturation	94.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	70.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	63.6
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	6.024
Induced OCR =	1.0	Initial Volume (cu.in)=	32.353
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.951

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	30.47
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	8.33
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	38.80
		Axial Strain (%) =	3.40



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-186	Consolidation Pressure :	20.0 psi
Depth(ft):	65.5	Initial Sample Height:	6.024 in
Sample No.:	17	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.984 in
Sample Description:	Strong Brown Clayey Sand	Final Sample Area (A)*:	5.337 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	30.1	0.00	0.00	0.00	0.00	2.88
50.0	45	0.003	33.0	1.21	0.06	0.41	0.61	3.07
50.0	64	0.010	35.2	1.72	0.17	0.74	0.86	3.01
50.0	75	0.017	36.7	2.02	0.29	0.96	1.01	2.93
50.0	84	0.024	37.9	2.26	0.39	1.12	1.13	2.89
50.0	91	0.031	38.7	2.44	0.51	1.24	1.22	2.86
50.0	98	0.038	39.4	2.63	0.63	1.33	1.31	2.86
50.0	104	0.044	39.9	2.79	0.74	1.41	1.39	2.86
50.0	110	0.051	40.3	2.94	0.86	1.46	1.47	2.89
50.0	117	0.057	40.5	3.13	0.95	1.50	1.56	2.94
50.0	124	0.063	40.8	3.31	1.05	1.54	1.66	3.00
50.0	130	0.070	40.9	3.47	1.17	1.56	1.73	3.06
50.0	137	0.077	41.0	3.65	1.28	1.57	1.82	3.13
50.0	144	0.084	41.1	3.83	1.40	1.58	1.92	3.22
50.0	157	0.098	41.1	4.17	1.64	1.58	2.08	3.38
50.0	164	0.106	41.1	4.35	1.77	1.58	2.17	3.48
50.0	171	0.113	41.0	4.53	1.89	1.57	2.26	3.58
50.0	185	0.128	40.8	4.88	2.14	1.54	2.44	3.78
50.0	192	0.136	40.7	5.06	2.27	1.52	2.53	3.89
50.0	208	0.150	40.4	5.47	2.50	1.48	2.74	4.14
50.0	216	0.157	40.2	5.68	2.62	1.45	2.84	4.26
50.0	224	0.163	40.0	5.88	2.72	1.43	2.94	4.39
50.0	243	0.177	39.6	6.36	2.96	1.37	3.18	4.69
50.0	252	0.184	39.4	6.59	3.08	1.33	3.29	4.84
50.0	271	0.198	38.9	7.07	3.31	1.27	3.53	5.15
50.0	281	0.205	38.6	7.32	3.43	1.23	3.66	5.31
50.0	300	0.220	38.1	7.80	3.67	1.15	3.90	5.63
50.0	310	0.227	37.8	8.05	3.80	1.10	4.02	5.80
50.0	319	0.235	37.4	8.27	3.93	1.06	4.13	5.96
50.0	339	0.249	36.8	8.77	4.16	0.96	4.38	6.30
50.0	349	0.257	36.4	9.01	4.30	0.91	4.51	6.47
50.0	360	0.264	36.1	9.28	4.41	0.86	4.64	6.66
50.0	380	0.278	35.3	9.78	4.65	0.76	4.89	7.01
50.0	391	0.285	35.0	10.05	4.76	0.70	5.02	7.20
50.0	412	0.299	34.2	10.56	5.00	0.59	5.28	7.57
50.0	422	0.306	33.8	10.80	5.11	0.53	5.40	7.76



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-186	Consolidation Pressure :	40.0 psi
Depth(ft):	65.5	Initial Sample Height:	6.024 in
Sample No.:	17	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	6.024 in
Sample Description:	Strong Brown Clayey Sand	Final Sample Area (A)*:	5.310 sq. in.
		Induced OCR=	1.0

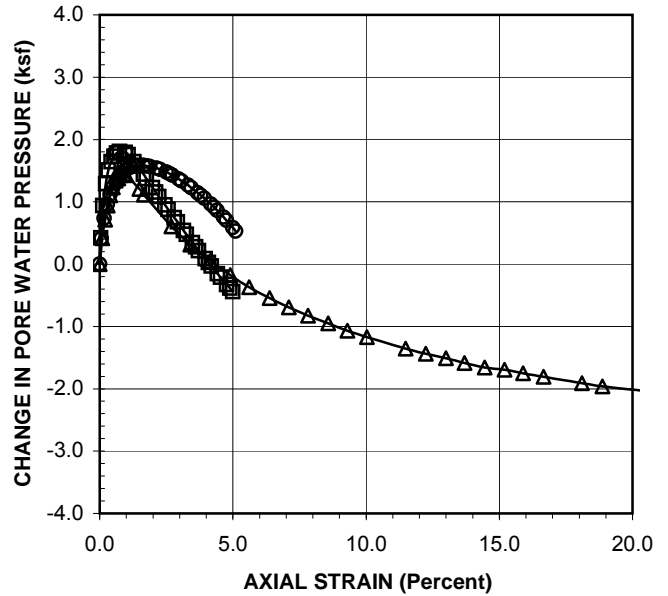
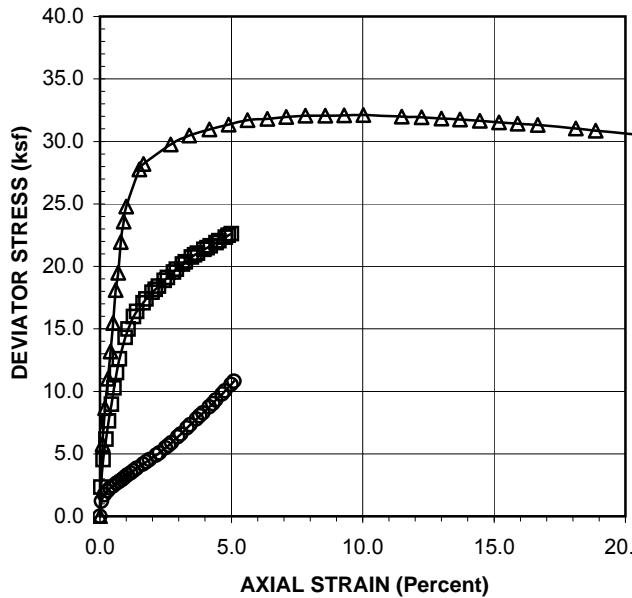
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	3	-0.001	30.1	0.08	-0.01	0.00	0.04	5.80
70.0	86	0.002	33.0	2.33	0.03	0.42	1.17	6.50
70.0	167	0.007	36.6	4.52	0.12	0.94	2.26	7.08
70.0	228	0.014	39.0	6.17	0.23	1.29	3.08	7.56
70.0	282	0.020	40.5	7.62	0.32	1.51	3.81	8.06
70.0	332	0.026	41.5	8.96	0.44	1.64	4.48	8.60
70.0	381	0.033	42.1	10.28	0.54	1.73	5.14	9.17
70.0	427	0.038	42.4	11.51	0.63	1.78	5.75	9.73
70.0	468	0.045	42.6	12.60	0.75	1.81	6.30	10.25
70.0	533	0.058	42.5	14.32	0.96	1.79	7.16	11.13
70.0	558	0.064	42.2	14.97	1.07	1.76	7.49	11.49
70.0	597	0.077	41.5	15.98	1.28	1.64	7.99	12.11
70.0	613	0.085	41.0	16.39	1.40	1.58	8.20	12.37
70.0	640	0.099	40.1	17.07	1.64	1.44	8.54	12.85
70.0	653	0.105	39.6	17.40	1.75	1.37	8.70	13.09
70.0	674	0.120	38.6	17.91	1.99	1.23	8.96	13.49
70.0	684	0.127	38.1	18.16	2.10	1.16	9.08	13.68
70.0	694	0.134	37.6	18.40	2.23	1.09	9.20	13.88
70.0	713	0.148	36.6	18.86	2.45	0.95	9.43	14.24
70.0	723	0.155	36.2	19.10	2.57	0.88	9.55	14.43
70.0	741	0.169	35.2	19.53	2.80	0.74	9.77	14.78
70.0	751	0.176	34.7	19.77	2.92	0.68	9.89	14.97
70.0	768	0.189	33.8	20.17	3.14	0.54	10.09	15.30
70.0	776	0.196	33.4	20.36	3.25	0.48	10.18	15.46
70.0	792	0.210	32.4	20.73	3.48	0.34	10.37	15.78
70.0	800	0.217	32.0	20.91	3.60	0.28	10.46	15.94
70.0	806	0.224	31.5	21.05	3.71	0.21	10.52	16.07
70.0	820	0.239	30.7	21.36	3.96	0.09	10.68	16.35
70.0	826	0.246	30.2	21.49	4.08	0.03	10.74	16.48
70.0	833	0.253	29.8	21.64	4.20	-0.03	10.82	16.61
70.0	845	0.267	29.0	21.90	4.43	-0.15	10.95	16.86
70.0	852	0.273	28.6	22.06	4.54	-0.21	11.03	17.00
70.0	865	0.287	27.8	22.34	4.77	-0.33	11.17	17.26
70.0	872	0.294	27.4	22.49	4.88	-0.38	11.25	17.39
70.0	878	0.301	27.0	22.62	5.00	-0.44	11.31	17.51



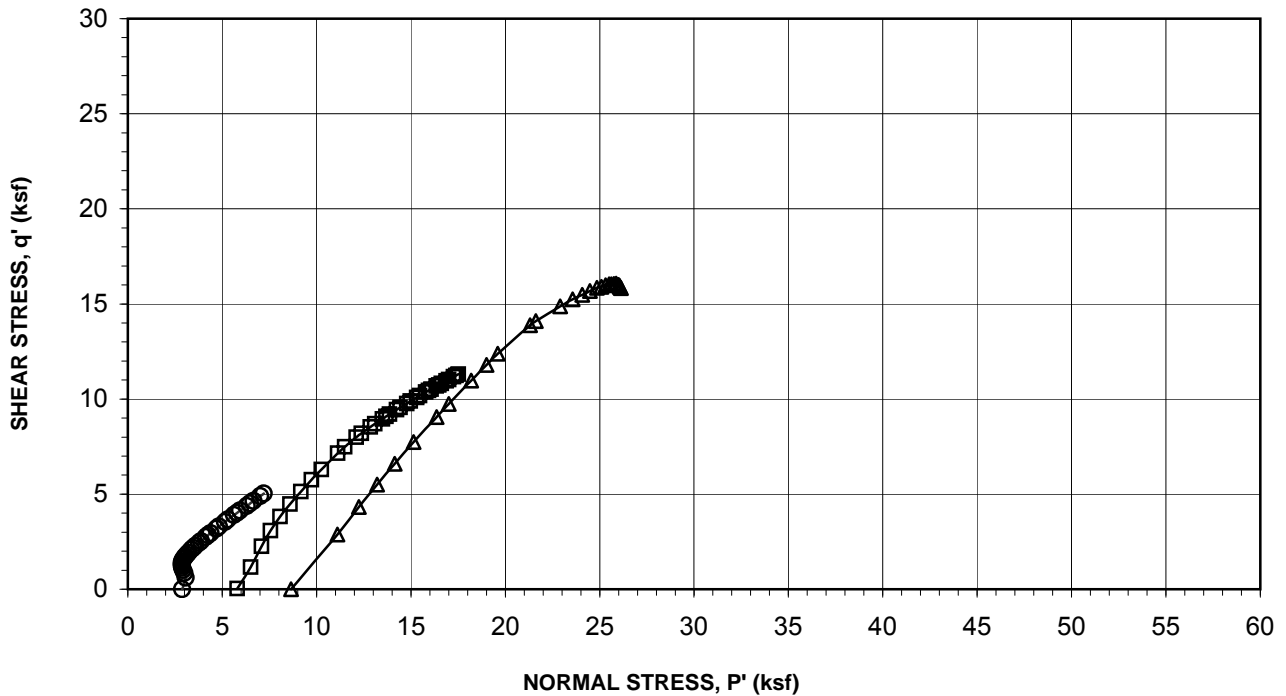
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-186	Consolidation Pressure :	60.0 psi
Depth(ft):	65.5	Initial Sample Height:	6.024 in
Sample No.:	17	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	6.024 in
Sample Description:	Strong Brown Clayey Sand	Final Sample Area (A)*:	5.304 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	212	0.006	32.9	5.75	0.10	0.42	2.88	11.10
90.0	319	0.012	35.0	8.64	0.20	0.71	4.32	12.25
90.0	407	0.018	36.5	11.02	0.30	0.94	5.51	13.21
90.0	488	0.024	37.7	13.20	0.40	1.10	6.60	14.14
90.0	573	0.030	38.6	15.48	0.50	1.23	7.74	15.15
90.0	671	0.036	39.3	18.11	0.60	1.34	9.05	16.36
90.0	723	0.042	39.6	19.49	0.70	1.38	9.75	17.01
90.0	815	0.048	39.9	21.95	0.80	1.43	10.98	18.19
90.0	877	0.054	40.0	23.60	0.90	1.44	11.80	19.00
90.0	922	0.060	39.9	24.78	1.00	1.43	12.39	19.60
90.0	1038	0.090	38.4	27.76	1.49	1.21	13.88	21.31
90.0	1056	0.100	37.7	28.19	1.66	1.11	14.10	21.62
90.0	1126	0.162	34.2	29.75	2.69	0.60	14.87	22.91
90.0	1162	0.205	32.2	30.47	3.40	0.31	15.24	23.57
90.0	1190	0.251	30.4	30.96	4.16	0.05	15.48	24.07
90.0	1214	0.295	28.8	31.35	4.90	-0.18	15.67	24.49
90.0	1237	0.338	27.4	31.70	5.61	-0.37	15.85	24.86
90.0	1251	0.384	26.2	31.80	6.38	-0.55	15.90	25.09
90.0	1267	0.427	25.2	31.96	7.09	-0.70	15.98	25.31
90.0	1281	0.471	24.3	32.06	7.82	-0.83	16.03	25.50
90.0	1292	0.517	23.4	32.07	8.57	-0.95	16.04	25.63
90.0	1303	0.560	22.6	32.09	9.29	-1.07	16.04	25.75
90.0	1315	0.604	21.9	32.12	10.03	-1.17	16.06	25.87
90.0	1331	0.692	20.6	31.99	11.49	-1.36	15.99	25.99
90.0	1340	0.737	20.0	31.93	12.24	-1.44	15.96	26.04
90.0	1347	0.783	19.5	31.82	12.99	-1.51	15.91	26.06
90.0	1355	0.825	19.0	31.75	13.70	-1.59	15.87	26.10
90.0	1363	0.871	18.5	31.66	14.45	-1.66	15.83	26.13
90.0	1369	0.915	18.2	31.52	15.19	-1.70	15.76	26.10
90.0	1376	0.958	17.8	31.42	15.90	-1.75	15.71	26.10
90.0	1384	1.004	17.5	31.32	16.66	-1.81	15.66	26.10
90.0	1396	1.091	16.7	31.04	18.11	-1.91	15.52	26.07
90.0	1401	1.137	16.4	30.86	18.87	-1.96	15.43	26.03
90.0	1413	1.224	15.9	30.57	20.31	-2.03	15.28	25.95

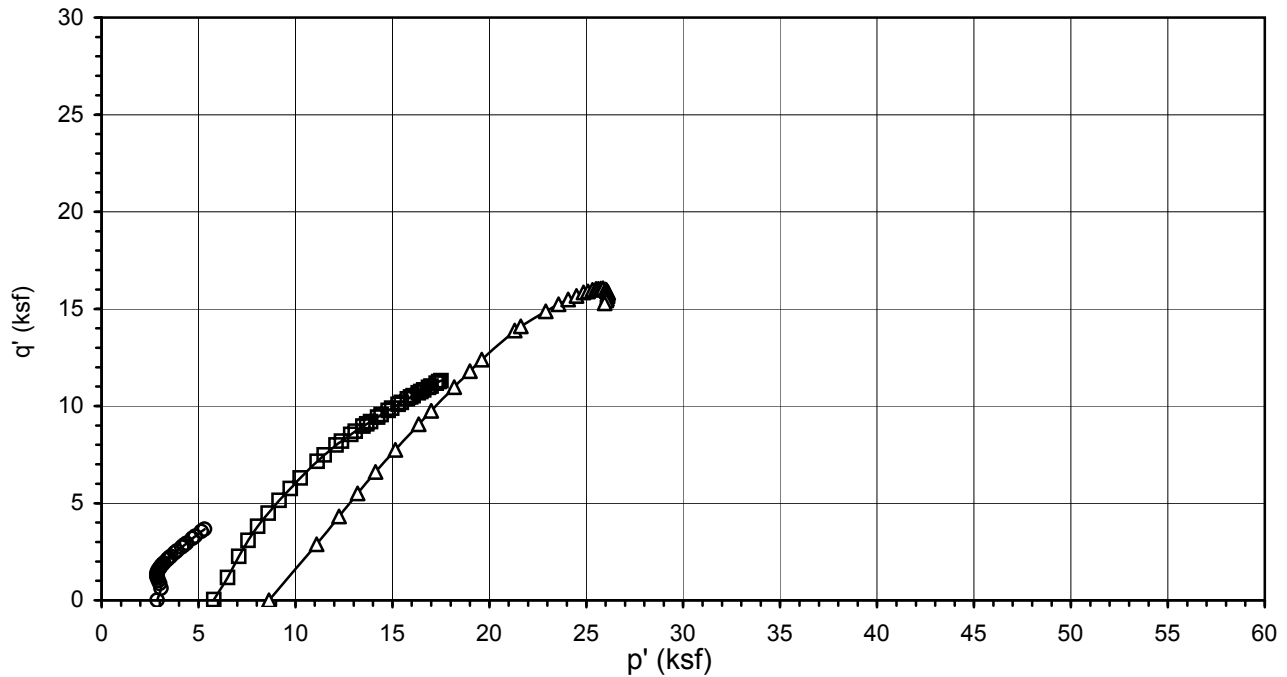


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi

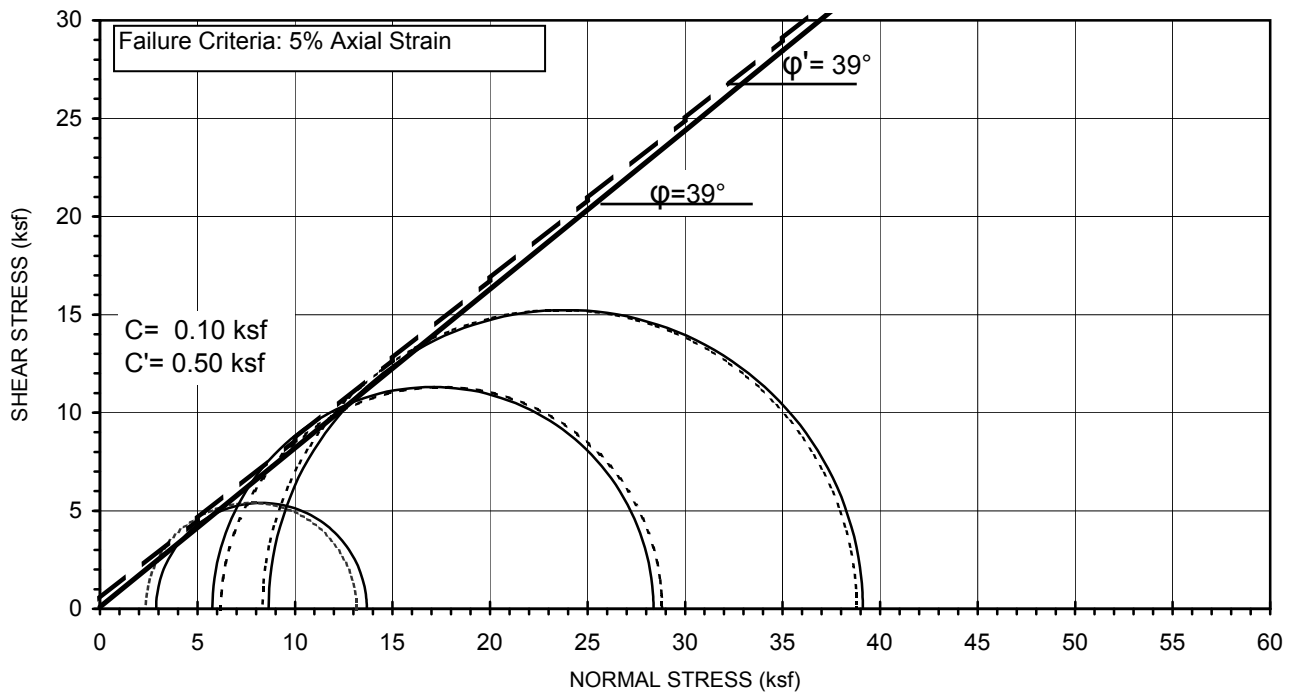


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Strong Brown Clayey Sand
Test Pit:	G-186	Avg. Dry Unit Weight (pcf):	117.6
Sample No.:	17	Avg. Initial Moisture Content (%):	15.1
Depth (ft):	65.5	Confining Pressure:	20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

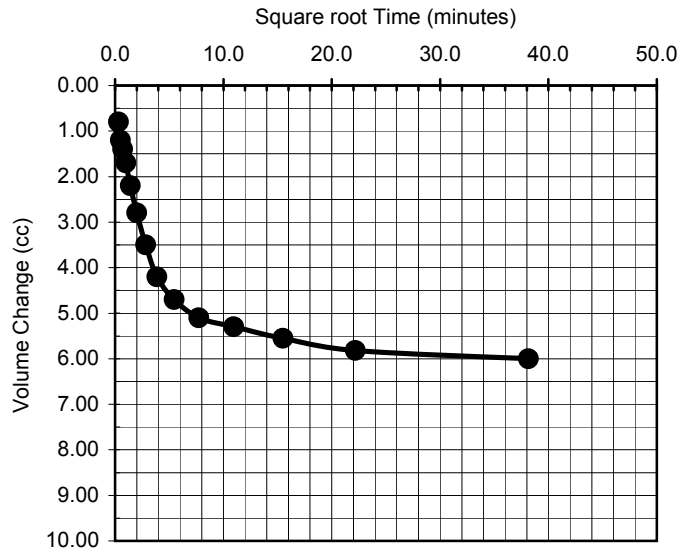
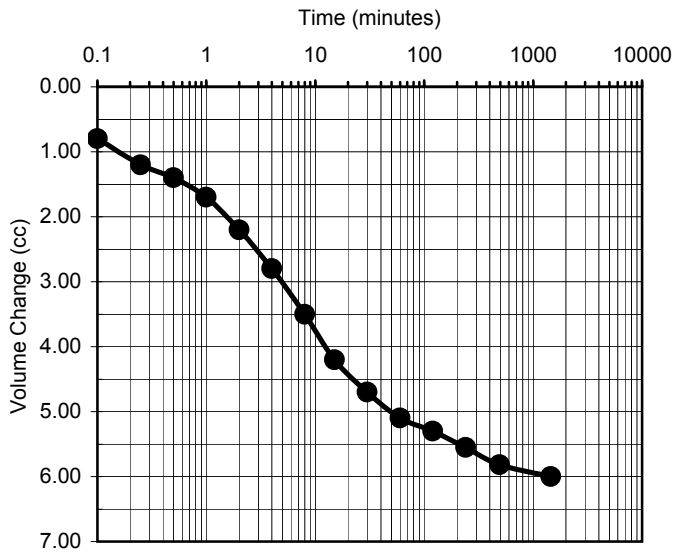


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Strong Brown Clayey Sand
Test Pit:	G-186	Avg. Dry Unit Weight (pcf):	117.6
Sample No.:	17	Avg. Initial Moisture Content (%):	15.1
Depth (ft):	65.5	Confining Pressure:	20.0, 40.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-186	Sample Type:	Mod. Cal.
Sample No.:	17	Soil Description:	Strong Brown Clayey Sand
Depth (feet):	65.5	Eff. Confining Pressure (psi):	40.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.8000
0.25	1.2000
0.5	1.4000
1	1.7000
2	2.2000
4	2.8000
8	3.5000
15	4.2000
30	4.7000
60	5.1000
120	5.3000
240	5.5500
492	5.8200
1457	6.0000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.8000
0.5000	1.2000
0.7071	1.4000
1.0000	1.7000
1.4142	2.2000
2.0000	2.8000
2.8284	3.5000
3.8730	4.2000
5.4772	4.7000
7.7460	5.1000
10.9545	5.3000
15.4919	5.5500
22.1811	5.8200
38.1707	6.0000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/17/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-09-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-189	Reviewed by:	AP	Date:	08-17-11
Sample No.:	3	Sample Description:	Silty Sand		
Depth(ft):	15.5				
Sample Type:	Mod. Cal.	Confining Pressure =	5.0 psi		

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>5.892</u>	<u>5.892</u>	<u>5.892</u>	Avg. =	5.892

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.406
Moisture Content (%)	7.11	11.27
Wet Weight (gms)	301.13	1321.24
Dry Weight (gms)	284.44	1202.44
Container Weight (gms)	49.82	148.53
Density and Saturation		
Wet Weight (gms)	1078.14	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.3	
Dry Density (pcf)	120.7	
Initial Void Ratio	0.396	
% Saturation	48.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	73.8
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	71.6
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	5.851
Induced OCR =	1.0	Initial Volume (cu.in)=	31.765
Change in Ht. of Specimen (in) =	0.0408	Final Volume (cu.in) =	31.631

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	6.10
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.40
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.50
		Axial Strain (%) =	5.06



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-09-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-189	Reviewed by:	AP	Date:	08-17-11
Sample No.:	3	Sample Description:	Silty Sand		
Depth(ft):	15.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>5.892</u>	<u>5.892</u>	<u>5.892</u>	Avg. =	5.892

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.351
Moisture Content (%)	7.11	11.27
Wet Weight (gms)	301.13	1321.24
Dry Weight (gms)	284.44	1202.44
Container Weight (gms)	49.82	148.53
Density and Saturation		
Wet Weight (gms)	1078.14	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.3	
Dry Density (pcf)	120.7	
Initial Void Ratio	0.396	
% Saturation	48.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)= 71.7
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)= 67.8
Eff. Consol. Stress (psi) =	15.0	Final Height (in)= 5.892
Induced OCR=	1.0	Initial Volume (cu.in)= 31.765
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 31.528

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.10
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.85
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	13.95
		Axial Strain (%) =	5.15



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-09-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-189	Reviewed by:	AP	Date:	08-17-11
Sample No.:	3	Sample Description:	Silty Sand		
Depth(ft):	15.5				
Sample Type:	Mod. Cal.	Confining Pressure =	25.0 psi		

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>5.892</u>	<u>5.892</u>	<u>5.892</u>	Avg. =	5.892

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.365
Moisture Content (%)	7.11	11.27
Wet Weight (gms)	301.13	1321.24
Dry Weight (gms)	284.44	1202.44
Container Weight (gms)	49.82	148.53
Density and Saturation		
Wet Weight (gms)	1078.14	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.3	
Dry Density (pcf)	120.7	
Initial Void Ratio	0.396	
% Saturation	48.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	67.8
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	65.3
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.892
Induced OCR =	1.0	Initial Volume (cu.in)=	31.765
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.613

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	15.55
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.18
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	19.72
		Axial Strain (%) =	5.34



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-189	Consolidation Pressure :	5.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.892 in
Sample No.:	3	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.851 in
Sample Description:	Silty Sand	Final Sample Area (A)*:	5.406 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	2	0.000	40.1	0.05	0.00	0.00	0.03	0.75
45.0	28	0.004	40.7	0.75	0.06	0.09	0.37	1.00
45.0	36	0.009	41.2	0.96	0.15	0.17	0.48	1.03
45.0	42	0.014	41.6	1.12	0.25	0.21	0.56	1.06
45.0	47	0.020	41.8	1.25	0.33	0.25	0.62	1.10
45.0	51	0.025	42.0	1.35	0.43	0.27	0.68	1.13
45.0	56	0.031	42.1	1.48	0.52	0.28	0.74	1.18
45.0	60	0.037	42.1	1.59	0.63	0.29	0.79	1.22
45.0	65	0.043	42.2	1.72	0.73	0.30	0.86	1.28
45.0	70	0.048	42.2	1.85	0.82	0.30	0.92	1.34
45.0	74	0.053	42.2	1.95	0.91	0.30	0.98	1.40
45.0	80	0.059	42.1	2.11	1.00	0.30	1.05	1.48
45.0	86	0.064	42.1	2.27	1.09	0.29	1.13	1.56
45.0	92	0.069	42.0	2.42	1.18	0.28	1.21	1.65
45.0	99	0.075	41.9	2.60	1.27	0.27	1.30	1.75
45.0	118	0.090	41.6	3.09	1.54	0.22	1.55	2.05
45.0	139	0.113	40.9	3.63	1.93	0.12	1.82	2.41
45.0	146	0.125	40.6	3.81	2.13	0.07	1.90	2.56
45.0	154	0.137	40.2	4.01	2.33	0.01	2.00	2.71
45.0	162	0.148	39.8	4.21	2.53	-0.04	2.10	2.86
45.0	169	0.160	39.4	4.38	2.73	-0.10	2.19	3.01
45.0	176	0.171	39.0	4.55	2.93	-0.15	2.28	3.15
45.0	183	0.183	38.7	4.72	3.12	-0.21	2.36	3.29
45.0	190	0.194	38.3	4.89	3.31	-0.26	2.45	3.43
45.0	198	0.204	37.9	5.09	3.49	-0.31	2.55	3.58
45.0	206	0.215	37.6	5.29	3.68	-0.36	2.64	3.72
45.0	213	0.226	37.2	5.45	3.86	-0.41	2.73	3.86
45.0	218	0.238	36.9	5.57	4.06	-0.46	2.79	3.96
45.0	223	0.249	36.6	5.69	4.26	-0.50	2.84	4.07
45.0	227	0.261	36.3	5.78	4.47	-0.55	2.89	4.16
45.0	232	0.273	36.0	5.89	4.67	-0.59	2.95	4.26
45.0	237	0.284	35.7	6.01	4.86	-0.64	3.00	4.36
45.0	241	0.296	35.4	6.10	5.06	-0.68	3.05	4.45



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-189	Consolidation Pressure :	15.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.892 in
Sample No.:	3	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.892 in
Sample Description:	Silty Sand	Final Sample Area (A)*:	5.351 sq. in.
		Induced OCR=	1.0

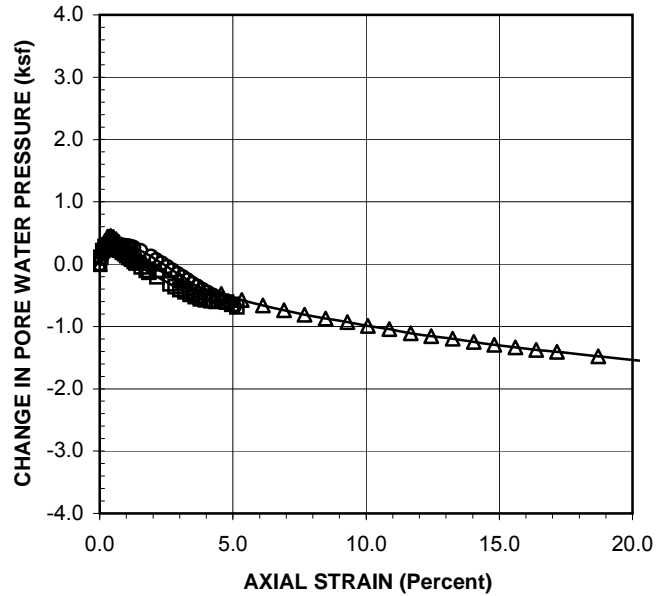
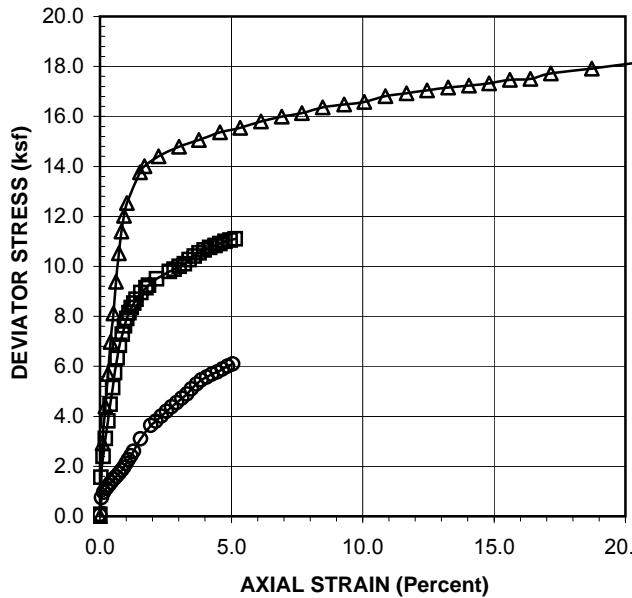
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	3	0.000	40.1	0.08	0.00	0.00	0.04	2.20
55.0	58	0.003	40.9	1.56	0.04	0.11	0.78	2.83
55.0	89	0.007	41.6	2.39	0.12	0.22	1.20	3.14
55.0	116	0.012	42.1	3.12	0.21	0.28	1.56	3.44
55.0	142	0.018	42.3	3.81	0.30	0.31	1.90	3.76
55.0	167	0.023	42.3	4.48	0.39	0.31	2.24	4.09
55.0	192	0.029	42.2	5.14	0.49	0.29	2.57	4.44
55.0	215	0.033	42.0	5.75	0.57	0.27	2.88	4.77
55.0	237	0.039	41.8	6.34	0.66	0.24	3.17	5.08
55.0	256	0.044	41.7	6.84	0.75	0.22	3.42	5.36
55.0	273	0.050	41.5	7.28	0.85	0.19	3.64	5.61
55.0	286	0.055	41.3	7.62	0.94	0.16	3.81	5.81
55.0	297	0.061	41.1	7.91	1.03	0.13	3.96	5.98
55.0	306	0.065	40.9	8.14	1.10	0.10	4.07	6.13
55.0	314	0.071	40.7	8.35	1.20	0.07	4.17	6.26
55.0	321	0.076	40.4	8.53	1.29	0.04	4.26	6.38
55.0	327	0.081	40.2	8.68	1.37	0.01	4.34	6.49
55.0	338	0.092	39.8	8.95	1.56	-0.05	4.48	6.68
55.0	346	0.104	39.4	9.15	1.76	-0.11	4.57	6.84
55.0	350	0.109	39.2	9.24	1.85	-0.13	4.62	6.91
55.0	361	0.127	38.7	9.51	2.15	-0.20	4.75	7.12
55.0	374	0.156	37.9	9.80	2.64	-0.32	4.90	7.38
55.0	378	0.167	37.6	9.88	2.83	-0.36	4.94	7.47
55.0	383	0.178	37.3	10.00	3.02	-0.41	5.00	7.57
55.0	388	0.189	37.0	10.11	3.21	-0.45	5.05	7.66
55.0	395	0.200	36.8	10.27	3.40	-0.49	5.13	7.78
55.0	401	0.212	36.5	10.40	3.59	-0.53	5.20	7.89
55.0	407	0.223	36.3	10.54	3.78	-0.56	5.27	7.99
55.0	412	0.234	36.2	10.65	3.97	-0.57	5.32	8.06
55.0	417	0.246	36.0	10.75	4.18	-0.59	5.38	8.13
55.0	421	0.258	36.0	10.83	4.38	-0.60	5.42	8.18
55.0	425	0.269	36.0	10.91	4.57	-0.59	5.46	8.21
55.0	429	0.281	35.9	10.99	4.76	-0.61	5.50	8.27
55.0	432	0.292	35.7	11.05	4.96	-0.65	5.52	8.33
55.0	435	0.304	35.4	11.10	5.15	-0.69	5.55	8.40



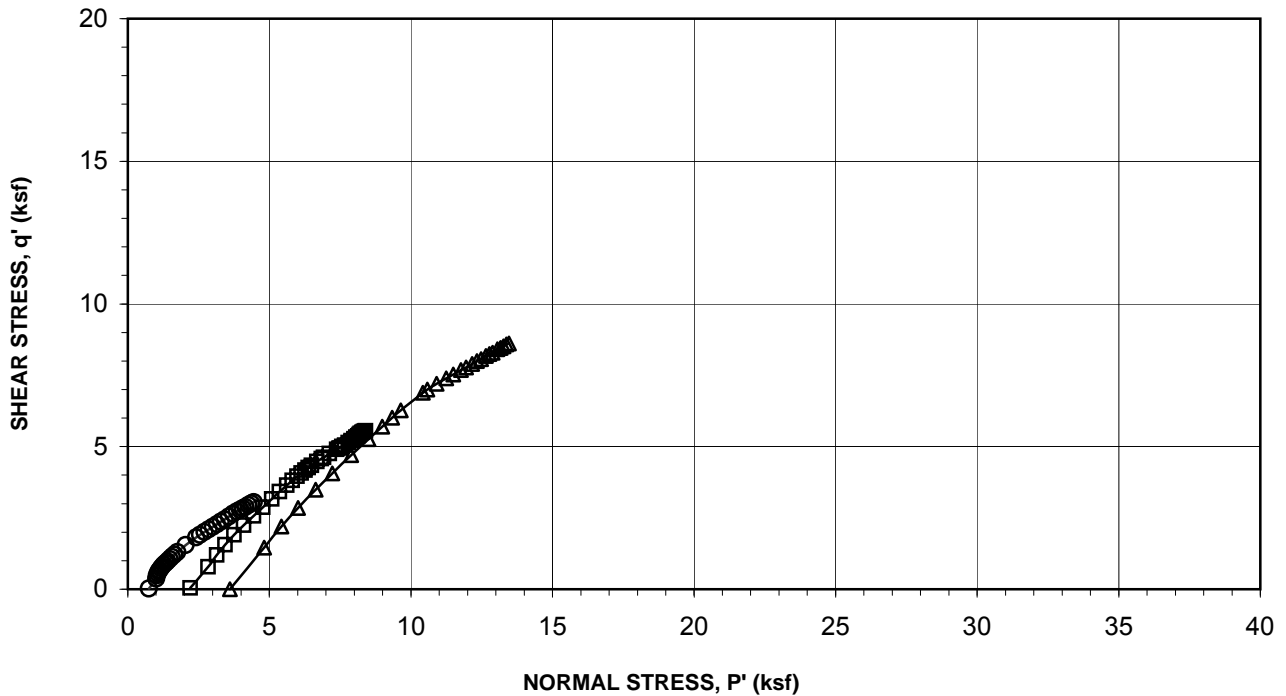
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-189	Consolidation Pressure :	25.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.892 in
Sample No.:	3	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.892 in
Sample Description:	Silty Sand	Final Sample Area (A)*:	5.365 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Porosity Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	40.0	0.00	0.00	0.00	0.00	3.60
65.0	109	0.006	41.7	2.92	0.10	0.24	1.46	4.82
65.0	164	0.012	42.6	4.39	0.20	0.38	2.20	5.42
65.0	213	0.018	43.1	5.70	0.31	0.44	2.85	6.01
65.0	261	0.024	43.1	6.98	0.41	0.45	3.49	6.64
65.0	304	0.030	43.0	8.12	0.51	0.44	4.06	7.22
65.0	352	0.036	42.8	9.39	0.61	0.40	4.69	7.89
65.0	395	0.042	42.5	10.53	0.71	0.36	5.26	8.50
65.0	428	0.048	42.2	11.39	0.81	0.32	5.70	8.98
65.0	452	0.054	41.9	12.02	0.92	0.27	6.01	9.34
65.0	472	0.060	41.6	12.54	1.02	0.23	6.27	9.64
65.0	521	0.090	40.5	13.77	1.53	0.07	6.88	10.42
65.0	531	0.100	40.2	14.01	1.70	0.02	7.00	10.58
65.0	549	0.131	39.3	14.41	2.22	-0.10	7.20	10.90
65.0	568	0.177	38.3	14.79	3.01	-0.25	7.39	11.24
65.0	583	0.222	37.4	15.06	3.76	-0.37	7.53	11.50
65.0	600	0.269	36.7	15.37	4.56	-0.48	7.68	11.76
65.0	612	0.314	36.0	15.55	5.34	-0.58	7.77	11.95
65.0	627	0.361	35.4	15.80	6.12	-0.66	7.90	12.16
65.0	640	0.408	34.9	15.99	6.92	-0.74	7.99	12.33
65.0	651	0.453	34.4	16.13	7.68	-0.81	8.06	12.48
65.0	666	0.499	33.9	16.36	8.48	-0.87	8.18	12.65
65.0	677	0.548	33.5	16.48	9.30	-0.93	8.24	12.77
65.0	687	0.593	33.1	16.58	10.06	-0.99	8.29	12.88
65.0	703	0.640	32.8	16.82	10.87	-1.04	8.41	13.05
65.0	714	0.688	32.3	16.93	11.67	-1.11	8.46	13.17
65.0	725	0.733	32.0	17.04	12.45	-1.16	8.52	13.27
65.0	737	0.781	31.7	17.16	13.25	-1.20	8.58	13.38
65.0	747	0.827	31.3	17.23	14.04	-1.25	8.62	13.47
65.0	758	0.873	31.0	17.33	14.82	-1.29	8.66	13.56
65.0	771	0.919	30.7	17.46	15.60	-1.33	8.73	13.67
65.0	780	0.966	30.5	17.50	16.39	-1.37	8.75	13.73
65.0	797	1.011	30.2	17.72	17.16	-1.41	8.86	13.87
65.0	821	1.103	29.7	17.91	18.72	-1.48	8.95	14.03
65.0	861	1.240	29.0	18.25	21.04	-1.58	9.12	14.31

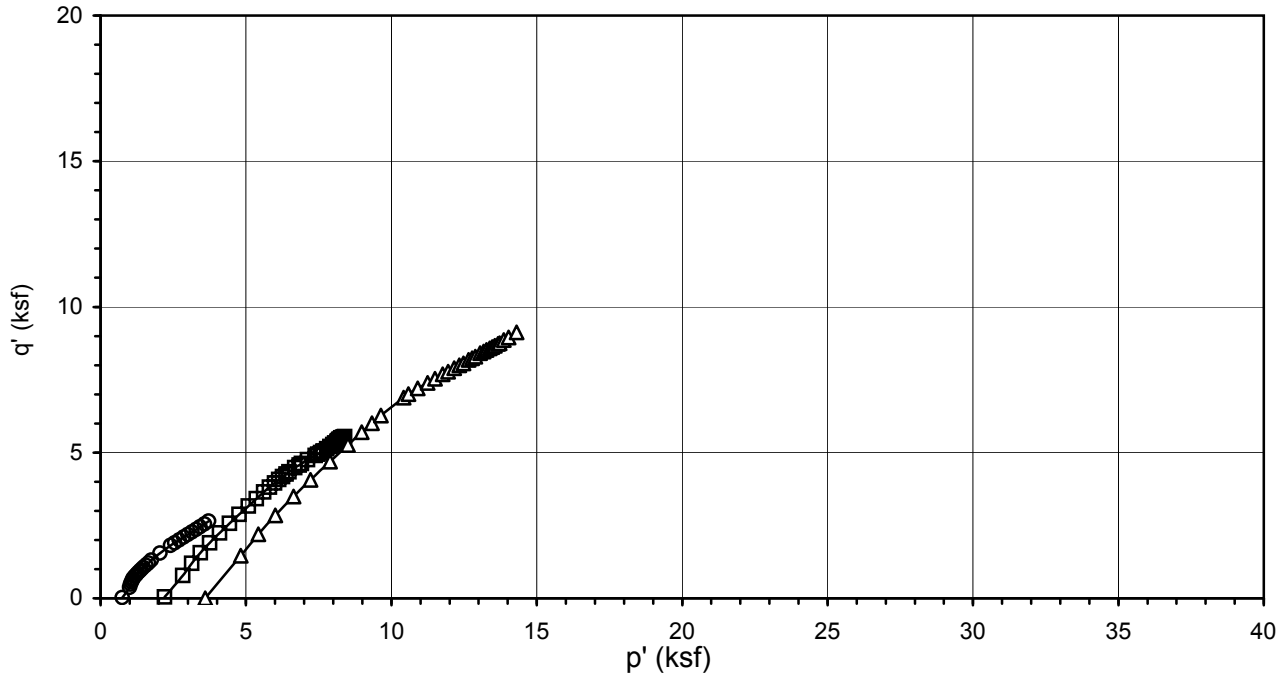


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi

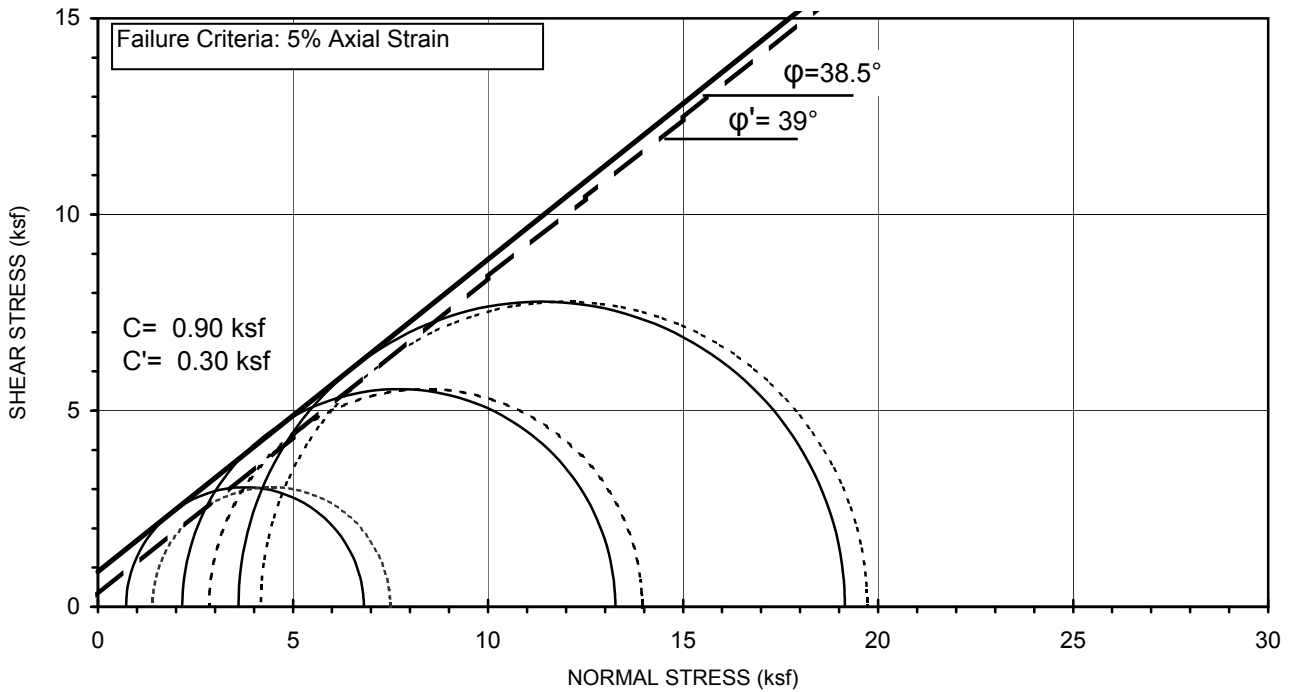


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Silty Sand
Test Pit:	G-189	Avg. Dry Unit Weight (pcf):	120.7
Sample No.:	3	Avg. Initial Moisture Content (%):	7.1
Depth (ft):	15.5	Confining Pressure:	5.0, 15.0, 25.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

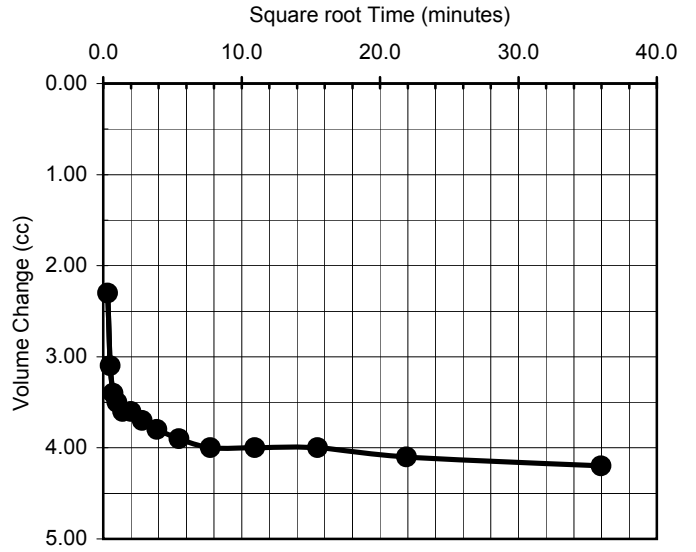
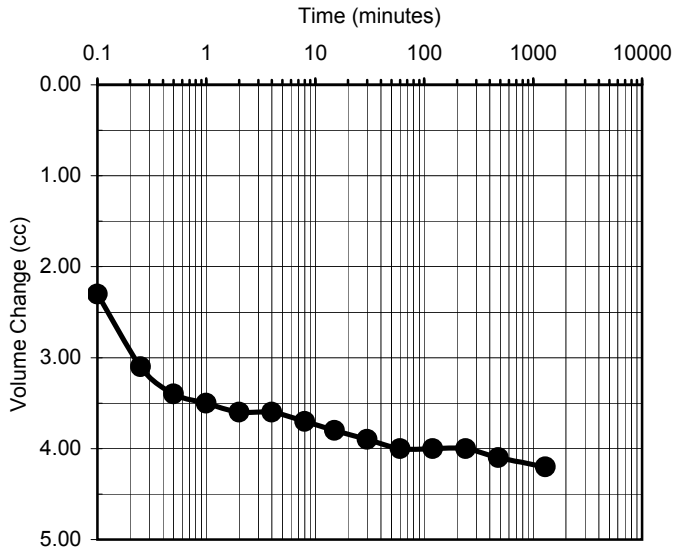


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi Δ 25 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Silty Sand
Test Pit:	G-189	Avg. Dry Unit Weight (pcf):	120.7
Sample No.:	3	Avg. Initial Moisture Content (%):	7.1
Depth (ft):	15.5	Confining Pressure:	5.0, 15.0, 25.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-189	Sample Type:	Mod. Cal.
Sample No.:	3	Soil Description:	Silty Sand
Depth (feet):	15.5	Eff. Confining Pressure (psi):	15.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	2.3000
0.25	3.1000
0.5	3.4000
1	3.5000
2	3.6000
4	3.6000
8	3.7000
15	3.8000
30	3.9000
60	4.0000
120	4.0000
240	4.0000
480	4.1000
1294	4.2000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	2.3000
0.5000	3.1000
0.7071	3.4000
1.0000	3.5000
1.4142	3.6000
2.0000	3.6000
2.8284	3.7000
3.8730	3.8000
5.4772	3.9000
7.7460	4.0000
10.9545	4.0000
15.4919	4.0000
21.9089	4.1000
35.9722	4.2000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 08/09/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-10-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-189	Reviewed by:	AP	Date:	08-17-11
Sample No.:	11	Sample Description:	Sandy Silt		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.625</u>	<u>2.625</u>	<u>2.625</u>	Avg. =	2.625
Height (in)	<u>5.714</u>	<u>5.714</u>	<u>5.714</u>	Avg. =	5.714

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.412	5.345
Moisture Content (%)	26.96	23.04
Wet Weight (gms)	70.56	1132.62
Dry Weight (gms)	66.34	948.08
Container Weight (gms)	50.69	147.22
Density and Saturation		
Wet Weight (gms)	1009.39	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.3	
Dry Density (pcf)	97.9	
Initial Void Ratio	0.720	
% Saturation	101.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	88.7
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	75.4
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.633
Induced OCR =	1.0	Initial Volume (cu.in)=	30.924
Change in Ht. of Specimen (in) =	0.0806	Final Volume (cu.in) =	30.112

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.32
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.34
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	6.66
		Axial Strain (%) =	5.23



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-10-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-189	Reviewed by:	AP	Date:	08-17-11
Sample No.:	11	Sample Description:	Sandy Silt		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	35.0 psi		

Diameter (in)	<u>2.625</u>	<u>2.625</u>	<u>2.625</u>	Avg. =	2.625
Height (in)	<u>5.714</u>	<u>5.714</u>	<u>5.714</u>	Avg. =	5.714

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.412	5.301
Moisture Content (%)	26.96	23.04
Wet Weight (gms)	70.56	1132.62
Dry Weight (gms)	66.34	948.08
Container Weight (gms)	50.69	147.22
Density and Saturation		
Wet Weight (gms)	1009.39	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.3	
Dry Density (pcf)	97.9	
Initial Void Ratio	0.720	
% Saturation	101.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)= 76.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)= 65.7
Eff. Consol. Stress (psi) =	35.0	Final Height (in)= 5.714
Induced OCR=	1.0	Initial Volume (cu.in)= 30.924
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 30.289

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) = 9.74
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) = 3.25
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 12.98
		Axial Strain (%) = 5.20



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-10-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-189	Reviewed by:	AP	Date:	08-17-11
Sample No.:	11	Sample Description:	Sandy Silt		
Depth(ft):	55.5				
Sample Type:	Mod. Cal.	Confining Pressure =	50.0 psi		

Diameter (in)	<u>2.625</u>	<u>2.625</u>	<u>2.625</u>	Avg. =	2.625
Height (in)	<u>5.714</u>	<u>5.714</u>	<u>5.714</u>	Avg. =	5.714

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.412	5.331
Moisture Content (%)	26.96	23.04
Wet Weight (gms)	70.56	1132.62
Dry Weight (gms)	66.34	948.08
Container Weight (gms)	50.69	147.22
Density and Saturation		
Wet Weight (gms)	1009.39	
Container Weight (gms)	0.00	
Wet Density (pcf)	124.3	
Dry Density (pcf)	97.9	
Initial Void Ratio	0.720	
% Saturation	101.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	65.7
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	58.0
Eff. Consol. Stress (psi) =	50.0	Final Height (in)=	5.712
Induced OCR =	1.0	Initial Volume (cu.in)=	30.924
Change in Ht. of Specimen (in) =	0.0017	Final Volume (cu.in) =	30.454

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	13.72
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.30
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	19.02
		Axial Strain (%) =	4.64



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

0.5 28

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-189	Consolidation Pressure :	20.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.714 in
Sample No.:	11	Initial Area of Sample:	5.412 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.633 in
Sample Description:	Sandy Silt	Final Sample Area (A)*:	5.345 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
50.0	0	0.000	30.1	0.00	0.00	0.00	0.00	2.88
50.0	42	0.004	32.3	1.14	0.07	0.32	0.57	3.13
50.0	61	0.010	34.2	1.63	0.17	0.60	0.82	3.09
50.0	71	0.015	35.7	1.92	0.27	0.81	0.96	3.03
50.0	79	0.021	36.8	2.13	0.36	0.97	1.06	2.97
50.0	86	0.026	37.7	2.30	0.46	1.10	1.15	2.93
50.0	91	0.031	38.4	2.44	0.56	1.20	1.22	2.90
50.0	95	0.037	39.0	2.54	0.65	1.29	1.27	2.87
50.0	99	0.042	39.5	2.65	0.74	1.35	1.32	2.85
50.0	102	0.047	39.9	2.72	0.84	1.41	1.36	2.82
50.0	106	0.054	40.2	2.82	0.96	1.46	1.41	2.83
50.0	108	0.060	40.5	2.89	1.06	1.50	1.44	2.82
50.0	111	0.065	40.7	2.95	1.15	1.54	1.48	2.82
50.0	114	0.070	40.9	3.02	1.24	1.57	1.51	2.82
50.0	116	0.076	41.1	3.09	1.35	1.59	1.54	2.83
50.0	119	0.081	41.3	3.15	1.44	1.61	1.58	2.84
50.0	121	0.087	41.4	3.22	1.54	1.63	1.61	2.86
50.0	128	0.099	41.6	3.39	1.75	1.66	1.69	2.92
50.0	139	0.123	41.8	3.65	2.18	1.69	1.83	3.02
50.0	147	0.140	41.9	3.85	2.49	1.70	1.92	3.11
50.0	154	0.168	41.8	4.04	2.98	1.69	2.02	3.20
50.0	158	0.180	41.8	4.13	3.19	1.69	2.07	3.26
50.0	162	0.191	41.7	4.23	3.39	1.68	2.11	3.31
50.0	168	0.202	41.7	4.35	3.58	1.67	2.18	3.39
50.0	173	0.212	41.6	4.48	3.77	1.66	2.24	3.46
50.0	180	0.224	41.5	4.64	3.98	1.65	2.32	3.55
50.0	185	0.237	41.4	4.77	4.20	1.64	2.38	3.63
50.0	191	0.249	41.3	4.93	4.41	1.62	2.46	3.72
50.0	197	0.261	41.2	5.05	4.63	1.60	2.53	3.80
50.0	201	0.272	41.1	5.14	4.83	1.58	2.57	3.87
50.0	205	0.284	40.9	5.23	5.04	1.56	2.62	3.93
50.0	208.56	0.295	40.8	5.32	5.23	1.54	2.66	4.00



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

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Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-189	Consolidation Pressure :	35.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.714 in
Sample No.:	11	Initial Area of Sample:	5.412 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.714 in
Sample Description:	Sandy Silt	Final Sample Area (A)*:	5.301 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.04
65.0	27	0.000	32.1	0.73	0.01	0.30	0.37	5.11
65.0	85	0.005	36.3	2.31	0.09	0.90	1.15	5.29
65.0	121	0.012	39.0	3.28	0.21	1.29	1.64	5.39
65.0	147	0.019	40.9	3.98	0.33	1.57	1.99	5.46
65.0	167	0.026	42.2	4.52	0.45	1.76	2.26	5.54
65.0	185	0.033	43.2	5.00	0.58	1.90	2.50	5.64
65.0	200	0.040	43.9	5.39	0.70	2.00	2.70	5.73
65.0	213	0.047	44.5	5.74	0.82	2.08	2.87	5.83
65.0	224	0.054	44.9	6.03	0.95	2.15	3.01	5.91
65.0	233	0.061	45.2	6.26	1.06	2.19	3.13	5.98
65.0	241	0.068	45.5	6.47	1.19	2.22	3.23	6.05
65.0	249	0.074	45.6	6.68	1.30	2.25	3.34	6.13
65.0	255	0.080	45.7	6.83	1.40	2.27	3.42	6.19
65.0	261	0.087	45.8	6.98	1.52	2.28	3.49	6.25
65.0	277	0.108	45.9	7.38	1.89	2.28	3.69	6.45
65.0	286	0.122	45.8	7.60	2.14	2.27	3.80	6.57
65.0	294	0.138	45.6	7.79	2.41	2.25	3.90	6.69
65.0	303	0.152	45.4	8.01	2.67	2.22	4.01	6.82
65.0	311	0.167	45.2	8.20	2.92	2.19	4.10	6.95
65.0	319	0.181	44.9	8.39	3.17	2.15	4.20	7.08
65.0	327	0.195	44.7	8.58	3.42	2.11	4.29	7.22
65.0	334	0.209	44.4	8.74	3.65	2.07	4.37	7.34
65.0	342	0.223	44.1	8.93	3.90	2.03	4.46	7.47
65.0	349	0.237	43.8	9.09	4.14	1.99	4.54	7.60
65.0	357	0.253	43.5	9.27	4.42	1.94	4.63	7.73
65.0	364	0.268	43.1	9.42	4.68	1.89	4.71	7.86
65.0	371	0.282	42.8	9.58	4.93	1.84	4.79	7.99
65.0	378	0.297	42.4	9.74	5.20	1.79	4.87	8.12

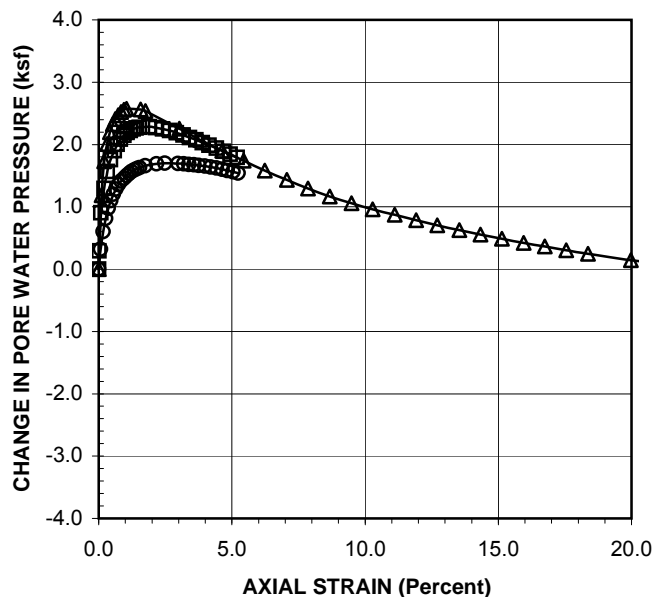
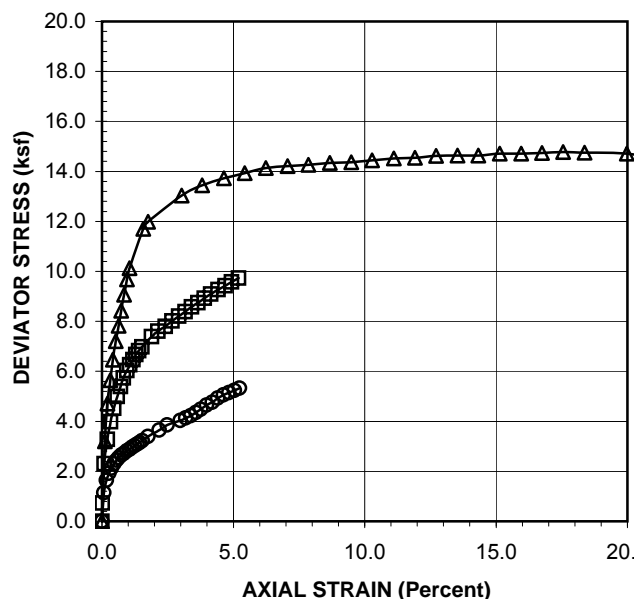


CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

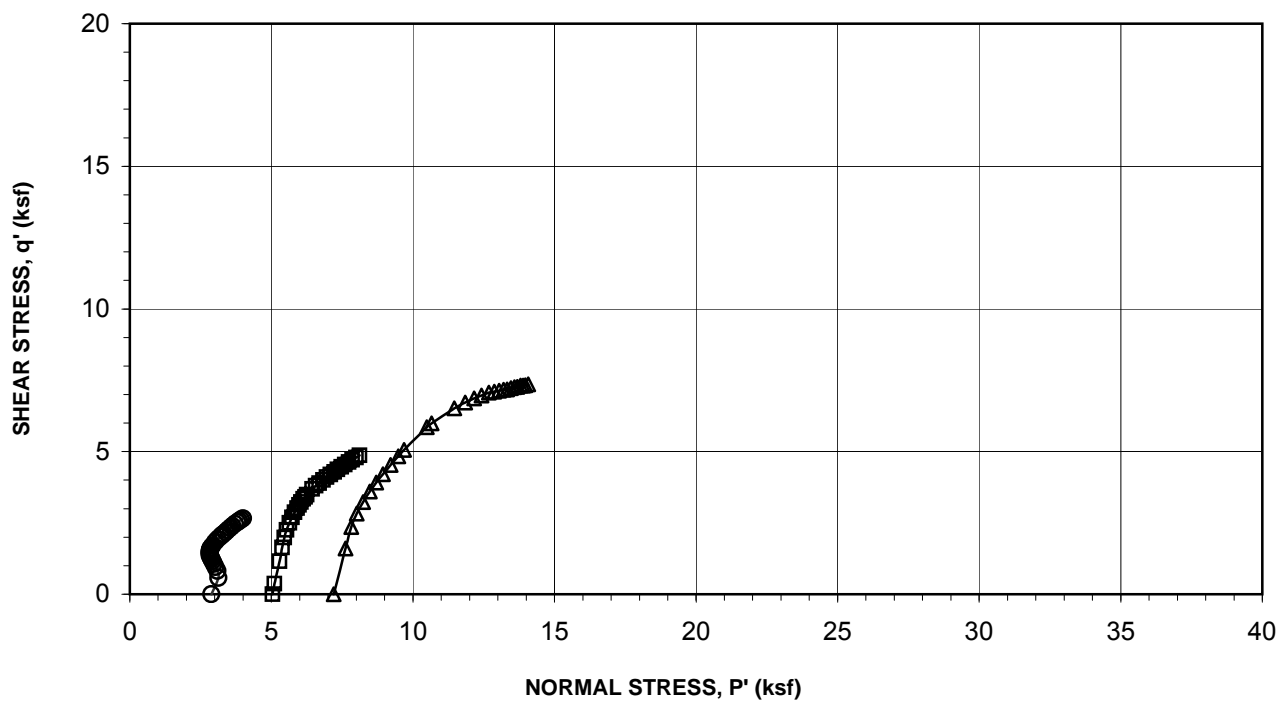
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Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-189	Consolidation Pressure :	50.0 psi
Depth(ft):	55.5	Initial Sample Height:	5.714 in
Sample No.:	11	Initial Area of Sample:	5.412 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.712 in
Sample Description:	Sandy Silt	Final Sample Area (A)*:	5.331 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
80.0	0	0.000	30.0	0.00	0.00	0.00	0.00	7.20
80.0	119	0.006	38.3	3.21	0.11	1.19	1.60	7.61
80.0	175	0.012	42.0	4.71	0.21	1.73	2.35	7.83
80.0	210	0.018	44.0	5.65	0.32	2.01	2.82	8.01
80.0	240	0.024	45.3	6.46	0.42	2.20	3.23	8.24
80.0	268	0.030	46.2	7.21	0.53	2.33	3.60	8.47
80.0	292	0.036	46.7	7.83	0.63	2.41	3.91	8.70
80.0	314	0.042	47.2	8.42	0.74	2.47	4.21	8.94
80.0	338	0.048	47.5	9.06	0.84	2.52	4.53	9.21
80.0	362	0.054	47.7	9.68	0.95	2.55	4.84	9.49
80.0	379	0.060	47.9	10.13	1.05	2.57	5.06	9.69
80.0	440	0.090	47.8	11.70	1.58	2.56	5.85	10.49
80.0	452	0.100	47.6	11.99	1.75	2.54	5.99	10.66
80.0	498	0.173	45.7	13.04	3.03	2.26	6.52	11.46
80.0	518	0.218	44.4	13.45	3.81	2.08	6.72	11.85
80.0	533	0.265	43.2	13.72	4.64	1.90	6.86	12.16
80.0	545	0.311	42.1	13.93	5.44	1.74	6.97	12.42
80.0	558	0.356	41.0	14.13	6.23	1.58	7.07	12.69
80.0	566	0.403	39.9	14.21	7.06	1.43	7.11	12.87
80.0	573	0.449	39.0	14.27	7.85	1.30	7.13	13.04
80.0	581	0.495	38.1	14.34	8.67	1.17	7.17	13.20
80.0	588	0.542	37.3	14.37	9.49	1.06	7.18	13.33
80.0	596	0.587	36.7	14.44	10.28	0.96	7.22	13.46
80.0	605	0.635	36.1	14.52	11.11	0.87	7.26	13.59
80.0	611	0.680	35.5	14.54	11.91	0.79	7.27	13.68
80.0	620	0.726	34.9	14.62	12.71	0.70	7.31	13.81
80.0	626	0.773	34.3	14.63	13.53	0.62	7.31	13.89
80.0	633	0.819	33.9	14.64	14.33	0.56	7.32	13.96
80.0	642	0.865	33.4	14.71	15.14	0.49	7.35	14.07
80.0	648	0.911	32.9	14.71	15.96	0.42	7.36	14.13
80.0	655	0.957	32.5	14.73	16.75	0.37	7.37	14.20
80.0	663	1.003	32.1	14.77	17.56	0.31	7.39	14.28
80.0	669	1.049	31.7	14.74	18.37	0.25	7.37	14.33
80.0	680	1.141	31.0	14.71	19.98	0.14	7.35	14.41
80.0	680	1.233	30.5	14.41	21.58	0.07	7.21	14.34



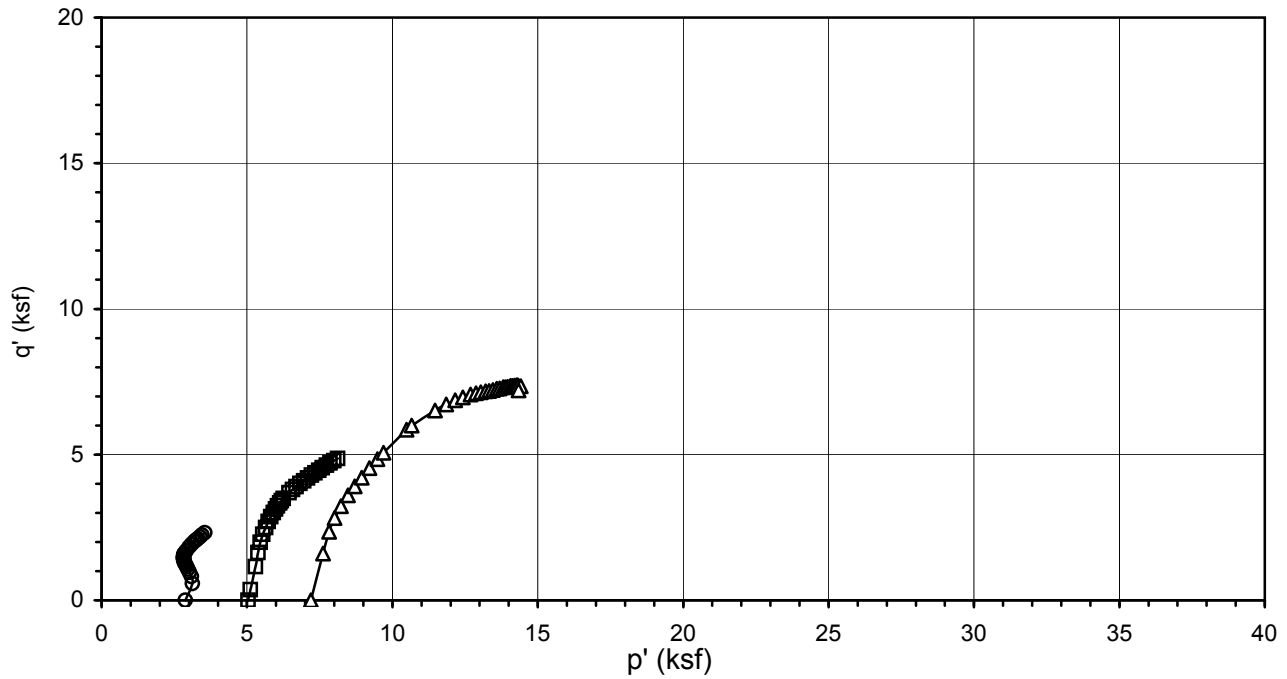
LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi



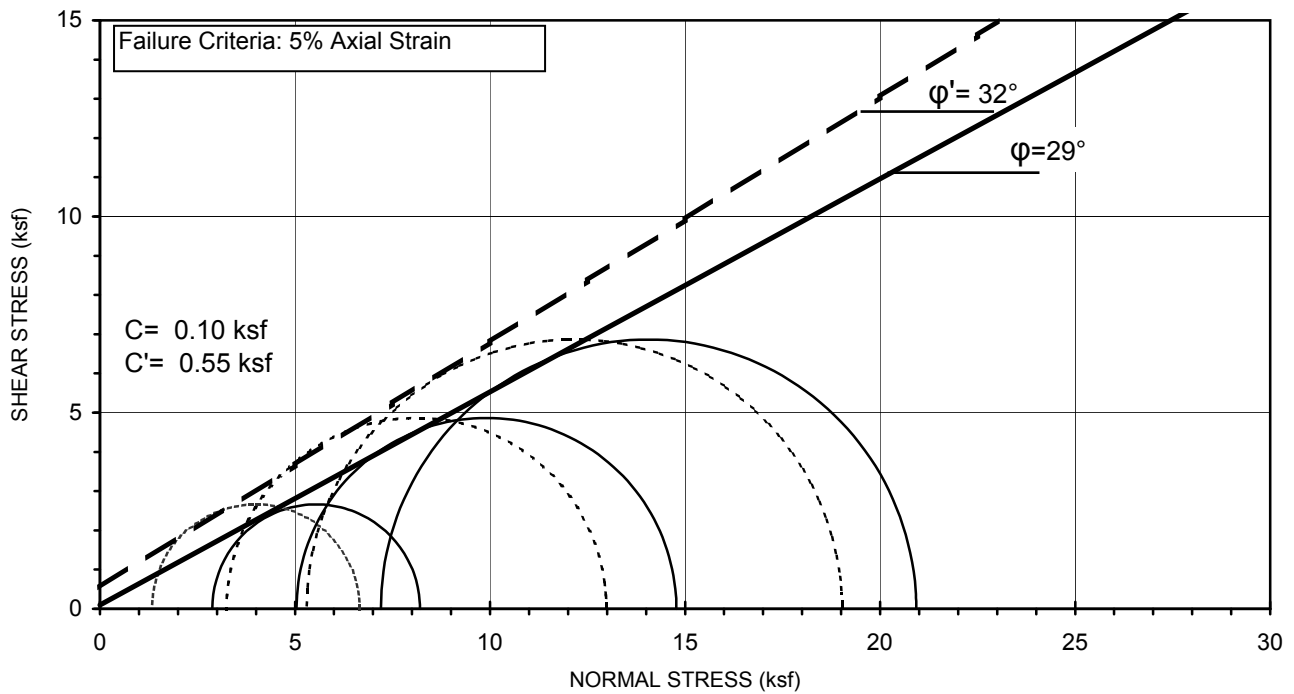
Project Name: Westside Subway Extension
Project No.: 4953-10-1561
Test Pit: G-189
Sample No.: 11
Depth (ft): 55.5

Sample Type: Mod. Cal.
Sample Description: Sandy Silt
Avg. Dry Unit Weight (pcf): 97.9
Avg. Initial Moisture Content (%): 27.0
Confining Pressure: 20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

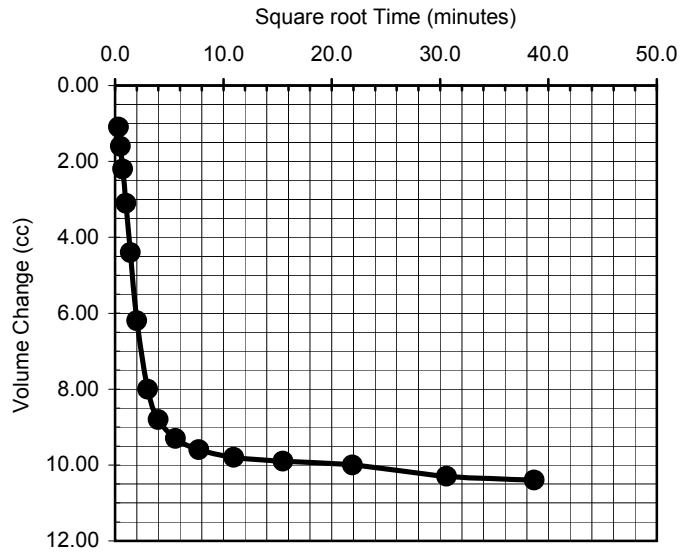
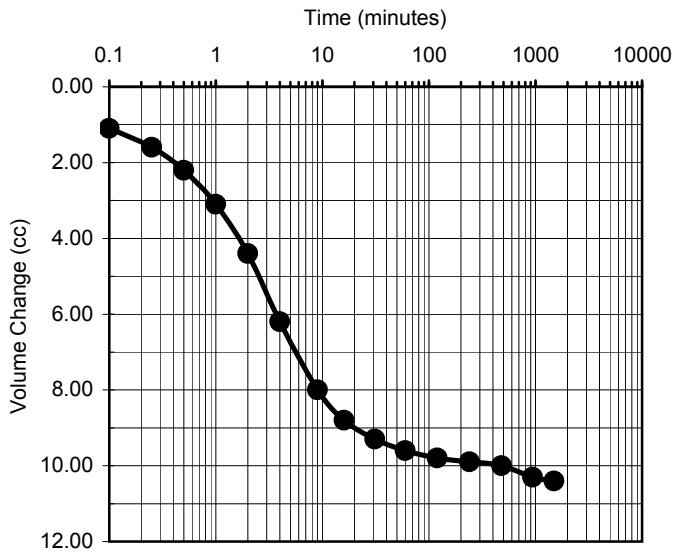


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Sandy Silt
Test Pit:	G-189	Avg. Dry Unit Weight (pcf):	97.9
Sample No.:	11	Avg. Initial Moisture Content (%):	27.0
Depth (ft):	55.5	Confining Pressure:	20.0, 35.0, 50.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-189	Sample Type:	Mod. Cal.
Sample No.:	11	Soil Description:	Sandy Silt
Depth (feet):	55.5	Eff. Confining Pressure (psi):	35.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.1000
0.25	1.6000
0.5	2.2000
1	3.1000
2	4.4000
4	6.2000
9	8.0000
16	8.8000
31	9.3000
60	9.6000
120	9.8000
240	9.9000
480	10.0000
937	10.3000
1497	10.4000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.1000
0.5000	1.6000
0.7071	2.2000
1.0000	3.1000
1.4142	4.4000
2.0000	6.2000
3.0000	8.0000
4.0000	8.8000
5.5678	9.3000
7.7460	9.6000
10.9545	9.8000
15.4919	9.9000
21.9089	10.0000
30.6105	10.3000
38.6911	10.4000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
Project No.: 4953-10-1561
Date: 08/10/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-13-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	8	Sample Description:	Clayey Sand		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	15.0 psi		

Diameter (in)	<u>2.604</u>	<u>2.604</u>	<u>2.604</u>	Avg. =	2.604
Height (in)	<u>5.890</u>	<u>5.890</u>	<u>5.890</u>	Avg. =	5.890

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.326	5.255
Moisture Content (%)	14.73	16.46
Wet Weight (gms)	11.04	1260.90
Dry Weight (gms)	9.95	1103.92
Container Weight (gms)	2.55	150.02
Density and Saturation		
Wet Weight (gms)	1106.27	
Container Weight (gms)	0.00	
Wet Density (pcf)	134.4	
Dry Density (pcf)	117.1	
Initial Void Ratio	0.439	
% Saturation	90.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	78.9
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	71.9
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.888
Induced OCR =	1.0	Initial Volume (cu.in)=	31.368
Change in Ht. of Specimen (in) =	0.0020	Final Volume (cu.in) =	30.941

Shear		At Failure	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	6.68
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	1.67
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.35
		Axial Strain (%) =	5.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-13-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	8	Sample Description:	Clayey Sand		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.604</u>	<u>2.604</u>	<u>2.604</u>	Avg. =	2.604
Height (in)	<u>5.890</u>	<u>5.890</u>	<u>5.890</u>	Avg. =	5.890

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.326	5.260
Moisture Content (%)	14.73	16.46
Wet Weight (gms)	11.04	1260.90
Dry Weight (gms)	9.95	1103.92
Container Weight (gms)	2.55	150.02
Density and Saturation		
Wet Weight (gms)	1106.27	
Container Weight (gms)	0.00	
Wet Density (pcf)	134.4	
Dry Density (pcf)	117.1	
Initial Void Ratio	0.439	
% Saturation	90.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)= 71.9
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)= 65.6
Eff. Consol. Stress (psi) =	30.0	Final Height (in)= 5.890
Induced OCR=	1.0	Initial Volume (cu.in)= 31.368
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 30.984

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) = 13.19
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) = 4.17
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 17.36
		Axial Strain (%) = 5.14



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-13-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	8	Sample Description:	Clayey Sand		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.604</u>	<u>2.604</u>	<u>2.604</u>	Avg. =	2.604
Height (in)	<u>5.890</u>	<u>5.890</u>	<u>5.890</u>	Avg. =	5.890

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.326	5.284
Moisture Content (%)	14.73	16.46
Wet Weight (gms)	11.04	1260.90
Dry Weight (gms)	9.95	1103.92
Container Weight (gms)	2.55	150.02
Density and Saturation		
Wet Weight (gms)	1106.27	
Container Weight (gms)	0.00	
Wet Density (pcf)	134.4	
Dry Density (pcf)	117.1	
Initial Void Ratio	0.439	
% Saturation	90.6	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	65.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	61.6
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.890
Induced OCR =	1.0	Initial Volume (cu.in)=	31.368
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.124

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	18.14
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	6.18
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	24.32
		Axial Strain (%) =	4.89



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	15.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.890 in
Sample No.:	8	Initial Area of Sample:	5.326 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.888 in
Sample Description:	Clayey Sand	Final Sample Area (A)*:	5.255 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.001	30.1	0.00	0.01	0.00	0.00	2.16
45.0	13	0.004	31.4	0.35	0.07	0.18	0.18	2.15
45.0	17	0.010	31.3	0.47	0.18	0.17	0.23	2.22
45.0	26	0.016	31.3	0.70	0.28	0.18	0.35	2.33
45.0	27	0.022	31.3	0.74	0.37	0.17	0.37	2.36
45.0	33	0.028	31.3	0.89	0.48	0.16	0.44	2.44
45.0	36	0.034	31.4	0.97	0.57	0.19	0.49	2.46
45.0	42	0.040	31.9	1.13	0.67	0.26	0.57	2.47
45.0	44	0.045	33.3	1.20	0.77	0.46	0.60	2.30
45.0	54	0.051	34.5	1.47	0.86	0.63	0.73	2.26
45.0	61	0.056	35.4	1.66	0.96	0.76	0.83	2.23
45.0	67	0.062	36.1	1.82	1.05	0.86	0.91	2.21
45.0	72	0.067	36.6	1.95	1.14	0.94	0.98	2.20
45.0	77	0.072	37.1	2.08	1.23	1.00	1.04	2.20
45.0	82	0.078	37.4	2.22	1.32	1.05	1.11	2.22
45.0	87	0.082	37.7	2.35	1.40	1.09	1.18	2.24
45.0	101	0.097	38.2	2.72	1.65	1.17	1.36	2.35
45.0	110	0.108	38.4	2.96	1.84	1.19	1.48	2.45
45.0	125	0.126	38.4	3.35	2.13	1.19	1.68	2.64
45.0	140	0.143	38.3	3.74	2.42	1.17	1.87	2.86
45.0	155	0.160	38.0	4.13	2.72	1.13	2.07	3.09
45.0	169	0.177	37.6	4.49	3.00	1.08	2.25	3.33
45.0	183	0.193	37.2	4.85	3.28	1.01	2.43	3.57
45.0	197	0.209	36.6	5.21	3.55	0.94	2.60	3.82
45.0	209	0.226	36.1	5.51	3.83	0.86	2.75	4.05
45.0	220	0.243	35.5	5.78	4.12	0.78	2.89	4.27
45.0	228	0.254	35.1	5.98	4.32	0.72	2.99	4.43
45.0	232	0.260	34.9	6.08	4.42	0.69	3.04	4.51
45.0	236	0.266	34.7	6.18	4.51	0.66	3.09	4.58
45.0	239	0.271	34.5	6.25	4.61	0.64	3.12	4.65
45.0	243	0.277	34.3	6.35	4.71	0.61	3.17	4.73
45.0	246	0.283	34.1	6.42	4.81	0.58	3.21	4.79
45.0	250	0.289	33.9	6.51	4.90	0.55	3.26	4.87
45.0	254	0.294	33.7	6.61	5.00	0.52	3.31	4.95
45.0	257	0.300	33.5	6.68	5.10	0.49	3.34	5.01



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	30.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.890 in
Sample No.:	8	Initial Area of Sample:	5.326 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.890 in
Sample Description:	Clayey Sand	Final Sample Area (A)*:	5.260 sq. in.
		Induced OCR=	1.0

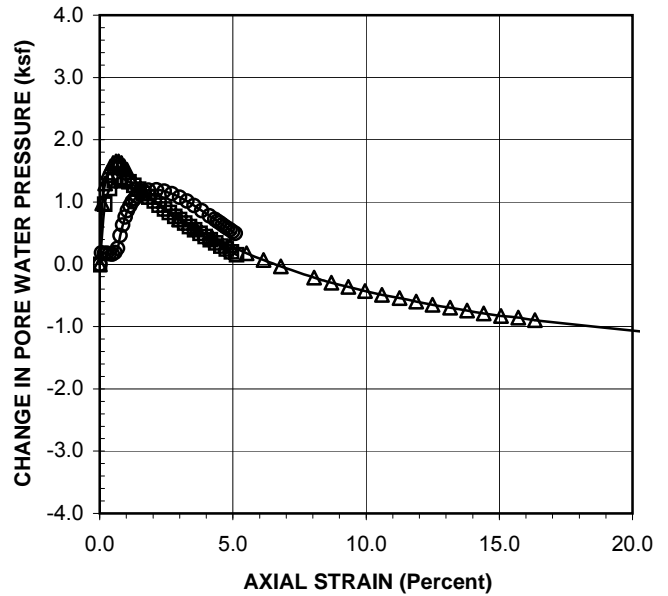
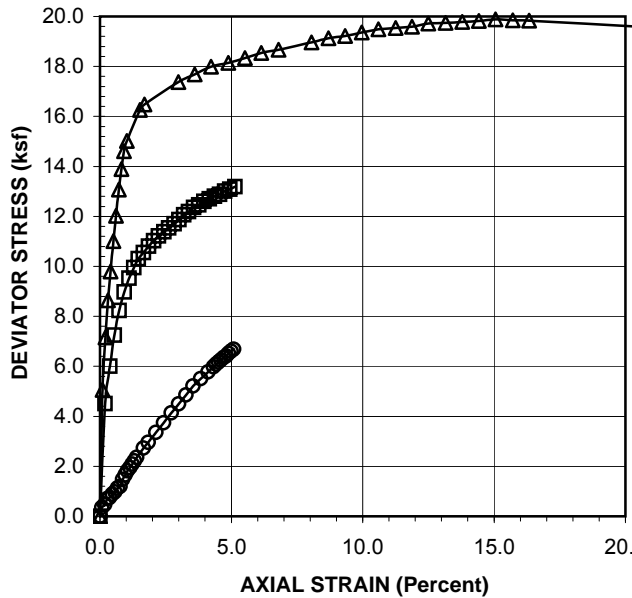
Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	0	0.000	30.0	0.00	0.00	0.00	0.00	4.32
60.0	165	0.011	36.7	4.51	0.19	0.96	2.25	5.61
60.0	220	0.022	38.4	6.00	0.37	1.22	3.00	6.10
60.0	266	0.032	39.3	7.24	0.55	1.34	3.62	6.60
60.0	303	0.043	39.6	8.23	0.73	1.38	4.12	7.05
60.0	331	0.054	39.5	8.98	0.92	1.37	4.49	7.44
60.0	352	0.065	39.2	9.53	1.10	1.32	4.76	7.76
60.0	368	0.076	38.8	9.94	1.29	1.26	4.97	8.03
60.0	382	0.086	38.4	10.30	1.47	1.20	5.15	8.27
60.0	392	0.098	37.9	10.55	1.66	1.14	5.28	8.46
60.0	402	0.109	37.5	10.80	1.85	1.07	5.40	8.65
60.0	411	0.121	37.0	11.02	2.05	1.01	5.51	8.82
60.0	419	0.132	36.6	11.21	2.23	0.95	5.61	8.98
60.0	426	0.143	36.2	11.38	2.43	0.89	5.69	9.12
60.0	433	0.154	35.8	11.54	2.62	0.83	5.77	9.26
60.0	440	0.166	35.4	11.70	2.82	0.77	5.85	9.40
60.0	447	0.177	35.0	11.87	3.01	0.71	5.93	9.54
60.0	455	0.188	34.6	12.06	3.20	0.66	6.03	9.69
60.0	461	0.199	34.2	12.19	3.37	0.60	6.10	9.81
60.0	468	0.210	33.8	12.35	3.57	0.55	6.18	9.95
60.0	473	0.222	33.5	12.46	3.77	0.50	6.23	10.05
60.0	479	0.233	33.1	12.59	3.96	0.44	6.30	10.17
60.0	484	0.245	32.7	12.70	4.16	0.39	6.35	10.27
60.0	489	0.257	32.4	12.80	4.36	0.34	6.40	10.38
60.0	493	0.268	32.0	12.88	4.56	0.29	6.44	10.47
60.0	499	0.280	31.7	13.01	4.76	0.24	6.51	10.58
60.0	503	0.291	31.4	13.09	4.95	0.20	6.54	10.67
60.0	508	0.303	31.1	13.19	5.14	0.15	6.60	10.76



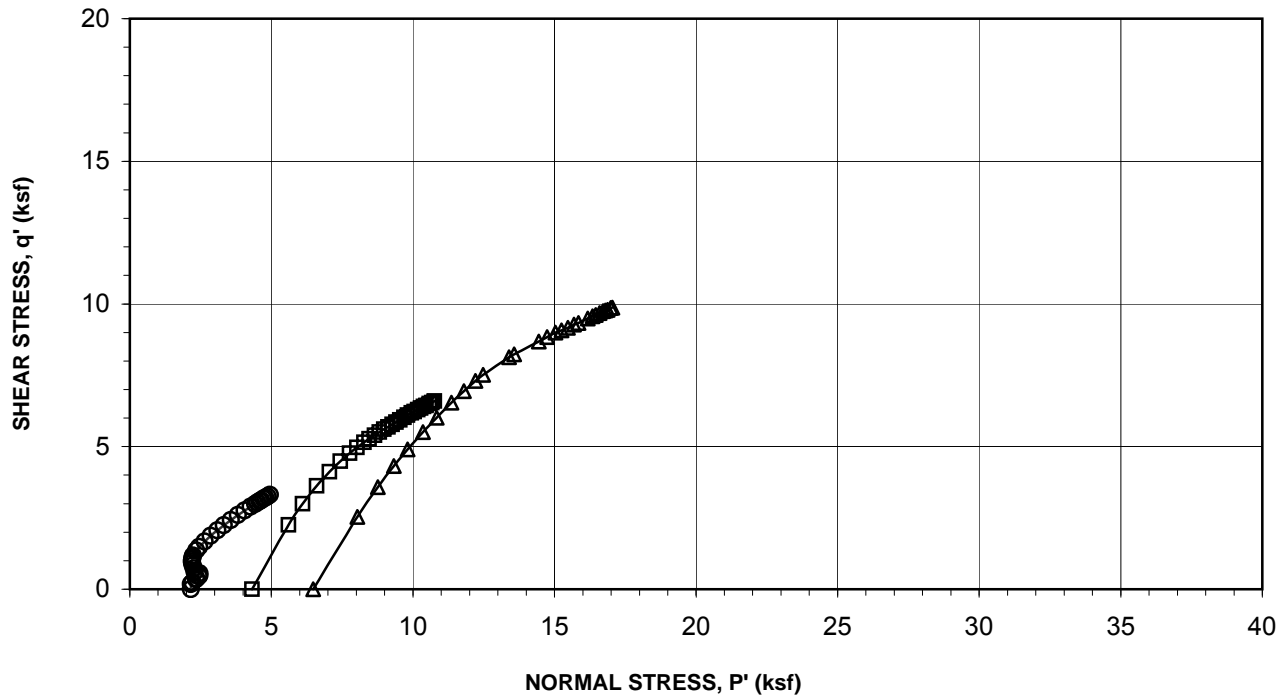
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	45.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.890 in
Sample No.:	8	Initial Area of Sample:	5.326 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.890 in
Sample Description:	Clayey Sand	Final Sample Area (A)*:	5.284 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	186	0.006	36.8	5.06	0.10	0.98	2.53	8.03
75.0	263	0.012	39.0	7.15	0.20	1.30	3.58	8.76
75.0	318	0.018	40.2	8.64	0.31	1.47	4.32	9.33
75.0	361	0.024	40.9	9.80	0.41	1.57	4.90	9.81
75.0	406	0.030	41.3	11.01	0.51	1.63	5.50	10.36
75.0	444	0.036	41.5	12.03	0.61	1.65	6.01	10.84
75.0	483	0.042	41.5	13.07	0.71	1.65	6.53	11.36
75.0	514	0.048	41.3	13.89	0.81	1.63	6.95	11.80
75.0	541	0.054	40.9	14.61	0.92	1.57	7.30	12.21
75.0	557	0.060	40.5	15.02	1.02	1.52	7.51	12.48
75.0	606	0.090	38.5	16.26	1.53	1.22	8.13	13.39
75.0	615	0.100	37.9	16.47	1.70	1.14	8.24	13.58
75.0	657	0.176	35.0	17.37	2.98	0.72	8.69	14.44
75.0	673	0.212	34.0	17.68	3.60	0.58	8.84	14.74
75.0	689	0.249	33.0	17.98	4.22	0.43	8.99	15.04
75.0	700	0.288	32.1	18.14	4.89	0.30	9.07	15.25
75.0	712	0.325	31.2	18.33	5.52	0.18	9.17	15.47
75.0	725	0.362	30.5	18.54	6.14	0.07	9.27	15.68
75.0	735	0.400	29.8	18.67	6.79	-0.03	9.33	15.85
75.0	757	0.474	28.5	18.97	8.05	-0.21	9.48	16.18
75.0	769	0.512	28.0	19.13	8.70	-0.29	9.57	16.34
75.0	778	0.550	27.5	19.22	9.33	-0.36	9.61	16.45
75.0	789	0.587	27.0	19.36	9.96	-0.43	9.68	16.59
75.0	800	0.624	26.6	19.49	10.59	-0.49	9.75	16.71
75.0	808	0.663	26.2	19.54	11.26	-0.54	9.77	16.79
75.0	816	0.700	25.8	19.59	11.88	-0.60	9.80	16.88
75.0	827	0.736	25.5	19.72	12.50	-0.65	9.86	16.99
75.0	834	0.775	25.2	19.74	13.15	-0.70	9.87	17.05
75.0	842	0.812	24.8	19.78	13.79	-0.74	9.89	17.11
75.0	850	0.849	24.5	19.82	14.42	-0.79	9.91	17.18
75.0	859	0.887	24.3	19.88	15.06	-0.83	9.94	17.25
75.0	864	0.925	24.1	19.85	15.71	-0.86	9.92	17.26
75.0	870	0.962	23.8	19.83	16.34	-0.89	9.92	17.29
75.0	907	1.225	22.3	19.58	20.79	-1.10	9.79	17.37

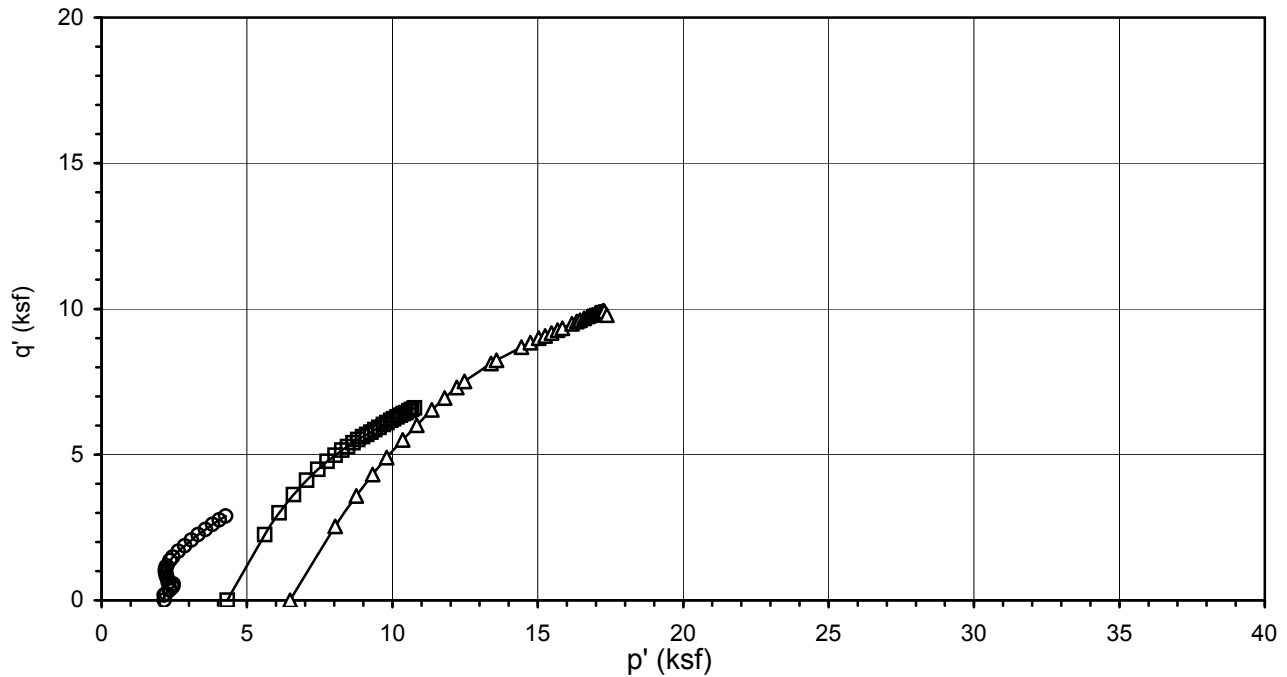


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi

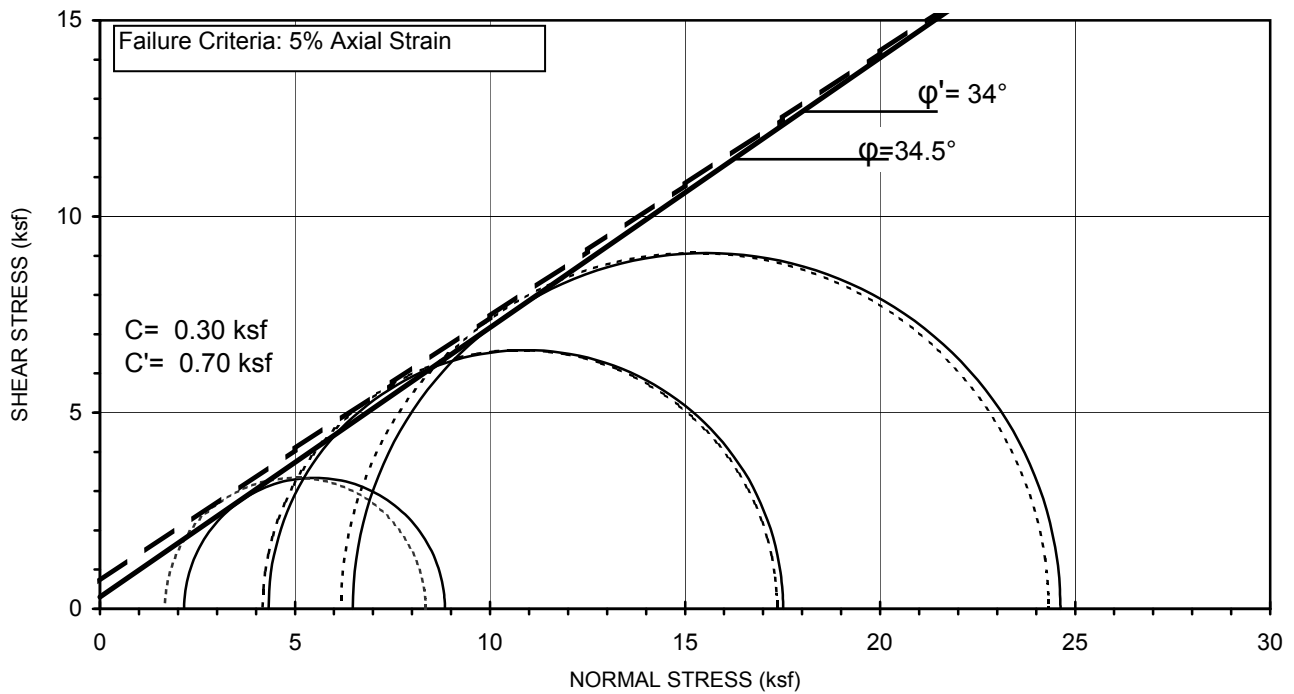


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Sand
Test Pit:	G-190	Avg. Dry Unit Weight (pcf):	117.1
Sample No.:	8	Avg. Initial Moisture Content (%):	14.7
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

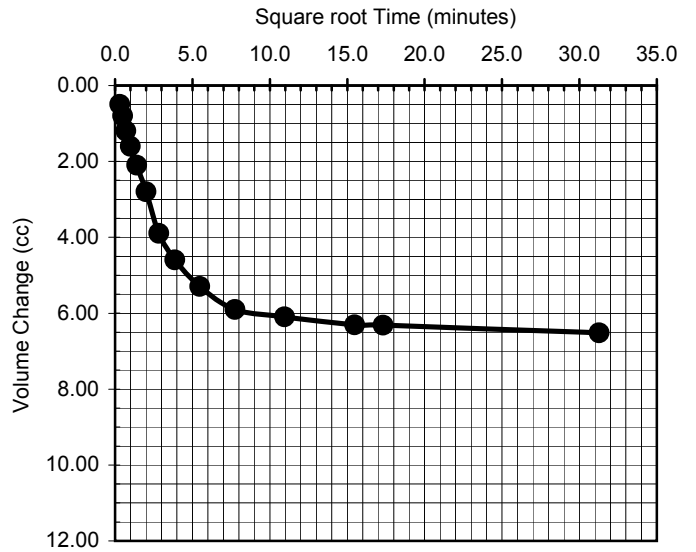
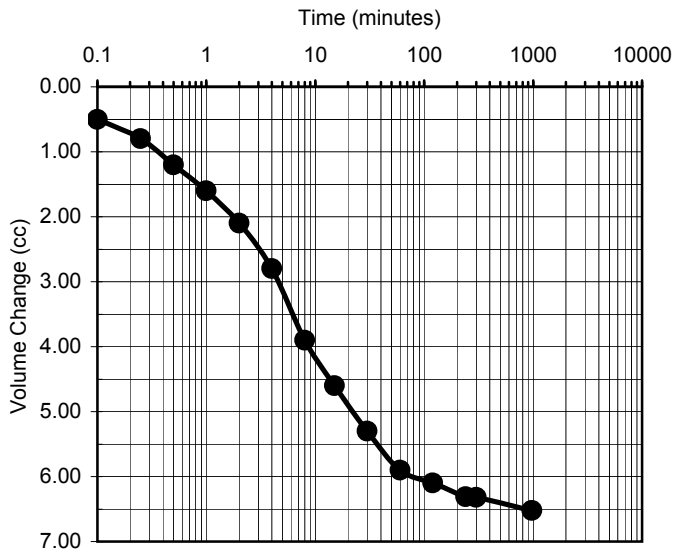


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Sand
Test Pit:	G-190	Avg. Dry Unit Weight (pcf):	117.1
Sample No.:	8	Avg. Initial Moisture Content (%):	14.7
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-190	Sample Type:	Mod. Cal.
Sample No.:	8	Soil Description:	Clayey Sand
Depth (feet):	35.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.5000
0.25	0.8000
0.5	1.2000
1	1.6000
2	2.1000
4	2.8000
8	3.9000
15	4.6000
30	5.3000
60	5.9000
120	6.1000
240	6.3100
300	6.3200
979	6.5200

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.5000
0.5000	0.8000
0.7071	1.2000
1.0000	1.6000
1.4142	2.1000
2.0000	2.8000
2.8284	3.9000
3.8730	4.6000
5.4772	5.3000
7.7460	5.9000
10.9545	6.1000
15.4919	6.3100
17.3205	6.3200
31.2890	6.5200

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	08/13/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-10-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	18	Sample Description:	Sandy Lean Clay		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	25.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.799</u>	<u>5.799</u>	<u>5.799</u>	Avg. =	5.799

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.312
Moisture Content (%)	18.79	17.83
Wet Weight (gms)	1074.38	1216.79
Dry Weight (gms)	904.42	1055.51
Container Weight (gms)	0.00	151.09
Density and Saturation		
Wet Weight (gms)	1074.38	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.4	
Dry Density (pcf)	110.6	
Initial Void Ratio	0.523	
% Saturation	97.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	55.0	Initial Burette Ht.(cm)=	75.5
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	64.7
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	5.739
Induced OCR =	1.0	Initial Volume (cu.in)=	31.145
Change in Ht. of Specimen (in) =	0.0603	Final Volume (cu.in) =	30.486

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	9.61
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	1.81
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	11.42
		Axial Strain (%) =	5.31



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-10-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	18	Sample Description:	Sandy Lean Clay		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	40.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.799</u>	<u>5.799</u>	<u>5.799</u>	Avg. =	5.799

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.296
Moisture Content (%)	18.79	17.83
Wet Weight (gms)	1074.38	1216.79
Dry Weight (gms)	904.42	1055.51
Container Weight (gms)	0.00	151.09
Density and Saturation		
Wet Weight (gms)	1074.38	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.4	
Dry Density (pcf)	110.6	
Initial Void Ratio	0.523	
% Saturation	97.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	64.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	57.7
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	5.799
Induced OCR=	1.0	Initial Volume (cu.in)=	31.145
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	30.712

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	15.84
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	4.51
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	20.35
		Axial Strain (%) =	5.20



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [08-10-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-17-11](#)
 Test Pit: [G-190](#) Reviewed by: [AP](#) Date: [08-17-11](#)
 Sample No.: [18](#) Sample Description: [Sandy Lean Clay](#)
 Depth(ft): [65.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 55.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	5.799	5.799	5.799	Avg. =	5.799

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.322
Moisture Content (%)	18.79	17.83
Wet Weight (gms)	1074.38	1216.79
Dry Weight (gms)	904.42	1055.51
Container Weight (gms)	0.00	151.09
Density and Saturation		
Wet Weight (gms)	1074.38	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.4	
Dry Density (pcf)	110.6	
Initial Void Ratio	0.523	
% Saturation	97.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	85.0	Initial Burette Ht.(cm)=	57.8
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	53.2
Eff. Consol. Stress (psi) =	55.0	Final Height (in)=	5.799
Induced OCR =	1.0	Initial Volume (cu.in)=	31.145
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	30.864

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	21.51
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	6.54
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	28.05
		Axial Strain (%) =	4.57



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	25.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.799 in
Sample No.:	18	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.739 in
Sample Description:	Sandy Lean Clay	Final Sample Area (A)*:	5.312 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	0	0.000	30.0	0.00	0.00	0.00	0.00	3.60
55.0	52	0.002	32.6	1.41	0.03	0.37	0.70	3.93
55.0	77	0.006	35.0	2.08	0.10	0.72	1.04	3.92
55.0	91	0.011	36.8	2.46	0.18	0.98	1.23	3.85
55.0	103	0.016	38.2	2.78	0.28	1.18	1.39	3.80
55.0	112	0.021	39.3	3.02	0.37	1.34	1.51	3.77
55.0	118	0.027	40.2	3.19	0.48	1.47	1.60	3.72
55.0	126	0.033	41.0	3.40	0.57	1.58	1.70	3.72
55.0	131	0.039	41.6	3.53	0.68	1.67	1.77	3.70
55.0	137	0.044	42.1	3.67	0.77	1.74	1.84	3.69
55.0	142	0.050	42.5	3.81	0.87	1.80	1.90	3.70
55.0	147	0.056	42.9	3.94	0.97	1.86	1.97	3.72
55.0	151	0.061	43.2	4.04	1.06	1.90	2.02	3.72
55.0	156	0.067	43.5	4.18	1.16	1.94	2.09	3.75
55.0	160	0.072	43.7	4.28	1.26	1.97	2.14	3.77
55.0	164	0.078	43.9	4.38	1.35	2.00	2.19	3.79
55.0	169	0.084	44.1	4.51	1.46	2.03	2.26	3.83
55.0	173	0.089	44.2	4.61	1.55	2.05	2.31	3.86
55.0	186	0.107	44.5	4.95	1.86	2.09	2.47	3.98
55.0	195	0.119	44.6	5.18	2.07	2.11	2.59	4.08
55.0	204	0.131	44.7	5.41	2.28	2.12	2.70	4.18
55.0	213	0.143	44.7	5.64	2.48	2.12	2.82	4.30
55.0	222	0.155	44.7	5.86	2.69	2.12	2.93	4.41
55.0	231	0.166	44.7	6.09	2.89	2.11	3.05	4.53
55.0	242	0.177	44.6	6.35	3.09	2.10	3.18	4.67
55.0	252	0.187	44.5	6.61	3.26	2.09	3.31	4.82
55.0	263	0.199	44.4	6.87	3.46	2.07	3.44	4.96
55.0	274	0.210	44.2	7.16	3.65	2.05	3.58	5.13
55.0	286	0.221	44.1	7.45	3.86	2.03	3.73	5.30
55.0	298	0.234	43.9	7.74	4.07	2.00	3.87	5.47
55.0	311	0.245	43.7	8.06	4.28	1.97	4.03	5.66
55.0	322	0.258	43.5	8.35	4.49	1.94	4.17	5.83
55.0	335	0.270	43.2	8.65	4.70	1.91	4.33	6.02
55.0	348	0.282	43.0	8.98	4.91	1.87	4.49	6.22
55.0	374	0.305	42.4	9.61	5.31	1.79	4.80	6.62



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	40.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.799 in
Sample No.:	18	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.799 in
Sample Description:	Sandy Lean Clay	Final Sample Area (A)*:	5.296 sq. in.
		Induced OCR=	1.0

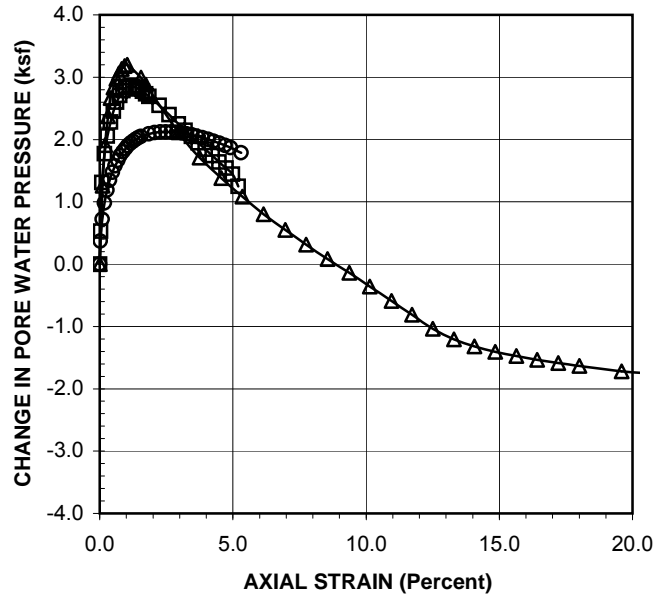
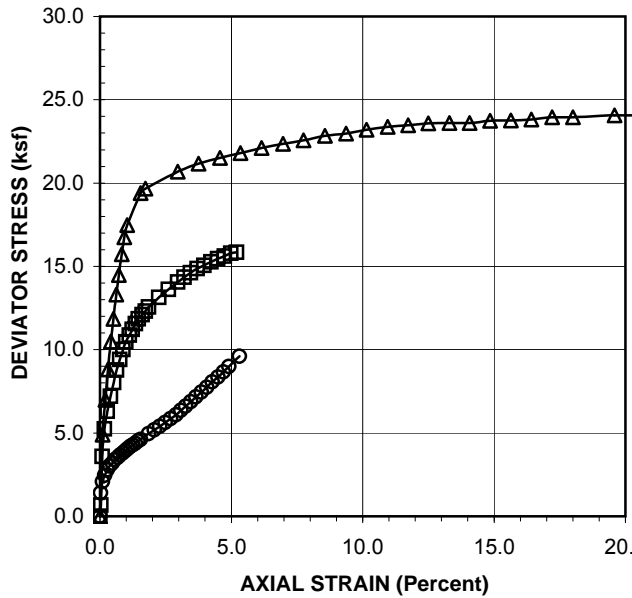
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.76
70.0	25	0.002	33.7	0.68	0.03	0.53	0.34	5.57
70.0	132	0.005	39.1	3.59	0.09	1.31	1.79	6.25
70.0	193	0.010	42.3	5.24	0.18	1.77	2.62	6.61
70.0	232	0.017	44.3	6.29	0.28	2.06	3.15	6.85
70.0	266	0.023	45.8	7.20	0.40	2.28	3.60	7.08
70.0	297	0.030	47.0	8.03	0.52	2.45	4.02	7.32
70.0	325	0.037	48.0	8.78	0.63	2.60	4.39	7.55
70.0	349	0.044	48.8	9.42	0.75	2.71	4.71	7.76
70.0	371	0.051	49.3	10.00	0.87	2.78	5.00	7.98
70.0	389	0.057	49.7	10.47	0.98	2.83	5.24	8.16
70.0	404	0.065	49.8	10.86	1.12	2.85	5.43	8.34
70.0	418	0.072	49.8	11.23	1.23	2.85	5.61	8.52
70.0	431	0.078	49.7	11.56	1.35	2.84	5.78	8.70
70.0	442	0.085	49.5	11.84	1.47	2.81	5.92	8.87
70.0	452	0.094	49.3	12.09	1.61	2.77	6.05	9.03
70.0	461	0.100	49.0	12.32	1.73	2.73	6.16	9.19
70.0	471	0.108	48.7	12.57	1.85	2.69	6.28	9.35
70.0	494	0.130	47.7	13.13	2.24	2.55	6.57	9.78
70.0	514	0.151	46.7	13.61	2.61	2.40	6.81	10.17
70.0	533	0.172	45.6	14.06	2.96	2.25	7.03	10.54
70.0	545	0.186	44.9	14.34	3.21	2.15	7.17	10.78
70.0	557	0.200	44.2	14.62	3.45	2.05	7.31	11.02
70.0	568	0.215	43.5	14.87	3.70	1.95	7.44	11.25
70.0	577	0.230	42.8	15.07	3.96	1.84	7.53	11.45
70.0	586	0.245	42.1	15.26	4.23	1.74	7.63	11.65
70.0	595	0.260	41.4	15.45	4.48	1.64	7.73	11.85
70.0	603	0.275	40.7	15.62	4.74	1.54	7.81	12.03
70.0	611	0.289	40.0	15.79	4.98	1.44	7.89	12.21
70.0	614	0.301	38.7	15.84	5.20	1.25	7.92	12.43



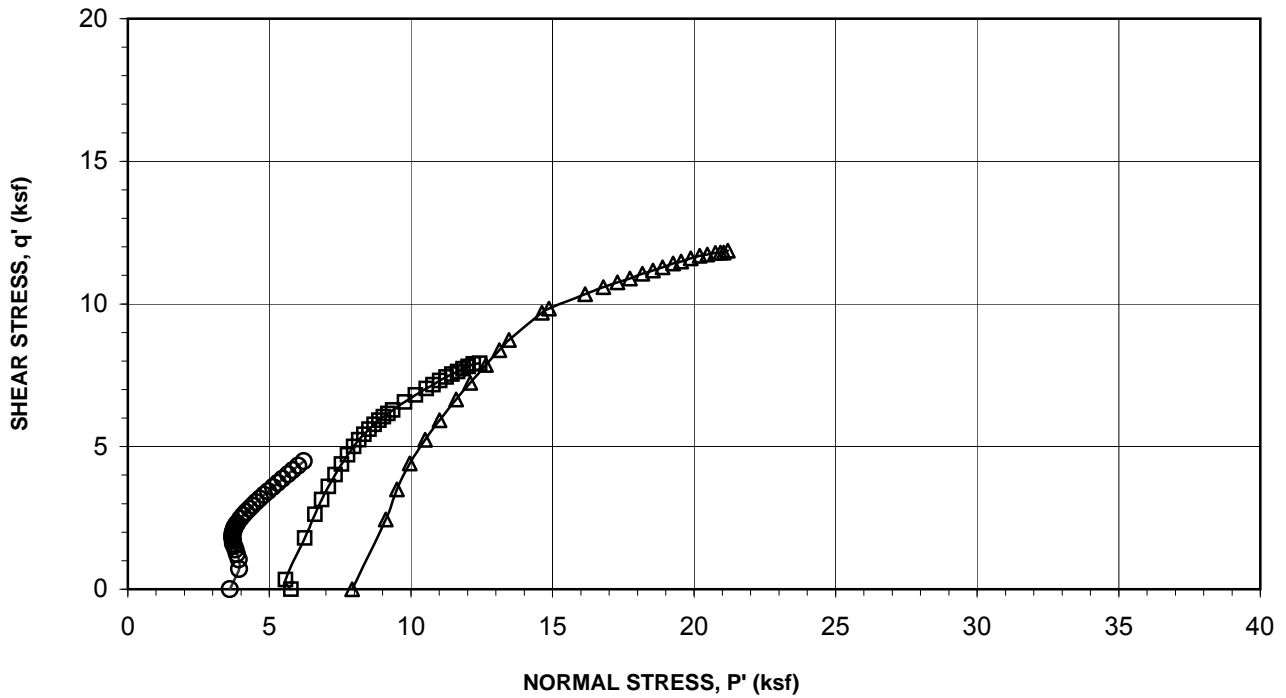
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	85.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	55.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.799 in
Sample No.:	18	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.799 in
Sample Description:	Sandy Lean Clay	Final Sample Area (A)*:	5.322 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
85.0	0	0.000	30.0	0.00	0.00	0.00	0.00	7.92
85.0	181	0.006	38.7	4.89	0.10	1.26	2.45	9.11
85.0	259	0.012	43.3	6.99	0.21	1.91	3.50	9.51
85.0	327	0.018	46.5	8.82	0.31	2.37	4.41	9.96
85.0	389	0.024	48.5	10.48	0.41	2.66	5.24	10.50
85.0	440	0.030	49.7	11.84	0.52	2.83	5.92	11.01
85.0	495	0.036	50.7	13.31	0.62	2.97	6.65	11.60
85.0	539	0.042	51.3	14.48	0.72	3.06	7.24	12.10
85.0	586	0.048	51.7	15.72	0.83	3.13	7.86	12.65
85.0	625	0.054	52.1	16.75	0.93	3.18	8.38	13.12
85.0	653	0.060	52.2	17.48	1.03	3.20	8.74	13.47
85.0	728	0.090	50.8	19.39	1.55	2.99	9.70	14.62
85.0	740	0.100	50.0	19.68	1.72	2.88	9.84	14.88
85.0	788	0.171	44.7	20.69	2.95	2.11	10.35	16.15
85.0	813	0.217	41.9	21.17	3.75	1.71	10.59	16.80
85.0	833	0.265	39.6	21.51	4.57	1.38	10.75	17.29
85.0	851	0.310	37.5	21.79	5.35	1.08	10.90	17.73
85.0	871	0.357	35.6	22.12	6.15	0.80	11.06	18.18
85.0	888	0.404	33.8	22.35	6.97	0.55	11.18	18.54
85.0	904	0.450	32.2	22.56	7.75	0.32	11.28	18.89
85.0	923	0.496	30.6	22.84	8.56	0.08	11.42	19.25
85.0	937	0.543	29.1	22.98	9.36	-0.14	11.49	19.55
85.0	954	0.588	27.5	23.19	10.14	-0.36	11.60	19.88
85.0	970	0.635	25.9	23.37	10.95	-0.59	11.69	20.19
85.0	983	0.680	24.4	23.48	11.73	-0.81	11.74	20.47
85.0	996	0.725	22.8	23.58	12.50	-1.04	11.79	20.75
85.0	1006	0.771	21.6	23.60	13.30	-1.21	11.80	20.93
85.0	1015	0.816	20.8	23.60	14.07	-1.32	11.80	21.04
85.0	1030	0.861	20.2	23.73	14.85	-1.41	11.87	21.19
85.0	1041	0.907	19.8	23.76	15.64	-1.47	11.88	21.27
85.0	1053	0.952	19.3	23.81	16.42	-1.54	11.91	21.36
85.0	1069	0.998	19.0	23.94	17.22	-1.59	11.97	21.48
85.0	1080	1.044	18.7	23.96	18.00	-1.63	11.98	21.53
85.0	1106	1.136	18.0	24.06	19.59	-1.72	12.03	21.67
85.0	1127	1.227	17.7	24.04	21.16	-1.77	12.02	21.71

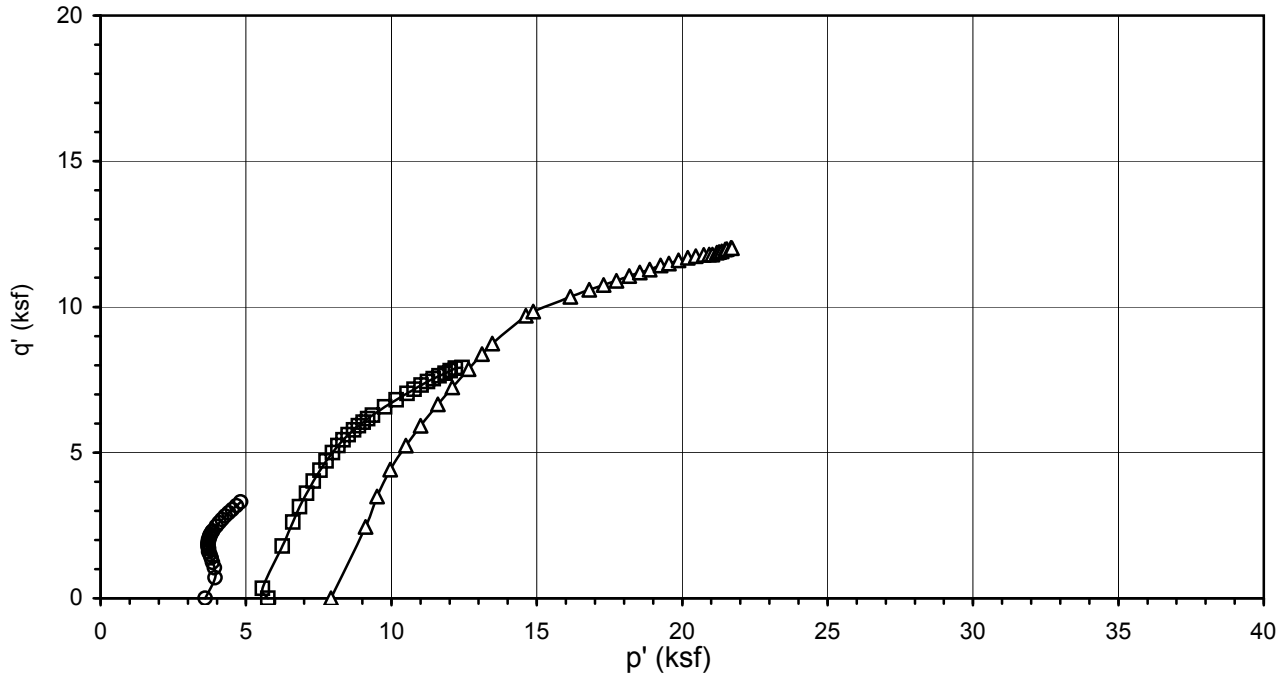


LEGEND: CONFINING PRESSURES= ○ 25 psi □ 40 psi △ 55 psi

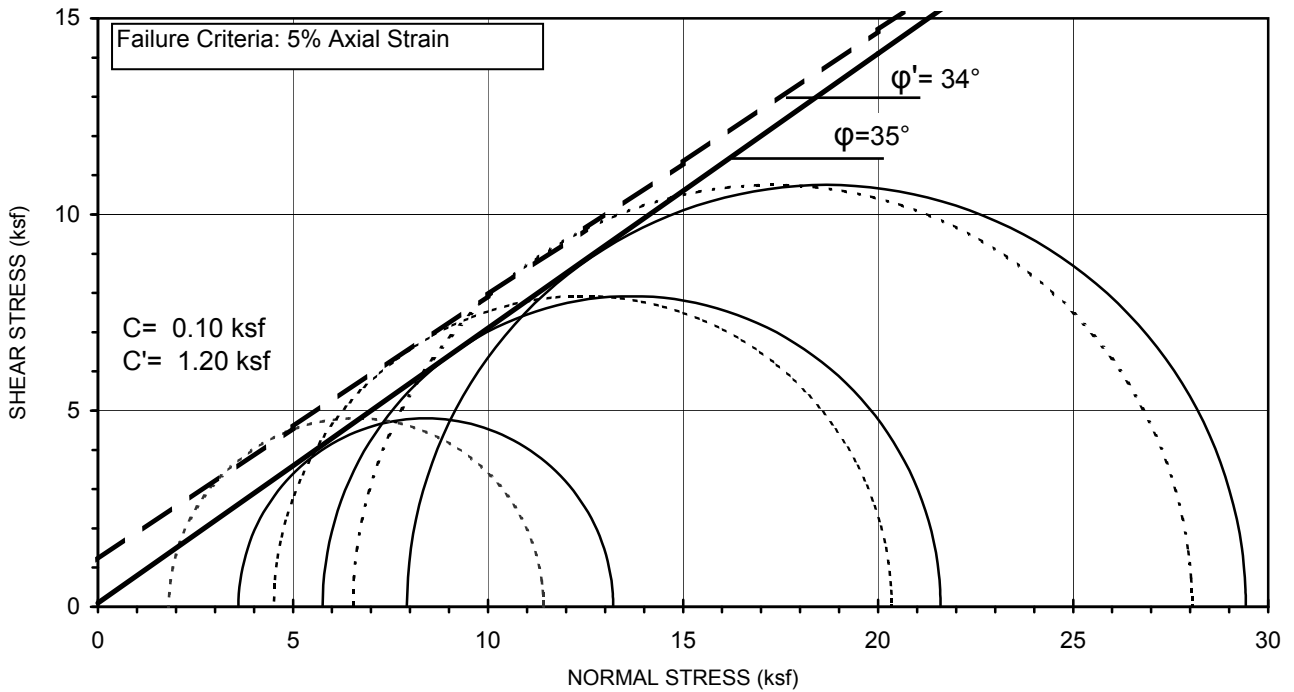


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Sandy Lean Clay
Test Pit:	G-190	Avg. Dry Unit Weight (pcf):	110.6
Sample No.:	18	Avg. Initial Moisture Content (%):	18.8
Depth (ft):	65.5	Confining Pressure:	25.0, 40.0, 55.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



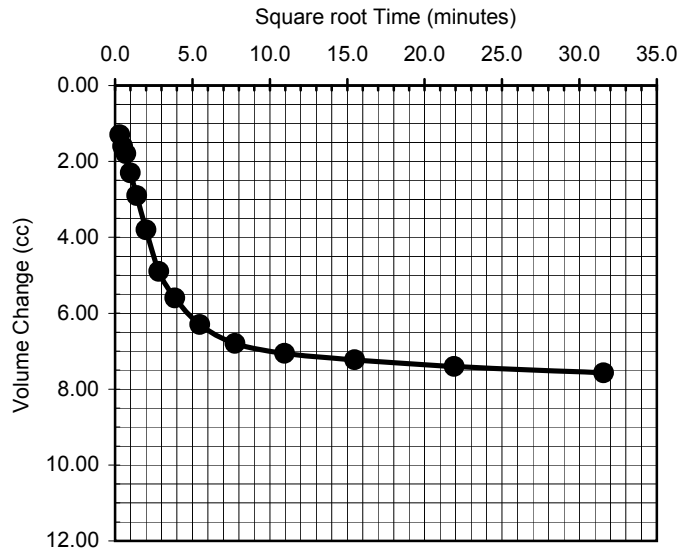
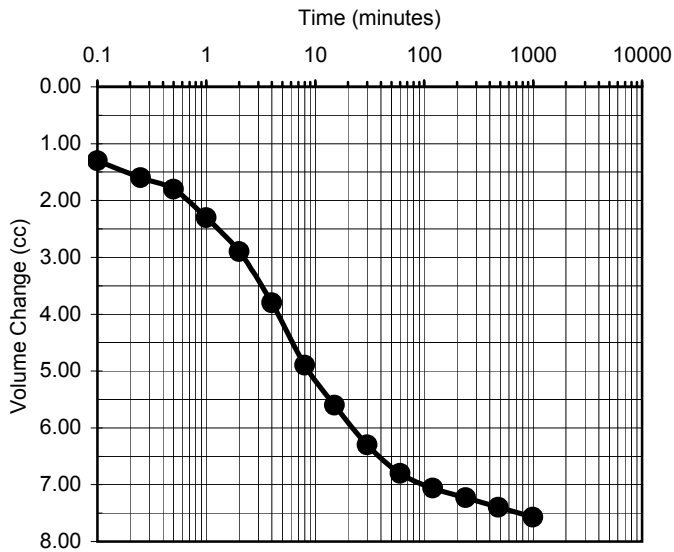
LEGEND: CONFINING PRESSURES= ○ 25 psi □ 40 psi △ 55 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-190
 Sample No.: 18
 Depth (ft): 65.5

Sample Type: Mod. Cal.
 Sample Description: Sandy Lean Clay
 Avg. Dry Unit Weight (pcf): 110.6
 Avg. Initial Moisture Content (%): 18.8
 Confining Pressure: 25.0, 40.0, 55.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**



Test Pit:	G-190	Sample Type:	Mod. Cal.
Sample No.:	18	Soil Description:	Sandy Lean Clay
Depth (feet):	65.5	Eff. Confining Pressure (psi):	40.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.3000
0.25	1.6000
0.5	1.8000
1	2.3000
2	2.9000
4	3.8000
8	4.9000
15	5.6000
30	6.3000
60	6.8000
120	7.0600
240	7.2300
480	7.4000
997	7.5700

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.3000
0.5000	1.6000
0.7071	1.8000
1.0000	2.3000
1.4142	2.9000
2.0000	3.8000
2.8284	4.9000
3.8730	5.6000
5.4772	6.3000
7.7460	6.8000
10.9545	7.0600
15.4919	7.2300
21.9089	7.4000
31.5753	7.5700

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	08/10/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-09-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	21	Sample Description:	Lean Clay with sand		
Depth(ft):	75.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>4.724</u>	<u>4.724</u>	<u>4.724</u>	Avg. =	4.724

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.252
Moisture Content (%)	21.85	20.13
Wet Weight (gms)	104.74	999.49
Dry Weight (gms)	94.94	856.66
Container Weight (gms)	50.08	147.29
Density and Saturation		
Wet Weight (gms)	858.47	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.4	
Dry Density (pcf)	105.4	
Initial Void Ratio	0.599	
% Saturation	98.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	90.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	79.2
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	4.721
Induced OCR =	1.0	Initial Volume (cu.in)=	25.468
Change in Ht. of Specimen (in) =	0.0027	Final Volume (cu.in) =	24.797

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.06
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	2.66
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	13.72
		Axial Strain (%) =	5.37



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [08-09-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-17-11](#)
 Test Pit: [G-190](#) Reviewed by: [AP](#) Date: [08-17-11](#)
 Sample No.: [21](#) Sample Description: [Lean Clay with sand](#)
 Depth(ft): [75.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 45.0 psi](#)

Diameter (in)	2.620	2.620	2.620	Avg. =	2.620
Height (in)	4.724	4.724	4.724	Avg. =	4.724

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.302
Moisture Content (%)	21.85	20.13
Wet Weight (gms)	104.74	999.49
Dry Weight (gms)	94.94	856.66
Container Weight (gms)	50.08	147.29
Density and Saturation		
Wet Weight (gms)	858.47	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.4	
Dry Density (pcf)	105.4	
Initial Void Ratio	0.599	
% Saturation	98.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	79.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	72.3
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	4.724
Induced OCR=	1.0	Initial Volume (cu.in)=	25.468
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	25.047

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	18.14
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.99
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	24.13
		Axial Strain (%) =	5.38



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-09-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-190	Reviewed by:	AP	Date:	08-17-11
Sample No.:	21	Sample Description:	Lean Clay with sand		
Depth(ft):	75.5				
Sample Type:	Mod. Cal.	Confining Pressure =	60.0 psi		

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>4.724</u>	<u>4.724</u>	<u>4.724</u>	Avg. =	4.724

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.300
Moisture Content (%)	21.85	20.13
Wet Weight (gms)	104.74	999.49
Dry Weight (gms)	94.94	856.66
Container Weight (gms)	50.08	147.29
Density and Saturation		
Wet Weight (gms)	858.47	
Container Weight (gms)	0.00	
Wet Density (pcf)	128.4	
Dry Density (pcf)	105.4	
Initial Void Ratio	0.599	
% Saturation	98.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	72.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	65.3
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	4.724
Induced OCR =	1.0	Initial Volume (cu.in)=	25.468
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	25.035

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	23.67
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	9.13
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	32.80
		Axial Strain (%) =	5.49



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	30.0 psi
Depth(ft):	75.5	Initial Sample Height:	4.724 in
Sample No.:	21	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.721 in
Sample Description:	Lean Clay with sand	Final Sample Area (A)*:	5.252 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	0	0.000	30.0	0.00	0.00	0.00	0.00	4.32
60.0	39	0.004	33.5	1.08	0.09	0.50	0.54	4.35
60.0	64	0.011	33.9	1.76	0.22	0.56	0.88	4.64
60.0	75	0.017	33.9	2.06	0.35	0.56	1.03	4.80
60.0	86	0.023	34.1	2.35	0.49	0.58	1.18	4.91
60.0	92	0.029	34.4	2.50	0.61	0.63	1.25	4.94
60.0	104	0.034	37.6	2.84	0.72	1.10	1.42	4.64
60.0	115	0.039	40.1	3.13	0.83	1.45	1.56	4.43
60.0	131	0.045	41.8	3.56	0.95	1.70	1.78	4.40
60.0	145	0.050	43.1	3.93	1.07	1.88	1.97	4.40
60.0	155	0.056	44.0	4.20	1.19	2.02	2.10	4.40
60.0	165	0.062	44.7	4.46	1.31	2.12	2.23	4.43
60.0	174	0.068	45.2	4.70	1.43	2.19	2.35	4.47
60.0	181	0.072	45.6	4.89	1.53	2.25	2.45	4.51
60.0	189	0.078	45.9	5.09	1.66	2.30	2.54	4.57
60.0	196	0.084	46.2	5.29	1.77	2.33	2.64	4.64
60.0	204	0.090	46.3	5.48	1.90	2.35	2.74	4.71
60.0	211	0.095	46.4	5.68	2.00	2.36	2.84	4.79
60.0	219	0.100	46.5	5.87	2.11	2.37	2.94	4.89
60.0	240	0.116	46.4	6.42	2.46	2.36	3.21	5.17
60.0	263	0.134	46.3	6.99	2.83	2.34	3.50	5.48
60.0	285	0.152	45.9	7.56	3.21	2.29	3.78	5.81
60.0	309	0.169	45.4	8.16	3.57	2.21	4.08	6.19
60.0	333	0.186	44.7	8.76	3.94	2.12	4.38	6.58
60.0	357.5	0.203	44.0	9.38	4.29	2.02	4.69	6.99
60.0	380	0.219	43.3	9.93	4.64	1.91	4.97	7.38
60.0	404	0.236	42.4	10.52	5.01	1.79	5.26	7.79
60.0	426	0.253	41.6	11.06	5.37	1.66	5.53	8.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	45.0 psi
Depth(ft):	75.5	Initial Sample Height:	4.724 in
Sample No.:	21	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.724 in
Sample Description:	Lean Clay with sand	Final Sample Area (A)*:	5.302 sq. in.
		Induced OCR=	1.0

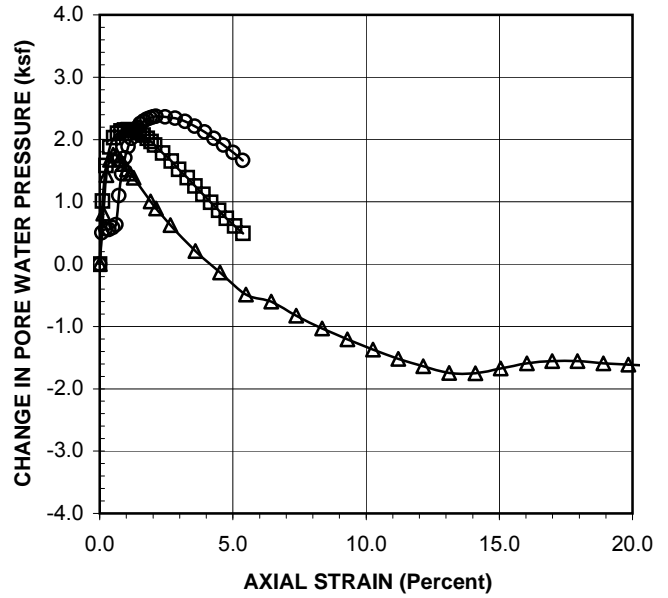
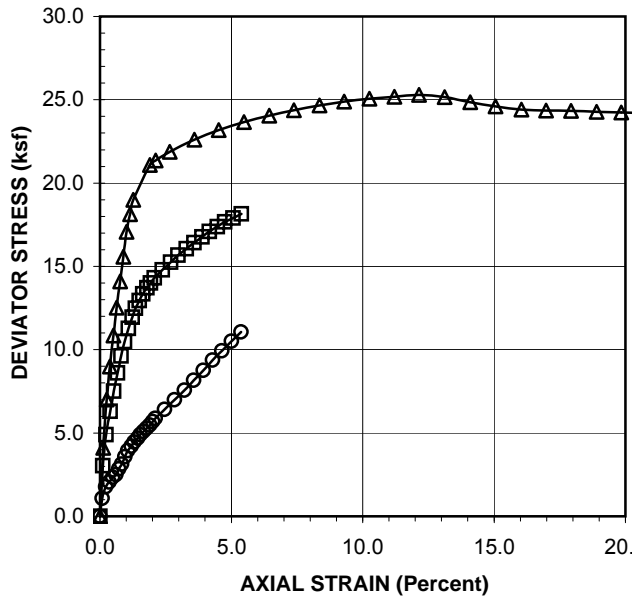
Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	112	0.005	37.0	3.04	0.11	1.01	1.52	6.99
75.0	181	0.011	41.0	4.90	0.24	1.58	2.45	7.35
75.0	233	0.018	43.1	6.30	0.39	1.88	3.15	7.75
75.0	278	0.025	44.1	7.51	0.52	2.03	3.76	8.21
75.0	319	0.032	44.6	8.61	0.67	2.10	4.30	8.68
75.0	357	0.038	44.8	9.62	0.80	2.14	4.81	9.15
75.0	390	0.044	45.0	10.49	0.94	2.15	5.25	9.57
75.0	420	0.051	45.0	11.28	1.09	2.16	5.64	9.96
75.0	445	0.058	44.9	11.94	1.23	2.15	5.97	10.30
75.0	466	0.064	44.8	12.48	1.36	2.13	6.24	10.59
75.0	484	0.071	44.6	12.95	1.49	2.11	6.47	10.85
75.0	500	0.077	44.4	13.36	1.64	2.07	6.68	11.09
75.0	514	0.084	44.0	13.71	1.78	2.02	6.86	11.31
75.0	526	0.091	43.7	14.01	1.93	1.97	7.00	11.52
75.0	538	0.098	43.3	14.31	2.07	1.91	7.15	11.72
75.0	558	0.112	42.4	14.80	2.37	1.78	7.40	12.09
75.0	577	0.127	41.5	15.25	2.69	1.65	7.62	12.45
75.0	595	0.140	40.6	15.68	2.97	1.52	7.84	12.80
75.0	611	0.155	39.6	16.05	3.29	1.38	8.02	13.12
75.0	627	0.169	38.7	16.42	3.58	1.25	8.21	13.44
75.0	642	0.183	37.8	16.76	3.88	1.12	8.38	13.74
75.0	657	0.197	36.9	17.10	4.17	0.99	8.55	14.04
75.0	670	0.211	36.0	17.38	4.47	0.86	8.69	14.31
75.0	683	0.225	35.1	17.67	4.75	0.73	8.83	14.58
75.0	694	0.239	34.2	17.89	5.07	0.61	8.95	14.82
75.0	706	0.254	33.4	18.14	5.38	0.49	9.07	15.06



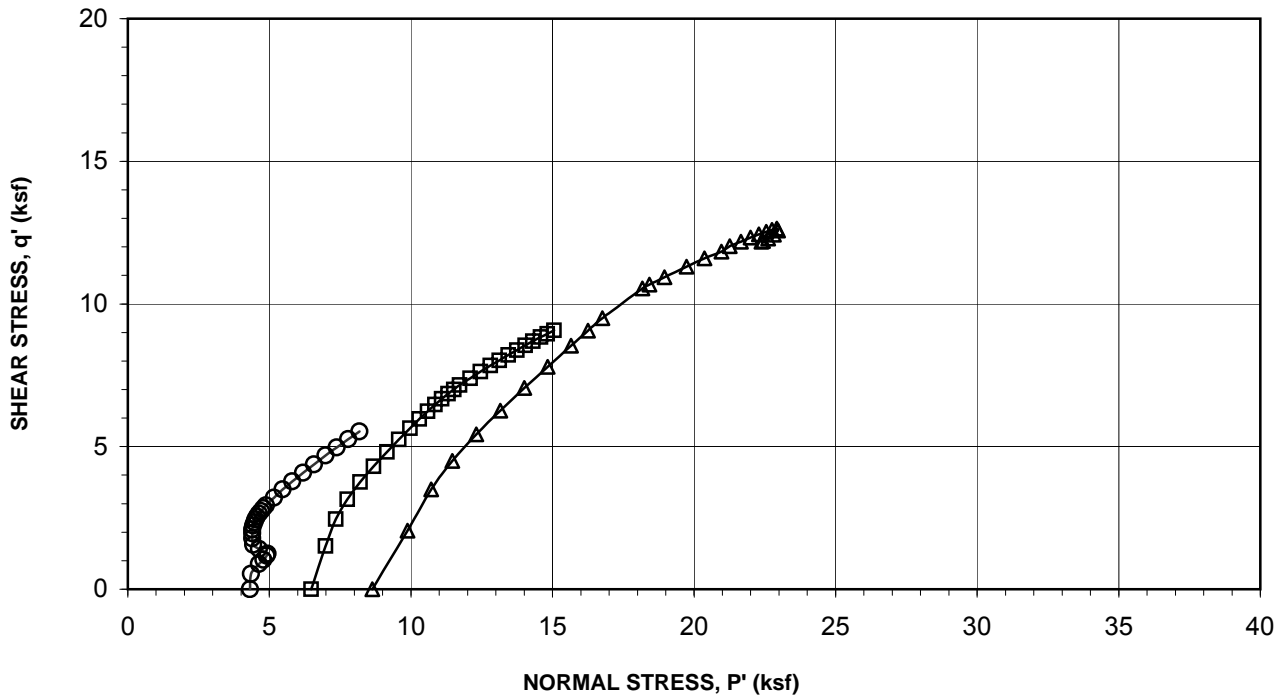
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-190	Consolidation Pressure :	60.0 psi
Depth(ft):	75.5	Initial Sample Height:	4.724 in
Sample No.:	21	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.724 in
Sample Description:	Lean Clay with sand	Final Sample Area (A)*:	5.300 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	151	0.006	35.7	4.10	0.13	0.81	2.05	9.88
90.0	258	0.012	39.9	7.00	0.25	1.43	3.50	10.71
90.0	332	0.018	41.6	8.99	0.38	1.67	4.49	11.46
90.0	401	0.024	42.2	10.85	0.51	1.76	5.43	12.31
90.0	464	0.030	42.1	12.51	0.64	1.74	6.26	13.16
90.0	523	0.036	41.7	14.10	0.76	1.68	7.05	14.01
90.0	579	0.042	41.2	15.58	0.89	1.61	7.79	14.83
90.0	635	0.048	40.6	17.07	1.02	1.52	8.53	15.65
90.0	675	0.054	40.1	18.13	1.14	1.45	9.07	16.25
90.0	708	0.060	39.6	19.00	1.27	1.38	9.50	16.76
90.0	791	0.090	37.0	21.09	1.91	1.01	10.54	18.18
90.0	803	0.100	36.2	21.35	2.12	0.89	10.68	18.42
90.0	827	0.125	34.4	21.88	2.65	0.63	10.94	18.95
90.0	863	0.170	31.5	22.61	3.60	0.21	11.30	19.73
90.0	894	0.213	29.1	23.19	4.52	-0.13	11.59	20.37
90.0	922	0.259	26.6	23.67	5.49	-0.49	11.83	20.96
90.0	946	0.304	25.8	24.05	6.44	-0.60	12.02	21.27
90.0	968	0.349	24.3	24.37	7.38	-0.83	12.19	21.65
90.0	990	0.395	22.8	24.65	8.35	-1.03	12.33	22.00
90.0	1010	0.439	21.6	24.89	9.30	-1.21	12.44	22.29
90.0	1028	0.485	20.5	25.06	10.26	-1.37	12.53	22.54
90.0	1044	0.529	19.5	25.19	11.21	-1.52	12.59	22.75
90.0	1059	0.574	18.6	25.29	12.14	-1.64	12.64	22.92
90.0	1066	0.620	17.9	25.16	13.12	-1.75	12.58	22.96
90.0	1065	0.666	17.8	24.85	14.10	-1.75	12.43	22.82
90.0	1066	0.711	18.4	24.60	15.05	-1.67	12.30	22.61
90.0	1070	0.758	18.9	24.41	16.04	-1.59	12.21	22.44
90.0	1080	0.802	19.2	24.36	16.98	-1.56	12.18	22.38
90.0	1091	0.847	19.2	24.32	17.93	-1.56	12.16	22.36
90.0	1102	0.893	19.0	24.27	18.91	-1.59	12.14	22.37
90.0	1113	0.938	18.8	24.25	19.85	-1.61	12.12	22.37
90.0	1123	0.983	18.7	24.17	20.80	-1.63	12.09	22.36
90.0	1133	1.027	18.7	24.09	21.75	-1.63	12.05	22.31

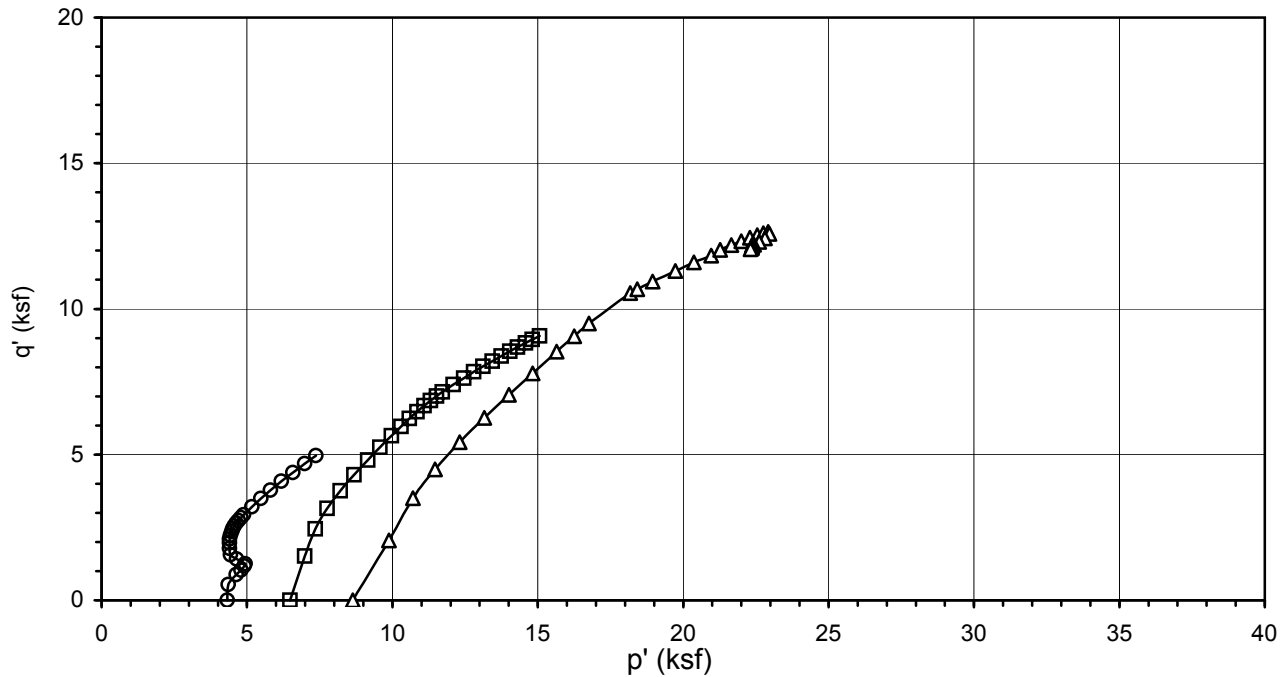


LEGEND: CONFINING PRESSURES= ○ 30 psi □ 45 psi △ 60 psi

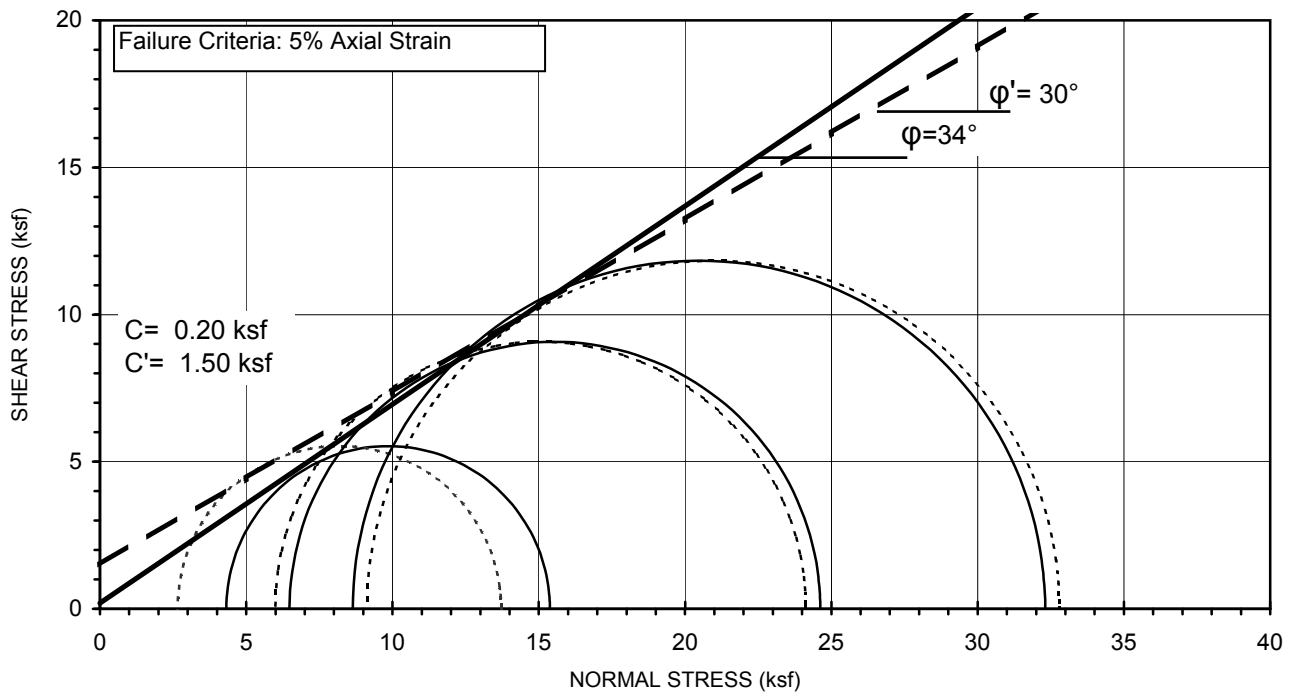


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Lean Clay with sand
Test Pit:	G-190	Avg. Dry Unit Weight (pcf):	105.4
Sample No.:	21	Avg. Initial Moisture Content (%):	21.8
Depth (ft):	75.5	Confining Pressure:	30.0, 45.0, 60.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

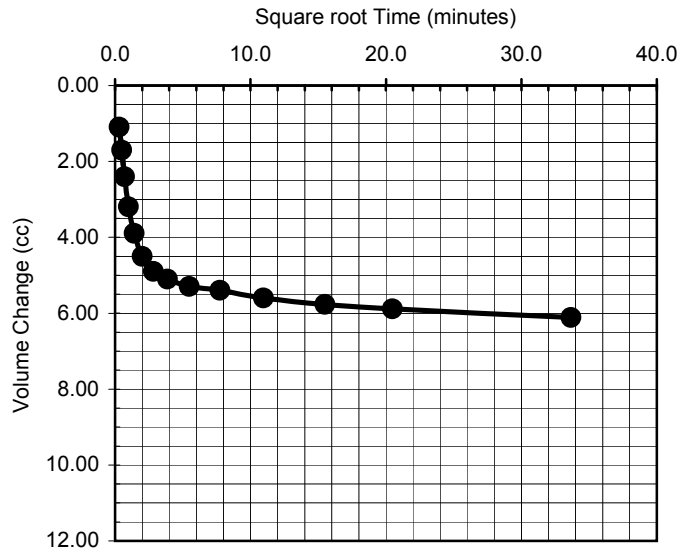
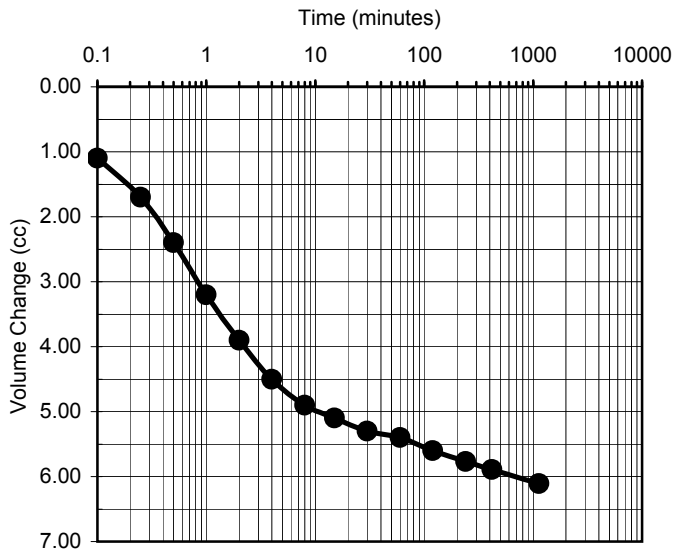


LEGEND: CONFINING PRESSURES= ○ 30 psi □ 45 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Lean Clay with sand
Test Pit:	G-190	Avg. Dry Unit Weight (pcf):	105.4
Sample No.:	21	Avg. Initial Moisture Content (%):	21.8
Depth (ft):	75.5	Confining Pressure:	30.0, 45.0, 60.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-190	Sample Type:	Mod. Cal.
Sample No.:	21	Soil Description:	Lean Clay with sand
Depth (feet):	75.5	Eff. Confining Pressure (psi):	45.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.1000
0.25	1.7000
0.5	2.4000
1	3.2000
2	3.9000
4	4.5000
8	4.9000
15	5.1000
30	5.3000
60	5.4000
120	5.6000
240	5.7700
420	5.8900
1134	6.1100

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.1000
0.5000	1.7000
0.7071	2.4000
1.0000	3.2000
1.4142	3.9000
2.0000	4.5000
2.8284	4.9000
3.8730	5.1000
5.4772	5.3000
7.7460	5.4000
10.9545	5.6000
15.4919	5.7700
20.4939	5.8900
33.6749	6.1100

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	08/09/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [08-10-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-17-11](#)
 Test Pit: [G-191](#) Reviewed by: [AP](#) Date: [08-17-11](#)
 Sample No.: [3](#) Sample Description: [Clayey to Silty Sand w/gravel](#)
 Depth(ft): [25.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 10.0 psi](#)

Diameter (in)	2.620	2.620	2.620	Avg. =	2.620
Height (in)	5.885	5.885	5.885	Avg. =	5.885

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.402
Moisture Content (%)	12.63	12.22
Wet Weight (gms)	1107.75	1251.56
Dry Weight (gms)	983.52	1131.36
Container Weight (gms)	0.00	147.84
Density and Saturation		
Wet Weight (gms)	1107.75	
Container Weight (gms)	0.00	
Wet Density (pcf)	133.0	
Dry Density (pcf)	118.1	
Initial Void Ratio	0.427	
% Saturation	79.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	89.6
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	88.0
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	5.855
Induced OCR =	1.0	Initial Volume (cu.in)=	31.728
Change in Ht. of Specimen (in) =	0.0297	Final Volume (cu.in) =	31.630

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	16.63
Time to 50% primary Consolidation (min) =	4	Eff. Minor Principal stress (ksf) =	3.23
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	19.86
		Axial Strain (%) =	5.18



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-10-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-17-11
Test Pit:	G-191	Reviewed by:	AP	Date:	08-17-11
Sample No.:	3	Sample Description:	Clayey to Silty Sand w/gravel		
Depth(ft):	25.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>5.885</u>	<u>5.885</u>	<u>5.885</u>	Avg. =	5.885

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.372
Moisture Content (%)	12.63	12.22
Wet Weight (gms)	1107.75	1251.56
Dry Weight (gms)	983.52	1131.36
Container Weight (gms)	0.00	147.84
Density and Saturation		
Wet Weight (gms)	1107.75	
Container Weight (gms)	0.00	
Wet Density (pcf)	133.0	
Dry Density (pcf)	118.1	
Initial Void Ratio	0.427	
% Saturation	79.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	88.0
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	86.1
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.885
Induced OCR=	1.0	Initial Volume (cu.in)=	31.728
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.612

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	26.95
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	5.82
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	32.77
		Axial Strain (%) =	4.99



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-10-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-17-11**
 Test Pit: **G-191** Reviewed by: **AP** Date: **08-17-11**
 Sample No.: **3** Sample Description: **Clayey to Silty Sand w/gravel**
 Depth(ft): **25.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 30.0 psi**

Diameter (in)	<u>2.620</u>	<u>2.620</u>	<u>2.620</u>	Avg. =	2.620
Height (in)	<u>5.885</u>	<u>5.885</u>	<u>5.885</u>	Avg. =	5.885

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.391	5.422
Moisture Content (%)	12.63	12.22
Wet Weight (gms)	1107.75	1251.56
Dry Weight (gms)	983.52	1131.36
Container Weight (gms)	0.00	147.84
Density and Saturation		
Wet Weight (gms)	1107.75	
Container Weight (gms)	0.00	
Wet Density (pcf)	133.0	
Dry Density (pcf)	118.1	
Initial Void Ratio	0.427	
% Saturation	79.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)=	86.0
Back Pressure(psi) =	50.0	Final Burette Ht.(cm)=	89.0
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.885
Induced OCR =	1.0	Initial Volume (cu.in)=	31.728
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.911

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	34.42
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	7.58
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	41.99
		Axial Strain (%) =	4.85



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-191	Consolidation Pressure :	10.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.885 in
Sample No.:	3	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.855 in
Sample Description:	Clayey to Silty Sand w/gravel	Final Sample Area (A)*:	5.402 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	50.1	0.00	0.00	0.00	0.00	1.44
60.0	38	0.003	51.9	1.01	0.06	0.25	0.51	1.69
60.0	55	0.010	53.2	1.46	0.16	0.44	0.73	1.73
60.0	69	0.015	54.0	1.83	0.25	0.57	0.92	1.79
60.0	80	0.021	54.6	2.13	0.35	0.65	1.06	1.85
60.0	91	0.027	55.0	2.41	0.46	0.71	1.21	1.94
60.0	103	0.033	55.3	2.73	0.56	0.74	1.37	2.06
60.0	114	0.038	55.4	3.02	0.65	0.76	1.51	2.18
60.0	126	0.044	55.5	3.33	0.75	0.78	1.67	2.33
60.0	138	0.050	55.5	3.65	0.85	0.78	1.82	2.49
60.0	151	0.056	55.5	3.99	0.95	0.77	1.99	2.66
60.0	165	0.061	55.4	4.35	1.04	0.76	2.18	2.86
60.0	178	0.066	55.2	4.69	1.13	0.74	2.35	3.04
60.0	193	0.072	55.1	5.08	1.22	0.72	2.54	3.26
60.0	207	0.077	54.9	5.45	1.31	0.69	2.72	3.47
60.0	221	0.082	54.7	5.81	1.39	0.66	2.90	3.69
60.0	236	0.088	54.4	6.20	1.50	0.62	3.10	3.92
60.0	250	0.093	54.1	6.56	1.58	0.57	3.28	4.14
60.0	265	0.099	53.8	6.95	1.68	0.53	3.47	4.38
60.0	281	0.104	53.4	7.36	1.77	0.48	3.68	4.64
60.0	295	0.110	53.0	7.72	1.87	0.42	3.86	4.88
60.0	309	0.115	52.6	8.08	1.96	0.37	4.04	5.11
60.0	323	0.120	52.2	8.43	2.06	0.31	4.22	5.35
60.0	335	0.126	51.8	8.74	2.16	0.25	4.37	5.56
60.0	374	0.143	50.5	9.73	2.44	0.05	4.86	6.25
60.0	409	0.160	49.1	10.61	2.73	-0.15	5.30	6.89
60.0	444	0.177	47.6	11.48	3.02	-0.36	5.74	7.54
60.0	477	0.192	46.2	12.30	3.28	-0.56	6.15	8.15
60.0	506	0.207	44.8	13.01	3.54	-0.77	6.51	8.71
60.0	535	0.223	43.4	13.72	3.80	-0.96	6.86	9.26
60.0	562	0.239	42.1	14.37	4.07	-1.15	7.19	9.78
60.0	587	0.256	40.9	14.96	4.37	-1.33	7.48	10.25
60.0	613	0.272	39.8	15.58	4.64	-1.49	7.79	10.72
60.0	637	0.288	38.7	16.14	4.92	-1.64	8.07	11.15
60.0	658	0.303	37.7	16.63	5.18	-1.79	8.32	11.54



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-191	Consolidation Pressure :	20.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.885 in
Sample No.:	3	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.885 in
Sample Description:	Clayey to Silty Sand w/gravel	Final Sample Area (A)*:	5.372 sq. in.
		Induced OCR=	1.0

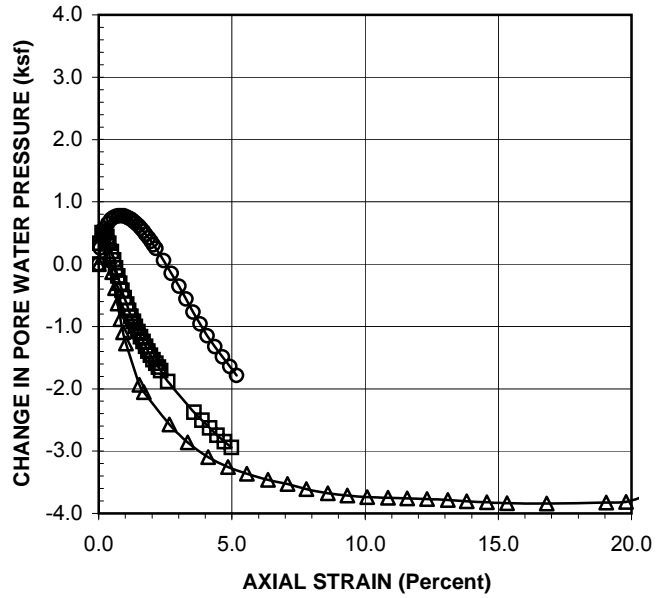
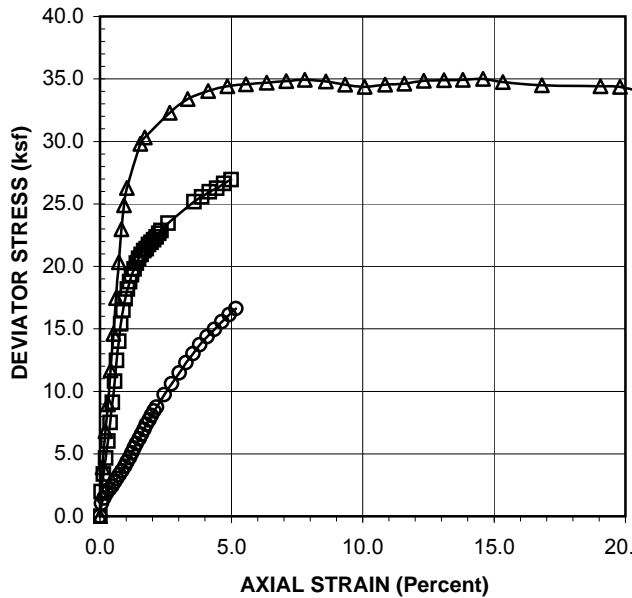
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	50.0	0.00	0.00	0.00	0.00	2.88
70.0	74	0.003	52.4	1.98	0.05	0.33	0.99	3.54
70.0	126	0.008	53.6	3.37	0.13	0.51	1.69	4.06
70.0	174	0.013	53.6	4.65	0.22	0.51	2.33	4.69
70.0	225	0.018	53.1	6.01	0.31	0.44	3.01	5.44
70.0	281	0.023	52.3	7.50	0.39	0.33	3.75	6.30
70.0	342	0.028	51.4	9.12	0.48	0.20	4.56	7.24
70.0	405	0.033	50.5	10.80	0.56	0.07	5.40	8.21
70.0	468	0.037	49.6	12.47	0.63	-0.06	6.23	9.18
70.0	526	0.043	48.7	14.00	0.72	-0.19	7.00	10.07
70.0	579	0.047	47.9	15.40	0.80	-0.31	7.70	10.89
70.0	621	0.052	47.1	16.50	0.88	-0.42	8.25	11.55
70.0	656	0.057	46.3	17.42	0.97	-0.54	8.71	12.13
70.0	685	0.062	45.6	18.17	1.05	-0.64	9.08	12.60
70.0	708	0.067	44.9	18.76	1.14	-0.74	9.38	13.01
70.0	730	0.071	44.2	19.33	1.21	-0.84	9.67	13.38
70.0	748	0.077	43.6	19.79	1.30	-0.92	9.90	13.70
70.0	766	0.081	43.1	20.25	1.38	-1.00	10.13	14.01
70.0	781	0.087	42.5	20.63	1.48	-1.09	10.31	14.28
70.0	794	0.093	41.9	20.95	1.57	-1.17	10.48	14.52
70.0	806	0.098	41.4	21.25	1.67	-1.24	10.62	14.75
70.0	813	0.104	40.9	21.41	1.76	-1.32	10.71	14.91
70.0	826	0.109	40.4	21.73	1.85	-1.40	10.87	15.14
70.0	834	0.115	39.9	21.92	1.95	-1.46	10.96	15.31
70.0	843	0.120	39.4	22.14	2.04	-1.54	11.07	15.48
70.0	852	0.126	39.0	22.35	2.14	-1.59	11.18	15.65
70.0	864	0.132	38.6	22.64	2.24	-1.65	11.32	15.85
70.0	873	0.137	38.2	22.86	2.33	-1.71	11.43	16.02
70.0	898	0.153	37.0	23.45	2.60	-1.88	11.72	16.49
70.0	974	0.211	33.5	25.18	3.58	-2.38	12.59	17.85
70.0	992	0.228	32.6	25.56	3.88	-2.51	12.78	18.17
70.0	1011	0.245	31.8	25.97	4.16	-2.63	12.99	18.50
70.0	1025	0.262	31.0	26.26	4.44	-2.75	13.13	18.76
70.0	1043	0.278	30.2	26.64	4.72	-2.85	13.32	19.05
70.0	1058	0.294	29.6	26.95	4.99	-2.94	13.47	19.30



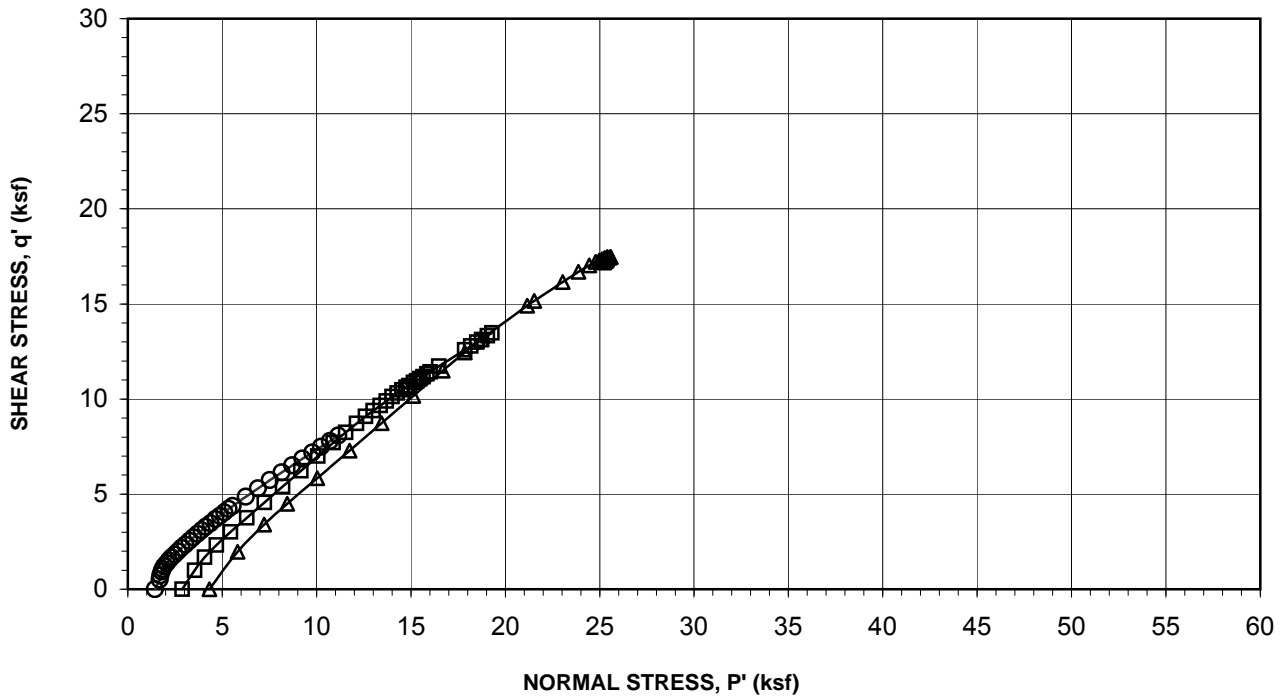
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	50.0 psi
Test Pit:	G-191	Consolidation Pressure :	30.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.885 in
Sample No.:	3	Initial Area of Sample:	5.391 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.*(L):	5.885 in
Sample Description:	Clayey to Silty Sand w/gravel	Final Sample Area (A)*:	5.422 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	50.0	0.00	0.00	0.00	0.00	4.32
80.0	148	0.006	53.3	3.93	0.10	0.47	1.96	5.81
80.0	257	0.012	53.5	6.81	0.20	0.50	3.41	7.23
80.0	339	0.018	52.5	8.98	0.31	0.36	4.49	8.45
80.0	442	0.024	50.9	11.69	0.41	0.13	5.85	10.04
80.0	552	0.030	49.1	14.58	0.51	-0.13	7.29	11.74
80.0	662	0.036	47.3	17.47	0.61	-0.38	8.74	13.44
80.0	771	0.042	45.6	20.33	0.71	-0.63	10.16	15.12
80.0	872	0.048	43.9	22.97	0.82	-0.88	11.48	16.69
80.0	946	0.054	42.4	24.89	0.92	-1.09	12.45	17.86
80.0	1000	0.060	41.2	26.29	1.02	-1.27	13.14	18.74
80.0	1140	0.090	36.6	29.81	1.53	-1.94	14.91	21.16
80.0	1161	0.100	35.7	30.31	1.70	-2.05	15.15	21.53
80.0	1249	0.156	32.1	32.29	2.65	-2.57	16.14	23.04
80.0	1301	0.197	30.2	33.40	3.34	-2.86	16.70	23.88
80.0	1337	0.242	28.5	34.05	4.11	-3.10	17.02	24.44
80.0	1362	0.285	27.4	34.42	4.85	-3.26	17.21	24.79
80.0	1378	0.327	26.6	34.56	5.56	-3.37	17.28	24.97
80.0	1395	0.374	26.0	34.69	6.35	-3.46	17.35	25.13
80.0	1411	0.417	25.5	34.82	7.09	-3.53	17.41	25.25
80.0	1426	0.459	24.9	34.92	7.80	-3.61	17.46	25.39
80.0	1434	0.506	24.5	34.81	8.60	-3.68	17.40	25.40
80.0	1435	0.549	24.2	34.55	9.33	-3.71	17.28	25.31
80.0	1439	0.593	24.1	34.36	10.07	-3.74	17.18	25.24
80.0	1459	0.639	24.0	34.54	10.85	-3.75	17.27	25.34
80.0	1474	0.682	23.9	34.61	11.58	-3.76	17.31	25.38
80.0	1497	0.726	23.8	34.85	12.33	-3.77	17.43	25.52
80.0	1513	0.771	23.7	34.92	13.10	-3.78	17.46	25.56
80.0	1526	0.813	23.6	34.93	13.81	-3.80	17.46	25.59
80.0	1543	0.858	23.5	35.00	14.57	-3.82	17.50	25.64
80.0	1546	0.902	23.4	34.76	15.33	-3.83	17.38	25.53
80.0	1561	0.990	23.3	34.48	16.82	-3.84	17.24	25.40
80.0	1601	1.121	23.4	34.42	19.05	-3.83	17.21	25.35
80.0	1613	1.165	23.5	34.36	19.79	-3.81	17.18	25.31
80.0	1611	1.208	24.2	34.00	20.52	-3.72	17.00	25.04

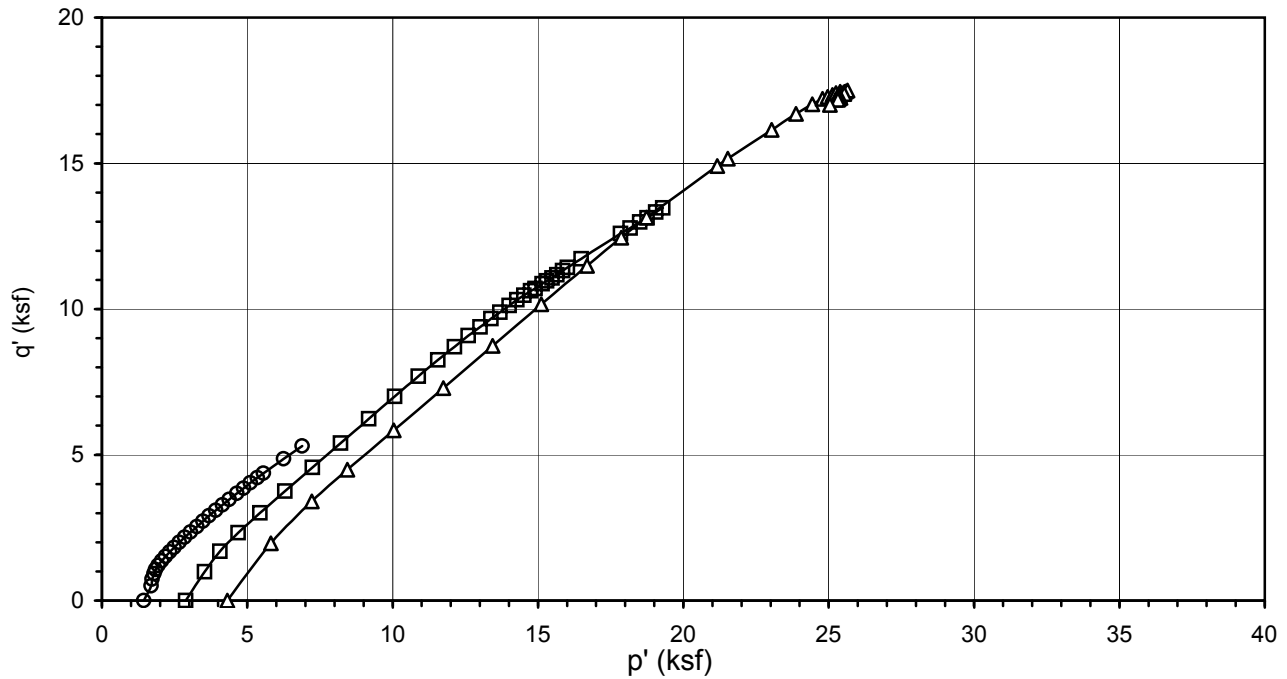


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi

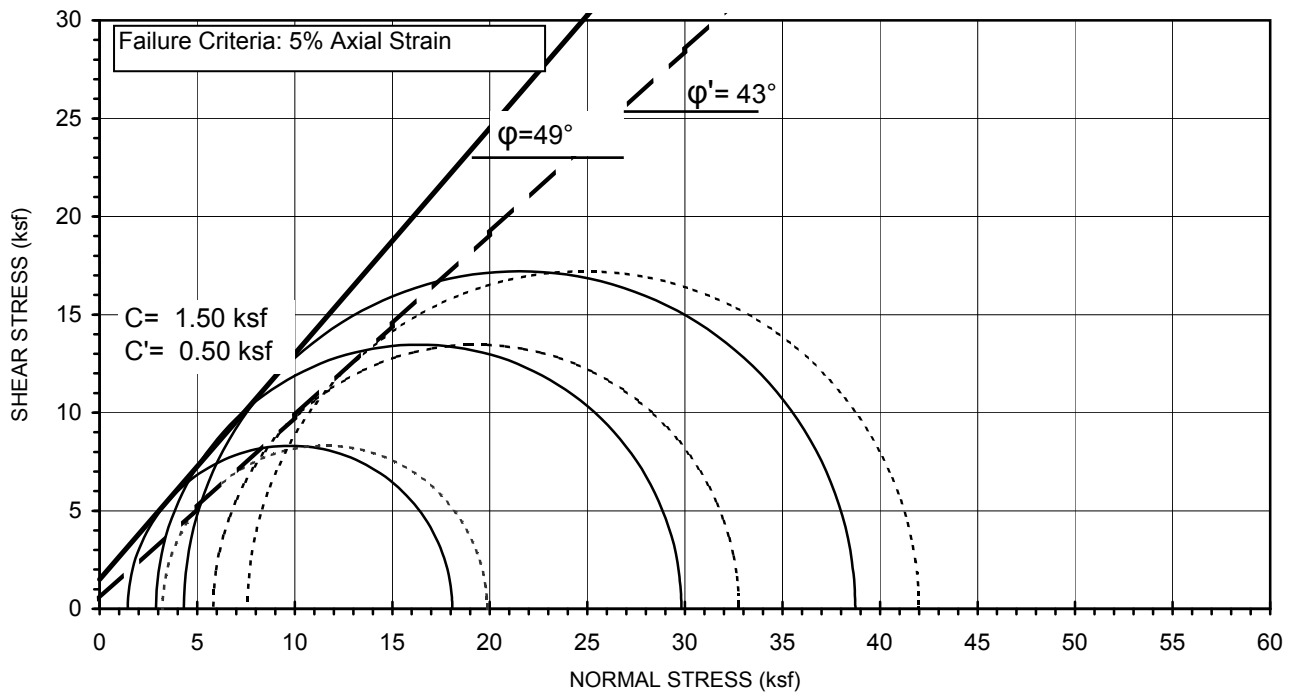


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey to Silty Sand w/gravel
Test Pit:	G-191	Avg. Dry Unit Weight (pcf):	118.1
Sample No.:	3	Avg. Initial Moisture Content (%):	12.6
Depth (ft):	25.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

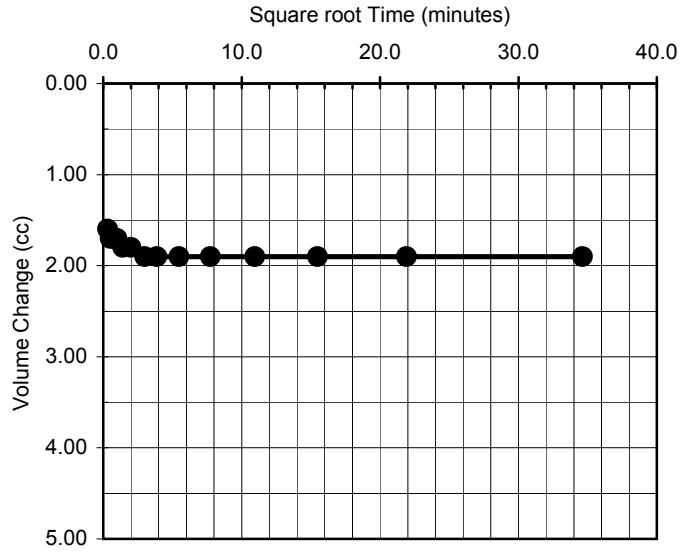
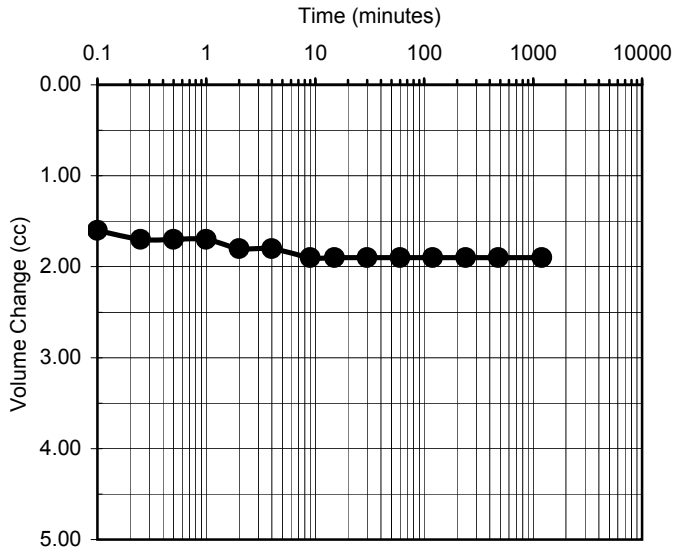


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey to Silty Sand w/gravel
Test Pit:	G-191	Avg. Dry Unit Weight (pcf):	118.1
Sample No.:	3	Avg. Initial Moisture Content (%):	12.6
Depth (ft):	25.5	Confining Pressure:	10.0, 20.0, 30.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-191	Sample Type:	Mod. Cal.
Sample No.:	3	Soil Description:	Clayey to Silty Sand w/gravel
Depth (feet):	25.5	Eff. Confining Pressure (psi):	20.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	1.6000
0.25	1.7000
0.5	1.7000
1	1.7000
2	1.8000
4	1.8000
9	1.9000
15	1.9000
30	1.9000
60	1.9000
120	1.9000
240	1.9000
480	1.9000
1200	1.9000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	1.6000
0.5000	1.7000
0.7071	1.7000
1.0000	1.7000
1.4142	1.8000
2.0000	1.8000
3.0000	1.9000
3.8730	1.9000
5.4772	1.9000
7.7460	1.9000
10.9545	1.9000
15.4919	1.9000
21.9089	1.9000
34.6410	1.9000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	08/10/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-13-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-17-11**
 Test Pit: **G-199** Reviewed by: **AP** Date: **08-17-11**
 Sample No.: **7** Sample Description: **Clayey Silty Sand w/ gravel**
 Depth(ft): **40**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.604</u>	<u>2.604</u>	<u>2.604</u>	Avg. =	2.604
Height (in)	<u>5.809</u>	<u>5.809</u>	<u>5.809</u>	Avg. =	5.809

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.326	5.294
Moisture Content (%)	9.48	10.89
Wet Weight (gms)	1155.39	1350.83
Dry Weight (gms)	1055.35	1235.94
Container Weight (gms)	0.00	180.59
Density and Saturation		
Wet Weight (gms)	1155.39	
Container Weight (gms)	0.00	
Wet Density (pcf)	142.3	
Dry Density (pcf)	130.0	
Initial Void Ratio	0.296	
% Saturation	86.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	65.3
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	59.8
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	5.780
Induced OCR =	1.0	Initial Volume (cu.in)=	30.937
Change in Ht. of Specimen (in) =	0.0291	Final Volume (cu.in) =	30.601

Shear		At Failure	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	12.50
Time to 50% primary Consolidation (min) =	4	Eff. Minor Principal stress (ksf) =	3.21
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	15.70
		Axial Strain (%) =	5.26



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-13-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-17-11**
 Test Pit: **G-199** Reviewed by: **AP** Date: **08-17-11**
 Sample No.: **7** Sample Description: **Clayey Silty Sand w/ gravel**
 Depth(ft): **40**
 Sample Type: **Mod. Cal.** **Confining Pressure = 35.0 psi**

Diameter (in)	<u>2.604</u>	<u>2.604</u>	<u>2.604</u>	Avg. =	2.604
Height (in)	<u>5.809</u>	<u>5.809</u>	<u>5.809</u>	Avg. =	5.809

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.326	5.285
Moisture Content (%)	9.48	10.89
Wet Weight (gms)	1155.39	1350.83
Dry Weight (gms)	1055.35	1235.94
Container Weight (gms)	0.00	180.59
Density and Saturation		
Wet Weight (gms)	1155.39	
Container Weight (gms)	0.00	
Wet Density (pcf)	142.3	
Dry Density (pcf)	130.0	
Initial Void Ratio	0.296	
% Saturation	86.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	59.8
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	55.9
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	5.809
Induced OCR=	1.0	Initial Volume (cu.in)=	30.937
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	30.699

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	20.67
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	5.29
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	25.96
		Axial Strain (%) =	5.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-13-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-17-11**
 Test Pit: **G-199** Reviewed by: **AP** Date: **08-17-11**
 Sample No.: **7** Sample Description: **Clayey Silty Sand w/ gravel**
 Depth(ft): **40**
 Sample Type: **Mod. Cal.** **Confining Pressure = 50.0 psi**

Diameter (in)	<u>2.604</u>	<u>2.604</u>	<u>2.604</u>	Avg. =	2.604
Height (in)	<u>5.809</u>	<u>5.809</u>	<u>5.809</u>	Avg. =	5.809

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.326	5.290
Moisture Content (%)	9.48	10.89
Wet Weight (gms)	1155.39	1350.83
Dry Weight (gms)	1055.35	1235.94
Container Weight (gms)	0.00	180.59
Density and Saturation		
Wet Weight (gms)	1155.39	
Container Weight (gms)	0.00	
Wet Density (pcf)	142.3	
Dry Density (pcf)	130.0	
Initial Void Ratio	0.296	
% Saturation	86.3	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	55.9
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	52.5
Eff. Consol. Stress (psi) =	50.0	Final Height (in)=	5.809
Induced OCR =	1.0	Initial Volume (cu.in)=	30.937
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	30.729

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.006	Deviator Stress (ksf) =	26.79
Time to 50% primary Consolidation =	4	Eff. Minor Principal stress (ksf) =	7.44
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	34.23
		Axial Strain (%) =	5.48



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-199	Consolidation Pressure :	20.0 psi
Depth(ft):	40	Initial Sample Height:	5.809 in
Sample No.:	7	Initial Area of Sample:	5.326 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.780 in
Sample Description:	Clayey Silty Sand w/ gravel	Final Sample Area (A)*:	5.294 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	32	0.004	41.1	0.87	0.07	0.16	0.43	3.15
60.0	56	0.010	42.7	1.52	0.17	0.39	0.76	3.25
60.0	83	0.015	44.7	2.25	0.26	0.67	1.13	3.33
60.0	109	0.020	46.3	2.95	0.35	0.91	1.48	3.44
60.0	132	0.026	47.5	3.57	0.44	1.09	1.79	3.58
60.0	153	0.031	48.4	4.14	0.53	1.21	2.07	3.74
60.0	174	0.037	49.0	4.70	0.63	1.29	2.35	3.94
60.0	194	0.041	49.3	5.24	0.71	1.34	2.62	4.16
60.0	215	0.047	49.5	5.80	0.81	1.37	2.90	4.41
60.0	233	0.052	49.5	6.28	0.90	1.37	3.14	4.65
60.0	251	0.058	49.3	6.76	1.00	1.35	3.38	4.91
60.0	267	0.063	49.1	7.18	1.08	1.31	3.59	5.16
60.0	283	0.068	48.8	7.61	1.17	1.26	3.80	5.42
60.0	296	0.074	48.4	7.95	1.27	1.21	3.97	5.65
60.0	309	0.079	47.9	8.29	1.36	1.14	4.15	5.88
60.0	320	0.084	47.5	8.58	1.45	1.08	4.29	6.09
60.0	330	0.090	47.0	8.84	1.55	1.01	4.42	6.29
60.0	339	0.095	46.5	9.07	1.65	0.94	4.53	6.47
60.0	348	0.101	46.1	9.30	1.74	0.88	4.65	6.65
60.0	355	0.106	45.6	9.48	1.83	0.81	4.74	6.81
60.0	362	0.112	45.2	9.66	1.93	0.75	4.83	6.96
60.0	369	0.117	44.8	9.83	2.03	0.69	4.92	7.10
60.0	374	0.123	44.4	9.96	2.12	0.64	4.98	7.22
60.0	390	0.140	43.4	10.35	2.42	0.48	5.18	7.57
60.0	403	0.157	42.4	10.66	2.72	0.35	5.33	7.86
60.0	414	0.174	41.6	10.92	3.02	0.23	5.46	8.11
60.0	425	0.191	40.9	11.18	3.31	0.13	5.59	8.33
60.0	436	0.208	40.3	11.43	3.59	0.04	5.72	8.56
60.0	446	0.225	39.7	11.66	3.89	-0.04	5.83	8.75
60.0	454	0.242	39.2	11.83	4.18	-0.11	5.92	8.91
60.0	463	0.259	38.8	12.03	4.48	-0.17	6.01	9.07
60.0	472	0.276	38.4	12.23	4.77	-0.23	6.11	9.22
60.0	480	0.293	38.0	12.39	5.07	-0.29	6.20	9.36
60.0	485	0.304	37.7	12.50	5.26	-0.33	6.25	9.45



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-199	Consolidation Pressure :	35.0 psi
Depth(ft):	40	Initial Sample Height:	5.809 in
Sample No.:	7	Initial Area of Sample:	5.326 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.809 in
Sample Description:	Clayey Silty Sand w/ gravel	Final Sample Area (A)*:	5.285 sq. in.
		Induced OCR=	1.0

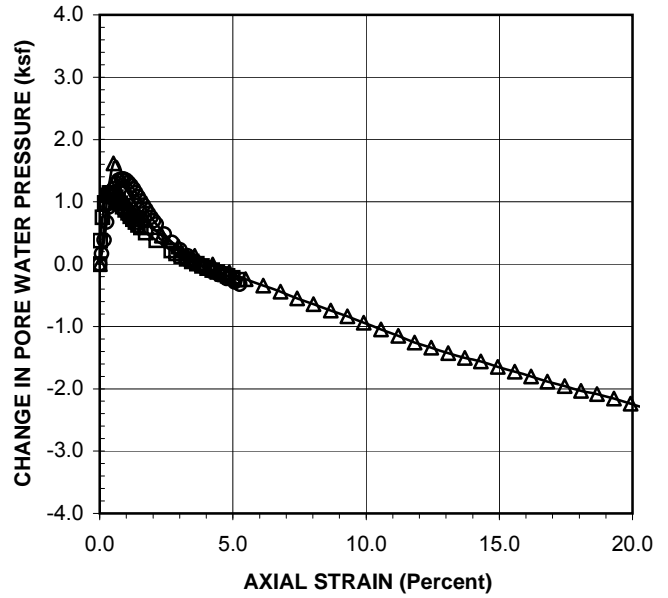
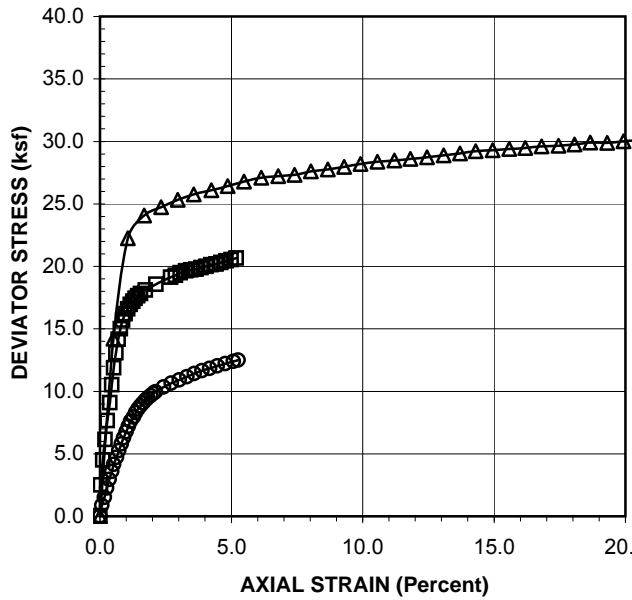
Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
75.0	2	0.000	40.0	0.05	0.00	0.00	0.03	5.07
75.0	92	0.002	42.7	2.51	0.03	0.38	1.25	5.92
75.0	166	0.006	45.2	4.52	0.11	0.75	2.26	6.55
75.0	226	0.011	46.9	6.15	0.19	0.98	3.07	7.13
75.0	282	0.017	47.7	7.66	0.29	1.10	3.83	7.77
75.0	335	0.022	48.0	9.09	0.37	1.14	4.55	8.45
75.0	388	0.026	48.0	10.52	0.45	1.14	5.26	9.16
75.0	438	0.031	47.8	11.87	0.53	1.11	5.94	9.86
75.0	483	0.036	47.5	13.08	0.61	1.07	6.54	10.51
75.0	523	0.040	47.2	14.15	0.70	1.03	7.08	11.09
75.0	555	0.046	46.8	15.00	0.78	0.98	7.50	11.56
75.0	581	0.050	46.4	15.69	0.87	0.92	7.85	11.97
75.0	601	0.056	46.1	16.22	0.97	0.87	8.11	12.28
75.0	616	0.062	45.7	16.61	1.07	0.82	8.30	12.52
75.0	629	0.067	45.4	16.94	1.15	0.77	8.47	12.74
75.0	640	0.073	45.0	17.22	1.25	0.72	8.61	12.93
75.0	649	0.078	44.7	17.45	1.34	0.67	8.72	13.09
75.0	657	0.084	44.4	17.64	1.44	0.63	8.82	13.24
75.0	664	0.090	44.1	17.81	1.55	0.59	8.91	13.36
75.0	676	0.101	43.5	18.10	1.73	0.51	9.05	13.59
75.0	696	0.124	42.7	18.56	2.13	0.38	9.28	13.94
75.0	721	0.156	41.5	19.12	2.69	0.21	9.56	14.39
75.0	729	0.167	41.2	19.29	2.88	0.17	9.65	14.52
75.0	738	0.178	40.9	19.49	3.06	0.12	9.75	14.66
75.0	745	0.190	40.6	19.64	3.26	0.08	9.82	14.78
75.0	750	0.201	40.3	19.73	3.45	0.04	9.87	14.86
75.0	753	0.212	40.1	19.77	3.65	0.00	9.88	14.92
75.0	759	0.223	39.8	19.89	3.84	-0.03	9.94	15.02
75.0	765	0.235	39.6	20.00	4.04	-0.07	10.00	15.11
75.0	771	0.246	39.3	20.12	4.23	-0.10	10.06	15.20
75.0	775	0.257	39.1	20.18	4.43	-0.13	10.09	15.26
75.0	781	0.268	38.9	20.30	4.61	-0.16	10.15	15.35
75.0	788	0.279	38.7	20.44	4.80	-0.19	10.22	15.45
75.0	793	0.290	38.5	20.53	4.99	-0.22	10.26	15.53
75.0	800	0.301	38.3	20.67	5.19	-0.25	10.33	15.62



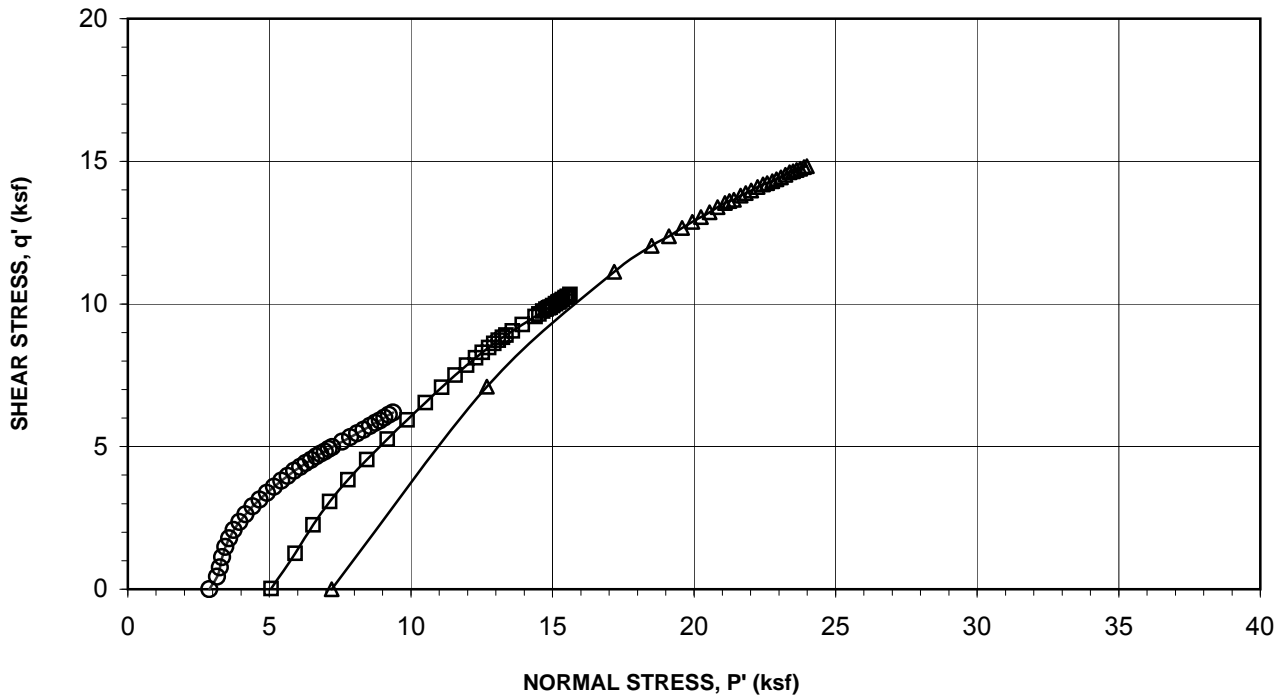
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-199	Consolidation Pressure :	50.0 psi
Depth(ft):	40	Initial Sample Height:	5.809 in
Sample No.:	7	Initial Area of Sample:	5.326 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.809 in
Sample Description:	Clayey Silty Sand w/ gravel	Final Sample Area (A)*:	5.290 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	40.0	0.00	0.00	0.00	0.00	7.20
90.0	525	0.030	51.3	14.21	0.51	1.62	7.11	12.69
90.0	826	0.062	48.0	22.25	1.07	1.15	11.13	17.17
90.0	899	0.098	45.1	24.06	1.68	0.73	12.03	18.50
90.0	931	0.135	43.2	24.74	2.33	0.46	12.37	19.11
90.0	959	0.172	42.0	25.32	2.96	0.28	12.66	19.58
90.0	981	0.207	40.9	25.75	3.57	0.14	12.88	19.94
90.0	1001	0.246	40.0	26.09	4.24	0.00	13.04	20.25
90.0	1021	0.282	39.1	26.43	4.86	-0.13	13.22	20.54
90.0	1041	0.318	38.3	26.79	5.48	-0.24	13.40	20.84
90.0	1060	0.357	37.6	27.09	6.14	-0.34	13.54	21.09
90.0	1073	0.394	36.9	27.22	6.79	-0.44	13.61	21.25
90.0	1084	0.430	36.2	27.31	7.41	-0.55	13.66	21.41
90.0	1103	0.466	35.5	27.60	8.03	-0.64	13.80	21.65
90.0	1117	0.504	34.8	27.77	8.68	-0.74	13.88	21.83
90.0	1132	0.540	34.2	27.95	9.30	-0.84	13.98	22.01
90.0	1150	0.576	33.5	28.21	9.91	-0.94	14.10	22.25
90.0	1166	0.613	32.7	28.38	10.56	-1.05	14.19	22.44
90.0	1178	0.651	32.0	28.48	11.21	-1.15	14.24	22.59
90.0	1192	0.687	31.3	28.60	11.82	-1.26	14.30	22.76
90.0	1206	0.723	30.7	28.74	12.45	-1.34	14.37	22.91
90.0	1220	0.760	30.1	28.87	13.09	-1.43	14.44	23.06
90.0	1237	0.796	29.6	29.05	13.71	-1.50	14.52	23.23
90.0	1253	0.831	29.2	29.23	14.30	-1.56	14.61	23.37
90.0	1265	0.868	28.6	29.30	14.94	-1.65	14.65	23.50
90.0	1279	0.905	28.0	29.39	15.58	-1.72	14.69	23.62
90.0	1292	0.941	27.5	29.49	16.19	-1.80	14.74	23.75
90.0	1307	0.977	26.9	29.59	16.81	-1.89	14.80	23.88
90.0	1319	1.014	26.4	29.65	17.45	-1.96	14.82	23.98
90.0	1334	1.049	25.9	29.75	18.06	-2.03	14.88	24.11
90.0	1351	1.084	25.5	29.91	18.66	-2.08	14.96	24.24
90.0	1361	1.121	25.0	29.89	19.30	-2.16	14.95	24.30
90.0	1377	1.158	24.5	30.01	19.93	-2.24	15.01	24.44
90.0	1391	1.192	24.0	30.08	20.52	-2.31	15.04	24.55
90.0	1408	1.229	23.7	30.21	21.15	-2.34	15.11	24.65

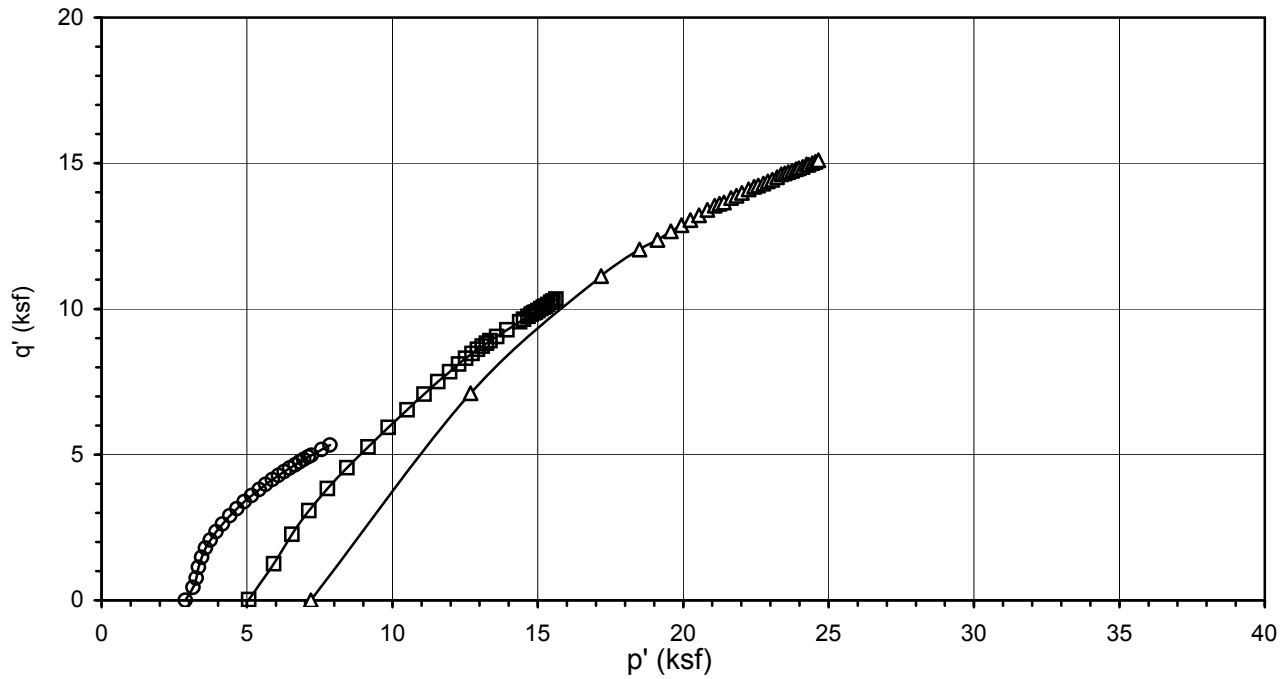


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi

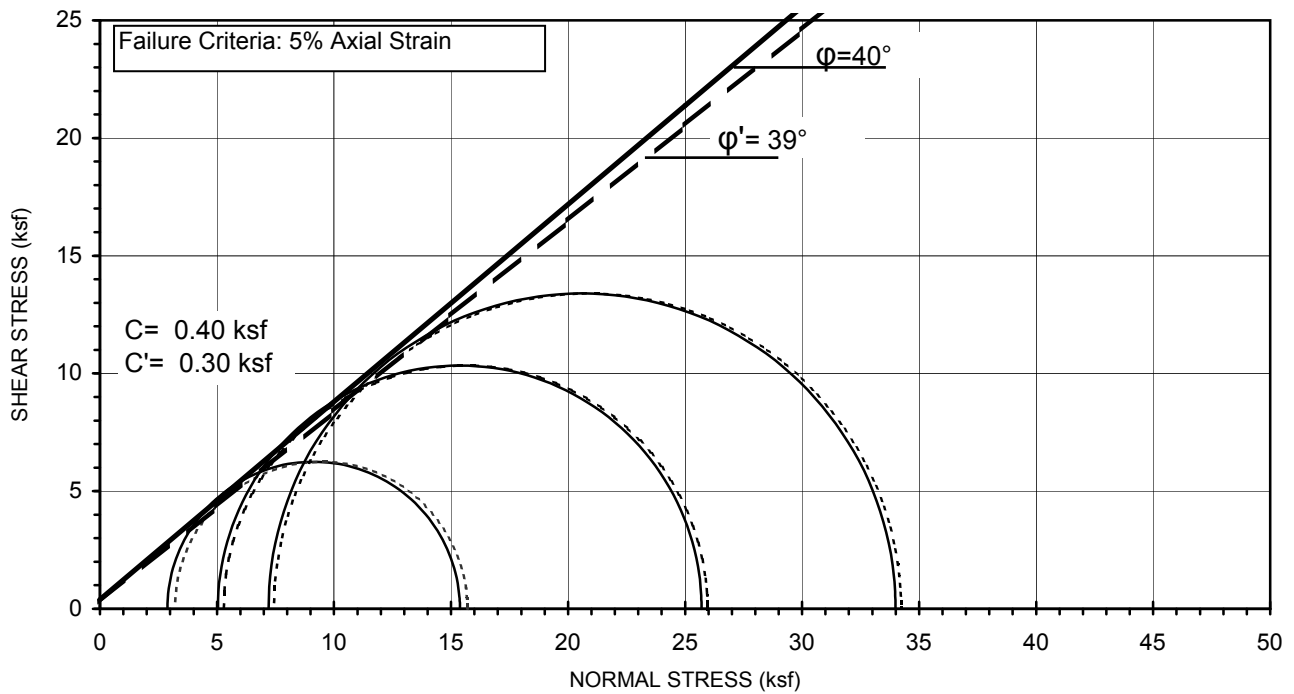


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Silty Sand w/ gravel
Test Pit:	G-199	Avg. Dry Unit Weight (pcf):	130.0
Sample No.:	7	Avg. Initial Moisture Content (%):	9.5
Depth (ft):	40	Confining Pressure:	20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

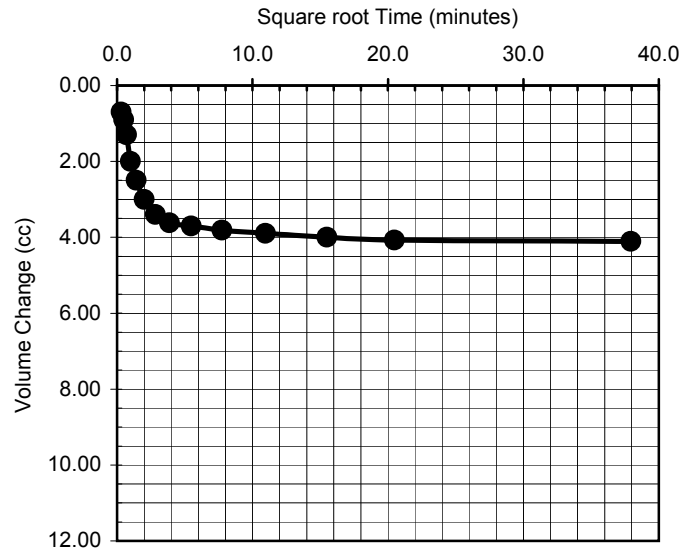
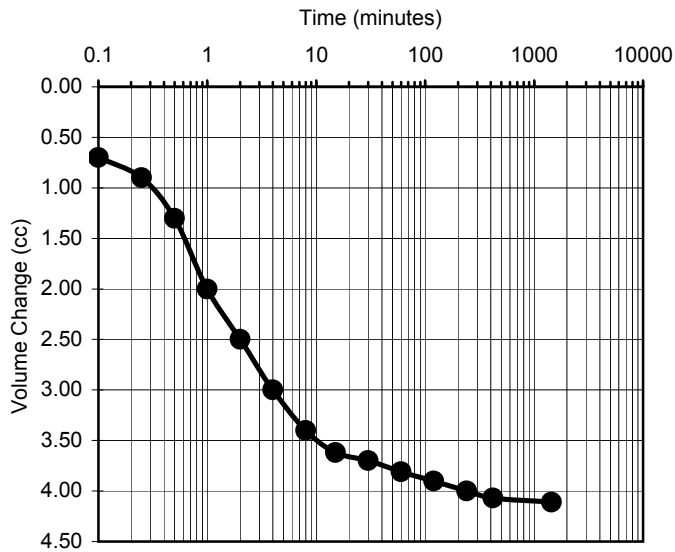


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Clayey Silty Sand w/ gravel
Test Pit:	G-199	Avg. Dry Unit Weight (pcf):	130.0
Sample No.:	7	Avg. Initial Moisture Content (%):	9.5
Depth (ft):	40	Confining Pressure:	20.0, 35.0, 50.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-199	Sample Type:	Mod. Cal.
Sample No.:	7	Soil Description:	Clayey Silty Sand w/ gravel
Depth (feet):	40	Eff. Confining Pressure (psi):	35.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.7000
0.25	0.9000
0.5	1.3000
1	2.0000
2	2.5000
4	3.0000
8	3.4000
15	3.6200
30	3.7000
60	3.8100
120	3.9000
240	4.0000
420	4.0700
1440	4.1100

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.7000
0.5000	0.9000
0.7071	1.3000
1.0000	2.0000
1.4142	2.5000
2.0000	3.0000
2.8284	3.4000
3.8730	3.6200
5.4772	3.7000
7.7460	3.8100
10.9545	3.9000
15.4919	4.0000
20.4939	4.0700
37.9473	4.1100

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 08/13/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [08-14-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-18-11](#)
 Test Pit: [G-199](#) Reviewed by: [AP](#) Date: [08-18-11](#)
 Sample No.: [9](#) Sample Description: [Silty Sand with gravel](#)
 Depth(ft): [60](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 30.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	5.675	5.675	5.675	Avg. =	5.675

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.373
Moisture Content (%)	11.99	11.96
Wet Weight (gms)	1136.20	1317.25
Dry Weight (gms)	1014.55	1195.93
Container Weight (gms)	0.00	181.38
Density and Saturation		
Wet Weight (gms)	1136.20	
Container Weight (gms)	0.00	
Wet Density (pcf)	142.0	
Dry Density (pcf)	126.8	
Initial Void Ratio	0.329	
% Saturation	98.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	54.0
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	50.3
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.630
Induced OCR =	1.0	Initial Volume (cu.in)=	30.479
Change in Ht. of Specimen (in) =	0.0448	Final Volume (cu.in) =	30.253

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	17.11
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	3.59
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	20.70
		Axial Strain (%) =	5.24



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	08-14-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	08-18-11
Test Pit:	G-199	Reviewed by:	AP	Date:	08-18-11
Sample No.:	9	Sample Description:	Silty Sand with gravel		
Depth(ft):	60				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.675</u>	<u>5.675</u>	<u>5.675</u>	Avg. =	5.675

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.611
Moisture Content (%)	11.99	11.96
Wet Weight (gms)	1136.20	1317.25
Dry Weight (gms)	1014.55	1195.93
Container Weight (gms)	0.00	181.38
Density and Saturation		
Wet Weight (gms)	1136.20	
Container Weight (gms)	0.00	
Wet Density (pcf)	142.0	
Dry Density (pcf)	126.8	
Initial Void Ratio	0.329	
% Saturation	98.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)= 50.3
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)= 45.3
Eff. Consol. Stress (psi) =	45.0	Final Height (in)= 5.675
Induced OCR=	1.0	Initial Volume (cu.in)= 30.479
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) = 30.174

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) = 28.02
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) = 7.64
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 35.66
		Axial Strain (%) = 5.29



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-18-11**
 Test Pit: **G-199** Reviewed by: **AP** Date: **08-18-11**
 Sample No.: **9** Sample Description: **Silty Sand with gravel**
 Depth(ft): **60**
 Sample Type: **Mod. Cal.** **Confining Pressure = 60.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.675</u>	<u>5.675</u>	<u>5.675</u>	Avg. =	5.675

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.638
Moisture Content (%)	11.99	11.96
Wet Weight (gms)	1136.20	1317.25
Dry Weight (gms)	1014.55	1195.93
Container Weight (gms)	0.00	181.38
Density and Saturation		
Wet Weight (gms)	1136.20	
Container Weight (gms)	0.00	
Wet Density (pcf)	142.0	
Dry Density (pcf)	126.8	
Initial Void Ratio	0.329	
% Saturation	98.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	95	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	45.3
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	42.4
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	5.675
Induced OCR =	1.0	Initial Volume (cu.in)=	30.479
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	30.302

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	37.62
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	10.42
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	48.04
		Axial Strain (%) =	4.49



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-199	Consolidation Pressure :	30.0 psi
Depth(ft):	60	Initial Sample Height:	5.675 in
Sample No.:	9	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.630 in
Sample Description:	Silty Sand with gravel	Final Sample Area (A)*:	5.373 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
60.0	0	0.000	30.0	0.00	0.00	0.00	0.00	4.32
60.0	74	0.004	34.7	1.97	0.06	0.67	0.99	4.63
60.0	113	0.009	39.4	3.02	0.16	1.35	1.51	4.48
60.0	140	0.014	42.5	3.75	0.25	1.80	1.88	4.40
60.0	161	0.020	44.5	4.30	0.35	2.08	2.15	4.39
60.0	177	0.026	45.8	4.72	0.45	2.27	2.36	4.41
60.0	191	0.031	46.6	5.09	0.54	2.40	2.54	4.47
60.0	205	0.037	47.2	5.45	0.65	2.48	2.73	4.57
60.0	216	0.042	47.6	5.75	0.74	2.53	2.88	4.66
60.0	229	0.048	47.8	6.08	0.84	2.57	3.04	4.79
60.0	240	0.053	48.0	6.38	0.94	2.59	3.19	4.92
60.0	252	0.059	48.0	6.68	1.04	2.59	3.34	5.07
60.0	263	0.064	48.0	6.98	1.14	2.59	3.49	5.22
60.0	275	0.069	47.9	7.27	1.23	2.58	3.64	5.38
60.0	286	0.075	47.8	7.57	1.33	2.56	3.79	5.54
60.0	298	0.080	47.7	7.87	1.42	2.54	3.93	5.71
60.0	308	0.085	47.5	8.13	1.52	2.52	4.07	5.87
60.0	320	0.091	47.3	8.43	1.62	2.49	4.21	6.05
60.0	330	0.097	47.0	8.69	1.72	2.45	4.35	6.21
60.0	342	0.103	46.8	8.99	1.82	2.42	4.49	6.40
60.0	353	0.108	46.5	9.28	1.92	2.38	4.64	6.58
60.0	385	0.126	45.6	10.09	2.23	2.25	5.05	7.11
60.0	417	0.143	44.7	10.90	2.54	2.11	5.45	7.66
60.0	451	0.161	43.7	11.74	2.85	1.97	5.87	8.22
60.0	481	0.177	42.6	12.48	3.14	1.82	6.24	8.74
60.0	511	0.193	41.5	13.21	3.43	1.66	6.61	9.27
60.0	542	0.209	40.5	13.98	3.72	1.51	6.99	9.80
60.0	570	0.226	39.4	14.67	4.01	1.35	7.34	10.31
60.0	597	0.244	38.3	15.30	4.33	1.19	7.65	10.78
60.0	622	0.261	37.2	15.90	4.64	1.03	7.95	11.24
60.0	650	0.278	36.1	16.55	4.94	0.88	8.28	11.72
60.0	674	0.295	35.1	17.11	5.24	0.73	8.56	12.14



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-199	Consolidation Pressure :	45.0 psi
Depth(ft):	60	Initial Sample Height:	5.675 in
Sample No.:	9	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.675 in
Sample Description:	Silty Sand with gravel	Final Sample Area (A)*:	5.611 sq. in.
		Induced OCR=	1.0

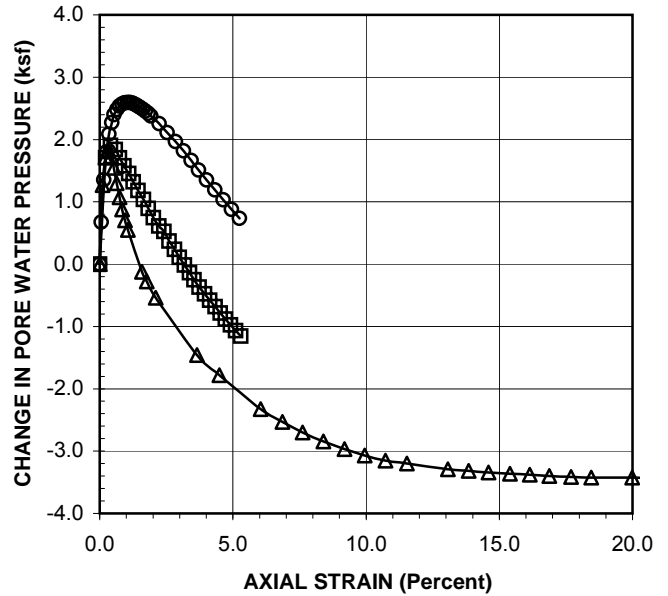
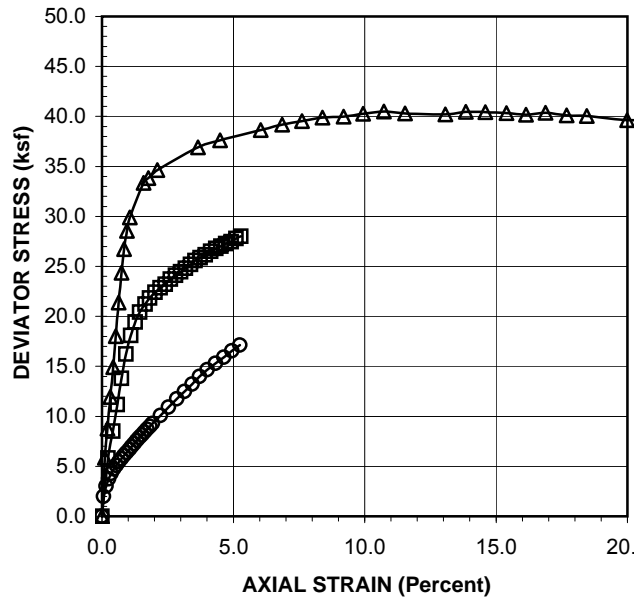
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	228	0.013	41.9	5.84	0.23	1.70	2.92	7.69
75.0	333	0.024	43.3	8.51	0.41	1.91	4.26	8.83
75.0	438	0.033	42.8	11.17	0.59	1.84	5.59	10.23
75.0	542	0.042	41.9	13.81	0.75	1.70	6.90	11.68
75.0	638	0.052	41.0	16.22	0.91	1.58	8.11	13.01
75.0	712	0.062	40.1	18.07	1.09	1.45	9.04	14.06
75.0	767	0.072	39.2	19.43	1.26	1.32	9.72	14.88
75.0	808	0.082	38.2	20.44	1.44	1.18	10.22	15.52
75.0	841	0.093	37.2	21.23	1.64	1.04	10.61	16.06
75.0	867	0.103	36.2	21.84	1.82	0.89	10.92	16.51
75.0	891	0.115	35.2	22.40	2.02	0.74	11.20	16.94
75.0	911	0.126	34.3	22.86	2.22	0.61	11.43	17.30
75.0	927	0.137	33.7	23.22	2.41	0.52	11.61	17.57
75.0	949	0.148	32.6	23.72	2.60	0.37	11.86	17.97
75.0	967	0.159	31.7	24.12	2.81	0.23	12.06	18.31
75.0	982	0.170	30.8	24.45	3.00	0.11	12.22	18.60
75.0	998	0.181	29.9	24.80	3.18	-0.02	12.40	18.89
75.0	1016	0.191	29.1	25.19	3.37	-0.14	12.60	19.21
75.0	1033	0.201	28.3	25.57	3.55	-0.25	12.78	19.52
75.0	1047	0.212	27.5	25.86	3.74	-0.37	12.93	19.78
75.0	1061	0.223	26.7	26.16	3.93	-0.48	13.08	20.03
75.0	1078	0.235	26.0	26.52	4.14	-0.58	13.26	20.32
75.0	1091	0.246	25.3	26.78	4.34	-0.68	13.39	20.55
75.0	1103	0.257	24.6	27.02	4.53	-0.78	13.51	20.78
75.0	1116	0.268	23.9	27.29	4.72	-0.88	13.64	21.01
75.0	1126	0.279	23.2	27.47	4.92	-0.98	13.74	21.20
75.0	1141	0.290	22.6	27.79	5.10	-1.07	13.89	21.44
75.0	1153	0.300	22.0	28.02	5.29	-1.16	14.01	21.65



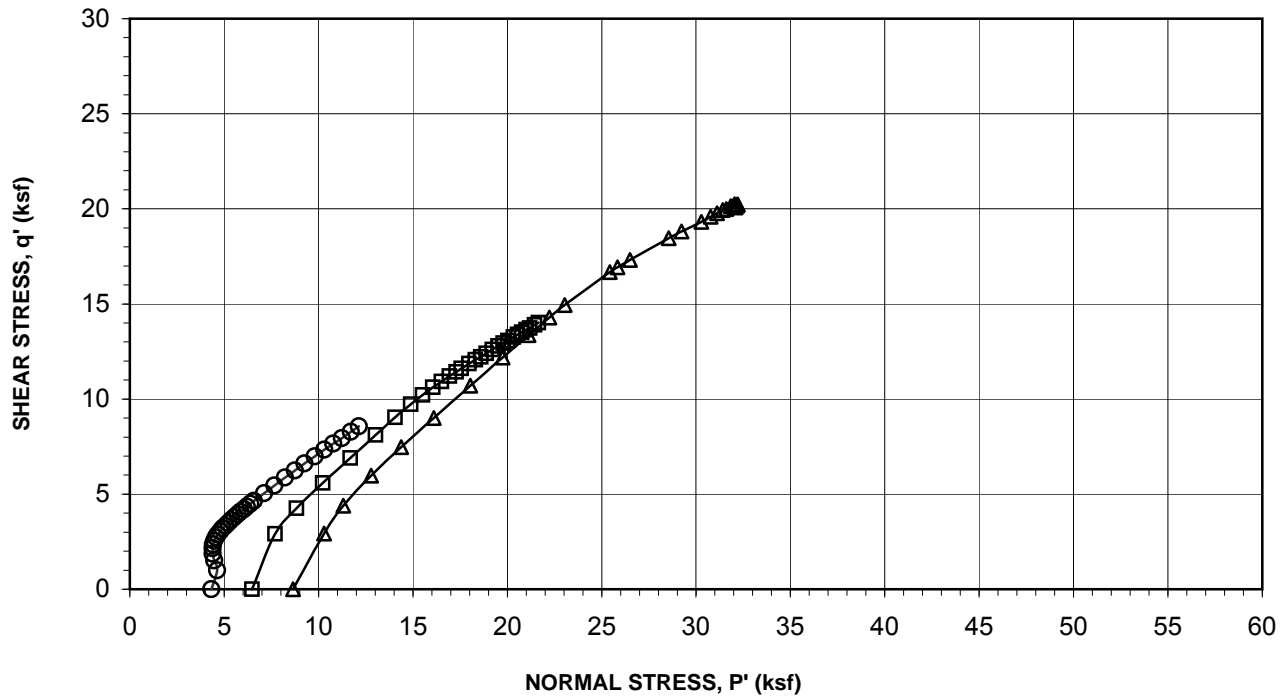
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-199	Consolidation Pressure :	60.0 psi
Depth(ft):	60	Initial Sample Height:	5.675 in
Sample No.:	9	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.675 in
Sample Description:	Silty Sand with gravel	Final Sample Area (A)*:	5.638 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	229	0.006	38.8	5.84	0.11	1.27	2.92	10.29
90.0	344	0.012	41.9	8.77	0.21	1.72	4.38	11.31
90.0	469	0.018	42.7	11.94	0.32	1.83	5.97	12.78
90.0	587	0.024	42.0	14.93	0.42	1.73	7.46	14.37
90.0	709	0.030	40.7	18.01	0.53	1.54	9.01	16.10
90.0	843	0.036	39.0	21.39	0.63	1.30	10.70	18.04
90.0	961	0.042	37.5	24.36	0.74	1.07	12.18	19.75
90.0	1055	0.048	36.1	26.72	0.85	0.88	13.36	21.12
90.0	1129	0.054	34.9	28.56	0.95	0.70	14.28	22.22
90.0	1183	0.060	33.8	29.90	1.06	0.55	14.95	23.04
90.0	1327	0.090	29.2	33.36	1.59	-0.12	16.68	25.44
90.0	1349	0.100	28.1	33.85	1.76	-0.28	16.92	25.84
90.0	1385	0.119	26.3	34.63	2.10	-0.54	17.32	26.49
90.0	1500	0.207	19.9	36.91	3.65	-1.46	18.46	28.55
90.0	1542	0.255	17.6	37.62	4.49	-1.78	18.81	29.23
90.0	1610	0.343	13.8	38.64	6.04	-2.33	19.32	30.29
90.0	1647	0.389	12.4	39.18	6.85	-2.53	19.59	30.76
90.0	1675	0.432	11.2	39.53	7.61	-2.70	19.76	31.10
90.0	1704	0.476	10.3	39.87	8.39	-2.84	19.94	31.42
90.0	1724	0.522	9.4	39.99	9.19	-2.97	19.99	31.60
90.0	1751	0.564	8.7	40.28	9.94	-3.07	20.14	31.85
90.0	1776	0.609	8.1	40.49	10.73	-3.15	20.25	32.04
90.0	1784	0.655	7.8	40.31	11.53	-3.20	20.16	32.00
90.0	1811	0.742	7.1	40.21	13.07	-3.29	20.10	32.04
90.0	1838	0.786	7.0	40.45	13.84	-3.32	20.22	32.18
90.0	1854	0.828	6.8	40.44	14.59	-3.34	20.22	32.21
90.0	1867	0.874	6.7	40.34	15.40	-3.36	20.17	32.17
90.0	1875	0.916	6.5	40.16	16.14	-3.38	20.08	32.10
90.0	1901	0.958	6.4	40.36	16.88	-3.40	20.18	32.22
90.0	1908	1.004	6.3	40.11	17.69	-3.42	20.06	32.11
90.0	1923	1.047	6.2	40.05	18.45	-3.42	20.03	32.09
90.0	1939	1.135	6.2	39.62	19.99	-3.43	19.81	31.88
90.0	1962	1.177	6.1	39.72	20.74	-3.44	19.86	31.93



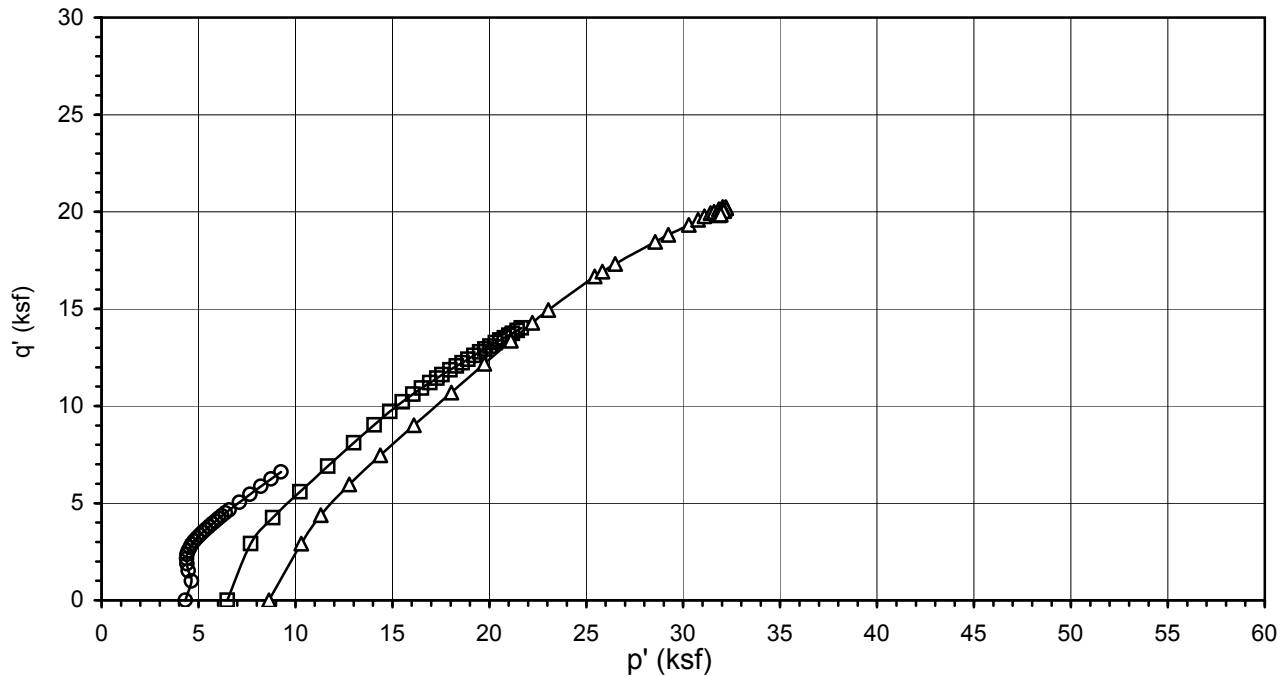
LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



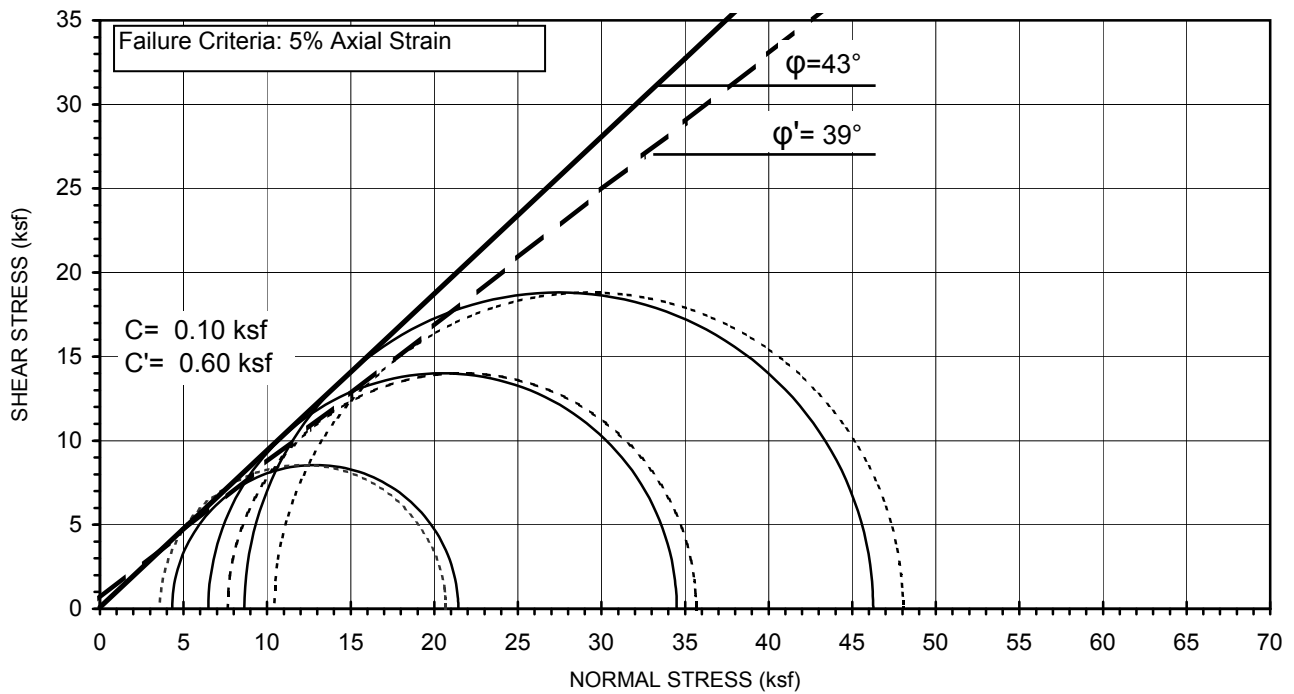
Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-199
 Sample No.: 9
 Depth (ft): 60

Sample Type: Mod. Cal.
 Sample Description: Silty Sand with gravel
 Avg. Dry Unit Weight (pcf): 126.8
 Avg. Initial Moisture Content (%): 12.0
 Confining Pressure: 30.0, 45.0, 60.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
 ASTM D 4767**

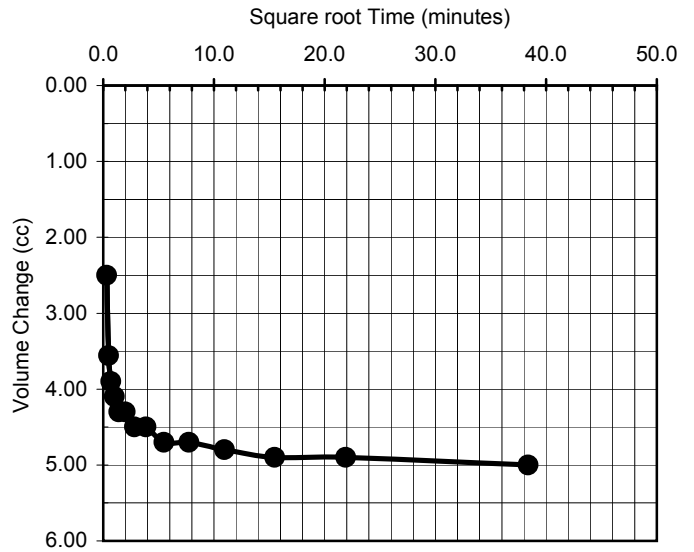
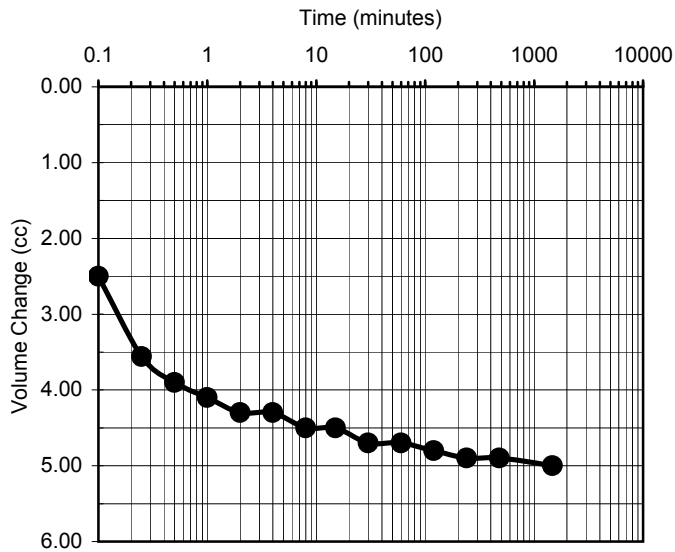


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 40 psi △ 60 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Silty Sand with gravel
Test Pit:	G-199	Avg. Dry Unit Weight (pcf):	126.8
Sample No.:	9	Avg. Initial Moisture Content (%):	12.0
Depth (ft):	60	Confining Pressure:	30.0, 45.0, 60.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-199	Sample Type:	Mod. Cal.
Sample No.:	9	Soil Description:	Silty Sand with gravel
Depth (feet):	60	Eff. Confining Pressure (psi):	45.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	2.5000
0.25	3.5600
0.5	3.9000
1	4.1000
2	4.3000
4	4.3000
8	4.5000
15	4.5000
30	4.7000
60	4.7000
120	4.8000
240	4.9000
480	4.9000
1474	5.0000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	2.5000
0.5000	3.5600
0.7071	3.9000
1.0000	4.1000
1.4142	4.3000
2.0000	4.3000
2.8284	4.5000
3.8730	4.5000
5.4772	4.7000
7.7460	4.7000
10.9545	4.8000
15.4919	4.9000
21.9089	4.9000
38.3927	5.0000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 08/14/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [08-14-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [08-19-11](#)
 Test Pit: [G-199](#) Reviewed by: [AP](#) Date: [08-19-11](#)
 Sample No.: [15](#) Sample Description: [Fat Clay w/sand](#)
 Depth(ft): [95](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 45.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	4.720	4.720	4.720	Avg. =	4.720

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.266
Moisture Content (%)	19.10	20.81
Wet Weight (gms)	118.31	1003.74
Dry Weight (gms)	107.38	856.35
Container Weight (gms)	50.16	148.06
Density and Saturation		
Wet Weight (gms)	858.83	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.1	
Dry Density (pcf)	108.4	
Initial Void Ratio	0.555	
% Saturation	93.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	72.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	57.2
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	4.641
Induced OCR =	1.0	Initial Volume (cu.in)=	25.350
Change in Ht. of Specimen (in) =	0.0786	Final Volume (cu.in) =	24.441

Shear		At Failure	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	12.25
Time to 50% primary Consolidation (min) =	15	Eff. Minor Principal stress (ksf) =	2.68
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.92
		Axial Strain (%) =	5.26



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-19-11**
 Test Pit: **G-199** Reviewed by: **AP** Date: **08-19-11**
 Sample No.: **15** Sample Description: **Fat Clay w/sand**
 Depth(ft): **95**
 Sample Type: **Mod. Cal.** **Confining Pressure = 60.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.720</u>	<u>4.720</u>	<u>4.720</u>	Avg. =	4.720

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.599
Moisture Content (%)	19.10	20.81
Wet Weight (gms)	118.31	1003.74
Dry Weight (gms)	107.38	856.35
Container Weight (gms)	50.16	148.06
Density and Saturation		
Wet Weight (gms)	858.83	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.1	
Dry Density (pcf)	108.4	
Initial Void Ratio	0.555	
% Saturation	93.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	90.0	Initial Burette Ht.(cm)=	57.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	51.9
Eff. Consol. Stress (psi) =	60.0	Final Height (in)=	4.718
Induced OCR=	1.0	Initial Volume (cu.in)=	25.350
Change in Ht. of Specimen (in) =	0.0016	Final Volume (cu.in) =	25.026

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	16.49
Time to 50% primary Consolidation =	15	Eff. Minor Principal stress (ksf) =	5.18
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	21.67
		Axial Strain (%) =	5.19



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **08-14-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **08-19-11**
 Test Pit: **G-199** Reviewed by: **AP** Date: **08-19-11**
 Sample No.: **15** Sample Description: **Fat Clay w/sand**
 Depth(ft): **95**
 Sample Type: **Mod. Cal.** **Confining Pressure = 75.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>4.720</u>	<u>4.720</u>	<u>4.720</u>	Avg. =	4.720

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.568
Moisture Content (%)	19.10	20.81
Wet Weight (gms)	118.31	1003.74
Dry Weight (gms)	107.38	856.35
Container Weight (gms)	50.16	148.06
Density and Saturation		
Wet Weight (gms)	858.83	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.1	
Dry Density (pcf)	108.4	
Initial Void Ratio	0.555	
% Saturation	93.0	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	105.0	Initial Burette Ht.(cm)=	51.9
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	44.8
Eff. Consol. Stress (psi) =	75.0	Final Height (in)=	4.720
Induced OCR =	1.0	Initial Volume (cu.in)=	25.350
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	24.917

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	20.32
Time to 50% primary Consolidation =	15	Eff. Minor Principal stress (ksf) =	6.85
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	27.17
		Axial Strain (%) =	4.55



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-199	Consolidation Pressure :	45.0 psi
Depth(ft):	95	Initial Sample Height:	4.720 in
Sample No.:	15	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.641 in
Sample Description:	Fat Clay w/sand	Final Sample Area (A)*:	5.266 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	78	0.004	35.7	2.14	0.08	0.82	1.07	6.73
75.0	120	0.009	38.9	3.26	0.19	1.28	1.63	6.84
75.0	147	0.014	41.3	4.01	0.30	1.62	2.01	6.86
75.0	169	0.019	43.2	4.60	0.41	1.90	2.30	6.88
75.0	186	0.024	44.8	5.07	0.53	2.14	2.53	6.88
75.0	201	0.030	46.2	5.47	0.65	2.33	2.73	6.89
75.0	214	0.035	47.3	5.80	0.76	2.49	2.90	6.89
75.0	225	0.041	48.3	6.11	0.87	2.63	3.05	6.90
75.0	237	0.047	49.1	6.41	1.00	2.75	3.21	6.93
75.0	246	0.052	49.9	6.65	1.13	2.86	3.33	6.95
75.0	255	0.057	50.5	6.90	1.23	2.96	3.45	6.97
75.0	265	0.062	51.1	7.14	1.34	3.04	3.57	7.01
75.0	271	0.068	51.7	7.31	1.45	3.12	3.66	7.02
75.0	281	0.073	52.1	7.55	1.57	3.19	3.78	7.07
75.0	288	0.079	52.6	7.73	1.70	3.25	3.86	7.10
75.0	296	0.084	53.0	7.94	1.81	3.30	3.97	7.14
75.0	302	0.089	53.3	8.11	1.93	3.36	4.06	7.18
75.0	309	0.096	53.6	8.29	2.06	3.40	4.14	7.22
75.0	316	0.101	53.9	8.46	2.18	3.45	4.23	7.26
75.0	322	0.107	54.2	8.60	2.31	3.49	4.30	7.29
75.0	342	0.125	54.9	9.09	2.69	3.59	4.54	7.43
75.0	361	0.143	55.5	9.57	3.08	3.67	4.79	7.59
75.0	381	0.159	55.9	10.05	3.43	3.73	5.03	7.78
75.0	400	0.176	56.2	10.53	3.79	3.77	5.26	7.97
75.0	419	0.192	56.4	10.97	4.15	3.80	5.49	8.16
75.0	437	0.209	56.5	11.41	4.50	3.81	5.71	8.37
75.0	455	0.226	56.5	11.85	4.87	3.81	5.92	8.59
75.0	473	0.244	56.4	12.25	5.26	3.80	6.12	8.80



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	90.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-199	Consolidation Pressure :	60.0 psi
Depth(ft):	95	Initial Sample Height:	4.720 in
Sample No.:	15	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.718 in
Sample Description:	Fat Clay w/sand	Final Sample Area (A)*:	5.599 sq. in.
		Induced OCR=	1.0

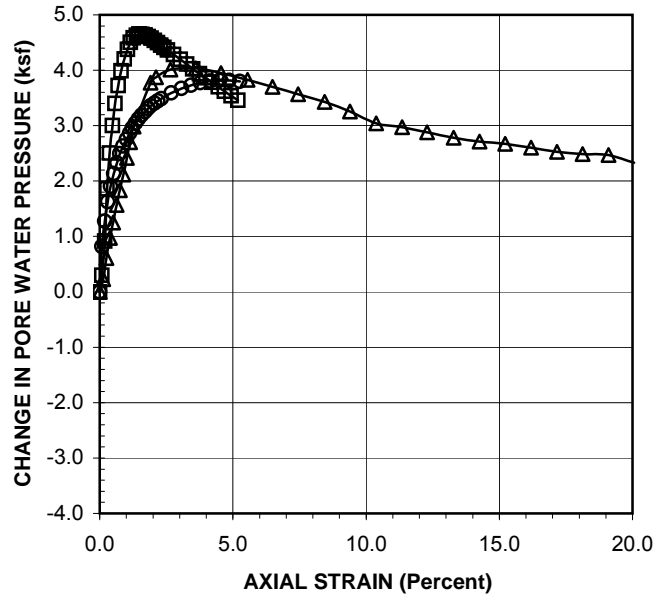
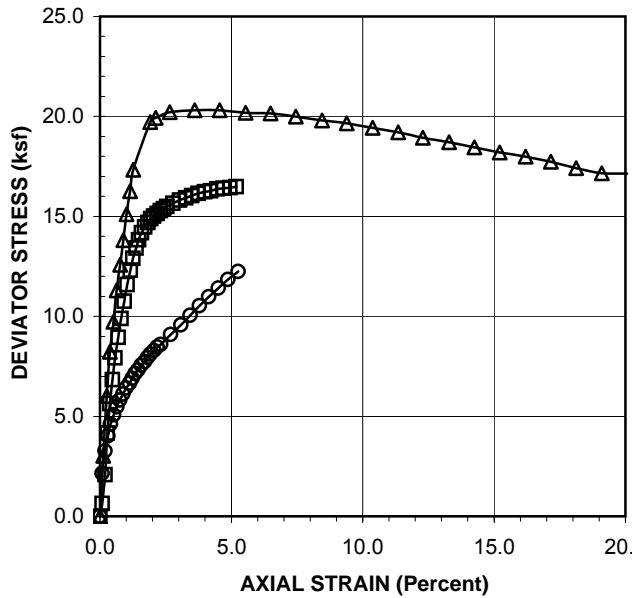
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
90.0	0	0.000	30.0	0.00	0.00	0.00	0.00	8.64
90.0	25	0.004	32.1	0.64	0.08	0.30	0.32	8.66
90.0	81	0.009	36.4	2.08	0.19	0.91	1.04	8.77
90.0	162	0.013	42.9	4.16	0.28	1.85	2.08	8.86
90.0	220	0.018	47.4	5.64	0.38	2.50	2.82	8.96
90.0	267	0.023	50.9	6.83	0.48	3.00	3.42	9.05
90.0	310	0.027	53.6	7.93	0.58	3.40	3.96	9.20
90.0	350	0.033	55.9	8.94	0.69	3.72	4.47	9.39
90.0	388	0.038	57.7	9.90	0.81	3.99	4.95	9.60
90.0	422	0.044	59.2	10.75	0.92	4.20	5.38	9.81
90.0	455	0.049	60.4	11.58	1.04	4.37	5.79	10.06
90.0	484	0.055	61.3	12.30	1.16	4.50	6.15	10.29
90.0	508	0.059	61.8	12.90	1.26	4.58	6.45	10.51
90.0	529	0.065	62.2	13.42	1.38	4.63	6.71	10.72
90.0	546	0.070	62.3	13.84	1.48	4.65	6.92	10.91
90.0	560	0.075	62.3	14.18	1.59	4.65	7.09	11.08
90.0	572	0.081	62.2	14.46	1.71	4.64	7.23	11.23
90.0	582	0.086	62.0	14.70	1.82	4.61	7.35	11.38
90.0	590	0.092	61.8	14.88	1.94	4.58	7.44	11.50
90.0	596	0.097	61.5	15.02	2.05	4.54	7.51	11.61
90.0	602	0.103	61.2	15.15	2.18	4.50	7.57	11.72
90.0	608	0.108	60.9	15.28	2.30	4.45	7.64	11.83
90.0	613	0.114	60.6	15.39	2.42	4.41	7.69	11.92
90.0	618	0.120	60.3	15.49	2.54	4.37	7.75	12.02
90.0	626	0.131	59.7	15.65	2.78	4.28	7.83	12.19
90.0	634	0.143	59.1	15.81	3.03	4.19	7.91	12.35
90.0	640	0.154	58.5	15.92	3.26	4.11	7.96	12.49
90.0	646	0.165	57.9	16.03	3.50	4.02	8.02	12.63
90.0	652	0.177	57.4	16.14	3.74	3.94	8.07	12.77
90.0	657	0.188	56.8	16.22	3.99	3.86	8.11	12.89
90.0	661	0.199	56.3	16.28	4.22	3.78	8.14	13.00
90.0	666	0.210	55.7	16.37	4.45	3.70	8.18	13.12
90.0	669	0.221	55.1	16.40	4.69	3.62	8.20	13.22
90.0	672	0.233	54.6	16.43	4.94	3.54	8.22	13.32
90.0	676	0.245	54.0	16.49	5.19	3.46	8.24	13.42



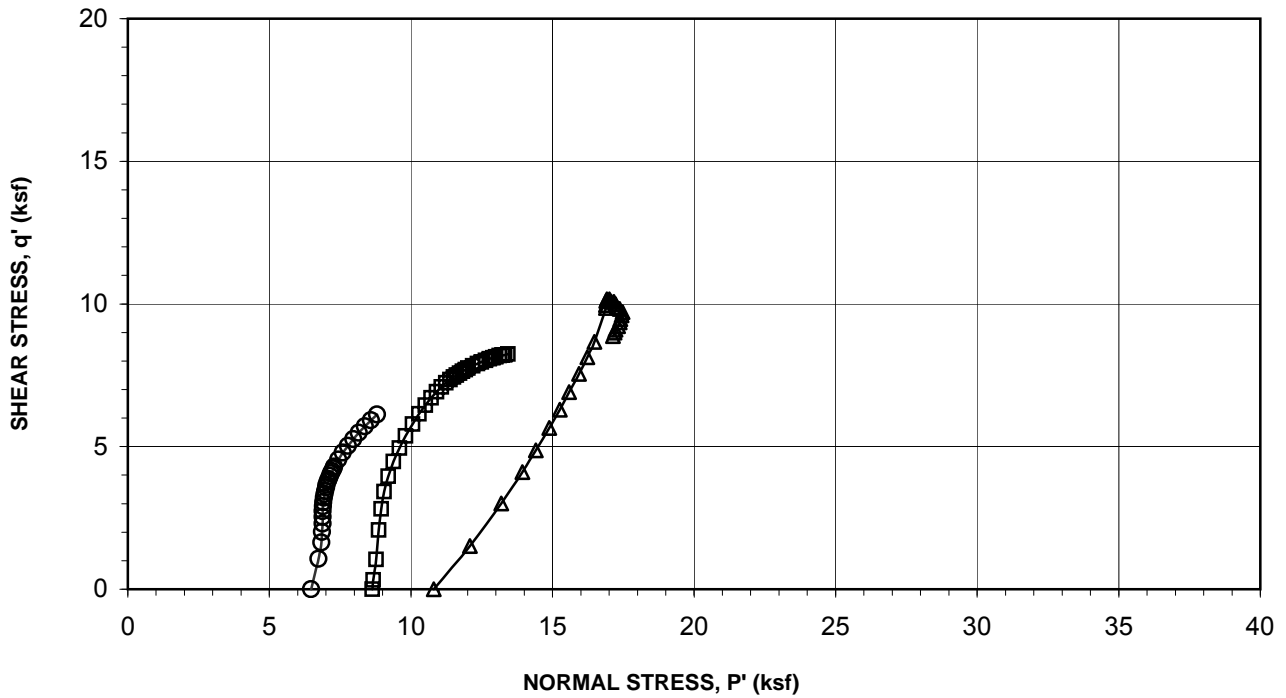
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	105.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-199	Consolidation Pressure :	75.0 psi
Depth(ft):	95	Initial Sample Height:	4.720 in
Sample No.:	15	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.720 in
Sample Description:	Fat Clay w/sand	Final Sample Area (A)*:	5.568 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
105.0	0	0.000	30.0	0.00	0.00	0.00	0.00	10.80
105.0	117	0.006	31.6	3.02	0.13	0.23	1.51	12.08
105.0	233	0.012	34.3	6.01	0.25	0.61	3.01	13.19
105.0	319	0.018	36.8	8.22	0.38	0.97	4.11	13.94
105.0	378	0.024	38.7	9.73	0.51	1.25	4.86	14.41
105.0	440	0.030	40.9	11.31	0.64	1.57	5.65	14.89
105.0	490	0.036	42.7	12.58	0.76	1.83	6.29	15.26
105.0	539	0.042	44.7	13.82	0.89	2.12	6.91	15.59
105.0	590	0.048	46.8	15.10	1.02	2.42	7.55	15.94
105.0	636	0.054	48.8	16.26	1.14	2.70	8.13	16.23
105.0	679	0.060	50.7	17.34	1.27	2.99	8.67	16.48
105.0	777	0.090	56.2	19.71	1.91	3.77	9.86	16.88
105.0	787	0.100	56.9	19.92	2.12	3.87	9.96	16.89
105.0	803	0.125	57.9	20.22	2.65	4.01	10.11	16.90
105.0	815	0.170	58.0	20.32	3.61	4.03	10.16	16.92
105.0	823	0.215	57.4	20.32	4.55	3.95	10.16	17.01
105.0	826	0.262	56.6	20.18	5.54	3.83	10.09	17.06
105.0	833	0.306	55.7	20.15	6.49	3.70	10.07	17.17
105.0	835	0.352	54.8	19.99	7.45	3.57	9.99	17.23
105.0	836	0.399	53.8	19.80	8.45	3.43	9.90	17.27
105.0	839	0.443	52.6	19.66	9.39	3.26	9.83	17.37
105.0	838	0.490	51.1	19.42	10.38	3.04	9.71	17.47
105.0	838	0.536	50.6	19.21	11.35	2.97	9.61	17.43
105.0	835	0.580	50.0	18.94	12.29	2.88	9.47	17.39
105.0	834	0.627	49.3	18.70	13.28	2.78	9.35	17.37
105.0	832	0.673	48.8	18.45	14.26	2.71	9.23	17.32
105.0	830	0.718	48.5	18.20	15.22	2.67	9.10	17.23
105.0	830	0.765	48.1	17.99	16.20	2.60	8.99	17.19
105.0	828	0.810	47.6	17.74	17.16	2.53	8.87	17.14
105.0	822	0.856	47.3	17.41	18.13	2.49	8.70	17.01
105.0	820	0.902	47.2	17.16	19.10	2.47	8.58	16.91
105.0	829	0.947	46.2	17.14	20.06	2.33	8.57	17.04

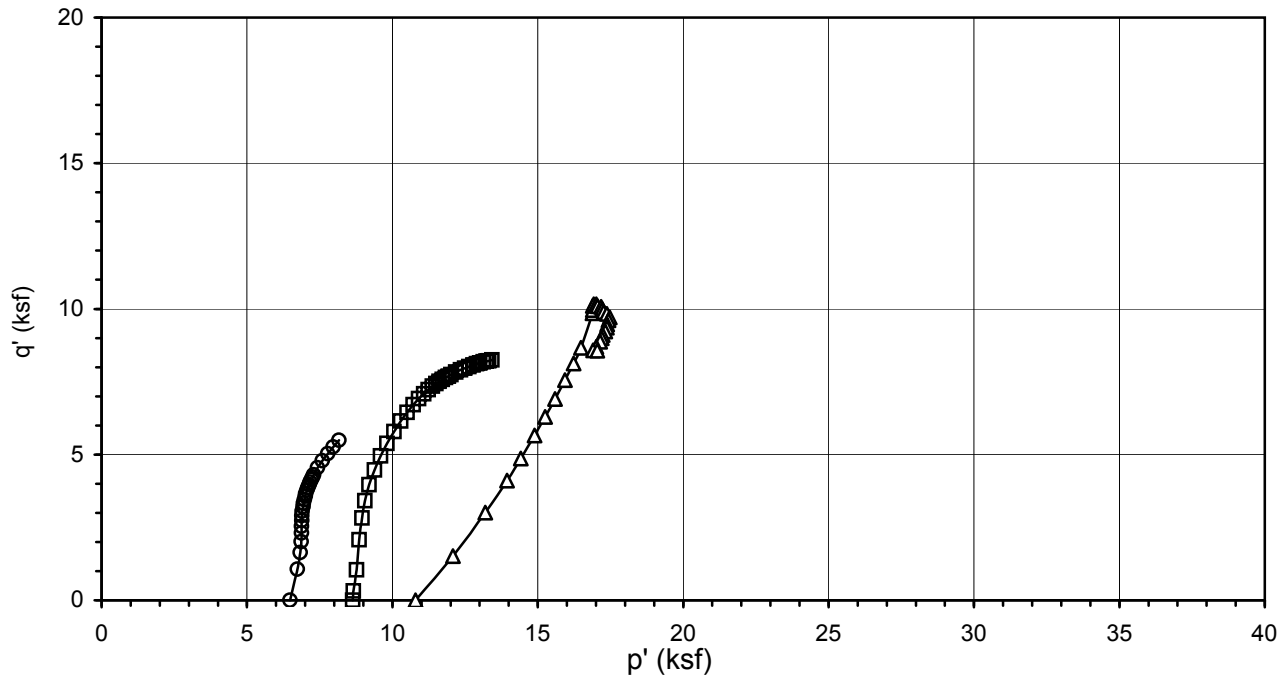


LEGEND: CONFINING PRESSURES= ○ 45 psi □ 60 psi △ 75 psi

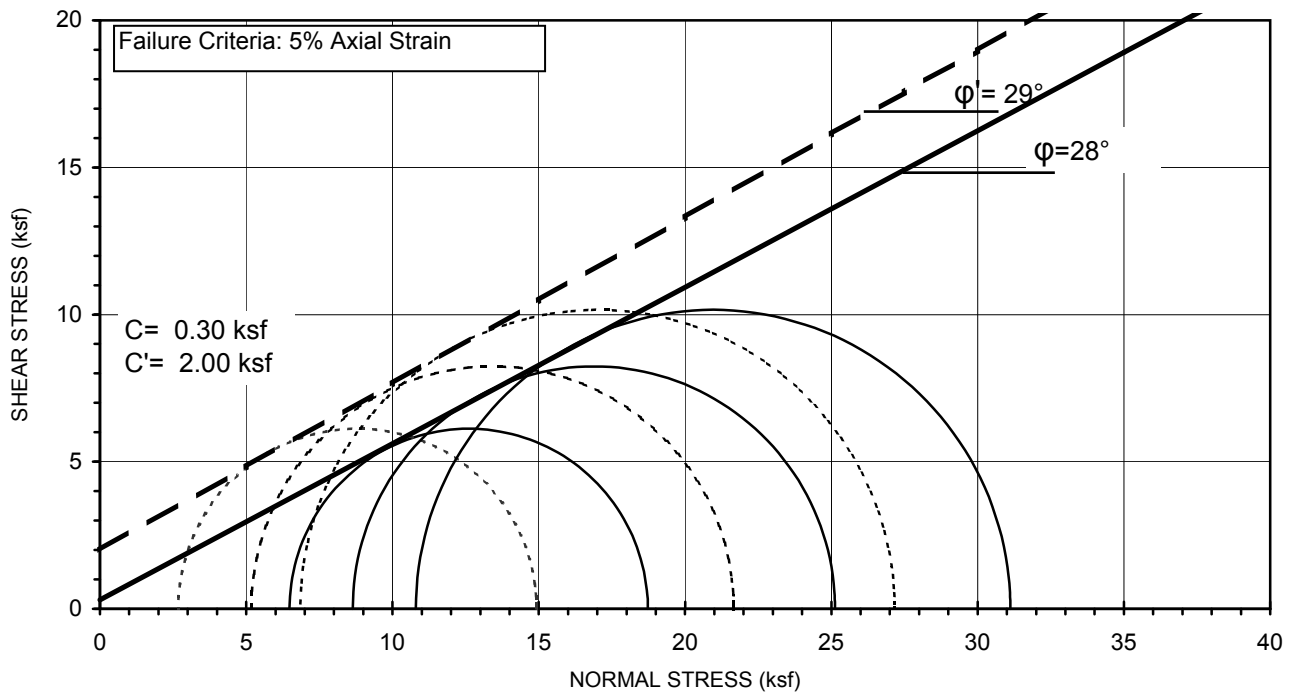


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Fat Clay w/sand
Test Pit:	G-199	Avg. Dry Unit Weight (pcf):	108.4
Sample No.:	15	Avg. Initial Moisture Content (%):	19.1
Depth (ft):	95	Confining Pressure:	45.0, 60.0, 75.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

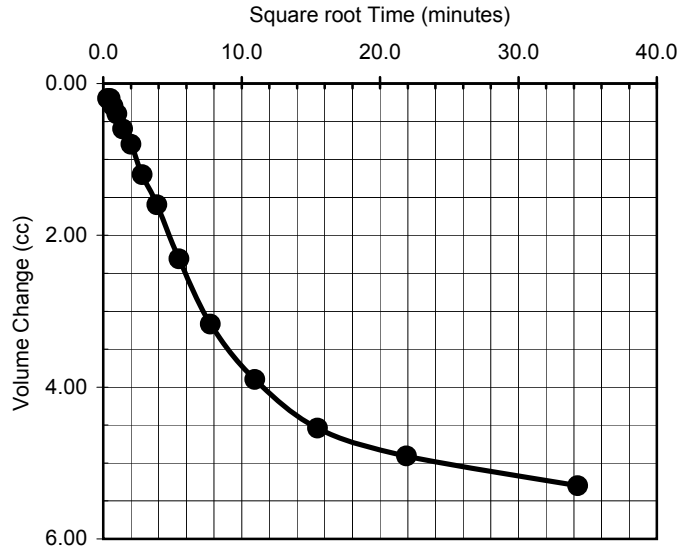
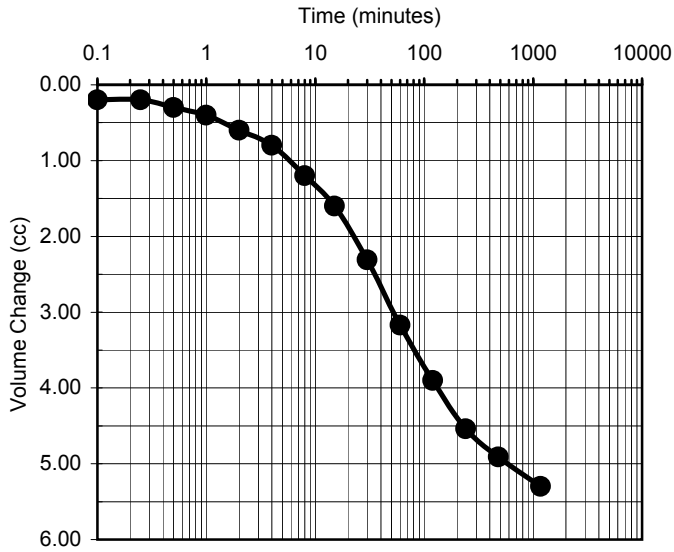


LEGEND: CONFINING PRESSURES= ○ 45 psi □ 60 psi △ 75 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Fat Clay w/sand
Test Pit:	G-199	Avg. Dry Unit Weight (pcf):	108.4
Sample No.:	15	Avg. Initial Moisture Content (%):	19.1
Depth (ft):	95	Confining Pressure:	45.0, 60.0, 75.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-199	Sample Type:	Mod. Cal.
Sample No.:	15	Soil Description:	Fat Clay w/sand
Depth (feet):	95	Eff. Confining Pressure (psi):	60.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.2000
0.25	0.2000
0.5	0.3000
1	0.4000
2	0.6000
4	0.8000
8	1.2000
15	1.6000
30	2.3100
60	3.1700
120	3.9000
240	4.5400
480	4.9100
1175	5.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.2000
0.5000	0.2000
0.7071	0.3000
1.0000	0.4000
1.4142	0.6000
2.0000	0.8000
2.8284	1.2000
3.8730	1.6000
5.4772	2.3100
7.7460	3.1700
10.9545	3.9000
15.4919	4.5400
21.9089	4.9100
34.2783	5.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	08/14/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-17-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-203	Reviewed by:	AP	Date:	07-28-11
Sample No.:	-	Sample Description:	Dark Brown Sandy Clay		
Depth(ft):	49.5				
Sample Type:	Mod. Cal.	Confining Pressure =	20.0 psi		

Diameter (in)	<u>2.619</u>	<u>2.619</u>	<u>2.619</u>	Avg. =	2.619
Height (in)	<u>4.941</u>	<u>4.941</u>	<u>4.941</u>	Avg. =	4.941

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.387	5.325
Moisture Content (%)	14.15	14.71
Wet Weight (gms)	204.85	1107.00
Dry Weight (gms)	185.14	984.42
Container Weight (gms)	45.89	150.88
Density and Saturation		
Wet Weight (gms)	943.64	
Container Weight (gms)	0.00	
Wet Density (pcf)	135.1	
Dry Density (pcf)	118.3	
Initial Void Ratio	0.424	
% Saturation	90.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation			
B Value (%) =	96	Change in Ht. of the Specimen (in)=	0

Consolidation			
Cell Pressure (psi) =	50.0	Initial Burette Ht.(cm)=	79.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	72.4
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	4.916
Induced OCR =	1.0	Initial Volume (cu.in)=	26.618
Change in Ht. of Specimen (in) =	0.0247	Final Volume (cu.in) =	26.179

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	10.52
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	2.82
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	13.34
		Axial Strain (%) =	5.14



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-17-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [07-28-11](#)
 Test Pit: [G-203](#) Reviewed by: [AP](#) Date: [07-28-11](#)
 Sample No.: - Sample Description: [Dark Brown Sandy Clay](#)
 Depth(ft): [49.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 35.0 psi](#)

Diameter (in)	2.619	2.619	2.619	Avg. =	2.619
Height (in)	4.941	4.941	4.941	Avg. =	4.941

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.387	5.349
Moisture Content (%)	14.15	14.71
Wet Weight (gms)	204.85	1107.00
Dry Weight (gms)	185.14	984.42
Container Weight (gms)	45.89	150.88
Density and Saturation		
Wet Weight (gms)	943.64	
Container Weight (gms)	0.00	
Wet Density (pcf)	135.1	
Dry Density (pcf)	118.3	
Initial Void Ratio	0.424	
% Saturation	90.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	65.0	Initial Burette Ht.(cm)=	72.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	69.3
Eff. Consol. Stress (psi) =	35.0	Final Height (in)=	4.940
Induced OCR=	1.0	Initial Volume (cu.in)=	26.618
Change in Ht. of Specimen (in) =	0.0006	Final Volume (cu.in) =	26.428

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	15.42
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	5.32
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	20.74
		Axial Strain (%) =	6.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-17-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-203** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Dark Brown Sandy Clay**
 Depth(ft): **49.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 50.0 psi**

Diameter (in)	<u>2.619</u>	<u>2.619</u>	<u>2.619</u>	Avg. =	2.619
Height (in)	<u>4.941</u>	<u>4.941</u>	<u>4.941</u>	Avg. =	4.941

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.387	5.359
Moisture Content (%)	14.15	14.71
Wet Weight (gms)	204.85	1107.00
Dry Weight (gms)	185.14	984.42
Container Weight (gms)	45.89	150.88
Density and Saturation		
Wet Weight (gms)	943.64	
Container Weight (gms)	0.00	
Wet Density (pcf)	135.1	
Dry Density (pcf)	118.3	
Initial Void Ratio	0.424	
% Saturation	90.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation		
Cell Pressure (psi) =	80.0	Initial Burette Ht.(cm)= 70.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)= 67.4
Eff. Consol. Stress (psi) =	50.0	Final Height (in)= 4.937
Induced OCR =	1.0	Initial Volume (cu.in)= 26.618
Change in Ht. of Specimen (in) =	0.0045	Final Volume (cu.in) = 26.453

Shear		<u>At Failure</u>
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) = 19.69
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) = 6.61
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) = 26.30
		Axial Strain (%) = 5.10



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-203	Consolidation Pressure :	20.0 psi
Depth(ft):	49.5	Initial Sample Height:	4.941 in
Sample No.:	-	Initial Area of Sample:	5.387 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.916 in
Sample Description:	Dark Brown Sandy Clay	Final Sample Area (A)*:	5.325 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.88
50.0	48	0.005	33.1	1.30	0.10	0.44	0.65	3.08
50.0	74	0.012	35.2	2.00	0.25	0.74	1.00	3.14
50.0	95	0.019	36.6	2.56	0.39	0.95	1.28	3.20
50.0	114	0.026	37.8	3.07	0.53	1.12	1.53	3.29
50.0	133	0.034	38.7	3.57	0.68	1.25	1.79	3.42
50.0	151	0.040	39.3	4.05	0.82	1.34	2.03	3.57
50.0	169	0.047	39.8	4.53	0.95	1.41	2.26	3.74
50.0	186	0.054	40.0	4.97	1.10	1.45	2.49	3.92
50.0	203	0.061	40.2	5.42	1.25	1.47	2.71	4.12
50.0	219	0.068	40.2	5.84	1.38	1.47	2.92	4.33
50.0	234	0.075	40.2	6.23	1.52	1.46	3.12	4.53
50.0	248	0.082	40.0	6.60	1.66	1.44	3.30	4.74
50.0	261	0.089	39.8	6.93	1.80	1.41	3.47	4.94
50.0	274	0.096	39.5	7.27	1.94	1.37	3.63	5.14
50.0	285	0.102	39.2	7.55	2.08	1.32	3.77	5.33
50.0	295	0.109	38.8	7.80	2.22	1.27	3.90	5.51
50.0	305	0.116	38.4	8.05	2.37	1.21	4.03	5.70
50.0	314	0.123	38.0	8.28	2.51	1.15	4.14	5.87
50.0	322	0.130	37.6	8.48	2.65	1.09	4.24	6.03
50.0	330	0.138	37.1	8.67	2.80	1.03	4.34	6.19
50.0	338	0.145	36.7	8.87	2.95	0.96	4.44	6.35
50.0	345	0.152	36.3	9.04	3.10	0.90	4.52	6.50
50.0	351	0.159	35.8	9.19	3.23	0.84	4.59	6.64
50.0	358	0.167	35.4	9.35	3.39	0.77	4.68	6.78
50.0	363	0.174	34.9	9.47	3.53	0.71	4.74	6.91
50.0	369	0.181	34.5	9.61	3.69	0.65	4.81	7.04
50.0	374	0.188	34.1	9.73	3.83	0.58	4.86	7.16
50.0	379	0.195	33.6	9.84	3.97	0.52	4.92	7.28
50.0	384	0.202	33.2	9.96	4.11	0.46	4.98	7.40
50.0	388	0.209	32.8	10.05	4.25	0.40	5.02	7.50
50.0	393	0.216	32.4	10.16	4.40	0.34	5.08	7.62
50.0	396	0.224	32.0	10.22	4.55	0.28	5.11	7.71
50.0	404	0.238	31.2	10.40	4.84	0.17	5.20	7.91
50.0	410	0.253	30.4	10.52	5.14	0.06	5.26	8.08



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-203	Consolidation Pressure :	35.0 psi
Depth(ft):	49.5	Initial Sample Height:	4.941 in
Sample No.:	-	Initial Area of Sample:	5.387 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.940 in
Sample Description:	Dark Brown Sandy Clay	Final Sample Area (A)*:	5.349 sq. in.
		Induced OCR=	1.0

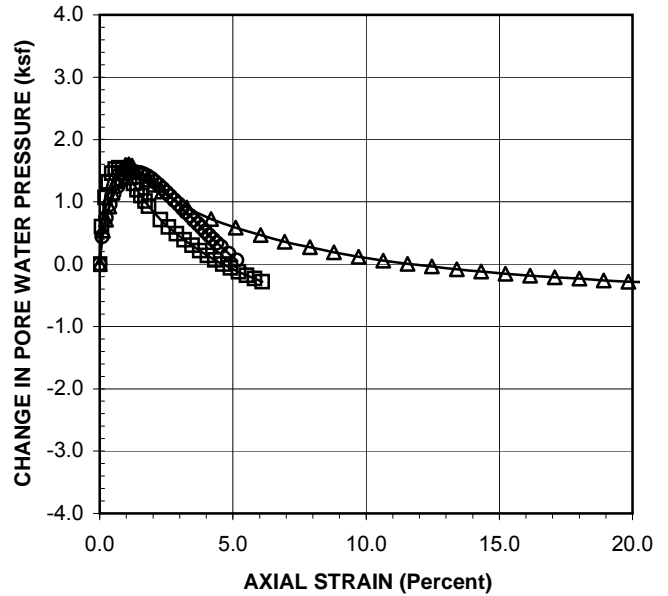
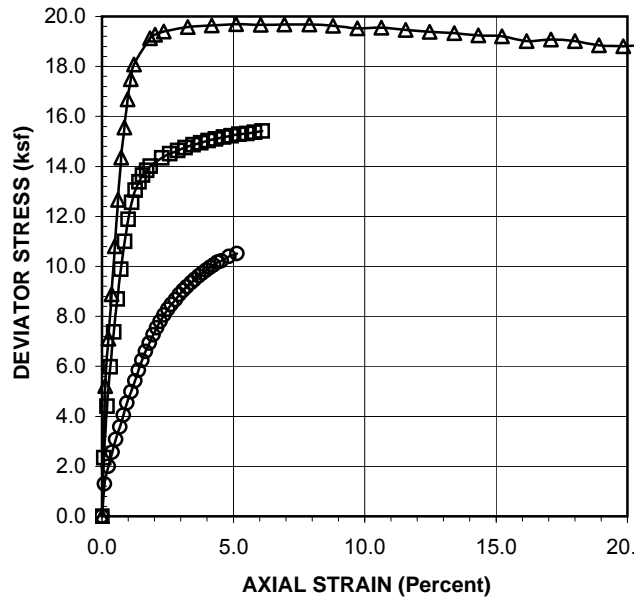
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.04
65.0	87	0.004	34.2	2.34	0.07	0.60	1.17	5.61
65.0	164	0.010	37.4	4.41	0.20	1.07	2.20	6.18
65.0	223	0.016	39.2	5.98	0.32	1.32	2.99	6.71
65.0	275	0.022	40.2	7.37	0.45	1.46	3.68	7.27
65.0	325	0.029	40.6	8.70	0.59	1.53	4.35	7.86
65.0	370	0.036	40.7	9.89	0.72	1.54	4.94	8.44
65.0	412	0.043	40.6	10.99	0.86	1.52	5.50	9.01
65.0	446	0.049	40.2	11.89	1.00	1.47	5.94	9.51
65.0	472	0.056	39.7	12.56	1.13	1.39	6.28	9.93
65.0	491	0.063	39.0	13.05	1.27	1.29	6.52	10.27
65.0	504	0.070	38.3	13.38	1.41	1.19	6.69	10.54
65.0	515	0.077	37.7	13.65	1.55	1.10	6.82	10.76
65.0	523	0.084	37.0	13.84	1.70	1.01	6.92	10.95
65.0	530	0.091	36.5	14.00	1.84	0.93	7.00	11.11
65.0	545	0.113	35.0	14.34	2.28	0.72	7.17	11.49
65.0	553	0.128	34.2	14.50	2.58	0.59	7.25	11.70
65.0	560	0.143	33.4	14.64	2.89	0.49	7.32	11.87
65.0	566	0.157	32.7	14.75	3.17	0.39	7.38	12.03
65.0	572	0.172	32.1	14.86	3.47	0.30	7.43	12.17
65.0	577	0.186	31.5	14.95	3.76	0.22	7.47	12.30
65.0	582	0.200	31.0	15.03	4.05	0.14	7.52	12.42
65.0	586	0.214	30.5	15.09	4.33	0.07	7.55	12.52
65.0	591	0.229	30.0	15.17	4.63	0.00	7.59	12.63
65.0	595	0.243	29.6	15.23	4.92	-0.06	7.61	12.72
65.0	599	0.258	29.2	15.28	5.22	-0.12	7.64	12.81
65.0	602	0.273	28.8	15.31	5.52	-0.18	7.66	12.88
65.0	606	0.287	28.4	15.36	5.81	-0.23	7.68	12.96
65.0	610	0.302	28.1	15.42	6.10	-0.28	7.71	13.03



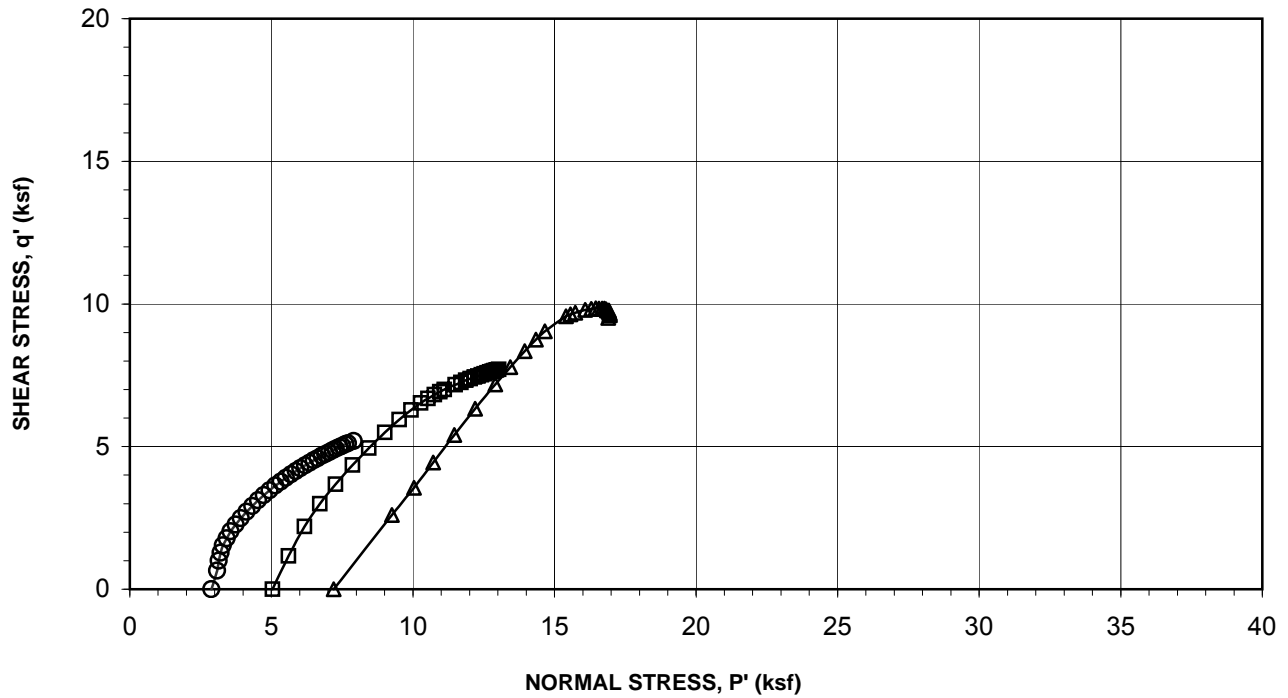
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	80.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-203	Consolidation Pressure :	50.0 psi
Depth(ft):	49.5	Initial Sample Height:	4.941 in
Sample No.:	-	Initial Area of Sample:	5.387 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	4.937 in
Sample Description:	Dark Brown Sandy Clay	Final Sample Area (A)*:	5.359 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
80.0	0	0.000	30.0	0.00	0.00	0.00	0.00	7.20
80.0	194	0.006	33.8	5.21	0.12	0.54	2.60	9.26
80.0	265	0.012	35.0	7.10	0.24	0.71	3.55	10.04
80.0	332	0.018	36.4	8.89	0.36	0.93	4.44	10.72
80.0	404	0.024	38.0	10.80	0.49	1.15	5.40	11.46
80.0	474	0.030	39.2	12.66	0.61	1.33	6.33	12.20
80.0	538	0.036	40.2	14.35	0.73	1.47	7.18	12.91
80.0	584	0.042	40.7	15.56	0.85	1.54	7.78	13.44
80.0	627	0.048	41.1	16.68	0.97	1.59	8.34	13.95
80.0	658	0.054	41.1	17.49	1.09	1.60	8.74	14.34
80.0	681	0.060	41.0	18.08	1.22	1.58	9.04	14.66
80.0	725	0.090	39.4	19.13	1.82	1.35	9.56	15.41
80.0	732	0.100	38.9	19.27	2.03	1.27	9.64	15.56
80.0	739	0.116	38.1	19.39	2.35	1.16	9.70	15.73
80.0	753	0.161	36.3	19.57	3.26	0.91	9.79	16.08
80.0	763	0.206	35.0	19.65	4.18	0.73	9.82	16.30
80.0	772	0.252	34.1	19.69	5.10	0.59	9.84	16.46
80.0	779	0.299	33.2	19.67	6.05	0.47	9.83	16.57
80.0	787	0.343	32.5	19.68	6.95	0.36	9.84	16.68
80.0	795	0.389	31.9	19.68	7.89	0.27	9.84	16.77
80.0	801	0.434	31.3	19.63	8.80	0.19	9.82	16.82
80.0	805	0.480	30.8	19.53	9.72	0.12	9.77	16.85
80.0	814	0.525	30.4	19.55	10.64	0.05	9.77	16.92
80.0	819	0.570	30.1	19.47	11.55	0.01	9.73	16.93
80.0	824	0.616	29.8	19.38	12.47	-0.04	9.69	16.93
80.0	831	0.662	29.4	19.34	13.41	-0.08	9.67	16.95
80.0	836	0.707	29.2	19.25	14.32	-0.12	9.62	16.94
80.0	843	0.752	28.9	19.20	15.23	-0.16	9.60	16.96
80.0	844	0.798	28.7	19.02	16.16	-0.18	9.51	16.89
80.0	856	0.843	28.5	19.07	17.08	-0.21	9.54	16.95
80.0	863	0.889	28.4	19.02	18.00	-0.23	9.51	16.94
80.0	865	0.934	28.2	18.85	18.92	-0.26	9.42	16.89
80.0	873	0.980	28.0	18.80	19.84	-0.28	9.40	16.89
80.0	885	1.025	28.0	18.84	20.77	-0.29	9.42	16.91
80.0	888	1.070	27.9	18.69	21.68	-0.30	9.34	16.85

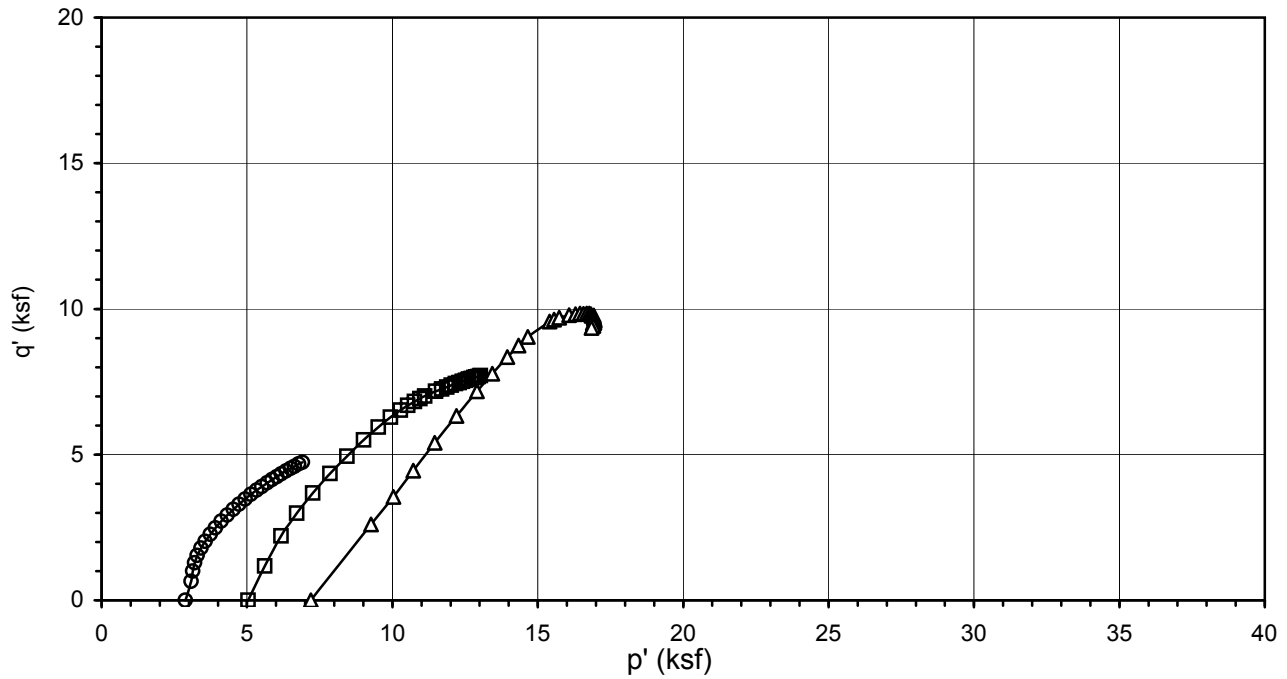


LEGEND: CONFINING PRESSURES= ○ 20 psi □ 35 psi △ 50 psi

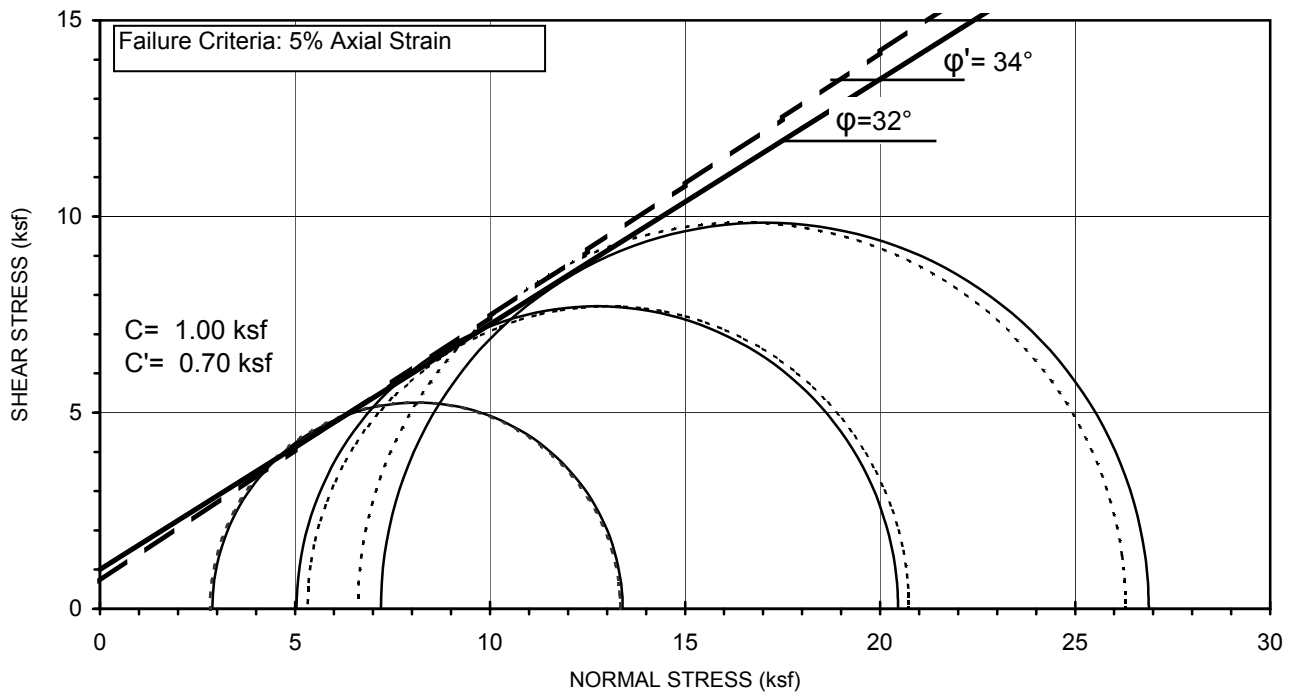


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Brown Sandy Clay
Test Pit:	G-203	Avg. Dry Unit Weight (pcf):	118.3
Sample No.:	-	Avg. Initial Moisture Content (%):	14.2
Depth (ft):	49.5	Confining Pressure:	20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

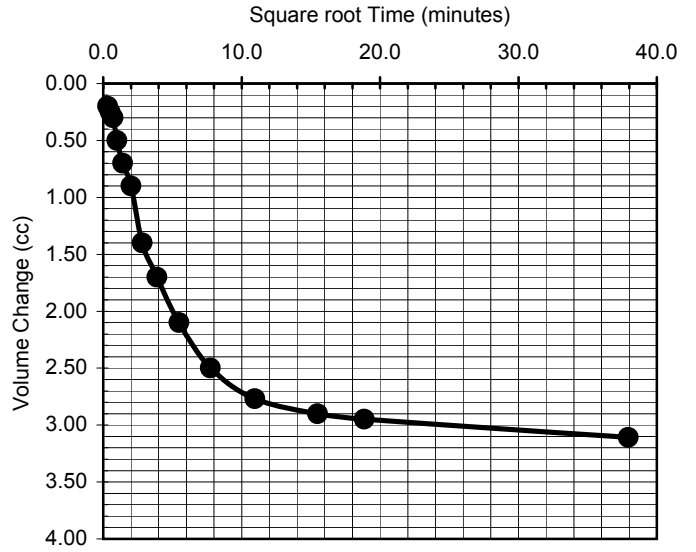
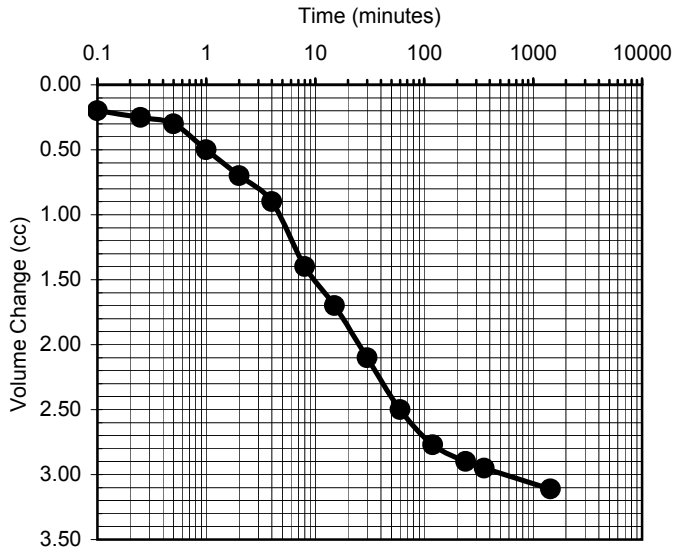


LEGEND: CONFINING PRESSURES= ○ 20psi □ 35 psi △ 50 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Brown Sandy Clay
Test Pit:	G-203	Avg. Dry Unit Weight (pcf):	118.3
Sample No.:	-	Avg. Initial Moisture Content (%):	14.2
Depth (ft):	49.5	Confining Pressure:	20.0, 35.0, 50.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-203	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Dark Brown Sandy Clay
Depth (feet):	49.5	Eff. Confining Pressure (psi):	35.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.2000
0.25	0.2500
0.5	0.3000
1	0.5000
2	0.7000
4	0.9000
8	1.4000
15	1.7000
30	2.1000
60	2.5000
120	2.7700
240	2.9000
356	2.9500
1440	3.1100

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.2000
0.5000	0.2500
0.7071	0.3000
1.0000	0.5000
1.4142	0.7000
2.0000	0.9000
2.8284	1.4000
3.8730	1.7000
5.4772	2.1000
7.7460	2.5000
10.9545	2.7700
15.4919	2.9000
18.8680	2.9500
37.9473	3.1100

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/17/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-19-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [07-28-11](#)
 Test Pit: [G-203](#) Reviewed by: [AP](#) Date: [07-28-11](#)
 Sample No.: - Sample Description: [Yellowish Brown Sandy Clay](#)
 Depth(ft): [65.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 40.0 psi](#)

Diameter (in)	2.610	2.610	2.610	Avg. =	2.610
Height (in)	5.643	5.643	5.643	Avg. =	5.643

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.248
Moisture Content (%)	17.26	19.73
Wet Weight (gms)	81.49	1123.90
Dry Weight (gms)	76.02	963.39
Container Weight (gms)	44.33	149.68
Density and Saturation		
Wet Weight (gms)	992.51	
Container Weight (gms)	0.00	
Wet Density (pcf)	125.2	
Dry Density (pcf)	106.8	
Initial Void Ratio	0.578	
% Saturation	80.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	70.0	Initial Burette Ht.(cm)=	67.9
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	46.3
Eff. Consol. Stress (psi) =	40.0	Final Height (in)=	5.502
Induced OCR =	1.0	Initial Volume (cu.in)=	30.191
Change in Ht. of Specimen (in) =	0.1407	Final Volume (cu.in) =	28.873

Shear		At Failure	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	10.81
Time to 50% primary Consolidation (min) =	5	Eff. Minor Principal stress (ksf) =	5.26
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	16.06
		Axial Strain (%) =	5.09



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-19-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-203** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Yellowish Brown Sandy Clay**
 Depth(ft): **65.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 55.0 psi**

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.643</u>	<u>5.643</u>	<u>5.643</u>	Avg. =	5.643

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.261
Moisture Content (%)	17.26	19.73
Wet Weight (gms)	<u>81.49</u>	<u>1123.90</u>
Dry Weight (gms)	<u>76.02</u>	<u>963.39</u>
Container Weight (gms)	<u>44.33</u>	<u>149.68</u>
Density and Saturation		
Wet Weight (gms)	<u>992.51</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	125.2	
Dry Density (pcf)	106.8	
Initial Void Ratio	0.578	
% Saturation	80.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>85.0</u>	Initial Burette Ht.(cm)=	<u>46.3</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>38.0</u>
Eff. Consol. Stress (psi) =	55.0	Final Height (in)=	<u>5.642</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.191</u>
Change in Ht. of Specimen (in) =	0.0011	Final Volume (cu.in) =	<u>29.685</u>

Shear		At Failure	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	11.95
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	5.38
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.33
		Axial Strain (%) =	5.28



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-19-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-203	Reviewed by:	AP	Date:	07-28-11
Sample No.:	-	Sample Description:	Yellowish Brown Sandy Clay		
Depth(ft):	65.5				
Sample Type:	Mod. Cal.	Confining Pressure =	70.0 psi		

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.643</u>	<u>5.643</u>	<u>5.643</u>	Avg. =	5.643

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.275
Moisture Content (%)	17.26	19.73
Wet Weight (gms)	81.49	1123.90
Dry Weight (gms)	76.02	963.39
Container Weight (gms)	44.33	149.68
Density and Saturation		
Wet Weight (gms)	992.51	
Container Weight (gms)	0.00	
Wet Density (pcf)	125.2	
Dry Density (pcf)	106.8	
Initial Void Ratio	0.578	
% Saturation	80.7	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	100.0	Initial Burette Ht.(cm)=	42.7
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	35.3
Eff. Consol. Stress (psi) =	70.0	Final Height (in)=	5.637
Induced OCR =	1.0	Initial Volume (cu.in)=	30.191
Change in Ht. of Specimen (in) =	0.0056	Final Volume (cu.in) =	29.740

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.005	Deviator Stress (ksf) =	15.33
Time to 50% primary Consolidation =	5	Eff. Minor Principal stress (ksf) =	7.17
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	22.50
		Axial Strain (%) =	3.69



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-203	Consolidation Pressure :	40.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.643 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.502 in
Sample Description:	Yellowish Brown Sandy Clay	Final Sample Area (A)*:	5.248 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	30.0	0.00	0.00	0.00	0.00	5.76
70.0	48	0.005	33.1	1.32	0.09	0.44	0.66	5.97
70.0	74	0.012	35.2	2.03	0.22	0.74	1.01	6.03
70.0	95	0.019	36.6	2.60	0.35	0.95	1.30	6.10
70.0	114	0.026	37.8	3.11	0.47	1.12	1.56	6.20
70.0	133	0.034	38.7	3.63	0.61	1.25	1.81	6.33
70.0	151	0.040	39.3	4.11	0.73	1.34	2.06	6.48
70.0	169	0.047	39.8	4.60	0.85	1.41	2.30	6.65
70.0	186	0.054	40.0	5.05	0.99	1.45	2.53	6.84
70.0	203	0.061	40.2	5.51	1.12	1.47	2.75	7.04
70.0	219	0.068	40.2	5.94	1.24	1.47	2.97	7.25
70.0	234	0.075	40.2	6.33	1.36	1.46	3.17	7.46
70.0	248	0.082	40.3	6.70	1.48	1.48	3.35	7.63
70.0	261	0.089	40.1	7.05	1.61	1.45	3.52	7.84
70.0	274	0.096	39.8	7.39	1.74	1.41	3.69	8.04
70.0	285	0.102	39.6	7.68	1.86	1.38	3.84	8.22
70.0	295	0.109	39.3	7.93	1.98	1.34	3.97	8.39
70.0	305	0.116	39.0	8.19	2.12	1.30	4.10	8.56
70.0	314	0.123	38.9	8.42	2.24	1.28	4.21	8.69
70.0	322	0.130	38.6	8.63	2.37	1.23	4.31	8.84
70.0	330	0.138	38.2	8.83	2.50	1.18	4.41	8.99
70.0	338	0.145	37.8	9.03	2.64	1.12	4.52	9.16
70.0	345	0.152	37.3	9.21	2.77	1.05	4.60	9.32
70.0	351	0.159	36.9	9.35	2.89	1.00	4.68	9.44
70.0	358	0.167	36.5	9.53	3.03	0.94	4.76	9.58
70.0	363	0.174	36.2	9.65	3.15	0.90	4.82	9.68
70.0	369	0.181	35.9	9.79	3.29	0.85	4.90	9.81
70.0	374	0.188	35.6	9.91	3.42	0.80	4.96	9.91
70.0	379	0.195	35.2	10.03	3.55	0.75	5.02	10.02
70.0	384	0.202	34.9	10.15	3.67	0.70	5.08	10.13
70.0	388	0.209	34.7	10.24	3.80	0.67	5.12	10.21
70.0	393	0.216	34.4	10.36	3.93	0.64	5.18	10.31
70.0	396	0.224	34.3	10.43	4.06	0.62	5.21	10.36
70.0	407	0.245	33.7	10.67	4.46	0.54	5.34	10.56
70.0	410	0.253	33.6	10.73	4.59	0.52	5.37	10.61
70.0	415	0.280	33.5	10.81	5.09	0.50	5.40	10.66



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	85.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-203	Consolidation Pressure :	55.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.643 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.642 in
Sample Description:	Yellowish Brown Sandy Clay	Final Sample Area (A)*:	5.261 sq. in.
		Induced OCR=	1.0

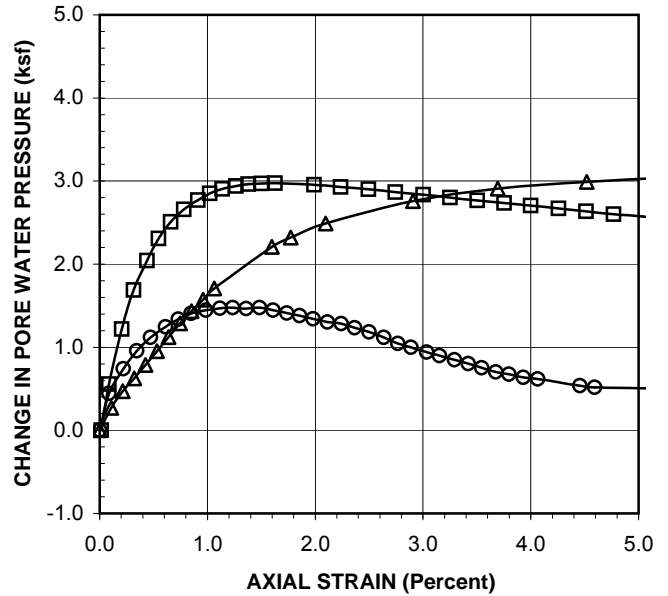
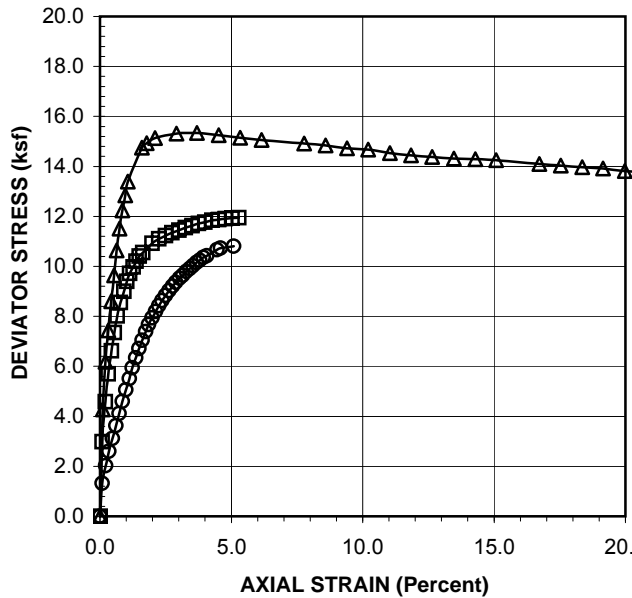
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
85.0	0	0.001	30.0	0.00	0.01	0.00	0.00	7.92
85.0	109	0.005	33.9	2.98	0.09	0.56	1.49	8.85
85.0	168	0.012	38.5	4.59	0.20	1.22	2.29	9.00
85.0	209	0.018	41.7	5.70	0.31	1.69	2.85	9.08
85.0	243	0.025	44.2	6.62	0.44	2.04	3.31	9.19
85.0	270	0.031	46.0	7.35	0.55	2.31	3.67	9.29
85.0	295	0.037	47.4	8.02	0.66	2.51	4.01	9.42
85.0	315	0.044	48.5	8.55	0.78	2.66	4.28	9.54
85.0	332	0.051	49.2	9.00	0.91	2.77	4.50	9.65
85.0	347	0.058	49.8	9.40	1.02	2.85	4.70	9.77
85.0	359	0.064	50.2	9.71	1.14	2.91	4.86	9.87
85.0	369	0.071	50.4	9.97	1.26	2.94	4.99	9.97
85.0	378	0.078	50.6	10.20	1.38	2.96	5.10	10.06
85.0	386	0.085	50.6	10.41	1.50	2.97	5.20	10.15
85.0	392	0.092	50.7	10.55	1.63	2.97	5.28	10.22
85.0	407	0.112	50.5	10.92	1.99	2.96	5.46	10.42
85.0	415	0.126	50.3	11.10	2.24	2.93	5.55	10.54
85.0	421	0.141	50.1	11.23	2.49	2.90	5.62	10.64
85.0	426	0.155	49.9	11.34	2.74	2.87	5.67	10.72
85.0	431	0.169	49.7	11.44	3.00	2.84	5.72	10.81
85.0	436	0.184	49.5	11.54	3.25	2.80	5.77	10.89
85.0	440	0.198	49.2	11.62	3.50	2.77	5.81	10.96
85.0	445	0.212	49.0	11.72	3.75	2.74	5.86	11.05
85.0	448	0.226	48.8	11.77	4.00	2.70	5.89	11.10
85.0	452	0.240	48.5	11.84	4.26	2.67	5.92	11.17
85.0	454	0.255	48.3	11.86	4.51	2.64	5.93	11.22
85.0	457	0.269	48.1	11.91	4.77	2.60	5.96	11.27
85.0	459	0.284	47.9	11.93	5.04	2.57	5.96	11.31
85.0	461	0.298	47.6	11.95	5.28	2.54	5.98	11.36



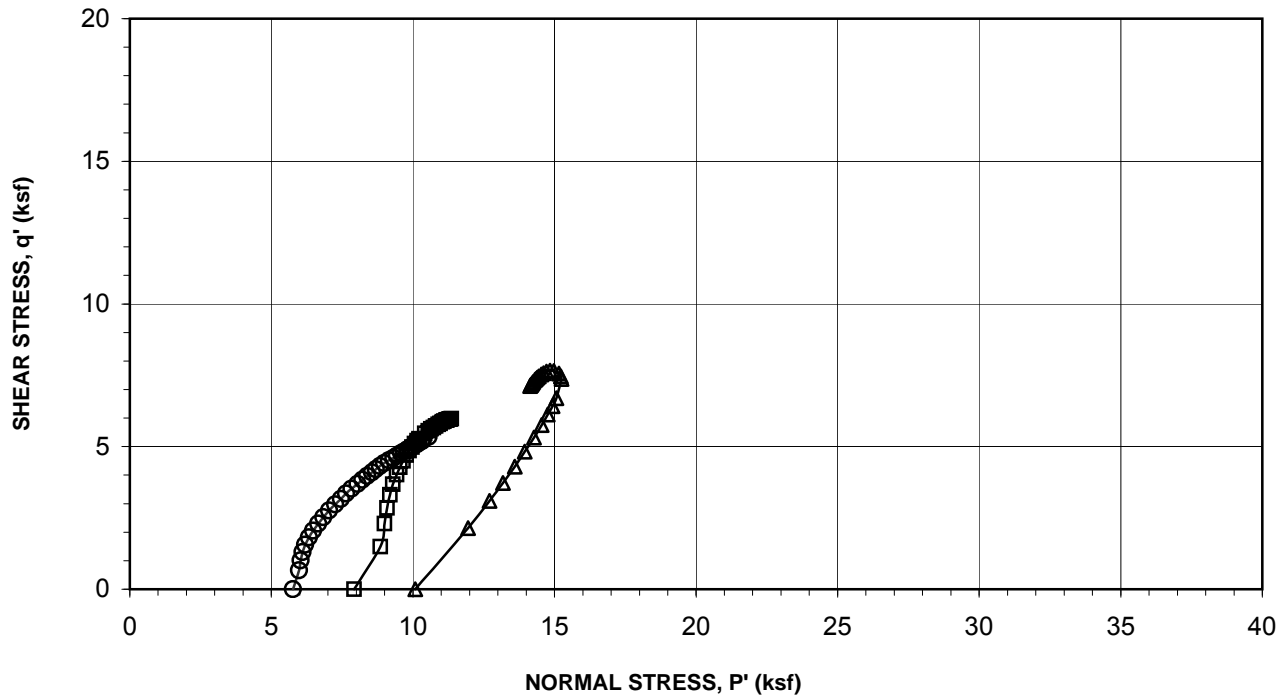
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	100.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-203	Consolidation Pressure :	70.0 psi
Depth(ft):	65.5	Initial Sample Height:	5.643 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.637 in
Sample Description:	Yellowish Brown Sandy Clay	Final Sample Area (A)*:	5.275 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
100.0	0	0.000	30.0	0.00	0.00	0.00	0.00	10.08
100.0	157	0.006	31.9	4.27	0.11	0.27	2.14	11.95
100.0	227	0.012	33.3	6.18	0.21	0.47	3.09	12.70
100.0	274	0.018	34.4	7.44	0.32	0.63	3.72	13.18
100.0	316	0.024	35.5	8.60	0.43	0.79	4.30	13.59
100.0	355	0.030	36.6	9.65	0.53	0.95	4.82	13.95
100.0	392	0.036	37.8	10.64	0.64	1.12	5.32	14.28
100.0	425	0.042	38.9	11.51	0.75	1.29	5.75	14.55
100.0	452	0.048	40.0	12.24	0.85	1.44	6.12	14.76
100.0	475	0.054	40.9	12.84	0.96	1.57	6.42	14.93
100.0	496	0.060	41.9	13.39	1.06	1.71	6.70	15.07
100.0	549	0.090	45.3	14.75	1.60	2.21	7.37	15.25
100.0	557	0.100	46.1	14.93	1.77	2.32	7.46	15.22
100.0	566	0.118	47.3	15.13	2.09	2.49	7.57	15.16
100.0	578	0.164	49.2	15.31	2.91	2.76	7.65	14.98
100.0	583	0.208	50.2	15.33	3.69	2.91	7.67	14.84
100.0	585	0.255	50.8	15.25	4.52	2.99	7.63	14.72
100.0	586	0.301	51.1	15.15	5.33	3.04	7.57	14.61
100.0	588	0.347	51.4	15.06	6.15	3.07	7.53	14.54
100.0	593	0.438	51.5	14.92	7.78	3.10	7.46	14.44
100.0	595	0.484	51.6	14.84	8.59	3.11	7.42	14.39
100.0	596	0.530	51.6	14.73	9.40	3.11	7.37	14.34
100.0	599	0.576	51.5	14.67	10.21	3.10	7.33	14.31
100.0	599	0.622	51.5	14.53	11.03	3.09	7.27	14.25
100.0	600	0.668	51.4	14.45	11.84	3.08	7.22	14.22
100.0	603	0.713	51.4	14.38	12.64	3.07	7.19	14.20
100.0	606	0.760	51.3	14.31	13.48	3.07	7.16	14.16
100.0	611	0.806	51.3	14.29	14.29	3.07	7.15	14.16
100.0	615	0.850	51.3	14.25	15.08	3.06	7.12	14.14
100.0	620	0.943	51.2	14.10	16.73	3.06	7.05	14.07
100.0	623	0.989	51.2	14.03	17.54	3.06	7.01	14.04
100.0	627	1.035	51.2	13.97	18.36	3.05	6.99	14.01
100.0	631	1.080	51.2	13.92	19.15	3.06	6.96	13.98
100.0	633	1.126	51.2	13.82	19.97	3.06	6.91	13.94
100.0	640	1.217	51.1	13.70	21.59	3.04	6.85	13.89

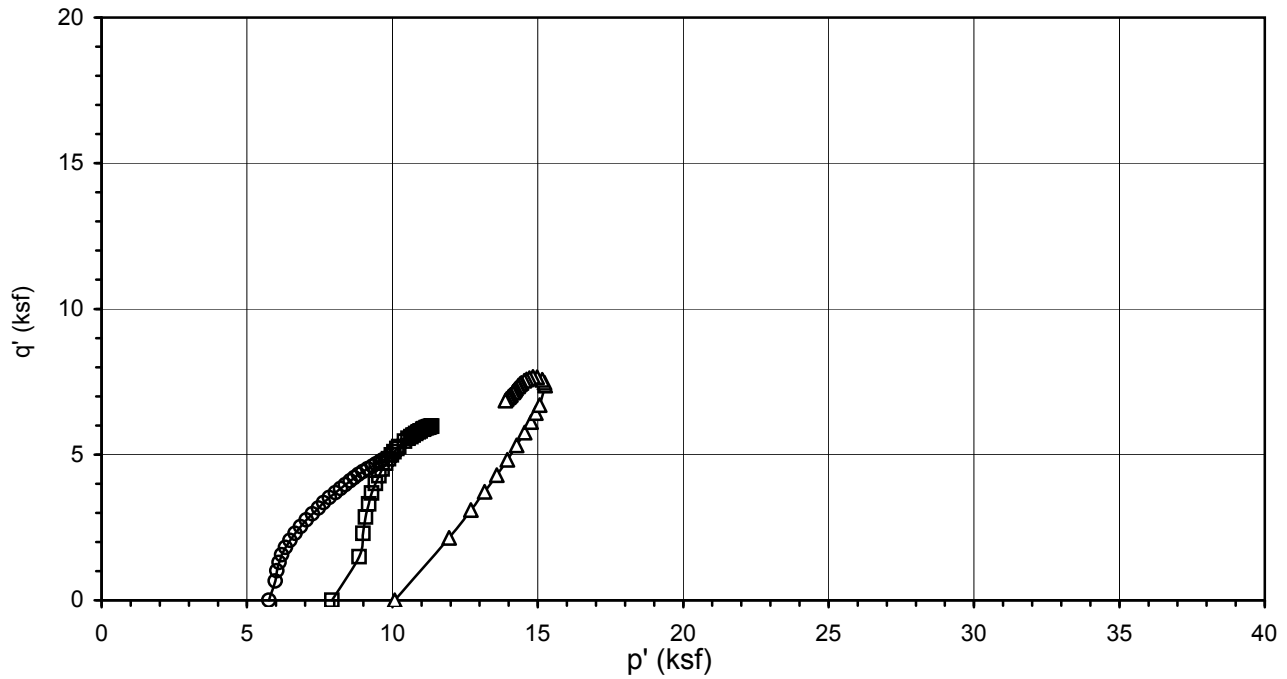


LEGEND: CONFINING PRESSURES= ○ 40 psi □ 55 psi △ 70 psi

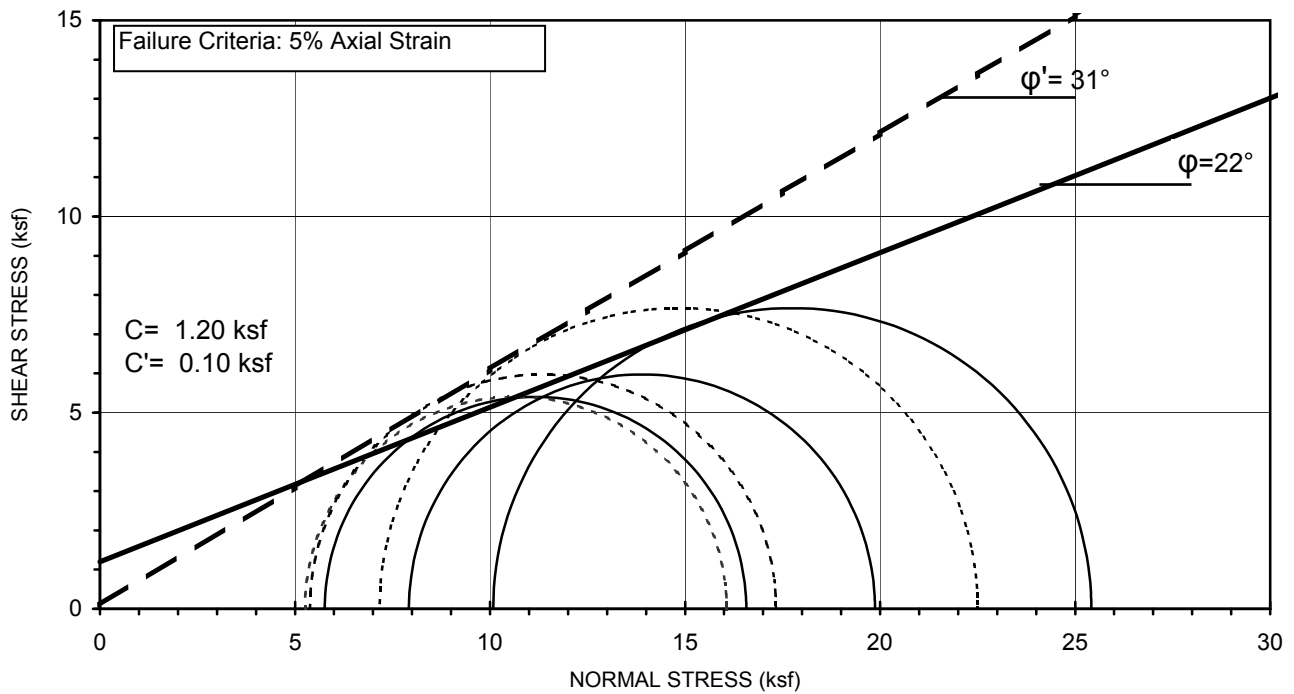


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Yellowish Brown Sandy Clay
Test Pit:	G-203	Avg. Dry Unit Weight (pcf):	106.8
Sample No.:	-	Avg. Initial Moisture Content (%):	17.3
Depth (ft):	65.5	Confining Pressure:	40.0, 55.0, 70.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

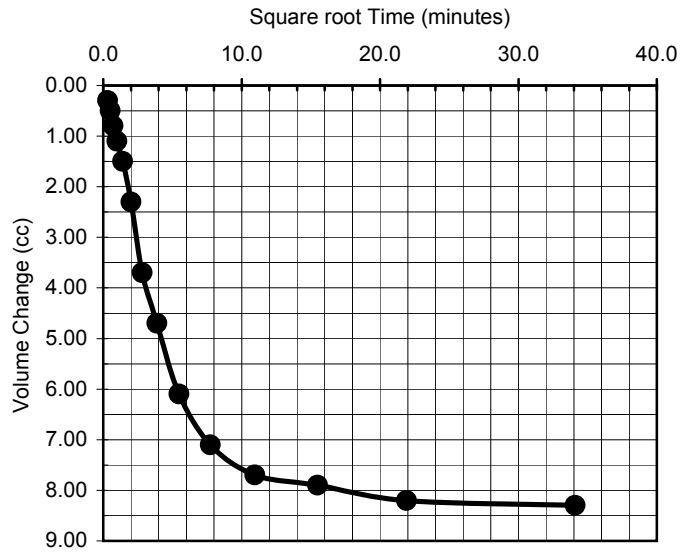
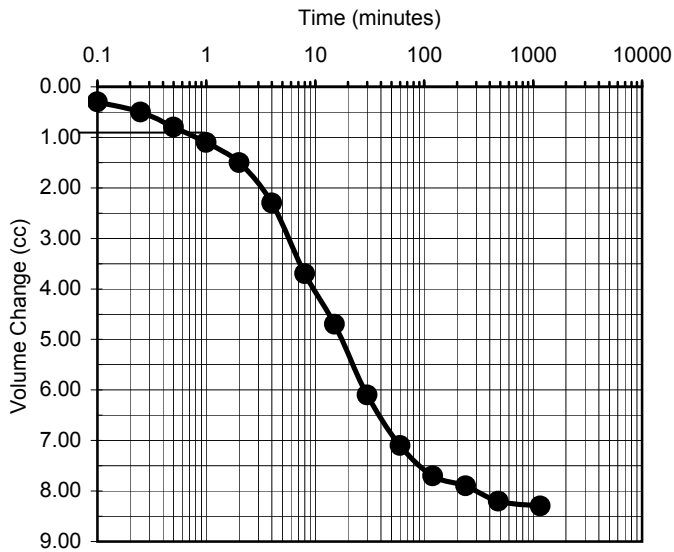


LEGEND: CONFINING PRESSURES= ○ 40 psi □ 55 psi △ 70 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Yellowish Brown Sandy Clay
Test Pit:	G-203	Avg. Dry Unit Weight (pcf):	106.8
Sample No.:	-	Avg. Initial Moisture Content (%):	17.3
Depth (ft):	65.5	Confining Pressure:	40.0, 55.0, 70.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-203	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Yellowish Brown Sandy Clay
Depth (feet):	65.5	Eff. Confining Pressure (psi):	55.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.3000
0.25	0.5000
0.5	0.8000
1	1.1000
2	1.5000
4	2.3000
8	3.7000
15	4.7000
30	6.1000
60	7.1000
120	7.7000
240	7.9000
480	8.2000
1163	8.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.3000
0.5000	0.5000
0.7071	0.8000
1.0000	1.1000
1.4142	1.5000
2.0000	2.3000
2.8284	3.7000
3.8730	4.7000
5.4772	6.1000
7.7460	7.1000
10.9545	7.7000
15.4919	7.9000
21.9089	8.2000
34.1028	8.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	07/19/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-19-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [07-28-11](#)
 Test Pit: [G-204](#) Reviewed by: [AP](#) Date: [07-28-11](#)
 Sample No.: - Sample Description: [Brown Lean Clay](#)
 Depth(ft): [5.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 5.0 psi](#)

Diameter (in)	2.610	2.610	2.610	Avg. =	2.610
Height (in)	5.622	5.622	5.622	Avg. =	5.622

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.347
Moisture Content (%)	16.49	19.86
Wet Weight (gms)	96.40	1162.13
Dry Weight (gms)	89.74	994.30
Container Weight (gms)	49.34	149.23
Density and Saturation		
Wet Weight (gms)	1022.99	
Container Weight (gms)	0.00	
Wet Density (pcf)	129.6	
Dry Density (pcf)	111.2	
Initial Void Ratio	0.515	
% Saturation	86.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	35.0	Initial Burette Ht.(cm)=	52.2
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	50.5
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	5.607
Induced OCR =	1.0	Initial Volume (cu.in)=	30.079
Change in Ht. of Specimen (in) =	0.0155	Final Volume (cu.in) =	29.975

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	2.74
Time to 50% primary Consolidation (min) =	6	Eff. Minor Principal stress (ksf) =	0.51
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	3.25
		Axial Strain (%) =	5.43



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-19-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-204** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Brown Lean Clay**
 Depth(ft): **5.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **10.0 psi**

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.622</u>	<u>5.622</u>	<u>5.622</u>	Avg. =	5.622

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.273
Moisture Content (%)	16.49	19.86
Wet Weight (gms)	<u>96.40</u>	<u>1162.13</u>
Dry Weight (gms)	<u>89.74</u>	<u>994.30</u>
Container Weight (gms)	<u>49.34</u>	<u>149.23</u>
Density and Saturation		
Wet Weight (gms)	<u>1022.99</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	129.6	
Dry Density (pcf)	111.2	
Initial Void Ratio	0.515	
% Saturation	86.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>40.0</u>	Initial Burette Ht.(cm)=	<u>50.5</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>43.3</u>
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	<u>5.621</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.079</u>
Change in Ht. of Specimen (in) =	0.0006	Final Volume (cu.in) =	<u>29.640</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	4.47
Time to 50% primary Consolidation =	6	Eff. Minor Principal stress (ksf) =	1.01
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	5.48
		Axial Strain (%) =	5.33



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-19-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-204** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Brown Lean Clay**
 Depth(ft): **5.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 15.0 psi**

Diameter (in)	<u>2.610</u>	<u>2.610</u>	<u>2.610</u>	Avg. =	2.610
Height (in)	<u>5.622</u>	<u>5.622</u>	<u>5.622</u>	Avg. =	5.622

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.350	5.290
Moisture Content (%)	16.49	19.86
Wet Weight (gms)	<u>96.40</u>	<u>1162.13</u>
Dry Weight (gms)	<u>89.74</u>	<u>994.30</u>
Container Weight (gms)	<u>49.34</u>	<u>149.23</u>
Density and Saturation		
Wet Weight (gms)	<u>1022.99</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	129.6	
Dry Density (pcf)	111.2	
Initial Void Ratio	0.515	
% Saturation	86.5	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>45.0</u>	Initial Burette Ht.(cm)=	<u>43.4</u>
Back Pressure(psi) =	<u>30.0</u>	Final Burette Ht.(cm)=	<u>37.8</u>
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	<u>5.622</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.079</u>
Change in Ht. of Specimen (in) =	0.0003	Final Volume (cu.in) =	<u>29.737</u>

Shear		At Failure	
Rate of Deformation (in/min)=	0.004	Deviator Stress (ksf) =	6.57
Time to 50% primary Consolidation =	6	Eff. Minor Principal stress (ksf) =	1.82
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	8.40
		Axial Strain (%) =	4.92



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	35.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-204	Consolidation Pressure :	5.0 psi
Depth(ft):	5.5	Initial Sample Height:	5.622 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.607 in
Sample Description:	Brown Lean Clay	Final Sample Area (A)*:	5.347 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
35.0	0	0.000	30.0	0.00	0.00	0.00	0.00	0.72
35.0	21	0.006	31.0	0.57	0.11	0.13	0.29	0.87
35.0	28	0.013	31.2	0.74	0.24	0.16	0.37	0.93
35.0	31	0.021	31.2	0.84	0.37	0.17	0.42	0.97
35.0	34	0.028	31.3	0.90	0.50	0.18	0.45	1.00
35.0	36	0.034	31.4	0.97	0.61	0.20	0.49	1.01
35.0	39	0.042	31.5	1.04	0.74	0.21	0.52	1.03
35.0	41	0.049	31.6	1.10	0.88	0.22	0.55	1.05
35.0	44	0.057	31.7	1.17	1.01	0.23	0.58	1.07
35.0	46	0.064	31.7	1.23	1.14	0.24	0.62	1.10
35.0	48	0.071	31.8	1.26	1.26	0.25	0.63	1.10
35.0	50	0.078	31.8	1.33	1.38	0.25	0.66	1.13
35.0	53	0.085	31.9	1.39	1.51	0.26	0.70	1.15
35.0	54	0.092	31.9	1.42	1.63	0.27	0.71	1.17
35.0	56	0.099	31.9	1.49	1.76	0.27	0.74	1.19
35.0	70	0.150	32.1	1.83	2.68	0.30	0.92	1.34
35.0	74	0.165	32.2	1.93	2.94	0.31	0.96	1.37
35.0	78	0.180	32.1	2.02	3.21	0.30	1.01	1.43
35.0	81	0.194	32.1	2.11	3.47	0.29	1.06	1.49
35.0	85	0.208	32.1	2.20	3.72	0.29	1.10	1.53
35.0	89	0.223	31.9	2.30	3.97	0.27	1.15	1.59
35.0	93	0.237	31.9	2.39	4.23	0.26	1.19	1.65
35.0	96	0.252	31.8	2.48	4.50	0.25	1.24	1.70
35.0	100	0.267	31.7	2.57	4.76	0.24	1.28	1.76
35.0	103	0.282	31.7	2.62	5.03	0.23	1.31	1.80
35.0	106	0.297	31.5	2.71	5.29	0.22	1.36	1.86
35.0	108	0.304	31.5	2.74	5.43	0.21	1.37	1.88



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	40.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-204	Consolidation Pressure :	10.0 psi
Depth(ft):	5.5	Initial Sample Height:	5.622 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.621 in
Sample Description:	Brown Lean Clay	Final Sample Area (A)*:	5.273 sq. in.
		Induced OCR=	1.0

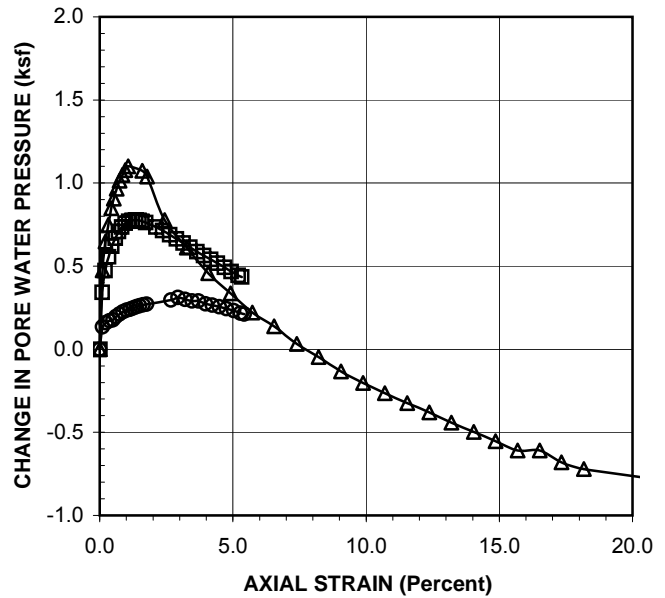
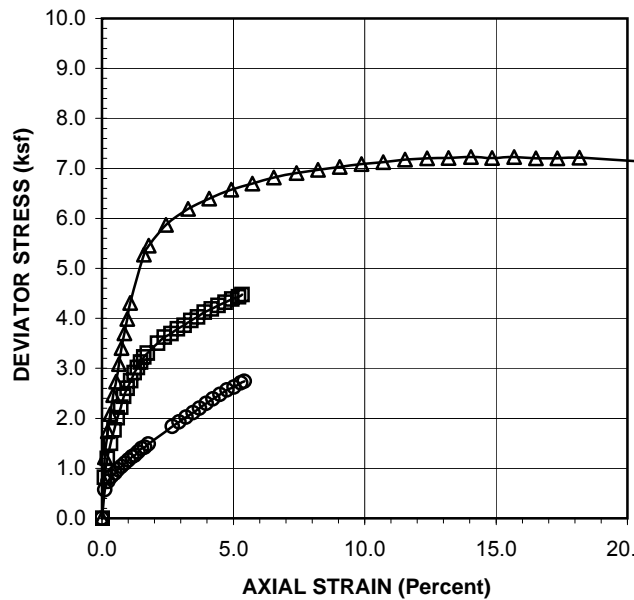
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
40.0	0	0.001	30.0	0.00	0.01	0.00	0.00	1.44
40.0	30	0.006	32.4	0.82	0.10	0.34	0.41	1.51
40.0	44	0.012	33.3	1.20	0.21	0.47	0.60	1.57
40.0	55	0.019	33.9	1.50	0.33	0.56	0.75	1.63
40.0	65	0.026	34.3	1.77	0.46	0.62	0.88	1.70
40.0	74	0.033	34.6	2.01	0.59	0.67	1.00	1.78
40.0	82	0.040	34.9	2.22	0.71	0.71	1.11	1.84
40.0	90	0.047	35.1	2.44	0.83	0.74	1.22	1.92
40.0	96	0.054	35.3	2.60	0.96	0.76	1.30	1.98
40.0	102	0.061	35.4	2.76	1.09	0.77	1.38	2.05
40.0	108	0.069	35.4	2.91	1.23	0.78	1.46	2.12
40.0	112	0.076	35.4	3.02	1.35	0.78	1.51	2.17
40.0	116	0.083	35.4	3.12	1.47	0.77	1.56	2.23
40.0	120	0.089	35.3	3.23	1.59	0.77	1.61	2.28
40.0	123	0.097	35.3	3.30	1.72	0.76	1.65	2.33
40.0	131	0.119	35.1	3.50	2.11	0.73	1.75	2.46
40.0	136	0.133	35.0	3.63	2.37	0.71	1.81	2.54
40.0	139	0.148	34.8	3.70	2.63	0.69	1.85	2.60
40.0	143	0.162	34.6	3.79	2.88	0.66	1.90	2.67
40.0	146	0.176	34.4	3.86	3.13	0.64	1.93	2.73
40.0	150	0.191	34.3	3.96	3.39	0.61	1.98	2.81
40.0	153	0.205	34.1	4.03	3.65	0.59	2.01	2.87
40.0	157	0.219	33.9	4.12	3.90	0.56	2.06	2.94
40.0	160	0.234	33.8	4.19	4.16	0.54	2.09	2.99
40.0	163	0.249	33.6	4.25	4.43	0.52	2.13	3.05
40.0	166	0.263	33.4	4.32	4.68	0.49	2.16	3.11
40.0	169	0.278	33.3	4.39	4.94	0.47	2.19	3.17
40.0	171	0.292	33.1	4.43	5.20	0.44	2.21	3.21
40.0	173	0.300	33.0	4.47	5.33	0.43	2.24	3.24



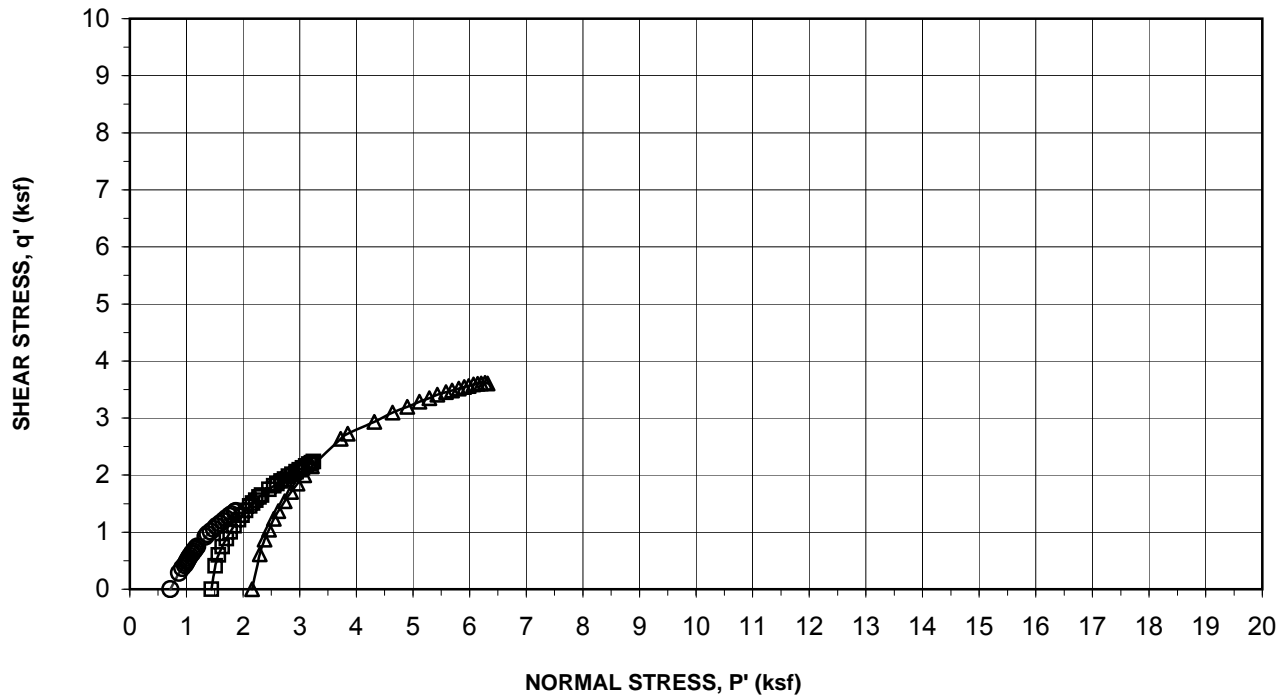
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-204	Consolidation Pressure :	15.0 psi
Depth(ft):	5.5	Initial Sample Height:	5.622 in
Sample No.:	-	Initial Area of Sample:	5.350 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.622 in
Sample Description:	Brown Lean Clay	Final Sample Area (A)*:	5.290 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	45	0.006	33.3	1.22	0.11	0.48	0.61	2.30
45.0	64	0.012	34.5	1.74	0.21	0.65	0.87	2.38
45.0	77	0.018	35.2	2.09	0.32	0.75	1.04	2.46
45.0	91	0.024	35.9	2.47	0.43	0.85	1.23	2.55
45.0	101	0.030	36.3	2.73	0.53	0.91	1.37	2.62
45.0	114	0.036	36.7	3.08	0.64	0.97	1.54	2.74
45.0	126	0.042	37.0	3.40	0.75	1.01	1.70	2.85
45.0	137	0.048	37.3	3.70	0.85	1.05	1.85	2.96
45.0	148	0.054	37.5	3.99	0.96	1.08	2.00	3.08
45.0	160	0.060	37.6	4.31	1.07	1.10	2.15	3.21
45.0	197	0.090	37.5	5.28	1.60	1.07	2.64	3.72
45.0	204	0.100	37.2	5.45	1.78	1.04	2.73	3.85
45.0	221	0.137	35.4	5.87	2.44	0.78	2.93	4.32
45.0	235	0.184	34.3	6.19	3.27	0.61	3.09	4.64
45.0	245	0.229	33.2	6.40	4.08	0.46	3.20	4.90
45.0	254	0.277	32.3	6.57	4.92	0.34	3.29	5.11
45.0	261	0.322	31.5	6.70	5.73	0.22	3.35	5.29
45.0	268	0.368	31.0	6.82	6.55	0.14	3.41	5.43
45.0	274	0.416	30.2	6.91	7.40	0.03	3.45	5.58
45.0	279	0.462	29.7	6.97	8.22	-0.05	3.49	5.69
45.0	284	0.509	29.1	7.03	9.05	-0.13	3.52	5.81
45.0	289	0.556	28.6	7.09	9.88	-0.20	3.54	5.91
45.0	293	0.602	28.2	7.12	10.70	-0.26	3.56	5.99
45.0	298	0.649	27.8	7.18	11.54	-0.32	3.59	6.07
45.0	302	0.696	27.4	7.20	12.37	-0.38	3.60	6.14
45.0	305	0.742	26.9	7.21	13.20	-0.44	3.60	6.20
45.0	309	0.789	26.6	7.23	14.04	-0.50	3.62	6.27
45.0	311	0.835	26.2	7.21	14.85	-0.55	3.60	6.32
45.0	315	0.882	25.8	7.23	15.68	-0.61	3.62	6.39
45.0	317	0.928	25.8	7.20	16.51	-0.61	3.60	6.37
45.0	320	0.975	25.3	7.20	17.33	-0.68	3.60	6.44
45.0	324	1.022	25.0	7.22	18.17	-0.72	3.61	6.49
45.0	330	1.161	24.6	7.13	20.65	-0.78	3.56	6.50
45.0	332	1.207	24.3	7.10	21.47	-0.82	3.55	6.53

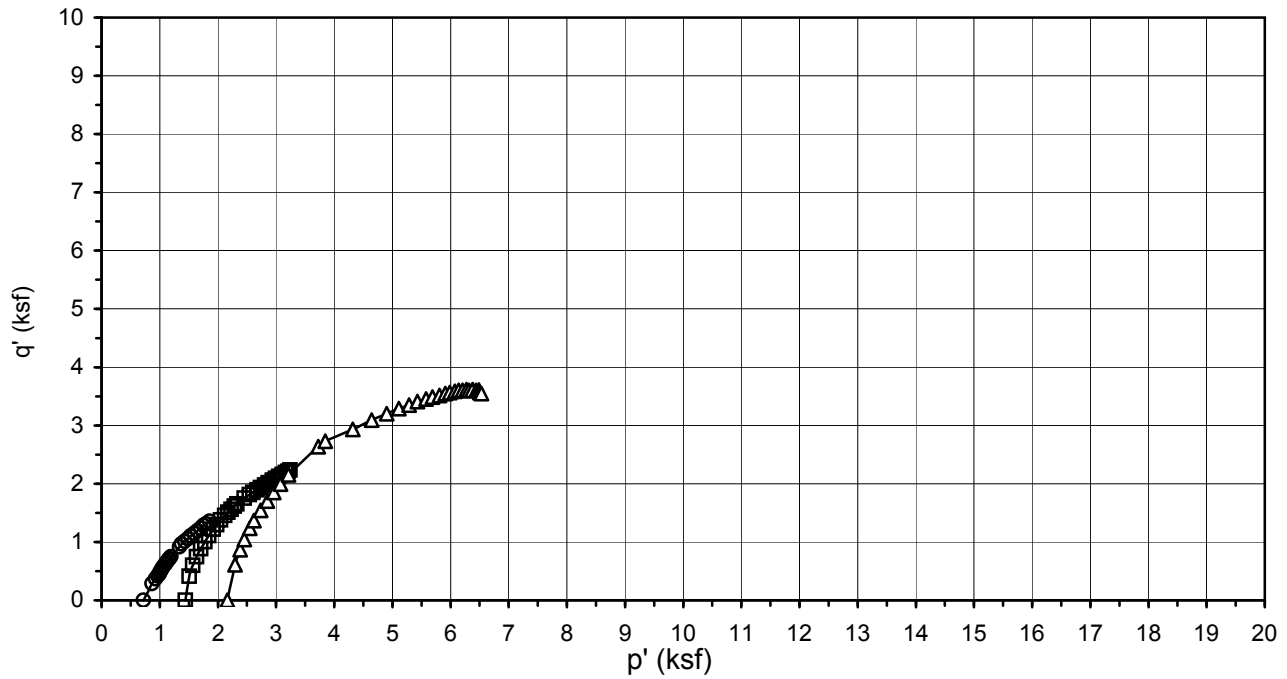


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 10 psi △ 15 psi

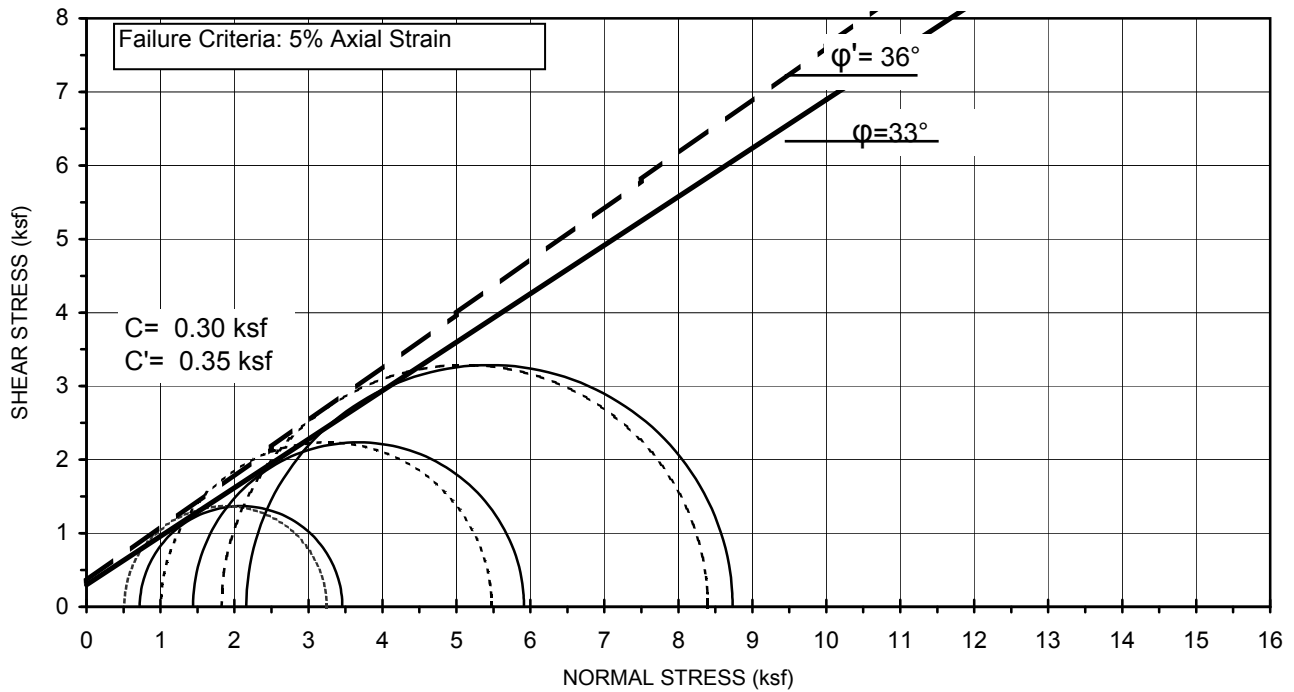


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Brown Lean Clay
Test Pit:	G-204	Avg. Dry Unit Weight (pcf):	111.2
Sample No.:	-	Avg. Initial Moisture Content (%):	16.5
Depth (ft):	5.5	Confining Pressure:	5.0, 10.0, 15.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



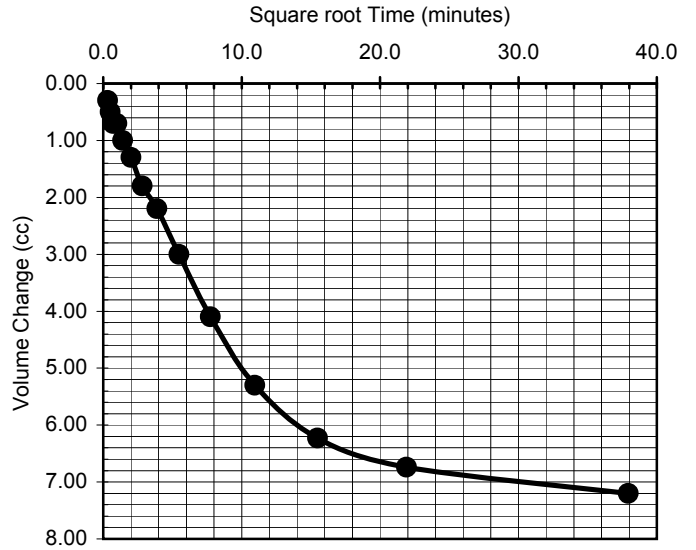
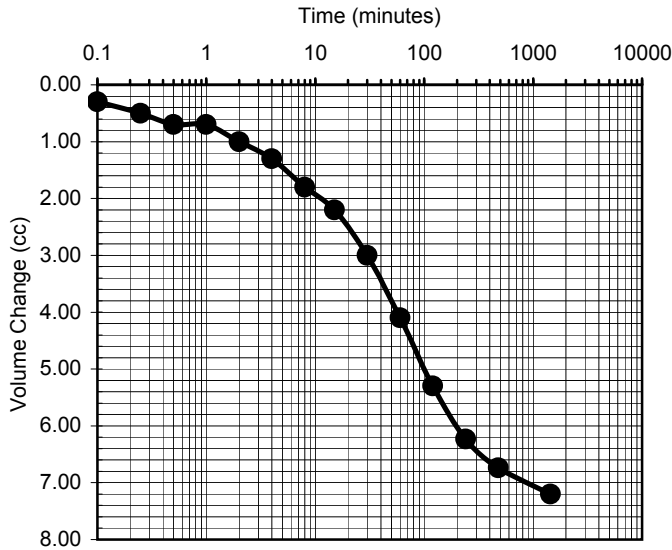
LEGEND: CONFINING PRESSURES= ○ 5 psi □ 10 psi △ 15 psi



Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Test Pit: G-204
 Sample No.: -
 Depth (ft): 5.5

Sample Type: Mod. Cal.
 Sample Description: Brown Lean Clay
 Avg. Dry Unit Weight (pcf): 111.2
 Avg. Initial Moisture Content (%): 16.5
 Confining Pressure: 5.0, 10.0, 15.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-204	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Brown Lean Clay
Depth (feet):	5.5	Eff. Confining Pressure (psi):	10.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.3000
0.25	0.5000
0.5	0.7000
1	0.7000
2	1.0000
4	1.3000
8	1.8000
15	2.2000
30	3.0000
60	4.1000
120	5.3000
240	6.2300
480	6.7400
1440	7.2000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.3000
0.5000	0.5000
0.7071	0.7000
1.0000	0.7000
1.4142	1.0000
2.0000	1.3000
2.8284	1.8000
3.8730	2.2000
5.4772	3.0000
7.7460	4.1000
10.9545	5.3000
15.4919	6.2300
21.9089	6.7400
37.9473	7.2000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	07/19/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: [Westside Subway Extension](#) Tested by: [ST](#) Date: [07-19-11](#)
 Project No.: [4953-10-1561](#) Input Data by: [KM](#) Date: [07-28-11](#)
 Test Pit: [G-204](#) Reviewed by: [AP](#) Date: [07-28-11](#)
 Sample No.: - Sample Description: [Drk Yell Brn Sandy Clay](#)
 Depth(ft): [35.5](#)
 Sample Type: [Mod. Cal.](#) [Confining Pressure = 15.0 psi](#)

Diameter (in)	2.615	2.615	2.615	Avg. =	2.615
Height (in)	5.943	5.943	5.943	Avg. =	5.943

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.286
Moisture Content (%)	16.76	16.95
Wet Weight (gms)	1100.03	1249.35
Dry Weight (gms)	942.14	1089.70
Container Weight (gms)	0.00	147.56
Density and Saturation		
Wet Weight (gms)	1100.03	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.3	
Dry Density (pcf)	112.4	
Initial Void Ratio	0.498	
% Saturation	90.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	76.6
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	68.1
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	5.940
Induced OCR =	1.0	Initial Volume (cu.in)=	31.918
Change in Ht. of Specimen (in) =	0.0027	Final Volume (cu.in) =	31.400

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	5.93
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.52
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	7.45
		Axial Strain (%) =	5.00



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-19-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-204	Reviewed by:	AP	Date:	07-28-11
Sample No.:	-	Sample Description:	Drk Yell Brn Sandy Clay		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	30.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.943</u>	<u>5.943</u>	<u>5.943</u>	Avg. =	5.943

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.292
Moisture Content (%)	16.76	16.95
Wet Weight (gms)	1100.03	1249.35
Dry Weight (gms)	942.14	1089.70
Container Weight (gms)	0.00	147.56
Density and Saturation		
Wet Weight (gms)	1100.03	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.3	
Dry Density (pcf)	112.4	
Initial Void Ratio	0.498	
% Saturation	90.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	60.0	Initial Burette Ht.(cm)=	68.1
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	60.4
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	5.943
Induced OCR=	1.0	Initial Volume (cu.in)=	31.918
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.448

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	10.70
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.57
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.27
		Axial Strain (%) =	5.00



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-19-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-204	Reviewed by:	AP	Date:	07-28-11
Sample No.:	-	Sample Description:	Drk Yell Brn Sandy Clay		
Depth(ft):	35.5				
Sample Type:	Mod. Cal.	Confining Pressure =	45.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.943</u>	<u>5.943</u>	<u>5.943</u>	Avg. =	5.943

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.308
Moisture Content (%)	16.76	16.95
Wet Weight (gms)	1100.03	1249.35
Dry Weight (gms)	942.14	1089.70
Container Weight (gms)	0.00	147.56
Density and Saturation		
Wet Weight (gms)	1100.03	
Container Weight (gms)	0.00	
Wet Density (pcf)	131.3	
Dry Density (pcf)	112.4	
Initial Void Ratio	0.498	
% Saturation	90.8	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	94	Change in Ht. of the Specimen (in)= 0

Consolidation			
Cell Pressure (psi) =	75.0	Initial Burette Ht.(cm)=	60.4
Back Pressure(psi) =	30.0	Final Burette Ht.(cm)=	54.3
Eff. Consol. Stress (psi) =	45.0	Final Height (in)=	5.943
Induced OCR =	1.0	Initial Volume (cu.in)=	31.918
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	31.546

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	15.12
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.29
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	20.41
		Axial Strain (%) =	5.23



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-204	Consolidation Pressure :	15.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.943 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.940 in
Sample Description:	Drk Yell Brn Sandy Clay	Final Sample Area (A)*:	5.286 sq. in.
		Induced OCR=	1.0

Cell Pressure (psi)	Load (lbs)	Axial Deformation (in)	Back Pressure (psi)	Deviator Stress (S1-S3) (ksf)	Axial Strain (%)	Pore Pressure Change (ksf)	Shear Stress q' (S1-S3)/2 (ksf)	Normal Stress p' (S1'+S3')/2 (ksf)
45.0	0	0.000	30.0	0.00	0.00	0.00	0.00	2.16
45.0	30	0.006	32.1	0.82	0.10	0.30	0.41	2.27
45.0	31	0.013	32.4	0.84	0.21	0.34	0.42	2.24
45.0	24	0.019	32.1	0.65	0.32	0.30	0.33	2.19
45.0	18	0.026	31.8	0.49	0.44	0.26	0.24	2.15
45.0	17	0.033	31.8	0.46	0.56	0.26	0.23	2.13
45.0	18	0.040	31.8	0.49	0.66	0.26	0.24	2.14
45.0	42	0.046	33.3	1.14	0.77	0.47	0.57	2.26
45.0	55	0.053	34.4	1.49	0.89	0.63	0.74	2.27
45.0	65	0.059	35.2	1.75	0.99	0.75	0.88	2.28
45.0	74	0.066	35.9	1.99	1.11	0.85	1.00	2.31
45.0	82	0.072	36.4	2.21	1.22	0.93	1.10	2.34
45.0	90	0.078	36.9	2.42	1.32	0.99	1.21	2.38
45.0	98	0.085	37.2	2.63	1.42	1.04	1.32	2.43
45.0	105	0.091	37.5	2.82	1.53	1.08	1.41	2.48
45.0	147	0.142	38.1	3.91	2.38	1.17	1.95	2.94
45.0	157	0.155	38.0	4.17	2.61	1.15	2.08	3.09
45.0	167	0.169	37.8	4.42	2.84	1.12	2.21	3.25
45.0	176	0.183	37.5	4.65	3.07	1.08	2.32	3.40
45.0	184	0.197	37.2	4.85	3.31	1.03	2.42	3.55
45.0	192	0.211	36.8	5.04	3.56	0.98	2.52	3.70
45.0	200	0.226	36.4	5.24	3.81	0.92	2.62	3.86
45.0	206	0.241	36.0	5.38	4.05	0.87	2.69	3.98
45.0	212	0.255	35.6	5.53	4.29	0.81	2.76	4.11
45.0	218	0.269	35.2	5.67	4.53	0.75	2.83	4.24
45.0	223	0.283	34.8	5.79	4.77	0.70	2.89	4.36
45.0	229	0.297	34.4	5.93	5.00	0.64	2.96	4.48



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-204	Consolidation Pressure :	30.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.943 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.943 in
Sample Description:	Drk Yell Brn Sandy Clay	Final Sample Area (A)*:	5.292 sq. in.
		Induced OCR=	1.0

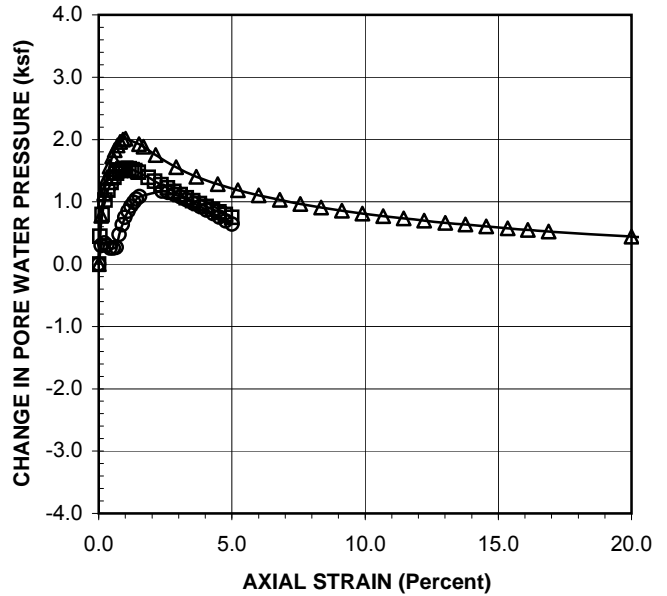
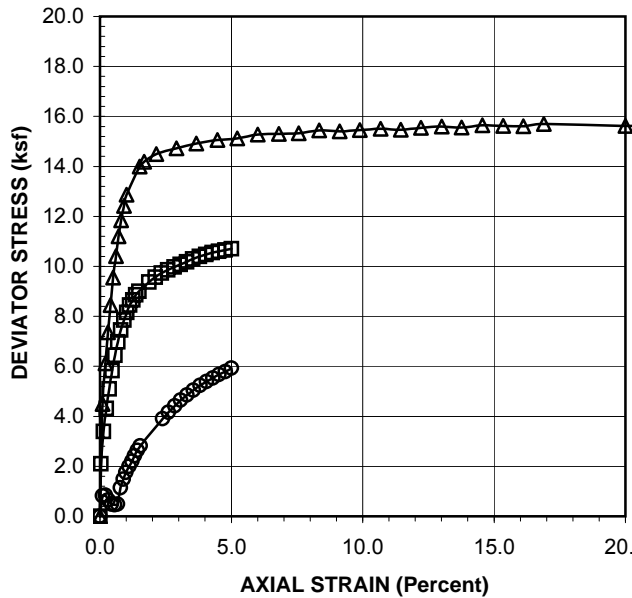
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	30.0	0.00	0.00	0.00	0.00	4.32
60.0	77	0.003	33.1	2.09	0.04	0.45	1.05	4.92
60.0	125	0.008	35.5	3.40	0.14	0.79	1.70	5.22
60.0	159	0.015	37.1	4.32	0.24	1.03	2.16	5.45
60.0	188	0.021	38.3	5.10	0.35	1.19	2.55	5.68
60.0	215	0.028	39.1	5.82	0.47	1.31	2.91	5.92
60.0	238	0.034	39.7	6.44	0.57	1.39	3.22	6.15
60.0	258	0.040	40.1	6.97	0.68	1.46	3.49	6.35
60.0	276	0.047	40.4	7.45	0.80	1.50	3.73	6.54
60.0	291	0.054	40.6	7.85	0.91	1.53	3.92	6.72
60.0	303	0.061	40.7	8.16	1.03	1.53	4.08	6.87
60.0	314	0.068	40.6	8.45	1.14	1.53	4.22	7.01
60.0	322	0.074	40.5	8.65	1.25	1.52	4.33	7.13
60.0	330	0.081	40.4	8.86	1.36	1.50	4.43	7.25
60.0	336	0.089	40.2	9.01	1.49	1.47	4.50	7.35
60.0	351	0.111	39.7	9.37	1.86	1.39	4.69	7.62
60.0	359	0.125	39.3	9.56	2.10	1.33	4.78	7.77
60.0	366	0.139	38.9	9.73	2.34	1.27	4.86	7.91
60.0	372	0.154	38.5	9.86	2.59	1.22	4.93	8.03
60.0	377	0.168	38.1	9.97	2.83	1.17	4.98	8.14
60.0	382	0.182	37.7	10.08	3.06	1.11	5.04	8.25
60.0	387	0.196	37.4	10.18	3.30	1.06	5.09	8.35
60.0	392	0.210	37.1	10.29	3.53	1.02	5.15	8.45
60.0	397	0.225	36.7	10.39	3.78	0.97	5.20	8.55
60.0	401	0.240	36.4	10.47	4.03	0.92	5.24	8.63
60.0	405	0.254	36.1	10.55	4.28	0.88	5.27	8.72
60.0	408	0.269	35.8	10.60	4.52	0.84	5.30	8.79
60.0	411	0.283	35.5	10.65	4.76	0.79	5.33	8.85
60.0	414	0.297	35.2	10.70	5.00	0.75	5.35	8.92



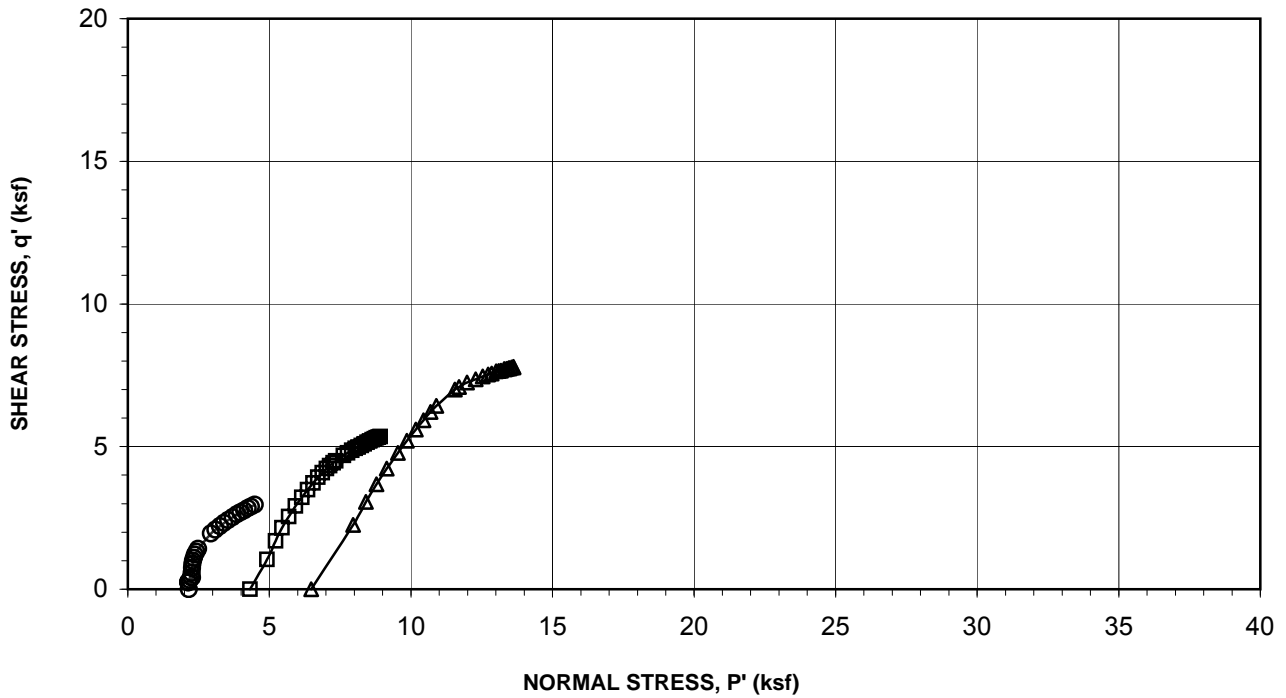
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	75.0 psi
Project No:	4953-10-1561	Back Pressure :	30.0 psi
Test Pit:	G-204	Consolidation Pressure :	45.0 psi
Depth(ft):	35.5	Initial Sample Height:	5.943 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.943 in
Sample Description:	Drk Yell Brn Sandy Clay	Final Sample Area (A)*:	5.308 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(ksf)	(%)	(ksf)	(S1-S3)/2	(S1'+S3')/2
75.0	0	0.000	30.0	0.00	0.00	0.00	0.00	6.48
75.0	166	0.006	35.4	4.50	0.10	0.78	2.25	7.95
75.0	226	0.012	37.9	6.12	0.20	1.13	3.06	8.40
75.0	272	0.018	39.6	7.36	0.30	1.38	3.68	8.78
75.0	313	0.024	40.9	8.46	0.40	1.57	4.23	9.14
75.0	354	0.030	42.0	9.55	0.50	1.72	4.78	9.53
75.0	386	0.036	42.7	10.41	0.61	1.83	5.20	9.86
75.0	416	0.042	43.2	11.21	0.71	1.91	5.60	10.18
75.0	440	0.048	43.6	11.84	0.81	1.96	5.92	10.44
75.0	462	0.054	43.9	12.42	0.91	2.00	6.21	10.69
75.0	479	0.060	44.0	12.86	1.01	2.01	6.43	10.90
75.0	524	0.090	43.4	14.00	1.51	1.93	7.00	11.55
75.0	532	0.100	43.1	14.19	1.68	1.88	7.09	11.69
75.0	546	0.127	42.2	14.50	2.14	1.75	7.25	11.98
75.0	559	0.173	40.8	14.72	2.91	1.56	7.36	12.29
75.0	571	0.218	39.7	14.92	3.66	1.40	7.46	12.54
75.0	581	0.265	38.9	15.06	4.46	1.28	7.53	12.72
75.0	588	0.311	38.2	15.12	5.23	1.19	7.56	12.85
75.0	599	0.357	37.7	15.27	6.01	1.10	7.64	13.01
75.0	605	0.404	37.2	15.30	6.80	1.03	7.65	13.10
75.0	611	0.450	36.7	15.32	7.57	0.97	7.66	13.17
75.0	621	0.496	36.3	15.44	8.35	0.91	7.72	13.29
75.0	625	0.542	36.0	15.41	9.12	0.86	7.70	13.32
75.0	632	0.588	35.7	15.45	9.89	0.81	7.72	13.39
75.0	640	0.635	35.4	15.51	10.68	0.77	7.75	13.46
75.0	644	0.681	35.1	15.47	11.45	0.73	7.73	13.48
75.0	653	0.726	34.9	15.55	12.22	0.70	7.77	13.56
75.0	661	0.773	34.6	15.60	13.01	0.66	7.80	13.62
75.0	665	0.818	34.4	15.56	13.77	0.64	7.78	13.62
75.0	675	0.865	34.2	15.65	14.55	0.60	7.82	13.70
75.0	680	0.912	34.0	15.62	15.35	0.58	7.81	13.71
75.0	686	0.958	33.8	15.61	16.11	0.55	7.81	13.74
75.0	696	1.004	33.6	15.69	16.89	0.52	7.85	13.80
75.0	720	1.188	33.1	15.63	20.00	0.44	7.81	13.85
75.0	728	1.234	33.0	15.65	20.76	0.43	7.82	13.88

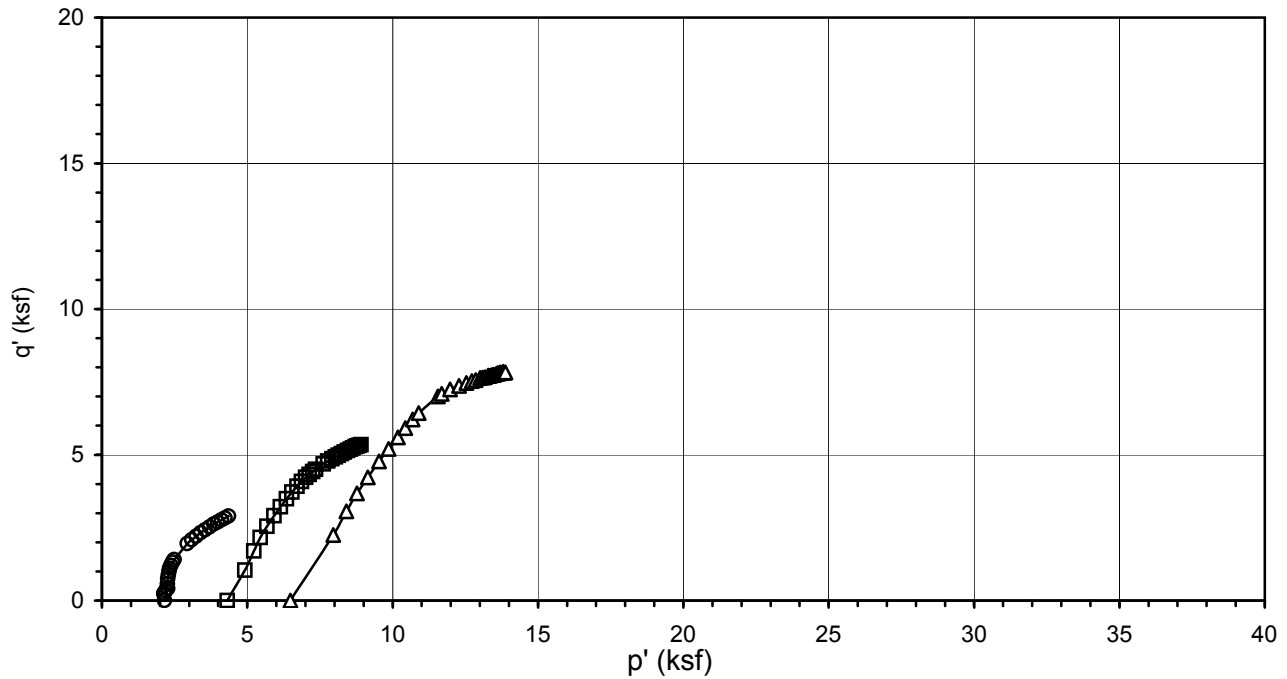


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi

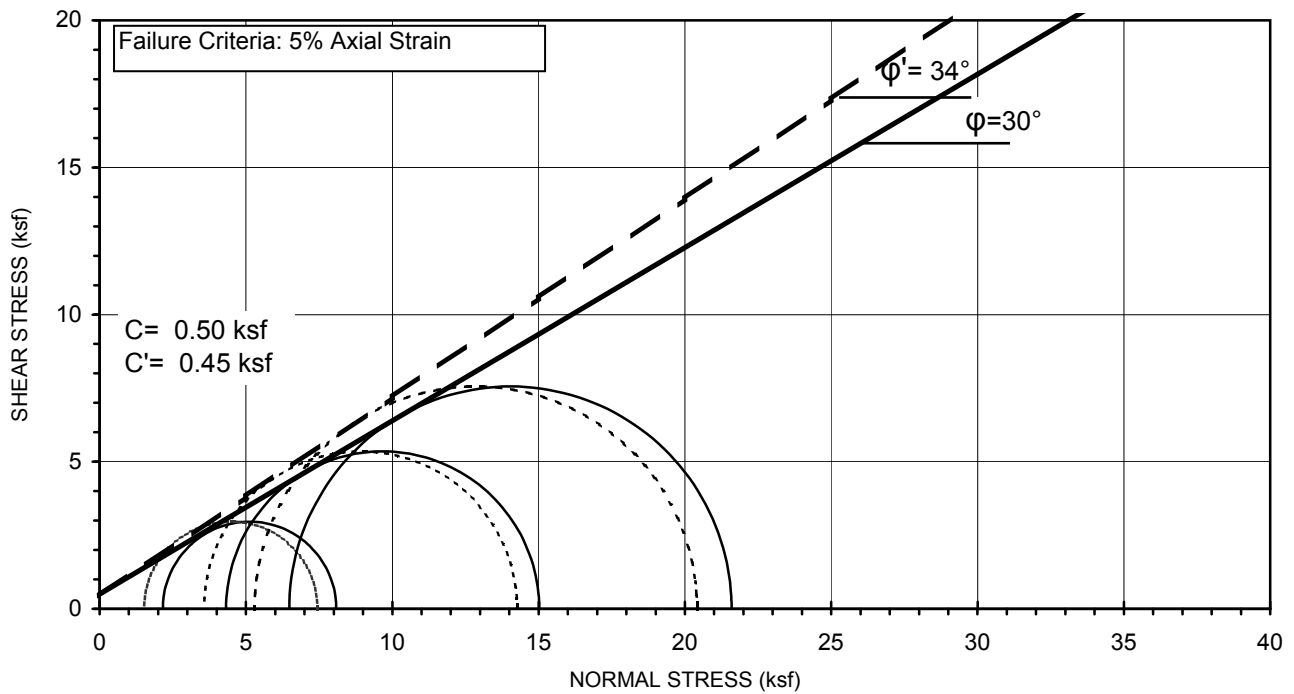


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Drk Yell Brn Sandy Clay
Test Pit:	G-204	Avg. Dry Unit Weight (pcf):	112.4
Sample No.:	-	Avg. Initial Moisture Content (%):	16.8
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**

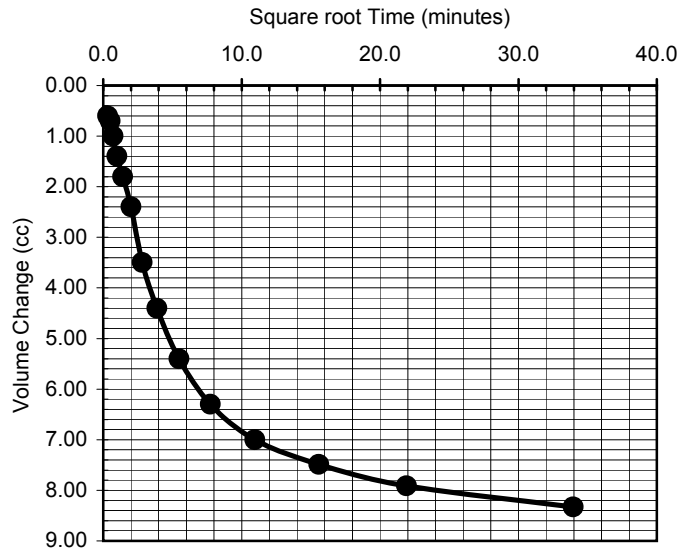
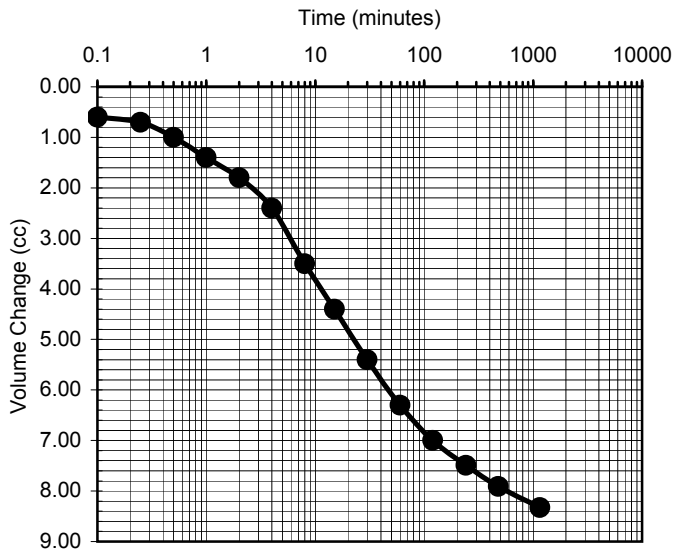


LEGEND: CONFINING PRESSURES= ○ 15 psi □ 30 psi △ 45 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Drk Yell Brn Sandy Clay
Test Pit:	G-204	Avg. Dry Unit Weight (pcf):	112.4
Sample No.:	-	Avg. Initial Moisture Content (%):	16.8
Depth (ft):	35.5	Confining Pressure:	15.0, 30.0, 45.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-204	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Drk Yell Brn Sandy Clay
Depth (feet):	35.5	Eff. Confining Pressure (psi):	30.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.6000
0.25	0.7000
0.5	1.0000
1	1.4000
2	1.8000
4	2.4000
8	3.5000
15	4.4000
30	5.4000
60	6.3000
120	7.0000
243	7.4900
480	7.9136
1154	8.3300

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.6000
0.5000	0.7000
0.7071	1.0000
1.0000	1.4000
1.4142	1.8000
2.0000	2.4000
2.8284	3.5000
3.8730	4.4000
5.4772	5.4000
7.7460	6.3000
10.9545	7.0000
15.5885	7.4900
21.9089	7.9136
33.9706	8.3300

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	07/19/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name:	Westside Subway Extension	Tested by:	ST	Date:	07-20-11
Project No.:	4953-10-1561	Input Data by:	KM	Date:	07-28-11
Test Pit:	G-205	Reviewed by:	AP	Date:	07-28-11
Sample No.:	-	Sample Description:	Dark Brown Sandy Lean Clay		
Depth(ft):	15.5				
Sample Type:	Mod. Cal.	Confining Pressure =	5.0 psi		

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.770</u>	<u>5.770</u>	<u>5.770</u>	Avg. =	5.770

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.388
Moisture Content (%)	26.96	27.40
Wet Weight (gms)	980.96	1165.74
Dry Weight (gms)	772.64	954.01
Container Weight (gms)	0.00	181.37
Density and Saturation		
Wet Weight (gms)	980.96	
Container Weight (gms)	0.00	
Wet Density (pcf)	120.6	
Dry Density (pcf)	95.0	
Initial Void Ratio	0.774	
% Saturation	94.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	96	Change in Ht. of the Specimen (in) = 0

Consolidation			
Cell Pressure (psi) =	45.0	Initial Burette Ht.(cm)=	83.2
Back Pressure(psi) =	40.0	Final Burette Ht.(cm)=	82.9
Eff. Consol. Stress (psi) =	5.0	Final Height (in)=	5.748
Induced OCR =	1.0	Initial Volume (cu.in)=	30.989
Change in Ht. of Specimen (in) =	0.0217	Final Volume (cu.in) =	30.971

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	4.18
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	1.21
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	5.40
		Axial Strain (%) =	5.18



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-20-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-205** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Dark Brown Sandy Lean Clay**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** Confining Pressure = **15.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.770</u>	<u>5.770</u>	<u>5.770</u>	Avg. =	5.770

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.304
Moisture Content (%)	26.96	27.40
Wet Weight (gms)	<u>980.96</u>	<u>1165.74</u>
Dry Weight (gms)	<u>772.64</u>	<u>954.01</u>
Container Weight (gms)	<u>0.00</u>	<u>181.37</u>
Density and Saturation		
Wet Weight (gms)	<u>980.96</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	120.6	
Dry Density (pcf)	95.0	
Initial Void Ratio	0.774	
% Saturation	94.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>55.0</u>	Initial Burette Ht.(cm)=	<u>82.9</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>76.6</u>
Eff. Consol. Stress (psi) =	15.0	Final Height (in)=	<u>5.770</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.989</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>30.605</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	8.08
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	2.68
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	10.76
		Axial Strain (%) =	5.22



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-20-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-205** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Dark Brown Sandy Lean Clay**
 Depth(ft): **15.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 25.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.770</u>	<u>5.770</u>	<u>5.770</u>	Avg. =	5.770

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.318
Moisture Content (%)	26.96	27.40
Wet Weight (gms)	<u>980.96</u>	<u>1165.74</u>
Dry Weight (gms)	<u>772.64</u>	<u>954.01</u>
Container Weight (gms)	<u>0.00</u>	<u>181.37</u>
Density and Saturation		
Wet Weight (gms)	<u>980.96</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	120.6	
Dry Density (pcf)	95.0	
Initial Void Ratio	0.774	
% Saturation	94.1	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>96</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>65.0</u>	Initial Burette Ht.(cm)=	<u>76.6</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>71.6</u>
Eff. Consol. Stress (psi) =	25.0	Final Height (in)=	<u>5.770</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.989</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>30.684</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	11.14
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	3.79
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	14.93
		Axial Strain (%) =	5.42



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	45.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-205	Consolidation Pressure :	5.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.770 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.748 in
Sample Description:	Dark Brown Sandy Lean Clay	Final Sample Area (A)*:	5.388 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
45.0	0	0.000	40.0	0.00	0.00	0.00	0.00	0.72
45.0	21	0.006	40.9	0.56	0.10	0.14	0.28	0.86
45.0	28	0.013	41.4	0.75	0.23	0.21	0.37	0.88
45.0	33	0.021	41.7	0.88	0.36	0.25	0.44	0.90
45.0	37	0.027	41.9	0.98	0.47	0.28	0.49	0.93
45.0	41	0.035	42.0	1.09	0.60	0.29	0.54	0.97
45.0	45	0.042	42.0	1.19	0.74	0.30	0.60	1.02
45.0	49	0.050	42.0	1.30	0.86	0.30	0.65	1.07
45.0	53	0.057	42.0	1.40	0.99	0.29	0.70	1.13
45.0	56	0.064	42.0	1.48	1.11	0.29	0.74	1.17
45.0	60	0.071	41.9	1.58	1.23	0.28	0.79	1.23
45.0	64	0.078	41.8	1.69	1.36	0.27	0.84	1.30
45.0	68	0.085	41.7	1.79	1.48	0.25	0.90	1.36
45.0	72	0.092	41.6	1.89	1.60	0.24	0.95	1.43
45.0	76	0.099	41.5	2.00	1.73	0.22	1.00	1.49
45.0	104	0.152	40.4	2.71	2.65	0.06	1.35	2.01
45.0	111	0.167	40.0	2.88	2.90	0.01	1.44	2.15
45.0	118	0.182	39.7	3.05	3.16	-0.04	1.53	2.29
45.0	125	0.196	39.3	3.23	3.40	-0.10	1.61	2.43
45.0	132	0.210	38.9	3.40	3.65	-0.16	1.70	2.58
45.0	138	0.224	38.5	3.54	3.90	-0.22	1.77	2.71
45.0	145	0.239	38.1	3.71	4.15	-0.28	1.86	2.85
45.0	151	0.254	37.7	3.86	4.42	-0.33	1.93	2.98
45.0	156	0.269	37.3	3.97	4.68	-0.39	1.99	3.09
45.0	161	0.284	36.9	4.09	4.94	-0.44	2.05	3.21
45.0	165	0.298	36.5	4.18	5.18	-0.49	2.09	3.30



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	55.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-205	Consolidation Pressure :	15.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.770 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.770 in
Sample Description:	Dark Brown Sandy Lean Clay	Final Sample Area (A)*:	5.304 sq. in.
		Induced OCR=	1.0

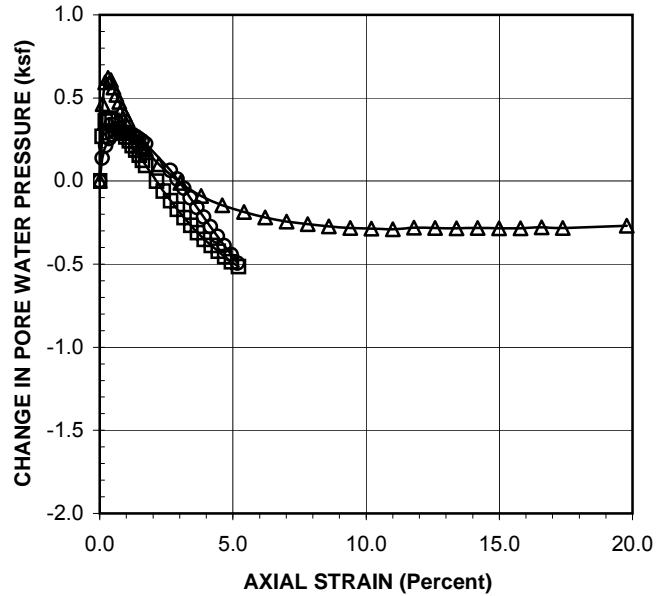
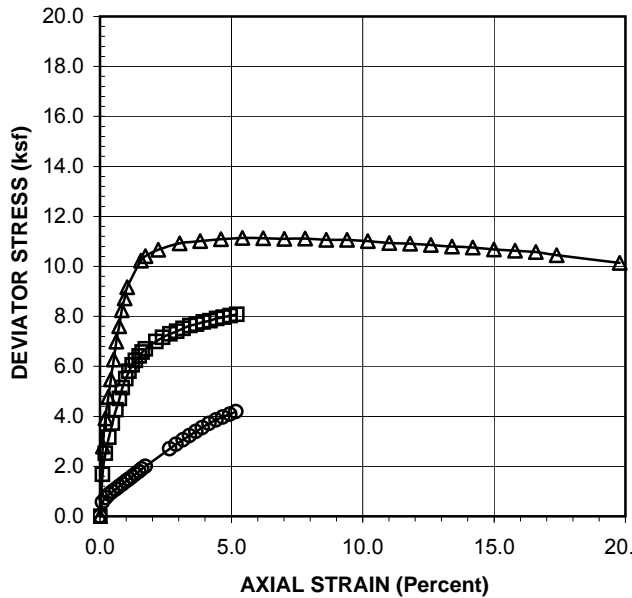
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
55.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.16
55.0	62	0.005	41.9	1.68	0.09	0.27	0.84	2.73
55.0	93	0.012	42.5	2.52	0.21	0.36	1.26	3.06
55.0	117	0.020	42.7	3.17	0.34	0.38	1.58	3.37
55.0	138	0.027	42.6	3.73	0.47	0.36	1.86	3.66
55.0	158	0.035	42.4	4.26	0.60	0.34	2.13	3.95
55.0	175	0.043	42.2	4.72	0.74	0.31	2.36	4.21
55.0	191	0.050	42.0	5.14	0.86	0.29	2.57	4.44
55.0	205	0.057	41.9	5.51	0.99	0.26	2.76	4.65
55.0	216	0.064	41.7	5.80	1.11	0.24	2.90	4.82
55.0	226	0.071	41.5	6.06	1.23	0.21	3.03	4.98
55.0	233	0.078	41.3	6.24	1.36	0.19	3.12	5.09
55.0	240	0.086	41.1	6.42	1.49	0.16	3.21	5.21
55.0	246	0.093	40.9	6.57	1.61	0.12	3.29	5.32
55.0	251	0.100	40.7	6.70	1.73	0.09	3.35	5.42
55.0	263	0.123	40.0	6.99	2.13	0.00	3.49	5.66
55.0	270	0.138	39.6	7.15	2.39	-0.06	3.58	5.80
55.0	276	0.154	39.2	7.29	2.67	-0.12	3.65	5.92
55.0	281	0.168	38.8	7.41	2.92	-0.17	3.70	6.03
55.0	286	0.183	38.5	7.52	3.17	-0.22	3.76	6.14
55.0	291	0.197	38.2	7.63	3.42	-0.27	3.82	6.24
55.0	294	0.212	37.9	7.69	3.68	-0.31	3.84	6.32
55.0	298	0.227	37.6	7.77	3.93	-0.35	3.89	6.40
55.0	301	0.242	37.3	7.83	4.19	-0.39	3.91	6.46
55.0	305	0.257	37.1	7.91	4.45	-0.42	3.96	6.54
55.0	308	0.271	36.9	7.97	4.70	-0.46	3.98	6.60
55.0	311	0.286	36.7	8.03	4.95	-0.49	4.01	6.66
55.0	314	0.301	36.5	8.08	5.22	-0.52	4.04	6.72



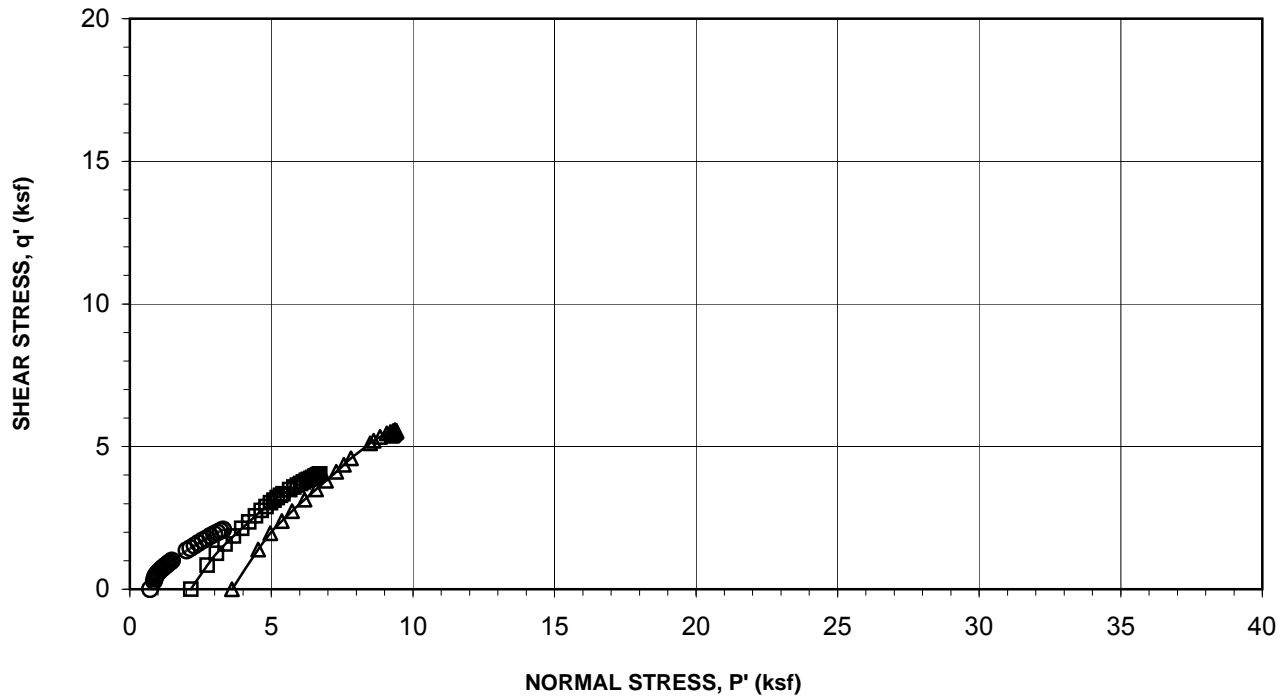
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	65.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-205	Consolidation Pressure :	25.0 psi
Depth(ft):	15.5	Initial Sample Height:	5.770 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.*(L):	5.770 in
Sample Description:	Dark Brown Sandy Lean Clay	Final Sample Area (A)*:	5.318 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
65.0	0	0.000	40.0	0.00	0.00	0.00	0.00	3.60
65.0	103	0.006	43.2	2.79	0.10	0.46	1.39	4.53
65.0	145	0.012	44.1	3.92	0.21	0.59	1.96	4.97
65.0	177	0.018	44.3	4.78	0.31	0.62	2.39	5.37
65.0	203	0.024	44.2	5.47	0.42	0.61	2.74	5.73
65.0	233	0.030	43.9	6.28	0.52	0.56	3.14	6.18
65.0	260	0.036	43.6	7.00	0.62	0.52	3.50	6.58
65.0	283	0.042	43.3	7.61	0.73	0.48	3.80	6.93
65.0	307	0.048	43.0	8.24	0.83	0.43	4.12	7.29
65.0	325	0.054	42.8	8.72	0.94	0.40	4.36	7.56
65.0	342	0.060	42.6	9.16	1.04	0.37	4.58	7.82
65.0	384	0.090	41.6	10.24	1.56	0.23	5.12	8.49
65.0	391	0.100	41.3	10.40	1.73	0.19	5.20	8.61
65.0	403	0.128	40.7	10.67	2.22	0.10	5.34	8.83
65.0	416	0.175	39.9	10.92	3.03	-0.01	5.46	9.07
65.0	423	0.220	39.4	11.02	3.81	-0.09	5.51	9.20
65.0	429	0.265	39.0	11.08	4.60	-0.15	5.54	9.29
65.0	435	0.313	38.7	11.14	5.42	-0.19	5.57	9.36
65.0	438	0.358	38.5	11.12	6.21	-0.22	5.56	9.38
65.0	441	0.405	38.3	11.10	7.02	-0.24	5.55	9.40
65.0	445	0.451	38.2	11.11	7.81	-0.26	5.55	9.41
65.0	447	0.497	38.1	11.06	8.61	-0.27	5.53	9.40
65.0	451	0.543	38.0	11.06	9.41	-0.28	5.53	9.41
65.0	453	0.589	38.0	11.02	10.20	-0.29	5.51	9.39
65.0	454	0.635	38.0	10.94	11.01	-0.29	5.47	9.36
65.0	457	0.681	38.1	10.92	11.80	-0.28	5.46	9.34
65.0	459	0.727	38.0	10.86	12.59	-0.28	5.43	9.31
65.0	460	0.773	38.0	10.79	13.40	-0.28	5.39	9.28
65.0	463	0.819	38.0	10.76	14.19	-0.28	5.38	9.26
65.0	464	0.865	38.0	10.68	14.99	-0.28	5.34	9.22
65.0	466	0.912	38.0	10.62	15.80	-0.28	5.31	9.20
65.0	468	0.957	38.1	10.57	16.59	-0.28	5.29	9.16
65.0	467	1.003	38.0	10.45	17.38	-0.28	5.22	9.11
65.0	467	1.141	38.1	10.14	19.78	-0.27	5.07	8.94

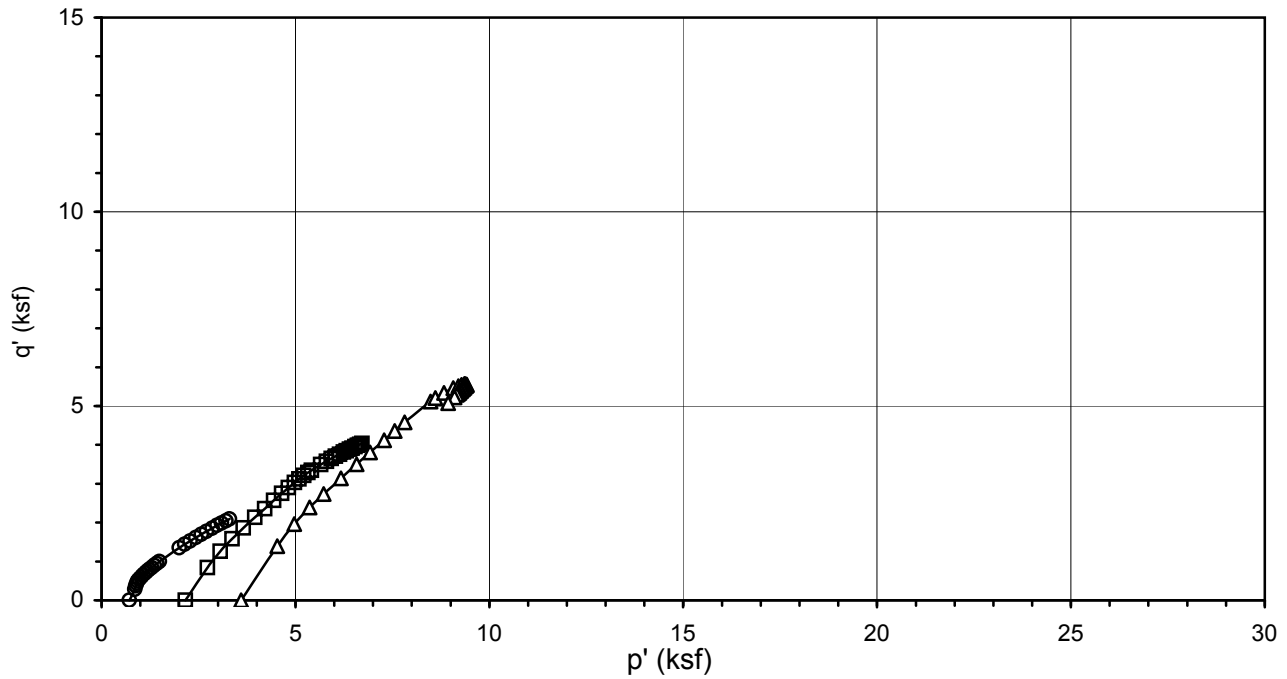


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi

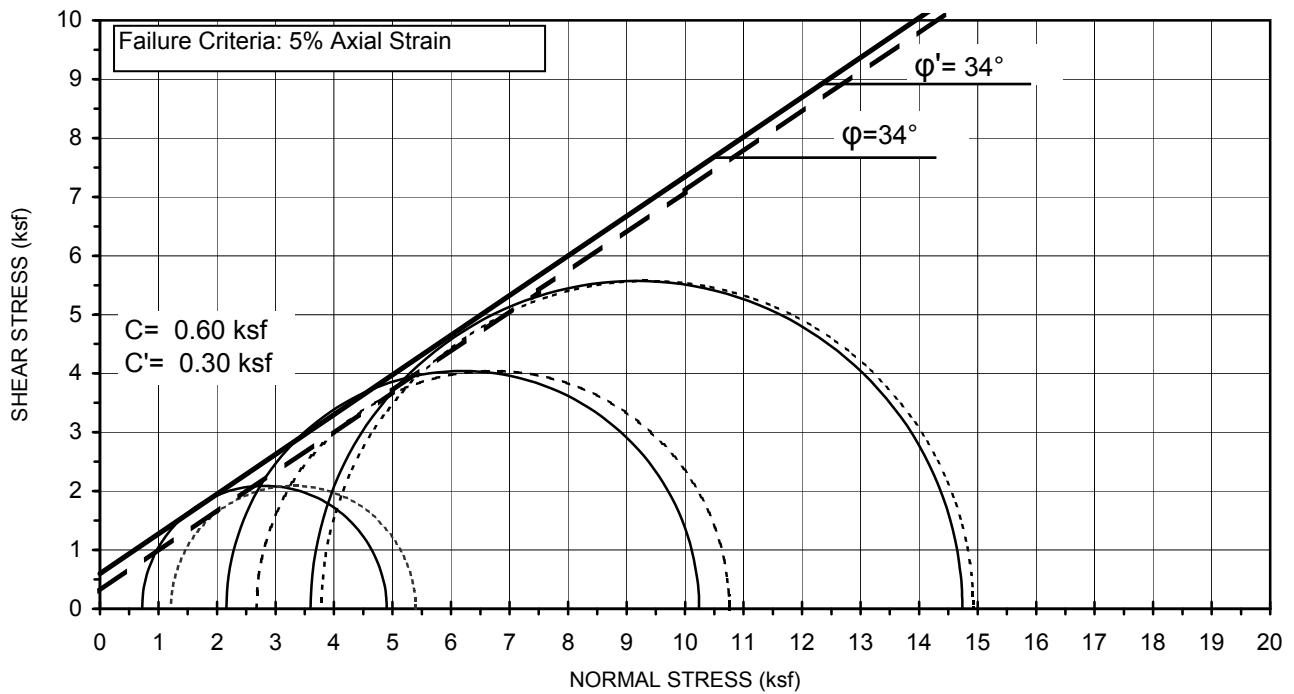


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Brown Sandy Lean Clay
Test Pit:	G-205	Avg. Dry Unit Weight (pcf):	95.0
Sample No.:	-	Avg. Initial Moisture Content (%):	27.0
Depth (ft):	15.5	Confining Pressure:	5.0, 15.0, 25.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

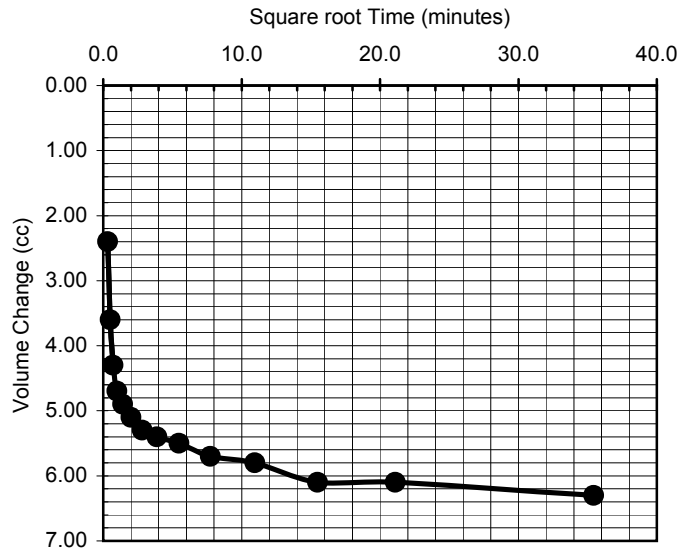
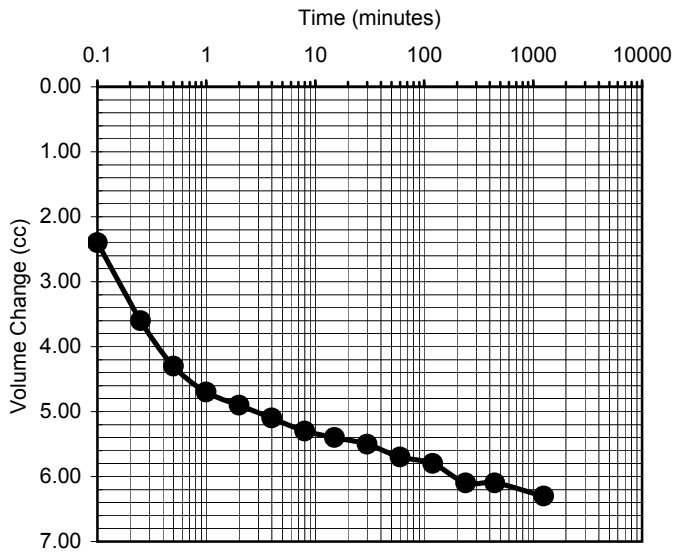


LEGEND: CONFINING PRESSURES= ○ 5 psi □ 15 psi △ 25 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Dark Brown Sandy Lean Clay
Test Pit:	G-205	Avg. Dry Unit Weight (pcf):	95.0
Sample No.:	-	Avg. Initial Moisture Content (%):	27.0
Depth (ft):	15.5	Confining Pressure:	5.0, 15.0, 25.0 psi

**CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767**



Test Pit:	G-205	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Dark Brown Sandy Lean Clay
Depth (feet):	15.5	Eff. Confining Pressure (psi):	15.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	2.4000
0.25	3.6000
0.5	4.3000
1	4.7000
2	4.9000
4	5.1000
8	5.3000
15	5.4000
30	5.5000
60	5.7000
120	5.8000
240	6.1000
446	6.1000
1257	6.3000

SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	2.4000
0.5000	3.6000
0.7071	4.3000
1.0000	4.7000
1.4142	4.9000
2.0000	5.1000
2.8284	5.3000
3.8730	5.4000
5.4772	5.5000
7.7460	5.7000
10.9545	5.8000
15.4919	6.1000
21.1187	6.1000
35.4542	6.3000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name: Westside Subway Extension
 Project No.: 4953-10-1561
 Date: 07/20/11




CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-21-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-205** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Yellowish Brown Sandy Clay**
 Depth(ft): **25.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 10.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.627</u>	<u>5.627</u>	<u>5.627</u>	Avg. =	5.627

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.362
Moisture Content (%)	12.72	16.50
Wet Weight (gms)	<u>91.94</u>	<u>1263.85</u>
Dry Weight (gms)	<u>86.99</u>	<u>1110.38</u>
Container Weight (gms)	<u>48.09</u>	<u>180.00</u>
Density and Saturation		
Wet Weight (gms)	<u>1061.40</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	133.8	
Dry Density (pcf)	118.7	
Initial Void Ratio	0.419	
% Saturation	81.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>50.0</u>	Initial Burette Ht.(cm)=	<u>72.0</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>68.7</u>
Eff. Consol. Stress (psi) =	10.0	Final Height (in)=	<u>5.599</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.221</u>
Change in Ht. of Specimen (in) =	<u>0.0284</u>	Final Volume (cu.in) =	<u>30.020</u>

Shear		At Failure	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	10.08
Time to 50% primary Consolidation (min) =	3	Eff. Minor Principal stress (ksf) =	2.55
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	12.63
		Axial Strain (%) =	5.44



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-21-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-205** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Yellowish Brown Sandy Clay**
 Depth(ft): **25.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 20.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.627</u>	<u>5.627</u>	<u>5.627</u>	Avg. =	5.627

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.353
Moisture Content (%)	12.72	16.50
Wet Weight (gms)	<u>91.94</u>	<u>1263.85</u>
Dry Weight (gms)	<u>86.99</u>	<u>1110.38</u>
Container Weight (gms)	<u>48.09</u>	<u>180.00</u>
Density and Saturation		
Wet Weight (gms)	<u>1061.40</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	133.8	
Dry Density (pcf)	118.7	
Initial Void Ratio	0.419	
% Saturation	81.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>60.0</u>	Initial Burette Ht.(cm)=	<u>68.7</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>67.1</u>
Eff. Consol. Stress (psi) =	20.0	Final Height (in)=	<u>5.627</u>
Induced OCR=	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.221</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>30.123</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	13.73
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	4.11
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	17.84
		Axial Strain (%) =	5.28



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Test Procedure: ASTM D 4767

Project Name: **Westside Subway Extension** Tested by: **ST** Date: **07-21-11**
 Project No.: **4953-10-1561** Input Data by: **KM** Date: **07-28-11**
 Test Pit: **G-205** Reviewed by: **AP** Date: **07-28-11**
 Sample No.: **-** Sample Description: **Yellowish Brown Sandy Clay**
 Depth(ft): **25.5**
 Sample Type: **Mod. Cal.** **Confining Pressure = 30.0 psi**

Diameter (in)	<u>2.615</u>	<u>2.615</u>	<u>2.615</u>	Avg. =	2.615
Height (in)	<u>5.627</u>	<u>5.627</u>	<u>5.627</u>	Avg. =	5.627

	BEFORE CONSOLIDATION	AFTER CONSOLIDATION
Area (in²)	5.371	5.320
Moisture Content (%)	12.72	16.50
Wet Weight (gms)	<u>91.94</u>	<u>1263.85</u>
Dry Weight (gms)	<u>86.99</u>	<u>1110.38</u>
Container Weight (gms)	<u>48.09</u>	<u>180.00</u>
Density and Saturation		
Wet Weight (gms)	<u>1061.40</u>	
Container Weight (gms)	<u>0.00</u>	
Wet Density (pcf)	133.8	
Dry Density (pcf)	118.7	
Initial Void Ratio	0.419	
% Saturation	81.9	

Assumed Specific Gravity = 2.70

Back Pressure Saturation		
B Value (%) =	<u>94</u>	Change in Ht. of the Specimen (in)= <u>0</u>

Consolidation			
Cell Pressure (psi) =	<u>70.0</u>	Initial Burette Ht.(cm)=	<u>67.1</u>
Back Pressure(psi) =	<u>40.0</u>	Final Burette Ht.(cm)=	<u>62.4</u>
Eff. Consol. Stress (psi) =	30.0	Final Height (in)=	<u>5.627</u>
Induced OCR =	<u>1.0</u>	Initial Volume (cu.in)=	<u>30.221</u>
Change in Ht. of Specimen (in) =	0.0000	Final Volume (cu.in) =	<u>29.934</u>

Shear		<u>At Failure</u>	
Rate of Deformation (in/min)=	0.008	Deviator Stress (ksf) =	16.71
Time to 50% primary Consolidation =	3	Eff. Minor Principal stress (ksf) =	5.02
Failure Mode: Bulging Failure		Eff. Major Principal stress (ksf) =	21.73
		Axial Strain (%) =	3.85



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	50.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-205	Consolidation Pressure :	10.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.627 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.599 in
Sample Description:	Yellowish Brown Sandy Clay	Final Sample Area (A)*:	5.362 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
50.0	0	0.000	40.0	0.00	0.00	0.00	0.00	1.44
50.0	35	0.008	42.2	0.94	0.14	0.31	0.47	1.60
50.0	52	0.015	43.4	1.39	0.27	0.49	0.70	1.64
50.0	66	0.023	44.2	1.77	0.41	0.61	0.88	1.71
50.0	78	0.030	44.8	2.08	0.54	0.69	1.04	1.79
50.0	90	0.038	45.1	2.40	0.68	0.74	1.20	1.90
50.0	103	0.044	45.4	2.74	0.79	0.77	1.37	2.04
50.0	115	0.052	45.5	3.06	0.93	0.79	1.53	2.18
50.0	128	0.060	45.6	3.40	1.07	0.80	1.70	2.34
50.0	142	0.067	45.5	3.77	1.20	0.80	1.88	2.53
50.0	157	0.074	45.5	4.16	1.32	0.78	2.08	2.74
50.0	171	0.081	45.3	4.53	1.44	0.76	2.26	2.94
50.0	186	0.087	45.1	4.92	1.56	0.73	2.46	3.17
50.0	201	0.094	44.8	5.31	1.68	0.69	2.65	3.40
50.0	215	0.101	44.5	5.67	1.81	0.65	2.83	3.63
50.0	291	0.151	41.2	7.60	2.70	0.18	3.80	5.06
50.0	306	0.165	40.2	7.98	2.95	0.03	3.99	5.39
50.0	318	0.180	39.3	8.27	3.21	-0.11	4.13	5.68
50.0	329	0.193	38.4	8.53	3.45	-0.24	4.27	5.94
50.0	341	0.207	37.5	8.82	3.70	-0.37	4.41	6.22
50.0	351	0.221	36.6	9.05	3.94	-0.49	4.53	6.46
50.0	361	0.233	35.8	9.29	4.17	-0.61	4.65	6.69
50.0	370	0.247	35.0	9.50	4.42	-0.72	4.75	6.91
50.0	378	0.262	34.3	9.68	4.68	-0.82	4.84	7.10
50.0	385	0.277	33.6	9.83	4.94	-0.92	4.91	7.28
50.0	391	0.291	32.9	9.96	5.19	-1.02	4.98	7.44
50.0	397	0.305	32.3	10.08	5.44	-1.11	5.04	7.59



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	60.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-205	Consolidation Pressure :	20.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.627 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.627 in
Sample Description:	Yellowish Brown Sandy Clay	Final Sample Area (A)*:	5.353 sq. in.
		Induced OCR=	1.0

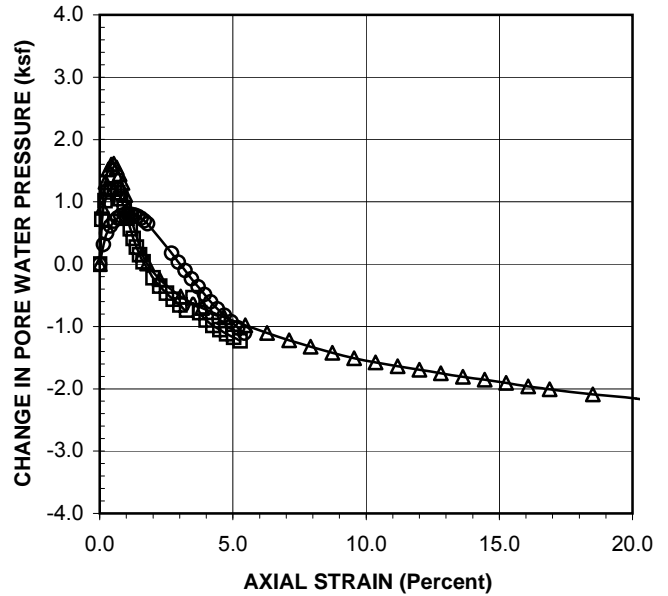
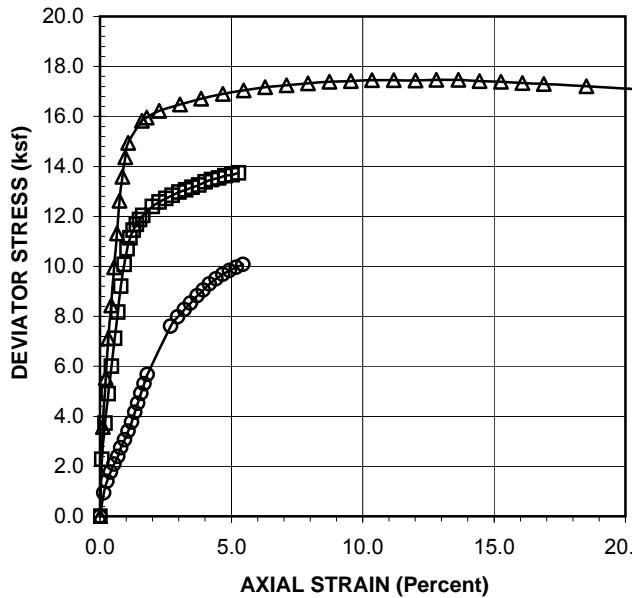
Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
60.0	0	0.000	40.0	0.00	0.00	0.00	0.00	2.88
60.0	85	0.004	45.0	2.28	0.08	0.72	1.14	3.30
60.0	139	0.011	47.1	3.73	0.20	1.02	1.87	3.73
60.0	183	0.018	48.0	4.91	0.32	1.15	2.45	4.18
60.0	224	0.025	48.4	6.00	0.44	1.20	3.00	4.68
60.0	266	0.031	48.3	7.12	0.55	1.20	3.56	5.24
60.0	306	0.038	48.0	8.18	0.68	1.15	4.09	5.82
60.0	345	0.045	47.3	9.21	0.80	1.05	4.60	6.44
60.0	378	0.052	46.3	10.07	0.92	0.91	5.04	7.01
60.0	402	0.058	45.1	10.70	1.04	0.73	5.35	7.50
60.0	419	0.065	43.9	11.14	1.15	0.57	5.57	7.88
60.0	431	0.071	42.8	11.45	1.27	0.41	5.72	8.19
60.0	440	0.078	41.9	11.67	1.38	0.27	5.84	8.45
60.0	448	0.085	41.0	11.87	1.51	0.15	5.93	8.67
60.0	455	0.092	40.3	12.04	1.63	0.04	6.02	8.86
60.0	470	0.113	38.5	12.39	2.00	-0.22	6.19	9.29
60.0	478	0.127	37.6	12.57	2.26	-0.35	6.28	9.52
60.0	485	0.141	36.8	12.72	2.51	-0.47	6.36	9.71
60.0	491	0.155	36.1	12.84	2.76	-0.57	6.42	9.87
60.0	497	0.170	35.4	12.97	3.01	-0.66	6.48	10.02
60.0	502	0.184	34.9	13.06	3.27	-0.74	6.53	10.15
60.0	507	0.198	36.2	13.16	3.51	-0.54	6.58	10.00
60.0	512	0.212	34.6	13.25	3.76	-0.78	6.63	10.29
60.0	518	0.225	33.8	13.38	4.00	-0.90	6.69	10.47
60.0	523	0.240	33.2	13.47	4.26	-0.98	6.73	10.60
60.0	527	0.254	32.7	13.54	4.51	-1.05	6.77	10.70
60.0	532	0.268	32.2	13.63	4.77	-1.12	6.81	10.81
60.0	535	0.283	31.8	13.67	5.04	-1.18	6.83	10.89
60.0	539	0.297	31.5	13.73	5.28	-1.23	6.87	10.98



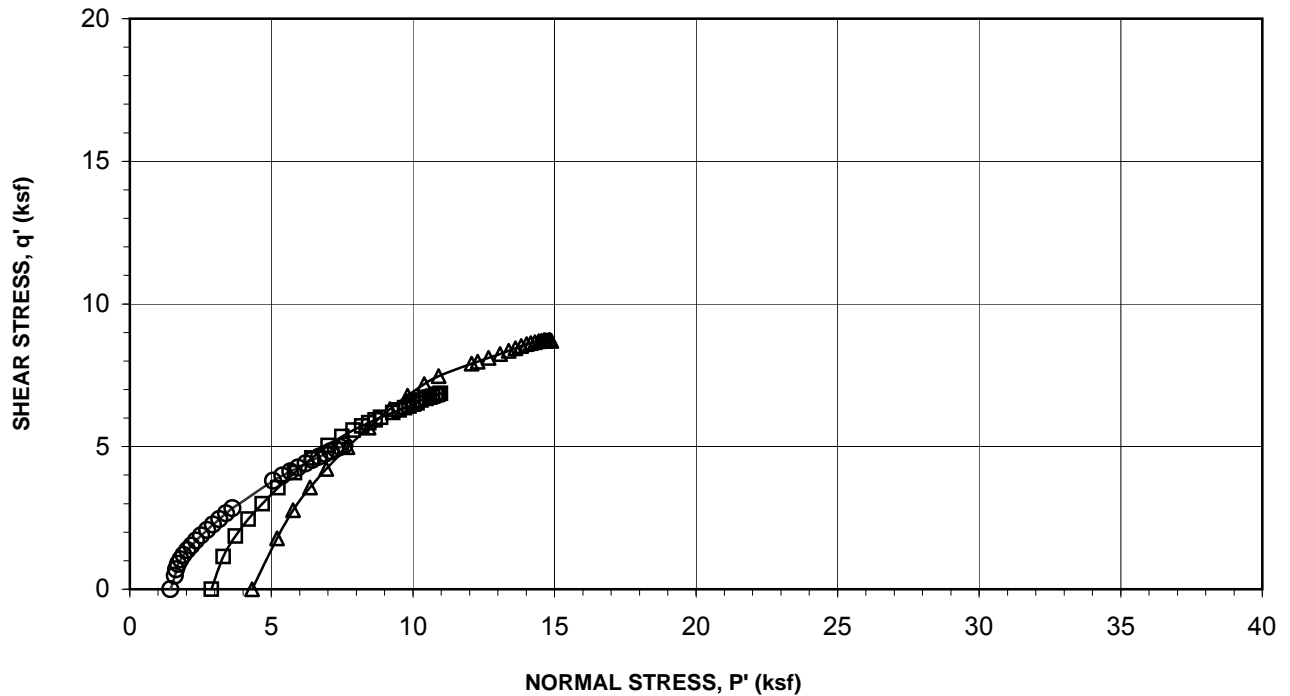
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT

Project Name:	Westside Subway Extension	Cell Pressure:	70.0 psi
Project No:	4953-10-1561	Back Pressure :	40.0 psi
Test Pit:	G-205	Consolidation Pressure :	30.0 psi
Depth(ft):	25.5	Initial Sample Height:	5.627 in
Sample No.:	-	Initial Area of Sample:	5.371 sq. in.
Sample Type:	Mod. Cal.	Final Sample Ht.* (L):	5.627 in
Sample Description:	Yellowish Brown Sandy Clay	Final Sample Area (A)*:	5.320 sq. in.
		Induced OCR=	1.0

Cell Pressure	Load	Axial Deformation	Back Pressure	Deviator Stress	Axial Strain	Pore Pressure Change	Shear Stress q'	Normal Stress p'
(psi)	(lbs)	(in)	(psi)	(S1-S3) (ksf)	(%)	(ksf)	(S1-S3)/2 (ksf)	(S1'+S3')/2 (ksf)
70.0	0	0.000	40.0	0.00	0.00	0.00	0.00	4.32
70.0	132	0.006	46.3	3.57	0.11	0.90	1.78	5.20
70.0	205	0.012	49.2	5.54	0.21	1.32	2.77	5.77
70.0	264	0.018	50.6	7.12	0.32	1.52	3.56	6.36
70.0	313	0.024	51.1	8.44	0.43	1.60	4.22	6.94
70.0	370	0.030	51.2	9.96	0.53	1.61	4.98	7.69
70.0	421	0.036	50.8	11.32	0.64	1.55	5.66	8.43
70.0	470	0.042	50.0	12.63	0.75	1.44	6.31	9.19
70.0	506	0.048	49.1	13.58	0.85	1.30	6.79	9.81
70.0	536	0.054	47.7	14.37	0.96	1.11	7.18	10.39
70.0	558	0.060	46.2	14.94	1.07	0.89	7.47	10.90
70.0	594	0.090	41.1	15.82	1.60	0.16	7.91	12.07
70.0	600	0.100	40.1	15.95	1.78	0.01	7.98	12.29
70.0	613	0.127	38.3	16.22	2.25	-0.24	8.11	12.67
70.0	628	0.171	36.4	16.48	3.04	-0.52	8.24	13.08
70.0	642	0.217	35.1	16.71	3.85	-0.70	8.35	13.38
70.0	655	0.263	34.1	16.90	4.67	-0.85	8.45	13.62
70.0	666	0.308	33.2	17.04	5.47	-0.98	8.52	13.82
70.0	677	0.354	32.3	17.17	6.28	-1.10	8.59	14.01
70.0	686	0.400	31.5	17.25	7.11	-1.22	8.62	14.17
70.0	695	0.446	30.8	17.32	7.92	-1.33	8.66	14.31
70.0	704	0.492	30.1	17.39	8.74	-1.42	8.70	14.44
70.0	711	0.538	29.5	17.41	9.55	-1.51	8.70	14.53
70.0	719	0.583	29.0	17.45	10.36	-1.58	8.72	14.62
70.0	726	0.629	28.6	17.45	11.18	-1.64	8.73	14.69
70.0	732	0.676	28.2	17.44	12.00	-1.69	8.72	14.73
70.0	740	0.721	27.9	17.47	12.80	-1.75	8.73	14.80
70.0	747	0.767	27.5	17.46	13.64	-1.81	8.73	14.86
70.0	752	0.813	27.1	17.42	14.44	-1.86	8.71	14.88
70.0	758	0.859	26.8	17.39	15.26	-1.91	8.69	14.92
70.0	763	0.905	26.4	17.33	16.08	-1.96	8.67	14.95
70.0	769	0.951	26.1	17.30	16.89	-2.01	8.65	14.98
70.0	780	1.042	25.5	17.21	18.51	-2.09	8.60	15.01
70.0	791	1.133	25.0	17.10	20.14	-2.16	8.55	15.03
70.0	803	1.224	24.3	17.01	21.75	-2.26	8.50	15.09

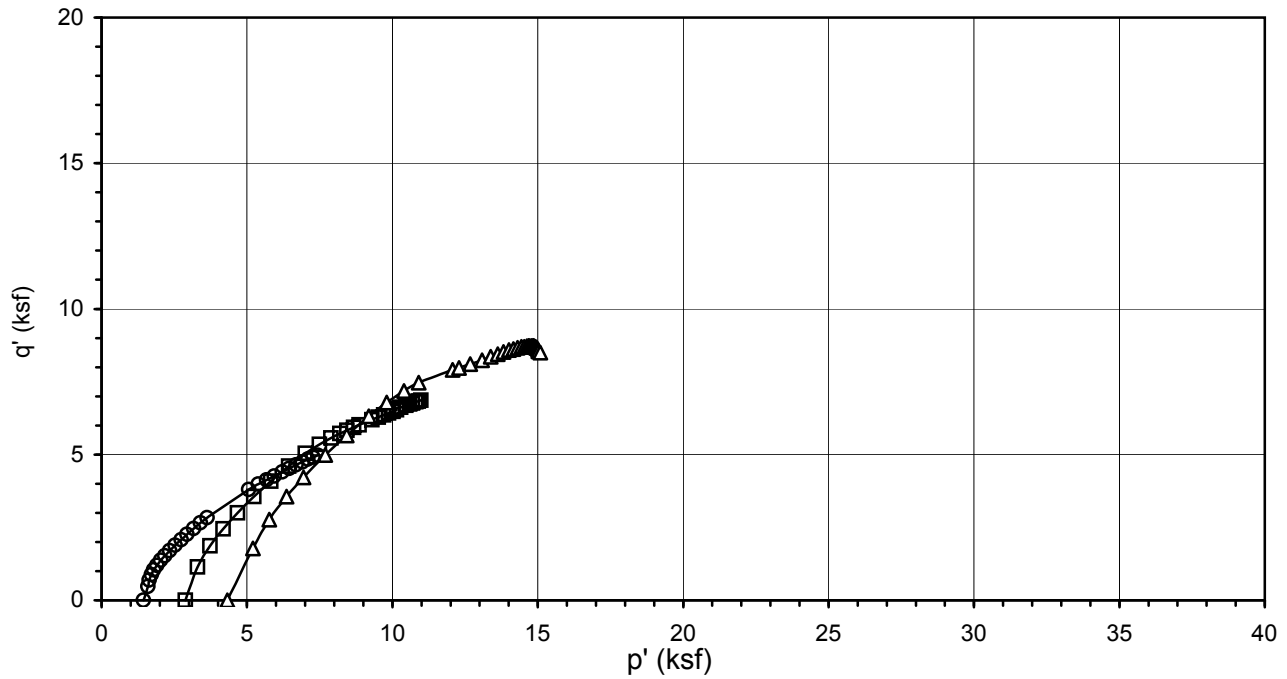


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi

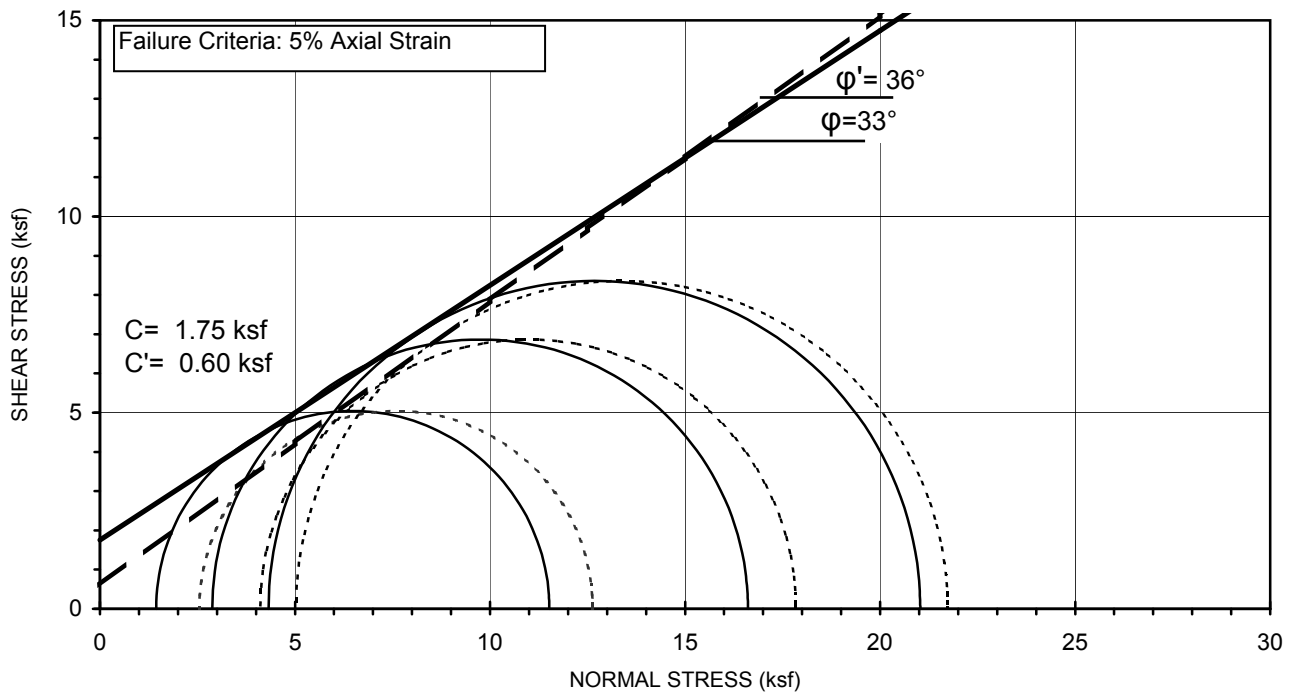


Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Yellowish Brown Sandy Clay
Test Pit:	G-205	Avg. Dry Unit Weight (pcf):	118.7
Sample No.:	-	Avg. Initial Moisture Content (%):	12.7
Depth (ft):	25.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767

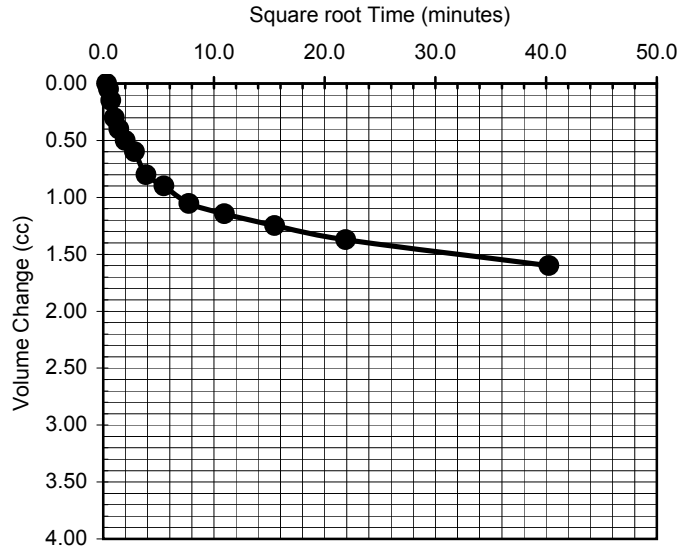
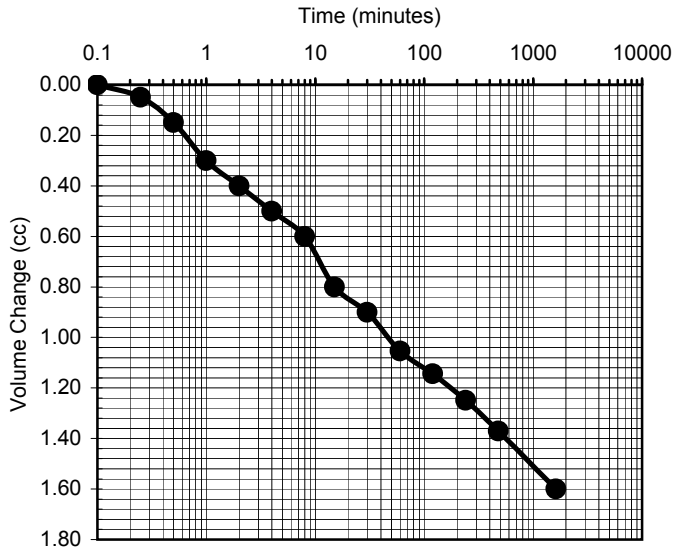


LEGEND: CONFINING PRESSURES= ○ 10 psi □ 20 psi △ 30 psi



Project Name:	Westside Subway Extension	Sample Type:	Mod. Cal.
Project No.:	4953-10-1561	Sample Description:	Yellowish Brown Sandy Clay
Test Pit:	G-205	Avg. Dry Unit Weight (pcf):	118.7
Sample No.:	-	Avg. Initial Moisture Content (%):	12.7
Depth (ft):	25.5	Confining Pressure:	10.0, 20.0, 30.0 psi

CU TRIAXIAL MULTI-STAGE TEST WITH PORE PRESSURE MEASUREMENT
ASTM D 4767



Test Pit:	G-205	Sample Type:	Mod. Cal.
Sample No.:	-	Soil Description:	Yellowish Brown Sandy Clay
Depth (feet):	25.5	Eff. Confining Pressure (psi):	20.0

Time (minutes)	Volume Change (cc)
0	0.0000
0.1	0.0000
0.25	0.0500
0.5	0.1500
1	0.3000
2	0.4000
4	0.5000
8	0.6000
15	0.8000
30	0.9000
60	1.0540
120	1.1440
240	1.2491
480	1.3709
1620	1.6000

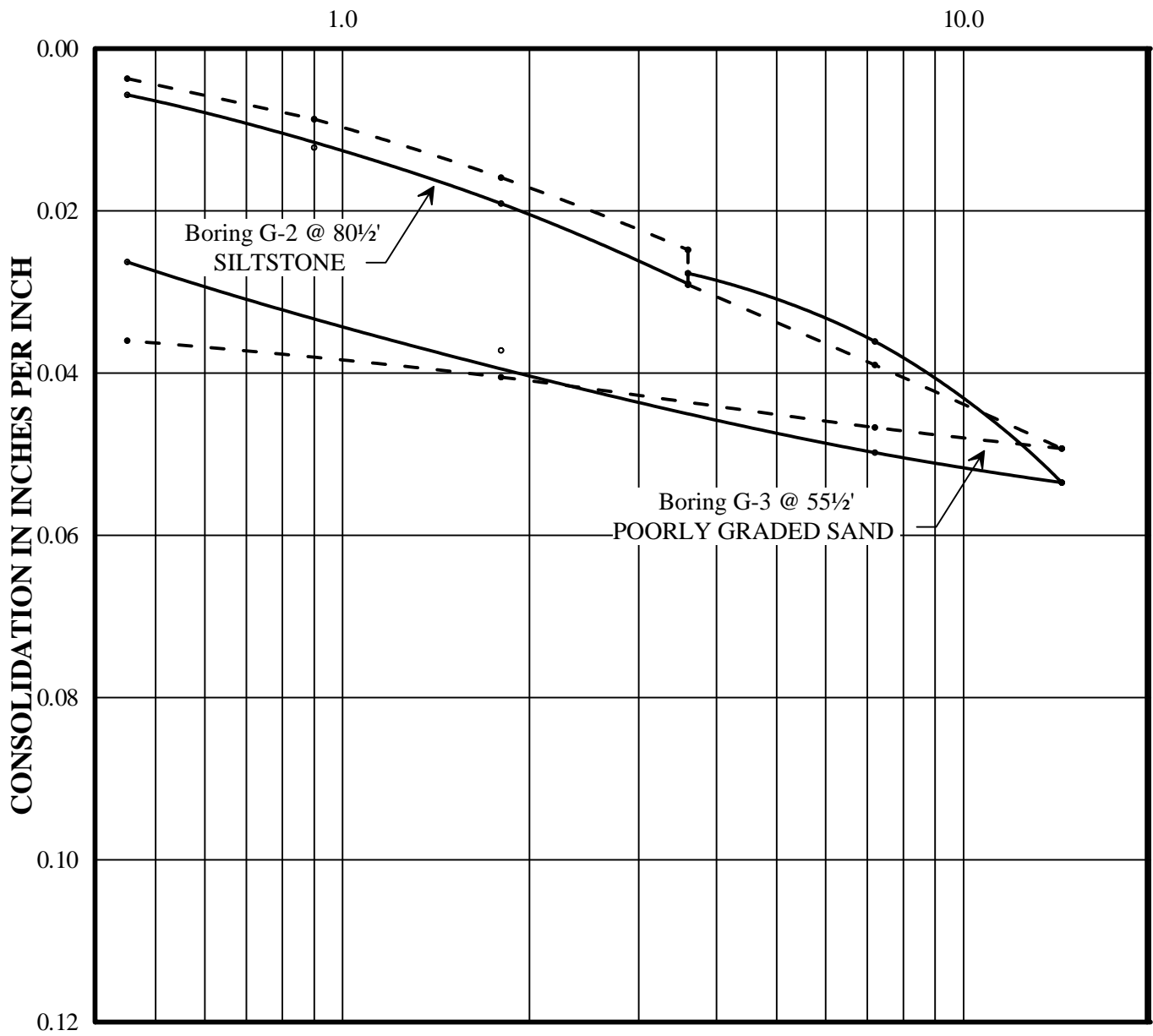
SQRT Time (minutes)	Volume Change (cc)
0.0000	0.0000
0.3162	0.0000
0.5000	0.0500
0.7071	0.1500
1.0000	0.3000
1.4142	0.4000
2.0000	0.5000
2.8284	0.6000
3.8730	0.8000
5.4772	0.9000
7.7460	1.0540
10.9545	1.1440
15.4919	1.2491
21.9089	1.3709
40.2492	1.6000

**TIME RATE CONSOLIDATION CURVE
ASTM D 2435**

Project Name:	Westside Subway Extension
Project No.:	4953-10-1561
Date:	07/21/11

**FIGURES F-3.1 THROUGH F-3.7
CONSOLIDATION TEST DATA (ACE PHASE)**

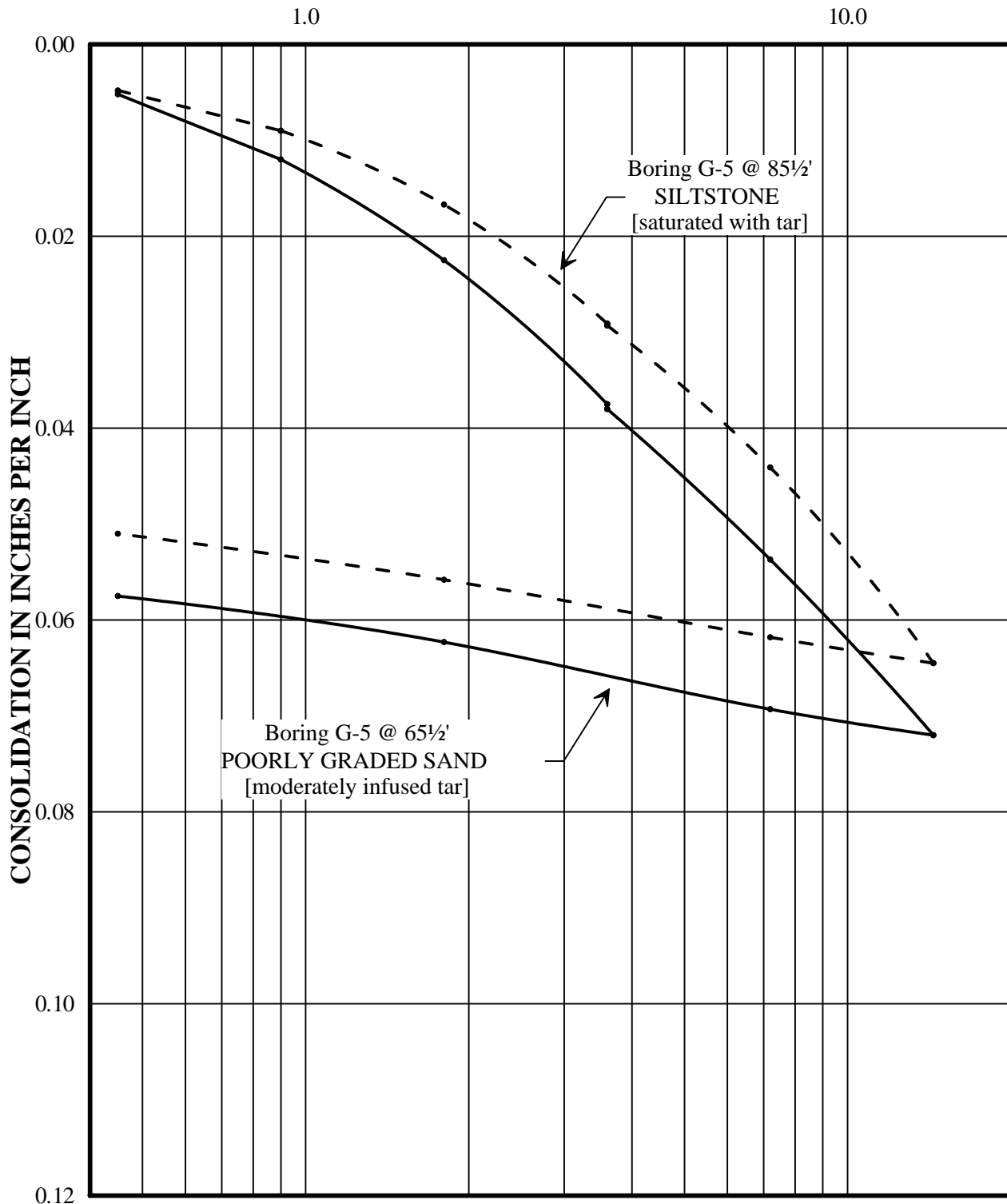
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: NH 08/10/09
 Checked/Date: AH 10/02/09

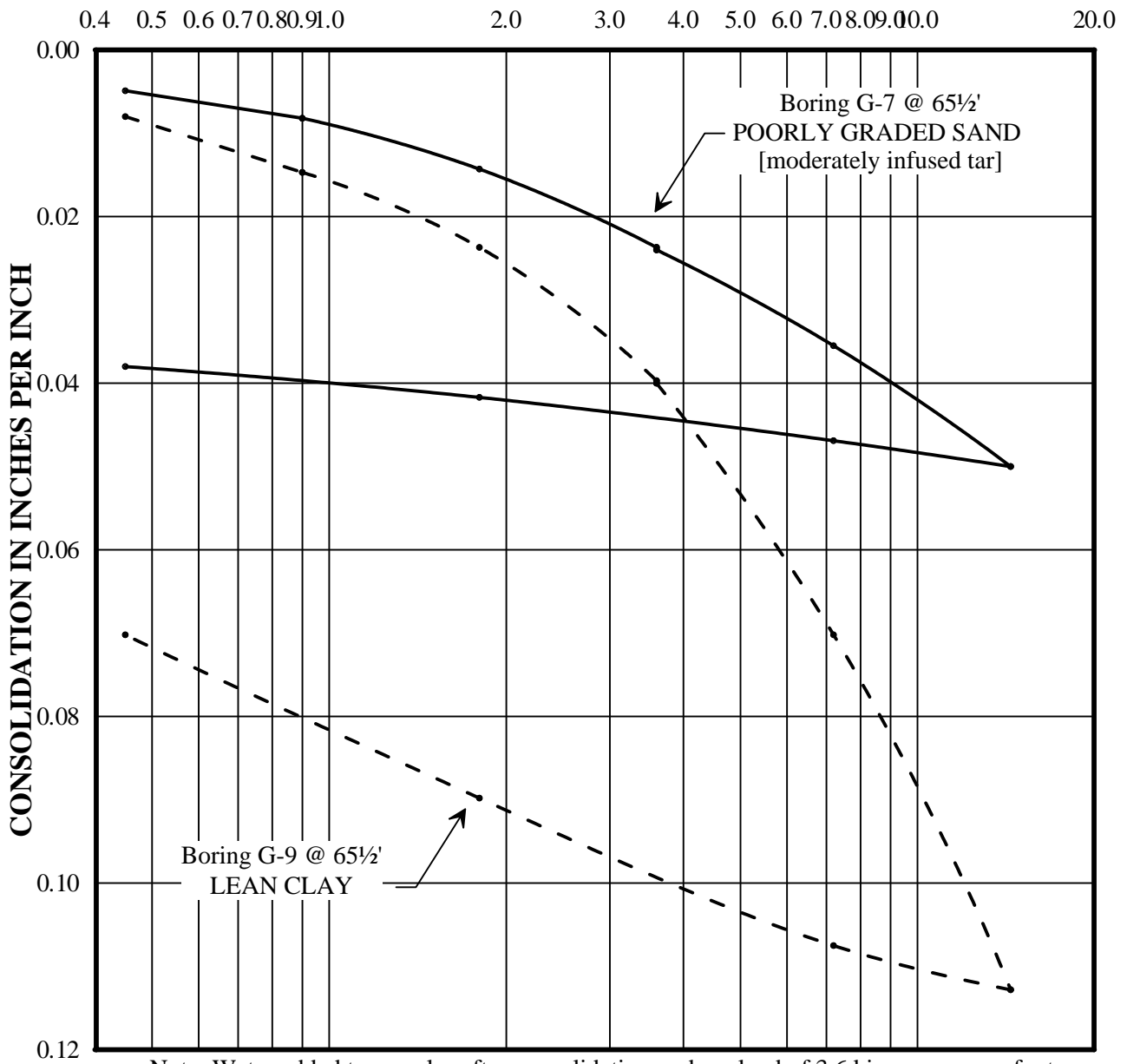
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: NH 08/10/09
Checked/Date: AH 10/02/09

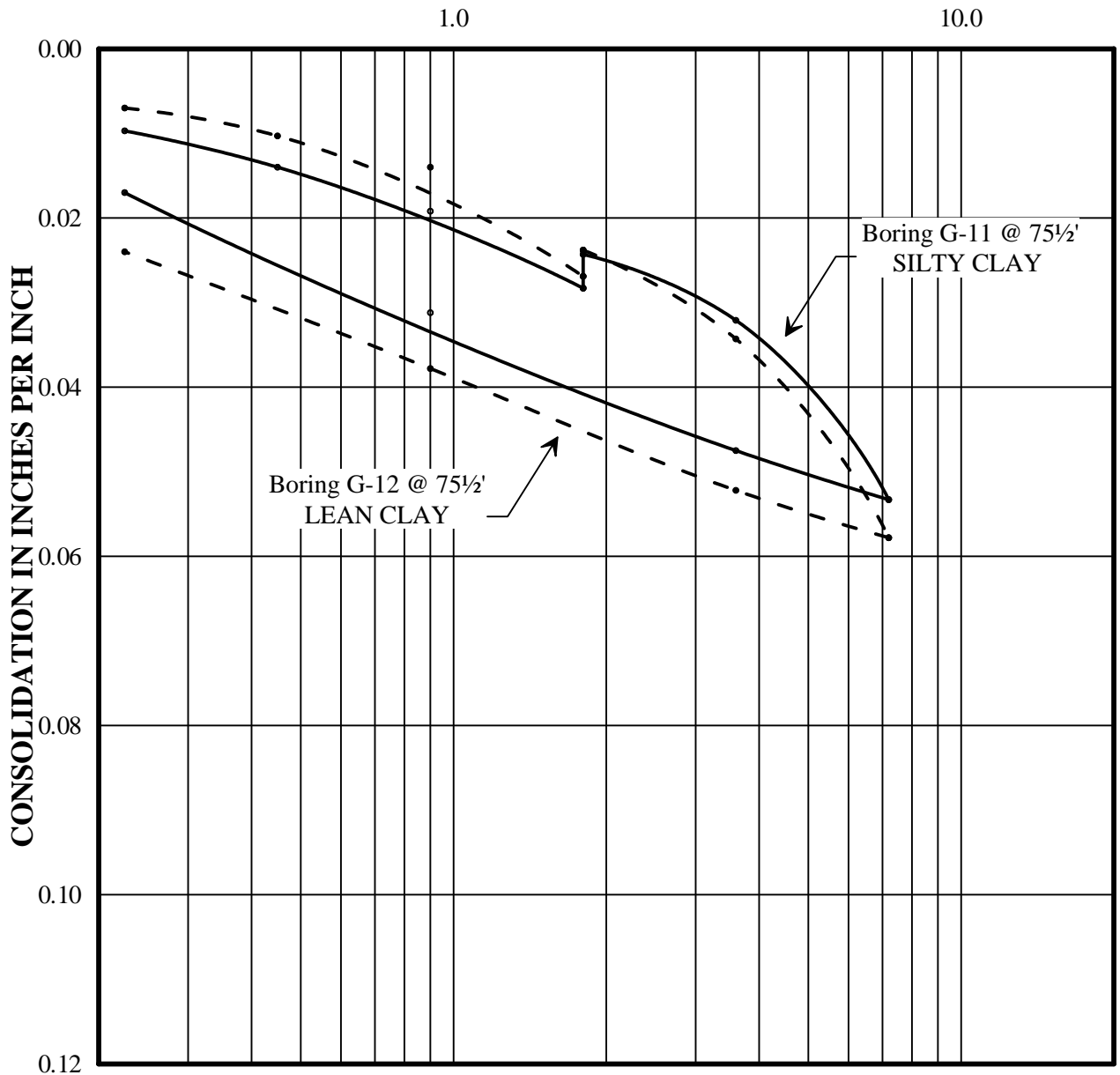
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: NH 08/10/09
 Checked/Date: AH 10/02/09

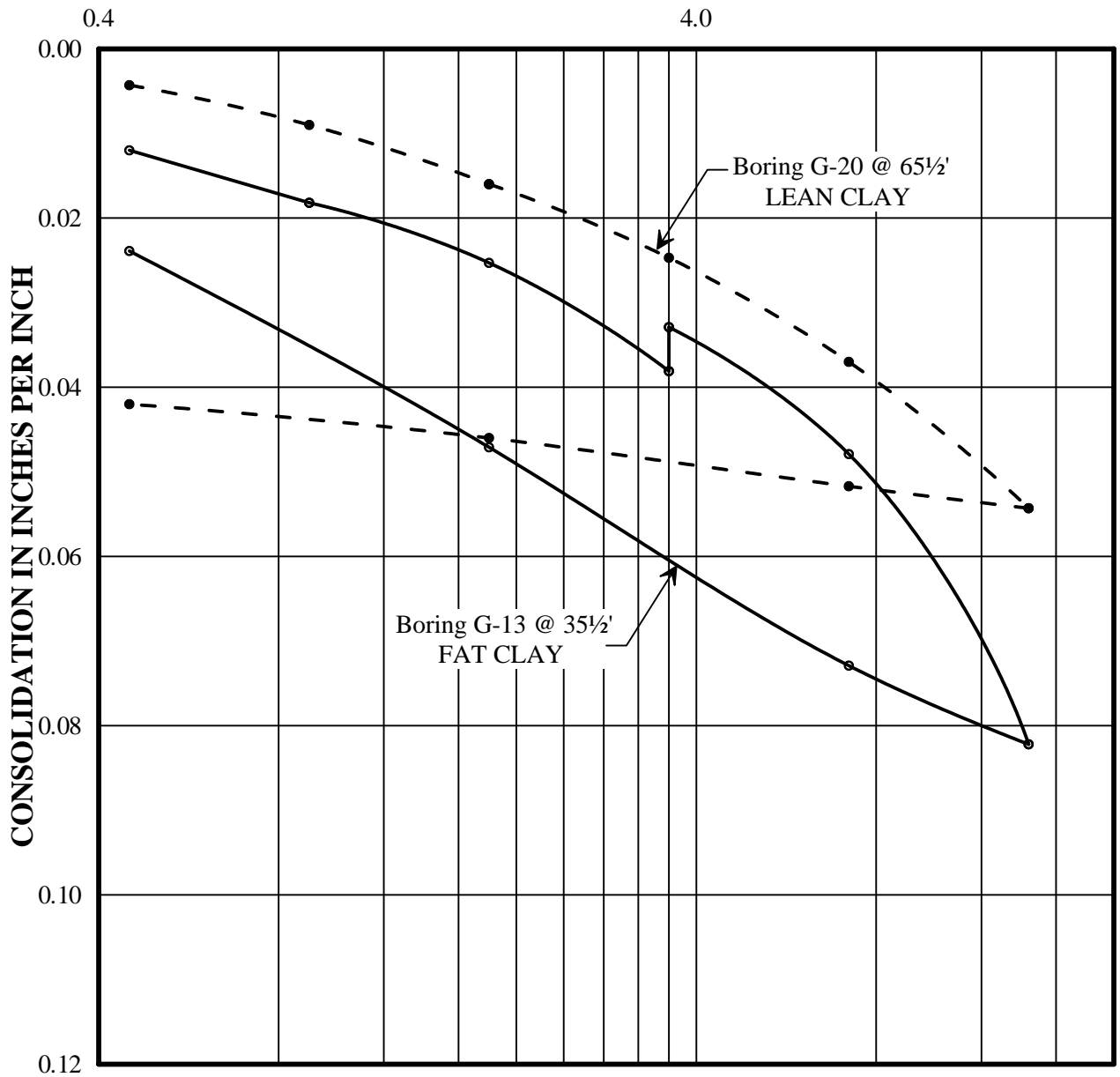
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 1.8 kips per square foot.

Prepared/Date: NH 08/10/09
 Checked/Date: AH 10/02/09

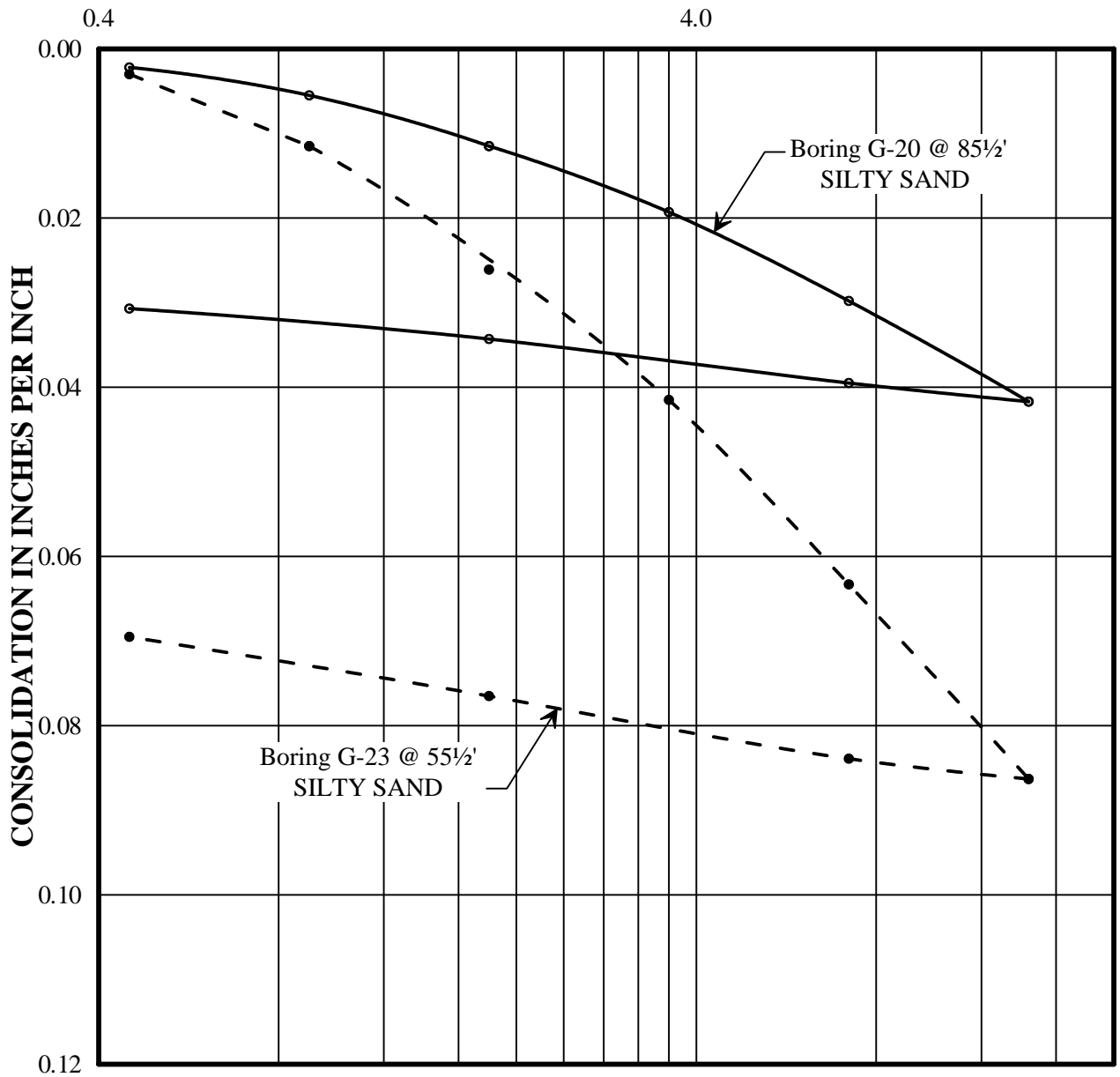
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample from Boring G-13@35½' after consolidation under a load of 3.6 kips per square foot.

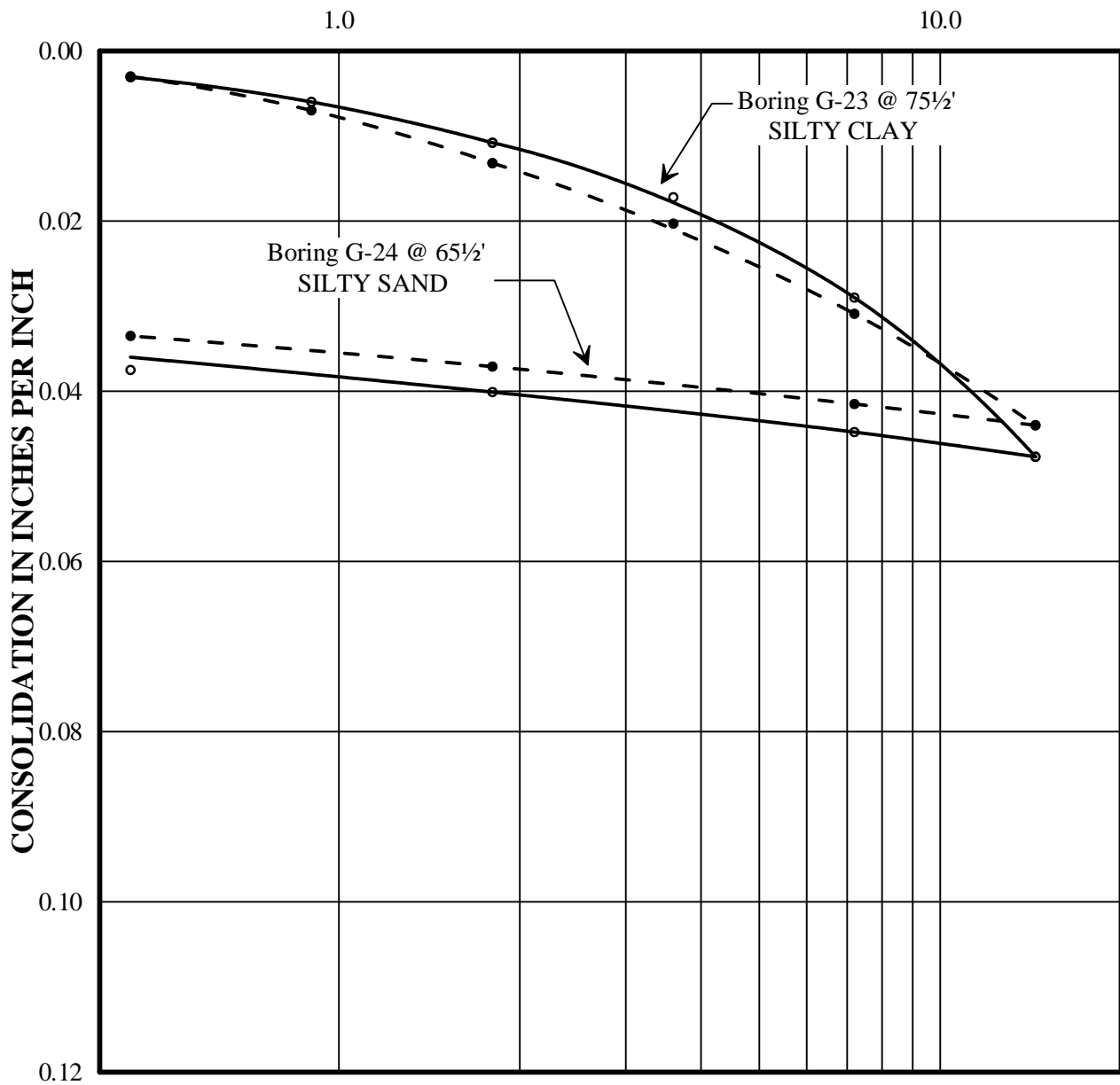
Prepared/Date: NH 2/4/10
 Checked/Date: HP 2/10/10

LOAD IN KIPS PER SQUARE FOOT



Prepared/Date: NH 2/4/10
 Checked/Date: HP 2/10/10

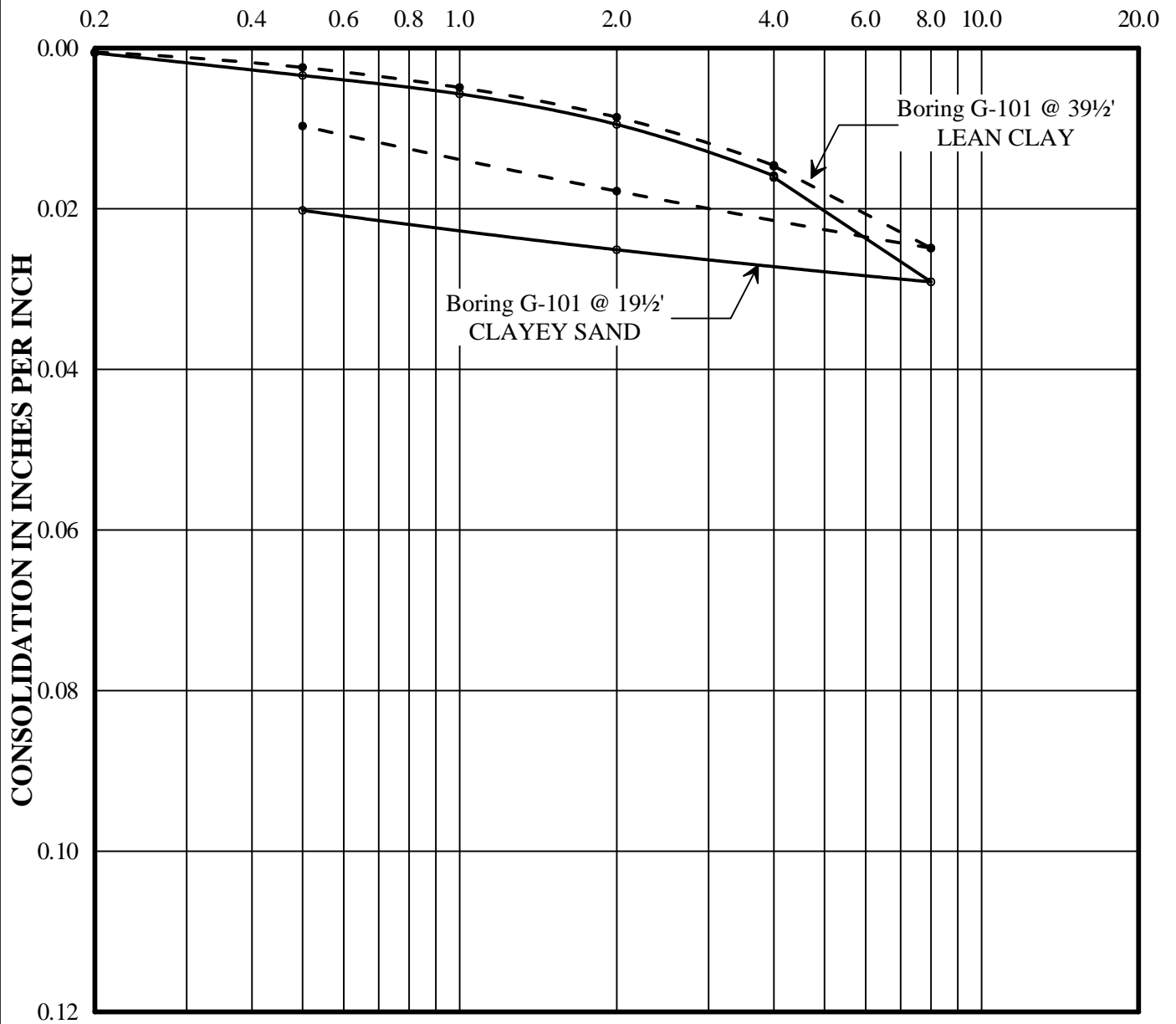
LOAD IN KIPS PER SQUARE FOOT



Prepared/Date: NH 2/4/10
 Checked/Date: HP 2/10/10

**FIGURES F-4.1 THROUGH F-4.97
CONSOLIDATION TEST DATA (PE PHASE)**

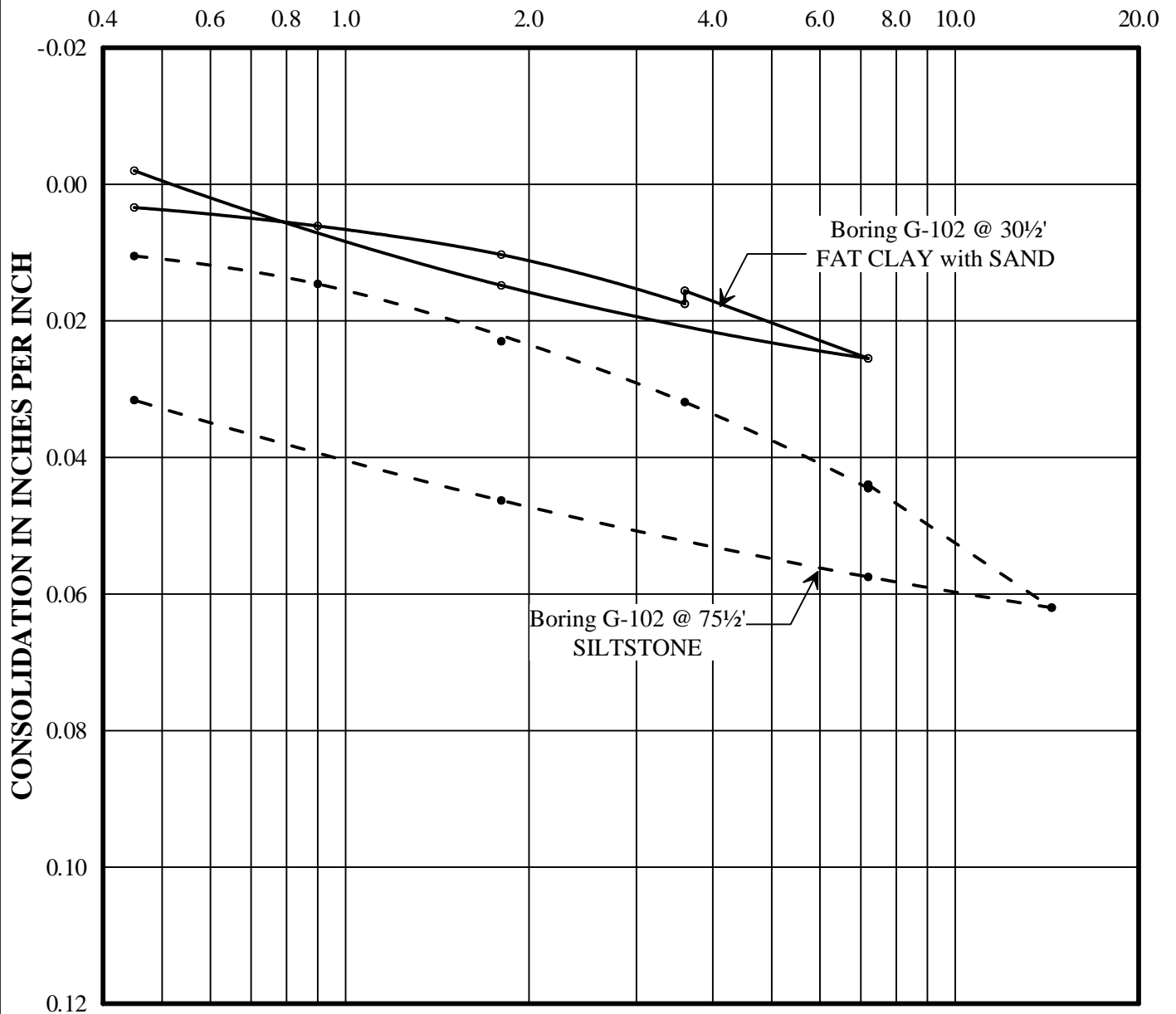
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 4.0 kips per square foot.

Prepared/Date: AH 9/14/11
 Checked/Date: LT 9/24/11

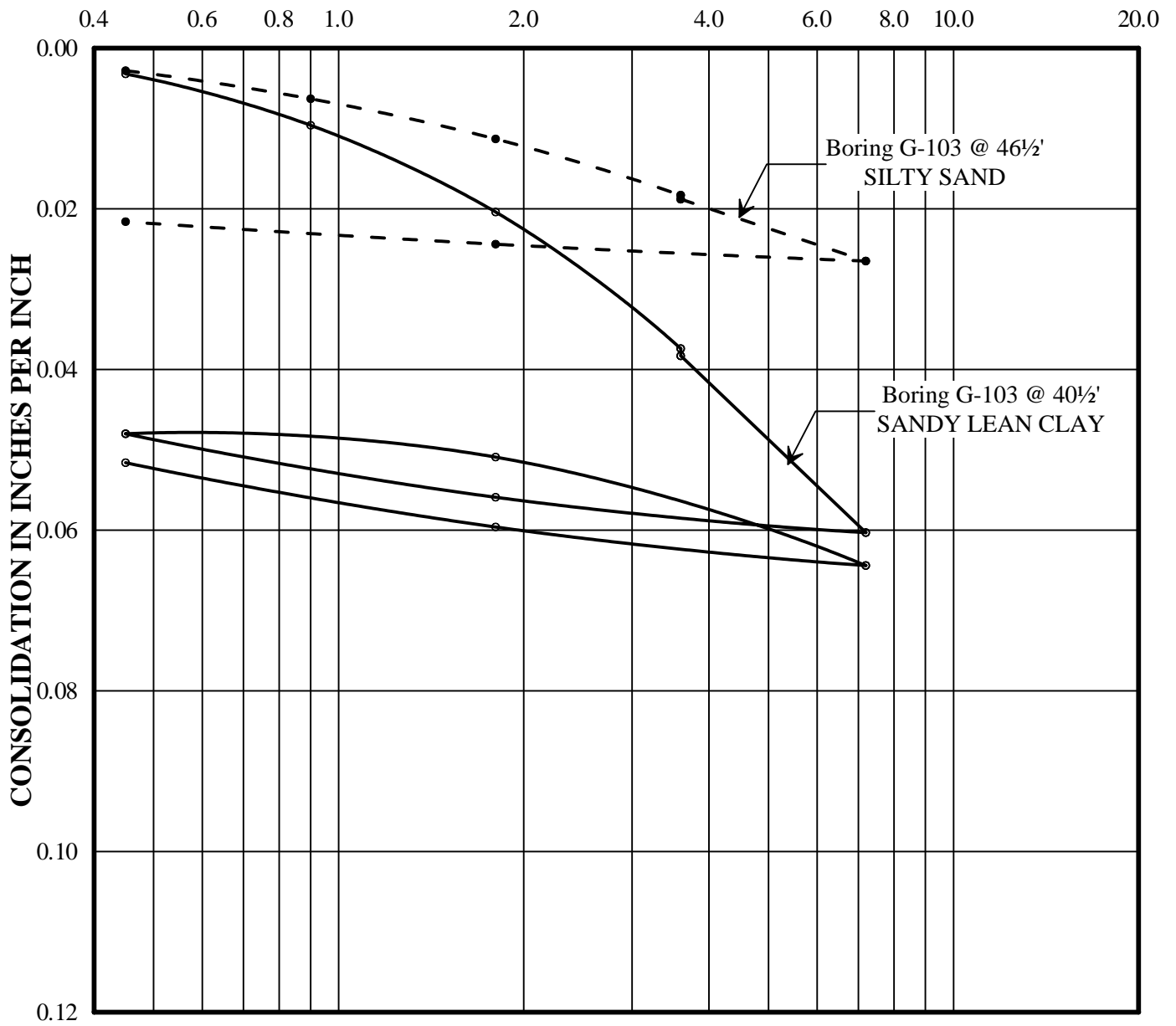
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 30 1/2' and 75 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/15/11

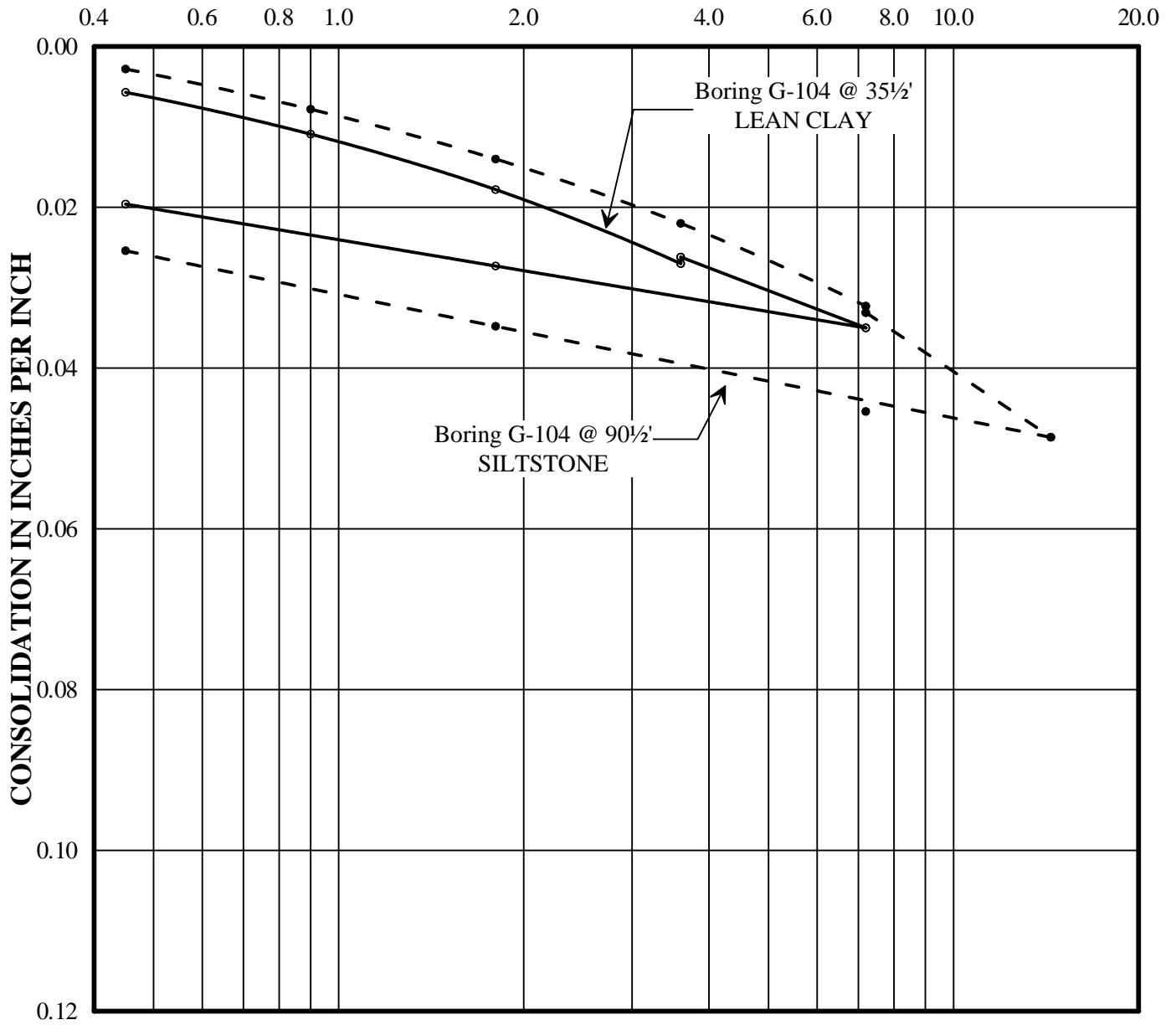
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH/JF 5/15/11
 Checked/Date: LT 8/16/11

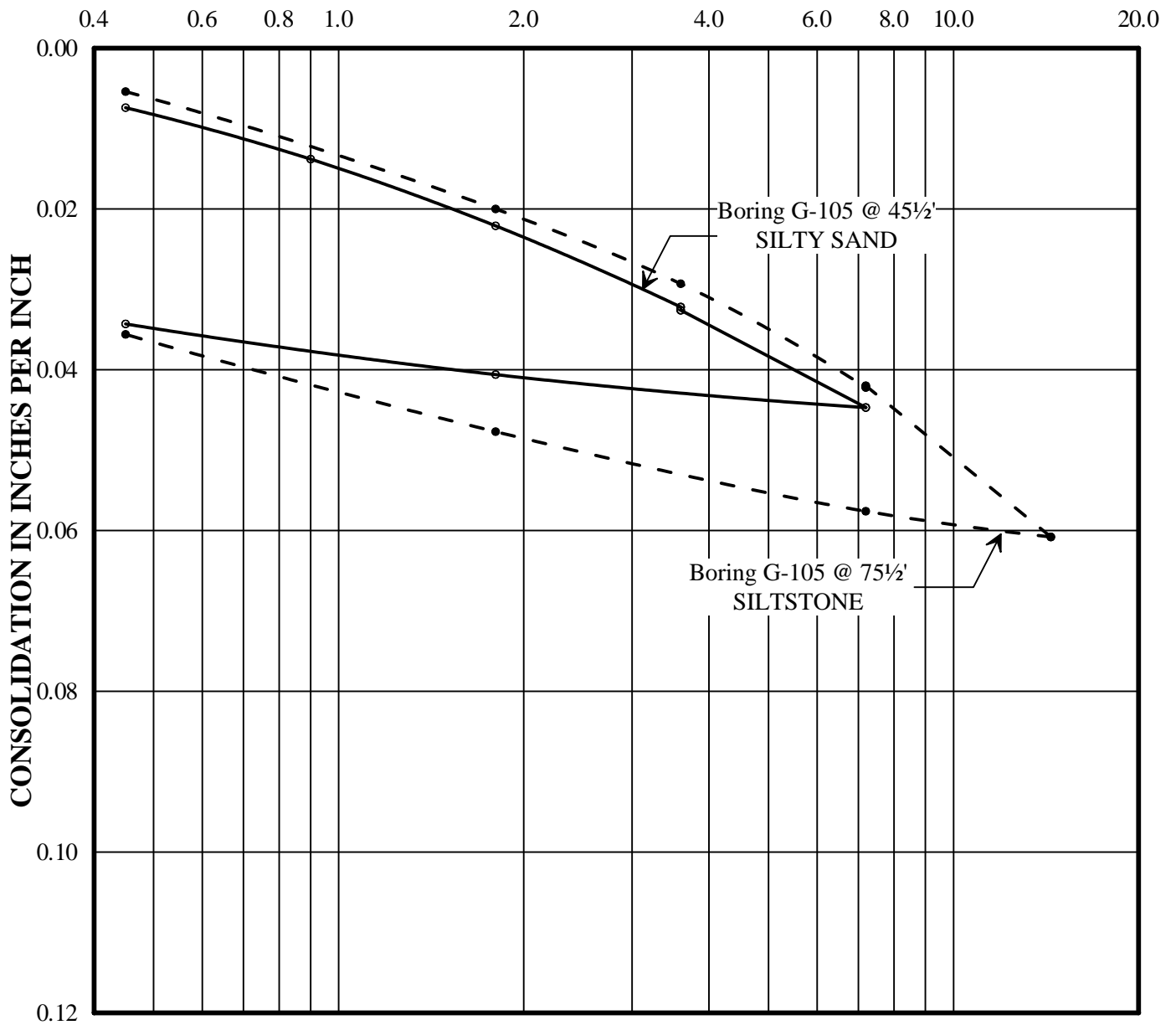
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 35 1/2' and 90 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH 8/25/11
 Checked/Date: LT 9/12/11

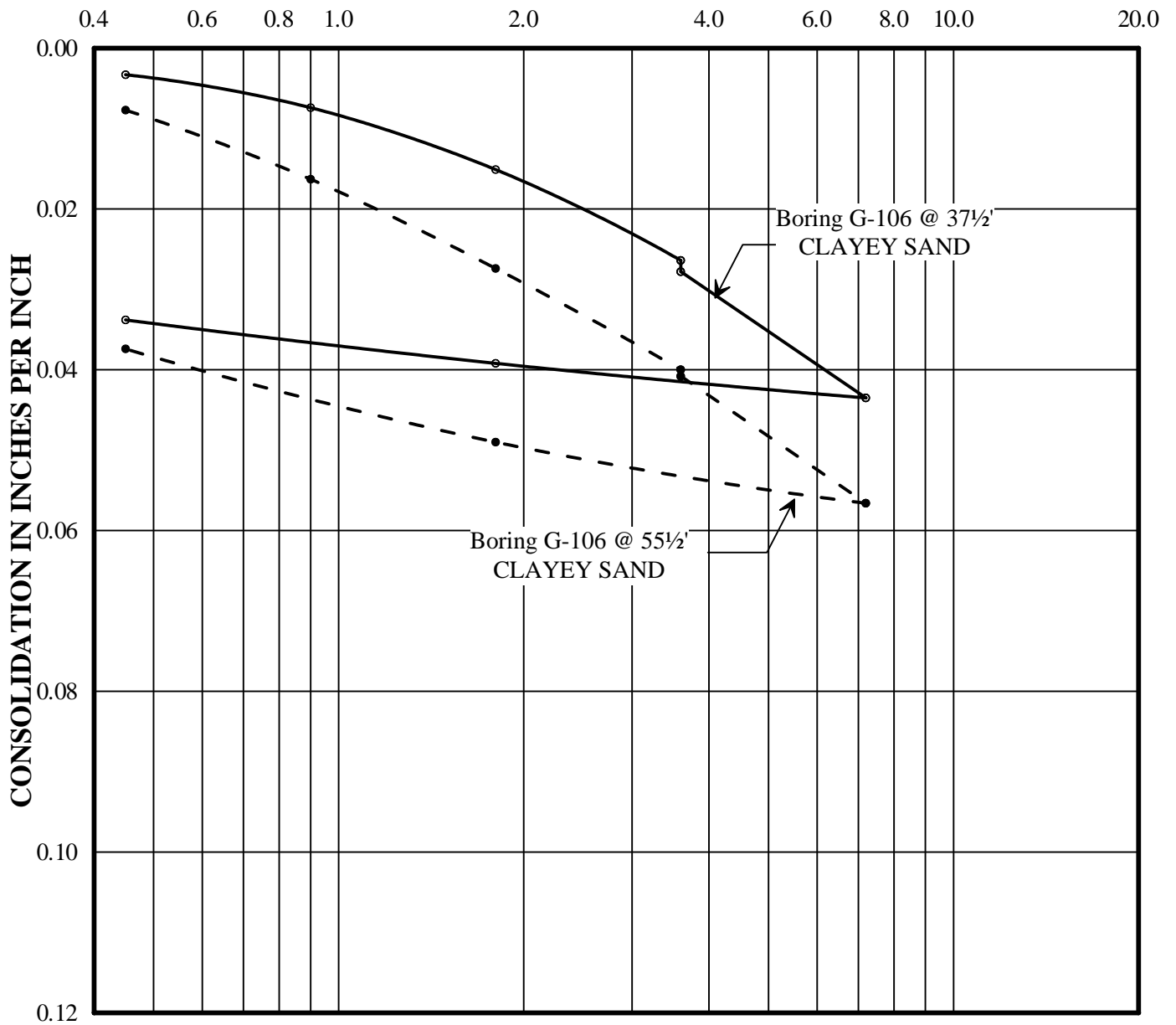
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 45 1/2' and 90 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively..

Prepared/Date: AH 7/25/11
Checked/Date: LT 8/16/11

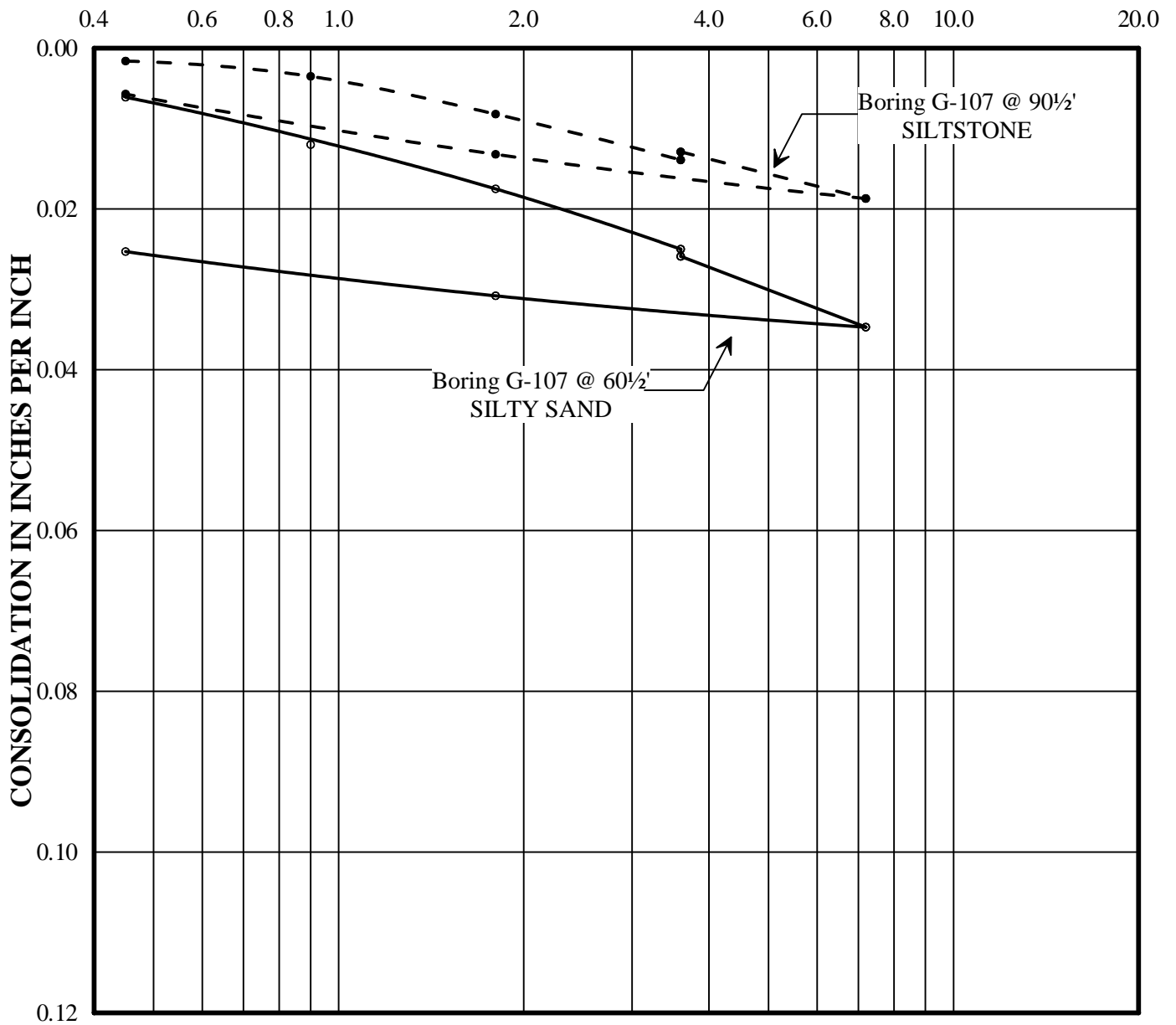
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH/JF 5/15/11
 Checked/Date: LT 8/16/11

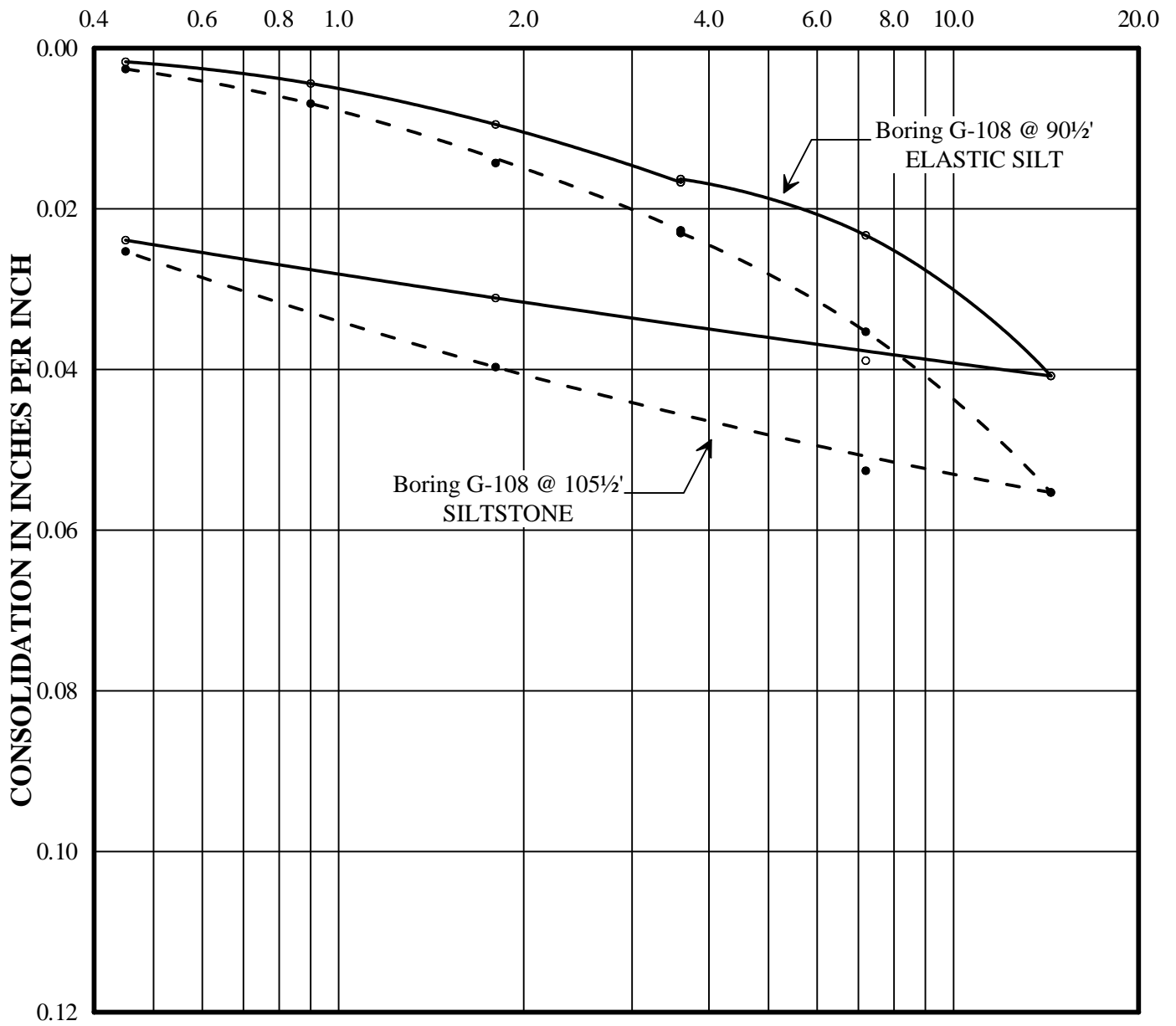
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/25/11
Checked/Date: LT 9/13/11

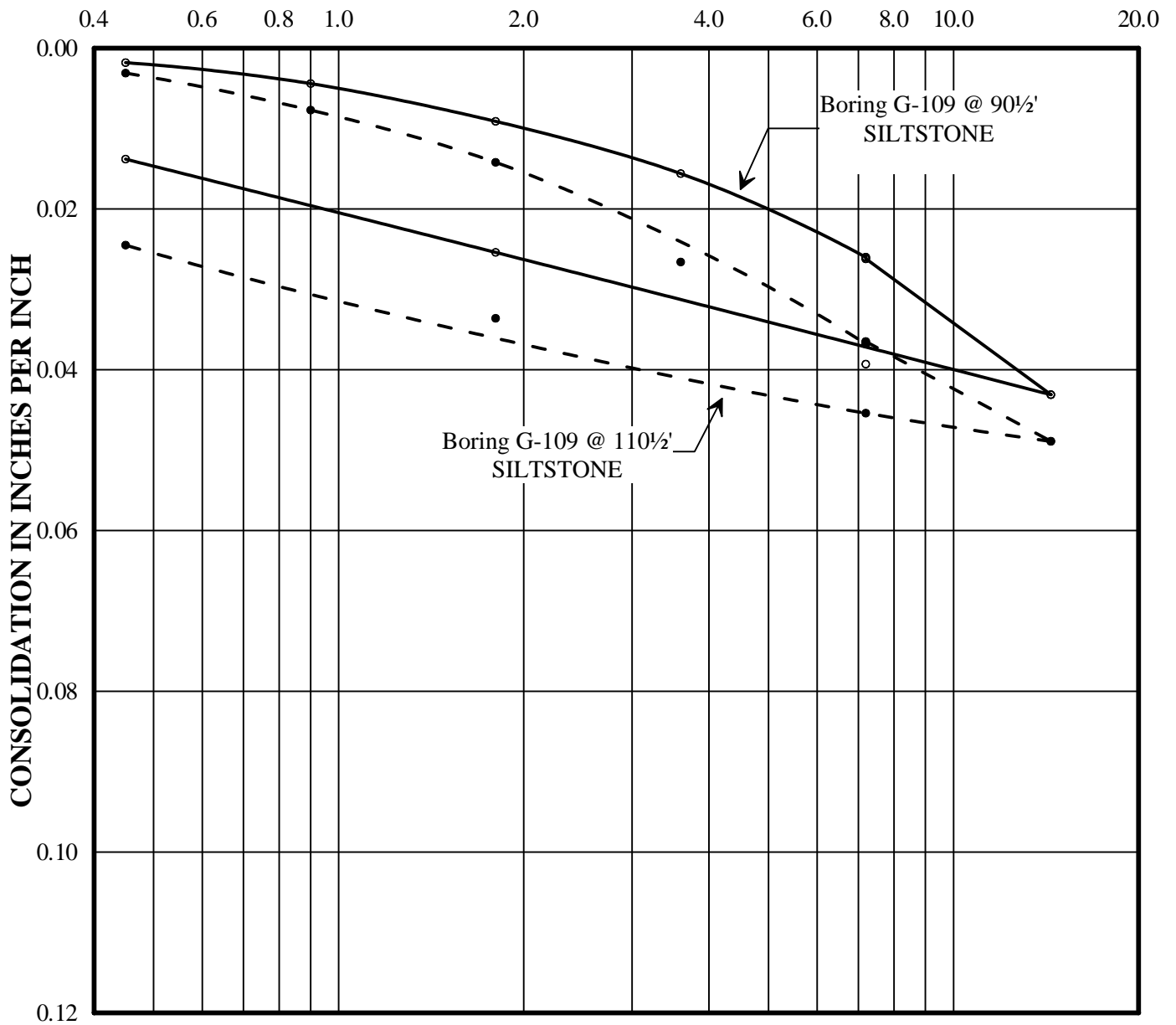
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/25/11
 Checked/Date: LT 9/13/11

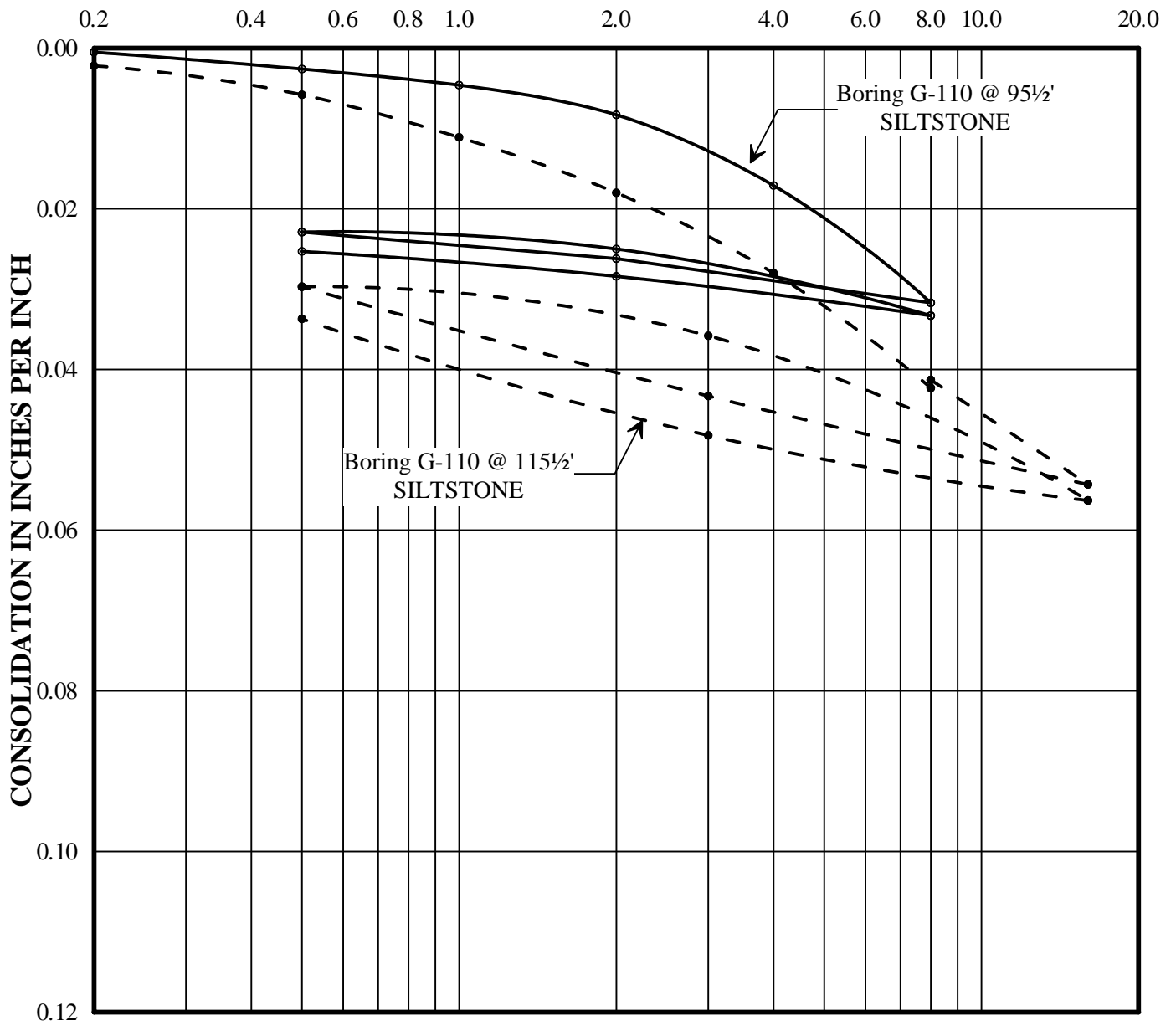
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/25/11
 Checked/Date: LT 9/13/11

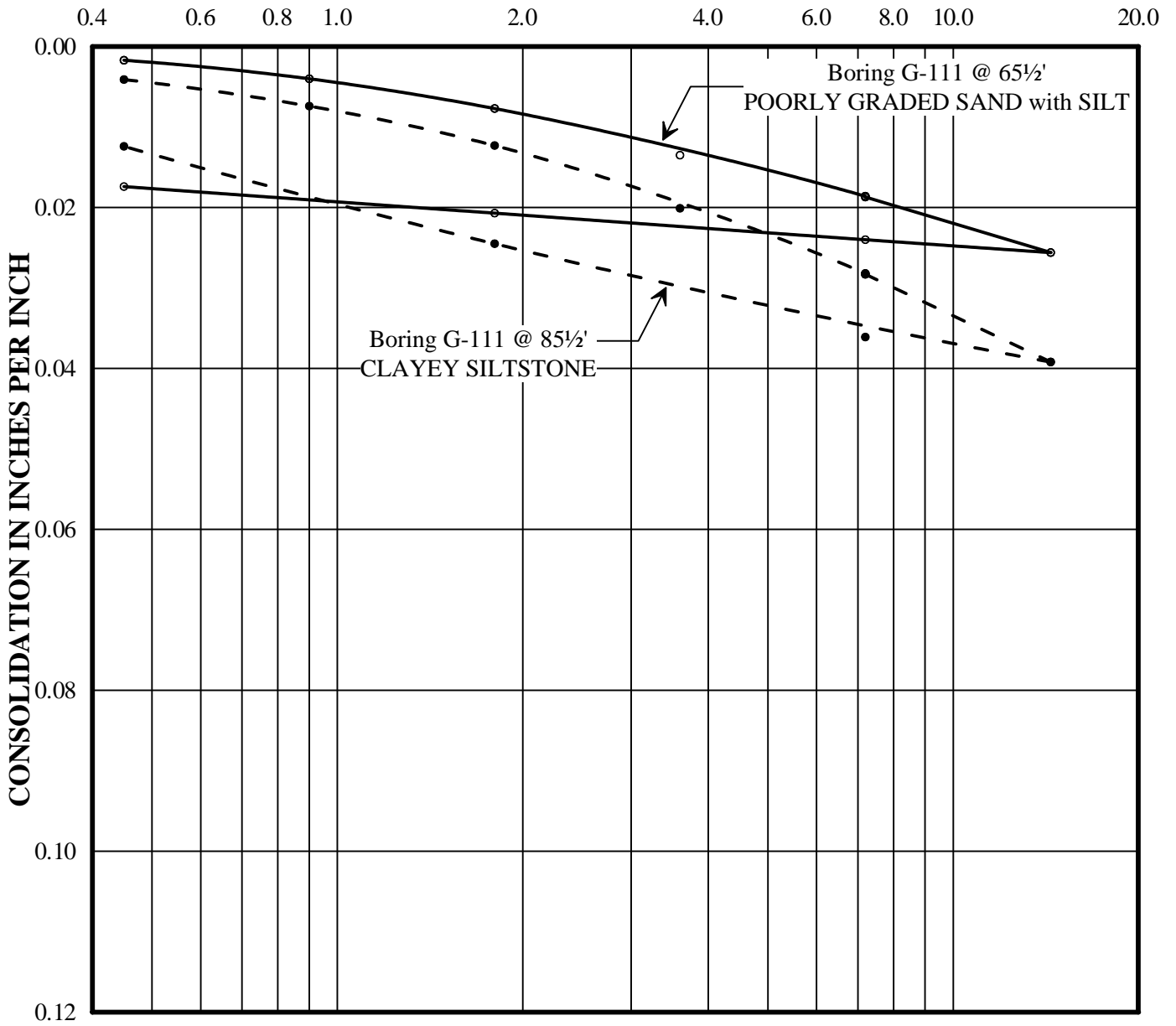
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 115 1/2' after consolidation under a load of 8.0 kips per square foot.
No water added to sample at 95 1/2'.

Prepared/Date: AH 9/14/11
Checked/Date: LT 9/26/11

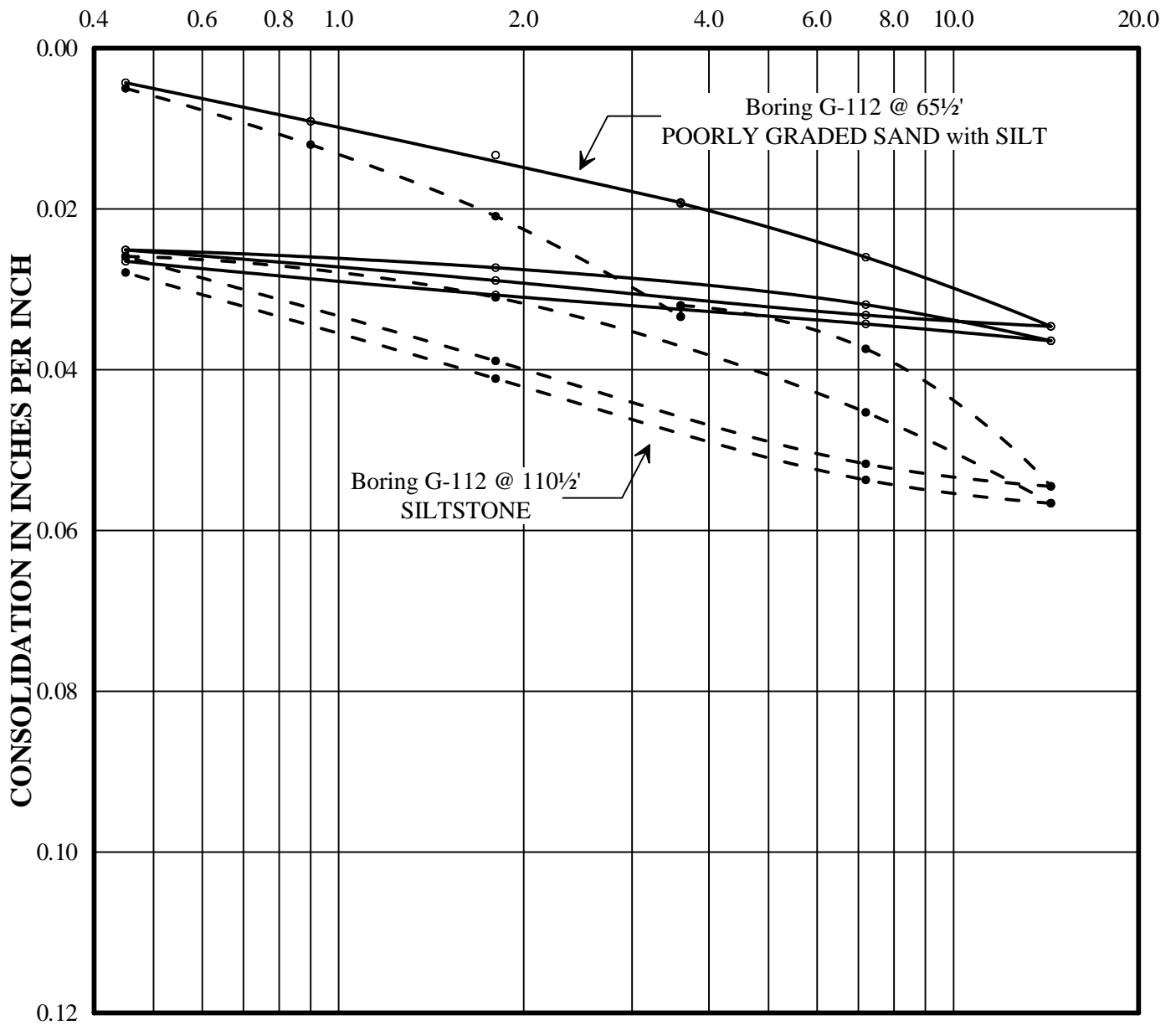
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/12/11

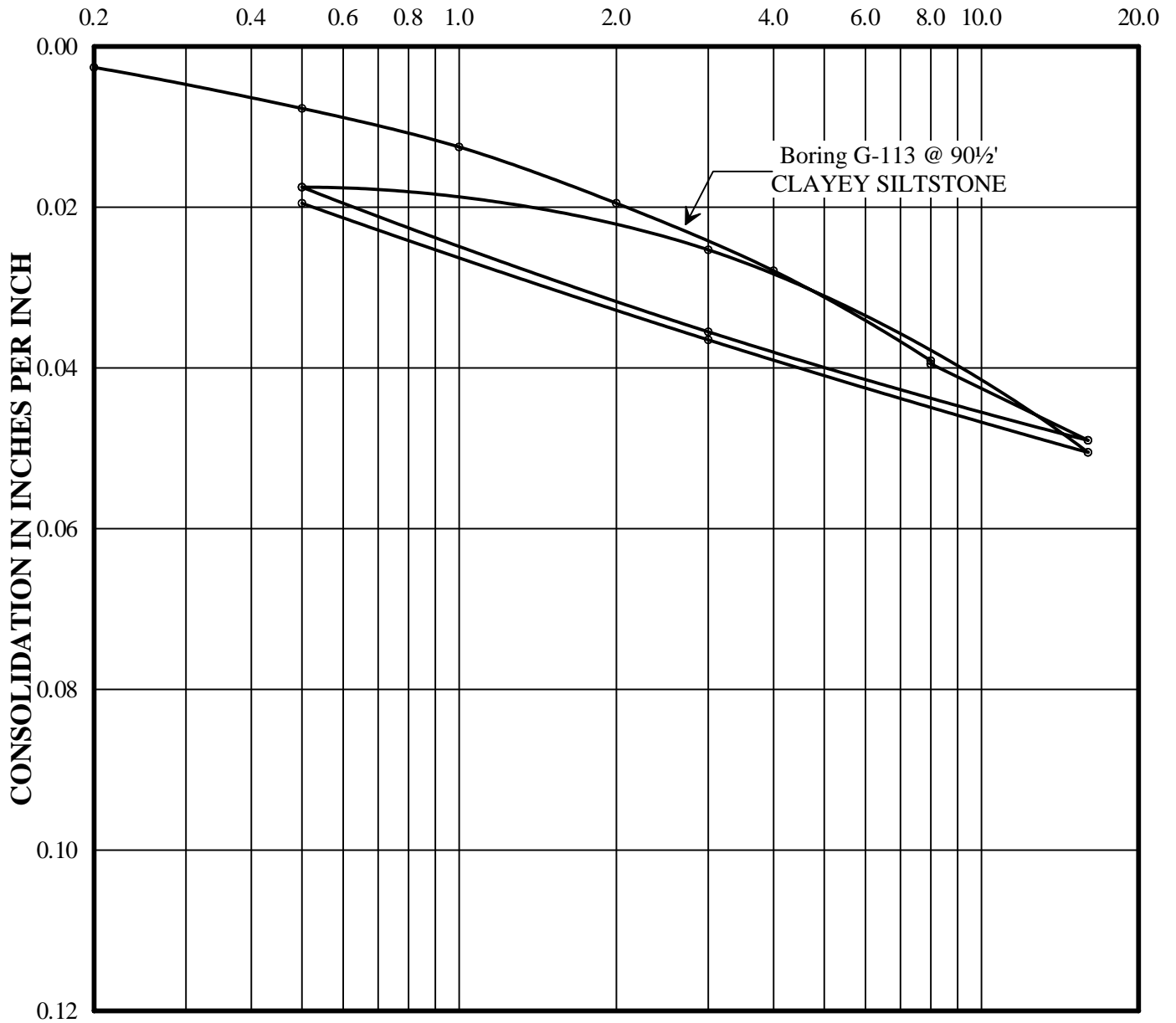
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/25/11
 Checked/Date: LT 9/12/11

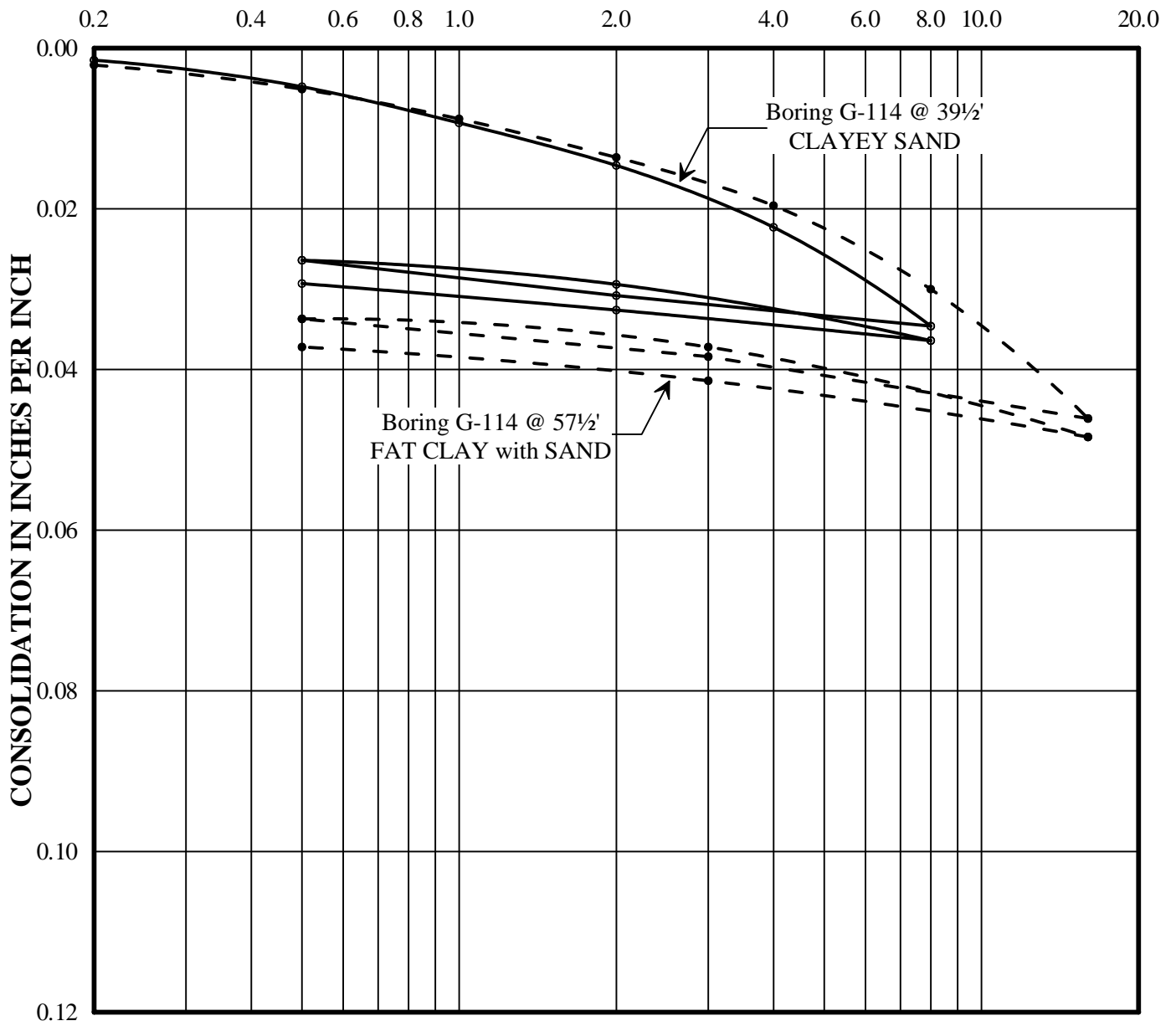
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/15/11
 Checked/Date: LT 9/26/11

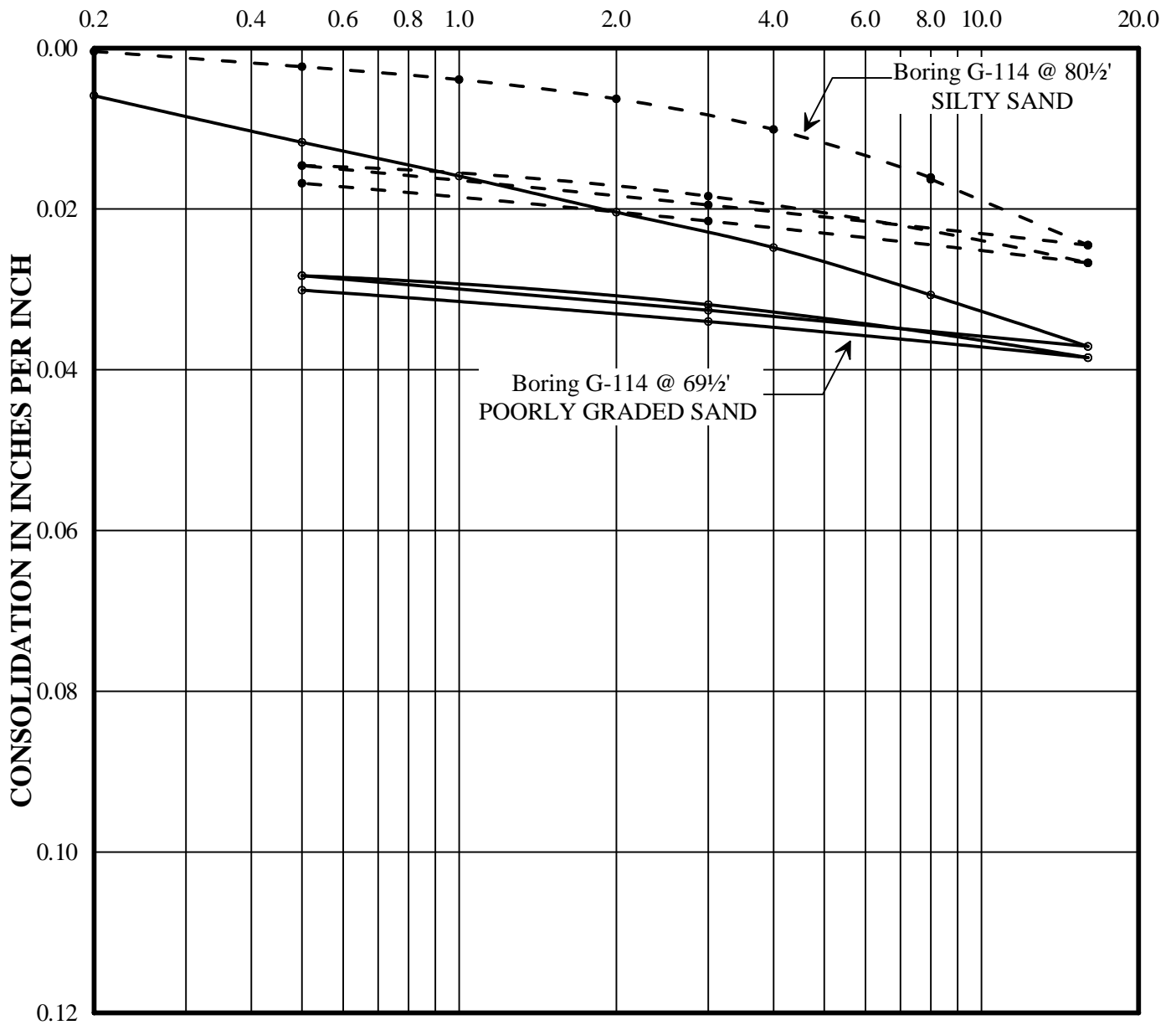
LOAD IN KIPS PER SQUARE FOOT



Note: No water added to samples.

Prepared/Date: AH 9/15/11
 Checked/Date: LT 9/26/11

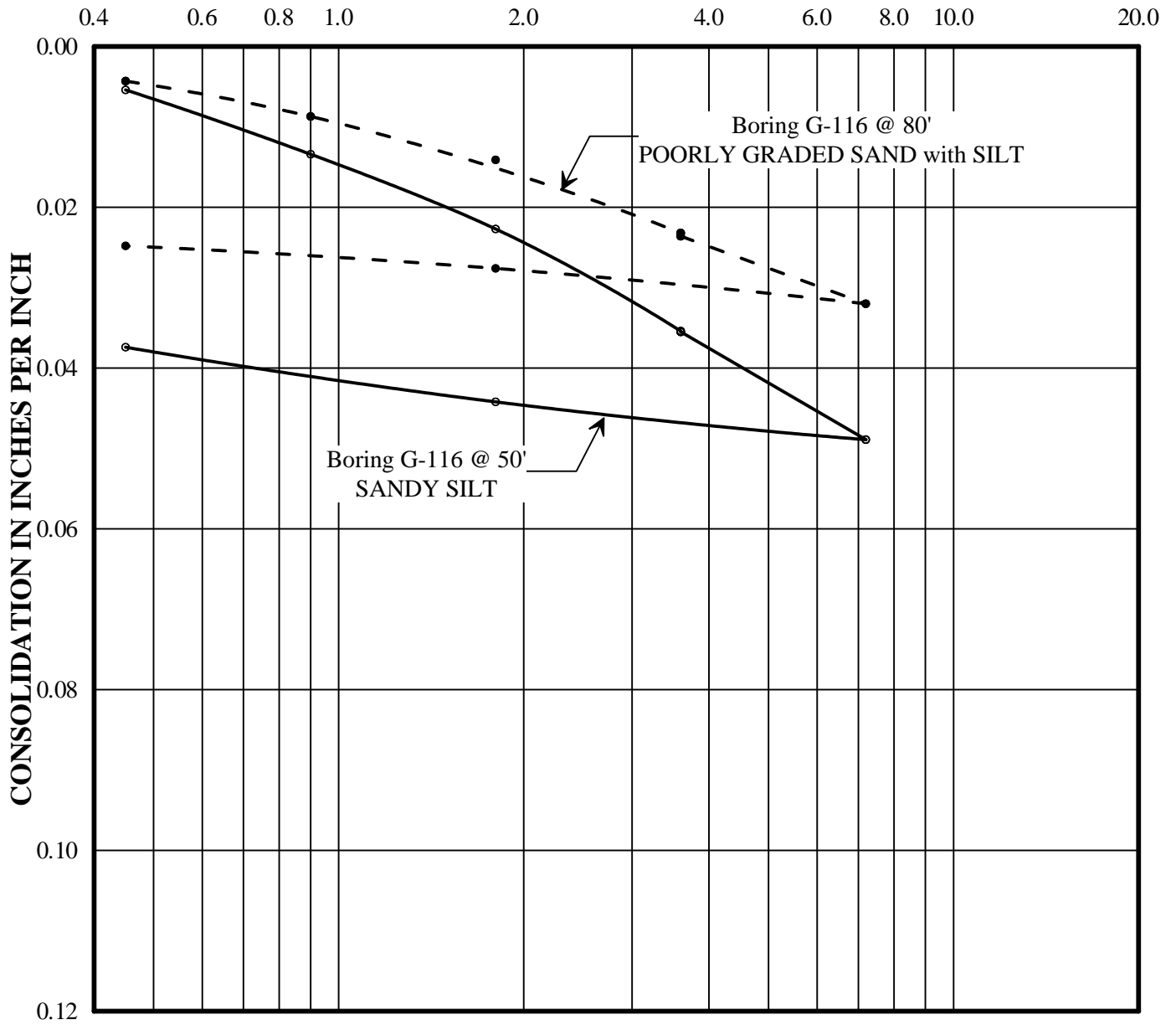
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 80' after consolidation under a load of 8.0 kips per square foot.
No water added to sample at 69'.

Prepared/Date: AH 9/15/11
Checked/Date: LT 9/26/11

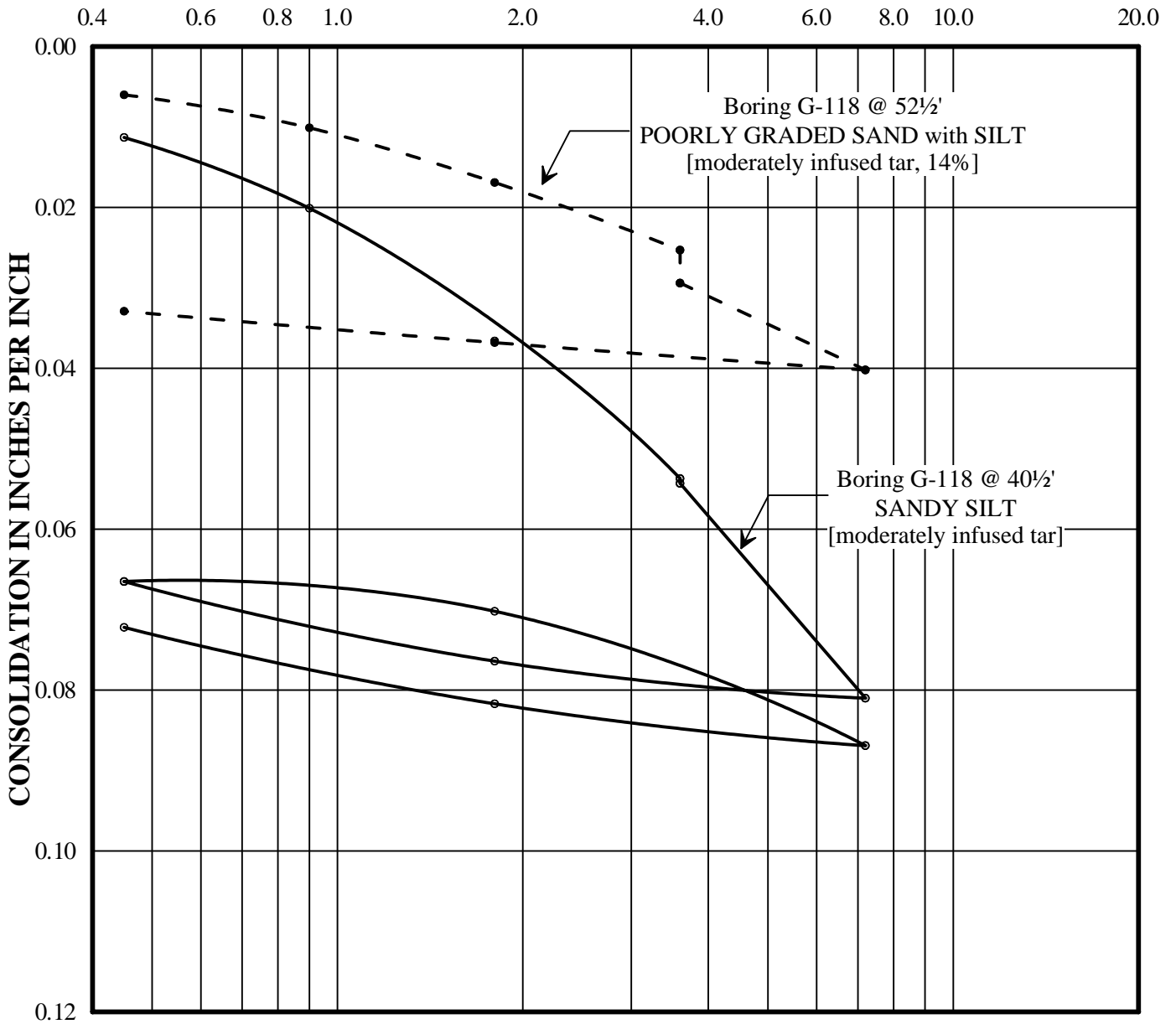
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 8/26/11
 Checked/Date: LT 9/15/11

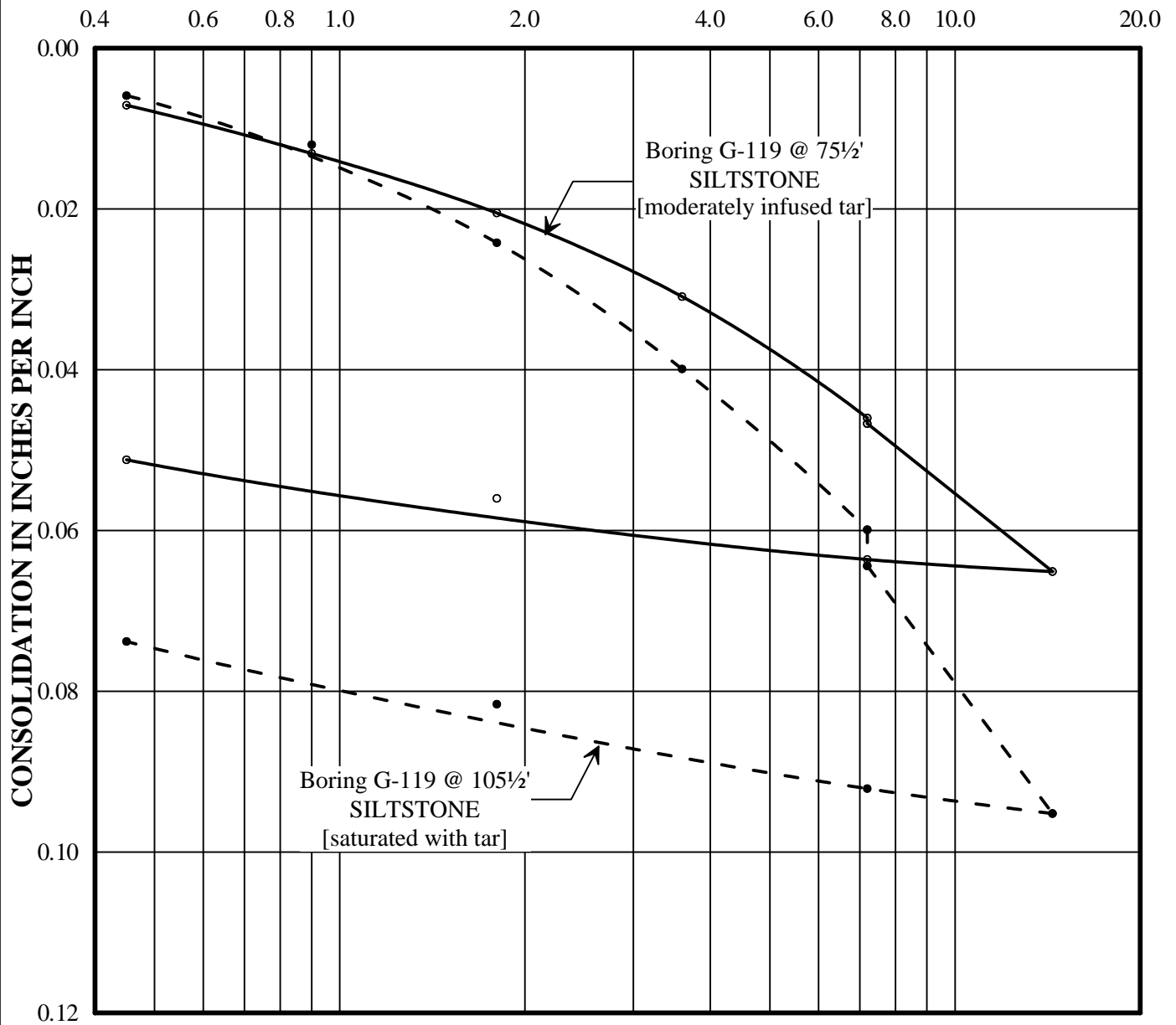
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 6/28/11
Checked/Date: LT 9/13/11

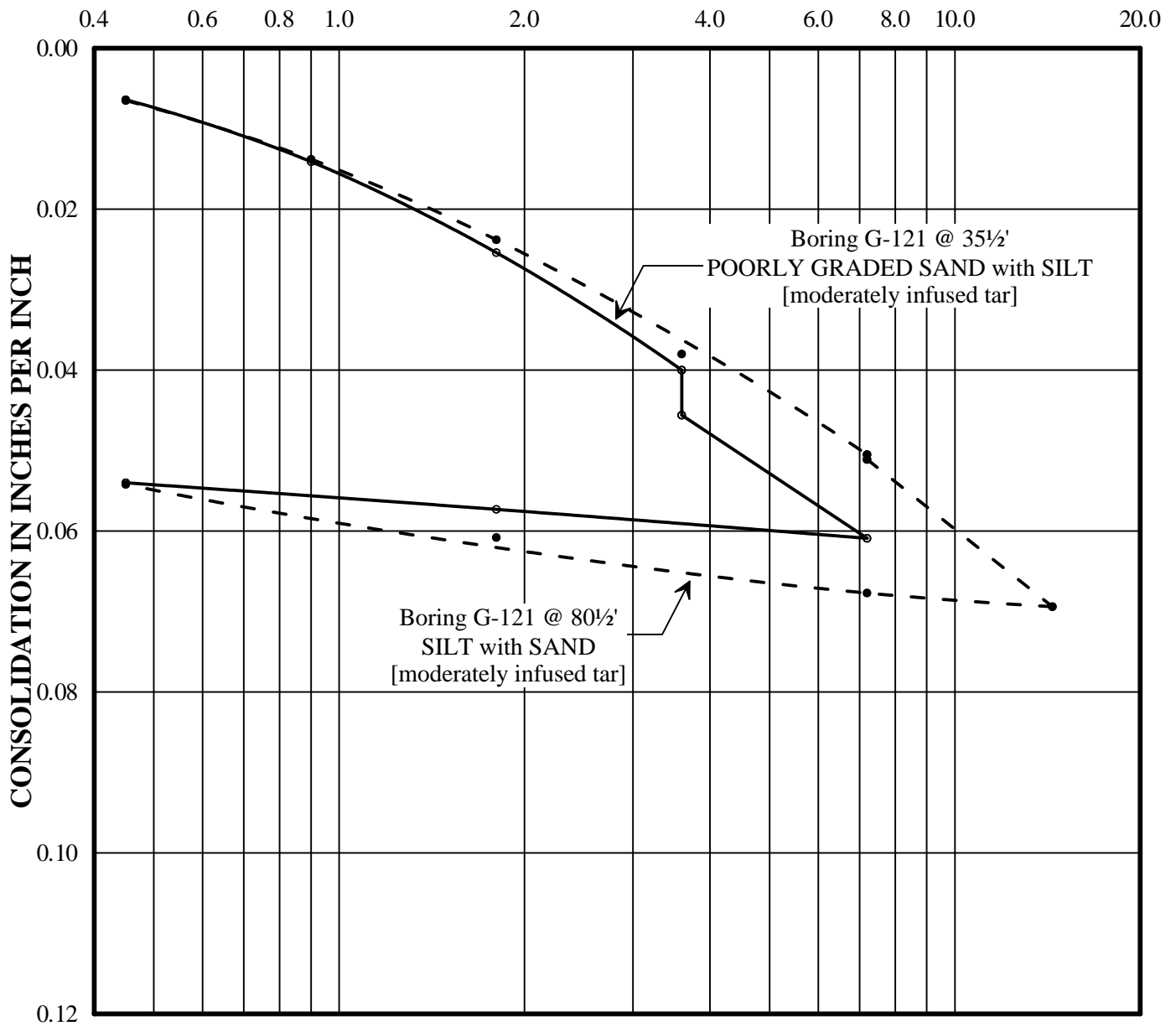
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/25/11
 Checked/Date: LT 9/12/11

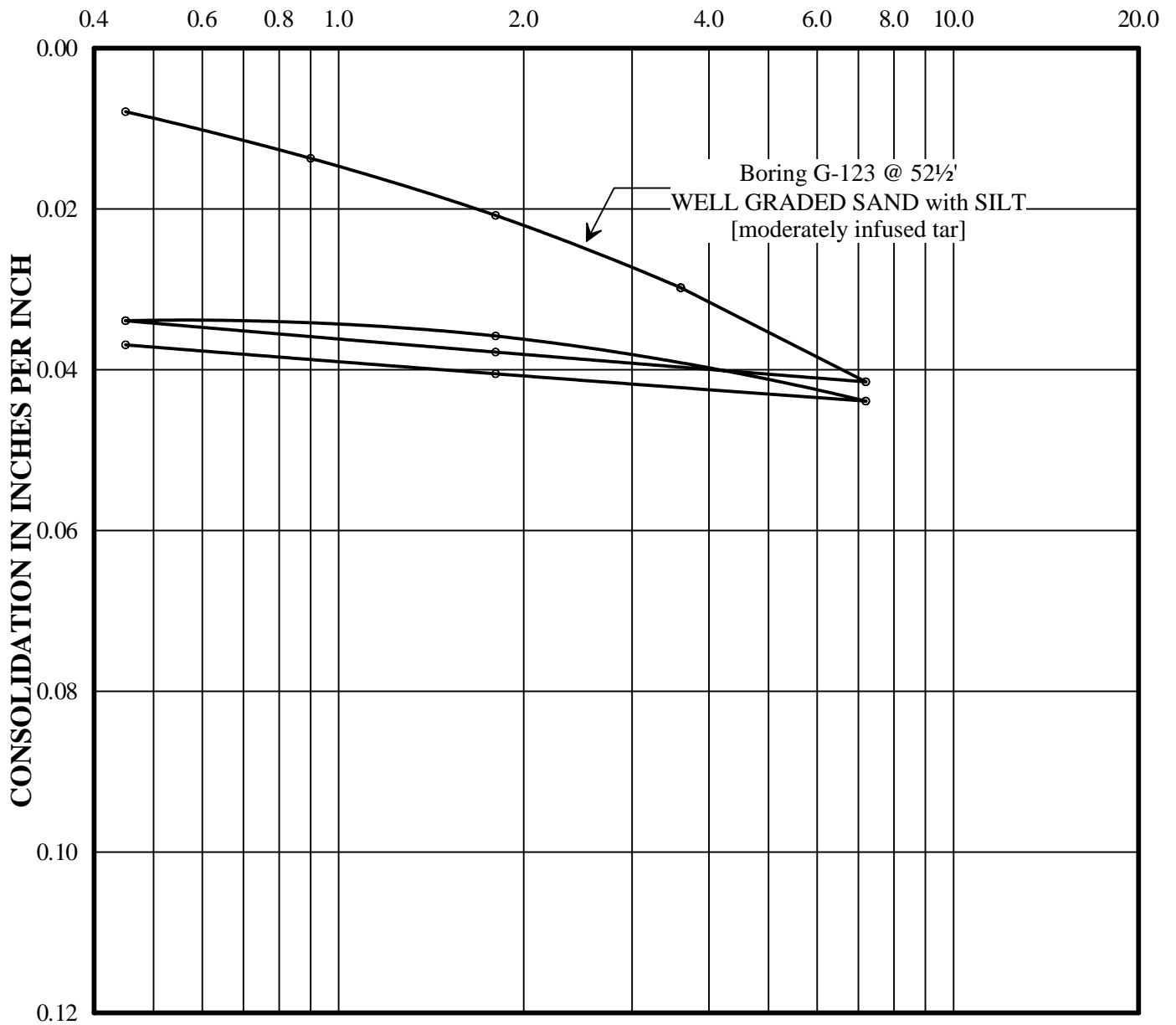
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 35 1/2' and 80 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH 9/12/11
 Checked/Date: LT 9/15/11

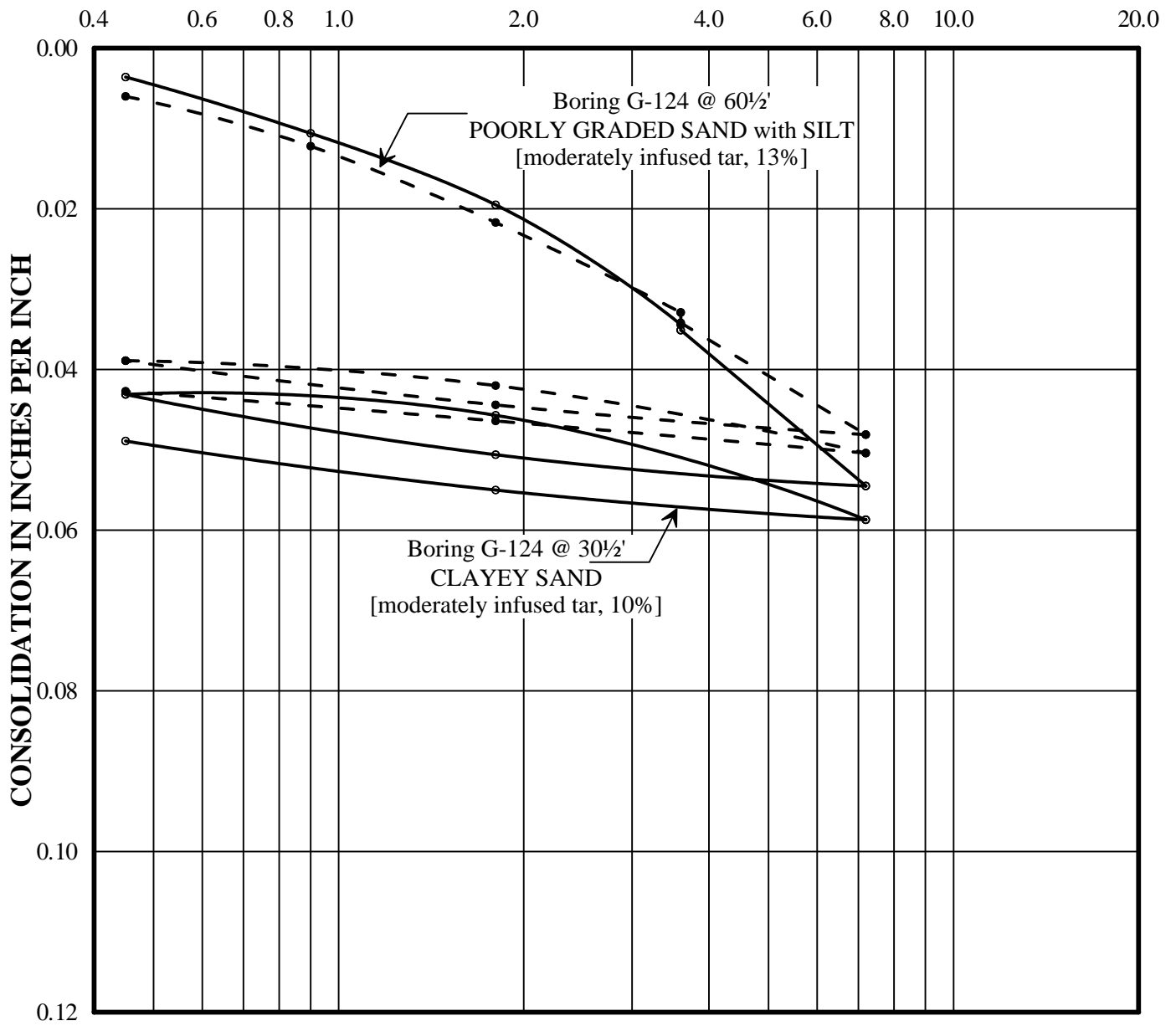
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 6/28/11
 Checked/Date: LT 9/15/11

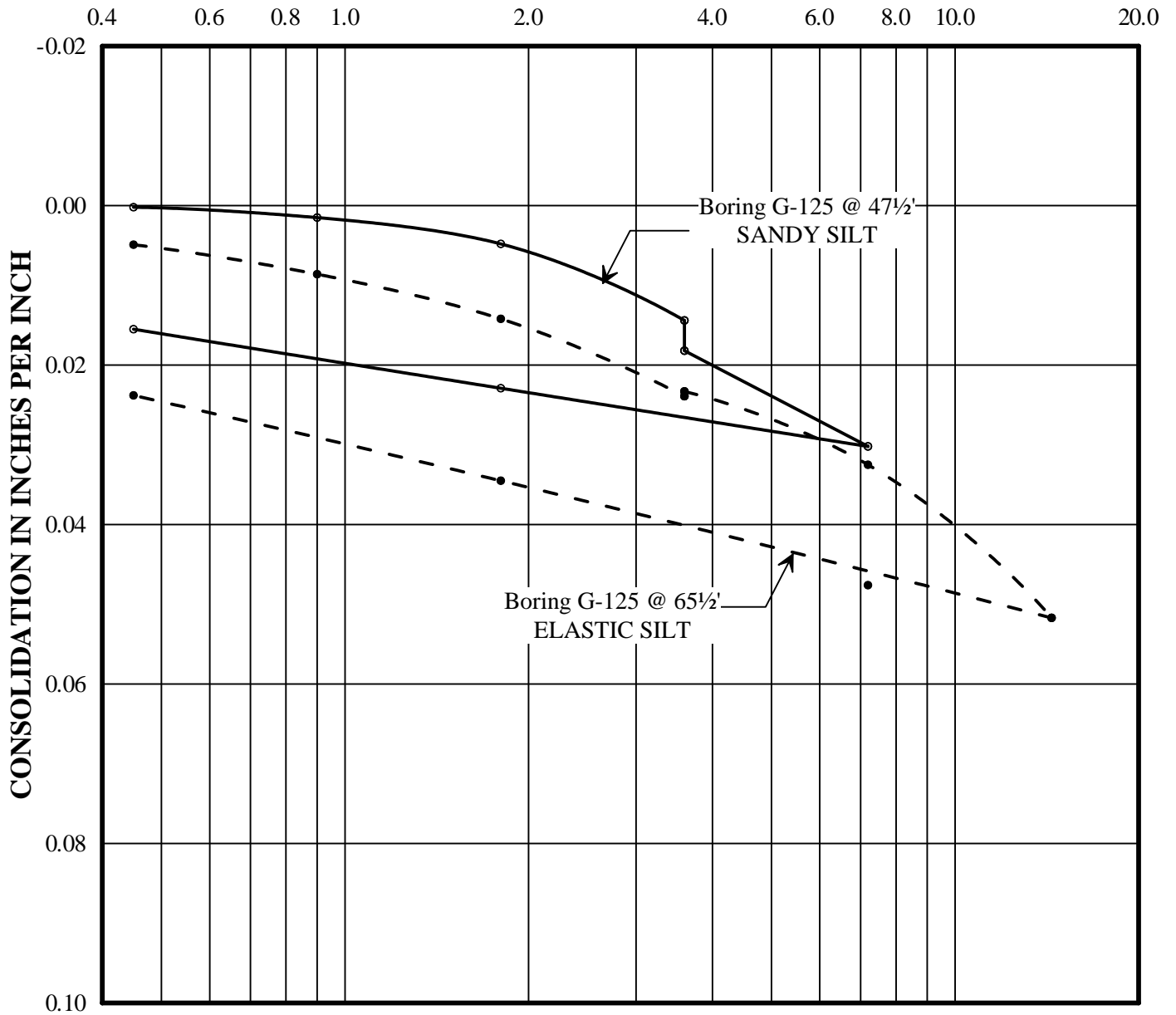
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 6/28/11
 Checked/Date: LT 9/15/11

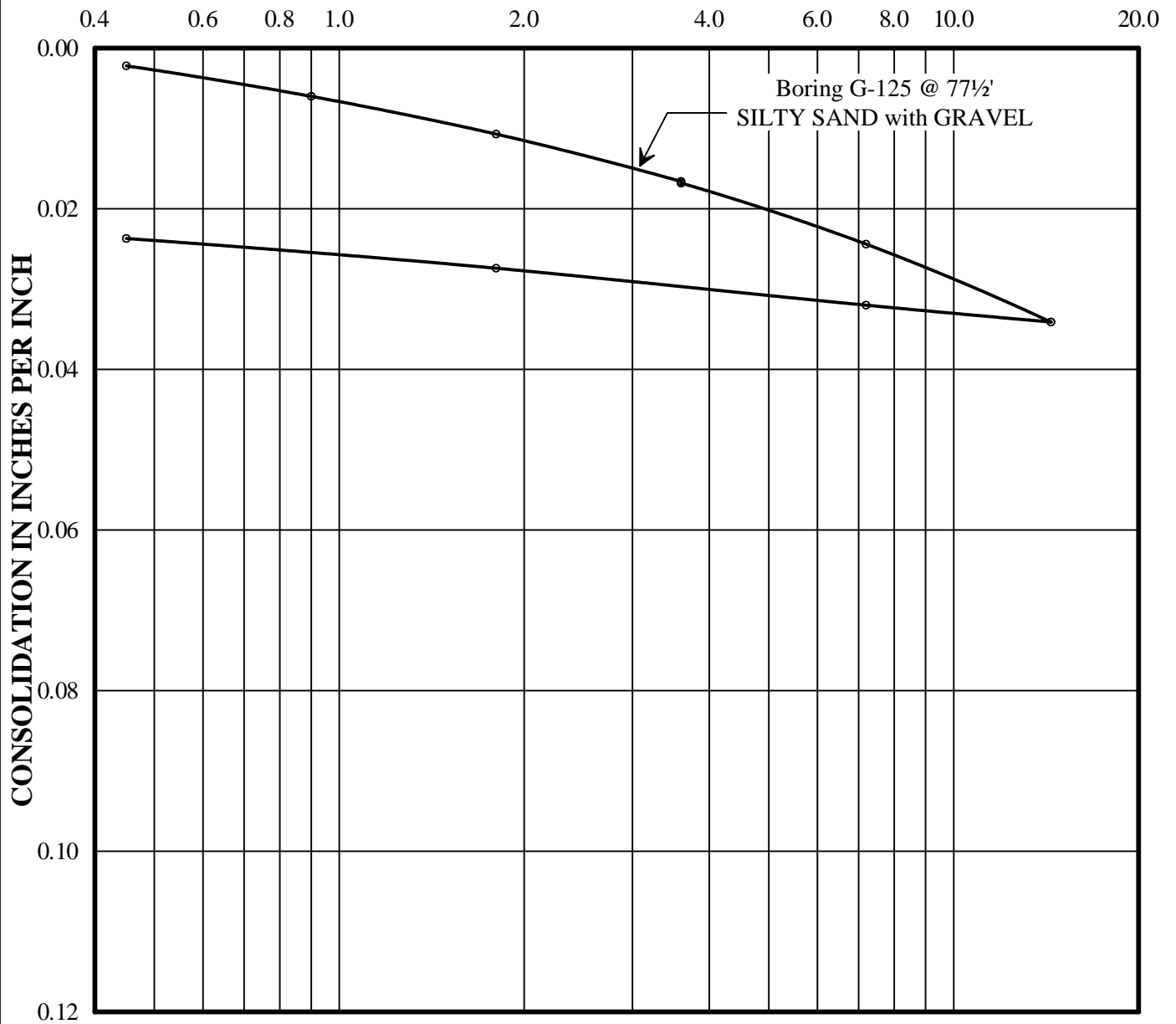
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/15/11

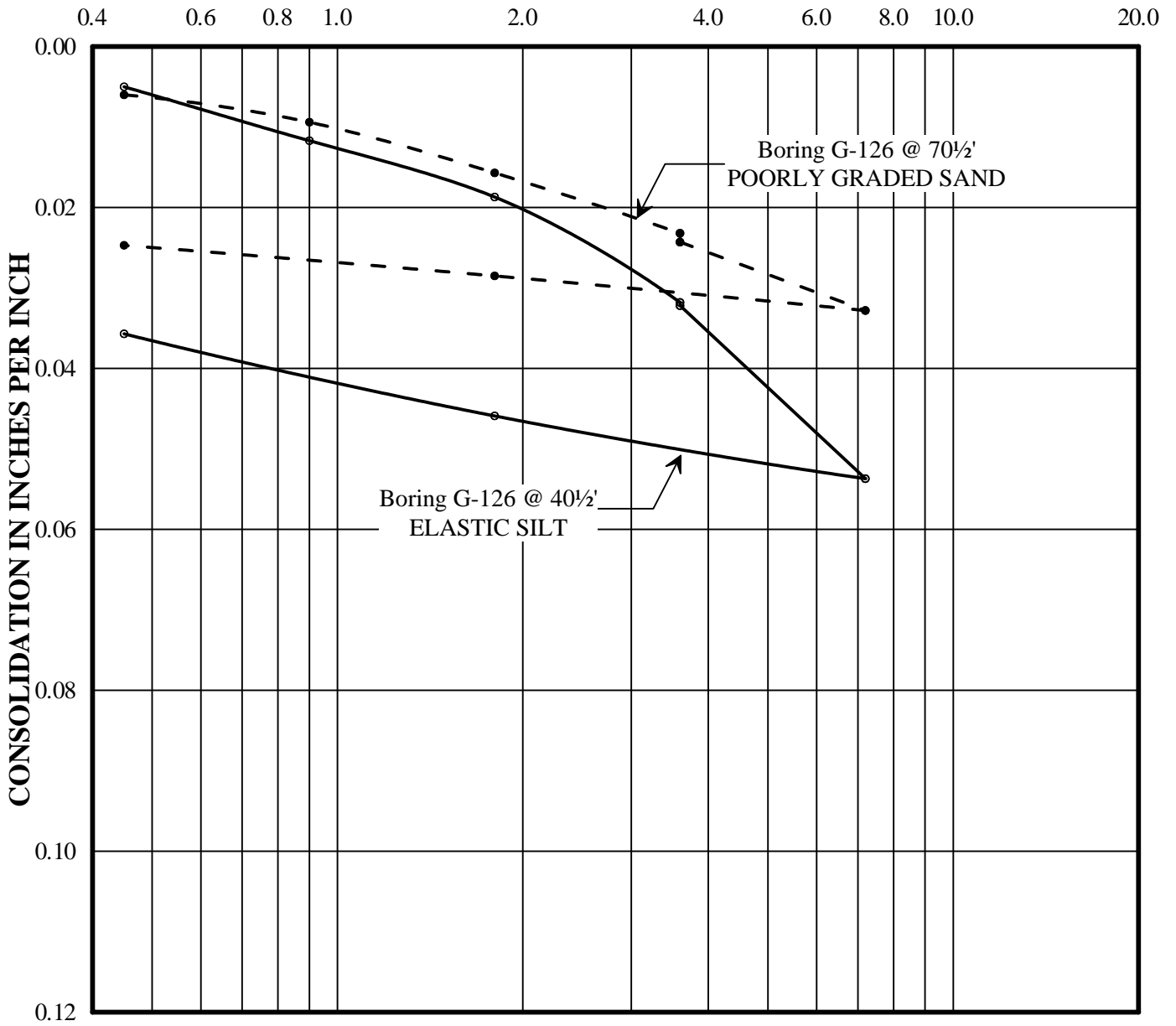
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/15/11

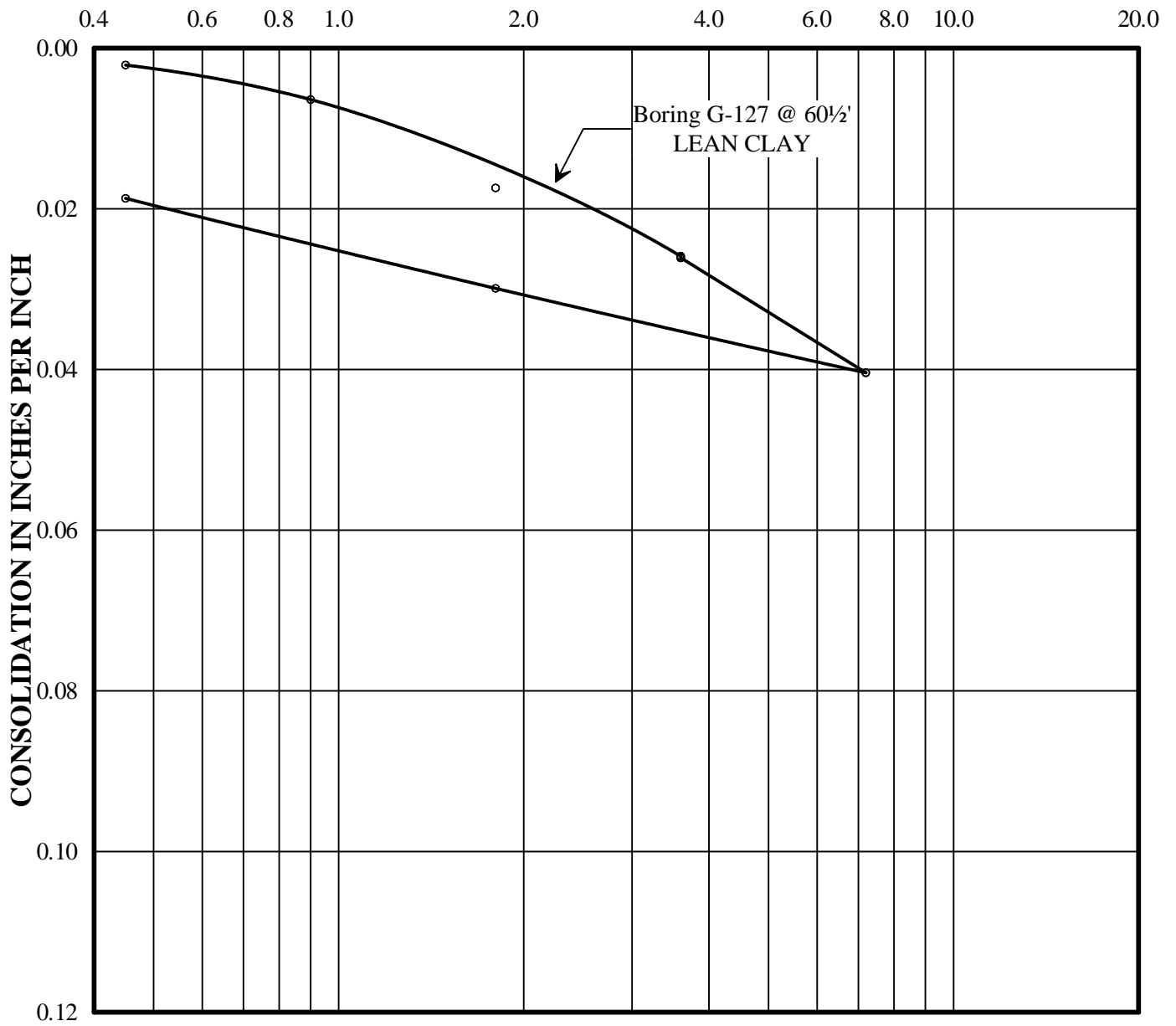
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 5/15/11
 Checked/Date: NH 5/20/11

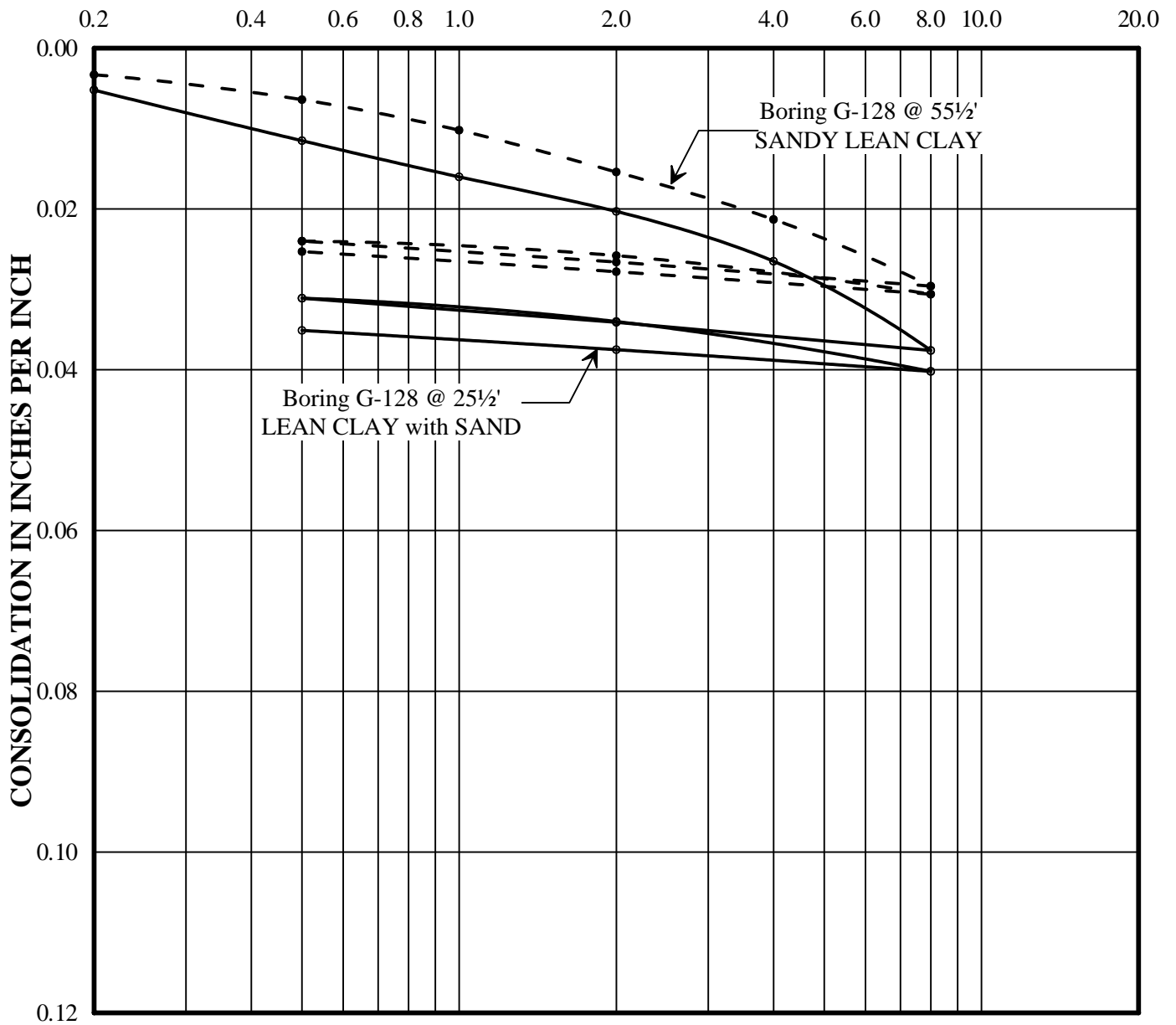
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/25/11
Checked/Date: LT 8/8/11

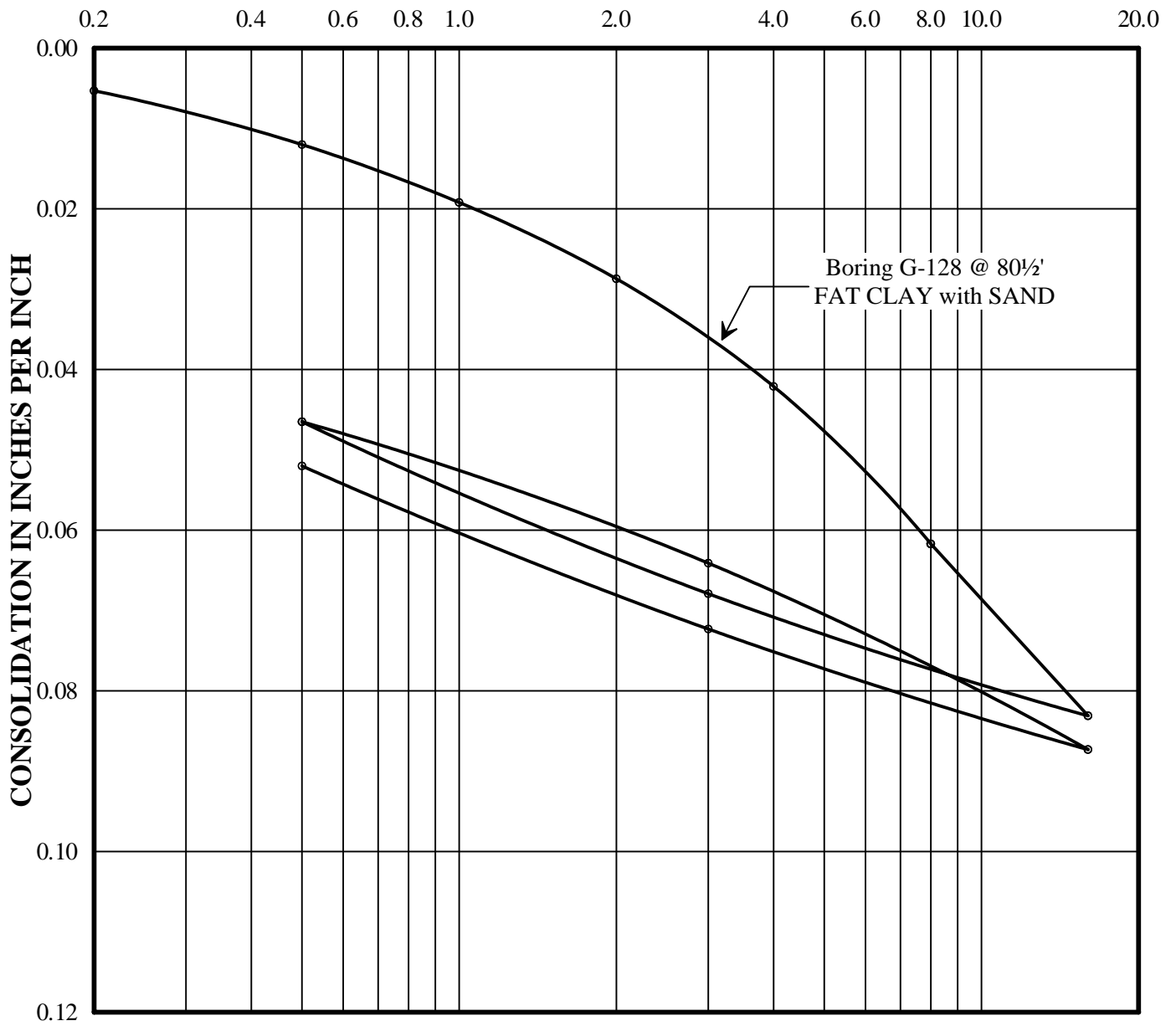
LOAD IN KIPS PER SQUARE FOOT



Note: No water added to samples.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/26/11

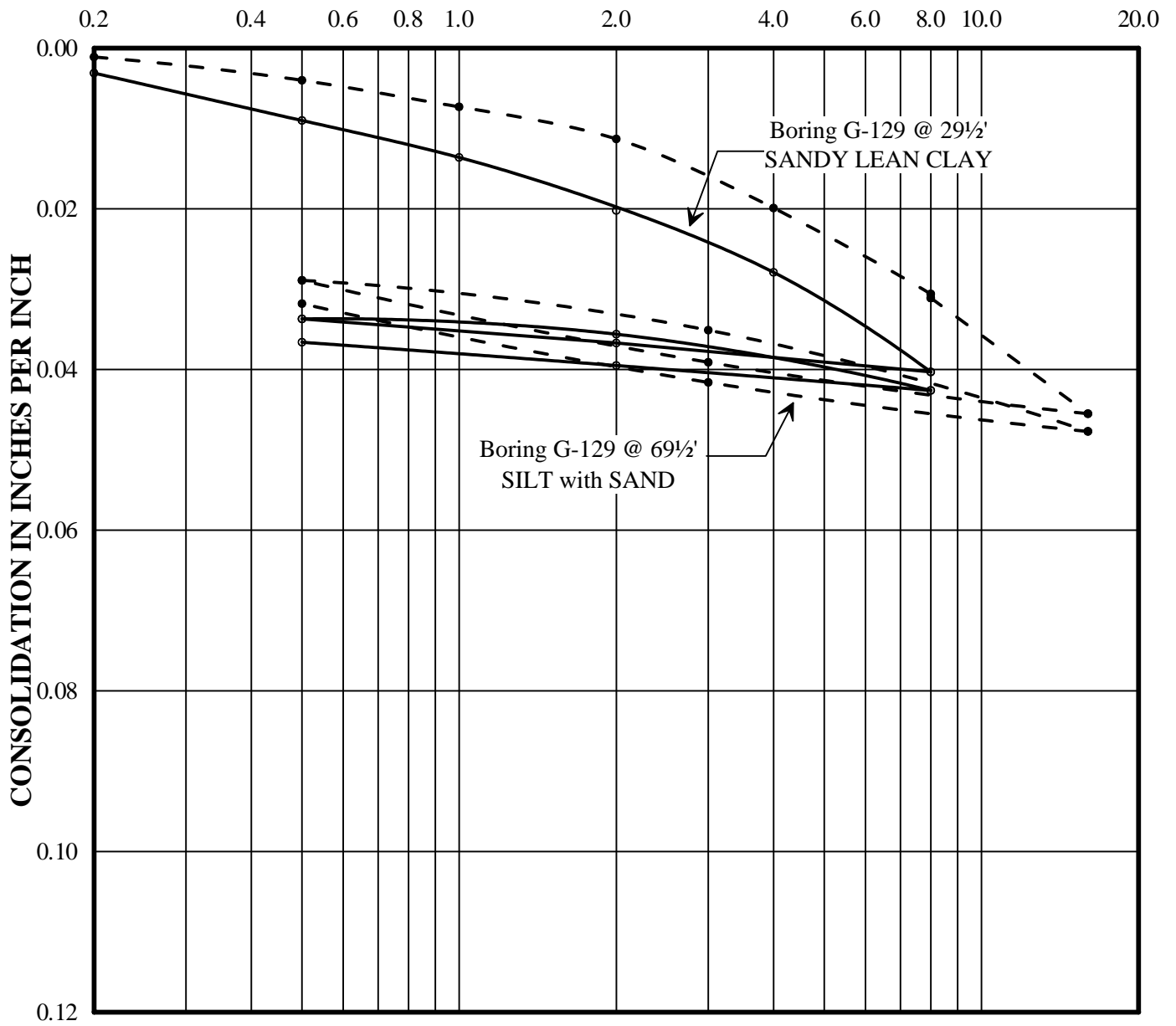
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/23/11

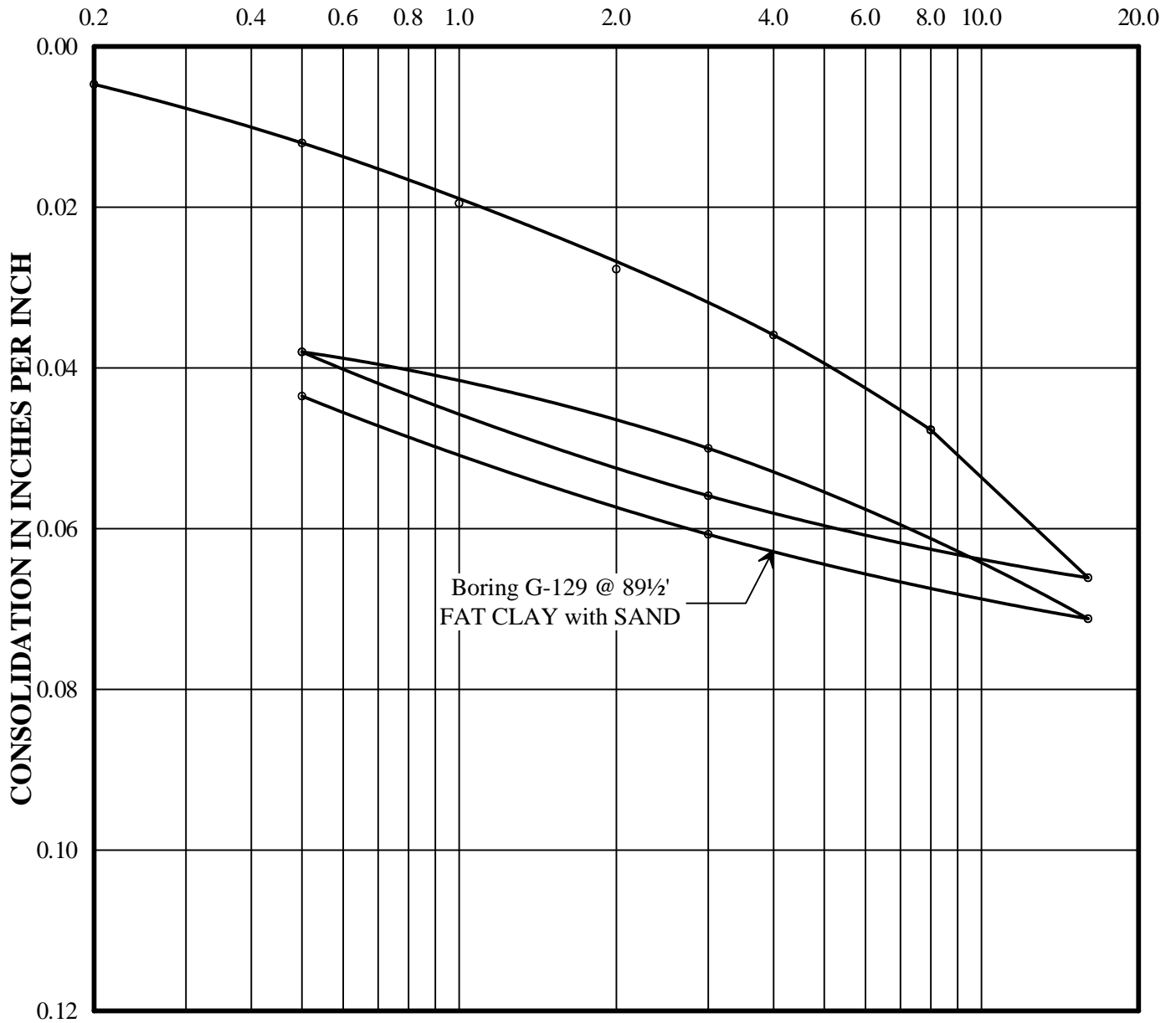
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 69½' after consolidation under a load of 8.0 kips per square foot.
No water added to sample at 29½'.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/26/11

LOAD IN KIPS PER SQUARE FOOT

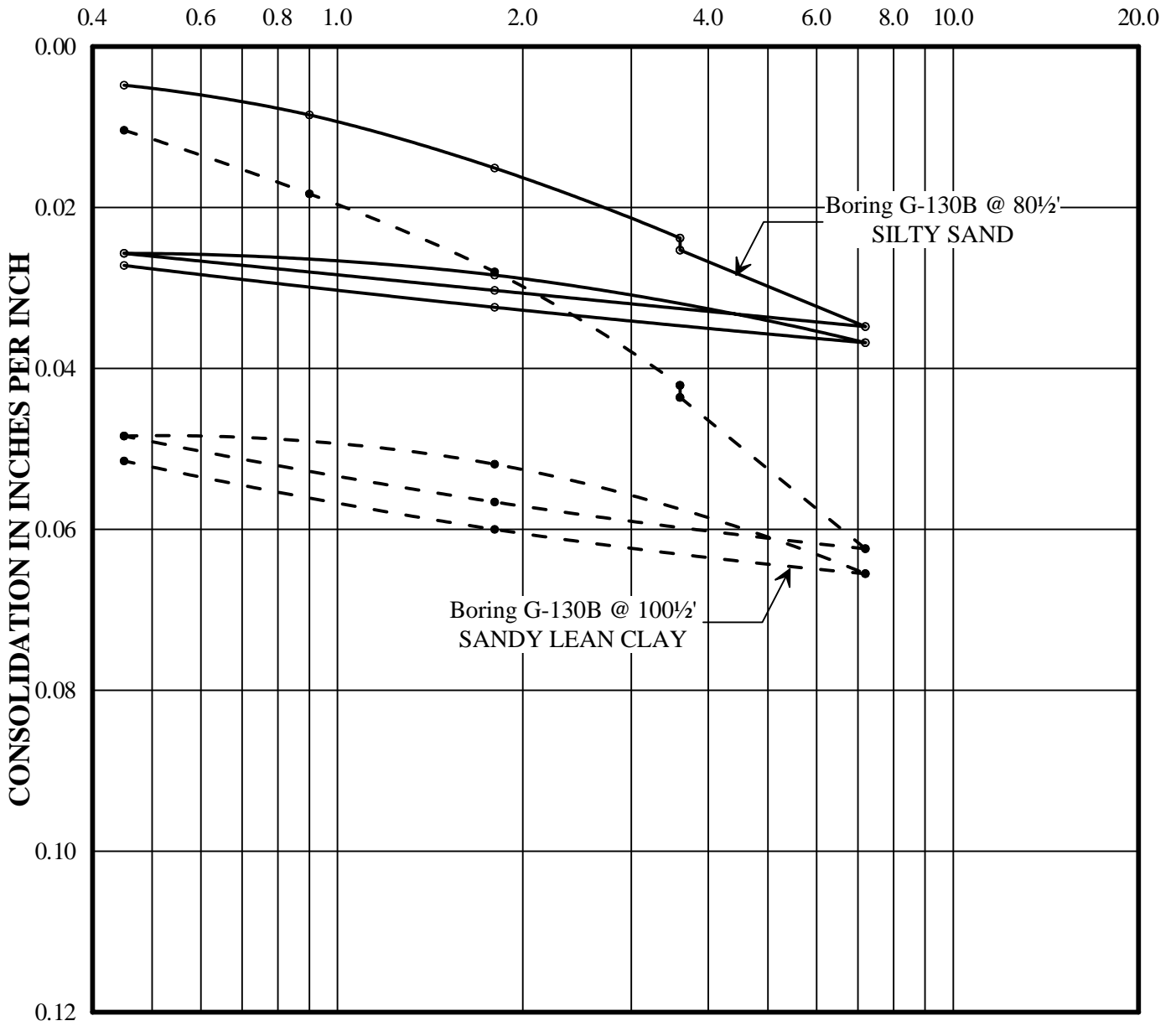


Boring G-129 @ 89½'
FAT CLAY with SAND

Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/26/11

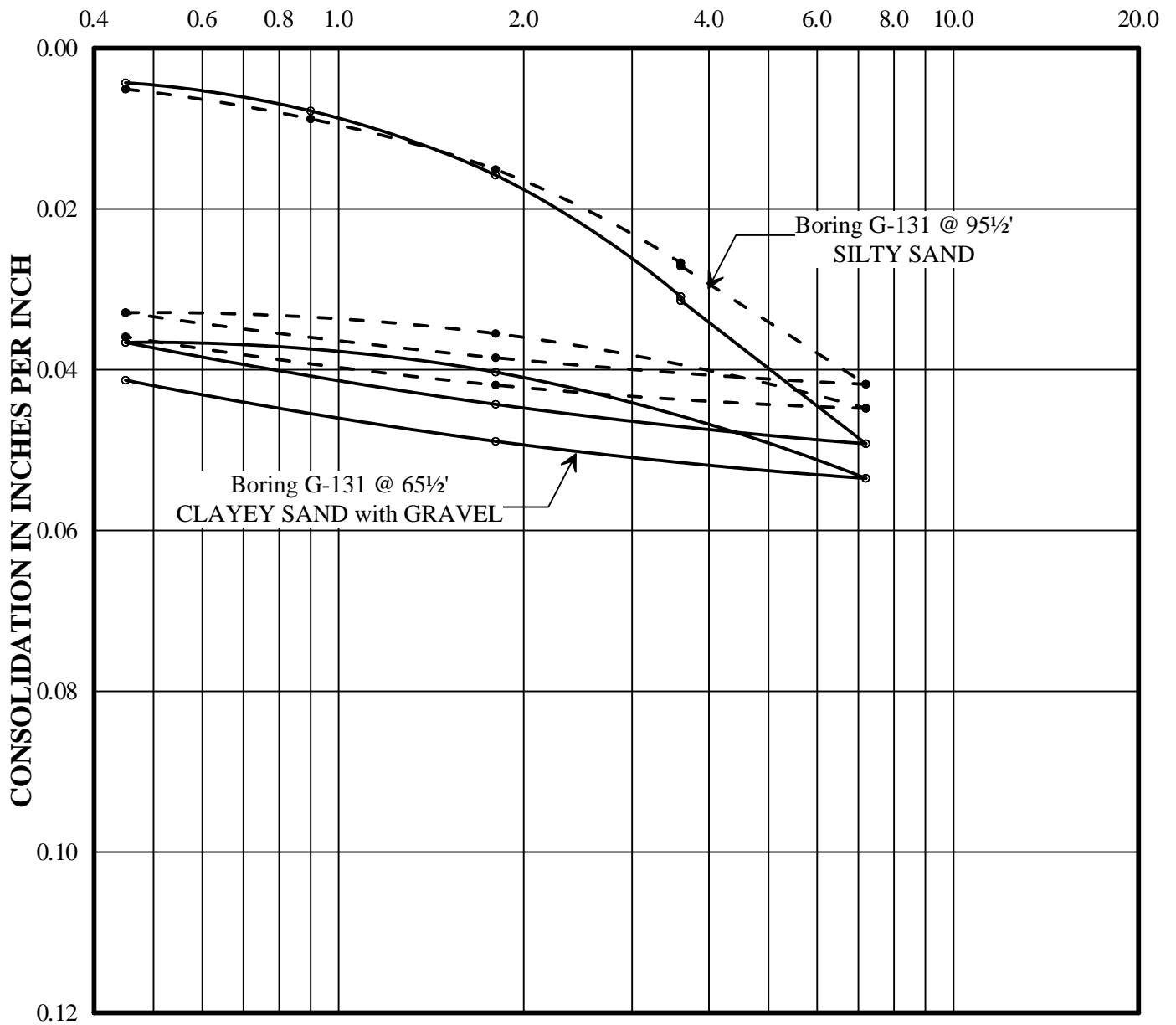
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 6/28/11
Checked/Date: LT 9/15/11

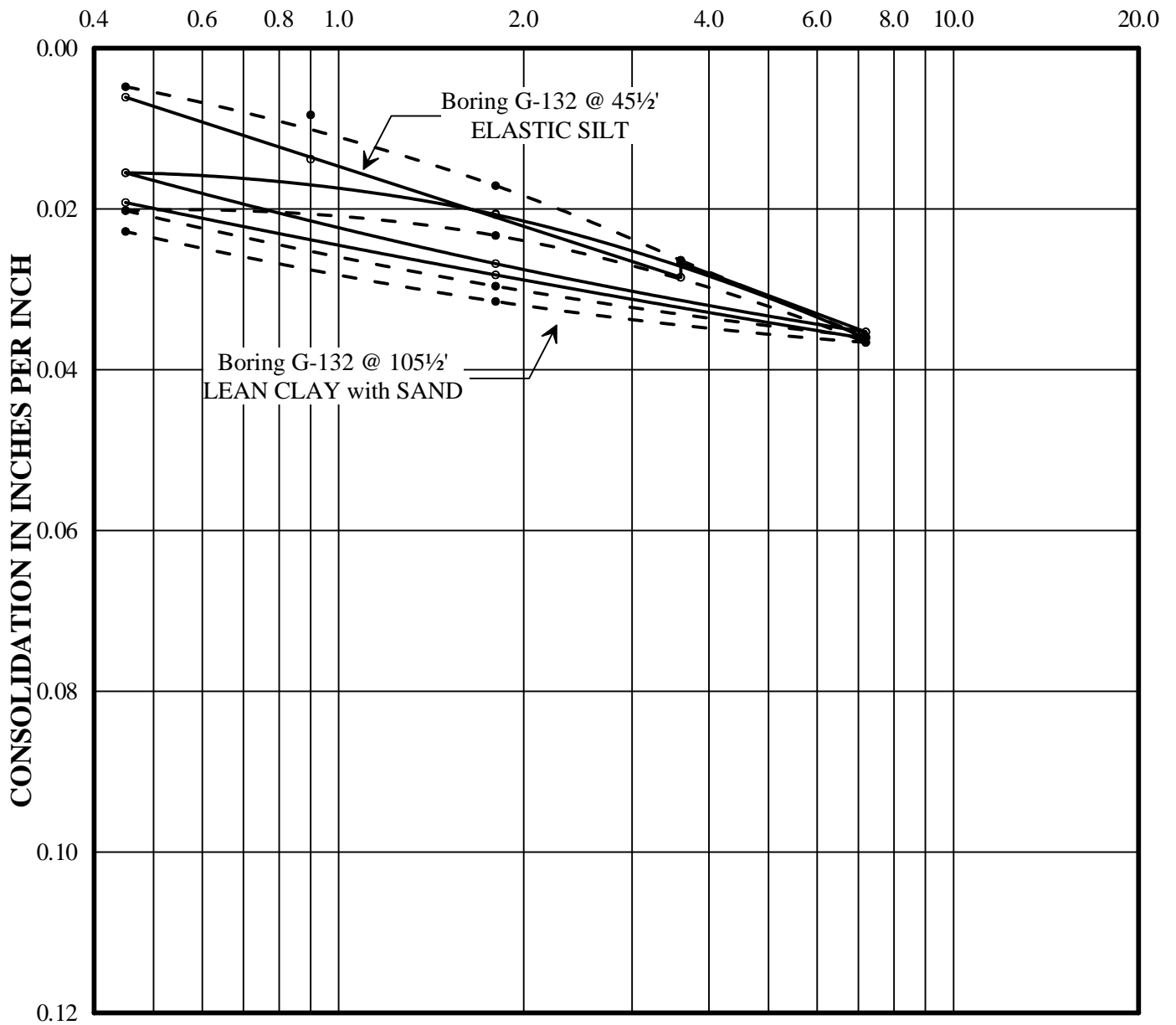
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 6/28/11
 Checked/Date: LT 9/15/11

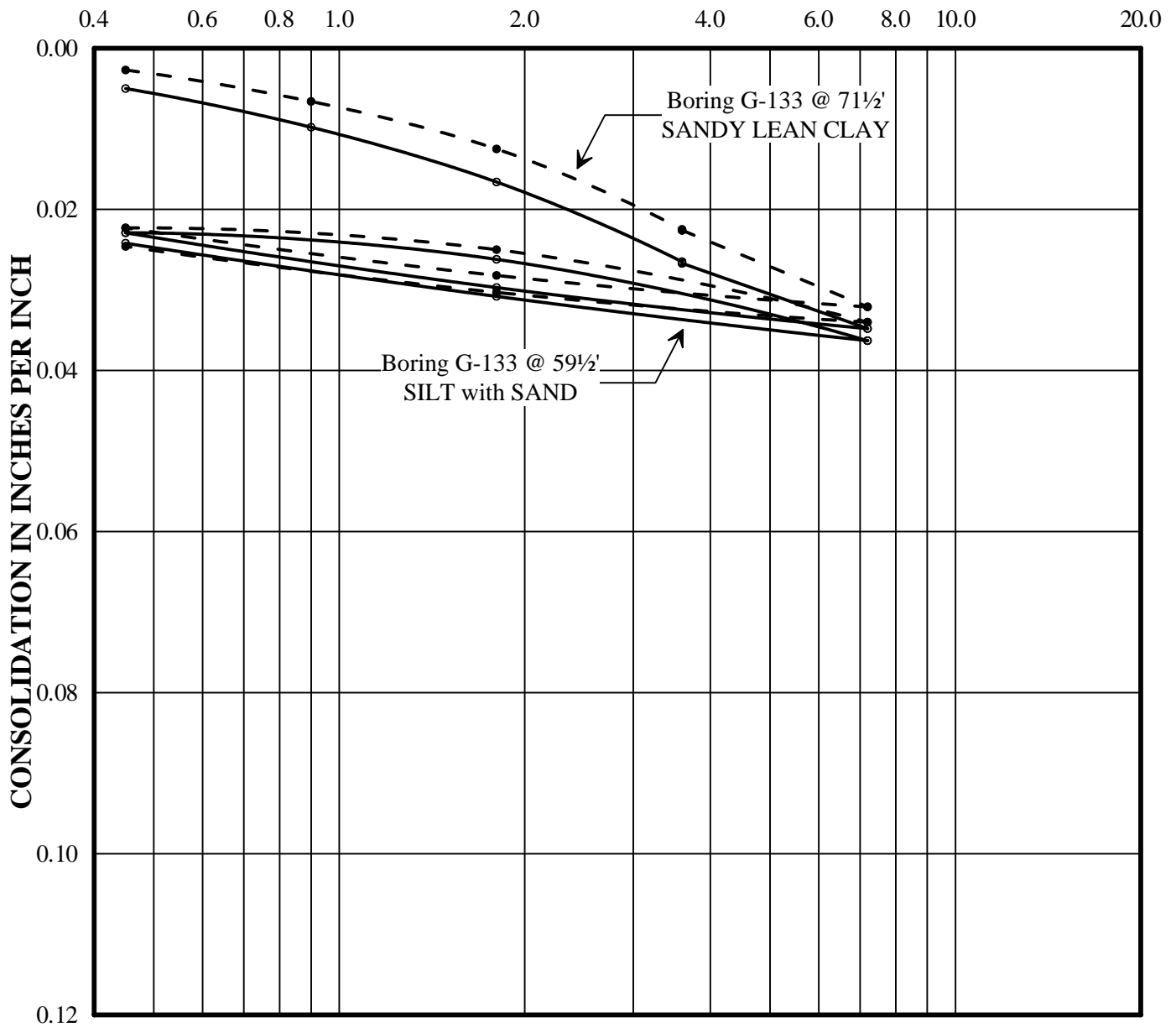
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/26/11
Checked/Date: LT 9/15/11

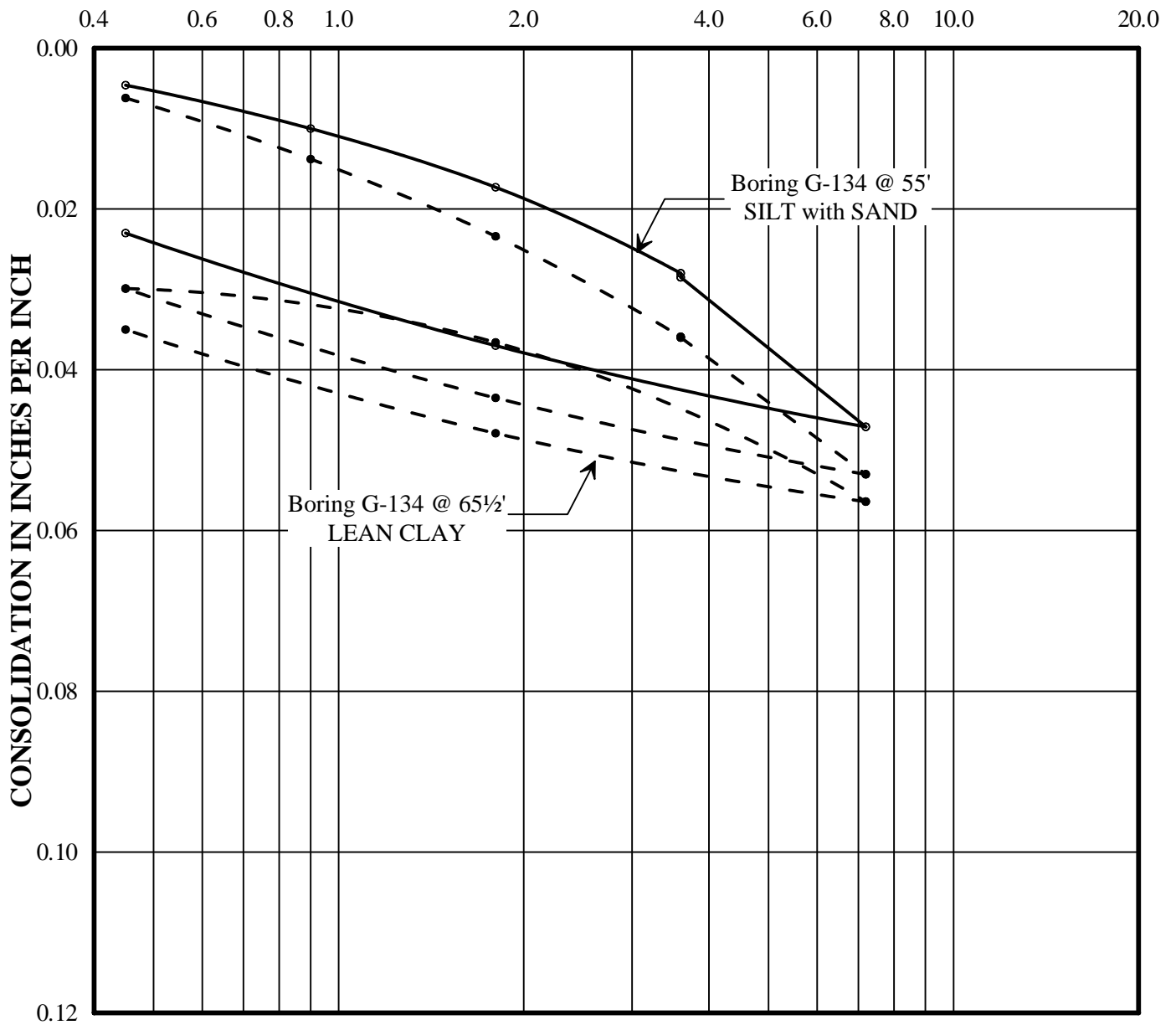
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 6/28/11
Checked/Date: LT 9/15/11

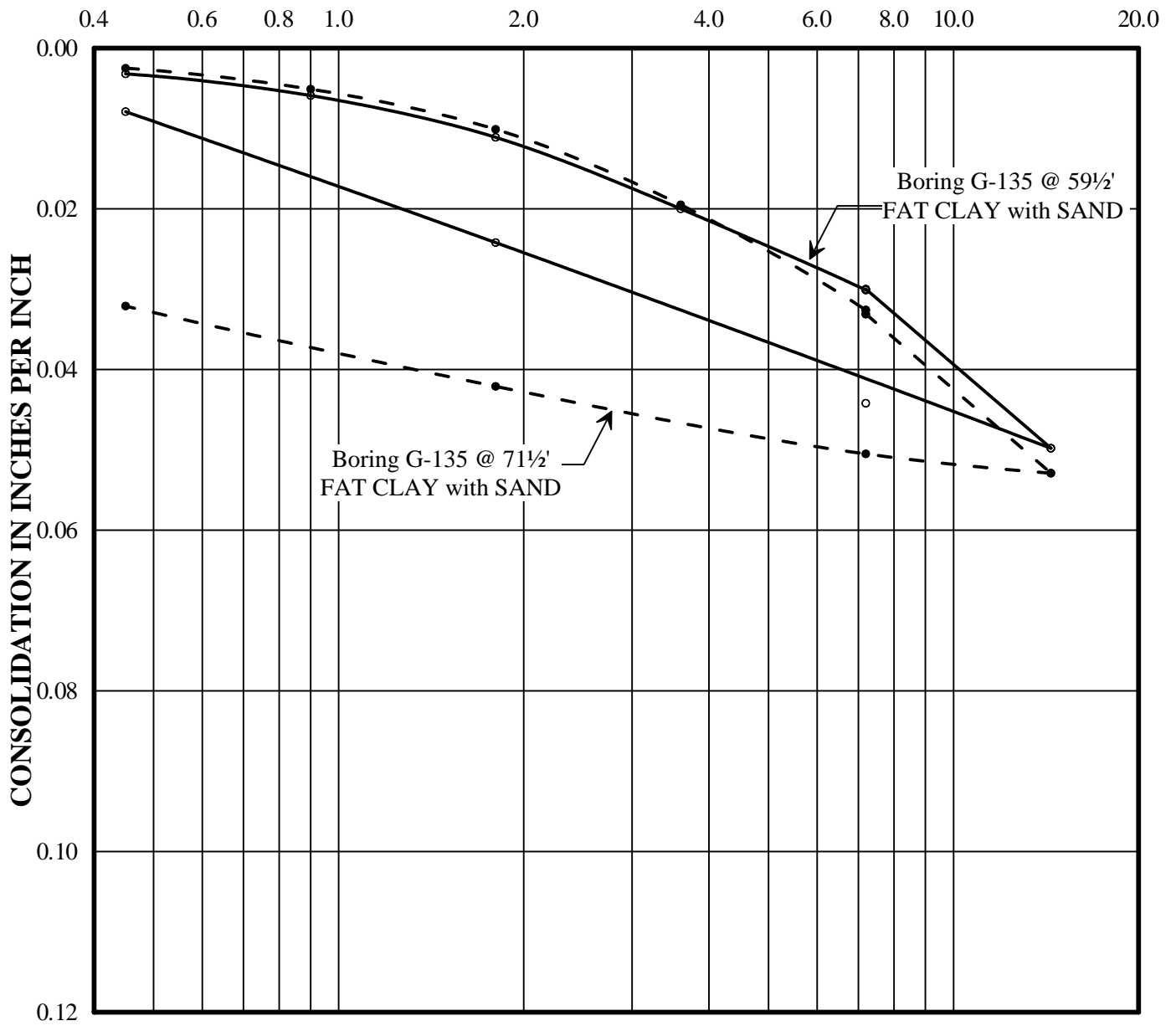
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 5/15/11
Checked/Date: NH 6/3/11

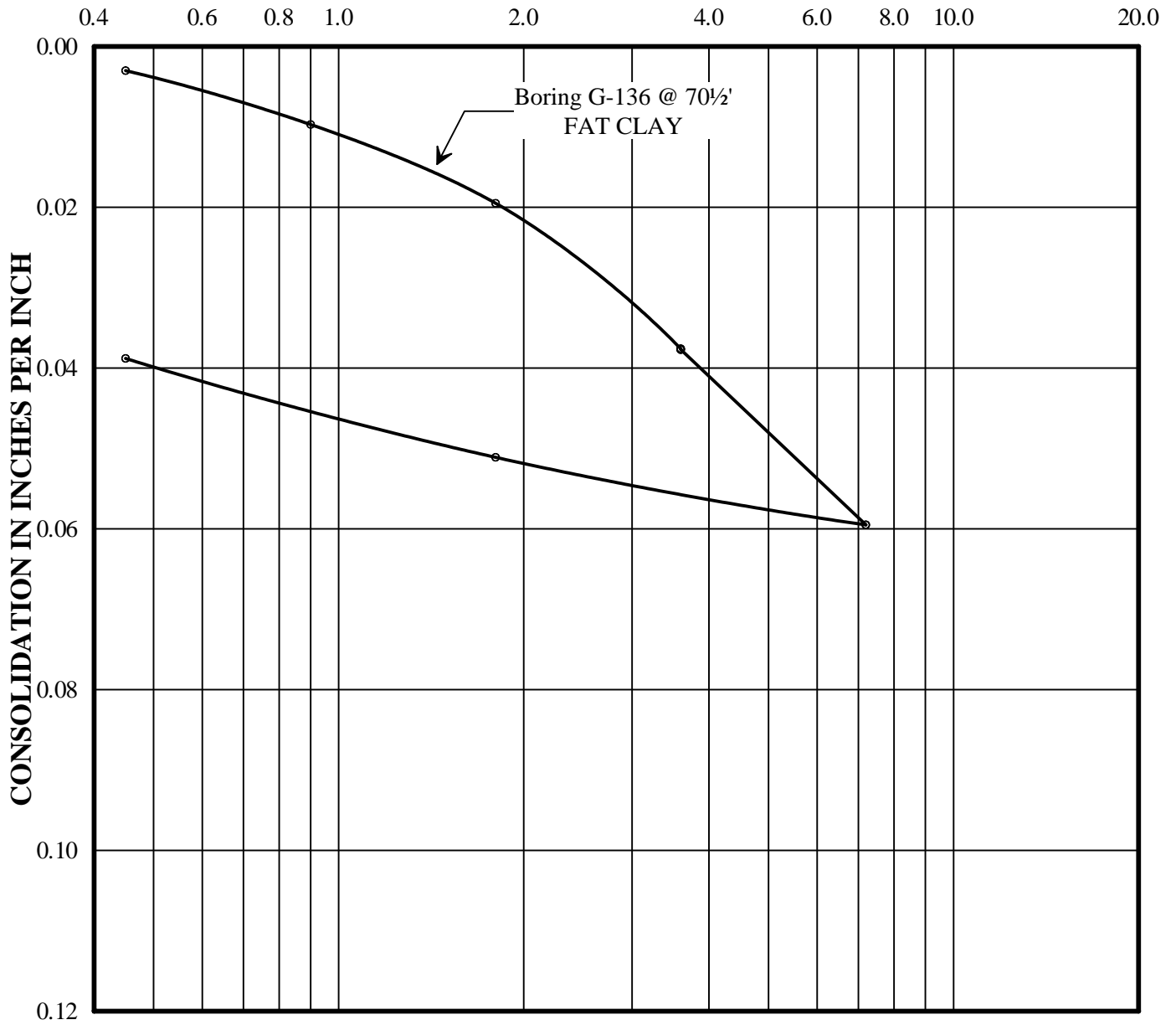
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/25/11
 Checked/Date: LT 9/15/11

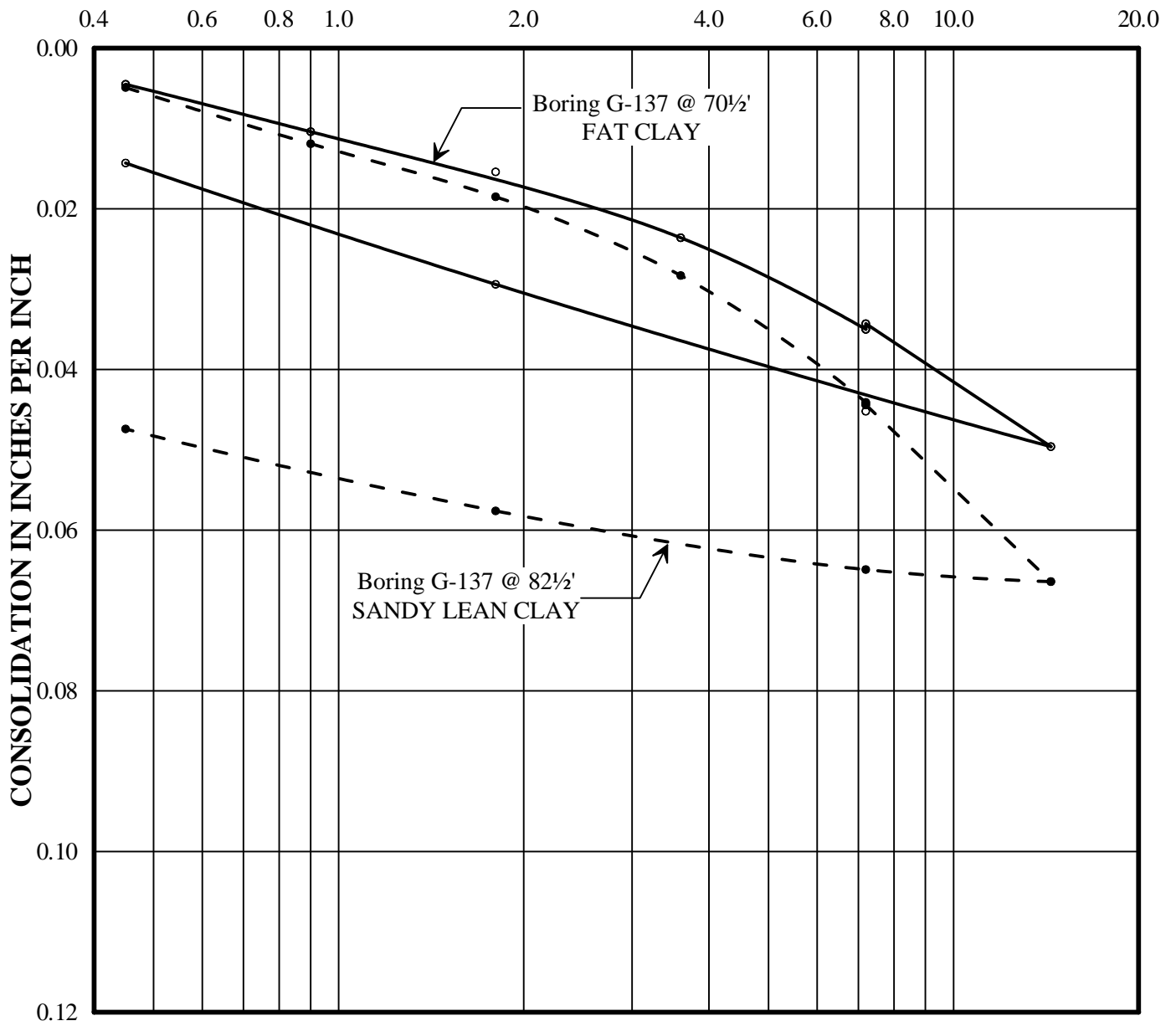
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/26/11
Checked/Date: LT 9/12/11

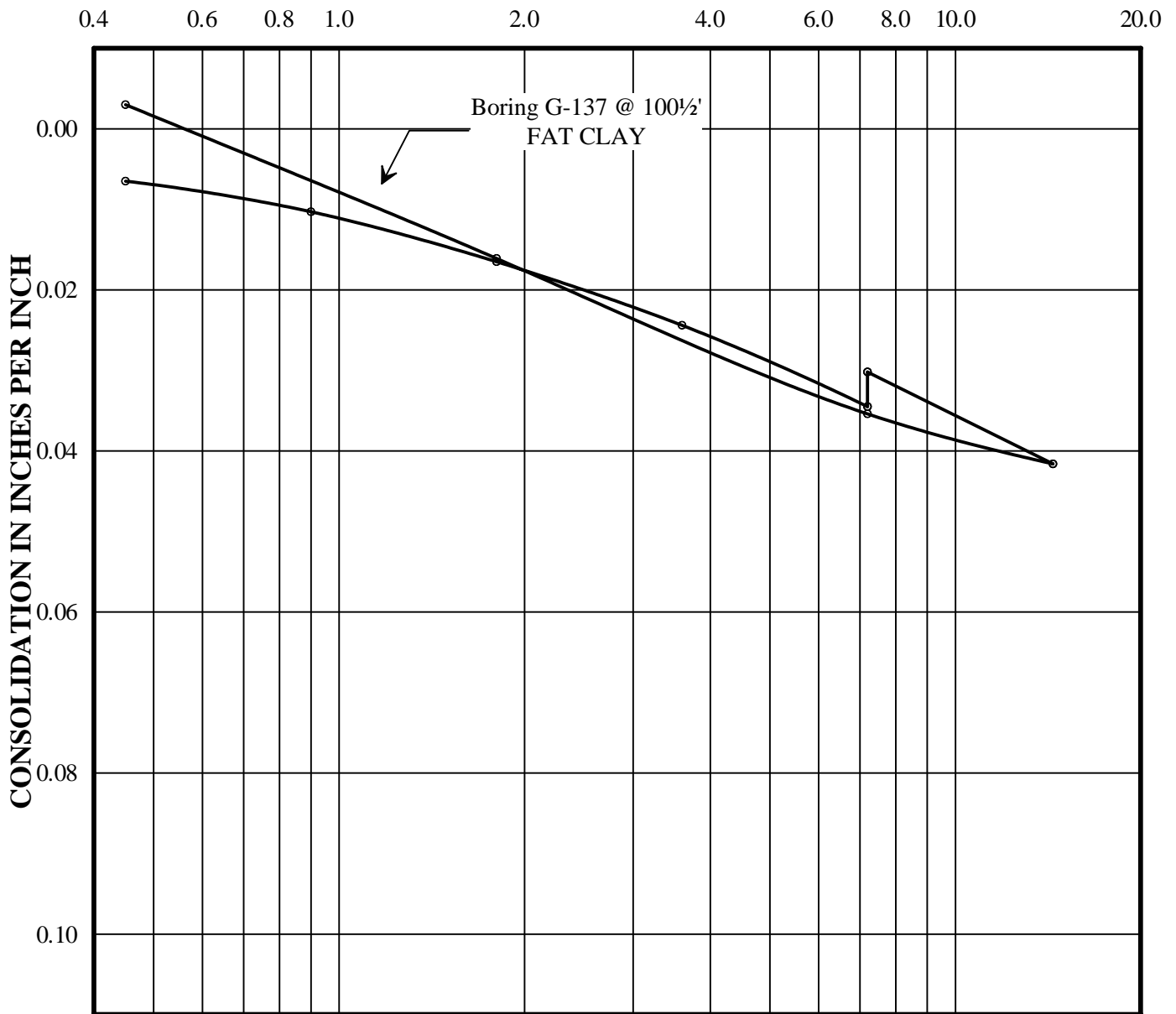
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/15/11
 Checked/Date: LT 9/12/11

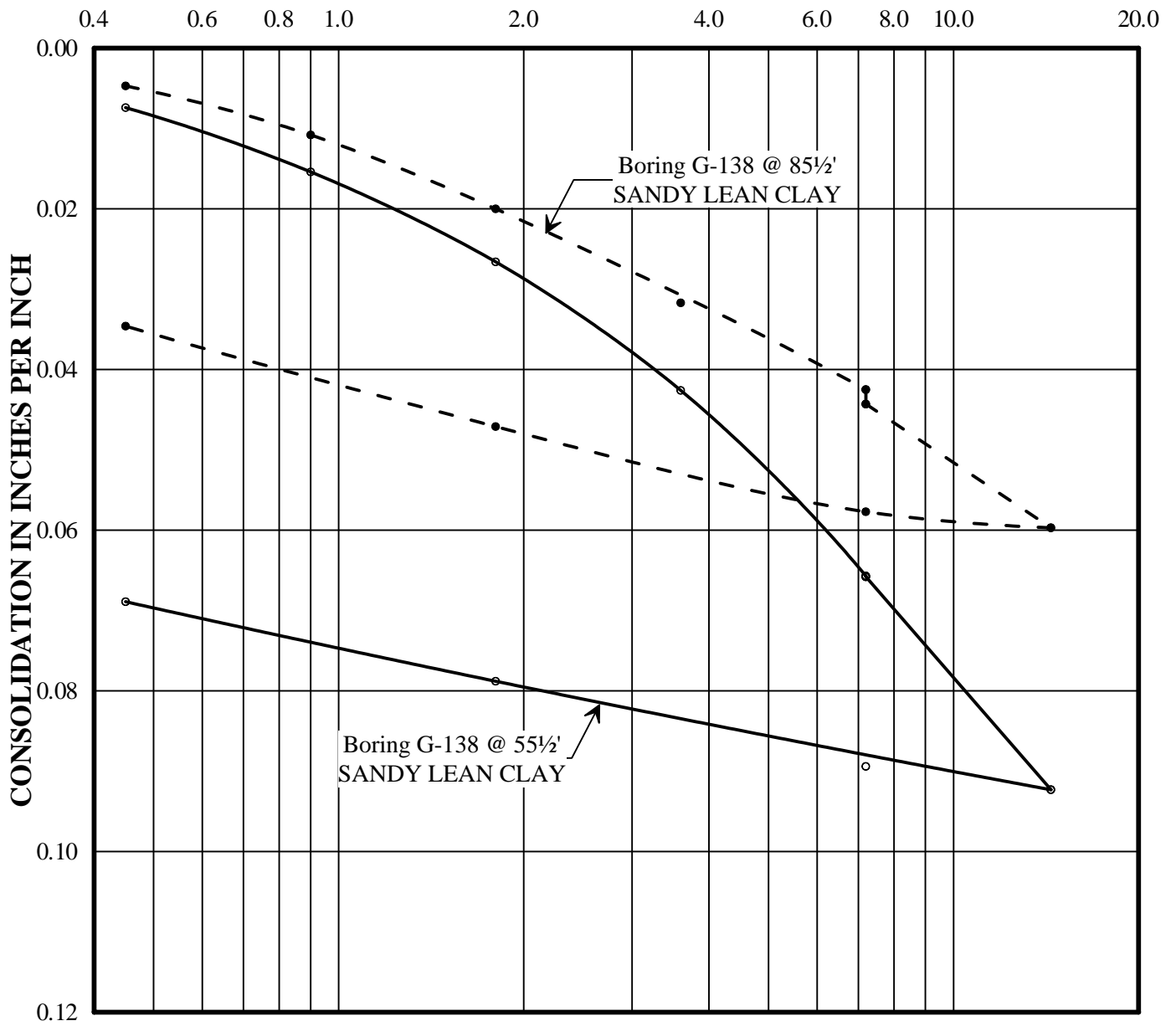
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/13/11

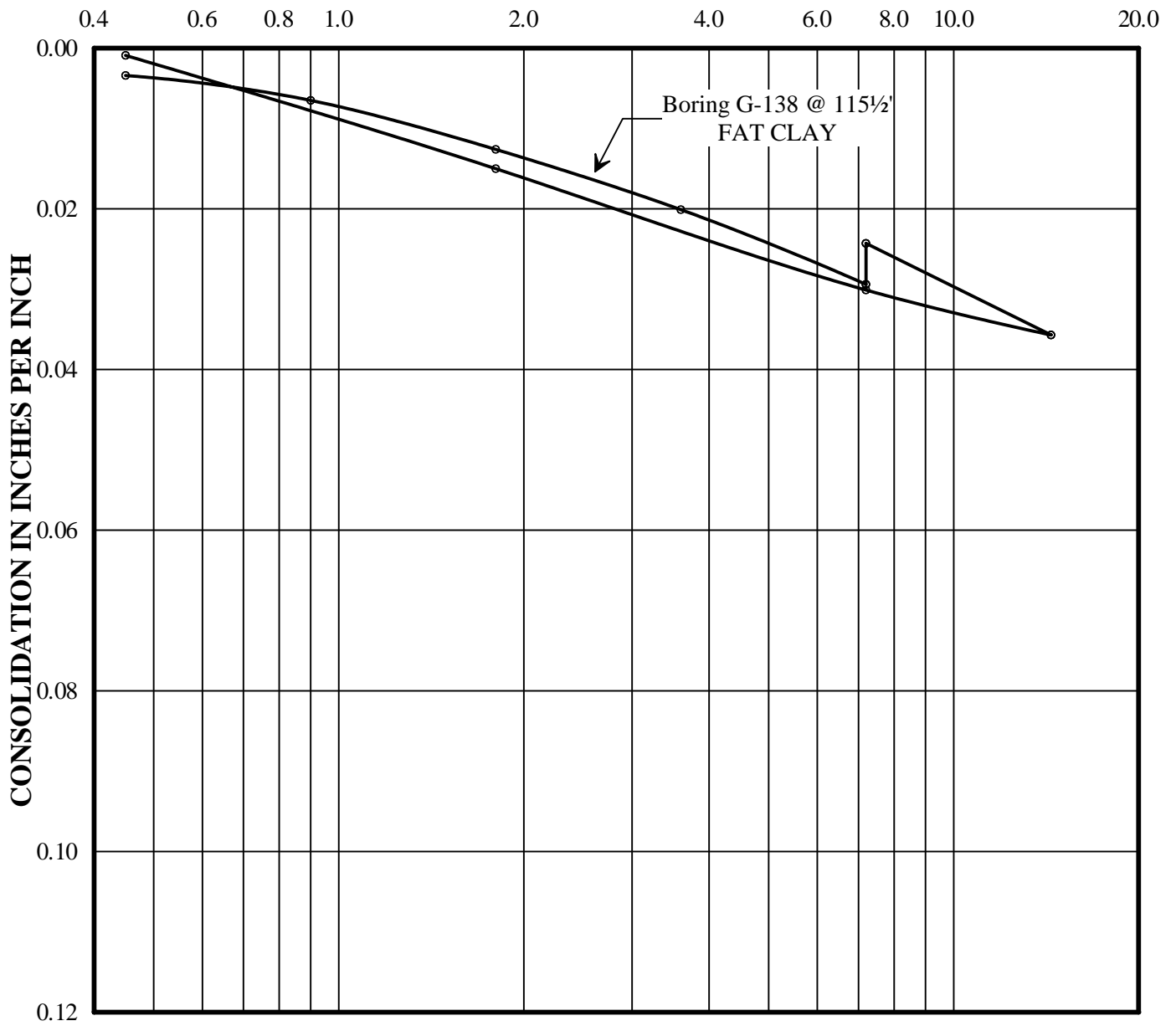
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/26/11
 Checked/Date: LT 9/15/11

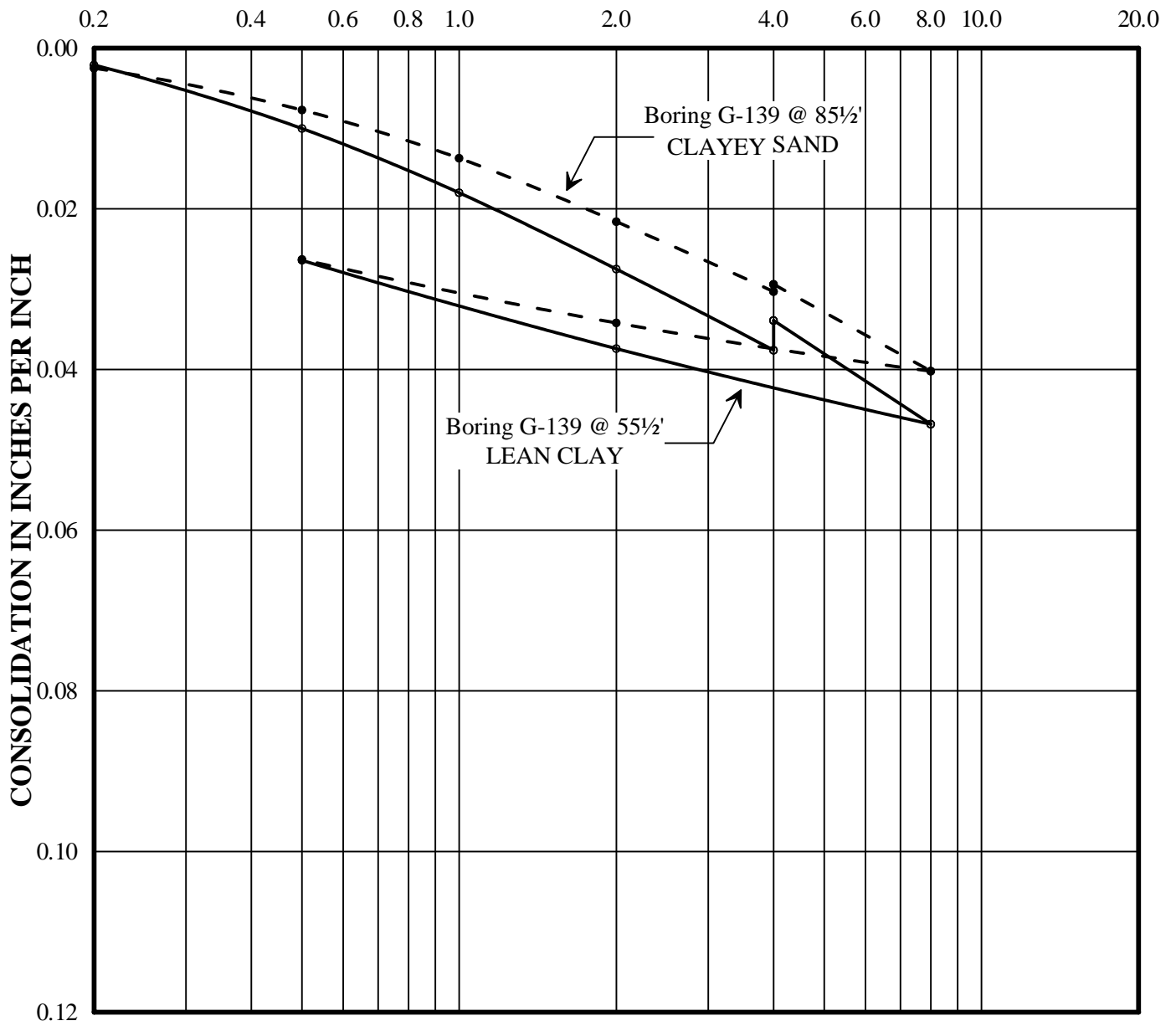
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/26/11
 Checked/Date: LT 9/15/11

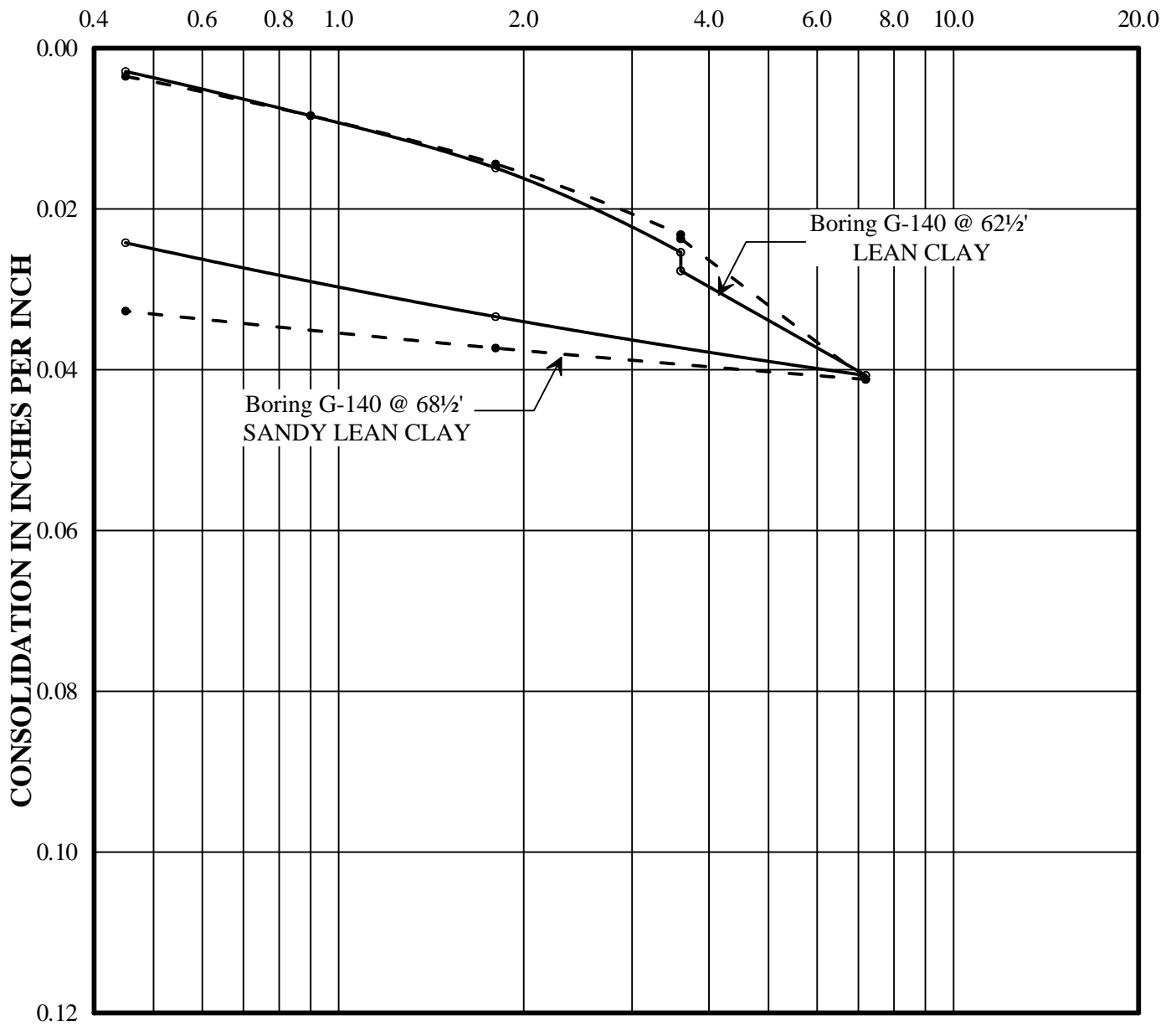
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 4.0 kips per square foot.

Prepared/Date: AH 9/20/11
 Checked/Date: LT 9/26/11

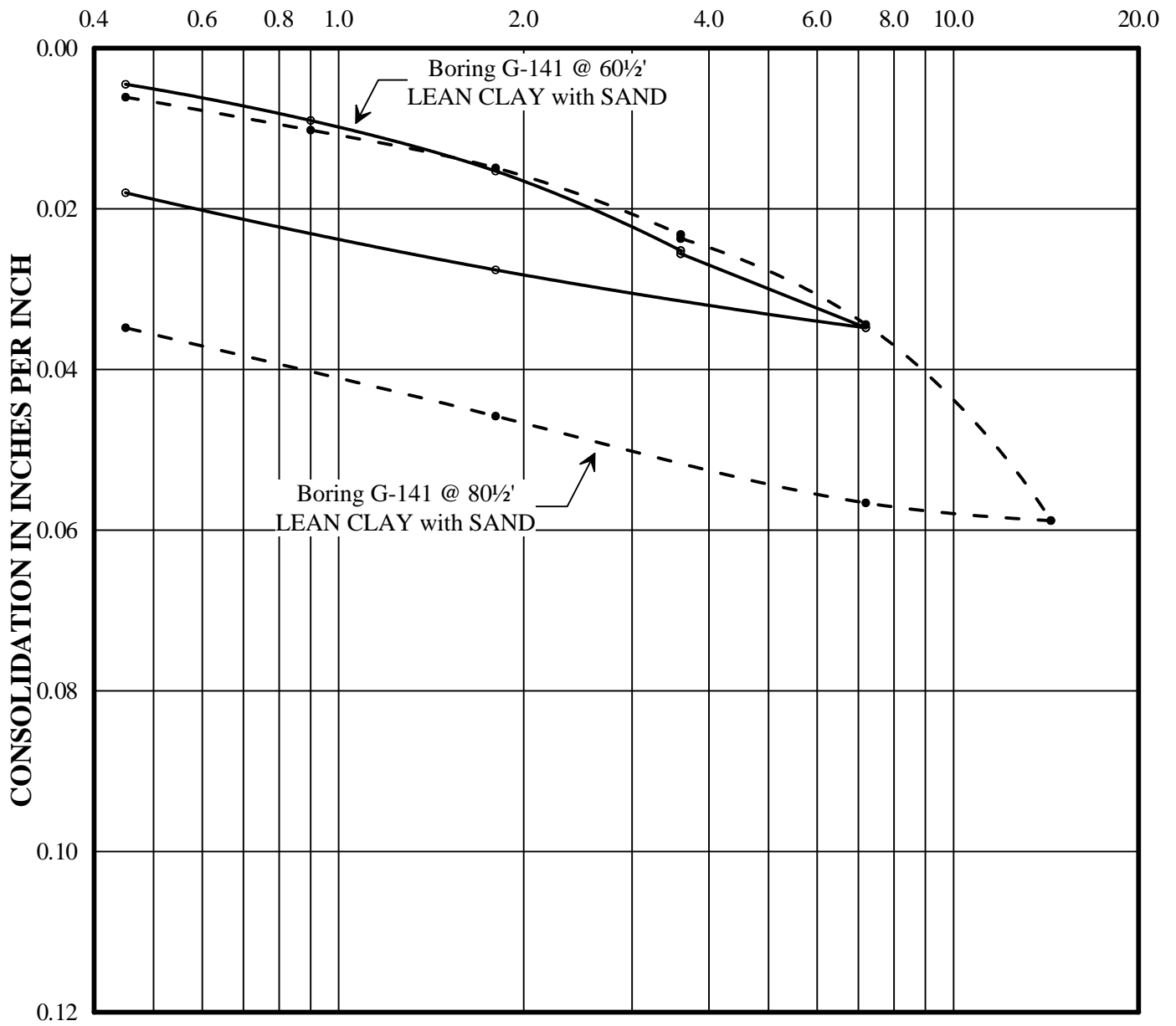
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 5/15/11
Checked/Date: NH 6/3/11

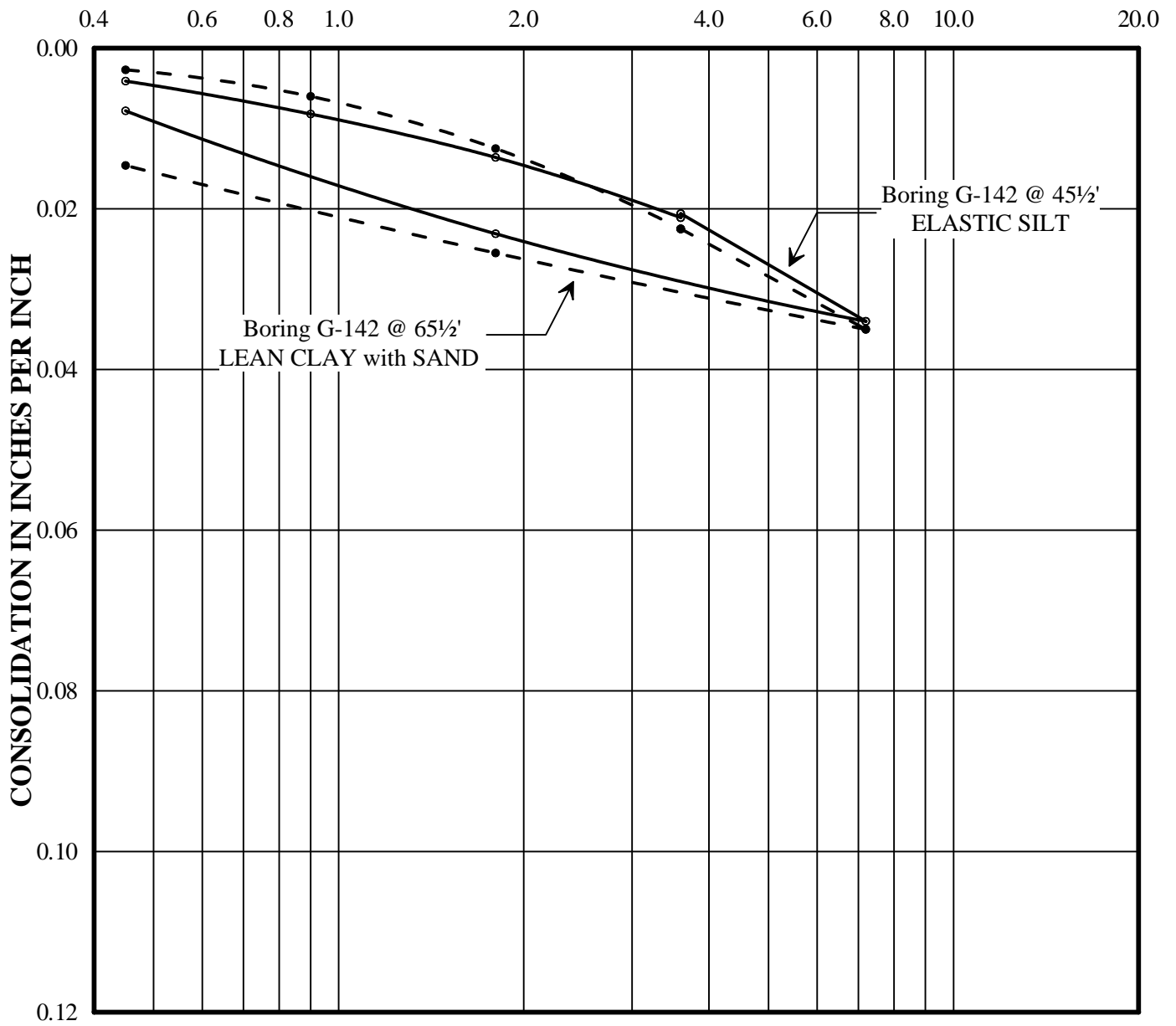
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: JF 9/30/11
 Checked/Date: LT 9/30/11

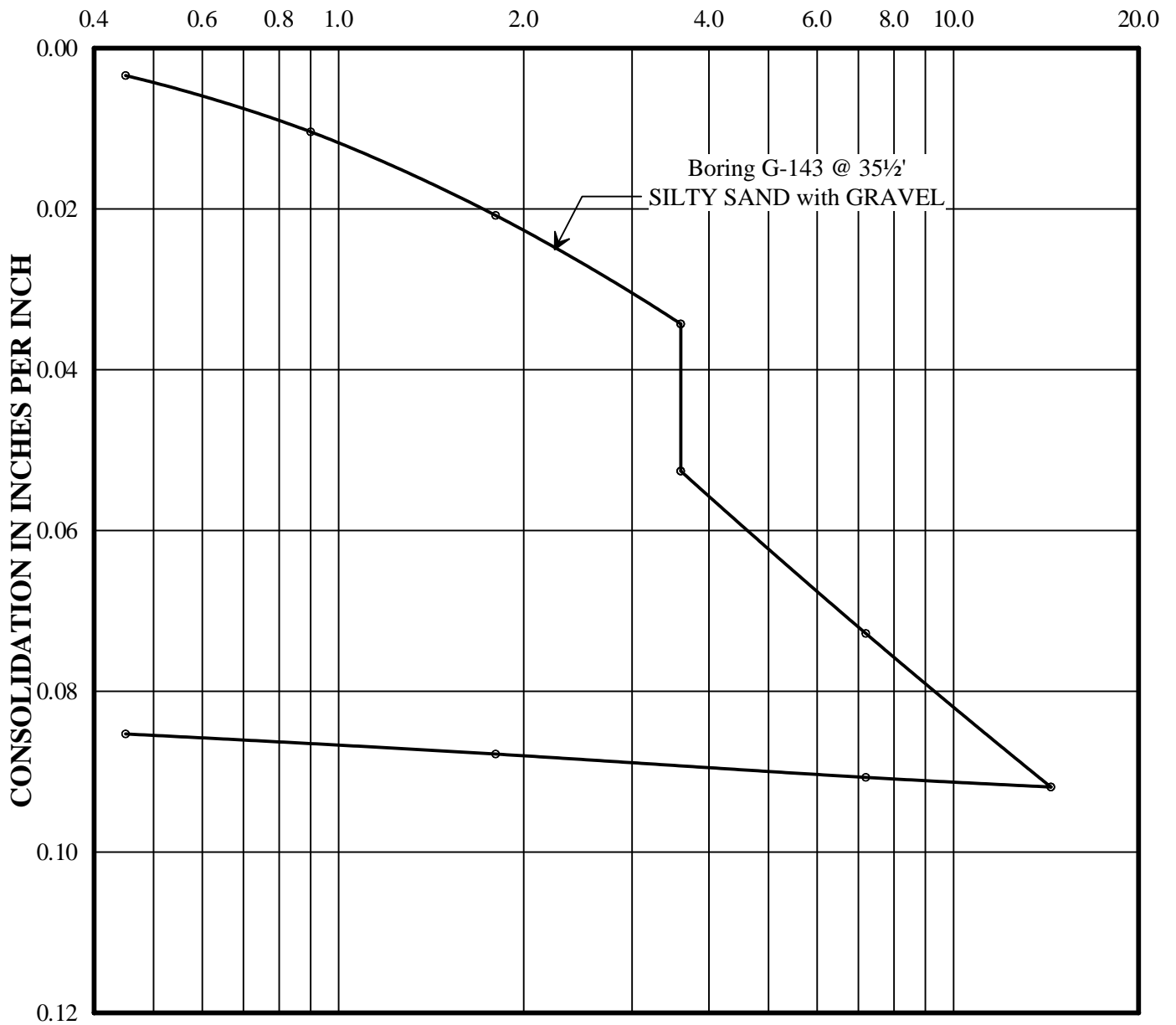
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: 9/15/11

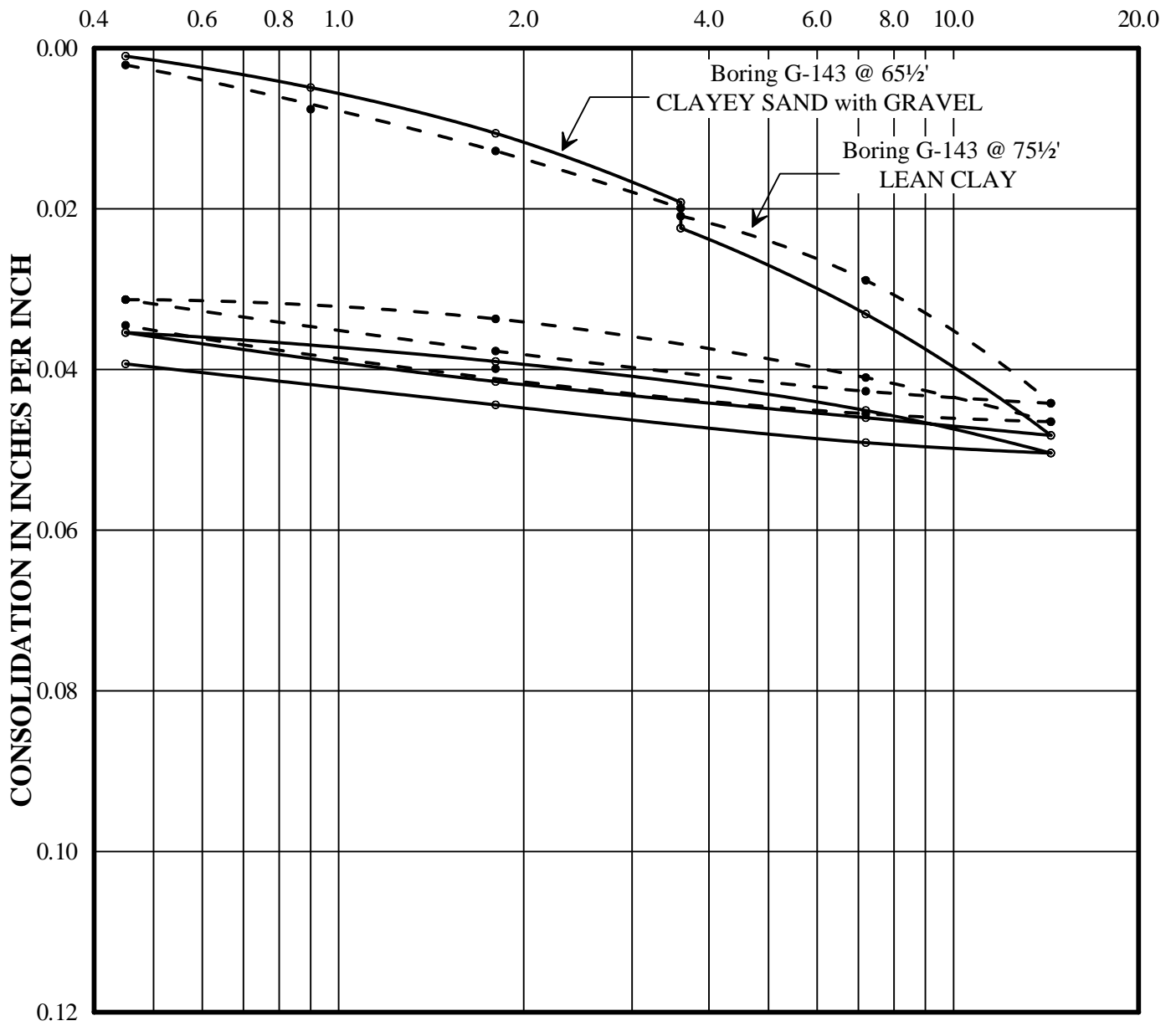
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/26/11
Checked/Date: LT 9/27/11

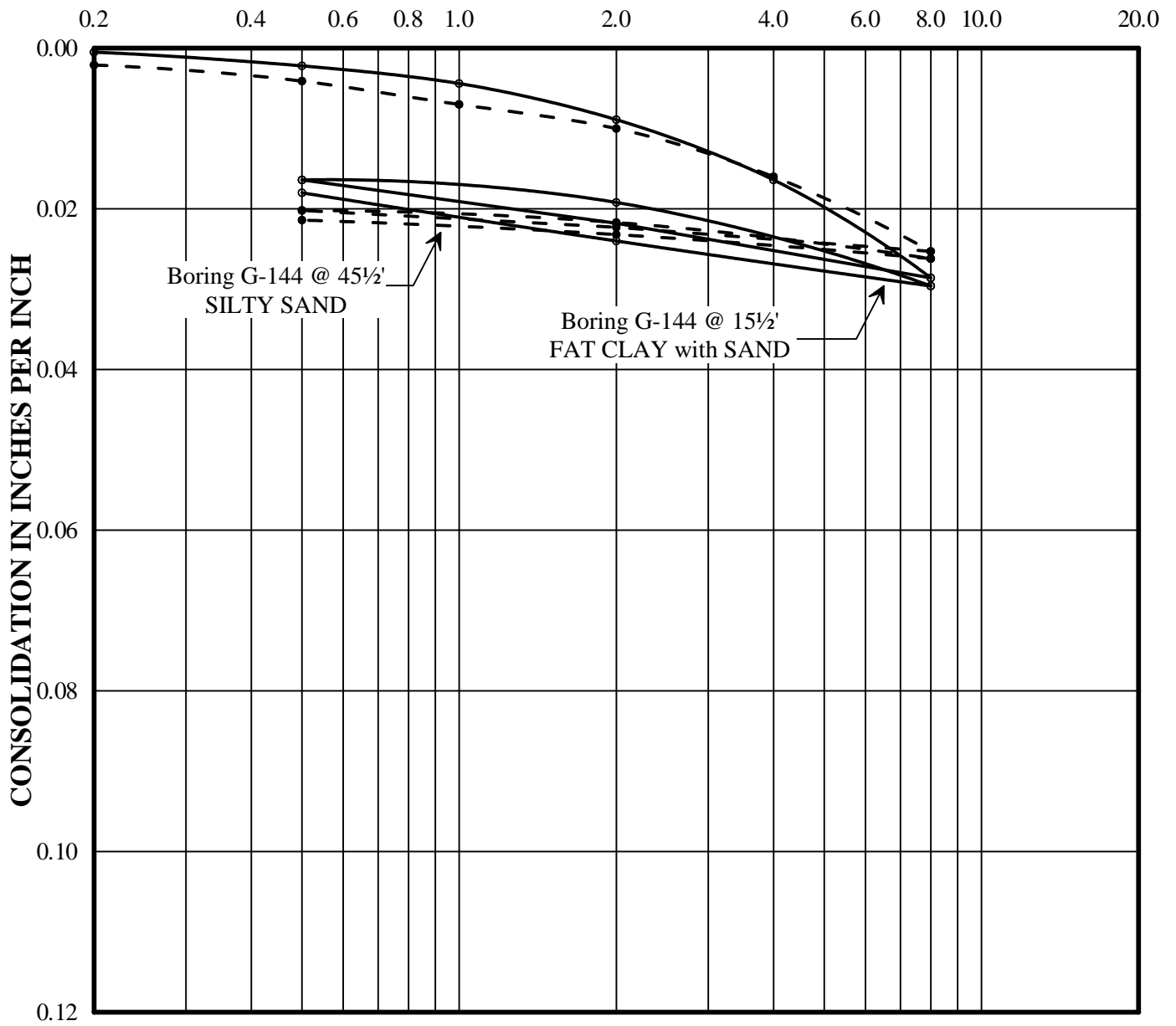
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/27/11

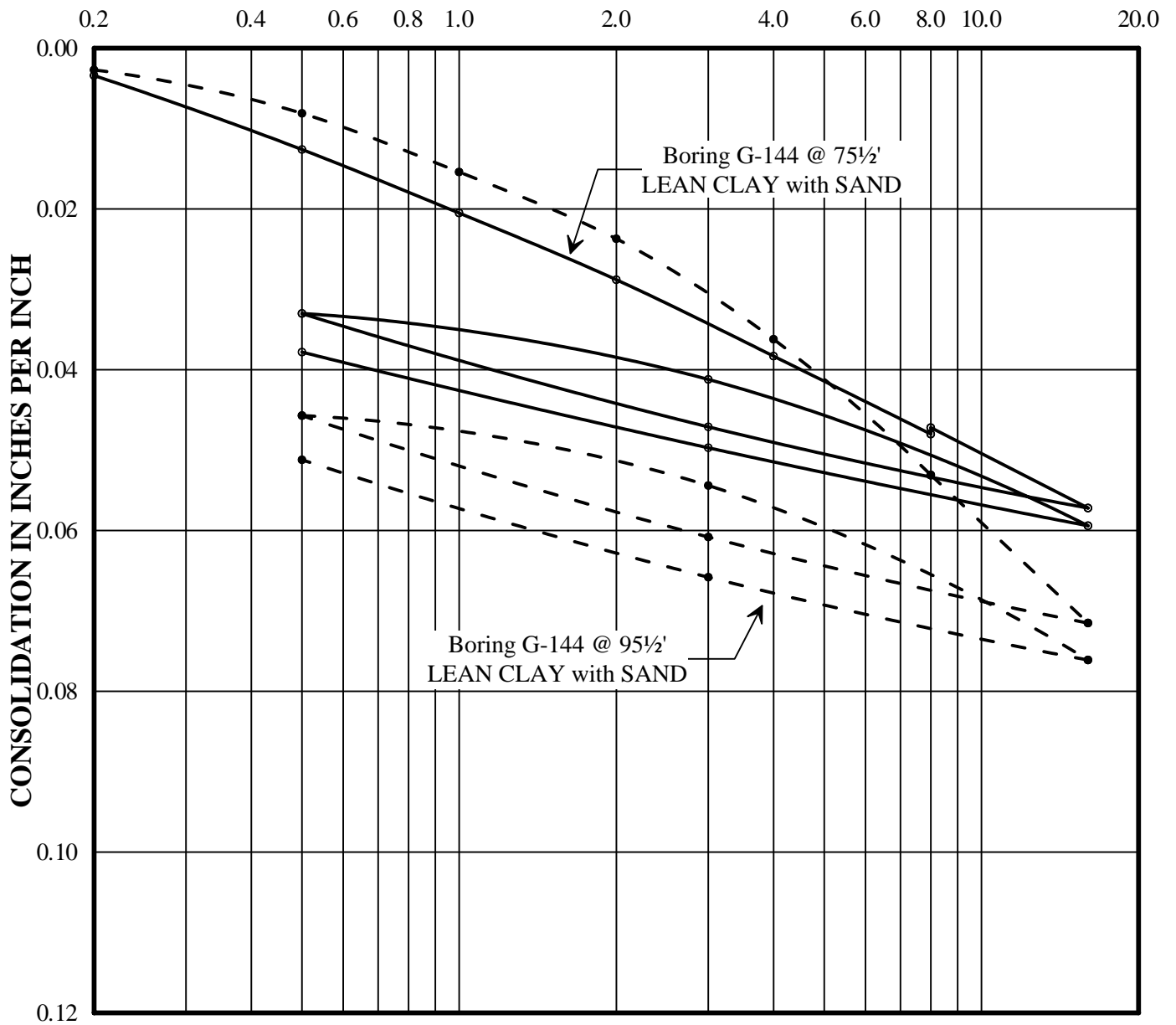
LOAD IN KIPS PER SQUARE FOOT



Note: Water not added to samples.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/26/11

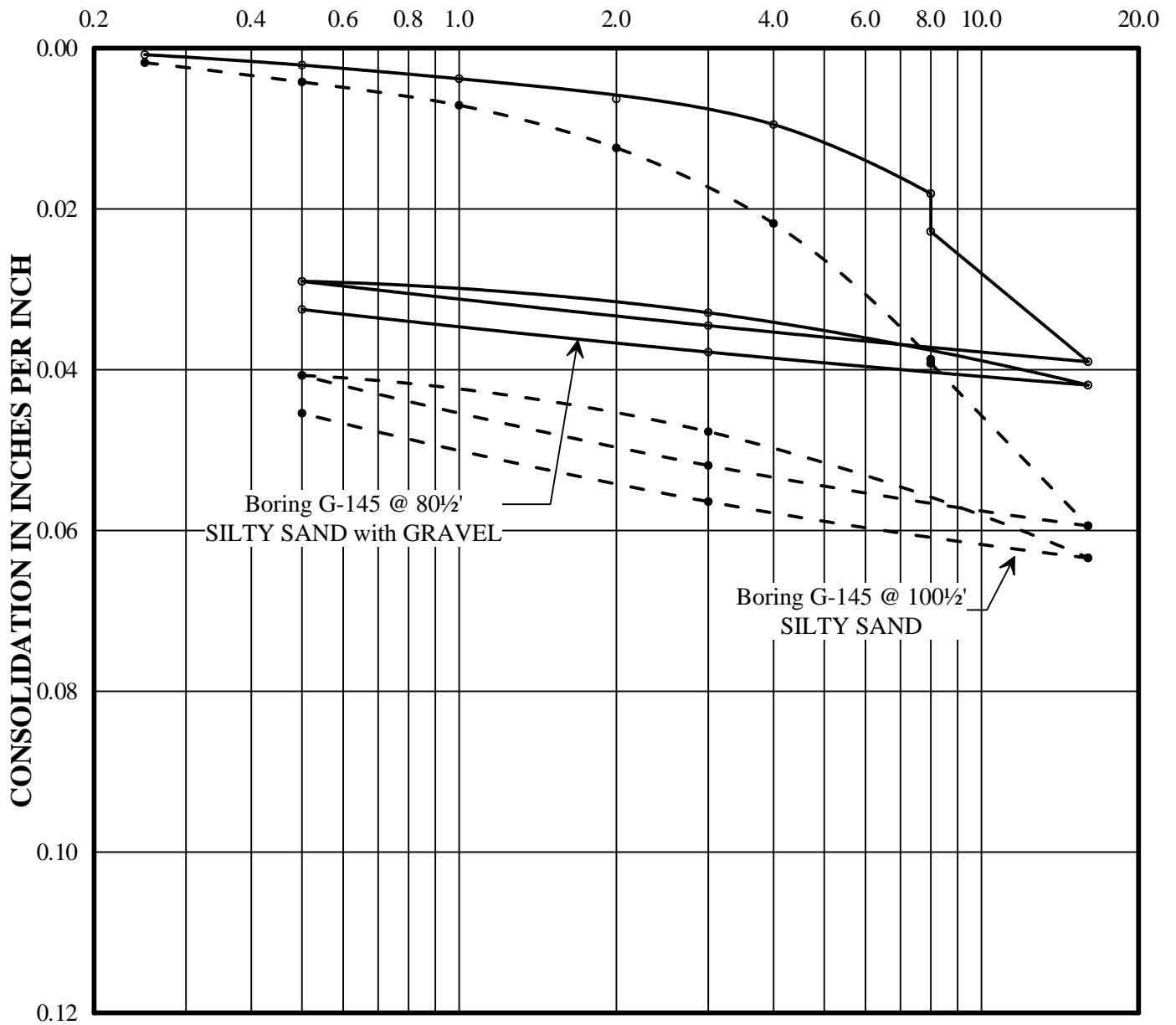
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/26/11

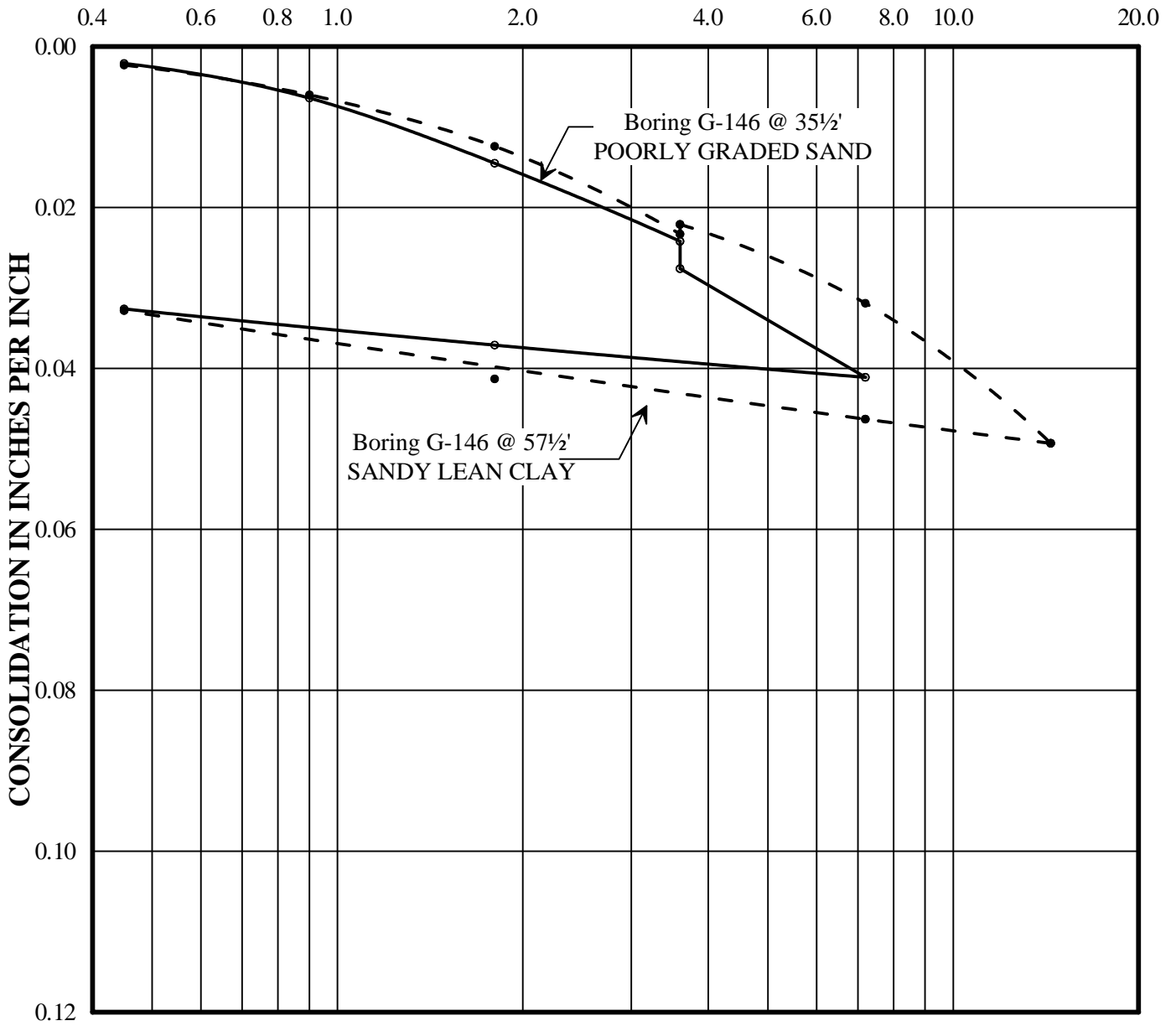
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/20/11
 Checked/Date: LT 9/26/11

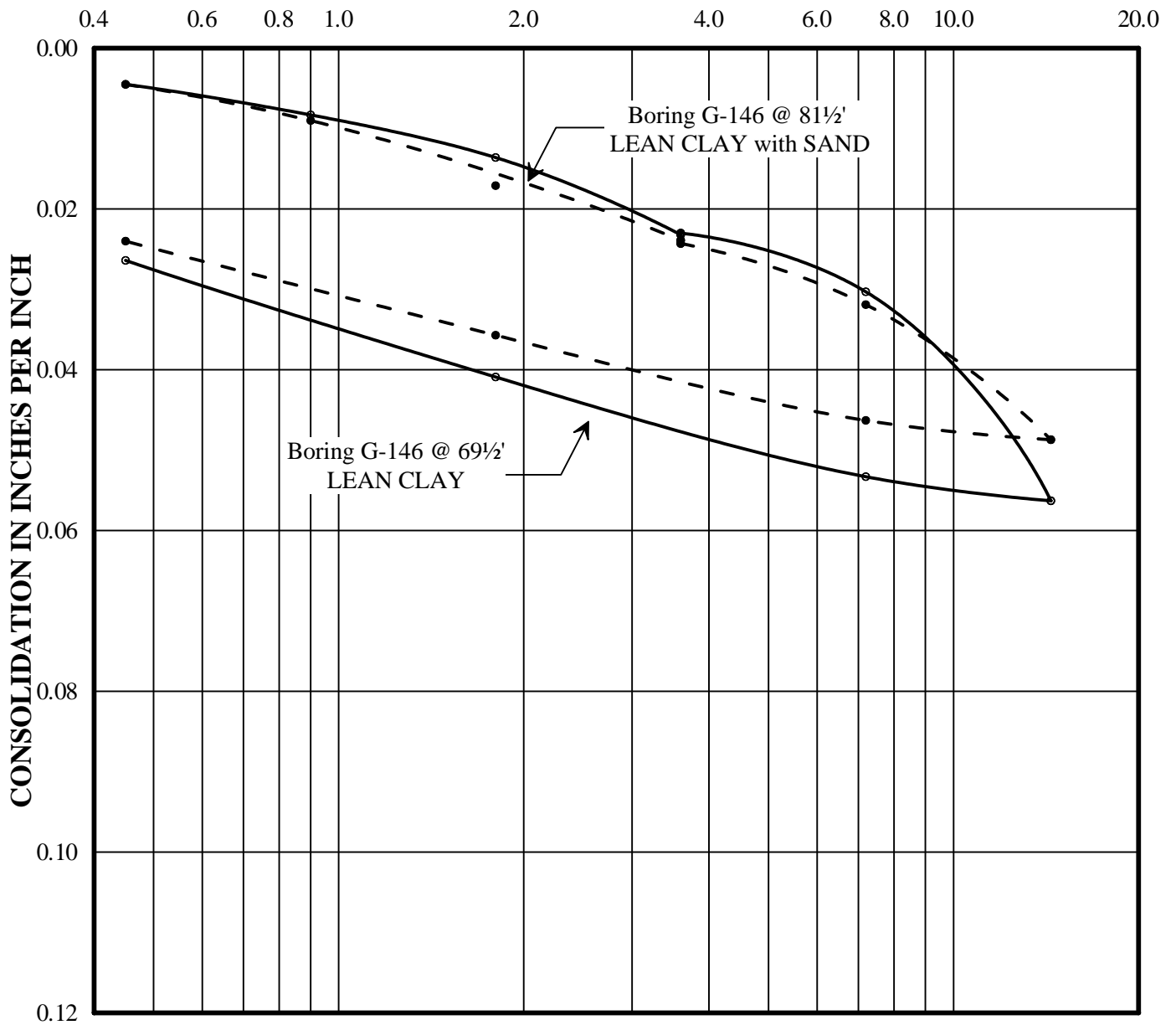
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/26/11
 Checked/Date: LT 8/8/11

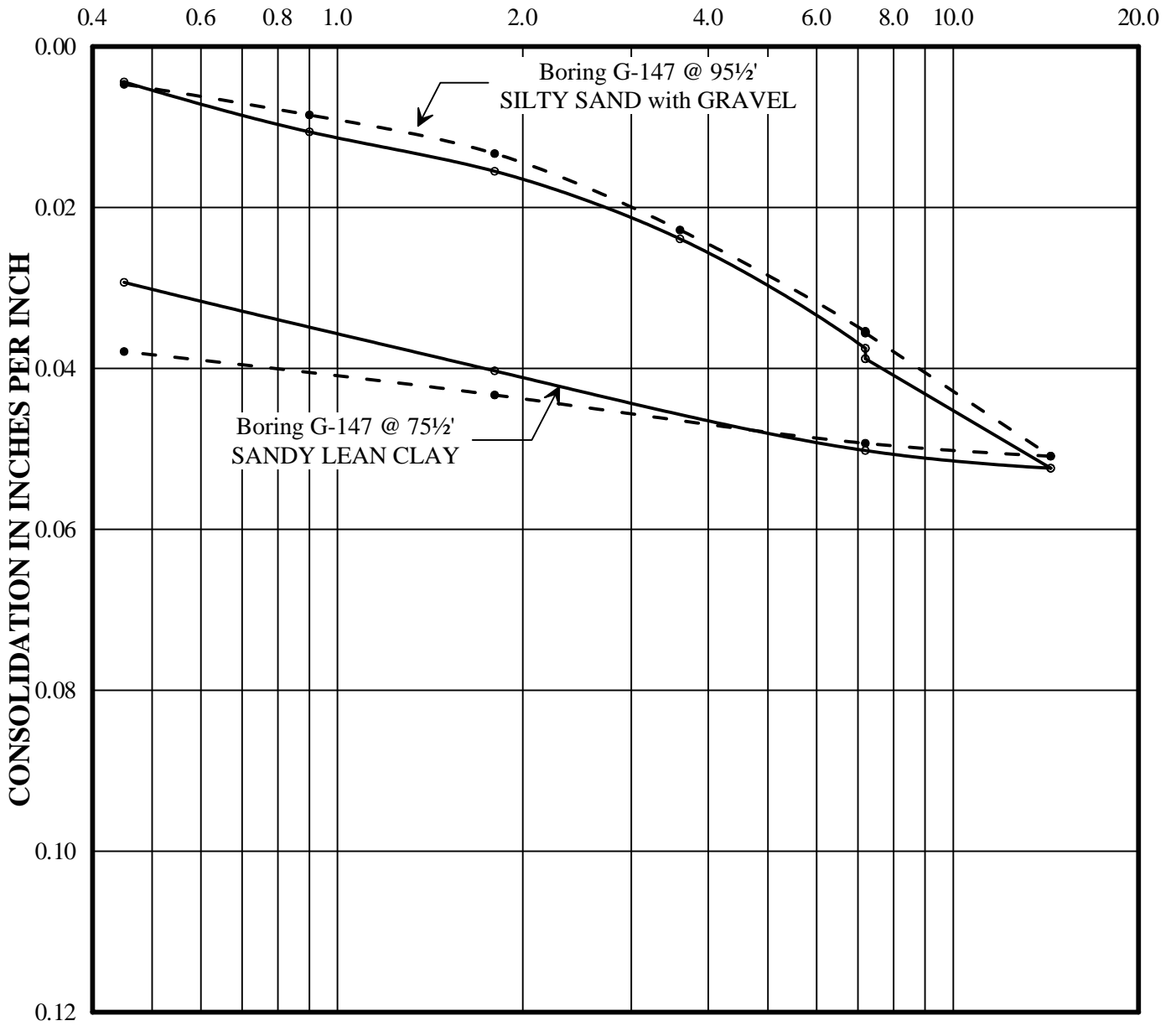
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 7/26/11
Checked/Date: LT 8/8/11

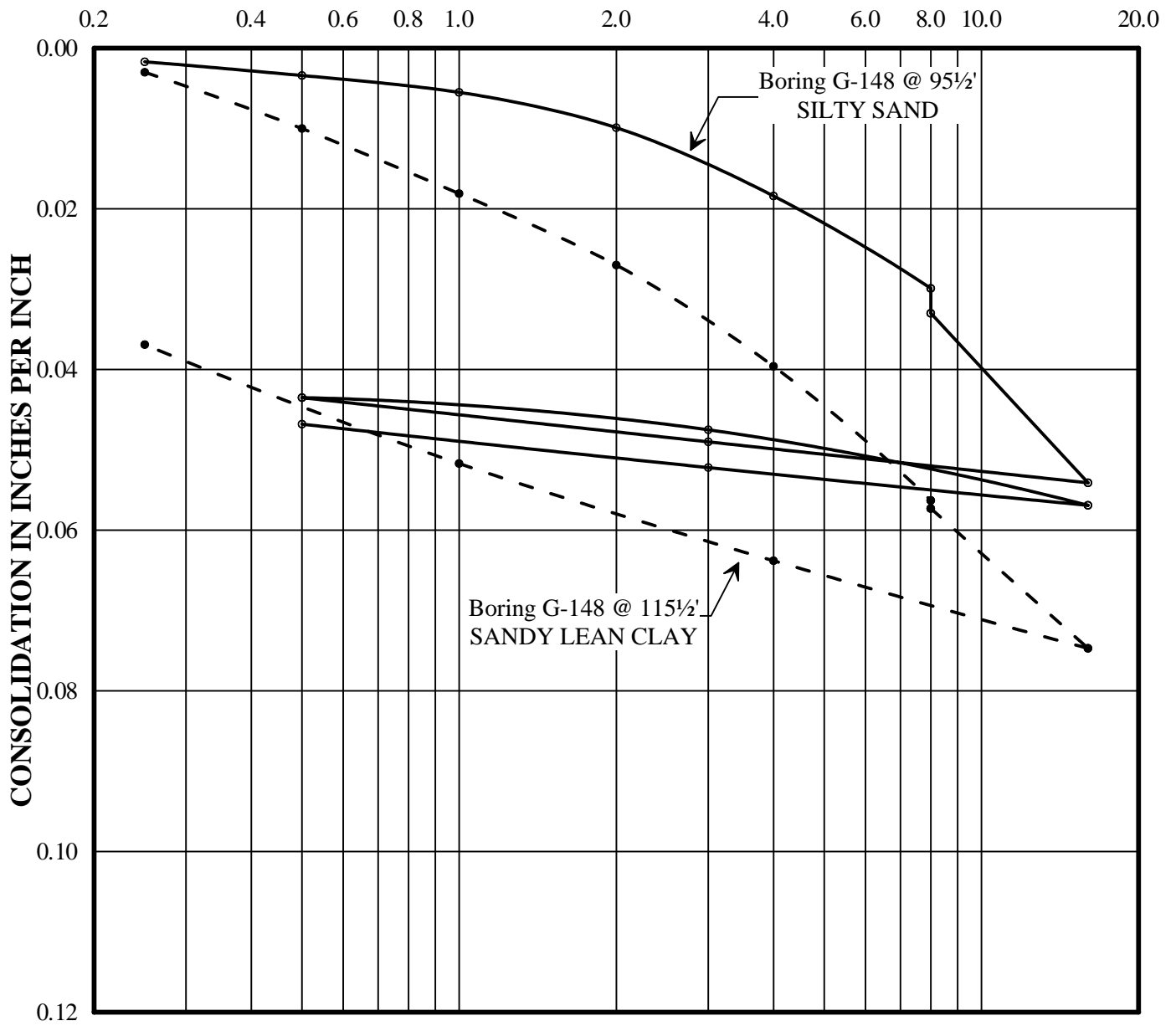
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: JF 9/28/11
 Checked/Date: LT 9/28/11

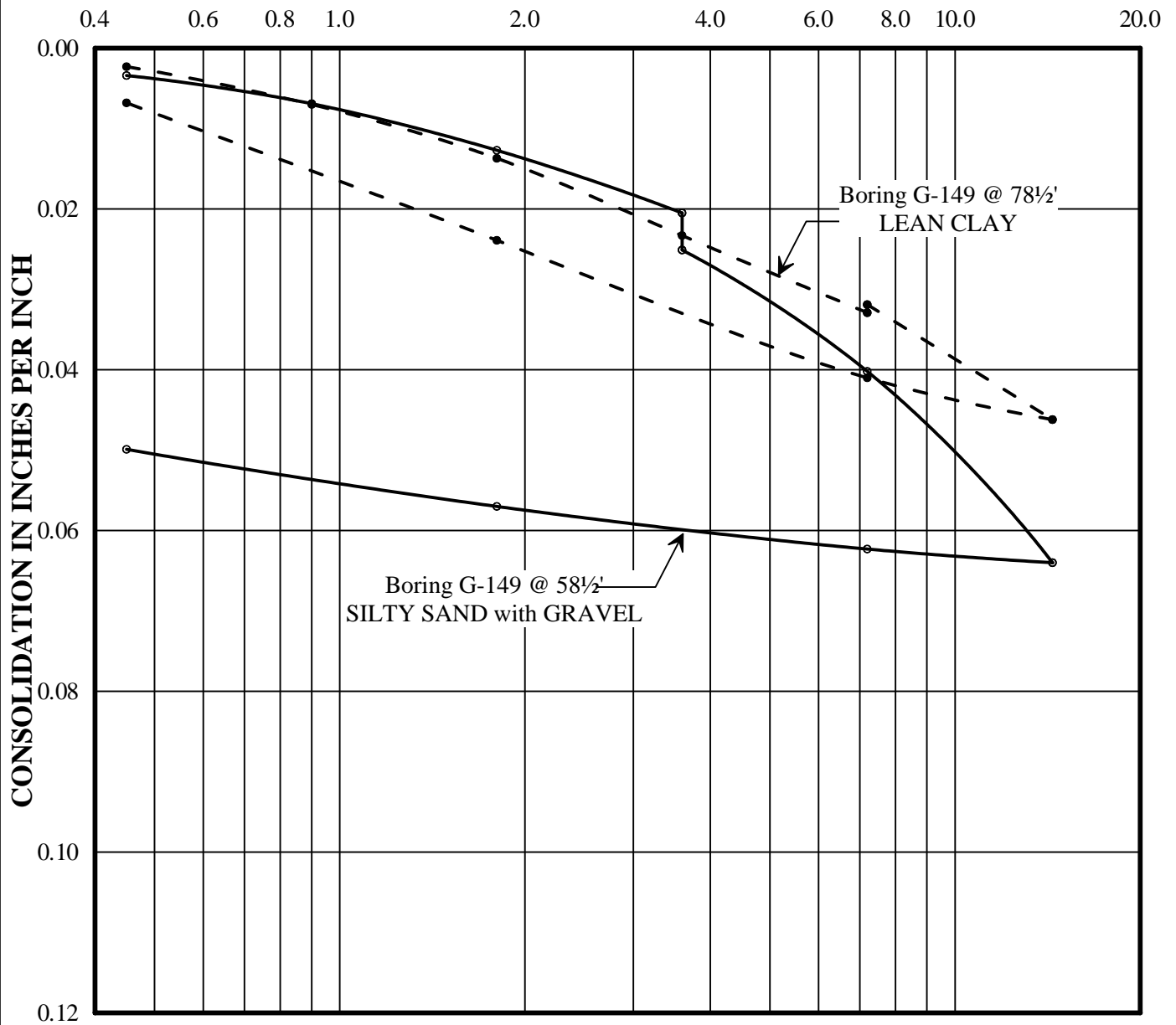
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/20/11
 Checked/Date: LT 9/26/11

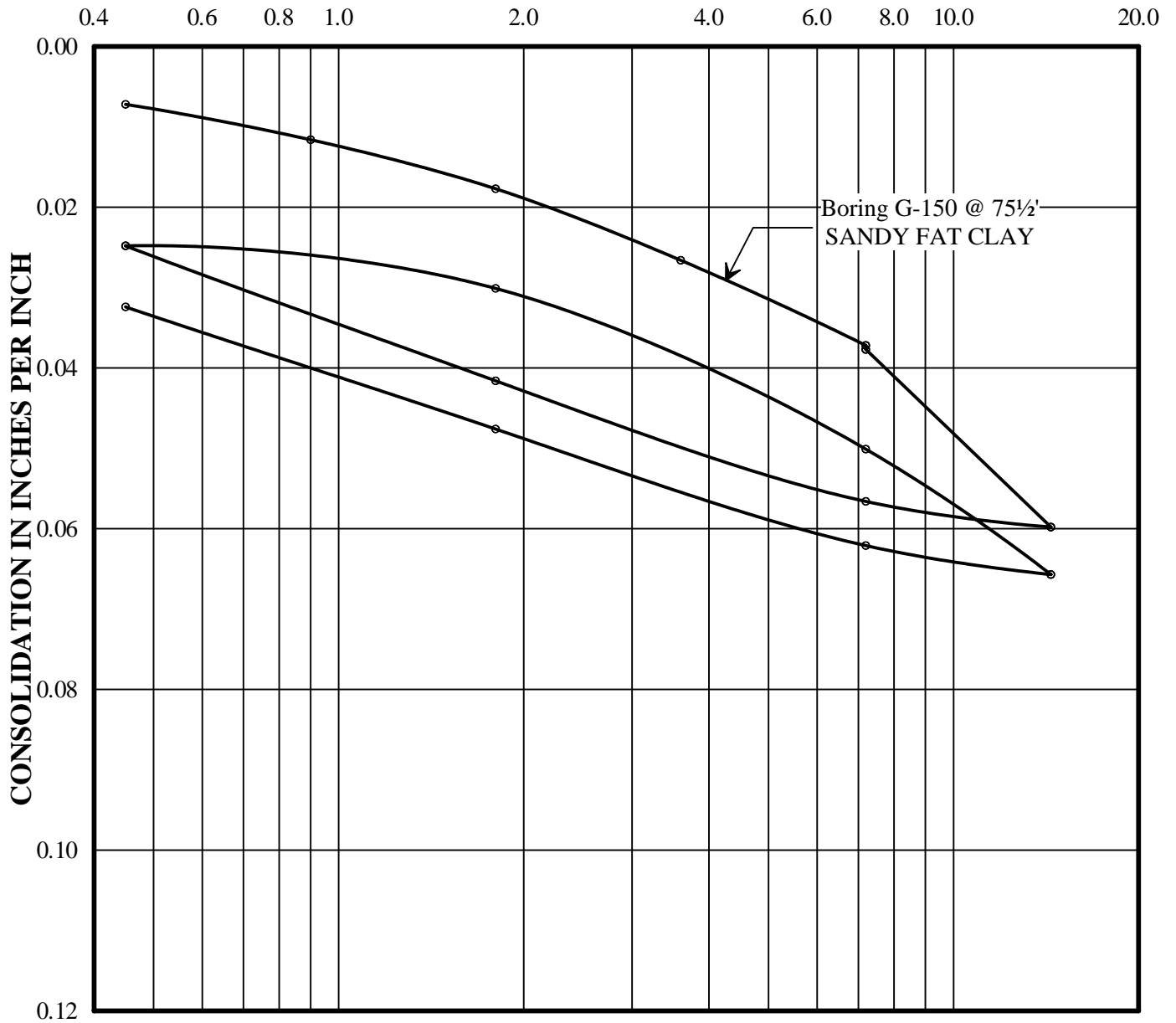
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 58 1/2' and 78 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH/JF 5/13/11
 Checked/Date: LT 8/16/11

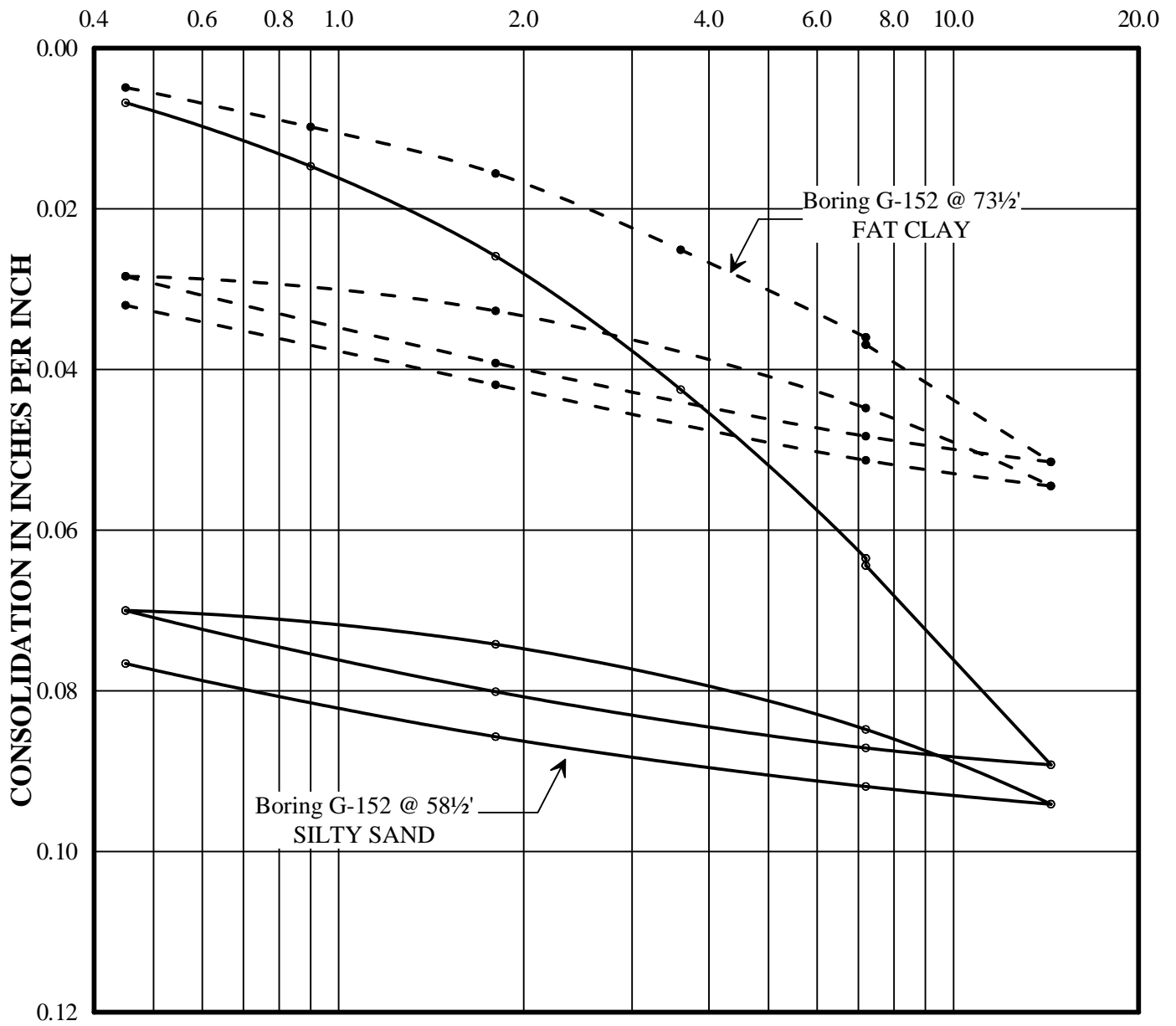
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/15/11
 Checked/Date: LT 8/16/11

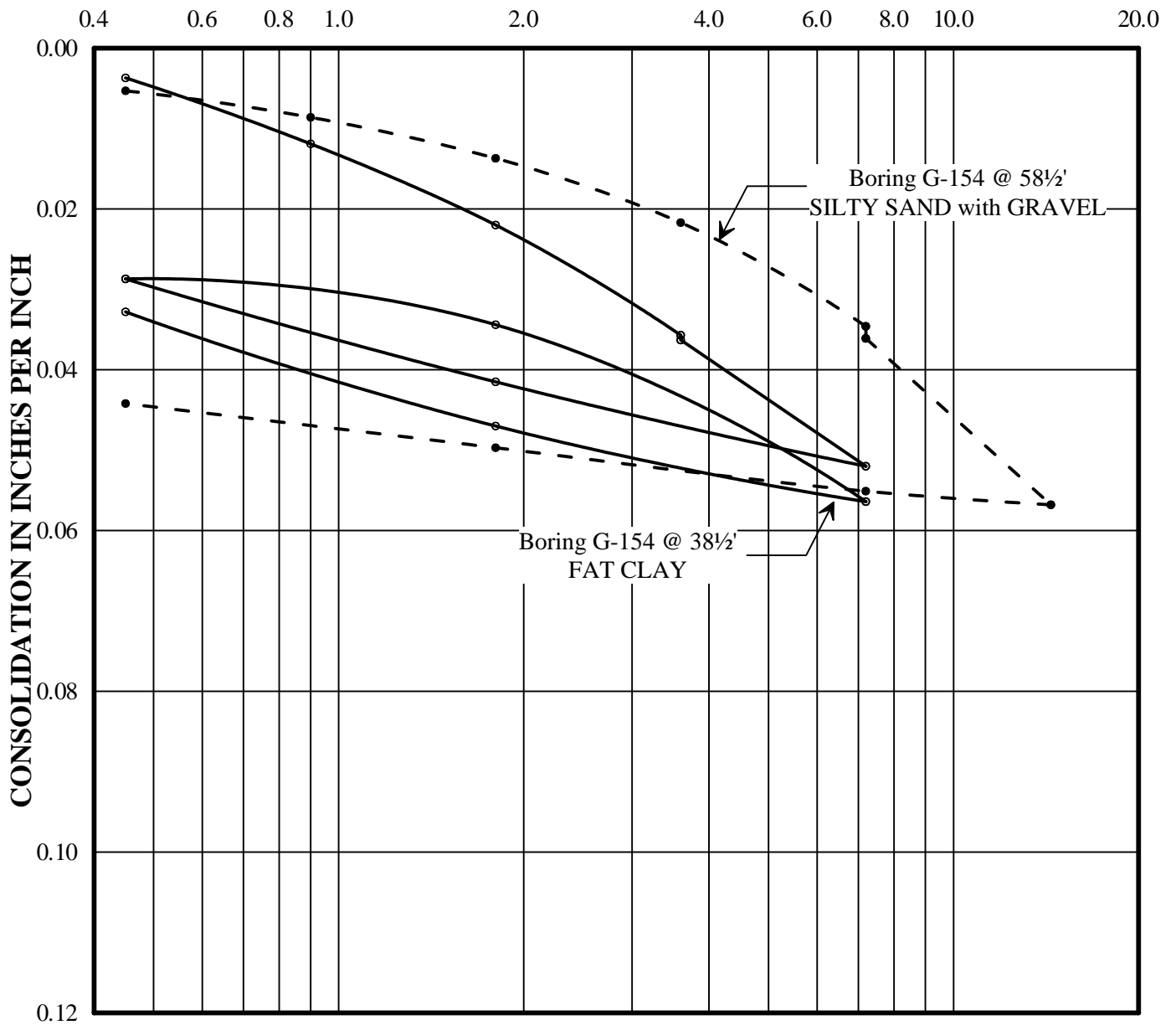
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/13/11
 Checked/Date: LT 8/16/11

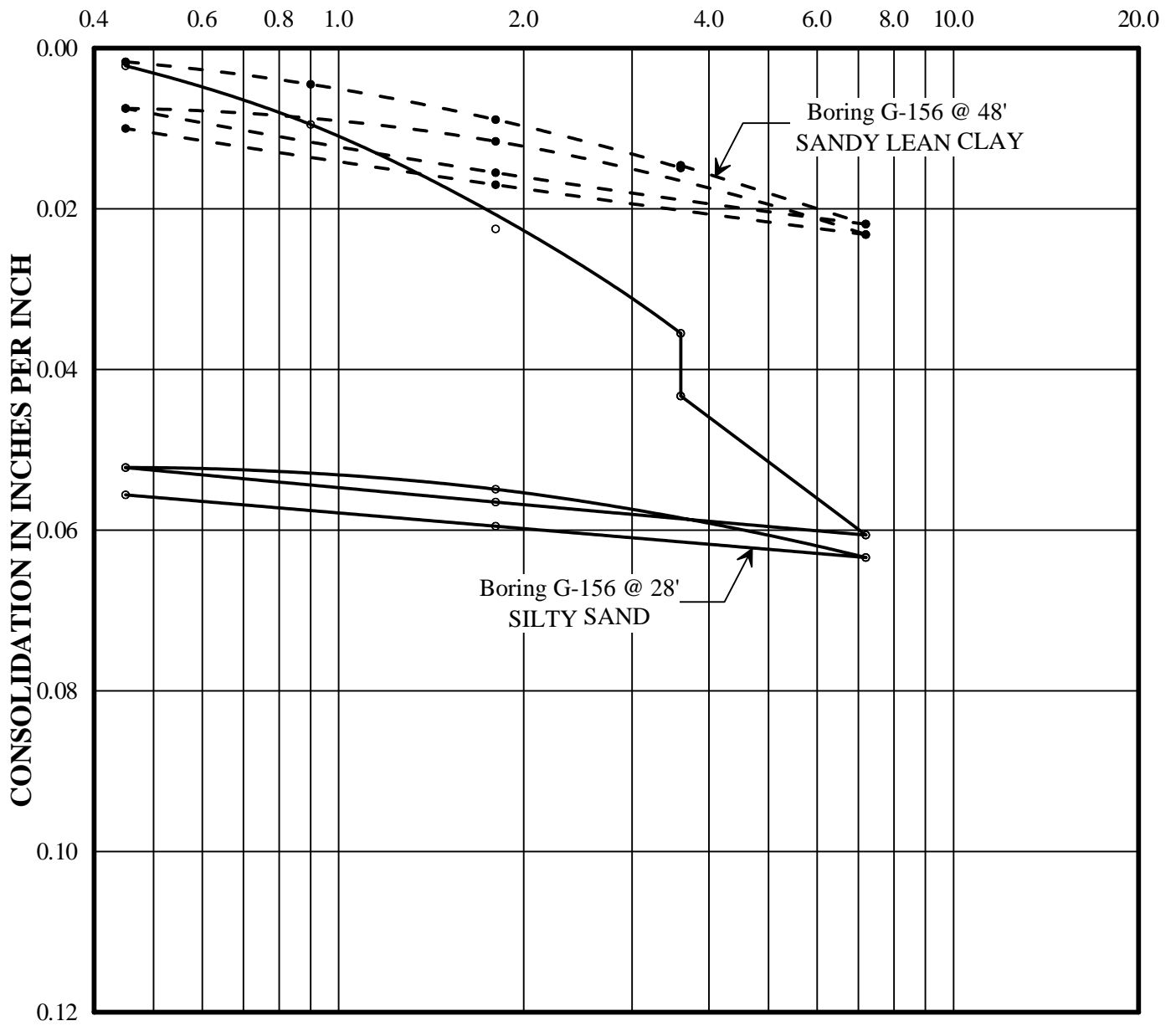
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 38 1/2' and 58 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH/JF 5/13/11
 Checked/Date: LT 8/16/11

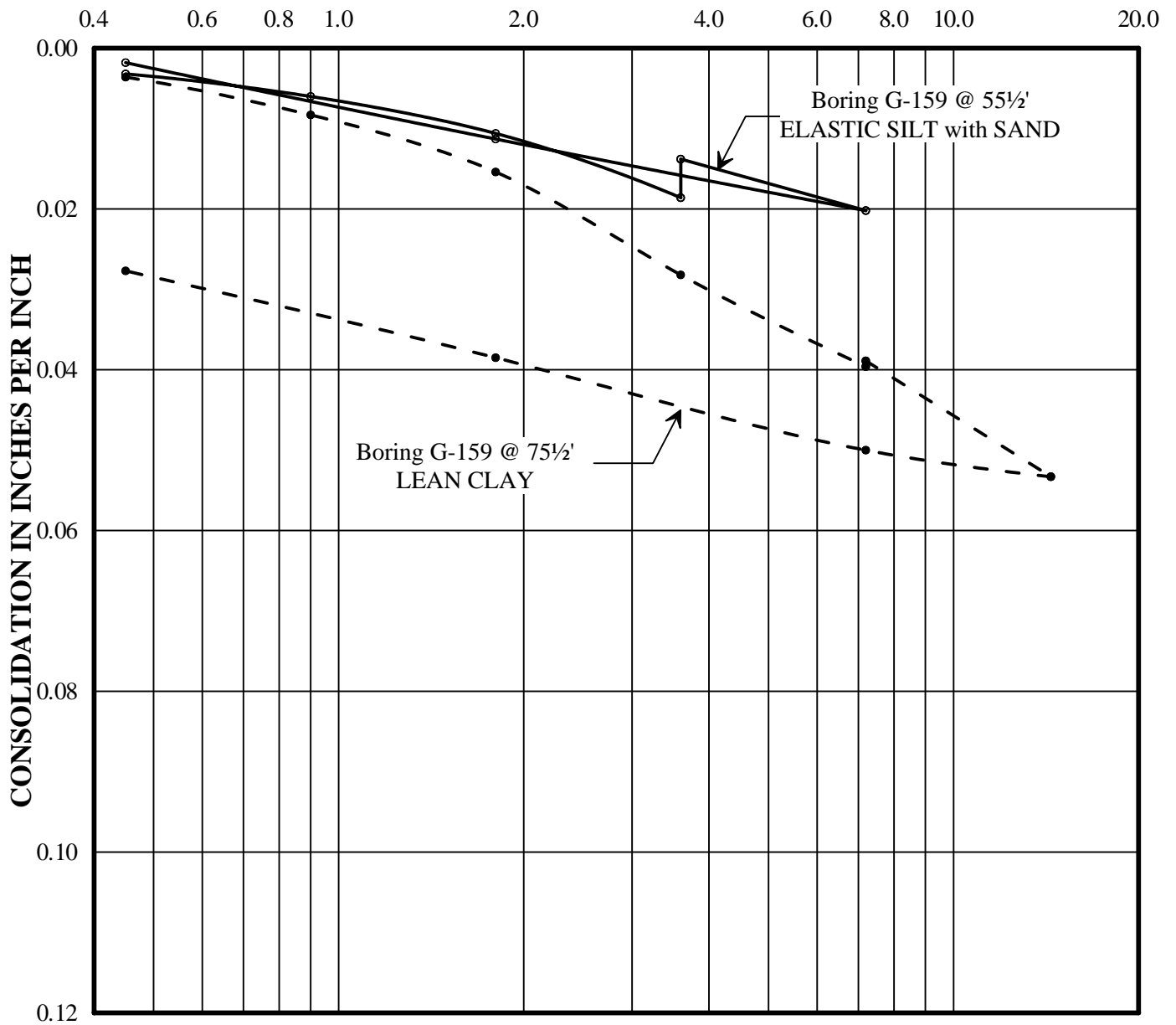
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/23/11

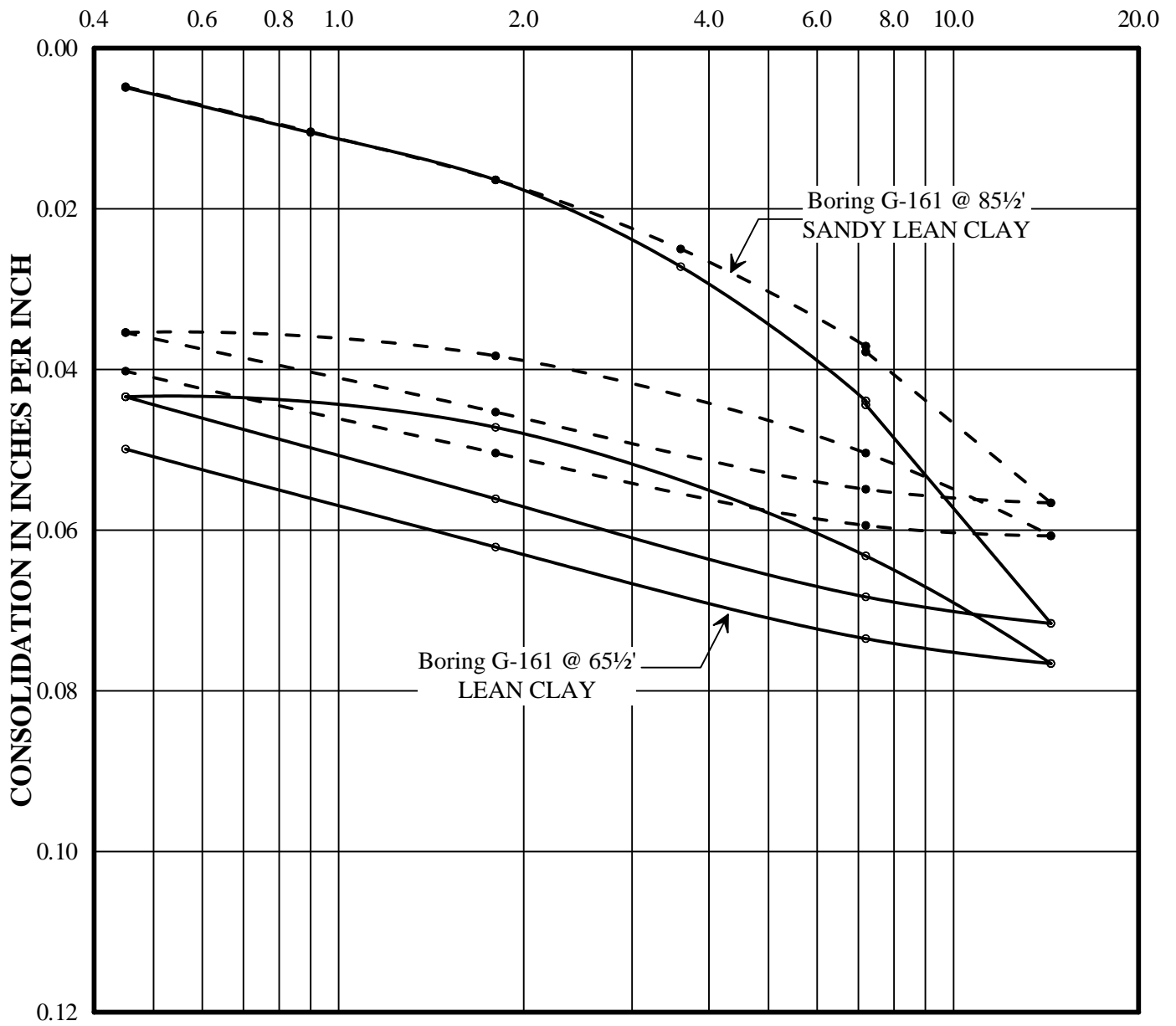
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 55½' and 75½' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH/JF 5/15/11
Checked/Date: LT 8/16/11

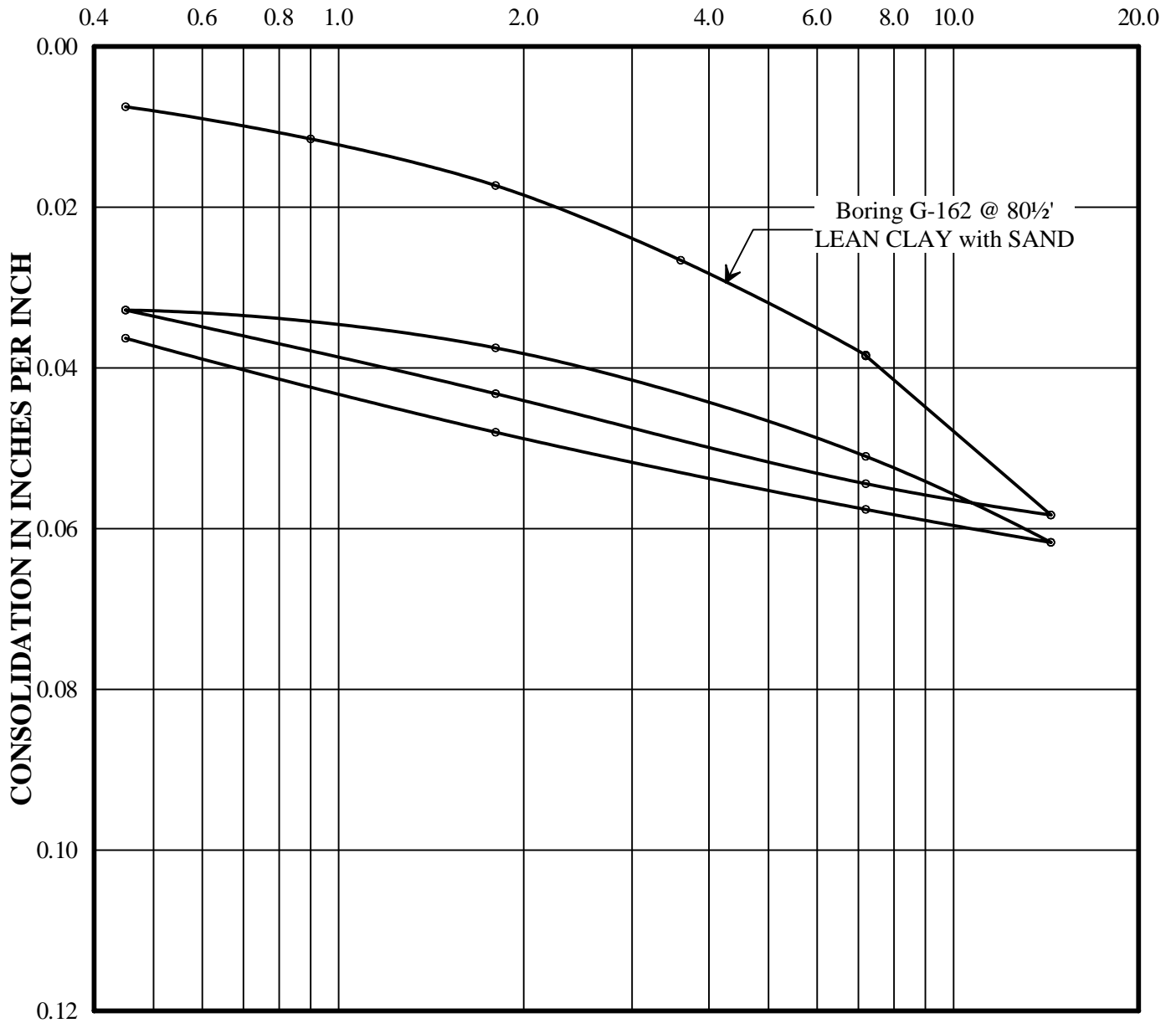
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/13/11
 Checked/Date: LT 8/16/11

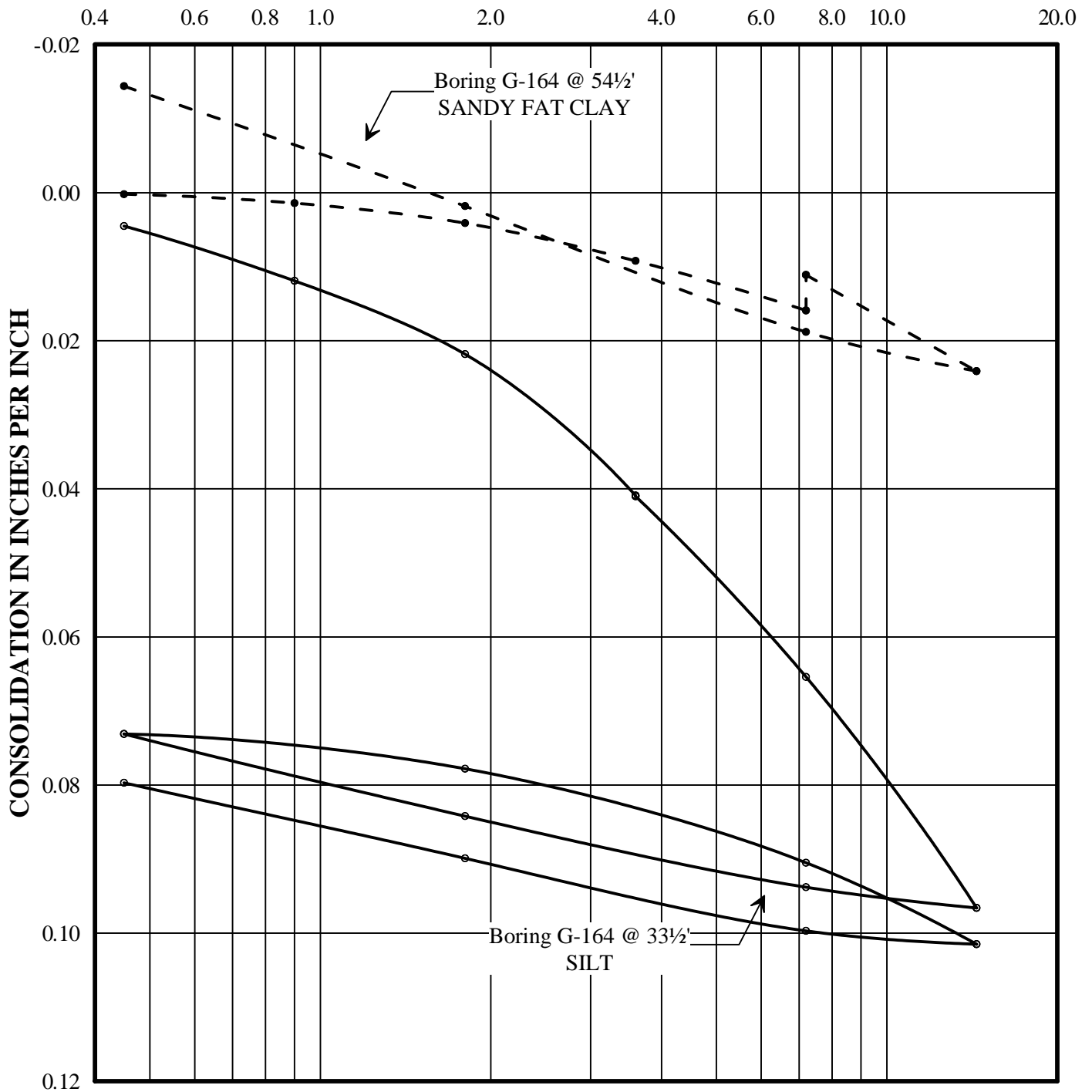
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/15/11
 Checked/Date: LT 8/16/11

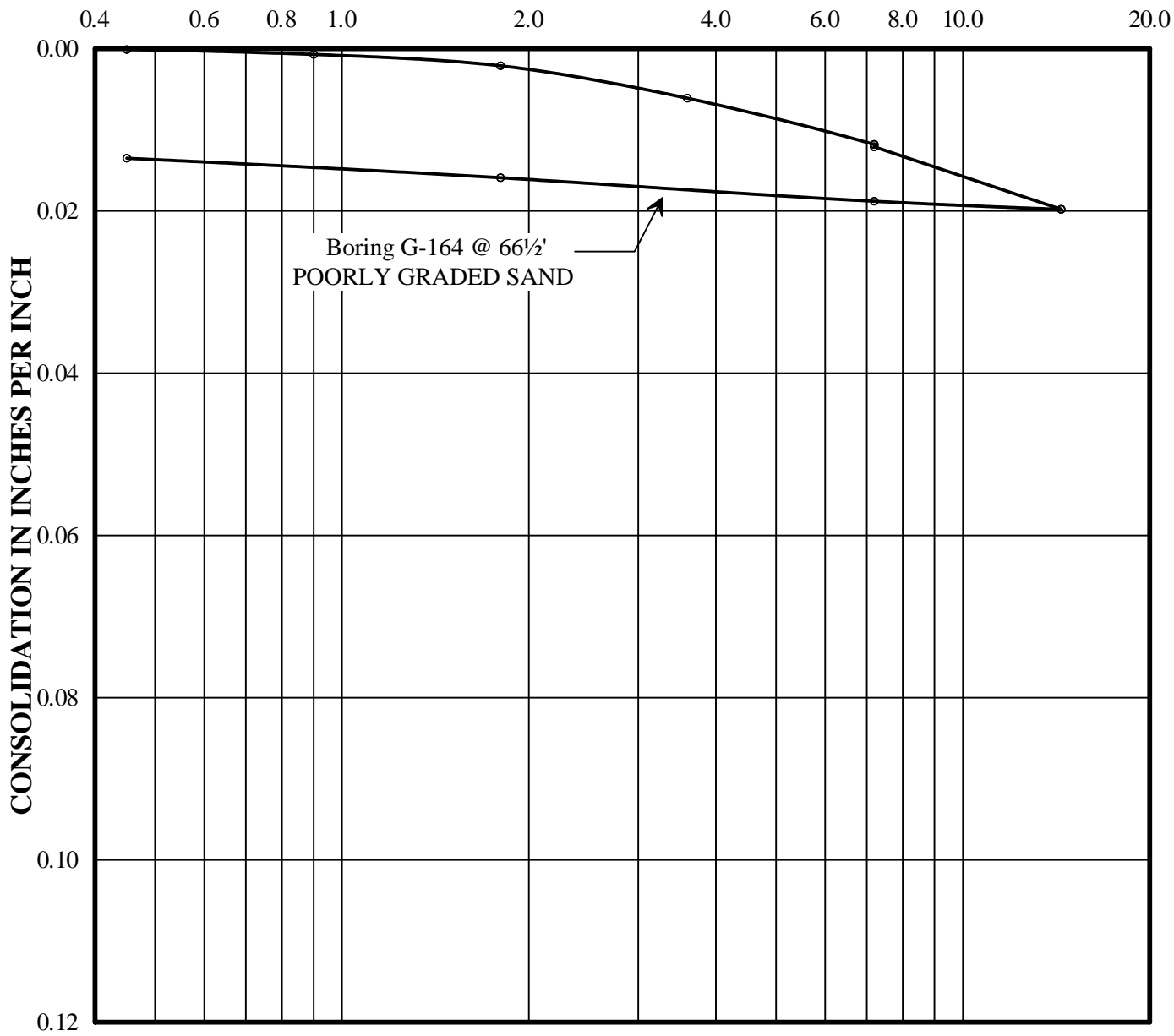
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 33 1/2' and 54 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH/JF 5/16/11
 Checked/Date: LT 8/16/11

LOAD IN KIPS PER SQUARE FOOT

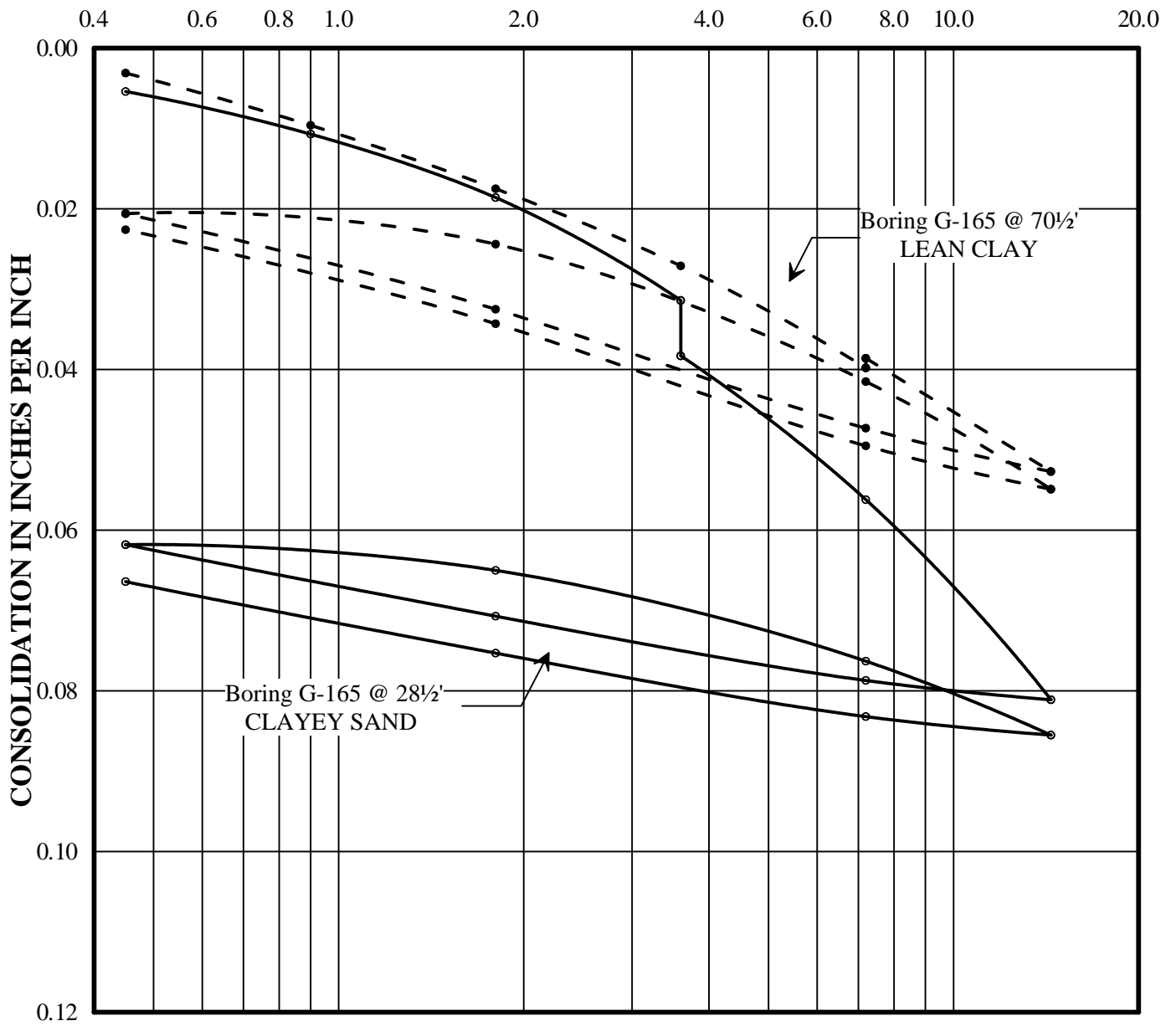


Boring G-164 @ 66½'
POORLY GRADED SAND

Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/16/11
Checked/Date: LT 8/16/11

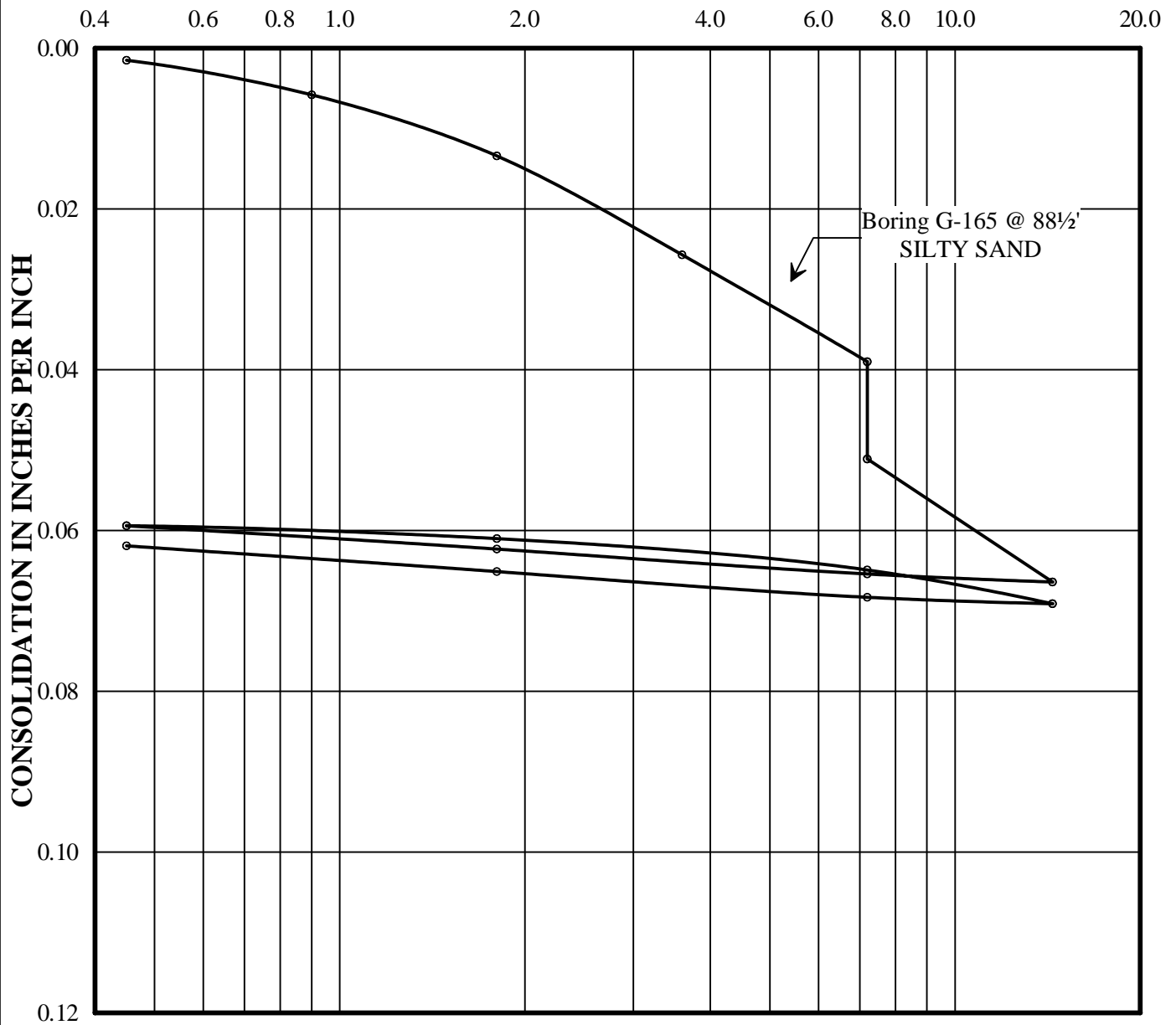
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 28 1/2' and 70 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: JF 9/27/11
 Checked/Date: LT 9/28/11

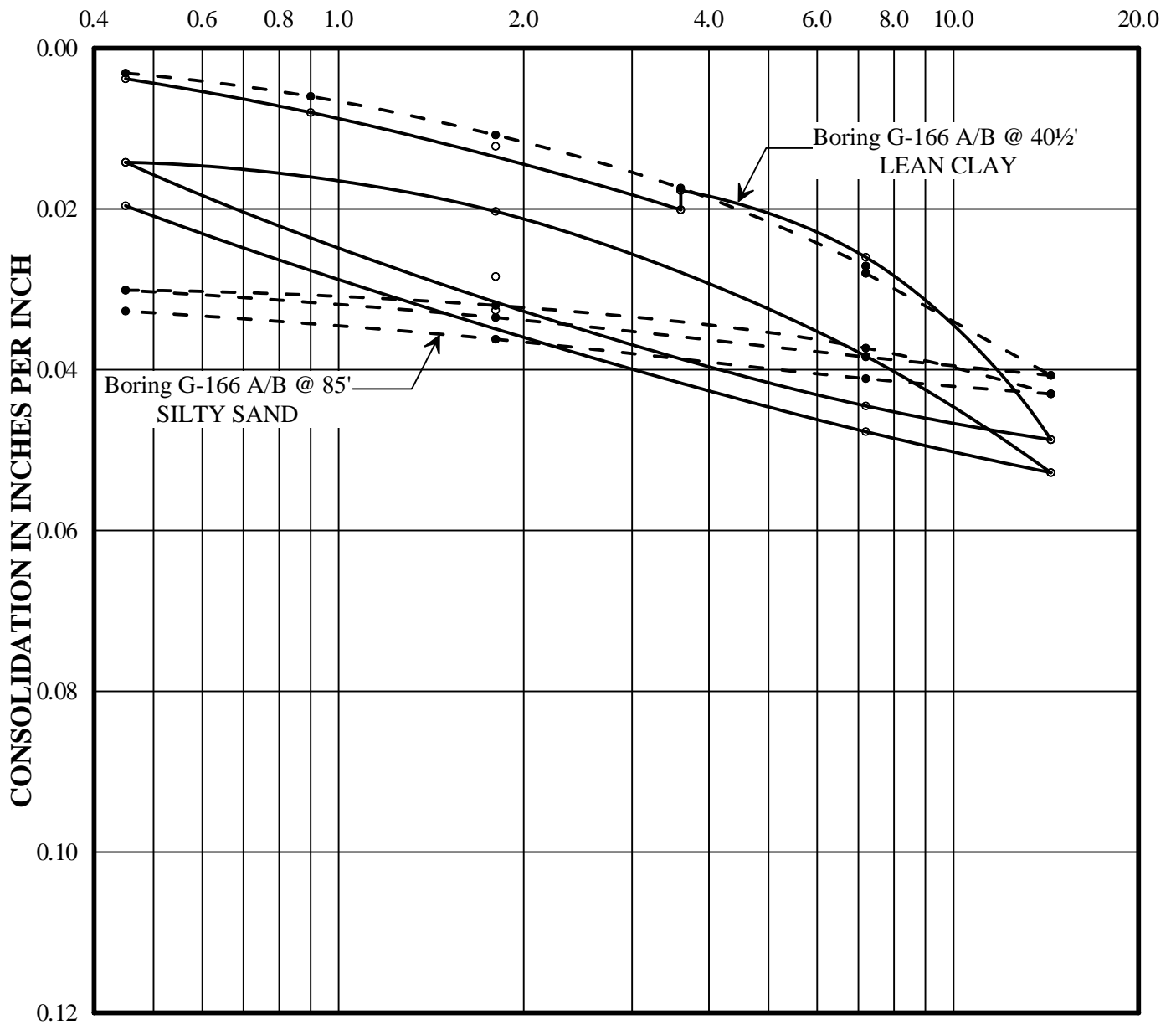
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: JF 9/27/11
 Checked/Date: JF 9/28/11

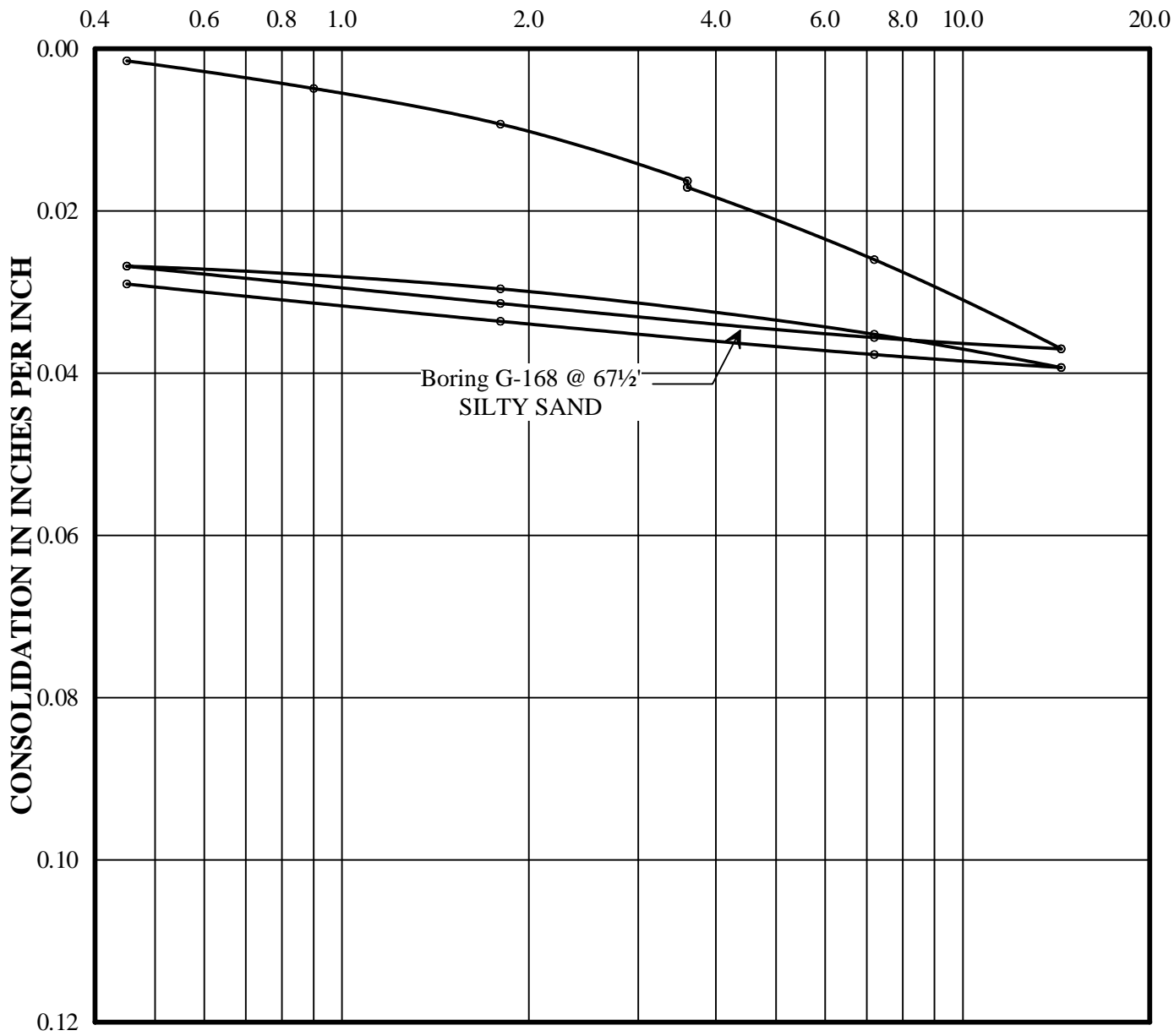
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 40 1/2' and 85' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/23/11

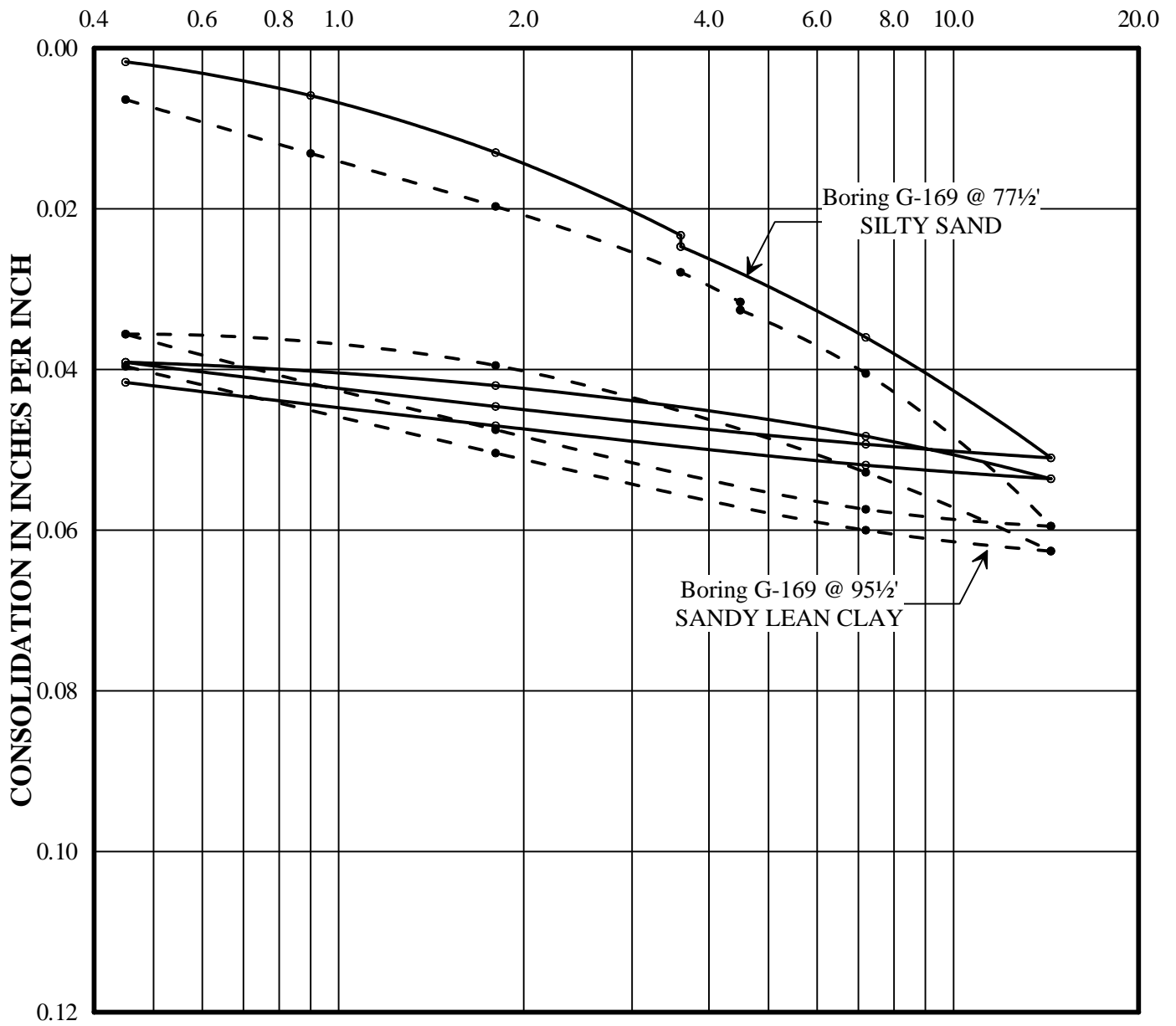
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH/JF 5/16/11
Checked/Date: LT 8/16/11

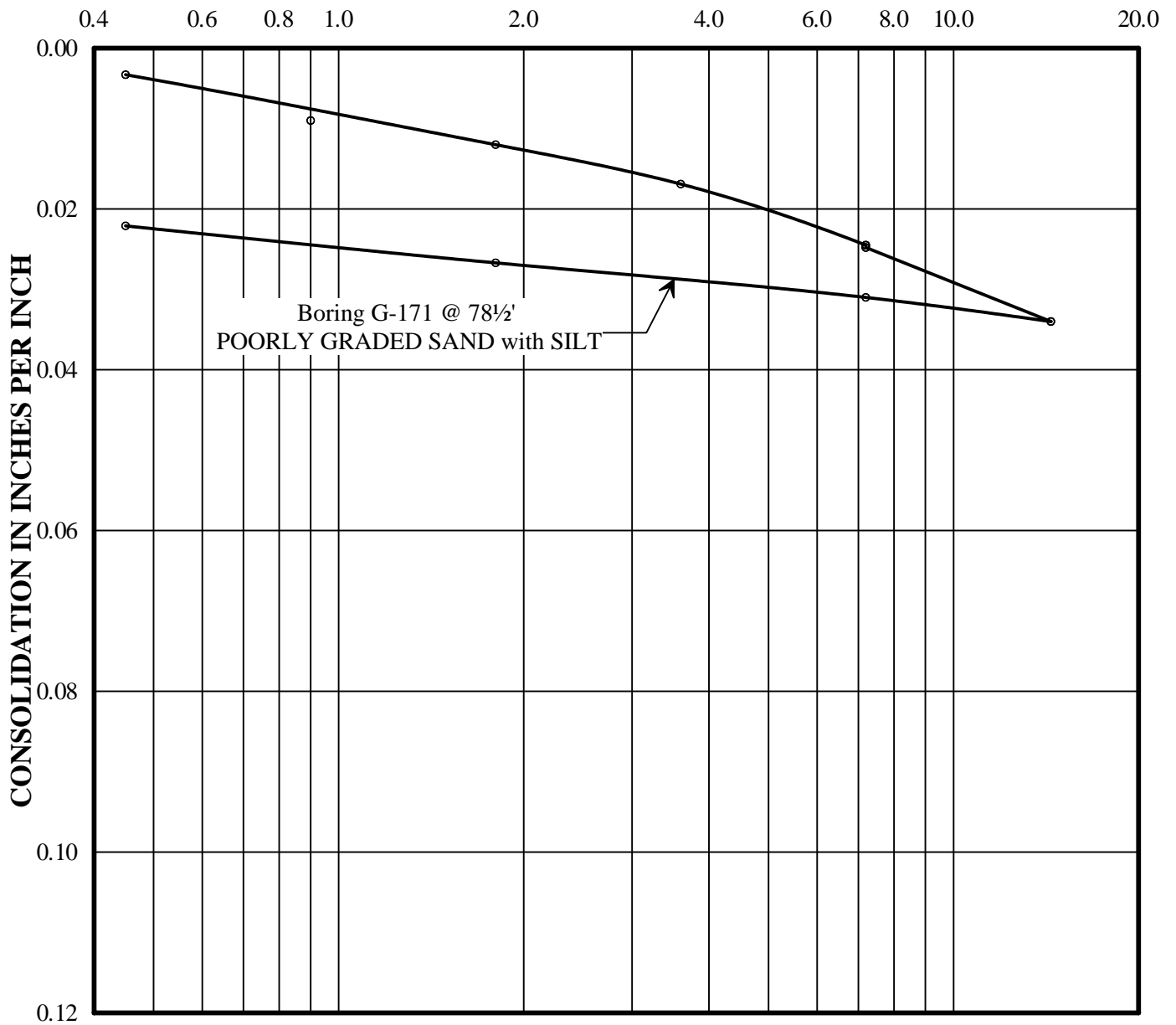
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 77 1/2' and 95 1/2' after consolidation under a load of 3.6 and 4.5 kips per square foot, respectively.

Prepared/Date: AH/JF 5/25/11
 Checked/Date: LT 8/16/11

LOAD IN KIPS PER SQUARE FOOT

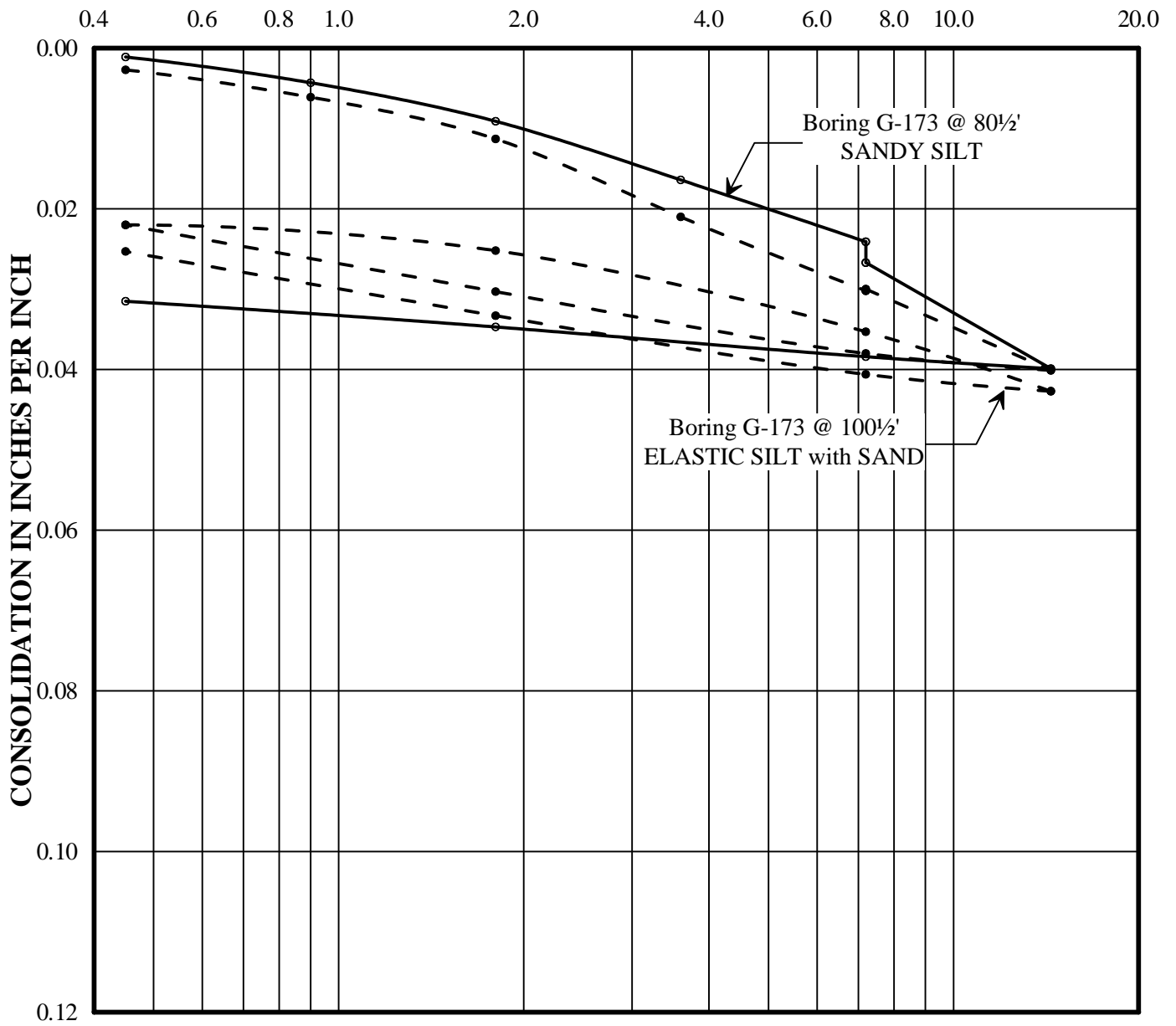


Boring G-171 @ 78½'
POORLY GRADED SAND with SILT

Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 9/23/11
Checked/Date: LT 9/23/11

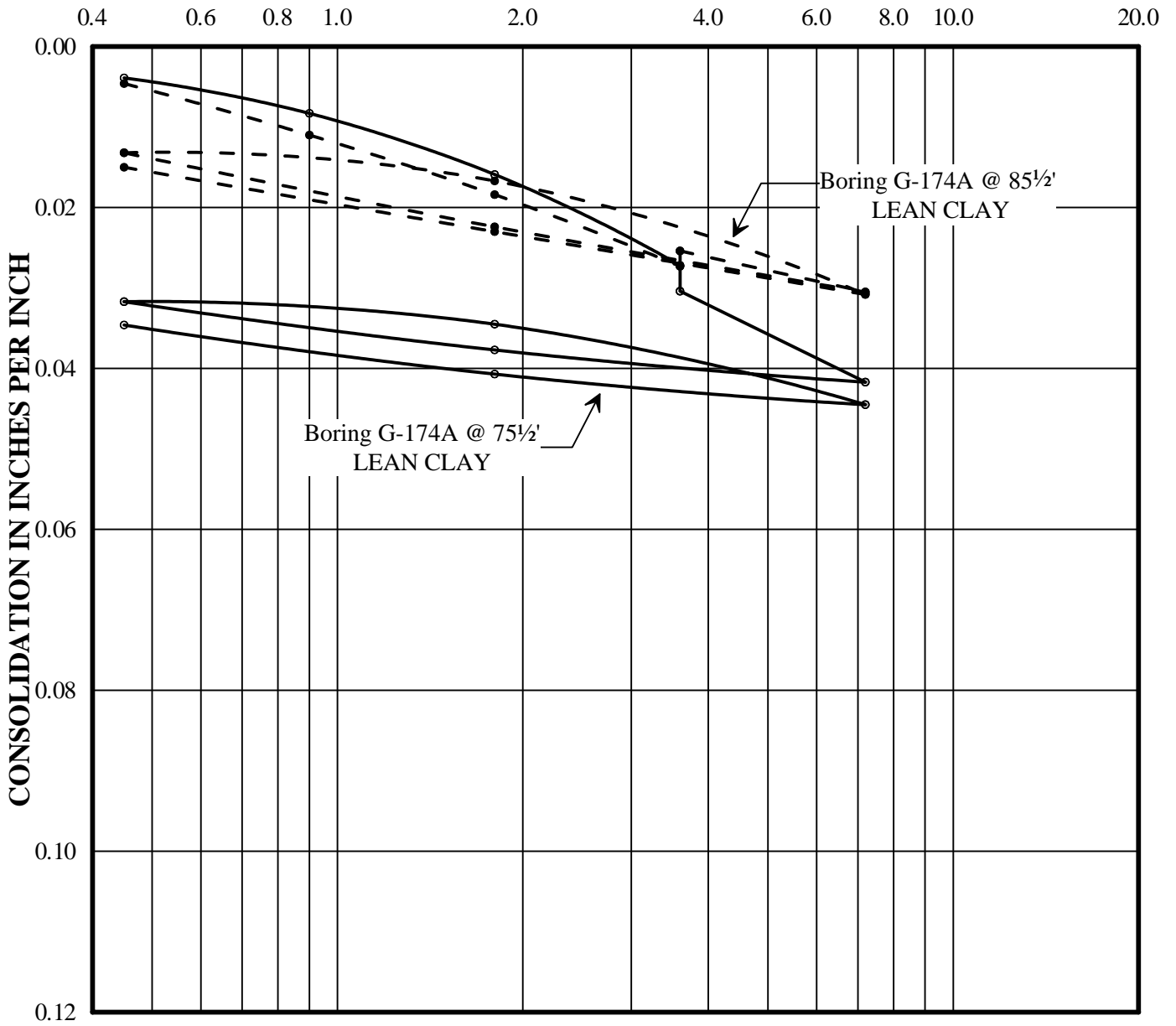
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/25/11
 Checked/Date: LT 8/16/11

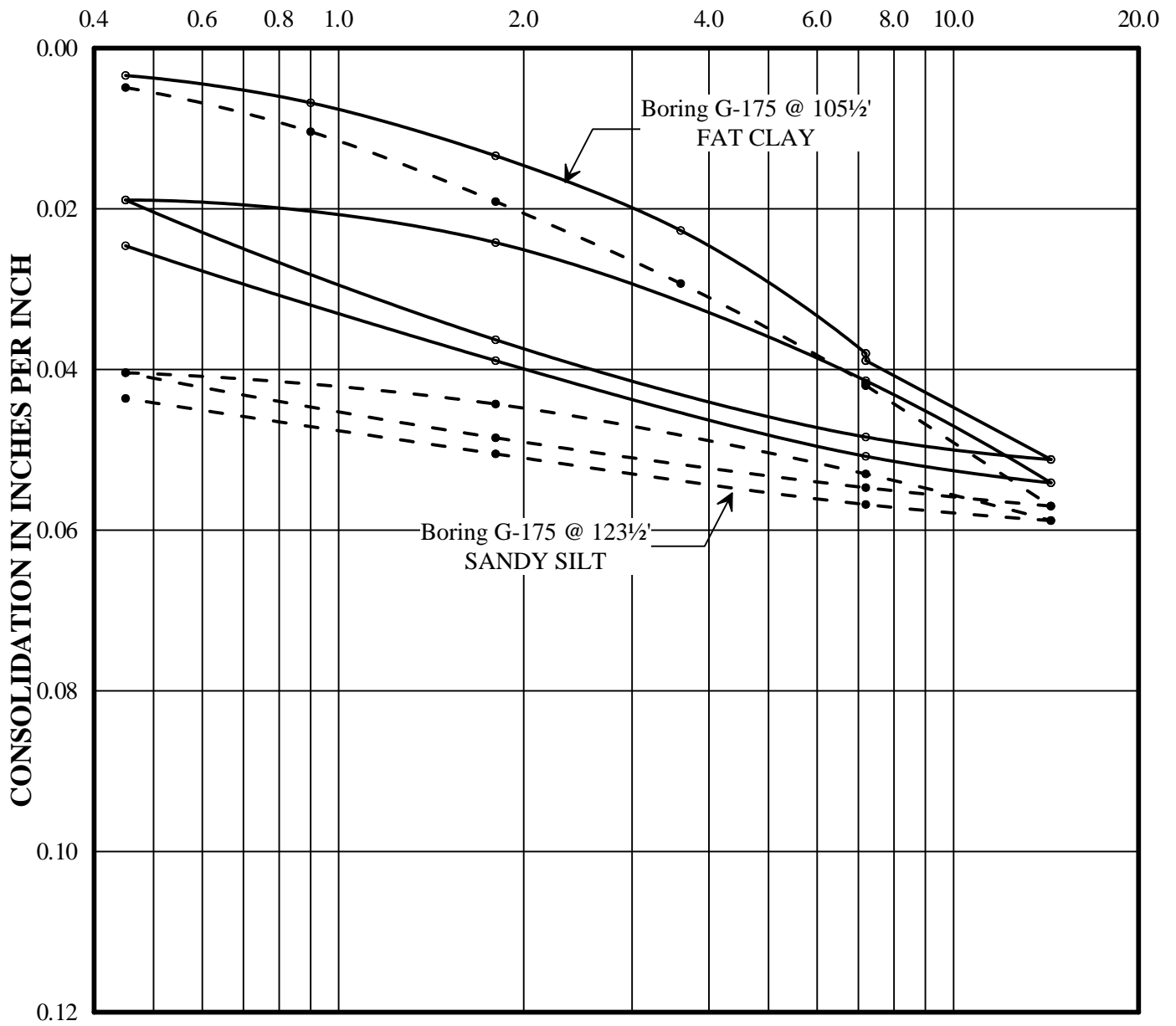
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/26/11

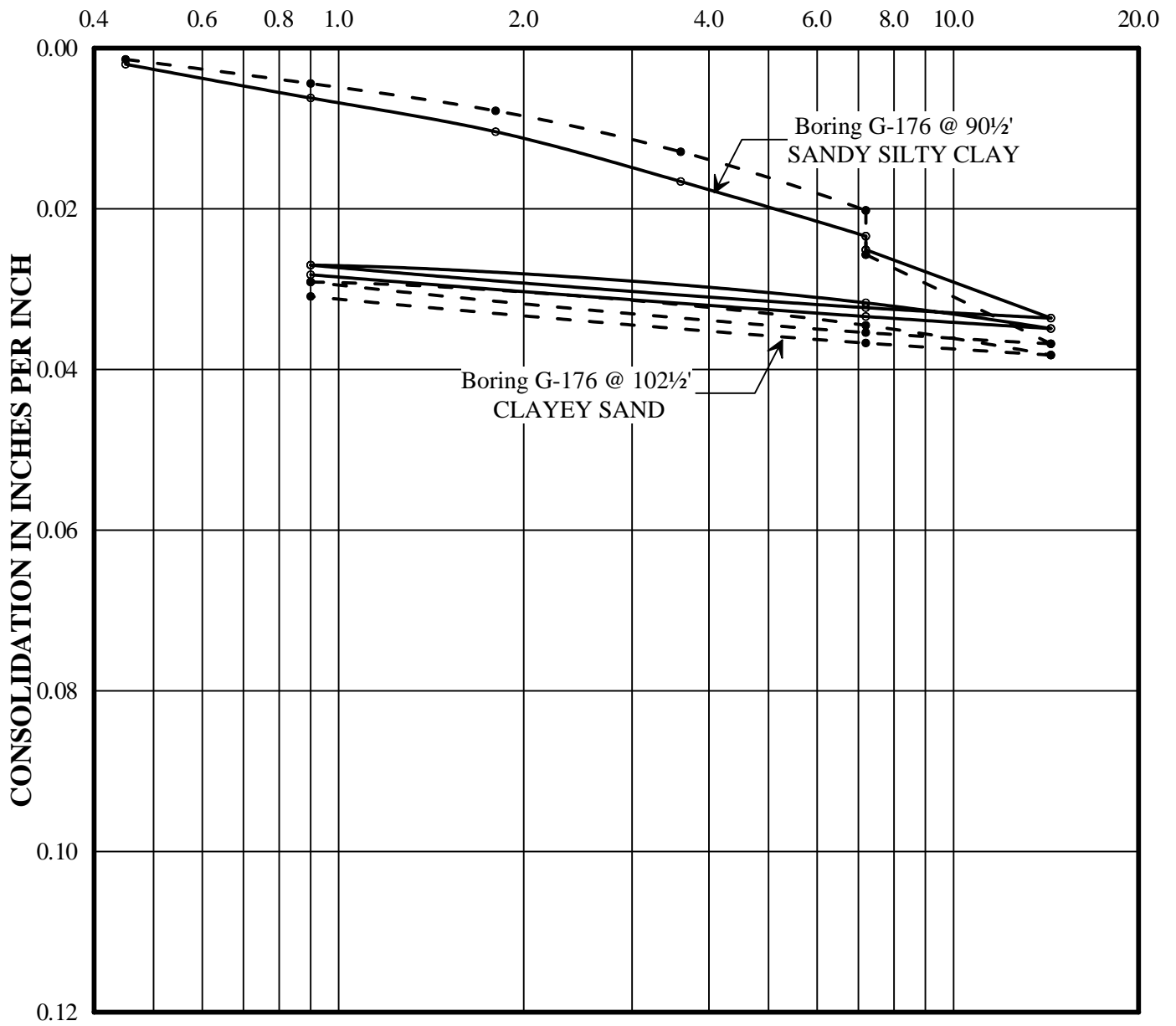
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/25/11
 Checked/Date: LT 8/17/11

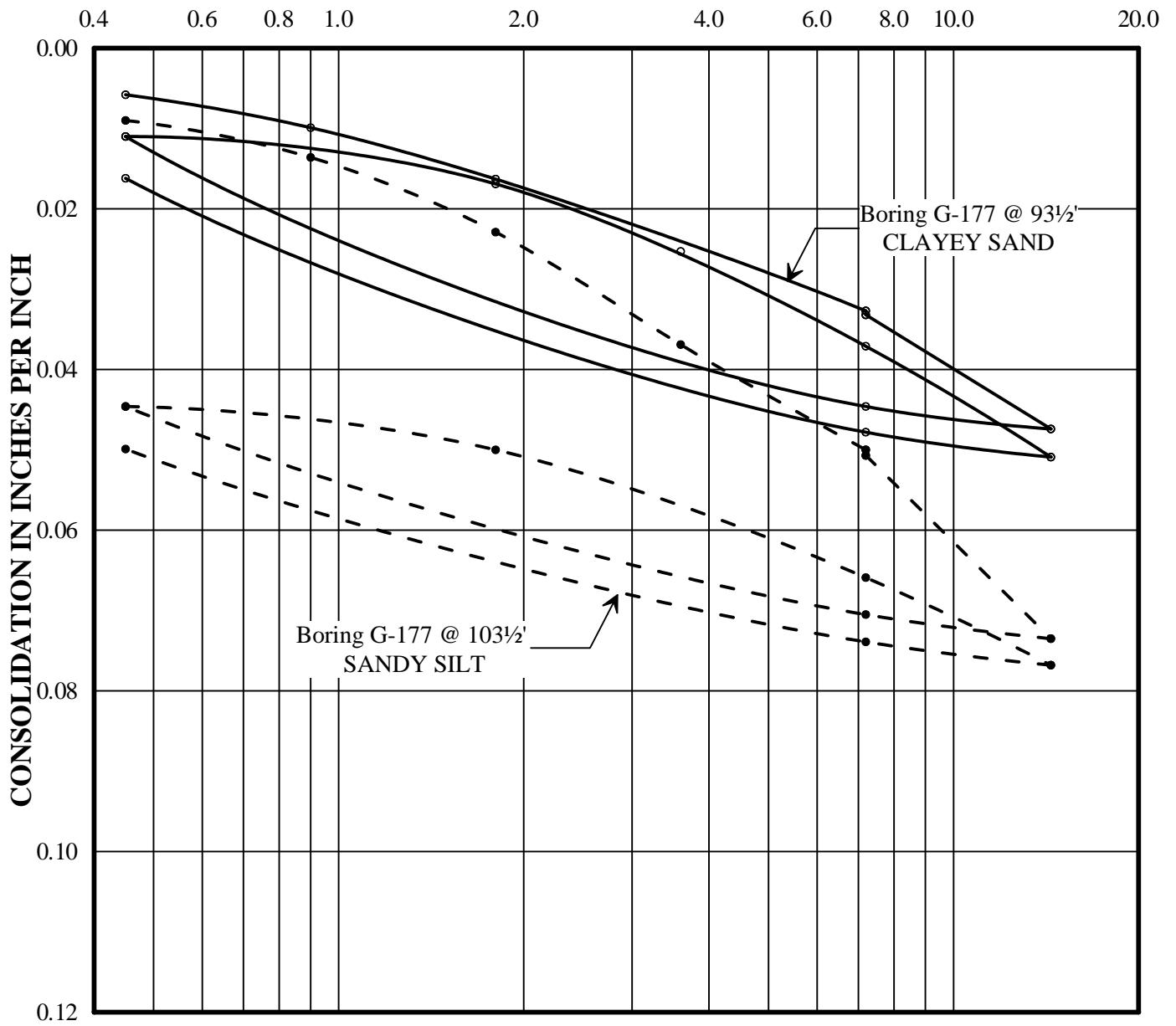
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/25/11
 Checked/Date: LT 8/17/11

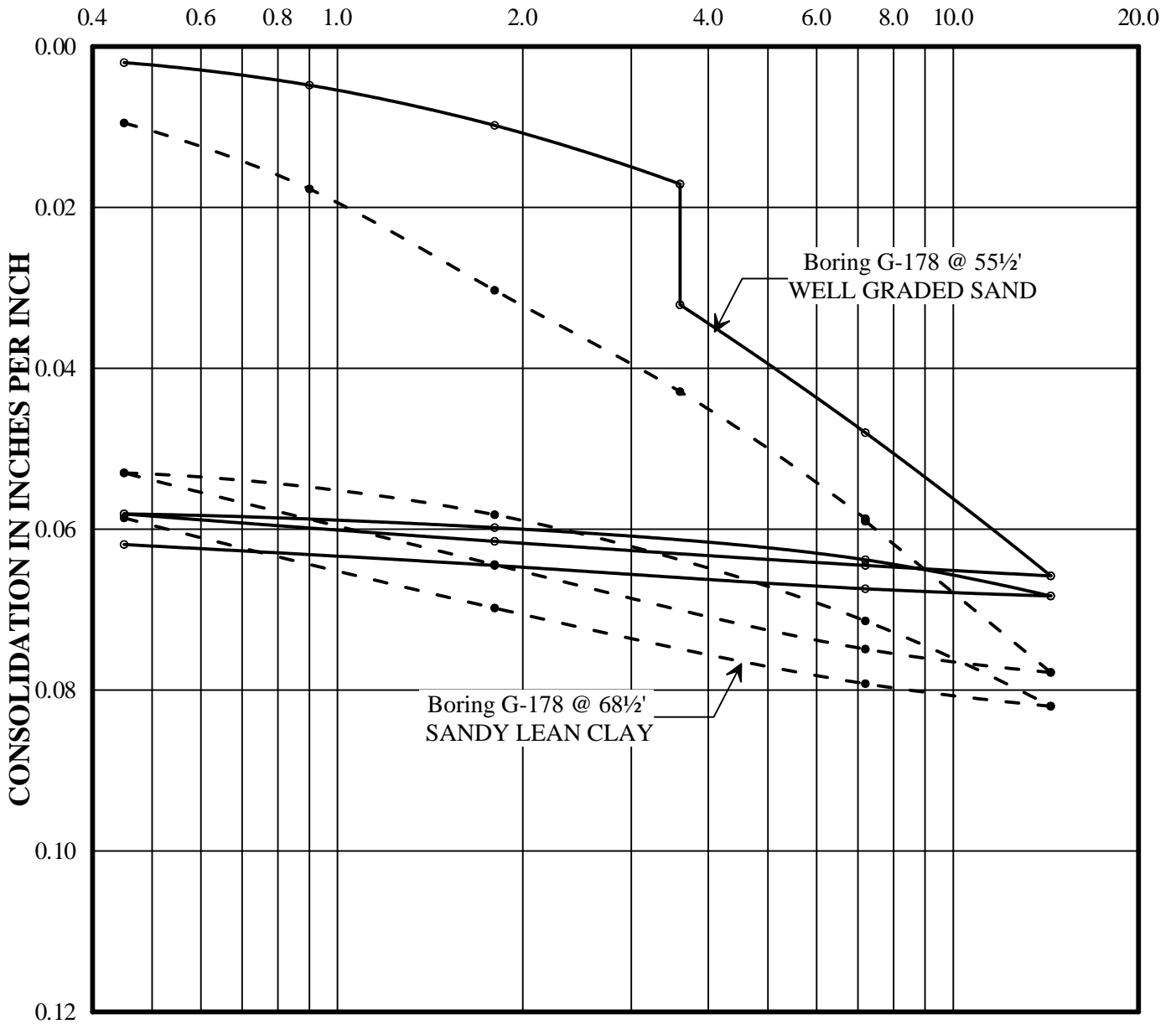
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 5/25/11
 Checked/Date: LT 8/17/11

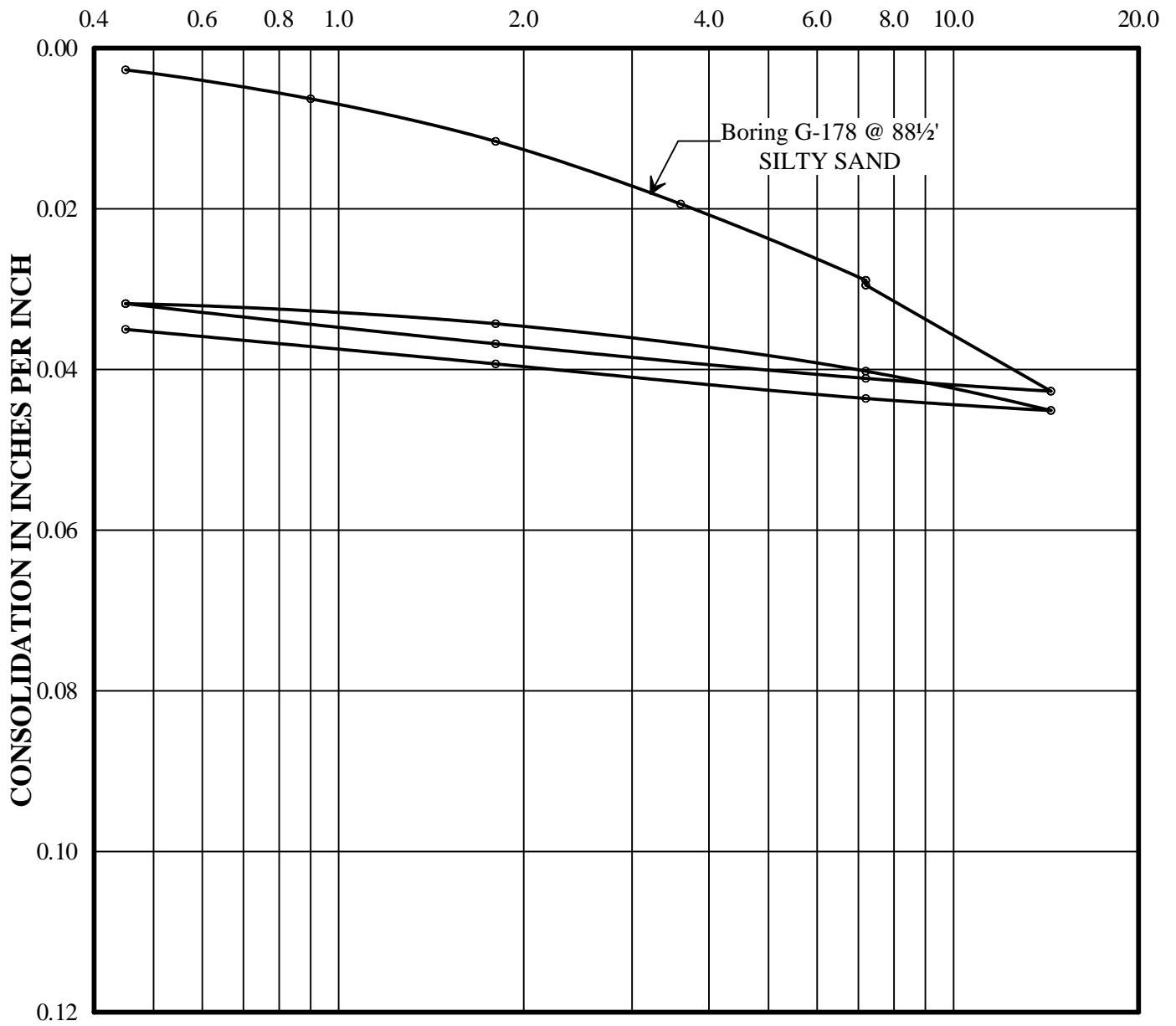
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples at 55 1/2' and 68 1/2' after consolidation under a load of 3.6 and 7.2 kips per square foot, respectively.

Prepared/Date: AH/JF 6/3/11
 Checked/Date: LT 8/17/11

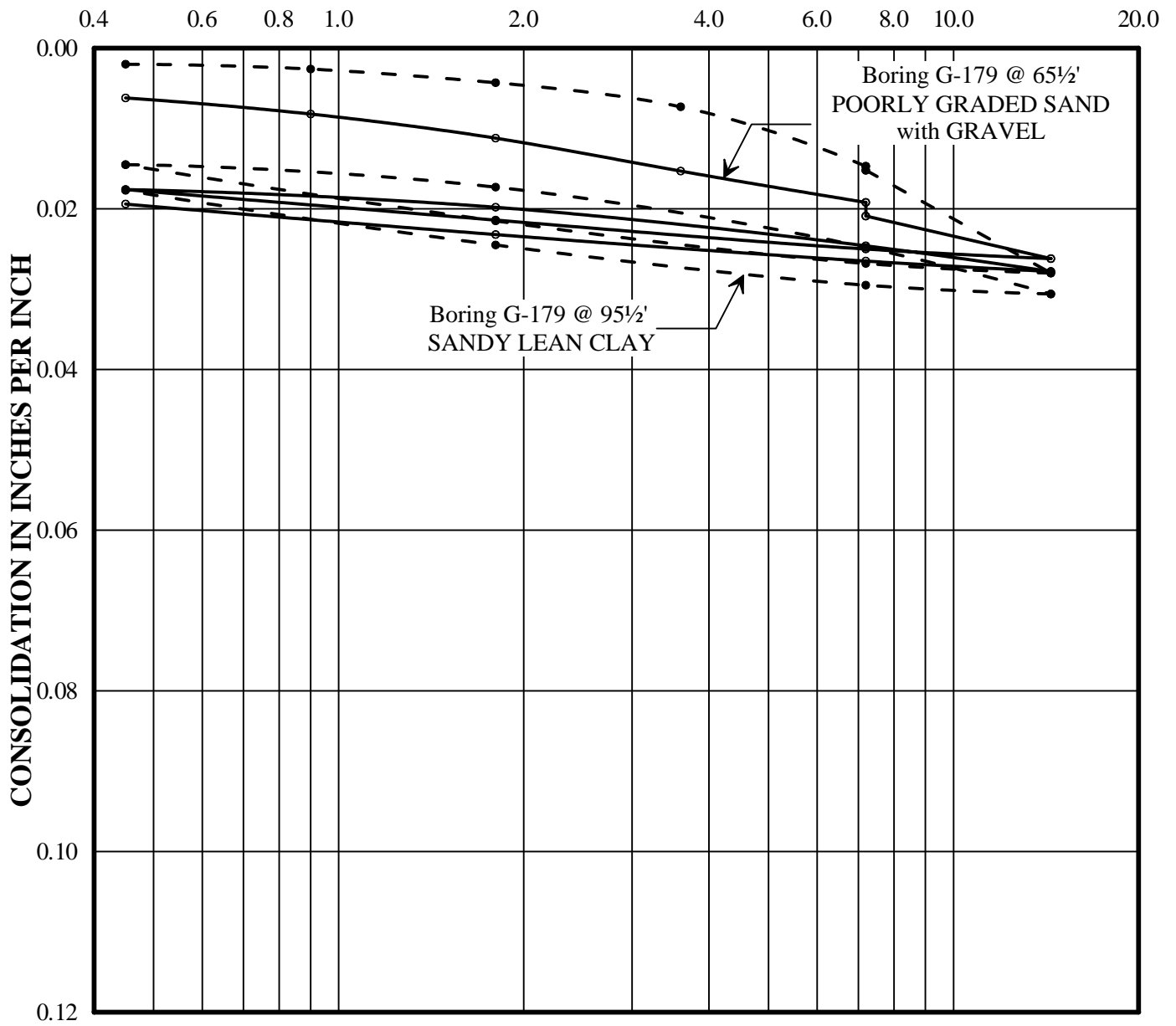
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 6/3/11
 Checked/Date: LT 8/17/11

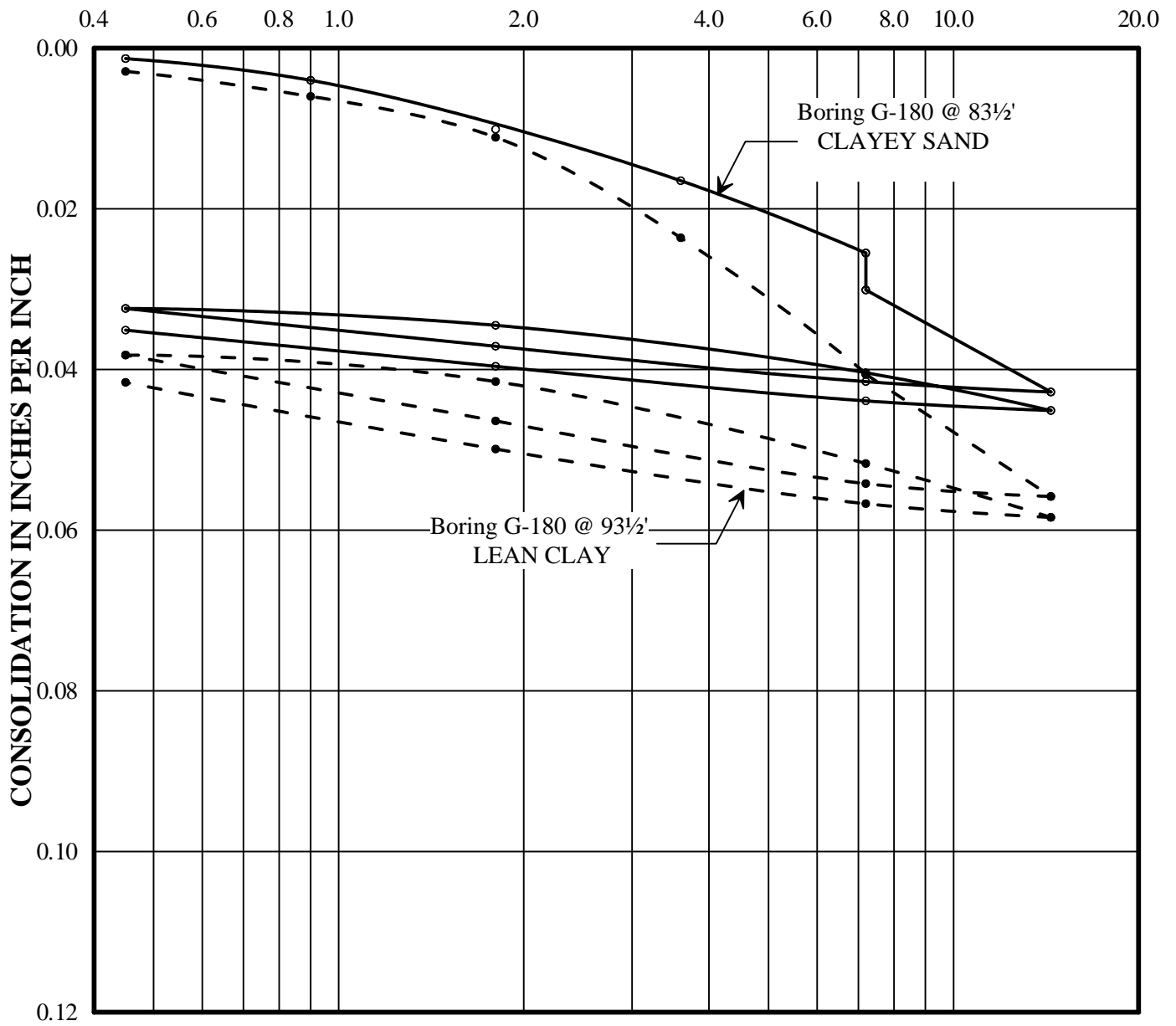
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 6/3/11
 Checked/Date: LT 8/17/11

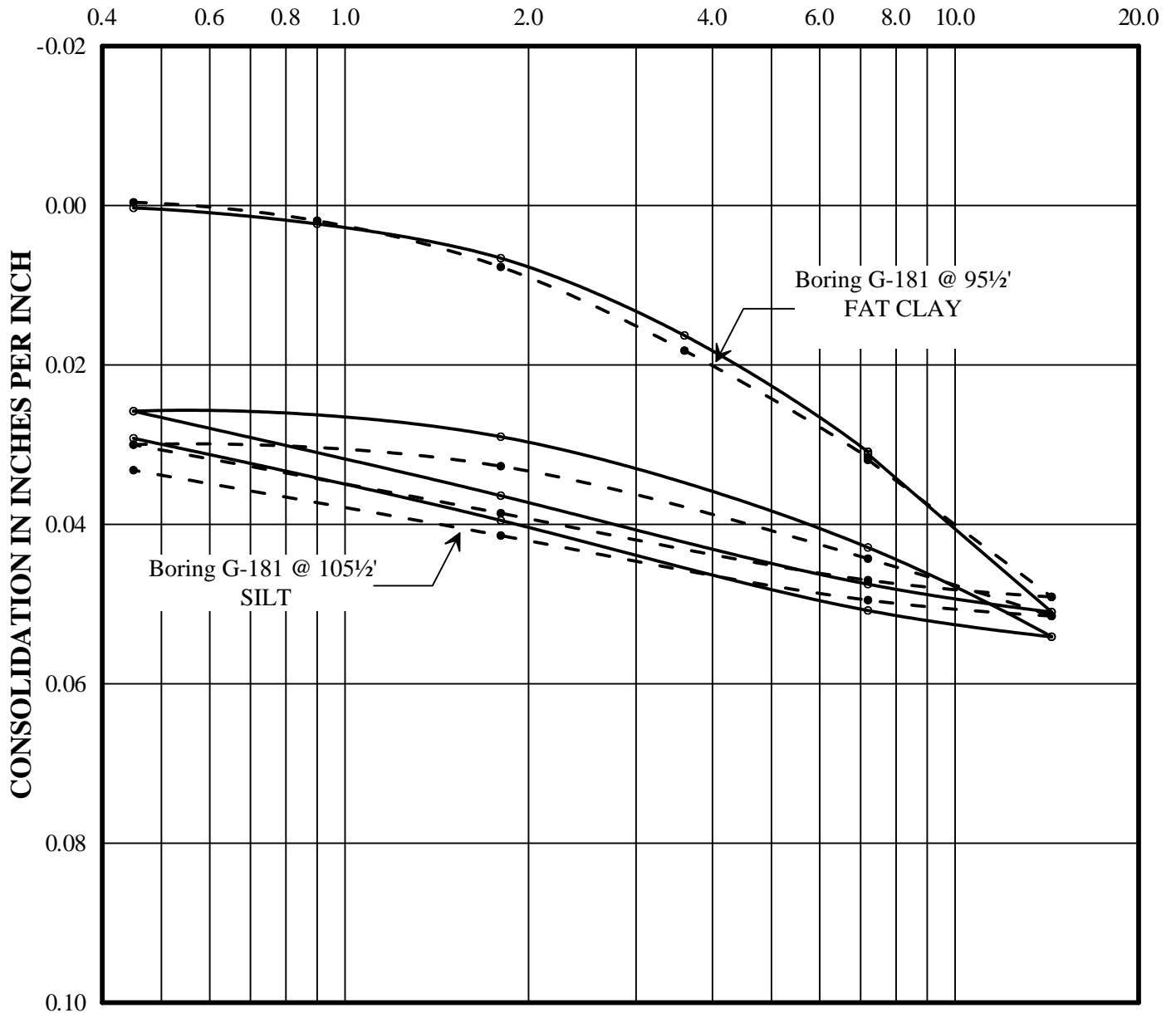
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 6/7/11
 Checked/Date: LT 8/17/11

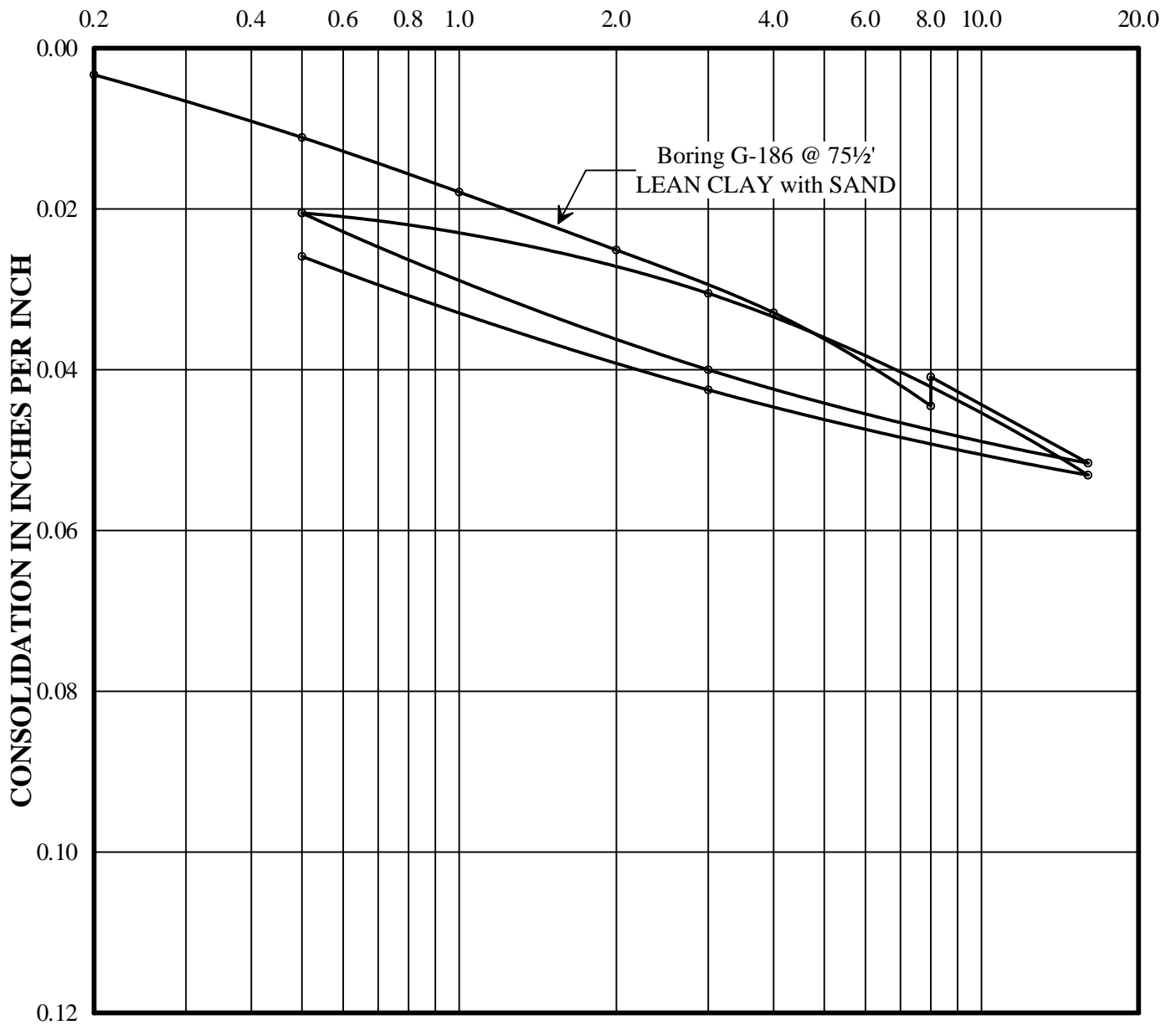
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH/JF 6/7/11
 Checked/Date: LT 8/17/11

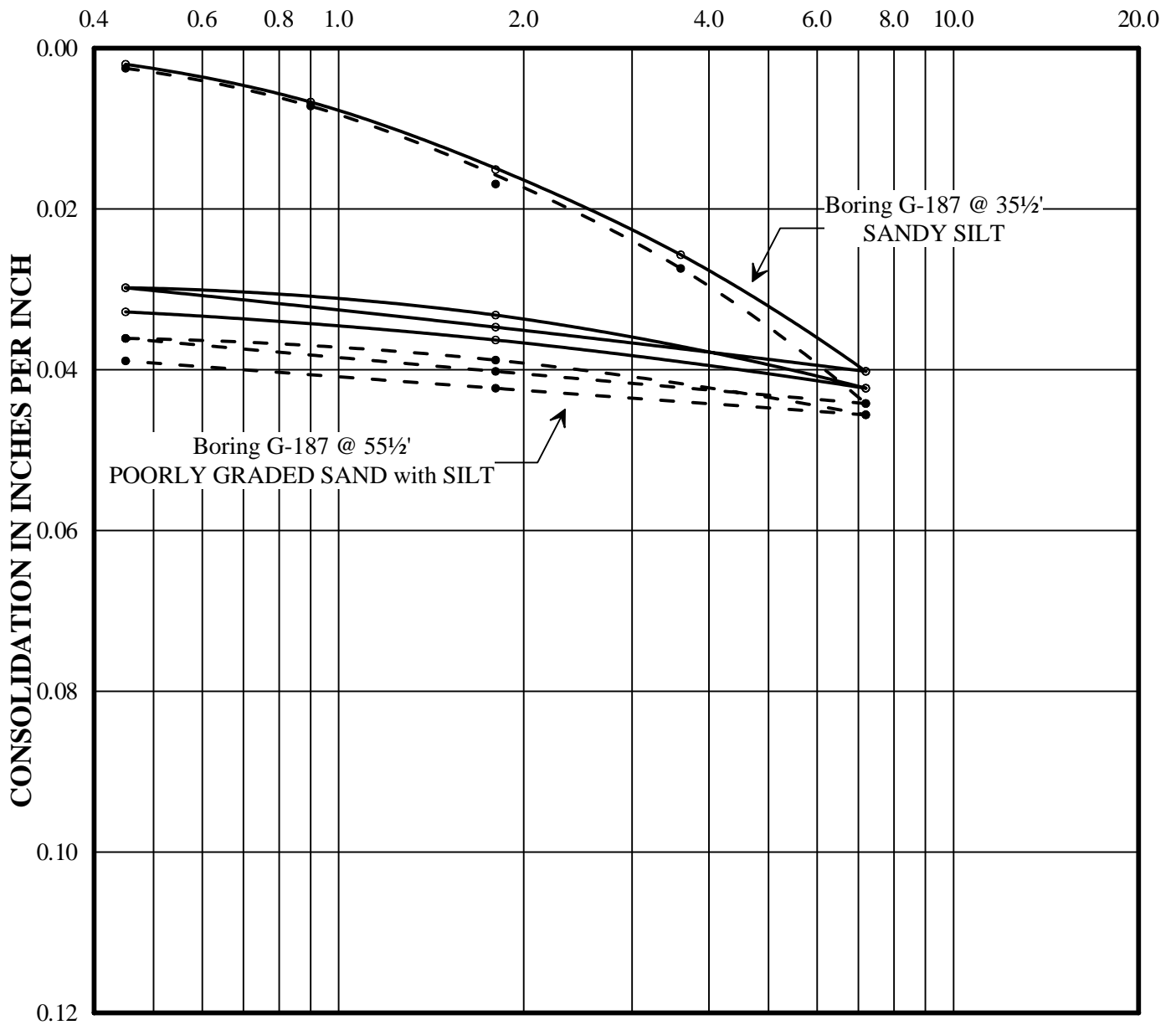
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/26/11

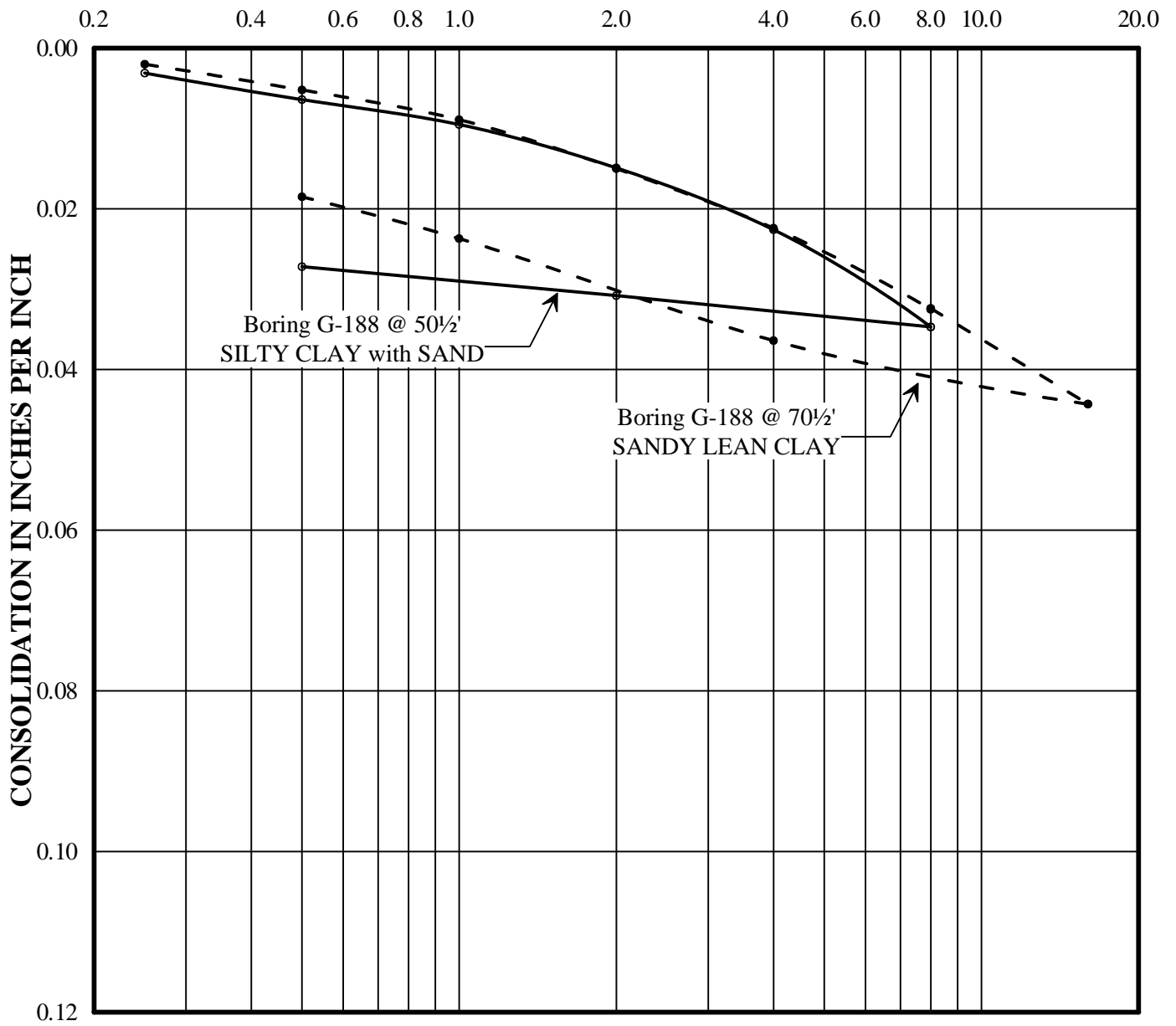
LOAD IN KIPS PER SQUARE FOOT



Note: Water not added to samples.

Prepared/Date: AH 9/6/11
Checked/Date: LT 9/13/11

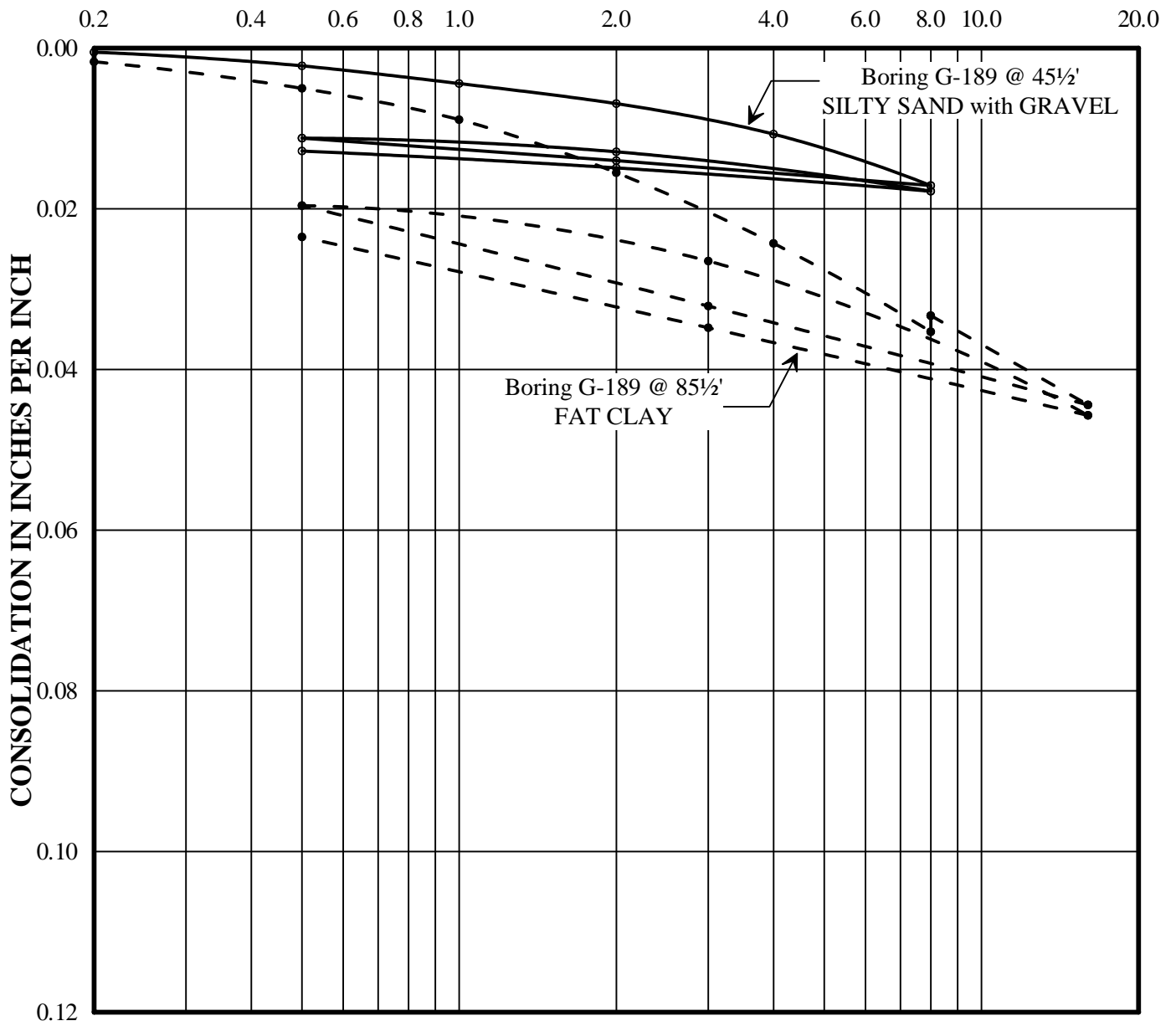
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 70 1/2' after consolidation under a load of 8.0 kips per square foot.
Water not added to sample at 50 1/2'.

Prepared/Date: AH 9/20/11
Checked/Date: LT 9/27/11

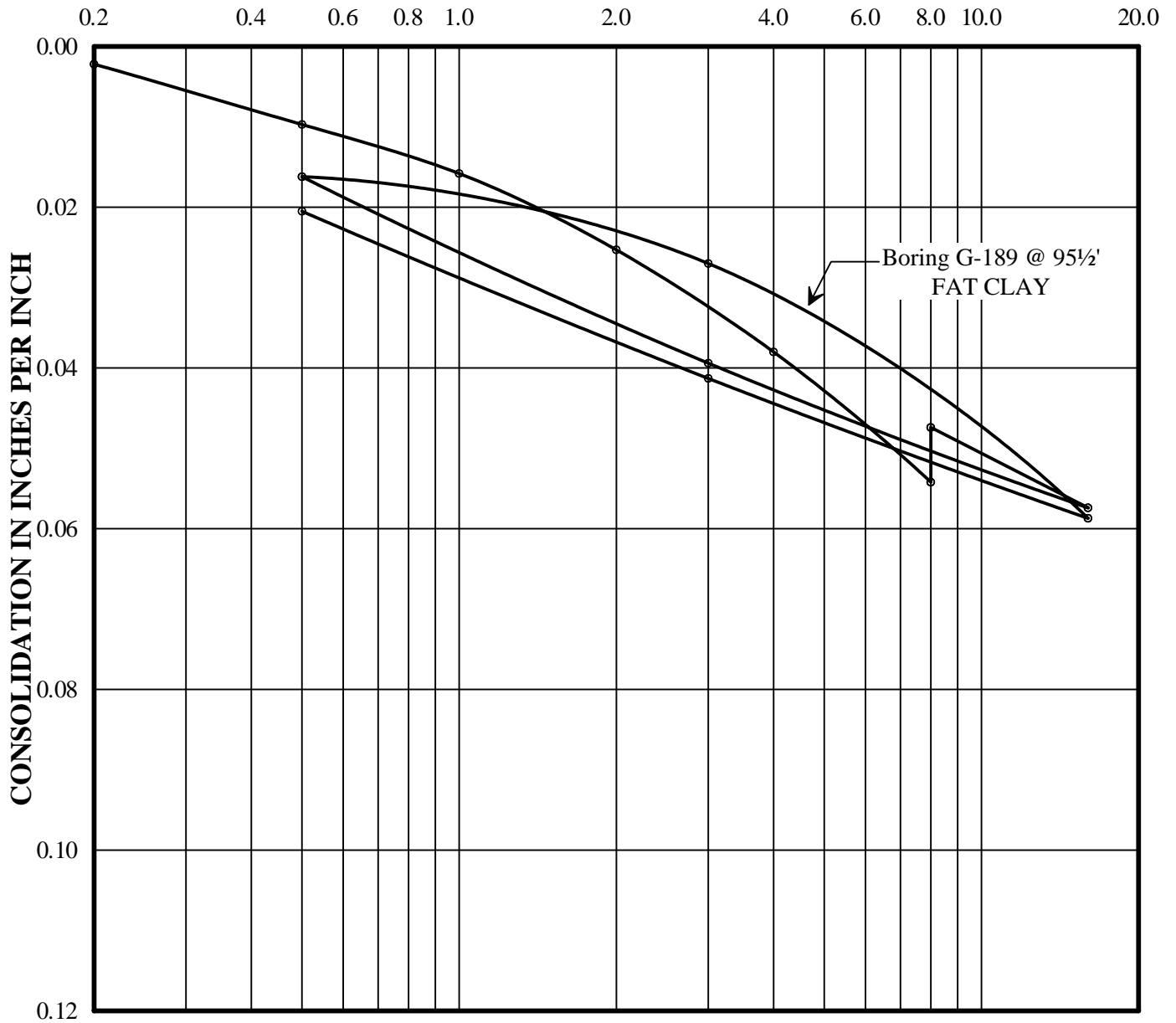
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 85 1/2' after consolidation under a load of 8.0 kips per square foot.
Water not added to sample at 45 1/2'.

Prepared/Date: AH 9/22/11
Checked/Date: LT 9/26/11

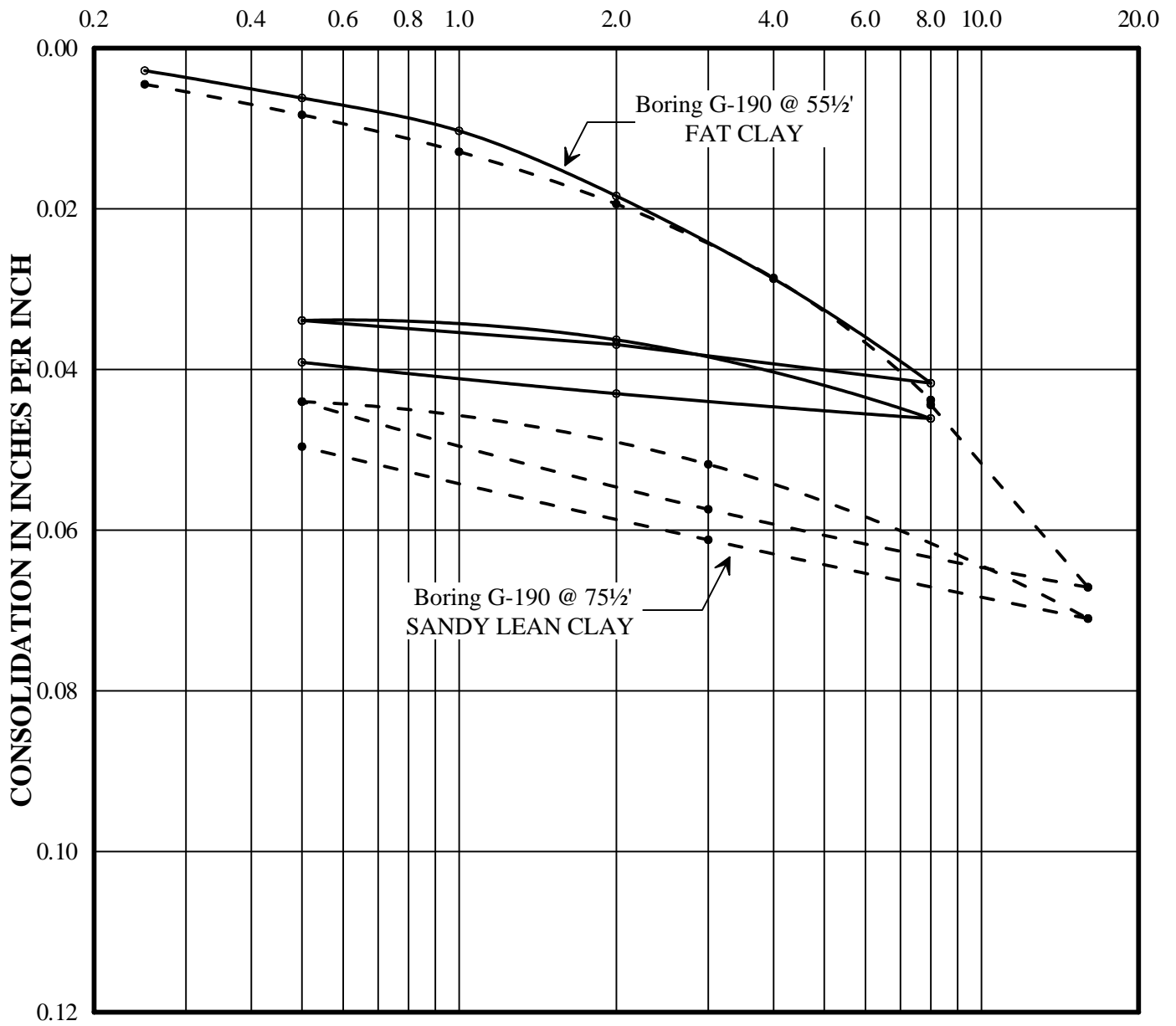
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/22/11
Checked/Date: LT 9/26/11

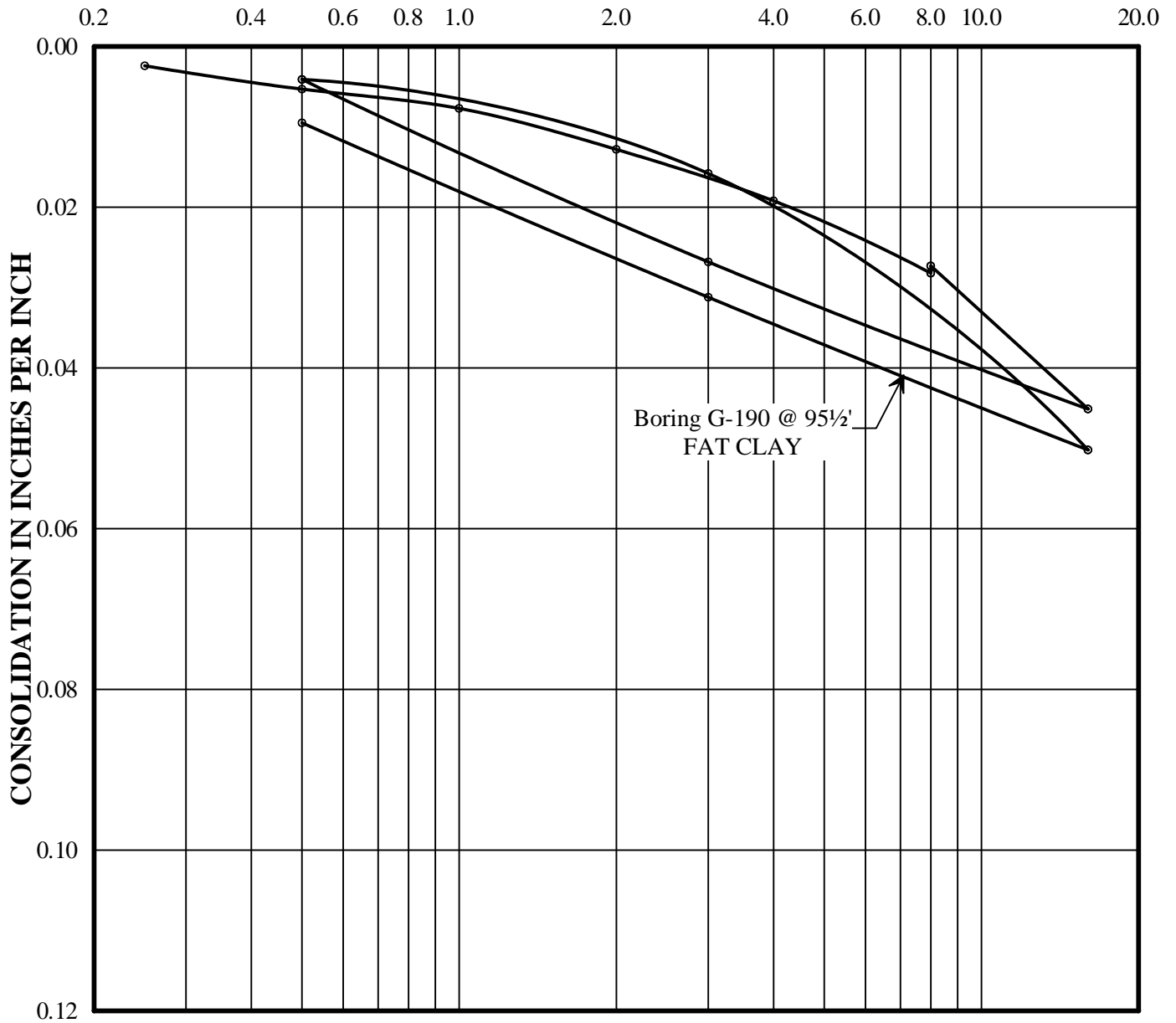
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 75½' after consolidation under a load of 8.0 kips per square foot.
Water not added to sample at 55½'.

Prepared/Date: AH 9/22/11
Checked/Date: LT 9/27/11

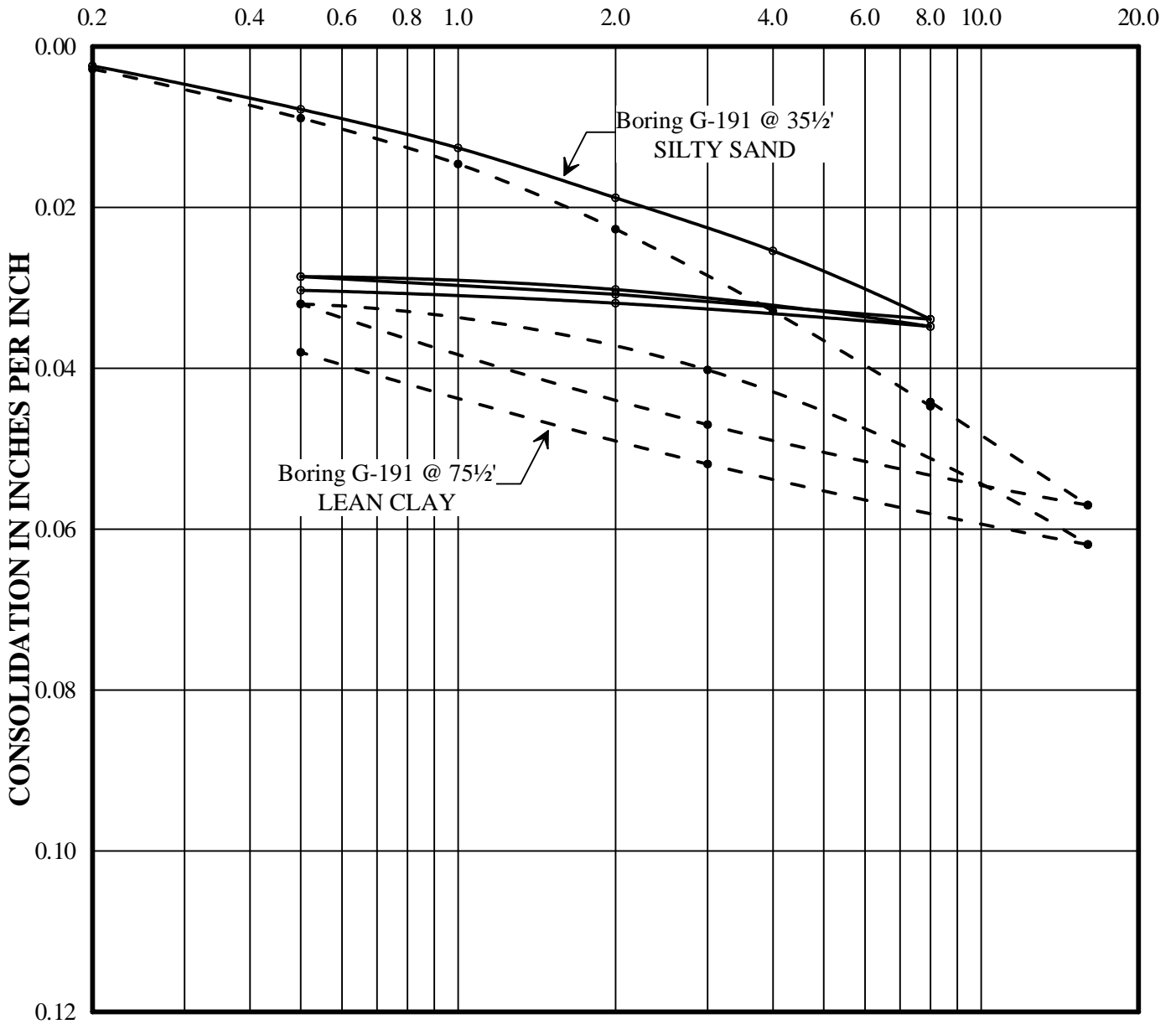
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/22/11
 Checked/Date: LT 9/27/11

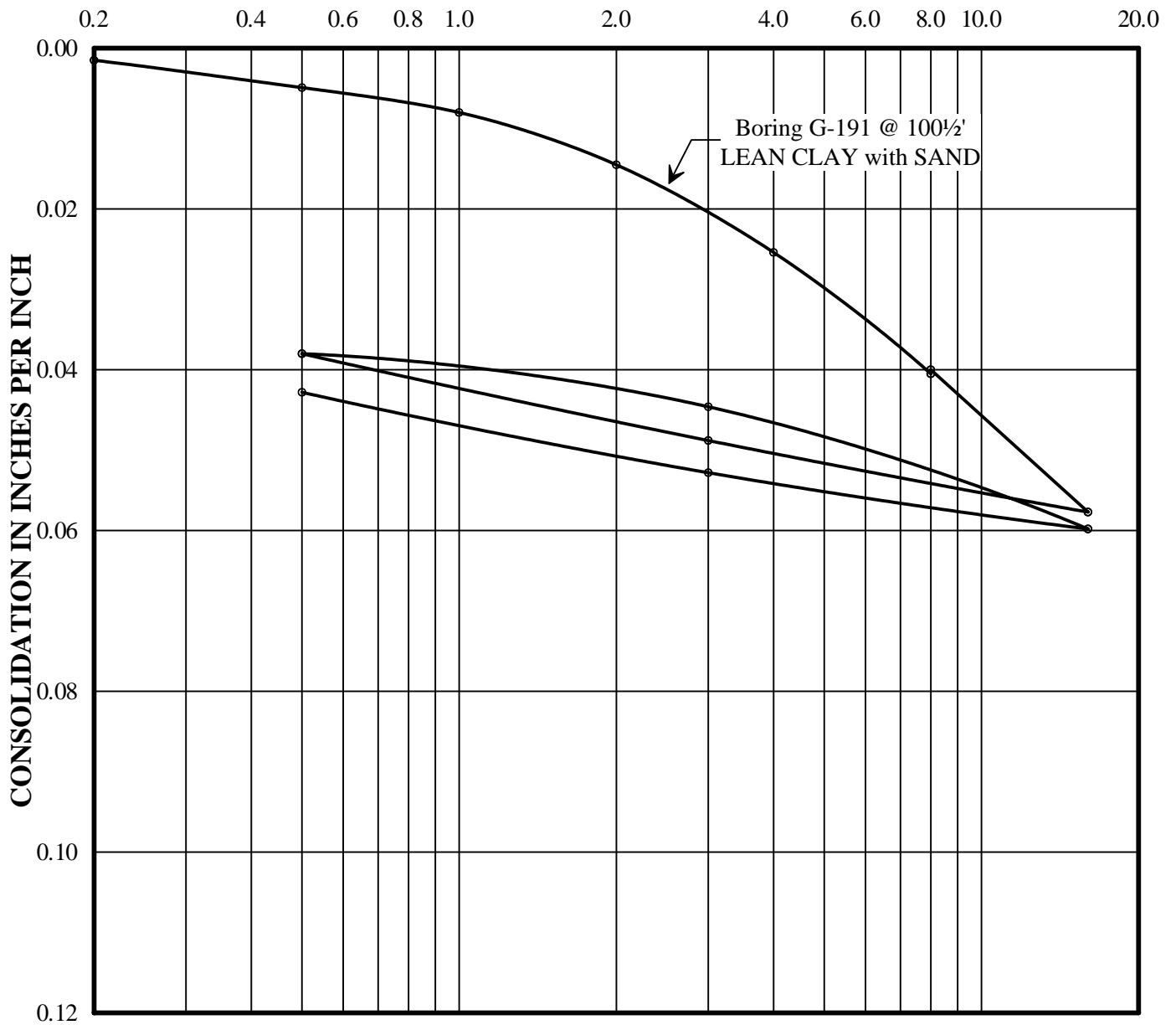
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 75 1/2' after consolidation under a load of 8.0 kips per square foot.
Water not added to sample at 35 1/2'.

Prepared/Date: AH 9/23/11
Checked/Date: LT 9/26/11

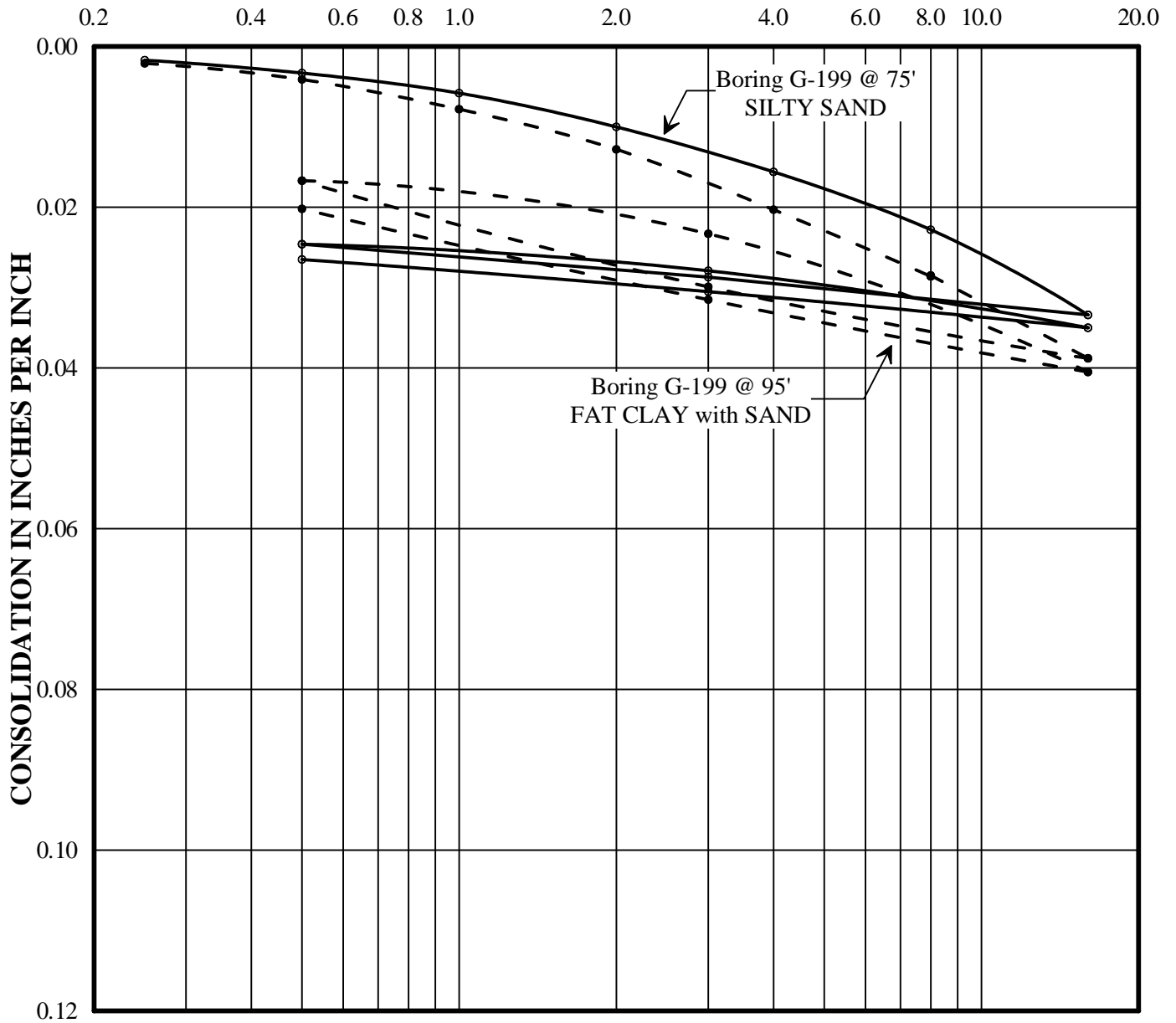
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/26/11

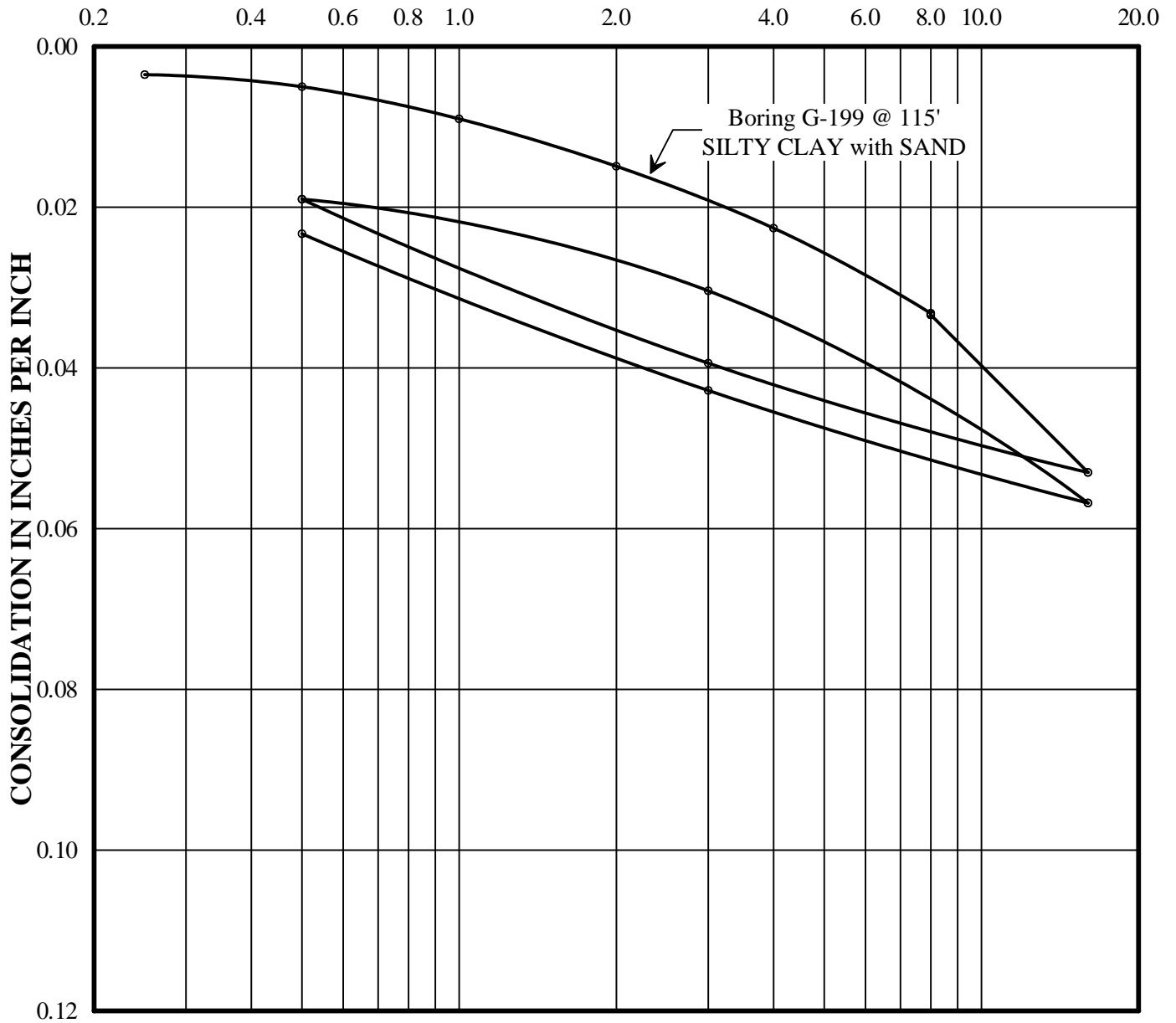
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample at 95' after consolidation under a load of 8.0 kips per square foot.
Water not added to sample at 75'.

Prepared/Date: AH 9/23/11
Checked/Date: LT 9/26/11

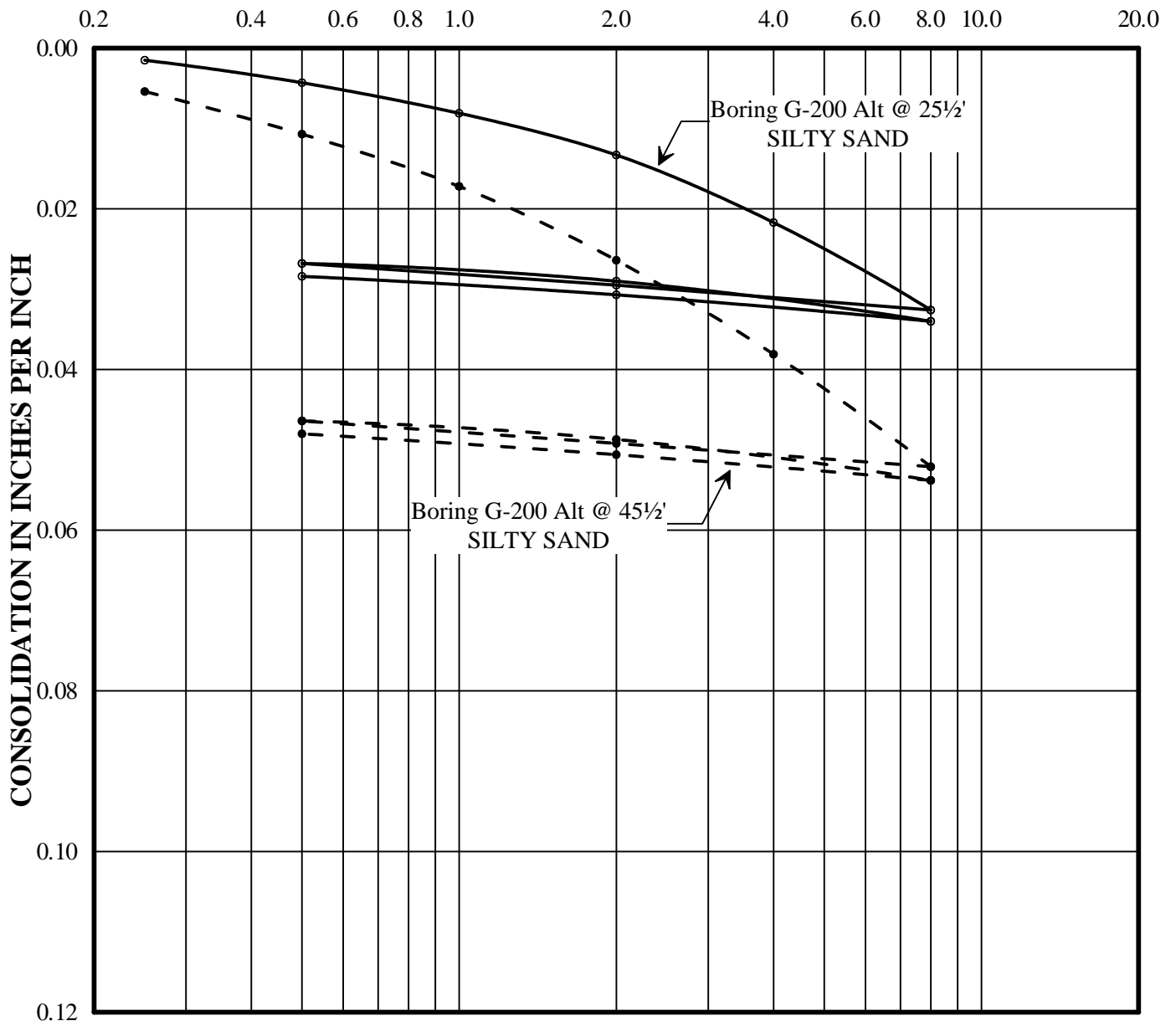
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/23/11
Checked/Date: LT 9/26/11

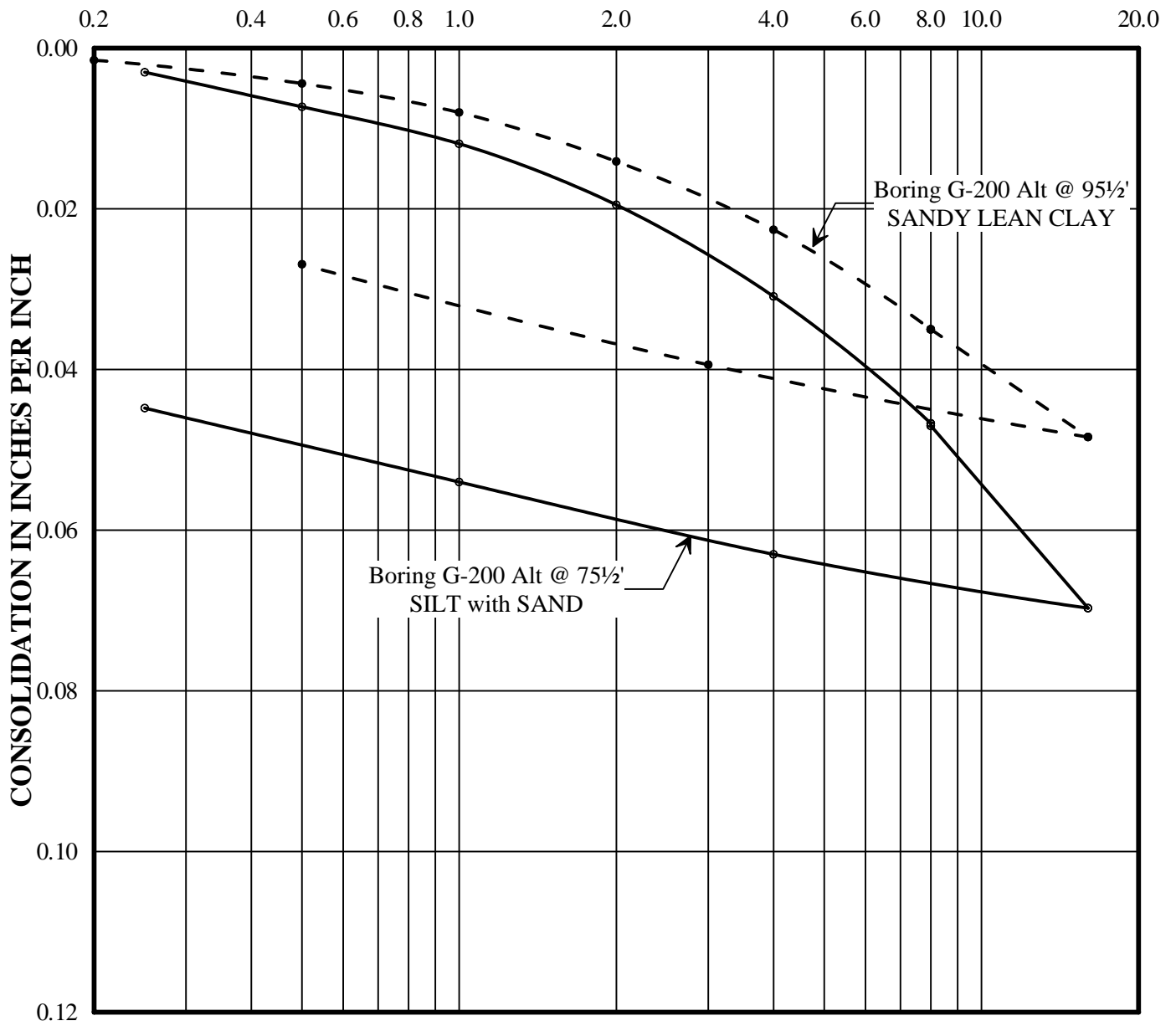
LOAD IN KIPS PER SQUARE FOOT



Note: Water not added to samples.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/26/11

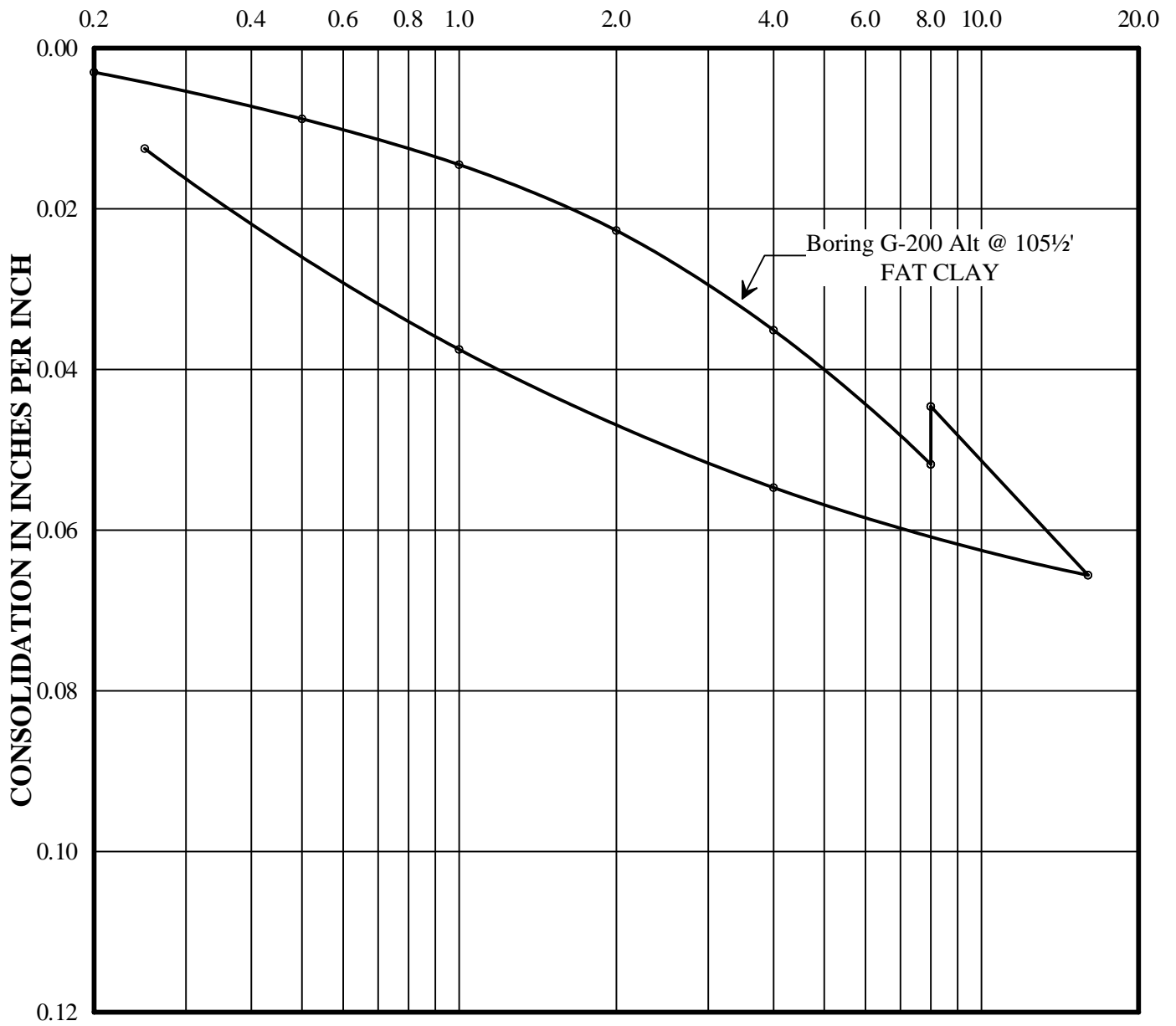
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/26/11

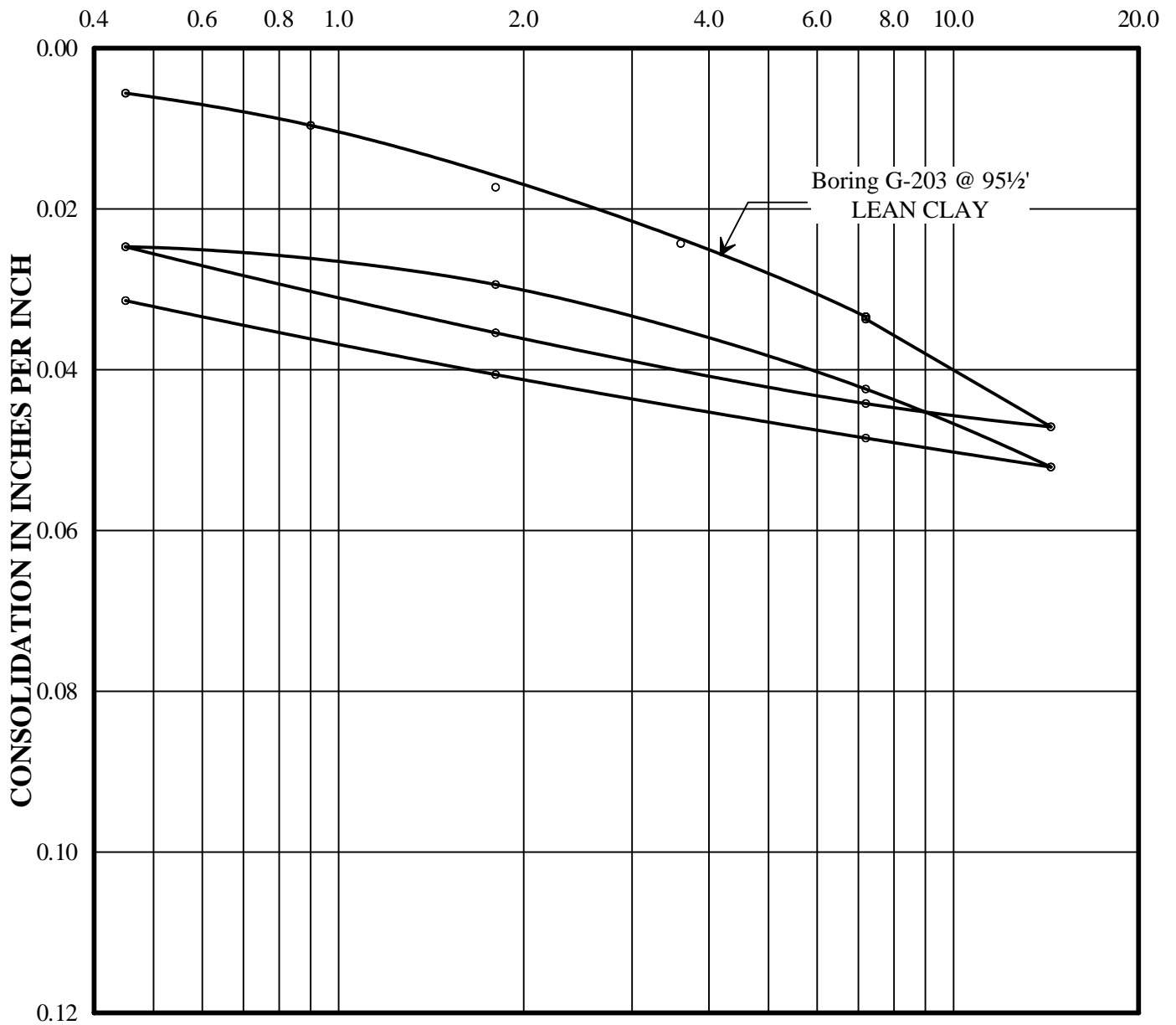
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 8.0 kips per square foot.

Prepared/Date: AH 9/23/11
 Checked/Date: LT 9/26/11

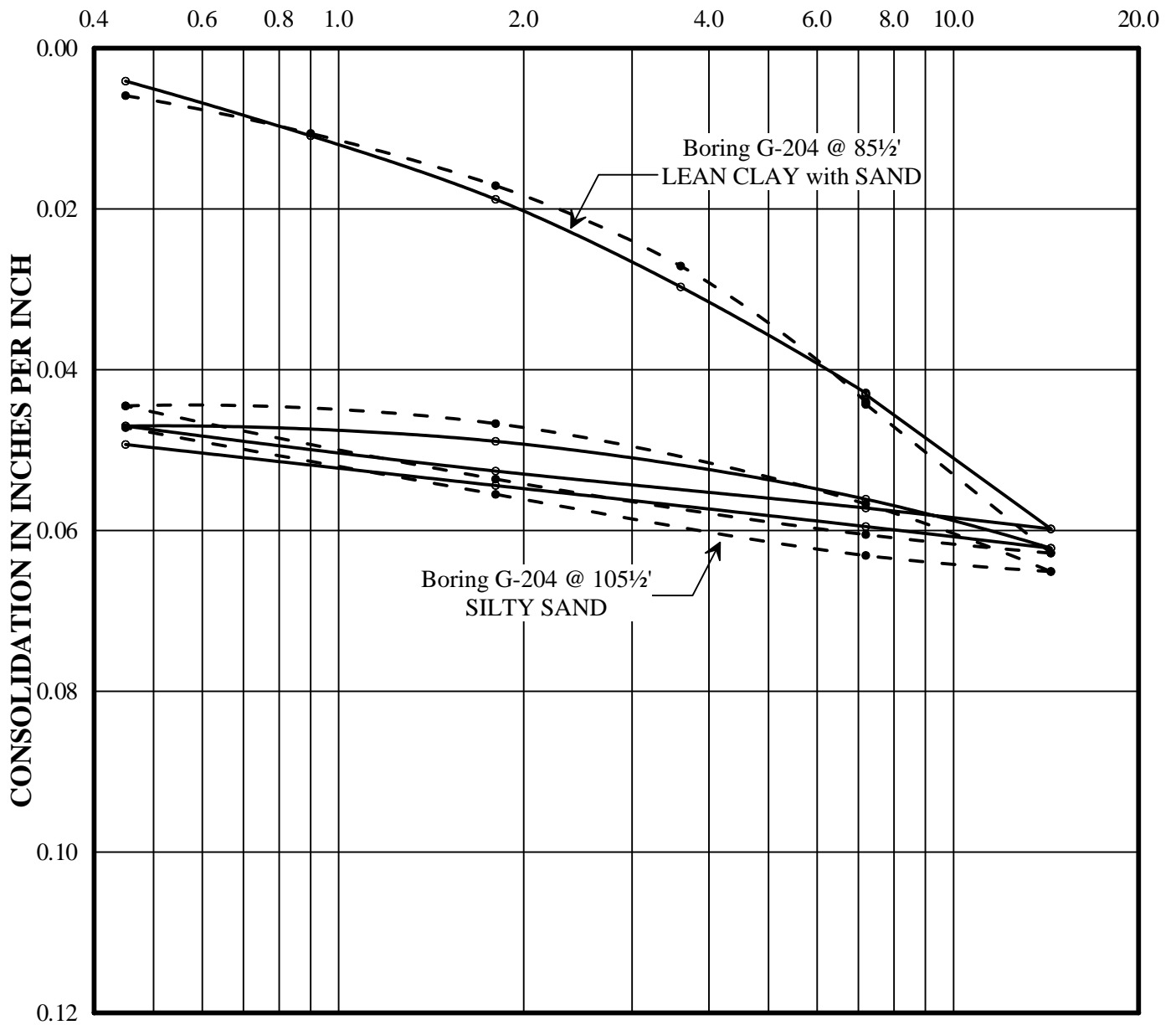
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to sample after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/26/11
Checked/Date: LT 9/13/11

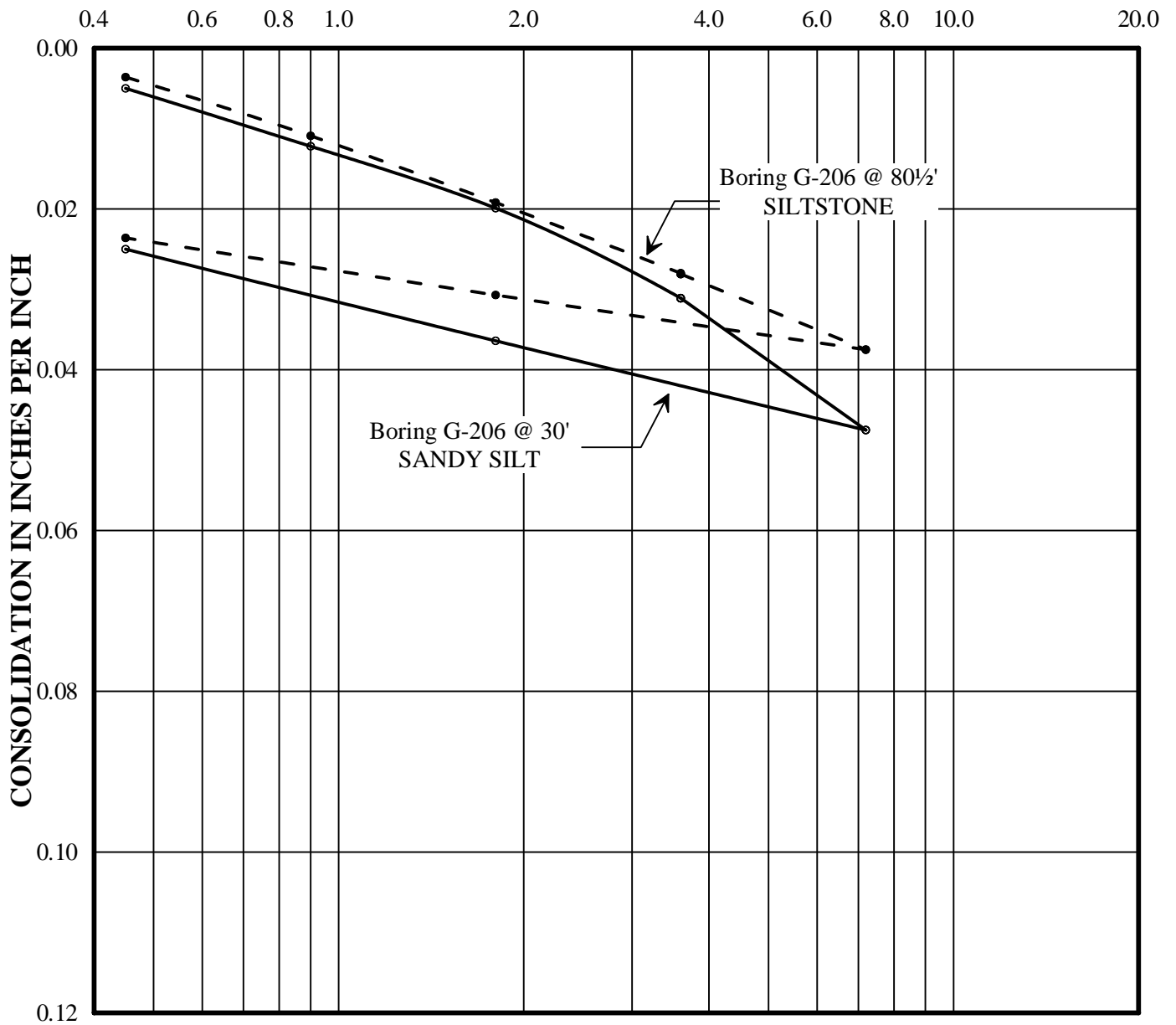
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 7.2 kips per square foot.

Prepared/Date: AH 8/25/11
Checked/Date: LT 9/13/11

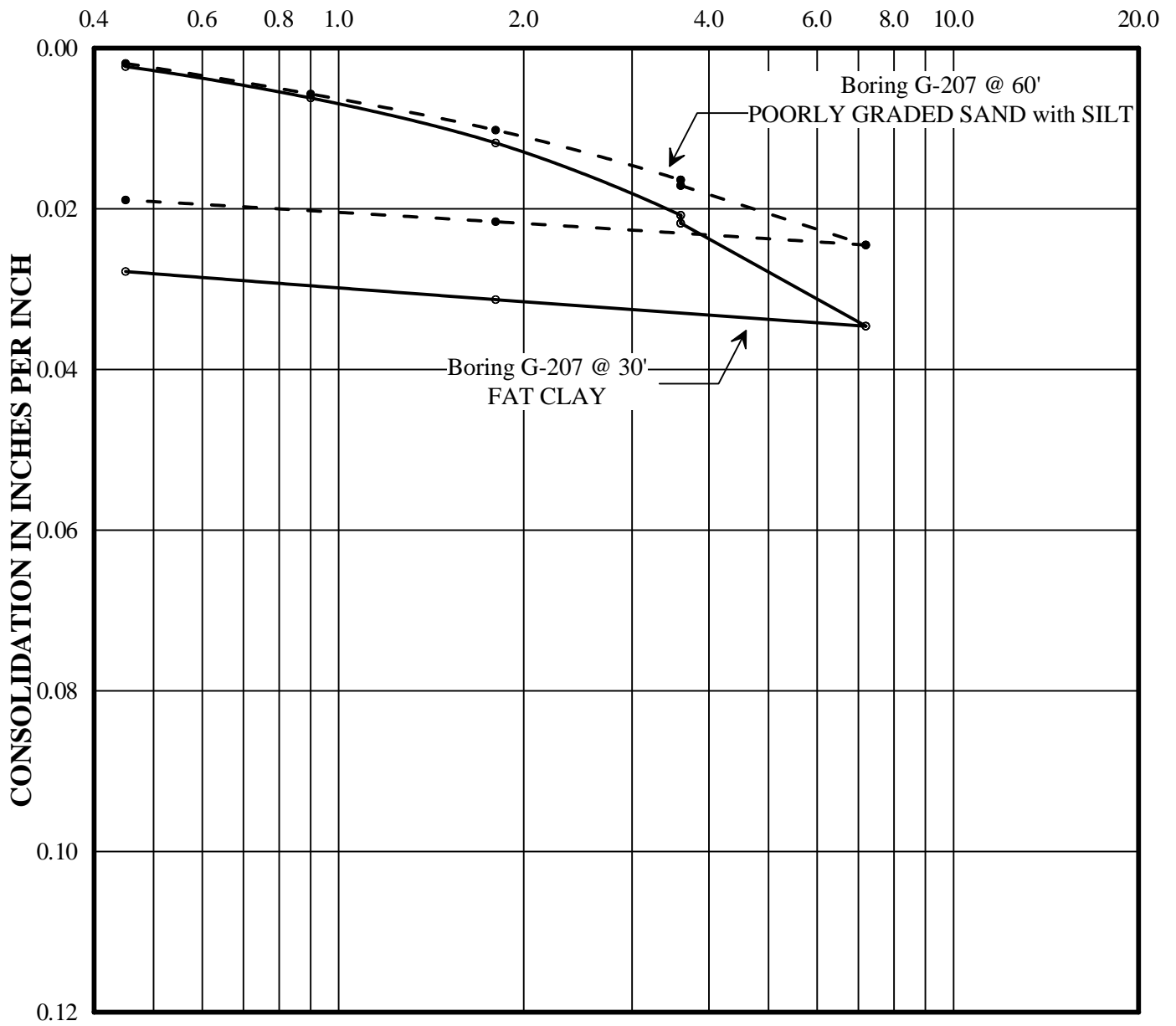
LOAD IN KIPS PER SQUARE FOOT



Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: JF 9/29/11
 Checked/Date: LT 9/29/11

LOAD IN KIPS PER SQUARE FOOT

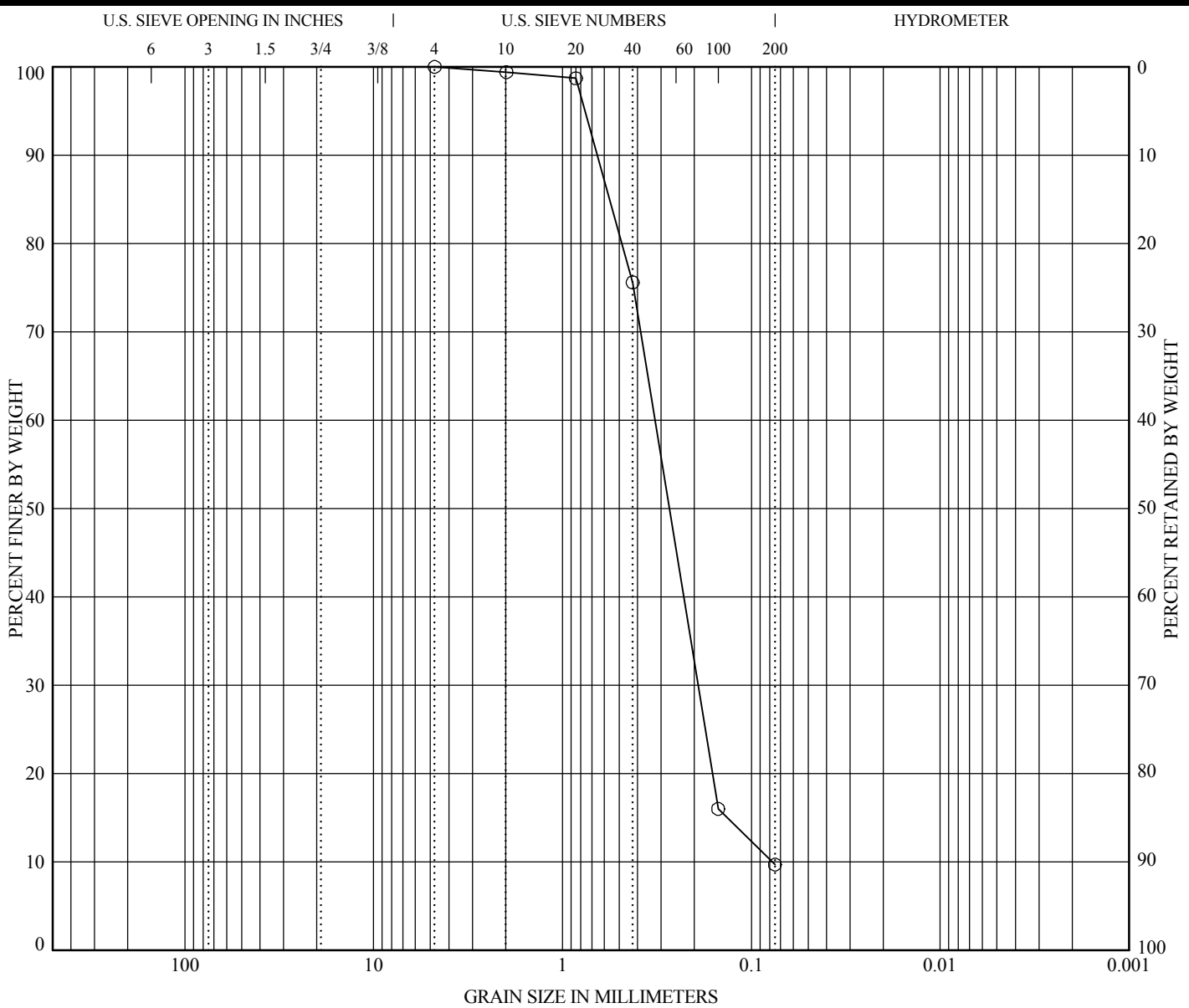


Note: Water added to samples after consolidation under a load of 3.6 kips per square foot.

Prepared/Date: JF 9/29/11
 Checked/Date: LT 9/29/11

**FIGURES F-5.1 THROUGH F-5.11
PARTICLE SIZE DISTRIBUTION (ACE PHASE)**

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-1	70.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	1.5	4.2

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-1	70.5	4.75	0.324	0.192	0.078	0.0	90.3	9.7

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

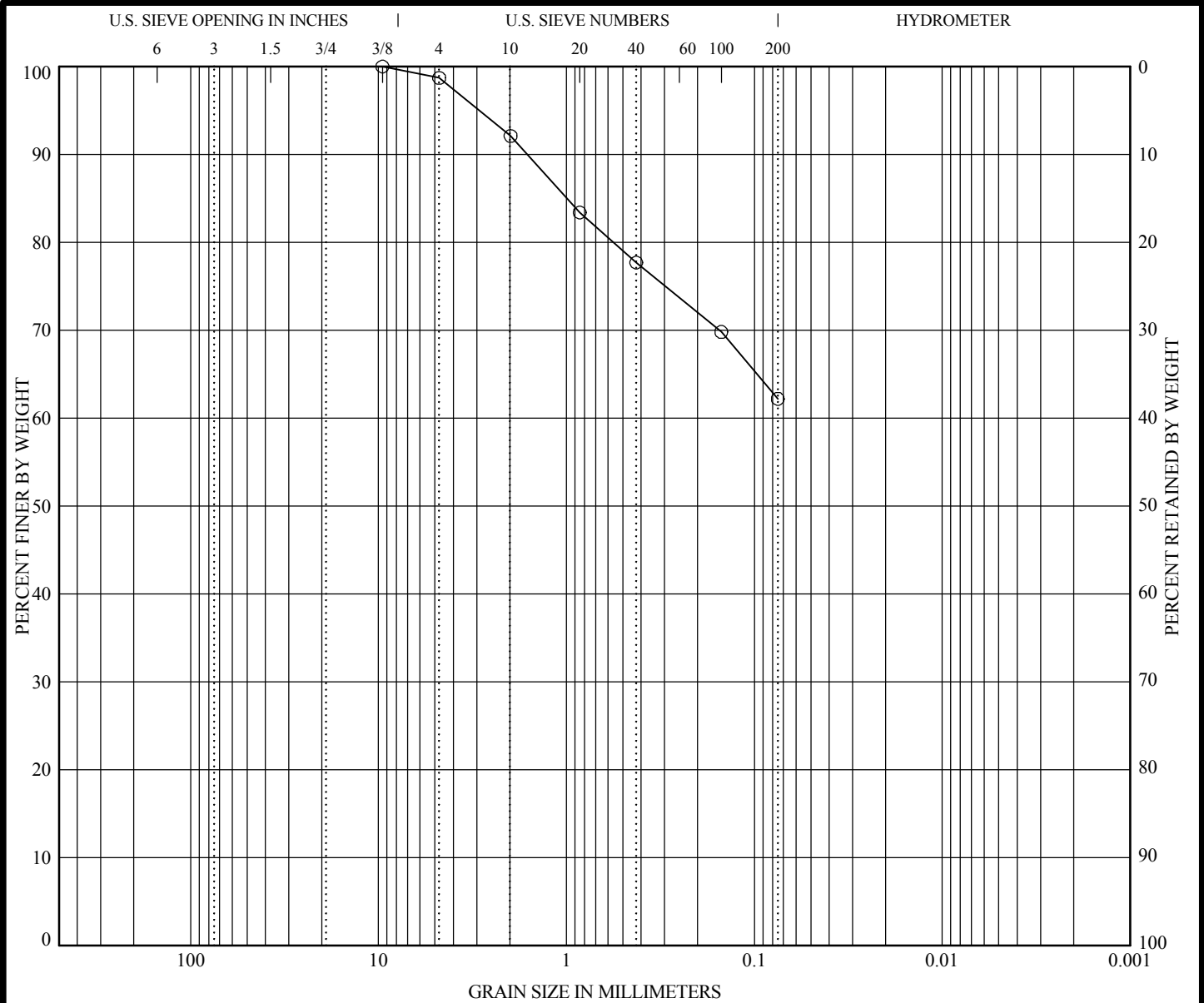
Prepared/Date: JF 6/29/2011
 Checked/Date: HP 12/2/2011

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PARTICLE SIZE DISTRIBUTION
 Project No.: 4953-10-1561
 Figure: F-5.1

MACTEC LA GRAIN SIZE S:\70131 GEOTECH\INTEL\LIBRARY MACTEC JUNE2011\GLB
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-3	30.5	SANDY SILT (ML)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-3	30.5	9.52	--	--	--	1.3	36.5	62.2

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

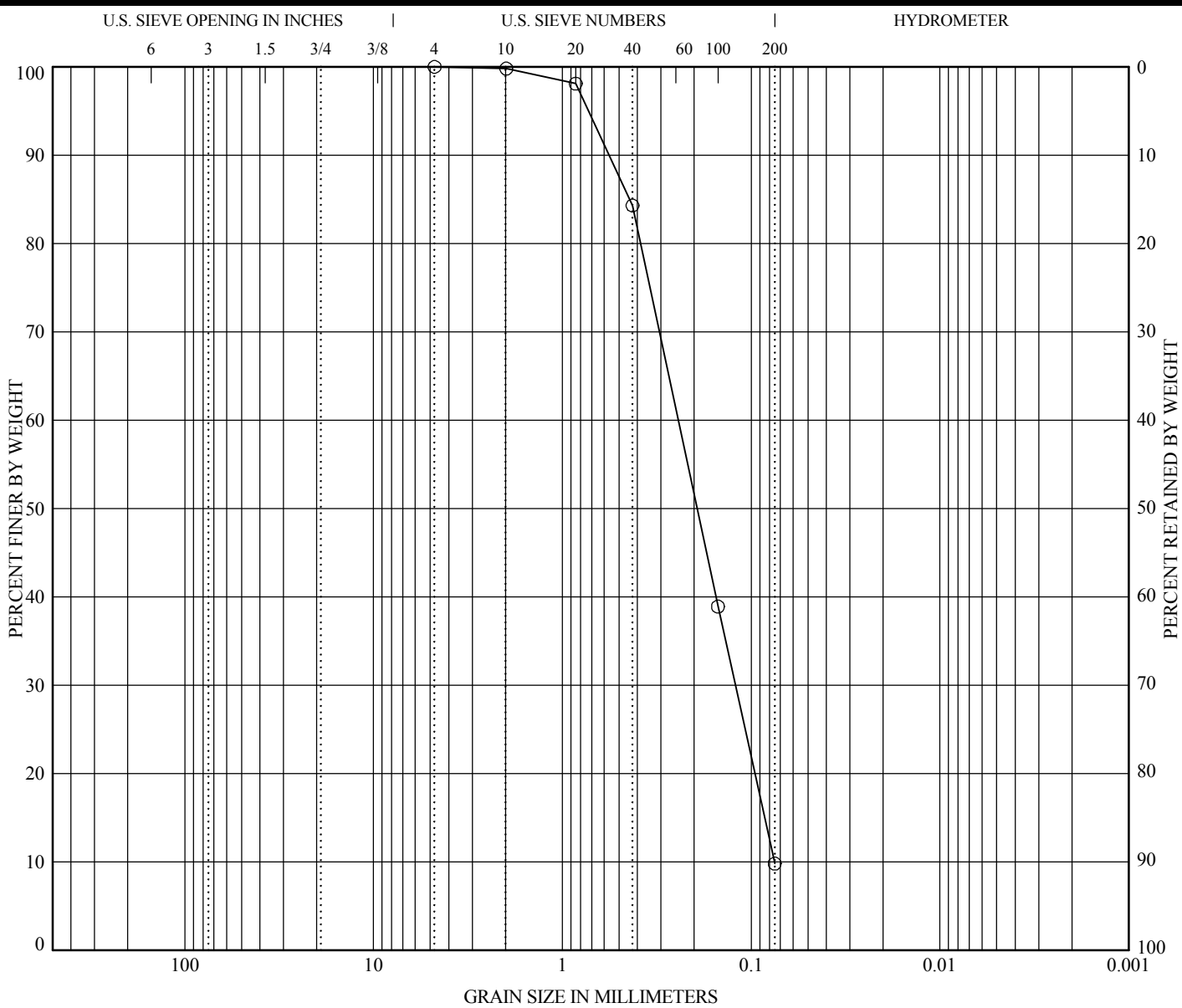
Prepared/Date: JF 6/29/2011
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PARTICLE SIZE DISTRIBUTION
 Project No.: 4953-10-1561
 Figure: F-5.2

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-4	70.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	0.8	3.2

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-4	70.5	4.75	0.243	0.121	0.075	0.0	90.2	9.8

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

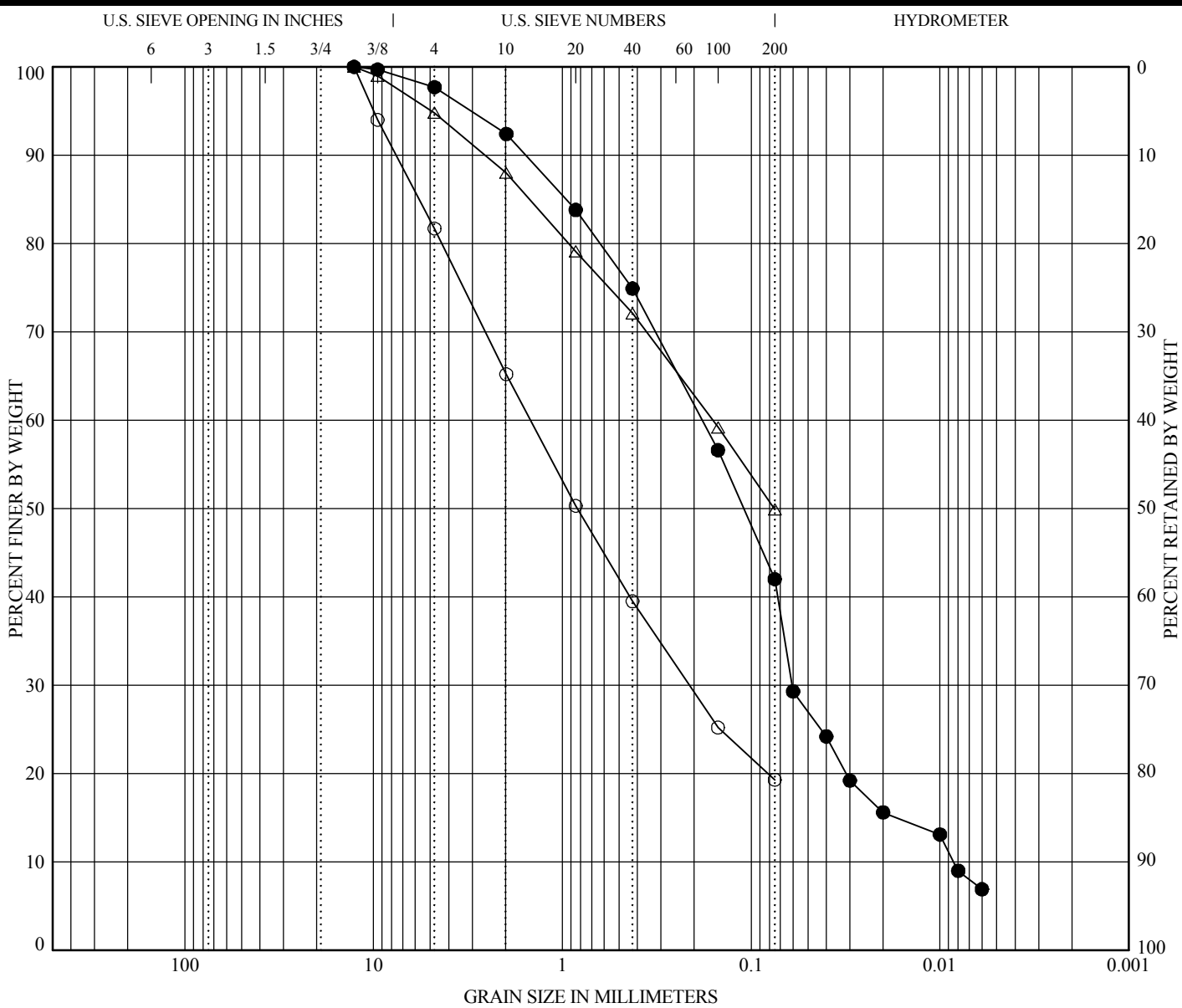
Prepared/Date: JF 6/29/2011
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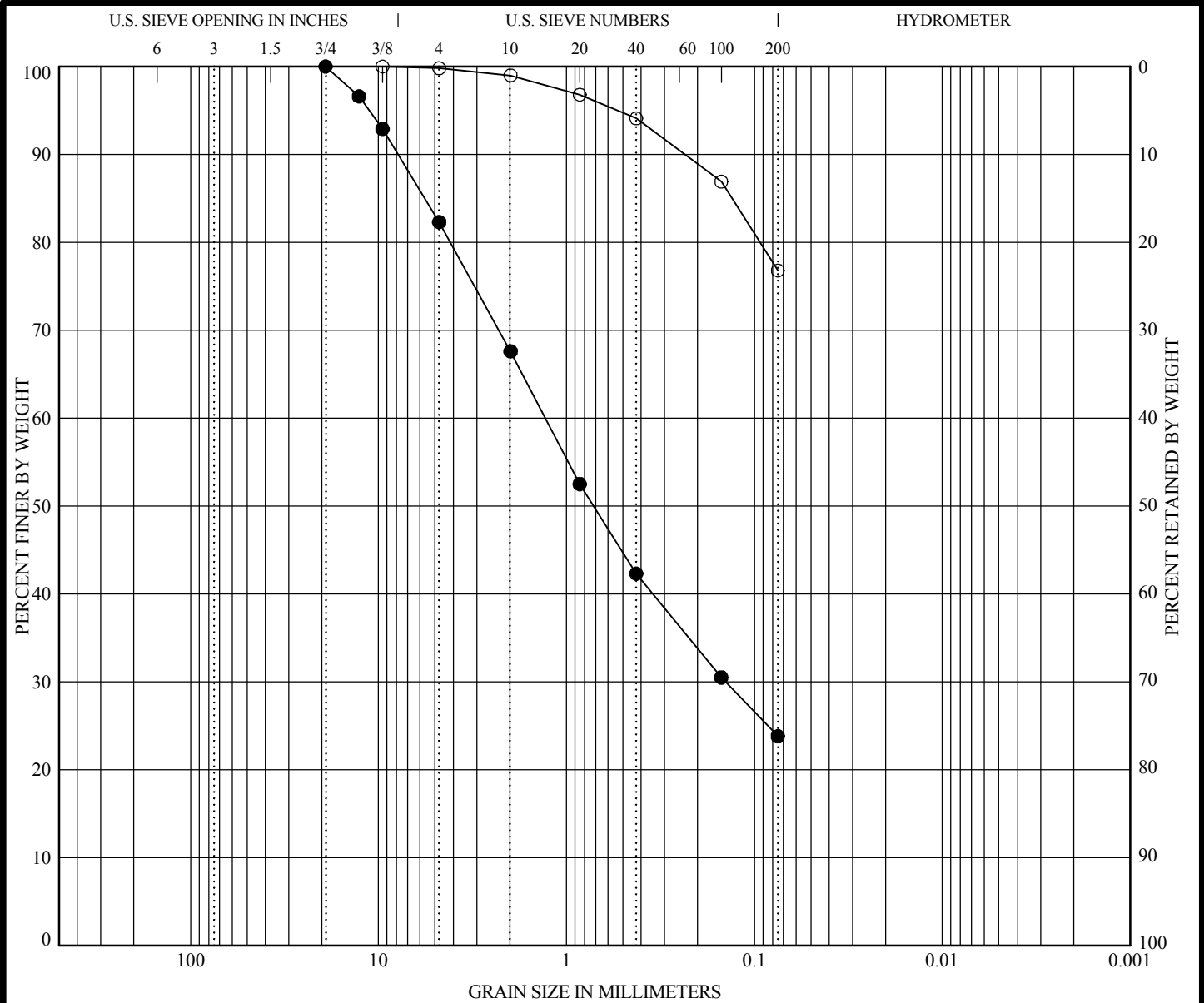


PARTICLE SIZE DISTRIBUTION
 Project No.: 4953-10-1561
 Figure: F-5.3

MACTEC LA GRAIN SIZE S:\70131 GEOTECH\IN\LAB\LIBRARY MACTEC JUNE2011\GLB
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-11	30.5	SILT (ML)	--	--	--	--	--
●	G-11	40.5	SILTY SAND (SM)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-11	30.5	9.52	--	--	--	0.2	23.0	76.8
●	G-11	40.5	19.10	1.294	0.142	--	17.7	58.5	23.8

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

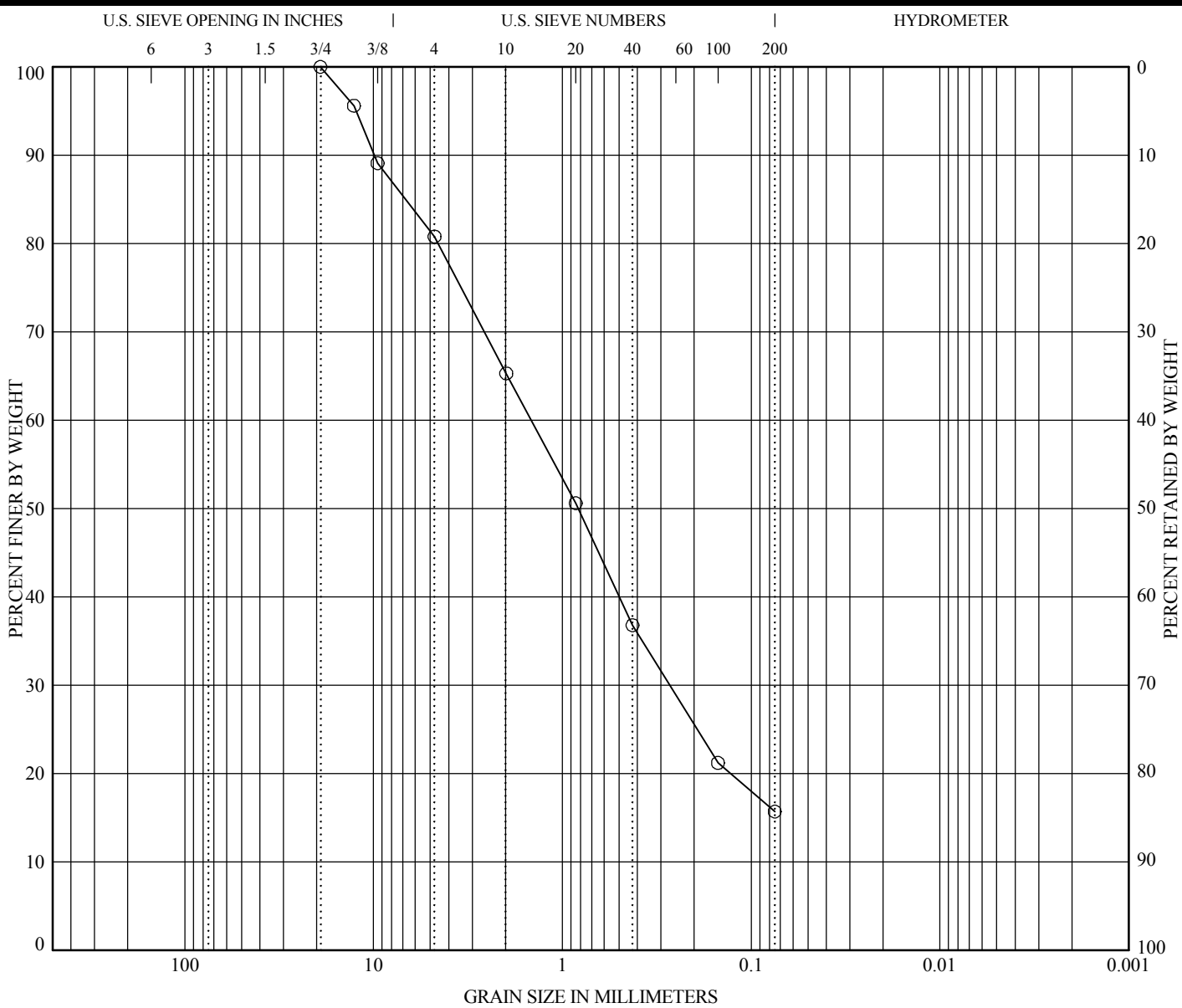
Prepared/Date: JF 6/29/2011
 Checked/Date: HP 12/2/2011

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PARTICLE SIZE DISTRIBUTION
 Project No.: 4953-10-1561
 Figure: F-5.5

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-12	40.5	SILTY SAND with GRAVEL (SM)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-12	40.5	19.10	1.460	0.270	--	19.2	65.1	15.7

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

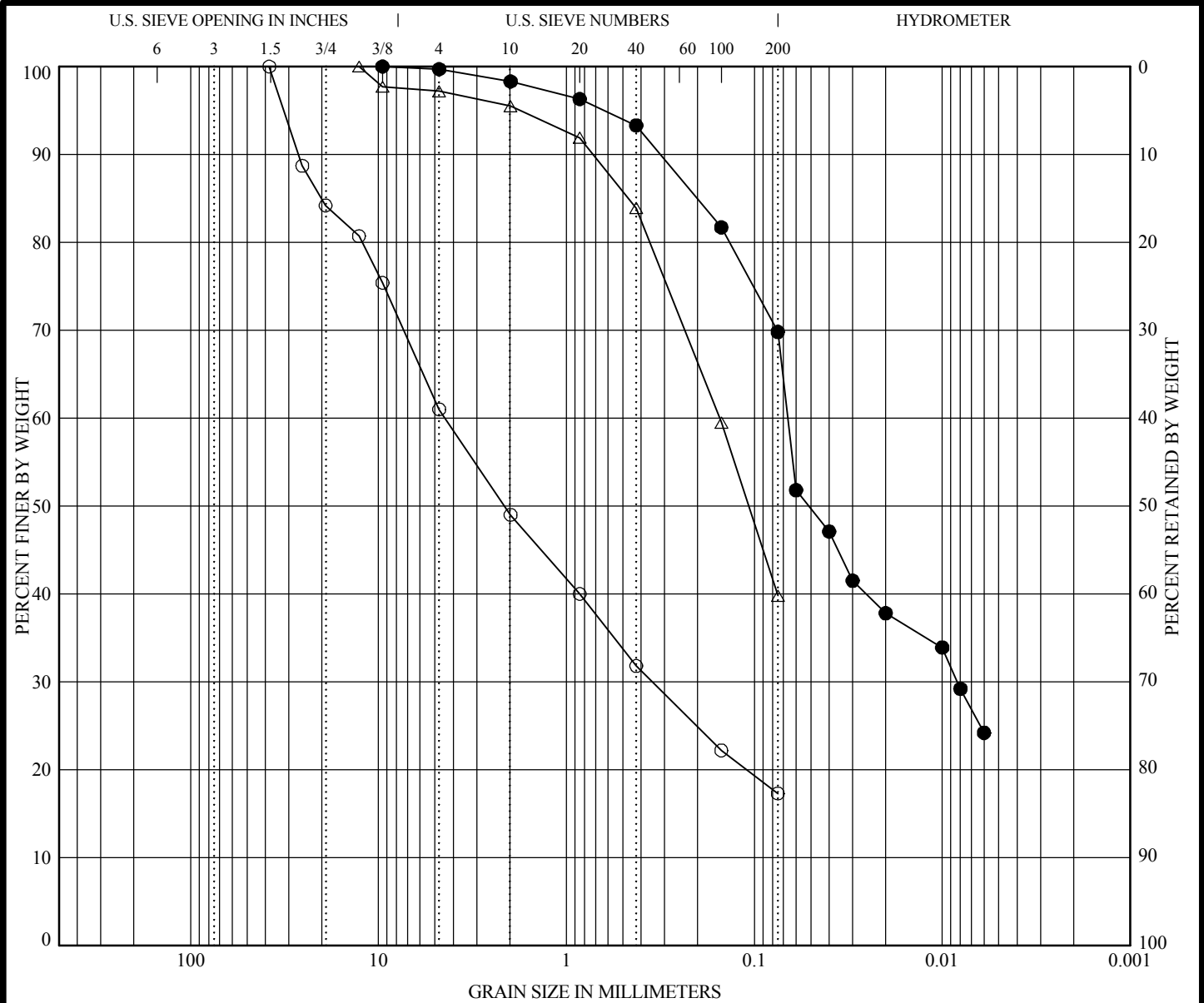
Prepared/Date: JF 6/29/2011
 Checked/Date: HP 12/2/2011

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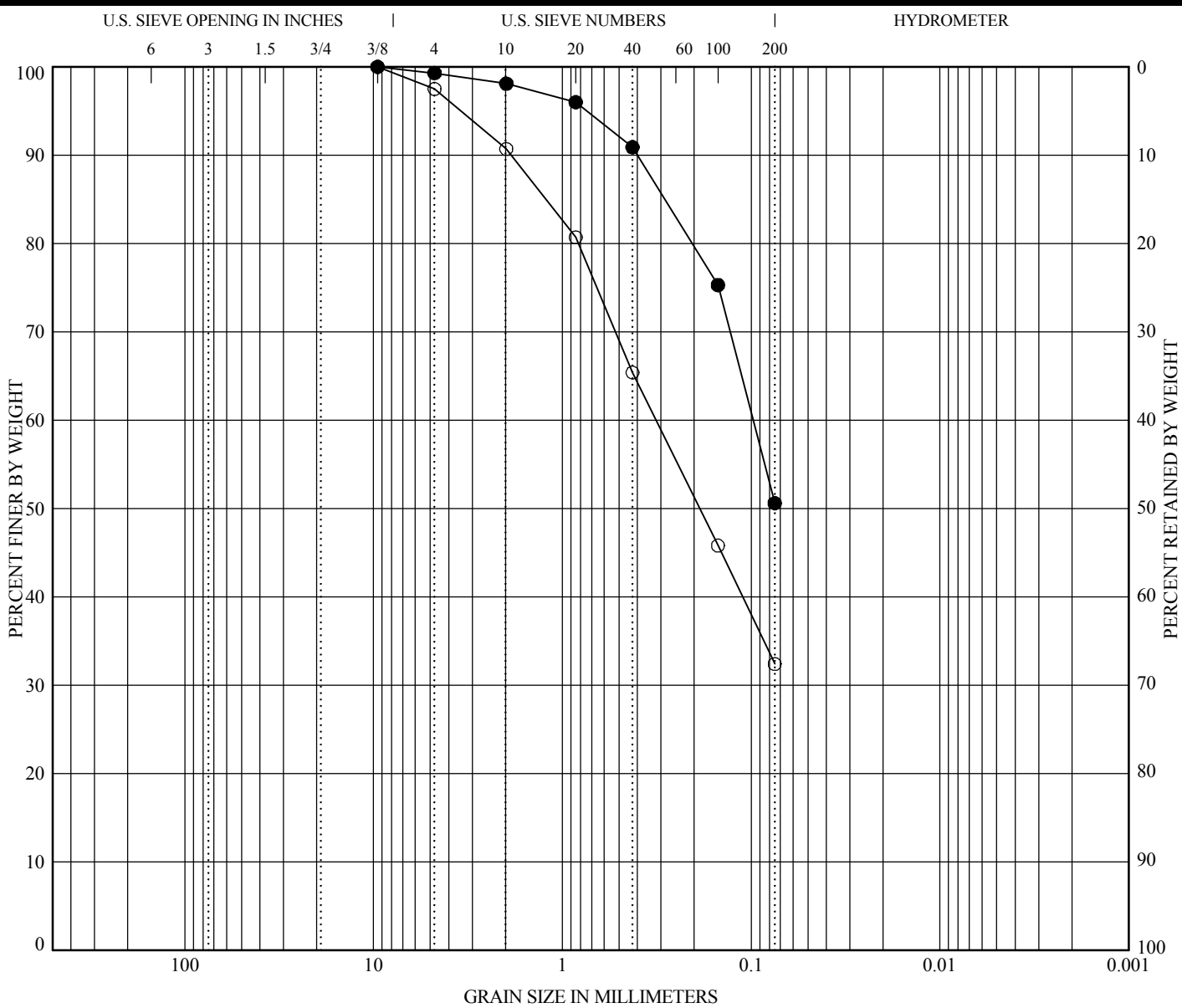


PARTICLE SIZE DISTRIBUTION
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 Figure: F-5.6

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-14	30.5	SILTY SAND (SM)	--	--	--	--	--
●	G-14	75.5	SANDY LEAN CLAY (CL)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-14	30.5	9.52	0.319	--	--	2.5	65.1	32.4
●	G-14	75.5	9.52	0.098	--	--	0.7	48.7	50.6

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

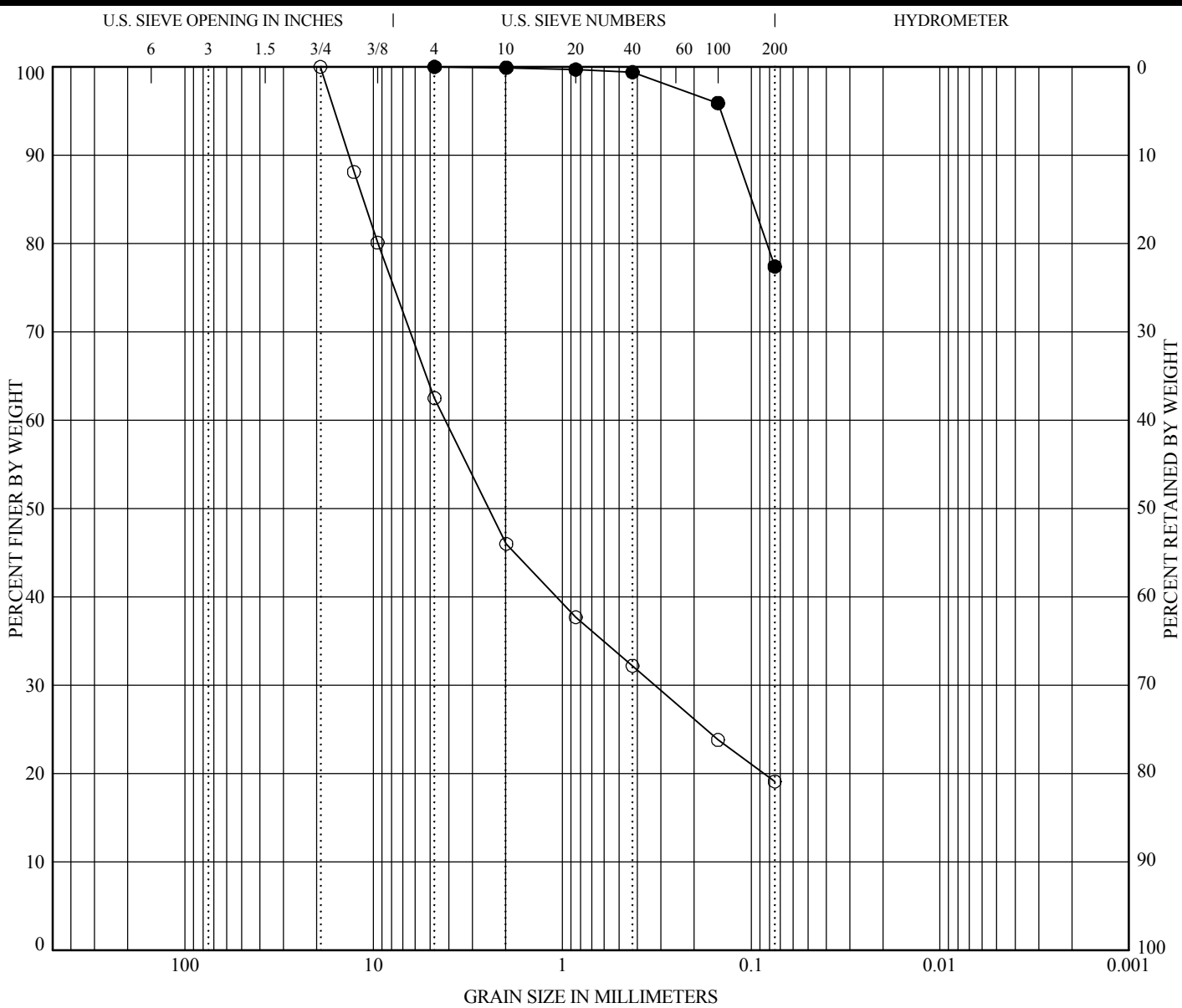
Prepared/Date: JF 6/29/2011
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PARTICLE SIZE DISTRIBUTION
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 Figure: F-5.8

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-20	15.5	SILTY SAND with GRAVEL (SM)	--	--	--	--	--
●	G-20	35.5	SILT with SAND (ML)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-20	15.5	19.10	4.160	0.324	--	37.5	43.4	19.1
●	G-20	35.5	4.75	--	--	--	0.0	22.6	77.4

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

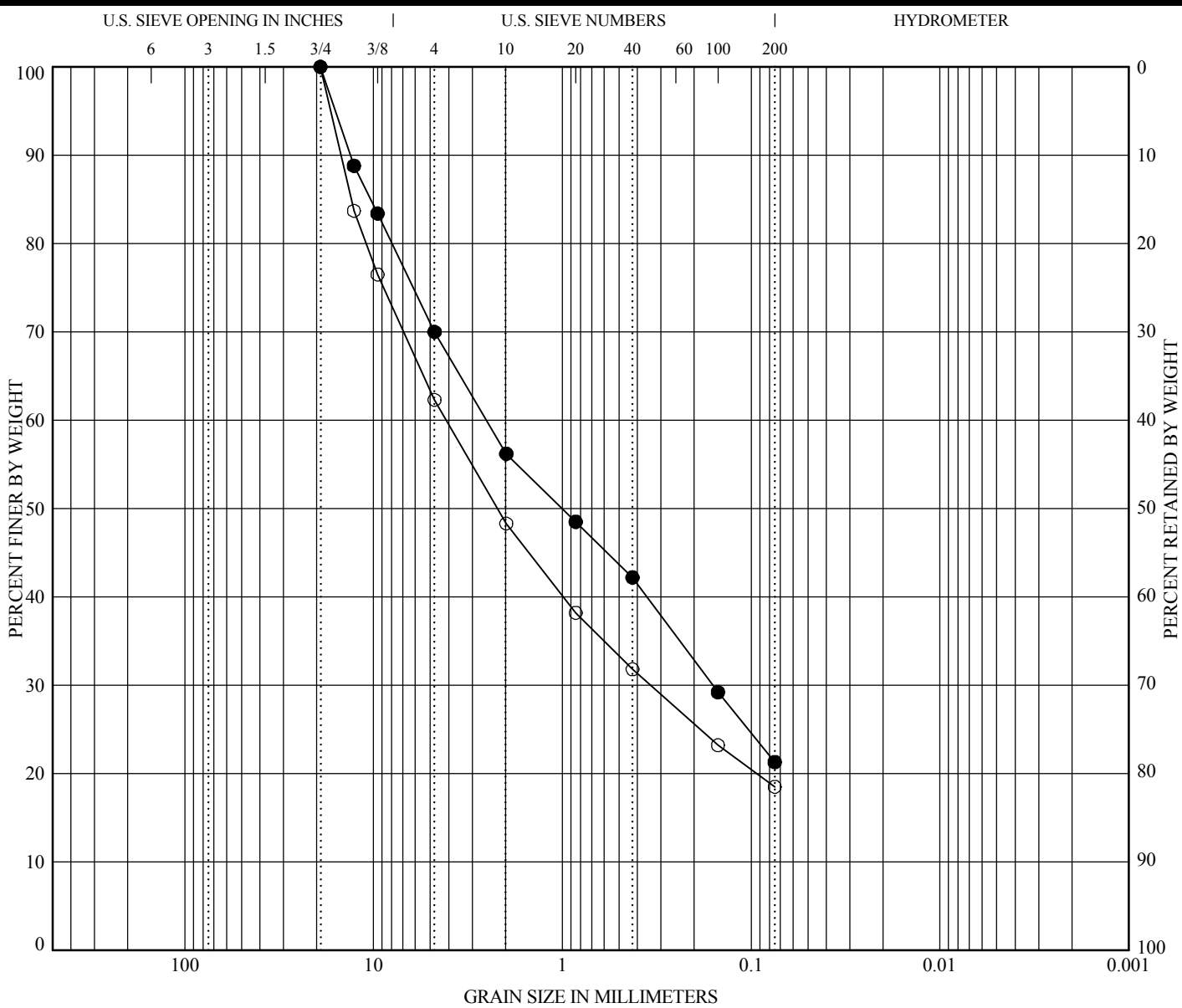
Prepared/Date: JF 6/29/2011
 Checked/Date: HP 12/2/2011

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 Figure: F-5.9

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-23	30.5	SILTY SAND with GRAVEL (SM)	--	--	--	--	--
●	G-23	60.5	SILTY SAND with GRAVEL (SM)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-23	30.5	19.10	4.114	0.342	--	37.7	43.8	18.5
●	G-23	60.5	19.10	2.519	0.160	--	30.0	48.7	21.3

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

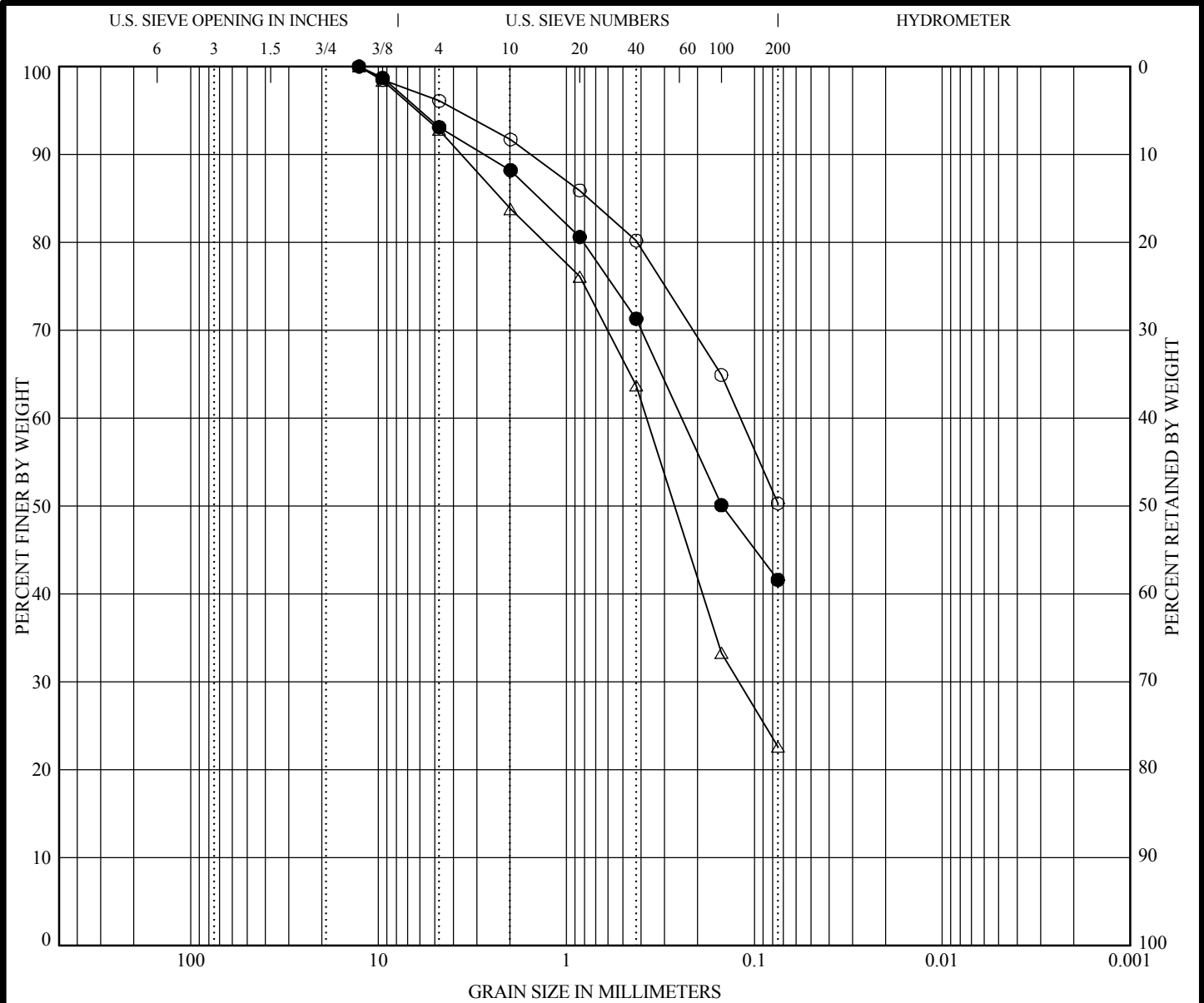
Prepared/Date: JF 6/29/2011
 Checked/Date: HP 12/2/2011

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PARTICLE SIZE DISTRIBUTION
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 Figure: F-5.10

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-24	20.5	SANDY LEAN CLAY (CL)	--	--	--	--	--
●	G-24	60.5	SILTY SAND (SM)	--	--	--	--	--
△	G-24	70.5	SILTY SAND (SM)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-24	20.5	12.70	0.119	--	--	3.9	45.8	50.3
●	G-24	60.5	12.70	0.244	--	--	6.9	51.5	41.6
△	G-24	70.5	12.70	0.374	0.121	--	7.2	70.2	22.6

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

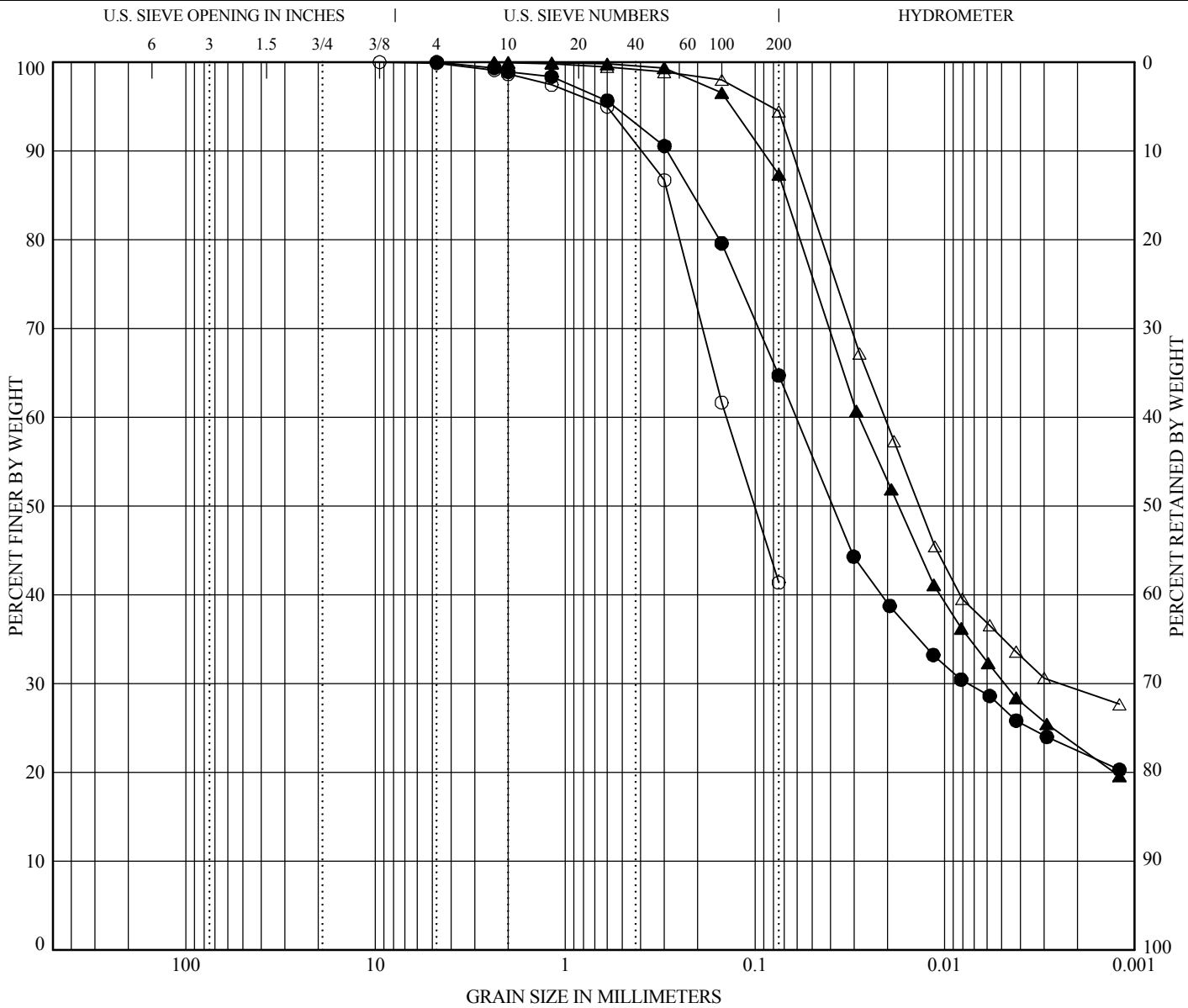
Prepared/Date: JF 6/29/2011
 Checked/Date: HP 12/2/2011

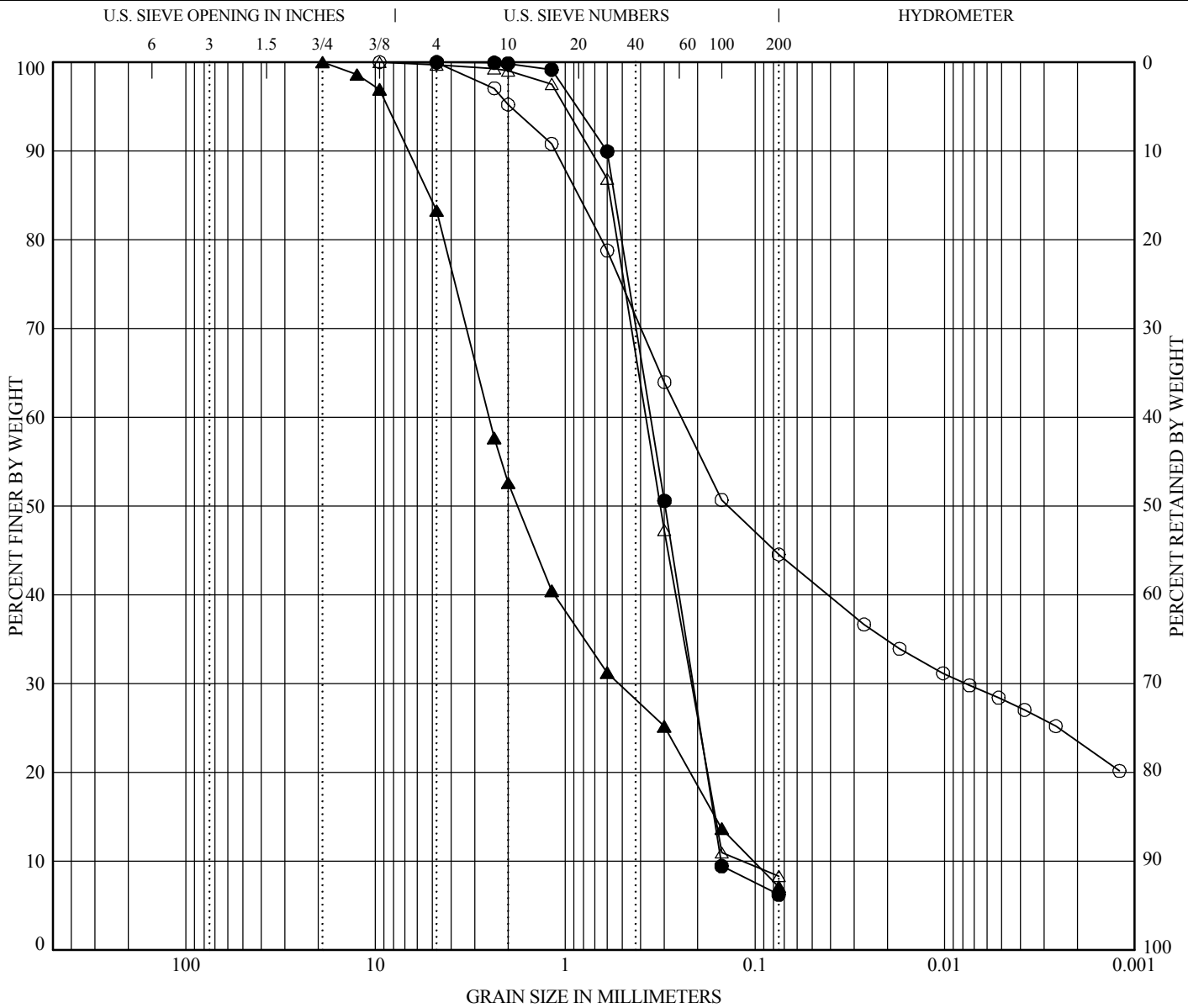
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PARTICLE SIZE DISTRIBUTION
 Project No.: 4953-10-1561
 Figure: F-5.11

**FIGURES F-6.1 THROUGH F-6.227
PARTICLE SIZE DISTRIBUTION (PE PHASE)**





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-101	49.5	CLAYEY SAND (SC)	--	--	--	--	--
●	G-101	54.0	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	0.8	2.3
△	G-101	59.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	1.1	3.2
▲	G-101	69.5	WELL GRADED SAND with SILT and GRAVEL (SW-SM)	--	--	--	1.1	24.7

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-101	49.5	9.50	0.244	0.008	--	0.1	55.4	44.5
●	G-101	54.0	4.75	0.354	0.212	0.151	0.0	93.8	6.2
△	G-101	59.5	9.50	0.375	0.216	0.116	0.3	91.4	8.3
▲	G-101	69.5	19.00	2.515	0.521	0.102	16.7	76.2	7.1

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

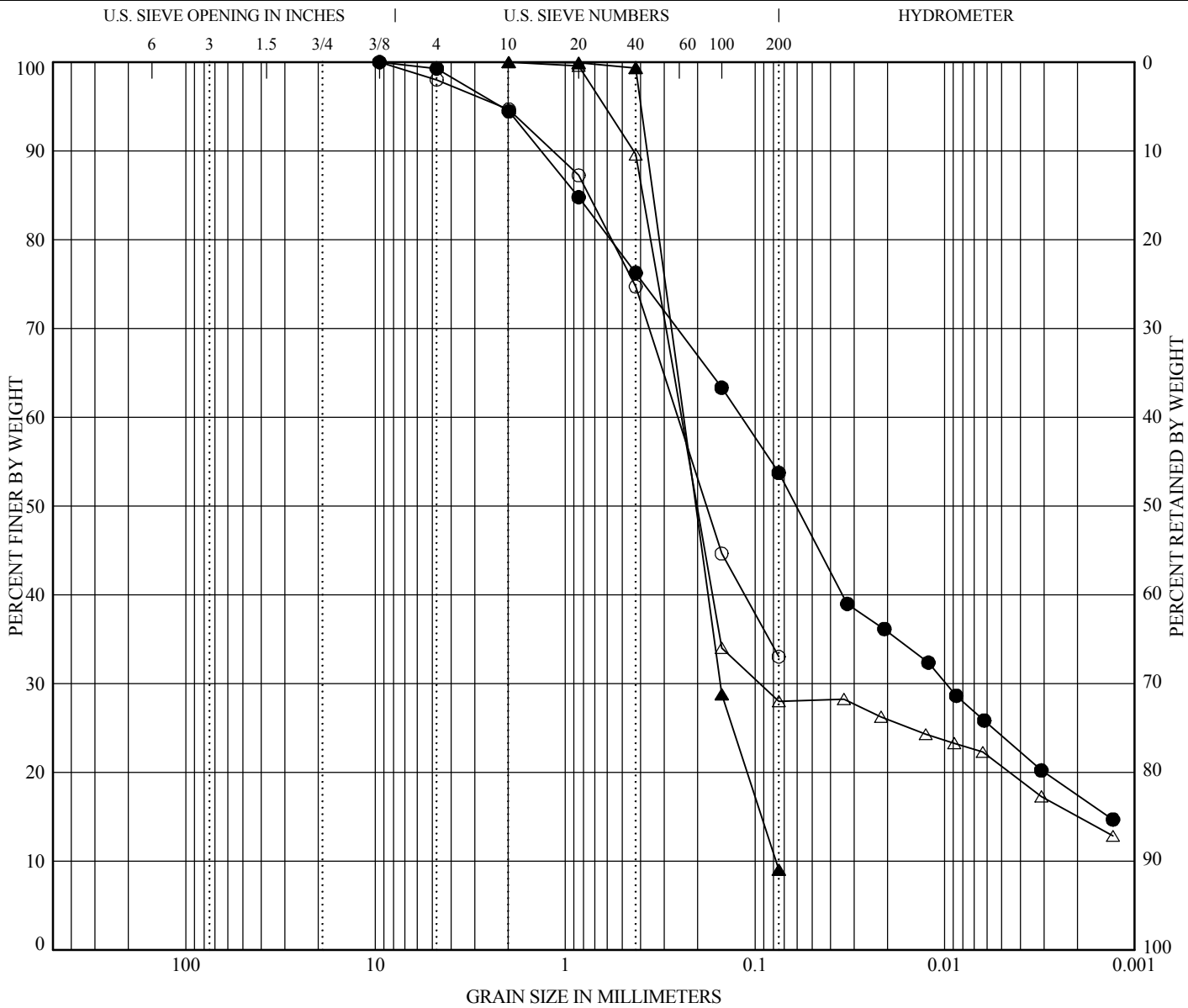
Prepared/Date: YN 8/9/2011
Checked/Date: LT 7/28/2011

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PARTICLE SIZE DISTRIBUTION
Project No.: 4953-10-1561
Figure: F-6.2

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-103	31.5	SILTY SAND (SM)	--	--	--	--	--
●	G-103	40.5	SANDY LEAN CLAY (CL)	38	23	15	--	--
△	G-103	49.5	CLAYEY SAND (SC)	44	21	23	--	--
▲	G-103	52.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	1.3	3.1

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-103	31.5	9.52	0.255	--	--	2.0	65.0	33.0
●	G-103	40.5	9.52	0.118	0.010	--	0.7	45.6	53.7
△	G-103	49.5	1.98	0.244	0.053	--	0.0	72.0	28.0
▲	G-103	52.5	1.98	0.238	0.153	0.078	0.0	91.0	9.0

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

Prepared/Date: JF 6/14/2011
Checked/Date: RH 6/15/2011

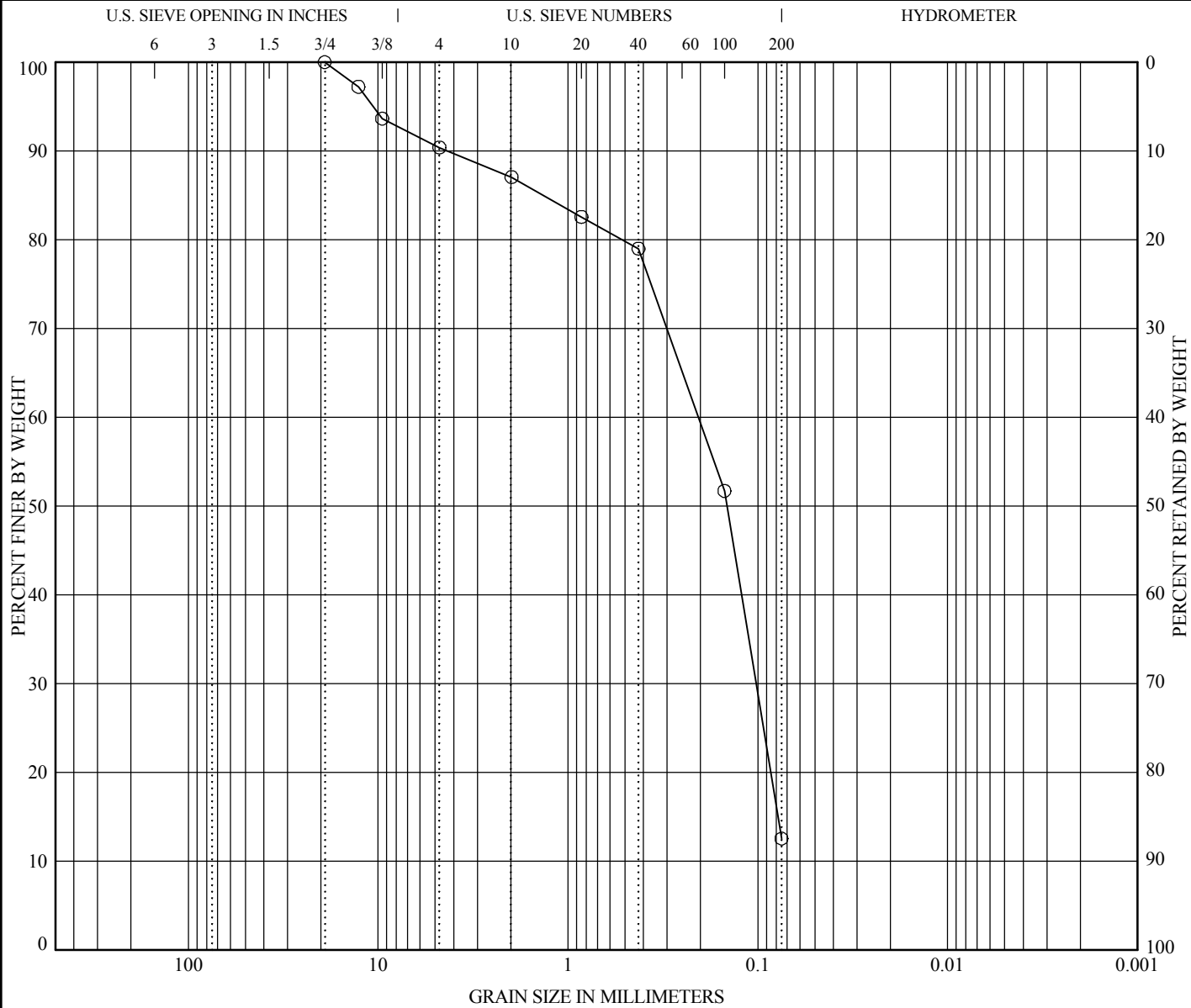
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Figure: F-6.5

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-103	61.5	SILTY SAND (SM)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-103	61.5	19.10	0.206	0.102	--	9.6	77.9	12.5

Laboratory Test Method: ASTM D 422

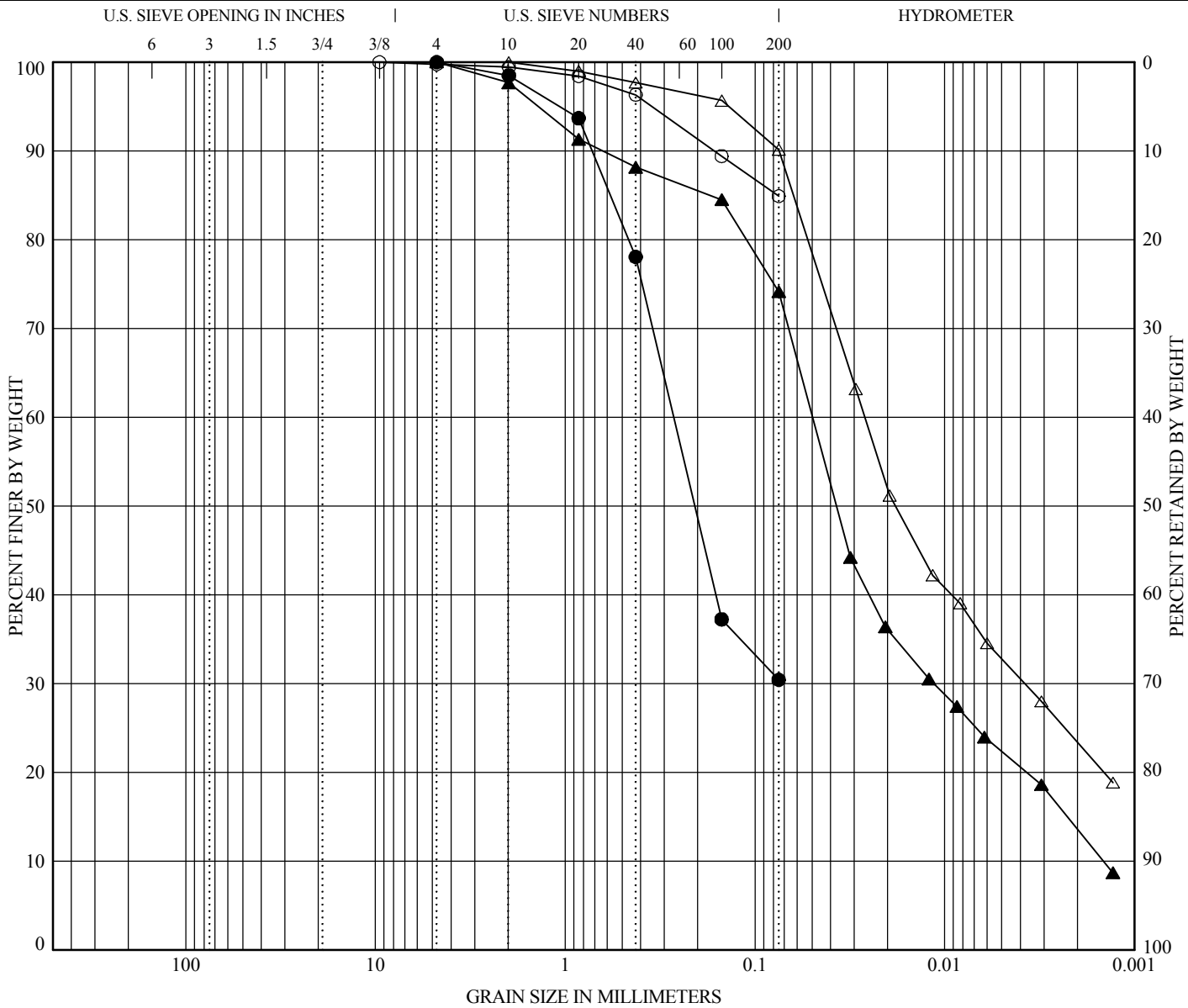
*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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 Figure: F-6.6



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-104	10.5	LEAN CLAY with SAND (CL)	--	--	--	--	--
●	G-104	25.5	SILTY SAND (SM)	--	--	--	--	--
△	G-104	35.5	LEAN CLAY (CL)	43	19	24	--	--
▲	G-104	45.5	LEAN CLAY with SAND (CL)	46	23	23	1.8	34.2

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-104	10.5	9.52	--	--	--	0.2	14.9	84.9
●	G-104	25.5	4.75	0.268	--	--	0.0	69.6	30.4
△	G-104	35.5	1.98	0.026	0.004	--	0.0	9.9	90.1
▲	G-104	45.5	4.75	0.050	0.011	0.001	0.0	25.9	74.1

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

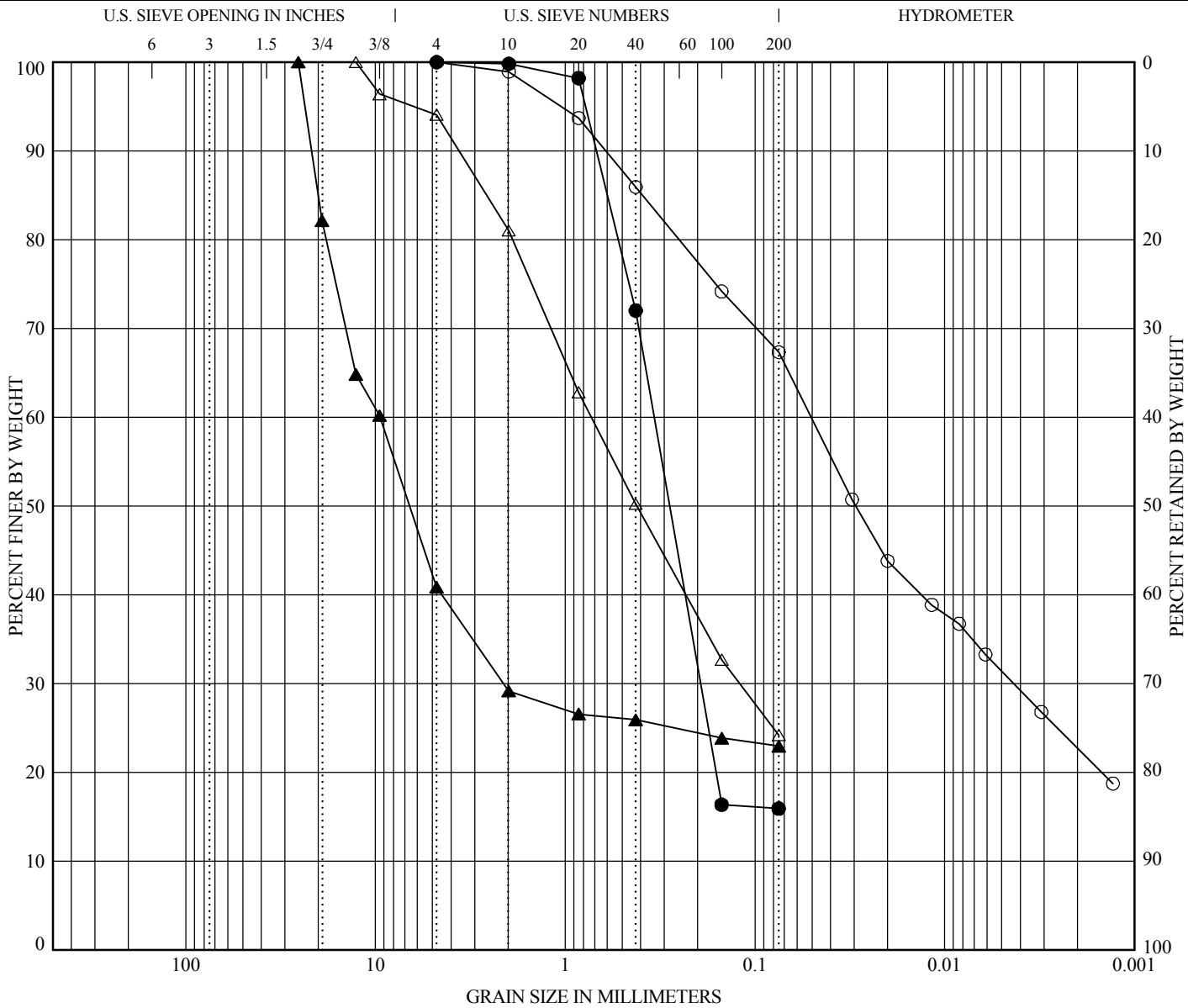
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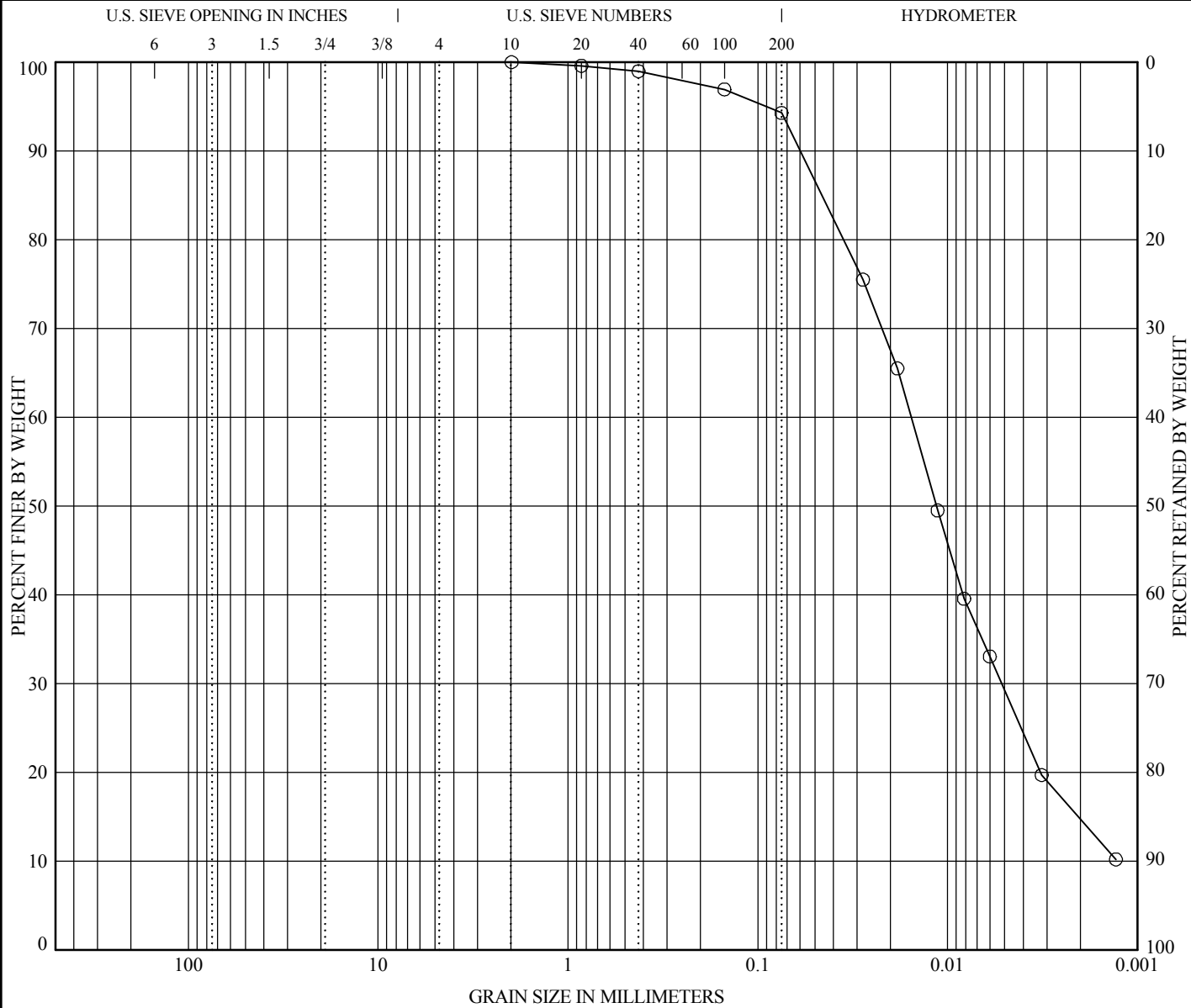


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Figure: F-6.7

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-104	90.5	SILTSTONE	47	35	12	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-104	90.5	1.98	0.016	0.005	--	0.0	5.7	94.3

Laboratory Test Method: ASTM D 422

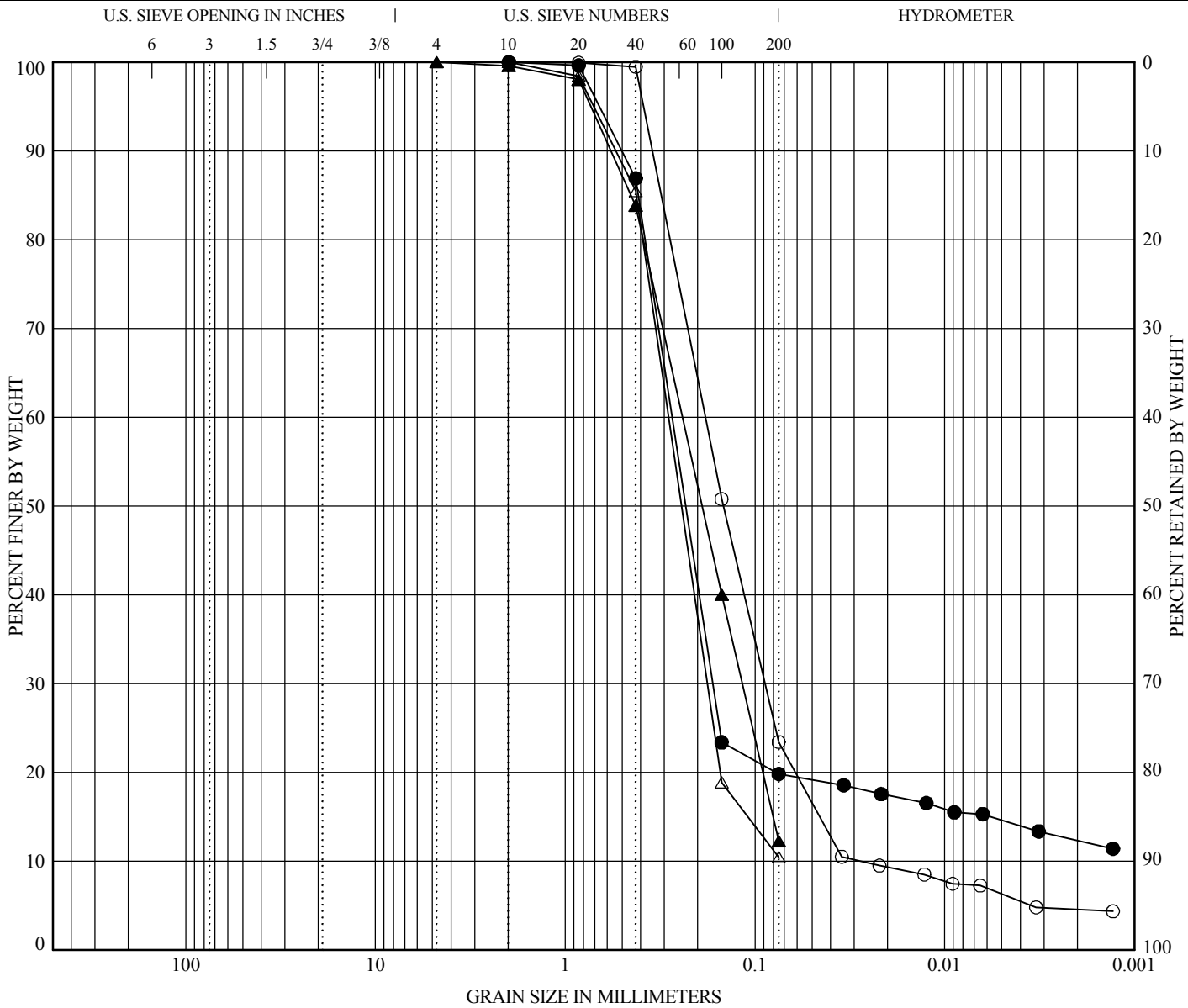
*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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 Project No.: 4953-10-1561
 Figure: F-6.9



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-105	45.5	SILTY SAND (SM)	--	--	--	1.5	6.6
●	G-105	55.5	SILTY SAND (SM)	NP	NP	NP	--	--
△	G-105	60.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	1.5	3.9
▲	G-105	70.5	SILTY SAND (SM)	--	--	--	0.8	3.4

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-105	45.5	1.98	0.183	0.089	0.028	0.0	76.6	23.4
●	G-105	55.5	1.98	0.273	0.167	--	0.0	80.2	19.8
△	G-105	60.5	4.75	0.285	0.178	--	0.0	89.5	10.5
▲	G-105	70.5	4.75	0.241	0.117	--	0.0	87.8	12.2

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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Checked/Date: LT 9/7/2011

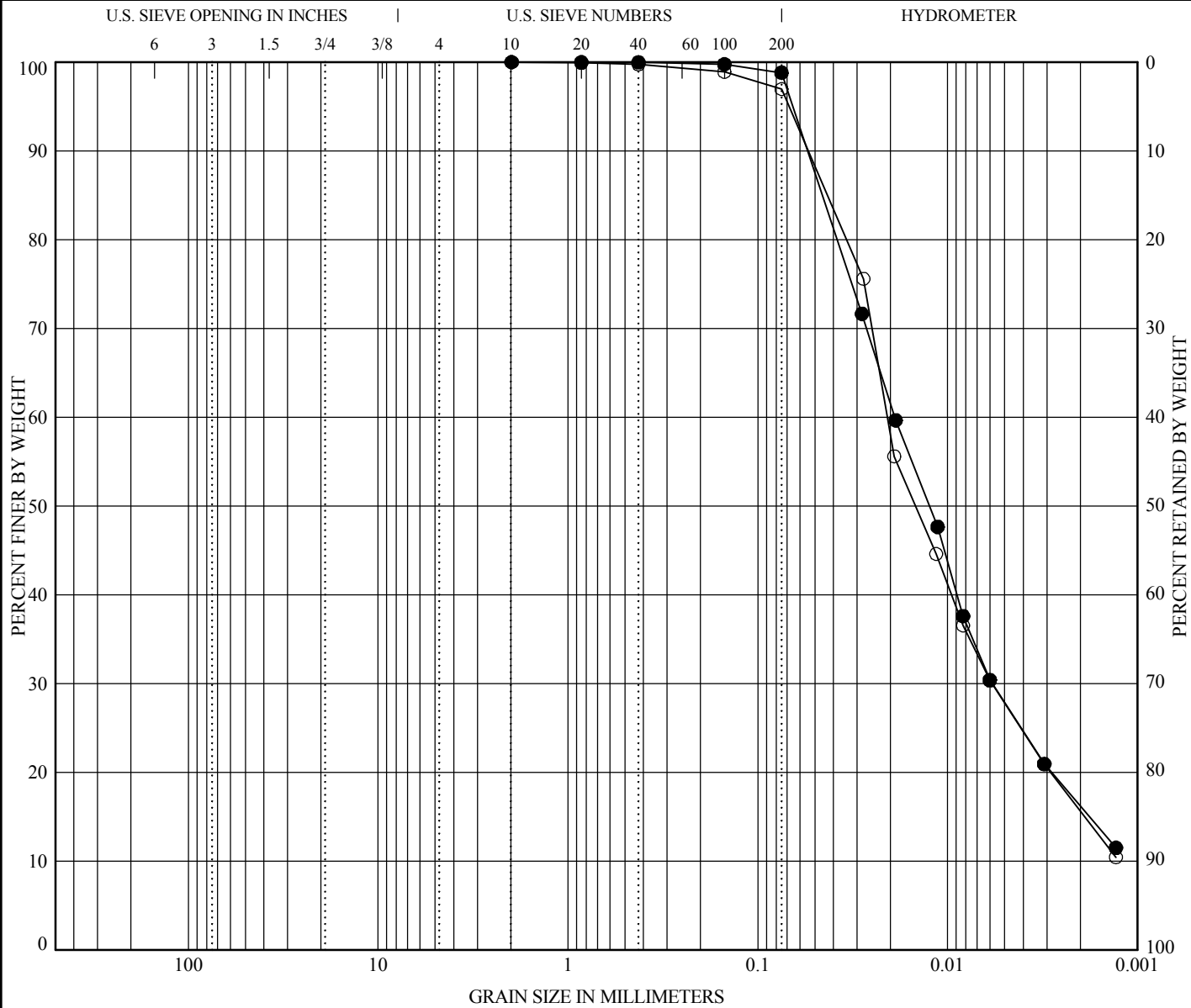
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Figure: F-6.10

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-105	80.5	SILTSTONE	55	32	23	--	--
●	G-105	95.5	SILTSTONE	54	34	20	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-105	80.5	1.98	0.021	0.006	--	0.0	3.0	97.0
●	G-105	95.5	1.98	0.019	0.006	--	0.0	1.2	98.8

Laboratory Test Method: ASTM D 422

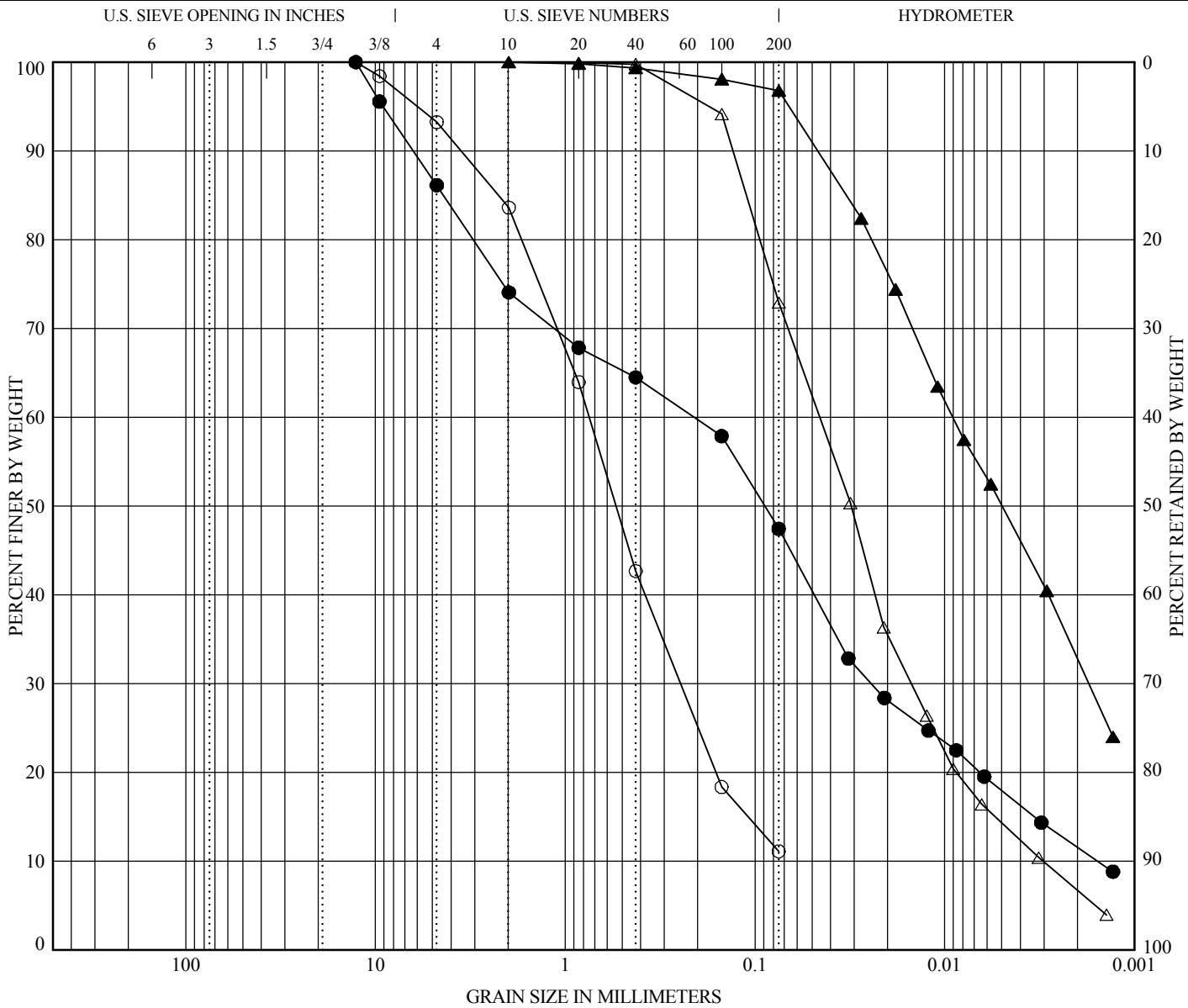
*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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 Figure: F-6.11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-106	28.5	WELL GRADED SAND with SILT (SW-SM)	--	--	--	1.2	11.1
●	G-106	37.5	CLAYEY SAND (SC)	34	20	14	1.8	134.0
△	G-106	43.5	SILT with SAND (ML)	43	31	12	1.6	15.0
▲	G-106	52.5	SILT (ML)	--	--	--	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-106	28.5	12.70	0.747	0.247	--	6.8	82.1	11.1
●	G-106	37.5	12.70	0.210	0.024	0.002	13.9	38.7	47.4
△	G-106	43.5	1.98	0.046	0.015	0.003	0.0	27.1	72.9
▲	G-106	52.5	1.98	0.009	0.002	--	0.0	3.2	96.8

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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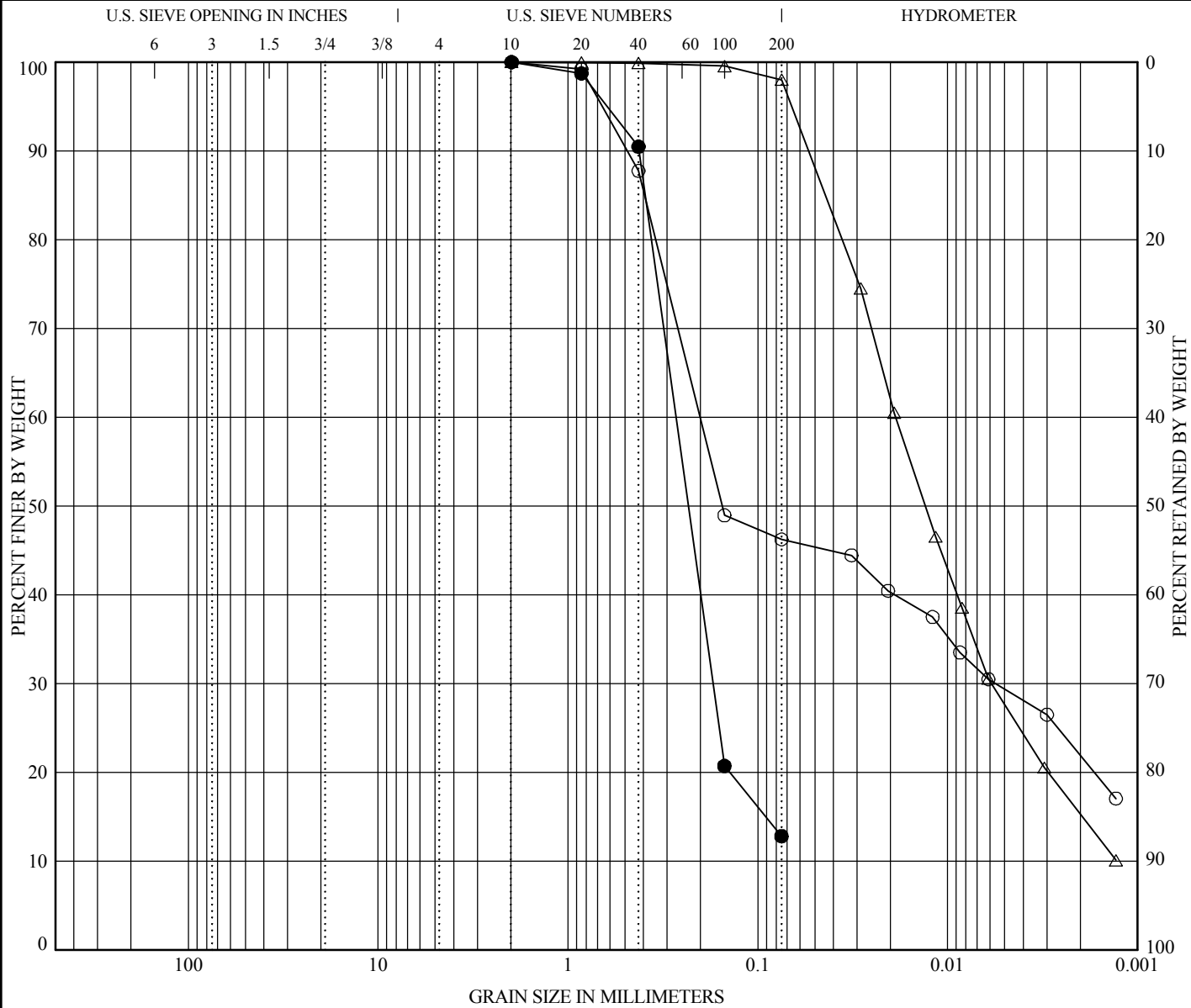
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Figure: F-6.12

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-106	55.5	CLAYEY SAND (SC)	45	21	24	--	--
●	G-106	64.5	SILTY SAND (SM)	--	--	--	--	--
△	G-106	81.5	SILTSTONE	53	37	16	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-106	55.5	1.98	0.202	0.006	--	0.0	53.8	46.2
●	G-106	64.5	1.98	0.270	0.172	--	0.0	87.2	12.8
△	G-106	81.5	1.98	0.019	0.006	--	0.0	2.0	98.0

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

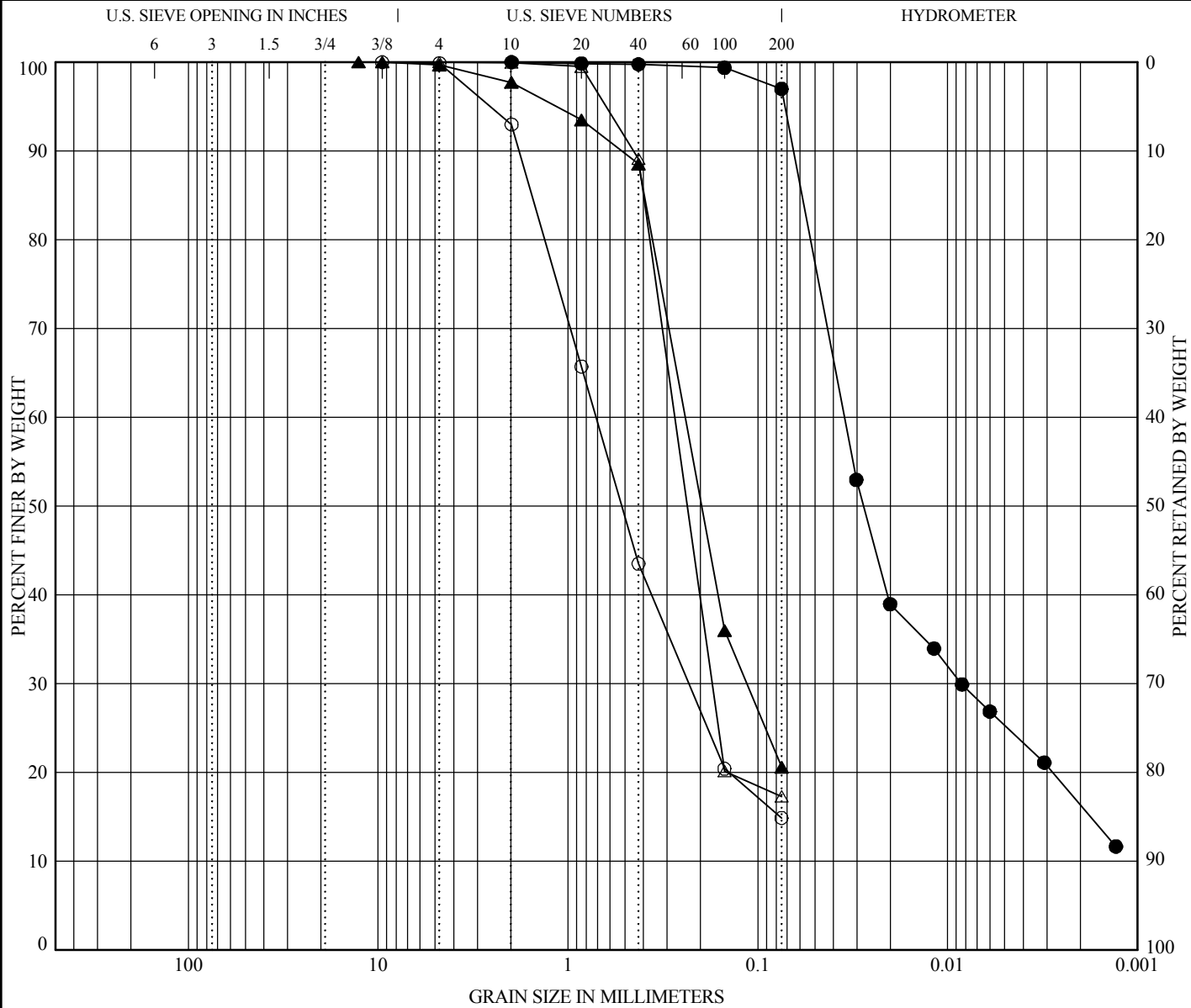
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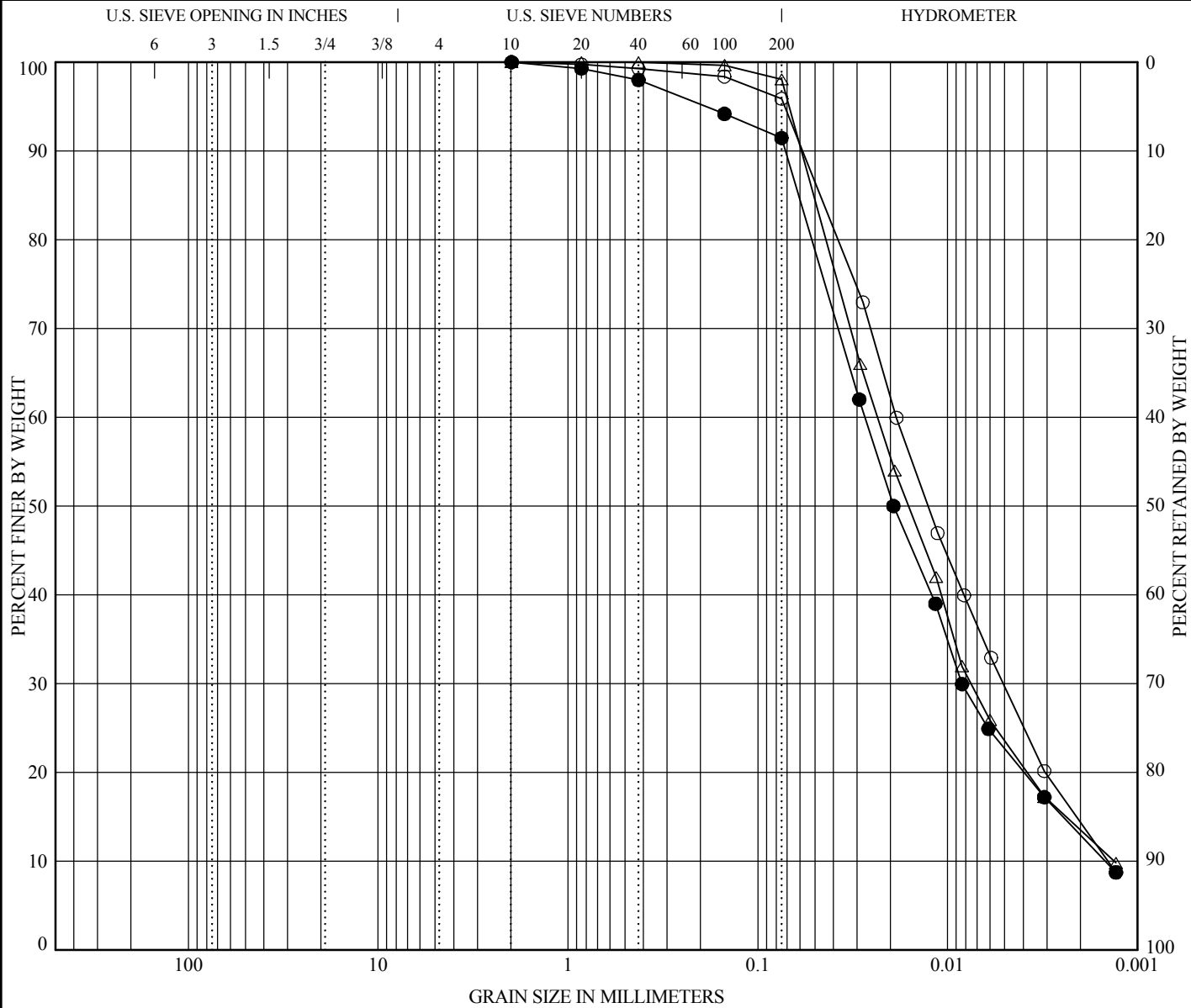


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 Figure: F-6.13

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-107	75.5	SILT (ML)	45	29	16	1.0	13.0
●	G-107	85.0	SILTSTONE	66	49	17	1.8	18.4
△	G-107	100.5	SILTSTONE	48	31	17	1.8	17.6

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-107	75.5	1.98	0.019	0.005	0.001	0.0	4.1	95.9
●	G-107	85.0	1.98	0.027	0.008	0.001	0.0	8.5	91.5
△	G-107	100.5	1.98	0.023	0.008	0.001	0.0	1.9	98.1

Laboratory Test Method: ASTM D 422

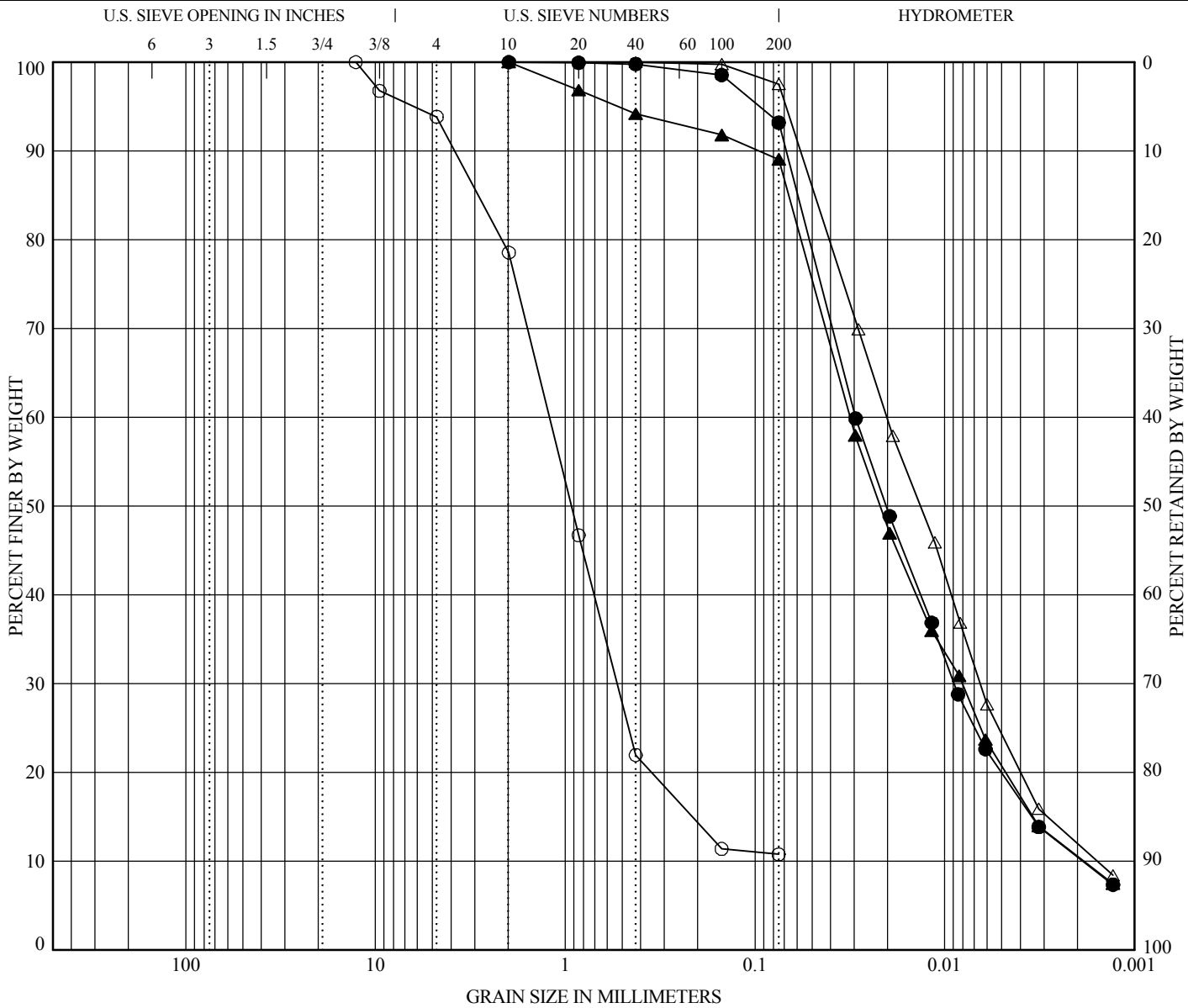
*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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 Figure: F-6.15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-108	10.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	7.3	37.6
●	G-108	70.5	ELASTIC SILT (MH)	53	37	16	1.4	15.8
△	G-108	90.5	ELASTIC SILT (MH)	54	39	15	1.3	12.8
▲	G-108	105.5	SILTSTONE	44	32	12	1.1	17.1

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-108	10.5	12.70	1.210	0.532	--	6.2	83.1	10.8
●	G-108	70.5	1.98	0.030	0.009	0.002	0.0	6.8	93.2
△	G-108	90.5	0.43	0.020	0.007	0.002	0.0	2.5	97.5
▲	G-108	105.5	1.98	0.032	0.008	0.002	0.0	11.0	89.0

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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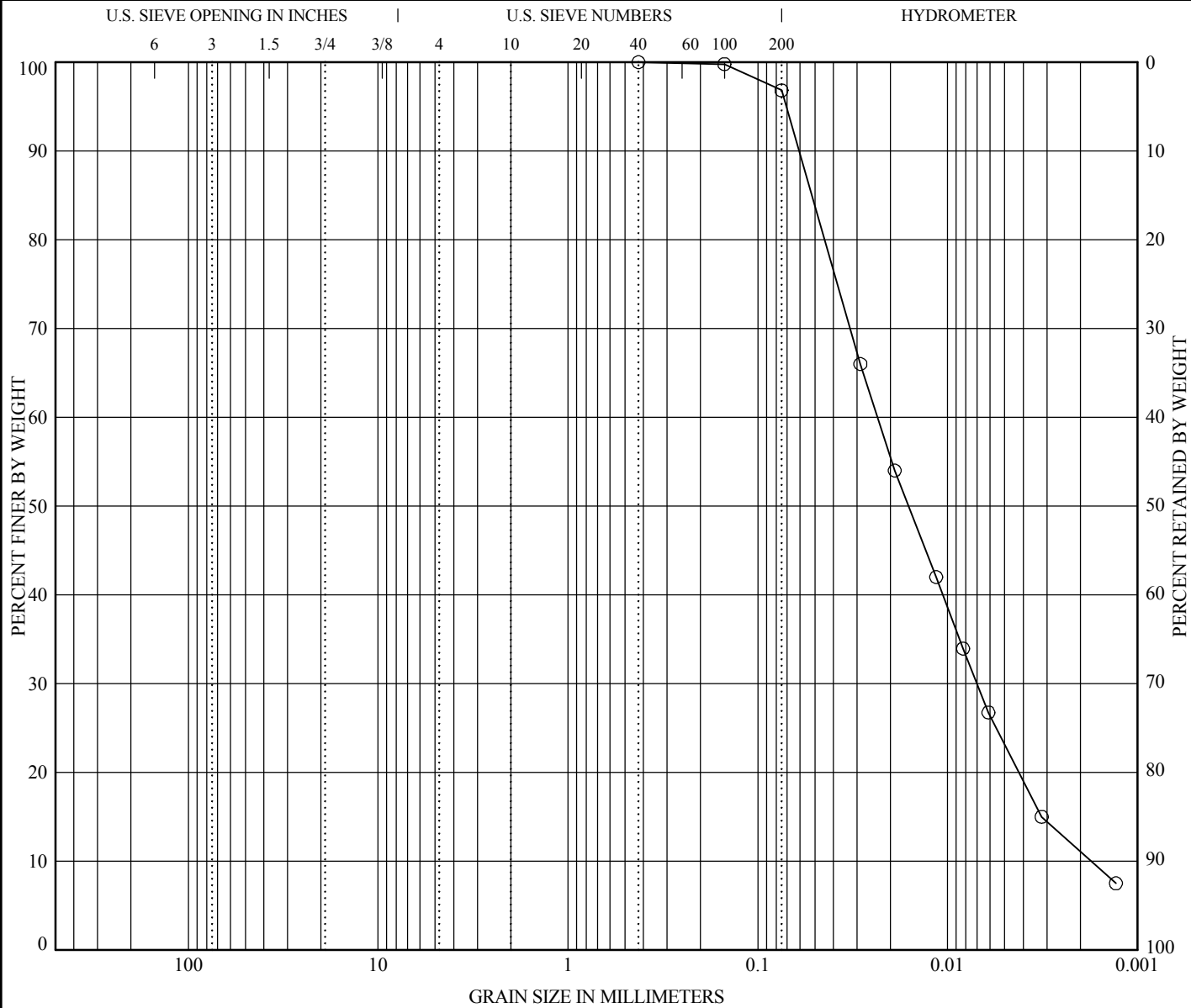
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Figure: F-6.16

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-108	115.5	SILTSTONE	--	--	--	1.2	13.3

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-108	115.5	0.43	0.023	0.007	0.002	0.0	3.2	96.8

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

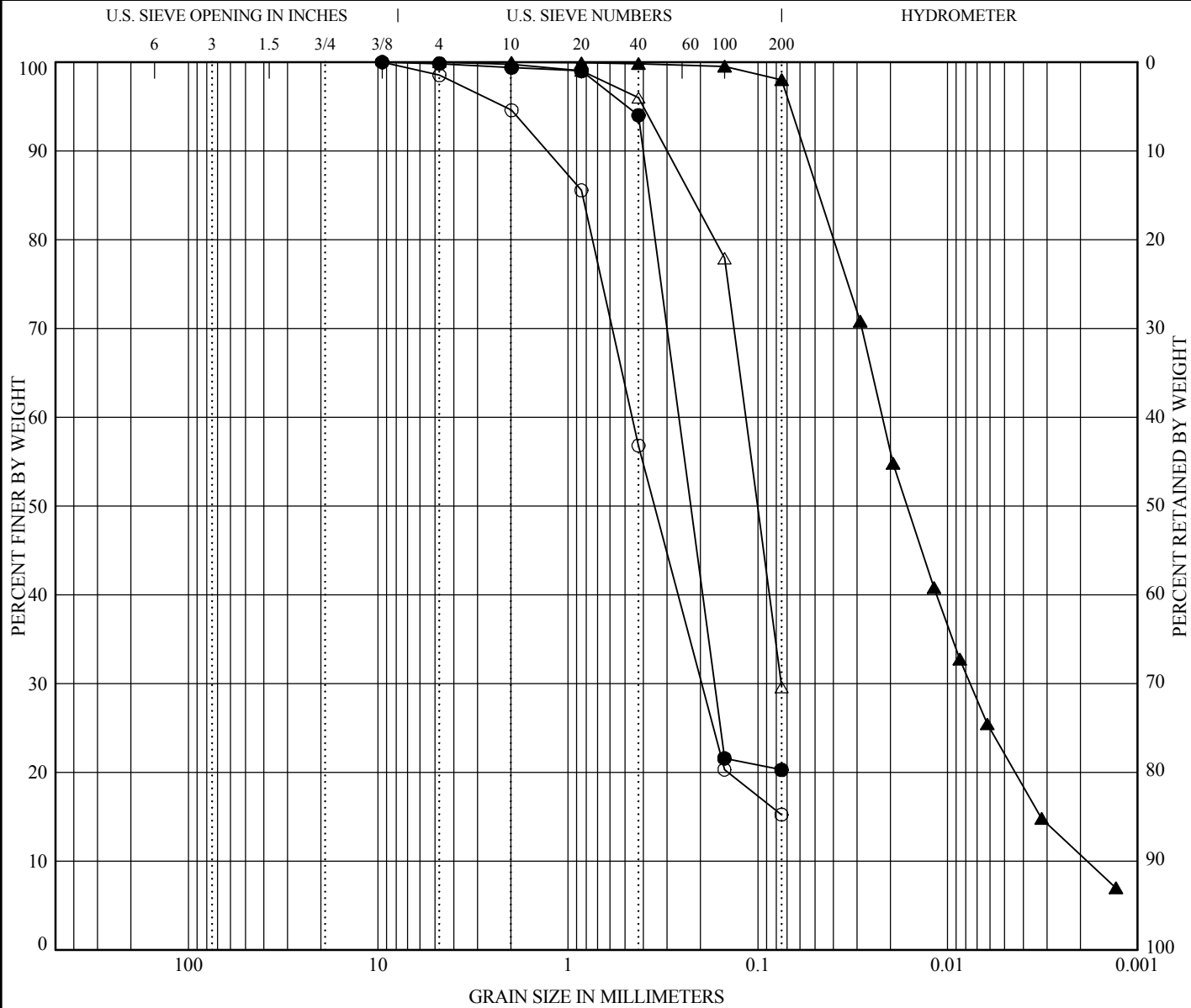
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 Figure: F-6.17

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-109	25.5	SILTY SAND (SM)	--	--	--	--	--
●	G-109	55.5	SILTY SAND (SM)	--	--	--	--	--
△	G-109	65.5	SILTY SAND (SM)	--	--	--	--	--
▲	G-109	90.5	SILTSTONE	63	47	16	1.4	12.0

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-109	25.5	9.52	0.459	0.198	--	1.5	83.3	15.2
●	G-109	55.5	9.52	0.261	0.169	--	0.2	79.6	20.3
△	G-109	65.5	4.75	0.116	0.075	--	0.0	70.4	29.6
▲	G-109	90.5	1.98	0.022	0.008	0.002	0.0	2.0	98.0

Laboratory Test Method: ASTM D 422

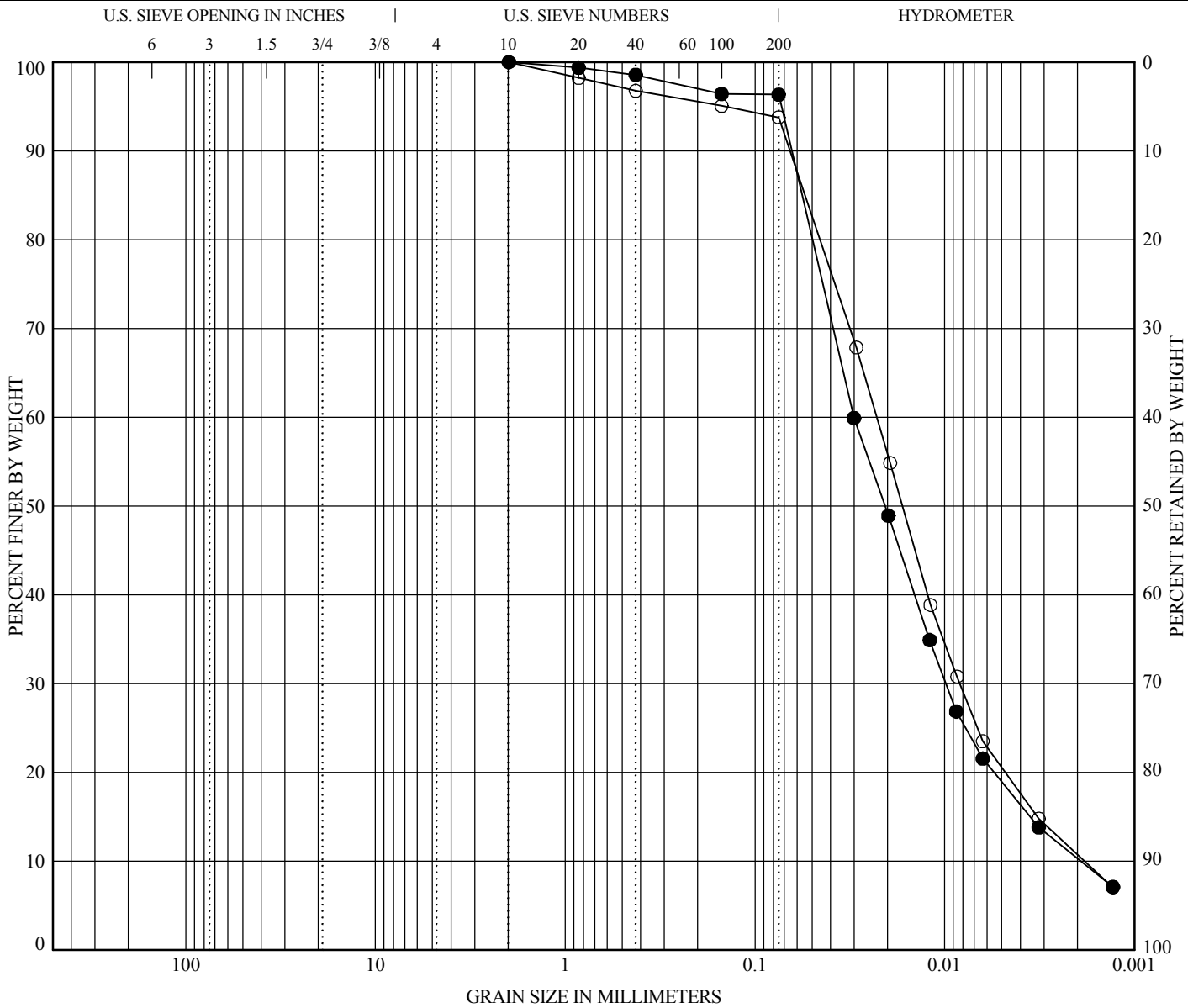
*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

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PARTICLE SIZE DISTRIBUTION
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 Figure: F-6.18



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-109	110.5	SILTSTONE	65	50	15	1.7	12.5
●	G-109	130.5	SILTSTONE	58	45	13	1.7	15.7

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-109	110.5	1.98	0.023	0.008	0.002	0.0	6.2	93.8
●	G-109	130.5	1.98	0.030	0.010	0.002	0.0	3.7	96.3

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

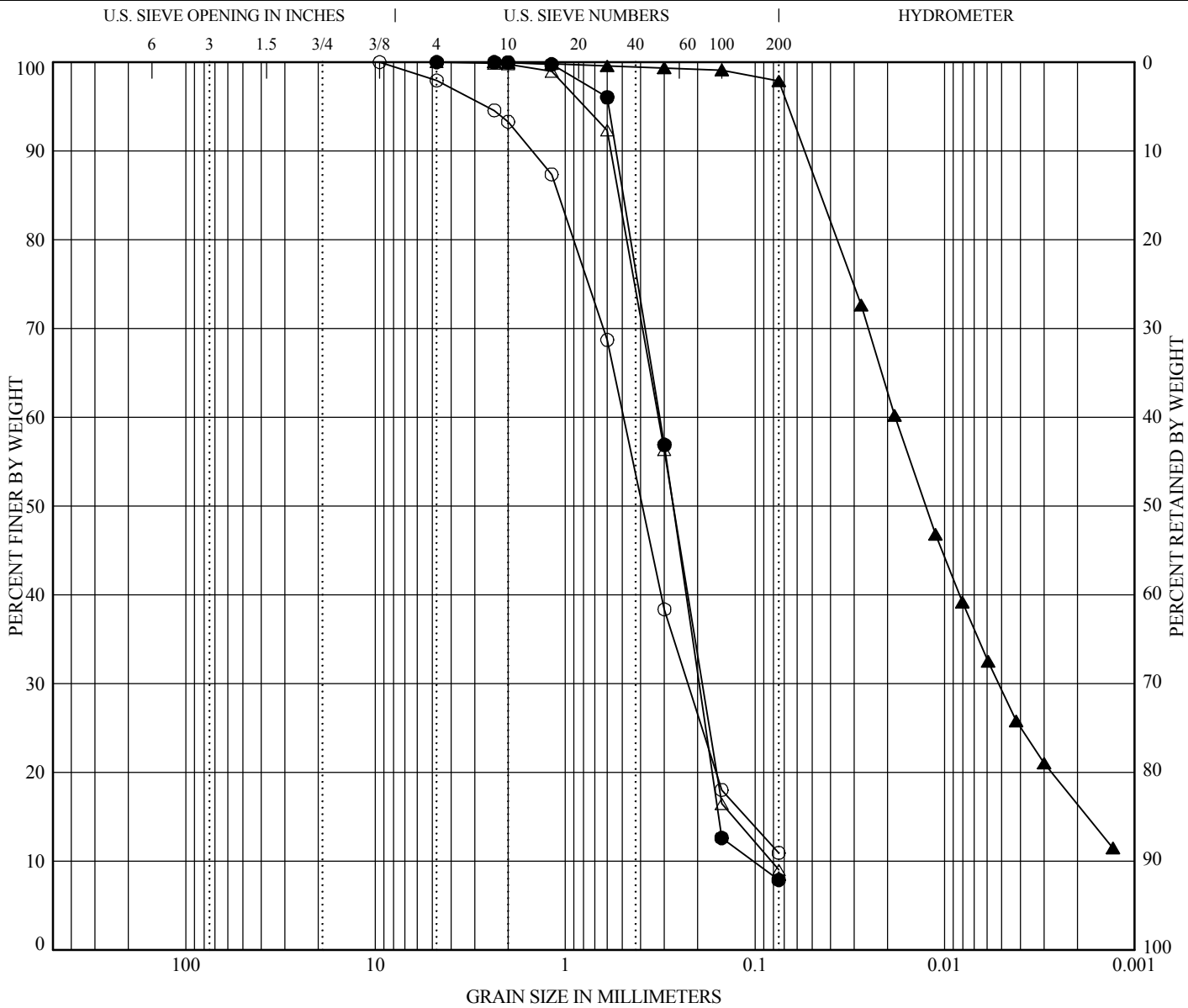
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PARTICLE SIZE DISTRIBUTION
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Figure: F-6.19



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-110	30.5	WELL GRADED SAND with SILT (SW-SM)	--	--	--	1.5	7.2
●	G-110	55.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	1.2	3.1
△	G-110	60.5	POORLY GRADED SAND with SILT (SP-SM)	--	--	--	1.4	3.9
▲	G-110	75.5	SILTSTONE	60	40	20	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-110	30.5	9.50	0.492	0.226	--	2.1	87.0	10.9
●	G-110	55.5	4.75	0.317	0.197	0.102	0.0	92.1	7.9
△	G-110	60.5	4.75	0.322	0.190	0.082	0.0	91.0	9.0
▲	G-110	75.5	2.36	0.018	0.005	--	0.0	2.1	97.9

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

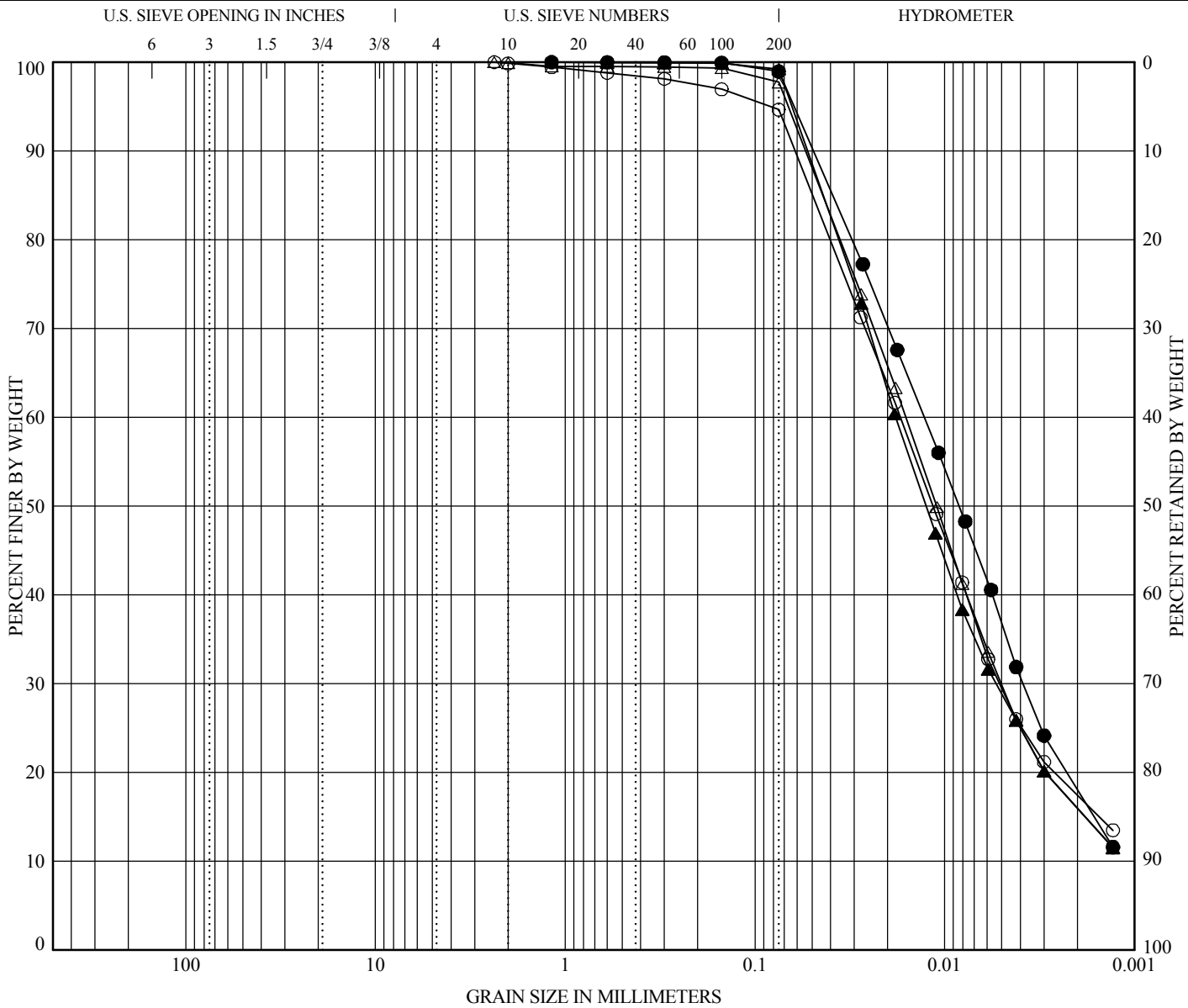
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Figure: F-6.20

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-110	85.5	SILTSTONE	66	53	13	--	--
●	G-110	95.5	SILTSTONE	51	35	16	--	--
△	G-110	105.5	SILTSTONE	45	28	17	--	--
▲	G-110	115.5	SILTSTONE	51	36	15	--	--

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-110	85.5	2.36	0.017	0.005	--	0.0	5.3	94.7
●	G-110	95.5	1.18	0.013	0.004	--	0.0	1.1	99.0
△	G-110	105.5	2.36	0.016	0.005	--	0.0	2.3	97.8
▲	G-110	115.5	1.18	0.018	0.005	--	0.0	0.8	99.2

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

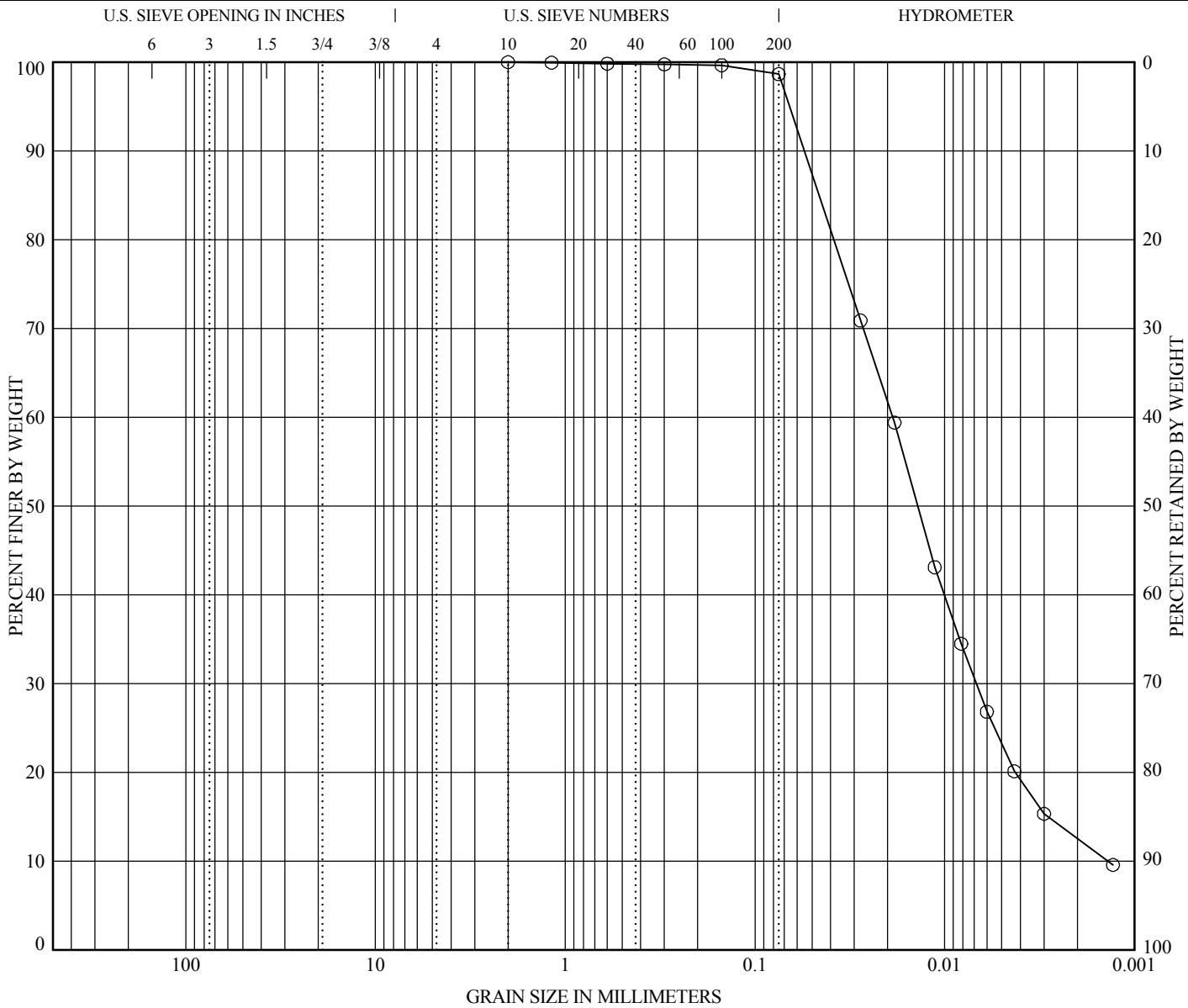
Prepared/Date: YN 8/9/2011
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Figure: F-6.21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	LL (%)*	PL (%)*	PI (%)*	C _c	C _u
○	G-110	122.0	SILTSTONE	52	32	20	1.8	13.6

SYMBOL	BORING	DEPTH (ft)	D ₁₀₀ (mm)	D ₆₀ (mm)	D ₃₀ (mm)	D ₁₀ (mm)	% Gravel	% Sand	% Silt or % Clay
○	G-110	122.0	2.00	0.019	0.007	0.001	0.0	1.3	98.7

Laboratory Test Method: ASTM D 422

*As determined by ASTM D 4318; see attached Atterberg Limits Test Results.

Prepared/Date: YN 8/9/2011
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Figure: F-6.22