

APPENDIX D

Geotechnical Laboratory Test Results

- Engineered Fill - QC (provided by Parsons) /QA
- Low-Permeability Soil Layer - QC (provided by Parsons) /QA
- Gravel Drainage Layer - QC (provided by Parsons) /QA

Engineered Fill

Structural Fill
Quality Control Data Summary
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Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	USCS Classification	Max Dry Density	Optimum Moisture Content (%)	6" (%)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2.5" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	5/8" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#20 (%)	#30 (%)	#40 (%)	#50 (%)	#80 (%)	#100 (%)	#140 (%)	#200 (%)	
Granby Quarry	SF-02	07/19/10		Atlantic Testing	ST3104SL-06-8-10	S06-SF02	GW	131.7	8									100	97	90		76	68	56	48		35		24		16	12	8	6		3.4	
Granby Quarry	SF-08	08/06/10	Stockpile	Atlantic Testing	ST3104SL-20-8-10	S20-SF08	GW-GM w/Sand	130.4	3.7									100	95	77		71	61	56	49	42	34		26	22	18	15	12	11		7.2	
Granby Quarry	SF-09	08/06/10	Stockpile	Atlantic Testing	ST3104SL-21-8-10	S21-SF09	SW-SM w/Gravel	128	5.5									100	96	87		77	71	62	56	49	41		31	27	21	19	15	13		9.1	
Granby Quarry	SF-10	09/02/10	Stockpile	Atlantic Testing	ST3104SL-37-09-10	S72-SF10	GP w/Sand	142.2	3.4			100	94		87		78	71	60	53		43		28	26	24	19	17		13		8	5	5		2.7	
Granby Quarry	SF-26	10/21/10	Stockpile	Atlantic Testing	ST3104SL-90-11-10	S112-SF26	SP-SM w/Gravel	128.6	6.1									100	97	89	78		70		53		37				25			12		7.9	
Granby Quarry	SF-27	10/21/10	Stockpile	Atlantic Testing	ST3104-91-11-10	S113-SF27	GW-GM w/Sand	5.3										100	98	87		75	66		48		33				21			11		7.2	
Granby Quarry	SF-34	10/21/10	Stockpile	Atlantic Testing	ST3104SL-100-11-10	S120-SF34	SP-SM w/Gravel	128.5	6.5									100	98	94		84		68	60		43				26			12		6.4	
Granby Quarry	SF-01	07/19/10		Atlantic Testing	ST3104SL-05-8-10	S05-SF01	GW	128.5	6.8									100	98	90			65	52	44		31		21		14	11	7	6		3.2	
Granby Quarry	SF-051	04/08/11	Stockpile #1	Atlantic Testing	ST3104SL-115-04-11	S135-SF51	SW-SM w/Gravel	131.9	6.4				100	98	91	78			52	36		23		10	5.3					15.7	6.7		4.34	1.07	0.23	0.15	
Granby Quarry	SF-052	04/08/11	Stockpile #1	Atlantic Testing	ST3104SL-116-04-11	S136-SF52	SW-SM w/Gravel	131.2	6.8				100	98	92	79			52	37		24		11	6.5					15.2	6.64		4.33	0.88	0.21	0.13	
Granby Quarry	SF-053	04/08/11	Stockpile #1	Atlantic Testing	ST3104SL-117-04-11	S137-SF53	GW w/Sand	142.2	3.9	100	90	77	73	63	58	51			37	27		15		7	4.6					66.5	21.6		12	2.66	0.43	0.23	
Granby Quarry	SF-054	04/08/11	Stockpile #2	Atlantic Testing	ST3104SL-118-04-11	S138-SF54	SW-SM w/Gravel	131.8	6.4				100	97	90	77			53	36		21		11	6.6					16.3	6.57		4.13	1.25	0.23	0.13	
Granby Quarry	SF-055	04/08/11	Stockpile #2	Atlantic Testing	ST3104SL-119-04-11	S139-SF55	GW-GM w/Sand	132.5	6.5				100	95	86	72			49	34		20		11	7					18.5	8.12		5	1.44	0.25	0.13	
Granby Quarry	SF-056	04/08/11	Stockpile #2	Atlantic Testing	ST3104SL-120-04-11	S140-SF56	SW-SM w/Gravel	131.2	6.3				100	98	93	85			66	33		20		10	6.3					12.7	4.01		3.13	1.79	0.25	0.15	
Granby Quarry	SF-057	04/08/11	Stockpile #2	Atlantic Testing	ST3104SL-121-04-11	S141-SF57	GW-GM w/Sand	133.1	7				100	97	90	77			47	28		17		9	5.4					16.2	7.45		5.29	2.26	0.32	0.17	
Granby Quarry	SF-058(1)	04/08/11	Stockpile #2	Atlantic Testing	ST3104SL-122-04-11	S142-SF58	GW-GM w/Sand	133.8	5.9				100	97	88	74			49	34		20		10	6.2					17.5	7.74		4.98	1.41	0.26	0.15	
Granby Quarry	SF-059(1)	04/22/11	SCA Stockpile	Atlantic Testing	ST3104SL-123-04-11	S143-SF59	GW w/Sand	140.6	3.8	100	82		71	62	55	45			28	19		12		4	2.3					80.8	23.4		15.6	5.51	0.82	0.32	
Granby Quarry	SF-060	04/22/11	SCA Stockpile	Atlantic Testing	ST3104SL-124-04-11	S144-SF60	GW w/Sand	141	3.8	100	83		69	60	53	43			26	17		11		4	2.1					79.4	25.4		16.9	6.32	1.37	0.36	
Granby Quarry	SF-58(2)	10/12/11	Installed On-site	PW-Labs		74 26206	GP w/sand	135.9	7								100	87.4	77.9	71.3		63.5	57	49.1	43.9		31		19.7	16.3		10.9	7		3.9		
Granby Quarry	SF-59(2)	10/12/11	Installed On-site	PW-Labs		74 26207	GP w/sand	140.3	5.4	100			87		87		76.6	68.8	57.6	51.8		44.5	39.9	33.6	29.9		21		13.8	11.6		8	5.2		3		
Granby Quarry	SF-65	08/11/11	Pit	PW-Labs		54 26076	GP w/sand	137.5	6.7	100			87.1		87.1		81.4	79	69.3	63.1		52	46.4	38.5	34.3		26.1		19	16.5		11.3	7.1		3.7		
OCC	SF-05	07/28/10		Atlantic Testing	ST3104SL-09-8-10	S09-SF05	SC-SM w/Gravel								100		96	92	91	86		79	75	67	61	53	43		33	29	25	23	19	17		14	
OCC	SF-06	07/28/10		Atlantic Testing	ST3104SL-10-8-10	S10-SF06	SC-SM w/Gravel										100	99	97	90		81	75	65	58	49	38		29	26	24	22	19	18		16	
OCC	SF-07	07/28/10		Atlantic Testing	ST3104SL-11-8-10	S11-SF-07	SC-SM w/Gravel								100		96	92	91	86		49	75	67	61	53	42		35	32	30	29	26	25		22	
SCA Test Plot	SF-049	03/29/11	East Berm	Atlantic Testing	ST3104SL-113-04-11	S133-SF49	GP-GM w/sand	140.3	5.8				100	81	73	63			42	29		18		11	7.4					28.1	11.2		7.14	2.18	0.28	0.12	
SCA Test Plot	SF-050	03/29/11	East Berm	Atlantic Testing	ST3104SL-114-04-11	S134-SF50	GP-GM w/sand	139.9	6.1				100	80	72	62			39	25		16		9	6.5					28.6	11.7		7.78	2.9	0.36	0.18	
Sennett Quarry	SF-25	10/14/10	Stockpile	Atlantic Testing	ST3104SL-82-10-10	S104-SF25	GP-GM	136.2	7.8									100	96	85		70	62		44	38	37		28		21		15		14	12	
Sennett Quarry	SF-28	10/20/10	Stockpile	Atlantic Testing	ST3104SL-92-11-10	S114-SF28	SW-SM w/Gravel	129	5									100	94	85		74	68		53		38				23			13		9	
Sennett Quarry	SF-29	10/25/10	Stockpile	Atlantic Testing	ST3104SL-93-11-10	S115-SF29	GP-GM w/sand	138.4	6.7									100	91	77		65			44		28				18			12		10	
Sennett Quarry	SF-30	10/25/10	Stockpile	Atlantic Testing	ST3104SL-94-11-10	S116-SF30	SP-SM w/Gravel	135.8	8.2									100	96	87		76			52		31				20			13		11	
Sennett Quarry	SF-31	10/25/10	Stockpile	Atlantic Testing	ST3104SL-95-11-10	S117-SF31	SP-SM w/Gravel	133.2	7.3									100	96	88			78		52		32				20			13		11	
Sennett Quarry	SF-32	10/25/10	Stockpile	Atlantic Testing	ST3104SL-96-10-10	S118-SF32	GP w/Sand	144.9	5				100		87		74		61	56		49			33		23					4		2		1.3	
Sennett Quarry	SF-33	10/25/10	Stockpile	Atlantic Testing	ST3104SL-98-10-10	S119-SF33	GW w/Sand	146.6	3.9		100		90		77		70		55	49		43			28		19					3			2		1.2
Sennett Quarry	SF-35	11/10/10	Stockpile	Atlantic Testing	ST3104SL-101-11-10	S121-SF35	SP-SM w/Gravel	137.8	6.6				100		92		84		75	71		64			50		31				15			13		12	
Sennett Quarry	SF-36	11/10/10	Stockpile	Atlantic Testing	ST3104SL-102-11-10	S122-SF36	GP-GM w/sand	142.2	6.2				100		92		84		75	69		63			47		30				15			13		11	
Sennett Quarry	SF-37	11/10/10	Stockpile	Atlantic Testing	ST3104SL-103-11-10	S123-SF37	GP-GM w/sand	142.7	5.8				100		92		83		70	64		57			41		26				13			11		9.7	
Sennett Quarry	SF-38	11/10/10	Stockpile	Atlantic Testing	ST3104SL-104-11-10	S124-SF38	GP-GM w/sand	142.6	5.2				100		88		74		65	60		48			38		22				12			10		8.6	
Sennett Quarry	SF-39	11/11/10	Bank Run	PW-Labs		4 25412	GW-GM	136	6.7	100			83.3		77.2		70.2	66.3	61.3		55.3	52.1	47	43.8		31.9				13.8			10.1		8.9		
Sennett Quarry	SF-40	11/11/10	Bank Run	PW-Labs		5 25413	GC-GM	131.1	8.7						100		79.2	76.7	71.6		65.4	60.8	54.7	51		38.1				20.9			16.7		14.7		
Sennett Quarry	SF-41	11/11/10	Bank Run	PW-Labs		6 25414	GP-GM	136	7.4				100		90.7		82.4	75.7	67.1		60.5	55.5	46.9	42.2		28.1					12.2			9.5		8.4	
Sennett Quarry	SF-42	11/11/10	Bank Run	PW-Labs		7 25415	GM	137.2	7	100			65.3		65.3		63.2	58.8	55.1		49.6	46.8	42.2	39.4		30.9					18.6			14.2		12.6	
Sennett Quarry	SF-43	11/11/10	Bank Run	PW-Labs		8 25416	GC-GM	128.6	10.2						100		87.9	84.1	80.7		72.5	68.1	60.4	56.3		45					26.9			19.7		17.1	
Sennett Quarry	SF-44	11/11/10	Bank Run	PW-Labs		9 25417	GW-GM	139	6.3				100		74.2		59.9	56	50.3		44.4	41.1	36.2	33.5		25.5				14.4			11.1		9.8		
Sennett Quarry	SF-45	11/11/10	Bank Run	PW-Labs		10 25418	GW-GM	142.3	5.4	100			81.3		61.1		53	49.9	45.2		40.1	37.3	33	30.2		21.6					11.4			8.7		7.6	
Sennett Quarry	SF-46	11/11/10	Bank Run	PW-Labs		11 25419	GC-GM	133.4	8.2						100		74.2	68.5	62.9		55.6	51.6	44.6	41		31.9					18.6			14.4		12.5	
Sennett Quarry	SF-47	11/11/10	Bank Run	PW-Labs		12 25420	GP-GM	136.1	6.9	100			82.4		72.3		65.2	60.9	56.1		49.7	45.9	39.6	35.9													

Structural Fill
Quality Control Data Summary
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Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	USCS Classification	Max Dry Density	Optimum Moisture Content (%)	6" (%)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2.5" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	5/8" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#20 (%)	#30 (%)	#40 (%)	#50 (%)	#80 (%)	#100 (%)	#140 (%)	#200 (%)
Warners Rd - I90	SF-15	09/17/10	Stockpile	Atlantic Testing	ST3104SL-68-09-10	S90-SF15	SM w/Gravel	133.2	8.2								100		96	92		86			72		62				51			40		32
Warners Rd - I90	SF-16	09/17/10	Stockpile	Atlantic Testing	ST3104SL-69-09-10	S91-SF16	SM w/Gravel	135.1	8.2								100		95	91		86			68		54				41			31		23
Warners Rd - I90	SF-17	09/17/10	Stockpile	Atlantic Testing	ST3104SL-70-09-10	S92-SF17	SM w/Gravel	135.7	6.7						100		86		83	80		71			61		54				43			33		26
Warners Rd - I90	SF-22	09/29/10	Stockpile	Atlantic Testing	ST3104SL-79-10-10	S101-SF22	SM w/Gravel	138.3	5.9								100		83	79		73			59		45				37			28		23
Warners Rd - I90	SF-23	09/29/10	Stockpile	Atlantic Testing	ST3104SL-80-10-10	S102-SF23	SM w/Gravel	140.6	5.7								100		85	82		74			58		46				35			25		20

TABLE A1
ENGINEERED FILL QA SUMMARY
Sediment Consolidation Area Construction Project
Parsons / Honeywell
Camillus, New York

TEST STANDARD			MOISTURE (ASTM D2216)	GRAIN SIZE (ASTM D 422)							CLASSIFICATION (ASTM D2487)	ORGANIC (ASTM D2974)	ATTERBERG LIMITS (ASTM D 4318)			STANDARD PROCTOR (ASTM D698)		
QA TEST FREQUENCY			@ 25,000 cyd	@ 25,000 cyd							@ 25,000 cyd	@ 25,000 cyd	@ 25,000 cyd			@ 25,000 cyd		
QA TEST REQUIRED			4	4							4	4	4			4		
SAMPLE No.	LOCATION		ω (%)	PASSING 3-in. (%)	PASSING 2-in. (%)	PASSING 1-in. (%)	PASSING NO. 10 (%)	PASSING NO.40 (%)	PASSING NO.100 (%)	PASSING NO.200 (%)	PASSING 0.002 mm (%)	USCS	(%)	LL	PL	PI	MAX. DRY DENSITY (PCF)	OPT. ω (%)
EF- Specs:				-	-	-	-	-	-	-	-	SC, SM, ML, CL, GM, GC, or GW						
CQC (see Parsons CD for details)																		
CQA																		
EF1	Granby - on-site	Grid E-9	5.8 / 7 / 6	100	90	67	34	23	15	12.8	2	GC-GM	0.9	20	13	7	129 / 140	8.5 / 5
EF2	Granby Pit #4	CQC data	4.6	90	77	63	27	15	7	4.6	1	GW w/ Sand	0.6	NP	NP	NP	142.2	3.9
EF3	Granby - on-site	Grid V-8	5.8	97	87	71	25	15	5	2.8	0	GP	0.1	NP	NP	NP	127 / 137	8 / 5
EF4	Granby - on-site NW stockpile		1.9	100	100	100	83	55	34	25	7	SC-SM	0.7	19	14	5	138 / 142.5	6 / 4.5
EF5	Granby - on-site	Grid D-10	4.1	100	100	82	29	20	9	6	1	GE-GM	0.4	NP	NP	NP	130 / 136.5	8 / 6
EST. TOTAL VOLUME (cyd) PLACED:			84,715	4	Number of QA Samples:							4	4	4			4	

Notes:

(1) The soil is being used to construct perimeter berms using material obtained from the Granby and Sennett sources. Engineering Fill was placed in 2010 and 2011. Prior to Geosyntec's being on-site and involvement with the basins, Parsons monitored the construction of the perimeter berms.

(2) Reference construction documents, including Technical Specification Section 02200 and Tables A-1 and 2 of the CQA Plan for further details. Analytical samples will be obtained from each source to confirm the material meets the Restricted Use Soil Cleanup Objectives (Table 375-6.8(b), NYDEC Subpart 375. The minimum dry density required is 90 and 95 percent for mid and upper lifts, respectively, -3 to +3 percent of the optimum moisture content.

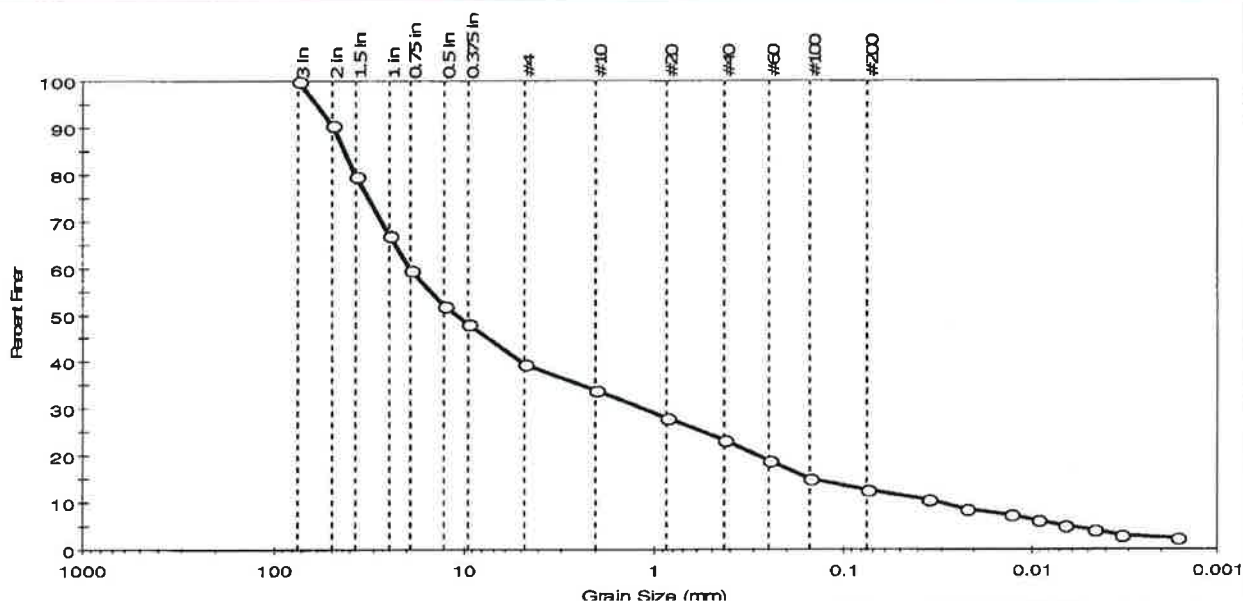
(3) In-place testing shall be performed at a minimum of 5 per acre/lift.

(4) *Italics* indicate an approximate value. **Bold** indicates oversized corrected numbers.



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY		
Boring ID: ---	Sample Type: bucket	Tested By: jbr
Sample ID: EF-001	Test Date: 05/18/11	Checked By: jdt
Depth: ---	Test Id: 208162	
Test Comment: ---		
Sample Description: Moist, dark brown silty, clayey gravel with sand		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	60.5	26.7	12.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3 in	75.00	100		
2 in	50.00	90		
1.5 in	37.50	80		
1 in	25.00	67		
0.75 in	19.00	60		
0.5 in	12.70	52		
0.375 in	9.50	48		
#4	4.75	39		
#10	2.00	34		
#20	0.85	28		
#40	0.42	23		
#60	0.25	19		
#100	0.15	15		
#200	0.075	13		
----	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
----	0.0355	11		
----	0.0223	9		
----	0.0129	7		
----	0.0092	6		
----	0.0066	5		
----	0.0047	4		
----	0.0033	3		
----	0.0016	2		

Coefficients

$D_{85} = 43.1604$ mm $D_{30} = 1.1244$ mm
 $D_{60} = 19.3329$ mm $D_{15} = 0.1471$ mm
 $D_{50} = 10.9177$ mm $D_{10} = 0.0311$ mm
 $C_u = N/A$ $C_c = N/A$

Classification

ASTM Silty, clayey gravel with sand (GC-GM) ✓

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
 Sand/Gravel Hardness : HARD

Pass
EM



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-001	Test Date:	05/19/11
Depth :	---	Sample Id:	99477
Test Comment:	---		
Sample Description:	Moist, dark brown silty, clayey gravel with sand		
Sample Comment:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	EF-001	---	Moist, dark brown silty, clayey gravel with sand	5.8 ✓

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-001	Test Date:	05/17/11
Depth :	---	Test Id:	208164
Test Comment:	---		
Sample Description:	Moist, dark brown silty, clayey gravel with sand		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

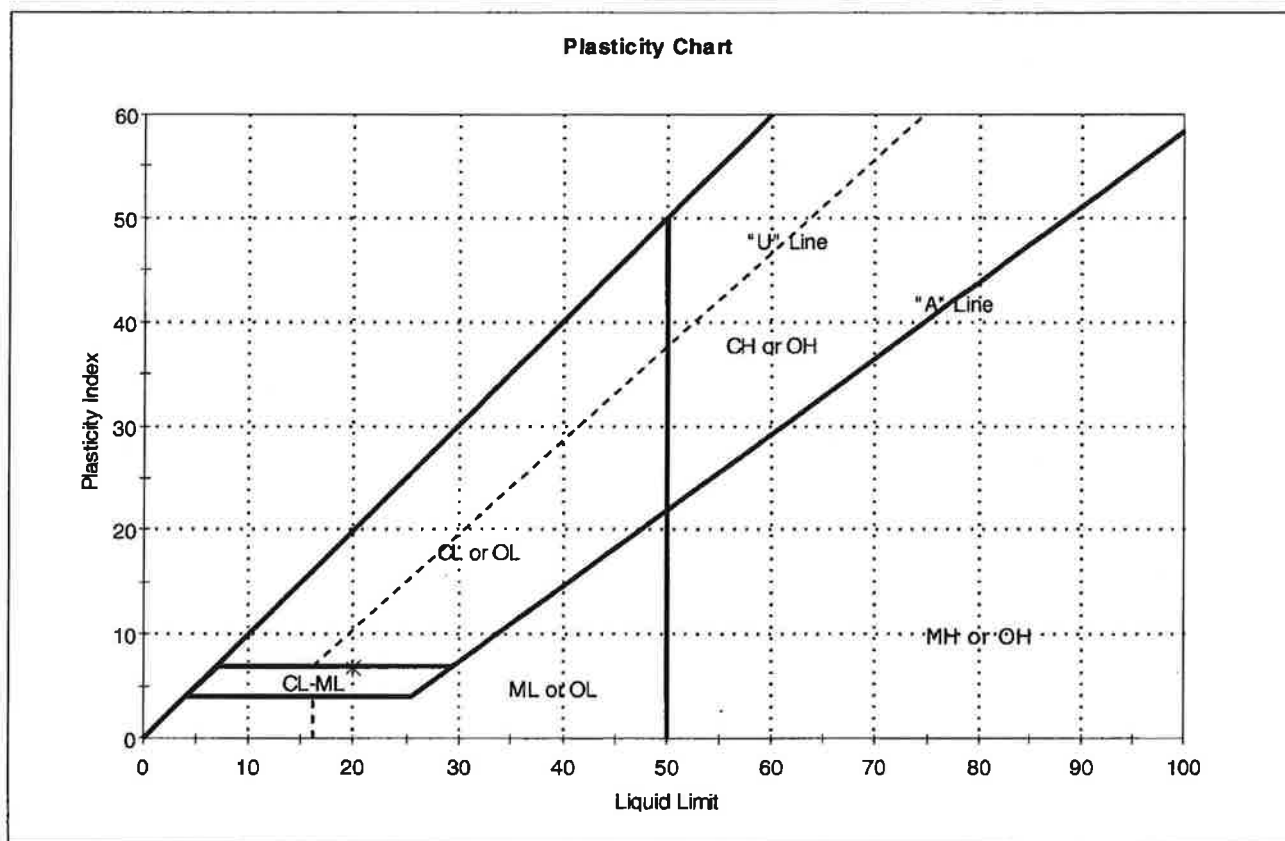
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
---	EF-001	---	Moist, dark brown silty, clayey gravel with sand	7	99.1	.9 ✓

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-001	Test Date:	05/17/11
Depth:	---	Test Id:	208160
Test Comment:	---		
Sample Description:	Moist, dark brown silty, clayey gravel with sand		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	EF-001	---	---	6	20	13	7	-1	Silty, clayey gravel with sand (GC-GM)

Sample Prepared using the WET method

76% Retained on #40 Sieve

Dry Strength: HIGH

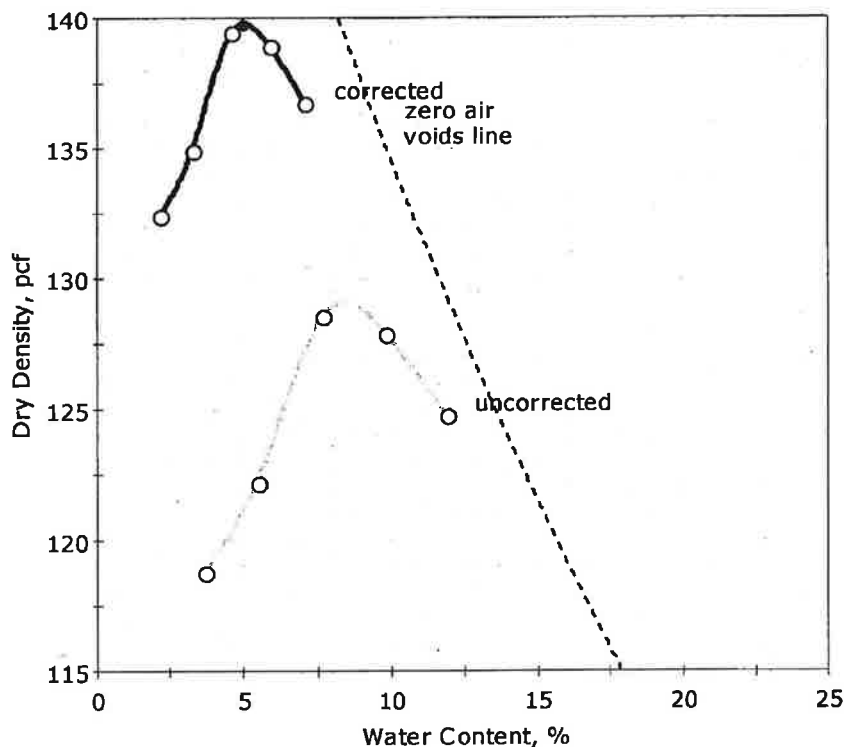
Dilatancy: RAPID

Toughness: LOW



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cwd
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-001	Test Date:	05/18/11
Depth:	---	Test Id:	208166
Test Comment:	ASTM does not recommend this method when >30% is >3/4-inch		
Sample Description:	Moist, dark brown silty, clayey gravel with sand		
Sample Comment:	---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	118.8	122.2	128.6	127.9	124.8
Moisture Content, %	3.6	5.4	7.7	9.8	11.9

Method : C

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 129.0 pcf
Optimum Moisture= 8.5 %

Upsize Correction (40.5% > 3/4 inch Sieve)
Corrected Maximum Dry Density= 140.0 pcf
Corrected Optimum Moisture= 5.0 %
Assumed Average Bulk Specific Gravity = 2.55



ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: SCA Phase 1A

Report No.: ST3104SL-117-04-11

Client: Parsons Engineering of New York, Inc.

Date: 04-14-2011

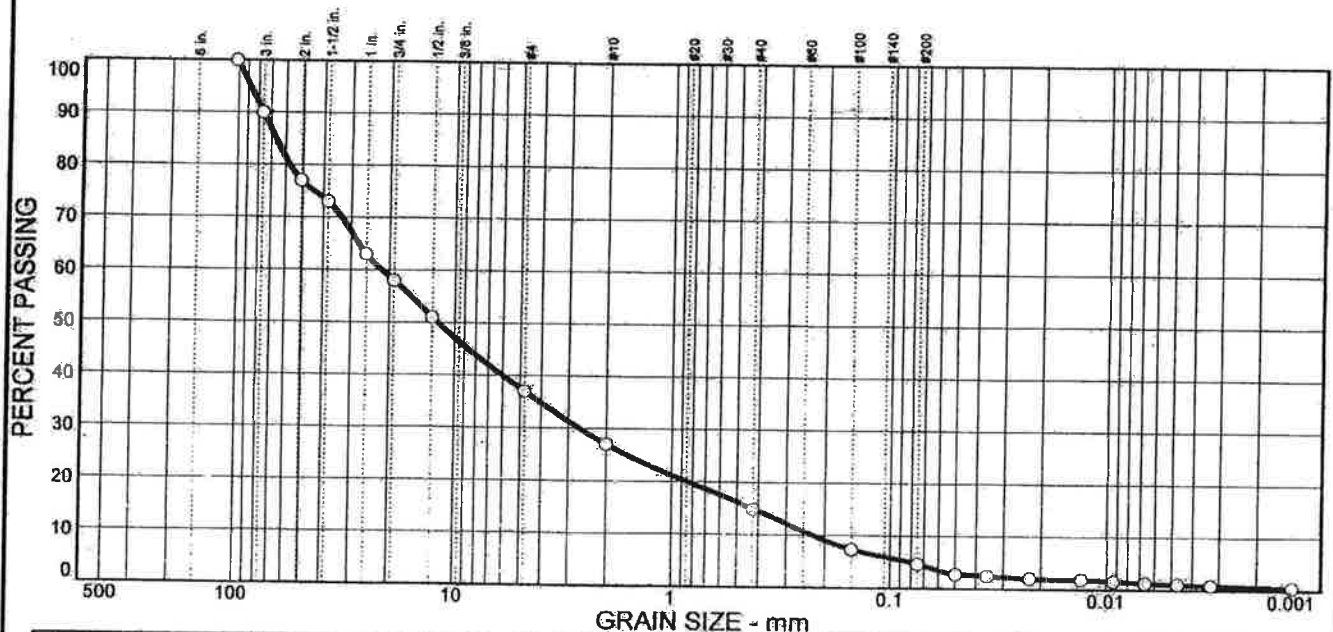
EF-002

Sample No: S137-SF53

Source of Sample: Granby Pit #4

Location: 1-4" Stockpile #1

Elev./Depth: ---



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
10	32	21	10	12	10	3	1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
4 in.	100		
3 in.	90		
2 in.	77		
1-1/2 in.	73		
1 in.	63		
3/4 in.	58		
1/2 in.	51		
#4	37		
#10	27		
#40	15		
#100	7		
#200	4.6		

* (no specification provided)

Soil Description

Brown c+mf GRAVEL; some emf SAND; trace COBBLES; trace SILT; trace CLAY (SF53)
ASTM D 2974 Percent Organics = 0.6%

Atterberg Limits

PL= NP

LL= NP

PI= NP

Coefficients

D₈₅= 66.5

D₆₀= 21.6

D₅₀= 12.0

D₃₀= 2.66

D₁₅= 0.425

D₁₀= 0.229

C_u= 94.60

C_c= 1.43

Classification

USCS= GW w/ Sand

AASHTO= ---

Remarks

ASTD D 422, ASTM D 4318 and ASTM D 2487

Sampled by P. Weiman 04-08-2011

ASTM D 2216 Recieved Moisture = 4.6%

Pass Em

ATLANTIC TESTING LABORATORIES, LIMITED

The USCS soil classification could not be performed in strict accordance with ASTM D 2487 due to this sample having material greater than 3 inches present.

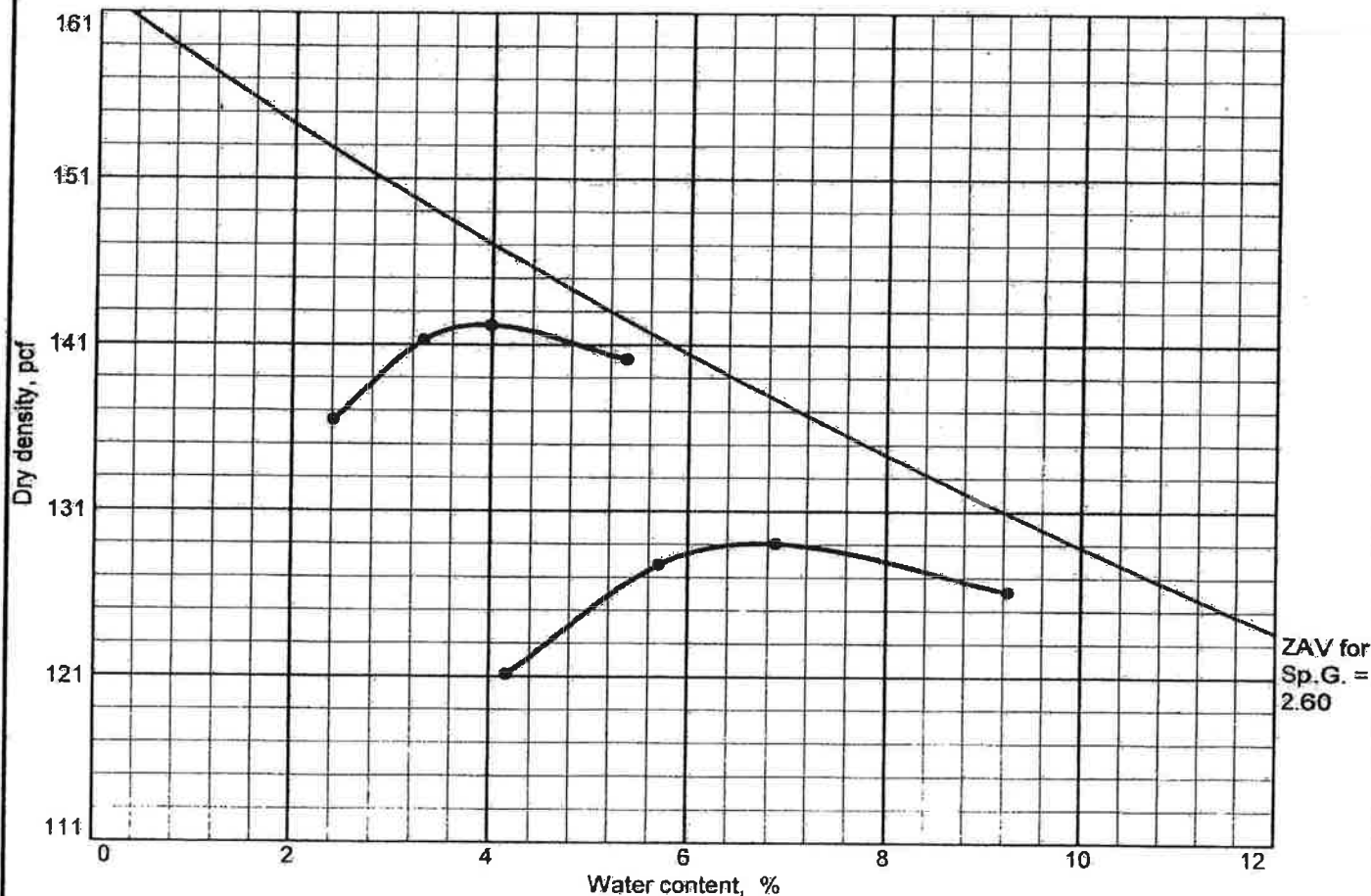
Reviewed by:

Date: 4/15/11



ATLANTIC TESTING LABORATORIES

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method C Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Received Moist.	Sp.G.	LL	PL	PI	% > 3/4 in.
	USCS	AASHTO						
---	GW w/ Sand	---	4.6	2.60	NP	NP	NP	42.0

TEST RESULTS

Maximum dry density = 142.2 pcf

Optimum moisture = 3.9 %

MATERIAL DESCRIPTION

Brown c+mf GRAVEL; some cmf SAND;
trace COBBLES; trace SILT; trace CLAY
(SF53)

ASTM D 2974 Percent Organics = 0.6%

Report No.: ST3104SL-117-04-11 Client: Parsons Engineering of New York, Inc.

Project: SCA Phase 1A

Sample No.: S137-SF53 Source of Sample: Granby Pit #4

Location: 1-4" Stockpile #1

Date: 04-12-2011

Remarks:

ASTM D 698 and ASTM D 2216
Sampled by P. Weiman 04-08-2011
Dry Preparation

Rammer: Mechanical

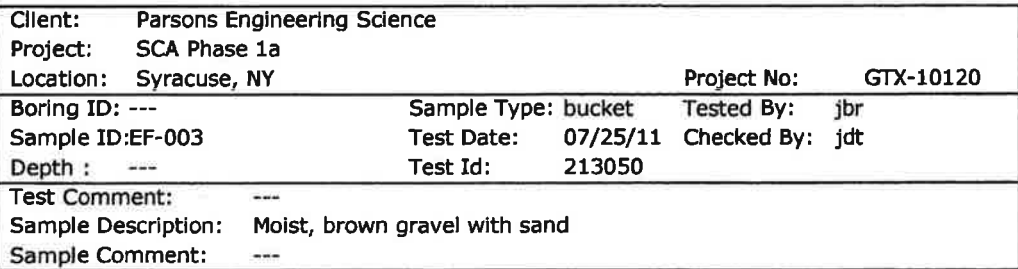
Specific Gravity: Assumed

Since this sample contained more than 30% plus 3/4" material, the Maximum Laboratory Dry Density and Optimum Moisture Content values may not be determined in strict accordance with ASTM D 698. Percent compaction determined by utilizing the Maximum Laboratory Dry Density may not be representative of compacted soil and should only be used as an indicator of percent compaction.

The USCS soil classification could not be performed in strict accordance with ASTM D 2487 due to this sample having material greater than 3 inches present.

Reviewed by:

Date: 4/15/11



The graph displays the grain size distribution of a sand sample. The y-axis represents the percentage of material finer than a given grain size, ranging from 0 to 100. The x-axis represents the grain size in millimeters on a logarithmic scale, ranging from 1000 mm down to 0.001 mm. Vertical dashed lines correspond to standard sieve sizes, labeled at the top: #4 (50 mm), #10 (2.0 mm), #20 (0.85 mm), #40 (0.425 mm), #60 (0.25 mm), #100 (0.15 mm), and #200 (0.075 mm). The data points are connected by a smooth curve, showing that approximately 32% of the sample is finer than 20 mm, and about 5% is finer than 0.075 mm.

Grain Size (mm)	Sieve Size	Percent Finer (%)
100	#4	100
75	-	98
60	-	88
47.5	-	82
37.5	-	71
30	-	64
25	-	53
20	-	46
15	-	32
12.5	-	25
10	#10	20
7.5	-	15
6	-	10
4.75	#40	5
3.75	-	4
3	-	3
2.5	-	2
2	#10	1
1.5	-	1
1.18	-	0.5
0.85	#20	0.5
0.6	-	0.5
0.425	#40	0.5
0.3	-	0.5
0.25	#60	0.5
0.18	-	0.5
0.15	#100	0.5
0.12	-	0.5
0.10	#20	0.5
0.075	#200	0.5
0.06	-	0.5
0.05	-	0.5
0.04	-	0.5
0.03	-	0.5
0.025	-	0.5
0.02	-	0.5
0.015	-	0.5
0.012	-	0.5
0.01	-	0.5
0.0075	-	0.5
0.006	-	0.5
0.005	-	0.5
0.004	-	0.5
0.003	-	0.5
0.002	-	0.5
0.001	-	0.5

% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	67.9	29.3	2.8

<u>Coefficients</u>	
D ₈₅ = 44.9552 mm	D ₃₀ = 3.6936 mm
D ₆₀ = 16.8233 mm	D ₁₅ = 0.4115 mm
D ₅₀ = 11.5145 mm	D ₁₀ = 0.2614 mm
C _u = 64.358	C _c = 3.102

Classification

ASTM Poorly graded gravel with sand (GP)

**AASHTO Stone Fragments, Gravel and Sand
(A-1-a (0))**

Sample/Test Description	Test Results
1. Pre-Test: Initial assessment of patient's condition. 2. Post-Test: Assessment after treatment. 3. Follow-up: Monitoring of patient's progress over time.	1. Pre-Test: Initial assessment of patient's condition. 2. Post-Test: Assessment after treatment. 3. Follow-up: Monitoring of patient's progress over time.

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jef
Sample ID: EF-003	Test Date: 07/29/11	Checked By: jdt
Depth : ---	Sample Id: 102026	
Test Comment: ---		
Sample Description: Moist, brown gravel with sand		
Sample Comment: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	EF-003	---	Moist, brown gravel with sand	5.8

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-003	Test Date:	07/21/11
Depth :	---	Test Id:	213052
Test Comment:	---		
Sample Description:	Moist, brown gravel with sand		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
---	EF-003	---	Moist, brown gravel with sand	5	99.9	.1

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: cam
Sample ID: EF-003	Test Date: 07/26/11	Checked By: jdt
Depth : ---	Test Id: 213048	
Test Comment: ---		
Sample Description: Moist, brown gravel with sand		
Sample Comment: ---		

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	EF-003	---	---	6	n/a	n/a	n/a	n/a	Poorly graded gravel with sand (GP) ✓

85% Retained on #40 Sieve

Dry Strength: NONE

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-003	Test Date:	07/29/11
Depth :	---	Test Id:	213049
Test Comment:	---		
Sample Description:	Moist, brown gravel with sand		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

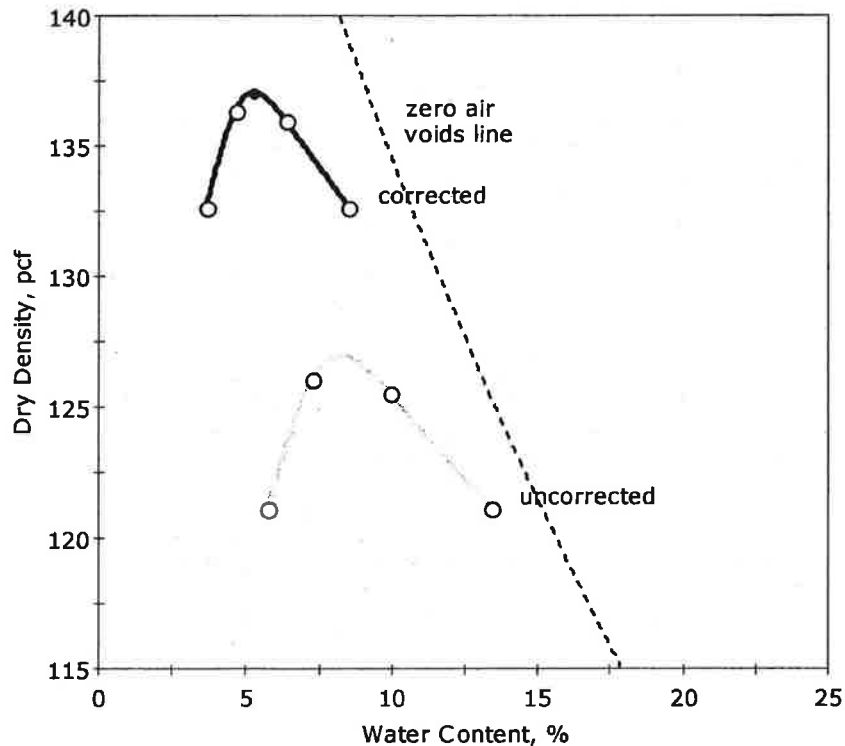
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	EF-003	---	Poorly graded gravel with sand	GP	67.9	29.3	2.8

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cwd
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-003	Test Date:	07/22/11
Depth:	---	Test Id:	213053
Test Comment:	ASTM does not recommend this method when >30% is >3/4-inch		
Sample Description:	Moist, brown gravel with sand		
Sample Comment:	---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	121.1	126.1	125.5	121.1
Moisture Content, %	5.7	7.3	10.0	13.4

Method : C

Preparation : WET

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

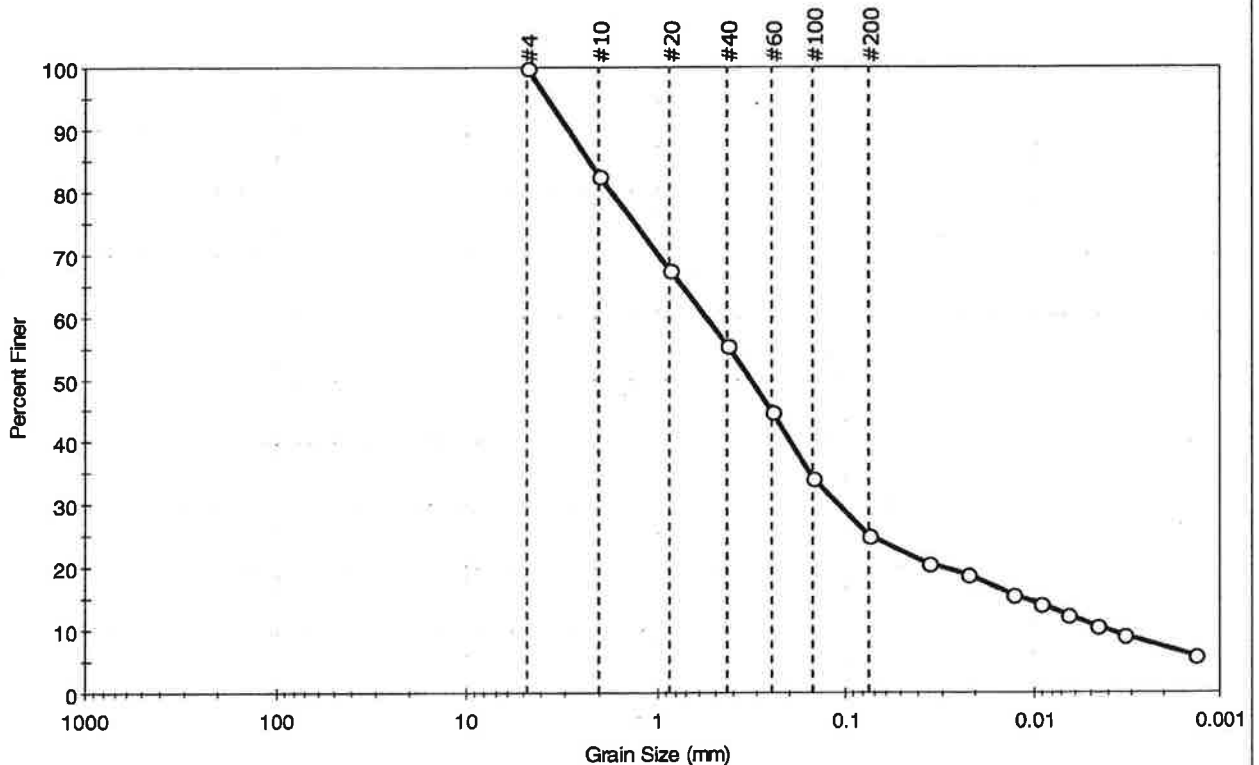
Maximum Dry Density= 127.0 pcf
Optimum Moisture= 8.0 %

Upsize Correction (36.4% > 3/4 inch Sieve)
Corrected Maximum Dry Density= 137.0 pcf
Corrected Optimum Moisture= 5.0 %
Assumed Average Bulk Specific Gravity = 2.55



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Boring ID: ---	Sample Type: bucket
	Sample ID: EF-004	Test Date: 10/05/11
	Depth: ---	Test Id: 219524
Test Comment: ---		
Sample Description: Moist, brown silty, clayey sand		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	75.1	24.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	83		
#20	0.85	68		
#40	0.42	55		
#60	0.25	45		
#100	0.15	34		
#200	0.075	25		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0354	21		
---	0.0222	19		
---	0.0128	16		
---	0.0091	14		
---	0.0066	12		
---	0.0047	11		
---	0.0033	9		
---	0.0014	6		

Coefficients	
D ₈₅ = 2.2628 mm	D ₃₀ = 0.1101 mm
D ₆₀ = 0.5524 mm	D ₁₅ = 0.0111 mm
D ₅₀ = 0.3247 mm	D ₁₀ = 0.0040 mm
C _u = N/A	C _c = N/A

Classification	
ASTM	Silty, clayey sand (SC-SM) ✓
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description	
Sand/Gravel Particle Shape :	---
Sand/Gravel Hardness :	---



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-004	Test Date:	10/18/11
Depth :	---	Sample Id:	105309
Test Comment:	---		
Sample Description:	Moist, brown silty, clayey sand		
Sample Comment:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	EF-004	---	Moist, brown silty, clayey sand	1.9

Notes: Temperature of Drying : 110° Celsius



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jef
Sample ID: EF-004	Test Date: 10/05/11	Checked By: jdt
Depth : ---	Test Id: 219526	
Test Comment: ---		
Sample Description: Moist, brown silty, clayey sand		
Sample Comment: ---		

Moisture, Ash, and Organic Matter - ASTM D 2974

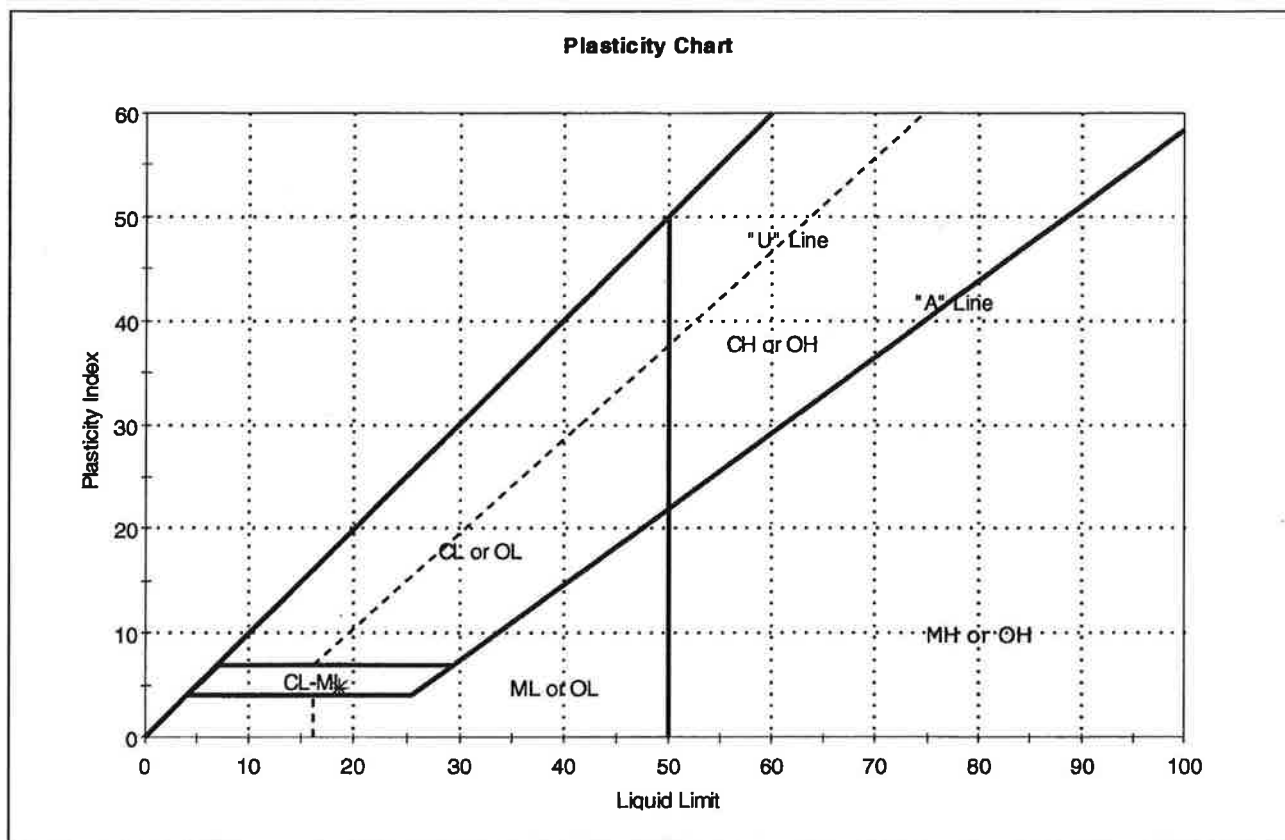
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	EF-004	---	Moist, brown silty, clayey sand	2	99.3	.7

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: cam	
Sample ID: EF-004	Test Date: 10/06/11	Checked By: jdt	
Depth : ---	Test Id: 219522		
Test Comment: ---			
Sample Description:	Moist, brown silty, clayey sand		
Sample Comment: ---			

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	EF-004	---	---	2	19	14	5	-2	Silty, clayey sand (SC-SM)

Sample Prepared using the WET method
 45% Retained on #40 Sieve
 Dry Strength: n/a
 Dilatancy: RAPID
 Toughness: LOW



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: cam
Sample ID: EF-004	Test Date: 10/18/11	Checked By: jdt
Depth : ---	Test Id: 219523	
Test Comment: ---		
Sample Description: Moist, brown silty, clayey sand		
Sample Comment: ---		

USCS Classification - ASTM D 2487-06

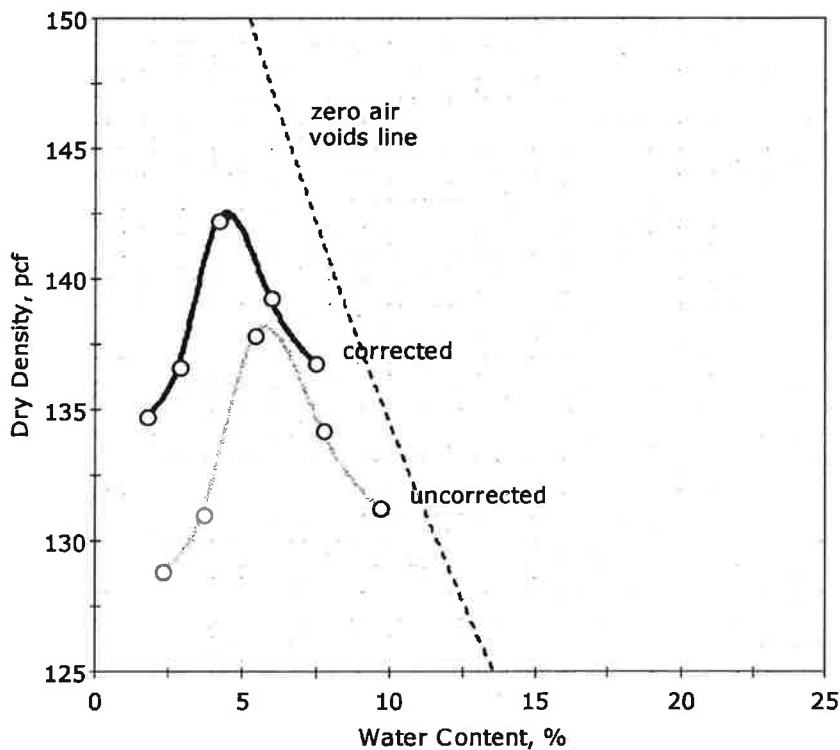
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	EF-004	---	Silty, clayey sand	SC-SM	0.0	75.1	24.9

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: cwd	
Sample ID: EF-004	Test Date: 10/05/11	Checked By: jdt	
Depth: ---	Test Id: 219527		
Test Comment:	---		
Sample Description:	Moist, brown silty, clayey sand		
Sample Comment:	---		

Compaction Report - ASTM D 1557



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	128.8	131.0	137.9	134.3	131.3
Moisture Content, %	2.3	3.7	5.4	7.7	9.7

Method : C

Preparation : WET

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

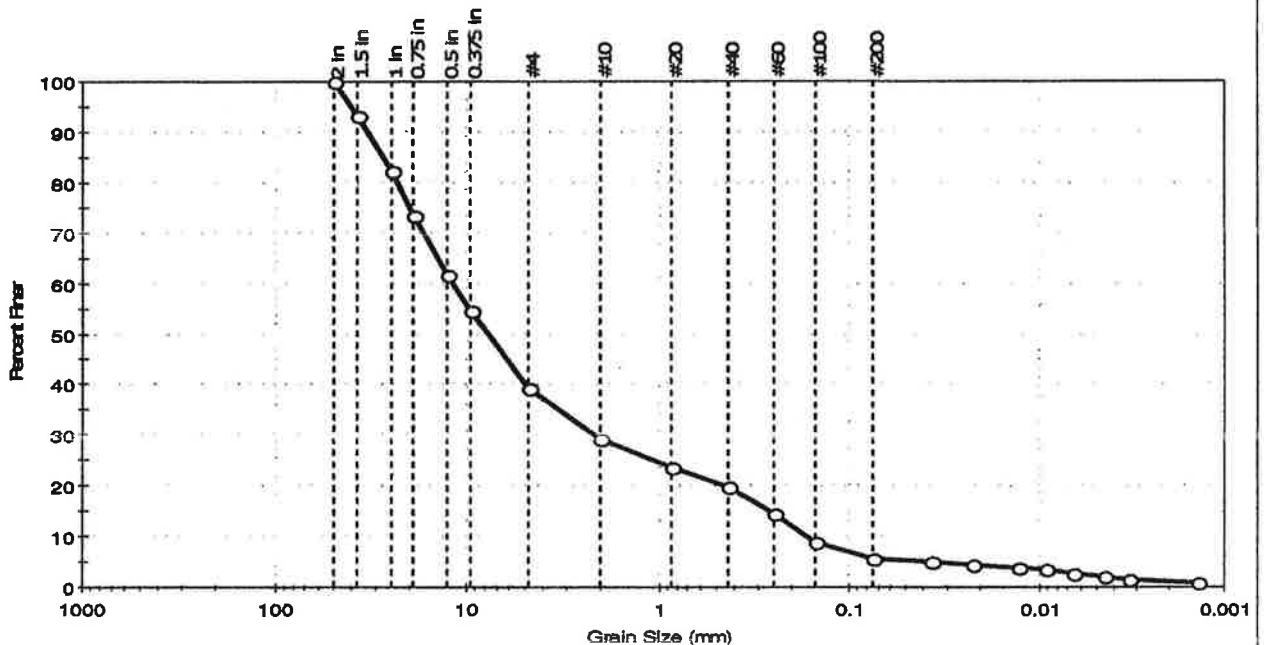
Maximum Dry Density= 138.0 pcf
Optimum Moisture= 6.0 %

Oversize Correction (23.1% > 3/4 inch Sieve)
Corrected Maximum Dry Density= 142.5 pcf
Corrected Optimum Moisture= 4.5 %
Assumed Average Bulk Specific Gravity = 2.55



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Boring ID: ---	Sample Type: bucket
	Sample ID: EF-005	Test Date: 11/07/11
	Depth: ---	Test Id: 222306
Test Comment: ---		
Sample Description: Moist, brown gravel with silt and sand		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	60.7	33.6	5.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	93		
1 in	25.00	82		
0.75 in	19.00	74		
0.5 in	12.70	62		
0.375 in	9.50	55		
#4	4.75	39		
#10	2.00	29		
#20	0.85	23		
#40	0.42	20		
#60	0.25	14		
#100	0.15	9		
#200	0.075	6		
	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0367	5		
---	0.0224	4		
---	0.0129	4		
---	0.0092	3		
---	0.0066	3		
---	0.0045	2		
---	0.0033	1		
---	0.0014	1		

Coefficients

$D_{85} = 27.6339$ mm $D_{30} = 2.1444$ mm
 $D_{60} = 11.8848$ mm $D_{15} = 0.2665$ mm
 $D_{50} = 7.7300$ mm $D_{10} = 0.1658$ mm
 $C_u = 71.682$ $C_c = 2.334$

Classification

ASTM Well-graded gravel with silt and sand (GW-GM) ✓
AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Pass
Em

Sample/Test Description

Sand/Gravel Particle Shape : **ROUNDED**
 Sand/Gravel Hardness : **HARD**



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-005	Test Date:	11/15/11
Depth :	---	Sample Id:	106829
Test Comment:	---		
Sample Description:	Moist, brown gravel with silt and sand		
Sample Comment:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	EF-005	---	Moist, brown gravel with silt and sand	4.1

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-005	Test Date:	11/07/11
Depth :	---	Test Id:	222308
Test Comment:	---		
Sample Description:	Moist, brown gravel with silt and sand		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	EF-005	---	Moist, brown gravel with silt and sand	4	99.6	.4

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client: Parsons Engineering Science		Project No: GTX-10120	
Project: SCA Phase 1a		Tested By: cam	
Location: Syracuse, NY		Checked By: jdt	
Boring ID: ---	Sample Type: bucket	Test Date: 11/07/11	
Sample ID: EF-005	Test Id: 222304	Sample Comment: ---	
Depth : ---	Sample Description: Moist, brown gravel with silt and sand		

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	EF-005	---	---	4	n/a	n/a	n/a	n/a	Well-graded gravel with silt and sand (GW-GM)

80% Retained on #40 Sieve

Dry Strength: NONE

Dilutancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	EF-005	Test Date:	11/15/11
Depth :	---	Test Id:	222305
Test Comment:	---		
Sample Description:	Moist, brown gravel with silt and sand		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

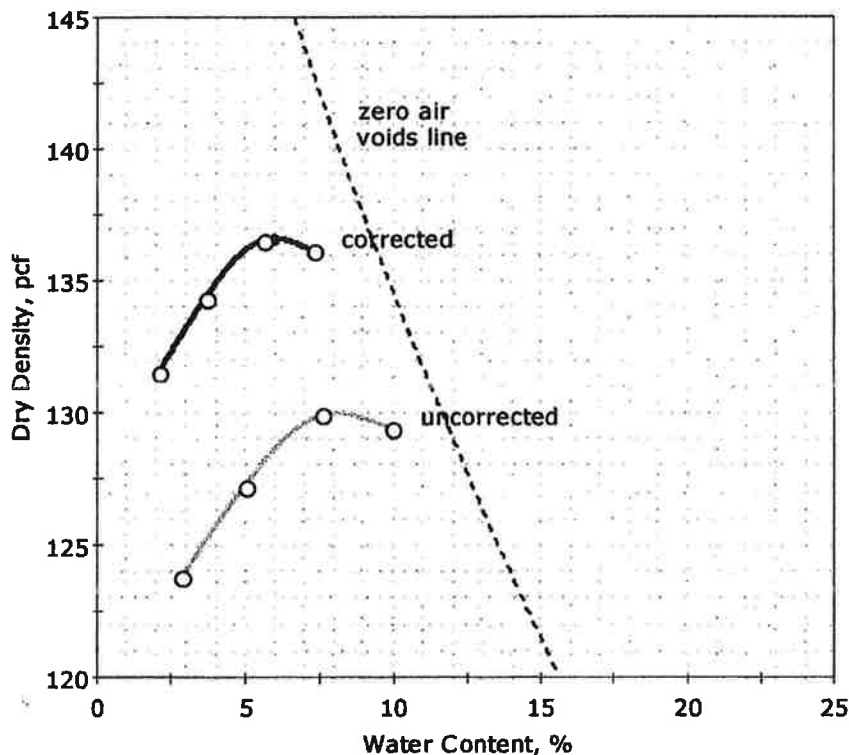
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	EF-005	---	Well-graded gravel with silt and sand	GW-GM	60.7	33.6	5.7

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	
Location: Syracuse, NY	
Boring ID: ---	Sample Type: bucket
Sample ID: EF-005	Test Date: 11/14/11
Depth: ---	Test Id: 222309
Test Comment: ---	Tested By: cwd
Sample Description: Moist, brown gravel with silt and sand	Checked By: jdt
Sample Comment: ---	

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	123.8	127.2	129.9	129.4
Moisture Content, %	2.8	4.9	7.6	9.9

Method : C

Preparation : WET

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 130.0 pcf

Optimum Moisture= 8.0 %

Oversize Correction (26.4% > 3/4 inch Sieve)

Corrected Maximum Dry Density= 136.5 pcf

Corrected Optimum Moisture= 6.0 %

Assumed Average Bulk Specific Gravity = 2.55

Low-Permeability Soil Layer

Low Permeability Soil
Quality Control Data Summary
Page 1 of 3

Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	USCS Classification	Permeability K (cm/sec)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#30 (%)	#40 (%)	#60 (%)	#100 (%)	#200 (%)	Notes	
Marcellus Clay Pit	LP-11	09/10/10	Stockpile	Atlantic Testing	ST3104SL-57-09-10	S77A-LP11	CL-ML	6.1E-08								100			100	100	100		88		88		87	86	approx. 2 months before test pad, borrow evaluation sample	
Marcellus Clay Pit	LP-11	09/10/10	Stockpile	Atlantic Testing	ST3104SL-57-09-10	S77C-LP11	CL-ML	1.1E-07								100			100	100	100		88		88		87	86	approx. 2 months before test pad, borrow evaluation sample	
Marcellus Clay Pit	LP-11	09/10/10	Stockpile	Atlantic Testing	ST3104SL-57-09-10	S77B-LP11	CL-ML	1.6E-07								100			100	100	100		88		88		87	86	approx. 2 months before test pad, borrow evaluation sample	
Marcellus Clay Pit	LP-11	09/10/10	Stockpile	Atlantic Testing	ST3104SL-58-09-10	S78-LP11	CL-ML									100			100	100	100		88		88		87	86	approx. 2 months before test pad, borrow evaluation sample	
Marcellus Clay Pit	LP-01	11/05/10		PW-Labs	1	25374A	CL	1.3E-08								100	99.2	99.2	99.2	99.1	99.1		98.9	98.7	98.6	98.4	98.1	97.1	representative of material used in test pad	
Marcellus Clay Pit	LP-01	11/05/10		PW-Labs	1	25374C	CL	2.2E-08								100	99.2	99.2	99.2	99.1	99.1		98.9	98.7	98.6	98.4	98.1	97.1	representative of material used in test pad	
Marcellus Clay Pit	LP-01	11/05/10		PW-Labs	1	25374B	CL	4.4E-08								100	99.2	99.2	99.2	99.1	99.1		98.9	98.7	98.6	98.4	98.1	97.1	representative of material used in test pad	
Marcellus Clay Pit	LP-04	11/24/10	Test Pad	PW-Labs		25466		1.5E-08																					sampled from test pad	
Black Creek	LP-12	12/20/10	Test Pit 1 - Shallow	Atlantic Testing	ST3104SL-105-01-11	S125-LP12	CL	5.1E-08								100					100		93		93		92	92	2010 borrow evaluation	
Black Creek	LP-13	12/20/10	Test Pit 1 - Deep	Atlantic Testing	ST3104SL-106-01-11	S126-LP13	CL	4.5E-08								100					100		98		98		98	97	2010 borrow evaluation	
Black Creek	LP-14	12/20/10	Test Pit 2	Atlantic Testing	ST3104SL-107-01-11	S127-LP14	ML	5.0E-08								100		100	100	100			100		99		97	87	2010 borrow evaluation	
Black Creek	LP-15	12/20/10	Test Pit 3	Atlantic Testing	ST3104SL-108-01-11	S128-LP15	CL	9.3E-07								100					100		97		97		96	95	2010 borrow evaluation	
Black Creek	LP-16	12/20/10	Test Pit 4	Atlantic Testing	ST3104SL-109-01-11	S129-LP16	CL	1.2E-07								100					100		98		98		97	97	2010 borrow evaluation	
Black Creek	LP-17	12/20/10	Test Pit 5	Atlantic Testing	ST3104SL-110-01-11	S130-LP17	CL	5.0E-08								100					100		98		98		97	95	2010 borrow evaluation	
Marcellus Clay Pit	LP-005	01/07/11	1 Bottom	PW-Labs	14	25562B	CL	8.5E-08								100										100	99.9	99.3		
Marcellus Clay Pit	LP-005	01/07/11	1 Bottom	PW-Labs	14	25562A	CL	3.5E-08								100										100	99.9	99.3		
Marcellus Clay Pit	LP-005	01/07/11	1 Bottom	PW-Labs	14	25562C	CL	2.2E-08								100										100	99.9	99.3		
Marcellus Clay Pit	LP-006	01/07/11	2 Lower Mid	PW-Labs	15	25563B	CL	7.4E-08								100							100	99.9	99.9	99.8	99.7	99.3		
Marcellus Clay Pit	LP-006	01/07/11	2 Lower Mid	PW-Labs	15	25563C	CL	3.0E-08								100							100	99.9	99.9	99.8	99.7	99.3		
Marcellus Clay Pit	LP-006	01/07/11	2 Lower Mid	PW-Labs	15	25563A	CL	2.9E-08								100							100	99.9	99.9	99.8	99.7	99.3		
Marcellus Clay Pit	LP-007	01/07/11	3 Upper Mid	PW-Labs	16	25564A	CL	1.3E-07								100	100	99.4	99.4	99.4	99.4		99.3	99.2	99.1	98.9	98.5	97.6		
Marcellus Clay Pit	LP-007	01/07/11	3 Upper Mid	PW-Labs	16	25564B	CL	1.1E-07								100	100	99.4	99.4	99.4	99.4		99.3	99.2	99.1	98.9	98.5	97.6		
Marcellus Clay Pit	LP-007	01/07/11	3 Upper Mid	PW-Labs	16	25564C	CL	4.3E-08								100	100	99.4	99.4	99.4	99.4		99.3	99.2	99.1	98.9	98.5	97.6		
Marcellus Clay Pit	LP-008	01/07/11	4 Southwest	PW-Labs	17	25565C	CL	1.0E-07								100				100	99.9		99.9	99.9	99.9	99.9	99.9	99.8		
Marcellus Clay Pit	LP-008	01/07/11	4 Southwest	PW-Labs	17	25565A	CL	9.3E-08								100				100	99.9		99.9	99.9	99.9	99.9	99.9	99.8		
Marcellus Clay Pit	LP-008	01/07/11	4 Southwest	PW-Labs	17	25565B	CL	4.8E-08								100				100	99.9		99.9	99.9	99.9	99.9	99.9	99.8		
Marcellus Clay Pit	LP-009	01/07/11	5 Northwest	PW-Labs	18	25566B	CL	2.1E-07								100			100	99.8	99.8		99.7	99.6	99.5	99.3	98.9	98.4		
Marcellus Clay Pit	LP-009	01/07/11	5 Northwest	PW-Labs	18	25566A	CL	7.8E-08								100			100	99.8	99.8		99.7	99.6	99.5	99.3	98.9	98.4		
Marcellus Clay Pit	LP-009	01/07/11	5 Northwest	PW-Labs	18	25566C	CL	4.9E-08								100			100	99.8	99.8		99.7	99.6	99.5	99.3	98.9	98.4		
Black Creek	LP-018	05/02/11	SCA Test Plot	Atlantic Testing	ST3104SL-125-05-11	S145-LP18	CL									100		100			100		99		98		97	97		
Black Creek	LP-018	05/02/11	SCA Test Plot	Atlantic Testing	ST1034SL-126-05-11	S145-LP18	CL									100		100			100		99		98		98	97		
Black Creek	LP-018	05/02/11	SCA Test Plot	Atlantic Testing	ST3104SL-125-05-11	S145B-LP18		4.2E-08																						
Black Creek	LP-018	05/02/11	SCA Test Plot	Atlantic Testing	ST3104SL-125-05-11	S145C-LP18		3.7E-08																						
Black Creek	LP-018	05/02/11	SCA Test Plot	Atlantic Testing	ST3104SL-125-05-11	S145A-LP18		3.4E-08																						
Black Creek	LP-022	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-135-05-11	S151-LP22	CL									100		100			100		95		95		94	93		
Black Creek	LP-022	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-135B-05-11	S151B-LP22	CL	5.8E-07																						
Black Creek	LP-022	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-135C-05-11	S151C-LP22	CL	1.8E-07																						
Black Creek	LP-022	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-135A-05-11	S151A-LP22	CL	9.1E-08																						
Black Creek	LP-023	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-139-05-11	S152-LP23	CL									100		100			98		96		94		93	91		
Black Creek	LP-023	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-138-05-11	S152-LP23	CL									100		100			98		96		95		94	92		
Black Creek	LP-023	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-138A-05-11	S152A-LP23	CL	9.4E-08																						
Black Creek	LP-022	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-136-05-11	S151-LP22										100		100			100		95		95		94	92		
Black Creek	LP-023	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-138B-05-11	S152B-LP23		5.7E-07																						
Black Creek	LP-023	05/12/11	Clay Pit - Wet/Dry Mix	Atlantic Testing	ST3104SL-138C-05-11	S152C-LP23		8.7E-08																						
Black Creek	LP-021	05/13/11	Clay Pit - Deep	Atlantic Testing	ST3104SL-132-05-11	S150-LP21	CL									100		100			98		88		88		88	87		
Black Creek	LP-021	05/13/11	Clay Pit - Deep	Atlantic Testing	ST3104SL-133-05-11	S150-LP21	CL									100		100			98		88		88		88	88		
Black Creek	LP-021	05/13/11	Clay Pit - Deep	Atlantic Testing	ST3104SL-132B-05-11	S150B-LP21	CL	2.4E-07																						
Black Creek	LP-021	05/13/11	Clay Pit - Deep	Atlantic Testing	ST3104SL-132C-05-11	S150C-LP21	CL	6.8E-08																						
Black Creek	LP-021	05/13/11	Clay Pit - Deep	Atlantic Testing	ST3104SL-132A-05-11	S150A-LP21	CL	5.1E-08																						
Black Creek	LP-024	05/24/11	Clay Pit	Atlantic Testing	ST3104SL-141-06-11	S153-LP24	CL	2.2E-08								100		100			99		99		99		98	96		
Black Creek	LP-025	05/24/11	Clay Pit	Atlantic Testing	ST3104SL-142-06-11	S154-LP25	CL									100		100			100		99		99		98	97		
Black Creek	LP-026	05/26/11	Clay Pit	Atlantic Testing	ST3104SL-143-06-11	S155-LP26	CL	1.9E-07								100		100			100		100		100		100	100		
Black Creek	LP-027	05/26/11	Clay Pit	Atlantic Testing	ST3104SL-144-06-11	S156-LP26	CL	3.0E-07								100		100			100		100		100		100	99	99	
Black Creek	LP-028	05/26/11	Clay Pit	Atlantic Testing	ST3104SL-145-06-11	S157-LP28	CL	3.7E-07								100		100			100		99		99		98	96		
Black Creek	LP-029	05/27/11	Clay Pit	Atlantic Testing	ST3104SL-146-06-11	S158-LP29	CL									100		100			100		100		100		99	97		
Black Creek	LP-030	05/27/11	Clay Pit	Atlantic Testing	ST3104SL-147-06-11	S159-LP30	CL									100		100			100		99		99		98	97		
Black Creek	LP-031	05/27/11	Clay Pit	Atlantic Testing	ST3104SL-148-06-11	S160-LP31	CL									100		100			100		99		98		97	95		
Black Creek	LP-032	05/31/11	Clay Pit	Atlantic Testing	ST3104SL-149-06-11	S161-LP32	CL	4.2E-07								100					100		100		100		99	99		
Black Creek	LP-033	05/31/11	Clay Pit	Atlantic Testing	ST3104SL-150-06-11	S162-LP33</																								

Low Permeability Soil
Quality Control Data Summary
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Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	USCS Classification	Permeability K (cm/sec)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#30 (%)	#40 (%)	#60 (%)	#100 (%)	#200 (%)	Notes	
Black Creek	LP-041	06/03/11	Stockpile	Atlantic Testing	ST31004SL-158-06-14	S170-LP41	CL	1.6E-08								100		100			100		100		100		99	98		
Black Creek	LP-042	06/03/11	Stockpile	Atlantic Testing	ST3104SL-159-06-11	S171-LP42	CL	3.0E-07								100		100			100		100		100		99	99		
Black Creek	LP-043	06/03/11	Stockpile	Atlantic Testing	ST3104SL-160-06-11	S172-LP43	CL	2.1E-07								100		100			100		100		100		100	99		
Marcellus Clay Pit	LP-044	06/03/11		PW-Labs	7	25842	CL									100			100	99	99.8		99.6	98.5	98	96.8	95.8	94.3		
Marcellus Clay Pit	LP-045	06/03/11		PW-Labs	7	25843	CL									100					100		99.9	99.7	99.6	99.3	98.9	97.9		
Marcellus Clay Pit	LP-046	06/03/11		PW-Labs	7	25844	CL									100					100		99.9	99.8	99.7	99.4	99.1	98.3		
Marcellus Clay Pit	LP-050	06/03/11	Pit	PW-Labs	8	LP-50										100			100	99.9	99.8		99.6	99.2	99.1	98.5	98	97		
Marcellus Clay Pit	LP-051	06/03/11	Pit	PW-Labs	8	LP-51										100			100	99.8	99.7		99.5	99.2	99.1	98.8	98.5	97.5		
Marcellus Clay Pit	LP-052	06/03/11	Pit	PW-Labs	8	LP-52										100			100	99.8	99.7		99.5	99.3	99.2	99	98.7	97.9		
Black Creek	LP-047	06/06/11	Stockpile	Atlantic Testing	ST3104SL-161-06-11	S173-LP47	CL									100					100		100		100		100	99		
Black Creek	LP-048	06/06/11	Stockpile	Atlantic Testing	ST3104SL-162-06-11	S174-LP48	CL									100					100		100		100		100	99		
Black Creek	LP-049	06/06/11	Stockpile	Atlantic Testing	ST3104SL-162-06-11	S175-LP49	CL									100						100		100		100	100			
Black Creek	LP-057	06/07/11	Stockpile	Atlantic Testing	ST3104SL-164-06-11	S176-LP57	CL	1.8E-06								100					100		100		100		100	100	Perm was close to Spec	
Black Creek	LP-058	06/07/11	Stockpile	Atlantic Testing	ST3104SL-165-06-11	S177-LP58	CL	5.6E-06								100					100		100		100		100	100	Tested at <95% MDD/OMC	
Black Creek	LP-059	06/07/11	Stockpile	Atlantic Testing	ST3104SL-166-06-11	S178-LP59	CL	2.9E-07								100					100		100		100		99	99		
Marcellus Clay Pit	LP-063	06/07/11	Pit	PW-Labs	11	25856								100	93.2	92.3	92.3	92.2	92.1	92	91.7		91	90.8	90	89.4	88.4			
Marcellus Clay Pit	LP-054	06/07/11	Pit	PW-Labs	10	25851										100		100	99.9	99.8	99.7		99.6	99.2	99.1	98.8	98.5	97.8		
Marcellus Clay Pit	LP-055	06/07/11	Pit	PW-Labs	10	25852										100			100	99.9	99.7		99.5	99.2	99.1	98.8	98.5	98.1		
Marcellus Clay Pit	LP-056	06/07/11	Pit	PW-Labs	10	25853										100						100	99.9	99.9	99.8	99.6	99.1			
Marcellus Clay Pit	LP-062	06/07/11	Pit	PW-Labs	11	25855										100	100	99.7	99.7	99.7	99.7		99.5	99.2	99.1	98.8	98.5	98		
Black Creek	LP-060	06/08/11	Stockpile	Atlantic Testing	ST3104SL-167-06-11	S179-LP60	CL									100					100		100		100		99	98		
Black Creek	LP-061	06/08/11	Stockpile	Atlantic Testing	ST3104SL-168-06-11	S180-LP61	CL									100				100		99		99		98	97			
Black Creek	LP-066	06/09/11	Stockpile	Atlantic Testing	ST3104SL-169-06-11	S181-LP66	CL	4.4E-07								100					100		100		100		99	98		
Black Creek	LP-067	06/09/11	Stockpile	Atlantic Testing	ST3104SL-170-06-11	S182-LP67	CL									100					100		100		100		100	99		
Marcellus Clay Pit	LP-064	06/09/11	Pit	PW-Labs	12	25868		3.6E-07								100			100	99.9	99.9		99.8	99.7	99.7	99.6	99.4	98.8		
Marcellus Clay Pit	LP-066	06/09/11	Pit	PW-Labs	12	25869		7.9E-07								100			100	99.9	99.9		99.8	99.7	99.7	99.6	99.4	98.9		
Black Creek	LP-068	06/10/11	Stockpile	Atlantic Testing	ST3104SL-171-06-11	S183-LP68	CL									100					100		100		100		100	99		
Black Creek	LP-069	06/10/11	Stockpile	Atlantic Testing	ST3104SL-172-06-11	S184-LP69	CL									100					100		100		100		100	100		
Marcellus Clay Pit	LP-070	06/10/11	Pit	PW-Labs	13	25873										100	100	99.4	99.3	99.2	99.1		99	98.8	98.7	98.4	98.1	97.4		
Marcellus Clay Pit	LP-071	06/10/11	Pit	PW-Labs	13	25874										100		100	99.9	99.9	99.9		99.9	99.8	99.8	99.7	99.5	99		
Black Creek	LP-072	06/13/11	Stockpile	Atlantic Testing	ST3104SL-173-06-11	S185-LP72	CL	4.3E-07								100		100				100		100		100		99	98	
Black Creek	LP-073	06/13/11	Stockpile	Atlantic Testing	ST3104SL-174-06-11	S186-LP73	CL	7.8E-08								100						100		100		100		100	99	
Marcellus Clay Pit	LP-074	06/13/11	Pit	PW-Labs	14	25876									100	98.8	98.8	98.8	98.7	98.3	98.2		97.7	96.6	96.4	95.5	94.6	93.2		
Marcellus Clay Pit	LP-075	06/13/11	Pit	PW-Labs	14	25877										100	100	99.4	99.3	98.9	98.8		98.3	97.2	96.9	96	95.1	93.8		
Black Creek	LP-076	06/14/11	Stockpile	Atlantic Testing	ST3104SL-175-06-11	S187-LP76	CL									100					100		100		100		100	99		
Black Creek	LP-077	06/14/11	Stockpile	Atlantic Testing	ST3104SL-176-06-11	S188-LP77	CL									100					100		100		100		100	99		
Marcellus Clay Pit	LP-078	06/14/11	Pit	PW-Labs	15	25879										100		100	99.9	99.8	99.7		99.4	98.6	98.5	97.9	97.4	96.3		
Marcellus Clay Pit	LP-079	06/14/11	Pit	PW-Labs	15	25880										100	100	99.7	99.6	99.4	99.2		98.8	98.5	98.4	98	97.6	96.7		
Black Creek	LP-080	06/15/11	Stockpile	Atlantic Testing	ST3104SL-177-07-11	S189-LP80	CL	6.4E-08								100		100				100		100		100		100	99	
Black Creek	LP-081	06/15/11	Stockpile	Atlantic Testing	ST3104SL-178-07-11	S190-LP81	CL	3.0E-08								100		100				100		100		100		100	99	
Marcellus Clay Pit	LP-082	06/15/11	Pit	PW-Labs	16	25901		1.5E-07								100						100		99.9	99.7	99.6	99.3	99	98.1	
Marcellus Clay Pit	LP-083	06/15/11	Pit	PW-Labs	16	25902		6.5E-07								100						100		99.9	99.7	99.7	99.4	99.1	98.3	
Black Creek	LP-084	06/16/11	Stockpile	Atlantic Testing	ST3104SL-179-06-11	S191-LP84	CL									100					100		100		100		99	98		
Black Creek	LP-085	06/16/11	Stockpile	Atlantic Testing	ST3104SL-180-06-11	S192-LP85	CL									100		100				100		100		99	99	96		
Marcellus Clay Pit	LP-086	06/16/11	Pit	PW-Labs	17	25903										100		100	99.8	99.7	99.5		99.2	98.9	98.8	98.5	98.2	97.3		
Marcellus Clay Pit	LP-087	06/16/11	Pit	PW-Labs	17	25904										100			100	99.9	99.7		99.4	98.2	97.8	96.6	95.8	94.4		
Black Creek	LP-088	06/17/11	Stockpile	Atlantic Testing	ST3104SL-181-07-11	S193-LP88	CL	3.6E-08								100						100		100		100		98	97	
Black Creek	LP-089	06/17/11	Stockpile	Atlantic Testing	ST3104SL-182-07-11	S194-LP89	CL									100		100				100		100		100		99	94	
Marcellus Clay Pit	LP-090	06/17/11	Pit	PW-Labs	18	25911										100		100	99.8	99.7	99.7		99.6	99.5	99.5	99.4	99.1	98.3		
Marcellus Clay Pit	LP-091	06/17/11	Pit	PW-Labs	18	25912										100									100	99.9	99.7	99.1		
Black Creek	LP-092	06/20/11	Stockpile	Atlantic Testing	ST3104SL-183-06-11	S195-LP92	CL									100					100		100		100		100	99		
Black Creek	LP-093	06/20/11	Stockpile	Atlantic Testing	ST3104SL-184-06-11	S196-LP93	CL									100		100				100		100		100		99	97	
Marcellus Clay Pit	LP-094	06/20/11	Pit	PW-Labs	19	25920										100						100		99.9	99.5	99.5	99.2	98.9	98.2	
Marcellus Clay Pit	LP-095	06/20/11	Pit	PW-Labs	19	25921										100		100	99.8	99.8	99.8		99.7	99.3	99.3	99	98.7	98		
Black Creek	LP-096	06/21/11	Stockpile	Atlantic Testing	ST3104SL-185-07-11	S197-LP96	CL	2.1E-07								100		100				100		100		100		100	99	
Black Creek	LP-097	06/21/11	Stockpile	Atlantic Testing	ST3104SL-186-07-11	S198-LP96	CL	5.8E-08								100						100		100		100		100	99	
Marcellus Clay Pit	LP-098	06/21/11	Pit	PW-Labs	20	25926										100	100	99.7	99.6	99.6		99.4	99.3	99.2	99	98.7	97.9			
Marcellus Clay Pit	LP-099	06/21/11	Pit	PW-Labs	20	25927										100						100		99.9	99.8	99.8	99.7	99.5	98.9	
Black Creek	LP-100	06/22/11	Stockpile	Atlantic Testing	ST3104SL-187-07-11	S																								

Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	USCS Classification	Permeability K (cm/sec)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#30 (%)	#40 (%)	#60 (%)	#100 (%)	#200 (%)	Notes		
Black Creek	LP-110	06/24/11	Stockpile	Atlantic Testing	ST3104SL-191-07-11	S203-LP110	CL									100		100			100		100		100		99	99			
Black Creek	LP-111	06/24/11	Stockpile	Atlantic Testing	ST3104SL-192-07-11	S204-LP111	CL									100		100			100		100		100		100	100			
Marcellus Clay Pit	LP-108	06/24/11	Pit	PW-Labs	23	25940	CL									100			100	99.9	99.9		99.8	99.5	99.3	98.8	98.3	97.3			
Marcellus Clay Pit	LP-109	06/24/11	Pit	PW-Labs	23	25941	CL									100		100	99.9	99.5	99.5		99.3	99.1	99	98.8	98.5	97.9			
Black Creek	LP-114	06/27/11	Stockpile	Atlantic Testing	ST3104SL-193-07-11	S205-LP114	CL									100		100			100		100		100		100	99			
Black Creek	LP-115	06/27/11	Stockpile	Atlantic Testing	ST3104SL-194-07-11	S206-LP115	CL									100		100			100		100		100		99	99			
Marcellus Clay Pit	LP-112	06/27/11	Pit	PW-Labs	25	25943										100		100	99.8	99.7	99.6		99.5	99.4	99.3	99.1	98.9	98.4			
Marcellus Clay Pit	LP-113	06/27/11	Pit	PW-Labs	25	25944										100		100	99.7	99.7	99.7		99.6	99.4	99.3	99.1	98.9	98.4			
Black Creek	LP-116	06/28/11	Stockpile	Atlantic Testing	ST3104SL-195-07-11	S207-LP116	CL									100		100			100		100		100		98	95			
Marcellus Clay Pit	LP-117	06/28/11	Pit	PW-Labs	24	25945										100		100	99.9	99.9	99.9		99.8	99.6	99.5	99.2	98.9	98.4			
Black Creek	LP-118	06/29/11	Stockpile	Atlantic Testing	ST3104SL-196-07-11	S208-LP118	CL	1.5E-07								100		100			100					100		99	96		
Marcellus Clay Pit	LP-119	06/29/11	Pit	PW-Labs	26	25949		1.8E-07								100							100	99.9	99.9	99.8	99.7	99.3			
Black Creek	LP-120	06/30/11	Stockpile	Atlantic Testing	ST3104SL-197-07-11	S209-LP120	CL									100		100			100		100		100		99	98			
Marcellus Clay Pit	LP-121	06/30/11	Pit	PW-Labs	27	25958										100							100	99.9	99.9	99.8	99.6	99.2			
Black Creek	LP-122	07/01/11	Stockpile	Atlantic Testing	ST3104SL-198-07-11	S210-LP122	CL	1.3E-07								100		100			100		100		100		100	99			
Marcellus Clay Pit	LP-123	07/01/11	Pit	PW-Labs	28	25970	CL									100										100	99.9	99.5			
Black Creek	LP-124	07/05/11	Stockpile	Atlantic Testing	ST3104SL-199-07-11	S211-LP124	CL									100		100			100		100		100		99	99			
Marcellus Clay Pit	LP-125	07/05/11	Pit	PW-Labs	29	25975	CL									100										100	99.9	99.6			
Black Creek	LP-126	07/06/11	Stockpile	Atlantic Testing	ST3104SL-200-07-11	S212-LP126	CL	2.3E-08								100		100			100		100		100		100	99			
Marcellus Clay Pit	LP-127	07/06/11	Pit	PW-Labs	30	25978	CL									100									100	99.9	99.7	99.2			
Black Creek	LP-128	07/07/11	Stockpile	Atlantic Testing	ST3104SL-201-07-11	S213-LP128	CL									100		100			100		100		100		100	100			
Marcellus Clay Pit	LP-129	07/07/11	Pit	PW-Labs	31	25979	CL									100			100	99.9	99.9		99.9	99.9	99.9	99.8	99.6	98.9			
Black Creek	LP-130	07/08/11	Stockpile	Atlantic Testing	ST3104SL-202-07-11	S214-LP130	CL	3.3E-08								100		100			100		100		100		99	98			
Marcellus Clay Pit	LP-131	07/08/11	Pit	PW-Labs	32	25980	CL									100									100	99.9	99.7	99.1			
Black Creek	LP-132	07/11/11	Stockpile	Atlantic Testing	ST3104SL-203-07-11	S215-LP132	CL									100		100			100		100		100		99	98			
Marcellus Clay Pit	LP-133	07/11/11	Pit	PW-Labs	33	25989	CL									100					100		99.9	99.8	99.8	99.7	99.5	98.9			
Black Creek	LP-135	07/12/11	Stockpile	Atlantic Testing	ST3104SL-205-07-11	S217-LP135	SC				100		93	90	87	82	81	79	77		72		67		63		52	43	Borrow Pit Investigation - Material Not Used		
Black Creek	LP-134	07/12/11	Stockpile	Atlantic Testing	ST3104SL-204-07-11	S216-LP134	ML	2.8E-07								100		100			100		100		99		98	92			
Marcellus Clay Pit	LP-136	07/12/11	Pit	PW-Labs	34	25990	CL	8.1E-07								100							100	99.9	99.8	99.7	99.4	98.3			
Black Creek	LP-137	07/13/11	Stockpile	Atlantic Testing	ST3104SL-206-07-11	S218-LP137	CL									100		100			100		100		100		100	99			
Marcellus Clay Pit	LP-138	07/13/11	Pit	PW-Labs	35	25992	CL									100							100	99.9	99.8	99.7	99.5	98.9			
Black Creek	LP-139	07/14/11	Stockpile	Atlantic Testing	ST3104SL-207-07-11	S219-LP139	CL	4.0E-08								100		100			100		100		100		99	98			
Marcellus Clay Pit	LP-140	07/14/11	Pit	PW-Labs	36	25994	CL	1.3E-07								100			100	99.8	99.8		99.7	99.6	99.5	99.4	99.1	98.3			
Marcellus Clay Pit	LP-142	07/14/11	Pit	PW-Labs	37	25997	CL									100							100	99.9	99.9	99.8	99.6	98.9			
Black Creek	LP-141	07/15/11	Stockpile	Atlantic Testing	ST3104SL-208-07-11	S220-LP141	CL									100		100			100		100		100		99	99			
Black Creek	LP-143	07/18/11	Stockpile	Atlantic Testing	ST3104SL-209-07-11	S221-LP143	CL									100		100			100		100		100		99	99			
Marcellus Clay Pit	LP-144	07/18/11	Pit	PW-Labs	38	26002	CL									100									100	99.9	99.5	98.5			
Black Creek	LP-145	07/19/11	Stockpile	Atlantic Testing	ST3104SL-210-08-11	S222-LP145	CL									100		100			100		100		100		99	99			
Marcellus Clay Pit	LP-146	07/19/11	Pit	PW-Labs	39	26004	CL									100									100	99.9	99.7	98.8			
Black Creek	LP-147	07/20/11	Stockpile	Atlantic Testing	ST3104SL-211-08-11	S223-LP147	CL									100		100			100		100		100		99	99			
Marcellus Clay Pit	LP-148	07/20/11	Pit	PW-Labs	40	26006										100					100		99.9	99.8	99.8	99.7	99.5	98.5			
Black Creek	LP-149	07/21/11	Stockpile	Atlantic Testing	ST3104SL-212-08-11	S224-LP149	CL									100		100			100		100		100		99	98			
Marcellus Clay Pit	LP-150	07/21/11	Pit	PW-Labs	42	26010	CL									100					100		99.9	99.9	99.8	99.7	98.9				
Black Creek	LP-152	07/22/11	Stockpile	Atlantic Testing	ST3104SL-213-08-11	S225-LP152	CL									100		100			100		100		100		99	99			
Black Creek	LP-155	07/22/11	Stockpile	Atlantic Testing	ST3104SL-214-08-11	S226-LP155	CL									100		100			100		100		100		100	99			
Marcellus Clay Pit	LP-151	07/22/11	Pit	PW-Labs	44	26013	CL									100		100	99.9	99.8	99.7		99.4	98.8	98.5	97.8	97.1	95.8			
Marcellus Clay Pit	LP-154	07/25/11	Pit	PW-Labs	45	26015	CL									100					100		99.9	99.8	99.8	99.7	99.5	98.7			
Black Creek	LP-156	07/27/11	Stockpile	Atlantic Testing	ST3104SL-215-08-11	S227-LP156	CL									100		100			100		100		100		100	99			
Marcellus Clay Pit	LP-157	07/27/11	Pit	PW-Labs	47	26016	CL	2.4E-07								100		100	99.9	99.7	99.6		99.5	99.2	99.1	98.9	98.6	97.7			
Black Creek	LP-158	07/29/11	Stockpile	Atlantic Testing	ST3104SL-216-08-11	S228-LP158	CL									100		100			100		100			99		98	97		
Marcellus Clay Pit	LP-159	07/29/11	Pit	PW-Labs	48	26045	CL									100			100	99.8	99.7		99.6	99.4	99.3	99.1	98.7	98			
Black Creek	LP-160	08/02/11	Stockpile	Atlantic Testing	ST3104SL-217-08-11	S229-LP160	CL									100		100			100		100		100		99	99			
Marcellus Clay Pit	LP-161	08/02/11	Pit	PW-Labs	49	26048	CL	2.7E-08								100			100	99.8	99.8		99.6	99.4	99.3	99.1	98.7	97.8			
Black Creek	LP-163	08/04/11	Stockpile	Atlantic Testing	ST3104SL-218-08-11	S230-LP163	CL									100		100			100		100		100		100	99			
Marcellus Clay Pit	LP-162	08/04/11	Pit	PW-Labs	51	26061	CL									100			100	99.8	99.7		99.6	99.4	99.4	99.1	98.7	97.8			
Marcellus Clay Pit	LP-165	08/09/11	Pit	PW-Labs	52	26074	CL									100		100	99.8	99.8	99.8		99.7	99.6	99.5	99.3	98.9	97.9			
Black Creek	LP-166	08/11/11	Stockpile	Atlantic Testing	ST3104SL-220-08-11	S232-LP166	CL									100		100			100				100		99	99			
Marcellus Clay Pit	LP-167	08/11/11	Pit	PW-Labs	53	26075										100		100	99.8	99.7	99.6		99.5	99.3	99.2	99	98.6	97.6			
Marcellus Clay Pit	LP-168	08/25/11	Pit	PW																											

TABLE B1
LOW-PERMEABILITY SOIL LAYER QA SUMMARY
Sediment Consolidation Area Construction Project
Parsons / Honeywell
Camillus, New York

TEST STANDARD			MOISTURE (ASTM D2216)	GRAIN SIZE (ASTM D 422)						CLASSIFICATION (ASTM D2487)	ORGANIC (ASTM D2974)	ATTERBERG LIMITS (ASTM D 4318)			STANDARD PROCTOR (ASTM D698)		HYDRAULIC CONDUCTIVITY (ASTM D 5084)								
QA TEST FREQUENCY			@ 1,000 cyd/10	@ 2,500 cyd/10						@ 2,500 cyd/10	@ 2,500 cyd/10	@ 1,000 cyd/10			@ 5,000 cyd/10		@ 5,000 cyd/10								
QA TEST REQUIRED			18	7						7	7	18			4		4								
SAMPLE No.	LOCATION	TESTING LAB	MOISTURE (%)	PASSING 1-in. (%)	PASSING NO. 10 (%)	PASSING NO.40 (%)	PASSING NO.100 (%)	PASSING NO.200 (%)	PASSING 0.002 (%)	USCS	(%)	LL	PL	PI	MAX. DRY DENSITY (PCF)	OPT. ω (%)	REL. COMP. (%)	DRY UNIT WEIGHT (PCF)	ω (%)	REL. ω (%)	PERMEABI LITY (CM/S)				
Specs:				100	-	-	-	100-50	SC / SM / ML / CL												≤ 1 E-6				
2011																									
LP1	Marcellus Rte 174 Pit	PW Labs		100	99	99	98	97	38	CL	2.2	33	19	14	112.7	17.2	99	111.8	20	2.8	2.2E-08				
LP4	Black Creek - Grid T-6	GTX	27	100	100	99	99	98.8	45	CL	0.4	44	19	25	103	20	-	-	-	-					
LP5	Black Creek - Grid U7	GTX	23 / 26	100	100	100	99	98.5	45	CL	0.9	40	20	20	104.5	19	95	99.3	18.7	-0.3	5.5E-08				
LP27	Black Creek - Grid Q6	GTX	29 / 28	100	100	100	100	99.3	50	CL	1.4	44	20	24	102	22	-	96.8	21.9	-0.1	1.6E-08				
LP28	Marcellus - Grid P12	GTX	18.9	100	100	100	99	98.3	45	CL	0.3	35	18	17	107.5	19.5	96	103	17.9	-1.6	1.7E-08				
LP68	Marcellus - Grid T10	GTX	20.7	100	100	100	99	98.5	42	CL	0.2	31	15	16	111	16	95	105	16.3	0.3	2.1E-08				
LP69	Black Creek - Grid L7	GTX	22.5	100	99	99	98	94.6	20	CL	0.7	32	14	18	107	17.5	94	101	18.6	1.1	5.9E-08				
Shelby Tube Results																									
ST-001C	Black Creek Clay - Test Pad 1st Lift	PW Labs	24.6									37	19	18											
ST-015B	Marcellus		22.2/24.9/20									42	20	22											
ST-016B	Marcellus		26.3/24.5/22									39	18	21											
ST-017	Black Creek		19									35	17	18											
ST-018	Black Creek		22									38	18	20											
ST-019	Marcellus		20									29	16	13											
ST-020	Marcellus		21									33	18	15											
ST-021	Marcellus		20.6									34	17	17											
ST-022	Marcellus		19.4									33	16	17											
ST-023	Black Creek		22.2									36	17	19											
ST-024	Marcellus		19.4									34	18	16											
ST-025	Marcellus		18.0									33	17	16											
ST-026	Marcellus		23.0									32	17	15											
ST-027	Marcellus		20.5									33	18	15											
ST-028	Black Creek		17.4									33	17	16											
ESTIMATED TOTAL VOLUME (cyd) PLACED:			174,262	21	Number of QA Samples:					7	7	22			7		6								
(does not includes Clay field MC results)																									

Notes:

(1) Samples obtained by others from source referred to as Marcellus Rte 147 Clay Pit and Black Creek.
The soil is being used to construct a 1 to 1.5-ft min. thick clay liner implemented by placing a bridge lift followed by mid lifts if necessary and an upper 6 in. compacted lift.
Reference construction documents, including Technical Specification Section 02250 for further details.

(2) The test pad program was conducted to verify that the upper 6-in thick lift meet the minimum permeability requirements @3,000 psf/ i= 30 (max)
The minimum dry density required is 90 and 95 percent for mid and upper lifts, respectively, -3 to +3 percent of the optimum moisture content.

(3) In-place testing shall be performed at a minimum of 9 per acre/lift.

(4) *Italics* indicate an approximate value. **Bold** indicates oversized corrected numbers.

(5) Test pads were constructed; first pad was removed the second was incorporated into the LP Layer
Test Pad Area (est.): 0.8 acres 15 FDT required
 34,848 sft

Assume 2-ft thick - est. volume: 2,600 cyd

(6) See Shelby Tube Summary for additional results.

TABLE B2
DRIVE CYLINDER / SHELBY TUBE DATA SUMMARY
Honeywell / Parsons
Sediment Consolidation Area - Phase I
Camillus, NY

SAMPLE No.	SOURCE	NUCLEAR DENSITY TEST			HC COMPARISON TO STANDARD PROCTOR				HYDRAULIC CONDUCTIVITY		
		TEST NO.	DRY UNIT WEIGHT (PCF)	FIELD MOIST. (%)	REL. COMP. (%)	MAX. DRY DENSITY (PCF)	OPT. MOISTURE (%)	REL. MOIST. (%)	DRY UNIT WEIGHT (PCF)	MOIST. (%)	PERM. (CM/S)
ST-001A	Black Creek	4-001	101.1	22.7	97.1	103	20	+3	100	23.3	5.3E-08
ST-001B	Black Creek	4-001	101.1	22.7	90.6	103	20	+5	93.3	25.3	5.6E-08
ST-002A	Black Creek	3-011	101.8	20.4	91.6	103	20	+6	94.3	26.1	4.0E-08
ST-003A	Black Creek	3-015	108.3	17.5	102.4	104.5	19	+1	107	20	1.6E-08
ST-004A	Marcellus	3-023	111.7	17.9	95.5	111	16	+3	106	19.3	1.1E-08
ST-005A	Marcellus	3-072	110	18.6	97.3	111	16	+3	108	19.1	2.4E-08
ST-006A	Marcellus	3-074	110.3	18.2	92.8	111	16	+6	103	21.9	1.5E-08
ST-007A	Marcellus	3-075	110.6	18	97.3	111	16	+3	108	18.8	6.6E-08
ST-008A	Marcellus	3-084	109.1	18.7	100.5	107.5	19.5	+0	108	19.6	2.3E-08
ST-009A	Marcellus	3-087	108.6	18.5	101.4	107.5	19.5	+0	109	19.5	1.0E-08
ST-010A	Marcellus	3-090	109.6	18.1	99.1	111	16	+3	110	18.5	1.1E-08
ST-011A	Black Creek	3-098	100.9	19.3	100.0	102	22	+1	102	21	1.3E-08
ST-012A	Black Creek	3-105	101.4	22.3	101.0	102	22	+1	103	23.4	1.9E-08
ST-013A	Marcellus	3-106	106.2	19.7	100.5	107.5	19.5	+1	108	20	8.5E-09
ST-014A	Marcellus	3-107	110.1	17.3	97.3	111	16	+3	108	18.9	1.5E-08
ST-015A	Marcellus	3-123	107.3	16.6	90.1	111	16	+6	100	22.2	1.2E-08
ST-016A	Marcellus	3-130	107.5	16.9	86.8	111	16	+10	96.3	26.3	1.2E-08
ST-017A	Black Creek	3-171	110.9	18.3	97.2	107	17.5	+3	104	20.3	1.4E-08
ST-018A	Black Creek	3-176	105.9	17.8	98.1	107	17.5	+3	105	20	7.2E-09
ST-019A	Marcellus	3-181	110.9	13.9	100.0	111	16	+6	111	21.6	8.6E-09
ST-020A	Marcellus	3-184	108.8	14.8	95.5	111	16	+5	106	21.3	1.2E-08
ST-021A	Marcellus	3-185	110.5	14.6	94.6	111	16	+3	105	19.2	1.1E-08
ST-022A	Marcellus	3-186	110.5	15.1	93.7	111	16	+4	104	20.2	2.8E-08
ST-023A	Black Creek	3-187	108	20	103.9	102	22	+3	106	18.8	1.0E-08
ST-024A	Marcellus	3-192	108.8	15.9	95.5	111	16	+4	106	19.8	8.7E-09
ST-025A	Marcellus	3-202	109.9	15.7	100.9	111	16	+4	112	20	6.0E-09
ST-026A	Marcellus	3-211	110.8	14.2	98.2	111	16	+2	109	17.5	1.2E-08
ST-027A	Marcellus	3-224	109.9	16.4	96.4	111	16	+4	107	19.9	1.4E-08
ST-028A	Black Creek	3-245	100	20.3	103.9	102	22	+2	106	20	1.4E-08

Number of QA samples: 29

Notes Duplicate samples are designated by the letter (A or B).

The field density test results for ST-1 & 2 were performed by an independent testing laboratory (ATL).

Backfill performances using LP matrial mixed with 10% granular bentonite, rodded in 3-in thick lifts.

Goal for field density test is to achieve +95 percent relative compaction (RC) at plus 3% above optimum moisture.



PW LABORATORIES, INC.

6544 FREMONT ROAD, EAST SYRACUSE, NY 13057

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November 9, 2010

L-10152
SCA Construction
RFP No. 444853.30004.00

**Atterberg Limits ASTM D4318 &
Unified Soil Classification ASTM D2487**

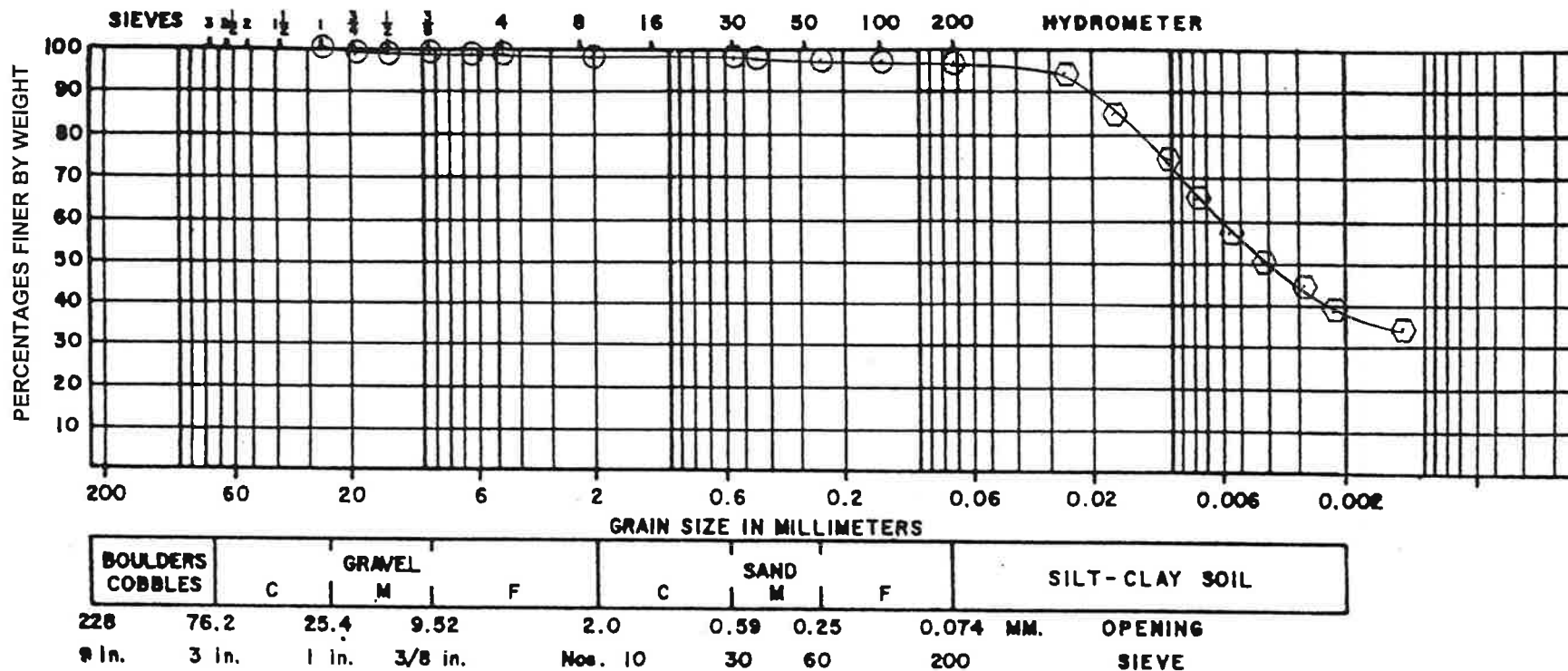
Lab ID #	Sample	Plastic Limit	Liquid Limit	Plasticity Index	Classification
25374	LP-1 Marcellus Clay Pit	19	33	14	CL
25375	LP-2 Hanson Tailings	16	19	3	ML
25376	LP-3 Brickyard Quarry	16	23	7	SC-SM



PW LABORATORIES, INC.
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Project #: L- 2
Report #: 1
Date: November 10, 2010

Grain Size Analysis



L-10152

SCA Construction

RFP No. 444853.30004.00

Lab I.D. #: 25374

Sample: LP-1

Marcellus Clay Pit

⊙ Sieve Analysis ASTM D422 & D1140

⊙ Hydrometer Analysis ASTM D422

Standard ☒ Modified ☐

Procedure A ☒ B ☐

C ☐

Preparation Method:

Moist ☐ Dry ☒

Rammer Used:

Manual ☒ Mechanical ☐

MAXIMUM DRY DENSITY (P.C.F.)

112.7

OPTIMUM MOISTURE CONTENT (%)

17.2

Performed in accordance with:

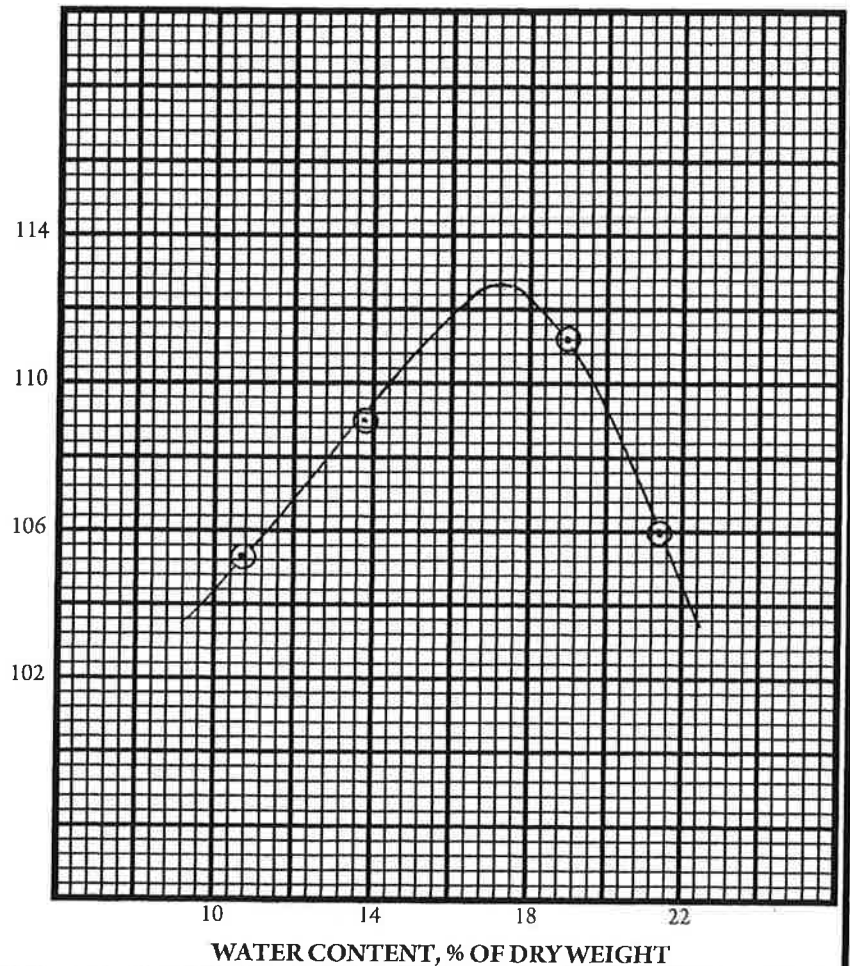
ASTM D698

0.9% retained on the #4 sieve

Apparent Specific Gravity: N/A

Compaction Test Report

DRY DENSITY, P.C.F.



SAMPLE NO.	1	2	3	4			
MOLD + SAMPLE WT.	13.34	13.59	13.86	13.74			
MOLD WEIGHT	9.48	9.48	9.48	9.48			
WET SAMPLE WT.	3.86	4.11	4.38	4.26			
WET DENSITY, P.C.F.	116.6	124.0	132.3	128.7			
MOISTURE CONTENT	10.7	13.8	19.0	21.4			
DRY DENSITY, P.C.F.	105.3	109.0	111.2	106.0			

Material

Color: Red

Classification: CL

Type: LP-1

Location: Marcellus Pit Clay

Lab I.D. #: 25374

Client: Parsons Corporation

Project Title: SCA Construction

RFP No. 444853.30004.00

Test Date: November 9, 2010

Tested By: SC & ES

Checked By: V.J. Thoma

Project #: L-10152

Report #: 1



PW LABORATORIES, INC.
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PW LABORATORIES, INC.
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**Measurement of Hydraulic Conductivity
of Saturated Porous Materials
Using a Flexible Wall Permeameter
ASTM D5084**

Report Date: November 12, 2010 Test Start Date: November 10, 2010

Project No.: L-10152 Project Title: SCA Construction - RFP No. 444853.30004.00

Test Sample Location LP-1 Marcellus Clay Pit Lab I.D. #: 25374C

ST No: -- Depth/Lift/Elev: -- Type of Sample:

Method of Compaction: ASTM D698 Undisturbed: -- Remolded: X

Percent Compaction: 95.0 Moisture Content (% of Dry Weight)

Initial Degree of Saturation (B Value) (%): -- Optimum: 17.2 Initial: 19.7

Final Degree of Saturation (B Value) (%): 96 Dry Unit Weight (PCF)

Permeant Liquid Used Deaired Deionized H₂O Maximum: 112.7 Initial: 107.1

Final Moisture Content (% of Dry Weight): 20.0 Final Dry Unit Weight (PCF): 111.8

Confining Pressure (PSI):	<u>71.0</u>	Test (head) Pressure (PSI):	<u>68.0</u>	Tail (back) Pressure (PSI):	<u>63.0</u>
------------------------------	-------------	--------------------------------	-------------	--------------------------------	-------------

Initial Gradient: 30.3 Initial Height (cm): 11.60 Initial Diameter (cm): 10.10

Final Gradient: 30.9 Final Height (cm): 11.38 Final Diameter (cm): 10.03

Final Four Determinations k (cm/sec)

<u>2.17 x 10⁻⁸</u>	<u>2.08 x 10⁻⁸</u>
<u>2.21 x 10⁻⁸</u>	<u>2.29 x 10⁻⁸</u>

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 2.19 x 10⁻⁸

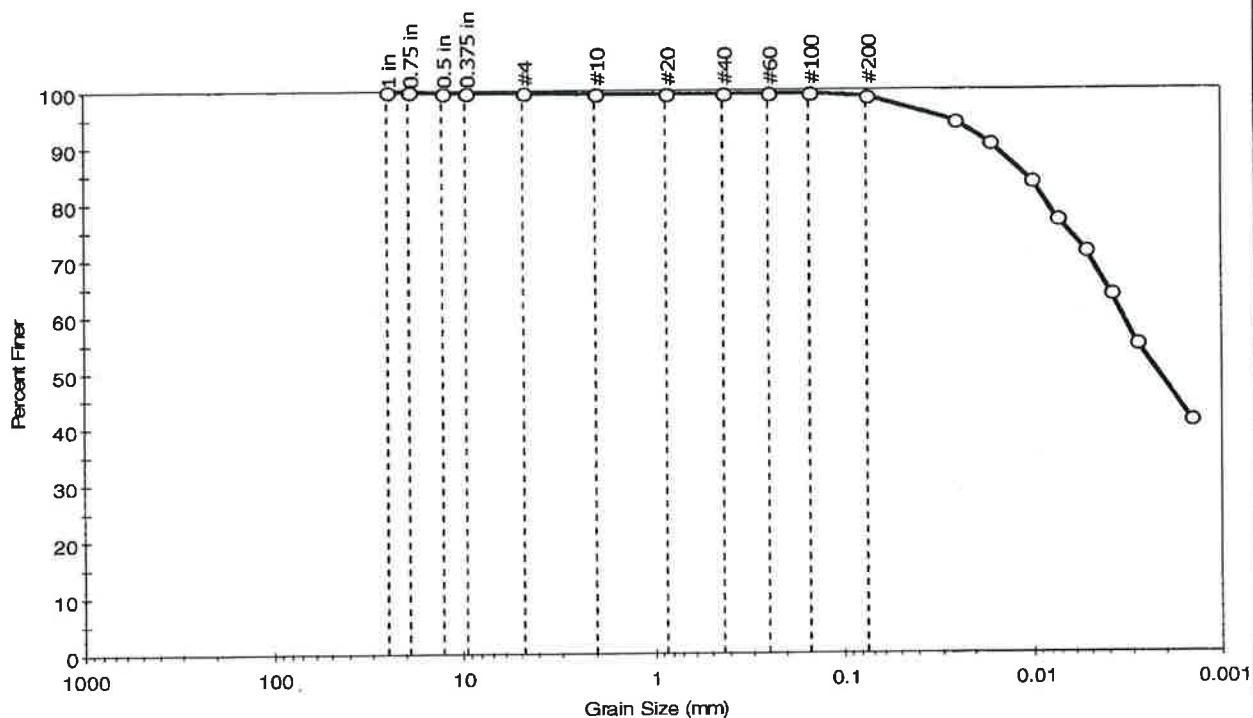
Project Specifications --

Notes:



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a	Tested By: jbr	
Location: Syracuse, NY	Sample Type: bucket	Checked By: jdt
Boring ID: ---	Test Date: 05/16/11	Test Id: 208135
Sample ID: LP-004		
Depth: ---		
Test Comment: ---		
Sample Description: Moist, olive brown clay		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.4	0.8	98.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	100		
0.5 in	12.70	100		
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#200	0.075	99		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.025	94		
---	0.0169	91		
---	0.0101	84		
---	0.0074	77		
---	0.0054	71		
---	0.0039	64		
---	0.0028	55		
---	0.0015	41		

Coefficients

$D_{85} = 0.0111 \text{ mm}$ $D_{30} = \text{N/A}$
 $D_{60} = 0.0034 \text{ mm}$ $D_{15} = \text{N/A}$
 $D_{50} = 0.0022 \text{ mm}$ $D_{10} = \text{N/A}$
 $C_u = \text{N/A}$ $C_c = \text{N/A}$

Classification

ASTM lean clay (CL) ✓
AASHTO Clayey Soils (A-7-6 (28))

Sample/Test Description

Sand/Gravel Particle Shape : ---
 Sand/Gravel Hardness : ---



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jef
Sample ID: LP-004	Test Date: 05/16/11	Checked By: jdt
Depth: ---	Test Id: 208139	
Test Comment: ---		
Sample Description: Moist, olive brown clay		
Sample Comment: ---		

Moisture, Ash, and Organic Matter - ASTM D 2974

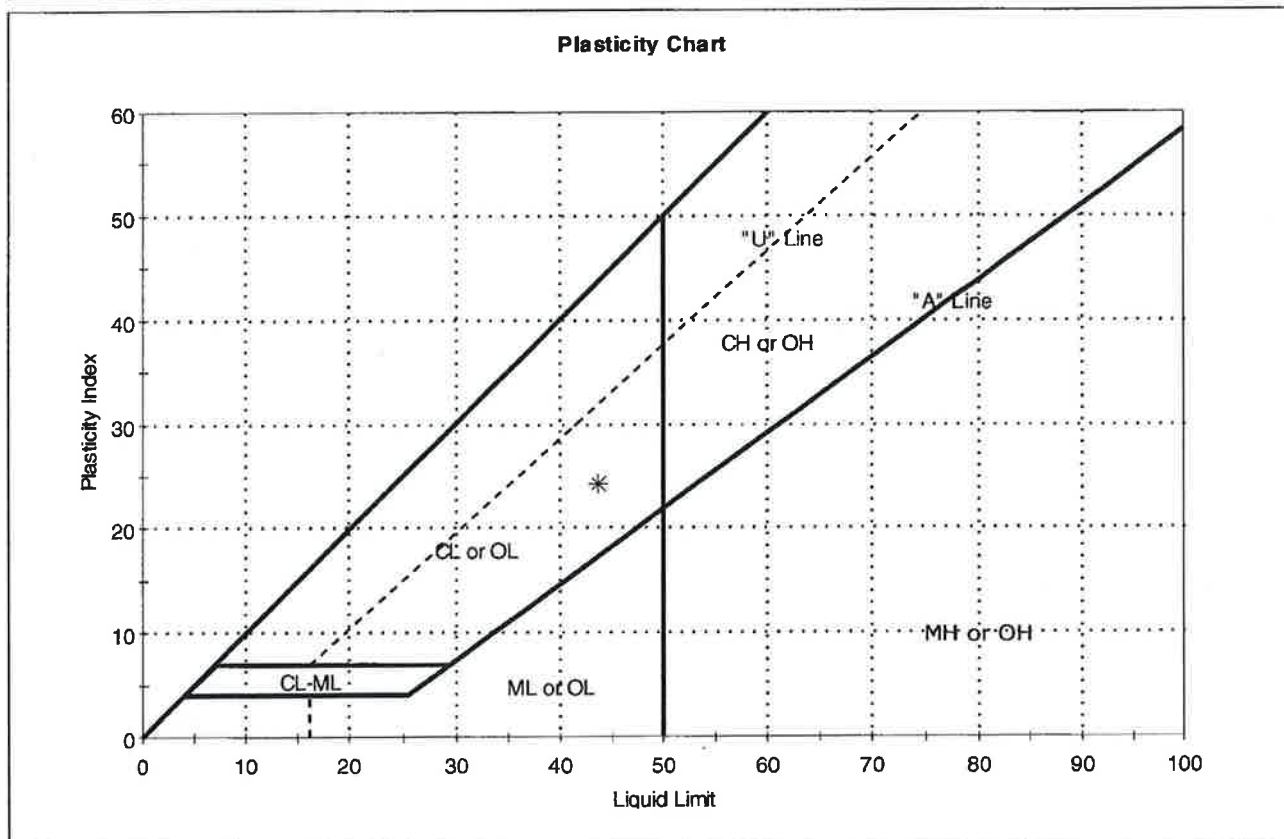
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	LP-004	---	Moist, olive brown clay	27	99.6	.4

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-004	Test Date:	05/16/11
Depth:	---	Test Id:	208131
Test Comment:	---		
Sample Description:	Moist, olive brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-004	---	---	27	44	19	25	0	lean clay (CL) ✓

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: VERY HIGH

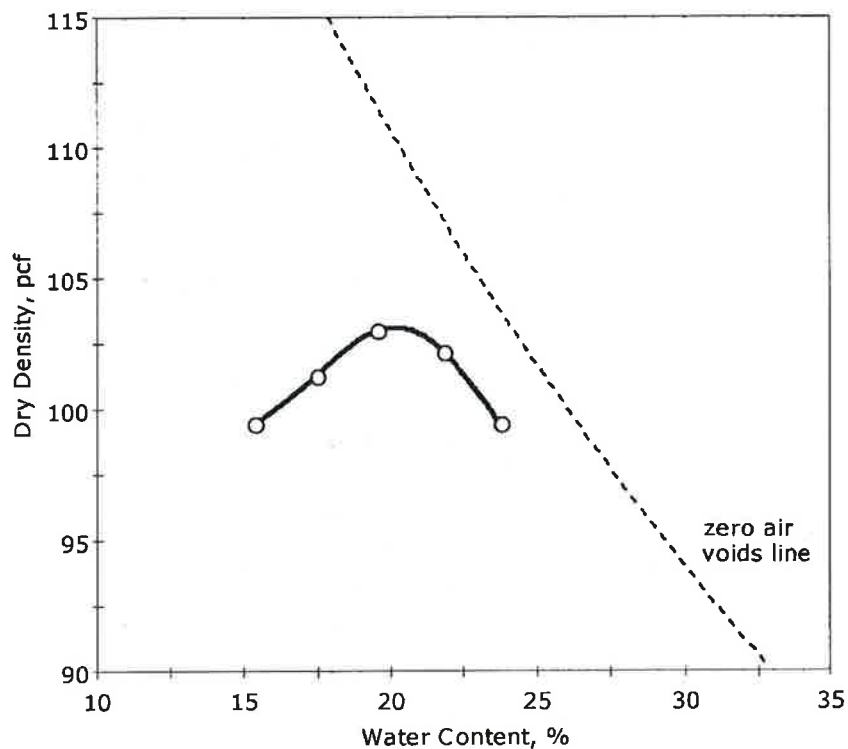
Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-004	Test Date:	05/16/11
Depth :	---	Test Id:	208176
Test Comment:	---		
Sample Description:	Moist, olive brown clay		
Sample Comment:	---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	99.4	101.3	103.0	102.2	99.4
Moisture Content, %	15.4	17.5	19.5	21.8	23.7

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

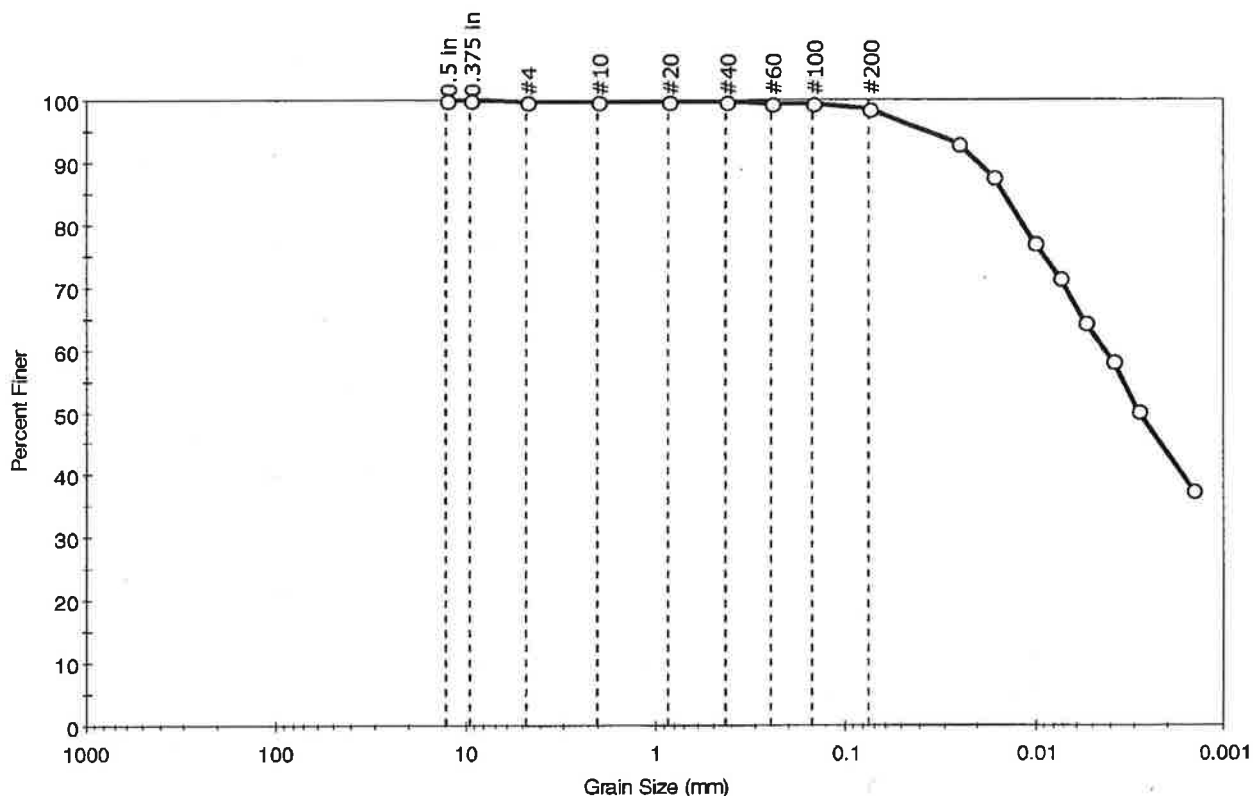
Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 103.0 pcf
Optimum Moisture= 20.0 %



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Sample Type: bucket	Tested By: jbr
Boring ID: ---	Test Date: 05/16/11	Checked By: jdt
Sample ID: LP-005	Test Id: 208136	
Depth: ---		
Test Comment: ---		
Sample Description: Moist, olive brown clay		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.3	1.2	98.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.70	100		
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#200	0.075	99		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.025	93		
---	0.0168	88		
---	0.0102	77		
---	0.0074	71		
---	0.0054	64		
---	0.0039	58		
---	0.0029	50		
---	0.0015	38		

Coefficients	
D ₈₅ = 0.0149 mm	D ₃₀ = N/A
D ₆₀ = 0.0043 mm	D ₁₅ = N/A
D ₅₀ = 0.0028 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	lean clay (CL)
AASHTO	Clayey Soils (A-7-6 (23))

Sample/Test Description	
Sand/Gravel Particle Shape	: ---
Sand/Gravel Hardness	: ---



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-005	Test Date:	05/16/11
Depth :	---	Test Id:	208140
Test Comment:	---		
Sample Description:	Moist, olive brown clay		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

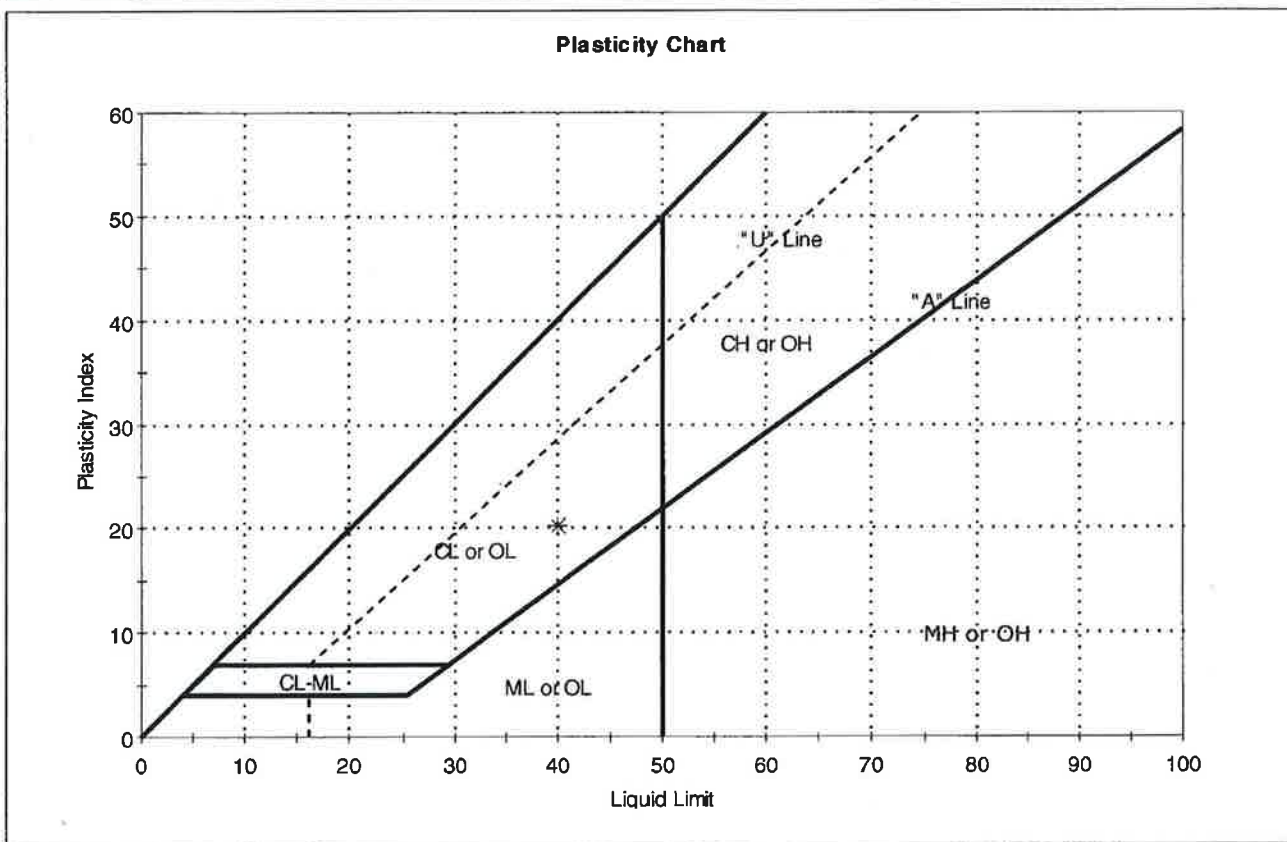
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	LP-005	---	Moist, olive brown clay	23	99.1	.9

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Sample Type:	bucket
Boring ID:	---	Tested By:	cam
Sample ID:	LP-005	Test Date:	05/17/11
Depth:	---	Checked By:	jdt
		Test Id:	208132
Test Comment:	---		
Sample Description:	Moist, olive brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



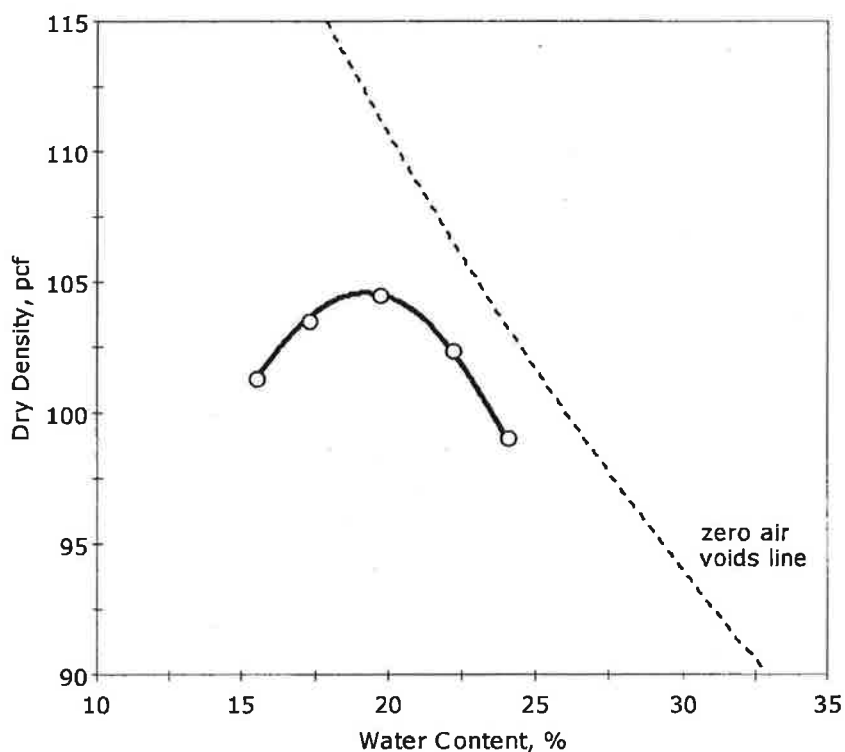
Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-005	---	---	26	40	20	20	0	lean clay (CL) ✓

Sample Prepared using the WET method
 0% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: cwd	
Sample ID: LP-005	Test Date: 05/16/11	Checked By: jdt	
Depth: ---	Test Id: 208177		
Test Comment:	---		
Sample Description:	Moist, olive brown clay		
Sample Comment:	---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	101.3	103.6	104.5	102.4	99.1
Moisture Content, %	15.5	17.2	19.7	22.1	24.0

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 104.5 pcf
Optimum Moisture= 19.0 %



Client:	Parsons Engineering Science		
Project Name:	SCA Phase1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	5/19/2011	Tested By:	ema
End Date:	5/25/2011	Checked By:	jdt
Boring #:	---		
Sample #:	LP-005		
Depth:	---		
Visual Description:	Moist, olive brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: Remolded **Permeant Fluid:** de-aired tap water
Orientation: Vertical **Cell #:** 6/8/2
Sample Preparation: Target Compaction: 95% of the Maximum Dry Density (104.5 pcf) at the Optimum Moisture Content (19.0%) Trimmings moisture content = 19.0%

Parameter	Initial	Final
Height, in	2.00	1.95
Diameter, in	2.85	2.84
Area, in ²	6.38	6.33
Volume, in ³	12.8	12.4
Mass, g	396	410
Bulk Density, pcf	118	126
Moisture Content, %	18.7	23.0
Dry Density, pcf	99.3	103
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.0 **Pressure Increment, psi:** 4.94
Sample Pressure, psi: 73.9 **B Coefficient:** 0.95

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
5/20	1	90.0	69.2	10.0	9.9	0.1	55	25.4	5.5E-08	20	1.000	5.5E-08
5/20	2	90.0	69.2	10.0	9.9	0.1	56	25.4	5.4E-08	20	1.000	5.4E-08
5/20	3	90.0	69.2	10.0	9.9	0.1	56	25.4	5.4E-08	20	1.000	5.4E-08
5/20	4	90.0	69.2	10.0	9.9	0.1	60	25.4	5.1E-08	20	1.000	5.1E-08

PERMEABILITY AT 20° C: 5.4×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	05/19/11
Depth :	---	Sample Id:	---
		Tested By:	jef
		Checked By:	jdt

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-004	---	Moist, olive brown clay	27
---	LP-005	---	Moist, olive brown clay	25.8
---	LP-006	---	Moist, yellowish brown clay	23.3
---	LP-007	---	Moist, yellowish brown clay	25.1
---	LP-008	---	Moist, light brown silt	26
---	LP-009	---	Moist, yellowish brown clay	24.7
---	LP-010	---	Moist, yellowish brown clay	21.7
---	LP-011	---	Moist, mottled gray and brown clay	24.6
---	LP-012	---	Moist, dark grayish brown clay	25
---	LP-013	---	Moist, yellowish brown clay	22.8

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: ---	Tested By:	jef
Sample ID:---	Test Date: 05/19/11	Checked By:	jdt
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-014	---	Moist, yellowish brown clay	26.3
---	LP-015	---	Moist, yellowish brown clay	25.5
---	LP-016	---	Moist, yellowish brown clay	25.8
---	LP-017	---	Moist, yellowish brown clay	24.8

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: ---	Tested By: jef	
Sample ID:---	Test Date: 06/03/11	Checked By: jdt	
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

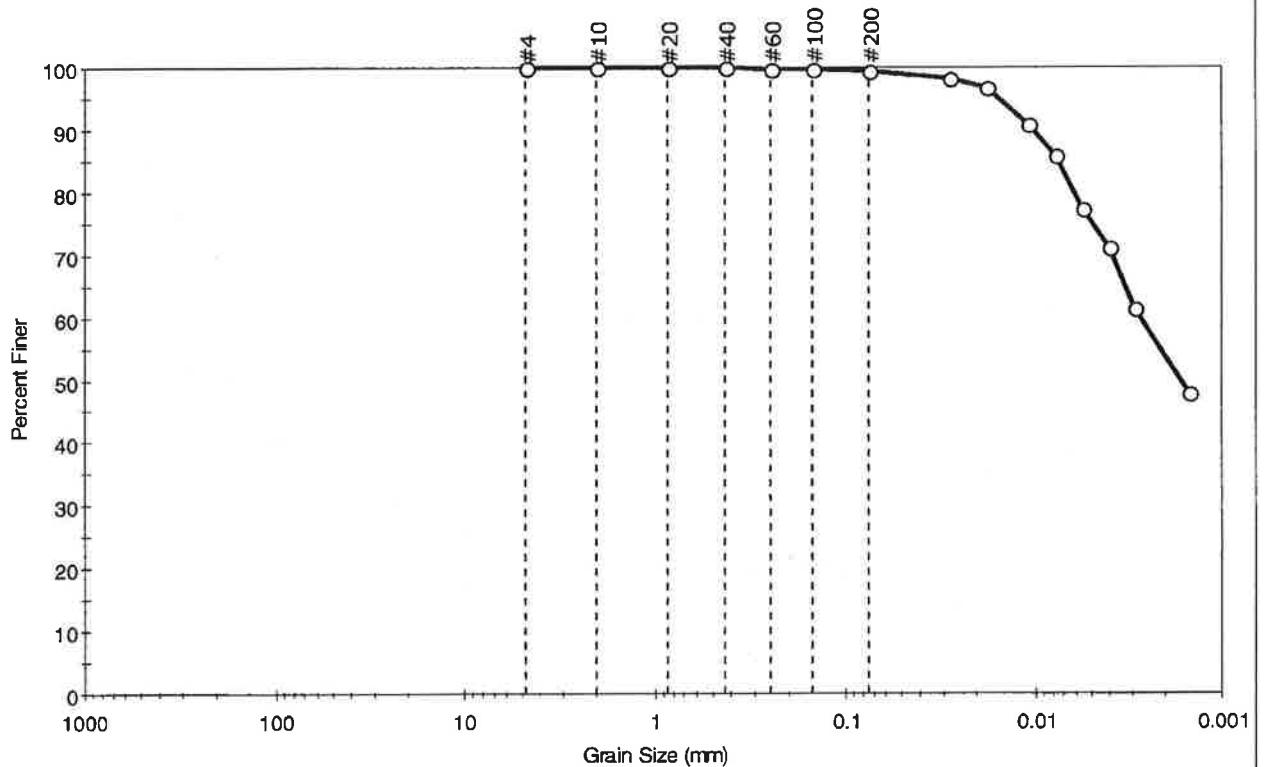
Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-018	---	Moist, brown clay	27.5
---	LP-019	---	Moist, brown clay	21.8
---	LP-020	---	Moist, brown clay	23.9
---	LP-021	---	Moist, dark brown clay	24.3
---	LP-022	---	Moist, brown clay	24.6
---	LP-023	---	Moist, brown clay	25
---	LP-024	---	Moist, brown clay	27.2
---	LP-025	---	Moist, brown clay	21.9
---	LP-026	---	Moist, brown clay	26.4
---	LP-027	---	Moist, dark brown clay	27.8

Notes: Temperature of Drying : 110° Celsius



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	
Location: Syracuse, NY	
Boring ID: ---	Sample Type: bucket
Sample ID: LP-027	Test Date: 05/18/11
Depth: ---	Test Id: 208169
Test Comment: ---	Tested By: jbr
Sample Description: Moist, dark brown clay	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.7	99.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100	✓	
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	99	✓	
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0262	98		
---	0.0181	97		
---	0.0106	91		
---	0.0077	86		
---	0.0056	77		
---	0.0040	71		
---	0.0029	61		
---	0.0015	48		

Coefficients

D ₈₅ = 0.0075 mm	D ₃₀ = N/A
D ₆₀ = 0.0027 mm	D ₁₅ = N/A
D ₅₀ = 0.0017 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM	lean clay (CL) ✓
AASHTO	Clayey Soils (A-7-6 (28))

Sample/Test Description

Sand/Gravel Particle Shape: ---
Sand/Gravel Hardness: ---



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-027	Test Date:	05/17/11
Depth :	---	Test Id:	208171
Test Comment:	---		
Sample Description:	Moist, dark brown clay		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

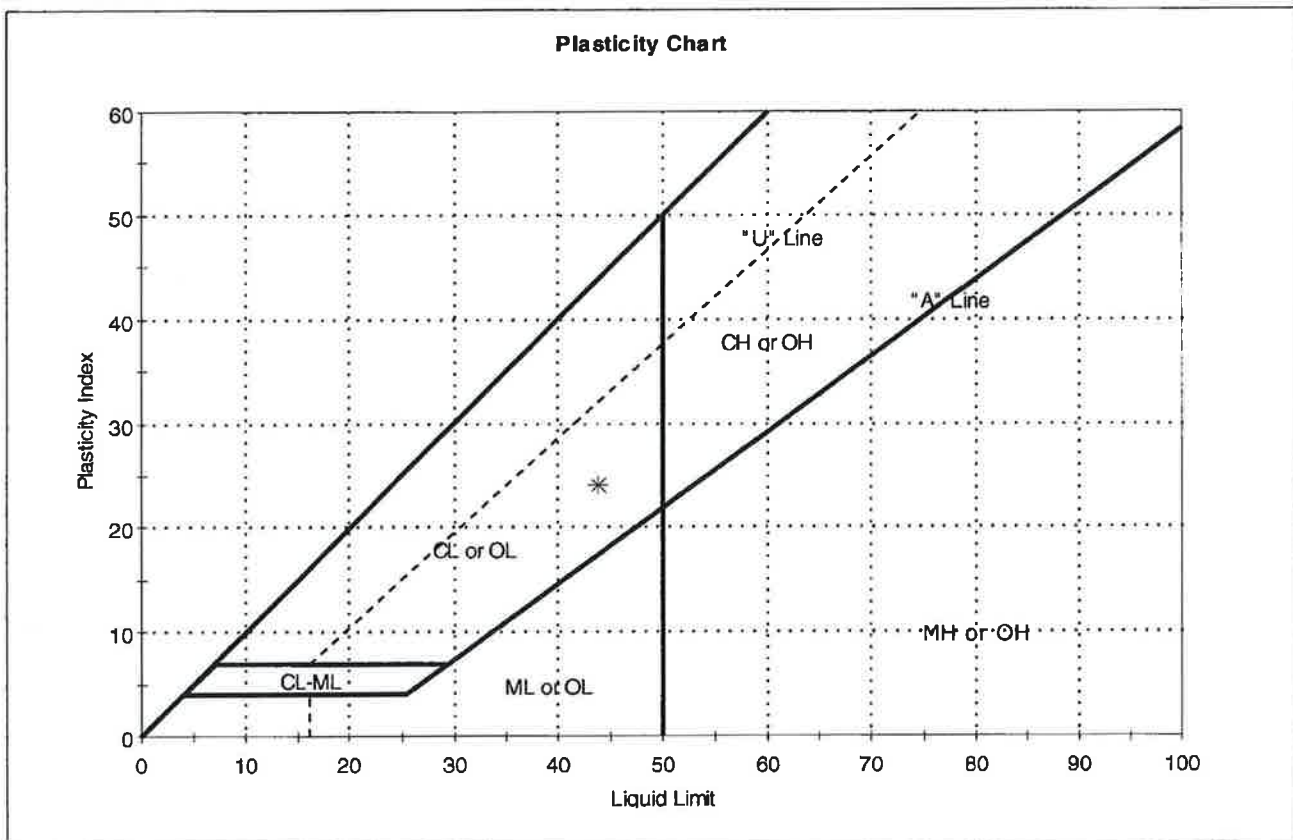
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	LP-027	---	Moist, dark brown clay	29	98.6	1.4

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	
Location: Syracuse, NY	
Boring ID: ---	Sample Type: bucket
Sample ID: LP-027	Test Date: 05/17/11
Depth: ---	Test Id: 208167
Test Comment: ---	Tested By: cam
Sample Description: Moist, dark brown clay	Checked By: jdt
Sample Comment: ---	

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-027	---	---	28	44	20	24	0	lean clay (CL) ✓

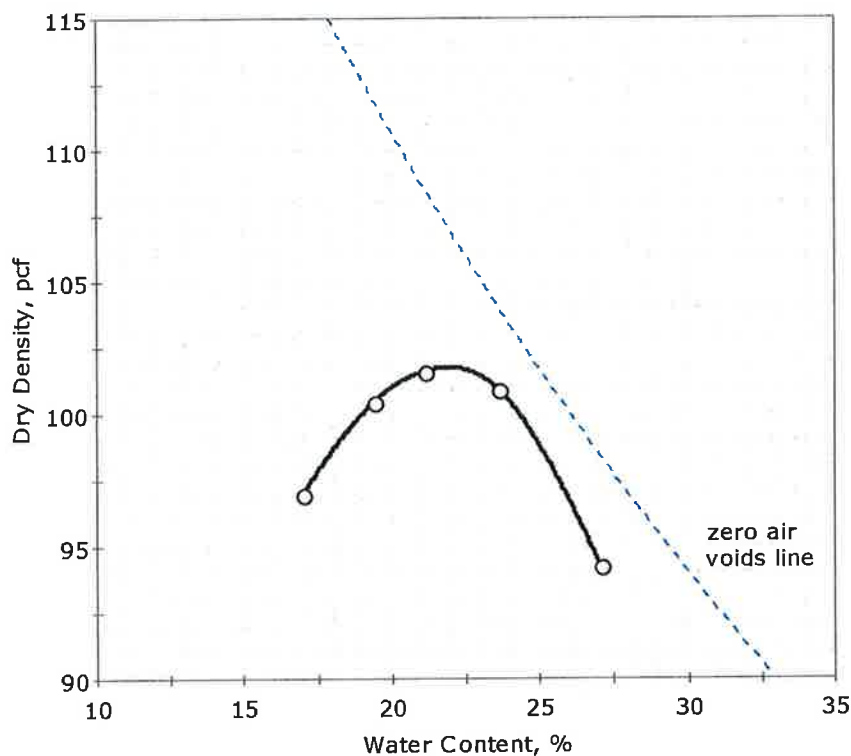
Sample Prepared using the WET method
 0% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: NONE
 Toughness: LOW

Black Creek



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Sample Type: bucket	Tested By: cwd
Boring ID: ---	Test Date: 05/19/11	Checked By: jdt
Sample ID: LP-027	Test Id: 208173	
Depth: ---		
Test Comment: ---		
Sample Description: Moist, dark brown clay		
Sample Comment: ---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	96.9	100.5	101.6	100.9	94.2
Moisture Content, %	17.0	19.4	21.1	23.6	27.1

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 102.0 pcf
Optimum Moisture= 22.0 %



Client:	Parsons Engineering Science		
Project Name:	SCA Phase1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	5/25/2011	Tested By:	ema
End Date:	5/27/2011	Checked By:	jdt
Boring #:	---		
Sample #:	LP-027		
Depth:	---		
Visual Description:	Moist, dark brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	Remolded	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	6/8/2
Sample Preparation:	Target Compaction: 95% of the Maximum Dry Density (102.0 pcf) at the Optimum Moisture Content (22.0%) Trimming moisture content = 21.3%		

Parameter	Initial	Final
Height, in	2.00	1.93
Diameter, in	2.85	2.84
Area, in ²	6.38	6.33
Volume, in ³	12.8	12.2
Mass, g	396	401
Bulk Density, pcf	118	125
Moisture Content, %	21.9	23.4
Dry Density, pcf	96.8	101
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.0	Pressure Increment, psi:	4.95
Sample Pressure, psi:	73.9	B Coefficient:	0.95

FLOW DATA

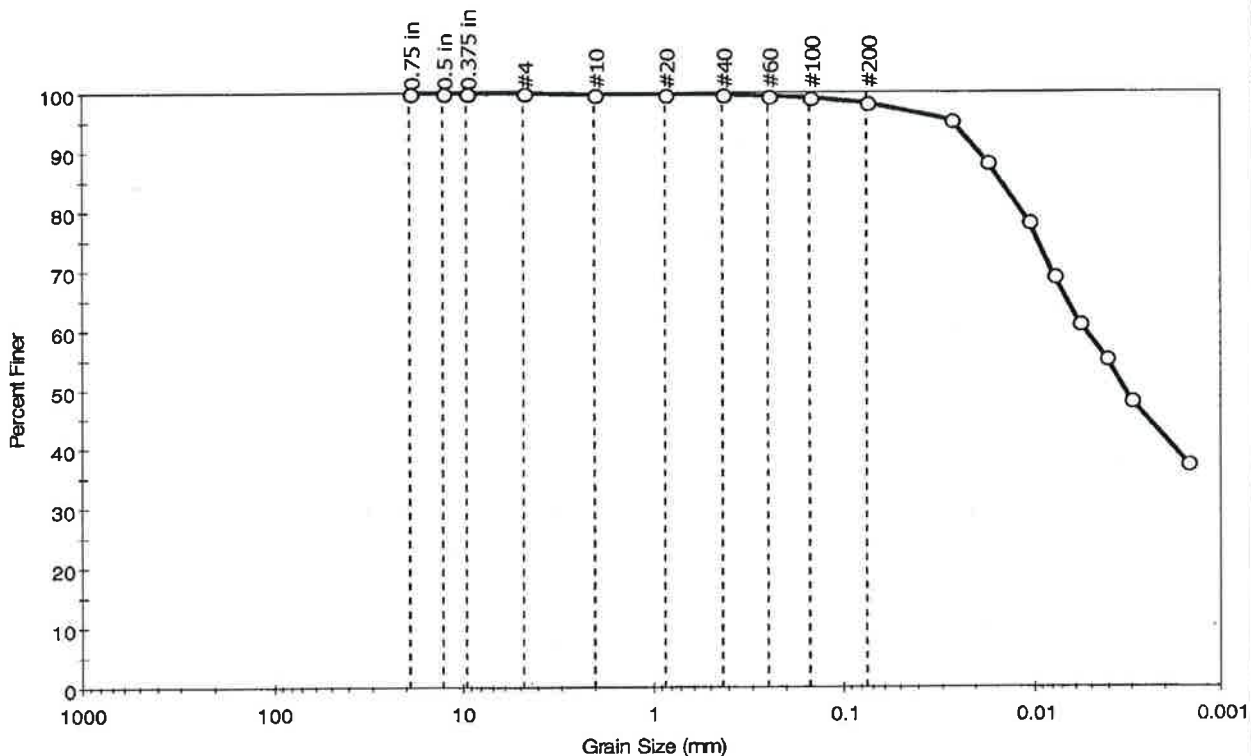
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
5/26	1	90.0	69.2	10.0	9.9	0.1	169	25.7	1.8E-08	20	1.000	1.8E-08
5/26	2	90.0	69.2	10.0	9.9	0.1	189	25.7	1.6E-08	20	1.000	1.6E-08
5/26	3	90.0	69.2	10.0	9.9	0.1	195	25.7	1.5E-08	20	1.000	1.5E-08
5/26	4	90.0	69.2	10.0	9.9	0.1	213	25.7	1.4E-08	20	1.000	1.4E-08

PERMEABILITY AT 20° C: 1.6×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Sample Type: bucket	Tested By: jbr
Boring ID: ---	Test Date: 06/10/11	Checked By: njh
Sample ID: LP-028	Test Id: 209742	
Depth: ---		
Test Comment: ---		
Sample Description: Moist, reddish brown clay		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.1	1.6	98.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100 ✓		
0.5 in	12.70	100		
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#200	0.075	98 ✓		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0269	95		
---	0.0175	88		
---	0.0106	78		
---	0.0078	69		
---	0.0057	61		
---	0.0041	55		
---	0.0030	48		
---	0.0015	37		

Coefficients	
D ₈₅ = 0.0149 mm	D ₃₀ = N/A
D ₆₀ = 0.0053 mm	D ₁₅ = N/A
D ₅₀ = 0.0032 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	lean clay (CL) ✓
AASHTO	Clayey Soils (A-6 (17))

Sample/Test Description	
Sand/Gravel Particle Shape	: ---
Sand/Gravel Hardness	: ---



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-028	Test Date:	06/17/11
Depth :	---	Sample Id:	100195
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-028	---	Moist, reddish brown clay	18.9

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-028	Test Date:	06/14/11
Depth :	---	Test Id:	209744
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

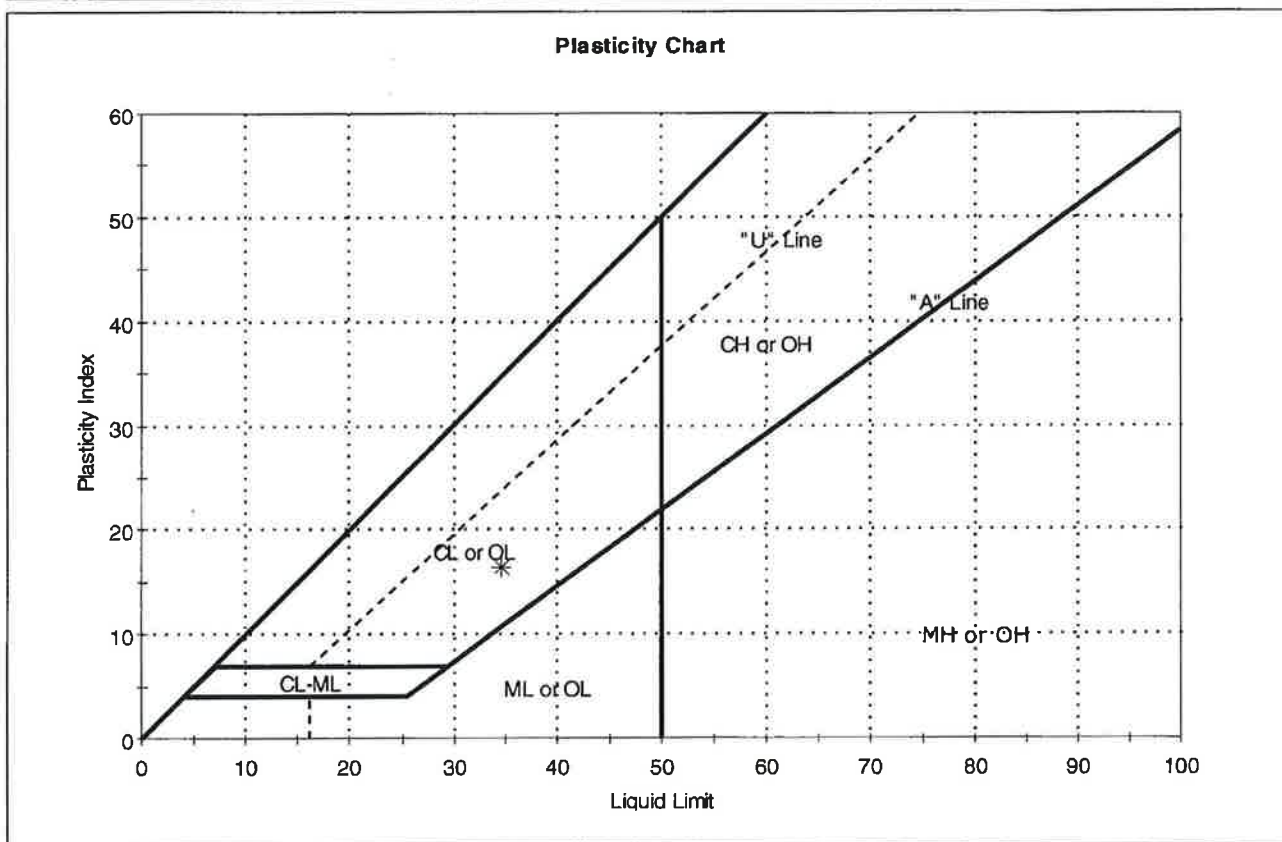
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	LP-028	---	Moist, reddish brown clay	19	99.7	.3

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Sample Type:	bucket
Location:	Syracuse, NY	Tested By:	cam
Boring ID:	---	Test Date:	06/13/11
Sample ID:	LP-028	Checked By:	njh
Depth:	---	Test Id:	209740
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



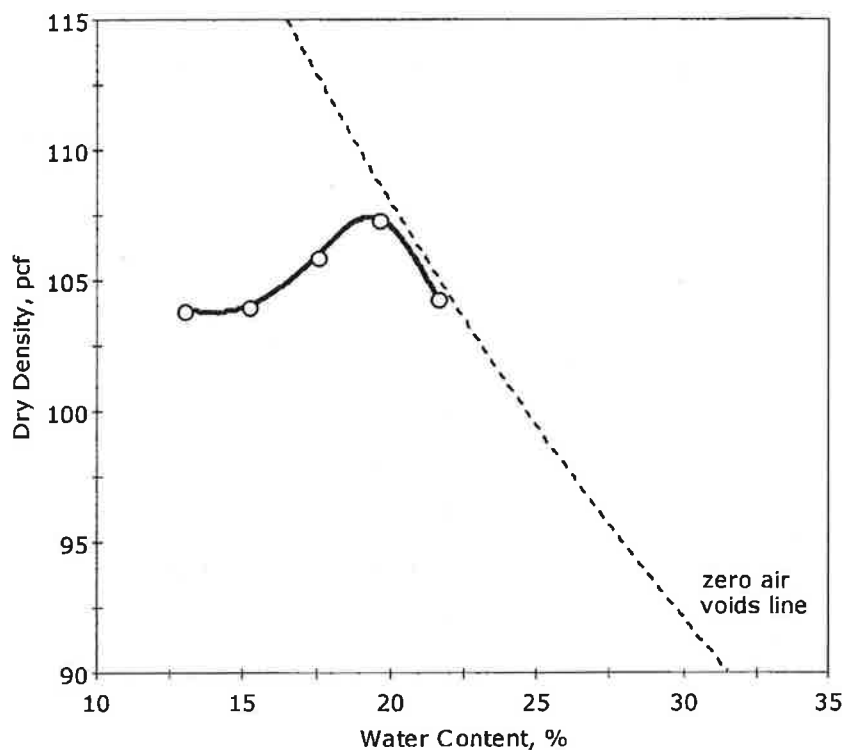
Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-028	---	---	19	35	18	17	0	lean clay (CL) ✓

Sample Prepared using the WET method
 0% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Parsons Engineering Science			
Project:	SCA Phase 1a			
Location:	Syracuse, NY		Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket	Tested By: cwd
Sample ID:	LP-028	Test Date:	06/14/11	Checked By: njh
Depth :	---	Test Id:	209747	
Test Comment:	---			
Sample Description:	Moist, reddish brown clay			
Sample Comment:	---			

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	103.9	104.0	105.9	107.4	104.3
Moisture Content, %	13.0	15.2	17.5	19.6	21.6

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.65

Maximum Dry Density= 107.5 pcf
Optimum Moisture= 19.5 %



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	6/15/2011	Tested By:	ema
End Date:	6/17/2011	Checked By:	njh
Boring #:	---		
Sample #:	LP-028		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	remolded	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	1/1/1
Sample Preparation:	Target Compaction: 95% of the Maximum Dry Density (107.5 pcf) at the Optimum Moisture Content (19.5%) Trimming moisture content = 17.9%		

Parameter	Initial	Final
Height, in	2.00	1.94
Diameter, in	2.85	2.82
Area, in ²	6.38	6.25
Volume, in ³	12.8	12.1
Mass, g	407	416
Bulk Density, pcf	121	131
Moisture Content, %	17.9	20.5
Dry Density, pcf	103	108
Degree of Saturation, %	---	100

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	4.96
Sample Pressure, psi:	73.9	B Coefficient:	0.94

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
6/16	1	90.0	69.2	9.0	8.9	0.1	186	23.0	1.8E-08	20	1.000	1.8E-08
6/16	2	90.0	69.2	9.0	8.9	0.1	194	23.0	1.8E-08	20	1.000	1.8E-08
6/16	3	90.0	69.2	9.0	8.9	0.1	219	23.0	1.6E-08	20	1.000	1.6E-08
6/16	4	90.0	69.2	9.0	8.9	0.1	222	23.0	1.5E-08	20	1.000	1.5E-08

PERMEABILITY AT 20° C: 1.7×10^{-8} cm/sec (@ 20.8 psi effective stress)

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 7 day June month 2011 year
 MATERIAL TYPE: Black Creek low-permeability soil

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight		QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams			
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams			
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams			
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms			
A	SAMPLE NUMBER:				
B	TARE NUMBER.:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>		
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams				
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams				
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams				
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%						
L	SAMPLE NUMBER:	LP-029	LP-030	LP-031	LP-032	LP-033
M	TARE NUMBER:	A	B	A	B	A
N	WT. OF TARE	287.9	292.4	287.9	292.4	287.9
O	WT. OF WET SOIL & TARE	489.4	515	486.9	510.8	493.7
P	WT. OF DRY SOIL & TARE	456.9	477.3	457.4	476.2	460.3
F	WT. OF WATER = D-E	32.5	37.7	29.5	34.6	33.4
G	WT. OF DRY SOIL = E-C	169.0	184.9	169.5	183.8	172.4
H	MOISTURE CONTENT = (F/G) * 100 %	19.2	20.4	17.4	18.8	19.4
T	NUCLEAR DENSITY GAUGE READING:	17.8	18.5	17.2	17.5	18.7
U	DELTA MOISTURE = S-T %	1.4	1.9	0.2	1.3	0.7
V	FDT NUMBER	3-012	3-013	3-014	3-015	3-016

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 7 day June month 2011 year
 MATERIAL TYPE: Black Creek low-permeability soil

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight		QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams			
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams			
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams			
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms			
A	SAMPLE NUMBER:				
B	TARE NUMBER:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>	
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams			
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams			
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams			
INITIAL SETTING TO BE AT 3.0 MINUTES. CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%					
L	SAMPLE NUMBER:	LP-034	LP-035	LP-036	LP-037
M	TARE NUMBER:	A	B	A	B
N	WT. OF TARE	287.9	292.4	287.9	292.4
O	WT. OF WET SOIL & TARE	492	508.1	497.2	511.9
P	WT. OF DRY SOIL & TARE	462.1	473.2	463.4	476.1
F	WT. OF WATER = D-E	29.9	34.9	33.8	35.8
G	WT. OF DRY SOIL = E-C	174.2	180.8	175.5	183.7
H	MOISTURE CONTENT = (F/G) * 100 %	17.2	19.3	19.3	19.5
T	NUCLEAR DENSITY GAUGE READING:	16.1	17.9	18.4	19.0
U	DELTA MOISTURE = S-T %	1.1	1.4	0.9	0.5
V	FDT NUMBER	3-017	3-018	3-019	3-020

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 20 day June month 2011 year
 MATERIAL TYPE: Black Creek and Marcellus low-permeability soil

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight			QA ID: <u>BB</u>	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams				
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams				
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams				
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms				
A	SAMPLE NUMBER:					
B	TARE NUMBER.:					
C	WT. OF TARE					
D	WT. OF WET SOIL & TARE					
E	WT. OF DRY SOIL & TARE					
F	WT. OF WATER = D-E					
G	WT. OF DRY SOIL = E-C					
H	MOISTURE CONTENT = (F/G) * 100 %					
I	NUCLEAR DENSITY GAUGE READING:					
J	DELTA MOISTURE = H-I %					
K	FDT NUMBER					

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>		
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams				
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams				
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams				
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%						
L	SAMPLE NUMBER:	LP-038	LP-039	LP-040	LP-041	
M	TARE NUMBER:	A	B	A	B	
N	WT. OF TARE	287.9	292.4	287.9	292.4	
O	WT. OF WET SOIL & TARE	516	507	520.4	513.7	
P	WT. OF DRY SOIL & TARE	478.4	463.5	469.4	478	
F	WT. OF WATER = D-E	37.6	43.5	51.0	35.7	
G	WT. OF DRY SOIL = E-C	190.5	171.1	181.5	185.6	
H	MOISTURE CONTENT = (F/G) * 100 %	19.7	25.4	28.1	19.2	
T	NUCLEAR DENSITY GAUGE READING:	N/A	N/A	N/A	N/A	
U	DELTA MOISTURE = S-T %	N/A	N/A	N/A	N/A	
V	FDT NUMBER	N/A	N/A	N/A	N/A	

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 24 day June month 2011 year
 MATERIAL TYPE: Black Creek low-permeability soils

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight		QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams			
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams			
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams			
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms			
A	SAMPLE NUMBER:				
B	TARE NUMBER.:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>	
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams			
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams			
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams			
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%					
L	SAMPLE NUMBER:	LP-042	LP-043		
M	TARE NUMBER:	A	A		
N	WT. OF TARE	288	288		
O	WT. OF WET SOIL & TARE	498.8	493.9		
P	WT. OF DRY SOIL & TARE	446.7	449		
F	WT. OF WATER = D-E	52.1	44.9		
G	WT. OF DRY SOIL = E-C	158.7	161.0		
H	MOISTURE CONTENT = (F/G) * 100 %	32.8	27.9		
T	NUCLEAR DENSITY GAUGE READING:				
U	DELTA MOISTURE = S-T %	32.8	27.9		
V	FDT NUMBER				

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 27 day June month 2011 year
 MATERIAL TYPE: Black Creek low-permeability soils

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight		QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams			
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams			
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams			
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms			
A	SAMPLE NUMBER:				
B	TARE NUMBER.:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>	
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams			
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams			
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams			
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%					
L	SAMPLE NUMBER:	LP-044			
M	TARE NUMBER: ✓ <i>0462</i>	A			
N	WT. OF TARE	288.1			
O	WT. OF WET SOIL & TARE	498.5			
P	WT. OF DRY SOIL & TARE	449.8			
F	WT. OF WATER = D-E	48.7			
G	WT. OF DRY SOIL = E-C	161.7			
H	MOISTURE CONTENT = (F/G) * 100 %	30.1			
T	NUCLEAR DENSITY GAUGE READING:	N/A			
U	DELTA MOISTURE = S-T %	N/A			
V	FDT NUMBER	N/A			



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: ---	Tested By: jef	
Sample ID:---	Test Date: 07/11/11	Checked By: jdt	
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-045	---	Moist, reddish brown clay	22
---	LP-046	---	Moist, light brown clay	25.7
---	LP-047	---	Moist, brown clay	27
---	LP-048	---	Moist, reddish brown clay	23.7
---	LP-049	---	Moist, yellowish brown clay	23
---	LP-050	---	Moist, reddish brown clay	20.8
---	LP-051	---	Moist, brown clay	20.4
---	LP-052	---	Moist, brown clay	29.5
---	LP-053	---	Moist, reddish brown clay	20.3
---	LP-054	---	Moist, reddish brown clay	19.4

Notes: Temperature of Drying : 110° Celsius

✱

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 28 day June month 2011 year
 MATERIAL TYPE: Black Creek and Marcellus low-permeability soils

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight		QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams			
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams			
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams			
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms			
A	SAMPLE NUMBER:				
B	TARE NUMBER.:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>	
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams			
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams			
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams			
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%					
L	SAMPLE NUMBER:	LP-045	LP-046		
M	TARE NUMBER:	A	B		
N	WT. OF TARE	287.9	292.4		
O	WT. OF WET SOIL & TARE	515.2	506.4		
P	WT. OF DRY SOIL & TARE	477.6	460.8		
F	WT. OF WATER = D-E	37.6	45.6		
G	WT. OF DRY SOIL = E-C	189.7	168.4		
H	MOISTURE CONTENT = (F/G) * 100 %	19.8	27.1		
T	NUCLEAR DENSITY GAUGE READING:				
U	DELTA MOISTURE = S-T %	19.8	27.1		
V	FDT NUMBER				

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 30 day June month 2011 year
 MATERIAL TYPE: Black Creek and Marcellus low-permeability soils

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight			QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams				
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams				
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams				
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms				
A	SAMPLE NUMBER:					
B	TARE NUMBER:					
C	WT. OF TARE					
D	WT. OF WET SOIL & TARE					
E	WT. OF DRY SOIL & TARE					
F	WT. OF WATER = D-E					
G	WT. OF DRY SOIL = E-C					
H	MOISTURE CONTENT = (F/G) * 100	%				
I	NUCLEAR DENSITY GAUGE READING:					
J	DELTA MOISTURE = H-I	%				
K	FDT NUMBER					

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>	
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams			
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams			
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams			
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%					
L	SAMPLE NUMBER:	LP-047	LP-048		
M	TARE NUMBER:	A	B		
N	WT. OF TARE	287.9	292.4		
O	WT. OF WET SOIL & TARE	498.4	505.3		
P	WT. OF DRY SOIL & TARE	447.9	465.7		
F	WT. OF WATER = D-E	50.5	39.6		
G	WT. OF DRY SOIL = E-C	160.0	173.3		
H	MOISTURE CONTENT = (F/G) * 100	31.6	22.9		
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I	31.6	22.9		
V	FDT NUMBER				

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: _____	Onondaga Lake SCA Phase I
LOCATION: <u>Camillus, New York</u>	PROJECT NO.: <u>GJ 4706</u> TASK NO.: <u>07</u>
DESCRIPTION: <u>CQA Construction of Phase I</u>	DATE: <u>1</u> day <u>July</u> month <u>2011</u> year
MATERIAL TYPE: <u>Black Creek and Marcellus low-permeability soils</u>	

OVEN METHOD (ASTM D2216):	Recommended Mass of Moist Sample Weight	QA ID: _____
100% PASSING THE NO. 10 (2-mm) SIEVE	20 grams	
100% PASSING THE NO. 4 (4.75-mm) SIEVE	100 grams	
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE	500 grams	
100% PASSING THE NO 3/4-in. (19-mm) SIEVE	2.5 kilograms	
A SAMPLE NUMBER:		
B TARE NUMBER.:		
C WT. OF TARE		
D WT. OF WET SOIL & TARE		
E WT. OF DRY SOIL & TARE		
F WT. OF WATER = D-E		
G WT. OF DRY SOIL = E-C		
H MOISTURE CONTENT = (F/G) * 100 %		
I NUCLEAR DENSITY GAUGE READING:		
J DELTA MOISTURE = H-I %		
K FDT NUMBER		

MICROWAVE METHOD (ASTM D4643):	Recommended Mass of Moist Sample Weight	QA ID: <u>BB</u>
90% PASSING THE NO. 10 (2-mm) SIEVE	100 to 200 grams	
90% PASSING THE NO. 4 (4.75-mm) SIEVE	200 to 500 grams	
90% PASSING THE NO 3/4-in. (19-mm) SIEVE	500 to 1000 grams	
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%		
L SAMPLE NUMBER:	LP-049	LP-050
M TARE NUMBER:	A	B
N WT. OF TARE	287.9	292.4
O WT. OF WET SOIL & TARE	512.6	501.6
P WT. OF DRY SOIL & TARE	469.3	453.6
F WT. OF WATER = D-E	43.3	48.0
G WT. OF DRY SOIL = E-C	181.4	161.2
H MOISTURE CONTENT = (F/G) * 100 %	23.9	29.8
T NUCLEAR DENSITY GAUGE READING:		
U DELTA MOISTURE = S-T %	23.9	29.8
V FDT NUMBER		

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase I
 LOCATION: Camillus, New York PROJECT NO.: GJ 4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase I DATE: 5 day July month 2011 year
 MATERIAL TYPE: Black Creek and Marcellus low-permeability soils

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight		QA ID: _____	
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams			
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams			
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams			
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms			
A	SAMPLE NUMBER:				
B	TARE NUMBER:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight		QA ID: <u>BB</u>	
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams			
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams			
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams			
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%					
L	SAMPLE NUMBER:	LP-051	LP-052		
M	TARE NUMBER:	A	B		
N	WT. OF TARE	298.4	292.4		
O	WT. OF WET SOIL & TARE	524	526.3		
P	WT. OF DRY SOIL & TARE	482.6	482.7		
F	WT. OF WATER = D-E	41.4	43.6		
G	WT. OF DRY SOIL = E-C	184.2	190.3		
H	MOISTURE CONTENT = (F/G) * 100 %	22.5	22.9		
T	NUCLEAR DENSITY GAUGE READING:				
U	DELTA MOISTURE = S-T %	22.5	22.9		
V	FDT NUMBER				



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: ---	Tested By: jef	
Sample ID:---	Test Date: 07/11/11	Checked By: jdt	
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-055	---	Moist, reddish brown clay	18
---	LP-056	---	Moist, reddish brown clay	17.4
---	LP-057	---	Moist, pale brown clay	26.9
---	LP-058	---	Moist, reddish brown clay	19.2
---	LP-059	---	Moist, reddish brown clay	20.3
---	LP-060	---	Moist, brown clay	20.3
---	LP-061	---	Moist, reddish brown clay	16.6
---	LP-062	---	Moist, reddish brown clay	23
---	LP-063	---	Moist, reddish brown clay	19.5
---	LP-064	---	Moist, reddish brown clay	17.3

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: ---	Tested By:	jef
Sample ID:---	Test Date: 07/11/11	Checked By:	jdt
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

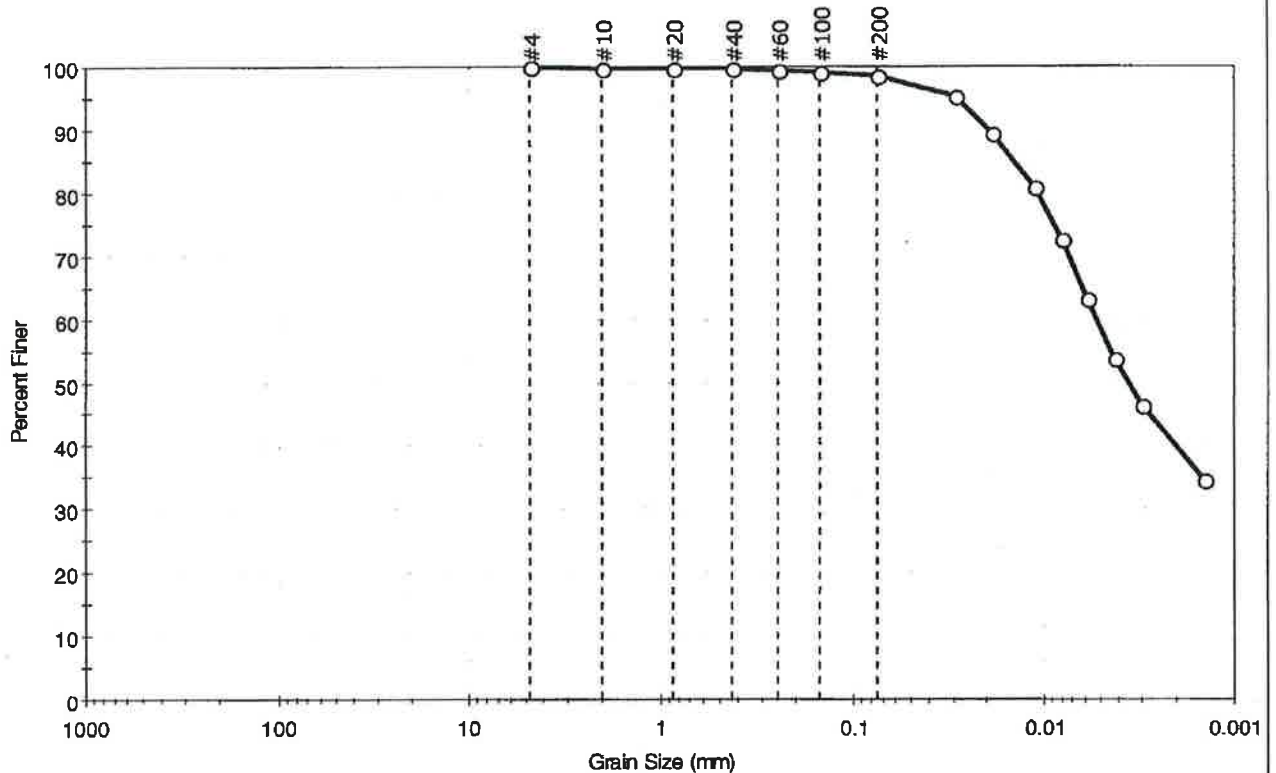
Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-065	---	Moist, reddish brown clay	21.7
---	LP-066	---	Moist, reddish brown clay	21.8
---	LP-067	---	Moist, reddish brown clay	17.9

Notes: Temperature of Drying : 110° Celsius



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Boring ID: ---	Sample Type: bucket
	Sample ID: LP-068	Test Date: 07/20/11
	Depth: ---	Test Id: 212148
Test Comment: ---		
Sample Description: Moist, brown clay		
Sample Comment: ---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	0.0	1.5	98.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100 ✓		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#200	0.075	98 ✓		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0297	95		
---	0.0186	89		
---	0.0111	81		
---	0.0060	73		
---	0.0058	63		
---	0.0042	54		
---	0.0030	46		
---	0.0014	35		

Coefficients

D ₈₅ = 0.0142 mm	D ₃₀ = N/A
D ₆₀ = 0.0052 mm	D ₁₅ = N/A
D ₅₀ = 0.0036 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM lean clay (CL) ✓

AASHTO Clayey Soils (A-6 (15))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jef
Sample ID: LP-068	Test Date: 07/21/11	Checked By: jdt
Depth : ---	Sample Id: 101553	
Test Comment: ---		
Sample Description: Moist, brown clay		
Sample Comment: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-068	---	Moist, brown clay	20.7

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-068	Test Date:	07/12/11
Depth :	---	Test Id:	212152
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Moisture, Ash, and Organic Matter - ASTM D 2974

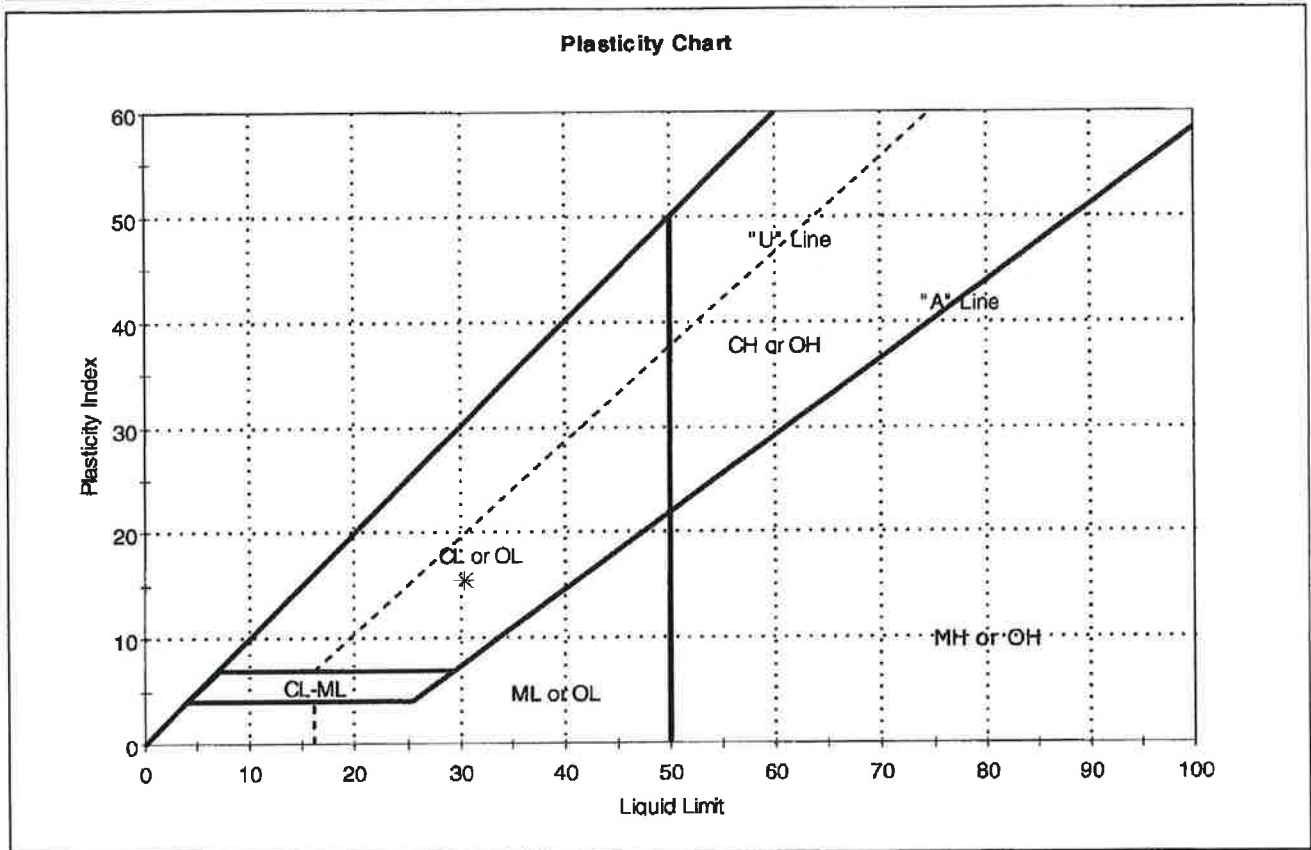
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	LP-068	---	Moist, brown clay	21	99.8	.2

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-068	Test Date:	07/20/11
Depth:	---	Test Id:	212144
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-068	---	---	21	31	15	16	0	lean clay (CL) ✓

Sample Prepared using the WET method

0% Retained on #40 Sieve

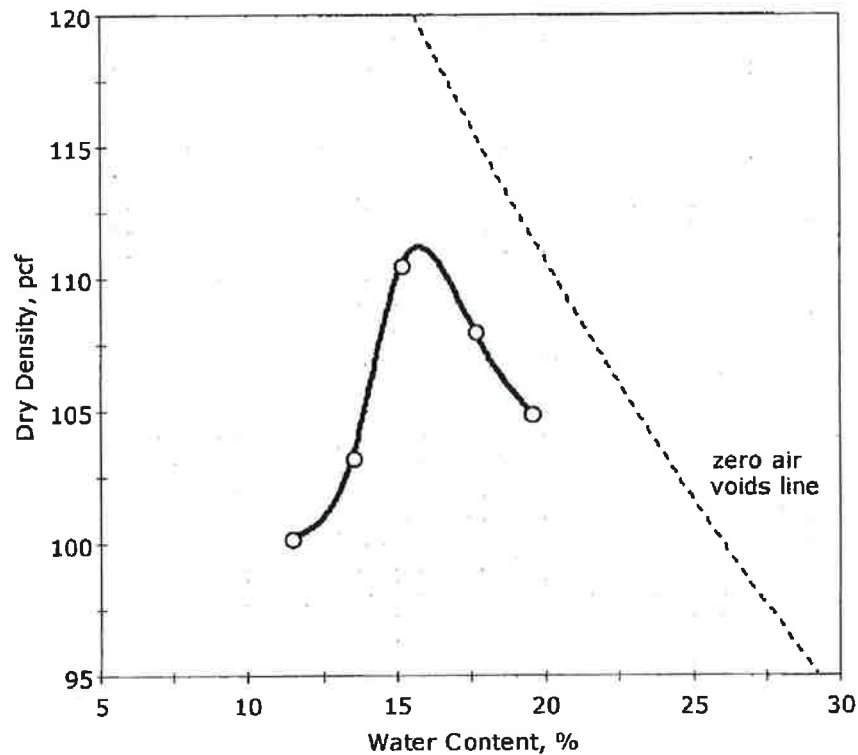
Dry Strength: MEDIUM

Dilatancy: SLOW

Toughness: MEDIUM

Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a		
Location:	Syracuse, NY		
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-068	Test Date:	07/14/11
Depth:	---	Test Id:	212156
Test Comment:	---	Tested By:	cwd
Sample Description:	Moist, brown clay	Checked By:	jdt
Sample Comment:	---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	100.2	103.3	110.5	108.0	104.9
Moisture Content, %	11.4	13.5	15.2	17.6	19.5

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 111.0 pcf
Optimum Moisture= 16.0 %



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/19/2011	Tested By:	ema
End Date:	7/21/2011	Checked By:	jdt
Boring #:	---		
Sample #:	LP-068		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: remolded Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: 12/12/2
 Sample Preparation: Target Compaction: 95% of the Maximum Dry Density (111 pcf) at the Optimum Moisture Content (16%)
 Trimmings moisture content = 16.9%

Parameter	Initial	Final
Height, in	2.00	1.95
Diameter, in	2.85	2.81
Area, in ²	6.38	6.20
Volume, in ³	12.8	12.1
Mass, g	409	417
Bulk Density, pcf	122	131
Moisture Content, %	16.3	18.6
Dry Density, pcf	105	111
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.1 Pressure Increment, psi: 5.02
 Sample Pressure, psi: 74.1 B Coefficient: 0.97

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
7/20	1	90.0	69.2	9.0	8.9	0.1	146	22.9	2.4E-08	20	1.000	2.4E-08
7/20	2	90.0	69.2	9.0	8.9	0.1	164	22.9	2.1E-08	20	1.000	2.1E-08
7/20	3	90.0	69.2	9.0	8.9	0.1	176	22.9	2.0E-08	20	1.000	2.0E-08
7/20	4	90.0	69.2	9.0	8.9	0.1	189	22.9	1.8E-08	20	1.000	1.8E-08

PERMEABILITY AT 20° C: 2.1×10^{-8} cm/sec (@ 20.8 psi effective stress)

Client: Parsons Engineering Science

Project: SCA Phase 1a

Location: Syracuse, NY

Project No: GTX-10120

Boring ID: ---

Sample Type: bucket

Tested By: jbr

Sample ID: LP-069

Test Date: 07/15/11

Checked By: jdt

Depth: ---

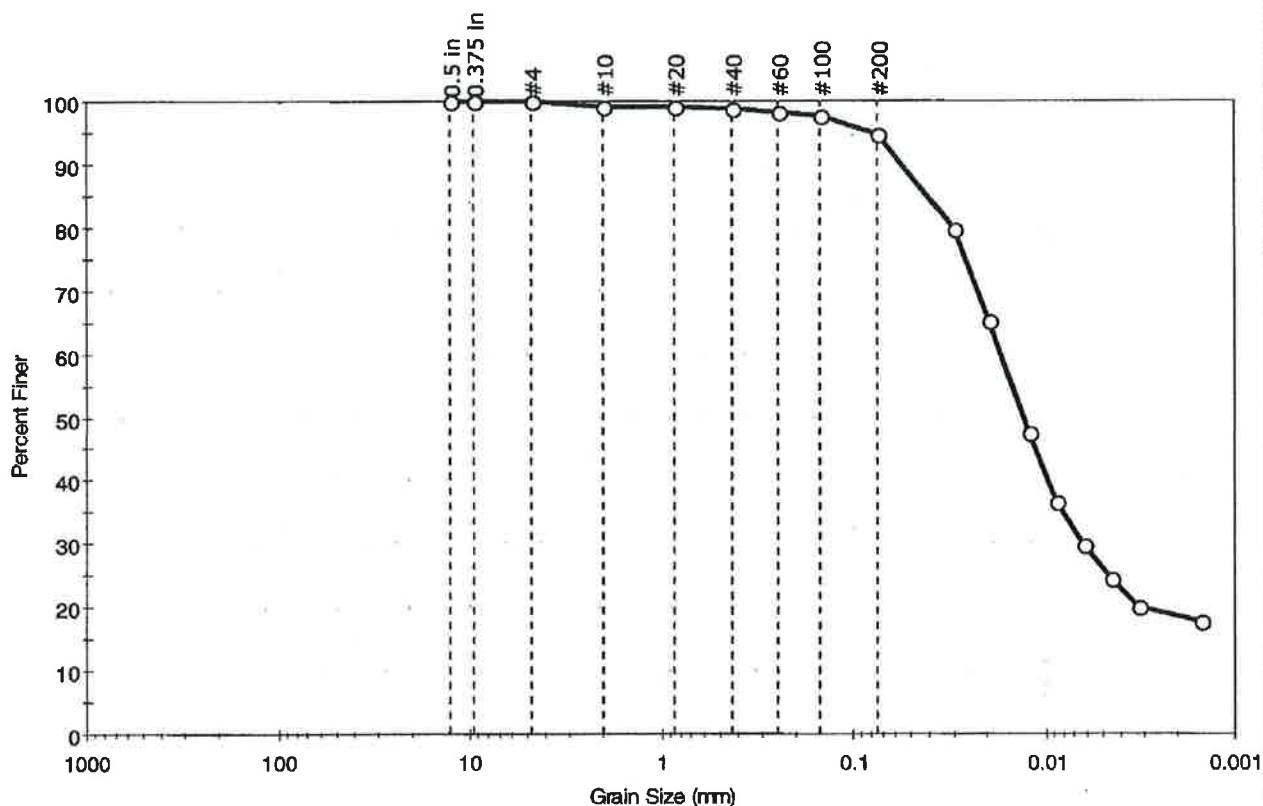
Test Id: 212149

Test Comment: ---

Sample Description: Moist, brown clay

Sample Comment: ---

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.1	5.3	94.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.70	100		
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	98		
#200	0.075	95		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0306	80		
---	0.0200	65		
---	0.0121	48		
---	0.0088	37		
---	0.0063	30		
---	0.0045	24		
---	0.0032	20		
---	0.0015	18		

Coefficients

$D_{85} = 0.0421$ mm $D_{30} = 0.0064$ mm
 $D_{60} = 0.0172$ mm $D_{15} = \text{N/A}$
 $D_{50} = 0.0130$ mm $D_{10} = \text{N/A}$
 $C_u = \text{N/A}$ $C_c = \text{N/A}$

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-6 (17))

Sample/Test Description

Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---



Client: Parsons Engineering Science		Project No: GTX-10120	
Project: SCA Phase 1a		Tested By: jef	
Location: Syracuse, NY		Checked By: jdt	
Boring ID: ---	Sample Type: bucket		
Sample ID: LP-069	Test Date: 07/21/11		
Depth : ---	Sample Id: 101554		
Test Comment: ---			
Sample Description: Moist, brown clay			
Sample Comment: ---			

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-069	---	Moist, brown clay	22.5

Notes: Temperature of Drying : 110° Celsius



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jef
Sample ID: LP-069	Test Date: 07/12/11	Checked By: jdt
Depth : ---	Test Id: 212153	
Test Comment: ---		
Sample Description: Moist, brown clay		
Sample Comment: ---		

Moisture, Ash, and Organic Matter - ASTM D 2974

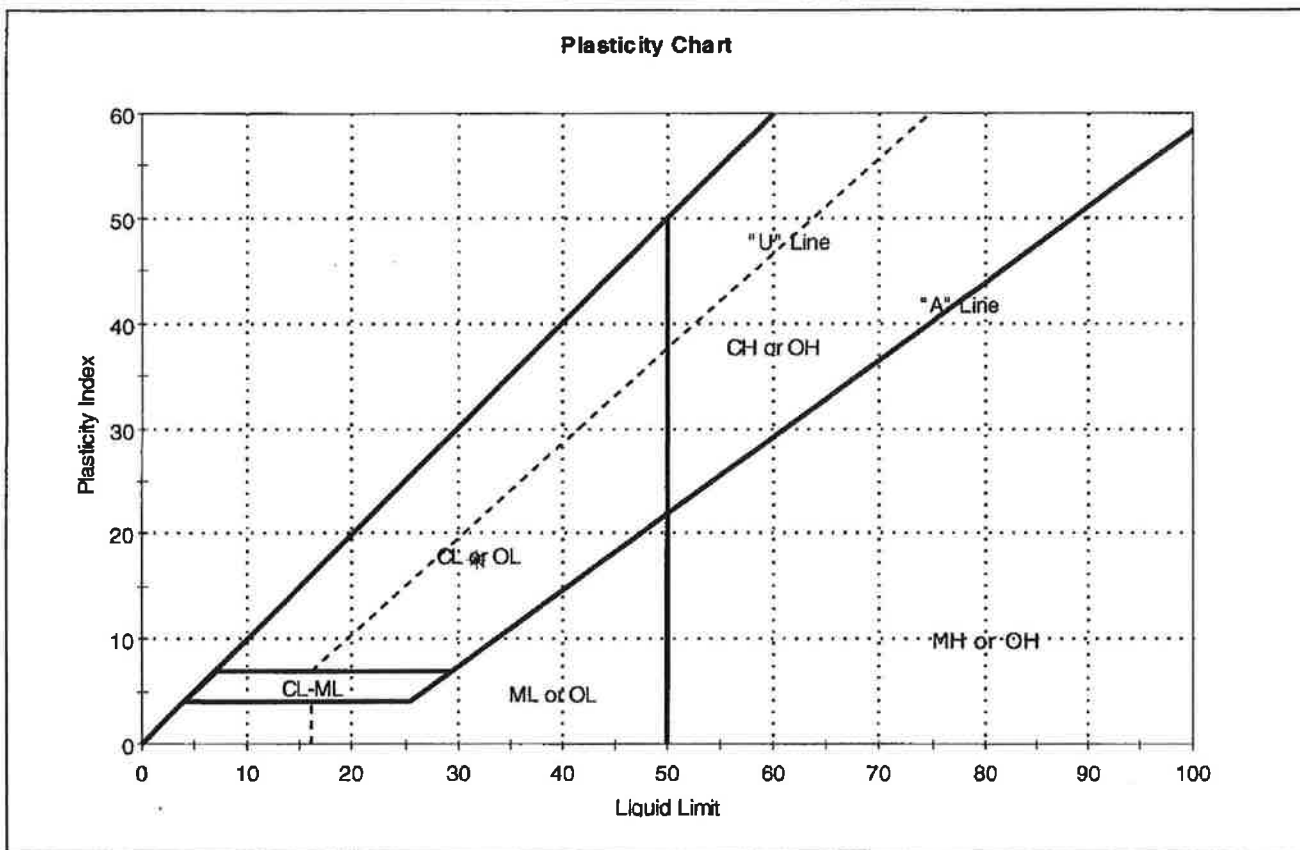
Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
---	LP-069	---	Moist, brown clay	22	99.3	.7

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	Tested By: cam
Location: Syracuse, NY	Checked By: jdt
Boring ID: ---	Sample Type: bucket
Sample ID: LP-069	Test Date: 07/20/11
Depth: ---	Test Id: 212145
Test Comment: ---	
Sample Description: Moist, brown clay	
Sample Comment: ---	

Atterberg Limits - ASTM D 4318-05



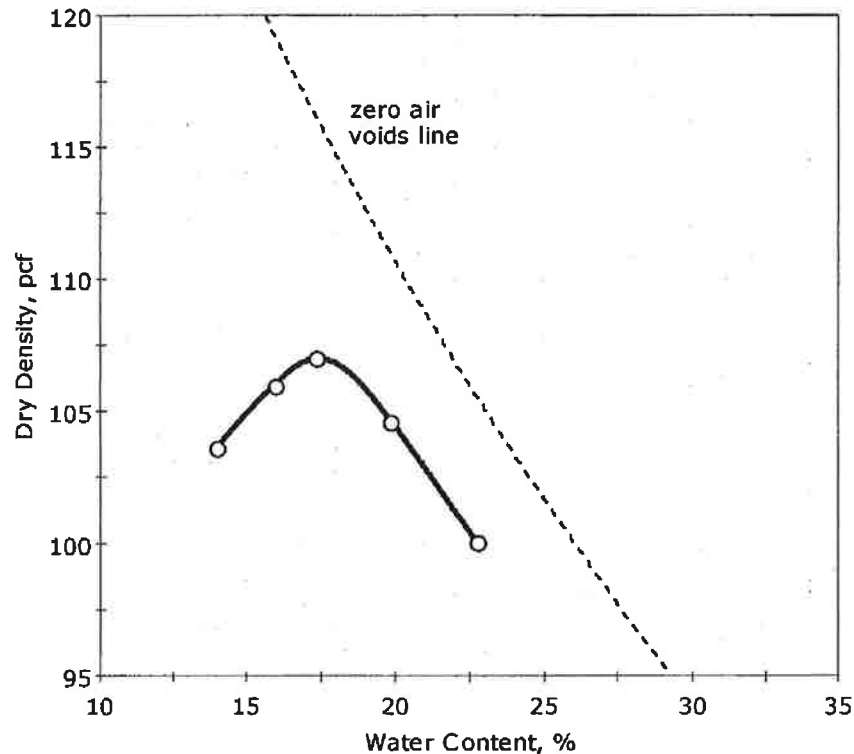
Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-069	---	---	22	32	14	18	0	lean clay (CL) ✓

Sample Prepared using the WET method
 1% Retained on #40 Sieve
 Dry Strength: n/a
 Dilatancy: RAPID
 Toughness: n/a



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	LP-069	Test Date:	07/14/11
Depth:	---	Test Id:	212157
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4	Point 5
Dry density, pcf	103.6	106.0	107.0	104.7	100.0
Moisture Content, %	13.9	15.9	17.3	19.8	22.7

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density= 107.0 pcf
Optimum Moisture= 17.5 %



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/19/2011	Tested By:	ema
End Date:	7/25/2011	Checked By:	jdt
Boring #:	---		
Sample #:	LP-069		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	remolded	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	1/1/1
Sample Preparation:	Target Compaction: 95% of the Maximum Dry Density (107.0 pcf) at the Optimum Moisture Content (18.7%) Trimming moisture content = 16.9%		

Parameter	Initial	Final
Height, in	2.00	1.98
Diameter, in	2.85	2.81
Area, in ²	6.38	6.20
Volume, in ³	12.8	12.3
Mass, g	400	411
Bulk Density, pcf	119	127
Moisture Content, %	18.6	21.9
Dry Density, pcf	101	104
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.01
Sample Pressure, psi:	69.8	B Coefficient:	0.96

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
7/20	4	90.0	69.2	9.0	8.9	0.1	56	22.5	6.3E-08	20	1.000	6.3E-08
7/20	5	90.0	69.2	9.0	8.9	0.1	58	22.5	6.0E-08	20	1.000	6.0E-08
7/20	6	90.0	69.2	9.0	8.9	0.1	61	22.5	5.7E-08	20	1.000	5.7E-08
7/20	7	90.0	69.2	9.0	8.9	0.1	62	22.5	5.6E-08	20	1.000	5.6E-08

PERMEABILITY AT 20° C: 5.9×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: ---	Tested By:	jef
Sample ID:---	Test Date: 07/20/11	Checked By:	n/a
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-070	---	Moist, olive brown clay	24.4
---	LP-071	---	Moist, olive brown clay	22.8
---	LP-072	---	Moist, olive brown clay	22.9
---	LP-073	---	Moist, olive brown clay	24.2
---	LP-074	---	Moist, olive brown clay	23
---	LP-075	---	Moist, olive brown clay	22.7
---	LP-076	---	Moist, olive brown clay	19.4
---	LP-077	---	Moist, olive brown clay	22.8
---	LP-078	---	Moist, olive brown clay	22.3
---	LP-079	---	Moist, olive brown clay	21.9

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: ---	Tested By: jef	
Sample ID:---	Test Date: 07/20/11	Checked By: n/a	
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-080	---	Moist, olive brown clay	26.7
---	LP-081	---	Moist, olive brown clay	22.9
---	LP-082	---	Moist, olive brown clay	24.7
---	LP-083	---	Moist, olive brown clay	19.8
---	LP-084	---	Moist, olive brown clay	22
---	LP-085	---	Moist, olive brown clay	23.5
---	LP-086	---	Moist, olive brown clay	22.3

Notes: Temperature of Drying : 110° Celsius

Sample Number LP-087
Was Collected for
Interface Friction Testing

Sample Number LP-088
Was Collected for
Interface Friction Testing



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: ---	Tested By:	jef
Sample ID:---	Test Date: 07/28/11	Checked By:	jdt
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	LP-089	---	Moist, grayish brown clay	23.8
---	LP-090	---	Moist, grayish brown clay	27.3
---	LP-091	---	Moist, grayish brown clay	23.4
---	LP-092	---	Moist, grayish brown clay	20.6
---	LP-093	---	Moist, grayish brown clay	25
---	LP-094	---	Moist, grayish brown clay	24.3
---	LP-095	---	Moist, grayish brown clay	23

Notes: Temperature of Drying : 110° Celsius

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase 1

LOCATION: Camillus, New York PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: CQA Construction of Phase 1 DATE: 14 day September month 2011 year

MATERIAL TYPE: Marcellus low-permeability soils

OVEN METHOD (ASTM D2216):		Recommended Mass of Moist Sample Weight	QA ID: <u>DW</u>
100% PASSING THE NO. 10 (2-mm) SIEVE		20 grams	
100% PASSING THE NO. 4 (4.75-mm) SIEVE		100 grams	
100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE		500 grams	
100% PASSING THE NO 3/4-in. (19-mm) SIEVE		2.5 kilograms	
A	SAMPLE NUMBER:		
B	TARE NUMBER.:		
C	WT. OF TARE		
D	WT. OF WET SOIL & TARE		
E	WT. OF DRY SOIL & TARE		
F	WT. OF WATER = D-E		
G	WT. OF DRY SOIL = E-C		
H	MOISTURE CONTENT = (F/G) * 100 %		
I	NUCLEAR DENSITY GAUGE READING:		
J	DELTA MOISTURE = H-I %		
K	FDT NUMBER		

MICROWAVE METHOD (ASTM D4643):		Recommended Mass of Moist Sample Weight	QA ID: <u>DW</u>
90% PASSING THE NO. 10 (2-mm) SIEVE		100 to 200 grams	
90% PASSING THE NO. 4 (4.75-mm) SIEVE		200 to 500 grams	
90% PASSING THE NO 3/4-in. (19-mm) SIEVE		500 to 1000 grams	
INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%			
L	SAMPLE NUMBER:	LP-099	LP-100
M	TARE NUMBER:	A	B
N	WT. OF TARE	289.9	292.4
O	WT. OF WET SOIL & TARE	644.8	544.4
P	WT. OF DRY SOIL & TARE	587.6	499.7
Q	WT. OF WATER = O-P	57.2	42.7
R	WT. OF DRY SOIL = P-N	297.7	207.3
S	MOISTURE CONTENT = (Q/R) * 100	19.2	20.6
T	NUCLEAR DENSITY GAUGE READING:	19.8	19.5
U	DELTA MOISTURE = S-T %	-0.6	1.1
V	FDT NUMBER	3-144	3-153

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOIL

(ASTM D 2216/D4643)

PROJECT: Onondaga Lake SCA Phase 1
 LOCATION: Camillus, New York PROJECT NO.: GJ4706 TASK NO.: 07
 DESCRIPTION: CQA Construction of Phase 1 DATE: 13 day September month 2011 year
 MATERIAL TYPE: Marcellus low-permeability soils

OVEN METHOD (ASTM D2216):

Recommended Mass of Moist Sample Weight

QA ID: DW

100% PASSING THE NO. 10 (2-mm) SIEVE 20 grams
 100% PASSING THE NO. 4 (4.75-mm) SIEVE 100 grams
 100% PASSING THE NO. 3/8-in. (9.5-mm) SIEVE 500 grams
 100% PASSING THE NO 3/4-in. (19-mm) SIEVE 2.5 kilograms

A	SAMPLE NUMBER:				
B	TARE NUMBER:				
C	WT. OF TARE				
D	WT. OF WET SOIL & TARE				
E	WT. OF DRY SOIL & TARE				
F	WT. OF WATER = D-E				
G	WT. OF DRY SOIL = E-C				
H	MOISTURE CONTENT = (F/G) * 100 %				
I	NUCLEAR DENSITY GAUGE READING:				
J	DELTA MOISTURE = H-I %				
K	FDT NUMBER				

MICROWAVE METHOD (ASTM D4643):

Recommended Mass of Moist Sample Weight

QA ID: DW

90% PASSING THE NO. 10 (2-mm) SIEVE 100 to 200 grams
 90% PASSING THE NO. 4 (4.75-mm) SIEVE 200 to 500 grams
 90% PASSING THE NO 3/4-in. (19-mm) SIEVE 500 to 1000 grams

INITIAL SETTING TO BE AT 3.0 MINUTES, CONTINUE DRYING SAMPLE AT 1.0 MINUTE SETTING UNTIL MOISTURE CONTENT VARIATION BETWEEN SETTINGS IS LESS THAN 0.1%

L	SAMPLE NUMBER:	LP-096	LP-097	LP-098	
M	TARE NUMBER:	B	A	B	
N	WT. OF TARE	292.4	289.9	292.4	
O	WT. OF WET SOIL & TARE	864	657	635	
P	WT. OF DRY SOIL & TARE	777.6	608	590.8	
Q	WT. OF WATER = O-P	86.4	49	44.2	
R	WT. OF DRY SOIL = P-N	485.2	318.1	298.4	
S	MOISTURE CONTENT = (Q/R) * 100	17.8	15.4	14.8	
T	NUCLEAR DENSITY GAUGE READING:	17.0	14.3	15.7	
U	DELTA MOISTURE = S-T %	0.8	1.1	-0.9	
V	FDT NUMBER	3-126	3-133	3-137	

Thin-Walled Tubes



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	5/11/2011	Tested By:	ema
End Date:	5/13/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-001A		
Depth:	---		
Visual Description:	Moist, olive brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	3/9
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 23.9%.		

Parameter	Initial	Final
Height, in	2.25	2.18
Diameter, in	2.87	2.83
Area, in ²	6.47	6.29
Volume, in ³	14.6	13.7
Mass, g	473	466
Bulk Density, pcf	124	129
Moisture Content, %	23.3	21.5
Dry Density, pcf	100	106
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.3	Pressure Increment, psi:	5.05
Sample Pressure, psi:	73.6	B Coefficient:	0.94
* B-value did not increase with increase in pressure			

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
5/12	2	90	69	13.0	12.9	0.1	46	29.6	5.7E-08	20	1.000	5.7E-08
5/12	3	90	69	13.0	12.9	0.1	49	29.6	5.4E-08	20	1.000	5.4E-08
5/12	4	90	69	13.0	12.9	0.1	51	29.6	5.2E-08	20	1.000	5.2E-08
5/12	5	90	69	13.0	12.9	0.1	53	29.6	5.0E-08	20	1.000	5.0E-08

PERMEABILITY AT 20° C: 5.3×10^{-8} cm/sec (@ 21 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	5/11/2011	Tested By:	ema
End Date:	5/13/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-001B		
Depth:	---		
Visual Description:	Moist, olive brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: 8/9/3
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content.
 Trimmings moisture content = 25.7%.

Parameter	Initial	Final
Height, in	2.38	2.28
Diameter, in	2.88	2.80
Area, in ²	6.51	6.16
Volume, in ³	15.5	14.0
Mass, g	477	466
Bulk Density, pcf	117	126
Moisture Content, %	25.3	22.6
Dry Density, pcf	93.3	103
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 94.9 Pressure Increment, psi: 5.03
 Sample Pressure, psi: 73.2 B Coefficient: 0.93
 * B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
5/12	2	90	69	13.0	12.9	0.1	44	28.3	6.4E-08	20	1.000	6.4E-08
5/12	3	90	69	13.0	12.9	0.1	48	28.3	5.8E-08	20	1.000	5.8E-08
5/12	4	90	69	13.0	12.9	0.1	52	28.3	5.4E-08	20	1.000	5.4E-08
5/12	5	90	69	13.0	12.9	0.1	57	28.3	4.9E-08	20	1.000	4.9E-08

PERMEABILITY AT 20° C: 5.6×10^{-8} cm/sec (@ 21 psi effective stress)



PW LABORATORIES, INC.

6544 FREMONT ROAD, EAST SYRACUSE, NY 13057

315-437-1420 • Fax 315-437-1752 • pwlabsinc@hotmail.com

May 19, 2011

L-10152
Laboratory Testing
SCA Construction
RFP No. 444853.30004.00

Natural Moisture Content
ASTM D2216

Lab I.D. #	Sample	Moisture Content as a Percent of Dry Weight
25791	ST-001C Black Creek Clay Test Pad 1st Lift	24.6



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May 19, 2011

L-10152
SCA Construction
RFP No. 444853.30004.00

Atterberg Limits
ASTM D4318

Lab I.D. #	Sample	Plastic Limit	Liquid Limit	Plasticity Index
25791	ST-001C Black Creek Clay Test Pad 1st Lift	19	37	18



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	5/16/2011	Tested By:	ema
End Date:	5/18/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-002A		
Depth:	---		
Visual Description:	Moist, olive brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: 8/9/3
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 28.8%.

Parameter	Initial	Final
Height, in	2.36	2.30
Diameter, in	2.88	2.80
Area, in ²	6.51	6.16
Volume, in ³	15.4	14.2
Mass, g	481	475
Bulk Density, pcf	119	127
Moisture Content, %	26.1	24.4
Dry Density, pcf	94.3	102
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.1 Pressure Increment, psi: 5.02
 Sample Pressure, psi: 74.1 B Coefficient: 0.98

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
5/17	2	90	69	11.0	10.9	0.1	80	23.7	4.2E-08	20	1.000	4.2E-08
5/17	3	90	69	11.0	10.9	0.1	83	23.7	4.0E-08	20	1.000	4.0E-08
5/17	4	90	69	11.0	10.9	0.1	86	23.7	3.9E-08	20	1.000	3.9E-08
5/17	5	90	69	11.0	10.9	0.1	88	23.7	3.8E-08	20	1.000	3.8E-08

PERMEABILITY AT 20° C: 4.0×10^{-8} cm/sec (@ 21 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	6/8/2011	Tested By:	md/ema
End Date:	6/13/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-003A		
Depth:	---		
Visual Description:	Moist, olive brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: 9/23
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 21.4%.

Parameter	Initial	Final
Height, in	2.51	2.47
Diameter, in	2.82	2.83
Area, in ²	6.25	6.29
Volume, in ³	15.7	15.5
Mass, g	529	528
Bulk Density, pcf	128	129
Moisture Content, %	20.0	19.7
Dry Density, pcf	107	108
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.0 Pressure Increment, psi: 5.04
 Sample Pressure, psi: 72.3 B Coefficient: 0.91

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
6/10	1	90.0	69.2	9.0	8.9	0.1	242	18.1	1.8E-08	20	1.000	1.8E-08
6/10	2	90.0	69.2	9.0	8.9	0.1	260	18.1	1.7E-08	20	1.000	1.7E-08
6/10	3	90.0	69.2	9.0	8.9	0.1	277	18.1	1.6E-08	20	1.000	1.6E-08
6/10	4	90.0	69.2	9.0	8.9	0.1	285	18.1	1.5E-08	20	1.000	1.5E-08

PERMEABILITY AT 20° C: 1.6×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/28/2011	Tested By:	md/ema
End Date:	8/1/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-004A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	6/8/2
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 19.3%.		

Parameter	Initial	Final
Height, in	2.56	2.45
Diameter, in	2.85	2.79
Area, in ²	6.38	6.11
Volume, in ³	16.3	15.0
Mass, g	541	530
Bulk Density, pcf	126	135
Moisture Content, %	19.3	17.0
Dry Density, pcf	106	115
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	94.8	Pressure Increment, psi:	4.96
Sample Pressure, psi:	73.9	B Coefficient:	0.89
*B value did not increase with increase in pressure			

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
7/29	2	90.0	69.2	10.0	9.9	0.1	319	20.2	1.2E-08	20	1.000	1.2E-08
7/29	3	90.0	69.2	10.0	9.9	0.1	355	20.2	1.1E-08	20	1.000	1.1E-08
7/29	4	90.0	69.2	10.0	9.9	0.1	394	20.2	1.0E-08	20	1.000	1.0E-08
7/29	5	90.0	69.2	10.0	9.9	0.1	412	20.2	9.6E-09	20	1.000	9.6E-09

PERMEABILITY AT 20° C: 1.1×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/28/2011	Tested By:	md/ema
End Date:	8/1/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-005A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	3\9
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 21.9%.		

Parameter	Initial	Final
Height, in	2.39	2.25
Diameter, in	2.75	2.75
Area, in ²	5.94	5.94
Volume, in ³	14.2	13.4
Mass, g	482	473
Bulk Density, pcf	129	134
Moisture Content, %	19.1	16.9
Dry Density, pcf	108	115
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.4	Pressure Increment, psi:	5.06
Sample Pressure, psi:	74.3	B Coefficient:	0.96

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
7/29	3	90.0	69.2	9.0	8.9	0.1	160	19.8	2.6E-08	20	1.000	2.6E-08
7/29	4	90.0	69.2	9.0	8.9	0.1	176	19.8	2.4E-08	20	1.000	2.4E-08
7/29	5	90.0	69.2	9.0	8.9	0.1	181	19.8	2.3E-08	20	1.000	2.3E-08
7/29	6	90.0	69.2	9.0	8.9	0.1	183	19.8	2.3E-08	20	1.000	2.3E-08

PERMEABILITY AT 20° C: 2.4×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/28/2011	Tested By:	md/ema
End Date:	8/1/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-006A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	12/12/2
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 21.8%.		

Parameter	Initial	Final
Height, in	2.58	2.49
Diameter, in	2.87	2.86
Area, in ²	6.47	6.42
Volume, in ³	16.7	16.0
Mass, g	552	540
Bulk Density, pcf	126	128
Moisture Content, %	21.9	19.3
Dry Density, pcf	103	108
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	94.8	Pressure Increment, psi:	8.00
Sample Pressure, psi:	74.0	B Coefficient:	0.95
*B value did not increase with increase in pressure			

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
7/29	1	90.0	69.2	10.0	9.9	0.1	226	19.9	1.7E-08	20	1.000	1.7E-08
7/29	2	90.0	69.2	10.0	9.9	0.1	257	19.9	1.5E-08	20	1.000	1.5E-08
7/29	3	90.0	69.2	10.0	9.9	0.1	274	19.9	1.4E-08	20	1.000	1.4E-08
7/29	4	90.0	69.2	10.0	9.9	0.1	289	19.9	1.3E-08	20	1.000	1.3E-08

PERMEABILITY AT 20° C: 1.5×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/28/2011	Tested By:	md/ema
End Date:	8/1/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-007A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	4/23
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 17.8%.		

Parameter	Initial	Final
Height, in	2.39	2.32
Diameter, in	2.84	2.84
Area, in ²	6.33	6.33
Volume, in ³	15.1	14.7
Mass, g	511	507
Bulk Density, pcf	128	131
Moisture Content, %	18.8	17.7
Dry Density, pcf	108	111
Degree of Saturation, %	---	97

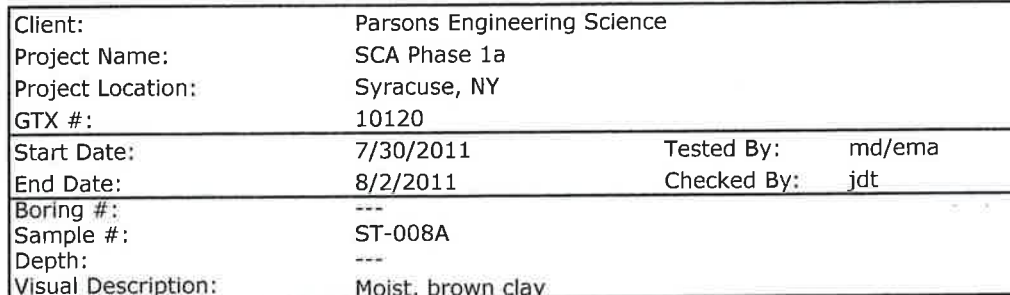
B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.02
Sample Pressure, psi:	74.7	B Coefficient:	1.00

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
7/29	2	90.0	69.2	10.0	9.9	0.1	53	21.4	6.8E-08	20	1.000	6.8E-08
7/29	3	90.0	69.2	10.0	9.9	0.1	55	21.4	6.6E-08	20	1.000	6.6E-08
7/29	4	90.0	69.2	10.0	9.9	0.1	55	21.4	6.6E-08	20	1.000	6.6E-08
7/29	5	90.0	69.2	10.0	9.9	0.1	56	21.4	6.5E-08	20	1.000	6.5E-08

PERMEABILITY AT 20° C: 6.6×10^{-8} cm/sec (@ 20.8 psi effective stress)



Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	---
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 16.9%.		

Parameter	Initial	Final
Height, in	2.21	2.18
Diameter, in	2.84	2.81
Area, in ²	6.33	6.20
Volume, in ³	14.0	13.5
Mass, g	477	471
Bulk Density, pcf	129	132
Moisture Content, %	19.6	18.1
Dry Density, pcf	108	112
Degree of Saturation, %	---	99

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.10
Sample Pressure, psi:	74.1	B Coefficient:	0.95

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	9.0	8.9	0.1	147	20.5	2.6E-08	20	1.000	2.6E-08
8/1	2	90.0	69.2	9.0	8.9	0.1	152	20.5	2.5E-08	20	1.000	2.5E-08
8/1	3	90.0	69.2	9.0	8.9	0.1	185	20.5	2.1E-08	20	1.000	2.1E-08
8/1	4	90.0	69.2	9.0	8.9	0.1	197	20.5	2.0E-08	20	1.000	2.0E-08

PERMEABILITY AT 20° C: 2.3×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/30/2011	Tested By:	md/ema
End Date:	8/2/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-009A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: ---
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content.
 Trimmings moisture content = 18.0%.

Parameter	Initial	Final
Height, in	2.03	1.96
Diameter, in	2.84	2.80
Area, in ²	6.33	6.16
Volume, in ³	12.9	12.1
Mass, g	441	434
Bulk Density, pcf	130	137
Moisture Content, %	19.5	17.6
Dry Density, pcf	109	116
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.0 Pressure Increment, psi: 5.00
 Sample Pressure, psi: 74.0 B Coefficient: 0.95

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	9.0	8.9	0.1	298	22.8	1.2E-08	20	1.000	1.2E-08
8/1	2	90.0	69.2	9.0	8.9	0.1	340	22.8	1.0E-08	20	1.000	1.0E-08
8/1	3	90.0	69.2	9.0	8.9	0.1	370	22.8	9.4E-09	20	1.000	9.4E-09
8/1	4	90.0	69.2	9.0	8.9	0.1	374	22.8	9.3E-09	20	1.000	9.3E-09

PERMEABILITY AT 20° C: 1.0×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/30/2011	Tested By:	md/ema
End Date:	8/2/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0010A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
Orientation: Vertical Cell #: ---
Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 16.6%.

Parameter	Initial	Final
Height, in	2.55	2.49
Diameter, in	2.84	2.82
Area, in ²	6.33	6.25
Volume, in ³	16.2	15.6
Mass, g	556	550
Bulk Density, pcf	131	134
Moisture Content, %	18.5	17.1
Dry Density, pcf	110	115
Degree of Saturation, %	---	99

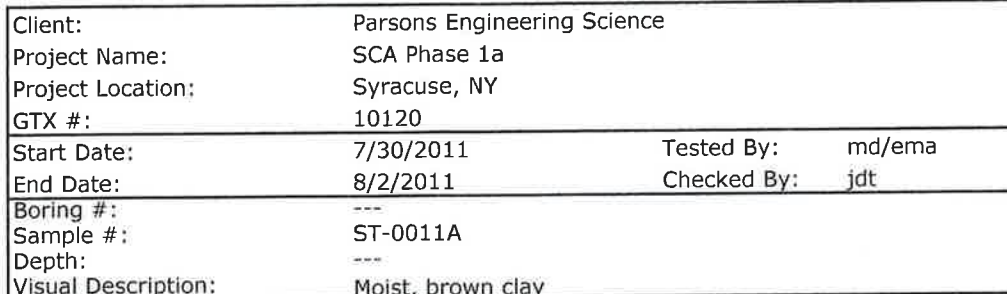
B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.1 Pressure Increment, psi: 5.10
Sample Pressure, psi: 74.1 B Coefficient: 0.96

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	10.0	9.9	0.1	308	19.9	1.3E-08	20	1.000	1.3E-08
8/1	2	90.0	69.2	10.0	9.9	0.1	337	19.9	1.2E-08	20	1.000	1.2E-08
8/1	3	90.0	69.2	10.0	9.9	0.1	364	19.9	1.1E-08	20	1.000	1.1E-08
8/1	4	90.0	69.2	10.0	9.9	0.1	380	19.9	1.0E-08	20	1.000	1.0E-08

PERMEABILITY AT 20° C: 1.1×10^{-8} cm/sec (@ 20.8 psi effective stress)



Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	---
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 18.9%.		

Parameter	Initial	Final
Height, in	2.30	2.27
Diameter, in	2.85	2.78
Area, in ²	6.38	6.07
Volume, in ³	14.7	13.8
Mass, g	477	472
Bulk Density, pcf	124	130
Moisture Content, %	21.0	19.7
Dry Density, pcf	102	109
Degree of Saturation, %	---	98

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	9.0	8.9	0.1	304	19.7	1.3E-08	20	1.000	1.3E-08
8/1	2	90.0	69.2	9.0	8.9	0.1	324	19.7	1.3E-08	20	1.000	1.3E-08
8/1	3	90.0	69.2	9.0	8.9	0.1	326	19.7	1.3E-08	20	1.000	1.3E-08
8/1	4	90.0	69.2	9.0	8.9	0.1	355	19.7	1.2E-08	20	1.000	1.2E-08

PERMEABILITY AT 20° C: 1.3×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/30/2011	Tested By:	md/ema
End Date:	8/2/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0012A		
Depth:	---		
Visual Description:	Moist, brown and gray clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	---
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 24.2%.		

Parameter	Initial	Final
Height, in	2.63	2.58
Diameter, in	2.83	2.82
Area, in ²	6.29	6.25
Volume, in ³	16.5	16.1
Mass, g	554	540
Bulk Density, pcf	127	127
Moisture Content, %	23.4	20.4
Dry Density, pcf	103	106
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.0	Pressure Increment, psi:	5.00
Sample Pressure, psi:	74.1	B Coefficient:	0.98

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	10.0	9.9	0.1	186	19.2	2.2E-08	20	1.000	2.2E-08
8/1	2	90.0	69.2	10.0	9.9	0.1	204	19.2	2.0E-08	20	1.000	2.0E-08
8/1	3	90.0	69.2	10.0	9.9	0.1	229	19.2	1.8E-08	20	1.000	1.8E-08
8/1	4	90.0	69.2	10.0	9.9	0.1	243	19.2	1.7E-08	20	1.000	1.7E-08

PERMEABILITY AT 20° C: 1.9×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/30/2011	Tested By:	md/ema
End Date:	8/2/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0013A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: ---
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content.
 Trimmings moisture content = 16.8%.

Parameter	Initial	Final
Height, in	2.60	2.53
Diameter, in	2.85	2.81
Area, in ²	6.38	6.20
Volume, in ³	16.6	15.7
Mass, g	566	557
Bulk Density, pcf	130	135
Moisture Content, %	20.0	18.2
Dry Density, pcf	108	114
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.0 Pressure Increment, psi: 5.10
 Sample Pressure, psi: 74.2 B Coefficient: 0.98

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	10.0	9.9	0.1	434	19.6	9.3E-09	20	1.000	9.3E-09
8/1	2	90.0	69.2	10.0	9.9	0.1	461	19.6	8.7E-09	20	1.000	8.7E-09
8/1	3	90.0	69.2	10.0	9.9	0.1	493	19.6	8.2E-09	20	1.000	8.2E-09
8/1	4	90.0	69.2	10.0	9.9	0.1	517	19.6	7.8E-09	20	1.000	7.8E-09

PERMEABILITY AT 20° C: 8.5×10^{-9} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	7/30/2011	Tested By:	md/ema
End Date:	8/2/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0014A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: ---
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content.
 Trimmings moisture content = 17.1%.

Parameter	Initial	Final
Height, in	2.12	2.03
Diameter, in	2.85	2.82
Area, in ²	6.38	6.25
Volume, in ³	13.5	12.7
Mass, g	458	452
Bulk Density, pcf	129	136
Moisture Content, %	18.9	17.5
Dry Density, pcf	108	115
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.1 Pressure Increment, psi: 5.02
 Sample Pressure, psi: 74.2 B Coefficient: 0.99

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
8/1	1	90.0	69.2	9.0	8.9	0.1	227	22.0	1.6E-08	20	1.000	1.6E-08
8/1	2	90.0	69.2	9.0	8.9	0.1	243	22.0	1.5E-08	20	1.000	1.5E-08
8/1	3	90.0	69.2	9.0	8.9	0.1	250	22.0	1.4E-08	20	1.000	1.4E-08
8/1	4	90.0	69.2	9.0	8.9	0.1	255	22.0	1.4E-08	20	1.000	1.4E-08

PERMEABILITY AT 20° C: 1.5×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	9/14/2011	Tested By:	md/ema
End Date:	9/16/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0015A		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	13/13/12
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 20.3%.		

Parameter	Initial	Final
Height, in	2.50	2.51
Diameter, in	2.85	2.85
Area, in ²	6.38	6.38
Volume, in ³	15.9	16.0
Mass, g	514	526
Bulk Density, pcf	123	125
Moisture Content, %	22.2	24.9
Dry Density, pcf	100	100
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.03
Sample Pressure, psi:	74.0	B Coefficient:	0.96

FLOW DATA

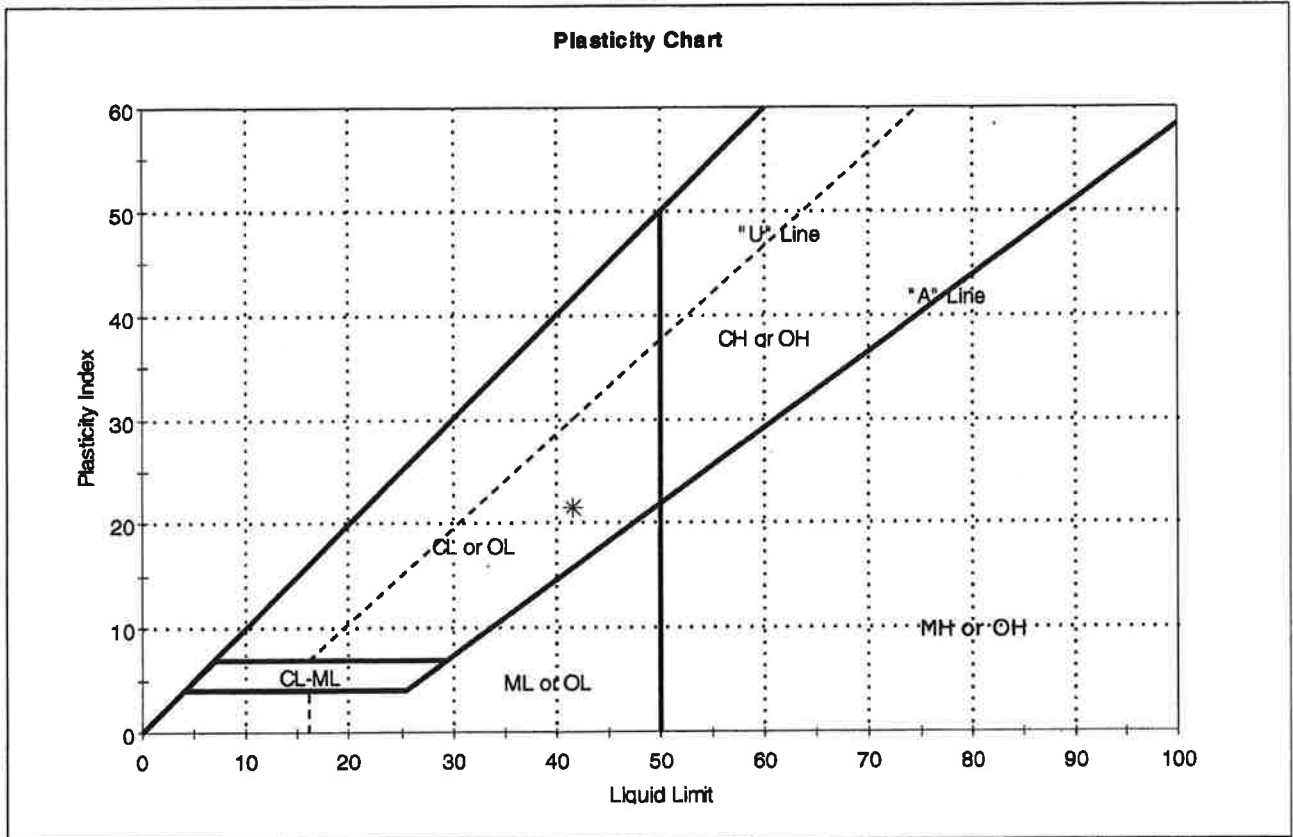
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
9/15	1	90.0	69.2	10.0	9.9	0.1	360	19.8	1.1E-08	20	1.000	1.1E-08
9/15	2	90.0	69.2	10.0	9.9	0.1	292	19.8	1.3E-08	20	1.000	1.3E-08
9/15	3	90.0	69.2	10.0	9.9	0.1	320	19.8	1.2E-08	20	1.000	1.2E-08
9/15	4	90.0	69.2	10.0	9.9	0.1	362	19.8	1.1E-08	20	1.000	1.1E-08

PERMEABILITY AT 20° C: 1.2×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	Tested By: cam
Location: Syracuse, NY	Checked By: jdt
Boring ID: ---	Sample Type: tube
Sample ID: ST-015B	Test Date: 11/03/11
Depth: ---	Test Id: 221958
Test Comment: ---	
Sample Description: Moist, brown clay	
Sample Comment: ---	

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-015B	---	---	20	42	20	22	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	9/14/2011	Tested By:	md/ema
End Date:	9/16/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0016A		
Depth:	---		
Visual Description:	Moist, mottled gray and olive brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	1/32/1
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 27.5%.		

Parameter	Initial	Final
Height, in	2.09	2.00
Diameter, in	2.81	2.80
Area, in ²	6.20	6.16
Volume, in ³	13.0	12.3
Mass, g	415	409
Bulk Density, pcf	122	126
Moisture Content, %	26.3	24.5
Dry Density, pcf	96.3	101
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	4.98
Sample Pressure, psi:	73.5	B Coefficient:	0.99

FLOW DATA

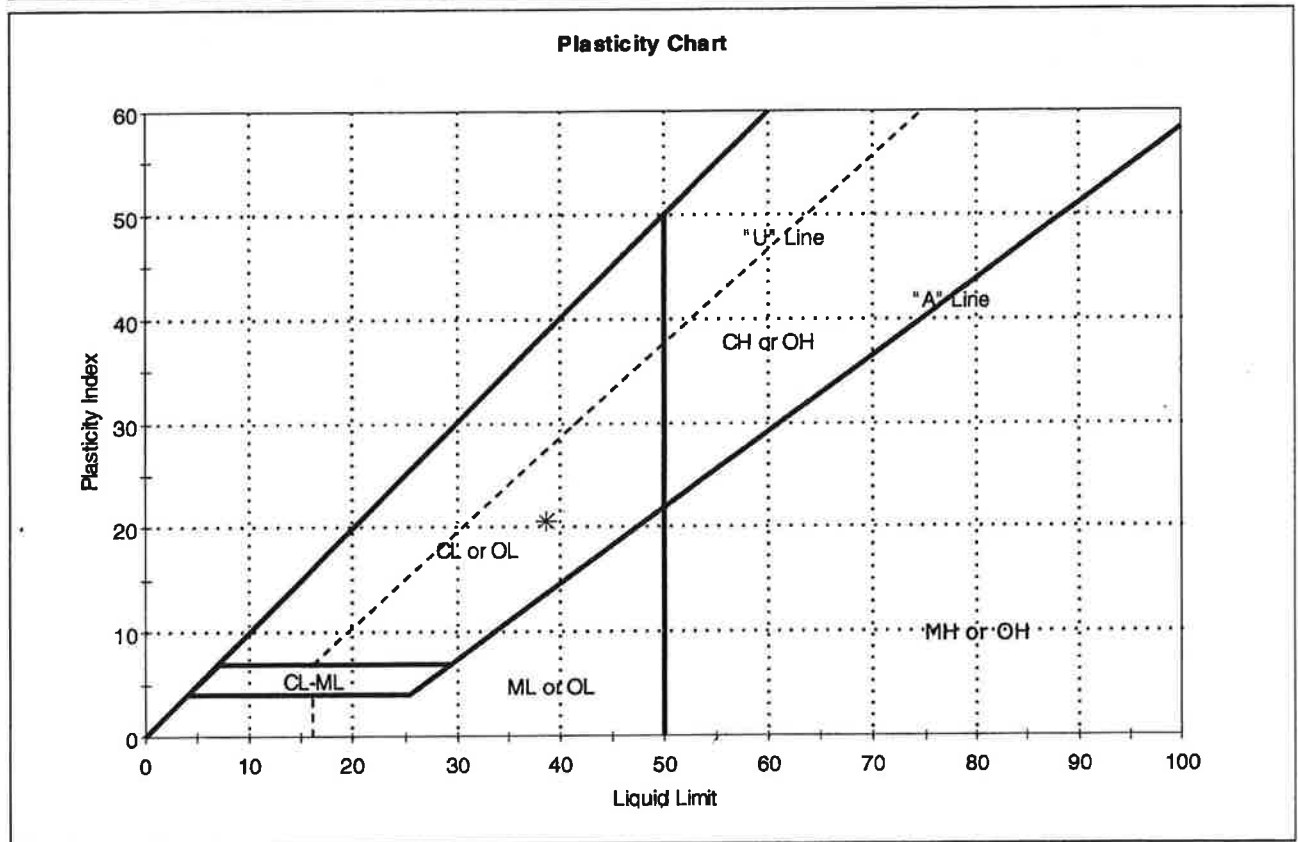
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
9/15	4	90.0	69.2	10.0	9.9	0.1	305	24.8	1.1E-08	20	1.000	1.1E-08
9/15	5	90.0	69.2	10.0	9.9	0.1	260	24.8	1.2E-08	20	1.000	1.2E-08
9/15	6	90.0	69.2	10.0	9.9	0.1	269	24.8	1.2E-08	20	1.000	1.2E-08
9/15	7	90.0	69.2	10.0	9.9	0.1	276	24.8	1.2E-08	20	1.000	1.2E-08

PERMEABILITY AT 20° C: 1.2×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: tube	Tested By:	cam
Sample ID:ST-016B	Test Date: 11/03/11	Checked By:	jdt
Depth : ---	Test Id: 221959		
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-016B	---	---	22	39	18	21	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	9/22/2011	Tested By:	md/ema
End Date:	9/26/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0017		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	1/23/1
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 19%.		

Parameter	Initial	Final
Height, in	2.22	2.20
Diameter, in	2.82	2.80
Area, in ²	6.25	6.16
Volume, in ³	13.9	13.5
Mass, g	458	456
Bulk Density, pcf	126	128
Moisture Content, %	20.3	19.8
Dry Density, pcf	104	107
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.03
Sample Pressure, psi:	74.0	B Coefficient:	0.97

FLOW DATA

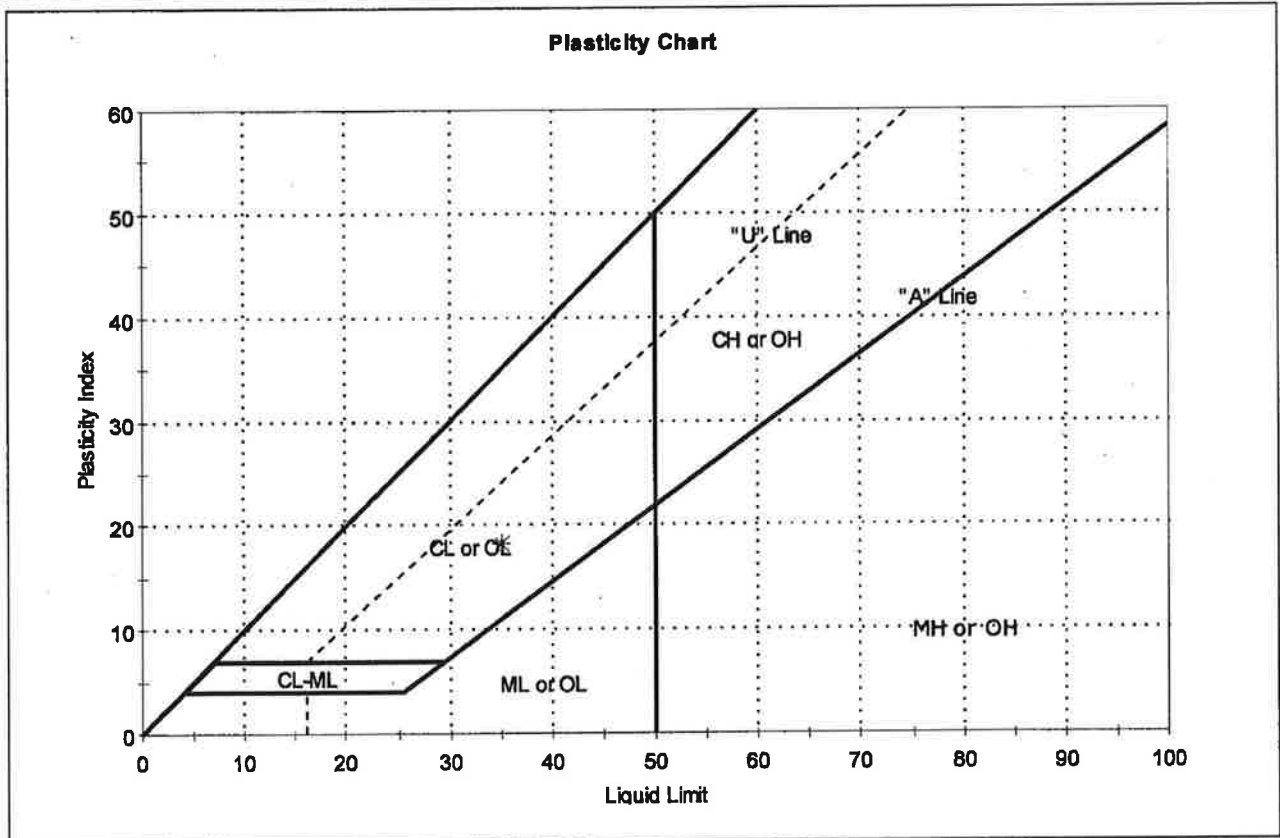
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
9/26	2	90.0	69.2	10.0	9.9	0.1	215	22.5	1.6E-08	20	1.000	1.6E-08
9/26	3	90.0	69.2	10.0	9.9	0.1	236	22.5	1.5E-08	20	1.000	1.5E-08
9/26	4	90.0	69.2	10.0	9.9	0.1	269	22.5	1.3E-08	20	1.000	1.3E-08
9/26	5	90.0	69.2	10.0	9.9	0.1	277	22.5	1.3E-08	20	1.000	1.3E-08

PERMEABILITY AT 20° C: 1.4×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	tube
Sample ID:	ST-017	Test Date:	10/04/11
Depth:	---	Test Id:	218448
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-017	---	---	19	35	17	18	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	9/22/2011	Tested By:	md/ema
End Date:	9/26/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0018		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	9/2/23
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 22.4%.		

Parameter	Initial	Final
Height, in	2.24	2.20
Diameter, in	2.84	2.82
Area, in ²	6.33	6.25
Volume, in ³	14.2	13.7
Mass, g	470	468
Bulk Density, pcf	126	130
Moisture Content, %	20.0	19.5
Dry Density, pcf	105	108
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.01
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

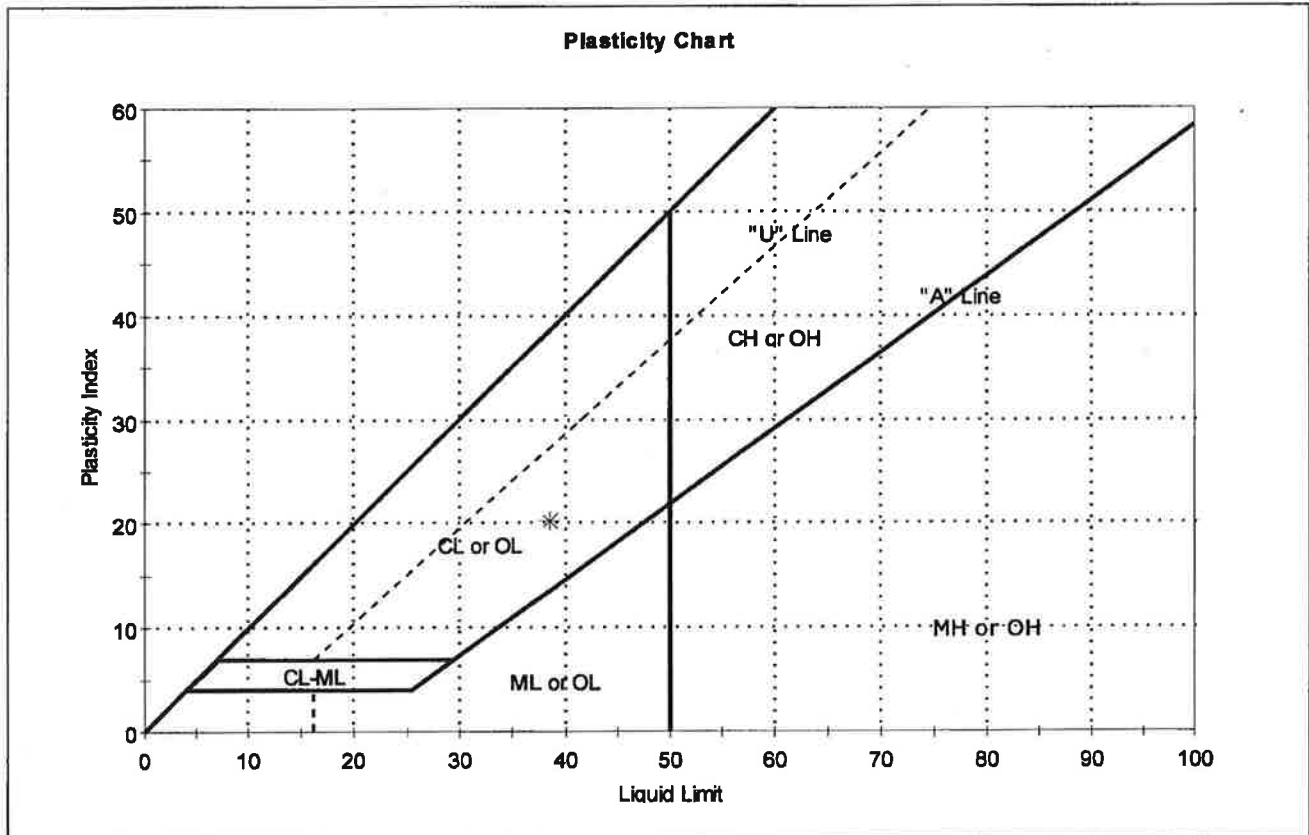
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
9/26	1	90.0	69.2	10.0	9.9	0.1	429	22.5	8.1E-09	20	1.000	8.1E-09
9/26	2	90.0	69.2	10.0	9.9	0.1	475	22.5	7.3E-09	20	1.000	7.3E-09
9/26	3	90.0	69.2	10.0	9.9	0.1	511	22.5	6.8E-09	20	1.000	6.8E-09
9/26	4	90.0	69.2	10.0	9.9	0.1	534	22.5	6.5E-09	20	1.000	6.5E-09

PERMEABILITY AT 20° C: 7.2×10^{-9} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	tube
Sample ID:	ST-018	Test Date:	10/04/11
Depth:	---	Test Id:	218449
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-018	---	---	22	38	18	20	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	9/22/2011	Tested By:	md/ema
End Date:	9/26/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0019		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	15/1/7
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 20%.		

Parameter	Initial	Final
Height, in	2.12	2.09
Diameter, in	2.85	2.87
Area, in ²	6.38	6.47
Volume, in ³	13.5	13.5
Mass, g	481	471
Bulk Density, pcf	135	133
Moisture Content, %	21.6	19.2
Dry Density, pcf	111	111
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	94.1	Pressure Increment, psi:	5.07
Sample Pressure, psi:	74.1	B Coefficient:	0.96

FLOW DATA

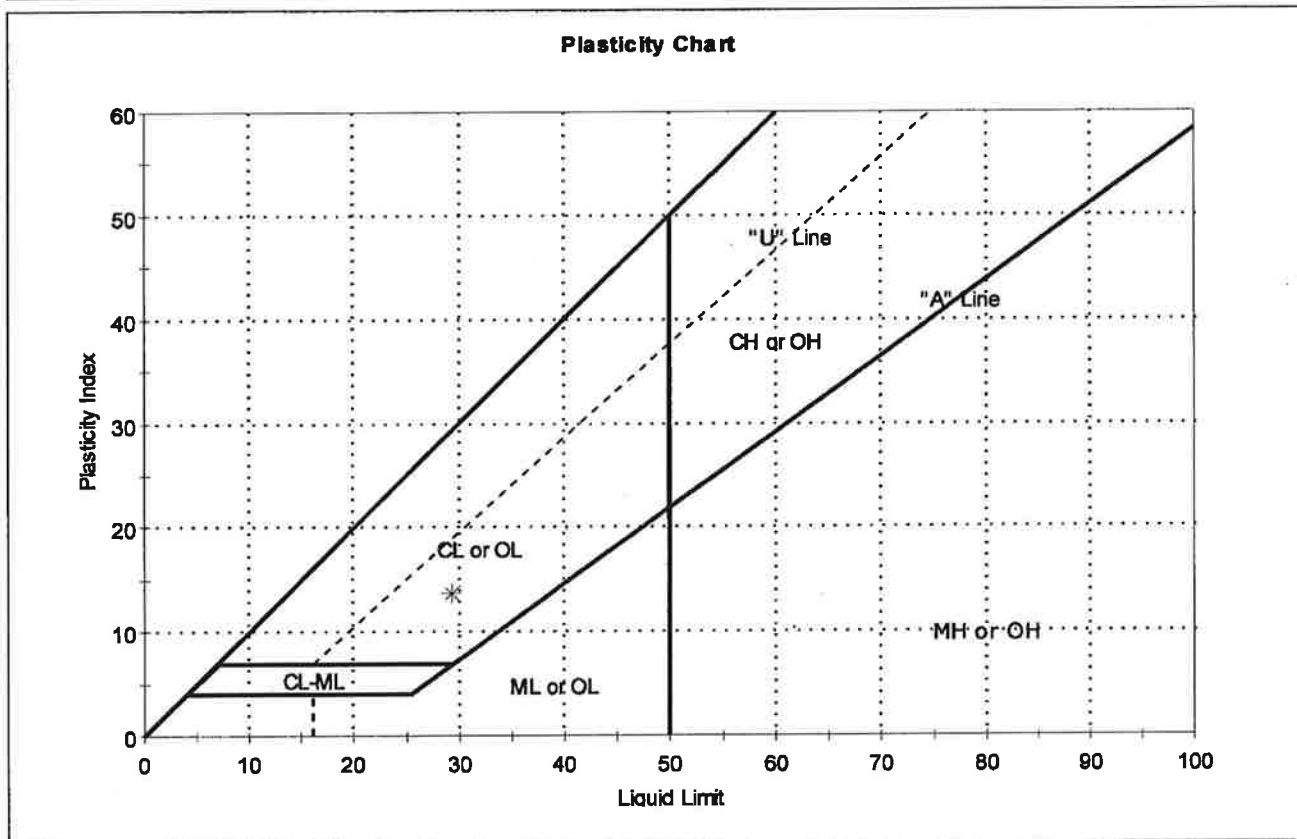
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
9/26	2	90.0	69.2	10.0	9.9	0.1	330	23.7	9.7E-09	20	1.000	9.7E-09
9/26	3	90.0	69.2	10.0	9.9	0.1	363	23.7	8.8E-09	20	1.000	8.8E-09
9/26	4	90.0	69.2	10.0	9.9	0.1	379	23.7	8.4E-09	20	1.000	8.4E-09
9/26	5	90.0	69.2	10.0	9.9	0.1	411	23.7	7.8E-09	20	1.000	7.8E-09

PERMEABILITY AT 20° C: 8.6×10^{-9} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	tube
Sample ID:	ST-019	Test Date:	10/03/11
Depth:	---	Test Id:	218450
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-019	---	---	20	29	16	13	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	9/22/2011	Tested By:	md/ema
End Date:	9/26/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-0020		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	11/11/11
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 20.6%.		

Parameter	Initial	Final
Height, in	2.31	2.25
Diameter, in	2.82	2.80
Area, in ²	6.25	6.16
Volume, in ³	14.4	13.9
Mass, g	489	479
Bulk Density, pcf	129	131
Moisture Content, %	21.3	18.7
Dry Density, pcf	106	111
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.5	Pressure Increment, psi:	5.10
Sample Pressure, psi:	74.1	B Coefficient:	0.95

FLOW DATA

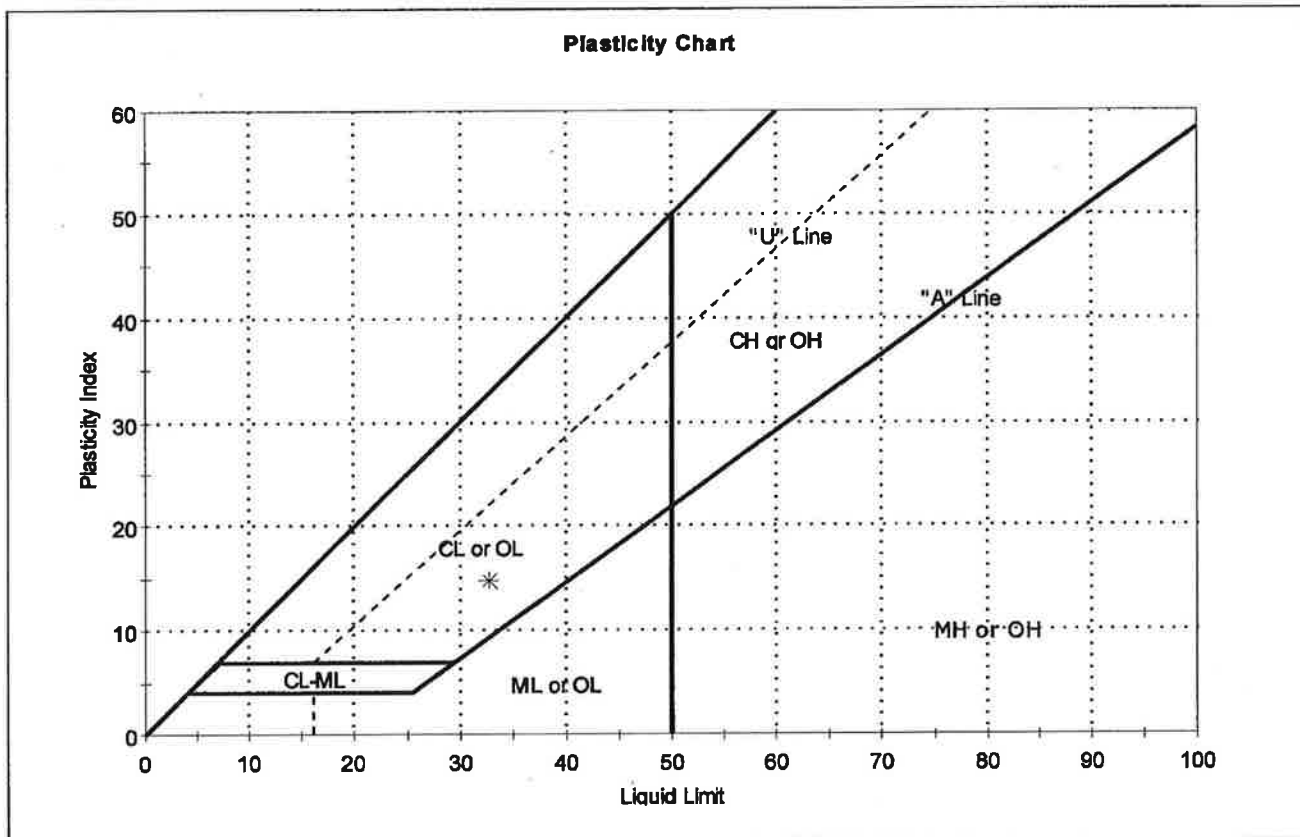
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
9/26	1	90.0	69.2	10.0	9.9	0.1	287	22.0	1.3E-08	20	1.000	1.3E-08
9/26	2	90.0	69.2	10.0	9.9	0.1	294	22.0	1.2E-08	20	1.000	1.2E-08
9/26	3	90.0	69.2	10.0	9.9	0.1	300	22.0	1.2E-08	20	1.000	1.2E-08
9/26	4	90.0	69.2	10.0	9.9	0.1	300	22.0	1.2E-08	20	1.000	1.2E-08

PERMEABILITY AT 20° C: 1.2×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	tube
Sample ID:	ST-020	Test Date:	10/03/11
Depth :	---	Test Id:	218451
Test Comment:	---		
Sample Description:	Moist, brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-020	---	---	21	33	18	15	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: ---	Tested By: jef	
Sample ID:---	Test Date: 10/19/11	Checked By: jdt	
Depth : ---	Sample Id: ---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content, %
---	ST-021	---	Moist, reddish brown clay	20.6
---	ST-022	---	Moist, reddish brown clay	19.4
---	ST-023	---	Moist, brown clay	22.4
---	ST-024	---	Moist, reddish brown clay	19.4
---	ST-025	---	Moist, reddish brown clay	18
---	ST-026	---	Moist, reddish brown clay	23
---	ST-027	---	Moist, reddish brown clay	20.5
---	ST-028	---	Moist, dark gray clay	17.4

Notes: Temperature of Drying : 110° Celsius



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-021		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	9/2/23
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 21.5%.		

Parameter	Initial	Final
Height, in	1.77	1.67
Diameter, in	2.80	2.83
Area, in ²	6.16	6.29
Volume, in ³	10.9	10.5
Mass, g	359	355
Bulk Density, pcf	125	129
Moisture Content, %	19.2	17.9
Dry Density, pcf	105	109
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.05
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

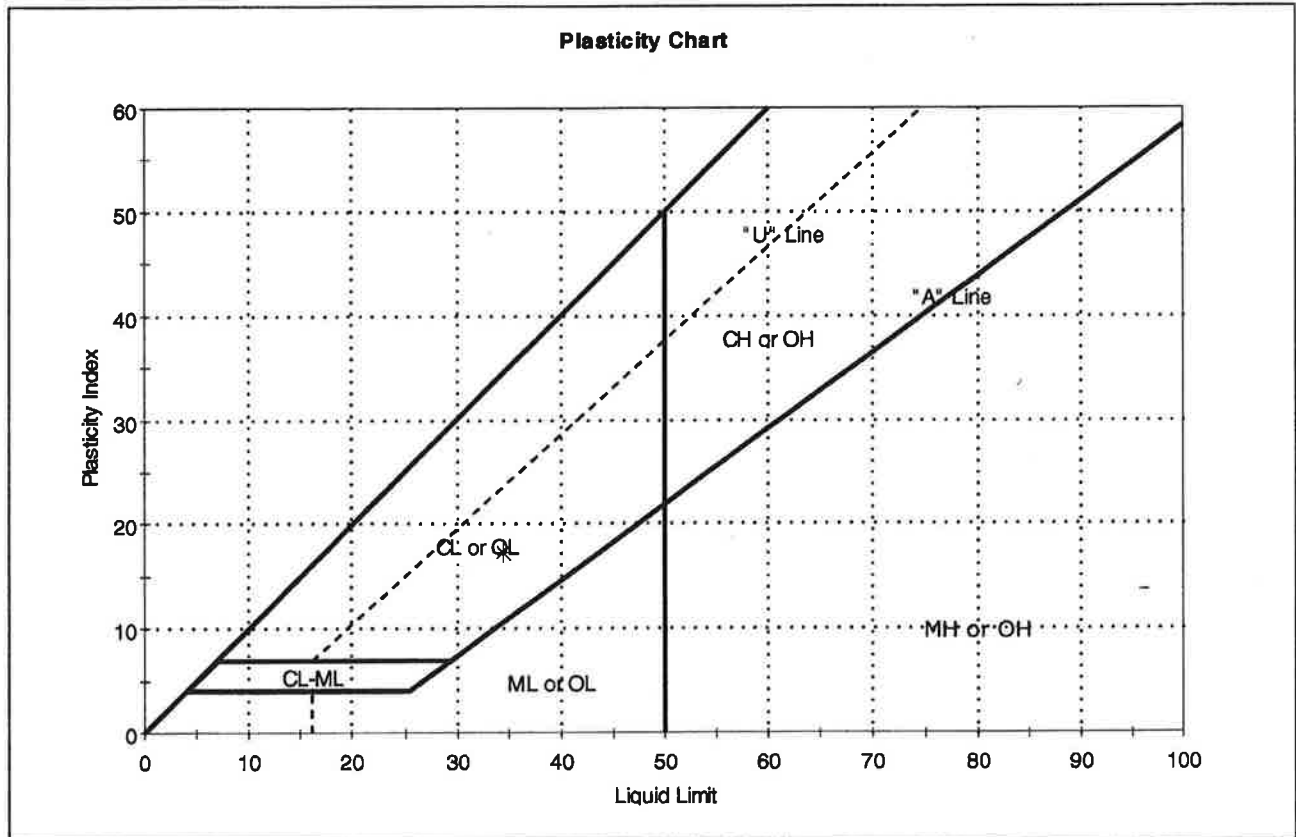
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	2	90.0	69.2	10.0	9.9	0.1	203	29.7	1.3E-08	20	1.000	1.3E-08
10/8	3	90.0	69.2	10.0	9.9	0.1	226	29.7	1.2E-08	20	1.000	1.2E-08
10/8	4	90.0	69.2	10.0	9.9	0.1	249	29.7	1.1E-08	20	1.000	1.1E-08
10/8	5	90.0	69.2	10.0	9.9	0.1	262	29.7	1.0E-08	20	1.000	1.0E-08

PERMEABILITY AT 20° C: 1.1×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: tube	Tested By:	cam
Sample ID:ST-021	Test Date: 10/12/11	Checked By:	jdt
Depth : ---	Test Id: 219905		
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-021	---	---	21	34	17	17	0	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-022		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: 12/3/2
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 18.1%.

Parameter	Initial	Final
Height, in	2.17	2.06
Diameter, in	2.84	2.80
Area, in ²	6.33	6.16
Volume, in ³	13.7	12.7
Mass, g	454	448
Bulk Density, pcf	125	134
Moisture Content, %	20.2	18.6
Dry Density, pcf	104	113
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.0 Pressure Increment, psi: 5.00
 Sample Pressure, psi: 74.0 B Coefficient: 0.96

FLOW DATA

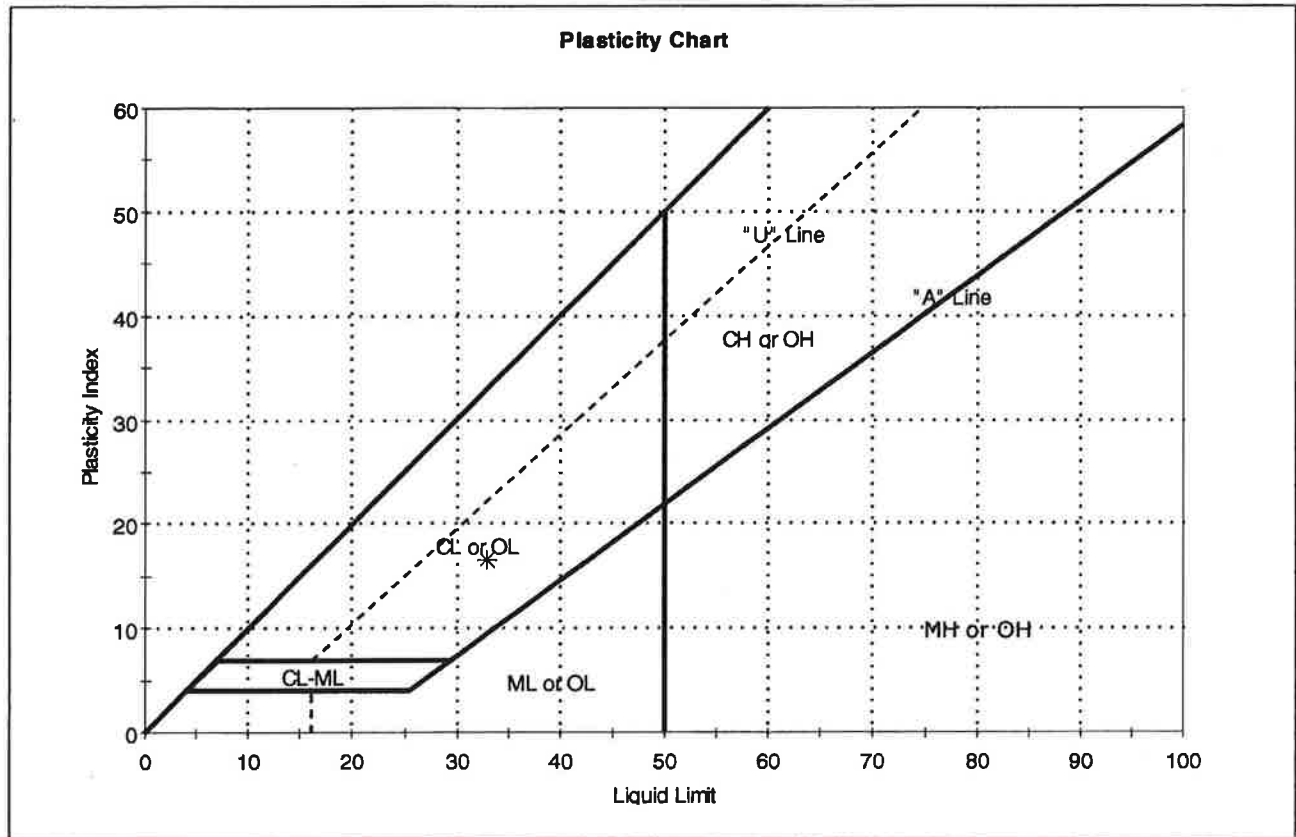
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	1	90.0	69.2	10.0	9.9	0.1	103	24.1	3.2E-08	20	1.000	3.2E-08
10/8	2	90.0	69.2	10.0	9.9	0.1	120	24.1	2.8E-08	20	1.000	2.8E-08
10/8	3	90.0	69.2	10.0	9.9	0.1	122	24.1	2.7E-08	20	1.000	2.7E-08
10/8	4	90.0	69.2	10.0	9.9	0.1	131	24.1	2.5E-08	20	1.000	2.5E-08

PERMEABILITY AT 20° C: 2.8×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: tube	Tested By:	cam
Sample ID:ST-022	Test Date: 10/12/11	Checked By:	jdt
Depth : ---	Test Id: 219906		
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-022	---	---	19	33	16	17	0	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-023		
Depth:	---		
Visual Description:	Moist, brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type: tube Permeant Fluid: de-aired tap water
 Orientation: Vertical Cell #: 8/9/3
 Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 17.9%.

Parameter	Initial	Final
Height, in	2.22	2.16
Diameter, in	2.88	2.85
Area, in ²	6.51	6.38
Volume, in ³	14.5	13.8
Mass, g	478	480
Bulk Density, pcf	126	132
Moisture Content, %	18.8	19.1
Dry Density, pcf	106	111
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.1 Pressure Increment, psi: 5.03
 Sample Pressure, psi: 74.1 B Coefficient: 0.97

FLOW DATA

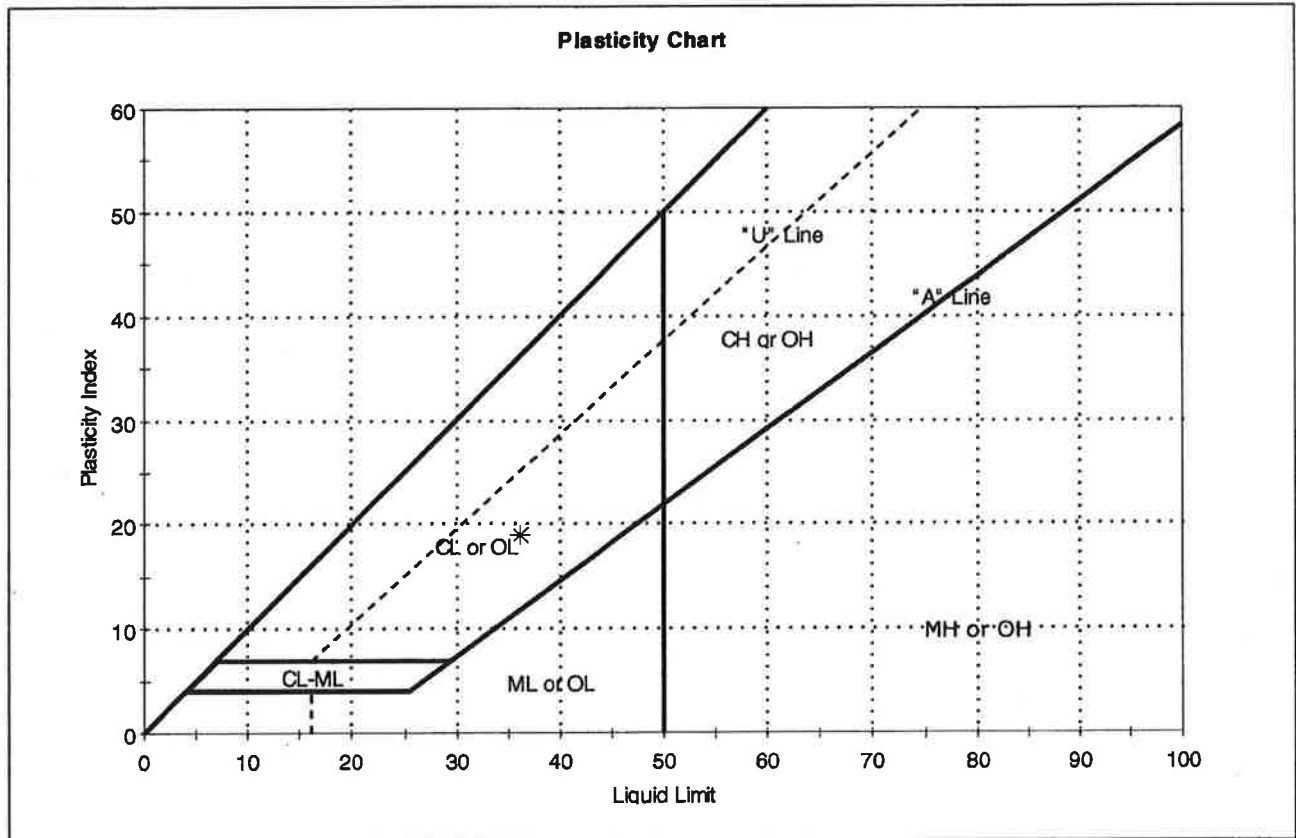
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	1	90.0	69.2	10.0	9.9	0.1	311	23.0	1.1E-08	20	1.000	1.1E-08
10/8	2	90.0	69.2	10.0	9.9	0.1	327	23.0	1.0E-08	20	1.000	1.0E-08
10/8	3	90.0	69.2	10.0	9.9	0.1	343	23.0	9.7E-09	20	1.000	9.7E-09
10/8	4	90.0	69.2	10.0	9.9	0.1	351	23.0	9.5E-09	20	1.000	9.5E-09

PERMEABILITY AT 20° C: 1.0×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	
Location: Syracuse, NY	
Boring ID: ---	Sample Type: tube
Sample ID: ST-023	Test Date: 10/13/11
Depth: ---	Test Id: 219907
Test Comment: ---	Tested By: cam
Sample Description: Moist, brown clay	Checked By: jdt
Sample Comment: ---	

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-023	---	---	22	36	17	19	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-024		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	15/1/7
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 19.5%.		

Parameter	Initial	Final
Height, in	2.14	2.10
Diameter, in	2.80	2.79
Area, in ²	6.16	6.11
Volume, in ³	13.2	12.8
Mass, g	442	436
Bulk Density, pcf	128	129
Moisture Content, %	19.8	18.2
Dry Density, pcf	106	109
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.07
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

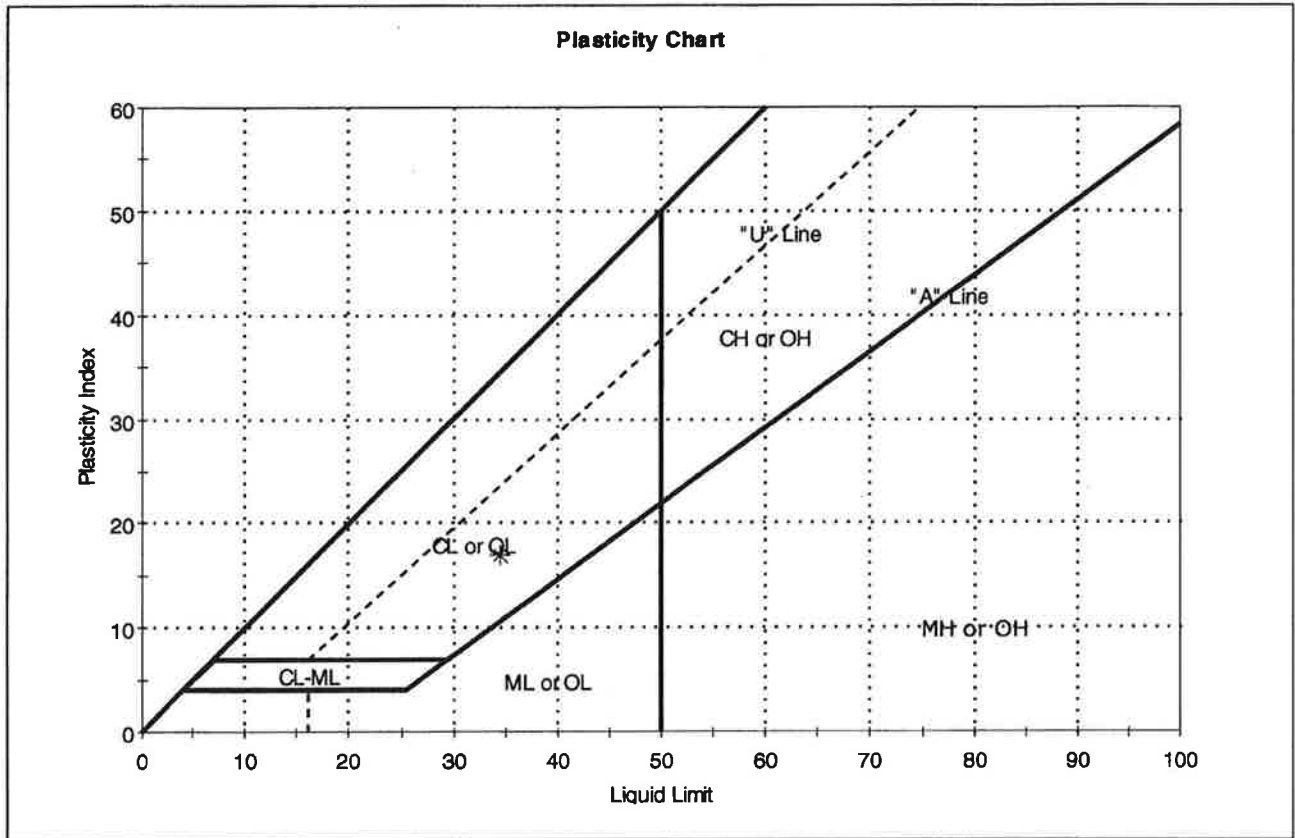
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	1	90.0	69.2	10.0	9.9	0.1	338	23.6	1.0E-08	20	1.000	1.0E-08
10/8	2	90.0	69.2	10.0	9.9	0.1	388	23.6	8.7E-09	20	1.000	8.7E-09
10/8	3	90.0	69.2	10.0	9.9	0.1	408	23.6	8.3E-09	20	1.000	8.3E-09
10/8	4	90.0	69.2	10.0	9.9	0.1	431	23.6	7.9E-09	20	1.000	7.9E-09

PERMEABILITY AT 20° C: 8.7×10^{-9} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	cam
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	tube
Sample ID:	ST-024	Test Date:	10/16/11
Depth:	---	Test Id:	219908
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-024	---	---	19	34	18	16	0	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-025		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	13/13/12
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 21.5%.		

Parameter	Initial	Final
Height, in	1.77	1.77
Diameter, in	2.78	2.74
Area, in ²	6.07	5.90
Volume, in ³	10.7	10.4
Mass, g	379	373
Bulk Density, pcf	134	136
Moisture Content, %	20.0	17.9
Dry Density, pcf	112	115
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.4	Pressure Increment, psi:	4.98
Sample Pressure, psi:	74.1	B Coefficient:	0.98

FLOW DATA

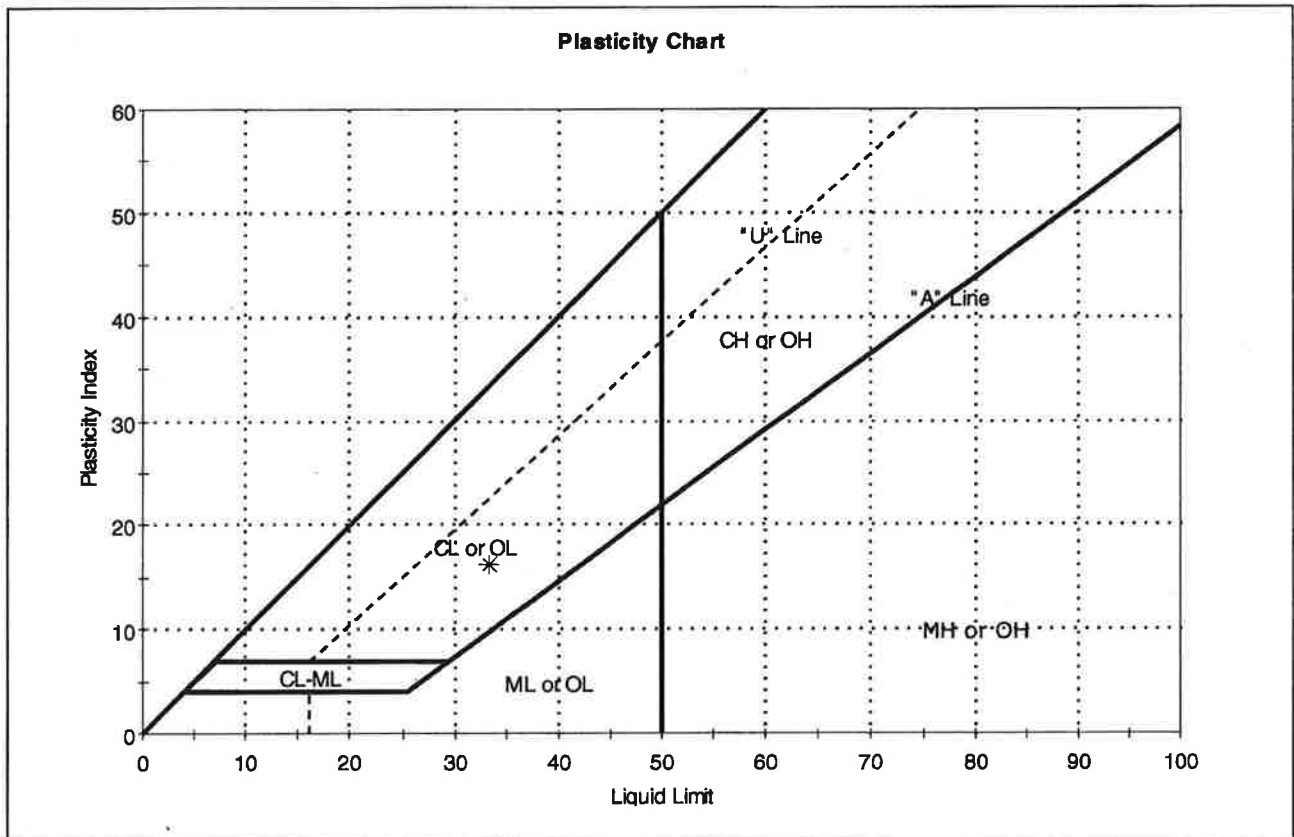
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	1	90.0	69.2	9.0	8.9	0.1	486	25.2	6.8E-09	20	1.000	6.8E-09
10/8	2	90.0	69.2	9.0	8.9	0.1	540	25.2	6.1E-09	20	1.000	6.1E-09
10/8	3	90.0	69.2	9.0	8.9	0.1	585	25.2	5.6E-09	20	1.000	5.6E-09
10/8	4	90.0	69.2	9.0	8.9	0.1	592	25.2	5.6E-09	20	1.000	5.6E-09

PERMEABILITY AT 20° C: 6.0×10^{-9} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: tube	Tested By:	cam
Sample ID:ST-025	Test Date: 10/13/11	Checked By:	jdt
Depth : ---	Test Id: 219909		
Test Comment:	---		
Sample Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-025	---	---	18	33	17	16	0	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-026		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	1/23/1
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 17.9%.		

Parameter	Initial	Final
Height, in	2.46	2.37
Diameter, in	2.80	2.79
Area, in ²	6.16	6.11
Volume, in ³	15.1	14.5
Mass, g	509	505
Bulk Density, pcf	128	133
Moisture Content, %	17.5	16.7
Dry Density, pcf	109	114
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.04
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

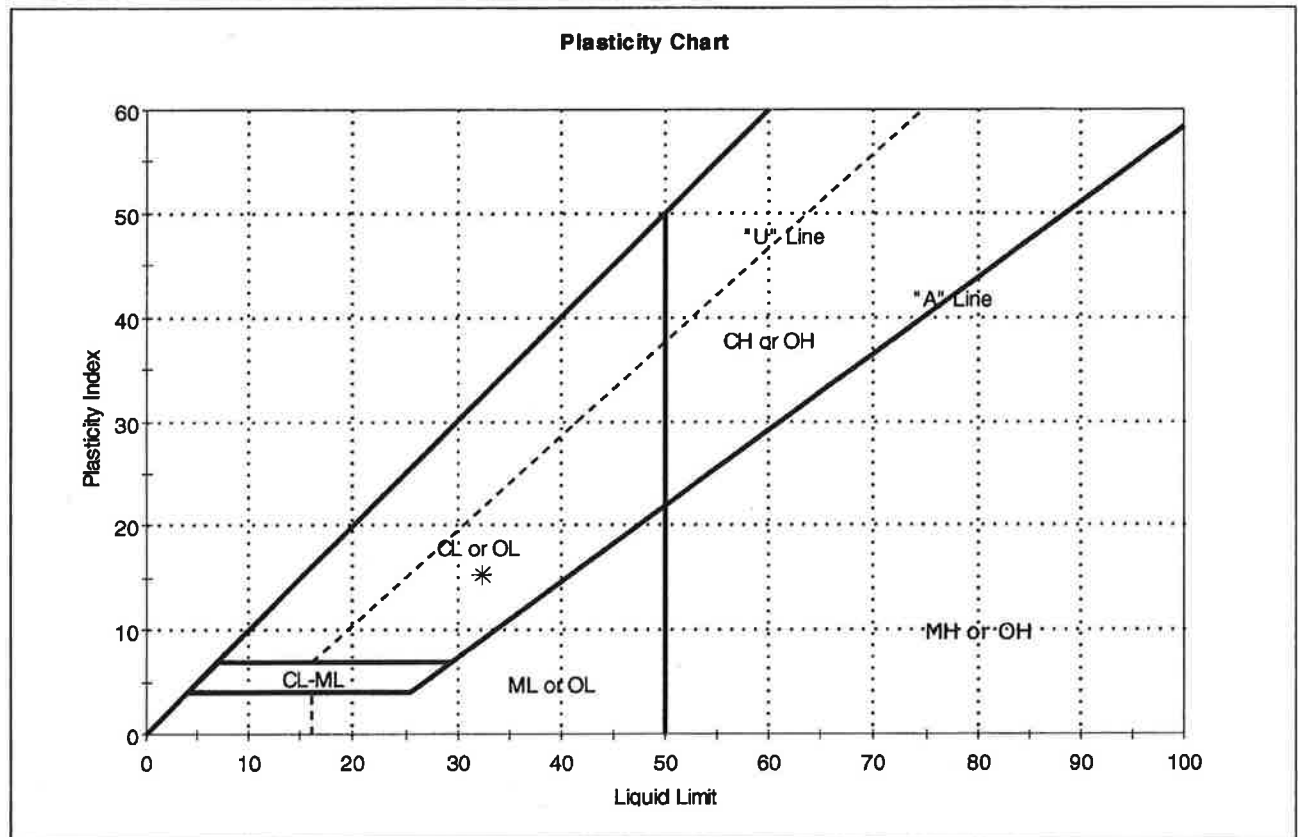
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	1	90.0	69.2	10.0	9.9	0.1	321	20.9	1.2E-08	20	1.000	1.2E-08
10/8	2	90.0	69.2	10.0	9.9	0.1	335	20.9	1.1E-08	20	1.000	1.1E-08
10/8	3	90.0	69.2	10.0	9.9	0.1	339	20.9	1.1E-08	20	1.000	1.1E-08
10/8	4	90.0	69.2	10.0	9.9	0.1	342	20.9	1.1E-08	20	1.000	1.1E-08

PERMEABILITY AT 20° C: 1.2×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: tube	Tested By:	cam
Sample ID:ST-026	Test Date: 10/15/11	Checked By:	jdt
Depth : ---	Test Id: 219910		
Test Comment:	---		
Sample Description:	Molst, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-026	---	---	23	32	17	15	0	

Sample Prepared using the WET method

Dry Strength: HIGH

Dilatancy: SLOW

Toughness: LOW



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-027		
Depth:	---		
Visual Description:	Moist, reddish brown clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	11/11/11
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 17.4%.		

Parameter	Initial	Final
Height, in	1.93	1.90
Diameter, in	2.79	2.75
Area, in ²	6.11	5.94
Volume, in ³	11.8	11.3
Mass, g	399	389
Bulk Density, pcf	129	131
Moisture Content, %	19.9	16.9
Dry Density, pcf	107	112
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.09
Sample Pressure, psi:	74.1	B Coefficient:	0.97

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	2	90.0	69.2	10.0	9.9	0.1	190	26.1	1.7E-08	20	1.000	1.7E-08
10/8	3	90.0	69.2	10.0	9.9	0.1	209	26.1	1.5E-08	20	1.000	1.5E-08
10/8	4	90.0	69.2	10.0	9.9	0.1	233	26.1	1.4E-08	20	1.000	1.4E-08
10/8	5	90.0	69.2	10.0	9.9	0.1	249	26.1	1.3E-08	20	1.000	1.3E-08

PERMEABILITY AT 20° C: 1.4×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	10/7/2011	Tested By:	ema
End Date:	10/11/2011	Checked By:	jdt
Boring #:	---		
Sample #:	ST-028		
Depth:	---		
Visual Description:	Moist, dark gray clay		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084 Constant Volume

Sample Type:	tube	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	3/9
Sample Preparation:	Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 20.2%.		

Parameter	Initial	Final
Height, in	2.34	2.31
Diameter, in	2.85	2.84
Area, in ²	6.38	6.33
Volume, in ³	14.9	14.6
Mass, g	501	502
Bulk Density, pcf	128	130
Moisture Content, %	20.0	20.2
Dry Density, pcf	106	109
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.09
Sample Pressure, psi:	74.1	B Coefficient:	0.96

FLOW DATA

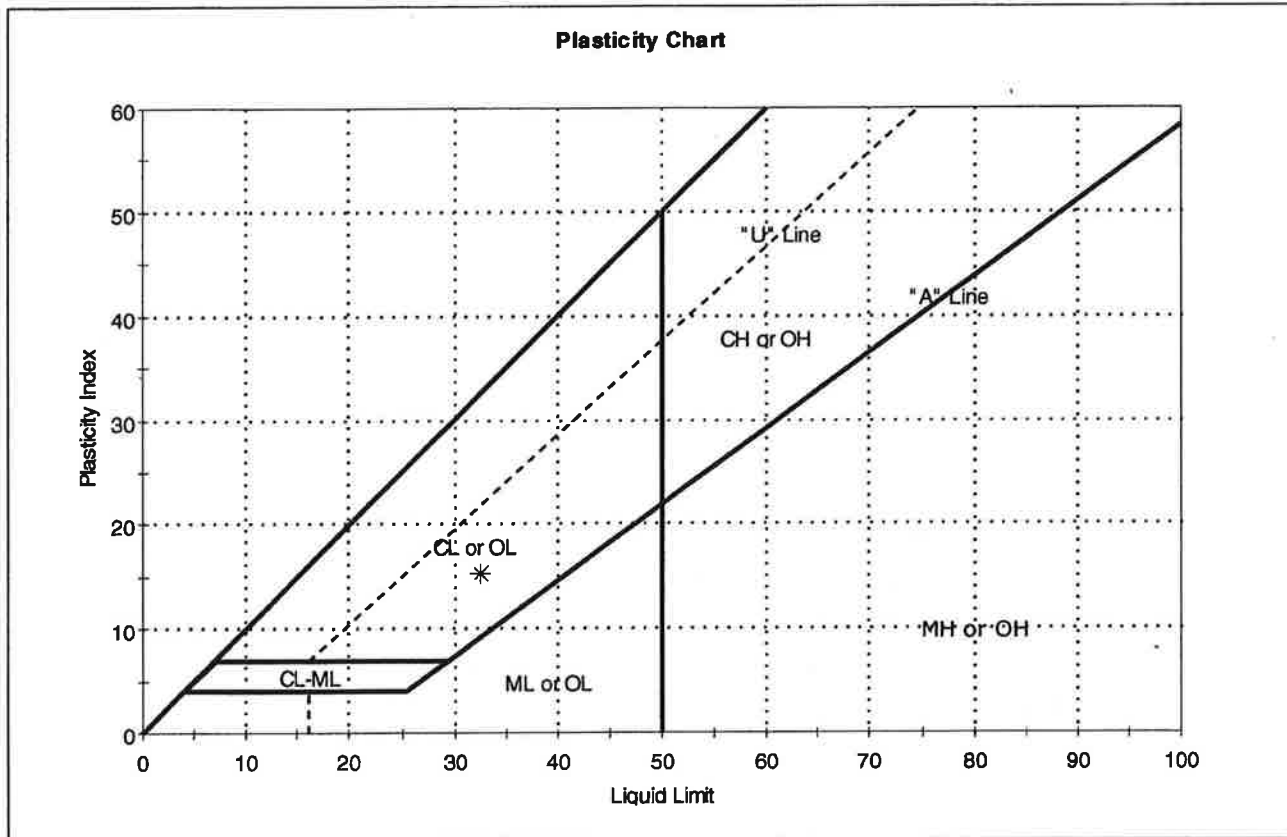
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R _t	Permeability K @ 20 °C, cm/sec
		Cell	Sample	Z ₁	Z ₂	Z ₁ -Z ₂						
10/8	2	90.0	69.2	10.0	9.9	0.1	262	21.5	1.4E-08	20	1.000	1.4E-08
10/8	3	90.0	69.2	10.0	9.9	0.1	263	21.5	1.4E-08	20	1.000	1.4E-08
10/8	4	90.0	69.2	10.0	9.9	0.1	269	21.5	1.3E-08	20	1.000	1.3E-08
10/8	5	90.0	69.2	10.0	9.9	0.1	272	21.5	1.3E-08	20	1.000	1.3E-08

PERMEABILITY AT 20° C: 1.4×10^{-8} cm/sec (@ 20.8 psi effective stress)



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID: ---	Sample Type: tube	Tested By:	cam
Sample ID:ST-028	Test Date: 10/16/11	Checked By:	jdt
Depth : ---	Test Id: 219912		
Test Comment:	---		
Sample Description:	Moist, dark gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D 4318-05



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-028	---	---	17	33	17	16	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilutancy: SLOW

Toughness: LOW

Gravel Drainage Layer

Drainage Gravel
Quality Control Data Summary
Page 1 of 3

Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	Water Content (%)	6" (%)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2.5" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	5/8" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#20 (%)	#30 (%)	#40 (%)	#50 (%)	#60 (%)	#80 (%)	#100 (%)	#140 (%)	#200 (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Classification	Permeability K (cm/sec)	Notes	
Granby Quarry	DG-01	07/19/10	Stockpile	Atlantic Testing	ST3104SL-01-8-10	S01-DG01	N/A				100		87		49	22	2	1		1	1	1	1		1		1		1	1		1	1	0.4	NP	NP	NP	GP	11.8			
Granby Quarry	DG-01	07/19/10	Stockpile	Atlantic Testing	ST3104SL-02-8-10	S02-DG01	N/A				100		88		48	21	3	3		2	2	2	2		2		2		1	1		1	1	0.6	NP	NP	NP	GP	11.8			
Granby Quarry	DG-02	07/19/10	Stockpile	Atlantic Testing	ST3104SL-03-8-10	S03-DG02	N/A				100		85		37	13	2	1		1	1	1	1		1		1		1	1		1	1	0.4	NP	NP	NP	GP	12.2			
Granby Quarry	DG-02	07/19/10	Stockpile	Atlantic Testing	ST3104SL-04-8-10	S04-DG02	N/A				100		86		36	11	3	1		1	1	1	1		1		1		1	1		1	1	0.4	NP	NP	NP	GP	12.2			
Sennett Quarry	DG-03	07/28/10	Stockpile	Atlantic Testing	ST3104SL-12-8-10	S12-DG03	N/A				100		100		86	74	53	34		21	19	16	15	13	12		9		8			6	6	4.9	NP	NP	NP	GP				
Sennett Quarry	DG-03	07/28/10	Stockpile	Atlantic Testing	ST3104SL-13-8-10	S13-DG03	N/A				100		100		93	81	53	32		20	18	16	15	13	12		10		8			6	6	5.1	NP	NP	NP	GP				
Sennett Quarry	DG-04	07/28/10	Stockpile	Atlantic Testing	ST3104SL-14-8-10	S14-DG04	N/A				100		93		86	69	46	26		17	16	14	13	12	11		9		7			6	6	4.8	NP	NP	NP	GP				
Sennett Quarry	DG-04	07/28/10	Stockpile	Atlantic Testing	ST3104SL-15-8-10	S15-DG04	N/A				100		94		91	71	47	29		20	18	16	15	13	12		10		8			7	6	5.4	NP	NP	NP	GP				
Granby Quarry	DG-05	08/06/10	Stockpile	Atlantic Testing	ST3104SL-16-8-10	S16-DG05	N/A				100		58		20	5	1	1		1	1	1	1		1				1			1		0.4	NP	NP	NP	GP	16.3			
Granby Quarry	DG-06	08/06/10	Stockpile	Atlantic Testing	ST3104SL-17-8-10	S17-DG06	N/A				100		41		3	0	0	0		0	0	0	0		0				0			0		0	NP	NP	NP	GP	16.4			
Granby Quarry	DG-07	08/06/10	Stockpile	Atlantic Testing	ST3104SL-18-8-10	S18-DG07	N/A				100		62	5			0	0	0		0	0	0	0		0				0			0		0	NP	NP	NP	GP	18.6		
Granby Quarry	DG-08	08/06/10	Stockpile	Atlantic Testing	ST3104SL-19-8-10	S19-DG08	N/A				100		25		6	2	0	0		0	0	0	0		0				0			0		0	NP	NP	NP	GP	14.0			
Granby Quarry	DG-09	09/10/10	Stockpile	Atlantic Testing	ST3104SL-60-09-10	S82-DG09	N/A				100		54		22		1			1		1	1	1	1	1		1					1		0.5	NP	NP	NP	GP	12.0		
Granby Quarry	DG-09	09/10/10	Stockpile	Atlantic Testing	ST3104SL-61-09-10	S83-DG09	N/A				100		54		22		1			1		1	1	1	1	1		1					1		0.5	NP	NP	NP	GP	12.0		
Granby Quarry	DG-10	09/10/10	Stockpile	Atlantic Testing	ST310SL-62-09-10	S84-DG10	N/A			100		82		63		7		0															0		0	NP	NP	NP	GP	12.8		
Granby Quarry	DG-10	09/10/10	Stockpile	Atlantic Testing	ST310SL-63-09-10	S85-DG10	N/A				100		53		15		1						1										1		0.5	NP	NP	NP	GP	12.8		
Sennett Quarry	DG-11	09/15/10	Stockpile	Atlantic Testing	ST3104SL-64-09-10	S86-DG11	N/A				100				50	27	4	3		3			3			2						2			1.2	NP	NP	NP	GP	12.8		
Sennett Quarry	DG-11	09/15/10	Stockpile	Atlantic Testing	ST3104SL-65-09-10	S87-DG11	N/A				100		80		30	11	3	2		2		2	2		2							2			0.9	NP	NP	NP	GP			
Sennett Quarry	DG-12	09/15/10	Stockpile	Atlantic Testing	ST3104SL-66-09-10	S88-DG12	N/A				100		88		31	8	1	1		1		1	1		1						1			0.4	NP	NP	NP	GP	12.4			
Sennett Quarry	DG-12	09/15/10	Stockpile	Atlantic Testing	ST3104SL-67-09-10	S89-DG12	N/A				100		51		30	12	2	2		2		2	1	1		1					1			0.5	NP	NP	NP	GP				
Granby Quarry	DG-13	10/14/10	Stockpile	Atlantic Testing	ST3104SL-83-11-10	S105-DG13	N/A				100		82		62		17						3								2			2		1.1	NP	NP	NP	GP	15.3	
Granby Quarry	DG-14	10/14/10	Stockpile	Atlantic Testing	ST3104SL-84-11-10	S106-DG14	N/A				100		83		63		11						2								2			1		0.7	NP	NP	NP	GP	18.4	
Granby Quarry	DG-15	10/14/10	Stockpile	Atlantic Testing	ST3104SL-85-11-10	S107-DG15	N/A				100		72		54		12						2							2			1		0.6	NP	NP	NP	GP	17.8		
Granby Quarry	DG-16	10/14/10	Stockpile	Atlantic Testing	ST3104SL-86-11-10	S108-DG16	N/A				100		8		66		15						3							2			2		0.8	NP	NP	NP	GP	19.5		
Granby Quarry	DG-17	10/14/10	Stockpile	Atlantic Testing	ST3104SL-87-11-10	S109-DG17	N/A				100		76		60		15						3							2			1		0.8	NP	NP	NP	GP	21.1		
Granby Quarry	DG-18	10/14/10	Stockpile	Atlantic Testing	ST3104SL-88-11-10	S110-DG18	N/A				100		92		73		11						3							3			2		0.8	NP	NP	NP	GP	19.1		
Granby Quarry	DG-19	10/14/10	Stockpile	Atlantic Testing	ST3104SL-89-11-10	S111-DG19	N/A				100		85		52		10						2							2			1		0.6	NP	NP	NP	GP	20.3		
Granby Quarry	DG-020	07/22/11	On-site Stockpile	PW-Labs		46 26014					100						16					7.3								5.9				3.2				GP				
Granby Quarry	DG-021	08/11/11	On-site Stockpile	PW-Labs		55 26077					100						15.7						7.9							6.2					2.9				GP			
Granby Quarry	DG-023	08/29/11	Pit	Atlantic Testing	ST3104SL-221-09-11	S233-DG23					100		96		77	47	20	13		11	10	9	9		8				7				5		3.5				GP			
Granby Quarry	DG-024	08/29/11	On-site Stockpile	Atlantic Testing	ST3104SL-222-09-11	S234-DG24					100		80		49	20	1	1		1	1	1	1		1				1				1		0.5				GP			
Granby Quarry	DG-025	09/20/11	In Place	Atlantic Testing	ST3104SL-223-09-11	S235-DG25					100		50		20	5	1	1		1	1	1	1		1				1				1		0.6				GP	14.8		
Granby Quarry	DG-026	09/21/11	In Place	Atlantic Testing	ST3104SL-224-09-11	S236-DG26					100		71		45	29	10	6		5	5	4	4		4					3				2		1.2				GP	7.0	mitigations implemented, consisting of: 1) remove material containing large amounts of fines by visual determination, full-time inspector at quarry, twice-per-day sampling of delivered gravel and testing at separate lab for gradation
Granby Quarry	DG-027	09/21/11	In Place	Atlantic Testing	ST3104SL-225-09-11	S237-DG27					100		91		81	63	24	12		8	7	6	6		6					5				3		1.9				GP	5.9	mitigations implemented, consisting of: 1) remove material containing large amounts of fines by visual determination, full-time inspector at quarry, twice-per-day sampling of delivered gravel and testing at separate lab for gradation
Granby Quarry	DG-028	09/29/11	In Place	PW-Labs		58 26176					100						4.9						3.5							3.3				1.5				GP				
Granby Quarry	DG-030	09/30/11	In Place	PW-Labs		59 26177					100						7.8						3							3				3				GP				
Granby Quarry	DG-032	10/03/11	In Place	PW-Labs		60 26178					100						5.7						4.1							3.8				2.1				GP				
Granby Quarry	DG-033	10/03/11	In Place	PW-Labs		61 26181					100						5.7						4.1							3.8				1.5				GP				
Granby Quarry	DG-034	10/04/11	In Place	PW-Labs		62 26182					100						3.8						2.9							2.7				1.3				GP				
Granby Quarry	DG-035	10/04/11	In Place	PW-Labs		63 26183					100						2.7						2.4							2.3				1				GP				
Granby Quarry	DG-036	10/05/11	In Place	Atlantic Testing	ST3104SL-226-10-11	S238-DG36					100		77		43	21	6	3		3	3	3	3		3								1		0.7				GP	6.4	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.	
Granby Quarry	DG-036A	10/05/11	In Place (Modified sample)	Atlantic Testing	ST3104SL-226A-10-11	S238A-DG36					100		96		66	25	3	1		1	1	1	1												NP	NP	NP		6.3	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.		
Granby Quarry	DG-037	10/05/11	In Place	PW-Labs		64 26184					100						2.4						2.2							2.1				0.8				GP				
Granby Quarry	DG-038	10/05/11	In Place	PW-Labs		65 26185					100						1.7						1.7							1.6				0.6				GP				
Granby Quarry	DG-039	10/06/11	In Place	PW-Labs		66 26188					100						6						3.5							3.3				1.7				GP				
Granby Quarry	DG-040	10/06/11	In Place	PW-Labs		67 26189					100						1.7						1.7							1.6				0.6				GP				

Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	Water Content (%)	6" (%)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2.5" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	5/8" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#20 (%)	#30 (%)	#40 (%)	#50 (%)	#60 (%)	#80 (%)	#100 (%)	#140 (%)	#200 (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Classification	Permeability K (cm/sec)	Notes	
Granby Quarry	DG-041	10/06/11	In Place	Atlantic Testing	ST3104SL-227-10-11	S239-DG41					100		96		81	59	25	12		8	7	7	6		6				5				3		1.6				GP	6.3	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.	
Granby Quarry	DG-042	10/07/11	In Place	Atlantic Testing	ST3104SL-228-10-11	S240-DG42					100		88		7	48	16	9		7	6	6	5		5				4				3		1.5				GP	5.9	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.	
Granby Quarry	DG-043	10/07/11	In Place	PW-Labs		69	26192				100						4.3						2.6						2.4						1				GP			
Granby Quarry	DG-044	10/07/11	In Place	PW-Labs		68	26193				100						2.6						2.2						2.2							1.1				GP		
Granby Quarry	DG-045	10/07/11	Stockpile (Pit)	Atlantic Testing	ST3104SL-229-10-11	S241-DG45					100		90		55	23	3	3		3	3	3	3		3				3				2		1.1				GP	8.4	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.	
Granby Quarry	DG-045A	10/07/11	Stockpile (Pit)	Atlantic Testing	ST3104SL-229A-10-11	S241-DG45																																		8.7	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.	
Granby Quarry	DG-046	10/10/11	Stockpile (Pit)	Atlantic Testing	ST3104SL-230-10-11	S242-DG46					100		96		55	29	8	5		2	2	2	2		2				2					1		1.2	NP	NP	NP	GP	5.7	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.
Granby Quarry	DG-047	10/10/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-231-10-11	S243-DG47					100		69		28	11	1	1		1	1	1	1		1				1					1		0.4	NP	NP	NP	GP	12.8	import stopped after 10/11, it is likely that this material was not imported because QC testing was of stockpiled material at quarry and should have been ahead of imports. Daily gradation data indicates that imported material was in compliance with specifications.
Granby Quarry	DG-048	10/10/11	In Place	PW-Labs		70	26194				100						6.1						2.5						2.4						1.3				GP			
Granby Quarry	DG-049	10/10/11	In Place	PW-Labs		71	26199				100						1.6						1.6						1.5						0.6				GP			
Granby Quarry	DG-050	10/11/11	Stockpile (Pit)	Atlantic Testing	ST3104SL-232-10-11	S244-DG50					100		68		32	14	3	2		2	2	2	2		2				2				1		0.7	NP	NP	NP	GP	12.7		
Granby Quarry	DG-051	10/11/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-233-10-11	S245-DG51					100		83		33	10	2	1		1	1	1	1		1				1				1		0.5	NP	NP	NP	GP	12.3		
Granby Quarry	DG-052	10/11/11	In Place	PW-Labs		72	26200				100						2.4						2.1						2.1						1.3							
Granby Quarry	DG-052	10/11/11	In Place	PW-Labs		72	26200				100						2.4						2.1						2.1						1.3				GP			
Granby Quarry	DG-053	10/11/11	In Place	PW-Labs		73	26204				100						1.6						1.5						1.4						0.6				GP			
Granby Quarry	DG-056	10/12/11	Stockpile (Pit)	Atlantic Testing	ST3104SL-234-10-11	S246-DG56					100		83		47	18	4	2		2	2	2	2		2				2				1		0.7	NP	NP	NP	GP	12.3		
Granby Quarry	DG-060	10/14/11	On-site Stockpile	Atlantic Testing	ST3104SL-236-10-11	S248-DG60					100		100		83	50	4	2		2	2	2	2		2				2				1		0.4	NP	NP	NP	GP	8.4	it was decided to change to 2" lower screen.	
Granby Quarry	DG-061	10/14/11	On-site Stockpile (rescreen)	Atlantic Testing	ST3104SL-237-09-11	S249-DG61					100		63		19	5	2	1		1	1	1	1		1				1				1		0.3	NP	NP	NP	GP	12.5	Material rescreened.	
Granby Quarry	DG-056A	10/17/11	Stockpile (Pit) (Modified Sample)	Atlantic Testing	ST3104SL-234A-10-11	S246A-DG56					100		79		43	24	5	3		2	2	2	1													NP	NP	NP				
Granby Quarry	DG-057	10/17/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-235-10-11	S246-DG57					100		68		27	8	1	1		1	1	1	1		1				1				1		0.4	NP	NP	NP	GP	11.9		
Granby Quarry	DG-062	10/19/11	On-site Stockpile	Atlantic Testing	ST3104SL-238-10-11	S250-DG62					100		53		7	1	1	1		1	1	1	1		1				1				1		0.4	NP	NP	NP	GP	15.6		
Granby Quarry	DG-063	10/19/11	On-site Stockpile (rescreen)	Atlantic Testing	ST3104SL-239-09-11	S251-DG63					100		61		8	2	2	2		2	2	2	2		2				2				1		0.7	NP	NP	NP	GP	13.9		
Granby Quarry	DG-064	10/24/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-240-10-11	S252-DG64					100		36		11	3	2	2		2	2	2	2		2				2				1		0.9	NP	NP	NP	GP	14.4		
Granby Quarry	DG-065	10/24/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-241-10-11	S253-DG65					100		85		11	3	2	2		2	2	2	2		2				2				1		0.9	NP	NP	NP	GP	13.3		
Granby Quarry	DG-066	10/24/11	In Place	PW-Labs		75	26212				100						3.4						3.4						3.2						1.5				GP			
Granby Quarry	DG-067	10/24/11	In Place	PW-Labs		76	26213				100						2.8						2.8						2.7						1.2				GP			
Granby Quarry	DG-068	10/25/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-242-11-11	S254-DG68					100		33		4	2	2	2		2	2	2	2		2				2				1		0.8	NP	NP	NP	GP	15.0		
Granby Quarry	DG-069	10/25/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-243-11-11	S255-DG69					100		57		7	2	2	2		2	2	2	2		2				2				1		0.6	NP	NP	NP	GP	14.7		
Granby Quarry	DG-070	10/25/11	In Place	PW-Labs		77	26214				100						3.3						3.3						3.1						1.3				GP			
Granby Quarry	DG-071	10/25/11	In Place	PW-Labs		78	26215				100						2.4						2.4						2.3						1.1				GP			
Granby Quarry	DG-072	10/26/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-244-11-11	S256-DG72					100		88		34	3	3	3		3	3	3	3		3				3				2		1.4	NP	NP	NP	GP	12.7		
Granby Quarry	DG-073	10/26/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-245-11-11	S257-DG73					100		56		12	3	2	2		2	2	2	2		2				2				1		0.9	NP	NP	NP	GP	13.0		
Granby Quarry	DG-074(1)	10/26/11	In Place	PW-Labs		79	26218				100						4.6						3						2.8						1.2				GP			

Sample Source	Field Sample ID	Sample Date	Sample Location	Test Lab	Report No.	Sample No.	Water Content (%)	6" (%)	5" (%)	4.5" (%)	4" (%)	3.5" (%)	3" (%)	2.5" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	5/8" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#8 (%)	#10 (%)	#16 (%)	#20 (%)	#30 (%)	#40 (%)	#50 (%)	#60 (%)	#80 (%)	#100 (%)	#140 (%)	#200 (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Classification	Permeability K (cm/sec)	Notes
Granby Quarry	DG-075(1)	10/26/11	In Place	PW-Labs		80 26220					100						3.6						3						2.9					1.2				GP			
Granby Quarry	DG-074(2)	10/27/11	SCA Site (Removed Material)	Atlantic Testing	ST3104SL-247-11-11	S259-DG74					100		100		62	30	14	9		8	8	7	7		7				6				4		2.8	NP	NP	NP	GP	7.2	sample on material removed from SCA
Granby Quarry	DG-075(2)	10/27/11	Stockpile (Screened)	Atlantic Testing	ST3104SL-248-11-11	S260-DG75					100		56		14	5	3	3		3	3	3	3		3				3				2		1.2	NP	NP	NP	GP	11.6	
Granby Quarry	DG-076	10/27/11	SCA Site (Removed Material)	Atlantic Testing	ST3104SL-246-11-11	S258-DG76					100		94		79	57	32	21		14	12	10	10		9				8				6		3.2	NP	NP	NP	GP	5.8	sample on material removed from SCA
Granby Quarry	DG-079	11/04/11	SCA Site (Rescreened Unwashed)	Atlantic Testing	ST3104SL-249-11-11	S261-DG79					100		96		65	31	3	2		2	2	2	2		2				2				2		1.1	NP	NP	NP	GP	9.4	material not placed, rescreened
Granby Quarry	DG-080	11/04/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-250-11-11	S262-DG80					100		100		57	22	2	1		1	1	1	1		1				1				1		0.5	NP	NP	NP	GP	9.0	material not placed, rescreened
Granby Quarry	DG-081	11/11/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-251-11-11	S263-DG81					100		77		39	10	1	1		1	1	1	1		1				1				1		0.5	NP	NP	NP	GP	12.6	
Granby Quarry	DG-082	11/11/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-252-11-11	S264-DG82					100		91		41	14	1	1		1	1	1	1		1				1				1		0.5	NP	NP	NP	GP	14.7	
Granby Quarry	DG-083	11/15/11	SCA Site (Rescreened Unwashed)	Atlantic Testing	ST3104SL-253-11-11	S265-DG83					100		73		25	10	2	2		2	2	2	2		2				2				2		1.1	NP	NP	NP	GP	11.5	
Granby Quarry	DG-084	11/17/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-254-11-11	S266-DG84					100		72		22	11	3	2		2	2	2	2		2				2				1		0.5	NP	NP	NP	GP	12.4	
Granby Quarry	DG-086	11/30/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-255-12-11	S267-DG86					100		56		18	1	1	1		1	1	1	1		1				1				1		0.5	NP	NP	NP	GP	13.7	
Granby Quarry	DG-085	12/01/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-256-12-11	S268-DG85					100		84		32	2	1	1		1	1	1	1		1				1				1		0.4	NP	NP	NP	GP	12.6	
Granby Quarry	DG-089	12/07/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-258-12-11	S270-DG89					100		81		35	6	2	2		2	2	2	2		2				2				1		1.1	NP	NP	NP	GP	13.2	
Granby Quarry	DG-090	12/09/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-259-12-11	S271-DG90					100		82		26	9	3	3		3	3	3	3		3				2				2		1.4	NP	NP	NP	GP	12.7	
Granby Quarry	DG-091	12/14/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-260-12-11	S272-DG91					100		64		36	13	3	3		3	3	3	3		3				2				2		1.2	NP	NP	NP	GP	13.1	
Granby Quarry	DG-092	12/19/11	SCA Site (Rescreened Washed)	Atlantic Testing	ST3104SL-261-12-11	S273-DG92					100		49		17	2	2	2		2	2	2	2		2				2				1		0.9	NP	NP	NP	GP	13.6	

TABLE C
Gravel Drainage Layer QA Summary
Honeywell / Parsons
Sediment Consolidation Area
Camillus, NY

TEST STANDARD			CLASSIFICATION (ASTM D2487)	GRAIN SIZE (ASTM D 422)						HYDRAULIC CONDUCTIVITY (ASTM D2434)
QA TEST FREQUENCY QA TEST REQUIRED			10,000 cyd 8	@ 10,000 cyd 8						@25,000 cyd 4
SAMPLE No.	LOCATION	APPROX. VOLUME PLACED	(%)	PASSING 4-in. dia. SIEVE (%)	PASSING 3-in. dia. SIEVE (%)	PASSING 2-in. dia. SIEVE (%)	PASSING 1-in. dia. SIEVE (%)	PASSING NO.4 SIEVE (%)	PASSING NO.200 SIEVE (%)	PERMEABILITY (CM/S)
GD-	Specs:		GW or GP	+100				0 - 5	0 - 3	≥ 10
1	<i>2011</i> On-site		GP	100	76	35	3	0	0	
2	On-site - interface friction									
3	Granby Source		GP	99	77	30	3	1	1	23.1
4	Granby Imported Grid N10		GP	89	74	48	4	2	0	14.6
5	Granby Imported Grid 09		GP	93	54	28	1	1	0	
6	Granby Imported Grid I12		GP	100	75	67	17	1	1	
7	Granby on-site screening		GP	100	88	46	1	0	0	
8	Granby on-site screening		GP	100	79	31	0	0	0	34.3
9	Granby on-site screening		GP	100	94	32	0	0	0	
10	Granby on-site screening		GP	100	92	42	13	0	0	34.8
11	Granby on-site screening									
12	Granby on-site screening		GP	98	81	16	1	1	0	
13	<i>2012</i> Granby - source		GP	100	82	39	2	1	1	14.3
ESTIMATED TOTAL VOLUME (cyd) PLACED:		77,382	11	Number of QA Samples:						5

Notes: (1) The soil was used to construct a 1-ft min. thick gravel drainage layer placed in one lift. Volume is based on Contractor's records.

(2) *Italics* indicate an approximate value.

(3) Reference Tables A-1 & A-2 of CQA Plan, Section 02300 of Specifications, RFI No. 17, and FCF No. 1 (regarding slope).

(4) See test reports for details of the size of material used for hydraulic conductivity testing.

Client: Parsons Engineering Science

Project: SCA Phase 1a

Location: Syracuse, NY

Project No: GTX-10120

Boring ID: ---

Sample Type: bucket

Tested By: jbr

Sample ID:GD-001

Test Date: 08/10/11

Checked By: njh

Depth : ---

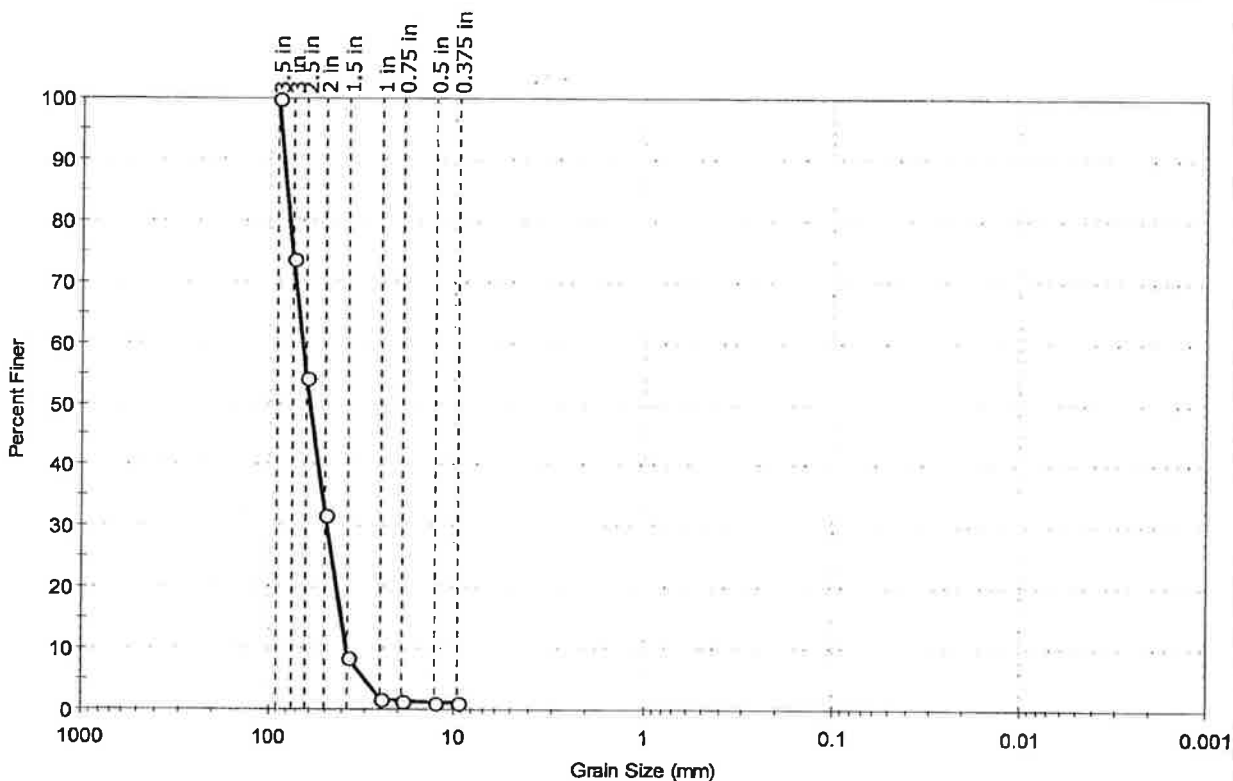
Test Id: 214877

Test Comment: ---

Sample Description: Moist, light gray gravel

Sample Comment: ---

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	100.0	0.0	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3.5 in	90.00	100	✓	
3 in	75.00	74		
2.5 in	63.00	54		
2 in	50.00	32		
1.5 in	37.50	9		
1 in	25.00	2		
0.75 in	19.00	1		
0.5 in	12.70	1	✓	
0.375 in	9.50	1	✓	

Coefficients

$D_{85} = 81.1374$ mm $D_{30} = 48.8497$ mm
 $D_{60} = 66.3176$ mm $D_{15} = 40.5677$ mm
 $D_{50} = 60.2590$ mm $D_{10} = 38.1317$ mm
 $C_u = 1.739$ $C_c = 0.944$

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
 Sand/Gravel Hardness : HARD



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	GD-001	Test Date:	08/11/11
Depth :	---	Test Id:	214905
Test Comment:	---		
Sample Description:	Moist, light gray gravel		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GD-001	---	Poorly graded gravel	GP	100.0	0.0	0.0

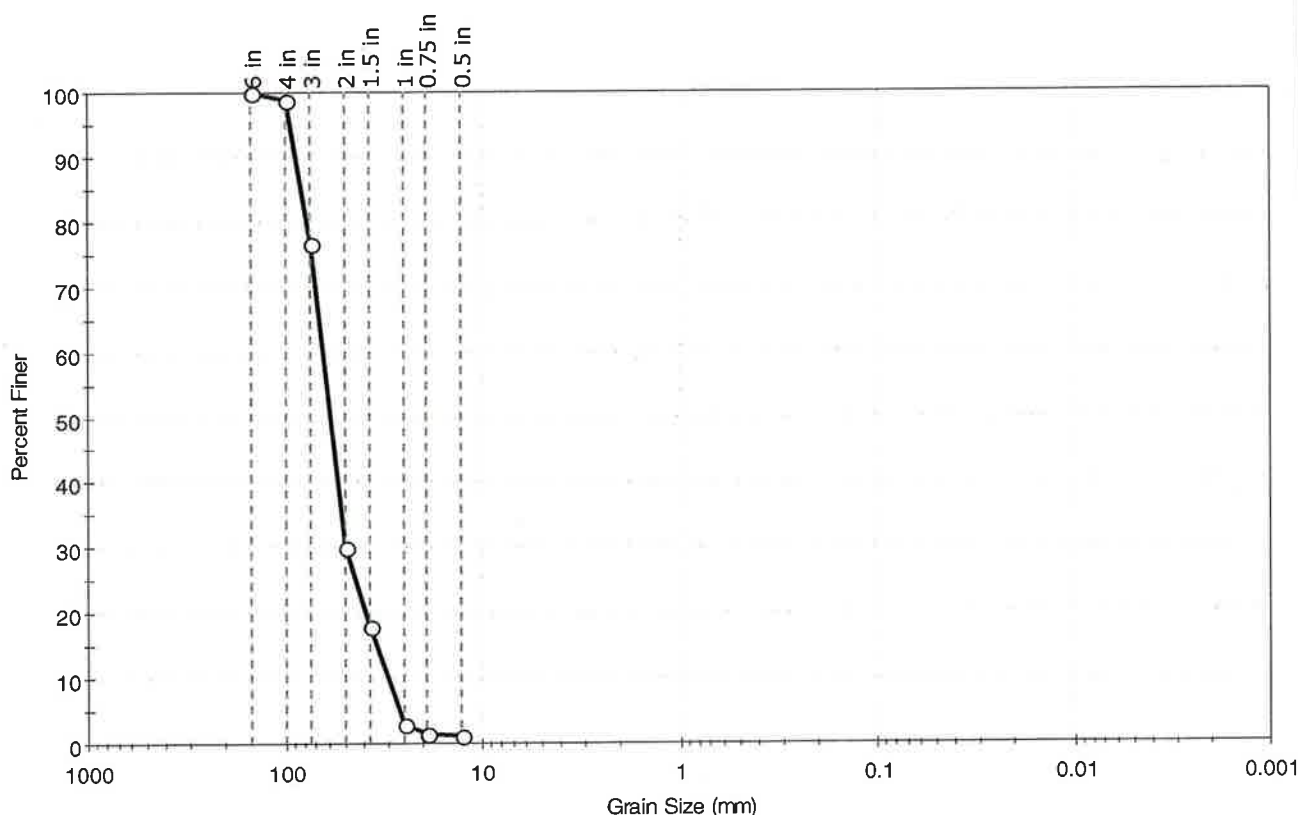
Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed

Sample Number GD-002

Was Collected for
Interface Friction Testing

Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Sample Type:	bucket
Location:	Syracuse, NY	Tested By:	jbr
Boring ID:	---	Test Date:	09/09/11
Sample ID:	GD-003	Checked By:	n/a
Depth:	---	Test Id:	217151
Test Comment:	---		
Sample Description:	Dry, gray and brown gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	100.0	0.0	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100 ✓		
4 in	100.00	99 ✓		
3 in	75.00	77		
2 in	50.00	30		
1.5 in	37.50	18		
1 in	25.00	3		
0.75 in	19.00	2		
0.5 in	12.70	1 ✓		

Coefficients

D ₈₅ = 83.4673 mm	D ₃₀ = 49.8895 mm
D ₆₀ = 64.8215 mm	D ₁₅ = 34.6183 mm
D ₅₀ = 59.4318 mm	D ₁₀ = 30.2382 mm
C _u = 2.144	C _c = 1.270

Classification

ASTM Poorly graded gravel (GP) ✓

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	9734		
Start Date:	10/11/11	Tested By:	md/ema
End Date:	10/11/11	Checked By:	jdt
Boring #:	---		
Sample #:	GD-003		
Depth:	---		
Visual Description:	Dry, gray and brown gravel		

Permeability of Granular Soils (Constant Head) by ASTM D 2434 (Modified)

Sample Type:	Remolded		
Sample Information:	Maximum Dry Density:	---	pcf
	Optimum Moisture Content:	---	%
	Compaction Test Method:	---	
	Classification (ASTM D 2487):	GP	
	Assumed Specific Gravity:	2.55	
Sample Preparation / Test Setup:	The sample was placed into the testing apparatus and tamped lightly to create as even a top surface as practical. The full gradation of the as-received sample was used. See attached grain size report for particle size distribution.		

Parameter	Initial
Height, in	19.95
Diameter, in	19.24
Area, in ²	290.7
Volume, in ³	5800
Mass, g	125910
Bulk Density, pcf	82.7
Moisture Content, % (assumed)	0
Dry Density, pcf	82.7
Degree of Saturation, %	---
Void Ratio, e	---

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20°C, cm/sec
10/11	1	166803	54	3089	0.08	21.9	18.5	1.038	22.7
10/11	2	166803	54	3089	0.08	21.9	18.5	1.038	22.7
10/11	3	166803	52	3208	0.08	22.7	18.5	1.038	23.6
10/11	4	166803	53	3147	0.08	22.3	18.5	1.038	23.2
10/11	5	166803	53	3147	0.08	22.3	18.5	1.038	23.2

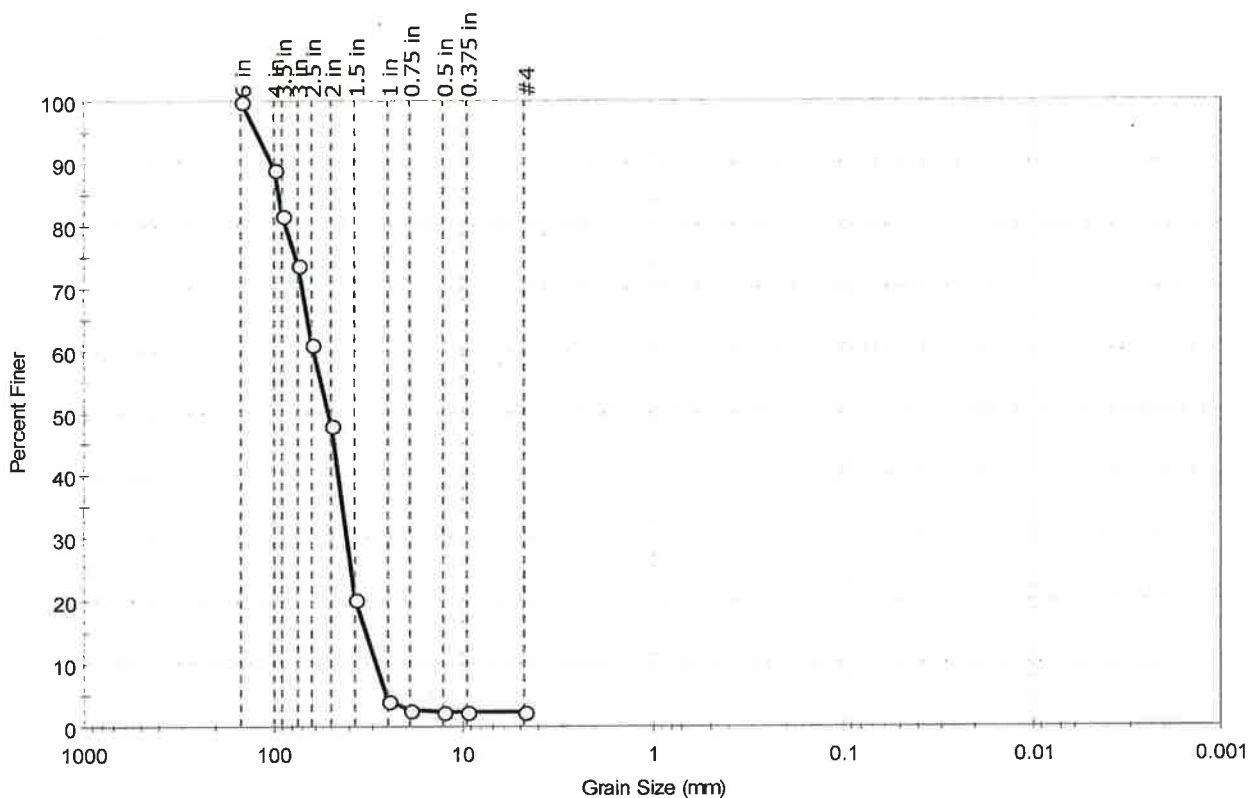
PERMEABILITY @ 20 °C = 23.1 ✓ cm/sec

Deviations from ASTM D 2434:

- Material greater than 3/4-inch was used in the test specimen.
- A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
- The test specimen was not de-aired under vacuum prior to testing.
- Test was performed at only one gradient range.
- The maximum particle size of 6-inch minus is not in accordance with the ASTM requirement that the permeameter have a diameter 8 to 12 times larger than the maximum particle size.

Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Sample Type:	bucket
Location:	Syracuse, NY	Tested By:	jbr
Boring ID:	---	Test Date:	10/07/11
Sample ID:	GD-004	Checked By:	jdt
Depth:	---	Test Id:	219531
Test Comment:	---		
Sample Description:	Moist, brown gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM C 136



%Cobble	%Gravel	%Sand	%Silt & Clay Size
---	97.7	2.3	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	89 ✓		
3.5 in	90.00	82		
3 in	75.00	74		
2.5 in	63.00	61		
2 in	50.00	48		
1.5 in	37.50	20		
1 in	25.00	4		
0.75 in	19.00	3		
0.5 in	12.70	2		
0.375 in	9.50	2		
#4	4.75	2 ✓		

Coefficients

D ₈₅ = 94.5060 mm	D ₃₀ = 41.4108 mm
D ₆₀ = 61.9129 mm	D ₁₅ = 32.7078 mm
D ₅₀ = 51.7131 mm	D ₁₀ = 28.8576 mm
C _u = 2.145	C _c = 0.960

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	9734		
Start Date:	10/11/11	Tested By:	md/ema
End Date:	10/11/11	Checked By:	jdt
Boring #:	---		
Sample #:	GD-004		
Depth:	---		
Visual Description:	Dry, gray and brown gravel		

Permeability of Granular Soils (Constant Head) by ASTM D 2434 (Modified)

Sample Type:	Remolded		
Sample Information:	Maximum Dry Density:	---	pcf
	Optimum Moisture Content:	---	%
	Compaction Test Method:	---	
	Classification (ASTM D 2487):	GP	
	Assumed Specific Gravity:	2.55	
Sample Preparation / Test Setup:	The sample was placed into the testing apparatus and tamped lightly to create as even a top surface as practical. The full gradation of the as-received sample was used. See attached grain size report for particle size distribution.		

Parameter	Initial
Height, in	17.50
Diameter, in	19.24
Area, in ²	290.7
Volume, in ³	5088
Mass, g	123800
Bulk Density, pcf	92.7
Moisture Content, % (assumed)	0
Dry Density, pcf	92.7
Degree of Saturation, %	---
Void Ratio, e	---

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20°C, cm/sec
10/11	1	166803	56	2979	0.11	13.9	18.5	1.038	14.4
10/11	2	166803	56	2979	0.11	13.9	18.5	1.038	14.4
10/11	3	166803	55	3033	0.11	14.1	18.5	1.038	14.7
10/11	4	166803	55	3033	0.11	14.1	18.5	1.038	14.7
10/11	5	166803	55	3033	0.11	14.1	18.5	1.038	14.7

PERMEABILITY @ 20 °C =

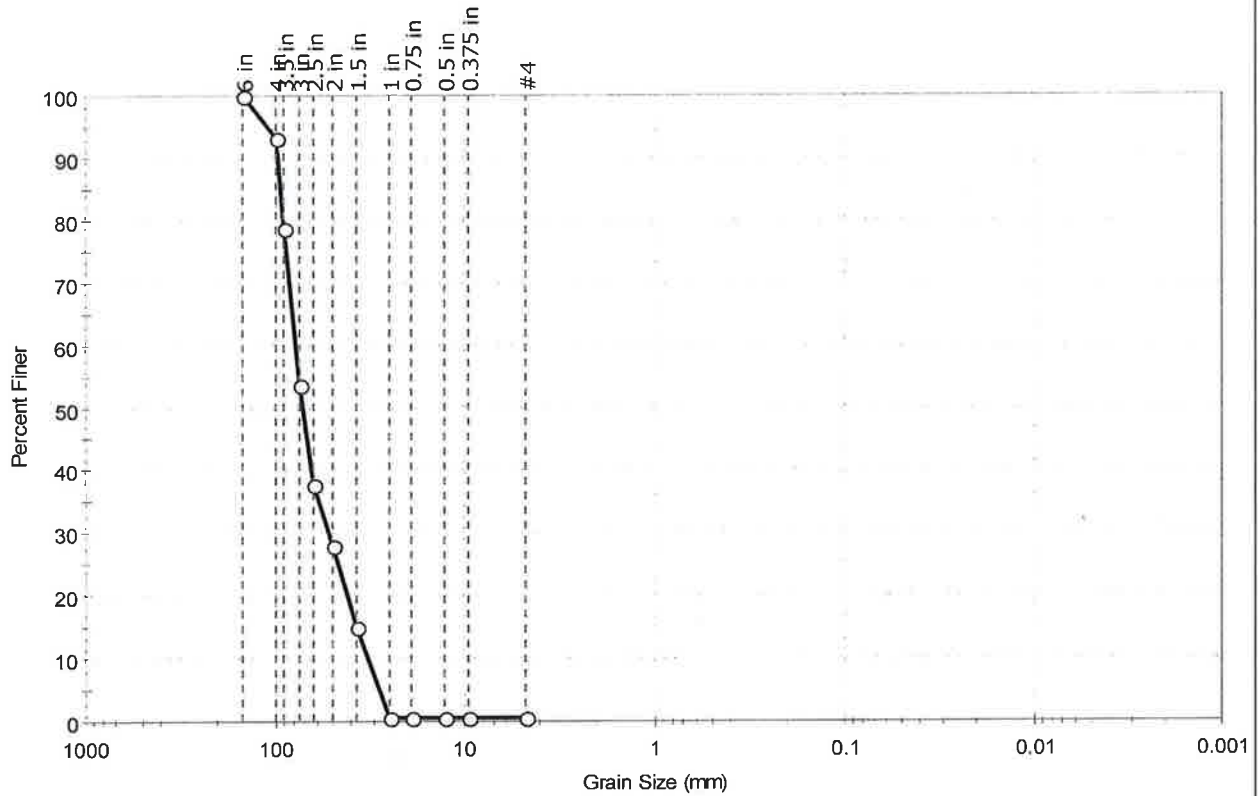
14.6 ✓ cm/sec

Deviations from ASTM D 2434:

- Material greater than 3/4-inch was used in the test specimen.
- A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
- The test specimen was not de-aired under vacuum prior to testing.
- Test was performed at only one gradient range.
- The maximum particle size of 6-inch minus is not in accordance with the ASTM requirement that the permeameter have a diameter 8 to 12 times larger than the maximum particle size.

Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY	Sample Type: tube	Tested By: jbr
Boring ID: ---	Test Date: 10/12/11	Checked By: jdt
Sample ID: GD-005	Test Id: 220373	
Depth: ---		
Test Comment: ---		
Sample Description: Moist, dark brown silty sand		
Sample Comment: ---		

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	99.4	0.6	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100 ✓		
4 in	100.00	93 ✓		
3.5 in	90.00	79		
3 in	75.00	54		
2.5 in	63.00	38		
2 in	50.00	28		
1.5 in	37.50	15		
1 in	25.00	1		
0.75 in	19.00	1		
0.5 in	12.70	1		
0.375 in	9.50	1		
#4	4.75	1 ✓		

Coefficients

$D_{85} = 94.1343 \text{ mm}$ $D_{30} = 52.3246 \text{ mm}$
 $D_{60} = 78.5286 \text{ mm}$ $D_{15} = 37.3938 \text{ mm}$
 $D_{50} = 72.0424 \text{ mm}$ $D_{10} = 32.4945 \text{ mm}$
 $C_u = 2.417$ $C_c = 1.073$

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
 Sand/Gravel Hardness : HARD

Client: Parsons Engineering Science

Project: SCA Phase 1a

Location: Syracuse, NY

Project No: GTX-10120

Boring ID: ---

Sample Type: bucket

Tested By: jbr

Sample ID:GD-006

Test Date: 11/01/11

Checked By: jdt

Depth: ---

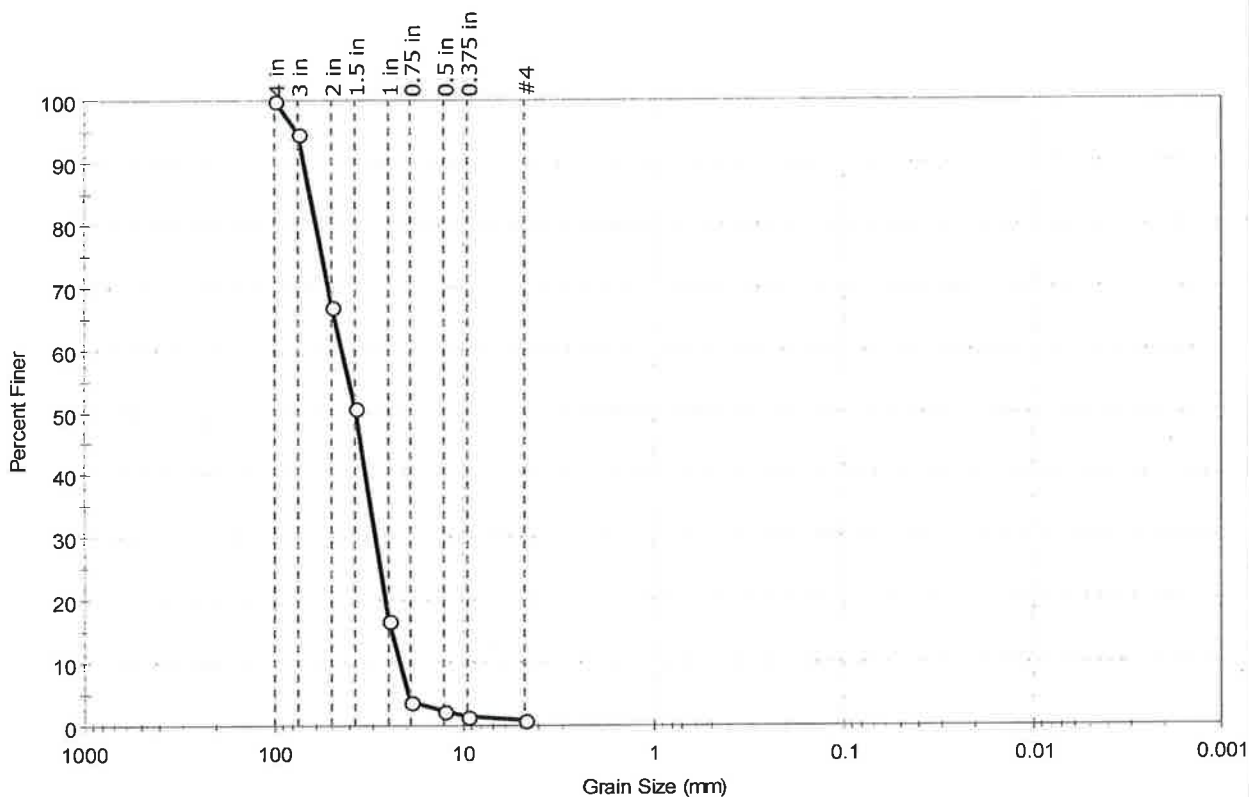
Test Id: 221359

Test Comment: ---

Sample Description: Moist, brown gravel

Sample Comment: ---

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	99.1	0.9	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100 ✓		
3 in	75.00	95		
2 in	50.00	67		
1.5 in	37.50	51		
1 in	25.00	17		
0.75 in	19.00	4		
0.5 in	12.70	2		
0.375 in	9.50	1		
#4	4.75	1 ✓		

Coefficients

$D_{85} = 65.1482$ mm $D_{30} = 29.2375$ mm
 $D_{60} = 44.1323$ mm $D_{15} = 24.0240$ mm
 $D_{50} = 37.1219$ mm $D_{10} = 21.6142$ mm
 $C_u = 2.042$ $C_c = 0.896$

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
 Sand/Gravel Hardness : HARD



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	GD-006	Test Date:	11/01/11
Depth :	---	Test Id:	221358
Tested By:	cam		
Checked By:	jdt		
Test Comment:	---		
Sample Description:	Moist, brown gravel		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

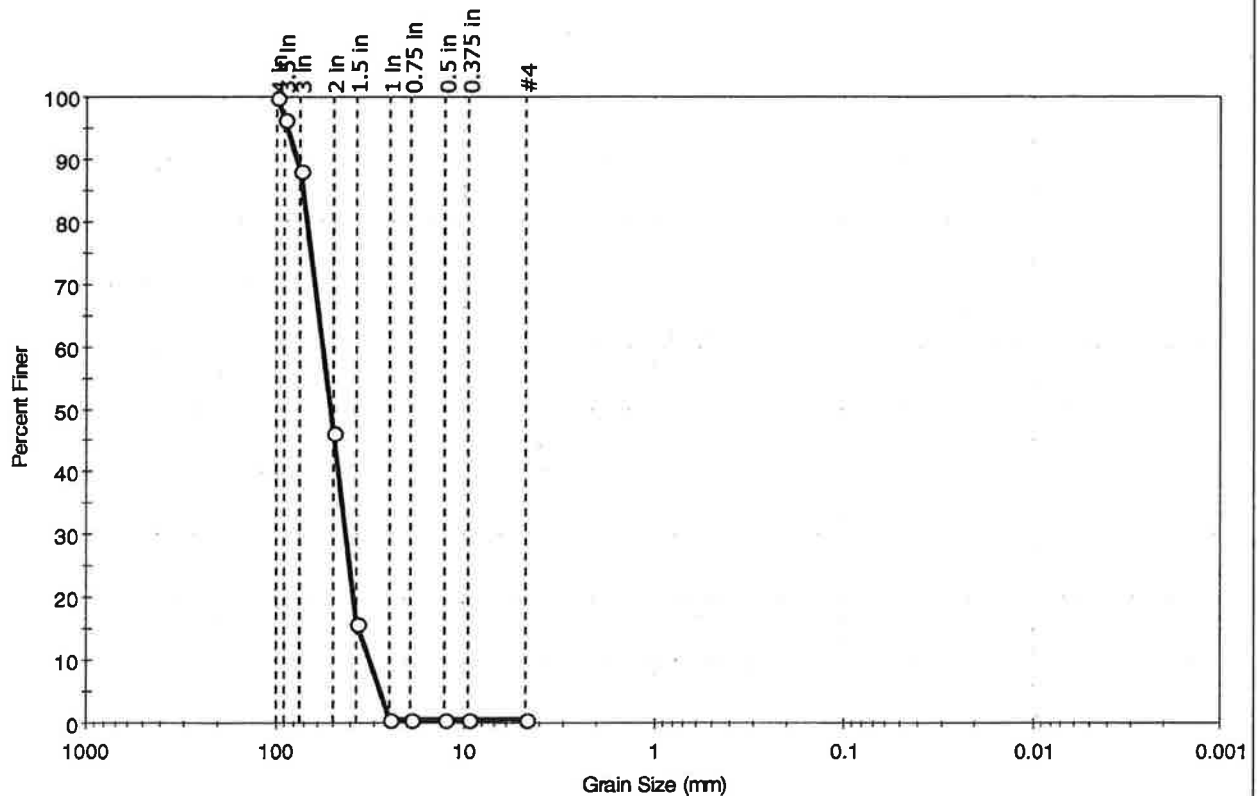
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GD-006	---	Poorly graded gravel	GP	99.1	0.9	0.0

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed



Client: Parsons Engineering Science	Project No: GTX-10120	
Project: SCA Phase 1a		
Location: Syracuse, NY		
Boring ID: ---	Sample Type: bucket	Tested By: jbr
Sample ID:GD-007	Test Date: 11/14/11	Checked By: jdt
Depth : ---	Test Id: 222622	
Test Comment: ---		
Sample Description: Moist, reddish brown gravel		
Sample Comment: ---		

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	99.6	0.4	0.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3.5 in	90.00	96		
3 in	75.00	88		
2 in	50.00	46		
1.5 in	37.50	16		
1 in	25.00	1		
0.75 in	19.00	0		
0.5 in	12.70	0		
0.375 in	9.50	0		
#4	4.75	0		

Coefficients

D ₈₅ = 72.7275 mm	D ₃₀ = 42.8516 mm
D ₆₀ = 57.0791 mm	D ₁₅ = 36.6339 mm
D ₅₀ = 51.8070 mm	D ₁₀ = 32.0504 mm
C _u = 1.781	C _c = 1.004

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jbr
Sample ID:GD-007	Test Date: 11/15/11	Checked By: jdt
Depth : ---	Test Id: 222623	
Test Comment: ---		
Sample Description: Moist, reddish brown gravel		
Sample Comment: ---		

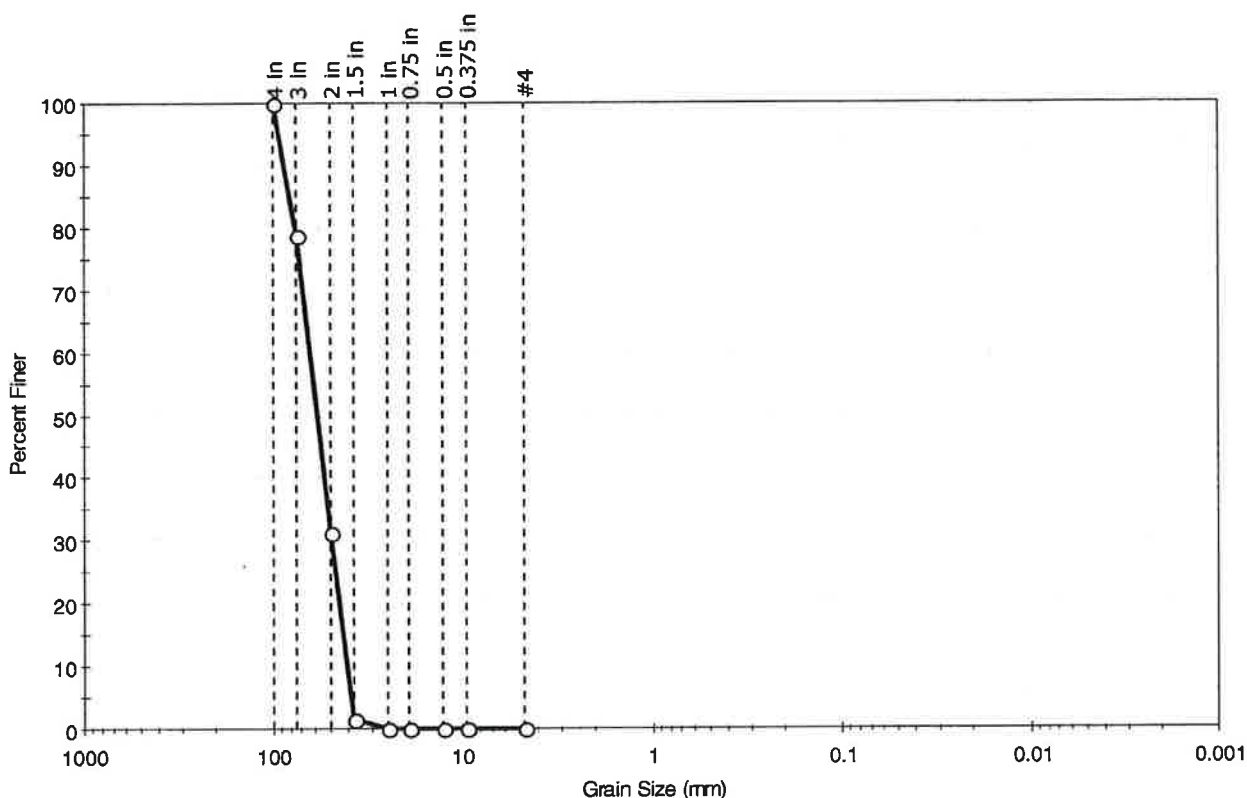
USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GD-007	---	Poorly graded gravel	GP	99.6	0.4	0.0



Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	
Location: Syracuse, NY	
Boring ID: ---	Sample Type: bucket
Sample ID: GDL-008	Test Date: 12/13/11
Depth: ---	Test Id: 224454
Test Comment: ---	
Sample Description: Dry, brown gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	99.9	0.1	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100 ✓		
3 in	75.00	79		
2 in	50.00	31		
1.5 in	37.50	1		
1 in	25.00	0		
0.75 in	19.00	0		
0.5 in	12.70	0		
0.375 in	9.50	0		
#4	4.75	0 ✓		

Coefficients

$D_{85} = 81.5236$ mm $D_{30} = 49.4047$ mm
 $D_{60} = 63.8686$ mm $D_{15} = 42.7333$ mm
 $D_{50} = 58.6573$ mm $D_{10} = 40.7161$ mm
 $C_u = 1.569$ $C_c = 0.939$

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
 Sand/Gravel Hardness : HARD



Client: Parsons Engineering Science		Project No: GTX-10120	
Project: SCA Phase 1a			
Location: Syracuse, NY			
Boring ID: ---	Sample Type: bucket	Tested By: jbr	
Sample ID: GDL-008	Test Date: 12/16/11	Checked By: jdt	
Depth: ---	Test Id: 224451		
Test Comment: ---			
Sample Description: Dry, brown gravel			
Sample Comment: ---			

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GDL-008	---	Poorly graded gravel	GP	99.9	0.1	0.0

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterberg Limits performed by ASTM 4318, results enclosed



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	12/14/11	Tested By:	ema
End Date:	12/14/11	Checked By:	jdt
Boring #:	---		
Sample #:	GDL-008	<i>GD 008</i>	
Depth:	---		
Visual Description:	Dry, brown gravel		

Permeability of Granular Soils (Constant Head) by ASTM D 2434 (Modified)

Sample Type:	Remolded		
Sample Information:	Maximum Dry Density:	---	pcf
	Optimum Moisture Content:	---	%
	Compaction Test Method:	---	
	Classification (ASTM D 2487):	GP	
	Assumed Specific Gravity:	2.55	
Sample Preparation / Test Setup:	The sample was placed into the testing apparatus and tamped lightly to create as even a top surface as practical. The full gradation of the as-received sample was used. See attached grain size report for particle size distribution.		

Parameter	Initial
Height, in	22.00
Diameter, in	19.24
Area, in ²	290.7
Volume, in ³	6396
Mass, g	154900
Bulk Density, pcf	92.3
Moisture Content, % (assumed)	0
Dry Density, pcf	92.3
Degree of Saturation, %	---
Void Ratio, e	---

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20 °C, cm/sec
12/14	1	166722.0	56	2977.2	0.1	23.3	11.6	1.254	29.2
12/14	1	166722.0	52	3206.2	0.1	25.1	11.6	1.254	31.5
12/14	1	166722.0	53	3145.7	0.1	29.5	11.6	1.254	37.0
12/14	1	166722.0	53	3145.7	0.1	29.5	11.6	1.254	37.0
12/14	1	166722.0	53	3145.7	0.1	29.5	11.6	1.254	37.0

PERMEABILITY @ 20 °C = 34.3 cm/sec

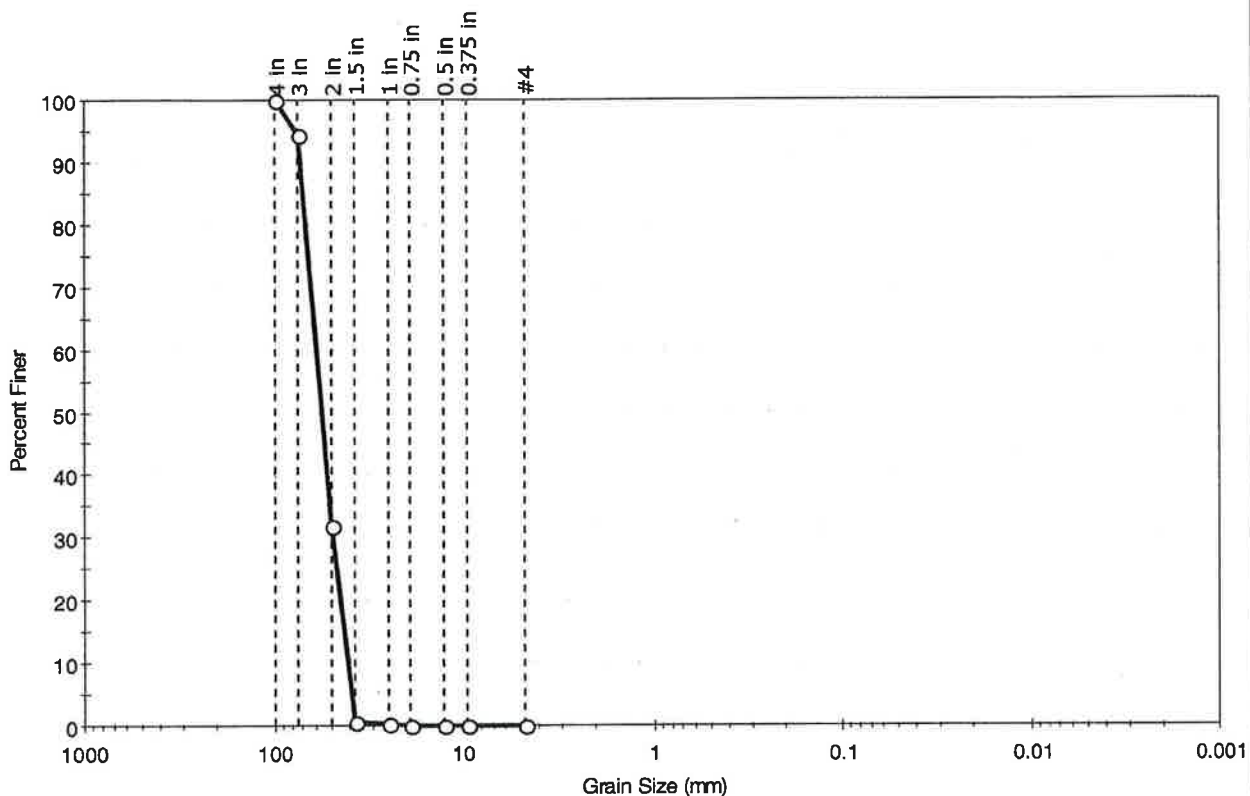
Deviations from ASTM D 2434:

- Material greater than 3/4-inch was used in the test specimen.
- A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
- The test specimen was not de-aired under vacuum prior to testing.
- Test was performed at only one gradient range.



Client:	Parsons Engineering Science	Project No:	GTX-10120
Project:	SCA Phase 1a	Tested By:	jbr
Location:	Syracuse, NY	Checked By:	jdt
Boring ID:	---	Sample Type:	bucket
Sample ID:	GDL-009	Test Date:	12/13/11
Depth:	---	Test Id:	224455
Test Comment:	---		
Sample Description:	Dry, reddish brown gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	100.0	0.0	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100 ✓		
3 in	75.00	94		
2 in	50.00	32		
1.5 in	37.50	1		
1 in	25.00	0		
0.75 in	19.00	0		
0.5 in	12.70	0		
0.375 in	9.50	0		
#4	4.75	0 ✓		

Coefficients

D ₈₅ = 70.5476 mm	D ₃₀ = 49.1004 mm
D ₆₀ = 59.9775 mm	D ₁₅ = 42.7816 mm
D ₅₀ = 56.2070 mm	D ₁₀ = 40.8615 mm
C _u = 1.468	C _c = 0.984

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
Sand/Gravel Hardness : HARD



Client: Parsons Engineering Science		
Project: SCA Phase 1a		
Location: Syracuse, NY		Project No: GTX-10120
Boring ID: ---	Sample Type: bucket	Tested By: jbr
Sample ID: GDL-009	Test Date: 12/16/11	Checked By: jdt
Depth: ---	Test Id: 224452	
Test Comment: ---		
Sample Description: Dry, reddish brown gravel		
Sample Comment: ---		

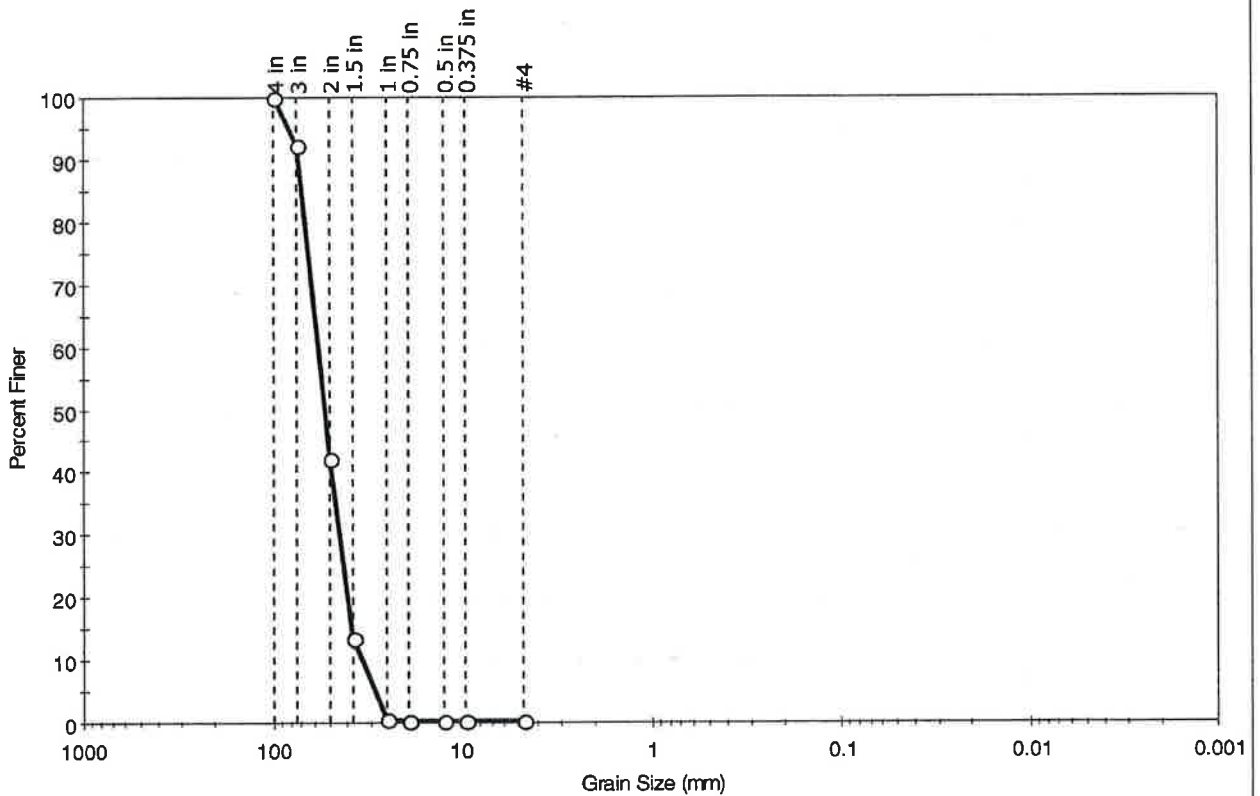
USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GDL-009	---	Poorly graded gravel	GP	100.0	0.0	0.0

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed

Client: Parsons Engineering Science	Project No: GTX-10120
Project: SCA Phase 1a	
Location: Syracuse, NY	
Boring ID: ---	Sample Type: bucket
Sample ID: GDL-010	Test Date: 12/13/11
Depth: ---	Test Id: 224456
Test Comment: ---	
Sample Description: Dry, reddish brown gravel	
Sample Comment: ---	

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	99.6	0.4	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100 ✓		
3 in	75.00	92		
2 in	50.00	42		
1.5 in	37.50	13		
1 in	25.00	0		
0.75 in	19.00	0		
0.5 in	12.50	0		
0.375 in	9.50	0		
#4	4.75	0 ✓		

Coefficients

D ₈₅ = 70.6685 mm	D ₃₀ = 44.2244 mm
D ₆₀ = 57.7079 mm	D ₁₅ = 38.0803 mm
D ₅₀ = 53.2156 mm	D ₁₀ = 33.6564 mm
C _u = 1.715	C _c = 1.007

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : **ROUNDED**
Sand/Gravel Hardness : **HARD**



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	GDL-010	Test Date:	12/15/11
Depth :	---	Test Id:	224453
Test Comment:	---		
Sample Description:	Dry, reddish brown gravel		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GDL-010	---	Poorly graded gravel	GP	99.6	0.4	0.0

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed



Client:	Parsons Engineering Science		
Project Name:	SCA Phase 1a		
Project Location:	Syracuse, NY		
GTX #:	10120		
Start Date:	12/14/11	Tested By:	ema
End Date:	12/14/11	Checked By:	jdt
Boring #:	---		
Sample #:	GDL-010		
Depth:	---		
Visual Description:	Dry, brown gravel		

Permeability of Granular Soils (Constant Head) by ASTM D 2434 (Modified)

Sample Type:	Remolded																								
Sample Information:	Maximum Dry Density:	---	pcf																						
	Optimum Moisture Content:	---	%																						
	Compaction Test Method:	---																							
	Classification (ASTM D 2487):	GP																							
	Assumed Specific Gravity:	2.55																							
Sample Preparation / Test Setup:	The sample was placed into the testing apparatus and tamped lightly to create as even a top surface as practical. The full gradation of the as-received sample was used. See attached grain size report for particle size distribution.																								
<table><tr><th>Parameter</th><th>Initial</th></tr><tr><td>Height, in</td><td>23.50</td></tr><tr><td>Diameter, in</td><td>19.24</td></tr><tr><td>Area, in²</td><td>290.7</td></tr><tr><td>Volume, in³</td><td>6832</td></tr><tr><td>Mass, g</td><td>156750</td></tr><tr><td>Bulk Density, pcf</td><td>87.4</td></tr><tr><td>Moisture Content, % (assumed)</td><td>0</td></tr><tr><td>Dry Density, pcf</td><td>87.4</td></tr><tr><td>Degree of Saturation, %</td><td>---</td></tr><tr><td>Void Ratio, e</td><td>---</td></tr></table>				Parameter	Initial	Height, in	23.50	Diameter, in	19.24	Area, in ²	290.7	Volume, in ³	6832	Mass, g	156750	Bulk Density, pcf	87.4	Moisture Content, % (assumed)	0	Dry Density, pcf	87.4	Degree of Saturation, %	---	Void Ratio, e	---
Parameter	Initial																								
Height, in	23.50																								
Diameter, in	19.24																								
Area, in ²	290.7																								
Volume, in ³	6832																								
Mass, g	156750																								
Bulk Density, pcf	87.4																								
Moisture Content, % (assumed)	0																								
Dry Density, pcf	87.4																								
Degree of Saturation, %	---																								
Void Ratio, e	---																								

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20 °C, cm/sec
12/14	1	166717.9	56	2977.1	0.1	21.3	11.4	1.262	26.9
12/14	1	166717.9	55	3031.2	0.1	25.3	11.4	1.262	32.0
12/14	1	166717.9	55	3031.2	0.1	30.4	11.4	1.262	38.3
12/14	1	166717.9	54	3087.4	0.1	30.9	11.4	1.262	39.1
12/14	1	166717.9	56	2977.1	0.1	29.8	11.4	1.262	37.7

PERMEABILITY @ 20 °C = 34.8 cm/sec

Deviations from ASTM D 2434:

- Material greater than 3/4-inch was used in the test specimen.
- A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
- The test specimen was not de-aired under vacuum prior to testing.
- Test was performed at only one gradient range.

Client: Parsons Engineering Science

Project: SCA Phase 1a

Location: Syracuse, NY

Project No: GTX-10120

Boring ID: ---

Sample Type: bucket

Tested By: jbr

Sample ID: GDL-012

Test Date: 12/19/11

Checked By: jdt

Depth: ---

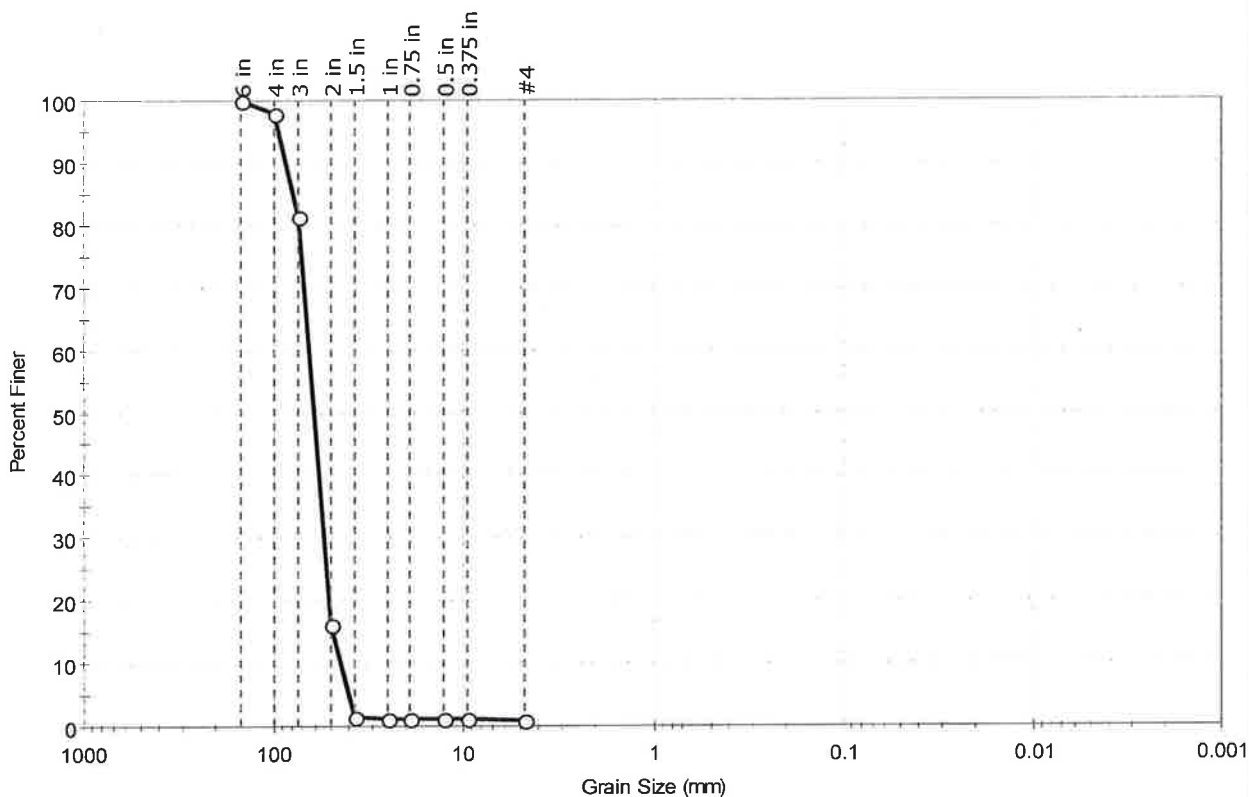
Test Id: 225109

Test Comment: ---

Sample Description: Moist, reddish brown gravel

Sample Comment: ---

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	99.0	1.0	0.0 ✓

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	98		
3 in	75.00	81		
2 in	50.00	16		
1.5 in	37.50	2		
1 in	25.00	1		
0.75 in	19.00	1		
0.5 in	12.70	1		
0.375 in	9.50	1		
#4	4.75	0		✓

Coefficients

$D_{85} = 79.9407 \text{ mm}$ $D_{30} = 54.5162 \text{ mm}$
 $D_{60} = 65.6936 \text{ mm}$ $D_{15} = 48.9313 \text{ mm}$
 $D_{50} = 61.7339 \text{ mm}$ $D_{10} = 44.3138 \text{ mm}$
 $C_u = 1.482$ $C_c = 1.021$

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED
 Sand/Gravel Hardness : HARD



Client:	Parsons Engineering Science		
Project:	SCA Phase 1a		
Location:	Syracuse, NY	Project No:	GTX-10120
Boring ID:	---	Sample Type:	bucket
Sample ID:	GDL-012	Test Date:	12/21/11
Depth :	---	Test Id:	225110
Test Comment:	---		
Sample Description:	Moist, reddish brown gravel		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	GDL-012	---	Poorly graded gravel	GP	99.0	1.0	0.0

Remarks: Grain Size analysis performed by ASTM D422, results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed



Client:	Parsons Engineering Science		
Project:	Onondaga SCA Phase I & II		
Location:	Camillus, NY	Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket
Sample ID:	DG-013	Test Date:	04/10/12
Depth :	---	Test Id:	233832
Test Comment:	---		
Sample Description:	Moist, reddish brown gravel		
Sample Comment:	---		

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-013	---	Poorly graded gravel	GP	98.7	0.6	0.7

Remarks: Grain Size Analysis performed by ASTM C 136, results enclosed



Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	04/10/12
Tested By:	jek
Checked By:	jdt

Material Finer Than #200 Sieve by ASTM C 117

Boring ID	Sample ID	Depth, ft	Sample Description	Fines, %
---	DG-013	---	Moist, reddish brown gravel	0.7

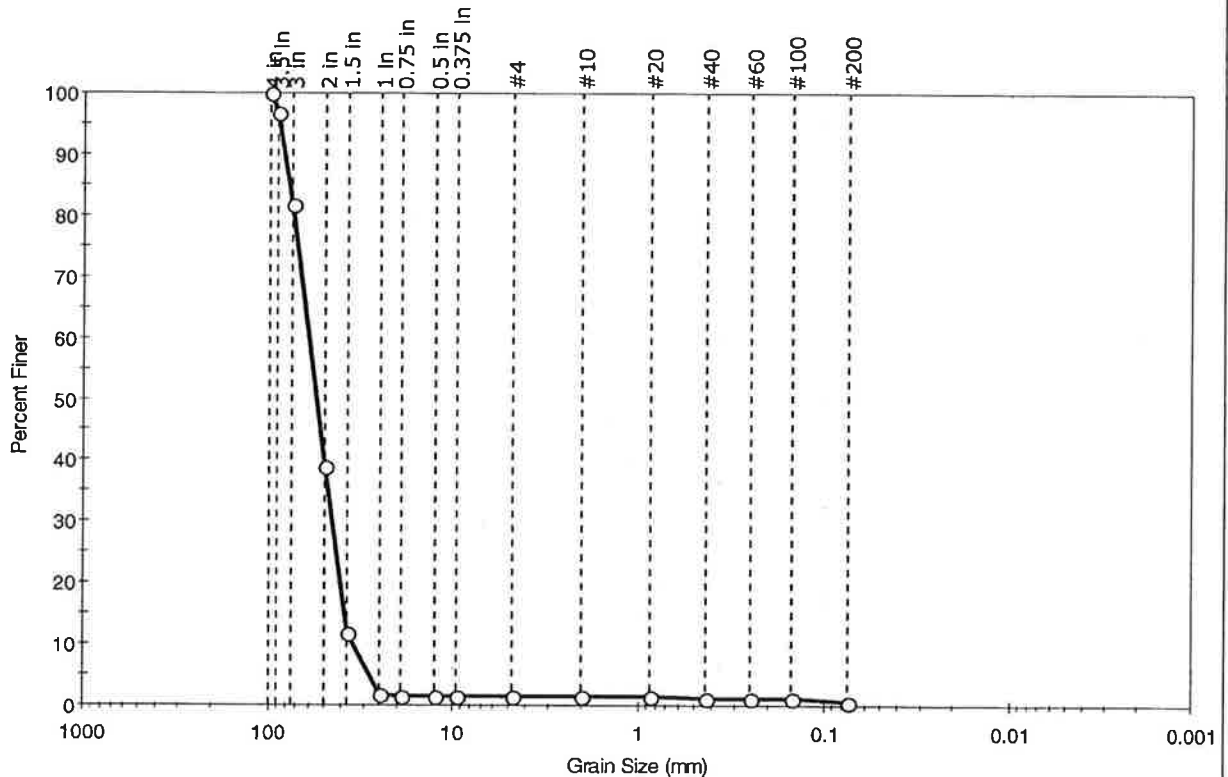
Notes: Procedure A used.

See ASTM C 136 report for full as-received sample gradation.



Client: Parsons Engineering Science	Project No: GTX-11670	
Project: Onondaga SCA Phase I & II		
Location: Camillus, NY	Boring ID: ---	Sample Type: bucket
	Sample ID: DG-013	Test Date: 04/10/12
	Depth: ---	Test Id: 233480
Test Comment: ---		
Sample Description: Moist, reddish brown gravel		
Sample Comment: ---		

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	98.7	0.6	0.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3.5 in	90.00	97		
3 in	75.00	82		
2 in	50.00	39		
1.5 in	37.50	12		
1 in	25.00	2		
0.75 in	19.00	1		
0.5 in	12.50	1		
0.375 in	9.50	1		
#4	4.75	1		
#10	2.00	1		
#20	0.85	1		
#40	0.42	1		
#60	0.25	1		
#100	0.15	1		
#200	0.075	1		

Coefficients

$D_{85} = 78.1424 \text{ mm}$ $D_{30} = 45.4851 \text{ mm}$
 $D_{60} = 61.0815 \text{ mm}$ $D_{15} = 38.8058 \text{ mm}$
 $D_{50} = 55.5432 \text{ mm}$ $D_{10} = 34.8884 \text{ mm}$
 $C_u = 1.751$ $C_c = 0.971$

Classification

ASTM Poorly graded gravel (GP)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : **ROUNDED**
 Sand/Gravel Hardness : **HARD**



Client:	Parsons Engineering Science		
Project Name:	SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	04/09/12	Tested By:	ema
End Date:	04/09/12	Checked By:	jdt
Boring #:	---		
Sample #:	GD-013		
Depth:	---		
Visual Description:	Moist, reddish brown gravel		

Permeability of Granular Soils (Constant Head) by ASTM D 2434 (Modified)

Sample Type:	Remolded		
Sample Information:	Maximum Dry Density:	---	pcf
	Optimum Moisture Content:	---	%
	Compaction Test Method:	---	
	Classification (ASTM D 2487):	GP	
	Assumed Specific Gravity:	2.55	
Sample Preparation / Test Setup:	The sample was placed into the testing apparatus and tamped lightly to create as even a top surface as practical. The full gradation of the as-received sample was used. See attached grain size report for particle size distribution.		

Parameter	Initial
Height, in	18.00
Diameter, in	19.24
Area, in ²	290.7
Volume, in ³	5233
Mass, g	115350
Bulk Density, pcf	84.0
Moisture Content, % (assumed)	0
Dry Density, pcf	84.0
Degree of Saturation, %	---
Void Ratio, e	---

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20°C, cm/sec
4/9	1	166803	55	3033	0.14	11.6	13.0	1.203	14.0
4/9	2	166803	54	3089	0.14	11.9	13.0	1.203	14.3
4/9	3	166803	51	3271	0.14	12.6	13.0	1.203	15.1
4/9	4	166803	54	3089	0.14	11.9	13.0	1.203	14.3
4/9	5	166803	55	3033	0.14	11.6	13.0	1.203	14.0

PERMEABILITY @ 20 °C = 14.3 cm/sec

Deviations from ASTM D 2434:

Material greater than 3/4-inch was used in the test specimen.
A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
The test specimen was not de-aired under vacuum prior to testing.
Test was performed at only one gradient range.
The maximum particle size of 6-inch minus is not in accordance with the ASTM requirement that the permeameter have a diameter 8 to 12 times larger than the maximum particle size.