Prepared for

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Syracuse, New York 13212
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ONONDAGA LAKE BOTTOM

PHASE II – SEDIMENT CONSOLIDATION AREA CONSTRUCTION

CONSTRUCTION QUALITY ASSURANCE (COA) FINAL REPORT ONONDAGA COUNTY, TOWN OF CAMILLUS, NEW YORK

Prepared by

Geosyntec consultants

engineers | scientists | innovators

289 Great Road, Suite 105
Acton, Massachusetts 01720

1255 Roberts Boulevard, Suite 200
Kennesaw, Georgia 30144

Project Number GJ4706B

April 2013

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EXECUTIVE SUMMARY

Honeywell International Inc. (Honeywell) entered into a Consent Decree (United States District Court, Northern District of New York, 2007) (89-CV-815) with the New York State Department of Environmental Conservation (NYSDEC) to implement the selected remedy for Onondaga Lake as outlined in the Record of Decision (ROD) issued on 1 July 1 2005. Under the agreement, Honeywell is required to construct a sediment consolidation area (SCA) over Wastebed 13, located in the Town of Camillus, New York. The SCA is being constructed to accept sediments dredged from nearby Onondaga Lake (reference Figure 1, Site Location Map)

The SCA is being developed in several phases of construction, dependent of the area needed; they are numbered one through three. This Construction Quality Assurance (CQA) Final Report presents a summary of the Phase II area construction activities for the Onondaga Lake SCA. It is noted that a debris management area (DMA) is located in the western edge of Phase II and has been previously certified under a separate cover, dated 12 June 2012. Due to operational constraints, Phase II was subdivided into Phase IIA, the eastern portion, and Phase IIB, the western portion (reference Figure 2, Limits of Phase II). Phase IIB was certified under separate cover, dated 12 October 2012. The data contained within this report covers Phase II of construction. The construction activities discussed in this report include: (i) engineered fill; (ii) low-permeability soil layer; (iii) gravel drainage layer; and (iv) installation of geosynthetics (i.e., geotextile, and geomembrane liner). As appendices to the report, quality assurance/quality control (QA/QC) documentation is provided.

This report provides certification by an engineer, registered in the State of New York, that the area was constructed in accordance with the approved plans and specifications, and modifications approved by the Designer and NYSDEC. The test requirements for each of the major components of the lining system are summarized on the tables that follow.

TABLE 1
Geotechnical Laboratory Testing Summary
Honeywell / Parsons
Sediment Consolidation Area - Phase II
Camillus, NY

	DESCRIPTION	TEST STANDARD	PROJECT SPECIFICATIONS	UNITS	FREQUENCY QUALITY CONTROL	FREQUENCY QUALITY ASSURANCE	ESTIMATED No. of QC TESTS REQUIRED [1]	ESTIMATED No. of QA TESTS REQUIRED [1]	No. of QC TESTS PERFORMED	No. of QA TESTS PERFORMED (failures)
A.	**Engineered Fill - Perimeter Berm (reference Tables A-1 & A-2 of CQA Plan and Section 02200 of Specifications)**									
	Estimated CQA volume [1] of less than:	1,700	cyd over an area of:	5	acres (per cyd)					
	Estimated QC volume [1] of less than:	1,198	cyd							
a.	Restricted Use Soil Cleanup Objectives (Reference RFI No. 1)	Table 375-6.8(b) NYSDEC Subpart 375	less than Industrial Standards	-	2,500	-	1	-	1	-
b.	Soil Classification (Reference RFI Nos. 2 & 15)	ASTM D2487	SC, SM, ML, CL, GM, GC, or GW GPw/sand, GP-GM, GP-GM w/sand, SP-SM w/Gravel, or SW-SM w/Gravel	USCS	2,500	1 per 10 QC tests	1	1	12	1
c.	Sieve Analysis	ASTM D422	remove visible rocks max. clod - 3 for 8-in thick lift max. 4 for 4-in thick lift max. 2	in.	2,500	1 per 10 QC tests	1	1	12	1
d.	Standard Proctor	ASTM D698	–	lb/ft^3	2,500	1 per 10 QC tests	1	1	12	1
e.	Atterberg Limits	ASTM D4318A	–	%	2,500	1 per 10 QC tests	1	1	11	1
f.	Organic Content / Loss of Ignition	ASTM D2974	–	%	2,500	1 per 10 QC tests	1	1	12	1
g.	Moisture Content	ASTM D2216	-2 to +2	%	2,500	1 per 10 QC tests	1	1	12	1
h.	Nuclear Field Moisture/Density (FDT)	ASTM D3017/2922	≥ 95 R.C. (non-bridge lift)	%	NP	5 tests/acre	-	25	-	64
i.	Sand Cone/Drive Cylinder	ASTM D1556/2937	≥ 95 R.C. (non-bridge lift)	%	NP	1 per 25 FDT	-	3	-	4
j.	Thickness (Reference RFI Nos. 3 & 16)	visual	Bridge Lift: 22 to 26-in (loose) Typical Lift: 7 to 10-in (loose) Hand Compacted: 3 to 5-in (loose)	-	during construction	during construction	-	-	-	-
k.	Survey	Record Drawings	+0.3% of designed slope along 50-ft edge	-	-	-	-	-	-	-
B.	**Low Permeability Soil Layer (reference Tables A-1 & A-2 of CQA Plan and Section 02250 of Specifications)**									
	Estimated CQA volume [1] of less than:	57,500	cyd over an area of:	24.5	acres (per cyd)					
	Estimated QC volume [1] of less than:	51,071	cyd							
a.	Restricted Use Soil Cleanup Objectives	Table 375-6.8(b) NYSDEC Subpart 375	less than Industrial Standards		1 per source	-	Reference Phase I CQA Final Report, Appendix C	-	-	-
b.	Soil Classification (Reference FCF No. 2 - not implemented)	ASTM D2487	SC, SM, ML, or CL	USCS	2,500	1 per 10 QC tests	21	3	22	4
c.	Sieve Analysis	ASTM D422	remove visible rocks >1-in 100% 1-in. 100-50% No. 200 sieve	in.	2,500	1 per 10 QC tests	21	3	23	4
d.	Standard Proctor	ASTM D698	–	lb/ft^3	5,000	1 per 10 QC tests	11	2	11	2
e.	Atterberg Limits	ASTM D4318A	-	%	1,000	1 per 10 QC tests	52	6	52	10
f.	Organic Content / Loss of Ignition	ASTM D2974	-	%	5,000	1 per 10 QC tests	11	2	11	4
g.	Moisture Content	ASTM D2216	-3 to +3	%	1,000	1 per 10 QC tests	52	6	52	10
h.	Permeability @3,000 psf / i ≤ 30	ASTM D5084	≤ 10-6	cm/s	5,000	1 per 10 QC tests	11	2	11	2
i.	Permeability- Shelby tubes	ASTM D5084	upper 6-in ≤ 10-6	cm/s	NP	1 test/acre top lift	-	25	-	28
j.	Nuclear Field Moisture/Density (FDT)	ASTM D3017/2922	≥ 95 R.C. top 6-in ≥ 90 R.C. mid lifts	%	NP	9 test/acre top lift 9 test/acre/lift	- -	221 100	- -	303 (12) 115 (5)
k.	Sand Cone/Drive Cylinder	ASTM D1556/2937	see above	%	NP	1 per 25 FDT	-	9	-	33
l.	Interface Direct Shear (700, 2100, 3500 psf @ 0.004 in/min)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg	-		1	-	-	1	
m.	Thickness (Reference RFI No. 3 and FCF No. 3)	visual	Minimum: 12-in Top: 6-in must meet perm req. with desiccation cracks less than width of dime Bridge Lift: 10 to 14-in (loose) Typical Lift: 6 to 10-in (loose) Hand Compacted: 3 to 5-in (loose)	-	during construction scarify min. 2-in moisture condition	during construction	-	-	-	-
n.	Survey	Top Surface: measure 50 by 50-ft grid thickness cals 100 by 100-ft grid (see Appx. N - Geot. Monit. Plan) For less than 18-in thick LP - install square steel plate and auger on 100 by 100-ft grid	+0.2% of designed slope along 50-ft edge	-	-	-	-	-	-	-
C.	**Gravel Drainage Layer (reference Tables A-1 & A-2 of CQA Plan and Section 02300 of Specifications)**									
	Estimated CQA volume [1] of less than:	46,800	cyd over an area of:	24.5	acres (per cyd)					
	Estimated QC volume [1] of less than:	66,442	cyd							
a.	Restricted Use Soil Cleanup Objectives	Table 375-6.8(b) NYSDEC Subpart 375	less than Industrial Standards		Reference FCF No. 10	-	-	-	-	-
b.	Soil Classification	ASTM D2488	GW or GP	USCS	1,000	1 per 10 QC tests	67	5	74	9
c.	Sieve Analysis (Reference RFI No. 17)	ASTM C136	100% +4-in. 0-5% No. 4 sieve 0-3% No. 200 sieve	in.	1,000	1 per 10 QC tests	67	5	74	9
d.	Hydraulic Conductivity	ASTM D 2434	≥ 10	cm/s	2,500	1 per 10 QC tests	27	2	35	5
e.	Interface Direct Shear (Reference RFI Nos. 12, 14 & 21)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg	-		1	-	-	1	
f.	Thickness (Reference FCF Nos. 1 & 7)	visual	Minimum: 12-in / 24-in under access roads	-	during construction	during construction	-	-	-	-
g.	Survey	Record Drawings	+/-0.2% of designed slope along 50-ft edge	-	-	-	-	-	-	-

Notes:

(1) Based upon received volume during construction. Reference FCF No. 5 regarding QA test frequency reliant on volumes and Table 4.1 of Parsons' Contractor Quality Control Plan, Rev0.
During construction CQA personnel tracked soil volumes by either obtaining volume from field personnel or the number of truck deliveries in a day. By using a conversion factor (e.g., 1.5 tons/cyd for soils and 1.6 tons/cyd for rock) estimates of loose volume was tracked on a daily basis. This tracked volume was used to obtain CQA samples.
Parsons independently tracked volumes of soil deliveies that was used to collect QC samples.

(2) First lift of LP soil is considered a bridge lift and not subjected to compaction requirement.
The lifts between the upper and bridge lifts are considered mid-lifts. Portions deeper than 3-ft below surface shall be less than 2-in dia.,
50% or greater passing No. 200 sieve, and be classified as SC, SM, ML or CL. Reference FCF No. 2 for details.
Assume final lift and at least one mid-lift exist for the entire cell for FDT estimate.

(3) The LP soil sample shall be compacted at 95 percent and at approximately +3% of the maximum as determined by the standard Proctor compaction test.
Reference Request For Information (RFI) and Field Change Form (FCF) for additional details.

NA-Not Applicable; NP-Not Provided; NR-Not Required

TABLE 2
Geosynthetic Laboratory Testing Summary
Honeywell / Parsons
Sediment Consolidation Area - Phase II
Camillus, NY

DESCRIPTION	TEST STANDARD	PROJECT SPECIFICATIONS	UNITS	MQC TEST FREQUENCY	MQC UNIT	QA TEST FREQUENCY	QA UNIT	MQC No. of TESTS REQUIRED (1)	QA No. of TESTS REQUIRED (1)	MQC No. of TESTS PERFORMED	QA No. of TESTS PERFORMED (failures)
A. Geomembrane (reference Part 4/Table A-4 of CQA Plan & Section 02070 of Specifications)											
Estimated area of less than:	1,602,870	sft to cover:	24.5	acres for Phase II and DMA				Assume 138 Agru America rolls, each roll 505 by 23-ft			
	53,287	lft seams welded						See RFI No. 25 regarding four sacrificial geomembrane rc			
a. Thickness	ASTM D5994	MARV 60	mil	50,000	SF	250,000	SF	33	7	138	7
b. Asperity Height	ASTM D7466	MARV 10	mil	50,000	SF	NR	-	33	-	138	-
c. Tensile Properties	ASTM D6693			50,000	SF	250,000	SF	33	7	40	7
Strength at Break	-Type IV	≥ 90	lb/in								
Elongation at Break		100	%								
Strength at Yield		≥ 126	lb/in								
Elongation at Yield		12	%								
d. Density/Specific Gravity	ASTM D792A / D1505	≥ 0.940 (sheet) 0.93 (resin)	g/cm^3	50,000	SF	250,000	SF	33	7	40	7
e. Melt Flow	ASTM D1238E	≤ 1.0	g/10 min	certify	-	-	-		-		-
f. Carbon Black Content (Reference RFI No. 13)	ASTM D1603 / 4218	2 to 3	%	50,000	SF	250,000	SF	33	7	40	7
g. Carbon Black Dispersion	ASTM D5596	9 out of 10-Cat 1, 2 10 out of 10-Cat 1, 2, 3	Cat.	50,000	SF	250,000	SF	33	7	40	7
h. Tear Resistance	ASTM D1004C	≥ 42	lb	50,000	SF	250,000	SF	33	7	40	7
i. Puncture Resistance	ASTM D4833	≥ 90	lb	NA	SF	250,000	SF	-	7	5	7
j. Oxidative Induction Time	ASTM D3895	MARV 100	min	batch	-	NR	-	4	-	40	-
k. Stress Crack Resistance	ASTM D5397	≥ 300 (on smooth edges)	hrs	batch	-	NR	-	4	-	Certified 1500 hrs	-
l. Seam Destructive Tests (2) (see FCF No. 9)	ASTM D6392	fusion peel - 91 extrusion peel - 78 fus./ext. shear - 120	ppi	NA	-	500	LF	-	107	-	114+27 (15)
m. Field Conditions	6-in above surface	weld 40 - 104 degrees wind 0 to 20 mph	F	-	-	-	-	-	-	-	-
n. Non-Destructive Tests	-	GRI GM9 below 32 deg 5 psi-Vacuum 25-30 (±3) psi-Air Leak Location Survey	20-secs 5min -	every seam	-	-	-	-	-	-	-
o. Interface Friction Angle-Geosynthetic/Soil	ASTM D5321	See Spec. 02250					-	-	-	-	
Interface Friction Angle-Geosynthetic (Reference RFI No. 12, 14 & 21)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg			1		-	-	-	-	1
B. Nonwoven Geotextile Cushion (reference Part 4/Table A-5 of CQA Plan & Section 02074 of Specifications)											
Estimated area of less than:	1,217,250	sft, a total of	267	rolls		supplied by Skaps (GE240) and 7 rolls supplied by GSE (GEO-240E) 15'X150'					
a. Mass Per Unit Area	ASTM D5261	≥ 24	oz/yd^2	90,000	SF	250,000	SF	14	5	55	6
b. Grab Strength	ASTM D4632	≥ 230	lb	90,000	SF	250,000	SF	14	5	55	6
c. Puncture Resistance	ASTM D4833	≥ ~~5,000~~ 250	lb	90,000	SF	250,000	SF	14	5	27	6
d. Trapezoidal Tear Strength	ASTM D4533	≥ 95	lb	90,000	SF	250,000	SF	14	5	55	6
e. UV Resistance (Reference FCF Nos. 6 and 11)	ASTM D4355	≥ 70	%	Batch	-	Certify	-	-	-	-	-
f. Seaming	ASTM D6193	single thermal weld (6-in overlap seam Stitch Type 401 / 3-ft overlap of butt seams shingled in direction of fill placement)	-	visual	-	visual	-	-	-	-	-
g. Interface Direct Shear (Reference RFI Nos. 12, 14 & 21)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg	-		1			-	-	1	

Notes:

(1) Based upon the testing frequency presented in the Project Documents. Material quantities provided by Site.
Basic area is assumed to be: 24.5 acres or 1,067,220 sft

(2) Assume geomembrane sheet width of 21 ft and destructive seam test frequency of 1 sample per 500 ft.
Trial seams were performed at the beginning of each seam period; min. 15-ft long with two & two samples tested in shear & peel, respectively.

(3) Reference Request For Information (RFI) and Field Change Form (FCF) for additional details.
ARV- Min. Average Value; NA-Not Applicable; NP-Not Provided; NR-Not Required

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1. INTRODUCTION

1.1 Overview

This final report summarizes the Construction Quality Assurance (CQA) activities performed by Geosyntec Consultants (Geosyntec) of Acton, Massachusetts and Kennesaw, Georgia during construction of Phase II at the Honeywell International Inc. (Honeywell) Onondaga Lake Sediment Consolidation Area (SCA) in Camillus, Onondaga County, New York. Honeywell entered into a Consent Decree (CD) (United States District Court, Northern District of New York, 2007) (89-CV-815) with the New York State Department of Environmental Conservation (NYSDEC) to implement the selected remedy for Onondaga Lake as outlined in the Record of Decision (ROD) issued 1 July 2005. The following documents are appended to the CD: ROD, Explanation of Significant Differences (ESD), Statement of Work (SOW), and Environmental Easement and can be referenced for additional information.

The CQA activities performed by Geosyntec included monitoring of: (i) engineered fill construction; (ii) low-permeability soil layer construction; (iii) gravel drainage layer construction; and (iv) installation of geosynthetics (i.e., geotextile and geomembrane liner). The CQA activities were performed to confirm construction materials and procedures that were monitored were in compliance with the Subpart 360 Regulations, as required by NYSDEC Solid Waste Management.

This report was prepared for Mr. Larry Somer of Honeywell by Mr. Marcus Fountain, Mr. David Williams, Mr. Doug Hamilton, and Mr. Billy Carruth, and was reviewed by Mr. David Bonnett, P.E., all of Geosyntec.

1.2 Report Organization

This final report is organized as described below.

- A description of the project is provided in Section 2.
- A summary description of the CQA program is presented in Section 3.
- A description of the CQA monitoring and testing activities performed during the earthwork portion of the project is provided in Section 4.
- A description of the CQA monitoring and testing activities performed during the geosynthetics installation is provided in Section 5.

- A summary of the observations resulting from the CQA monitoring and testing activities performed by Geosyntec and a certification statement signed and sealed by a professional engineer registered in the State of New York are presented in Section 6.

Documentation and record drawings presenting the results of the CQA monitoring and testing activities performed by Geosyntec are contained in the appendices to this report. Construction quality control (QC) information provided by Parsons is also presented for completeness.

2. PROJECT DESCRIPTION

The Onondaga Lake is a 4.6 square mile (approximately 3,000 acre) lake located in central New York State, immediately northwest of the City of Syracuse. Honeywell is currently working on a sediment removal and lake remediation project to restore the lake. Parsons of Syracuse, New York and Geosyntec are members of the team assisting Honeywell in this effort. The remediation of the Onondaga Lake bottom is on the New York State Registry of Inactive Hazardous Waste Sites and is part of the Onondaga Lake National Priorities List site. As specified in the ROD [NYSDEC and USEPA, 2005], the major components of the remedy include construction of a hydraulic control system (consisting of a hydraulic barrier wall and a groundwater collection system); hydraulic dredging of contaminated sediments on the lakeside of the barrier wall; pumping of the dredge material to a sediment consolidation area (i.e., SCA); placing of the sediments within geotextile tubes for the purpose of dewatering in the SCA; and the collection and treatment of the decanted water through an on-site treatment facility.

The SCA is located on Wastebed 13, which encompasses approximately 163 acres. It is bordered to the north by Ninemile Creek and the CSX Railroad tracks; to the west by an Onondaga County Garage property and a former gravel excavation owned by Honeywell; and to the east and south by Wastebeds 12 and 14, respectively. (Reference Figure 1 – Site Location Map.) Wastebed 13 was originally designed as a settling basin for the disposal of Solvay waste and has recently been used by the State University of New York College of Environmental Science and Forestry (SUNY ESF) and Honeywell for willow/evapotranspiration cover pilot test plots. The SCA has been designed to provide long-term containment of the dredged sediment. The SCA has been designed to hold up to the ROD specified volume of 2,653,000 cubic yards (cyd) of dredged sediment.

The base liner system design of the SCA incorporates a single-composite liner system and other engineering controls that meet the requirements established in the New York State approved "Onondaga *Lake Sediment Consolidation Area (SCA) Civil and Geotechnical Final Design*", dated March 2011. The design of the SCA includes a centrally located 200 foot wide (east-west direction) sump corridor. The single-composite liner system consists of the following components (from top to bottom):

- 12-in thick (minimum) gravel drainage layer with 24-in minimum in traffic areas, having a minimum permeability of 10 cm/sec;
- 24 oz/syd nonwoven, needle-punched geotextile cushion;
- 60-mil thick textured high density polyethylene (HDPE) geomembrane liner;

- geosynthetic clay liner (GCL) in sump areas only;
- 12-in (minimum) outside of the sump corridor and 18-in thick (minimum) within the sump area of a low-permeability (LP) soil layer, the upper six inches of which requiring permeability not exceeding 1 x 10^{-6} cm/sec;
- varying thickness of low-permeability soil bridge lift over existing Solvay waste; and
- varying thickness of engineered fill along the perimeter.

The Phase II footprint has a rectangular configuration and is approximately 1,700-ft long (east-west) and approximately 700-ft wide (north-south). Phase I and future Phase III are located to the north. Two SCA basins have been constructed adjacent to the eastern and western extents of Phase I. These basins are considered part of the sediment management system (SMS) for the SCA. Construction details of the SMS basins was presented in an 11 July 2012 report. It is noted that a debris management area (DMA) is located in the western edge of Phase II and has been previously certified under a separate cover. Due to operational constraints, Phase II was subdivided into Phase IIA and Phase IIB along the crest line separating drainage to the east and west. Phase IIB, the western portion, was certified under separate cover on 12 October 2012. Reference Figure 2 – Limits of Phase II. The data presented within this report supplements the previous Phase II submittals.

The original design and construction drawings were prepared by Geosyntec and Parsons. Parsons performed construction of the majority of the Phase II earthwork components, including the engineered fill, low-permeability soil, and gravel drainage layers. The geosynthetics installer for the project was Chenango Contracting (Chenango or installer), of Johnson City, New York. Parsons retained THG Geophysics (THG) of Murrysville, Pennsylvania to conduct the liner integrity or leak location testing. The surveyor retained by Parsons for the project was Thew Associates (Thew) of Canton, New York. Thew performed initial site control and occasionally verified elevations. As required by the Phase II project documents, Parsons surveyed the required layers of the low-permeability soil and drainage layers and prepared certified record drawings. Parsons used global positioning system (GPS) based survey equipment to accomplish this task. Geosyntec provided the construction quality assurance (CQA) monitoring, testing, and documentation. A list of personnel involved in construction of Phase II is included in Section 3.2 of this report.

A list of the key construction activities and associated dates are provided below.

- Geosyntec arrived on site to observe earthwork construction associated with Phase II occurring within the 2012 construction season on 26 March 2012, when construction of the low-permeability soil layer resumed following the winter shutdown. A portion of the initial lift of the low-permeability soil layer was constructed during the 2011 construction season concurrent with Phase I construction.

- Geomembrane installation commenced on 15 May 2012.

- Gravel drainage layer placement began on 4 June 2012.

- Construction of Phase II was substantially completed on 14 November 2012.

- An inclinometer, referred to as SI-G1, was decommissioned (by others) in March 2013; Geosyntec monitored the repairs to the lining system conducted on 3 and 4 April 2013.

This Final Report pertains to construction of Phase II of the SCA, monitored by Geosyntec, which primarily occurred in 2012. However, due to the nature of the construction, activities overlapped and some information is included that is inter related to Phase I or the SMS construction. Reports generated during Phase I construction and submitted previously under separate cover contain some information regarding observations of the initial low-permeability soil layer placement activities occurring within that time period.

3. CONSTRUCTION QUALITY ASSURANCE PROGRAM

3.1 Scope of Services

3.1.1 Overview

The scope of CQA monitoring, testing, and documentation services performed by Geosyntec during Phase II construction included review of documents, field CQA operations, and preparation of this Final Report and record drawings. These are described in the following subsections.

3.1.2 Review of Documents

As previously noted, this final report summarizes the CQA activities performed by Geosyntec during Phase II construction. The CQA activities conducted by Geosyntec were intended to satisfy the requirements of the following documents:

- Permit Drawings entitled "*Sediment Consolidation Area Final Design, Camillus, New York*", dated July 2010, revised April 2011, prepared by Parsons and Geosyntec;

- "*Construction Quality Assurance Plan, Onondaga Lake Sediment Consolidation Area (SCA) Final Design*", prepared by Geosyntec, dated April 2011; and

- Specifications entitled "*Onondaga Lake Sediment Consolidation Area (SCA) Final Design Submittal*", prepared by Parsons and Geosyntec, dated April 2011.

Geosyntec reviewed the above documents for familiarity prior to the commencement of on-site CQA activities. During construction, clarifications of the project specifications and drawings were typically requested in the form of Request for Information (RFI). Changes to the design documents were handled through Construction Field Change Forms (FCF). The RFIs and FCFs were issued by the contractor with responses by the Designer. The FCFs were also signed by the Owner and the NYSDEC. The design changes were typically reviewed routinely during weekly progress meetings. Copies of the RFIs and FCFs relating to Phase II construction are provided in Appendix B.

A major change to the CQC and CQA testing program included the following:

- FCF No. 5: "in lieu of using the number of CQC samples, CQA sample frequency will be tied to the delivered volumes such that the test frequency shall become: volume of soil delivered to the site divided by CQC test frequency and divided by ten".

Reference to the various RFIs and FCFs are provided throughout the report in the various related sections as well as in the material tables found in the executive summary.

All of the above documents will be collectively referred to as the CQA Plan in this final report.

3.1.3 Field CQA Operations

The following activities were performed as part of Geosyntec's on-site CQA services:

- attending daily health and safety meetings;
- attending weekly progress meetings;
- maintaining photographic documentation of the construction;
- summarizing construction and CQA activities in weekly field reports;
- documenting construction progress and CQA activities in daily field reports;
- conducting field density tests of the engineered fill and low-permeability soil layer;
- collecting samples of soils and geosynthetics; and
- coordinating geomembrane as-built surveys.

Earthwork:

- collecting samples of soils considered for use as engineered fill (i.e., berms), low-permeability soil layer, and gravel drainage layer for testing at either an on-site or off-site geotechnical laboratory;
- reviewing and evaluating geotechnical laboratory test results for compliance with the requirements of the CQA Plan;
- visual monitoring of placement, grading, and compaction operations of the soil layers of the cell;
- visually monitoring site preparation; and
- selective monitoring perimeter berms.

Geosynthetics:

- monitoring and tracking the inventory of geosynthetic materials delivered to the site;

- collecting geosynthetic conformance samples from delivered rolls and forwarding samples to an off-site geosynthetics testing laboratory;

- collecting and reviewing geosynthetic manufacturers' certification documents (through contractor's submittals) and geosynthetic laboratory conformance test results for compliance with the requirements of the CQA Plan;

- monitoring installation of geosynthetic materials, including trial seaming, destructive and nondestructive sampling, and repair operations; and

- selective monitoring of the anchorage of the geosynthetics in the perimeter anchor trench.

During construction activities involving monitoring and/or testing, the observations made and results obtained by Geosyntec CQA personnel were compared to the CQA Plan. The construction manager, and/or the appropriate contractor were notified of deficiencies in construction practices and/or materials so the contractor or installer could implement the appropriate corrective actions. The corrective actions were monitored and/or tested by CQA personnel for compliance with the CQA Plan.

3.1.4 Final Report and Record Drawings

Record drawings and this Final CQA Report were prepared as the final task of the CQA program. During construction, CQA documentation of on-site activities was maintained by CQA personnel in Daily Field Reports (DFRs) and summarized in weekly reports. In addition, quality control (QC) certificates for the geosynthetic materials and as-built drawings were provided to Geosyntec for review. The weekly reports are included in the appendices to this report. CQA personnel also documented the results of on-site and off-site geotechnical testing conducted as part of the CQA program. Descriptions of the construction activities and the CQA documentation are presented in this Final CQA Report which contains the report text, summary tables, and Appendices A through P.

3.2 Personnel

3.2.1 Project Personnel

Senior personnel or representatives for the firms involved in the project are as follows:

Honeywell International Inc. (Owner)

- Larry Somer

New York State Department of Environmental Conservation (Regulatory Agency)

- Tom Annal
- Jim Christopher
- Bob Edwards
- Donald Hesler
- Marleiah O'Neal
- Timothy Larson
- Robert Phaneuf
- William Zeppetelli

Parsons and Geosyntec (Designer)

- Paul Blue
- Laura Brussel
- Xiaodong Huang
- David Steele
- John (Jay) Beech
- Ramachandran Kulasingam
- Joseph Sura
- Ming Zu

Geosyntec (CQA Consultant)

- David Bonnett
- Joshua Bullock
- John (Billy) Carruth
- Marcus Fountain
- Douglas Hamilton
- David Williams

Parsons (Earthwork Contractor)

- Adam Dorn
- Josh Hawley
- Dhana Hillenbrand
- Xiaodong Huang
- William Mathe
- Bill Moon
- Ron Prohaska
- Ken Sommerfield
- David Steele
- Al Steinhoff
- Sean Sullivan
- Scott Swift

Thew Associates (Surveyor)

- Michael Merithew

GeoTesting Express (Off-site Geotechnical Laboratory)

- Mark Dobday
- Joe Tomei

SGI Testing Services, Inc. (Off-site Geotechnical Laboratory)

- Zehong Yuan

Chenango Contracting (Installer, senior personnel only)

- Matt Bilodeau
- Nick Brechko
- Carl Burdick
- Martin Bystrak
- Rod Parker
- Charlie Parks
- Joe Randall
- Peter Ward

THG Geophysics Ltd (Leak Location Surveyor)

- Maggie Beird
- Heather Kribos
- Peter Hutchison
- Simon Eydlin

4. CONSTRUCTION QUALITY ASSURANCE - EARTHWORK

4.1 Overview

As described in Section 3.1 of this report, several administrative activities were routinely performed by CQA personnel throughout the duration of construction. Many of these administrative activities were related to documenting overall construction status and progress. Other activities presented under general CQA services included monitoring of the related components and facilities for the construction project. Photographs of the construction were obtained on a regular basis and select photographs are presented in Appendix A. CQA personnel summarized the daily construction and CQA activities in weekly field reports. Weekly field reports are presented in Appendix B.

The contractor was responsible for performing general civil site work for the project. The work included site preparation (dewatering, excavating, relocating Solvay waste onsite, preparing subgrade, including clearing and grubbing); provision of imported fills (such as stockpiling, placing and compacting engineered fill and low-permeability soil layer, and screening and placing gravel drainage layer); establishment of infrastructure; and survey control associated with earthworks and as-built drawings.

As part of the site preparation that occurred in 2011, Parsons removed oversized and woody vegetation by various means, including manually and using compact track loader mounted with a Bradco or Caterpillar BR166 brush cutter, Caterpillar SG18 stump grinder, or a landscape rake (see RFI No. 10). NYSDEC along with CQA personnel would typically approve an area referred to using a grid layout. If areas required additional work, the area of concern was identified using survey flags. Once a grid area had been deemed suitable, the contractor was notified that the area was approved for placement of low-permeability material. The initial lift of low-permeability material was placed in 2011. Upon remobilization to the site in 2012, the previously placed material was observed and deficient areas were reworked by Parsons.

Geosyntec's CQA personnel visually monitored the construction of the various earthwork components. Different material types were used to construct the various components of the single-composite liner system. These materials included clay for the low-permeability soil layer, gravel for the gravel drainage layer, and engineered fill material for the perimeter berm. Various sources were pre-qualified to supply the soils by Parsons. The earthwork construction activities using these materials are described below.

- The perimeter berms were constructed using engineered fill material obtained from the Granby and Sennett sources or re-used from previous construction, placed and compacted initially in approximately 14-in thick (loose) bridge lift (that was not required to be tested) and subsequent in approximately 10-in thick (loose) lifts.

- The cell area was cleared and partially grubbed of vegetation, a bridge lift of low-permeability material was placed and compacted (that was not required to be tested) over the prepared subgrade with soils obtained from the Marcellus and Black Creek sources (note the Black Creek source was only used in 2011).

- The minimum 12-in thick low-permeability layer was constructed using 8- to 10-in thick lifts (loose) material obtained from the Marcellus source.

- The minimum 12-in thick gravel drainage layer was constructed in one lift using material obtained from the Granby, Lake Road, Amboy, Orin Delphi, Hayes Road, County Road 6 sources.

CQA personnel observed these earthwork construction activities and tested the soil materials to confirm that the material properties conformed to the CQA Plan, specific lift thicknesses were not exceeded, and compaction requirements were met. Geosyntec personnel also performed geotechnical soil tests during construction. The testing was performed either: (i) in-place; (ii) on-site; or (iii) off-site, at GeoTesting Express (GTX) in Acton, Massachusetts. The contractor was responsible for obtaining and testing QC samples. The geotechnical QC samples were tested by Atlantic Testing Laboratories Inc. (ATL) in Syracuse, New York or P-W Laboratories, Inc. (PW) in East Syracuse, New York. These laboratories also supported Parsons in various capacities such as collecting samples and monitoring borrow sources. The QC laboratory results are presented in Appendix D.

Variation exists between the soil quantities used for CQA and QC testing. Geosyntec used a conservative approach by basing CQA quantities on truck counts using an assumed volume per truckload that was agreed upon by Parsons. QC test frequencies were based upon actual weights of materials delivered, later converted to a volume. Due to the different approaches to managing the process, volumes presented as a basis for CQA testing and QC testing differ.

Separately, the contractor was required to perform analytical testing at each source at a minimum frequency of one representative composite sample per 2,500 cyd for engineered fill and one per source for low-permeability material. The sampling was

done internally by Parsons to ensure samples met the NYSDEC Subpart 375, Table 375-6.8(b). No new low-permeability sources were used so no additional testing was conducted in 2012 (see Phase I report for test results). The analytical testing from an engineered fill sample is presented in Appendix C.

During construction, the contractor was responsible for erecting and maintaining erosion and sediment (E&S) controls. The E&S controls that were installed included: silt fence, temporary soil diversion berms, and operation of a wheel wash located at the main entrance. Geosyntec field personnel were not actively engaged in monitoring E&S activities. However, recommendations were occasionally made in an effort to minimize potential damage to the single-composite lining system.

4.2 Soil Source Sampling Activities

Representative samples of engineered fill, low-permeability material, and drainage material were obtained from their respective sources and tested to verify conformance with the CQA Plan. Soils for the project were provided by Riccelli Enterprises, Inc. (Riccelli) of Syracuse, New York. Riccelli excavated and transported material from several sources to meet the needs of the project. The source and associated layer are listed below, followed by the common reference in parentheses.

Engineered Fill:

- Riccelli Syracuse Sand & Gravel, 489 County Rt 85, Granby, New York 13069 (Granby source)

Low-Permeability Soil:

- County Rt 174, Marcellus, New York (Marcellus source)

Drainage Gravel:

- Riccelli Syracuse Sand & Gravel, 489 County Rt 85, Granby, New York 13069 (Granby source)
- Lake Road Pit, Phelps, New York 14533 (Lake Road source)
- Amboy Pit, Finnerty Road, Amboy, New York 13493 (Amboy source)
- Oran Delphi / Kinsella, 2308 Oran Delphi Road, Malius, New York 13104 (Oran Delphi source)
- Hayes Road, 1850 Hayes Road, Geneva, New York 14456 (Hayes Road source)
- County Route 6 / Dendis, Geneva, New York 14456 (Route 6 source)

The geotechnical tests were performed to confirm that the following requirements were met.

- Engineered fill material used in construction classified as SC, SM, ML, CL, GM, or GW (reference RFI Nos. 2 and 15 for additional classifications for GP, SP and SW) according to the Unified Soil Classification Systems (USCS) when evaluated in accordance with ASTM D2487; had a nominal dimension less than 4 inches for 8 inches ± 2 inches thick loose lifts and 2 inches for 4 inches ± 1 inch thick loose lifts.

- Low-permeability soil material used in construction classified as SC, SM, ML, or CL according to the Unified Soil Classification Systems (USCS) when evaluated in accordance with ASTM D2487; had a maximum particle size of 1-in diameter and had not less than 50 percent of the particles, by weight, passing through the standard U.S. No. 200 standard sieve when evaluated in accordance with ASTM D422 (sieve analysis); and the hydraulic conductivity (i.e., permeability) requirement of the upper 6 inches was 1×10^{-6} cm/s or less, when evaluated in accordance with ASTM D5084.

- The material used in construction of the gravel drainage layer was classified as GW or GP according to the USCS when evaluated in accordance with ASTM D2487; had a nominal particle size of 4-in diameter, maximum of five percent and three percent passing the No. 4 and No. 200 sieves, respectively, when tested in accordance with ASTM C136/C117 (reference RFI No. 17 for maximum diameter acceptance); and the hydraulic conductivity requirement was 10 cm/s or greater when evaluated in general accordance with ASTM D2434. (Note that the test method was modified by the testing laboratories due to the 'oversized' particles contained in the gravel.)

A description of the geotechnical tests performed on placed materials and results of these tests are presented in the next section of this report. Details of construction of the perimeter termination trench for anchorage of the geosynthetic components of the single-composite liner are described in Section 4.4 of this report.

4.3 Field Monitoring and Testing

4.3.1 General

Geosyntec's CQA personnel monitored the placement of soil as described in Section 3.1.3. At times, several earthwork construction operations were conducted simultaneously in the Phase II area. When this occurred, the on-site personnel

monitored the operations considered most critical to the performance of the liner system. Potentially nonconforming or questionable practices observed by CQA personnel were brought to the attention of the concerned parties for review and correction.

As part of CQA activities, geotechnical testing was performed on each of the soil components of the Phase II single-composite liner system. Depending on the specific test, testing was performed either in-place, at the on-site laboratory, or off-site at GTX.

The following geotechnical tests were performed:

- In-place nuclear moisture/density tests were performed on compacted lifts of engineered fill, and low-permeability layer. The tests were performed in general accordance with ASTM D2922 and ASTM D3017.

- Standard Proctor compaction tests were conducted on the soils used for engineered fill and low-permeability layer. The tests were performed in general accordance with ASTM D698.

- Moisture content tests were performed on engineered fill and low-permeability soil material. The tests were performed in general accordance with ASTM D2216. On-site oven moisture content tests were occasionally run in general accordance with ASTM D2216 as a periodic check during construction.

- Particle-size distribution tests were conducted on engineered fill, low-permeability soil layer, and gravel drainage layer. The tests were performed in general accordance with ASTM D422 or C136/C117.

- Atterberg limits tests were conducted on the soils used for low-permeability material. The tests were performed in general accordance with ASTM D4318.

- Soil classification was performed on soils used for engineered fill, low-permeability soil layer, and gravel drainage layer in general accordance with ASTM D2487.

- Hydraulic conductivity tests were performed on the low-permeability and drainage material. The hydraulic conductivity tests on low-permeability soil material were conducted in accordance with ASTM D5084. The hydraulic conductivity test on granular material (i.e., gravel drainage material) was performed in general accordance with ASTM D2434. The test method for

granular materials was modified slightly by the testing laboratories to accommodate the larger particles contained in the gravel.

The results of the geotechnical laboratory tests are presented in Appendix D. The results of the in-place nuclear moisture/density tests are presented in Appendix E. A grid layout of the site, presented in Appendix E, was used to visually locate the in-place tests and sample locations. CQA personnel used the physical features, such as toe of slope to estimate the test locations. Since only visual positioning of test locations was used, the test and sample locations given in the appendices are approximate.

In 2012, Geosyntec mobilized a nuclear gauge (i.e., Troxler model 3440, Serial No. 28800) that was used to perform the moisture/density tests. Standard counts were performed daily prior to use of the gauge. These counts were recorded on a standard count log, which is presented in Appendix E. The accuracy of the nuclear gauge was checked periodically by comparing test results with results observed using the drive cylinder method (conducted in general accordance with ASTM D2937) and with moisture content tests (conducted in general accordance with ASTM D2216 or D4643).

The moisture results are presented along with the in-place moisture/density test results in Appendix D.

4.3.2 Engineered Fill

CQA personnel monitored the placement of the fill for perimeter berms when on-site. Geosyntec observed the placement of fill, and performed in-place testing of the material.

Construction of the perimeter berm consisted of the following activities:

- Engineered fill material was hauled directly from the Granby source or re-used from the Phase I construction and unloaded;
- Lifts of material were typically spread using Caterpillar D-5 or D-6 low ground pressure (LGP) bulldozers and were compacted using a Caterpillar CS56 smooth drum roller; and
- The surface of each lift was typically scarified with tracks of a bulldozer or disked prior to placement of subsequent lifts or layers.

Engineered fill was required to be compacted to a minimum relative compaction of 95 percent of the maximum dry unit weight at a moisture content ±2 percent of the

optimum moisture content, as determined by the Standard Proctor compaction test method (ASTM D698). CQA personnel conducted in-place nuclear moisture/density tests at a frequency of 5 tests per acre (estimated one test per 200 feet of berm per lift along the perimeter berms). A total of 64 field moisture/density tests were performed, of which meet the minimum compaction requirement. Drive cylinder tests were periodically performed; a total of four tests were conducted. The results of the field moisture/density tests are presented in Appendix E.

In addition to the in-place density testing, grain-size distribution test, soil classification, and standard Proctor compaction tests were performed on the engineered fill material. The results of these geotechnical tests are presented in Appendix D.

4.3.3 Low-Permeability Soil Layer

After completing the removal of woody vegetation, CQA personnel observed the placement of the low-permeability soil layer. RFI No. 3 and FCF No. 3 provided topographic surveys of the subgrade and top of low-permeability soil layer. The difference between the layers determined the thickness of the low-permeability soil layer. The Specification (Section 2250 Part 3.02.B) allowed the first lift (referred to as a bridge lift) to be placed without compaction requirements in a 10 to 14-in thick (loose) lift. The intermediate lifts, placed in 6 to 10-in thick (loose) lifts, were required to be compacted to 90 percent of the maximum dry density at a moisture content ±3% of optimum moisture, as determined by the standard Proctor test (ASTM D698). The upper lift was to be compacted to 95 percent of the maximum dry density at a moisture content ±3% of optimum moisture, as determined by ASTM D698, and achieve a maximum permeability of 1×10^{-6} cm/s.

The construction sequence of the compacted low-permeability soil layer is described below.

- Low-permeability material was delivered directly from the Marcellus source. At the source, an excavator loaded the material into various sized on-road trucks. Trucks were weighed before being unloaded.

- The top surface of each lift was typically scarified with the tracks of a bulldozer or with a disk prior to placement of the subsequent lift.

- Low-permeability material was placed in appropriately 10 to 14-in for bridge lift and 6 to 10-in for other lifts. Typically the lifts were placed using Caterpillar D-5 or D-6 LGP bulldozers. Occasionally, laborers were used to manually remove rocks and roots from materials placed.

- After spreading, if necessary, water was added to increase the soil moisture content or if too wet, a tractor with a draw type disc harrow was used to mix the water, break up the clods or dry the material.

- Each lift of soil was compacted using a Caterpillar CS56 smooth drum or pad-foot vibratory compactor.

- A Caterpillar D-5 or D-6 LGP bulldozer (equipped with GPS) was used to fine grade the low-permeability material. The final lift was rolled with a smooth drum roller (including an attachment on a compact loader) to seal the top surface of the compacted low-permeability soil liner in preparation for geosynthetics deployment.

- The contractor confirmed the final grade elevations using GPS methods.

Prior to deployment of the geosynthetics, the compacted low-permeability soil layer surface was visually observed by the installer and CQA personnel for surface cracks (e.g., less than the width of a dime) and greater than 1-in diameter particles. If drying or cracking of the surface was observed, the contractor was required to moisture condition and rework the affected area. Observed oversized particles were manually removed.

A series of tests were performed on the material used to construct the compacted low-permeability soil liner. Grain-size distribution tests, moisture-density relationships (i.e., Proctor tests) and remolded permeability tests were performed. In addition Atterberg limits tests were performed on the low-permeability liner material to classify the material. The geotechnical test results are presented in Appendix D.

Off-site geotechnical laboratory permeability tests were performed on thin-walled (i.e., Shelby) tube samples to confirm the material met the permeability criterion. Samples were obtained from the upper lift during cell construction. Tubes were obtained on a minimum one per acre basis for the final lift of installed LP soil liner. A total of 28 thin-walled tube sample pairs were removed from the compacted low-permeability layer. Samples were tested by the independent laboratory and all met the hydraulic conductivity criterion of 1×10^{-6} cm/s or less.

CQA personnel performed in-place nuclear moisture/density tests on a frequency of nine tests per acre for each lift above the bridge lift of the compacted low-permeability layer including the final lift. A total of 418 field moisture/density tests were performed by Geosyntec, 17 tests failed to meet the minimum compaction requirement of 95 or 90 percent. Failures were typically attributed to the material being too wet or to dry. In

each case of a failing test, the contractor reworked, removed and replaced, or recompacted the area represented by the failure before the area was retested by field personnel. This procedure was repeated until satisfactory moisture/density test results were obtained in each test location. Drive cylinder tests were periodically performed; a total of five tests were conducted along with 28 Shelby tubes. The results of the field moisture/density tests are presented in Appendix E. Moisture content samples, obtained periodically to verify the accuracy of the nuclear moisture/density gauge, indicated a correction was necessary. A moisture correction formula was developed for low-permeability materials by plotting the results of the moisture content tests to the nuclear gauge moisture content readings. Assuming a linear relationship, the formula was used to correct the nuclear gauge moisture readings. The correction formula was periodically updated as additional data was collected.

To verify that the minimum thickness was achieved, the contractor used various methods to measure the thickness in Phase II. The contractor surveyed the low-permeability layer on 50 foot grid pattern, performed thickness calculations on 100-ft grid pattern, and in areas with design thickness of less than 18 inches, installed 12-in square steel plates on a 100-ft grid pattern. Initially, a hand drill with a 24-in long drill bit was used to bore into the low-permeability soil. If the plate had not been reached at a depth of 24 inches, then a pointed rod was hammered down to the plate. Once the bit or rod had been driven to the steel plate, a mark was made on the bit or rod. The bit or rod was extracted and a measurement was made to determine the low-permeability soil layer thickness. The thickness verification results are presented in Appendix E.

Perforations in the low-permeability soil were filled with bentonite/soil material. The material was manually tamped into the perforations.

4.3.4 Gravel Drainage Layer

CQA personnel periodically monitored the placement of the gravel drainage material for the Phase II area. The 12-in thick (minimum) gravel drainage layer was constructed using material obtained from several sources, with the majority of material being provided by the Granby source supplemented by the Lake Road, Amboy, Oran Delphi, Hayes Road, and Route 6 sources. The construction sequence of gravel drainage was as follows:

- Gravel was screened and washed, as necessary, at the source (e.g., Turbo Chieftain 1400 power screener) and stockpiled at the quarry;

- Front-end loaders or tracked excavators loaded on-road live bottom trucks or end dump trucks at the source. Each truck was weighed and the trucks hauled the material to the cell area; and

- The gravel was either spread in one 12-in thick (minimum) lift using a Caterpillar D-5 or D-6 LGP bulldozer (equipped with GPS) or processed in-place through a flip screen attached to compact loader.

The contractor used spotters to assist with off-loading activities. The spotters would direct traffic to ensure trucks operated on greater than 2-ft thick minimum roads/ramps and occasionally reject loads with observed high fines content. A sacrificial geotextile was deployed under the gravel at access ramps. In long ramp areas of high traffic, the gravel was observed to have a higher fines content and therefore it was necessary to re-process the material using a flip screen attachment equipped compact loader or removed and replaced with new material.

During placement of the gravel drainage layer, CQA personnel periodically monitored the contractor's activities to assure that the risk of damage to the underlying geosynthetics was minimized. CQA personnel also confirmed that the contractor operated bulldozers in areas where at least 1-ft thick layer of gravel was maintained over the geosynthetics, and that a minimum 2-ft thick layer of gravel was maintained over the geosynthetics in heavily trafficked areas.

During placement, discussions were held between parties regarding the fines content of the gravel. As indicated above, delivered loads containing high fines content were periodically observed and when observed, the load was rejected. Visits to the quarry confirmed that, on occasion, front-end loader operators were too aggressive by loading from the base of the stockpile (an area of fines accumulation) or fine grain material accumulated in the loading bucket (from previous loading operations) and were mixed in with the gravel.

Areas within the cell with observed high fines content were identified and were removed using low ground pressure equipment. The determination of these areas of concern was subjective (i.e., through observation). Results of the CQA tests indicated the fines content (by weight) was in compliance with the requirements of the CQA Plan. However, to mitigate observed pockets of fines, a mini-excavator (Caterpillar 307D) or a compact track loader (Caterpillar 299C) was used to excavate the area of concern and load low-ground pressure vehicles (i.e., Hydrema 912HM rubber tired vehicle) which typically transported the material to a stockpile area located west of Phase I.

Geosyntec had off-site laboratory geotechnical tests performed on the material used for the gravel drainage layer as part of the CQA activities during Phase II construction. Samples were obtained directly from the soil source and from the in-place material and typically included two to twelve 5-gallon sized buckets. GTX performed an off-site hydraulic conductivity tests and grain size distribution tests on representative samples. The laboratory test results are presented in Appendix D.

4.4 Soil Anchorage of Geosynthetics

4.4.1 General

Geosyntec CQA personnel periodically monitored the method of anchorage for the geosynthetic material around the Phase II perimeter. Along the north, the geosynthetic layers were tie-in to the Phase I geosynthetic layers. Along the remaining perimeter, the layers of geosynthetics were terminated in an anchor trench. Soil was subsequently placed and compacted in the trench to provide permanent anchorage of the single-composite liner system. Details of the anchoring are discussed below.

4.4.2 Perimeter Anchor Trench

As required by the CQA Plan, a permanent anchor trench was constructed around the southern, eastern and western perimeter of the Phase II construction area. The construction sequence of the perimeter anchor trench was as follows:

- a 2-ft deep by 2-ft wide (minimum) trench was excavated approximately 4-ft from the crest of slope of perimeter berm;
- the geosynthetic components were subsequently placed in and across the bottom of the anchor trench (including a sacrificial geomembrane) and ballasted with sandbags; and
- lifts of LP soil and/or engineered fill were placed over the geosynthetic materials and compacted.

The anchor trench backfill was compacted using various means including the bucket of an excavator and a vibratory plate tamper. No in-place tests were conducted on the material.

5. CONSTRUCTION QUALITY ASSURANCE - GEOSYNTHETICS

5.1 General

The following types of geosynthetic materials were deployed in Phase II:

- 60-mil thick textured HDPE geomembrane liner was installed over the low-permeability soil layer; and
- 24 oz/sy non-woven geotextile cushion was installed over the geomembrane liner.

Geosyntec CQA personnel monitored installation of geosynthetic components of the SCA. Field and laboratory tests were conducted to assure that the material properties were in compliance with construction documents and that prescribed installation procedures were followed. The specific geosynthetic monitoring and testing activities are described in the following subsections.

As part of the initial design, a hydrostatic puncture test was performed on a geosynthetic sandwich with gravel over an extended duration (e.g., minimum 50 hours) to verify that no puncture or holes were observed in the geomembrane after the application of a 5,000 lb/ft^2 normal stress. The tests were performed by SGI Testing Services, LLC (SGI) of Norcross, Georgia and were conducted in general accordance with ASTM D5514 (modified). Reference FCF Nos. 6 and 11 and Section 5.3 for additional details. The puncture test results are presented in Appendix G.

Interface direct shear testing was conducted on the liner system (i.e., gravel, geotextile cushion, geomembrane, and Marcellus LP soil). During construction the CQC and CQA requirements were modified to run one set of tests. The tests were performed by SGI, conducted in general accordance with ASTM D5321, under normal stresses of 700, 2,000, and 3,500 lb/ft^2. The peak and residual (or long-term) friction angles measured using the Marcellus low-permeability soil source indicated angles of 28 and 25 degrees, respectively; reference RFI Nos. 12 and 14 for additional details. The interface friction test results are presented in Appendix G.

Periodically during construction, temperatures fell below 40 degrees Fahrenheit (°F) and occasionally were below 32°F. As indicated in Geosynthetic Research Institute (GRI) Test Method GM9 – *Cold Weather Seaming Geomembranes*, the installation and seaming procedures were modified to take into consideration the colder temperatures (e.g., slower welding speeds) and increased moisture (e.g., panel edges were dried). However the installer did not use nor require moveable enclosures. The installer would

typically conduct his production welding well after sunrise and well before sunset. Trial welds were used to confirm a welder's ability to seam in the actual field conditions.

During seaming operations in the morning of 1 June 2012, light precipitation occurred periodically. Being at a critical location (i.e., adjacent to the highest elevation in the central portion of the cell), the installer completed deployment of the geomembrane (i.e., extend over past the high point) and seamed the deployed panels. After the installer non-destructively tested the seam, QC destructive samples were obtained. Based on passing results, Geosyntec marked out destructive seam samples on the required frequency, with additional samples obtained from the last four seams that were welded. See FCF No. 9 for further details.

5.2 CQA of Geomembrane

5.2.1 Conformance Testing and Documentation

A textured geomembrane was installed directly over the low-permeability layer. The geomembrane liner, Micro Spike®, was supplied by Agru America Inc. (Agru) of Georgetown, South Carolina. A total of 138 rolls were produced for the project, totaling 1,602,870 ft^2 in area. A total of 132 rolls were delivered initially, totaling 1,533,180 ft^2 in area. Near the end of the installation, the installer delivered the additional six rolls (Nos. 312330 through 312335) along with four additional rolls (Nos. 424799, 425101 through 425103). These additional rolls were used as part of the sacrificial flap that was installed on the exposed portions of the perimeter berms. No conformance samples were obtained from these final four additional rolls; see RFI No. 26 for details.

Geomembrane conformance samples were taken from the 60-mil thick HDPE textured geomembrane rolls used to construct the lining system in the manufacturer's plant. A total of seven (7) conformance samples were obtained (not including one sample obtained for interface friction testing). The sample frequency of one sample per 228,981 ft^2 of produced material exceeds the minimum acceptable sample frequency of one sample per 250,000 ft^2 required by the CQA Plan. A total of 1,087,333 ft^2 was installed, as observed by CQA personnel.

The conformance test results for the 60-mil thick liner and the manufacturer's QC certificates were reviewed by CQA personnel and were found to be in compliance with the CQA Plan. The geomembrane manufacturer's QC documentation, including the resin and geomembrane certifications, and the conformance tests are presented in Appendix F and Appendix G, respectively.

5.2.2 Field Monitoring Activities

5.2.2.1 Delivery and On-Site Storage

Upon delivery to the site, geomembrane rolls were stored in an area located to the southeast of the construction area. The rolls were typically transported by a Caterpillar 299C compact track loader or a Caterpillar TL943 telehandler. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner. The CQA personnel also compared the roll numbers of the geomembrane rolls delivered to the manufacturer's bill of lading and maintained an inventory of delivered materials.

5.2.2.2 Deployment

Prior to geomembrane deployment, the surface of the LP soil barrier layer was visually checked for cracks and sharp objects. The installer signed certificates of acceptance of the subgrade surface, which are presented in Appendix H. The geomembrane rolls were lifted using a spreader bar attached to a tracked excavator or compact track loader. Prior to deployment and when needed, the surface of the low-permeability soil layer was prepared by pulling a weighted, chain link fence behind a four-wheel, low-ground pressure, all-terrain vehicle (ATV) or with a compact track loader with a smooth drum attachment.

During deployment, a 16 gauge, solid, type S wire was installed under geomembrane panels on approximately 200-ft centers. The installer connected one end with the existing Phase I wires and marked the south end of the wire for future reference for the leak location survey. Details of the leak location survey are provided in Section 5.2.3.2.

CQA personnel monitored the deployment of geomembrane panels. During deployment, the CQA personnel checked for the following:

- manufacturing defects;
- damage that may have occurred during shipment, storage, and handling; and
- damage resulting from installation activities, including damage as a consequence of panel placement, seaming operations, or weather.

If materials were observed to be damaged or deficient, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed and documented the repair locations to verify compliance with the CQA Plan. Details of the

geomembrane panel placement were recorded by CQA personnel on panel placement logs, which are presented in Appendix I.

5.2.2.3 Trial Seams

Prior to production seaming, the installer prepared geomembrane trial seams for each technician using each piece of seaming equipment. Typically, either a Demtech Services Inc. Pro-Wedge or a Concord Geotech Services, LLC, welder was used. Additional trial seams were prepared every four to five hours or less during cold weather seaming. CQA personnel evaluated the trial seams as follows:

- trial seam samples in the beginning of the day were typically 15-ft long for fusion and 3 ft long for extrusion and over 12 in. wide;
- trial seams were welded under similar conditions as for seaming;
- test strips were cut from the trial seams at random locations across each trial-seam weld using a manual die press; each strip was 1 in. wide and 6 in. long; and
- test strips were tested for seam strength using a calibrated field tensiometer; two of the weld test strips were tested two in peel and two were tested in shear; the passing criteria for the tests were as follows:

  Fusion

  - *Peel tests* - a minimum bonded seam strength of 91 lb/in - Film Tear Bond (FTB); and
  - *Shear test* - a minimum bonded seam strength of 120 lb/in.

  Extrusion

  - *Peel test* - a minimum bonded seam strength of 78 lb/in - FTB; and
  - *Shear test* - a minimum bonded seam strength of 120 lb/in.

A total of 289 trial seams were observed by CQA personnel during Phase II construction; 183 trial seams were made using double-track fusion (i.e., hot wedge) welders and 106 were made using extrusion welders. All of the trial welds meet the criteria above.

Trial seam samples were not archived. Details of the trial seams, including the trial seam test results, are presented in Appendix J. The calibration certificates for the tensiometers are also provided.

5.2.2.4 Production Seams

Geomembrane production seaming operations were monitored by CQA personnel. The majority of the geomembrane production seams were fabricated using double-track fusion welders. Seam repairs were made using hand-held extrusion welders. Rub sheets were periodically used during production seaming to provide a clean surface to weld over. During or after fabrication, the geomembrane seams were visually examined for workmanship and continuity. Geomembrane seaming logs are presented in Appendix K.

5.2.3 Nondestructive Testing

5.2.3.1 Scope

Nondestructive testing of geomembrane was periodically monitored by CQA personnel. Leak location survey was performed on the geomembrane liner. Spark test was conducted on temporary pipe boot. Geomembrane seams were nondestructively tested for continuity by the installer using the air pressure procedure for double-track fusion seams and the vacuum-box test procedure for extrusion-welded seams. Failed air-pressure test seams, if applicable, were capped and then retested using vacuum-box test methods after determining the failed seam length. Leaks identified using the vacuum-box method were repaired and retested as described in Section 5.2.5.

5.2.3.2 Leak Location Survey

As required by the CQA Plan, an electrical leak location method was used to survey the installed geomembrane liner. An independent contractor, THG Geophysics Ltd (THG) of Murrysville, Pennsylvania, conducted the surveys. The surveys were performed following ASTM D7703 - *Practice for Electrical Leak Location on Exposed Geomembranes Using the Water Lance System* (water lance method) and ASTM D7007 - *Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earth Materials* (dipole method).

On the exposed geomembrane on the east and west berms, the water lance method was performed by applying a 12 volt direct current to a flow of water between two electrodes.

After placement of the gravel drainage layer, THG re-mobilized several times to perform dipole method survey that involved establishing a direct current was between a stainless steel cathode (installed in the gravel) and the anode (16-gauge wire under the liner). Water was added, as needed, using a water truck or sprinkler. Anomalies in the potentiometric measurements caused by electrical current flowing through probable holes were monitored.

During surveys of the geomembrane liner, nine defects were positively identified. The contractor removed the overlying drainage gravel and geotextile in the identified areas and the geomembrane was observed by project personnel for obvious holes or tears. The located damage was repaired and vacuum-tested by the installer as described in Section 5.2.5. Resurvey of the repaired area and areas disturbed during rework of the gravel drainage layer was conducted.

5.2.3.3 Air Pressure Testing

Accessible double-track fusion seams were nondestructively tested using the air pressure test. The procedure used by the installer for air pressure testing was as follows:

- visually observe the integrity of the annulus of the section of seam being tested and isolating the section by sealing the ends using heat and pressure;
- insert the needle of a pressure test apparatus into the annulus at one end of the seam;
- inflate the annulus to a gauge pressure of a minimum 25 - 30 psi with an air pump and maintain the gauge pressure for at least five minutes;
- if the pressure loss exceeded 3-psi, or if the pressure did not stabilize, the faulty area was repaired in accordance with Section 5.2.5 of this report; and
- confirm airflow through the entire annulus by releasing the air from the seam at the opposite end from where the needle was inserted.

Nondestructive test results are presented with the production seam logs in Appendix K.

5.2.3.4 Vacuum-Box Testing

The vacuum-box was used by the installer to nondestructively test extrusion seams and repairs. The procedure used by the installer for vacuum testing was as follows:

- wet a strip of seam with a soapy solution;
- place the vacuum-box assembly over the wetted area, close the bleed valve and open the vacuum valve;
- force the box onto the sheet until 5-psi vacuum is observed;
- examine the seam through the viewing window for a period of approximately 20 seconds (when observed by CQA personnel) for the occurrence of air bubbles;
- remove the assembly and continue the process over the entire seam with a typical 3-in wide overlap; and
- record the location of any leaks.

If nondestructive testing indicated repairs were necessary, repairs were made in accordance with procedures presented in Section 5.2.5 of this report and vacuum testing was repeated. Vacuum test results are presented with the production seam logs and repair summary logs in Appendices K and L, respectively.

5.2.3.4 Spark Testing

Geomembrane boots were welded around pipe penetrations (e.g., inclinometer located in Phase II). A spark test was used to nondestructively test extrusion seams used to fabricate the pipe boots. The spark test requires a continuous copper wiring to be extrusion welded into the seam. An electric current is applied while a probe is passed next to the seam. Any seam discontinuity is detected by the generation of a spark passing between the wire and the probe. When a spark was observed, repairs were made and the seam re-tested. After being non-destructively tested, three stainless steel straps with neoprene gaskets were installed and the ends of the pipe penetration were sealed using a silicone sealant. The pipe boot for inclinometer, S1-G1, was later removed and repaired (see Section 5.2.5 for details).

5.2.4 Destructive Seam Sample Testing

5.2.4.1 Scope

In accordance with the CQA Plan, CQA personnel identified and collected geomembrane seam samples for destructive testing. The samples were tested in the field prior to being forwarded to the independent laboratory, GTX.

During Phase II construction, 114 geomembrane seam samples were taken initially from approximately 53,286 linear ft of production seams constructed. This corresponds to an approximate sample frequency of one per 467 linear ft of production seams. This frequency meets the minimum acceptable sample frequency of one per 500 linear ft of production seams, as required by the CQA Plan. Prior to the removal of the full seam sample, two geomembrane test strips were taken by the installer from either end of the destructive sample. Each strip was peel-tested in the field. If the peel samples exhibited passing results, the adjacent destructive seam sample was shipped to the laboratory for testing.

For a destructive seam sample to be considered as passing, the seam strength criteria, which are described in Section 5.2.4.3, had to be met.

5.2.4.2 Sampling Procedures

At each destructive seam sample location, a test sample measuring approximately 12 in. across the seam and 42 in. along the seam was obtained. The sample was divided into three pieces and distributed to: (i) the geosynthetics laboratory for testing, (ii) the installer, and (iii) for an on-site archive.

5.2.4.3 Test Results

Off-site laboratory testing of geomembrane seam samples was performed in accordance with the CQA Plan. At the testing laboratory (i.e., GTX), 1-in wide test specimens were removed from the destructive seam sample using a die press. On a calibrated tensiometer, five test specimens were peel-tested for adhesion strength. For fusion seams, peel tests were performed on both the inside and outside tracks. Additionally, five specimens were tested for shear strength. The seam strength acceptance/rejection criteria described in Section 5.2.2.3 were used to evaluate the destructive seam samples.

For Phase II, a total of 114 initial destructive sample locations were selected of which eight samples failed (DS Nos. 34, 49, 55, 72, 73, 88, 97, and 108). Several of these

failures were observed along the Phase I tie-in even though the installer took measures to clean the Phase I edge.

During testing operations, five samples (DS 49, 55, 88, 97 and 108) were observed to fail field-testing; while three original samples were noted to fail laboratory testing. In the case of failed samples, additional test strips were taken from the seam at locations approximately 10 ft from each side of the failing sample location. If the additional test strips had passing results, a full destructive seam sample was taken. If the samples did not pass, test strips were obtained at another location approximately 10 ft further from the failure, repeating until passing samples were obtained and the failing area was localized (an additional seven bounding samples initially failed in the laboratory). Once the bounds of the failing seam were determined, the entire seam length between the passing samples was repaired by the procedures described in the following subsection. For extended repairs (i.e., greater than 150-ft), a destructive sample was obtained from the repair. A total of four destructive samples were removed from capped areas (DS Nos. 49C, 72C, 97C, and 108C); all passed the seam strength acceptance/rejection criteria described in Section 5.2.2.3. The destructive seam test results and the panel layout drawings are presented in Appendix L and Appendix P, respectively.

5.2.5 Geomembrane Repairs

The repair procedures presented in this subsection were used by the installer to patch holes and tears, spot-extrude impact damage or other minor scratches. In the cases where patches or caps were used to repair the damaged geomembrane (i.e., small holes, tears, or on seams which failed nondestructive or destructive testing), an approximately 12-in wide capping strip was used.

During the repair or panel tie-in operations, the following procedures were implemented:

- technicians and seaming equipment used were required to pass trial welds;
- patches or caps extended at least 6-in beyond the edge of the defect and all corners were rounded; and
- repairs were vacuum tested and visually observed for continuity.

As previously mention, an existing inclinometer, SI-G1, had a temporary geomembrane boot installed. RFI-026 required that the inclinometer be decommissioned. At Parson's direction, ATL monitored the inclinometer's abandonment that required removal of the boot; see Appendix O for a copy of their report. On 3 and 4 April 2013, Geosyntec

monitored the repairs to the geomembrane and geotextile as well as placement of the gravel layer.

Seam and panel repair logs are presented in Appendix M. Complete panel layout drawings illustrating the location of seam and panel repairs are shown in the record drawings in Appendix P.

5.3 CQA of Geotextile

5.3.1 Conformance Testing and Documentation

A non-woven geotextile was used as a cushion between the gravel drainage layer and geomembrane liner. The majority of the non-woven geotextile (267 rolls of GE-240) was manufactured by Skaps of Athens, Georgia. At the end of the project additional geotextile (seven rolls of GSE NW24) was manufactured by GSE Lining Technology, LLC (GSE) of Kingstree, South Carolina. The needle-punched, non-woven geotextile has a nominal weight per unit area of 24-oz/yd^2.

A total of six (6) passing conformance samples were obtained (not including one sample obtained for interface friction testing) from the 274 rolls delivered; totaling 1,217,250 ft^2 in area. The sampling frequency of one sample per 202,875 ft^2 of material exceeds the minimum acceptable sample frequency of one per 250,000 ft^2 required by the CQA Plan.

During the design phase, a hydrostatic puncture test, ASTM D5514 (modified), was performed on a geosynthetic sandwich over a 55 hour duration to verify that no puncture or holes were observed in the geomembrane after the application of a 5,000 lb/ft^2 normal stress. During Phase II geotextile installation and prior to placement of the gravel drainage layer, the geotextile exposure exceeded the ultraviolet (UV) exposure requirement of fourteen days (reference Section 02710 Part 3.01.c). To confirm the now-woven geotextile would function as intended after exposure, an exposed geotextile sample was obtained and a similar hydrostatic puncture test, ASTM D5514 (modified), was performed to verify that no puncture or holes were observed in the geomembrane after the application of a 5,000 lb/ft^2 normal stress; see FCF Nos. 6 and 11 for details and Appendix G for results.

The conformance test results and the manufacturer's quality control (QC) letters and certificates were reviewed by CQA personnel and were found to be in compliance with the CQA Plan. The manufacturer's QC certificates and the results of the conformance tests were presented in Appendices F and G, respectively.

5.3.2 Field Monitoring Activities

5.3.2.1 Delivery and On-Site Storage

Upon delivery to the site, geotextile rolls were typically stored in an area located south of the construction area. The geotextile rolls were transported on site by a Caterpillar 299C compact loader or Caterpillar TL 943 telehandler. CQA personnel periodically monitored the delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner. An inventory of delivered rolls was maintained by CQA personnel.

5.3.2.2 Deployment and Seaming

The non-woven geotextile was manually unrolled over the geomembrane liner. CQA personnel monitored the deployment of the non-woven geotextile rolls for manufacturing defects, damage that may have occurred during shipment, storage, and handling, and damage resulting from installation activities. If any materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the requirements of the CQA Plan.

After deployment of the geotextile, CQA personnel observed that the installer overlapped geotextile panels a minimum of 4 to 6-in then used a wedge welder to seam the panels together. As a precaution prior to placement of gravel, tarpaulins were deployed over central and eastern portions of installed geotextile as ultra-violet protection. The temporary tarpaulins were ballasted with sand bags. The tarpaulins were re-located typically eastwards as gravel placement proceeded.

As required by the CQA Plan, Parsons prepared a geotextile panel layout. A copy of the panel layout is presented in Appendix P.

7. SUMMARY AND CONCLUSIONS

Observation of the construction of Phase II at the Onondaga Lake Sediment Consolidation Area was performed by Geosyntec during the period of 26 March to 14 November 2012 and 3 and 4 April 2013 for a repair. During this time, CQA personnel monitored the installation of the following components:

- earthwork (subgrade preparation, engineered fill, compacted low-permeability soil liner, and gravel drainage layer construction); and
- geosynthetics (geomembrane liner and geotextile cushion).

During construction of the above components, CQA personnel verified that conformance and CQA testing were performed on the construction materials at the frequencies required in the CQA Plan (as defined in Section 3.1.2 of this report), and that materials meeting the CQA Plan requirements were used. CQA personnel also verified that conditions or materials identified as not conforming to the CQA Plan were replaced, repaired, and/or retested, as described in this report.

The results of the CQA activities undertaken by Geosyntec as described in this report indicate that Phase II of the Onondaga Lake Sediment Consolidation Area was constructed in accordance with the Specifications, as well as the design clarification (i.e., RFIs and FCFs).

Marcus Fountain
CQA Manager

David J. Bonnett, P.E.
CQA Engineer-of-Record
New York PE #89889

I, David J. Bonnett, certify that I am currently a New York State Registered Professional Engineer, who had primary responsibility to ensure implementation of the subject construction program, and that I certify that the Remedial Design Plans and Specifications were implemented and that construction activities were completed in substantial conformance with the approved NYSDEC approved Remedial Design and Specifications including modifications approved by the Designer and/or NYSDEC.

SITE LOCATION MAP

SOURCE: PARSONS MAP

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\4706F001

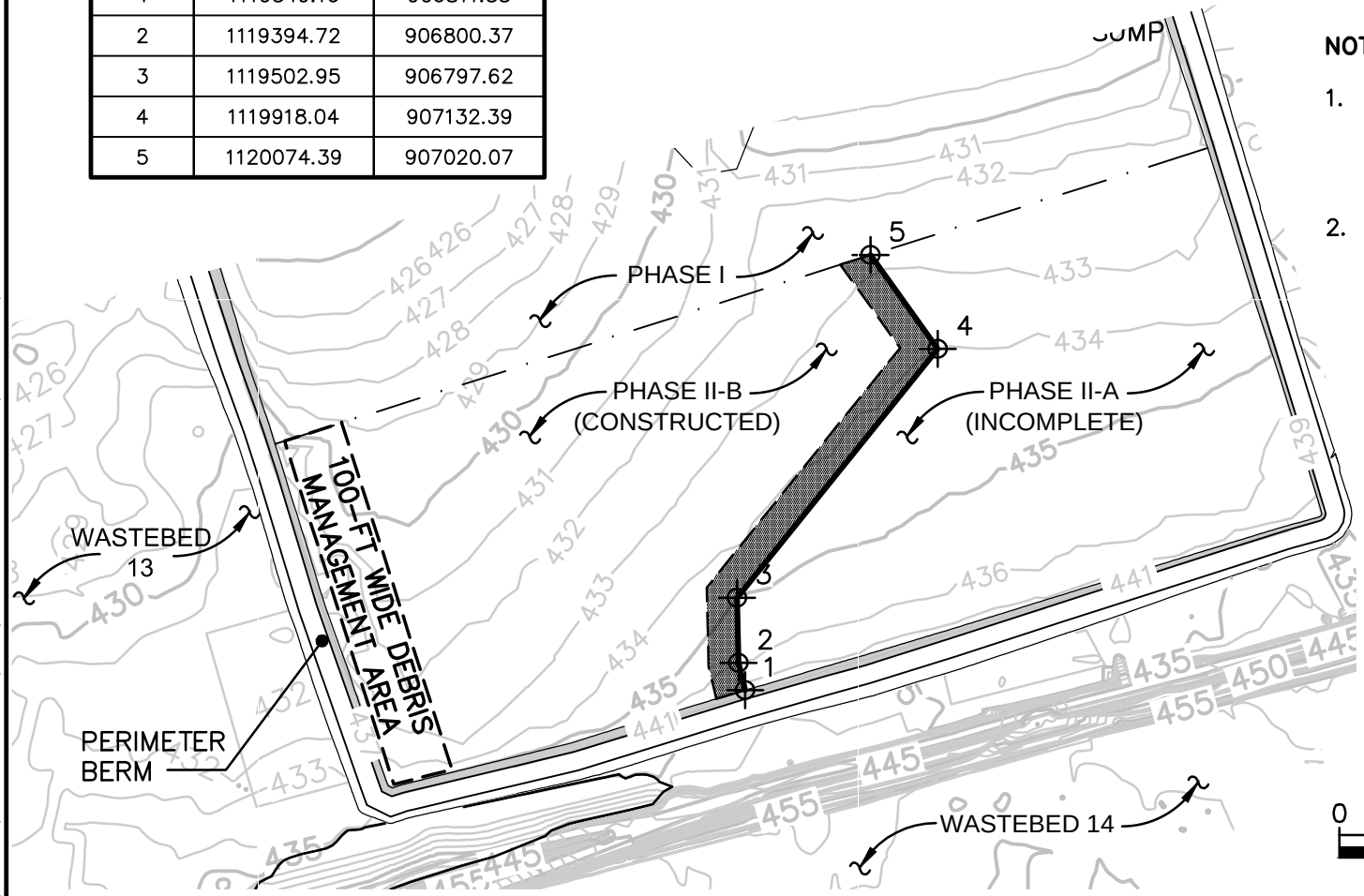
Geosyntec consultants

KENNESAW, GA

DATE:	May-12	SCALE:	NTS
PROJECT NO.	GJ4706B	FILE NO.	4706f001
DOCUMENT NO.	-	FIGURE NO.	1

LIMITS OF PHASE II

SURVEY CONTROL DATA		
NAME	NORTHING	EASTING
1	1119349.16	906811.53
2	1119394.72	906800.37
3	1119502.95	906797.62
4	1119918.04	907132.39
5	1120074.39	907020.07



NOTES:

1. TOP OF LOW PERMEABILITY SOIL LAYER CONTOURS ARE SHOWN WITHIN PHASES I AND II.
2. WATER PRODUCED BY OPERATION OF PHASE II–B SHALL BE CONTROLLED TO PREVENT OVERFLOW INTO PHASE II–A

0 300' 600'

SCALE IN FEET

LEGEND

- 430 — ELEVATION CONTOUR (FEET)
- PHASE BOUNDARY
- LIMIT OF PHASE II–B CERTIFICATION
- 50–FT OPERATIONAL BUFFER
- 1 CONTROL POINT

Geosyntec consultants

KENNESAW, GA

DATE:	Oct–12	SCALE:	AS SHOWN
PROJECT NO.	GJ4706B	FILE NO.	4706F001
DOCUMENT NO.	GA120495	FIGURE NO.	2

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\CQA\PHASE II CERTIFICATION\DRAWINGS\4706F001

APPENDIX A

Photographic Documentation

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 1: The Phase II LP soil material was placed using Caterpillar D6N dozers equipped with GPS guidance systems. The material was placed in multiple lifts to achieve a minimum thickness of 1-ft.

Photograph 2: A dozer and draw-type harrow was used to homogenize placed lifts of LP soil.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 3: Placed lifts of LP soil were compacted using a CAT CS-56 vibratory roller.

Photograph 4: The surface of LP soil lifts were scarified approximately 2-in deep prior to placement of subsequent lift.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	Onondaga Lake SCA Phase II	PROJECT NO.:	GJ4706B
CLIENT.:	Honeywell	FILE NAME:	Photolog.pptx

Photograph 5: Water was added to the scarified surface, as necessary, to promote adhesion between the lifts of LP soil and to maintain the moisture content of the LP layer.

Photograph 6: An excavator was used to remove overburden along the Phase I tie-in.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 7: The geomembrane in Phase I was rolled back and ballasted to facilitate access to the underlying LP soil to allow the Phase II LP soil to be keyed in.

Photograph 8: The LP soil layer in Phase I was trimmed to a shear face to ensure the minimum layer thickness was achieved along the tie-in.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 9: LP layer thickness verification was performed by Parsons using either a driven probe rod (shown) or a drill bit to contact steel plates.

Photograph 10: Additional geomembrane rolls were delivered to the site during construction of Phase II. The material was unloaded and stockpiled on-site using a telehandler.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	Onondaga Lake SCA Phase II	PROJECT NO.:	GJ4706B
CLIENT.:	Honeywell	FILE NAME:	Photolog.pptx

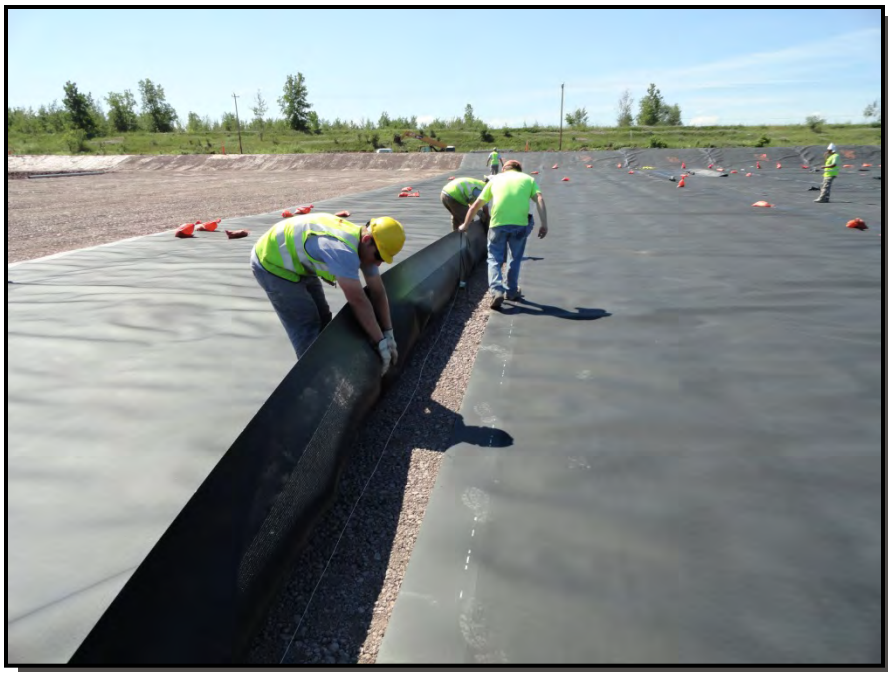
Photograph 11: The Phase I geomembrane was unfolded over the completed LP soil layer prior to welding a connection to the Phase II geomembrane.

Photograph 12: A compact track loader was used to deploy panels from rolls of 60-mil thick HDPE geomembrane.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx



Photograph 13: Deployed geomembrane panels were manually positioned to achieve the proper overlap for seaming.

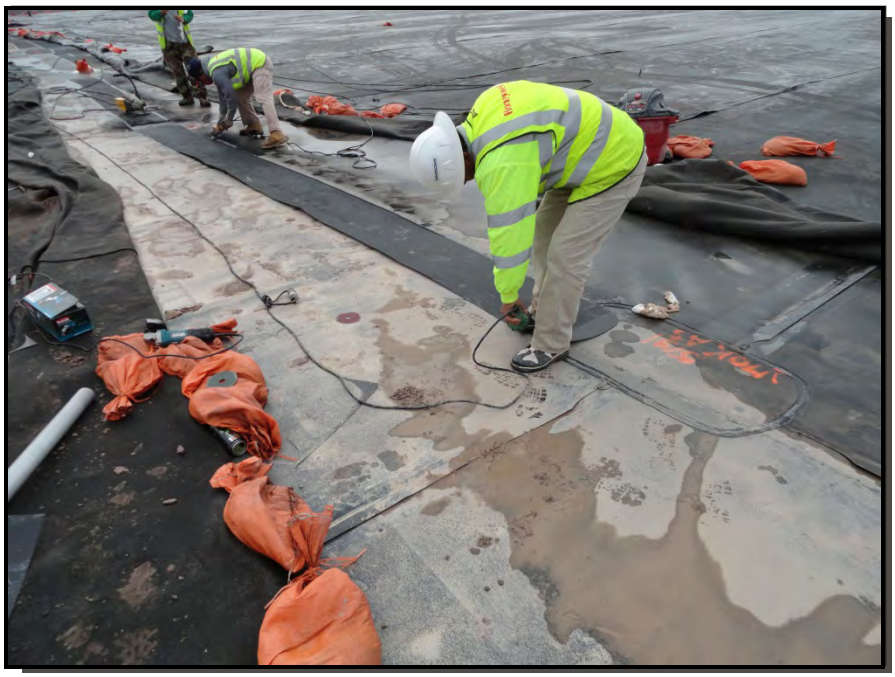
Photograph 14: Calibrated tensiometers were used to conduct field testing of trial welds and destructive samples.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 15: Seams between adjacent geomembrane panels were constructed using fusion welding equipment.

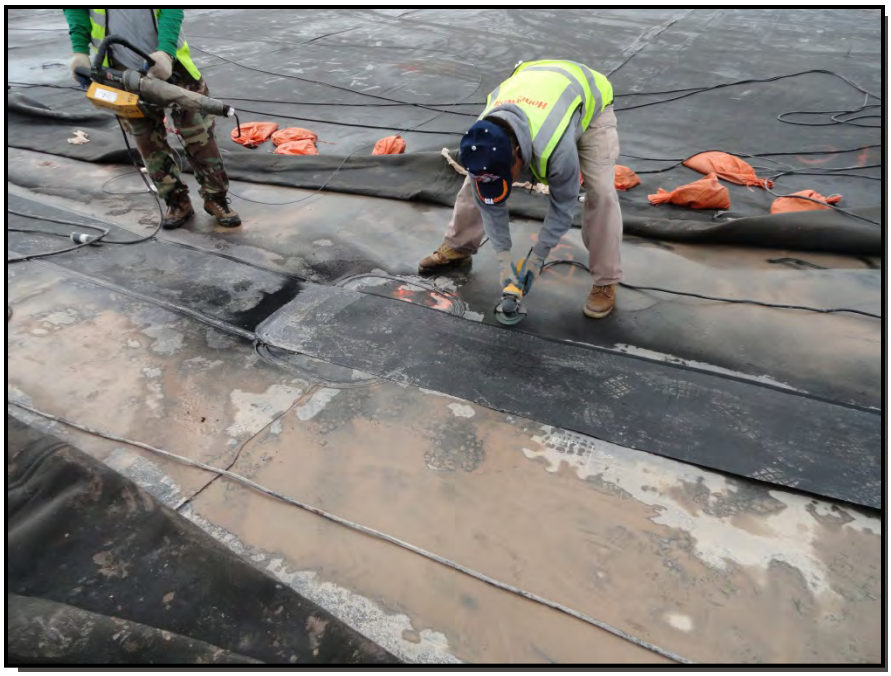


Photograph 16: Repairs to the geomembrane were initially heat bonded to facilitate preparation for extrusion welding.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx



Photograph 17: Electric powered grinders were used to abrade the surface of the geomembrane prior to extrusion welding.

Photograph 18: Hand-held extrusion welders were used to weld repairs.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 19: Fusion welded seams were non-destructively tested using the air pressure test method.

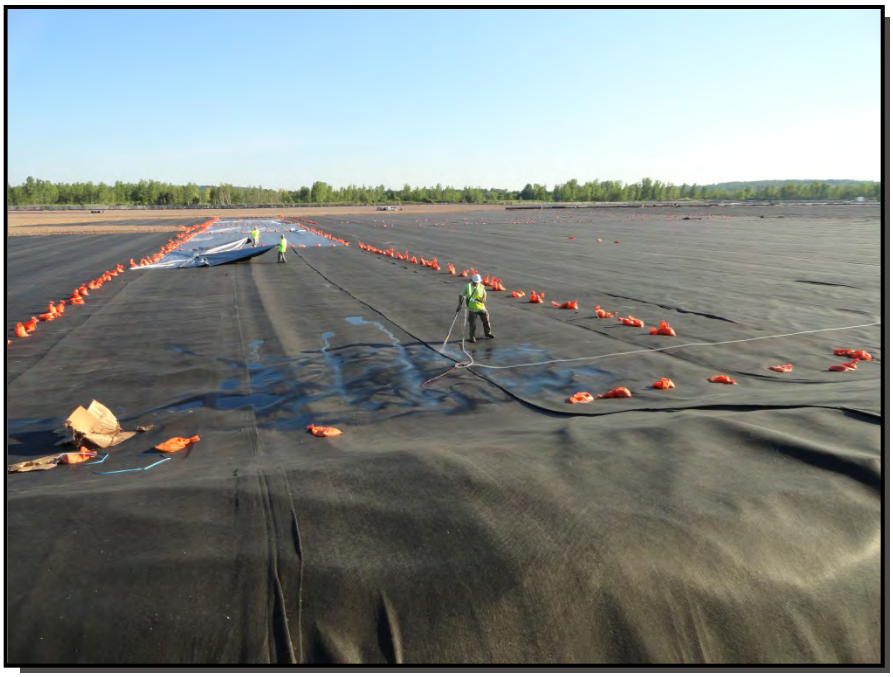
Photograph 20: Extrusion welds were non-destructive tested using the vacuum test method.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 21: A non-woven geotextile cushion (24 oz/syd) was deployed over the installed geomembrane. Adjacent geotextile panels were joined using a fusion welder.



Photograph 22: The slopes of Phase II were leak tested using the water lance method prior to installation of a sacrificial geomembrane layer.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	Onondaga Lake SCA Phase II	PROJECT NO.:	GJ4706B
CLIENT.:	Honeywell	FILE NAME:	Photolog.pptx

Photograph 23: Panels of the sacrificial geomembrane were deployed using an excavator equipped with a spreader bar. The rolls were suspended and unrolled along the length of the slope.

Photograph 24: The anchor trench was backfilled and compacted following placement of the sacrificial geomembrane. The backfill was placed in lifts.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 25: Temporary tarpaulins were used to cover areas of installed geotextile to minimize UV exposure. the tarpaulins were re-located with the placement of gravel.

Photograph 26: Two foot thick access roads were established inside the Phase II area on which trucks transporting drainage gravel used. After unloading, gravel was placed to a thickness of 1 ft using Caterpillar D6N LGP dozers.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	Onondaga Lake SCA Phase II	PROJECT NO.:	GJ4706B
CLIENT.:	Honeywell	FILE NAME:	Photolog.pptx

Photograph 27: The tarpaulins covering the geotextile were removed as drainage gravel placement progressed.

Photograph 28: Sprinklers were used to apply water to the installed drainage gravel layer and underlying geosynthetics to facilitate electrical leak location surveying (ELLS).

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 29: The ELLS was performed using the dipole method. The locations of data anomalies were excavated. Located holes were repaired, the gravel was reinstalled, and the area retested.

Photograph 30: A boot was installed around inclinometer SI-G1 in 2012 as a temporary measure. The inclinometer was abandoned in March 2013.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: Onondaga Lake SCA Phase II	PROJECT NO.: GJ4706B
CLIENT.: Honeywell	FILE NAME: Photolog.pptx

Photograph 31: Abandonment of inclinometer SI-G1 and removal of the associated boot left an approximately 6-in diameter hole within the geomembrane.

Photograph 32: Chenango mobilized to the SCA on 3 April 2013 to repair the hole at the former location of inclinometer SI-G1 by extrusion welding a patch. Parsons placed the gravel drainage layer after repairs were completed.

APPENDIX B

Field Reports and Correspondence

- Request For Information
- Field Change Forms
- Weekly Field Reports

Request For Information

PARSONS
301 Plainfield Road
Suite 350, 3rd Floor
Syracuse, NY 13212

REQUEST FOR INFORMATION
No. 00002

TITLE: Structural Fill Classification

DATE: 10/25/2010

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

STARTED:
COMPLETED:
REQUIRED: 11/1/2010

WORK	SCHEDULE	COST
IMPACT: Unknown	**IMPACT:** Yes	**IMPACT:** No

REQUEST:

Can you please clarify if we would be able to use material that has been tested as GP w/sand on the berm work.

PROPOSED SOLUTION:

Earthwork specification 02200 2.01B gives the following allowable soil classification for use as structural fill (SC, SM, ML, CL, GM, GC, or GW). We have a readily available material that was tested as a GP w/sand results attached) that we would like to include for use as first 14" bridge lift over SOLW. Limited use of this material would only be allowed as first 14" bridge lift. All other subsequent lifts would follow the current specifications. We believe this type of material would greatly enhance the bridging capability when places as a 14" lift over the SOLW. We believe this material would give a more stable foundation to complete the berm construction and allow work to continue in Syracuse fall and early winter weather conditions.

ANSWER:

Dave Steele approved the proposed solution. He stated this would need to now go to Geosyntec since it would be a submittal change and would need their approval as well.

Geosyntec responded "Acceptable for use under the berms; use in other areas of the SCA will require prior approval"

COMPLETED

Requested By: PARSONS

Date _____

Signed: _____
Mark Hoffmann

PARSONS

REQUEST FOR INFORMATION
RFI-002

Request

Information:
1. Estimated Cost Impact: Unknown
2. Estimated Schedule Impact: Would allow continuation of berm work in Syracuse fall and early winter weather conditions..
3. Prepared By: Mark Hoffmann
4. Requested Response By: 10/29/10
5. Written Description (attach sketches if applicable): Earthwork specification 02200 2.01B gives the following allowable soil classification for use as structural fill (SC, SM, ML, CL, GM, GC, or GW.
6. Subcontractor's Solution: We have a readily available material that was tested as a GP w/Sand (results attached) that we would like to include for use as first 14" bridge lift over SOLW. Limited use of this material would only be allowed as first 14" bridge lift. All other subsequent lifts would follow the current specifications. We believe this type of material would greatly enhance the bridging capability when placed as a 14" lift over the SOLW. We believe this material would give a more stable foundation to complete the berm construction and allow work to continue in Syracuse fall and early winter weather conditions.
7. Project Engineer's Response:
Attachment Sheets: ST3104SL-37-09-10 (2 pages)

Subcontractor: _____ Date: 10/22/10

Project Engineer: _____ Date: 29 Oct 2010

Acceptable for use under berms - use in other areas of SCA will require prior approval. JFB

ATLANTIC TESTING LABORATORIES

Particle Size Distribution Report

Project: SCA Phase 1A

Report No.: ST3104SL-37-09-10

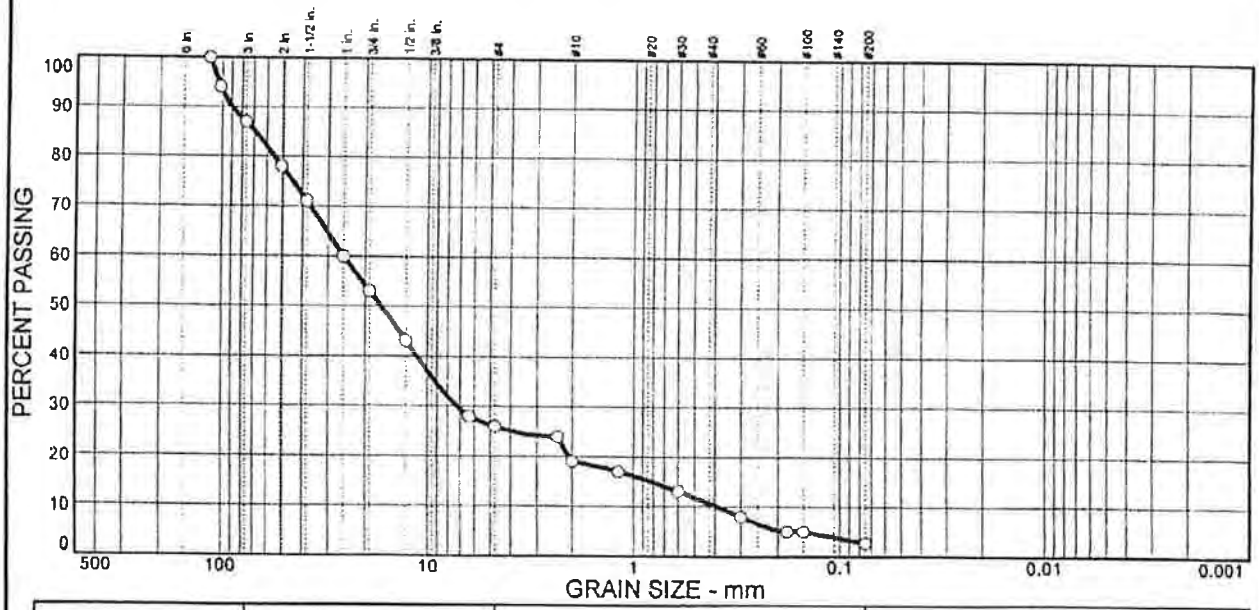
Client: Parsons Engineering of New York, Inc.

Date: 09-13-2010

Sennett

Sample No: S72-SF10 **Source of Sample:** ~~Granby~~ Quarry

Location: Stockpile **Elev./Depth:** ---



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
13	34	27	7	8	8	3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
4.5 in.	100		
4 in.	94		
3 in.	87		
2 in.	78		
1.5 in.	71		
1.0 in.	60		
3/4 in.	53		
1/2 in.	43		
1/4 in.	28		
#4	26		
#8	24		
#10	19		
#16	17		
#30	13		
#50	8		
#80	5		
#100	5		
#200	2.7		

* (no specification provided)

Soil Description

Brown cm+f GRAVEL; some cm+f SAND; little COBBLES; trace SILT/CLAY
Structural Fill (SF10)
ASTM D 2974 Percent Organic = 0.5%

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 68.7 D_{60}= 25.4 D_{50}= 16.8
D_{30}= 7.23 D_{15}= 0.822 D_{10}= 0.390
C_u= 65.10 C_c= 5.27

Classification

USCS= GP w/ Sand AASHTO= ---

Remarks

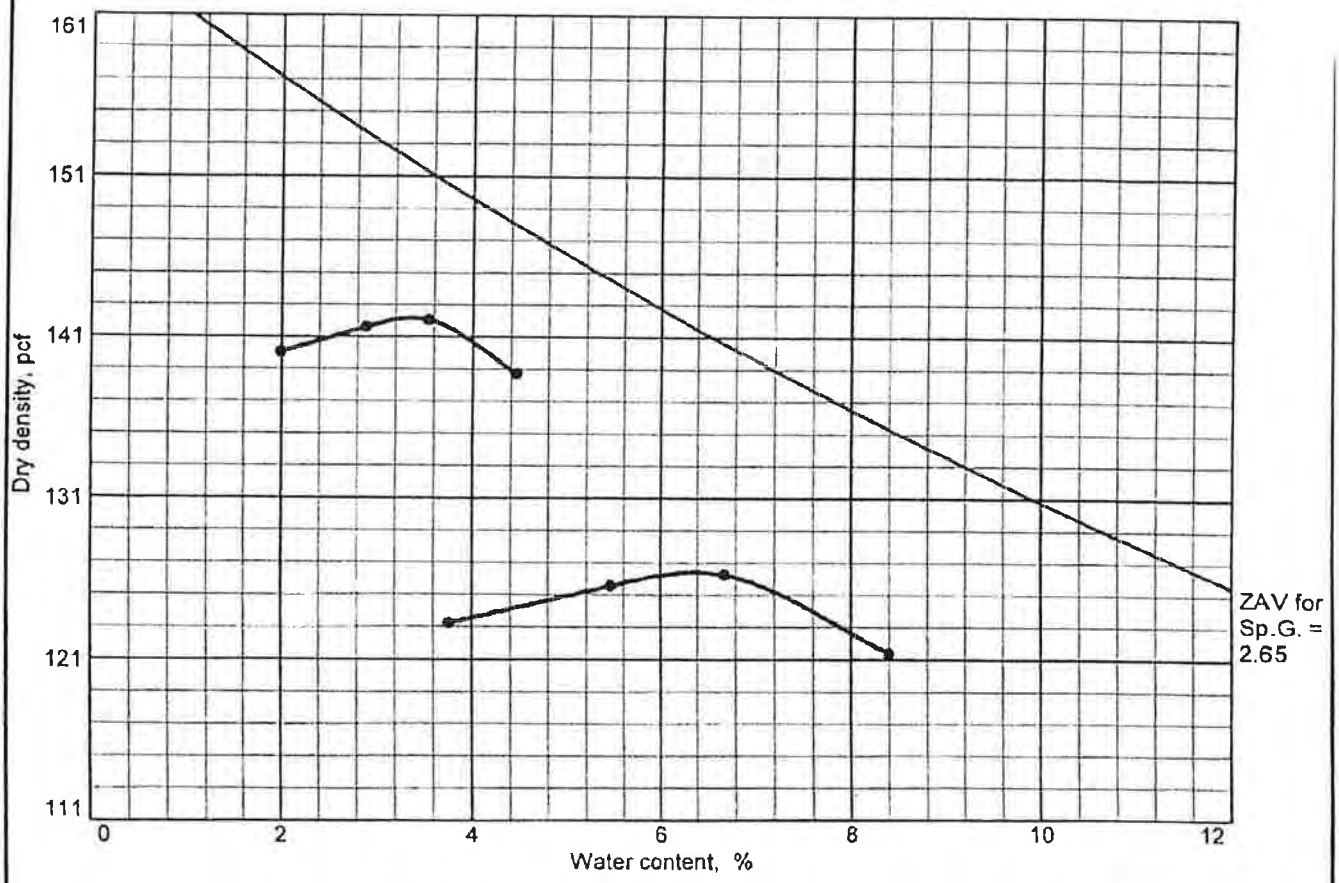
ASTM D 136,ASTM D 4318 and ASTM D 2487
Sampled by A. Stanton on 09-02-10
ASTM D 2216 Recieved Moisture = 5.6%

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 9/14/10

ATLANTIC TESTING LABORATORIES

COMPACTION TEST REPORT



Test specification: ASTM D 698-00 Method C Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Received Moist.	Sp.G.	LL	PL	PI	% > 3/4 in.
	USCS	AASHTO						
—	GP w/ Sand	—	5.6	2.65	NP	NP	NP	47.0

CORRECTED TEST RESULTS

Maximum dry density = 142.2 pcf

Optimum moisture = 3.4 %

MATERIAL DESCRIPTION

Brown cm+f GRAVEL; some cm+f SAND; little COBBLES; trace SILT/CLAY
Structural Fill (SF10)
ASTM D 2974 Percent Organic = 0.5%

Report No.: ST3104SL-37-09-10 **Client:** Parsons Engineering of New York, Inc.

Project: SCA Phase 1A

Sample No.: S72-SF10 **Source of Sample:** Sennett ~~Granby~~ Quarry

Location: Stockpile **Date:** 09-13-2010

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.

Remarks:

ASTM D 2216 and ASTM D 698
Sampled by A. Stanton on 09-02-10
Dry Preparation

Rammer: Mechanical

Specific Gravity: Assumed

Reviewed by: _____ Date: 9/14/10

PARSONS
301 Plainfield Road
Suite 350, 3rd Floor
Syracuse, NY 13212
Phone: 315-552-9737
Fax: 315-457-9571

REQUEST FOR INFORMATION
No. 00003

TITLE: Subgrade Elevations
DATE: 4/14/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 4/15/2011

WORK IMPACT: Unknown
SCHEDULE IMPACT: No
COST IMPACT:

QUESTION:
The Berm and Subgrade Grading Plan is +/- one (1) foot higher than the actual elevation measured in the field. This will have a significant cost impact for both the structural fill and the clay if built per current design plans. (Spec # 0220 and 02250) The SCA plans on starting clay placement Monday, April 25, 2011 and need resolution on this issues ASAP to support our project schedule.

PROPOSED SOLUTION:

ANSWER:
The following approach was discussed in the field:

Provide the northings, eastings, and elevations for points on a 50 ft grid across Phase I, and any high points between the grid points. From this information Geosyntec will prepare a contour drawing of the existing surface. We will provide a drawing with this surface for review and approval within two working days of receipt of the survey information.
Once approved we will prepare a revised top of clay layer within 2 to 3 working days of approval of the revised existing surface.

NOTE: Revised clay grades have been received from Geosyntec and the berms are to be built to the height (i.e., vertical distance between the ground and the top of the dike) shown in the design (elevation can be lower than design elevation). per Dave Steele (24 Jun 11)

COMPLETED

equested By: PARSONS
Date: 4/14/2011

Signed: _____
Alan Steinhoff

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\4299X006_TOP OF LINER (Revised with Phase II).dwg, 6/14/2011 2:20:30 PM, JSpeed, 1:250

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00010

TITLE: Stripping Vegetation with Bulldozer

DATE: 7/13/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Bonnett
GEOSYNTEC CONSULTANTS

STARTED:

COMPLETED:

REQUIRED: 7/20/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:

QUESTION:
Is Geosyntec OK with stripping vegetation with a bulldozer (i.e., clearing and grubbing -although we may not completely grub)?

PROPOSED SOLUTION:

ANSWER:
The current method that involves manual and light equipment and the proposed method of using a low ground pressure bulldozer are acceptable. Clearing and grubbing operation shall not get too far in front of the clay placement operation.

After the stripping is complete, the area shall be observed by NYSDEC with CQC and CQA personnel to approve and record acceptable area.

COMPLETED

Requested By: PARSONS **Date:** 7/13/2011

Signed: _____
David Steele

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION

No. 00012

TITLE: Interface Friction Testing

DATE: 7/19/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Bonnett
GEOSYNTEC CONSULTANTS

STARTED:

COMPLETED:

REQUIRED: 7/25/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:

QUESTION:

: Interface Friction Testing(Specification Section 02250 – Low Permeability Soil Layer)
To follow-up on coordination of interface direct shear (ASTM D5321) testing - Reference Specification Section 02250 Part 2.01.F.1:
The Contractor shall perform a minimum of one round of the following tests per borrow source, prior to material being delivered to the site:
1. Interface Direct Shear (ASTMD 5321)

The CQA Plan required one test per 10 CQC tests

PROPOSED SOLUTION:

ANSWER:

To streamline the process as well as a concern for the CQA Independent Testing Laboratory's ability to conduct a sandwich test, the following is proposed.
The project will require one interface direct shear per borrow source for the upper 12 to 18-in thick low-permeability soil layer. Each test shall consist of testing the following cross-section, from top to bottom:
•24-in thick gravel drainage layer – from the Granby Pit
•Geotextile cushion – GSE NW24;
•Geomembrane liner - GSE HDT-060AE-BBB-B-WO; and
•12-in LP soil layer – two sources to date; Black Creek and Marcellus sources.
The clay shall be remolded to 95% of the maximum dry density as determined by the standard Proctor test (ASTM D698) at approximately 3% wet of the optimum moisture content.
Three points shall be performed at the following normal stresses: 700, 2,100, and 3,500 psf (similar to pre-design study). The test will be run at 0.004 in per minute.
The minimum sample size for soils is three 5 gallons buckets and for the geosynthetics, is a minimum of three wide by roll width.

COMPLETED

Requested By: PARSONS **Date:** 7/18/2011

Signed: _____
David Steele

PARSONS

REQUEST FOR INFORMATION
No. 00013

TITLE: ASTM D4218 Testing

DATE: 7/22/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 7/29/2011

WORK IMPACT: Unknown

SCHEDULE IMPACT: Unknown

COST IMPACT: Unknown

QUESTION:

Specification 02740 states HDPE Geomembrane Liner to be tested per ASTM D4218 for carbon black content. GSE manufcturer tested per ASTM D1603. As testing per ASTM D1603 also meets the required testing criteria Parsons requests that ASTM D1603 be used in place of ASTM D4218.
Drawings 444853-101-C-009 through 444853-101-C-012

PROPOSED SOLUTION:

Parsons proposes substituting ASTM D1603, which also meets specified requirements, for ASTM D4218.

ANSWER:

Proposed solution is acceptable.

COMPLETED

Requested By: PARSONS

Date: 7/22/2011

Signed: _____
Michael Dobson

GEOSYNTEC CONSULTANTS

REQUEST FOR INFORMATION
No. 00014

TITLE: Interface Friction Testing

DATE: 8/29/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

STARTED:

COMPLETED:

REQUIRED: 9/5/2011

WORK IMPACT:

SCHEDULE IMPACT: No

COST IMPACT: No

Subcontractor: GEOSYNTEC CONSULTANTDavid Bonnett

Architect:

QUESTION:
RFI SUBJECT(s): Interface Friction Testing (Specification Section 02250 – Low Permeability Soil Layer Part 2.01.F.1 and see RFI-11 for details)

QUESTION:
To confirm results meet the project requirements. The interface direct shear (ASTM D5321) tests were performed at the following normal stresses: 700, 2,100, and 3,500 psf and run at 0.004 in per minute. The results are attached for approval by the design engineer.

PROPOSED SOLUTION:
The results meet the intent of the design.

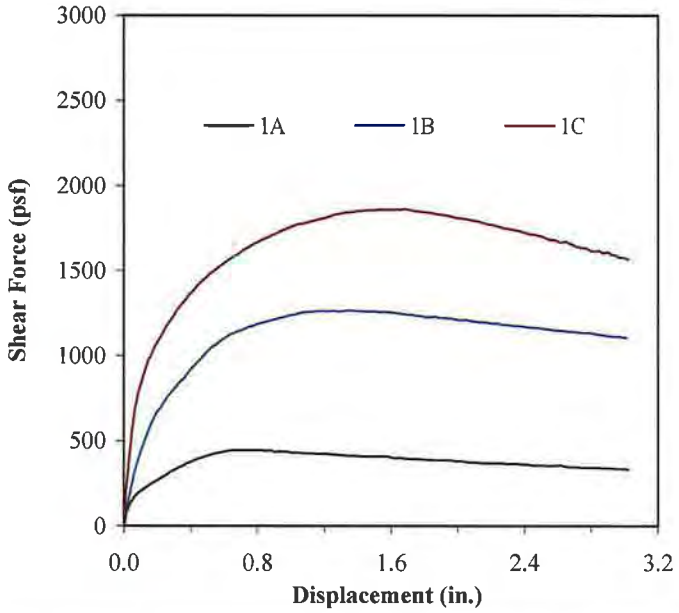
ANSWER:
PER JAY BEECH 07 Sep 11
The results meet the intent of the design.

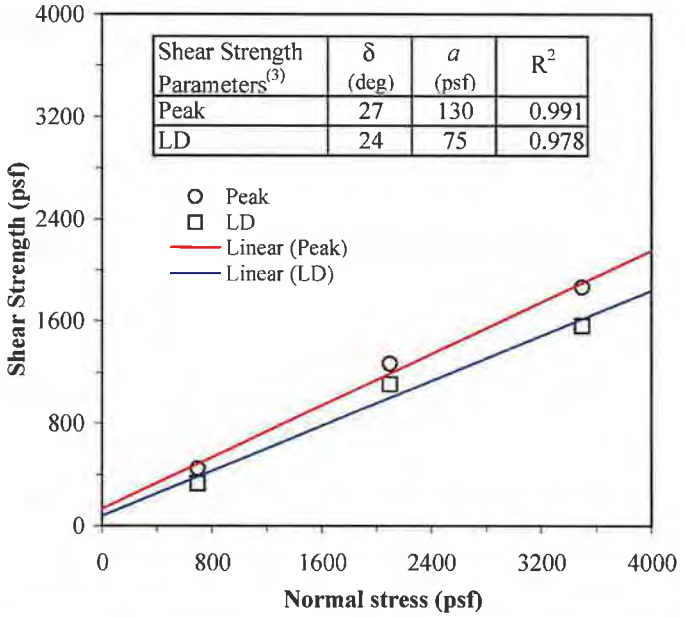
PER DAVID STEELS' email dated 01 Sep 11
I approve this RFI. We need to send to the Design Engineer for approval.

COMPLETED

GEOSYNTEC CONSULTANTS - ONONDAGA SCA PHASE 1
INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)

Upper Shear Box: Drainage gravel nominally compacted/
GSE 240E (24 oz) nonwoven geotextile #130401943 with heart-treated side up/
GSE 60-mil textured HDPE geomembrane # 102158865/
Lower Shear Box: Marcellus clay #LP-087compacted to approximately 95% of max standard Proctor density at 3% wet of OMC (OMC = 19.5%)





Shear Strength Parameters[3]	δ (deg)	a (psf)	R^2
Peak	27	130	0.991
LD	24	75	0.978

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	Soaking		Consolidation		Drainage Gravel			Clay			GCL		Shear Strength		Failure Mode
				Stress (psf)	Time (hour)	Stress (psf)	Time (hour)	γ_d (pcf)	ω_i (%)	ω_f (%)	γ_d (pcf)	ω_i (%)	ω_f (%)	ω_i (%)	ω_f (%)	τ_P (psf)	τ_{LD} (psf)	
1A	12 x 12	700	0.004	-	-	700	24	-	-	-	102.8	21.7	20.5	-	-	447	332	(1)
1B	12 x 12	2100	0.004	-	-	2100	24	-	-	-	102.5	22.1	20.1	-	-	1268	1107	(2)
1C	12 x 12	3500	0.004	-	-	3500	24	-	-	-	102.6	21.9	19.0	-	-	1862	1565	(2)

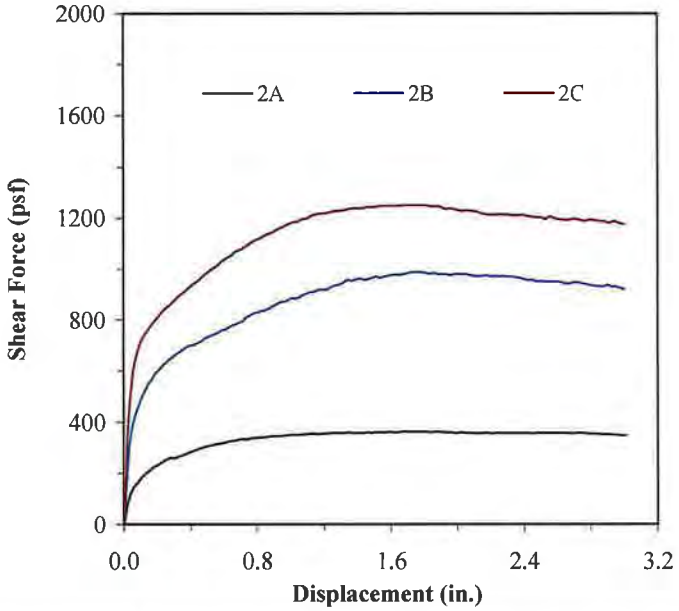
NOTES:
(1) Sliding occurred at the interface between the geotextile and geomembrane
(2) Sliding occurred at the interface between the geomembrane and clay.
(3) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

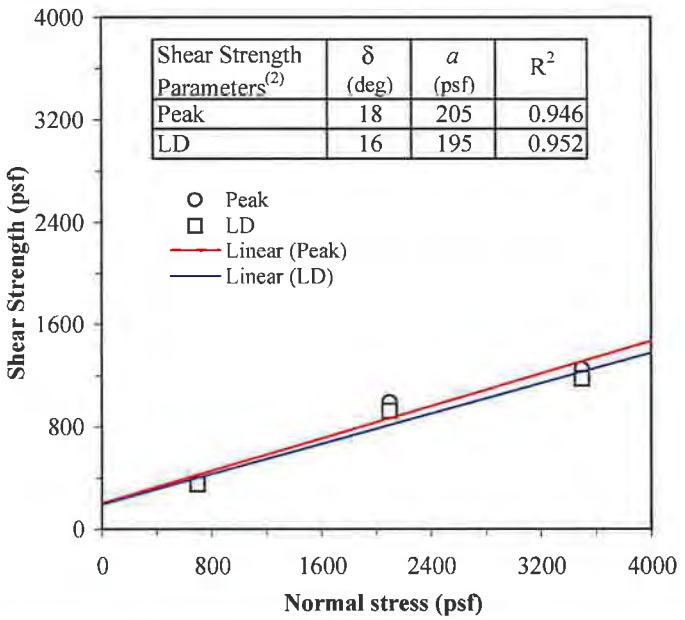
SGI TESTING SERVICES, LLC

DATE OF REPORT:	7/31/2011
FIGURE NO.	C-1
PROJECT NO.	SGI11017
DOCUMENT NO.	
FILE NO.	

GEOSYNTEC CONSULTANTS - ONONDAGA SCA PHASE 1
INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)

Upper Shear Box: Drainage gravel nominally compacted/
GSE 240E (24 oz) nonwoven geotextile #130401943 with heart-treated side up/
GSE 60-mil textured HDPE geomembrane # 102158865/
Lower Shear Box: Black Creek clay #LP-088 compacted to approximately 95% of max standard Proctor density at 3% wet of OMC (OMC = 22%)





Shear Strength Parameters[2]	δ (deg)	a (psf)	R^2
Peak	18	205	0.946
LD	16	195	0.952

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	Soaking Stress (psf)	Soaking Time (hour)	Consolidation Stress (psf)	Consolidation Time (hour)	Drainage Gravel γ_d (pcf)	Drainage Gravel ω_i (%)	Drainage Gravel ω_f (%)	Clay γ_d (pcf)	Clay ω_i (%)	Clay ω_f (%)	GCL ω_i (%)	GCL ω_f (%)	Shear Strength τ_P (psf)	Shear Strength τ_{LD} (psf)	Failure Mode
2A	12 x 12	700	0.004	-	-	700	24	-	-	-	97.1	24.7	23.4	-	-	363	349	(1)
2B	12 x 12	2100	0.004	-	-	2100	24	-	-	-	97.4	24.4	23.7	-	-	989	923	(1)
2C	12 x 12	3500	0.004	-	-	3500	24	-	-	-	97.6	24.1	23.2	-	-	1249	1175	(1)

NOTES:
(1) Sliding occurred at the interface between the geomembrane and clay.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

DATE OF REPORT:	7/31/2011
FIGURE NO.	C-2
PROJECT NO.	SGI11017
DOCUMENT NO.	
FILE NO.	

SGI TESTING SERVICES, LLC

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00015

TITLE: SF Classification

DATE: 9/6/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 9/13/2011

WORK IMPACT:

SCHEDULE IMPACT:

COST IMPACT:

QUESTION:

Specification Section 02200-2.01B states:
"Soil materials used for engineered fill shall consist of relatively homogeneous natural soils free of materials, which, due to nature or size, are deleterious to he intended use. Unless otherwise specified herein, engineered fill shall classify as SC, SM, ML, CL, GM, GC, or GW according to the Unified Soil Classification System (per ASTM D 2487) or combinations of these materials. Classification shall be based on the results of soil conformance tests."
This RFI is to ask if materials can be used for SCA berm construction that that are relatively homogeneous natural soils free of deleterious materials and classify as the following:
•GP w/Sand
•GP-GM
•GP-GM w/Sand
•SP-SM w/Gravel
•SW-SM w/Gravel

The following field observations are presented to justify acceptance of this material:
1) berms have held up to construction traffic, including loaded trucks, with minimal signs of deflection, and
2) berms have help up since fall of 2010 with minimal signs of erosion.

PROPOSED SOLUTION:

ANSWER:

PER JAY BEECH 08 Sep 11
The proposed materials may be used, with the restiction that the maximum particle size should be 4 inches. Erosion protection measures should be applied as necessary.

COMPLETED

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00016

TITLE: Elevations for East and West Berms
DATE: 10/17/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 10/24/2011

WORK IMPACT:	SCHEDULE IMPACT: No	COST IMPACT: No

QUESTION:
Drawing C-006 shows the elevations for the top of the berms around the SCA. Drawing C-009 shows the height of the temporary berm to be 5.7 feet. The east and west berms of the SCA are being built 0.5 feet lower than the design to account for the land-based topography data (as discussed in Field Change Form #3). This RFI is to ask what elevations are required for the top of the east and west berms and the top of the temporary berm to provide the necessary containment during the period when only Phase I and II are in operation.

PROPOSED SOLUTION:

ANSWER:
(1) The elevations of the East and West Berms vary along their profiles and must be sufficient for both water retention and installation of the perimeter drainage channel during closure. Geosyntec will review as appropriate when the as-built elevations are provided.
(2) The temporary berm between Phases I and III shall have a minimum elevation of 434 ft msl.
(3) The temporary berm between Phases I and II shall have a minimum elevation of 436 ft msl.

See attached file for more information

COMPLETED

E-MAILED
08 Nov 11

Geosyntec consultants

PARSONS

REQUEST FOR INFORMATION (RFI) RESPONSE

TO:	David Steele, Dhana Hillenbrand	**Date:** 7 Nov. 2011	**Job No.:** GJ4706
ADDRESS:	Parsons	Sediment Consolidation Area (SCA)	
	Gerelock Road	Phase I	
	Syracuse, NY	Camillus, NY	

RFI No.: SCA-RFI-00016	**Revision No.:** 0	**Date of RFI:** 17 October 2011

RFI SUBJECT(s): Berm Elevations

QUESTIONS:

RFI-00016: This RFI is to ask what elevations are required for the Top of East and West Berms and the top of the temporary berm to provide the necessary containment during the period when only Phase I and II are in operation.

RESPONSES:

(1) The elevations of the East and West Berms vary along their profiles and must be sufficient for both water retention and installation of the perimeter drainage channel during closure. Geosyntec will review as appropriate when the as-built elevations are provided.

(2) The temporary berm between Phases I and III shall have a minimum elevation of 434 ft msl.

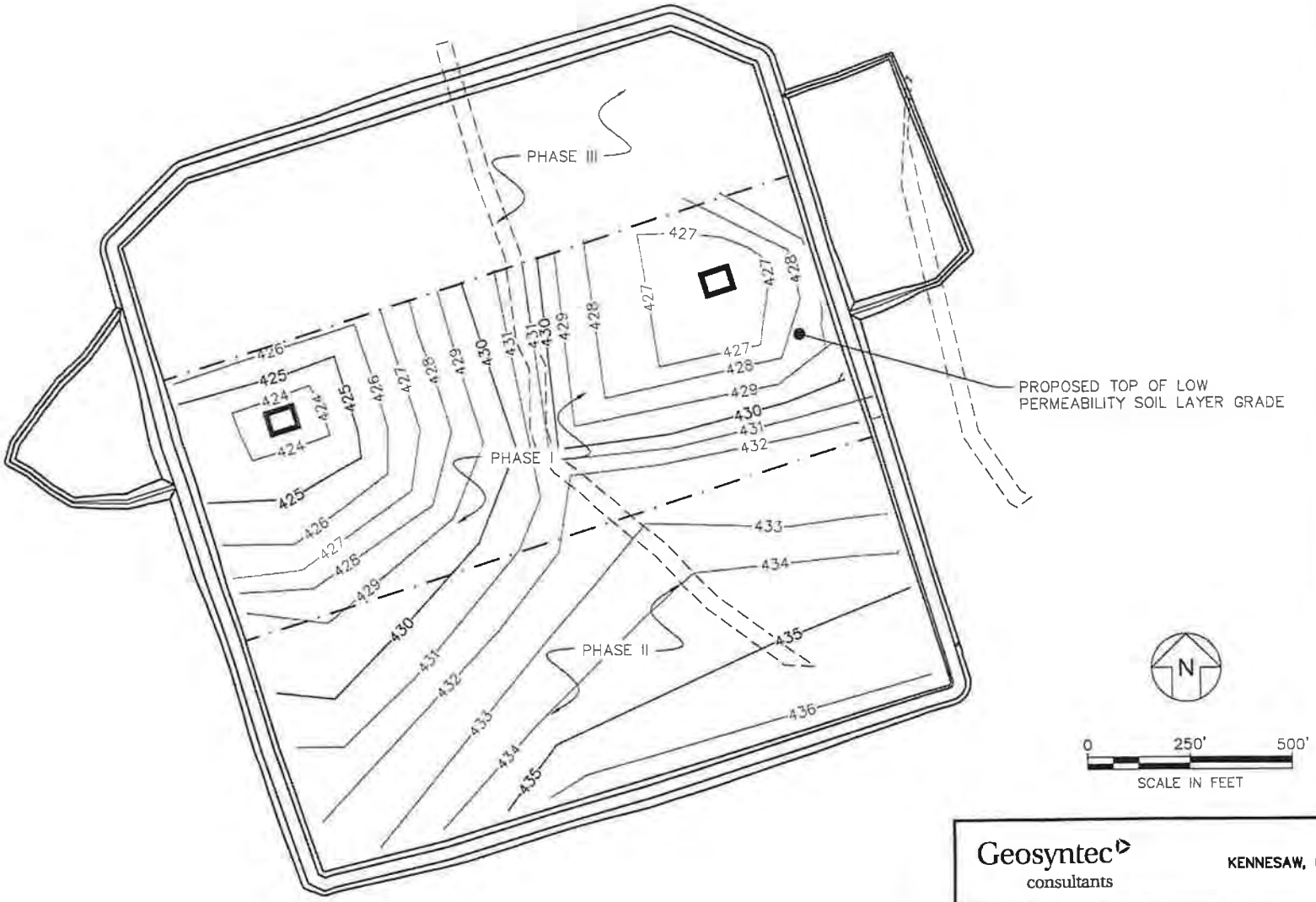
(3) The temporary berm between Phases I and II shall have a minimum elevation of 436 ft msl.

Prepared by	Date	Engineer-of-Record	Date
Name: Joseph Sura	7 Nov. 2011	Name: Jay Beech, P.E.	7 Nov. 2011

Distribution: ☒ David Steele, Parsons ☒ Ming Zhu, Geosyntec ☒ Ramachandran Kulasingam, Geosyntec

Attachments

RECEIVED
Nov -7 2011
Dhana
PARSONS

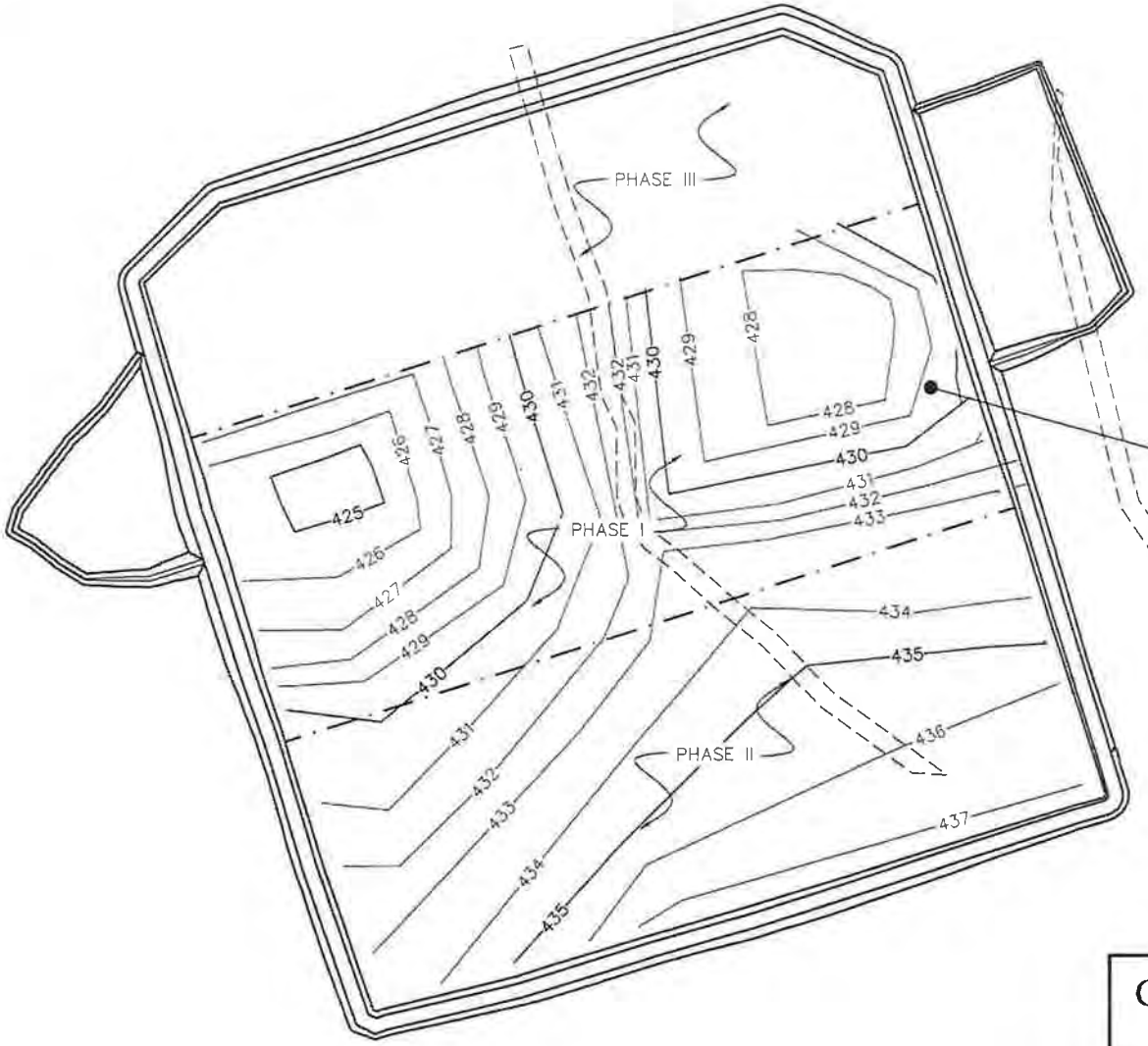


Geosyntec consultants

KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706.08	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	1

L:\CAD\GA\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF LINER (REVISED WITH PHASE II RELOCATED EAST 30ft).dwg



Geosyntec consultants

KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706.08	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	2

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF GRAVEL (REVISED WITH PHASE II RELOCATED EAST 30M').

Original Analysis - Before survey bust, minimum berm elevation of 434 ft msl

Phase	Design Storm (24-hour)	Lowest Berm EL (ft msl)		Freeboard (ft.)	
		West Area	East Area	West Area	East Area
I	25-year	434.0	434.0	3.95	2.35
I	100-year	434.0	434.0	3.65	2.15
I & II	25-year	434.0	434.0	2.41	1.35
I & II	100-year	434.0	434.0	1.40	1.06
I, II & III	25-year	434.0	434.0	0.86	0.61

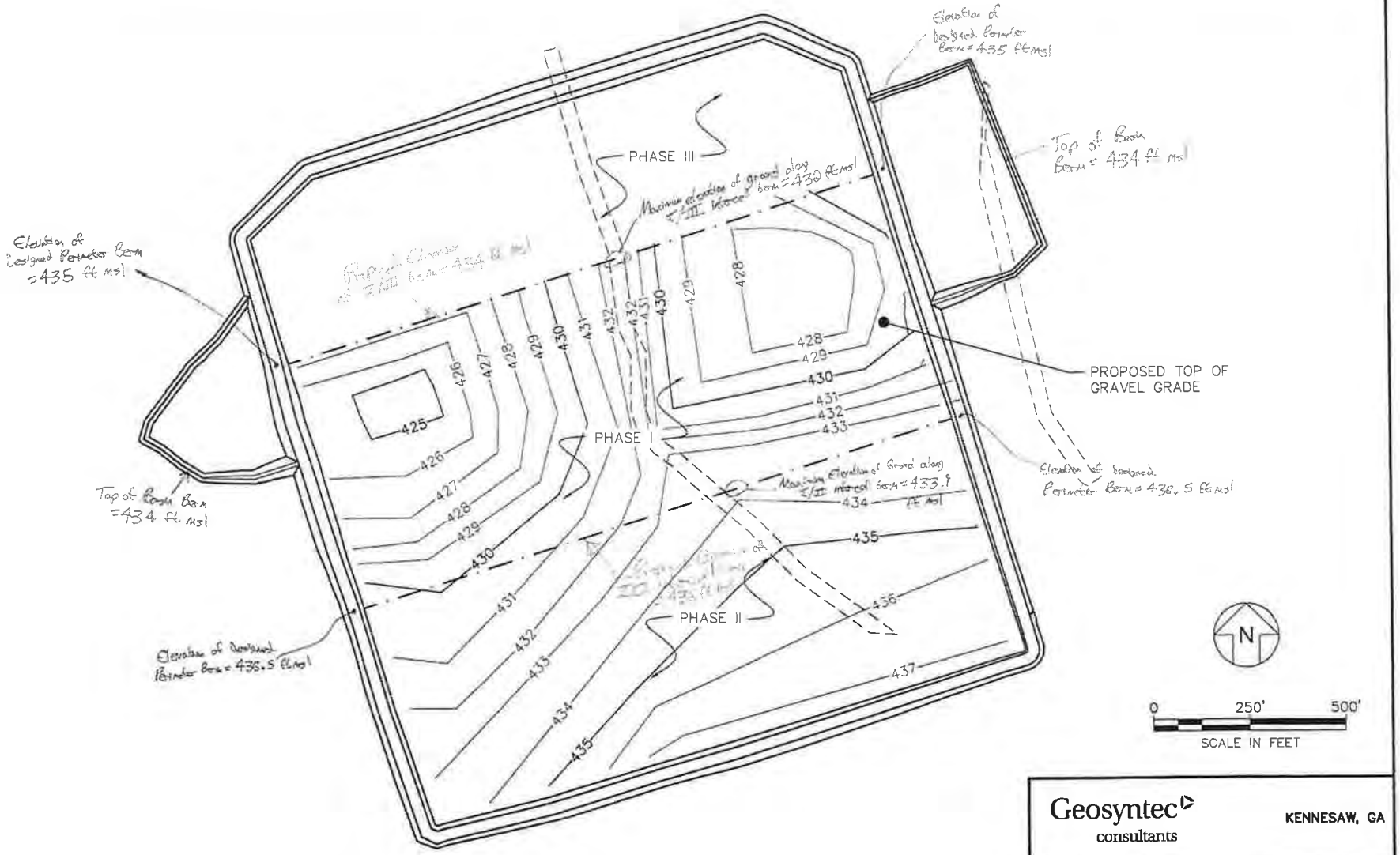
Revised Analysis - Includes survey bust, allows different minimum berm elevation

Phase	Design Storm (24-hour)	Lowest Berm EL (ft msl)		Freeboard (ft.)	
		West Area	East Area	West Area	East Area
I	25-year	434.0	434.0	3.69	2.14
I	100-year	434.0	434.0	3.33	1.92
II (Liner Only)	25-year	436.0		1.23	
II (Liner Only)	100-year	436.0		0.99	
I & II	25-year	434.0	434.0	1.88	1.13
I & II	100-year	434.0	434.0	1.29	0.78
I, II & III	25-year	Not updated - Analyses can be performed if Phase III is needed			

Notes:

1.) It is noted that the minimum height of the berm is considered to be 2 ft above the Top of Gravel. This results in a minimum berm elevation of 434 ft msl in Phase I and 436 ft msl in Phase II.

2.) The minimum freeboard requirement is considered to be 0.5 ft (6").



Geosyntec consultants — KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706.08	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	3

L:\CADD\ONONDAGA LAKE\PERMITS\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF GRAVEL (REVISED WITH PHASE II RELOCATED EAST 2007).

GEOSYNTEC CONSULTANTS

REQUEST FOR INFORMATION

No. 00017

COMPLETED

TITLE: Gravel Drainage Grain Size

DATE: 12/8/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 12/15/2011

E-MAILED
15 Dec 11

WORK IMPACT:

SCHEDULE IMPACT:

COST IMPACT:

QUESTION:

Regarding Gravel Drainage Layer (Specification Section 02300-2.01.B and see FCF#1)

(i) To confirm the tested material properties of the gravel meets the intent of the project. The results from construction quality assurance (CQA) testing, specifically the grain size analysis (ASTM D422) tests, indicate oversized material was retained on the 4-in diameter sieve. See summary attached for detail.

(ii) To confirm the removal procedure to be used in the field to remove marginal material observed during gravel placement.

PROPOSED SOLUTION:

(i) The material with oversized material meets the intent of the specification. The Contractor should avoid dumping gravel directly on the lining system using a maximum drop of less than 3-ft.

(ii) During gravel placement operations, accumulation of fines has been observed. These areas have been delineated using high visibility sand bags. It appears fines become concentrated in high traffic areas (e.g., off access roads) or can become accumulated by the washing of fines through precipitation. These areas of concentrated fines will require removal.

Small low ground pressure equipment should be used to remove observed accumulated fines. The equipment bucket should be a straight edge with plastic, flexible rubber or similar material to avoid excessively sharp edges. The removal work should be coordinated with CQA personnel and a spotter should be present during removal activities to ensure no damage occurs to the existing lining system.

ANSWER:

(i) The material with oversized material meets the intent of the specification. The Contractor should avoid dumping gravel directly on the lining system using a drop of less than 3-ft.
(ii) During gravel placement operations, accumulation of fines has been observed. These areas have been delineated using high visibility sand bags. It appears fines become concentrated in high traffic areas (e.g., off access roads) or can become accumulated by the washing of fines through precipitation. These areas of concentrated fines will require removal.

nall low ground pressure equipment should be used to remove observed accumulated fines. The equipment ucket should be a straight edge with plastic, flexible rubber or similar material to avoid excessively sharp edges. The removal work should be coordinated with CQA personnel and a spotter should be present during removal activities to ensure no damage occurs to the existing lining system.

Detail Summary for SCA RFI 17

TEST STANDARD			CLASSIFICATION (ASTM D2487)	GRAIN SIZE (ASTM D 422)						HYDRAULIC CONDUCTIVITY (ASTM D2434)
QA TEST FREQUENCY QA TEST REQUIRED			10,000 cyd 3	@ 10,000 cyd 3						@25,000 cyd 1
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)
GOL-	Specs		GW or GP	100				0 - 5	0 - 3	± 10
1	On-site		GP	100	76	35	3	0	0	
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 D9		GP	85	54	29	1	1	0	

Geosyntec consultants

PARSONS

REQUEST FOR INFORMATION (RFI) RESPONSE

TO:	David Steele and Dhana Hillenbrand	**Date:** 1 May 2012	**Job No.:** GJ4706B
ADDRESS:	Parsons	Sediment Management System (SMS)	
	522 Gerelock Road	Sediment Consolidation Area (SCA)	
	Camillus, NY 13031	Camillus, NY	

RFI No.: SCA-RFI-0018	**Revision No.:** 0	**Date of RFI:** 24 April 2012

RFI SUBJECT: SCA Specification Section 02710 – Geotextile Cushion

(i) Reference Table 2710-1: Request to modify geotextile cushion puncture strength (ASTM D4833) from 5,000 psf to 250 lb.

(ii) Reference Part 3.02 and 303, which indicates geotextile seams shall be overlapped or seamed. Patches will extend a minimum one foot beyond damaged area and sewn into place

PROPOSED RESPONSE:

(i) During the design, geotextile performance tests were performed and a 24 oz/syd material was chosen. The 24 oz/syd puncture strength of 250 pounds is acceptable per GRI-GT12(a).

(ii) Heat bonding of geotextile overlaps and patches is acceptable. The Contractor shall take care to avoid disturbing repairs during gravel placement.

Prepared by	Date	Engineer-of-Record	Date
Name: Joseph Sura	1 May 2012	Name: Jay Beech, P.E.	1 May 2012

Distribution: ☒ M. Fountain, Geosyntec ☒ Joe Sura, Geosyntec ☒ Ramachandran Kulasingam, Geosyntec ☒ David Bonnett, Geosyntec

Attachments:
GRI-GT12(a)

Geosyntec consultants

PARSONS

REQUEST FOR INFORMATION (RFI) RESPONSE

TO:	David Steele and Dhana Hillenbrand	**Date:** 1 May 2012	**Job No.:** GJ4706B
ADDRESS:	Parsons	Sediment Management System (SMS)	
	522 Gerelock Road	Sediment Consolidation Area (SCA)	
	Syracuse, NY	Camillus, NY	

RFI No.: SCA-RFI-00019	**Revision No.:** 0	**Date of RFI:** 24 April 2012

RFI SUBJECT: SCA Specification Section 07240 - Geomembrane

Request change to the specification for Geomembrane (Section 020740) to allow substitution of the test method ASTM D792 used for QC testing of the material for sheet density/specific gravity in place of ASTM D1505 specified.

PROPOSED RESPONSE:

The proposed changes are acceptable.

Density provides an indication of a material's molecular structure and degree of crystallinity. It can be measured using a water displacement method or in a gradient column. ASTM D792 (Method B) and ASTM D1505 are considered equal and are industry standards, as discussed in GRI GM-13.

Joseph Mebra

J. E. Beech

Prepared by	Date	Engineer-of-Record	Date
Name: Joseph Sura	1 May 2012	Name: Jay Beech, P.E.	1 May 2012

Distribution: ☒ M. Fountain, Geosyntec ☒ Joe Sura, Geosyntec ☒ Ramachandran Kulasingam, Geosyntec ☒ David Bonnett, Geosyntec

Attachments:
GRI GM-13

Geosyntec consultants

PARSONS

REQUEST FOR INFORMATION (RFI) RESPONSE

TO:	David Steele / Dhana Hillenbrand	**Date:** 9 May 2012	**Job No.:** GJ4706
ADDRESS:	Parsons	Sediment Consolidation Area (SCA)	
	Gerelock Road	Phase I	
	Syracuse, NY	Camillus, NY	

RFI No.: SCA-RFI-00021	**Revision No.:** 0	**Date of RFI:** 9 May 2012

RFI SUBJECT(s): Interface Friction Testing (Specification Section 02250 – Low Permeability Soil Layer Part 2.01.F.1 and see RFI-00012 for details)

QUESTIONS:

To confirm results meet the project requirements. The interface direct shear (ASTM D5321) tests were performed at the following normal stresses: 700, 2,100, and 3,500 psf and run at 0.004 in per minute. The results are attached for approval by the design engineer.

RESPONSES:

The results meet the intent of the design.

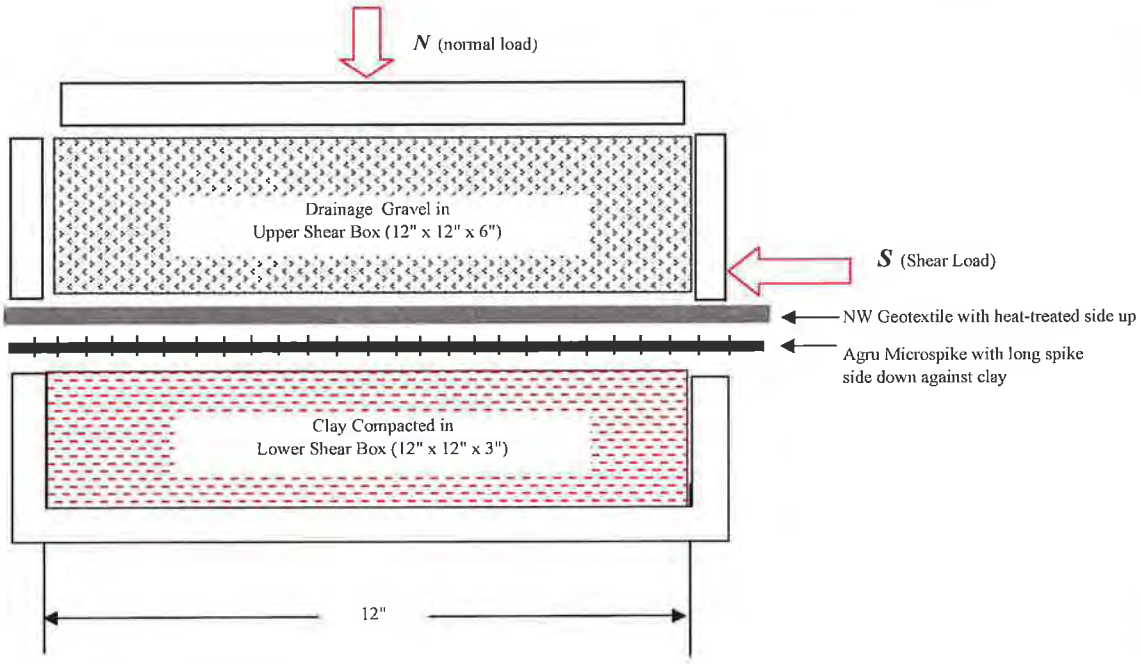
Joseph Sura	May 14, 2012	J. F. Beech	14 MAY 2012
Prepared by Name: Joseph Sura	Date 14 May 2012	Engineer-of-Record Name: Jay Beech, P.E.	Date 14 May 2012

Distribution: ☒ M. Fountain, Geosyntec ☒ Joe Sura, Geosyntec ☒ R. Kulasingam, Geosyntec ☒ David Bonnett, Geosyntec

Attachments
SGI Interface Shear Testing Results

SCHEMATIC DIAGRAM
GEOSYNTEC CONSULTANTS - INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)
ONONDAGA SCA PHASE 1

The "sandwich" test, where GM and GT are not clamped, is to evaluate the shear strength of the weakest interface within the liner system. The weakest interface is the interface with the lowest PEAK shear strength within the 4-layer system.



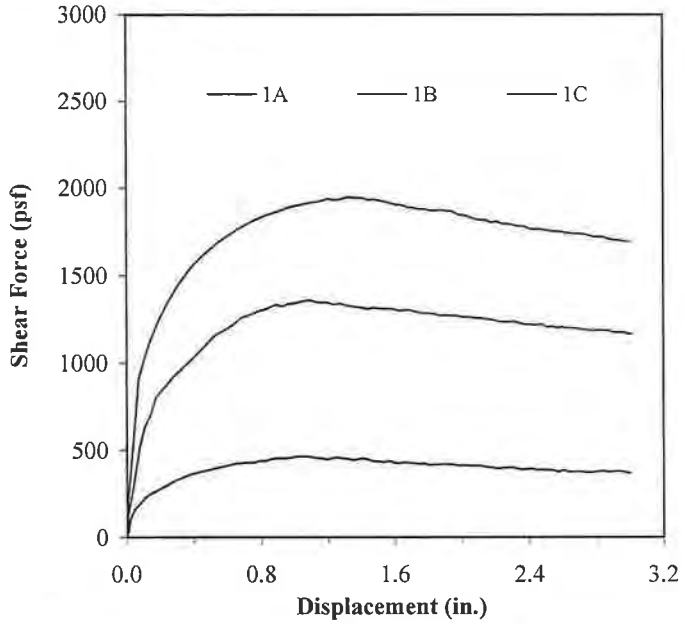
(NOTE: NOT TO SCALE)

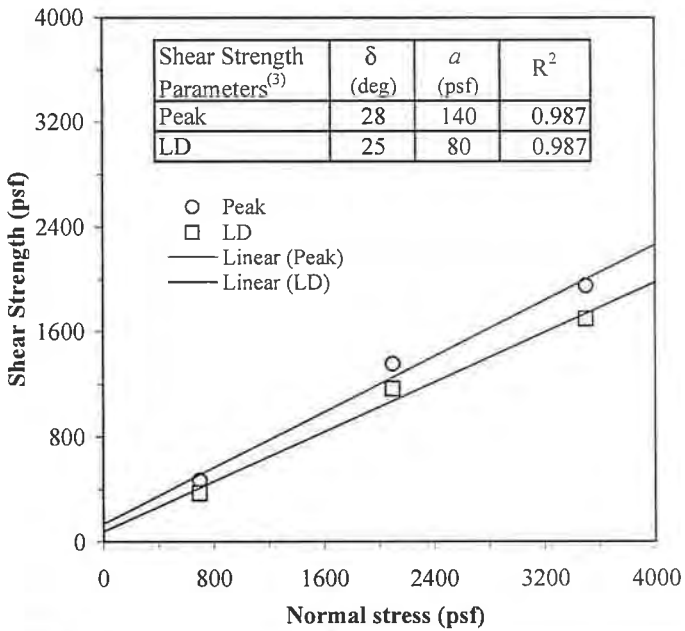
SGI TESTING SERVICES, LLC

DATE:	5/3/2012
FIGURE NO	5
PROJECT NO	SGI11017.1
DOCUMENT NO	
FILE NO	

GEOSYNTEC CONSULTANTS - ONONDAGA SCA PHASE 1
INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)

Upper Shear Box: Drainage gravel nominally compacted/
SKAPS GE240 (24 oz) nonwoven geotextile #22388.166 with heart-treated side up/
Agru 60-mil Microspike HDPE geomembrane # 443563-11 with dull (short spike) side up/
Lower Shear Box: Marcellus clay #LP-103 compacted to approximately 95% of max standard Proctor density at 3% wet of OMC (γ_{dmax} = 113 pcf OMC = 17.5%)





Shear Strength Parameters[3]	δ (deg)	a (psf)	R^2
Peak	28	140	0.987
LD	25	80	0.987

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	Soaking		Consolidation		Drainage Gravel			Clay			GCL		Shear Strength		Failure Mode
				Stress (psf)	Time (hour)	Stress (psf)	Time (hour)	γ_d (pcf)	ω_i (%)	ω_f (%)	γ_d (pcf)	ω_i (%)	ω_f (%)	ω_i (%)	ω_f (%)	τ_P (psf)	τ_{LD} (psf)	
1A	12 x 12	700	0.004	-	-	700	24	-	-	-	107.4	20.4	-	-	-	464	369	(1)
1B	12 x 12	2100	0.004	-	-	2100	24	-	-	-	107.2	20.7	-	-	-	1355	1165	(1)
1C	12 x 12	3500	0.004	-	-	3500	24	-	-	-	107.7	20.1	-	-	-	1949	1695	(1)

NOTES:
(1) Sliding occurred at the interface between the geomembrane and clay.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

DATE OF REPORT:	5/3/2012
FIGURE NO.	C-1
PROJECT NO.	SGI11017
DOCUMENT NO.	
FILE NO.	

SGI TESTING SERVICES, LLC

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00024

TITLE: Inclinometer

DATE: 7/5/2012

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 7/12/2012

Five inclinometers have been installed as part of the SCA project; reference Drawing No. 444853-101-C-007. Note No. 7 on the drawing indicates SI-G1 and 2 were to be abandoned during construction of Phase II. SI-G1 has been left in place within Phase II in order to provide for some monitoring during initial geotube filling. SI-G1 will be abandoned at some point during the operational period of Phase 1 and Phase 2. When SI-G1 will be abandoned will be determined by the data collected and by operational considerations (e.g., access). SI-G2 was re-located outside of Phase I in the Phase III area. In anticipation of leaving SI-G1 in-place can a detail be provided to install a pipe penetration?

Requested By: PARSONS **Date:** 7/5/2012

Signed: _____
David Steele

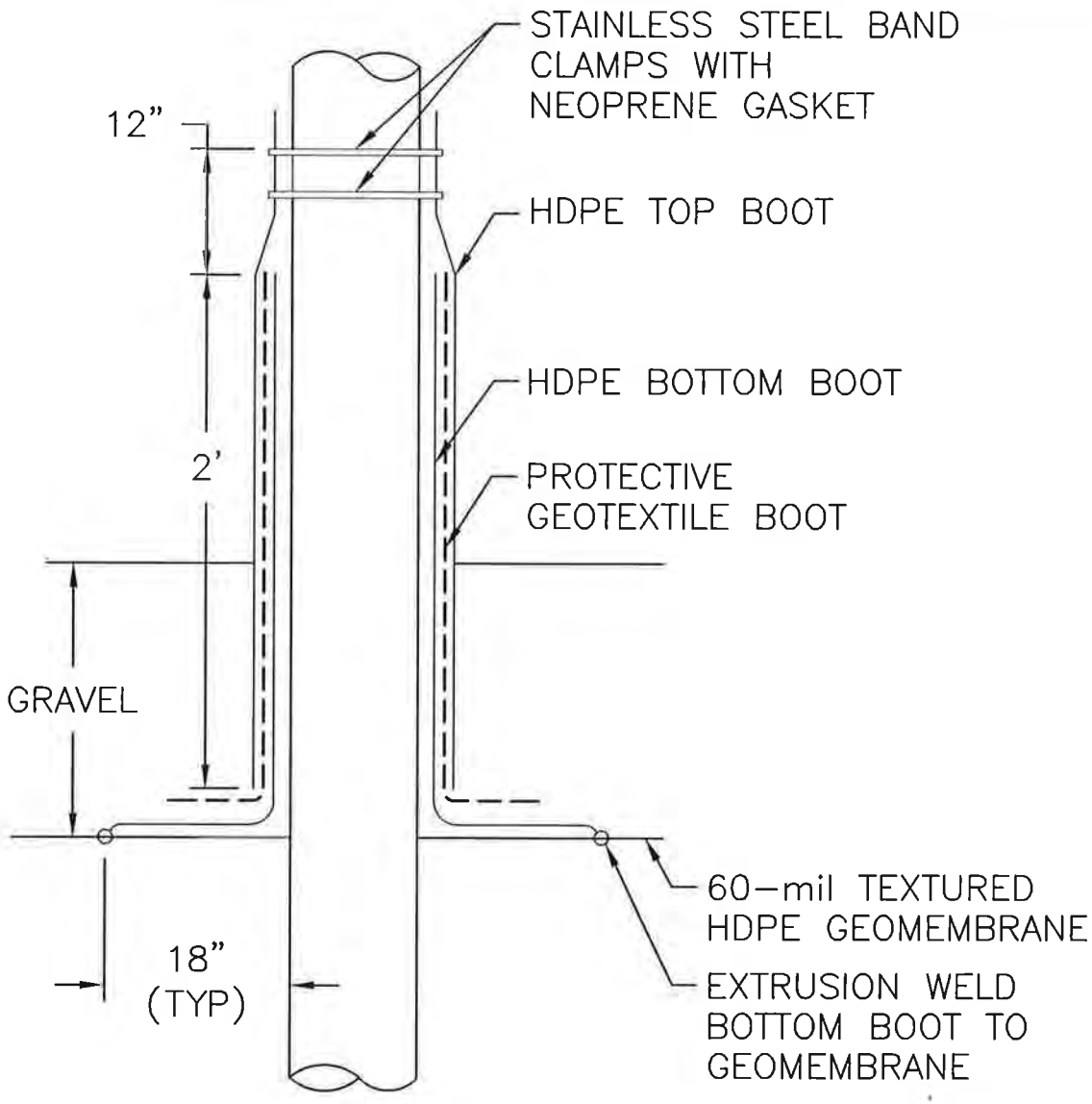
ANSWER:

The proposed pipe boot is acceptable. It is critical the bottom boot is free to move relative to the top boot (i.e., do not inadvertently clamp bottom boot to the pipe).

COMPLETED

Answered By: GEOSYNTEC CONSULTANTS **Date:** 7/9/2012

Signed: _____
John (Jay) Beech



DETAIL (TYP) PIPE BOOT

NOT TO SCALE

T:\PROJECTS_CADD\O\ONONDAGA LAKE\DWG\SEDMANSYS_EAST - WEST BASINS\DETAIL - PIPE BOOT

DETAIL PIPE BOOT ONONDAGA LAKE SEDIMENT MANAGEMENT SYSTEM		
Geosyntec consultants		Figure RFI
Acton, MA	JULY 2012	

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00025

TITLE: Geomembrane

DATE: 7/5/2012

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 7/12/2012

On 28 June 2012 to complete the Phase II installation, the installer, Chenango Contracting, re-delivered six rolls that had been initially produced for the project (roll Nos. 312330, 312331, 312332, 312333, 312334, and 312335). Another four rolls (Nos. 424799, 425101, 425102, and 425103) were also delivered. Chenango plans to utilize these extra four rolls to complete the sacrificial geomembrane on the sideslope (see Detail 4 on Drawing No. 444853-101-C-009).

Do these extra rolls need to be conformance sampled?

Requested By: PARSONS **Date:** 7/5/2012

Signed: _____
David Steele

ANSWER:

Provided that the extra four rolls are used as sacrificial geomembrane and not part of the lining system, the manufacturer's quality control certificates indicating the material meets the intent of the Specification will be sufficient. No conformance tests will be required on the sacrificial geomembrane

COMPLETED

Answered By: GEOSYNTEC CONSULTANTS **Date:** 7/9/2012

Signed: _____
John (Jay) Beech

Geosyntec consultants

PARSONS

REQUEST FOR INFORMATION (RFI) RESPONSE

TO:	David Steele, Dhana Hillenbrand	**Date:** Nov 21, 2012	**Job No.:** GJ4706
ADDRESS:	Parsons	Sediment Consolidation Area (SCA)	
	522 Gerelock Road	Phases I and II	
	Syracuse, NY	Camillus, NY	

RFI No.: SCA-RFI-00026	**Revision No.:** 0	**Date of RFI:** November 20, 2012

RFI SUBJECT(s): Inclinometer abandonment (see Note 7 of Drawing 444853-101-C-007)

QUESTION: The time for abandonment of the inclinometer between Phases 1 and 2 (SI-G1) is coming close. What procedure and timing should be used for the inclinometer abandonment?

The following procedure is proposed:

1. Remove gravel to expose the geomembrane pipe boot.
2. Cut off the geosynthetics in an approximately 2-ft circle around the penetration.
3. Overdrill the casing down to a minimum depth of 15 ft.
4. Fill the casing hole with manually compacted backfill. The top 5 ft of the hole should be backfilled with a soil-bentonite mixture, lower depths can be backfilled with soil if preferred.
5. Repair the liner and geotextile.
6. Survey the patch location.

The following limitations should be noted:

- The equipment used to perform the overdrilling work should be LGP or tracked equipment to avoid damage to the gravel or underlying liner system. If this is not possible, a temporary access road will need to be constructed.
- This procedure involves liner repair work. Therefore, Geosyntec CQA personnel will need to be present to observe and document the liner repair work.
- The abandonment of SI-G1, located between Phases I and II, shall occur when necessary for geotextile tube placement in Phase II.
- Inclinometer SI-G2, located between Phases II and III, shall not be abandoned until work proceeds into Phase III.

PROPOSED RESPONSE:

The proposed procedure is acceptable. Geosyntec agrees with the noted limitations. Geosyntec CQA personnel will be available to observe and document the liner repair work during the abandonment procedure.

Joseph Sura	21 November 2012	J. Beech	21 Nov 2012
Prepared by	Date	Engineer-of-Record	Date
Name: Joseph Sura	21 Nov 2012	Name: Jay Beech, P.E.	21 Nov 2012

Field Change Forms

ORIGINAL

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 3

Project Number: 444853 Date: 8/3/11

Construction Manager: Ken Sommerfield

Contractor: Parsons

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The clay grading in the SCA design was based on topography of the site developed through aerial methods. Upon mobilization, land-based survey methods were used to re-evaluate the site topography. Two drawings showing revised subgrade and top of clay grading and limits of GCL (based on the land-based site topography) are attached. The revised clay grading and limits of GCL meet the design and performance criteria defined in the SCA Final Design.

APPROVALS:

Design Engineer

Name: J.F. Beech, Ph.D., P.E.
Signature:
Date: 3 August 2011

Contractor Representative

Name: David Steele, P.E.
Signature: David Steele
Date: 8/3/11

Owner

Name: Larry M. Somer
Signature:
Date: 8/10/11

NYSDEC Representative

Name: Timothy J. Larson
Signature:
Date: 8/22/11

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 5

Project Number:	444853	Date: 14 October 2011
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The Earthwork Specifications Sections 02200/02250/02300 Part 1.05 D set the minimum construction quality control (CQC) soil sample testing frequency. The Construction Quality Assurance (CQA) Plan Table A-1 requires that conformance samples be collected typically 1 test per 10 CQC tests. It is proposed that the CQA sampling frequency for soils be modified. In lieu of using the number of CQC samples, CQA sample frequency will be tied to delivered volumes such that the test frequency shall become:

- Volume of soil delivered to the site divided by CQC test frequency (presented in Spec Part 1.05.D for each material type) and divided by ten.

This change is proposed so that CQA personnel can track material deliveries and sample as the appropriate quantities are reached, rather than on number of CQC samples (the number of which can be related to additional factors beyond material delivery quantities, including borrow investigations).

APPROVALS:

Design Engineer

Name:	J.F. Beech
Signature:	J.F. Beech
Date:	14/10/2011

Contractor Representative

Name:	David Steele
Signature:	David Steele
Date:	17/Oct/11

Owner

Name:	Larry M. Somer
Signature:	Larry Somer
Date:	10/17/11

NYSDEC Representative

Name:	Timothy J. Larson
Signature:	Timothy Larson
Date:	10/31/11

SCA CONSTRUCTION
CAMILLUS, NEW YORK

ORIGINAL

FIELD CHANGE FORM # 6

Project Number:	444853	Date: 18 January 2012
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The SCA Specification 02710 Geotextile Cushion Part 3 Execution 3.01.C Placement states, "After unwrapping the geotextiles from their opaque cover, do not leave them exposed for a period in excess of 14 days". A geotextile sample was collected on 6 December 2011 from an area located in the north-east corner of Phase I. According to our records, the geotextile had been deployed on 17 September 2011 (i.e., an exposure period of approximately 80 days). The sample was tested under the same conditions as the original design test and the results of both tests are attached. The results demonstrates that the sampled geotextile can be exposed for at least 80 days at the site and meet the design intent (i.e., protect the underlying geomembrane from being damaged by the drainage gravel). The test demonstrates that the exposed geotextile provides adequate protection of the underlying geomembrane.

APPROVALS:

Design Engineer

Name:	J. F. Beech
Signature:	J.F. BEECH
Date:	18 JAN 2012

Contractor Representative

Name:	David Steele
Signature:	David steele
Date:	24 Jan 2012

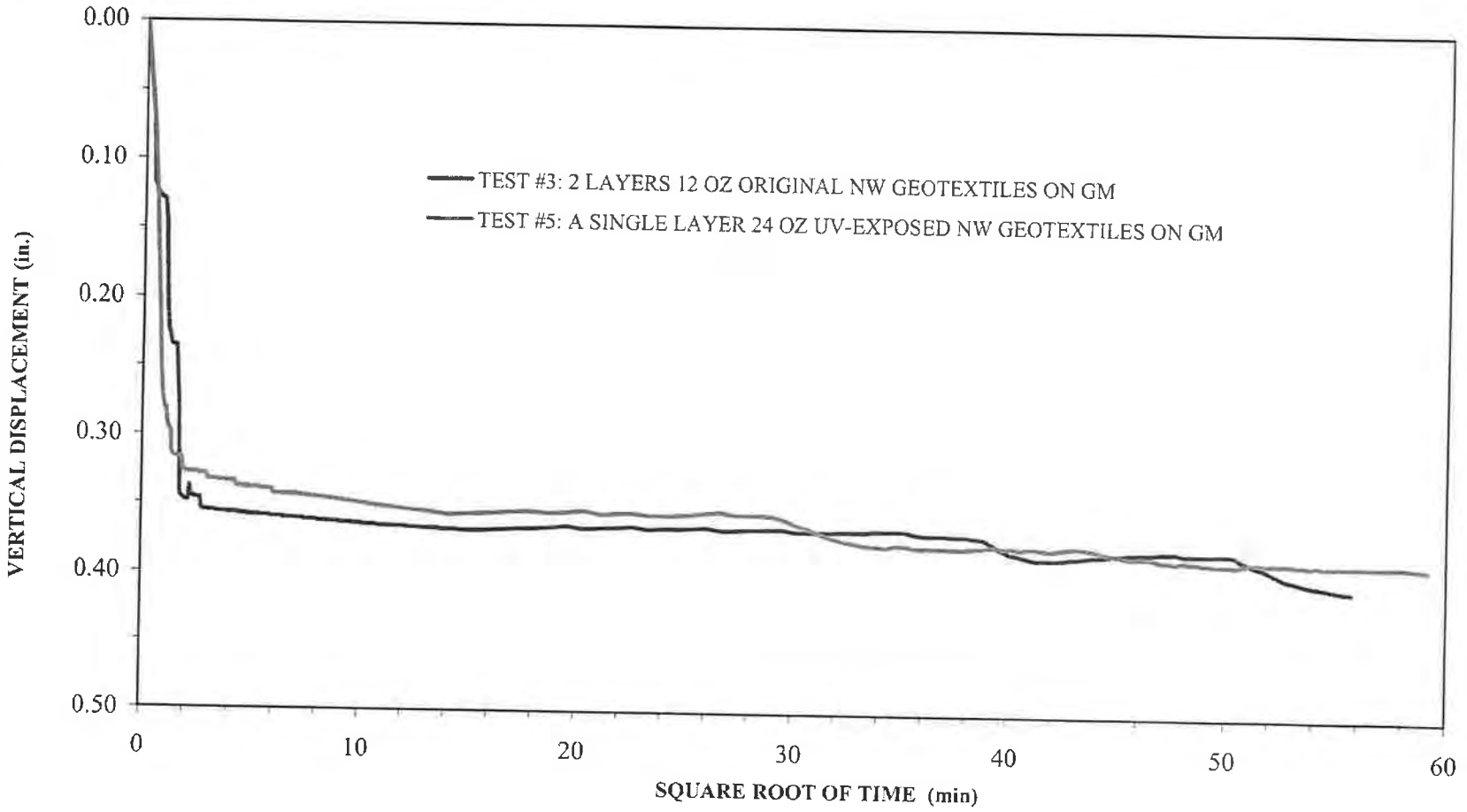
Owner

Name:	Larry M. Somer
Signature:	Larry Somer
Date:	20 Jan 2012

NYSDEC Representative

Name:	Timothy J. Larson
Signature:	
Date:	2/1/12

PARSONS - ONONDAGA LAKE
HYDROSTATIC PUNCTURE TESTING (ASTM D 5514 MODIFIED)
COMPARISON OF THE VERTICAL DISPLACEMENT-TIME CURVES (TEST #3 VS. TEST #5)



SGI TESTING SERVICES, LLC

DATE OF REPORT:	1/15/2012
FIGURE NO.	A-2
PROJECT NO.	SGI10043
DOCUMENT NO.	
FILE NO.	

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 9

Project Number:	444853	Date: 30 June 2012
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

Specification Section 3.04.C states: "In all cases geomembrane seam areas shall be dry and protected from wind. Do not seam geomembrane during periods of precipitation or if winds are in excess of 20 miles per hour."

Five welders were in operation the morning of June 1 (one for only a short period due to a mechanical failure) and they welded approximately 3,600 linear feet of seams in an effort to seal the geomembrane up to and beyond Phase II high point. The last weld of the day was started at 11:45 am. There were periods of precipitation during the morning on June 1. The seams were kept dry through the use of paper towels. All seams were non-destructively tested in accordance with the specifications and met the specified criteria. Seven destruct samples were taken from these seams and tested in a laboratory in accordance with the specifications and the CQAP. These seven samples did not show effects of precipitation. Six of the samples met the specified criteria. One of the seven samples did not meet the specified criteria; the cause appeared to be dirt on the seam. The extent of the unacceptable weld was defined by two additional destruct samples that passed the criteria and the seam in between was reconstructed. As an additional demonstration of these seams' suitability, an additional four destructive samples were collected from the last seam that the four primary welders performed that day, DS-111 through 114. These additional samples were tested and also passed the specified criteria.

The seams welded on 6/1 are considered acceptable.

APPROVALS:

Design Engineer

Name:	J.F. BEECH
Signature:	J.F. Beech
Date:	09 July 2012

Contractor Representative

Name:	David Steele
Signature:	David A Steele
Date:	13 July 2012

Owner

Name:	Larry M. Somer
Signature:	Larry Somer
Date:	7/12/12

NYSDEC Representative

Name:	Timothy J. Larson
Signature:	
Date:	8/2/12

Honeywell

SCA Construction
Field Change Form

Field Change Form Number: 10 **Originator:** William Long
Date: 9/21/2012

Field Design Change:

Work Element: SCA

Construction Manager: Ken Sommerfield

Contractor: Parsons

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The exemption from Part 375 chemical analysis as per DER-10, section 5.4e.5 may be applied to the SCA drainage gravel:

"The following material may be imported, without chemical testing, to be used as backfill beneath pavement, buildings or as part of the final site cover, provided that it contains less than 10% by weight material which would pass through a size 80 sieve and consists of:

i. gravel, rock or stone, consisting of virgin material from a permitted mine or quarry; or

ii. recycled concrete or brick from a DEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002)."

The SCA drainage gravel specification requires less than 5% by weight material passing the #4 sieve; therefore, it meets the less than 10% by weight passing the #80 sieve required by DER-10

Honeywell

SCA Construction
Field Change Form

Field Change Form Number: 10 **Originator:** William Long
Date: 9/21/2012

Approval/Acceptance:

Design Engineer (Geosyntec): Name: [illegible] Signature: J F BEECH
Date: 26 Sept 2012 Time: 18:21

Contractor Representative (Parsons Name: David Steele Signature: David Steele
Date: 9/26/12 Time: 0759

Owner (Honeywell): Name: Larry M. Somer Signature: [signature]
Date: 10/2/12 Time: 0850

Agency Representative (NYSDEC): Name: Timothy Larson Signature: [signature]
Date: 10/10/12 Time: 11:45 AM

Distribution:
(list recipients here)

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 11

Project Number:	444853	Date: 21 August 2012
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The SCA Specification Section 02710 – Geotextile Cushion, Part 3 – Execution, Paragraph 3.01.C – Placement states:

"After unwrapping the geotextiles from their opaque cover, do not leave them exposed for a period in excess of 14 days."

Field change form (FCF) Number 6, dated 18 January 2012, modified the UV exposure for the GSE 24 oz/sy non-woven geotextile previously used on the project to a period of 80 days. Additional material required to complete the project was purchased from SKAPS Industries, Inc. (SKAPS) of Athens, Georgia. The procurement of a different product necessitates repetition of the FCF process.

A geotextile sample was collected on 20 July 2012 from an area located in the southwest corner of Phase II. The material in this area was deployed on 25 May 2012, based on Geosyntec's CQA records. This correlates to an approximate exposure period of 56 days. This sample was forwarded to SGI Testing Services, LLC. (SGI) of Norcross, Georgia for testing.

SGI performed hydrostatic puncture testing (ASTM D5514, modified) under similar conditions as the original design test. Two tests were performed using gravel drainage layer material from each of the two current sources (i.e., Granby and Lake Road), SKAPS GE240 non-woven geotextile, and Agru America 60-mil thick high density polyethylene (HDPE) geomembrane. The results of the tests, attached to this FCF, indicate the SKAPS GE240 non-woven geotextile, with UV exposure up to and including 56 days, meets the design intent for geomembrane protection.

APPROVALS:

Design Engineer

Name:	J.F. BERUT
Signature:	J.F. Berut
Date:	12 OCT 2012

Contractor Representative

Name:	David Steele
Signature:	David Steele
Date:	10/18/12

Owner

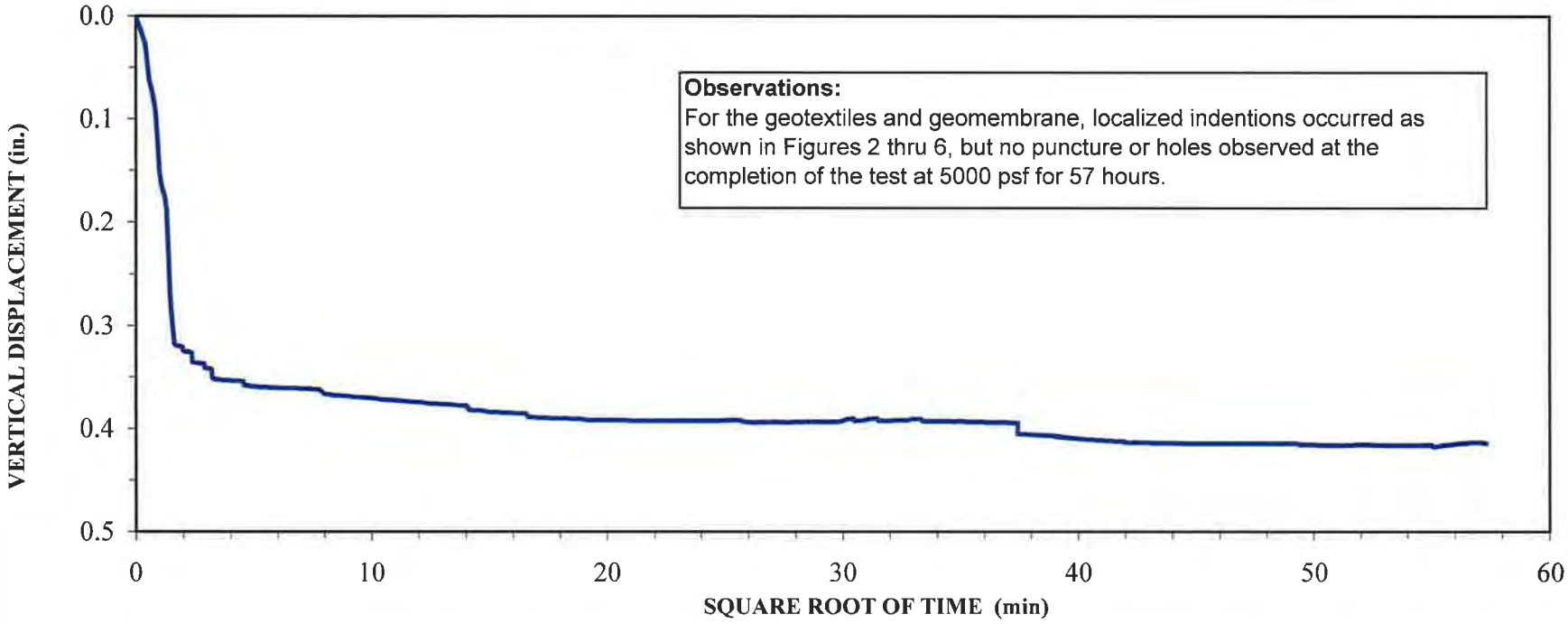
Name:	Larry M Somer
Signature:	Larry M Somer
Date:	10/23/12

NYSDEC Representative

Name:	Robert Edwards
Signature:	Robert Edwards
Date:	10/23/12

PARSONS - ONONDAGA LAKE
HYDROSTATIC PUNCTURE TESTING (ASTM D 5514 MODIFIED [1])

8" thick Granby Pit stone nominally compacted at as-received moisture content/
Exposed SKAPS GE240 NWGT deployed 25 May 12 (recovered from the project site with non heat-treated side down)/
Agru 60-mil Microspike HDPE geomembrane with long spike side down (recovered from the project site) /
3" thick subgrade soil compacted to approximately 95% of max. standard Proctor dry density at optimum moisture content



Test	Test Specimen Size				Normal Stress	Duration	Gravel			Subgrade Soil		
	Length	Width	Gravel Thickness	Subgrade Soil Thickness			γ_d	ω_i	ω_f	γ_d	ω_i	ω_f
No.	(in.)	(in.)	(in.)	(in.)	(psf)	(hours)	(pcf)	(%)	(%)	(pcf)	(%)	(%)
6	12.0	12.0	8.0	3.0	5000	58				94.4	19.2	

NOTE: *localized strains of the deformed geomembrane not calculated.*

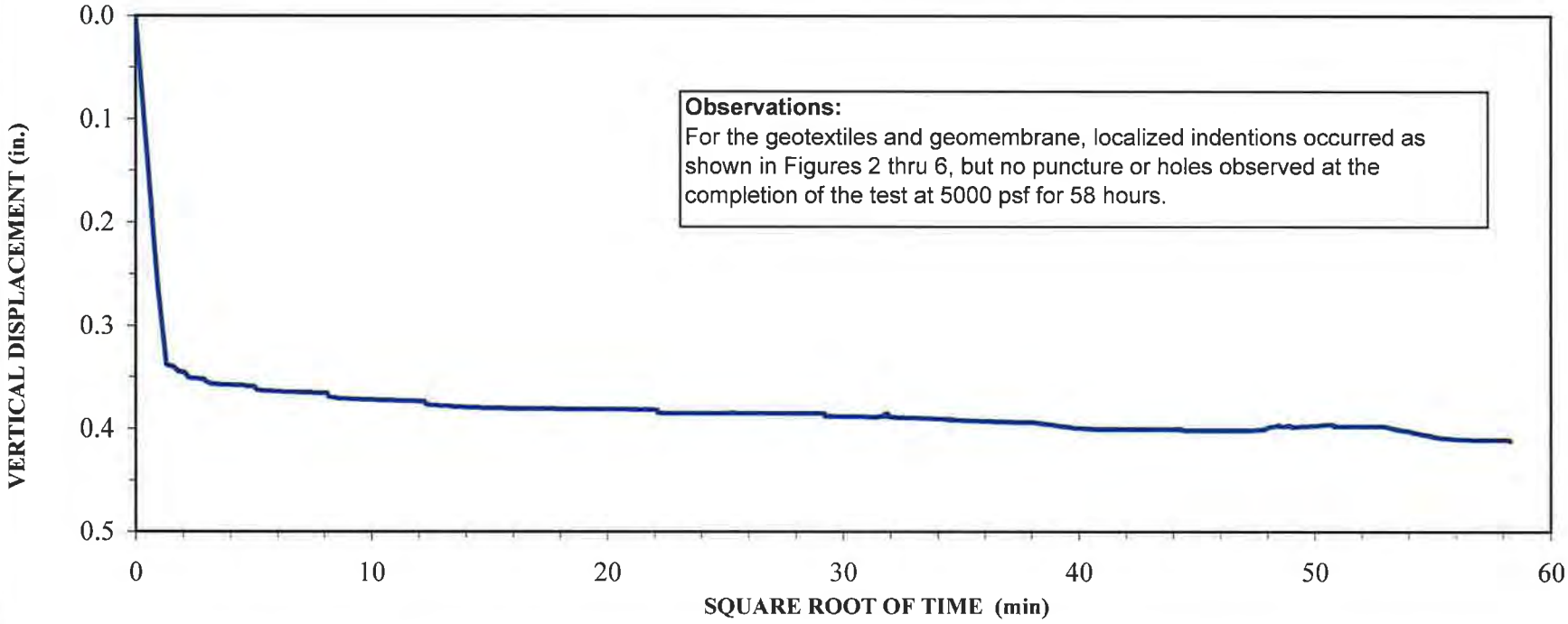
DATE OF REPORT: 8/9/2012

SGI TESTING SERVICES, LLC

FIGURE NO.	A-6
PROJECT NO.	SGI10043
DOCUMENT NO.	
FILE NO.	

PARSONS - ONONDAGA LAKE
HYDROSTATIC PUNCTURE TESTING (ASTM D 5514 MODIFIED [1])

8" thick Lake Road Pit stone nominally compacted at as-received moisture content/
Exposed SKAPS GE240 NWGT deployed 25 May 12 (recovered from the project site with non heat-treated side down)/
Agru 60-mil Microspike HDPE geomembrane with long spike side down (recovered from the project site) /
3" thick subgrade soil compacted to approximately 95% of max. standard Proctor dry density at optimum moisture content



Test	Test Specimen Size				Normal Stress	Duration	Gravel			Subgrade Soil		
No.	Length (in.)	Width (in.)	Gravel Thickness (in.)	Subgrade Soil Thickness (in.)	(psf)	(hours)	γ_d (pcf)	ω_i (%)	ω_f (%)	γ_d (pcf)	ω_i (%)	ω_f (%)
7	12.0	12.0	8.0	3.0	5000	58				93.7	18.5	

NOTE: *localized strains of the deformed geomembrane not calculated.*

DATE OF REPORT: 8/9/2012

SGI TESTING SERVICES, LLC

FIGURE NO.	A-7
PROJECT NO.	SGI10043
DOCUMENT NO.	
FILE NO.	

Weekly Field Reports

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200/300

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II/SMS WEEK ENDING: April 1, 2012

This report is written for the period of 26 March through 01 April 2012. Geosyntec was on-site 5 days (181 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 21°F to a high of 64°F during the hours worked. A total of approximately 0.11 inches of rain were recorded between 28-29 March. Representatives of Geosyntec, Chenango Contractors, and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday, 26 March. A visit to the Riccelli Enterprises quarry in Granby was conducted 30 March. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

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- Parsons continued to dewater the East and West Basins.
- Parsons graded and compacted the existing Low Permeability (LP) soil at the eastern and western portions of Phase IIB.
- LP soil was hauled by trucks to site from the Marcellus Pit this week totaling approximately 5,848 cyd.
- Between 21-23 March, Parsons hauled and placed 3,336 cyd of LP soil along the northern portion of Phase II prior to Geosyntec mobilizing to site.
- LP soil was placed at the western portion of Phase IIB placed this week.
- Engineered Fill was placed at the western portion of the south perimeter berm. Geosyntec performed three field density testing (FDT) on Engineered Fill. The tests met the project requirements for relative compaction and moisture content.
- Parsons resumed placement of screened and washed Drainage Gravel material for the Phase IA sump from the Granby Pit. Operations were halted to investigate increase of fines content.
- Received volume of Drainage Gravel screened and hauled to date from Parsons. Three loads were calculated to be approximately 35 tons/load. Total to date in 2012 is estimated to be 105 tons, or 70 lcy the delivered material was placed in Phase I toward the Phase IA sump.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200/300

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II/SMS WEEK ENDING: April 1, 2012

- Geosyntec obtained and shipped one sample of Low Permeability soil (LP-103) and one sample of Drainage Gravel (DG-013) for CQA testing.

GEOSYNTHETICS:

- Chenango worked three days this week in the East Basin installing double-sided geocomposite over secondary geomembrane and started installation of the primary geomembrane.
- Chenango successfully completed three passing extrusion trial seams and seven passing fusion trial seams prior to seaming and repair work this week.
- Chenango performed repairs and non-destructive testing of extrusion repairs on secondary (anchor trench only) and on primary geomembrane at the East Basin.
- Chenango installed approximately 142,900 sft of double-sided geocomposite and installed approximately 121,500 sft of primary geomembrane at the East Basin.
- Approximately 5,840 lf of production seams were welded. Non-destructive testing of fusion seams was started. Eight destructive samples were marked to date by Geosyntec for removal and testing.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 8, 2012

This report is written for the period of 02 through 06 April 2012. Geosyntec was on-site 5 days (186 days total to date) to provide CQA services during construction of the SCA and geosynthetic deployment in the Sediment Management System (SMS). Temperatures generally ranged from a low of 25° F to a high of 53° F during the hours worked. Approximately 0.5-in of rainfall was recorded this week. Representatives of Geosyntec, Chenango, and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

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- Parsons continued to dewater the East and West Basins.
- Engineered Fill was placed and compacted along the western portion of the south perimeter berm. Field Density Testing (EF-004 to EF-006) was conducted on Engineered Fill by Geosyntec this week. All three FDT met the project requirements for relative compaction and moisture content.
- Parsons graded, moisture conditioned, and compacted Low Permeability (LP) soil material in west end of Phase II, lift 2 over existing LP layer. In addition Parson's placed LP soil at the northeast area of Phase II. Approximately 7,098 LCY of LP soil was hauled from the Marcellus Pit, placed, and compacted in Phase II.
- Approximately 1,538 LCY of Drainage Gravel material was hauled from the Granby Pit and stockpiled on site this week.
- Geosyntec obtained and shipped one sample of Low Permeability soil (LP-103) and one sample of Drainage Gravel (DG-013) last week for CQA conformance testing. Results are pending.
- Geosyntec obtained samples for Interface testing of materials in Phase II; Geotextile (GT-012), Geomembrane (GM-011) Low Permeability Clay (LP-104) and Drainage Gravel (DG-014). Results are pending.

GEOSYNTHETICS:

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 8, 2012

- Chenango worked five days this week in the East and West Basins installing double-sided geocomposite over secondary geomembrane and started installation of the primary geomembrane.
- Chenango successfully completed nine passing extrusion trial seams and seventeen passing fusion trial seams prior to seaming and repair work this week.
- Chenango performed repairs and non-destructive testing of extrusion welded repairs on primary geomembrane at the East and West Basins.
- Chenango installed approximately 186,150 sf. of double-sided geocomposite in the East and West Basins.
- Chenango installed approximately 109,400 sf. of primary geomembrane at the West Basin.
- Chenango installed approximately 50,000 sf. of primary geomembrane at the East Basin.
- Approximately 4,360 lf. of production seams were welded. Non-destructive testing of fusion seams was completed.
- Thirteen destructive samples (DS 3-001 to DS 3-013) were obtained and shipped to GeoTesting Express (GTX) for testing. All destructive tests passed with the exception of DS 3-007. Additional destructive samples (DS 3-007A and DS 3-007B) were collected to delineate the failing area. DS 3-007B also failed to meet the project requirements. Geosyntec and Chenango will continue to delineate the failing area.
- Ten destructive samples (DS 5-001 through DS 5-010) were marked on the primary geomembrane deployed in the West Basin and are pending field testing before being forwarded to GTX.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 15, 2012

This report is written for the period of 9 April through 13 April 2012. Geosyntec was on-site 5 days (191 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 39° F to a high of 61° F during the hours worked. Less than 0.1 inch of rain was recorded this week. Representatives of Geosyntec, Chenango Contractors and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

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- Approximately 5,117 LCY of Low Permeability (LP) soil was transported to the site from the Marcellus borrow source this week.
- Parsons graded, moisture conditioned, and compacted P soil material in Phase II.
- Approximately 922 LCY of Drainage Gravel material was transported to the site from the Granby borrow source this week. The material was stockpiled adjacent to Phase I.
- No Engineered Fill was placed this week.
- Field Density Testing (5-001 to 5-037) was conducted on placed LP soil material this week. Four of the 37 tests failed to meet the requirements of the layer. Three of the four failures were retested and met the project requirements. The retest of one failure is pending.
- Geosyntec obtained three samples of LP soil (LP-105 through LP-108) for CQA testing. Results for these samples are pending.
- Parsons placed Drainage Gravel in the Phase IA sump. Material was placed 8-in thick in the floor of the sump and 12-in thick over the side slopes of the sump. Completion of the Drainage Gravel in the Phase IA sump is pending installation of other components.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 15, 2012

GEOSYNTHETICS:

- Chenango worked five days this week in the East and West Basins installing primary geomembrane and 24 oz/sy non-woven geotextile.
- Chenango successfully completed seven (7) passing extrusion trial seams and 28 passing fusion trial seams prior to seaming and repair work this week.
- Chenango performed repairs and non-destructive testing of extrusion welded repairs on primary geomembrane at the East and West Basins.
- Chenango installed approximately 30,000 sf. of primary geomembrane in the West Basin.
- Chenango installed approximately 70,000 sf. of primary geomembrane in the East Basin.
- Approximately 5,130 lf. of production seams were welded. Non-destructive testing of fusion seams was completed.
- One destructive samples (DS-007B1) was removed and shipped to GeoTesting Express for testing, Destructive sample DS-007B1 met the project requirements.
- Seven additional destructive samples are marked on primary geomembrane deployed in the East Basin, but have not been removed as of yet.
- Approximately 16,200 sf. of 24 oz/sy non-woven geotextile was installed in the East and West Basins.
- THG Geophysics conducted a leak location survey of the geomembrane in Phase I. No leaks have been identified to date. The leak location survey is incomplete and has been postponed until a significant rain event occurs in lieu of using a water truck to provide adequate moisture.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 22, 2012

This report is written for the period of 16 April through 20 April 2012. Geosyntec was on-site 5 days (196 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 33° F to a high of 84° F during the hours worked. No rainfall was recorded during the week. Representatives of Geosyntec, Chenango Contractors, and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily. No incidents were reported.

EARTHWORK:

- Parsons graded, moisture conditioned, and compacted low-permeability (LP) soil in Phase II.
- Approximately 6,133 LCY of LP soil was imported from the Marcellus Pit this week. Material was transported, placed, and compacted in Phase II, western end of cell.
- Benching of the LP layer occurred along the Phase I and II tie-in.
- Field density tests (FDTs) 5-038 to 5-058 were conducted on the LP soil layer in Phase II for lifts requiring 90 percent of maximum dry density and $\pm$3 percent of optimum moisture, as determined by ASTM D698. Three of these tests failed to meet the minimum project requirements and are pending retest.
- FDTs 6-001 to 6-038 were conducted on the LP soil layer final lift in Phase II. All of these tests meet or exceed the minimum project requirements.
- Geosyntec obtained 11 samples of LP soil material (LP-109 through LP-119) for CQA testing. Results are pending. Geosyntec also obtained 4 thin-walled (i.e., Shelby) tube samples (ST-029 through ST-032). Results of samples ST-029 through ST -031 meet or exceed the project's permeability requirements. Results for sample ST-032 are pending.
- No Engineered Fill was placed this week.
- Parsons placed Drainage Gravel in the Phase IB sump. Material was placed approximately 8-in thick in the sump floor and 12-in thick along the side slopes of the sump. Parsons plans to complete placement of the Drainage Gravel in the floor of the sump in Phase IA and IB upon completion of piping installation.
- Approximately 970 LCY of Drainage Gravel material was imported from the Granby Pit and stockpiled on-site this week.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 22, 2012

GEOSYNTHETICS:

- Chenango worked five days this week performing detail work (e.g., pipe boot penetrations, repairs, non-destructive testing, etc.) on the primary liner system in the East and West Basins.
- Chenango successfully completed twelve passing extrusion trial seams prior to extrusion welding repair work this week.
- Eleven destructive samples (DS 3-013 through 3-020 and DS 5-011 through DS 5-014) were obtained and shipped to GeoTesting Express for testing. All destructive samples achieved the minimum project requirements.
- Approximately 545,905 sf. of 60-mil thick HDPE geomembrane was delivered and inventoried during the week.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: April 29, 2012

This report is written for the period of 23 through 29 April 2012. Geosyntec was on-site 6 days (202 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 29° F to a high of 59° F during the hours worked. Approximately 1.36 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 117 LCY of Drainage Gravel material (+4 inches) were hauled from the Granby Pit for placement in Phase IA sump this week. Two of the loads received were rejected due to excessive fines content.
- Engineered Fill was placed in the West Basin along the western anchor trench this week.
- Test results were received for Low Permeability soil samples LP-106 through LP-108 and ST-032 from GeoTesting Express. These samples meet the minimum project specifications.
- Parsons placed an additional 4 inches of Drainage Gravel in the Phase IA sump floor, for a total thickness of 12 inches.
- Parsons fused segments of 12-in diameter SDR-11 perforated HDPE pipe and connected the segments to the risers in Phase IA and IB sumps.

GEOSYNTHETICS:

- No activities were conducted by Chenango crew this week and
- Approximately 569,135 SF of 60-mil thick HDPE geomembrane was delivered and inventoried this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: May 5, 2012

This report is written for the period of 30 April through 4 May 2012. Geosyntec was on-site five (5) days (207 days total to date) to provide CQA services during construction in the SCA. Temperatures generally ranged from a low of 29° F to a high of 81° F during the hours worked. Approximately 1 inch of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 550 LCY of Low Permeability (LP) soil was imported this week from the Marcellus borrow source. Material was placed along the southern berm at the western end of Phase II and in the northwest corner of Phase II.
- Approximately 1,341 LCY of 4-inch maximum particle size Drainage Gravel was imported from the Granby borrow source and stockpiled on site. Parsons placed an additional 4 inches of Drainage Gravel (<4-inch) material in the Phase IB sump floor for a total of 12 inch thick layer.
- Approximately 1,079 LCY of Drainage Gravel material (4<12 inch) was imported from the Granby borrow source and placed in the Phase IA and IB sumps this week.
- Engineered Fill was placed in the East and West Basin anchor trenches this week, however, backfilling has not been completed.
- Parsons completed installation of 12-in diameter SDR-11 perforated HDPE lateral pipes and connection to the risers within the Phase IB sump.
- Parsons exposed and removed plywood placed along the southern limits of Phase I at former ramp locations.

GEOSYNTHETICS:

- No activities were conducted by Chenango (CCI) this week due to wet conditions.
- Parsons crew exposed the geomembrane in an area approximately 10 feet square within Phase IB where an electrical leak location survey indicated a potential hole in the 60-mil thick HDPE geomembrane. CCI will vacuum test the extrusion welded patch located at the indicated area to determine location of the hole and make appropriate repair.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: May 13, 2012

This report is written for the period of 7 through 11 May 2012. Geosyntec was on-site 5 days (212 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 42° F to a high of 71° F during the hours worked. Approximately 1.65 inches of rainfall were recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is provided below.

SAFETY:

- Safety meetings were held daily. No incidents were reported.

EARTHWORK:

- Approximately 1,733 LCY of Low Permeability (LP) soil were imported this week from the Marcellus borrow source. The imported material was placed in Phase II as it was received onsite. Importation efforts were delayed Tuesday through Friday due to wet site conditions. Lifts 2 and lift 3 were placed in Grids H through J this week.
- Geosyntec conducted a total of 41 FDTs on compacted LP soil in Phase II this week. Nine of the FDTs failed to achieve satisfactory results due to low moisture content. Geosyntec obtained LP soil samples LP-120 thru LP-127 for moisture content analysis and LP-128 and LP-129 for conformance testing.
- Approximately 289 LCY of 4 inch maximum diameter particle size Drainage Gravel were imported from the Granby borrow source this week and stockpiled on-site.
- Parsons crew used a compact loader with a flip screen attachment to process areas of excessive fines within the Drainage Gravel in the Phase I area.
- Parsons stockpiled material rejected during screening operations along the northern limits of Phase I for future use. Parsons has proposed the material as an alternate fill material for the construction of the Phase I/Phase III temporary berm.
- Parsons continued to pump stormwater from Phase IA and IB sumps.
- Parsons placed Engineered Fill in the West Basin anchor trench.
- Parsons crew pumped stormwater from the East Basin trapped between the primary and secondary geomembrane in the East Basin sump area. The four culverts require banding and caulking.

GEOSYNTHETICS:

- No Geosynthetics activities were conducted this week due to wet site conditions.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: May 20, 2012

This report is written for the period of 14 through 18 May 2012. Geosyntec was on-site 5 days (217 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 44° F to a high of 74° F during the hours worked. Approximately 0.01 inches of rainfall was recorded this week. Representatives of Geosyntec, Chenango, and Parsons were on-site throughout the week. THG Geophysics on-site 14-16 May to conduct electrical leak location survey. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 9,817 LCY of Low Permeability (LP) soil were imported this week from the Marcellus borrow source. Parsons continued placement of LP soil within Phase II and also performed moisture conditioning and compaction of material placed previously. Parsons prepared the surface of the LP soil layer for geosynthetics in Grids E through I.
- Geosyntec conducted field density tests (FDTs) on compacted LP soil in Phase II. A total of 60 FDTs were performed this week, two of which failed to meet the minimum project requirements for moisture and/or compaction.
- Geosyntec obtained Shelby Tube samples ST-033 to ST-037 for CQA testing. Results were received for ST-033 to ST-035, which indicated acceptable values.
- Approximately 454 LCY of 4-in dia. Drainage Gravel was imported and stockpiled on site.
- Parsons crew stockpiled fill material along the northern limits of Phase I to be used in construction of Phase I containment berm.
- Parsons continued to use the flip screen attachment to remove excess fines from Drainage Gravel in Phase I.
- Parsons crew investigated four areas in Phase I for possible leaks in the geomembrane based on THG survey. Holes were located in each of the areas of the geomembrane within Phase I.

GEOSYNTHETICS:

- Chenango worked four days this week in Phase II installing geomembrane and worked one day on repairs in the East Basin.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: May 20, 2012

- Chenango successfully completed six passing extrusion trial seams and forty four passing fusion trial seams prior to seaming and repair work this week.
- Chenango performed repairs and non-destructive testing of extrusion welded repairs on primary geomembrane at the East Basin and Phase II.
- Chenango installed approximately 354,900 square feet of primary geomembrane in Phase II.
- Approximately 16,787 linear feet of production seams were welded. Non-destructive testing of fusion seams was started but not completed.
- Eleven destructive samples (DS-6-001 to 6-009 and 6-012 to 6-013) were removed and shipped to GeoTesting Express for testing. Thirty three destructive samples to date were marked on primary geomembrane deployed in Phase II, but all samples have not been removed or field tested yet.
- (THG Geophysics crew completed leak testing on the geomembrane liner system in Phase I; four leaks were detected to date that are scheduled to be repaired by Chenango next week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: May 27, 2012

This report is written for the period of 21 through 27 May 2012. Geosyntec was on-site five days (222 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 54° F to a high of 86° F during the hours worked. 0.01 inches of rainfall was recorded this week, however, production was unaffected. Representatives of Geosyntec, Chenango, and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 12,167 LCY of Low Permeability (LP) soil was imported this week from the Marcellus borrow source. Parsons continued placement of LP soil within Phase II. Parsons also conducted moisture conditioning and compaction of material placed previously.
- Geosyntec conducted a total of 65 Field Density Tests (FDTs) on compacted LP soil this week. One FDT failed to meet project requirements initially, but passed upon retest.
- Geosyntec obtained Shelby Tube samples ST-038 to ST-044 for testing. Results were received for ST-036 to ST-042, which indicated the samples met the minimum project requirements for permeability.
- Approximately 1,382 LCY of Drainage Gravel (4 inch maximum particle size) were imported from the Granby borrow source and stockpiled on site.
- Removal of the eastern end of the existing haul road in Phase II was progressed.
- Areas within Phase I requiring additional remediation of the Drainage Gravel were identified. Geosyntec informed Parsons of the areas requiring additional work.
- Parsons crew stockpiled fill material along the northern limits of Phase I to be used in construction of the Phase I/III temporary berm.
- Parsons prepared the surface of the LP soil layer for geosynthetics in Grids J through L.

GEOSYNTHETICS:

- Chenango progressed installation of the 60-mil thick HDPE geomembrane and 24-oz/sy non-woven geotextile within Phase II.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: May 27, 2012

- Chenango successfully complete ten passing extrusion trial seams and seventeen passing fusion trial seams prior to seaming and repair work this week.
- Chenango performed repairs and non-destructive testing on extrusion welds on repairs to geomembrane in Phase II.
- Chenango installed approximately 193,000 sf of geomembrane and 242,600 sf of 24 oz Geotextile in Phase II.
- Approximately 9,200 lf of production seams were constructed. Non-destructive testing of fusion seams is on-going.
- A total of 54 destructive sample locations have been marked on the primary geomembrane deployed in Phase II. A total of 32 destructive samples (DS-6-010 to 6-011 and 6-014 to 6-040 and DS-6-050 to DS-6-052) were removed and shipped to GeoTesting Express for laboratory testing. DS-6-034 failed to meet the minimum project requirements in the laboratory. Isolation of the failing area is pending.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 3, 2012

This report is written for the period of 29 May through 1 June 2012. Geosyntec was on-site 4 days (226 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 47° F to a high of 86° F during the hours worked. Approximately 0.61 inches of rainfall was recorded this week. Representatives of Geosyntec, Chenango, and Parsons were on-site Tuesday through Friday, following observance of Memorial Day. A weekly construction meeting was not held this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 4,067 LCY of Low Permeability (LP) soil were imported this week from the Marcellus borrow source. Parsons placed the material in Phase II concurrent with importation.
- Geosyntec conducted a total of 33 Field Density Tests (FDTs) on compacted LP soil in Phase II, all of which met the minimum project requirements.
- Geosyntec conducted a total of 8 FDTs on compacted Engineered Fill material along the northern haul road of Phase II, all of which met the minimum project requirements.
- Geosyntec obtained Shelby Tube samples ST-045 to ST-048 for conformance testing. Results were received for ST-043 to ST-046, which indicated the samples achieve the minimum project requirements. Results of ST-047 and ST-048 are pending.
- Approximately 681 LCY of Drainage Gravel (4 inch maximum particle size) were imported from the Granby borrow source and stockpiled on site this week. Parsons placed Drainage Gravel from the stockpile in the western end of Phase II (i.e., the Debris Management Area).
- Parsons crew completed removal of the existing haul road remaining in Phase II.
- Parsons crew stockpiled fill material along the northern limits of Phase I and began construction of the temporary Phase I/III northern berm this week. The material used for construction of the berm is off-spec, however, Parsons is seeking modification of the specifications through an RFI.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 3, 2012

GEOSYNTHETICS:

- Chenango installed approximately 74,250 sf of primary geomembrane, 45,360 sf of sacrificial geomembrane, and 204,000 sf of 24 oz/sy non-woven geotextile in Phase II.
- Chenango successfully completed six passing extrusion trial seams and eight passing fusion trial seams prior to seaming and repair work this week.
- Chenango performed repairs and non-destructive testing of repairs on the Phase II geomembrane.
- Approximately 3,600 lf of production seams were welded. Non-Destructive testing of fusion seams was completed, except for seams welded on Friday. Seam construction on Friday was performed during periods of precipitation, contrary to the Project Specifications. Parsons was informed of the discrepancy and resolution is pending.
- A total of 54 original destructive sample locations have been marked to date; however, not all samples marked have been removed from the geomembrane for testing. Two of the original destructive samples collected to date (DS 6-034 and 6-049) failed to meet the minimum project requirements, necessitating five additional samples to isolate the failing areas.
- THG Geophysics was on site this week conducting electrical leak location surveying on the Phase II geomembrane along the west and northern interior berms and at Drainage Gravel areas in Phase I that were remediated. No leaks were detected.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 10, 2012

This report is written for the period of 4 through 8 June 2012. Geosyntec was on-site five days (227 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 50° F to a high of 73° F during the hours worked. Approximately 0.2 inches of rainfall was recorded this week causing delays in production at the beginning of the week. Representatives of Geosyntec, Chenango, and Parsons were on-site throughout the week. A weekly construction meeting was held Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported. A minor hydraulic leak occurred and was cleaned up.

EARTHWORK:

- Parsons crew completed removal of the existing haul road in Phase II.
- Parsons placed Engineered Fill along the northern haul road of Phase II.
- Geosyntec conducted a total of 13 FDTs (7-015 thru 7-027) on compacted Engineered Fill. No new material was received, as the contractor reused previously delivered material.
- Approximately 3,100 LCY of Low Permeability (LP) soil were imported this week from the Marcellus borrow source. Parsons continued placement of LP soil within Phase II. Parsons also conducted moisture conditioning and compaction of material placed previously.
- Geosyntec conducted a total of 17 Field Density Tests (FDTs) (6-201 thru 6-217) on compacted LP soil in Phase II, all of which met the minimum project requirements.
- Geosyntec obtained Shelby Tube samples ST-049 to ST-051. Results were received results for ST-047 and ST-048 which indicated the samples met the minimum project requirements for permeability.
- Approximately 1,279 LCY of Drainage Gravel (4 inch maximum particle size) were imported from the Granby borrow source and placed in western end of Phase II.
- Geosyntec obtained sample DG-016 from the Drainage Gravel for conformance testing and visited the Granby quarry to confirm suitable procedures are being performed to process and handle the gravel.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 10, 2012

- Parsons crew completed construction of the temporary berm between Phase I and future Phase III.

GEOSYNTHETICS:

- Chenango installed approximately 90,000 sf of primary geomembrane and 76,500 sf of 24 oz/sy non-woven geotextile in Phase II,
- Chenango installed geomembrane over the Phase I/III temporary intercell berm.
- Chenango completed repair to pipe boot on one of the eastern culverts to the basins.
- Chenango successfully completed eleven passing extrusion trial seams and nine passing fusion trial seams prior to seaming and repair work this week.
- Approximately 4,200 lf of production seams were constructed. Non-Destructive testing of fusion seams was completed, except for seams welded on 8 June 2012.
- Chenango performed repairs and non-destructive testing on extrusion welds on repairs to primary geomembrane in Phase II.
- A total of nine (9) destructive sample locations (DS 6-055 to 6-063) have been marked on the primary geomembrane deployed in Phase II. Results were received for destructive samples DS-049B1 and DS-049C indicating construction conforms to project specifications. A total of 63 original destructive samples have been collected to date in Phase II. Five additional samples have been required to isolate failing areas. One destructive sample has been obtained from a capped seam. Resolution of the seams welded 1 June 2012 is pending.
- The THG Geophysics Ltd was on site this week to conduct leak testing on the geomembrane in the west end of Phase II. The debris management area (DMA) was completed with no leaks detected. Operations of the DMA was initiated 8 June 2012.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 17, 2012

This report is written for the period of 11 June through 15 June 2012. Geosyntec was on-site 5 days (232 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 54° F to a high of 91° F during the hours worked. Approximately 0.5 inch of rainfall was recorded this week. Representatives of Geosyntec, Chenango, and Parsons were on-site throughout the week. Minimum site activities occurred Tuesday due to rain. A weekly construction meeting was held on Monday of this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,676 LCY of Low Permeability (LP) soil were imported from the Marcellus borrow source this week and placed in Phase II.
- Parsons processed the final lift of LP soil within Phase II.
- Geosyntec conducted a total of 68 field density tests (FDTs) on compacted LP soil in Phase II, all of which met the minimum project requirements.
- Geosyntec obtained Shelby Tube samples ST-052 to ST-055 for CQA testing. Results were received for ST-049 and ST-051 which indicated the samples achieve the minimum project requirements.
- Approximately 1,444 LCY of Drainage Gravel (4-in dia, maximum particle size) were imported from the Granby borrow source and placed in Phase II.
- Approximately 1,073 LCY of Engineered Fill were imported, ,placed, and compacted along the southern haul road of Phase II.
- Geosyntec conducted a total of 19 FDTs on Engineered Fill material along southern haul road of Phase II, all of which met minimum project requirements.
- Portions of the anchor trench were backfilled, including East Basin.

GEOSYNTHETICS:

- Chenango installed approximately 119,700 sf of primary geomembrane in Phase II.
- Chenango successfully completed eleven passing extrusion trial seams and thirteen passing fusion trial seams prior to seaming and repair work this week.
- Approximately 5,700 lf of production seams were welded this week. Non-destructive testing of fusion seams was completed.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 17, 2012

- Chenango performed repairs and non-destructive testing of repairs to primary geomembrane in Phase II and in East Basin.
- Chenango continued welding of temporary geomembrane flap along Phase I/III northern perimeter.
- Destructive sample DS-055 failed to meet project requirements necessitating four additional samples to isolate the failing area.
- Destructive seam samples DS 6-056 through 6-063 met minimum project specifications for both field and laboratory testing. DS 6-064 through 6-075 have passed field testing, however, laboratory results are pending. A total of 75 original samples have been collected to date from Phase II. A total of nine (9) additional samples have been required to date to isolate failing areas. One additional sample has been obtained from a cap repair of a failing area.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 24, 2012

This report is written for the period of 16 through 22 June 2012. Geosyntec was on-site 5 days (237 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 67° F to a high of 93° F during the hours worked. Approximately 0.18 inches of rainfall was recorded this week. Representatives of Geosyntec, Chenango, and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday of this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 233 LCY of Low Permeability (LP) soil was imported this week from the Marcellus borrow source. Parsons placed the material in Phase II concurrent with importation. Placement of LP soil in Phase II was completed this week.
- Geosyntec conducted a total of 40 field density tests (FDTs) on compacted LP soil in Phase II, all of which met minimum project requirements.
- Geosyntec obtained Shelby tube sample ST-056 for conformance testing. Results were received for ST-052 and ST-056, which indicated the samples achieve the minimum project requirements.
- Approximately 1,757 LCY of Drainage Gravel (4 inch dia. maximum particle size) were imported from the Granby borrow pit and placed in the western end of Phase II.
- Results were received on conformance samples DG-016, which indicated the samples achieve the minimum project requirements.
- Parsons placed Engineered Fill (EF) along the southern haul road. Geosyntec conducted a total of five FDTs on compacted EF material along the western haul road of Phase II.
- Results were received on conformance samples EF-006, which indicated the samples achieve the minimum project requirements.

GEOSYNTHETICS:

- Chenango installed approximately 268,500 sf of primary geomembrane this week completing the Phase II deployment on 21 June.
- Chenango successfully completed four passing extrusion trial seams and sixteen passing fusion trial seams prior to seaming and repair work this week.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: June 24, 2012

- Chenango performed repairs and non-destructive testing on repairs to primary geomembrane in Phase II.
- Approximately 13,450 lf of production seams were welded. Non-Destructive testing of fusion seams was completed.
- Thirteen destructive samples were marked and removed this week, laboratory test results indicate that all but four meet minimum project requirements. Fifteen destructive samples have been marked and pending removal. A total of 103 original destructive samples have been marked to date. A total of 11 additional samples have been collected to isolate failures. One sample has been obtained from a cap repair.
- THG Geophysics mobilized to site 22 June to perform geomembrane leak location survey of the southern interior slopes of Phase II.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: July 1, 2012

This report is written for the period of 23 June through 1 July 2012. Geosyntec was on-site 5 days (242 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 54°F to a high of 90°F during the hours worked. Approximately 0.02 inch of rainfall was recorded this week. Representatives of Geosyntec, Chenango Contracting, Inc., and Parsons were on-site throughout the week. A weekly construction meeting was held on Monday of this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Geosyntec conducted a total of 10 field density tests (FDTs) on re-used Engineered Fill (EF) material along the Phase II perimeter haul road/berm, all of which met minimum compaction requirements.
- Geosyntec obtained a sample of Drainage Gravel (DG-017) for conformance testing, results are pending.
- Approximately 1,197 LCY of Drainage Gravel (4–in maximum particle size) was imported and placed in western end of Phase II.

GEOSYNTHETICS:

- Ten additional rolls of HDPE geomembrane were delivered of which six were being re-delivered. The four additional rolls are to be used to complete the sacrificial flap (see RFI No. 25 for details).
- Chenango successfully completed eighteen passing extrusion trial seams prior to performing repair work this week.
- Chenango extrusion welded primary geomembrane repairs in Phase II and along the Phase I north.
- Chenango performed repairs and non-destructive testing on extrusion welds on repairs to primary geomembrane in Phase II and over the north berm this week.
- Thirty eight destructive samples were marked, removed, and field tested this week. A total of 114 original destructive samples have been removed and tested to date. Twenty

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: July 1, 2012

two additional samples have been required to isolate failures. Three additional destructive samples have been obtained from cap repairs to failing areas greater than 150-ft long. Four additional samples were obtained from Panels 111 through 121 which had been deployed 1 June 2012 (See FCF No. 9 for details).

- The THG Geophysics Ltd crew was on site Monday and Tuesday performing the Electrical Leak Location Survey (ELLS) on the interior berms for Phase II prior to placement of the sacrificial geomembrane layer. The work is not yet completed.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – /Phase II WEEK ENDING: July 8, 2012

This report is written for the period of 02 through 08 July 2012. Geosyntec was on-site 4 days (246 days total to date) to provide CQA services during construction in the SCA. Temperatures generally ranged from a low of 64° F to a high of 95° F during the hours worked. No rainfall was observed this week. Representatives of Geosyntec, Chenango Contracting, Inc., and Parsons were on-site throughout the week except Wednesday, in observance of Independence Day. A weekly construction meeting was held on Monday of this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,135 LCY of Drainage Gravel (4-in maximum particle size) was imported from the Granby source and placed in western end of Phase II.

GEOSYNTHETICS:

- Chenango installed approximately 69,250 ft^2 of 24-oz/yd non-woven geotextile and 83,850 ft^2 of sacrificial 60-mil thick HDPE geomembrane this week.
- Chenango successfully completed seven passing extrusion trial seams prior to performing repair work this week.
- Chenango conducted extrusion welding on geomembrane repairs in Phase II and the Phase I north berm.
- Chenango performed repairs and non-destructive testing on extrusion welds on repairs to primary geomembrane in Phase II and the temporary north berm flap.
- Extrusion welding of geomembrane deployed in Phase I over the north berm is complete.
- Two destructive samples, DS-6-097C and 6-108C, were marked and removed this week. Field and laboratory test results indicates both met minimum project specifications. A total of 114 original destructive samples have been removed and tested to date. Twenty two additional samples have been required to isolate failures. Five additional destructive samples have been obtained from cap repairs to failing areas greater than 150-ft long.
- Chenango demobilized from the project on 06 July 2012 and will return upon Parsons' request to continue the 24-oz/sy non-woven geotextile deployment in Phase II.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – /Phase II WEEK ENDING: July 8, 2012

- The THG Geophysics Ltd. crew was on-site conducting the Electrical Leak Location Survey (ELLS) in Phase II, testing primary liner from the toe of the east and south berms out approximately 25 ft over the Phase II floor.

COPY TO: File PER: Doug Hamilton

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: July 15, 2012

This report is written for the period of 09 through 15 July 2012. Geosyntec was on-site 5 days (251 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 62° F to a high of 93° F during the hours worked. Approximately 0.30 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Chenango was onsite Wednesday through Friday. A weekly construction meeting was held on Monday of this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,526 LCY of Drainage Gravel (4-in maximum particle size) was imported from the Granby source and placed in the western end of Phase II this week.
- Low Permeability (LP) soil was placed in a 1-ft thick lift in the south and east anchor trenches during the week.

GEOSYNTHETICS:

- Chenango performed an Electrical Leak Location Survey (ELLS) on the primary geomembrane in the West Basin. A leak was located around one of the 24-in diameter inlet pipes. Chenango repaired and non-destructively tested the boot repair.
- Parsons installed temporary tarps over exposed 24-oz/sy non-woven geotextile this week to reduce UV exposure.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: July 22, 2012

This report is written for the period of 16 through 20 July 2012. Geosyntec was on-site 5 days (256 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 59° F to a high of 98° F during the hours worked. No rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Representatives of Chenango were onsite Monday and Tuesday. A construction meeting was not held this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,217 LCY of Drainage Gravel (4-in maximum particle size) was imported from the Granby source and placed in northwestern section of Phase II.
- Approximately 500 LCY of Engineered Fill material was imported, placed, and compacted in the southern anchor trench for Phase II.

GEOSYNTHETICS:

- Chenango investigated a possible leak along the east slope of the West Basin.
- THG Geophysics crew worked three days this week conducting an Electrical Leak Location Survey in the West Basin and in the western end of Phase II. No leaks were observed.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: July 29, 2012

This report is written for the period of 23 through 27 July 2012. Geosyntec was on-site 5 days (261 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 62° F to a high of 88° F during the hours worked. Approximately 1.4 inches of rainfall were recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. A construction meeting was not held this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,403 LCY of 4-in maximum particle size Drainage Gravel was imported from the Granby source and placed in western end of Phase II. Temporary tarpaulins over the geotextile cushion were re-located as necessary. Continue to mark out areas of excessive fines that are to be re-worked.
- The Lake Road Pit was identified as a new Drainage Gravel source.

GEOSYNTHETICS:

- Samples of 24 oz/yd geotextile, 60-mil thick HDPE geomembrane, and Drainage Gravel from the Granby Pit were shipped to SGI laboratory for puncture resistance testing according to ASTM D5541.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 5, 2012

This report is written for the period of 30 July through 05 August 2012. Geosyntec was on-site six (6) days (267 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 69° F to a high of 94° F during the hours worked. No rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Chenango Contracting Inc. (CCI) was on site Saturday. A construction meeting was not held this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 2,166 LCY of Drainage Gravel (4-in maximum particle size) was imported from the Granby and Lake Road sources and placed in western end of Phase II.
- A sample of Drainage Gravel (DG-019) was obtained from the Lake Road source. The sample was split and portions were shipped to GeoTesting Express and SGI for testing.

GEOSYNTHETICS:

- Parsons continued pumping of water from the SCA western basin and removed a portion of the sideslope riser pipe. CCI investigated a potential leak in the West Basin primary sump. No leaks were detected; however, the investigation is not complete.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 12, 2012

This report is written for the period of 05 through 12 August 2012. Geosyntec was on-site seven (7) days (274 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 53° F to a high of 89° F during the hours worked. Approximately 0.52 inch of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Chenango Contracting Inc. (CCI) was on site Wednesday, Saturday, and Sunday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 2,001 LCY of Drainage Gravel (4-in maximum particle size) was imported from the Granby and Lake Road sources and placed in western end of Phase II.
- The Debris Management Area (DMA) was expanded in Phase II an additional 50-ft to the east by adding an additional 1-ft thickness of Drainage Gravel material over the existing material, for a total minimum thickness of 2-ft.
- Conformance test results on sample DG-019 (Drainage Gravel) from the Lake Road source are pending.

GEOSYNTHETICS:

- Chenango deployed approximately 159,250 SF of 24 oz/sy non-woven geotextile in Phase II.
- Investigation of the leak in the West Basin primary liner system is ongoing. CCI completed a repair to a pipe boot within the primary liner system of the West Basin.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 19, 2012

This report is written for the period of 13 through 19 August 2012. Geosyntec was on-site five (5) days (279 days to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 63° F to a high of 83° F during the hours worked. Approximately 0.81 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Chenango Contracting Inc. (CCI) crew was on site Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 2,166 LCY of Drainage Gravel (-4 in. maximum particle size) was imported from the Granby and Lake Road sources and placed in the northeastern limits of Phase II.

GEOSYNTHETICS:

- Repairs to the primary liner system in the West Basin were performed. The silicone sealant was removed from the boots to the 24-in diameter HDPE pipes penetrating the liner system in the West Basin. The geomembrane boots were extrusion welded to the HDPE pipe.
- One repair was completed on the sacrificial 60-mil thick HDPE geomembrane on the south slope of Phase II.
- Water levels in the West Basin secondary sump continue to be monitored by Parsons for indication of a leak in the primary liner system.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 26, 2012

This report is written for the period of 20 through 26 August 2012. Geosyntec was on-site 5 days (284 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 52° F to a high of 88° F during the hours worked. No rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. The west basin of the SMS was accepted by the State and can be used in the management of stormwater. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- A new source of Drainage Gravel material, the Amboy Pit, was identified by Parsons. A conformance sample of the Drainage Gravel material from the Amboy Pit (DG-020) was obtained by Geosyntec from material placed in Phase II, Grid R-14.
- Approximately 2,619 LCY of Drainage Gravel was imported from the Granby, Lake Road, and Amboy sources. The imported material was placed in the northeastern limits of Phase II.

GEOSYNTHETICS:

- No geosynthetic activities were observed this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 02, 2012

This report is written for the period of 27 August through 02 September 2012. Geosyntec was on-site 5 days (289 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 55° F to a high of 84° F during the hours worked. Approximately 1 inch of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Representatives from Chenango were on site Wednesday, the 29 August. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 2,207 LCY of Drainage Gravel was imported from the Granby, Lake Road, and Amboy sources. No Drainage Gravel was delivered on Wednesday.
- Parsons extended the Debris Management Area (DMA) width to approximately 150-ft, measured East to West. Parsons placed an additional 1-ft thick lift of Drainage Gravel over the previously placed material, for a total minimum thickness of 2-ft within the DMA.
- Parsons continued placement of the 1-ft thick Gravel Drainage Layer within Phase II.

GEOSYNTHETICS:

- Chenango installed approximately 119,500 ft^2 of the 24-oz/sy non-woven geotextile at the north end of Phase IIA on Wednesday.

COPY TO: File PER: Douglas W. Hamilton

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 09, 2012

This report is written for the period of 03 August through 09 September 2012. Geosyntec was on-site 4 days (293 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 64° F to a high of 86° F during the hours worked. Approximately 0.10 inch of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,340 LCY of Drainage Gravel was imported from the Granby, Lake Road, and Amboy sources.
- Parsons placed Drainage Gravel in a 1-ft thick lift within Phase II.
- Parsons excavated, stockpiled, and re-screened Drainage Gravel material from areas observed having excessive fines along the Phase II northwestern access road. The screened material was placed into Phase II.

GEOSYNTHETICS:

- No construction activities this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 16, 2012

This report is written for the period of 10 through 16 September 2012. Geosyntec was on-site six (6) days (300 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 51° F to a high of 88° F during the hours worked. Approximately 0.95 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Representatives of Chenango were on site Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,464 LCY of Drainage Gravel was imported from the Granby, Lake Road, and Amboy sources.
- Parsons placed the imported Drainage Gravel in Phase II in a single, minimum 1-ft thick lift.
- Parsons reprocessed areas of Drainage Gravel material with excessive fines in the western end of Phase II. The material was reprocessed using a flip screen and then returned to the location of excavation within Phase II.
- Based on a review of survey data the LP soil layer was noted to be thinner than required at survey point 21ss within Phase II. Parsons and Geosyntec verified the LP soil layer thickness at survey point 21ss by manual excavation and measurement. The manual thickness measurement indicated the layer at this location to be 12.04-in thick. Repair of the geosynthetics at the location is pending.

GEOSYNTHETICS:

- Chenango deployed approximately 117,000 sf. of 24 oz/sy non-woven geotextile cushion in the southeast section of Phase II.
- Will verify the puncture resistance of UV exposed geotextile as exposure has been extended (though temporary tarpaulins continue to be used to manage exposure).

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 16, 2012

This report is written for the period of 17 through 23 September 2012. Geosyntec was on-site five (5) days (305 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 41° F to a high of 82° F during the hours worked. Approximately 1.2 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Representatives of Chenango were on site Monday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 2,723 LCY of Drainage Gravel was imported from the Granby, Hayes, Oran Delphi, and Amboy sources.
- Parsons placed imported Drainage Gravel materials either into a stockpile or directly into Phase II. Material placed into Phase II was spread in a minimum 1-ft thick lift.
- Parsons performed removal of areas of excessive fines accumulation within Phase II. The areas were excavated, removed from the cell, and placed into a stockpile. Imported material was used to backfill the excavations within Phase II. Parsons completed the removal and replacement of Drainage Gravel material with excessive fines in the western end of Phase II.

GEOSYNTHETICS:

- Chenango completed a repair to the geosynthetics in the eastern end of Phase II where the liner was cut open for LP soil thickness verification.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 30, 2012

This report is written for the period of 24 through 30 September 2012. Geosyntec was on-site five (5) days (310 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 42° F to a high of 75° F during the hours worked. Approximately 0.9 inch of rainfall was recorded this week. Representatives of Geosyntec, THG Geophysics, and Parsons were on-site throughout the week. Chenango was on site Monday through Wednesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 4,620 LCY of Drainage Gravel (minus 4 in. dia. maximum particle size) were imported from the Granby, Dendis, and Amboy sources and placed within the limits of Phase II.
- Parsons completed the removal and replacement of Drainage Gravel material with excessive fines in the western end of Phase II.

GEOSYNTHETICS:

- Chenango crew installed 24 oz/sy non-woven geotextile cushion layer in the southeastern section of Phase II. Approximately 198,000 sf. of geotextile material was deployed this week, exhausting material stockpiled onsite.
- Approximately four additional rolls of 24 oz/sy non-woven geotextile are required to complete the installation in Phase II.
- THG Geophysics crew conducted electrical leak location surveying of the geomembrane in Phase II. Two leaks and two potential leaks in the geomembrane were located and marked so that they can be investigated further.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 7, 2012

This report is written for the period of 01 through 07 October 2012. Geosyntec was on-site five (5) days (315 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 50°F to a high of 81°F during the hours worked. Approximately 0.53 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Representatives of THG Geophysics were on-site Monday and Wednesday. Representatives of Chenango were onsite Monday, Tuesday, Thursday, and Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,361 LCY of Drainage Gravel (4-in dia. maximum particle size) was imported from the Granby, Lake Road, and Amboy sources and placed within the limits of Phase II.
- Parsons removed Drainage Gravel from the locations of potential leaks identified by THG Geophysics using leak location survey techniques.

GEOSYNTHETICS:

- Chenango delivered 7 rolls (15,750 SF) of 24 oz/sy non-woven geotextile cushion layer material manufactured by GSE. One conformance sample was obtained from the delivered rolls.
- Chenango installed 4 rolls (9,000 SF) of the 24 oz/sy non-woven geotextile cushion layer in the southeastern section of Phase II.
- Chenango completed repairs to the geomembrane at locations identified by THG Geophysics. Repaired areas were re-surveyed by THG Geophysics to confirm the indicated leaks were corrected.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 14, 2012

This report is written for the period of 08 through 14 October 2012. Geosyntec was on-site five (5) days (320 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 41°F to a high of 67°F during the hours worked. Approximately 1.06 inches of rainfall were recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. Representatives of Chenango were on-site Monday, Tuesday, and Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,300 LCY of Drainage Gravel (4-in dia. maximum particle size) was imported from the Granby and Amboy sources and placed within the limits of Phase II.
- Parsons removed Drainage Gravel containing excessive fines in the northeast section of Phase II and replaced it with Drainage Gravel from an on-site stockpile.
- Geosyntec obtained sample DG-023 of Drainage Gravel material for conformance testing from the Oran Delphi Road source.
- Results for samples DG-021, DG-022, DG-023, ST-51, and ST-52 are pending from GeoTesting Express.

GEOSYNTHETICS:

- Chenango completed installation of a floating cover on the East Basin on Tuesday. Geosyntec did not provide CQA of this work.
- Chenango installed approximately 5,625 SF of 24 oz/sy non-woven geotextile cushion, completing installation of the layer.
- Results for conformance sample GT-014 are pending from GeoTesting Express.

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WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: October 21, 2012

This report is written for the period of 15 through 21 October 2012. Geosyntec was on-site five (5) days (325 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 35° F to a high of 68° F during the hours worked. Approximately 1.35 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 2,454 LCY of Drainage Gravel (4-in dia. maximum particle size) was imported from the Granby, Amboy, Oran Delphi Road, and Route 6/Dendis sources and placed within the southeastern limits of Phase II.
- Results for conformance samples DG-021, DG-022, DG-023, ST-51, and ST-52 are pending.

GEOSYNTHETICS:

- Results for conformance sample GT-014 are pending.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: October 28, 2012

This report is written for the period of 22 through 28 October 2012. Geosyntec was on-site five (5) days (330 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 44° F to a high of 74° F during the hours worked. Approximately 0.45 inch of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 1,794 LCY of Drainage Gravel (4-in dia. maximum particle size) was imported from the Granby, Amboy, Oran Delphi Road, and Route 6/Dendis sources and placed within Phase II.
- Placement of the 12-in thick lift of Drainage Gravel over the in place geosynthetic liner system was completed this week.
- Parsons removed Drainage Gravel containing excessive fines and replaced it with Drainage Gravel from an on-site stockpile.
- Results of conformance sample DG-023 are pending.
- Testing results for samples DG-021, DG-022, ST-51, and ST-52 were received from GeoTesting Express. The samples achieved the minimum project requirements.

GEOSYNTHETICS:

- Test results for geotextile conformance sample GT-014 were received from GeoTesting Express. The sample achieved the minimum project requirements.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: November 4, 2012

This report is written for the period of 29 October through 04 November 2012. Geosyntec was on-site five (5) days (335 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 40° F to a high of 60° F during the hours worked. Approximately 1.23 inches of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site throughout the week. THG Geophysics was onsite Monday through Thursday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Approximately 45 LCY of Drainage Gravel (4-in maximum particle size) was imported from the Oran Delphi Road source and placed within the southeastern portion of Phase II, as Parsons continued to remove and replace drainage gravel containing excessive fines from the NE and SE Phase II access roads. Sufficient amount of gravel appears to have been delivered for the project.

GEOSYNTHETICS:

- THG Geophysics completed the leak location surveys for the SE portion of Phase II and the previous NE drainage gravel access road at Phase II.
- THG Geophysics located four potential leak locations during leak location surveys performed this week. Drainage gravel was removed from the areas; further investigation of the areas is being scheduled.

COPY TO: File PER: Billy Carruth

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: November 11, 2012

This report is written for the period of 05 through 11 November 2012. Geosyntec was on-site three (3) days (338 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 25°F to a high of 42°F during the hours worked. Approximately 0.2 inch of rainfall was recorded this week. Representatives of Geosyntec were on-site Monday through Wednesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons completed removal and replacement of drainage gravel at the previous SE access road and ramp.

GEOSYNTHETICS:

- Completion of leak location survey. The repairs of potential leak locations are pending.

COPY TO: File PER: Billy Carruth

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: November 18, 2012

This report is written for the period of 12 through 18 November 2012. Geosyntec was on-site three (3) days (341 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 36° F to a high of 67° F during the hours worked. Approximately 0.6 inch of rainfall was recorded this week. Representatives of Geosyntec and Parsons were on-site Monday through Wednesday. Representatives of THG Geophysics and Chenango Contracting were on-site Tuesday and Wednesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons completed removal and replacement of drainage gravel at eight locations in eastern Phase II identified by THG Geophysics for primary geomembrane repair.

GEOSYNTHETICS:

- THG Geophysics completed leak location survey of Phase II and the previous location for the SE access ramp in SE Phase I.
- THG Geophysics identified four potential leak locations along the SE access road in Phase II.
- Chenango Contracting completed nine repairs to the primary geomembrane in Phase II.
- Parsons completed the asbuilt survey of nine repairs to the primary geomembrane in eastern Phase II.

Geosyntec demobilized from the site on Wednesday.

COPY TO: File PER: Billy Carruth

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase II WEEK ENDING: 07 April 2013

This report is written for the period of 01 through 07 April 2013. Geosyntec mobilized to the site and remained on-site two (2) days (343 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged from a low of 24° F to a high of 39° F during the hours worked. Approximately 6 inches of snowfall was recorded this week. Representatives of Geosyntec and Parsons were on-site Wednesday and Thursday. Representatives Chenango Contracting were on-site Wednesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons completed placement of the drainage gravel within the inclinometer abandonment area after the geosynthetics were repaired.

GEOSYNTHETICS:

- Chenango Contracting completed one repair to the primary geomembrane and 24 oz/sy non-woven geotextile in Phase II at the former location of inclinometer SI-G1.

- The repair and remaining extrusion weld of the boot repair associated with the inclinometer were vacuum tested.

Geosyntec demobilized from the site on Thursday.

APPENDIX C

Analytical Summary from Borrow Source

(provided by Parsons)

Provided By Parsons

			Field Sample ID	SCA-0022-01
			Location	SCA-SP-GQ-SF063
			Sample Date	6/16/2012
			Sample Delivery Group	JB9437
			Matrix	SOIL
			Sample Purpose	Regular sample
			Sample Type	Surface soil
Method	Parameter Name	Units	Restricted Use SCOs-Commercial	
SW6010	ARSENIC	mg/kg	16	3.1
SW6010	BARIUM	mg/kg	400	56.7
SW6010	BERYLLIUM	mg/kg	590	0.39
SW6010	CADMIUM	mg/kg	9.3	0.026 U
SW6010	CHROMIUM	mg/kg	400	7.9
SW6010	COPPER	mg/kg	270	20.9
SW6010	LEAD	mg/kg	1000	3.6
SW6010	MANGANESE	mg/kg	10000	764
SW6010	NICKEL	mg/kg	310	9.6
SW6010	SELENIUM	mg/kg	1500	0.25 U
SW6010	SILVER	mg/kg	1500	0.17 J
SW6010	ZINC	mg/kg	10000	23.6
SW7471	MERCURY	mg/kg	2.8	0.012 U
SW8081	4,4'-DDD	ug/kg	92000	0.69 U
SW8081	4,4'-DDE	ug/kg	62000	0.69 U
SW8081	4,4'-DDT	ug/kg	47000	0.69 U
SW8081	ALDRIN	ug/kg	680	0.69 U
SW8081	ALPHA-BHC	ug/kg	3400	0.69 U
SW8081	ALPHA-CHLORDANE	ug/kg	24000	0.69 U
SW8081	BETA-BHC	ug/kg	3000	0.69 U
SW8081	DELTA-BHC	ug/kg	500000	0.69 U
SW8081	DIELDRIN	ug/kg	1400	0.69 U
SW8081	ENDOSULFAN I	ug/kg	200000	0.69 U
SW8081	ENDOSULFAN II	ug/kg	200000	0.69 U
SW8081	ENDOSULFAN SULFATE	ug/kg	200000	0.69 U
SW8081	ENDRIN	ug/kg	89000	0.69 U
SW8081	GAMMA-BHC (LINDANE)	ug/kg	9200	0.69 U
SW8081	HEPTACHLOR	ug/kg	15000	0.69 U
SW8082	AROCLOR-1016	ug/kg	1000	34 U
SW8082	AROCLOR-1221	ug/kg	1000	34 U
SW8082	AROCLOR-1232	ug/kg	1000	34 U
SW8082	AROCLOR-1242	ug/kg	1000	34 U
SW8082	AROCLOR-1248	ug/kg	1000	34 U
SW8082	AROCLOR-1254	ug/kg	1000	34 U
SW8082	AROCLOR-1260	ug/kg	1000	34 U
SW8082	AROCLOR-1262	ug/kg	1000	34 U
SW8082	AROCLOR-1268	ug/kg	1000	34 U
SW8151	2,4,5-TP (SILVEX)	ug/kg	500000	3.3 U
SW8260	1,1,1-TRICHLOROETHANE	ug/kg	500000	5.3 U
SW8260	1,1-DICHLOROETHANE	ug/kg	240000	5.3 U
SW8260	1,1-DICHLOROETHENE	ug/kg	500000	5.3 U
SW8260	1,2,4-TRIMETHYLBENZENE	ug/kg	190000	5.3 U
SW8260	1,2-DICHLOROBENZENE	ug/kg	500000	5.3 U
SW8260	1,2-DICHLOROETHANE	ug/kg	30000	1.1 U
SW8260	1,3,5-TRIMETHYLBENZENE	ug/kg	190000	5.3 U
SW8260	1,3-DICHLOROBENZENE	ug/kg	280000	5.3 U
SW8260	1,4-DICHLOROBENZENE	ug/kg	130000	5.3 U
SW8260	1,4-DIOXANE	ug/kg	130000	130 U
SW8260	2-BUTANONE	ug/kg	500000	11 U
SW8260	ACETONE	ug/kg	500000	18.7
SW8260	BENZENE	ug/kg	44000	1.1 U
SW8260	BUTYLBENZENE	ug/kg	500000	5.3 U
SW8260	CARBON TETRACHLORIDE	ug/kg	22000	5.3 U
SW8260	CHLOROBENZENE	ug/kg	500000	5.3 U
SW8260	CHLOROFORM	ug/kg	350000	5.3 U
SW8260	CIS-1,2-DICHLOROETHENE	ug/kg	500000	5.3 U
SW8260	ETHYLBENZENE	ug/kg	390000	1.1 U
SW8260	METHYL TERT-BUTYL ETHER	ug/kg	500000	1.1 U
SW8260	METHYLENE CHLORIDE	ug/kg	500000	5.3 U
SW8260	N-PROPYLBENZENE	ug/kg	500000	5.3 U
SW8260	NAPHTHALENE	ug/kg	500000	5.3 U
SW8260	SEC-BUTYLBENZENE	ug/kg	500000	5.3 U
SW8260	TERT-BUTYLBENZENE	ug/kg	500000	5.3 U
SW8260	TETRACHLOROETHENE	ug/kg	150000	5.3 U
SW8260	TOLUENE	ug/kg	500000	1.1 U
SW8260	TRANS-1,2-DICHLOROETHENE	ug/kg	500000	5.3 U
SW8260	TRICHLOROETHENE	ug/kg	200000	5.3 U
SW8260	VINYL CHLORIDE	ug/kg	13000	5.3 U
SW8260	XYLENES, TOTAL	ug/kg	500000	1.1 U
SW8270	2-METHYLPHENOL	ug/kg	500000	60 U
SW8270	3&4-METHYLPHENOL	ug/kg	null	60 U
SW8270	ACENAPHTHENE	ug/kg	500000	30 U
SW8270	ACENAPHTHYLENE	ug/kg	500000	30 U
SW8270	ANTHRACENE	ug/kg	500000	30 U
SW8270	BENZO(A)ANTHRACENE	ug/kg	5600	30 U
SW8270	BENZO(A)PYRENE	ug/kg	1000	30 U
SW8270	BENZO(B)FLUORANTHENE	ug/kg	5600	30 U
SW8270	BENZO(G,H,I)PERYLENE	ug/kg	500000	30 U
SW8270	BENZO(K)FLUORANTHENE	ug/kg	56000	30 U
SW8270	CHRYSENE	ug/kg	56000	30 U
SW8270	DIBENZO(A,H)ANTHRACENE	ug/kg	560	30 U
SW8270	DIBENZOFURAN	ug/kg	350000	60 U
SW8270	FLUORANTHENE	ug/kg	500000	30 U
SW8270	FLUORENE	ug/kg	500000	30 U
SW8270	HEXACHLOROBENZENE	ug/kg	6000	60 U
SW8270	INDENO(1,2,3-CD)PYRENE	ug/kg	5600	30 U
SW8270	NAPHTHALENE	ug/kg	500000	30 U
SW8270	PENTACHLOROPHENOL	ug/kg	6700	300 U
SW8270	PHENANTHRENE	ug/kg	500000	30 U
SW8270	PHENOL	ug/kg	500000	60 U
SW8270	PYRENE	ug/kg	500000	30 U
SW9012	CYANIDE	mg/kg	27	0.11 U

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

		Soil Classification	Moisture Content	Organic Content	Standard Proctor	Particle Size Analysis	Atterberg Limits
	Test	ASTM D 2487	ASTM D 2216	ASTM D 2974	ASTM D 698	ASTM D 422	
Engineered / Structural Fill Sediment Consoidation Area-Phase II Camillus, New York	**Spec Requirement**	SC, SM, ML, CL, GM, GC, GW or combination RFI 15: GP w/ sand, GP GM, SP-SM w/ gravel, SW-SM w/ gravel	No Spec	No Spec	No Spec	No Spec	No Spec

> 50%

Sample Source	Field Sample ID	Sample No.	USCS Classification	ASTM D2216 Moisture (%)	ASTM D2974 Organic (%)	Max Dry Density	Optimum Moisture Content (%)	4" (%)	3" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	1/2" (%)	3/8" (%)	1/4" (%)	#4 (%)	#10 (%)	#20 (%)	#40 (%)	#80 (%)	#100 (%)	#200 (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
Sennett Quarry	SF-067	S274-SF67	GW	3.9	0.4	136.1	8.2		100	97.0	91.0	87.0	80.0	67.0			40.0	22.0		8.0	-	5.0	4.5	NP	NP	NP
Sennett Quarry	SF-068	S275-SF68	GW-GM	4.0	0.3	139.3	7.9		100	95.0	91.0	82.0	74.0	64.0			38.0	22.0		8.0	-	6.0	5.3	NP	NP	NP
SCA Retest	SF-069	S280-SF69	GW-GM w/ sand	4.8	0.5	140.3	6.4	100	96.8	96.8	92.0	78.4	69.4	58.6	53.6	46.8	43.3	34.2	28.0	22.5	14.7	13.3	9.0	NP	NP	NP
SCA Retest	SF-070	S281-SF70	SP-SM with gravel	4.9	0.8	132.9	7		100	98.5	95.2	83.5	76.5	68.9	66.5	62.3	60.1	53.3	47.7	32.0	12.3	11.6	8.4	NP	NP	NP
SCA Retest	SF-071	S282-SF71	GW-GM w/ sand	5.2	0.8	137.1	6.7	100	95.6	90.8	86.3	80.5	71.5	61.4	54.2	46.5	41.7	29.5	21.9	16.5	9.4	8.2	4.9	NP	NP	NP
SCA Retest	SF-072	S283-SF72	GW-GM w/ sand	4.3	0.6	139.4	6.4	100	93.9	90.3	85.2	76.8	69.3	59.8	52.9	43.6	39.2	28.1	21.6	16.7	9.8	8.5	5.0	NP	NP	NP
SCA Retest	SF-073	S284-SF73	GW w/ sand	5.4	0.9	140.6	4.9		100	91.9	87.2	80.1	72.6	61.3	55.2	47.4	42.4	29.4	22.0	16.5	8.9	7.5	4.2	NP	NP	NP
SCA Retest	SF-074	S285-SF74	GW w/ sand	4.9	0.6	139.1	5.6	100	95.3	94.2	91.8	80.5	71.4	60.2	52.5	44.8	40.3	29.2	21.8	16.2	8.7	7.5	4.3	NP	NP	NP
SCA Retest	SF-075	S286-SF75	GW w/ sand	4.3	0.5	140.1	4.9	100	87.4	79.5	73.6	66.6	61.1	55.3	49.2	43.4	39.7	29.5	22.2	17.3	8.2	6.6	3.3	NP	NP	NP
SCA Retest	SF-076	S287-SF76	GW w/ sand	4.3	0.7	144.5	4.4		100	84.3	72.1	60.1	52.3	40.4	37.7	32.9	30.0	21.2	15.1	11.3	6.7	5.9	3.6	NP	NP	NP
Granby Quarry	SF-077	S355-SF77	GW	4.5	1.3	140.1	5.4	100	93.0	90.0	80.0	71.0	65.0	56.0	50.0		38.0	26.0	19.0	13.0	5.0	4.0	2.0	NP	NP	NP
Granby Quarry	SF-078	S356-SF78	GP with sand	4.0	0.9	140.3	5.7	100	94.0	87.0	83.0	78.0	72.0	63.0	57.0		45.0	32.0	24.0	15.0	6.0	5.0	3.0			

TABLE D-1
ENGINEERED FILL QA SUMMARY
Parsons / Honeywell
Sediment Consolidation Area - Phase II
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			1	1								1	1	1			1	
SAMPLE No.	LOCATION	APPROX. VOLUME PLACED	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							
Phase I																		
EF1	Granby - on-site		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**
EF3	Granby - on-site		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 D-10		4.1	100	100	82	29	20	9	6	*1*	GE-GM	0.4	NP	NP	NP	130 / **136.5**	8 / **6**
Phase II																		
EF-6	On-site S. Haul Rd - Grid O		5	92	81	65	22	11	5	3	*1*	GP	0.1	NP	NP	NP	128 / **139.5**	8.5 / **5**
EST. TOTAL VOLUME (cyd) PLACED:		1,700	1	Number of QA Samples:			1					1	1		1		1	

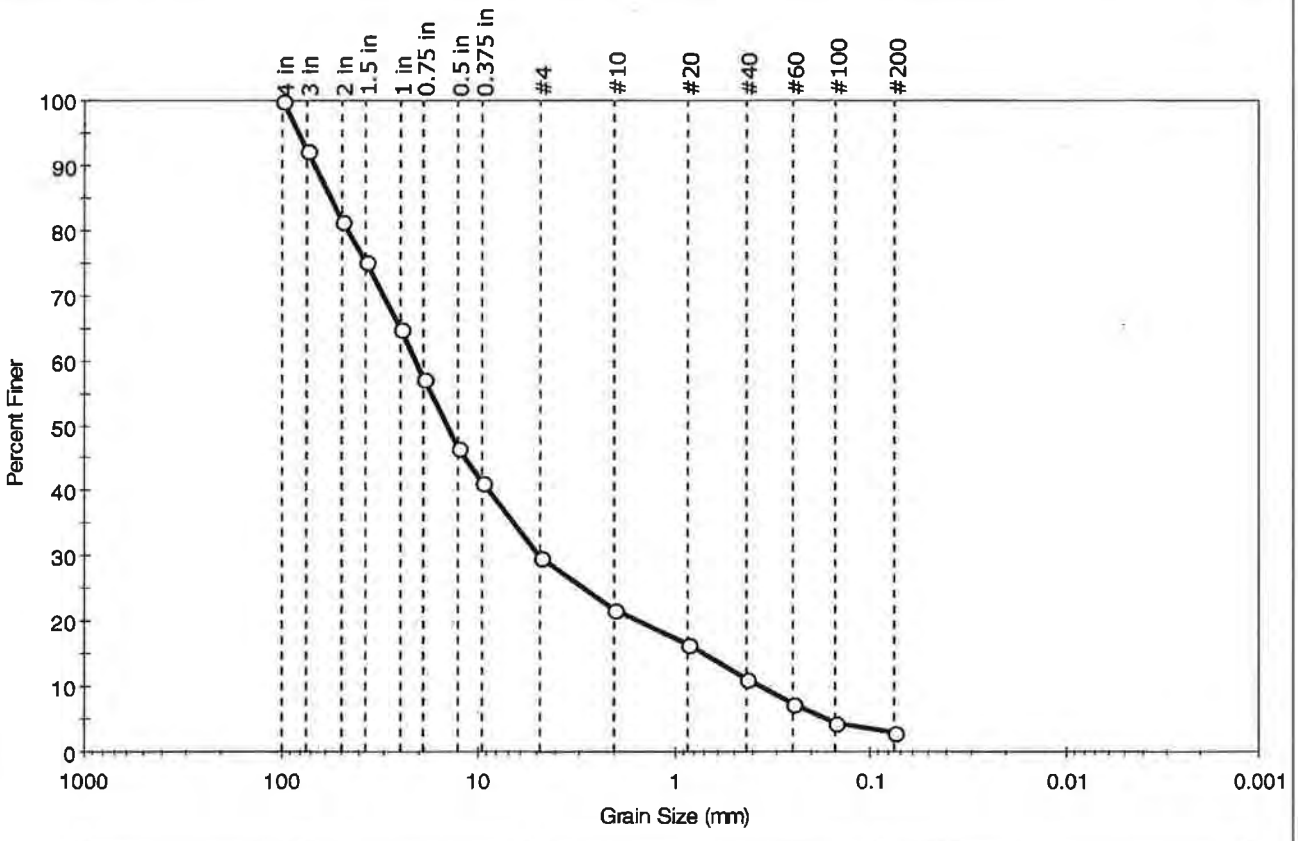
Notes:

(1) The majority if the soil used to construct perimeter berms was obtained from the Granby source.
(2) Reference construction documents, including Technical Specification Section 02200 and Tables A-1 and 2 of the CQA Plan for further details.
Analytical samples were obtained by Parsons 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 was performed at a minimum of 5 per acre/lift.
(4) *Italics* indicate an approximate value. **Bold** indicates oversized corrected numbers.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	EF-006	Test Date:	06/20/12	Checked By:	jdt
Depth :	---	Test Id:	240063		
Test Comment:	---				
Sample Description:	Moist, reddish brown gravel with sand				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	70.3	26.7	3.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	92		
2 in	50.00	81		
1.5 in	37.50	75		
1 in	25.00	65		
0.75 in	19.00	57		
0.5 in	12.70	47		
0.375 in	9.50	41		
#4	4.75	30		
#10	2.00	22		
#20	0.85	17		
#40	0.42	11		
#60	0.25	7		
#100	0.15	5		
#200	0.075	3		

Coefficients

D_{85} = 57.0836 mm	D_{30} = 4.8166 mm
D_{60} = 20.9720 mm	D_{15} = 0.6931 mm
D_{50} = 14.3987 mm	D_{10} = 0.3606 mm
C_u = 58.159	C_c = 3.068

Classification

ASTM: Poorly graded gravel with sand (GP)

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

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	EF-006	Test Date:	06/21/12	Checked By:	jdt
Depth :	---	Sample Id:	115985		
Test Comment:	---				
Sample Description:	Moist, reddish brown gravel with sand				
Sample Comment:	---				

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	EF-006	---	Moist, reddish brown gravel with sand	5

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	EF-006	Test Date:	06/20/12	Checked By:	jdt
Depth :	---	Test Id:	240065		
Test Comment:	---				
Sample Description:	Moist, reddish 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-006	---	Moist, reddish 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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	EF-006	Test Date:	06/21/12	Checked By:	jdt
Depth :	---	Test Id:	240062		
Test Comment:	---				
Sample Description:	Moist, reddish 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-006	---	Poorly graded gravel with sand	GP	70.3	26.7	3.0

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	EF-006	Test Date:	06/21/12	Checked By:	jdt
Depth :	---	Test Id:	240061		
Test Comment:	---				
Sample Description:	Moist, reddish brown gravel with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

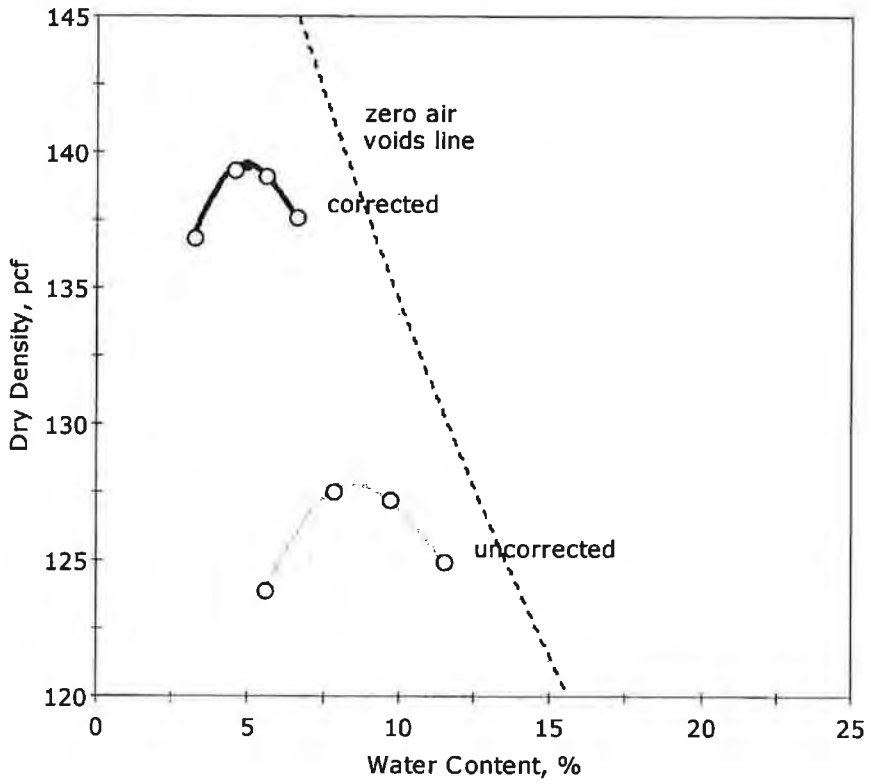
Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	EF-006	---	---	5	n/a	n/a	n/a	n/a	Poorly graded gravel with sand (GP)

89% Retained on #40 Sieve
Dry Strength: NONE
Dilentancy: RAPID
Toughness: n/a
The sample was determined to be Non-Plastic

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type:	bucket	Tested By:	cwd
Sample ID:	EF-006	Test Date:	06/20/12	Checked By:	jdt
Depth :	---	Test Id:	240066		
Test Comment:	ASTM does not recommend this method when >30% is >3/4-inch				
Sample Description:	Moist, reddish brown gravel with sand				
Sample Comment:	---				

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	123.9	127.6	127.3	125.0
Moisture Content, %	5.5	7.8	9.6	11.5

Method : C

Preparation : WET

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.75

Maximum Dry Density=	128.0 pcf
Optimum Moisture=	8.5 %
Oversize Correction	(42.8% > 3/4 inch Sieve)
Corrected Maximum Dry Density=	139.5 pcf
Corrected Optimum Moisture=	5.0 %
Assumed Average Bulk Specific Gravity =	2.55

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Low-Permeability Soil Layer

- Index Testing
- Thin-Walled Tube Samples

		Soil Classification	Moisture Content	Organic Content	Standard Proctor	Particle Size Analysis			Atterberg Limits	Permeability
	Test	ASTM D 2487	ASTM D 2216	ASTM D 2974	ASTM D 698	ASTM D 422				ASTM D 5084
Low-Permeability Soil Layer Sediment Consoidation Area-Phase II	**Spec Requirement**	SC, SM, ML, CL or combination	No Spec	No Spec	No Spec	100%		>50%		</ = 1.0E-06

Sample Source	Field Sample ID	Sample No.	USCS Classification	ASTM D2216 Moisture (%)	ASTM D2974 Organic (%)2	Max Dry Density	Optimum Moisture Content (%)	1" (%)	#4 (%)	#10 (%)	#40 (%)	#100 (%)	#200 (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Permeability K (cm/sec)	Final Moisture Content (%)	Final Dry Unit Weight (PCF)
Marcellus Clay Pit	LP-176	S276-LP176	CL	22.0	0.9	106.1	17.4	100		100	100	99	98	34	17	17	3.0E-08	21.7	100.3
Marcellus Clay Pit	LP-177	S277-LP177	CL	24.4	1.0	105.7	17.4	100		100	100	100	99	36	18	18	3.5E-08	20.1	107.7
Marcellus Clay Pit	LP-178	S278-LP178	CL	20.4				100		100	100	99	98	35	17	17			
Marcellus Clay Pit	LP-179	S279-LP179	CL	21.1				100		100	100	99	98	34	17	17			
Marcellus Clay Pit	LP-180	S291-LP180		23.3										34	18	16			
Marcellus Clay Pit	LP-181	S292-LP181		24.0										34	18	16			
Marcellus Clay Pit	LP-182	S294-LP182	CL	23.9	0.7	106.7	17.6	100		100	99.4	98.7	97.0	35	18	17	8.4E-08	20.9	101.9
Marcellus Clay Pit	LP-183	S295-LP183	CL	22.5	1.0	107.7	17.6	100		100	99.8	98.5	97.3	36	18	18	5.3E-08	19.9	102.8
Marcellus Clay Pit	LP-184	S298-LP184		23.2										35	17	18			
Marcellus Clay Pit	LP-185	S299-LP185		21.7										36	17	19			
Marcellus Clay Pit	LP-186	S300-LP186		22.1										36	18	18			
Marcellus Clay Pit	LP-187	S310-LP187		21.6										35	17	18			
Marcellus Clay Pit	LP-188	S311-LP188		24.6										35	18	17			
Marcellus Clay Pit	LP-189	S312-LP189	CL	23.4				100		100	99.8	99.3	98.5	35	16	19			
Marcellus Clay Pit	LP-190	S313-LP190	CL	22.3	2.6	105.8	18.6	100		100	99.8	99.6	99.1	34	16	18	4.2E-08	21.0	99.4
Marcellus Clay Pit	LP-191	S314-LP191	CL	22.7				100		100	99.5	99.1	98.4	34	17	17			
Marcellus Clay Pit	LP-192	S315-LP192	CL	22.4				100		100	99.5	98.9	97.8	34	16	18			
Marcellus Clay Pit	LP-193	S316-LP193	CL	22.5				100	100	99	99.1	98.6	97.8	34	16	18			
Marcellus Clay Pit	LP-194	S317-LP194		23.5										28	16	12			
Marcellus Clay Pit	LP-195	S318-LP195		25.1										28	17	11			
Marcellus Clay Pit	LP-196	S319-LP196	CL	21.5				-	100	100	99.2	98.6	97.6	33	17	16			
Marcellus Clay Pit	LP-197	S320-LP197		20.1										33	16	17			
Marcellus Clay Pit	LP-198	S321-LP198		23.4										33	16	17			
Marcellus Clay Pit	LP-199	S323-LP199	CL	20.1	0.7	108.5	18.0	100		100	100	99	98	33	17	16	2.9E-08	18.5	104.5
Marcellus Clay Pit	LP-200	S324-LP200	CL	22.1				100		100	100	99	99	34	16	18			
Marcellus Clay Pit	LP-201	S325-LP201		19.2										34	16	18			
Marcellus Clay Pit	LP-202	S326-LP202	CL	19.7	0.9	109.0	16.6	100		100	100	99	98	33	16	17	4.0E-08	17.3	103.8
Marcellus Clay Pit	LP-203	S327-LP203		20.1										33	16	17			
Marcellus Clay Pit	LP-204	S328-LP204		22.2										34	17	17			
Marcellus Clay Pit	LP-205	S329-LP205	CL	19.3	0.6	106.9	17.1	100		100	99.0	99	98	33	15	18	4.5E-08	17.4	102.3
Marcellus Clay Pit	LP-206	S330-LP206		18.1										35	17	18			
Marcellus Clay Pit	LP-207	S331-LP207		17.7										33	16	17			
Marcellus Clay Pit	LP-208	S332-LP208	CL	19.6	0.9	107.1	16.3	100		100	100	99	98	34	16	18	2.9E-08	17.2	102.2
Marcellus Clay Pit	LP-209	S333-LP209		18.9										35	17	18			
Marcellus Clay Pit	LP-210	S334-LP210		20.8										35	16	19			
Marcellus Clay Pit	LP-211	S335-LP211	CL	19.2				100		100	100	99	99	35	17	18			
Marcellus Clay Pit	LP-212	S336-LP212		20.2										35	17	18			
Marcellus Clay Pit	LP-213	S337-LP213		18.2										33	16	17			
Marcellus Clay Pit	LP-214	S338-LP214	CL	17.3				100		100	100	99	98	34	17	17			
Marcellus Clay Pit	LP-215	S339-LP215		21.9										34	15	19			
Marcellus Clay Pit	LP-216	S340-LP216		20.4										34	18	16			
Marcellus Clay Pit	LP-217	S343-LP217		19.4										35	17	18			
Marcellus Clay Pit	LP-218	S344-LP218		20.8										35	19	16			
Marcellus Clay Pit	LP-219	S345-LP219	CL	16.8	0.6	108.4	17.5	100		100	100	99	99	33	16	17	3.4E-08	17.7	104.5
Marcellus Clay Pit	LP-220	S346-LP220		16.1				100		100	99.0	99	98	34	17	17			
Marcellus Clay Pit	LP-221	S347-LP221		19.4										35	18	17			
Marcellus Clay Pit	LP-222	S349-LP222		17.7										34	15	19			
Marcellus Clay Pit	LP-223	S350-LP223	CL	18.0				100		100	100	99	98	34	17	17			
Marcellus Clay Pit	LP-224	S351-LP224		18.3										33	16	17			
Marcellus Clay Pit	LP-225	S352-LP225		16.9										35	17	18			
Marcellus Clay Pit	LP-226	S353-LP226	CL	20.1	0.5	108.9	18.4	100		100	100	99	98	34	16	18	4.8E-08	18.6	103.9
Marcellus Clay Pit	LP-227	S354-LP227		21.5										35	17	18			
				22	52	11	11						23	52			11		

TABLE D-2
LOW-PERMEABILITY SOIL LAYER QA SUMMARY
Parsons / Honeywell
Sediment Consolidation Area - Phase II
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				@ 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				3						3	3	6			2		2				
SAMPLE No.	LOCATION	APPROX. VOLUME PLACED	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 (%)	PERMEABILITY (CM/S)
Specs:				100	-	-	-	100-50		SC / SM / ML / CL										≤ 1 E-6	
Phase II																					
LP-103	Marcellus - Grid E14		18.5	100	100	100	100	99	*38*	CL	0.3	33	18	15	113	17.5	96	109	15.3	-2.2	3.2E-08
LP-106	Marcellus FDT 5-015		13									30	16	14							
LP-107	Marcellus FDT 5-025		14									31	17	14							
LP-108	Marcellus - Grid E15		13	100	100	99	99	97	*40*	CL	0.4	33	17	16							
LP-128	Marcellus - Grid I-14		17.6	100	100	100	99	96	*35*	CL	0.2	29	16	13	115.5	16.0	95	110	16.1	0.1	1.0E-08
LP-129	Marcellus - Grid H-18		19.5									30	16	14							
ST-51	Marcellus - Grid P-19		15.7									28	15	13							
ST-52	Marcellus - Grid Q-14		15.5									30	16	14							
LP-141	Marcellus - Grid Q-13		12.5	100	100	100	99	98	-	CL	0.2	27	15	12							
LP-142	Marcellus - Grid R-16		15.8									27	15	12							
ESTIMATED TOTAL VOLUME (cyd) PLACED:		57,500	10	Number of QA Samples:		4				4	4	10			2		2				

Notes: (1) The soil was 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.
See Shelby Tube summary, Table D-3, for results.
(2) The minimum dry density required is 90 and 95 percent for mid and upper lifts, respectively, at -3 to +3 percent of the optimum moisture content.
(3) In-place testing was performed at a minimum of 9 per acre/lift.
(4) *Italics* indicate an approximate value.

TABLE D-3

SHELBY TUBE DATA SUMMARY
Honeywell / Parsons
Sediment Consolidation Area - Phase II
Camillus, NY

SAMPLE No.	SOURCE	NUCLEAR DENSITY TEST			HC COMPARISON TO STANDARD PROCTOR				HYDRAULIC CONDUCTIVITY		
		TEST NO.	DRY UNIT WEIGHT (PCF)	FIELD MOIST. (cor) (%)	REL. COMP. (%)	MAX. DRY DENSITY (PCF)	OPT. MOISTURE (%)	REL. MOIST. (%)	DRY UNIT WEIGHT (PCF)	MOIST. (%)	PERM. (CM/S)
ST-29A	Marcellus	6-002	108.8	19.4	94	113	17.5	+3	106	20.7	1.5E-08
ST-30A	Marcellus	6-012	108.9	17.8	95	113	17.5	+2	107	19.4	2.3E-08
ST-31A	Marcellus	6-022	109.9	17.9	90	113	17.5	+4	102	21.5	1.4E-08
ST-32A	Marcellus	6-035	108.6	19.5	96	113	17.5	+4	109	21.4	1.0E-08
ST-33A	Marcellus	6-078	108.9	17	99	113	17.5	-+2	112	15.8	9.4E-09
ST-34A	Marcellus	6-080	116.2	16.8	106	113	17.5	-+3	120	14.2	8.7E-09
ST-35A	Marcellus	6-083	116.8	15.6	99	113	17.5	-+1	112	16.5	6.9E-09
ST-36A	Marcellus	6-108	114.1	18.1	95	113	17.5	+0	107	17.7	1.2E-08
ST-37A	Marcellus	6-114	111.0	18.1	100	113	17.5	+1	113	18.3	7.3E-09
ST-38A	Marcellus	6-120	113.3	16.6	99	115.5	16	+2	114	17.5	7.3E-09
ST-39A	Marcellus	6-133	113.0	16.3	99	115.5	16	+1	114	17.4	9.6E-09
ST-40A	Marcellus	6-140	111.5	17.0	96	115.5	16	+1	111	17.2	1.2E-08
ST-41A	Marcellus	6-146	110.5	17.3	100	115.5	16	+2	116	17.8	7.4E-09
ST-42A	Marcellus	6-149	111.9	17.2	98	115.5	16	+2	113	17.6	7.2E-09
ST-43A	Marcellus	6-158	113.3	17.7	99	115.5	16	+1	114	16.6	2.3E-08
ST-44A	Marcellus	6-163	114.8	16.3	98	115.5	16	-+1	113	15.5	8.8E-09
ST-45A	Marcellus	6-172	110.2	18.4	93	115.5	16	+3	107	19.2	2.9E-08
ST-46A	Marcellus	6-184	111.3	17.0	97	115.5	16	+4	112	19.9	7.5E-09
ST-47A	Marcellus	6-187	113.0	15.9	96	115.5	16	+1	111	17.0	1.1E-08
ST-48A	Marcellus	6-193	110.8	18.0	93	115.5	16	+1	107	17.4	1.3E-08
ST-49A	Marcellus	6-202	112.4	16.5	95	115.5	16	+2	110	17.7	2.9E-08
ST-50A	Marcellus	6-209	112.4	17.4	93	115.5	16	+3	107	19.1	1.9E-08
ST-51A	Marcellus	6-211	112.4	16.5	98	115.5	16	+2	113	18.1	1.3E-08
ST-52A	Marcellus	6-222	110.3	18.3	96	115.5	16	+2	111	18.2	1.8E-08
ST-53A	Marcellus	6-231	112.7	17.9	99	115.5	16	+1	114	17.1	1.3E-08
ST-54A	Marcellus	6-243	112.0	18.0	100	115.5	16	+3	116	18.6	1.2E-08
ST-55A	Marcellus	6-258	111.7	17.6	101	115.5	16	-+3	117	13.4	2.4E-08
ST-56A	Marcellus	6-279	112	15.1	97	115.5	16	+2	114	17.5	1.1E-08

Number of QA samples: 28

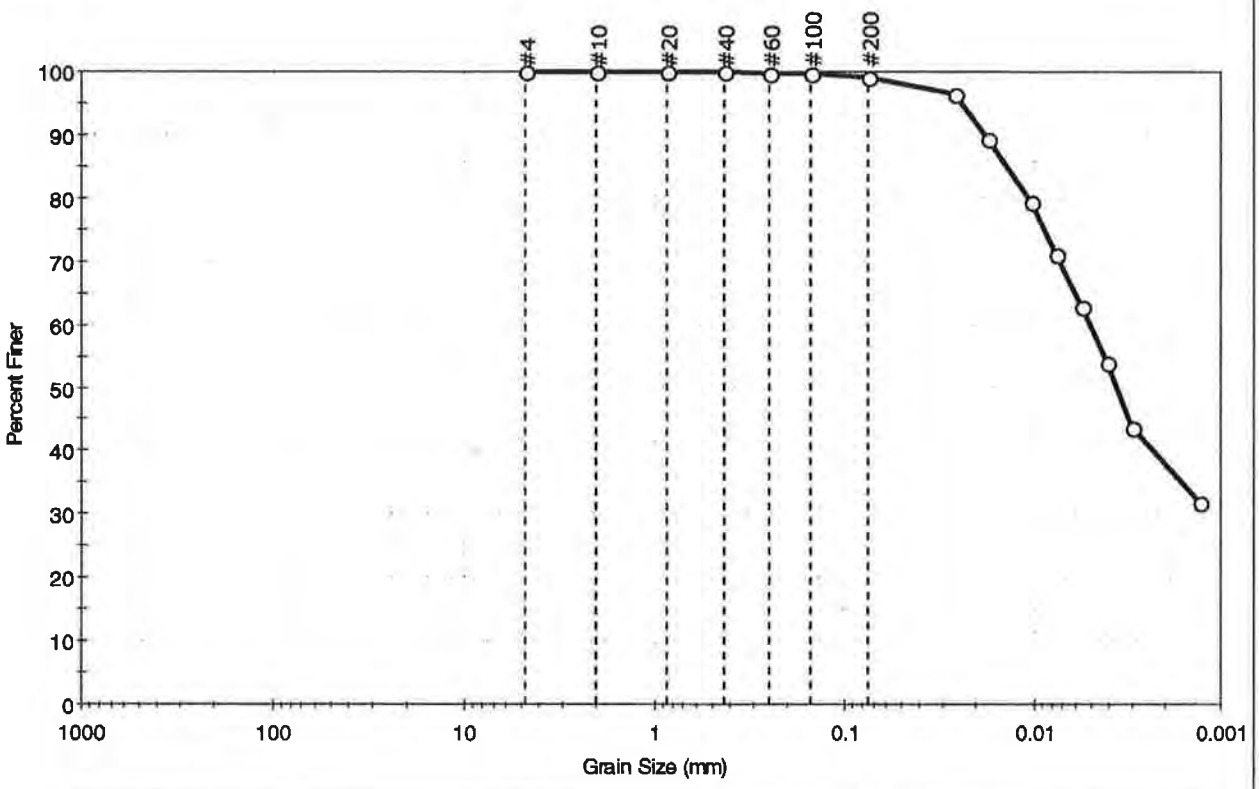
Notes: LP material mixed with 10% granular bentonite was used to backfill perforations in LP layer.
Hydraulic conductivity tests performed at 20.8 psi consolidation pressure.

Index Testing

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	LP-103	Test Date:	04/03/12	Checked By:	jdt
Depth :	---	Test Id:	233269		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

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



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

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
---	0.0260	96		
---	0.0174	89		
---	0.0104	79		
---	0.0077	71		
---	0.0056	63		
---	0.0041	54		
---	0.0030	44		
---	0.0013	32		

Coefficients

D_{85} = 0.0139 mm D_{30} = N/A
D_{60} = 0.0051 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 (16))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	LP-103	Test Date:	04/10/12	Checked By:	jdt
Depth :	---	Sample Id:	112011		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	LP-103	---	Moist, dark reddish brown clay	18.5

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	LP-103	Test Date:	04/10/12	Checked By:	jdt
Depth :	---	Test Id:	233268		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

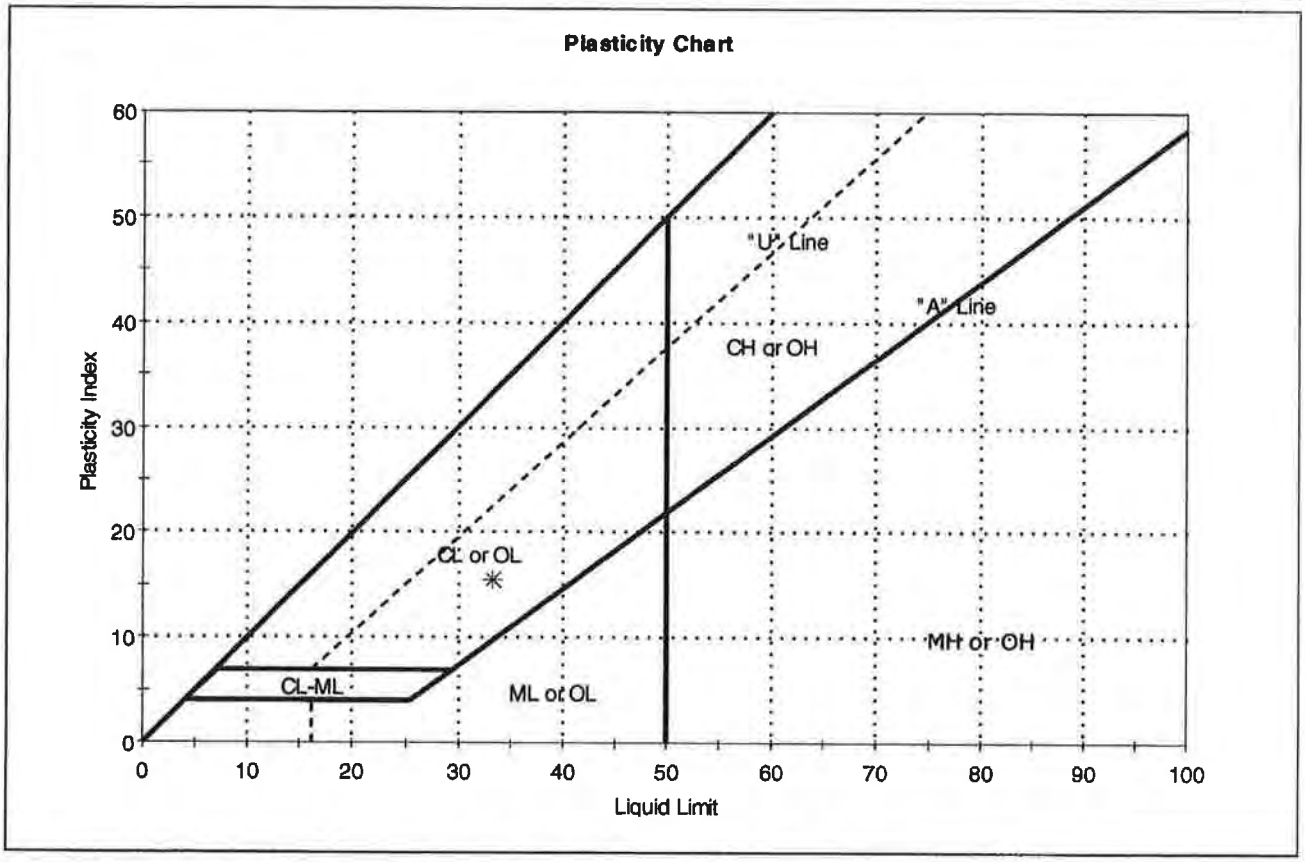
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	LP-103	---	lean clay	CL	0.0	0.9	99.1

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	LP-103	Test Date:	04/06/12	Checked By:	jdt
Depth :	---	Test Id:	233267		
Test Comment:	---				
Sample Description:	Moist, dark 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-103	---	---	18	33	18	15	0	lean clay (CL)

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	LP-103	Test Date:	04/03/12	Checked By:	jdt
Depth :	---	Test Id:	233271		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

Moisture, Ash, and Organic Matter - ASTM D 2974

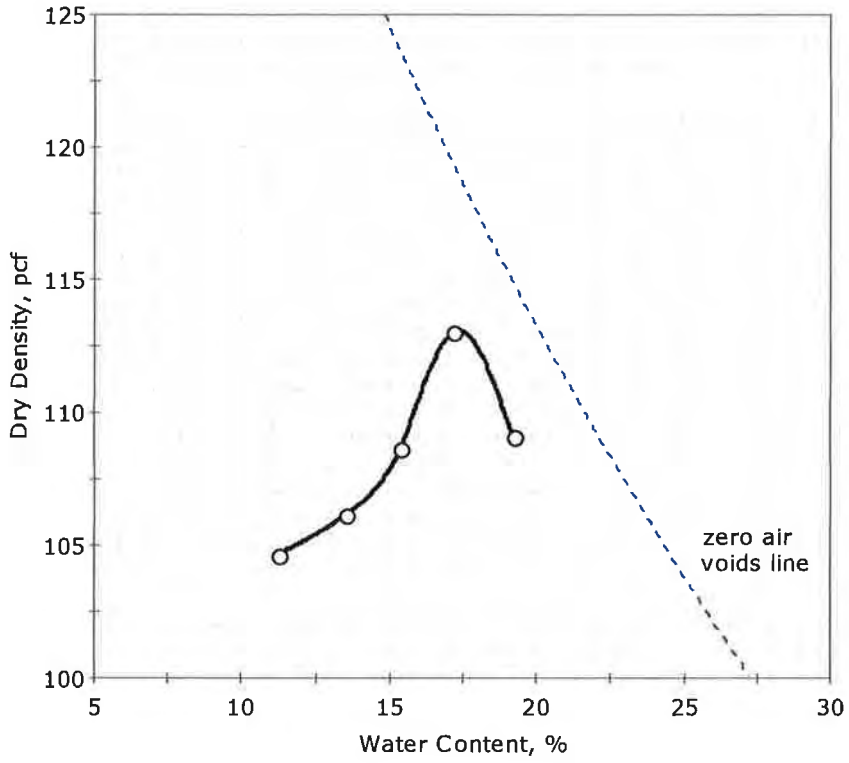
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
---	LP-103	---	Moist, dark reddish brown clay	18	99.7	.3

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	kdm
Sample ID:	LP-103	Test Date:	04/10/12	Checked By:	jdt
Depth :	---	Test Id:	233272		
Test Comment:	---				
Sample Description:	Moist, dark 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	104.6	106.1	108.6	113.0	109.1
Moisture Content, %	11.2	13.5	15.4	17.2	19.2

Method : A

Preparation : WET

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.85

Maximum Dry Density= 113.0 pcf

Optimum Moisture= 17.5 %

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GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	4/11/2012	Tested By:	ema
End Date:	4/13/2012	Checked By:	njh
Boring #:	---		
Sample #:	LP-103		
Depth:	---		
Visual Description:	Moist, dark 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 distilled water
Orientation:	Vertical	Cell #:	19/5

Sample Preparation: Target Compaction: 95% of the Maximum Dry Density (113 pcf) at the Optimum Moisture Content (17.5%). Values specified by client. Trimmings moisture content = 14.6%

Parameter	Initial	Final
Height, in	2.00	1.99
Diameter, in	2.85	2.83
Area, in^2	6.38	6.29
Volume, in^3	12.8	12.5
Mass, g	422	436
Bulk Density, pcf	126	132
Moisture Content, %	15.3	18.9
Dry Density, pcf	109	111
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.45	Pressure Increment, psi:	5.04
Sample Pressure, psi:	74.79	B Coefficient:	0.988

FLOW DATA

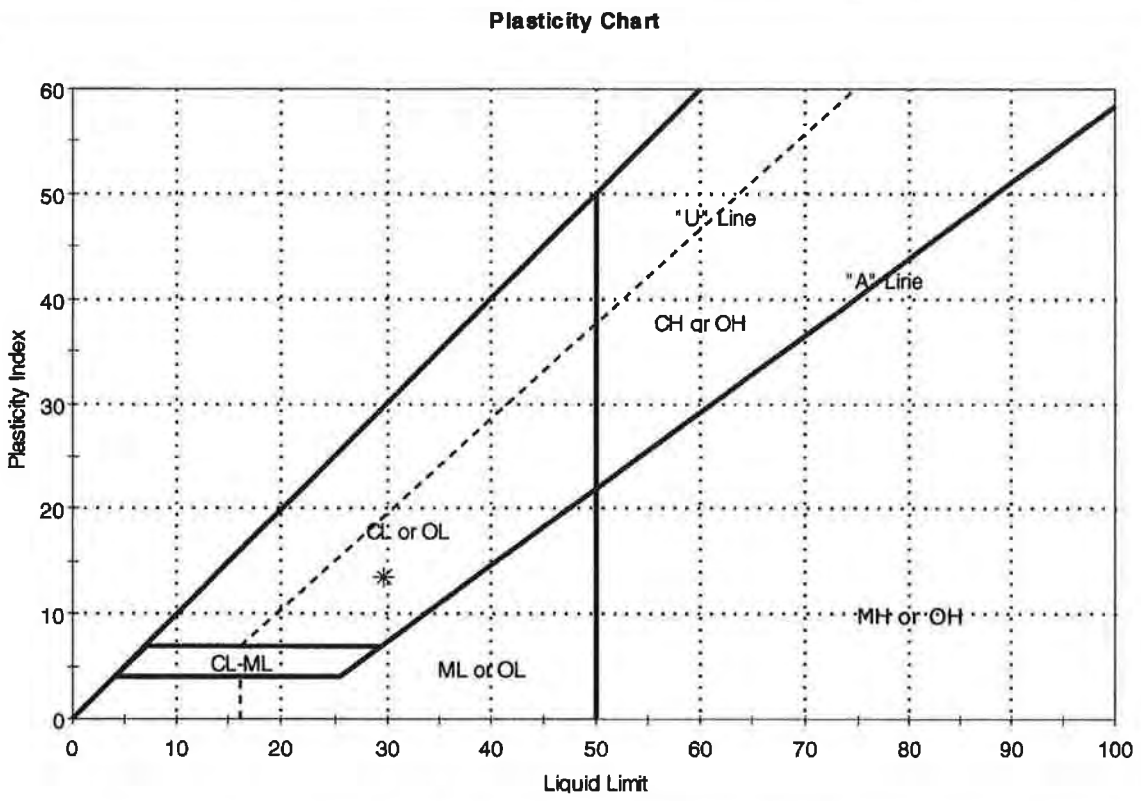
Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,	R_t	Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C		cm/sec
4/13	1	90	69.2	9.0	8.9	0.1	99	22.4	3.5E-08	20	1.000	3.5E-08
4/13	2	90	69.2	9.0	8.9	0.1	109	22.4	3.2E-08	20	1.000	3.2E-08
4/13	3	90	69.2	9.0	8.9	0.1	115	22.4	3.0E-08	20	1.000	3.0E-08
4/13	4	90	69.2	9.0	8.9	0.1	117	22.4	3.0E-08	20	1.000	3.0E-08

PERMEABILITY AT 20° C: 3.2 x 10^{-8} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	LP-106	Test Date:	04/23/12	Checked By:	jdt
Depth :	---	Test Id:	234358		
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-106	---	---	13	30	16	14	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilentancy: SLOW

Toughness: LOW

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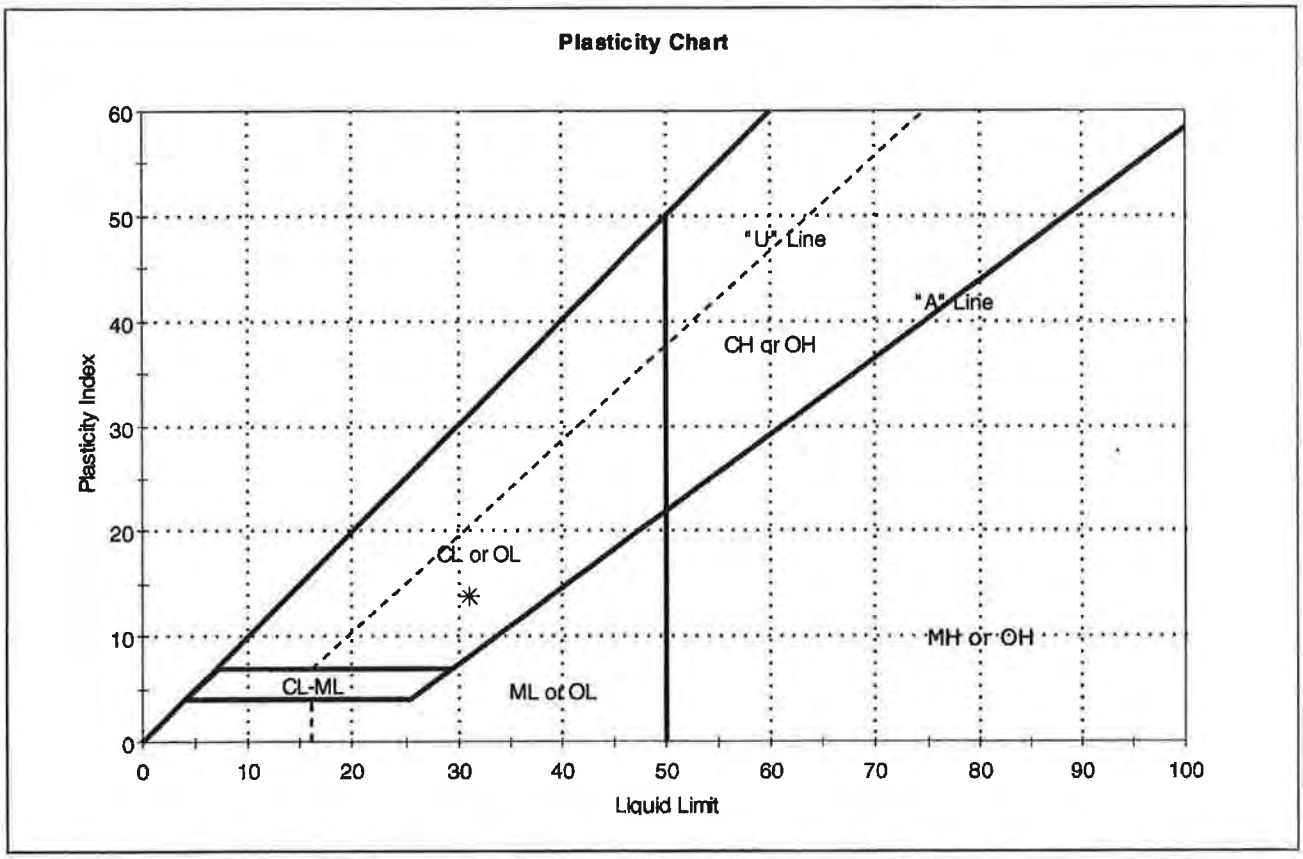
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	LP-107	Test Date:	04/23/12	Checked By:	jdt
Depth :	---	Test Id:	234359		
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-107	---	---	14	31	17	14	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilentancy: SLOW

Toughness: LOW

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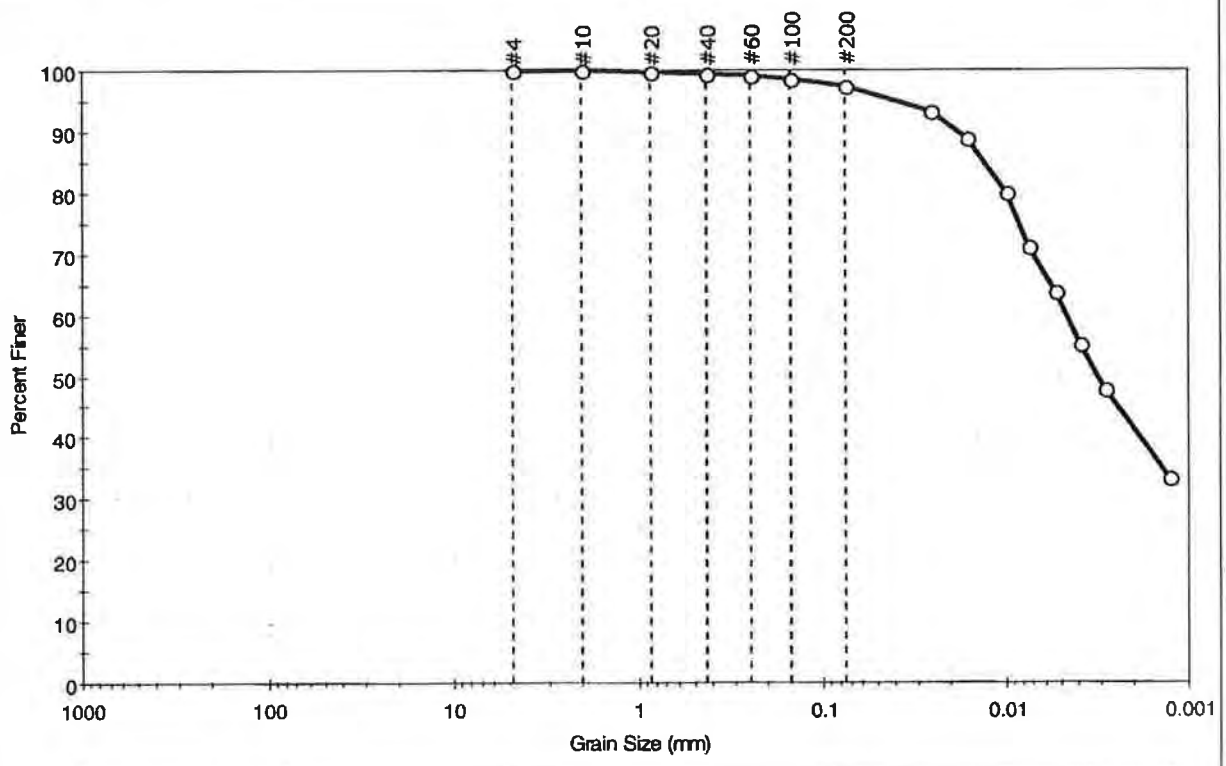
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type:	bucket	Tested By:	jbr
Sample ID:LP-108		Test Date:	04/20/12	Checked By:	jdt
Depth : ---		Test Id:	234362		
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
—	0.0	2.5	97.5

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	99		
#60	0.25	99		
#100	0.15	99		
#200	0.075	97		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0257	93		
---	0.0164	89		
---	0.0099	80		
---	0.0073	71		
---	0.0053	64		
---	0.0039	55		
---	0.0029	48		
---	0.0013	33		

Coefficients

D_{85} = 0.0132 mm D_{30} = N/A
D_{60} = 0.0046 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 (16))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	LP-108	Test Date:	04/25/12	Checked By:	jdt
Depth :	---	Test Id:	234361		
Test Comment:	---				
Sample Description:	Moist, reddish brown clay				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	LP-108	---	lean clay	CL	0.0	2.5	97.5

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	LP-108	Test Date:	04/25/12	Checked By:	jdt
Depth :	---	Sample Id:	112554		
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-108	---	Moist, reddish brown clay	13

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type:	bucket	Tested By:	jek
Sample ID:LP-108		Test Date:	04/20/12	Checked By:	jdt
Depth : ---		Test Id:	234364		
Test Comment:	---				
Sample Description:	Moist, reddish brown clay				
Sample Comment:	---				

Moisture, Ash, and Organic Matter - ASTM D 2974

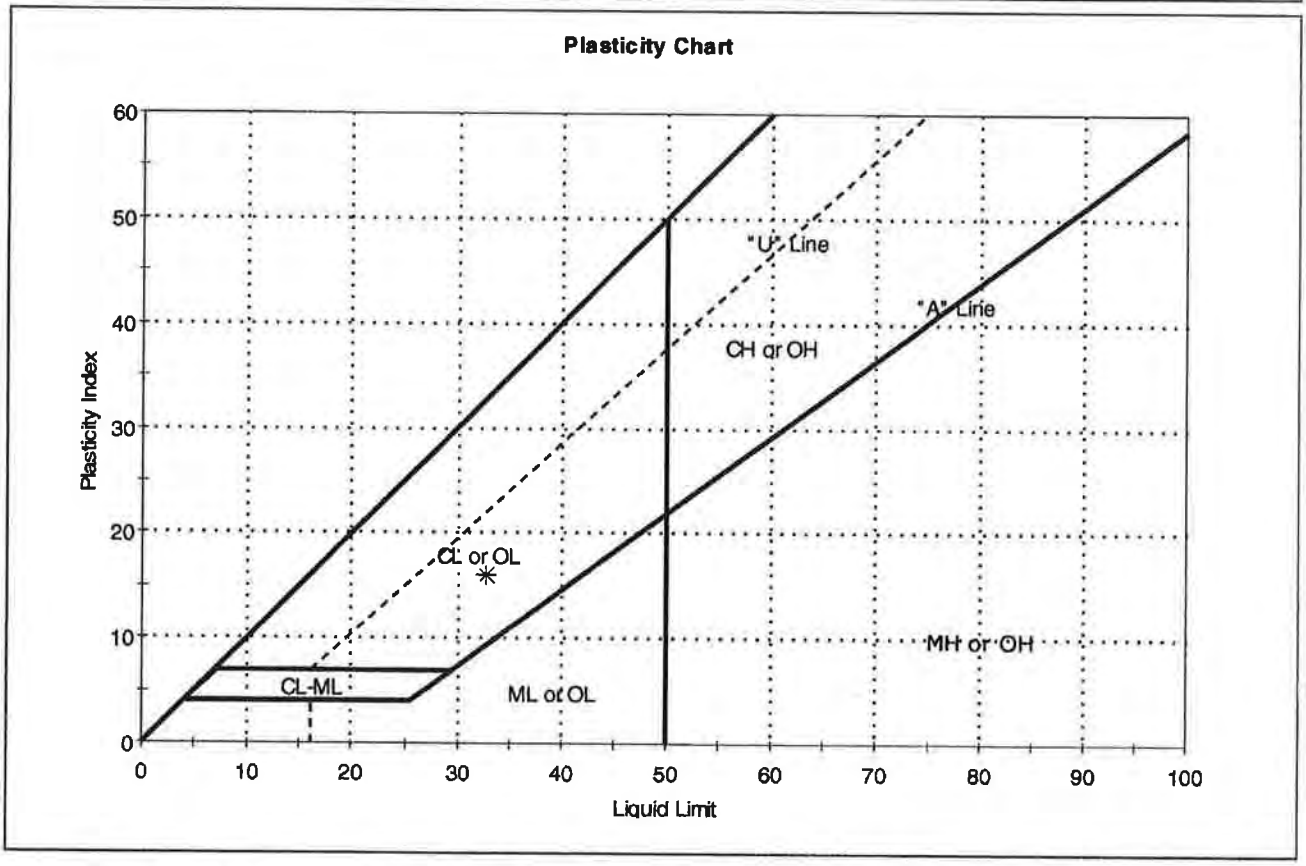
Boring ID	Sample ID	Depth	Description	Moisture Content,%	Ash Content,%	Organic Matter,%
---	LP-108	---	Moist, reddish brown clay	13	99.6	.4

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	LP-108	Test Date:	04/23/12	Checked By:	jdt
Depth :	---	Test Id:	234360		
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-108	---	---	13	33	17	16	0	lean clay (CL)

Sample Prepared using the WET method
1% Retained on #40 Sieve
Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: LOW

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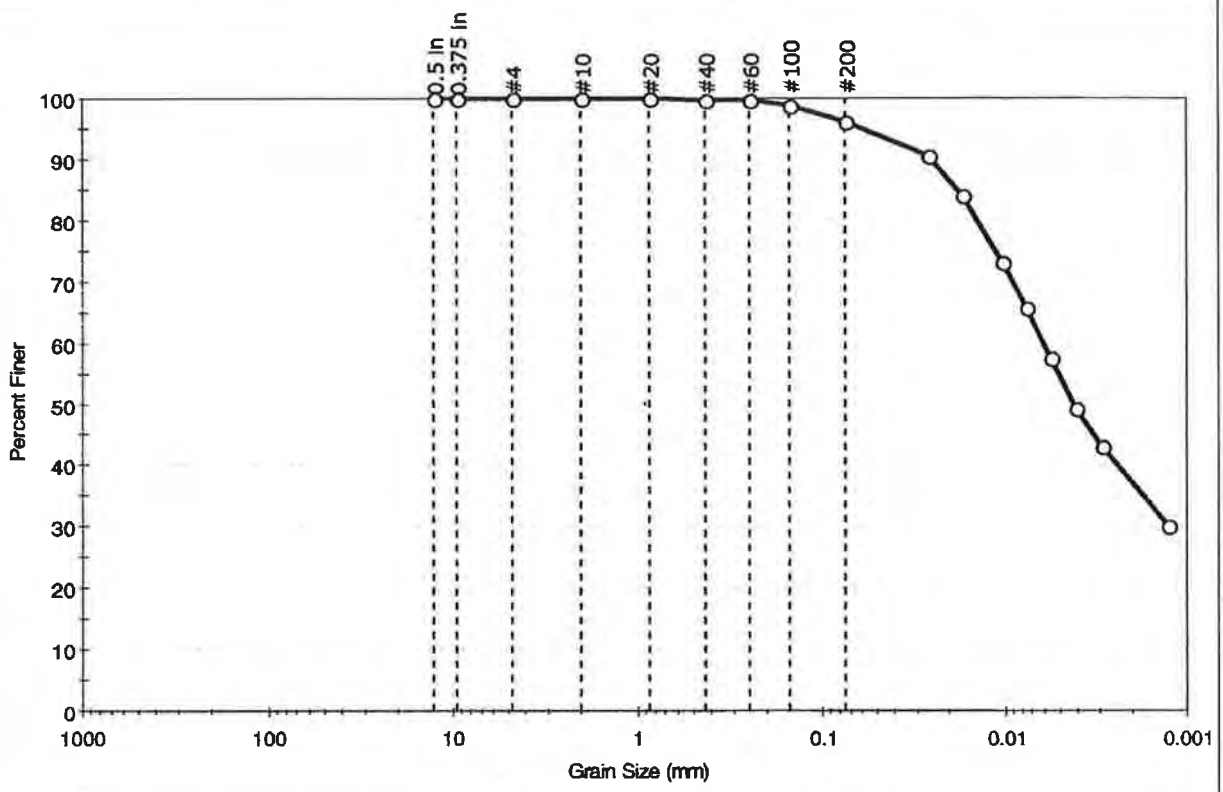
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	LP-128	Test Date:	05/14/12	Checked By:	jdt
Depth :	---	Test Id:	235831		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	3.8	96.2

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	96		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0261	91		
---	0.0171	84		
---	0.0104	73		
---	0.0076	66		
---	0.0056	57		
---	0.0041	49		
---	0.0029	43		
---	0.0013	30		

Coefficients

D_{85} = 0.0181 mm D_{30} = N/A
D_{60} = 0.0061 mm D_{15} = N/A
D_{50} = 0.0042 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-6 (12))

Sample/Test Description

Sand/Gravel Particle Shape :

Sand/Gravel Hardness :

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	LP-128	Test Date:	05/17/12	Checked By:	jdt
Depth :	---	Sample Id:	113452		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	LP-128	---	Moist, dark reddish brown clay	17.6

Notes: Temperature of Drying : 110° Celsius

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jek
Sample ID:	LP-128	Test Date:	05/16/12	Checked By:	jdt
Depth :	---	Test Id:	235832		
Test Comment:	---				
Sample Description:	Moist, dark 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-128	---	Moist, dark reddish brown clay	18	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

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	LP-128	Test Date:	05/17/12	Checked By:	jdt
Depth :	---	Test Id:	235830		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

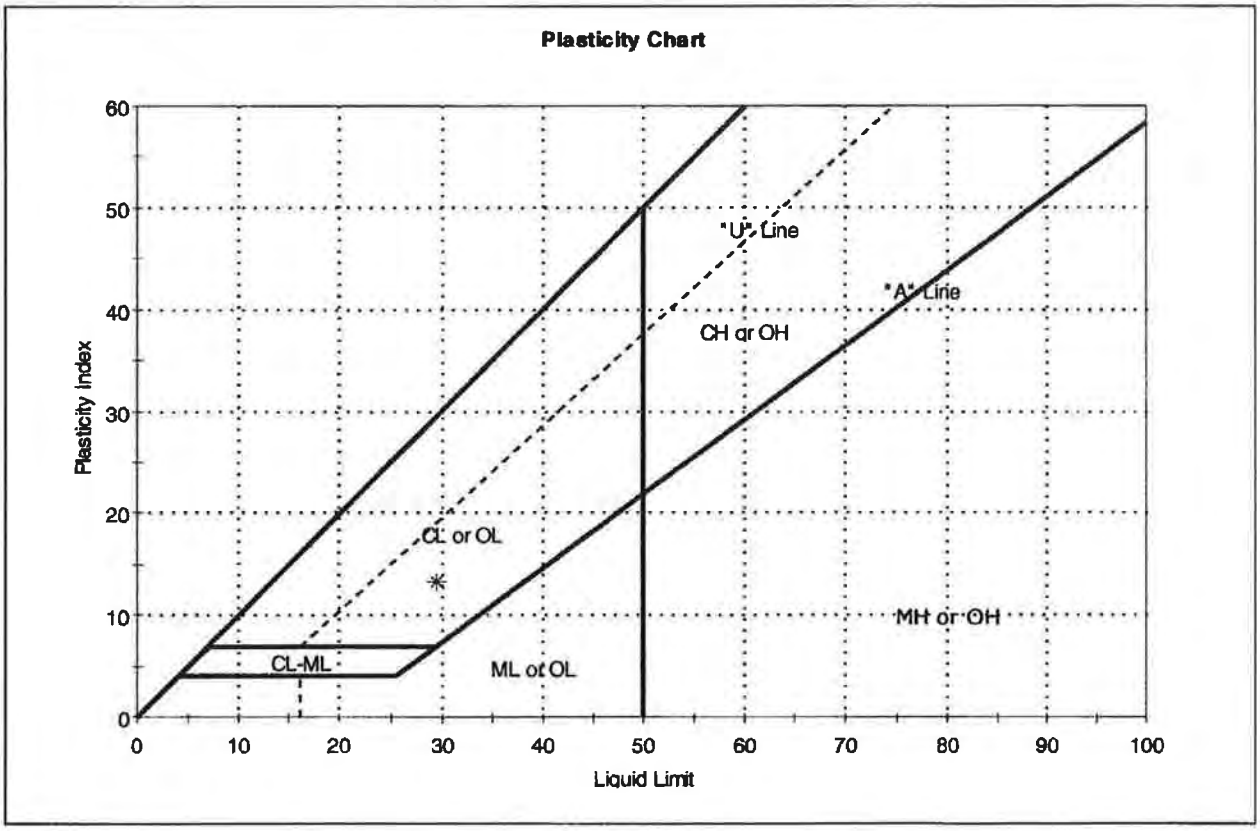
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	LP-128	---	lean clay	CL	0.0	3.8	96.2

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	LP-128	Test Date:	05/16/12	Checked By:	jdt
Depth :	---	Test Id:	235826		
Test Comment:	---				
Sample Description:	Moist, dark 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-128	---	---	18	29	16	13	0	lean clay (CL)

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

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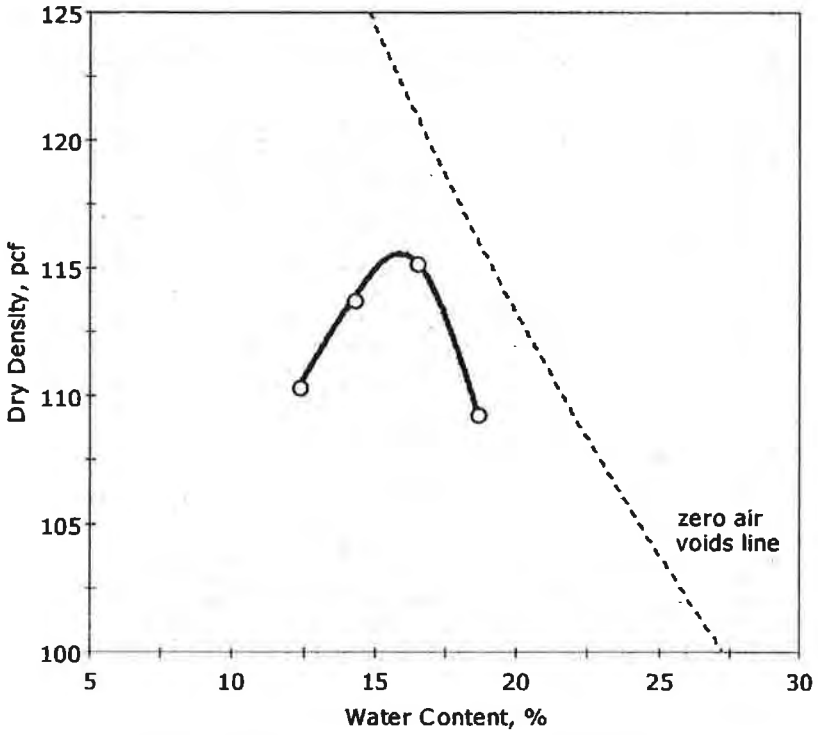
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type:	bucket	Tested By:	cwd
Sample ID:LP-128		Test Date:	05/15/12	Checked By:	jdt
Depth : ---		Test Id:	235834		
Test Comment:	---				
Sample Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

Compaction Report - ASTM D 698



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	110.4	113.8	115.3	109.3
Moisture Content, %	12.3	14.2	16.5	18.6

Method : A

Preparation : DRY

As received Moisture :

Rammer : Manual

Zero voids line based on assumed specific gravity of 2.85

Maximum Dry Density= 115.5 pcf

Optimum Moisture= 16.0 %

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GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/16/2012	Tested By:	ema
End Date:	5/17/2012	Checked By:	jdt
Boring #:	---		
Sample #:	LP-128		
Depth:	---		
Visual Description:	Moist, dark 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 distilled water
Orientation:	Vertical	Cell #:	5/12/15

Sample Preparation: Target Compaction: 95% of the Maximum Dry Density (115.5 pcf) at the Optimum Moisture Content (16.0%). Values specified by client. Trimmings moisture content = 16.4%

Parameter	Initial	Final
Height, in	2.00	1.92
Diameter, in	2.85	2.81
Area, in^2	6.38	6.20
Volume, in^3	12.8	11.9
Mass, g	427	430
Bulk Density, pcf	127	137
Moisture Content, %	16.1	16.9
Dry Density, pcf	110	117
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	94.7	Pressure Increment, psi:	4.95
Sample Pressure, psi:	74.5	B Coefficient:	0.97

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,		Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C	R_t	cm/sec
5/17	1	90	69.2	11.0	10.9	0.1	262	28.4	1.1E-08	20	1.000	1.1E-08
5/17	2	90	69.2	11.0	10.9	0.1	258	28.4	1.1E-08	20	1.000	1.1E-08
5/17	3	90	69.2	11.0	10.9	0.1	272	28.4	1.0E-08	20	1.000	1.0E-08
5/17	4	90	69.2	11.0	10.9	0.1	277	28.4	1.0E-08	20	1.000	1.0E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	jek
Sample ID:	LP-129	Test Date:	05/17/12	Checked By:	jdt
Depth :	---	Sample Id:	113453		
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-129	---	Moist, reddish brown clay	19.5

Notes: Temperature of Drying : 110º Celsius

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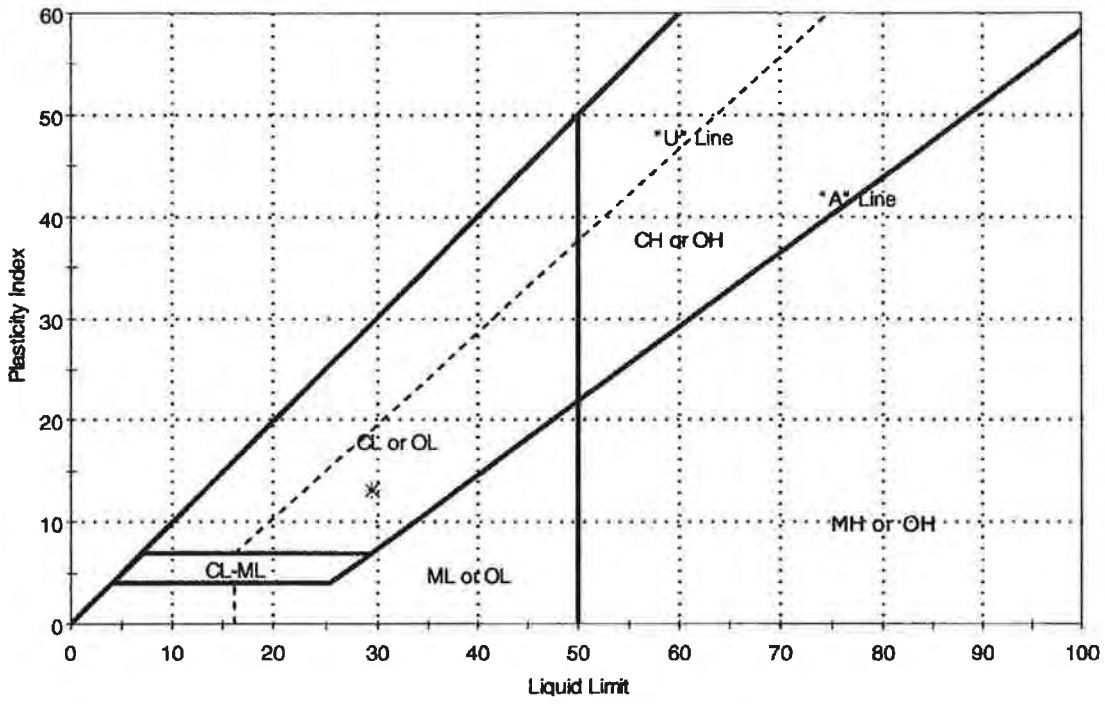
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	cam
Sample ID:	LP-129	Test Date:	05/17/12	Checked By:	jdt
Depth :	---	Test Id:	235827		
Test Comment:	---				
Sample Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Plasticity Chart



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	LP-129	---	---	19	30	16	14	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilentancy: SLOW

Toughness: LOW

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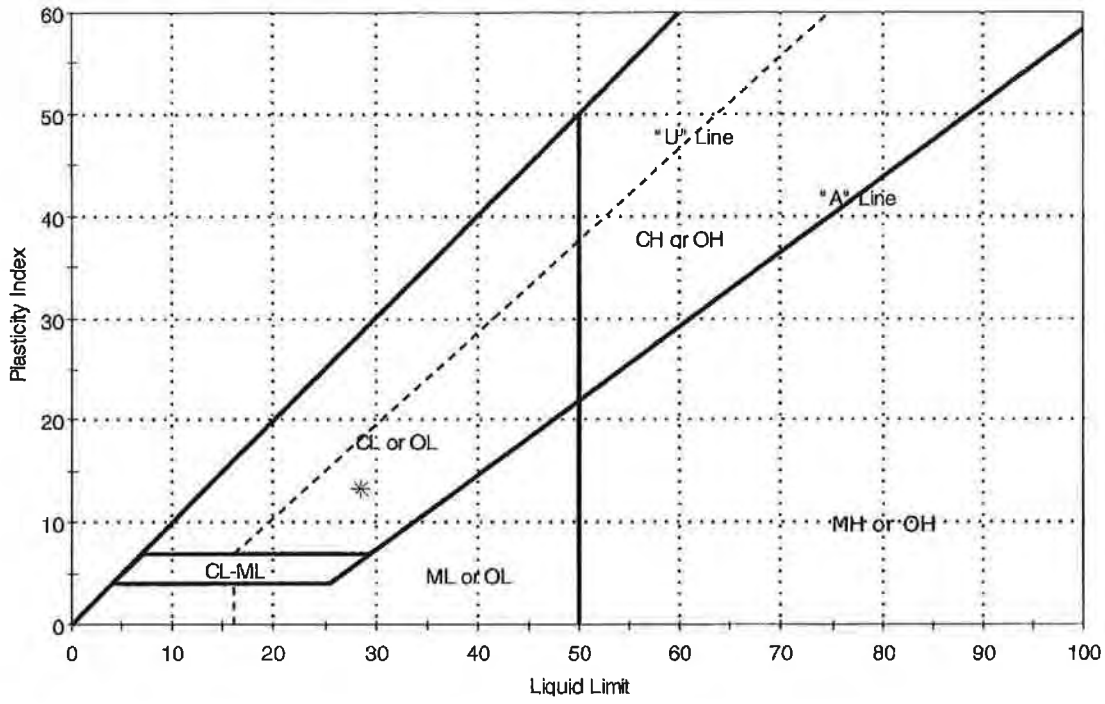
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-051B	Test Date:	10/18/12	Checked By:	jdt
Depth :	---	Test Id:	252067		
Test Comment:	---				
Sample Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Plasticity Chart



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	ST-051B	---	---	16	28	15	13	0	

Sample Prepared using the WET method

Dry Strength: HIGH
Dilentancy: SLOW
Toughness: LOW

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	tube	Tested By:	jek
Sample ID:	ST-051B	Test Date:	10/25/12	Checked By:	jdt
Depth :	---	Sample Id:	122187		
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,%
---	ST-051B	---	Moist, reddish brown clay	15.7

Notes: Temperature of Drying : 110° Celsius

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GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/13/2012	Tested By:	ema
End Date:	6/15/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-052A		
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 distilled 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	2.32	2.16
Diameter, in	2.71	2.75
Area, in^2	5.77	5.94
Volume, in^3	13.4	12.8
Mass, g	462	454
Bulk Density, pcf	131	134
Moisture Content, %	18.2	16.0
Dry Density, pcf	111	116
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.07
Sample Pressure, psi:	74.2	B Coefficient:	0.95

FLOW DATA

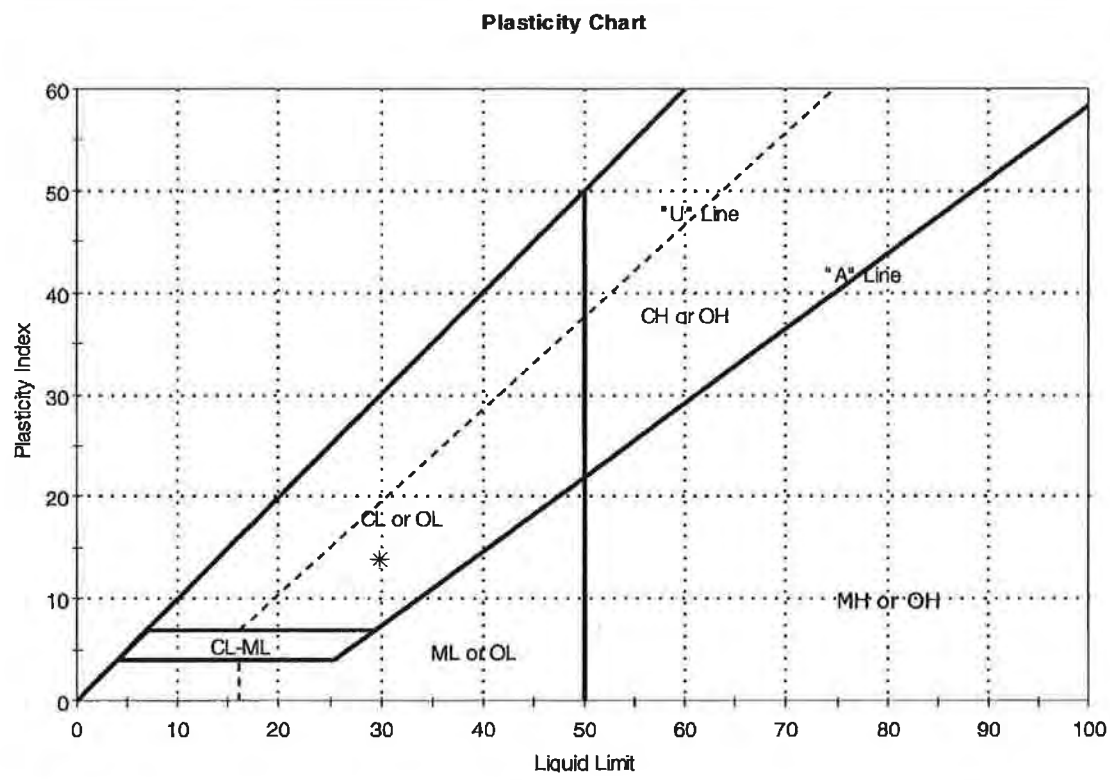
Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
06/14	1	90.0	69.2	12.0	11.9	0.1	154	27.6	1.9E-08	20	1.000	1.9E-08
06/14	2	90.0	69.2	12.0	11.9	0.1	161	27.6	1.9E-08	20	1.000	1.9E-08
06/14	3	90.0	69.2	12.0	11.9	0.1	166	27.6	1.8E-08	20	1.000	1.8E-08
06/14	4	90.0	69.2	12.0	11.9	0.1	174	27.6	1.7E-08	20	1.000	1.7E-08

PERMEABILITY AT 20° C: 1.8 x 10^{-8} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-052B	Test Date:	10/19/12	Checked By:	jdt
Depth :	---	Test Id:	252068		
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-052B	---	---	15	30	16	14	0	

Sample Prepared using the WET method

Dry Strength: HIGH
Dilentancy: SLOW
Toughness: LOW

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	tube	Tested By:	jek
Sample ID:	ST-052B	Test Date:	10/25/12	Checked By:	jdt
Depth :	---	Sample Id:	122188		
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,%
---	ST-052B	---	Moist, reddish brown clay	15.5

Notes: Temperature of Drying : 110° Celsius

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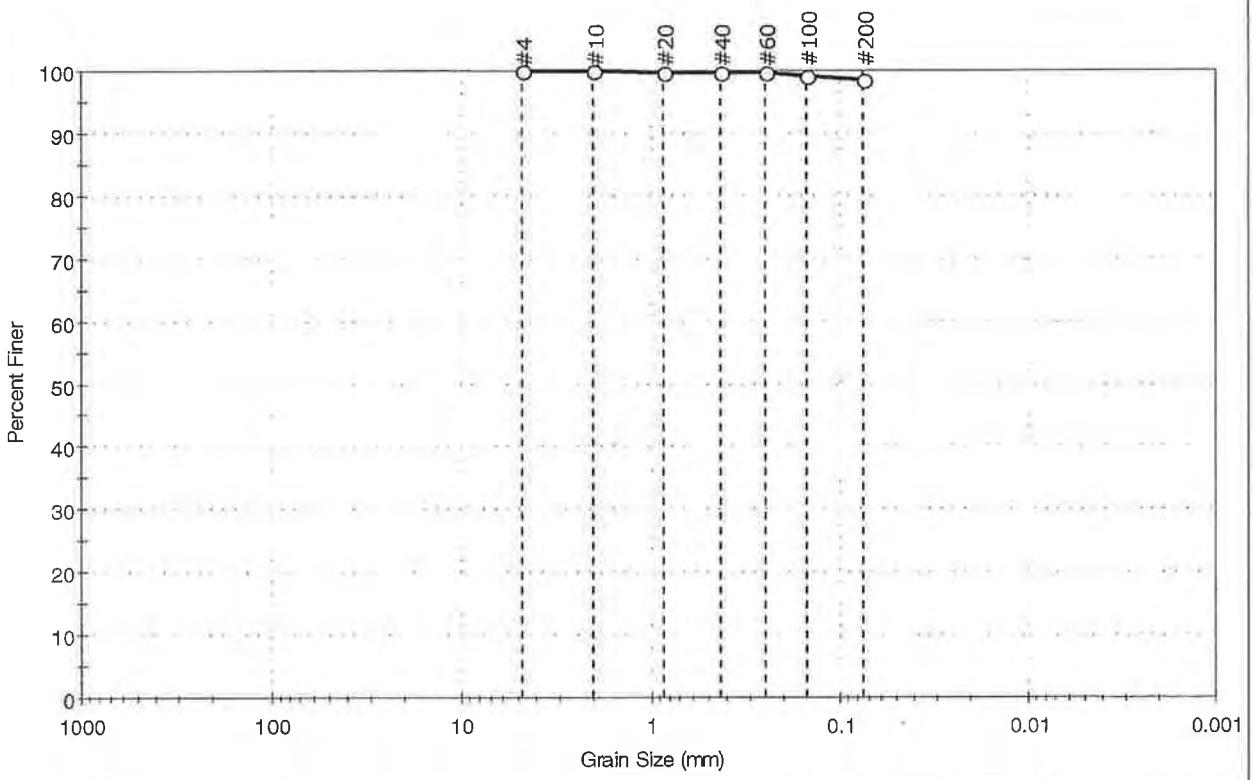
GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	jbr
Sample ID:	LP-141	Test Date:	06/25/12	Checked By:	jdt
Depth :	---	Test Id:	240787		
Test Comment:	---				
Sample Description:	Mosit, reddish brown clay				
Sample Comment:	---				

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



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	1.6	98.4

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	99		
#200	0.075	98		

Coefficients

D_{85} = N/A	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM lean clay (CL)

AASHTO Clayey Soils (A-6 (10))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project:	Onondaga SCA Phase I & II		
Location:	Camillus, NY	Project No:	GTX-11670
Boring ID: ---	Sample Type: bag	Tested By:	jek
Sample ID:LP-141	Test Date: 06/29/12	Checked By:	jdt
Depth : ---	Sample Id: 116370		
Test Comment:	---		
Sample Description:	Mosit, reddish brown clay		
Sample Comment:	---		

Moisture Content of Soil - ASTM D 2216-05

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	LP-141	---	Mosit, reddish brown clay	12.5

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	jek
Sample ID:	LP-141	Test Date:	06/29/12	Checked By:	jdt
Depth :	---	Test Id:	240788		
Test Comment:	---				
Sample Description:	Mosit, 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-141	---	Mosit, reddish brown clay	12	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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	jek
Sample ID:	LP-141	Test Date:	06/29/12	Checked By:	jdt
Depth :	---	Test Id:	240785		
Test Comment:	---				
Sample Description:	Mosit, reddish brown clay				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

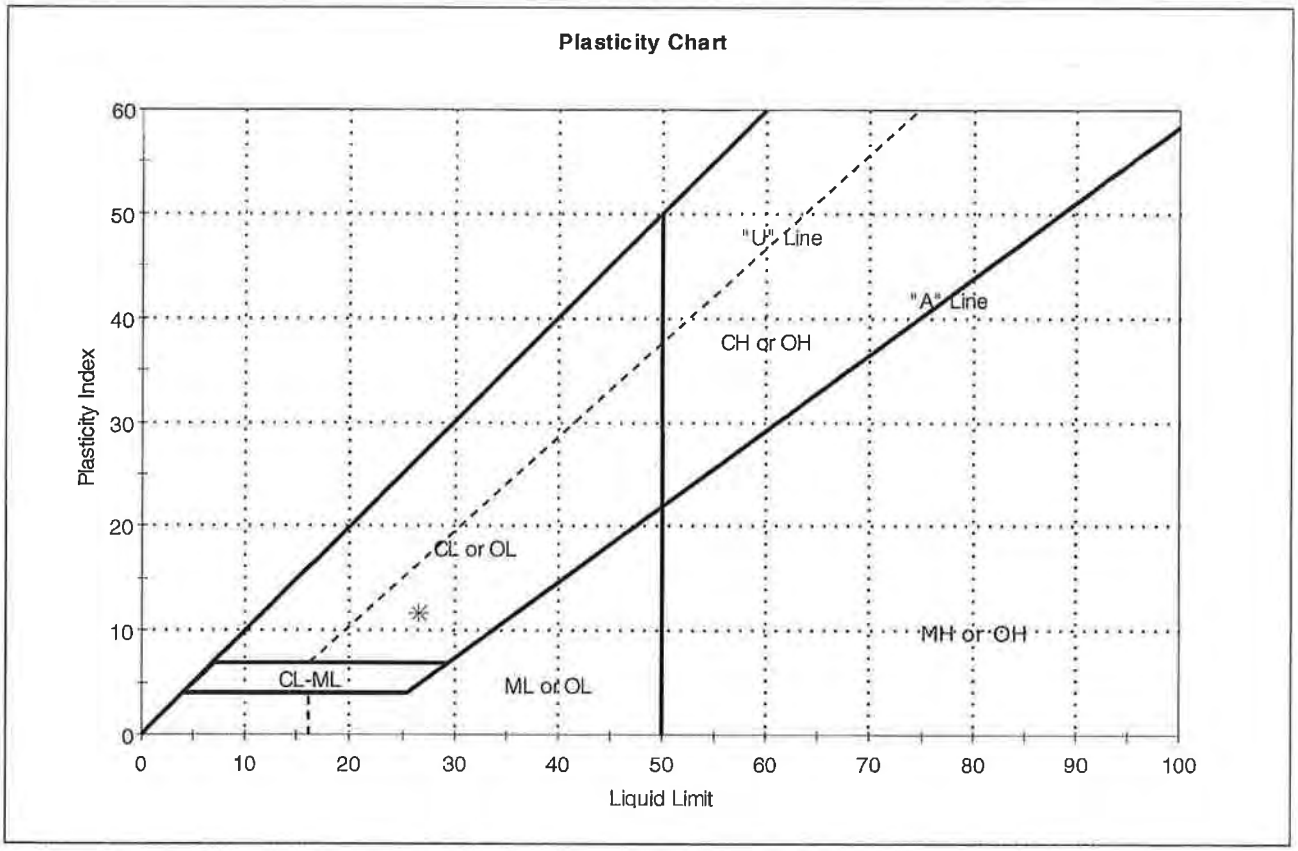
Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	LP-141	---	lean clay	CL	0.0	1.6	98.4

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	cam
Sample ID:	LP-141	Test Date:	06/27/12	Checked By:	jdt
Depth :	---	Test Id:	240780		
Test Comment:	---				
Sample Description:	Mosit, 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-141	---	---	13	27	15	12	0	lean clay (CL)

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	jek
Sample ID:	LP-142	Test Date:	06/29/12	Checked By:	jdt
Depth :	---	Sample Id:	116371		
Test Comment:	---				
Sample Description:	Moist, light reddish brown clay				
Sample Comment:	---				

Moisture Content of Soil - ASTM D 2216-05

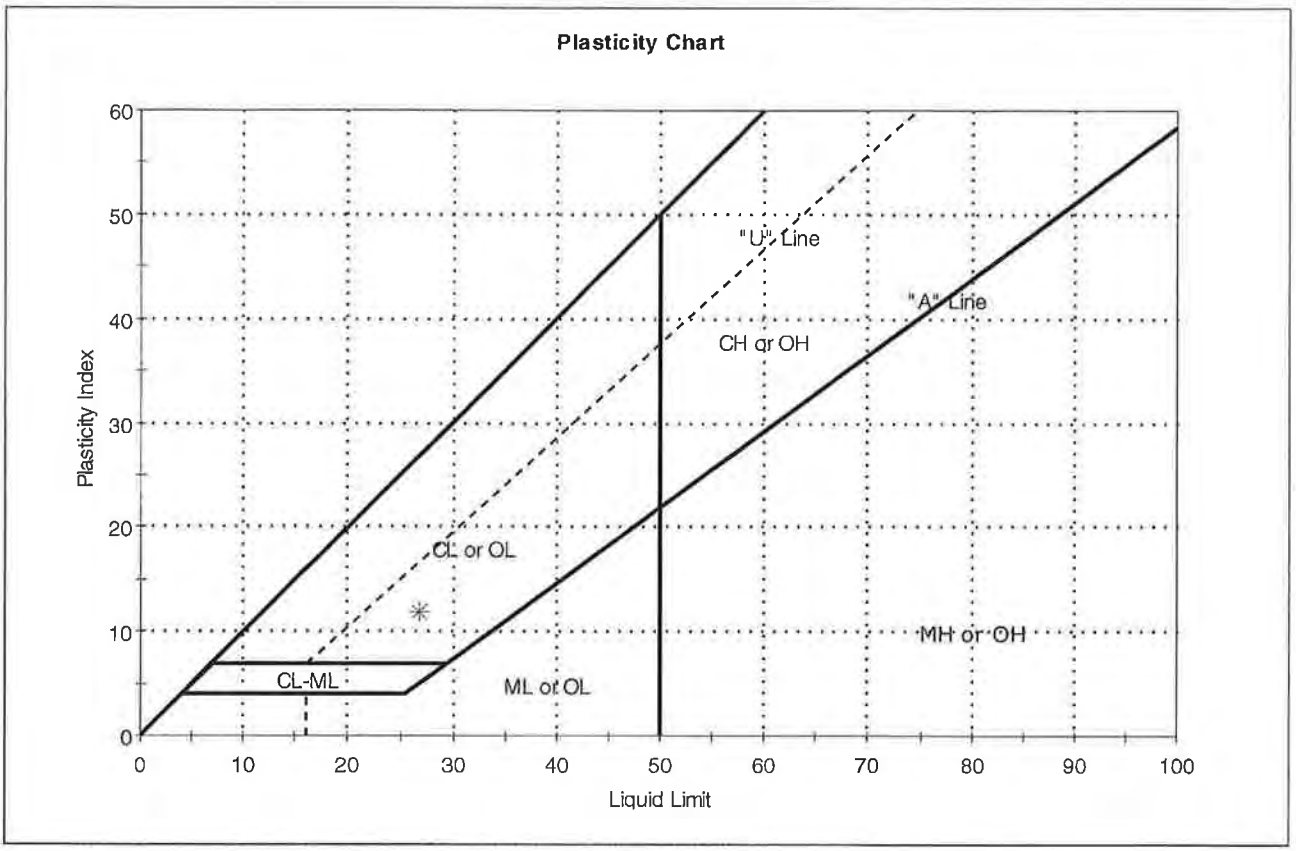
Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	LP-142	---	Moist, light reddish brown clay	15.8

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bag	Tested By:	cam
Sample ID:	LP-142	Test Date:	06/26/12	Checked By:	jdt
Depth :	---	Test Id:	240781		
Test Comment:	---				
Sample Description:	Moist, light 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-142	---	---	16	27	15	12	0	

Sample Prepared using the WET method

Dry Strength: VERY HIGH
Dilentancy: SLOW
Toughness: MEDIUM

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Thin-Walled Tube Samples

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	4/18/2012	Tested By:	ema
End Date:	4/20/2012	Checked By:	mpd
Boring #:	---		
Sample #:	ST-029A		
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 distilled 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 = 19.1%.

Parameter	Initial	Final
Height, in	3.09	2.91
Diameter, in	2.88	2.90
Area, in^2	6.51	6.61
Volume, in^3	20.1	19.2
Mass, g	675	661
Bulk Density, pcf	127	131
Moisture Content, %	20.7	18.2
Dry Density, pcf	106	111
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi: 95.2
Sample Pressure, psi: 74.3

Pressure Increment, psi: 4.98
B Coefficient: 0.93
*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
4/19	1	90.0	69.2	10.0	9.9	0.1	264	17.0	1.6E-08	20	1.000	1.6E-08
4/19	2	90.0	69.2	10.0	9.9	0.1	285	17.0	1.5E-08	20	1.000	1.5E-08
4/19	3	90.0	69.2	10.0	9.9	0.1	288	17.0	1.5E-08	20	1.000	1.5E-08
4/19	4	90.0	69.2	10.0	9.9	0.1	292	17.0	1.5E-08	20	1.000	1.5E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	4/19/2012	Tested By:	ema
End Date:	4/23/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-030A		
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 distilled 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 = 18.7%.

Parameter	Initial	Final
Height, in	2.68	2.64
Diameter, in	2.88	2.85
Area, in^2	6.51	6.38
Volume, in^3	17.5	16.8
Mass, g	587	576
Bulk Density, pcf	128	130
Moisture Content, %	19.4	17.0
Dry Density, pcf	107	111
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	4.99
Sample Pressure, psi:	74.2	B Coefficient:	0.90

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
04/20	1	90.0	69.2	10.0	9.9	0.1	170	18.8	2.4E-08	20	1.000	2.4E-08
04/20	2	90.0	69.2	10.0	9.9	0.1	173	18.8	2.4E-08	20	1.000	2.4E-08
04/20	3	90.0	69.2	10.0	9.9	0.1	180	18.8	2.3E-08	20	1.000	2.3E-08
04/20	4	90.0	69.2	10.0	9.9	0.1	187	18.8	2.2E-08	20	1.000	2.2E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	4/19/2012	Tested By:	ema
End Date:	4/23/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-031A		
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 distilled 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 = 19.8%.

Parameter	Initial	Final
Height, in	2.65	2.52
Diameter, in	2.80	2.79
Area, in^2	6.16	6.11
Volume, in^3	16.3	15.4
Mass, g	532	521
Bulk Density, pcf	124	128
Moisture Content, %	21.5 ✓	18.9 ✓
Dry Density, pcf	102 ✓	108 ✓
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.06
Sample Pressure, psi:	74.1	B Coefficient:	0.92

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
04/20	1	90.0	69.2	10.0	9.9	0.1	261	19.7	1.6E-08	20	1.000	1.6E-08
04/20	2	90.0	69.2	10.0	9.9	0.1	275	19.7	1.5E-08	20	1.000	1.5E-08
04/20	3	90.0	69.2	10.0	9.9	0.1	296	19.7	1.4E-08	20	1.000	1.4E-08
04/20	4	90.0	69.2	10.0	9.9	0.1	300	19.7	1.4E-08	20	1.000	1.4E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	4/20/2012	Tested By:	ema
End Date:	4/24/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-032A		
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 distilled 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 = 18.5%.

Parameter	Initial	Final
Height, in	2.43	2.37
Diameter, in	2.85	2.86
Area, in^2	6.38	6.42
Volume, in^3	15.5	15.2
Mass, g	539	526
Bulk Density, pcf	132	131
Moisture Content, %	21.4	18.4
Dry Density, pcf	109	111
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.01
Sample Pressure, psi:	74.3	B Coefficient:	0.92

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
4/23	1	90.0	69.2	10.0	9.9	0.1	335	20.9	1.1E-08	20	1.000	1.1E-08
4/23	2	90.0	69.2	10.0	9.9	0.1	341	20.9	1.1E-08	20	1.000	1.1E-08
4/23	3	90.0	69.2	10.0	9.9	0.1	360	20.9	1.0E-08	20	1.000	1.0E-08
4/23	4	90.0	69.2	10.0	9.9	0.1	376	20.9	9.7E-09	20	1.000	9.7E-09

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/15/2012	Tested By:	ema
End Date:	5/17/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-033A		
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 distilled 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 = 15.1%.

Parameter	Initial	Final
Height, in	2.31	2.26
Diameter, in	2.78	2.78
Area, in^2	6.07	6.07
Volume, in^3	14.0	13.7
Mass, g	477	478
Bulk Density, pcf	129	133
Moisture Content, %	15.8	16.1
Dry Density, pcf	112	114
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.05
Sample Pressure, psi:	74.4	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,	R_t	Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C		cm/sec
05/16	2	90.0	69.2	10.0	9.9	0.1	360	21.9	1.0E-08	20	1.000	1.0E-08
05/16	3	90.0	69.2	10.0	9.9	0.1	396	21.9	9.3E-09	20	1.000	9.3E-09
05/16	4	90.0	69.2	10.0	9.9	0.1	407	21.9	9.0E-09	20	1.000	9.0E-09
05/16	5	90.0	69.2	10.0	9.9	0.1	411	21.9	8.9E-09	20	1.000	8.9E-09

PERMEABILITY AT 20° C: 9.4×10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/15/2012	Tested By:	ema
End Date:	5/17/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-034A		
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 distilled 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 = 15.1%.

Parameter	Initial	Final
Height, in	2.14	2.14
Diameter, in	2.75	2.75
Area, in^2	5.94	5.94
Volume, in^3	12.7	12.7
Mass, g	460	459
Bulk Density, pcf	138	137
Moisture Content, %	14.2	14.0
Dry Density, pcf	120	120
Degree of Saturation, %	---	95

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 Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
05/16	1	90.0	69.2	10.0	9.9	0.1	362	23.2	9.8E-09	20	1.000	9.8E-09
05/16	2	90.0	69.2	10.0	9.9	0.1	398	23.2	8.9E-09	20	1.000	8.9E-09
05/16	3	90.0	69.2	10.0	9.9	0.1	431	23.2	8.2E-09	20	1.000	8.2E-09
05/16	4	90.0	69.2	10.0	9.9	0.1	455	23.2	7.8E-09	20	1.000	7.8E-09

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/15/2012	Tested By:	ema
End Date:	5/17/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-035A		
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 distilled 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 = 20.0%

Parameter	Initial	Final
Height, in	2.18	2.07
Diameter, in	2.78	2.78
Area, in^2	6.07	6.07
Volume, in^3	13.2	12.6
Mass, g	453	450
Bulk Density, pcf	130	136
Moisture Content, %	16.5	15.9
Dry Density, pcf	112	118
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

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_f	Permeability K @ 20 °C, cm/sec
05/16	2	90.0	69.2	11.0	10.9	0.1	428	26.4	7.1E-09	20	1.000	7.1E-09
05/16	3	90.0	69.2	11.0	10.9	0.1	439	26.4	7.0E-09	20	1.000	7.0E-09
05/16	4	90.0	69.2	11.0	10.9	0.1	451	26.4	6.8E-09	20	1.000	6.8E-09
05/16	5	90.0	69.2	11.0	10.9	0.1	460	26.4	6.6E-09	20	1.000	6.6E-09

PERMEABILITY AT 20° C: 6.9 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/18/2012	Tested By:	ema
End Date:	5/22/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-036A		
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 distilled 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 = 18.0%.

Parameter	Initial	Final
Height, in	2.31	2.25
Diameter, in	2.89	2.84
Area, in^2	6.56	6.33
Volume, in^3	15.2	14.3
Mass, g	503	499
Bulk Density, pcf	126	133
Moisture Content, %	17.7	16.7
Dry Density, pcf	107	114
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.03
Sample Pressure, psi:	74.1	B Coefficient:	0.86

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
05/21	3	90.0	69.2	11.0	10.9	0.1	224	24.3	1.4E-08	20	1.000	1.4E-08
05/21	4	90.0	69.2	11.0	10.9	0.1	265	24.3	1.2E-08	20	1.000	1.2E-08
05/21	5	90.0	69.2	11.0	10.9	0.1	270	24.3	1.2E-08	20	1.000	1.2E-08
05/21	6	90.0	69.2	11.0	10.9	0.1	278	24.3	1.1E-08	20	1.000	1.1E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/18/2012	Tested By:	ema
End Date:	5/22/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-037A		
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 distilled water
Orientation:	Vertical	Cell #:	1/4/8

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 16.4%.

Parameter	Initial	Final
Height, in	2.08	2.07
Diameter, in	2.85	2.82
Area, in^2	6.38	6.25
Volume, in^3	13.3	12.9
Mass, g	465	458
Bulk Density, pcf	133	135
Moisture Content, %	18.3	16.5
Dry Density, pcf	113	115
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.01
Sample Pressure, psi:	73.7	B Coefficient:	0.80

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
05/21	1	90.0	69.2	11.0	10.9	0.1	374	26.4	7.9E-09	20	1.000	7.9E-09
05/21	2	90.0	69.2	11.0	10.9	0.1	403	26.4	7.4E-09	20	1.000	7.4E-09
05/21	3	90.0	69.2	11.0	10.9	0.1	425	26.4	7.0E-09	20	1.000	7.0E-09
05/21	4	90.0	69.2	11.0	10.9	0.1	441	26.4	6.7E-09	20	1.000	6.7E-09

PERMEABILITY AT 20° C: 7.3 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/22/2012	Tested By:	ema
End Date:	5/24/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-038A		
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 distilled 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 = 16.6%.

Parameter	Initial	Final
Height, in	2.36	2.19
Diameter, in	2.72	2.77
Area, in^2	5.81	6.03
Volume, in^3	13.7	13.2
Mass, g	482	476
Bulk Density, pcf	134	137
Moisture Content, %	17.5	16.0
Dry Density, pcf	114	118
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.08
Sample Pressure, psi:	74.2	B Coefficient:	0.89

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
05/23	1	90.0	69.2	11.0	10.9	0.1	402	24.9	8.1E-09	20	1.000	8.1E-09
05/23	2	90.0	69.2	11.0	10.9	0.1	435	24.9	7.5E-09	20	1.000	7.5E-09
05/23	3	90.0	69.2	11.0	10.9	0.1	469	24.9	6.9E-09	20	1.000	6.9E-09
05/23	4	90.0	69.2	11.0	10.9	0.1	482	24.9	6.8E-09	20	1.000	6.8E-09

PERMEABILITY AT 20° C: 7.3 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/22/2012	Tested By:	ema
End Date:	5/24/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-039A		
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 distilled water
Orientation:	Vertical	Cell #:	1/7/8

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	2.24	2.14
Diameter, in	2.79	2.79
Area, in^2	6.11	6.11
Volume, in^3	13.7	13.1
Mass, g	481	477
Bulk Density, pcf	134	139
Moisture Content, %	17.4	16.3
Dry Density, pcf	114	119
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.04
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,	R_t	Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C		cm/sec
05/23	1	90.0	69.2	11.0	10.9	0.1	307	25.5	1.0E-08	20	1.000	1.0E-08
05/23	2	90.0	69.2	11.0	10.9	0.1	327	25.5	9.6E-09	20	1.000	9.6E-09
05/23	3	90.0	69.2	11.0	10.9	0.1	335	25.5	9.4E-09	20	1.000	9.4E-09
05/23	4	90.0	69.2	11.0	10.9	0.1	340	25.5	9.2E-09	20	1.000	9.2E-09

PERMEABILITY AT 20° C: 9.6 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/23/2012	Tested By:	ema
End Date:	5/25/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-040A		
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 distilled 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 = 17%.

Parameter	Initial	Final
Height, in	2.45	2.41
Diameter, in	2.80	2.78
Area, in^2	6.16	6.07
Volume, in^3	15.1	14.6
Mass, g	515	512
Bulk Density, pcf	130	133
Moisture Content, %	17.2	16.6
Dry Density, pcf	111	114
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.00
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,	R_t	Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C		cm/sec
05/24	1	90.0	69.2	11.0	10.9	0.1	288	22.6	1.2E-08	20	1.000	1.2E-08
05/24	2	90.0	69.2	11.0	10.9	0.1	290	22.6	1.2E-08	20	1.000	1.2E-08
05/24	3	90.0	69.2	11.0	10.9	0.1	295	22.6	1.2E-08	20	1.000	1.2E-08
05/24	4	90.0	69.2	11.0	10.9	0.1	300	22.6	1.2E-08	20	1.000	1.2E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/23/2012	Tested By:	ema
End Date:	5/25/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-041A		
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 distilled water
Orientation:	Vertical	Cell #:	1/4/8

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	2.41	2.40
Diameter, in	2.81	2.80
Area, in^2	6.20	6.16
Volume, in^3	14.9	14.8
Mass, g	539	533
Bulk Density, pcf	137	137
Moisture Content, %	17.8	16.4
Dry Density, pcf	116	118
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.5	Pressure Increment, psi:	5.13
Sample Pressure, psi:	74.2	B Coefficient:	0.98

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,	R_t	Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C		cm/sec
05/24	1	90.0	69.2	11.0	10.9	0.1	423	22.7	8.3E-09	20	1.000	8.3E-09
05/24	2	90.0	69.2	11.0	10.9	0.1	451	22.7	7.7E-09	20	1.000	7.7E-09
05/24	3	90.0	69.2	11.0	10.9	0.1	496	22.7	7.0E-09	20	1.000	7.0E-09
05/24	4	90.0	69.2	11.0	10.9	0.1	543	22.7	6.4E-09	20	1.000	6.4E-09

PERMEABILITY AT 20° C: 7.4 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/23/2012	Tested By:	ema
End Date:	5/25/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-042A		
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 distilled water
Orientation:	Vertical	Cell #:	2/2/4

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 17.5%.

Parameter	Initial	Final
Height, in	2.33	2.25
Diameter, in	2.79	2.79
Area, in^2	6.11	6.11
Volume, in^3	14.2	13.8
Mass, g	498	493
Bulk Density, pcf	133	136
Moisture Content, %	17.6	16.5
Dry Density, pcf	113	117
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.05
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,		Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C	R_t	cm/sec
05/24	1	90.0	69.2	11.0	10.9	0.1	421	24.3	7.8E-09	20	1.000	7.8E-09
05/24	2	90.0	69.2	11.0	10.9	0.1	454	24.3	7.3E-09	20	1.000	7.3E-09
05/24	3	90.0	69.2	11.0	10.9	0.1	477	24.3	6.9E-09	20	1.000	6.9E-09
05/24	4	90.0	69.2	11.0	10.9	0.1	494	24.3	6.7E-09	20	1.000	6.7E-09

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/24/2012	Tested By:	ema
End Date:	5/29/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-043A		
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 distilled water
Orientation:	Vertical	Cell #:	16/5/11

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 16.4%.

Parameter	Initial	Final
Height, in	2.73	2.66
Diameter, in	2.80	2.78
Area, in^2	6.16	6.07
Volume, in^3	16.8	16.1
Mass, g	588	582
Bulk Density, pcf	133	137
Moisture Content, %	16.6	15.4
Dry Density, pcf	114	119
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.4	Pressure Increment, psi:	5.11
Sample Pressure, psi:	74.1	B Coefficient:	0.97

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
5/25	1	90.0	69.2	12.0	11.9	0.1	155	22.4	2.3E-08	20	1.000	2.3E-08
5/25	2	90.0	69.2	12.0	11.9	0.1	149	22.4	2.4E-08	20	1.000	2.4E-08
5/25	3	90.0	69.2	12.0	11.9	0.1	162	22.4	2.2E-08	20	1.000	2.2E-08
5/25	4	90.0	69.2	12.0	11.9	0.1	168	22.4	2.1E-08	20	1.000	2.1E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/24/2012	Tested By:	ema
End Date:	5/29/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-044A		
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 distilled water
Orientation:	Vertical	Cell #:	2/2/4

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 15.7%.

Parameter	Initial	Final
Height, in	2.25	2.10
Diameter, in	2.83	2.81
Area, in^2	6.29	6.20
Volume, in^3	14.2	13.0
Mass, g	487	484
Bulk Density, pcf	131	141
Moisture Content, %	15.5	14.8
Dry Density, pcf	113	123
Degree of Saturation, %	---	99

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.00
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
5/25	1	90.0	69.2	12.0	11.9	0.1	294	28.3	9.5E-09	20	1.000	9.5E-09
5/25	2	90.0	69.2	12.0	11.9	0.1	310	28.3	9.0E-09	20	1.000	9.0E-09
5/25	3	90.0	69.2	12.0	11.9	0.1	325	28.3	8.6E-09	20	1.000	8.6E-09
5/25	4	90.0	69.2	12.0	11.9	0.1	347	28.3	8.0E-09	20	1.000	8.0E-09

PERMEABILITY AT 20° C: 8.8 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/30/2012	Tested By:	ema
End Date:	6/1/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-045A		
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 distilled 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 = 18.6%.

Parameter	Initial	Final
Height, in	2.99	2.86
Diameter, in	2.85	2.84
Area, in^2	6.38	6.33
Volume, in^3	19.1	18.1
Mass, g	641	630
Bulk Density, pcf	128	132
Moisture Content, %	19.2	17.1
Dry Density, pcf	107	113
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.0	Pressure Increment, psi:	4.99
Sample Pressure, psi:	74.0	B Coefficient:	0.96

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
5/31	3	90.0	69.2	12.0	11.9	0.1	122	20.8	3.0E-08	20	1.000	3.0E-08
5/31	4	90.0	69.2	12.0	11.9	0.1	128	20.8	2.9E-08	20	1.000	2.9E-08
5/31	5	90.0	69.2	12.0	11.9	0.1	134	20.8	2.8E-08	20	1.000	2.8E-08
5/31	6	90.0	69.2	12.0	11.9	0.1	137	20.8	2.7E-08	20	1.000	2.7E-08

PERMEABILITY AT 20° C: 2.9 x 10^{-8} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	5/31/2012	Tested By:	ema
End Date:	6/5/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-046A		
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 distilled 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 = 19.3%.

Parameter	Initial	Final
Height, in	2.82	2.67
Diameter, in	2.79	2.81
Area, in^2	6.11	6.20
Volume, in^3	17.2	16.6
Mass, g	609	593
Bulk Density, pcf	134	136
Moisture Content, %	19.9	16.8
Dry Density, pcf	112	117
Degree of Saturation, %	---	98

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 Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
6/1	1	90.0	69.2	12.0	11.9	0.1	426	22.3	8.3E-09	20	1.000	8.3E-09
6/1	2	90.0	69.2	12.0	11.9	0.1	453	22.3	7.8E-09	20	1.000	7.8E-09
6/1	3	90.0	69.2	12.0	11.9	0.1	489	22.3	7.2E-09	20	1.000	7.2E-09
6/1	4	90.0	69.2	12.0	11.9	0.1	519	22.3	6.8E-09	20	1.000	6.8E-09

PERMEABILITY AT 20° C: 7.5 x 10^{-9} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/1/2012	Tested By:	ema
End Date:	6/6/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-047A		
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 distilled 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 = 19.7%.

Parameter	Initial	Final
Height, in	2.69	2.56
Diameter, in	2.85	2.84
Area, in^2	6.38	6.33
Volume, in^3	17.2	16.2
Mass, g	587	579
Bulk Density, pcf	130	136
Moisture Content, %	17.0	15.5
Dry Density, pcf	111	118
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.5	Pressure Increment, psi:	4.75
Sample Pressure, psi:	73.9	B Coefficient:	0.97

FLOW DATA

Date	Trial #	Pressure, psi		Manometer Readings			Elapsed Time,	Gradient	Permeability K,	Temp,		Permeability K @ 20 °C,
		Cell	Sample	Z_1	Z_2	Z_1-Z_2	sec		cm/sec	°C	R_t	cm/sec
6/6	1	90.0	69.2	12.0	11.9	0.1	295	23.3	1.1E-08	20	1.000	1.1E-08
6/6	2	90.0	69.2	12.0	11.9	0.1	301	23.3	1.1E-08	20	1.000	1.1E-08
6/6	3	90.0	69.2	12.0	11.9	0.1	326	23.3	1.0E-08	20	1.000	1.0E-08
6/6	4	90.0	69.2	12.0	11.9	0.1	331	23.3	1.0E-08	20	1.000	1.0E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/11/2012	Tested By:	ema
End Date:	6/13/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-050A		
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 distilled water
Orientation:	Vertical	Cell #:	1/4/8

Sample Preparation: Extruded from tube, cut, trimmed and placed into permeameter at as-received density and moisture content. Trimmings moisture content = 16.5%.

Parameter	Initial	Final
Height, in	2.28	2.08
Diameter, in	2.79	2.80
Area, in^2	6.11	6.16
Volume, in^3	13.9	12.8
Mass, g	467	456
Bulk Density, pcf	127	135
Moisture Content, %	19.1	16.3
Dry Density, pcf	107	116
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.04
Sample Pressure, psi:	74.1	B Coefficient:	0.97

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
06/12	2	90.0	69.2	12.0	11.9	0.1	131	28.6	2.1E-08	20	1.000	2.1E-08
06/12	3	90.0	69.2	12.0	11.9	0.1	143	28.6	1.9E-08	20	1.000	1.9E-08
06/12	4	90.0	69.2	12.0	11.9	0.1	148	28.6	1.9E-08	20	1.000	1.9E-08
06/12	5	90.0	69.2	12.0	11.9	0.1	154	28.6	1.8E-08	20	1.000	1.8E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/11/2012	Tested By:	ema
End Date:	6/13/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-051A		
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 distilled 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 = 18.5%.

Parameter	Initial	Final
Height, in	2.45	2.33
Diameter, in	2.75	2.78
Area, in^2	5.94	6.07
Volume, in^3	14.6	14.1
Mass, g	512	503
Bulk Density, pcf	134	135
Moisture Content, %	18.1	15.9
Dry Density, pcf	113	117
Degree of Saturation, %	---	96

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.1	Pressure Increment, psi:	5.05
Sample Pressure, psi:	74.1	B Coefficient:	0.96

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
06/12	1	90.0	69.2	12.0	11.9	0.1	235	25.5	1.3E-08	20	1.000	1.3E-08
06/12	2	90.0	69.2	12.0	11.9	0.1	246	25.5	1.3E-08	20	1.000	1.3E-08
06/12	3	90.0	69.2	12.0	11.9	0.1	251	25.5	1.3E-08	20	1.000	1.3E-08
06/12	4	90.0	69.2	12.0	11.9	0.1	259	25.5	1.2E-08	20	1.000	1.2E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/13/2012	Tested By:	ema
End Date:	6/15/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-053A		
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 distilled 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 = 16.7%.

Parameter	Initial	Final
Height, in	1.97	1.89
Diameter, in	2.75	2.74
Area, in^2	5.94	5.90
Volume, in^3	11.7	11.1
Mass, g	411	402
Bulk Density, pcf	133	137
Moisture Content, %	17.1	14.8
Dry Density, pcf	114	120
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.10
Sample Pressure, psi:	74.1	B Coefficient:	0.96

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
06/14	1	90.0	69.2	12.0	11.9	0.1	181	31.5	1.5E-08	20	1.000	1.5E-08
06/14	2	90.0	69.2	12.0	11.9	0.1	195	31.5	1.4E-08	20	1.000	1.4E-08
06/14	3	90.0	69.2	12.0	11.9	0.1	200	31.5	1.3E-08	20	1.000	1.3E-08
06/14	4	90.0	69.2	12.0	11.9	0.1	213	31.5	1.2E-08	20	1.000	1.2E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/15/2012	Tested By:	ema
End Date:	6/19/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-054A		
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 distilled water
Orientation:	Vertical	Cell #:	2/2/4

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	2.30	2.24
Diameter, in	2.80	2.85
Area, in^2	6.16	6.38
Volume, in^3	14.2	14.3
Mass, g	514	504
Bulk Density, pcf	138	134
Moisture Content, %	18.6	16.2
Dry Density, pcf	116	115
Degree of Saturation, %	---	95

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.4	Pressure Increment, psi:	4.98
Sample Pressure, psi:	73.9	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
06/18	1	90.0	69.2	12.0	11.9	0.1	230	26.6	1.3E-08	20	1.000	1.3E-08
06/18	2	90.0	69.2	12.0	11.9	0.1	235	26.6	1.2E-08	20	1.000	1.2E-08
06/18	3	90.0	69.2	12.0	11.9	0.1	246	26.6	1.2E-08	20	1.000	1.2E-08
06/18	4	90.0	69.2	12.0	11.9	0.1	251	26.6	1.1E-08	20	1.000	1.1E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/18/2012	Tested By:	ema
End Date:	6/20/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-055A		
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 distilled 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 = 15%.

Parameter	Initial	Final
Height, in	2.29	2.20
Diameter, in	2.80	2.76
Area, in^2	6.16	5.98
Volume, in^3	14.1	13.2
Mass, g	490	487
Bulk Density, pcf	132	141
Moisture Content, %	13.4	12.7
Dry Density, pcf	117	125
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.0	Pressure Increment, psi:	4.98
Sample Pressure, psi:	74.0	B Coefficient:	0.97

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
6/19	1	90.0	69.2	12.0	11.9	0.1	111	27.1	2.7E-08	20	1.000	2.7E-08
6/19	2	90.0	69.2	12.0	11.9	0.1	128	27.1	2.4E-08	20	1.000	2.4E-08
6/19	3	90.0	69.2	12.0	11.9	0.1	135	27.1	2.2E-08	20	1.000	2.2E-08
6/19	4	90.0	69.2	12.0	11.9	0.1	139	27.1	2.2E-08	20	1.000	2.2E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/19/2012	Tested By:	ema
End Date:	6/21/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-056A		
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 distilled water
Orientation:	Vertical	Cell #:	16/5/11

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	2.67	2.59
Diameter, in	2.85	2.83
Area, in^2	6.38	6.29
Volume, in^3	17.0	16.3
Mass, g	601	587
Bulk Density, pcf	134	137
Moisture Content, %	17.5	14.8
Dry Density, pcf	114	119
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.0	Pressure Increment, psi:	4.92
Sample Pressure, psi:	73.8	B Coefficient:	0.91

FLOW DATA

*B-value did not increase with increase in pressure

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
6/20	1	90.0	69.2	12.0	11.9	0.1	283	23.0	1.2E-08	20	1.000	1.2E-08
6/20	2	90.0	69.2	12.0	11.9	0.1	297	23.0	1.1E-08	20	1.000	1.1E-08
6/20	3	90.0	69.2	12.0	11.9	0.1	311	23.0	1.1E-08	20	1.000	1.1E-08
6/20	4	90.0	69.2	12.0	11.9	0.1	326	23.0	1.0E-08	20	1.000	1.0E-08

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/11/2012	Tested By:	ema
End Date:	6/13/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-049A		
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 distilled 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 = 18.7%.

Parameter	Initial	Final
Height, in	2.68	2.51
Diameter, in	2.80	2.78
Area, in^2	6.16	6.07
Volume, in^3	16.5	15.2
Mass, g	564	555
Bulk Density, pcf	130	138
Moisture Content, %	17.7	15.8
Dry Density, pcf	110	120
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.00
Sample Pressure, psi:	74.0	B Coefficient:	0.95

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
06/12	1	90.0	69.2	12.0	11.9	0.1	113	23.7	3.0E-08	20	1.000	3.0E-08
06/12	2	90.0	69.2	12.0	11.9	0.1	117	23.7	2.9E-08	20	1.000	2.9E-08
06/12	3	90.0	69.2	12.0	11.9	0.1	120	23.7	2.8E-08	20	1.000	2.8E-08
06/12	4	90.0	69.2	12.0	11.9	0.1	122	23.7	2.8E-08	20	1.000	2.8E-08

PERMEABILITY AT 20° C: 2.9 x 10^{-8} cm/sec (@ 20.8 psi effective stress)

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	6/1/2012	Tested By:	ema
End Date:	6/6/2012	Checked By:	jdt
Boring #:	---		
Sample #:	ST-048A		
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 distilled 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 = 17%.

Parameter	Initial	Final
Height, in	2.64	2.50
Diameter, in	2.80	2.73
Area, in^2	6.16	5.85
Volume, in^3	16.3	14.6
Mass, g	536	531
Bulk Density, pcf	125	138
Moisture Content, %	17.4	16.3
Dry Density, pcf	107	119
Degree of Saturation, %	---	98

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.2	Pressure Increment, psi:	5.05
Sample Pressure, psi:	73.9	B Coefficient:	0.90

*B-value did not increase with increase in pressure

FLOW DATA

Date	Trial #	Pressure, psi Cell	Pressure, psi Sample	Manometer Readings Z_1	Manometer Readings Z_2	Manometer Readings Z_1-Z_2	Elapsed Time, sec	Gradient	Permeability K, cm/sec	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
6/6	1	90.0	69.2	12.0	11.9	0.1	261	23.8	1.3E-08	20	1.000	1.3E-08
6/6	2	90.0	69.2	12.0	11.9	0.1	273	23.8	1.3E-08	20	1.000	1.3E-08
6/6	3	90.0	69.2	12.0	11.9	0.1	276	23.8	1.3E-08	20	1.000	1.3E-08
6/6	4	90.0	69.2	12.0	11.9	0.1	278	23.8	1.3E-08	20	1.000	1.3E-08

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

Gravel Drainage Layer

		Soil Classification	Particle Size Analysis				Permeability
Gravel Drainage Layer Sediment Consoidation Area-Phase II Camillus, New York	**Test**	ASTM D 2487	ASTM C 136				ASTM D 2434
	Spec Requirement	GW or GP	100%		<5%	<3%	>/= 10 cm/sec

Sample Source	Field Sample ID	Sample No.	USCS Classification	4" (%)	3" (%)	2" (%)	1-1/2" (%)	1" (%)	3/4" (%)	1/2" (%)	#4 (%)	#200 (%)	Permeability K (cm/sec)
Granby Quarry	DG-093	S288-DG93	GP	100	84.0	30.0	11.0	1	1	1	<1.0	<1.0	12.6
Granby Quarry	DG-094	S289-DG94	GP	100	83.0	38.0	6.0	1	1	1	< 1.0	< 1.0	12.7
Granby Quarry	DG-095	S290-DG95	GP	100	75.0	32.0	4.0	2	2	2	< 2.0	< 2.0	13.8
Granby Quarry	DG-096	S293-DG96	GP	100	51.9	14.9	3.2	0.9	0.8	0.8	< 0.8	< 0.8	15.4
Granby Quarry	DG-097	S296-DG97	GP	100	60.2	29.2	5.2	0.6			< 0.6	< 0.6	
Granby Quarry	DG-098	S297-DG98	GP	100	76.1	23.7	5.4	0.7			< 0.7	< 0.7	
Granby Quarry	DG-099	S301-DG99	GP	100	73.4	18.1	7.5	0.8	0.8		< 0.8	< 0.8	
Granby Quarry	DG-100	S302-DG100	GP	100	76.0	8.1	2.2	1.2			< 1.2	< 1.2	
Granby Quarry	DG-101	S303-DG101	GP	100	66.2	14.4	5.5	5.5	5.5	5.5	< 5.5	< 5.5	
Granby Quarry	DG-102	S304-DG102	GP	100	66.4	9.1	2.3	1.1	1.1	1.1	< 1.1	< 1.1	
Granby Quarry	DG-103	S305-DG103	GP	100	58.7	13.8	1.7	1.2	1.2	1.2	< 1.2	< 1.2	
Granby Quarry	DG-104	S306-DG104	GP	100	84.4	30.9	8.0	1.4	1.0	1.0	< 1.0	< 1.0	
Granby Quarry	DG-105	S307-DG105	GP	100	86.4	42.9	16.6	1.8	1.3	1.3	< 1.3	< 1.3	
Granby Quarry	DG-106	S308-DG106	GP	100	89.7	46.8	14.8	2.7	2.6	2.6	< 2.6	< 2.6	
Granby Quarry	DG-107	S309-DG107	GP	100	93.5	43.0	17.8	1.5	1.2	1.1	< 1.1	< 1.1	
Granby Quarry	DG-108	S322-DG108	GP	100	55.8	6.9	1.1	0.9	0.9	0.9	< 0.9	< 0.9	
Granby Quarry	DG-109	S341-DG109	GP	100	61.0	8.0	4.0	0.0			< 0	< 0	14.3
Granby Quarry	DG-110	S342-DG110	GP	100	68.0	12.0	5.0	1.0			< 1.0	< 1.0	
Granby Quarry	DG-111	S348-DG111	GP	100	79.0	46.0	2.0	2.0	2		< 2.0	< 2.0	12.4
Granby Quarry	DG-112	S357-DG112	GP	100	35.0	1.0					< 1.0	< 1.0	16.9
Granby Quarry	DG-113	S358-DG113	GP	100	50.0	11.0	4.0				< 4.0	< 4.0	15.7
Granby Quarry	DG-114	S359-DG114	GP	100	60.0	18.0	3.0				< 3.0	< 3.0	
Granby Quarry	DG-115	S360-DG115	GP	100	67.0	23.0	4.0	2	1	1	< 1.0	< 1.0	14.5
Granby Quarry	DG-116	S361-DG116	GP	100	61.0	19.0	6.0	2	2	2	< 2.0	< 2.0	14.6
Granby Quarry	DG-117	S362-DG117	GP	100	56.0	22.0	5.0	2	2	2	< 2.0	< 2.0	
Granby Quarry	DG-118	S363-DG118	GP	100	83.0	49.0	11.0	2	2	2	< 2.0	< 2.0	14.1
Granby Quarry	DG-119	S364-DG119	GP	100	76.0	48.0	6.0	2	2		< 2.0	< 2.0	
Granby Quarry	DG-120	S365-DG120	GP	100	51.0	23.0	1.0	1	1		< 1.0	< 1.0	15.7
Granby Quarry	DG-121	S366-DG121	GP	100	59.0	14.0	4.0	2	2		< 2.0	< 2.0	
Granby Quarry	DG-122	S367-DG122	GP	100	72.0	57.0	6.0	2	2	1	< 1.0	< 1.0	13.2
Granby Quarry	DG-123	S368-DG123	GP	100	59.0	31.0	8.0	3			< 3.0	< 3.0	
Granby Quarry	DG-124	S369-DG124	GP	100	45.0	7.0	1.0	1			< 1.0	< 1.0	
Granby Quarry	DG-125	S370-DG125	GP	100	61.0	20.0	1.0	1	1	1	< 1.0	< 1.0	
Granby Quarry	DG-126	S371-DG126	GP	100	51.0	13.0	1.0	1.0			< 1.0	< 1.0	15
Granby Quarry	DG-127	S372-DG127	GP	100	67.0	14.0	0.0				0	0	
Granby Quarry	DG-128	S373-DG128	GP	100	92.0	57.0	9.0	1			< 1.0	< 1.0	
Granby Quarry	DG-129	S374-DG129	GP	100	76.0	43.0	14.0	1	1	1	< 1.0	< 1.0	14.5
Granby Quarry	DG-130	S375-DG130	GP	100	79.0	38.0	13.0	1	1	1	< 1.0	< 1.0	15.3
Granby Quarry	DG-131	S376-DG131	GP	100	88.0	43.0	4.0	0.0	0	0	0	0	
Granby Quarry	DG-132	S377-DG132	GP	100	90.0	42.0	5.0	1.0	0	0	0	0	
Lake Road Quarry	DG-133	S378-DG133	GP	100	87.0	12.0	0.0				0	0	15.1
Lake Road Quarry	DG-134	S379-DG134	GP	100	90.0	8.0	0.0				0	0	14.1
Granby Quarry	DG-135	S380-DG135	GP	100	72.0	31.0	8.0	0.0			0	0	
Granby Quarry	DG-136	S381-DG136	GP	100	97.0	48.0	6.0	1.0			< 1.0	< 1.0	
Amboy Pit	DG-137	S382-DG137	GP	100	66.0	15.0	1.0	1.0			< 1.0	< 1.0	14.7
Lake Road Quarry	DG-138	S383-DG138	GP	100	89.0	28.0	3.0	1.0			< 1.0	< 1.0	14.4
Lake Road Quarry	DG-139	S384-DG139	GP	100	97.0	65.0	16.0	2.0	1	1	< 1.0	< 1.0	
Amboy Pit	DG-140	S385-DG140	GP	100	77.7	21.3	1.5	0.9			< 0.9	<0.9	15.4
Granby Quarry	DG-141	S386-DG141	GP	100	51.1	8.6	1.8	1.5			< 1.5	< 1.5	14.8
Granby Quarry	DG-142	S387-DG142	GP	100	95.7	31.3	3.7	0.8			< 0.8	< 0.8	13.9
Ambot Pit	DG-143	S388-DG143	GP	100	56.7	13.6	1.9	1.6			< 1.6	< 1.6	14.4
Oran Delphi Pit (Kinsella)	DG-144	S389-DG144	GP	100	100.0	79.5	32.1	4.1	2.2	1.8	< 1.8	< 1.8	14.4
Oran Delphi Pit (Kinsella)	DG-145	S390-DG145	GP	100	100.0	72.4	32.8	3.1	1.7	1.3	< 1.3	< 1.3	14.5
Hayes Rd Pit (Dendis)	DG-146	S391-DG146	GP	100	78.9	15.2	3.0	0.5	0.4	0.3	< 0.3	< 0.3	14.0
Hayes Rd Pit (Dendis)	DG-147	S392-DG147	GP	100	79.8	29.8	1.4	0.2	0.2	0.2	< 0.2	< 0.2	14.8
Ambot Pit	DG-148	S393-DG148	GP	100	73.8	13.3	2.2	0.8			< 0.8	< 0.8	15.0
Granby Quarry	DG-149	S394-DG149	GP	100	80.5	25.1	2.6	0.6			< 0.6	< 0.6	
Granby Quarry	DG-150	S395-DG150	GP	100	79.9	31.7	4.1	0.5			< 0.5	< 0.5	
Lake Road Quarry	DG-151	S396-DG151	GP	100	67.8	8.9	1.8	0.4	0.4		< 0.5	< 0.5	
County Rte 6 Pit (Dendis)	DG-152	S397-DG152	GP	100	69.5	24.9	0.8	0.5	0.5	0.4	< 0.5	< 0.5	14.6
Granby Quarry	DG-153	S398-DG153	GP	100	92.6	46.5	5.7	1.5	1.0	0.9	< 0.9	< 0.9	
Amboy Pit	DG-154	S399-DG154	GP	100	50.6	4.0	1.1	-			< 1.1	< 1.1	
Granby Quarry	DG-155	S400-DG155	GP	100	41.9	16.2	3.3	0.6			< 0.6	< 0.6	15.3
Granby Quarry	DG-156	S401-DG156	GP	100	45.1	15.0	3.9	0.6			< 0.6	< 0.6	
Lake Road Quarry	DG-157	S402-DG157	GP	100	51.5	10.8	1.5	0.3			< 0.3	< 0.3	
Lake Road Quarry	DG-158	S403-DG158	GP	100	55.9	7.7	0.7	0.4	0.3		< 0.3	< 0.3	16.26
County Rte 6 Pit (Dendis)	DG-159	S404-DG159	GP	100	69.2	22.3	4.9	1.1	1.0		< 1.0	< 1.0	16.44
County Rte 6 Pit (Dendis)	DG-160	S405-DG160	GP	100	72.0	29.7	5.8	1.3			< 1.3	< 1.3	16.04
Oran Delphi Pit (Kinsella)	DG-161	S406-DG161	GP	100	100.0	64.8	18.3	0.4	0.3		< 0.3	< 0.3	
Oran Delphi Pit (Kinsella)	DG-162	S407-DG162	GP	100	100.0	63.4	12.3	0.4	0.3		< 0.3	< 0.3	
Granby Quarry	DG-163	S408-DG163	GP	100	82.4	24.9	3.0	0.2			< 0.2	< 0.2	15.8
Hayes Rd Pit (Dendis)	DG-164	S409-DG164	GP	100	69.7	31.2	5.4	1.0	0.6	0.5	< 0.5	< 0.5	
Hayes Rd Pit (Dendis)	DG-165	S410-DG165	GP	100	79.9	38.0	6.7	0.6	0.4		< 0.4	< 0.4	
Lake Road Quarry	DG-166	S411-DG166	GP	100	95.6	51.0	8.1	0.6	0.5		< 0.5	< 0.5	
				74	74								35

TABLE D-4
Gravel Drainage Layer QA Summary
Honeywell / Parsons
Sediment Consolidation Area - Phase II
Camillus, NY

TEST STANDARD			CLASSIFICATION (ASTM D2487)	GRAIN SIZE (ASTM D 422/C117)						HYDRAULIC CONDUCTIVITY (ASTM D2434)
QA TEST FREQUENCY QA TEST REQUIRED			10,000 cyd 5	@ 10,000 cyd 5						@25,000 cyd 2
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)
DG-	Specs:		GW or GP	100				0 - 5	0 -3	≥ 10
Phase II										
13	Granby Imported Stockpile		GP	100	82	39	2	1	1	14.3
14	Granby Imported Stockpile	interface friction								
15	Granby Imported Stockpile		GP	100	94	49	4	1	1	32
16	Granby Imported Stockpile		GP	100	68	19	1	1	0.7	
17	Granby Imported - Grid J-14		GP	100	94	39	12	1	0.9	
18	Granby Imported - Grid H-18/19	puncture test								
19	Lake Road Pit (source)		GP	100	57	1	0	0	0	44.8
20	Amboy - Grid I-19		GP	96	71	20	1	1	0.7	14.0
21	Dendis Pit/Rte 6 (on site)		GP	100	84	31	0.2	0.2	0.1	
22	Hayes Road Pit (on site)		GP	100	80	25	1	0	0	
23	Oran Delphi Road (source)		GP	100	100	61	1	1	0	20.6
ESTIMATED TOTAL VOLUME (cyd) PLACED:		46,800	9	Number of QA Samples:				9		5

Notes: (1) Volume is based on truck count provided by contractor and are considered an estimate only.
The soil is used to construct a 1.5-ft min. thick gravel drainage layer.
(2) *Italics* indicate an approximate value.
(3) Reference Tables A-1 & A-2 of CQA Plan, Section 02300 of Specifications and FCF No. 1 (regarding slope).
(4) See test reports for details of the size of material used for hydraulic conductivity testing.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-013	Test Date:	04/03/12	Checked By:	jdt
Depth :	---	Test Id:	233250		
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, %
---	DG-013	---	Poorly graded gravel	GP	100.0	0.0	0.0

JWC 4-3-12

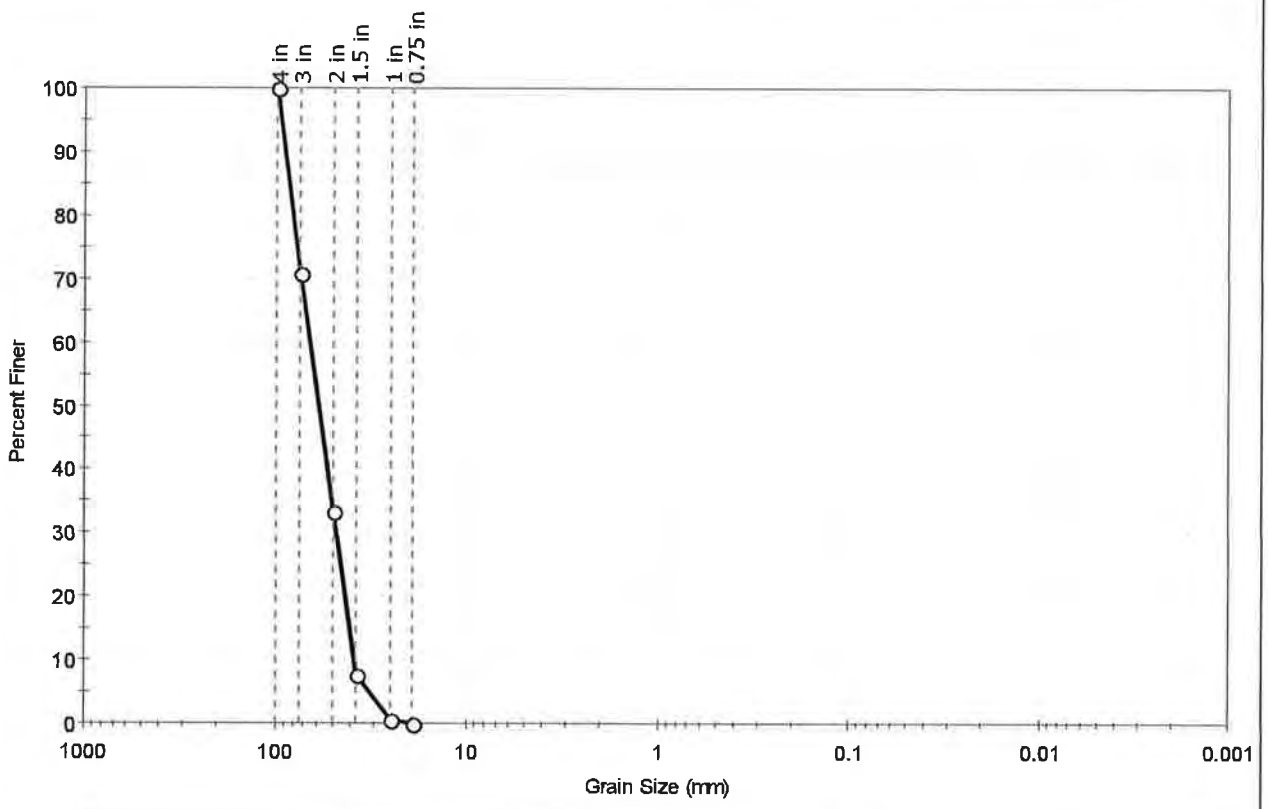
C 136

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-013	Test Date:	04/03/12	Checked By:	jdt
Depth :	---	Test Id:	233249		
Test Comment:	---				
Sample Description:	Moist, 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	71		
2 in	50.00	33		
1.5 in	37.50	8		
1 in	25.00	0		
0.75 in	19.00	0		

Coefficients

D_{85} =86.2892 mm	D_{30} =48.1349 mm
D_{60} =66.7433 mm	D_{15} =40.7230 mm
D_{50} =59.8732 mm	D_{10} =38.5153 mm
C_u =1.733	C_c =0.901

Classification

ASTM Poorly graded gravel (GP)

AASHTO ()

Sample/Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

JWC 4-3-12

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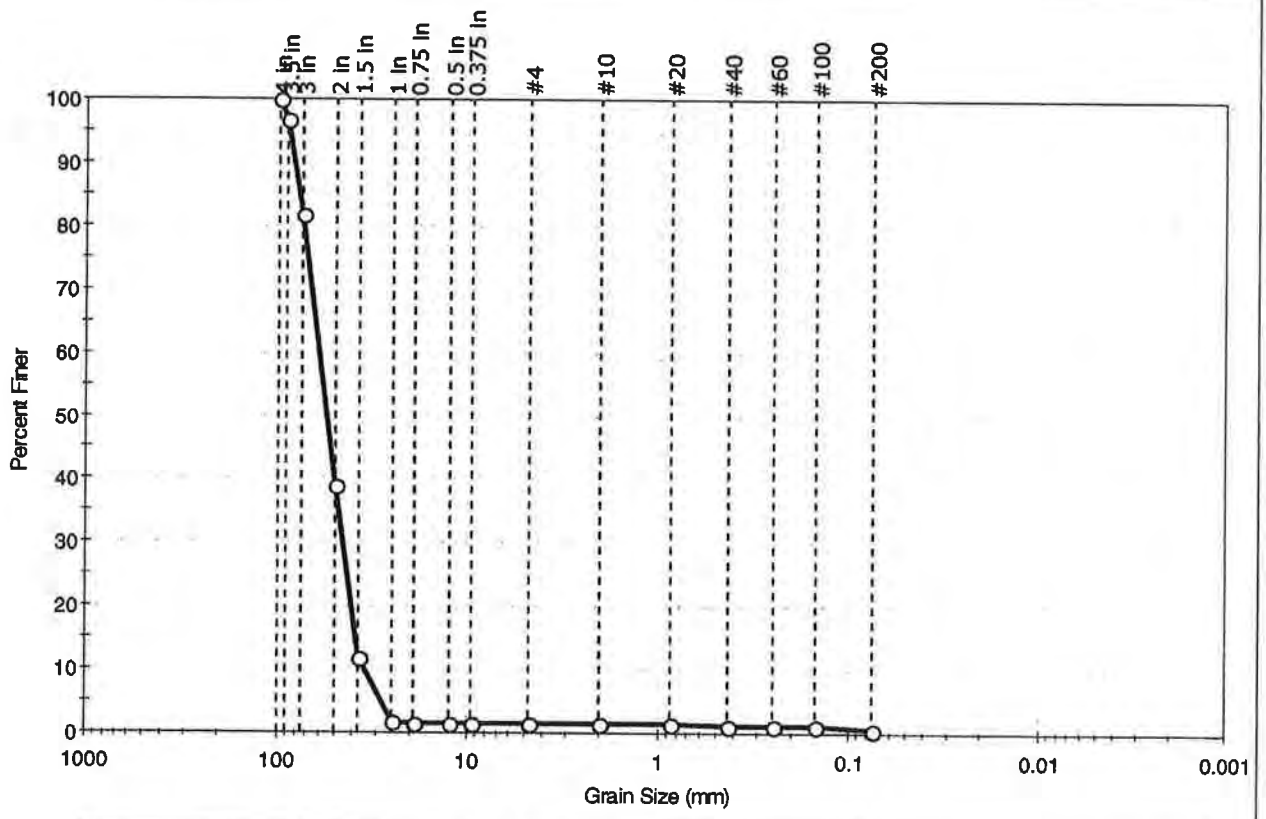
GeoTesting EXPRESS

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

Gravelly

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 mm	D_{30} = 45.4851 mm
D_{60} = 61.0815 mm	D_{15} = 38.8058 mm
D_{50} = 55.5432 mm	D_{10} = 34.8884 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

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jdt
Sample ID:	DG-013	Test Date:	04/10/12	Checked By:	jdt
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

GeoTesting EXPRESS

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.

GeoTesting EXPRESS

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:

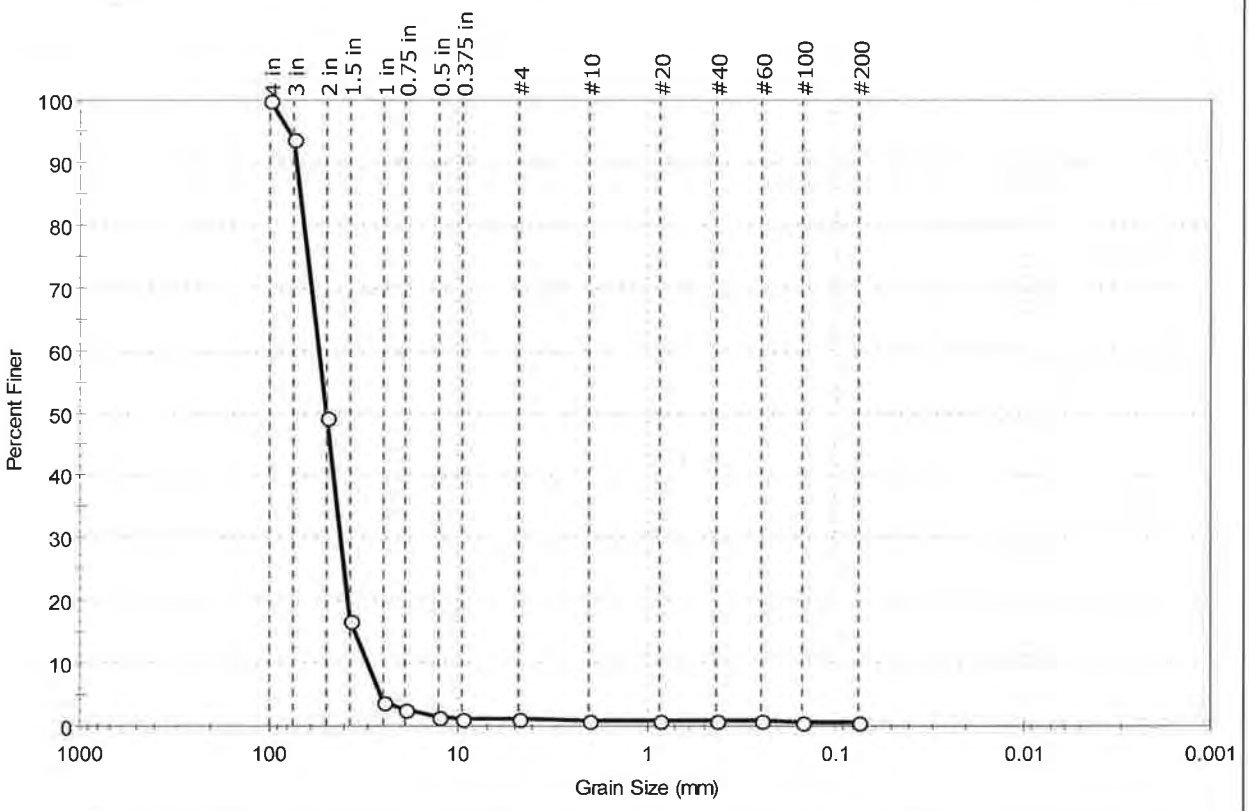
Material greater than 3/4-inch was used in the test specimen.
A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
The test specimen was not de-aired under vacuum prior to testing.
Test was performed at only one gradient range.
The maximum particle size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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-015	Test Date:	06/07/12	Checked By:	jdt
Depth :	---	Test Id:	238868		
Test Comment:	---				
Sample Description:	Dry, yellowish brown gravel				
Sample Comment:	---				

Granby

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	98.8	0.5	0.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	94		
2 in	50.00	49		
1.5 in	37.50	17		
1 in	25.00	4		
0.75 in	19.00	3		
0.5 in	12.70	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} = 69.2074 mm D_{30} = 42.1607 mm
D_{60} = 55.1445 mm D_{15} = 35.4736 mm
D_{50} = 50.3549 mm D_{10} = 30.3904 mm
C_u = 1.815 C_c = 1.061

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

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jdt
Sample ID:	DG-015	Test Date:	06/15/12	Checked By:	jdt
Depth :	---	Test Id:	240306		
Test Comment:	---				
Sample Description:	Dry, yellowish brown gravel				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-015	---	Poorly graded gravel	GP	98.8	0.5	0.7

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	06/07/12
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-015	---	Dry, yellowish brown gravel	0.7

Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	06/14/12	Tested By:	ema
End Date:	06/14/12	Checked By:	jdt
Boring #:	---		
Sample #:	DG-015		
Depth:	---		
Visual Description:	Dry, yellowish 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	114200
Bulk Density, pcf	85.5
Moisture Content, % (assumed)	0
Dry Density, pcf	85.5
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
06/14	1	166803	46	3626	0.07	27.1	17.7	1.059	28.7
06/14	2	166803	48	3475	0.06	32.4	17.7	1.059	34.3
06/14	3	166803	48	3475	0.07	25.9	17.7	1.059	27.5
06/14	4	166803	47	3549	0.06	33.1	17.7	1.059	35.1
06/14	5	166803	48	3475	0.06	32.4	17.7	1.059	34.3

PERMEABILITY @ 20 °C = 32.0 cm/sec

Deviations from ASTM D 2434:

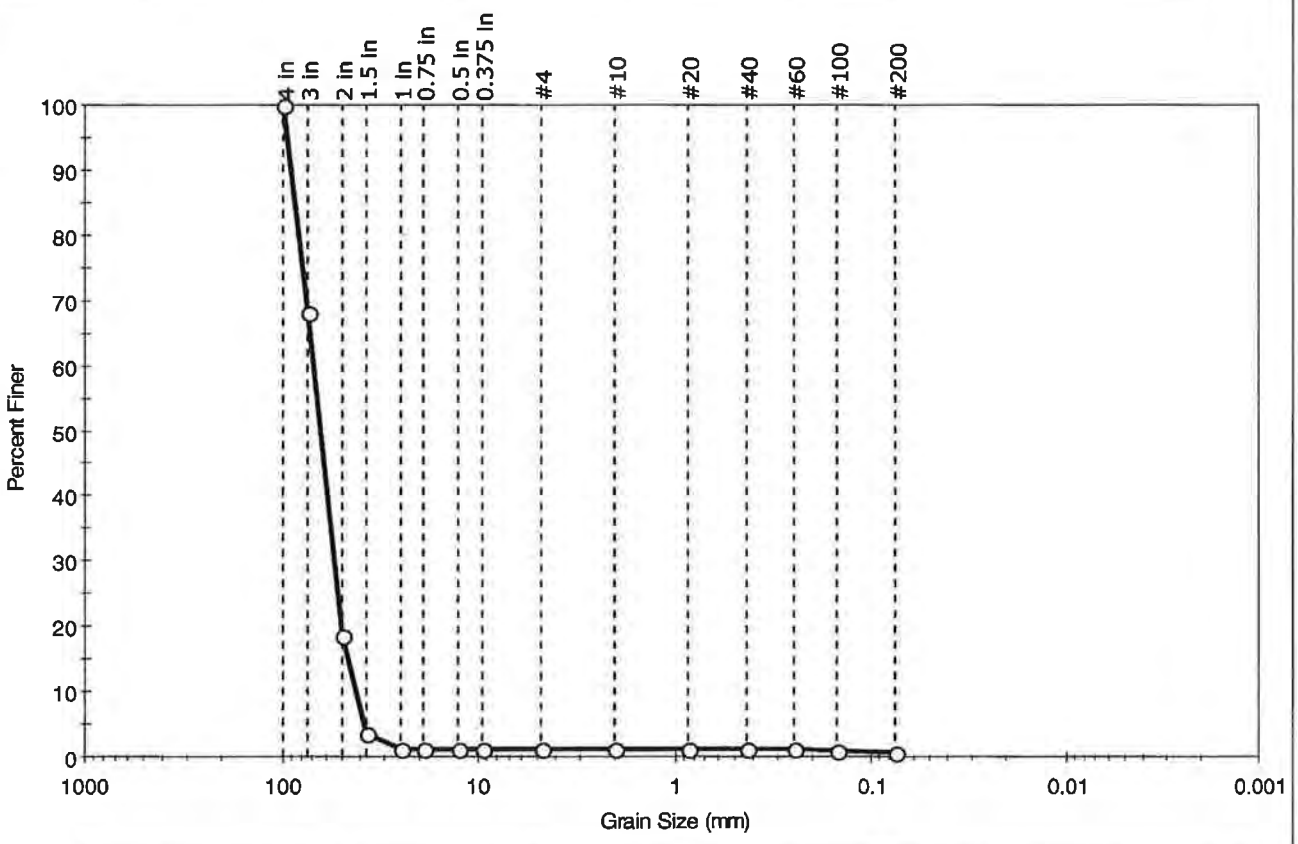
Material greater than 3/4-inch was used in the test specimen.
A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
The test specimen was not de-aired under vacuum prior to testing.
Test was performed at only one gradient range.
The maximum particle size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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-016	Test Date:	06/19/12	Checked By:	jdt
Depth :	---	Test Id:	240060		
Test Comment:	---				
Sample Description:	Moist, reddish brown gravel				
Sample Comment:	---				

Granby

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 in	75.00	68		
2 in	50.00	19		
1.5 in	37.50	4		
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		
#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} = 87.3196 mm	D_{30} = 54.9004 mm
D_{60} = 70.1529 mm	D_{15} = 46.6953 mm
D_{50} = 64.6481 mm	D_{10} = 42.4179 mm
C_u = 1.654	C_c = 1.013

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	06/21/12
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-016	---	Moist, reddish brown gravel	0.7

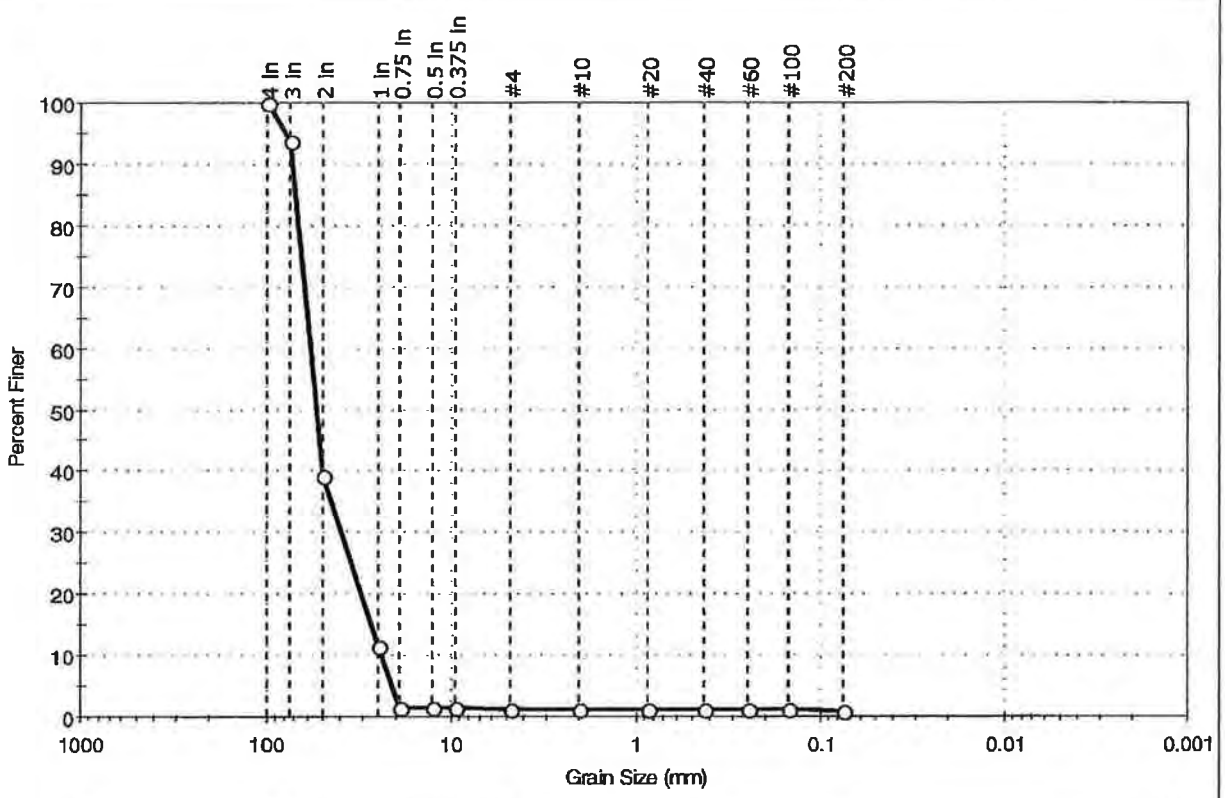
Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type: bucket		Tested By:	jbr
Sample ID:DG-017		Test Date:	07/09/12	Checked By:	jdt
Depth : ---		Test Id:	242664		
Test Comment:	---				
Sample Description:	Moist, reddish brown gravel				
Sample Comment:	---				

Granby

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	98.7	0.4	0.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	94		
2 in	50.00	39		
1 in	25.00	12		
0.75 in	19.00	1		
0.5 in	12.70	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} = 70.2869 mm D_{30} = 39.6875 mm
D_{60} = 58.3614 mm D_{15} = 27.2423 mm
D_{50} = 54.1784 mm D_{10} = 23.9579 mm
C_u = 2.436 C_c = 1.127

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	DG-017	Test Date:	07/13/12	Checked By:	jdt
Depth :	---	Test Id:	242666		
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-017	---	Poorly graded gravel	GP	98.7	0.4	0.9

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	07/13/12
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-017	---	Moist, reddish brown gravel	0.9

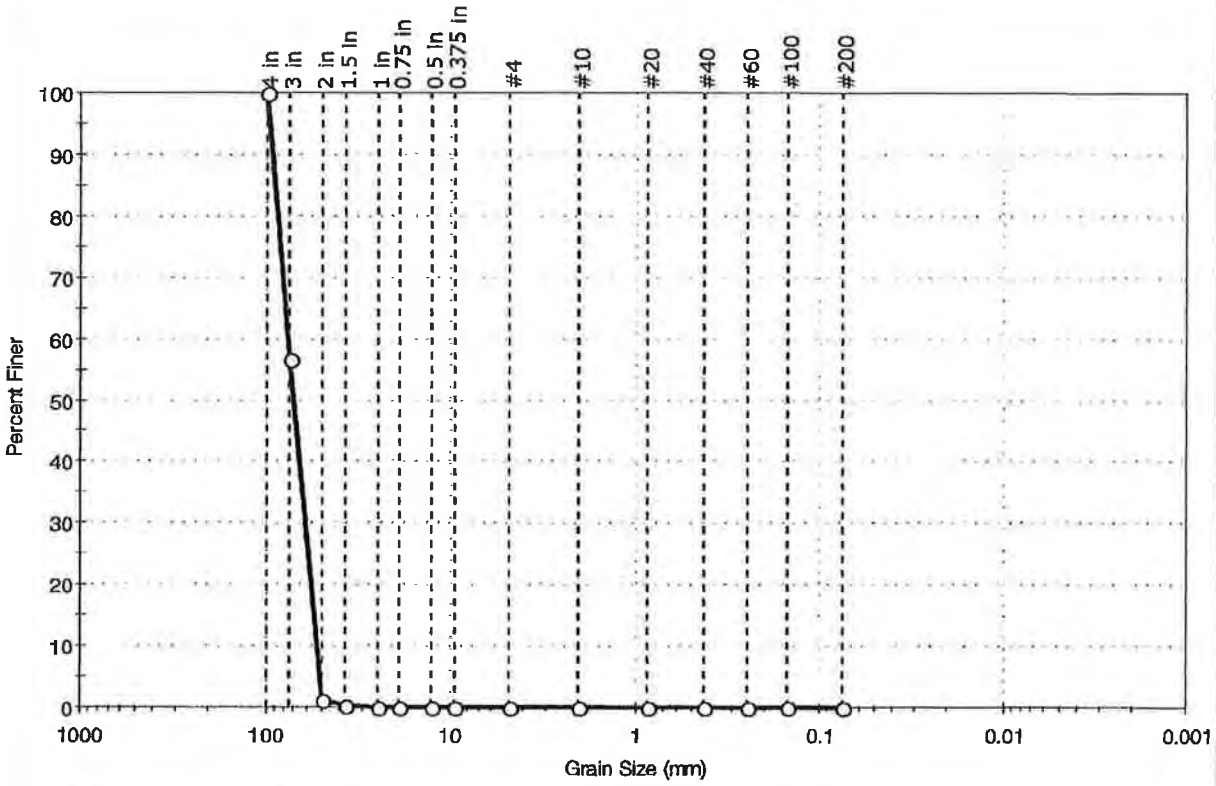
Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type:	bucket	Tested By:	jbr
Sample ID:DG-019		Test Date:	08/09/12	Checked By:	jdt
Depth : ---		Test Id:	246233		
Test Comment:	---				
Sample Description:	Moist, gray and reddish brown gravel				
Sample Comment:	---				

Lake Rd

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	57		
2 in	50.00	1		
1.5 in	37.50	0		
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		
#10	2.00	0		
#20	0.85	0		
#40	0.42	0		
#60	0.25	0		
#100	0.15	0		
#200	0.075	0		

Coefficients

D_{85} =90.5172 mm	D_{30} =61.7225 mm
D_{60} =76.6684 mm	D_{15} =55.3201 mm
D_{50} =71.4262 mm	D_{10} =53.3371 mm
C_u =1.437	C_c =0.932

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

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID: ---		Sample Type:	bucket	Tested By:	cam
Sample ID:DG-019		Test Date:	08/13/12	Checked By:	jdt
Depth : ---		Test Id:	246231		
Test Comment:	---				
Sample Description:	Moist, gray and reddish brown gravel				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-019	---	Poorly graded gravel	GP	99.9	0.1	0.0

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	08/09/12
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-019	---	Moist, gray and reddish brown gravel	0

Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	08/10/12	Tested By:	ema
End Date:	08/10/12	Checked By:	jdt
Boring #:	---		
Sample #:	DG-019	Lake Rd	
Depth:	---		
Visual Description:	Dry, gray and 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	19.00
Diameter, in	19.24
Area, in^2	290.7
Volume, in^3	5524
Mass, g	131400
Bulk Density, pcf	90.6
Moisture Content, % (assumed)	0
Dry Density, pcf	90.6
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
8/10	1	166803	37	4508	0.05	45.7	20.0	1.000	45.7
8/10	2	166803	36	4633	0.05	46.9	20.0	1.000	46.9
8/10	3	166803	37	4508	0.05	45.7	20.0	1.000	45.7
8/10	4	166803	39	4277	0.05	43.3	20.0	1.000	43.3
8/10	5	166803	40	4170	0.05	42.2	20.0	1.000	42.3

JDW

PERMEABILITY @ 20 °C = 44.8 cm/sec

Deviations from ASTM D 2434:

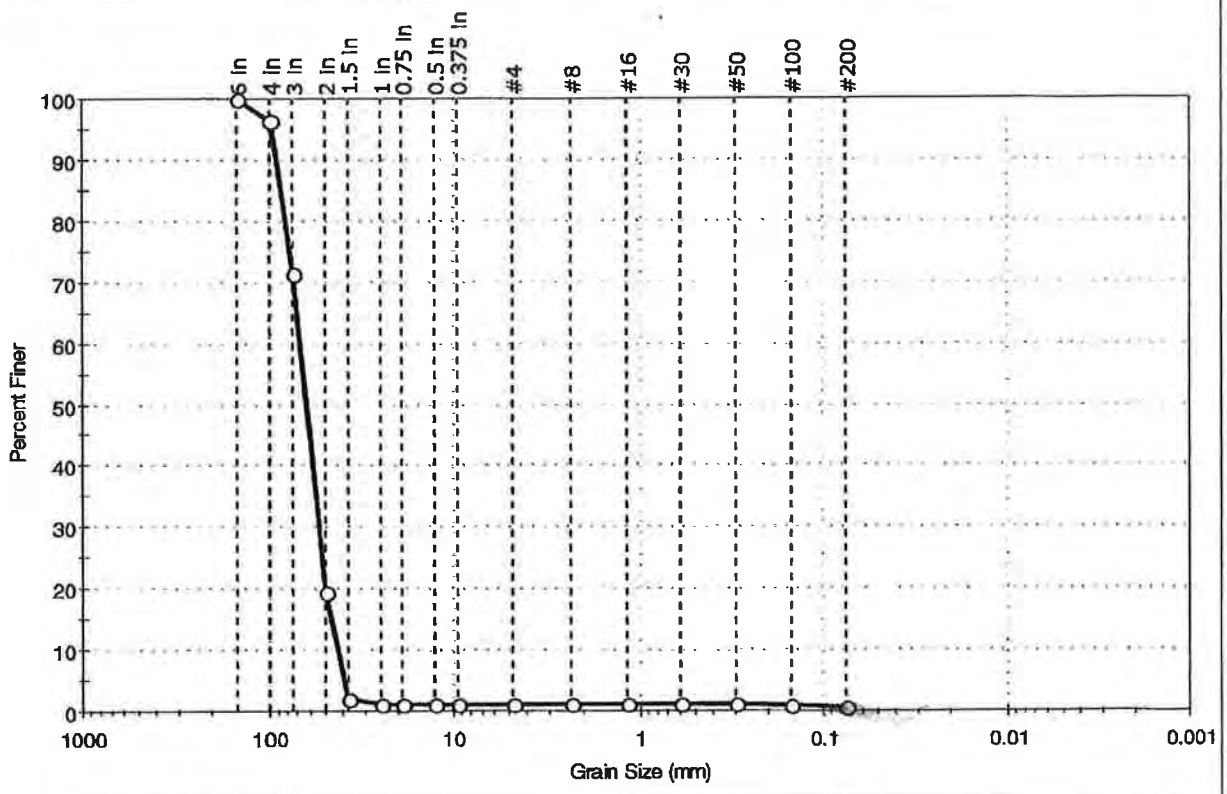
Material greater than 3/4-inch was used in the test specimen.
A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
The test specimen was not de-aired under vacuum prior to testing.
Test was performed at only one gradient range.
The maximum particle size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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-020	Test Date:	08/31/12	Checked By:	jdt
Depth :	---	Test Id:	248264		
Test Comment:	---				
Sample Description:	Dry, gray gravel				
Sample Comment:	---				

Amboy Rt

Particle Size Analysis - ASTM C 136



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	98.8	0.5	0.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	96		
3 in	75.00	71		
2 in	50.00	20		
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	1		
#8	2.36	1		
#16	1.18	1		
#30	0.60	1		
#50	0.30	1		
#100	0.15	1		
#200	0.075	1		

Coefficients

D_{85} =87.7409 mm	D_{30} =54.2503 mm
D_{60} =68.6255 mm	D_{15} =46.3984 mm
D_{50} =63.4538 mm	D_{10} =42.7676 mm
C_u =1.605	C_c =1.003

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	08/31/12
Tested By:	jbr
Checked By:	jdt

Material Finer Than #200 Sieve by ASTM C 117

Boring ID	Sample ID	Depth, ft	Sample Description	Fines, %
---	DG-020	---	Dry, gray gravel	0.7

Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	DG-020	Test Date:	09/07/12	Checked By:	jdt
Depth :	---	Test Id:	248262		
Test Comment:	---				
Sample Description:	Dry, gray gravel				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-020	---	Poorly graded gravel	GP	98.8	0.5	0.7

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

DW 9/7/12

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-021	Test Date:	10/15/12	Checked By:	jdt
Depth :	---	Test Id:	251042		
Test Comment:	---				
Sample Description:	Moist, grayish brown gravel				
Sample Comment:	---				

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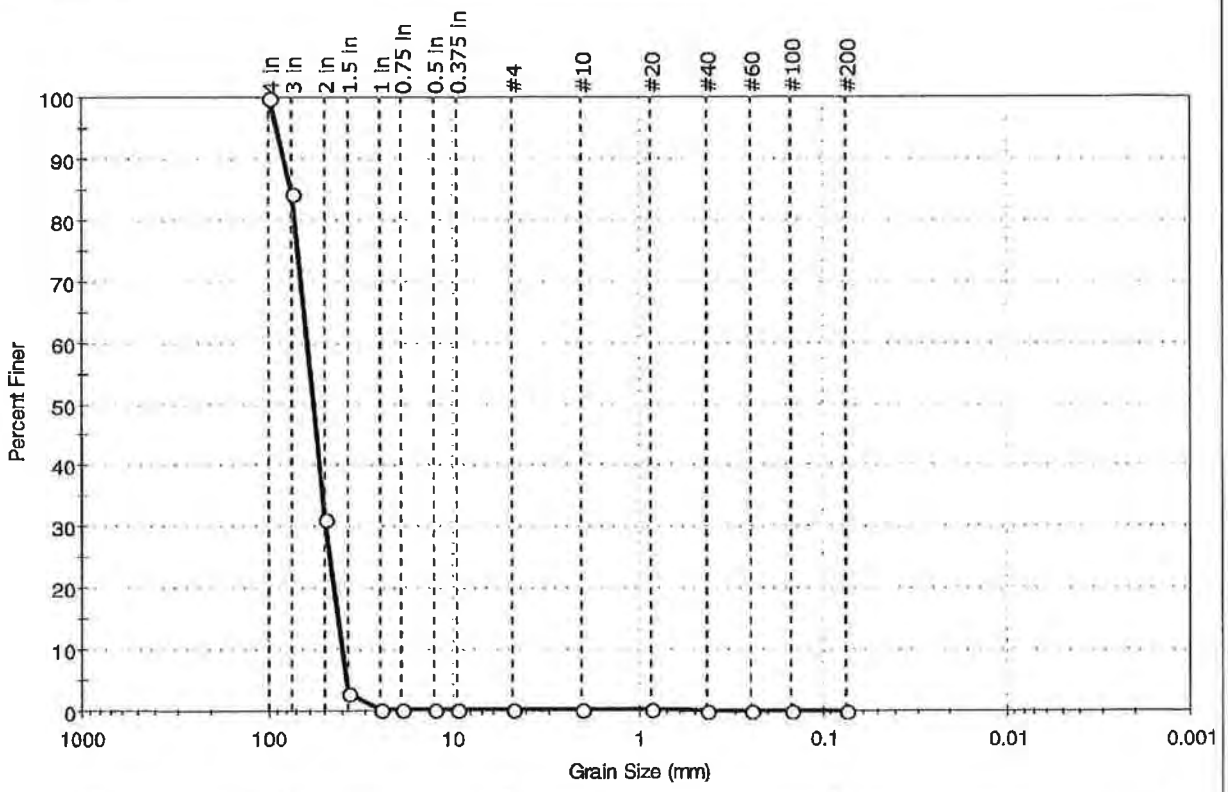
Particle Size Analysis - ASTM C 136



%Cobble	%Gravel	%Sand	%Silt & Clay Size
—	99.7	0.2	0.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	84		
2 in	50.00	31		
1.5 in	37.50	3		
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		
#10	2.00	0		
#20	0.85	0		
#40	0.42	0		
#60	0.25	0		
#100	0.15	0		
#200	0.075	0		

Coefficients

D_{85} =75.7022 mm	D_{30} =49.4094 mm
D_{60} =62.2540 mm	D_{15} =42.4303 mm
D_{50} =57.6961 mm	D_{10} =40.3304 mm
C_u =1.544	C_c =0.972

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	DG-021	Test Date:	10/25/12	Checked By:	jdt
Depth :	---	Test Id:	251041		
Test Comment:	---				
Sample Description:	Moist, grayish brown gravel				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-021	---	Poorly graded gravel	GP	99.7	0.2	0.1

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	10/15/12
Tested By:	jbr
Checked By:	jdt

Material Finer Than #200 Sieve by ASTM C 117

Boring ID	Sample ID	Depth, ft	Sample Description	Fines, %
---	DG-021	---	Moist, grayish brown gravel	0.1

Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	11/01/12	Tested By:	ema
End Date:	11/01/12	Checked By:	jdt
Boring #:	---		
Sample #:	DG-021		
Depth:	---		
Visual Description:	Moist, grayish 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	158650
Bulk Density, pcf	94.5
Moisture Content, % (assumed)	0
Dry Density, pcf	94.5
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
11/1	1	166803	53	3147	0.10	17.4	16.7	1.087	18.9
11/1	2	166803	54	3089	0.10	17.0	16.7	1.087	18.5
11/1	3	166803	54	3089	0.10	17.0	16.7	1.087	18.5
11/1	4	166803	54	3089	0.10	17.0	16.7	1.087	18.5
11/1	5	166803	53	3147	0.10	17.4	16.7	1.087	18.9

PERMEABILITY @ 20 °C = 18.7 cm/sec

Deviations from ASTM D 2434:

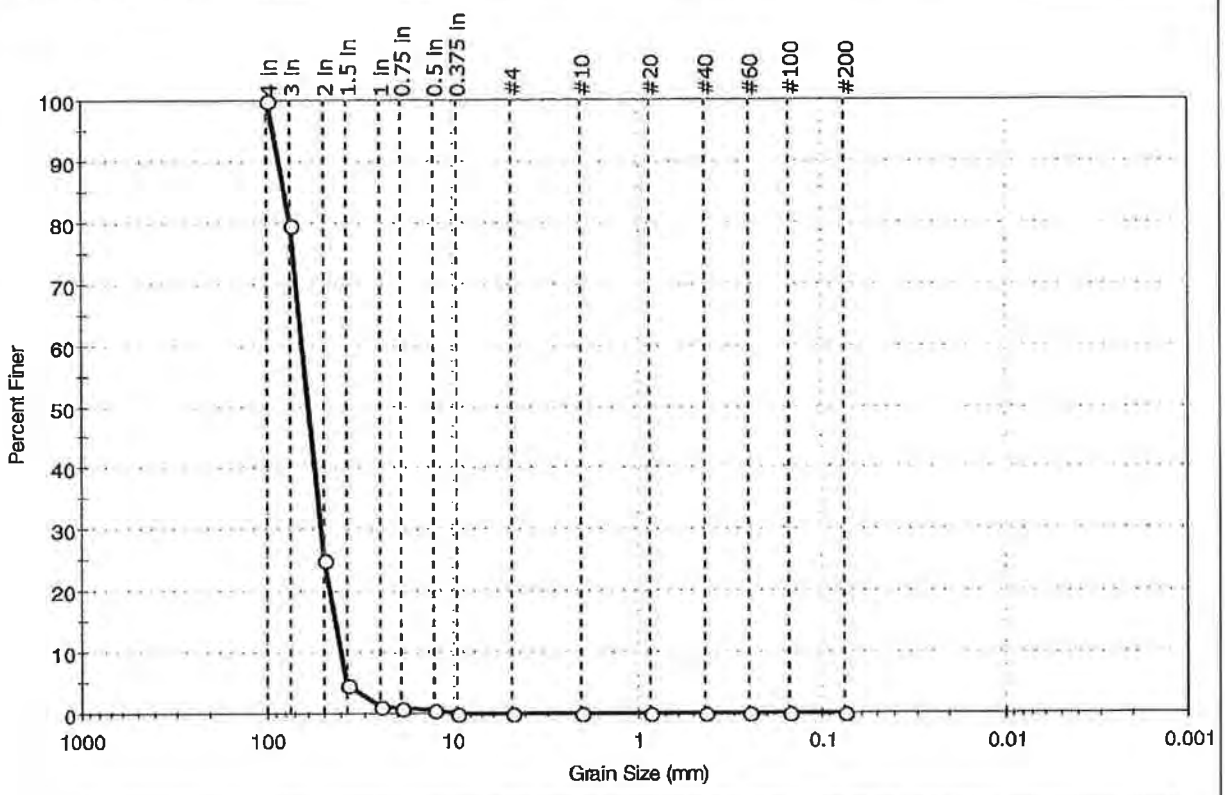
Material greater than 3/4-inch was used in the test specimen.
A top plate and light spring pressure was not applied to the top of the test specimen prior to testing.
The test specimen was not de-aired under vacuum prior to testing.
Test was performed at only one gradient range.
The maximum particle size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

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-022	Test Date:	10/11/12	Checked By:	jdt
Depth :	---	Test Id:	251264		
Test Comment:	---				
Sample Description:	Moist, grayish brown gravel				
Sample Comment:	---				

Hayes e d

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	80		
2 in	50.00	25		
1.5 in	37.50	5		
1 in	25.00	1		
0.75 in	19.00	1		
0.5 in	12.70	0		
0.375 in	9.50	0		
#4	4.75	0		
#10	2.00	0		
#20	0.85	0		
#40	0.42	0		
#60	0.25	0		
#100	0.15	0		
#200	0.075	0		

Coefficients

D_{85} =80.8167 mm	D_{30} =51.8845 mm
D_{60} =64.7970 mm	D_{15} =43.3779 mm
D_{50} =60.1703 mm	D_{10} =40.4050 mm
C_u =1.604	C_c =1.028

Classification

ASTM Poorly graded gravel (GP)

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

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Parsons Engineering Science
Project Name:	Onondaga SCA Phase I & II
Project Location:	Camillus, NY
GTX #:	11670
Test Date:	10/11/12
Tested By:	jbr
Checked By:	jdt

Material Finer Than #200 Sieve by ASTM C 117

Boring ID	Sample ID	Depth, ft	Sample Description	Fines, %
---	DG-022	---	Moist, grayish brown gravel	0.0

Notes: Procedure A used.
See ASTM C 136 report for full as-received sample gradation.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	DG-022	Test Date:	10/25/12	Checked By:	jdt
Depth :	---	Test Id:	251263		
Test Comment:	---				
Sample Description:	Moist, grayish brown gravel				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-022	---	Poorly graded gravel	GP	100.0	0.0	0.0

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

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	11/01/12	Tested By:	ema
End Date:	11/01/12	Checked By:	jdt
Boring #:	---		
Sample #:	DG-022		
Depth:	---		
Visual Description:	Moist, grayish 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	21.00
Diameter, in	19.24
Area, in^2	290.7
Volume, in^3	6105
Mass, g	157950
Bulk Density, pcf	98.6
Moisture Content, % (assumed)	0
Dry Density, pcf	98.6
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
11/1	1	166803	46	3626	0.10	20.3	16.7	1.087	22.1
11/1	2	166803	43	3879	0.10	21.7	16.7	1.087	23.6
11/1	3	166803	45	3707	0.10	20.7	16.7	1.087	22.6
11/1	4	166803	46	3626	0.10	20.3	16.7	1.087	22.1
11/1	5	166803	45	3707	0.10	20.7	16.7	1.087	22.6

PERMEABILITY @ 20 °C = 22.6 cm/sec ✓

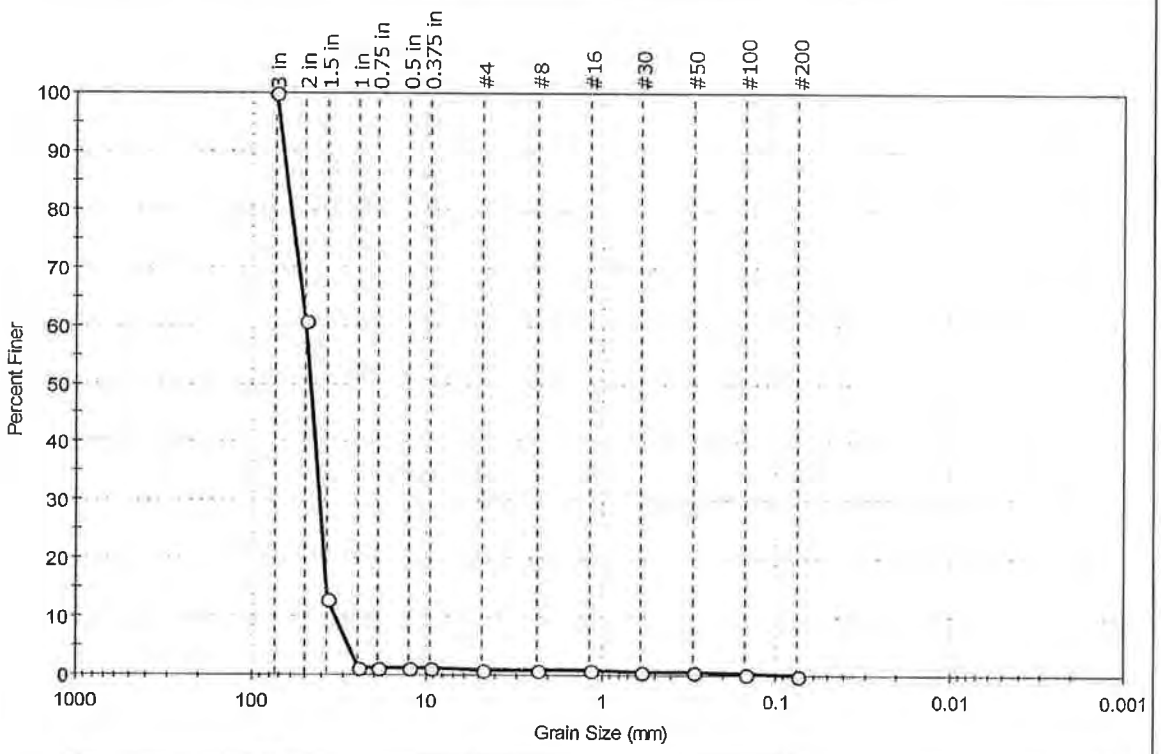
Deviations from ASTM D 2434:

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.

GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	jbr
Sample ID:	DG-023	Test Date:	10/27/12	Checked By:	jdt
Depth :	---	Test Id:	252439		
Test Comment:	---				
Sample Description:	Moist, gray gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM C 136-06



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

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3 in	75.00	100	✓	
2 in	50.00	61		
1.5 in	37.50	13		
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	✓	
#8	2.36	1		
#16	1.18	1		
#30	0.60	1		
#50	0.30	0		
#100	0.15	0		
#200	0.075	0	✓	

Coefficients

D_{85} = 64.2408 mm	D_{30} = 41.5621 mm
D_{60} = 49.7829 mm	D_{15} = 37.9757 mm
D_{50} = 46.8762 mm	D_{10} = 33.8838 mm
C_u = 1.469	C_c = 1.024

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

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GeoTesting EXPRESS

Client:	Parsons Engineering Science				
Project:	Onondaga SCA Phase I & II				
Location:	Camillus, NY			Project No:	GTX-11670
Boring ID:	---	Sample Type:	bucket	Tested By:	cam
Sample ID:	DG-023	Test Date:	11/14/12	Checked By:	jdt
Depth :	---	Test Id:	252438		
Test Comment:	---				
Sample Description:	Moist, gray gravel				
Sample Comment:	---				

USCS Classification - ASTM D 2487-06

Boring ID	Sample ID	Depth	Group Name	Group Symbol	Gravel, %	Sand, %	Fines, %
---	DG-023	---	Poorly graded gravel	GP ✓	99.0	1.0	0.0 ✓

Remarks: Grain Size analysis performed by ASTM C 136 results enclosed
Atterbeg Limits performed by ASTM 4318, results enclosed

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	SCA Phase I & II		
Project Location:	Camillus, NY		
GTX #:	11670		
Start Date:	11/01/12	Tested By:	ema
End Date:	11/01/12	Checked By:	jdt
Boring #:	---		
Sample #:	DG-023		
Depth:	---		
Visual Description:	Moist, grayish 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	123650
Bulk Density, pcf	92.6
Moisture Content, % (assumed)	0
Dry Density, pcf	92.6
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
11/1	1	166803	43	3879	0.11	19.3	16.7	1.087	21.0
11/1	2	166803	44	3791	0.11	18.9	16.7	1.087	20.5
11/1	3	166803	45	3707	0.11	18.4	16.7	1.087	20.1
11/1	4	166803	42	3971	0.11	19.8	16.7	1.087	21.5
11/1	5	166803	45	3707	0.11	18.4	16.7	1.087	20.1

PERMEABILITY @ 20 °C = 20.6 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.

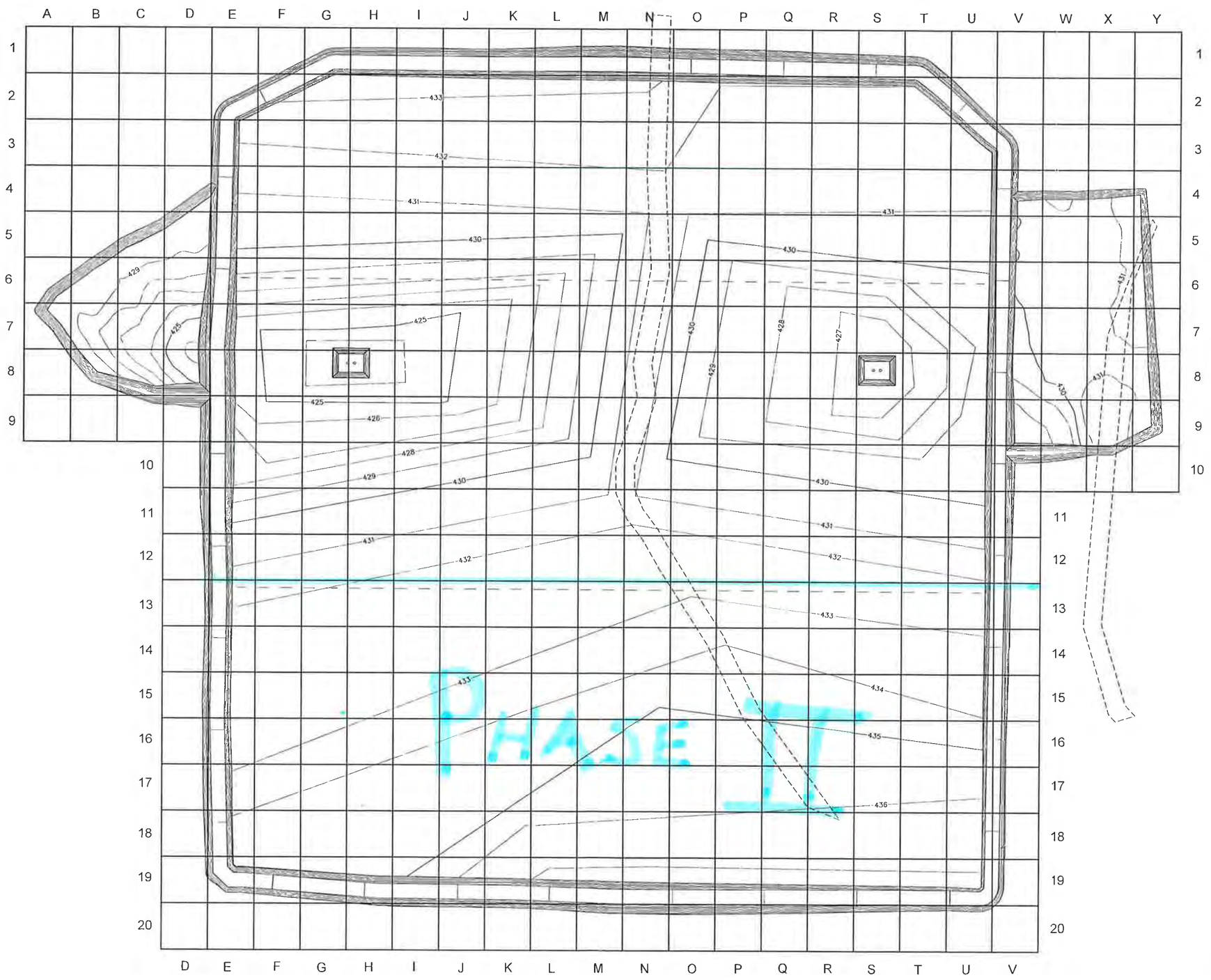
APPENDIX E

In-Place Field Test Results

- Test Reference Grid Layout
- As-Built Thickness Memorandum
- Nuclear Gauge Standard Count Log
- Engineered Fill
- Low-Permeability Layer

Test Reference Grid Layout

ONONDAGA LAKE
CONSTRUCTION MASTER GRID MAP



0 100' 200'
SCALE IN FEET

Geosyntec consultants
KENNESAW, GA

DATE:	May-11	SCALE:	AS SHOWN
PROJECT NO:	GJ4706	FILE NO.	AS SHOWN
DOCUMENT NO.	–	FIGURE NO.	1

As-Built Thickness Memorandum

Geosyntec consultants

1255 Roberts Blvd NW, Suite 200
Kennesaw, GA 30144
PH 678 202 9500
www.geosyntec.com

Memorandum

Date: 11 October 2012

To: David Steele, P.E.
Parsons

From: Joseph Sura, E.I.T., Ramachandran Kulasingam, Ph.D., P.E., and Jay Beech, Ph.D., P.E.
Geosyntec Consultants

Subject: Evaluation of As-built Low Permeability Soil Liner Grades and Thickness in Phase II of the Sediment Consolidation Area (SCA), Onondaga Lake, Syracuse, NY

The purpose of this memorandum is to evaluate the as-built grades and thickness of the low permeability soil layer (LPSL) constructed in Phase II of the SCA to verify the intent of the design is met. The LPSL construction was intended to satisfy the requirements of the following documents:

- Permit Drawings entitled "*Sediment Consolidation Area Final Design, Camillus, New York*", dated July 2010, revised April 2011, prepared by Parsons and Geosyntec;
- "*Construction Quality Assurance Plan, Onondaga Lake Sediment Consolidation Area (SCA) Final Design*", prepared by Geosyntec, dated April 2011; and
- Specifications entitled "*Onondaga Lake Sediment Consolidation Area (SCA) Final Design Submittal*", prepared by Parsons and Geosyntec, dated April 2011.

During construction, clarifications were typically requested related to project specifications and drawings in the form of "Request for Information" (RFI). Changes to the design documents were handled through Construction Field Change Forms (FCF). The RFIs and FCFs were issued by the contractor with responses by the Designer. RFI No. 16 addressed the perimeter berm elevations and FCF No. 3 the proposed design elevation of the LPSL. The as-built grades and thickness are addressed separately in the following sections.

It is noted that the as-built grades and thickness of the LPSL constructed in Phase I of the SCA were evaluated in a previous memorandum titled "Evaluation of As-built Low Permeability Soil Liner Grades and Thickness in Phase 1 of the Sediment Consolidation Area (SCA), Onondaga

Lake, Syracuse, NY" (referred to as the "Phase I Memorandum"). Therefore, the information discussed herein will focus on the LPSL within Phase II.

AS-BUILT GRADES

Attachment 1 presents the design and as-built grades for the top of LPSL. The design top of LPSL drawing prepared by Geosyntec Consultants (Geosyntec) states the following on Note 3:

"The elevation measurements of the top of the low permeability soil layer taken after the construction shall be used to verify general conformance with design slopes to meet positive drainage requirements as presented in the technical specifications. Due to the compressible nature of the foundation, a strict conformance with the design elevations is not required."

The as-built grades were provided to Geosyntec by Parsons. Based on our review, the as-built LPSL grades within Phase II match the design grades closely and meet the intent of the design.

THICKNESS

To verify that the minimum thickness was achieved, the contractor used various methods to measure the minimum thickness of 12-in in Phase II. The contractor surveyed the LPSL on 50-ft grid pattern. The contractor also installed 12-in square steel plates on a 100-ft grid pattern in areas with a proposed thickness of 18-in or less. A hand drill with a 24-in long drill bit was used to bore into the LPSL. If contact with the plate had not been achieved at a depth of 24 inches, then a pointed rod was hammered down to the plate. Once the bit or rod had been driven to the steel plate, a mark was made on the bit or rod. Once the bit or rod was extracted, a measurement was made to determine the LPSL thickness at that location. It is noted, based on the data provided to Geosyntec by Parsons, that thickness measurements were not performed everywhere.

Attachment 2 presents four figures related to as-built LPSL thickness. Based on the Attachment E titled "Sample Thickness and Settlement Calculation" in the "Geotechnical Instrumentation and Monitoring Plan" prepared for the SCA by Geosyntec, the thickness of the LPSL is calculated as follows:

LPSL thickness = [Top of LPSL survey elevation] - [Initial subgrade survey elevation] + [Measured settlement].

The minimum required LPSL thickness within Phase II is 1.0 ft.

The surveyed elevations of the top of LPSL and the initial subgrade in Phase II were provided by Parsons in an electronic table as well as in the form of drawings presented in Attachment 2. The calculated LPSL thicknesses, without consideration of subgrade settlement, are shown in Figure

1 in Attachment 2. The LPSL thicknesses were also measured directly during the hand drilling and the measured thicknesses all exceeded 1-ft thickness, as shown in Figure 2 in Attachment 2. At 472 out of the total 475 surveyed locations (i.e., 99.4% of the total locations), the calculated LPSL thicknesses shown in Figure 1 in Attachment 2 met the minimum required thickness when the settlement of subgrade was not considered. The LPSL thicknesses at the remaining 3 locations (i.e., Locations No. 1 through No. 3 on Figure 1 in Attachment 2) were further evaluated by considering the settlement that had occurred during the LPSL placement, as discussed below.

Figure 3 in Attachment 2 presents the calculated settlement from the settlement plates within Phase II. To complete the independent thickness calculation, direct thickness measurements at the settlement plate locations were used along with the subgrade elevations, and top of LPSL elevations. It is noted that some of the plates showed negative settlement (i.e., heave). The heave is not considered to represent field conditions and, therefore, has not been included. Figure 4 in Attachment 2 presents the settlement from the settlement plates within Phase II without the negative settlement (i.e., heave) points.

The justification that the LPSL thicknesses at the 3 locations met the minimum required thickness is presented below:

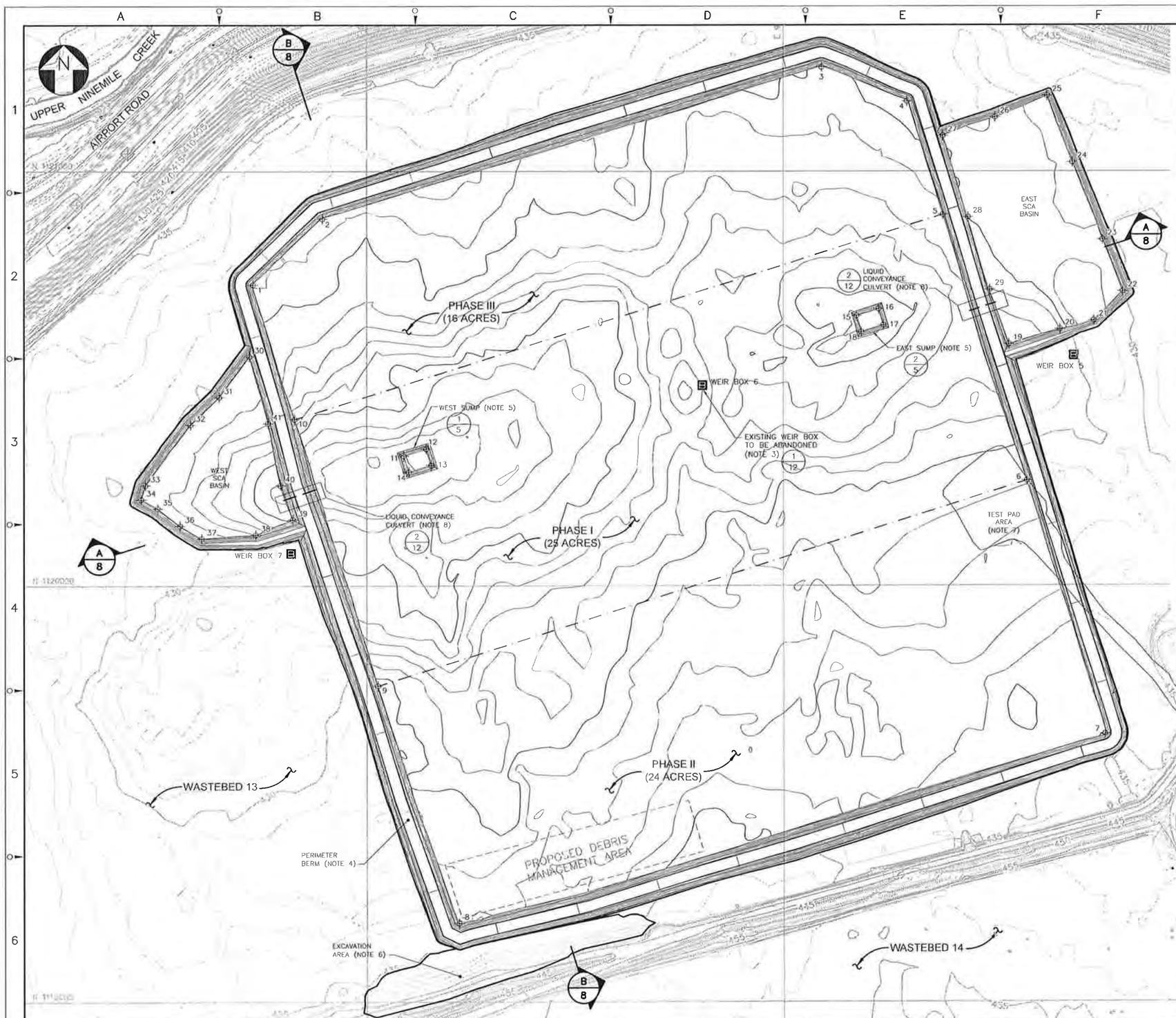
- For Location No. 1 near the northwestern corner of Phase II, the settlement plates near this location show an estimated settlement of 0.16 ft (approximately mean minus one standard deviation). Adding the 0.16 ft of settlement, the estimated LPSL thickness of 1.1 ft meets the requirement.
- For Location No. 2, near the boundary between Phases I and II, the settlement plates surrounding this location in both Phase I and Phase II show an estimated settlement of 0.21 ft (approximately mean minus one standard deviation) was considered to be reasonable. Therefore, for Location No. 2 of Phase II, upon adding the 0.21 ft of settlement, the estimated LPSL thickness of 1.04 ft meets the requirement.
- For Location No. 3, near the northeastern boundary of Phase II, the settlement plate near this location shows an estimated settlement of 0.17 ft (approximately mean minus one standard deviation). Adding the 0.17 ft of settlement, the estimated LPSL thickness of 1.08 ft meets the requirement.

Based on the evaluation presented in this memorandum, the thickness of LPSL installed in Phase II of the SCA is considered to be acceptable.

*****

Attachment 1
Design and As-Built Drawings

Approved Design Drawings
April 2011
(Prepared by Geosyntec)



BERM AND SUMP CONTROL POINTS

POINT NUMBER	NORTHING	EASTING
1	1120726	905728
2	1120886	905894
3	1121250	907092
4	1121169	907298
5	1120896	907383
6	1120253	907584
7	1119642	907770
8	1119188	906220
9	1119759	906026
10	1120402	905828
11	1120314	906089
12	1120330	906142
13	1120291	906154
14	1120275	906101
15	1120652	907175
16	1120668	907229
17	1120629	907241
18	1120613	907188
19	1120583	907541
20	1120619	907664
21	1120640	907743
22	1120710	907813
23	1120836	907764
24	1121022	907693
25	1121181	907634
26	1121130	907509
27	1121086	907383
28	1120890	907443
29	1120715	907496
30	1120553	905720
31	1120455	905648
32	1120389	905580
33	1120243	905471
34	1120209	905461
35	1120187	905501
36	1120145	905555
37	1120114	905607
38	1120124	905735
39	1120160	905823
40	1120243	905794
41	1120392	905764

NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.
2. THE SCA DESIGN SHOWN ON THIS DRAWING IS FOR A CAPACITY OF UP TO 2.65 MILLION CUBIC YARDS.
3. WEIR BOX NO. 6 SHALL BE ABANDONED BEFORE BEGINNING CONSTRUCTION PER THE DETAIL SHOWN ON DRAWING 12.
4. THE PERIMETER BERM SHALL HAVE A MINIMUM HEIGHT OF 5 FEET WITH 2.5H:1V SIDE SLOPES AND AN OVERALL MINIMUM LONGITUDINAL SLOPE OF 0.5%.
5. EXCAVATIONS SHALL BE PERFORMED AT PROPOSED SUMP LOCATIONS PER THE GRADES PRESENTED ON DRAWING NO. 5.
6. THE EXISTING FILL SOIL SHALL BE EXCAVATED PER THE GRADES SHOWN ON THIS DRAWING PRIOR TO CONSTRUCTING THE PERIMETER BERM DURING PHASE II.
7. THE FILL SOIL IN THE TEST PAD AREA SHALL BE EXCAVATED PER THE GRADES SHOWN ON THIS DRAWING PRIOR TO CONSTRUCTION. THE EXCAVATED FILL MATERIAL SHALL BE REUSED AS DIRECTED BY THE ENGINEER. ANY EXISTING INSTRUMENTATION WITHIN THE TEST PAD AREA SHOULD ALSO BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER.
8. THE TEMPORARY LIQUID CONVEYANCE CULVERT SHALL CONSIST OF (4) 24 INCH DIAMETER PIPES AT A SLOPE OF 1%. THESE PIPES SHALL BE PLUGGED WITH BENTONITE BEFORE CLOSURE PER THE DETAILS SHOWN ON DRAWING 12.
9. TEMPORARY SURFACE WATER CONTROL STRUCTURES BETWEEN PHASES SHALL BE CONSTRUCTED TO CONTROL RUNOFF AND RUNON.
10. TEMPORARY BERMS, CONSISTENT WITH DETAIL 5 ON DRAWING 9 SHALL BE CONSTRUCTED AROUND THE DEBRIS MANAGEMENT AREA.

LEGEND

- 430 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- 440 — PROPOSED PERIMETER BERM (NOTE 4)
- EXISTING ROAD
- EXISTING WEIR BOX (WEIR BOX 5)
- PHASE BOUNDARY

Geosyntec consultants
1255 ROBERTS BOULEVARD, N.W., SUITE 200
KENNESAW, GEORGIA 30144 USA
PHONE: 678.202.9500

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
2	ADDRESS ADDITIONAL NYSDEC COMMENTS	MARCH 2011	JHS	RK	JFB
1	ADDRESS NYSDEC COMMENTS	OCT 2010	JHS	RK	JFB
0	ISSUED FOR CONSTRUCTION	JULY 2010	JHS	RK	JFB

DRAWN BY: JHS	DATE: JULY 2010	SEAL
CHECKED BY: RK	DATE: JULY 2010	
APPROVED BY: JFB	DATE: JULY 2010	
PROJECT MGR: JFB	DATE: JULY 2010	

PARSONS
COMMERCIAL TECHNOLOGY GROUP

OFFICE: 301 PLAINFIELD ROAD, SYRACUSE, NY 13212, (315) 451-9560
JOB: 444853
WBS:

PROJECT TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA
ONONDAGA LAKE BOTTOM
SUBSITE REMEDIAL DESIGN

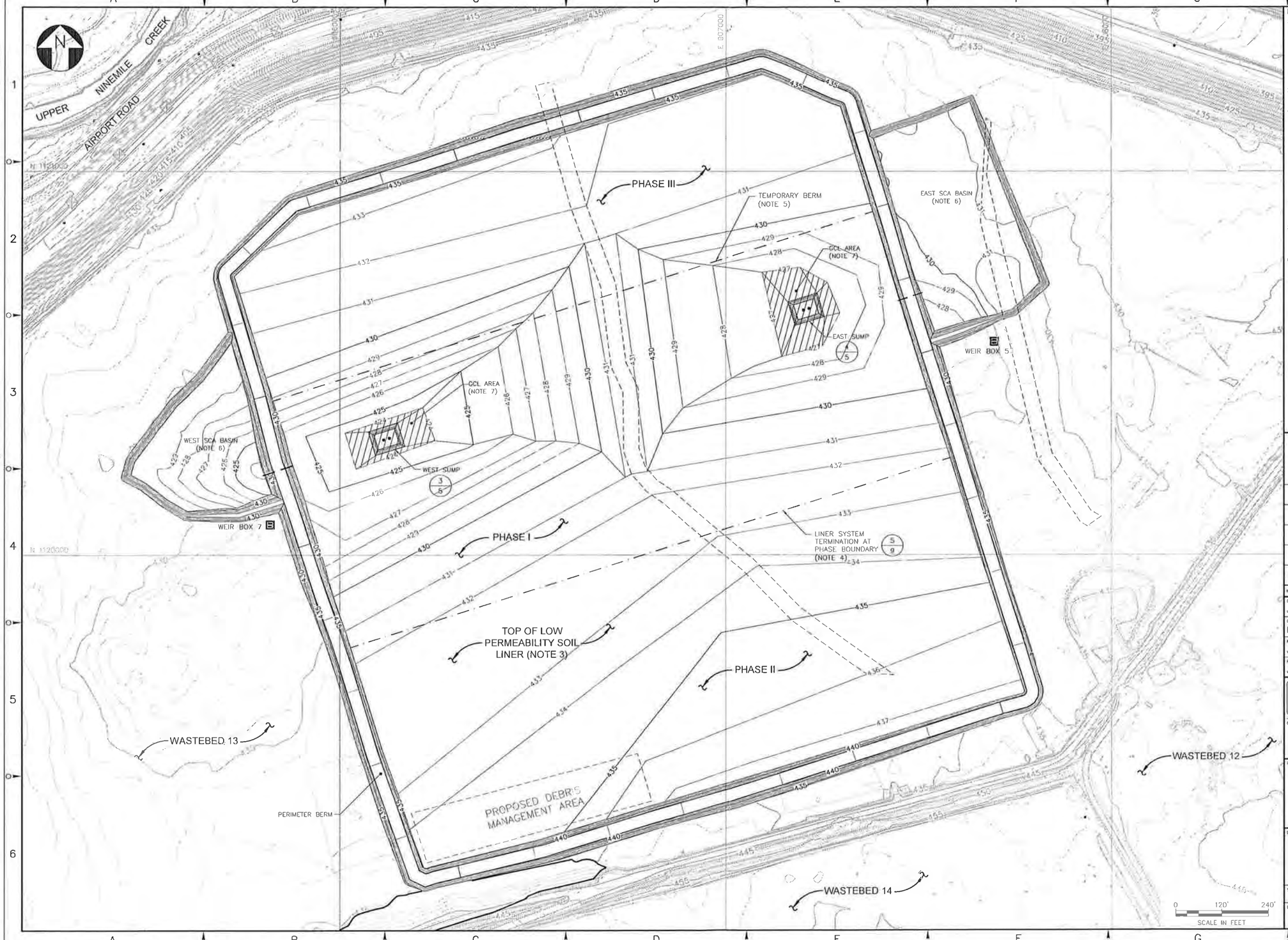
DRAWING TITLE
BERM AND SUBGRADE GRADING PLAN

SCALE: 1" = 120' (IF PRINTED ON 22x34 SHEET)

DRAWING NO: 444853-101-C-003 REV: 2

0 120' 240'
SCALE IN FEET

FILE NAME: E:\CADD\DRAWINGS\444853\ENGR\SCA DESIGNS\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-2\444853102.DWG
PLOT DATE: 4/16/2007 12:45 PM PLOTTED BY: JOSHUA SPEED



NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.
2. THE SCA DESIGN SHOWN ON THIS DRAWING IS FOR A CAPACITY OF UP TO 2.65 MILLION CUBIC YARDS.
3. LOW PERMEABILITY SOIL LAYER THICKNESS WILL BE USED TO VERIFY THAT THE MINIMUM THICKNESS REQUIREMENTS ARE MET AS PRESENTED IN THE TECHNICAL SPECIFICATIONS. THE ELEVATION MEASUREMENTS OF THE TOP OF THE LOW PERMEABILITY SOIL LAYER TAKEN AFTER THE CONSTRUCTION SHALL BE USED TO VERIFY GENERAL CONFORMANCE WITH DESIGN SLOPES TO MEET POSITIVE DRAINAGE REQUIREMENTS AS PRESENTED IN THE TECHNICAL SPECIFICATIONS. DUE TO THE COMPRESSIBLE NATURE OF THE FOUNDATION, A STRICT CONFORMANCE WITH THE DESIGN ELEVATIONS IS NOT REQUIRED.
4. THE TEMPORARY BERM ON THE SOUTHERN PERIMETER OF PHASE I LINER SYSTEM SHALL BE REMOVED TO TIE-IN PHASE II LINER SYSTEM.
5. THE TEMPORARY BERM ON THE NORTHERN PERIMETER OF PHASE I LINER SYSTEM SHALL BE REMOVED TO TIE-IN PHASE III LINER SYSTEM IF NEEDED.
6. DETAILED DESIGN OF THE SCA BASINS WILL BE PRESENTED IN THE SEDIMENT MANAGEMENT FINAL DESIGN.
7. A LAYER OF GCL SHALL BE PLACED DIRECTLY UNDER THE GEOMEMBRANE IN THE SUMP AND ADJACENT AREAS EXTENDING UP TO ELEVATION 424 FOR THE WESTERN SUMP AND ELEVATION 427 FOR THE EASTERN SUMP ON THE TOP OF LOW PERMEABILITY SOIL LINER CONTOURS SHOWN ON DRAWING 4

LEGEND

- 430 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- 440 — PROPOSED PERIMETER BERM
- EXISTING ROAD
- EXISTING WEIR BOX (WEIR BOX 5)
- PHASE BOUNDARY
- BREAKLINE

Geosyntec consultants
1255 ROBERTS BOULEVARD, N.W., SUITE 200
KENNESAW, GEORGIA 30144 USA
PHONE: 678.202.9500

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPR'D
2	ADDRESS ADDITIONAL NYSDEC COMMENTS	MARCH 2011	JHS	RK	JFB
1	ADDRESS NYSDEC COMMENTS	OCT 2010	JHS	RK	JFB
0	ISSUED FOR CONSTRUCTION	JULY 2010	JHS	RK	JFB

DRAWN BY: JHS	DATE: JULY 2010	SEAL
CHECKED BY: RK	DATE: JULY 2010	
APPROVED BY: JFB	DATE: JULY 2010	
PROJECT MGR: JFB	DATE: JULY 2010	

PARSONS
COMMERCIAL TECHNOLOGY GROUP
OFFICE: 301 PLAINFIELD ROAD, SYRACUSE, NY 13212, (315) 451-9560

JOB: 444853
WBS:

PROJECT TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA
ONONDAGA LAKE BOTTOM
SUBSITE REMEDIAL DESIGN

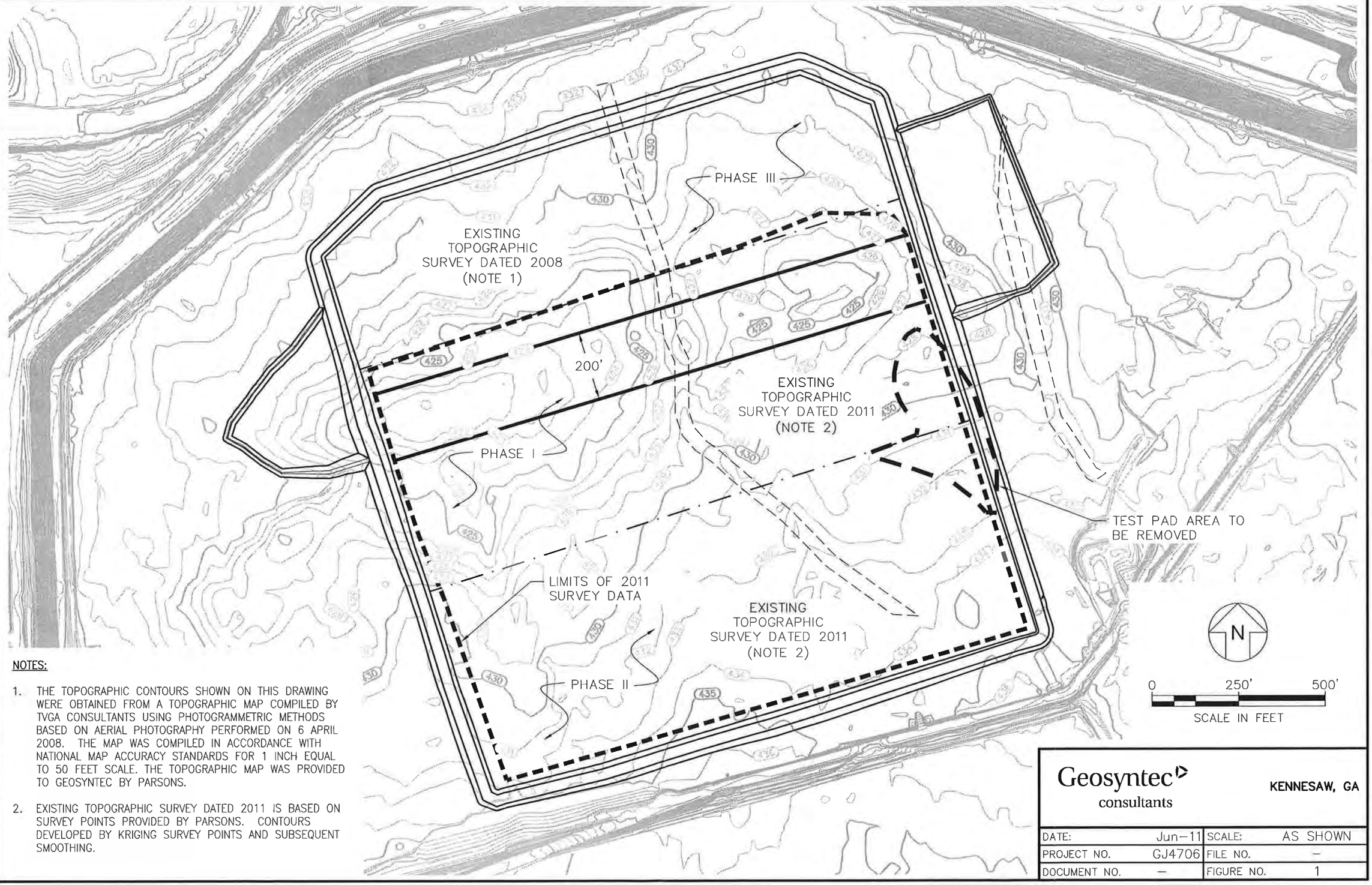
DRAWING TITLE
TOP OF LOW
PERMEABILITY SOIL LINER

SCALE: SCALE: 1" = 120'
(IF PRINTED ON 22x34 SHEET)

DRAWING NO: 444853-101-C-004
REV: 2

FILE NAME: I:\CADD\ONONDAGA LAKE\REMAIN\SCA GEOMEMBRANES\ISSUED FOR CONSTRUCTION REV-0\REVISED SET (NO FINAL COVER)\REV-2\429TOGCL.DWG
PLOT DATE: 4/26/2007 12:42 PM PLOTTED BY: JONATHAN SIEGEL

Revised Design Grades per Field Change Form #3
August 2011
(Prepared by Geosyntec)



NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.

2. EXISTING TOPOGRAPHIC SURVEY DATED 2011 IS BASED ON SURVEY POINTS PROVIDED BY PARSONS. CONTOURS DEVELOPED BY KRIGING SURVEY POINTS AND SUBSEQUENT SMOOTHING.

Geosyntec consultants

KENNESAW, GA

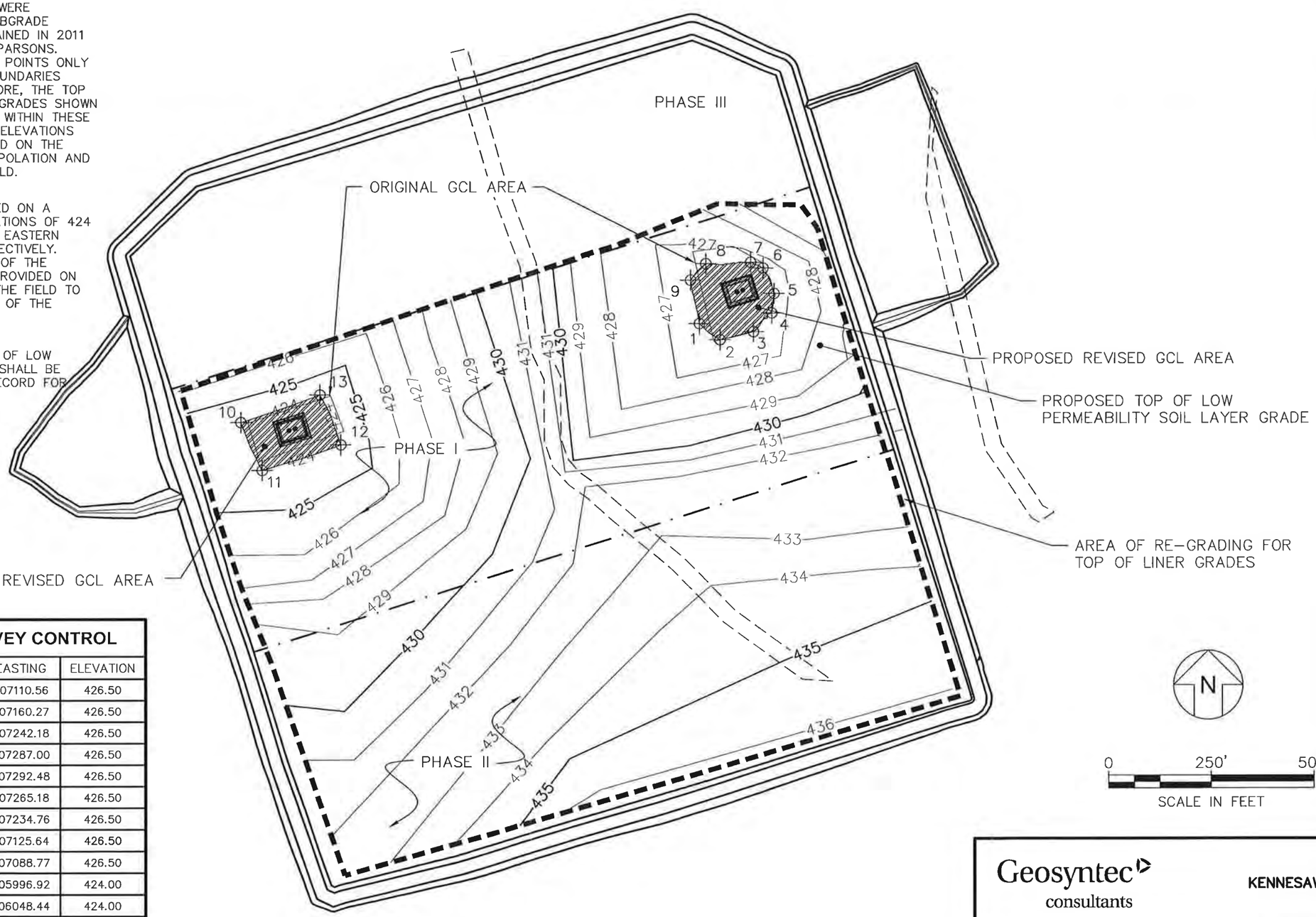
DATE:	Jun-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	1

NOTES:

1. THE TOP OF LOW PERMEABILITY SOIL LAYER GRADES SHOWN ON THIS DRAWING WERE DEVELOPED USING THE EXISTING SUBGRADE TOPOGRAPHIC SURVEY POINTS OBTAINED IN 2011 AND PROVIDED TO GEOSYNTEC BY PARSONS. THESE EXISTING SUBGRADE SURVEY POINTS ONLY COVERED THE AREA WITHIN THE BOUNDARIES SHOWN ON THE DRAWING. THEREFORE, THE TOP OF LOW PERMEABILITY SOIL LAYER GRADES SHOWN ON THIS DRAWING ARE ONLY VALID WITHIN THESE BOUNDARIES. EXISTING SUBGRADE ELEVATIONS WITHIN THE TEST PAD AREA MARKED ON THE DRAWING WERE OBTAINED BY INTERPOLATION AND NEED TO BE CONFIRMED IN THE FIELD.

2. THE GCL PLACEMENT AREA IS BASED ON A TARGET AREA WITHIN DESIGN ELEVATIONS OF 424 AND 426.5 FOR THE WESTERN AND EASTERN PARTS OF THE SCA PHASE I, RESPECTIVELY. DUE TO THE ONGOING SETTLEMENT OF THE SUBGRADE, THE CONTROL POINTS PROVIDED ON THIS DRAWING SHALL BE USED IN THE FIELD TO STAKEOUT THIS AREA, REGARDLESS OF THE ACTUAL ELEVATIONS.

3. AN AS-BUILT SURVEY OF THE TOP OF LOW PERMEABILITY SOIL LAYER GRADES SHALL BE PROVIDED TO THE ENGINEER-OF-RECORD FOR APPROVAL.



SUMP GCL LIMIT SURVEY CONTROL

POINT NUMBER	NORTHING	EASTING	ELEVATION
1	1120561.18	907110.56	426.50
2	1120521.66	907160.27	426.50
3	1120541.02	907242.18	426.50
4	1120587.10	907287.00	426.50
5	1120634.83	907292.48	426.50
6	1120696.76	907265.18	426.50
7	1120710.96	907234.76	426.50
8	1120707.66	907125.64	426.50
9	1120667.27	907088.77	426.50
10	1120319.85	905996.92	424.00
11	1120202.94	906048.44	424.00
12	1120265.16	906239.42	424.00
13	1120387.43	906188.22	424.00

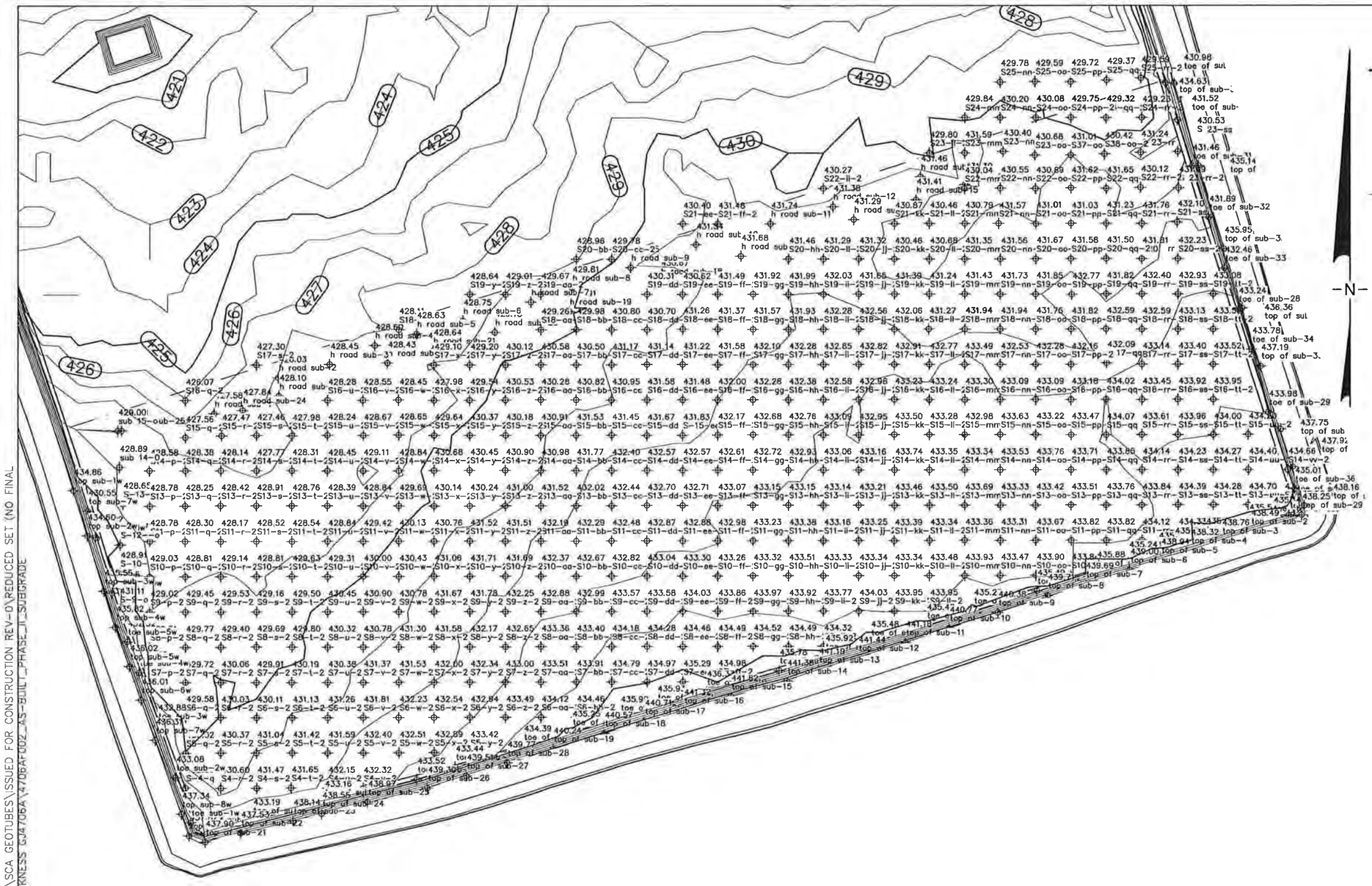
Geosyntec consultants — KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	2

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF LINER (REVISED WITH PHASE I_SUMPS.dg

As-Built Grades
September 2012
(Prepared by Parsons)

Note: Figures 1A and 2A include the surveyed points and the contours generated by Parsons. For clarity, Figures 1B and 2B only show the contours.



LEGEND

1.95 — TOP OF SUBGRADE ELEVATION AT SURVEYED LOCATION

PHASE II BOUNDARY

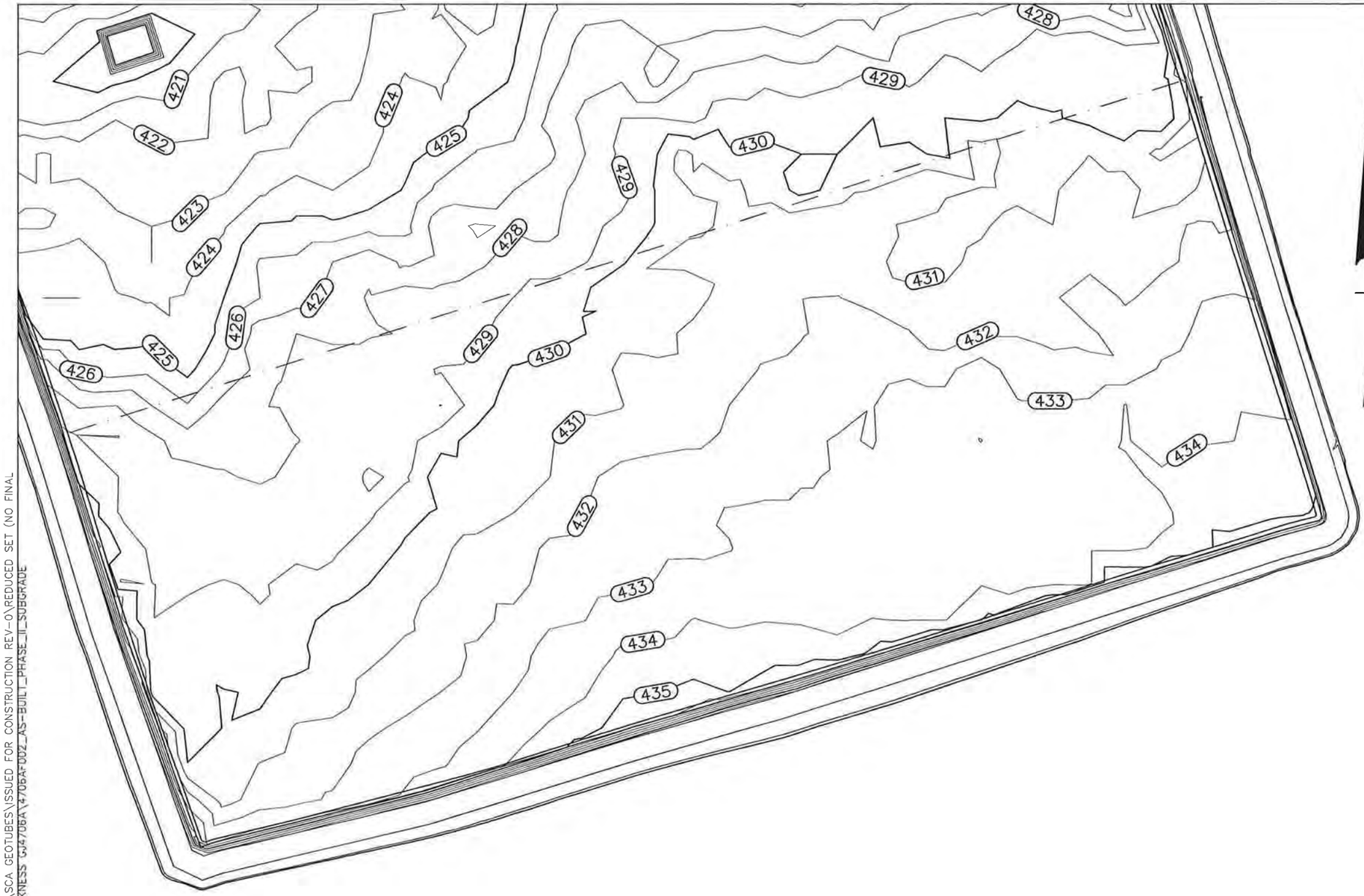
NOTE: THE ELEVATIONS SHOWN IN THIS DRAWING WERE SURVEYED BY PARSONS AND PROVIDED TO GEOSYNTEC ON SEPTEMBER 27, 2012.

TOP OF SUBGRADE - POINTS AND CONTOURS

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	4706AF002
DOCUMENT NO.	—	FIGURE NO.	1A

L:\CADD\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\4706AF002_AS-BUILT_PHASE_II_SUBGRADE



LEGEND

PHASE II BOUNDARY

NOTE: THE CONTOURS SHOWN IN THIS DRAWING WERE PREPARED BY PARSONS AND PROVIDED TO GEOSYNTEC.

-N-

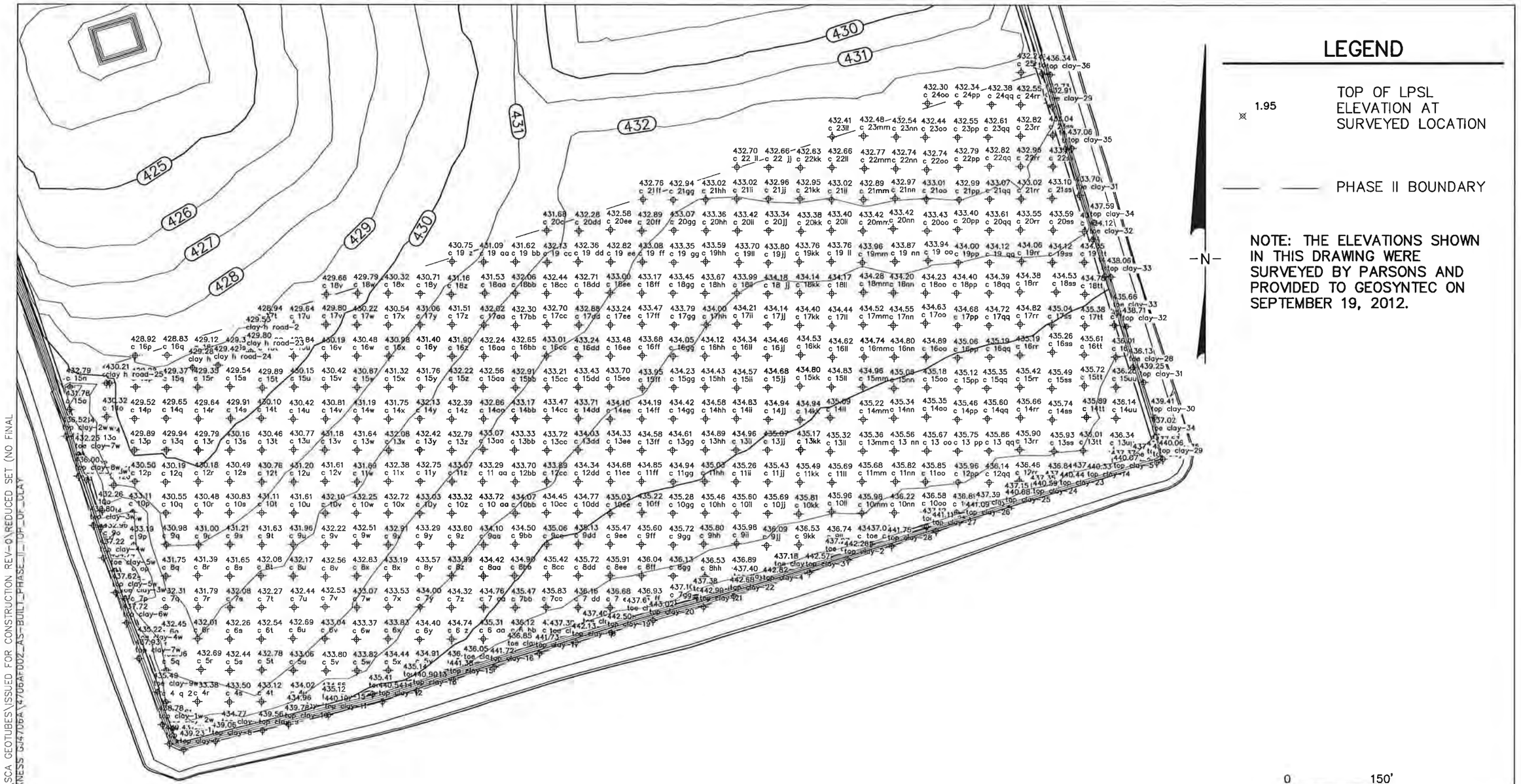
0 150'
SCALE IN FEET

TOP OF SUBGRADE - CONTOURS ONLY

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	4706AF002
DOCUMENT NO.	–	FIGURE NO.	1B

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\4706AF002_AS-BUILT_PHASE_II_SUBGRADE



LEGEND

1.95 — TOP OF LPSL ELEVATION AT SURVEYED LOCATION

—— —— PHASE II BOUNDARY

NOTE: THE ELEVATIONS SHOWN IN THIS DRAWING WERE SURVEYED BY PARSONS AND PROVIDED TO GEOSYNTEC ON SEPTEMBER 19, 2012.

0 150'

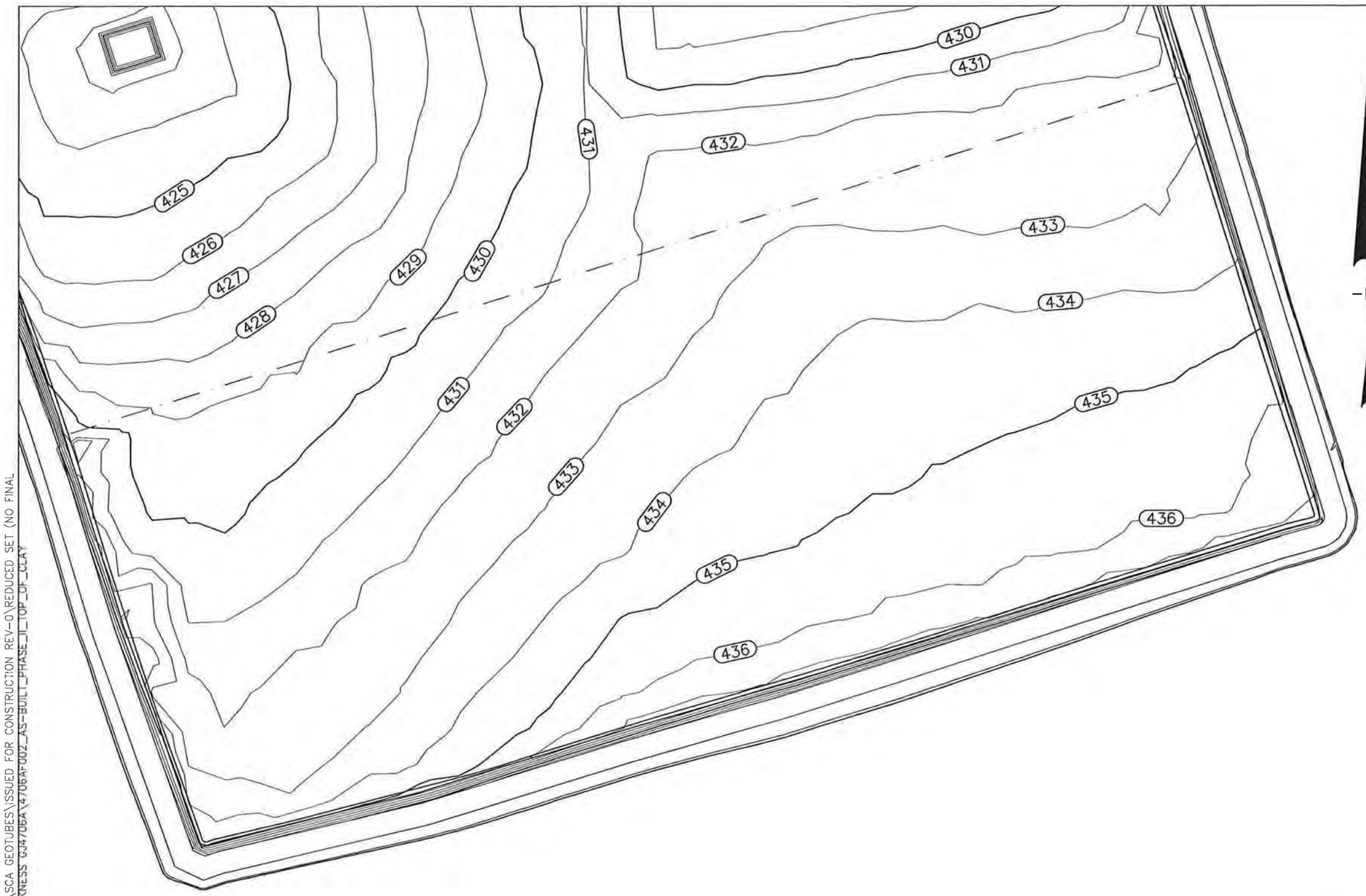
SCALE IN FEET

TOP OF LPSL - POINTS AND CONTOURS

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	4706AF002
DOCUMENT NO.	–	FIGURE NO.	2A

L:\CADD\O_ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\4706AF002_AS-BUILT_PHASE_II_TOP_OF_CLAY



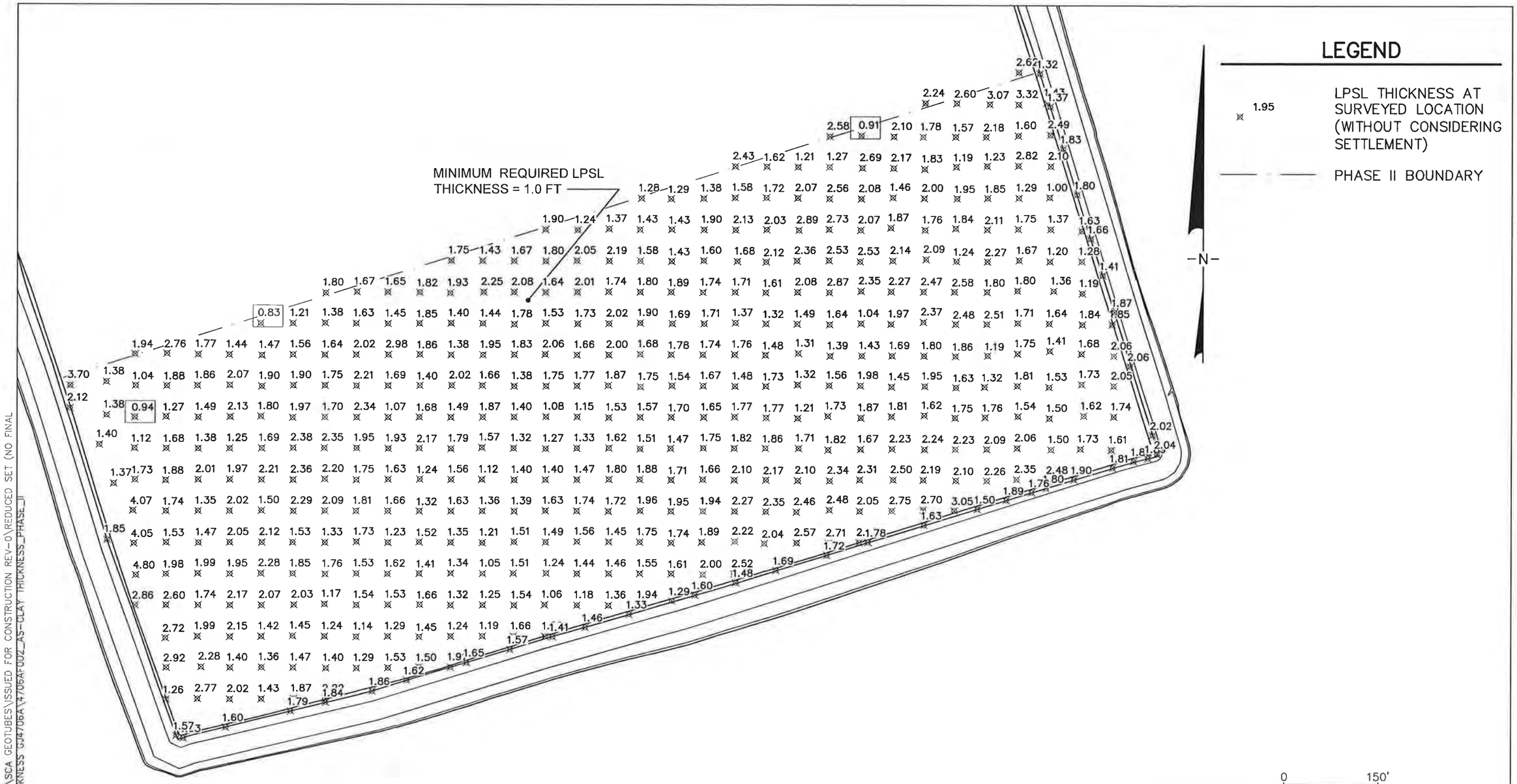
TOP OF LPSL - CONTOURS ONLY

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	4706AF002
DOCUMENT NO.	–	FIGURE NO.	2B

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\4706AF002_AS-BUILT_PHASE_II_TOP_OF_CLAY

Attachment 2
Thickness Figures

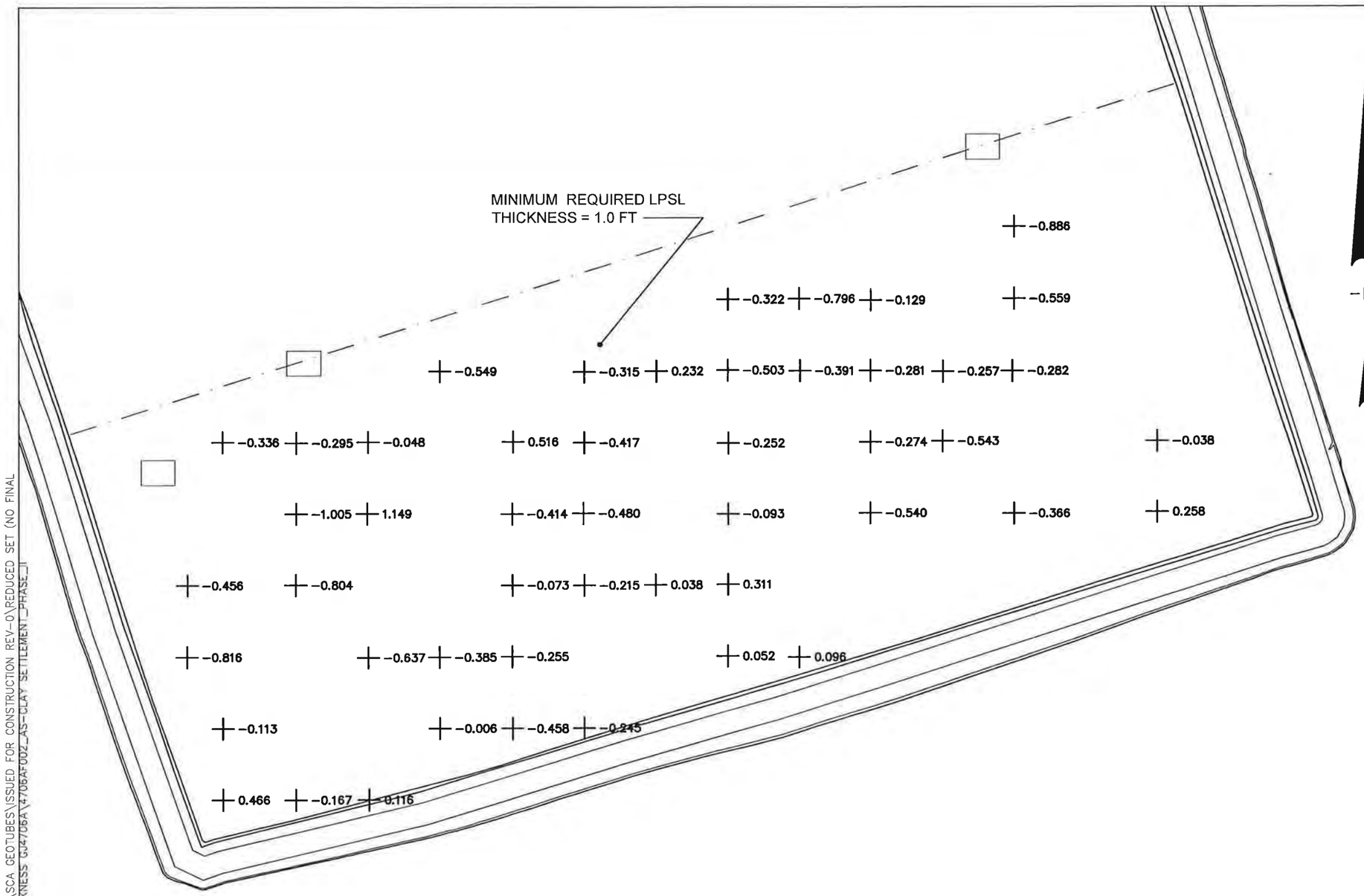


LPSL THICKNESS (WITHOUT CONSIDERING SETTLEMENT)

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	–
DOCUMENT NO.	–	FIGURE NO.	1

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\47056002_AS-CLAY THICKNESS_PHASE_II



LEGEND

-1.95 CALCULATED SETTLEMENT AT PLATE LOCATIONS

PHASE II BOUNDARY

-N-

NOTES:

1. ALL CORINGS HAD MEASURED LPSL THICKNESSES GREATER THAN ONE FOOT.

2. PHASE II CORING DATA WAS PROVIDED TO GEOSYNTEC BY PARSONS ON SEPTEMBER 1, 2012.

0 150'

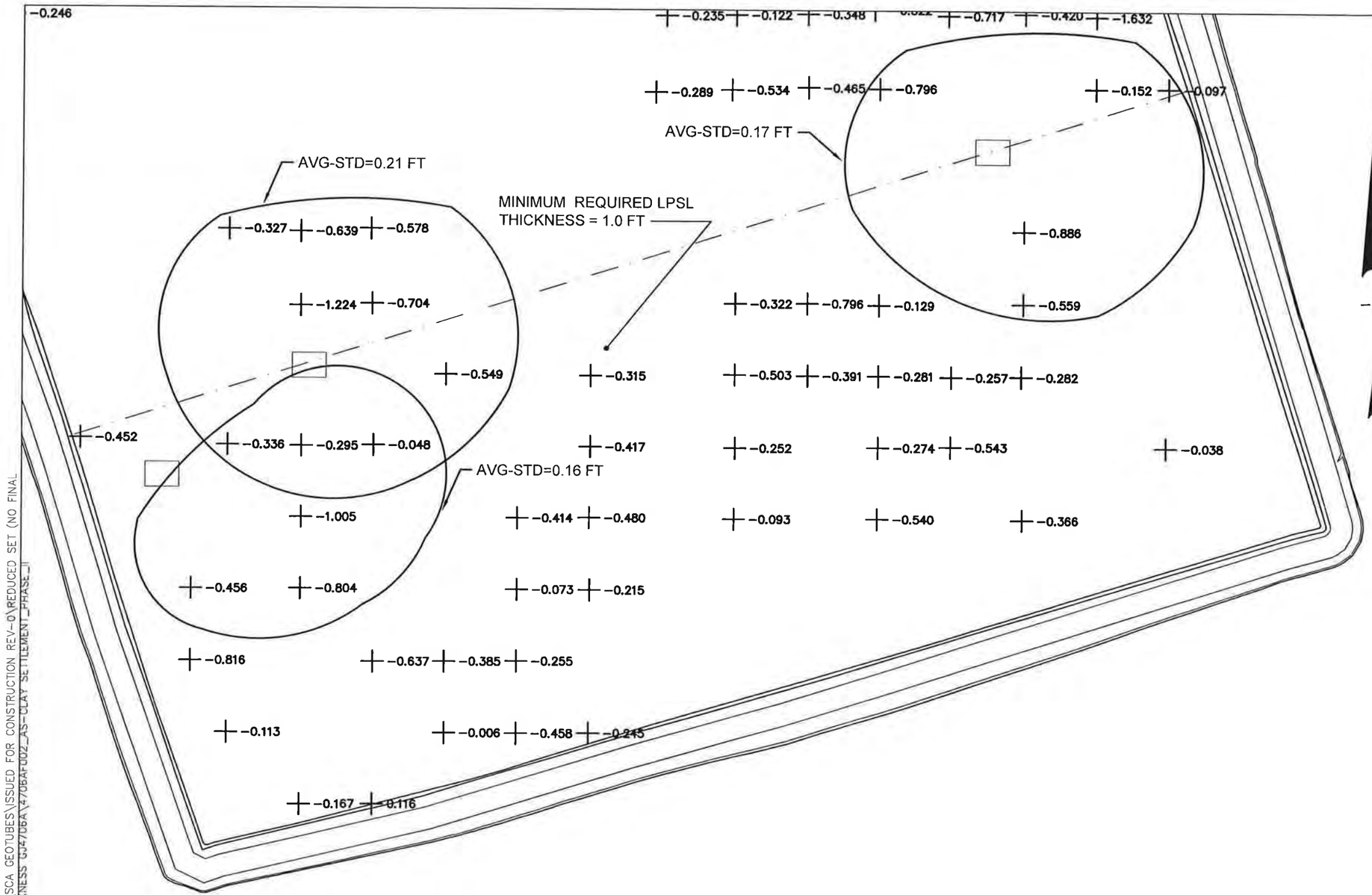
SCALE IN FEET

CALCULATED SETTLEMENT FROM SETTLEMENT PLATES

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	–
DOCUMENT NO.	–	FIGURE NO.	3

L:\CADD\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\4706AF002_AS-CLAY SETTLEMENT_PHASE_II



L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\CLAY THICKNESS GJ4706A\4706AF002_AS-CLAY SETTLEMENT_PHASE_II

CALCULATED SETTLEMENT FROM SELECTED SETTLEMENT PLATES

Geosyntec consultants

DATE:	OCT 2012	SCALE:	AS SHOWN
PROJECT NO.	GJ4706A	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	4

Nuclear Gauge Standard Count Log

Geosyntec
consultants

Nuclear Gauge Standard Count Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Model: Troxler 3440 *SerialNo:* 28800
ArrivalDate: 4/27/2012 *DepartureDate:*
LeakTestDate: 1/3/2012

Date	*Moisture Count*	*Density Count*	*Result*	*QAID*
3/30/2012	2256	693	F	JWC
3/30/2012	2269	696	F	JWC
3/30/2012	2274	683	P	JWC
4/2/2012	2288	690	P	DW
4/5/2012	2280	695	P	DW
4/6/2012	2281	700	P	DW
4/9/2012	2294	702	P	DW
4/10/2012	2350	694	F	DW
4/10/2012	2356	696	F	DW
4/10/2012	2350	694	F	DW
4/10/2012	2354	701	P	DW
4/11/2012	2314	700	F	DW
4/11/2012	2310	702	f	DW
4/11/2012	2313	705	P	DW
4/12/2012	2319	701	p	DW
4/16/2012	2307	698	P	DW
4/17/2012	2283	695	f	DW
4/17/2012	2286	700	p	DW
4/18/2012	2294	693	p	DW
4/19/2012	2276	699	p	DW
4/20/2012	2262	695	p	DW
5/7/2012	2276	699	P	DW
5/11/2012	698	2311	F	JWC
5/11/2012	695	2307	P	JWC
5/14/2012	698	2263	F	JWC
5/14/2012	693	2266	F	JWC
5/14/2012	696	2266	P	JWC
5/16/2012	700	2256	P	JWC
5/17/2012	696	2301	F	JWC

Geosyntec
consultants

Nuclear Gauge Standard Count Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Model: Troxler 3440 *SerialNo:* 28800
ArrivalDate: 4/27/2012 *DepartureDate:*
LeakTestDate: 1/3/2012

Date	*Moisture Count*	*Density Count*	*Result*	*QAID*
5/17/2012	696	2286	P	JWC
5/18/2012	692	2316	F	JWC
5/18/2012	696	2288	P	JWC
5/21/2012	693	2249	f	DW
5/21/2012	697	2249	f	DW
5/21/2012	683	2260	p	DW
5/22/2012	701	2260	p	DW
5/23/2012	701	2313	f	DW
5/23/2012	699	2303	f	DW
5/23/2012	701	2302	p	DW
5/24/2012	702	2299	p	DW
5/25/2012	698	2269	f	DW
5/25/2012	698	2287	p	DW
5/29/2012	696	2290	P	DW
5/30/2012	697	2268	P	DW
5/31/2012	694	2265	p	DW
6/5/2012	700	2284	p	DW
6/6/2012	698	2290	p	DW
6/7/2012	698	2295	p	DW
6/11/2012	687	2273	p	DW
6/13/2012	690	2280	p	DW
6/14/2012	691	2277	p	DW
6/15/2012	691	2278	p	DW
6/18/2012	700	2270	p	DW
6/19/2012	695	2255	p	DW
6/19/2012	694	2259	p	DW
6/21/2012	697	2228	f	DW
6/21/2012	695	2238	p	DW
6/22/2012	691	2233	p	DW

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Nuclear Gauge Standard Count Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Model: Troxler 3440 *SerialNo:* 28800
ArrivalDate: 4/27/2012 *DepartureDate:*
LeakTestDate: 1/3/2012

Date	*Moisture Count*	*Density Count*	*Result*	*QAID*
6/25/2012	702	2233	p	DW
6/26/2012	699	3339	p	DW

Engineered Fill

- Field Density Tests
- Drive Cylinders

Field Density Tests

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for Onondaga SCA Phase II Cell

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 12 - **Moisture Range:** -2 - 2

Soil Type: 1 Engineered Fill-Gramby **Guage Type:** Troxler 3440 **Correction Factor:** NONE
Series: 7 Engineering Fill Phase II **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
7-001	P-19	3/30/2012	6	2	EF-001	8.5	129	6.6	6.6	134.5	126.2	98	p	JWC		
7-002	L-19	3/30/2012	6	2	EF-001	8.5	129	6.7	6.7	132.7	124.4	96	p	JWC		
7-003	F-19	3/30/2012	6	2	EF-001	8.5	129	6.5	6.5	130.7	122.7	96	p	JWC		
7-004	Q-19	4/2/2012	6	3	EF-001	8.5	129	6.8	6.8	131.4	123	96	p	DW		
7-005	K-19	4/2/2012	6	3	EF-001	8.5	129	7	7	132	123.4	96	p	DW		
7-006	G-19	4/2/2012	6	3	EF-001	8.5	129	6.7	6.7	132.6	124.2	96	p	DW		
7-007	F-19	5/29/2012	10	4	EF-001	8.5	129	6.5	6.5	133.7	125.5	98	p	DW		
7-008	G-19	5/29/2012	10	4	EF-001	8.5	129	6.7	6.7	134.3	125.9	98	p	DW		
7-009	H-19	5/29/2012	10	4	EF-001	8.5	129	7.2	7.2	131.6	122.8	95	p	DW		
7-010	I-19	5/29/2012	10	4	EF-001	8.5	129	6.5	6.5	133.4	125.3	97	p	DW		
7-011	J-19	5/29/2012	10	4	EF-001	8.5	129	7.4	7.4	134.7	125.4	97	p	DW		
7-012	K-19	5/29/2012	10	4	EF-001	8.5	129	6.5	6.5	132	123.9	96	p	DW		
7-013	L-19	5/29/2012	10	4	EF-001	8.5	129	7.3	7.3	131.7	122.7	95	p	DW		
7-014	M-19	5/29/2012	10	4	EF-001	8.5	129	6.5	6.5	132.5	124.4	96	p	DW		
7-015	E-19	6/5/2012	10	5	EF-001	8.5	129	6.6	6.5	138.4	130	100	p	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for Onondaga SCA Phase II Cell

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 12 - **Moisture Range:** -2 - 2

Soil Type: 1 Engineered Fill-Gramby **Guage Type:** Troxler 3440 **Correction Factor:** NONE

Series: 7 Engineering Fill Phase II **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
7-016	F-19	6/5/2012	10	5	EF-001	8.5	129	7.4	7.4	133.5	124.3	96	p	DW		
7-017	G-19	6/5/2012	10	5	EF-001	8.5	129	6.9	6.9	135.4	126.7	98	p	DW		
7-018	H-19	6/5/2012	10	5	EF-001	8.5	129	7.9	7.9	135.5	125.6	97	p	DW		
7-019	I-19	6/5/2012	10	5	EF-001	8.5	129	7.3	7.3	137.7	128.3	100	p	DW		
7-020	J-19	6/5/2012	10	5	EF-005	6	136.5	6.5	6.6	139.4	130.8	96	p	DW		
7-021	K-19	6/5/2012	10	5	EF-001	8.5	129	7.2	7.2	136.2	127.1	98	p	DW		
7-022	L-19	6/5/2012	10	5	EF-001	8.5	129	7.8	7.8	137	127.1	99	p	DW		
7-023	M-19	6/5/2012	10	5	EF-001	8.5	129	7.9	7.9	135.6	125.7	97	p	DW		
7-024	N-19	6/5/2012	10	5	EF-001	8.5	129	6.7	6.7	137.4	128.8	99	p	DW		
7-025	O-10	6/5/2012	10	5	EF-001	8.5	129	6.9	6.9	134	125.4	97	p	DW		
7-026	P-19	6/5/2012	10	5	EF-001	8.5	129	7.7	7.7	136.1	126.4	98	p	DW		
7-027	Q-19	6/5/2012	10	4	EF-001	8.5	129	7.3	7.3	135.5	126.3	98	p	DW		
7-028	F-19	6/11/2012	10	6	EF-005	6	136.5	5.2	5.2	139.9	132.9	97	p	DW		
7-029	F-19	6/11/2012	8	6	EF-005	6	136.5	5.2	5.2	139.9	132.9	97	p	DW		
7-030	G-19	6/11/2012	8	6	EF-005	6	136.5	5	5	139.1	132.5	97	p	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for Onondaga SCA Phase II Cell

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 12 - **Moisture Range:** -2 - 2

Soil Type: 1 Engineered Fill-Gramby
Series: 7 Engineering Fill Phase II

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: NONE

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
7-031	I-19	6/11/2012	8	6	EF-005	6	136.5	4.7	4.7	139.7	133.4	97	p	DW		
7-032	K-19	6/11/2012	8	6	EF-005	6	136.5	5.3	5.3	137.8	130.9	95	p	DW		
7-033	L-19	6/11/2012	8	6	EF-005	6	136.5	5	5	140	133.3	98	p	DW		
7-034	M-19	6/11/2012	8	6	EF-005	6	136.5	5.1	5.1	138.6	131.9	97	p	DW		
7-035	N-19	6/11/2012	8	6	EF-005	6	136.5	4.7	4.7	138.2	132	96	p	DW		
7-036	O-19	6/11/2012	8	6	EF-005	6	136.5	5.2	5.2	140.1	133.2	97	p	DW		
7-037	Q-19	6/13/2012	8	6	EF-005	6	136.5	5	5	141	134.3	98	p	DW		
7-038	R-19	6/13/2012	8	4	EF-005	6	136.5	4.8	4.8	140	133.6	97	p	DW		
7-039	S-19	6/13/2012	8	3	EF-005	6	136.5	5.2	5.2	138.6	131.7	97	p	DW		
7-040	T-19	6/13/2012	8	1	EF-005	6	136.5	4.5	4.5	139.8	133.8	98	p	DW		
7-041	U-19	6/13/2012	8	1	EF-005	6	136.5	5.2	5.2	139	132.1	97	p	DW		
7-042	V-19	6/13/2012	8	1	EF-005	6	136.5	4.9	4.9	137.4	131	96	p	DW		
7-043	V-17	6/13/2012	8	1	EF-005	6	136.5	5.4	5.4	137.7	130.6	96	p	DW		
7-044	V-15	6/13/2012	8	1	EF-005	6	136.5	5	5	138.9	132.3	97	p	DW		
7-045	L-19	6/13/2012	8	7	EF-005	6	136.5	5.2	5.2	139.6	132.7	97	p	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for Onondaga SCA Phase II Cell

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 12 - **Moisture Range:** -2 - 2

Soil Type: 1 Engineered Fill-Gramby
Series: 7 Engineering Fill Phase II

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: NONE

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
7-046	M-19	6/13/2012	8	7	EF-005	6	136.5	4.7	4.7	140.1	133.8	98	p	DW		
7-047	N-19	6/13/2012	8	7	EF-005	6	136.5	5.4	5.4	140	132.8	97	p	DW		
7-048	P-19	6/13/2012	8	7	EF-005	6	136.5	5.1	5.1	138.7	132	97	p	DW		
7-049	Q-19	6/13/2012	8	7	EF-005	6	136.5	5.2	5.2	139.6	132.7	97	p	DW		
7-050	E-18	6/26/2012	8	1	EF-006	5	139.5	5.1	5.1	141.8	134.9	97	p	DW		
7-051	E-16	6/26/2012	8	1	EF-006	5	139.5	6.4	6.4	146.1	137.3	98	p	DW		
7-052	E-15	6/26/2012	8	1	EF-006	5	139.5	5.7	5.7	142.9	135.2	97	p	DW		
7-053	E-14	6/26/2012	8	1	EF-006	5	139.5	4.9	4.9	139.6	133.1	95	p	DW		
7-054	E-13	6/26/2012	8	1	EF-006	5	139.5	5.5	5.5	142.6	135.2	97	p	DW		
7-055	E-12	6/26/2012	8	1	EF-006	5	139.5	5.9	5.9	141.8	133.9	96	p	DW		
7-056	E-11	6/26/2012	8	1	EF-006	5	139.5	5.5	5.5	140.9	133.6	96	p	DW		
7-057	E-10	6/26/2012	8	1	EF-006	5	139.5	6.1	6.1	143.9	135.6	97	p	DW		
7-058	E-9	6/26/2012	8	1	EF-006	5	139.5	5.2	5.2	143.9	136.8	98	p	DW		
7-059	E-8	6/26/2012	8	1	EF-006	5	139.5	4.8	4.8	142	135.5	97	p	DW		
7-060	V-15	6/26/2012	8	1	EF-006	5	139.5	4.7	4.7	139.8	133.5	96	p	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for Onondaga SCA Phase II Cell

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 12 - **Moisture Range:** -2 - 2

Soil Type: 1 Engineered Fill-Gramby
Series: 7 Engineering Fill Phase II

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: NONE

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
7-061	V-14	6/26/2012	8	1	EF-006	5	139.5	5.4	5.4	142.1	134.8	97	p	DW		
7-062	V-13	6/26/2012	8	1	EF-006	5	139.5	6	6	141.2	133.2	96	p	DW		
7-063	V-12	6/26/2012	8	1	EF-006	5	139.5	5.9	5.9	143.3	135.3	97	p	DW		
7-064	V-11	6/26/2012	8	1	EF-006	5	139.5	6.4	6.4	144.6	135.9	97	p	DW		

Drive Cylinders

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 2 day April month 2012 year

SOURCE: EF Soil (Granby)

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [✓] SUBGRADE [ ] SUBBASE [ ] CLAY [ ] OTHER: ____

% COMPACTION: 95 MOISTURE CONTENT RANGE: + 2%

TEST LOCATION: 7-004 TEST NO. DCEF-001

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): ____ CYL HT 2 (IN): ____ CYL DIA 1 (IN): ____ CYL DIA 2 (IN): ____

A	CYLINDER NO.: T VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	132.7
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.74	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	124.8
C	WEIGHT OF CYLINDER	(lbs)	1.36	G	PERCENT COMPACTION = F/L	(%)	96.7
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.38	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. F	(gm)	15.2	R	WT. OF WATER = P - Q	(lbs)	23.1
P	WT. OF WET SOIL & TARE	(gm)	402.1	S	WT OF DRY SOIL = Q - O	(pcf)	363.8
Q	WT. OF DRY SOIL & TARE	(gm)	379.0	T	MOISTURE CONTENT = (R/S)X100		6.3

PROCTOR TEST DATA EF-001 [L] MAXIMUM DRY UNIT WT. (pcf) 129 (M) OPT. MOIST. CONTENT (%) 8.5

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		0.2	X	FDT MOISTURE CONTENT	(%)	6.1
V	FDT WET UNIT WT.	(pcf)	131.4	Y	FDT DRY UNIT WT.	(pcf)	123.8
W	DELTA DRY UNIT WT. = F - Y		1.0				

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II
LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200
DESCRIPTION: CQA of SCA Construction, Phase I DATE: 5 day June month 2012 year
SOURCE: EF Soil (Granby)

SPECIFICATION REQUIREMENTS:
MATERIAL TYPE: FILL [✓] SUBGRADE [ ] SUBBASE [ ] CLAY [ ] OTHER:
% COMPACTION: 95 MOISTURE CONTENT RANGE: + 2%
TEST LOCATION: 7-018 TEST NO. DCEF-002

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: T VOLUME [1] (cf)	0.033	E	WET UNIT WEIGHT = D/A (lbs)	135.5
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.83	F	DRY UNIT WEIGHT = E/(1 + (T/100) (pcf)	126.9
C	WEIGHT OF CYLINDER (lbs)	1.36	G	PERCENT COMPACTION = F/L (%)	98.3
D	WEIGHT OF WET SAMPLE = B - C (lbs)	4.47	H	PASS/FAIL	P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. K (gm)	15.2	R	WT. OF WATER = P - Q (lbs)	19.5
P	WT. OF WET SOIL & TARE (gm)	322.5	S	WT OF DRY SOIL = Q - O (pcf)	287.8
Q	WT. OF DRY SOIL & TARE (gm)	303.0	T	MOISTURE CONTENT = (R/S)X100	6.8

PROCTOR TEST DATA EF-001 [L] MAXIMUM DRY UNIT WT. (pcf) 129 (M) OPT. MOIST. CONTENT (%) 8.5

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		-1.1	X	FDT MOISTURE CONTENT (%)	7.9
V	FDT WET UNIT WT. (pcf)	135.5	Y	FDT DRY UNIT WT. (pcf)	125.6
W	DELTA DRY UNIT WT. = F - Y		1.3			

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 5 day June month 2012 year

SOURCE: EF Soil (Granby)

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [✓] SUBGRADE [ ] SUBBASE [ ] CLAY [ ] OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: + 2%

TEST LOCATION: 7-027 TEST NO. **DCEF-003**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: T VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	133.6
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.77	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	125.0
C	WEIGHT OF CYLINDER	(lbs)	1.36	G	PERCENT COMPACTION = F/L	(%)	96.9
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.41	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. P	(gm)	15.2	R	WT. OF WATER = P - Q	(lbs)	18.3
P	WT. OF WET SOIL & TARE	(gm)	298.6	S	WT OF DRY SOIL = Q - O	(pcf)	265.1
Q	WT. OF DRY SOIL & TARE	(gm)	280.3	T	MOISTURE CONTENT = (R/S)X100		6.9

PROCTOR TEST DATA EF-001 [L] MAXIMUM DRY UNIT WT. (pcf) 129 (M) OPT. MOIST. CONTENT (%) 8.5

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		-0.4	X	FDT MOISTURE CONTENT	(%)	7.3
V	FDT WET UNIT WT.	(pcf)	135.5	Y	FDT DRY UNIT WT.	(pcf)	126.3
W	DELTA DRY UNIT WT. = F - Y		-1.3				

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 26 day June month 2012 year

SOURCE: EF Soil (Granby)

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [✓] SUBGRADE [ ] SUBBASE [ ] CLAY [ ] OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: + 2%

TEST LOCATION: 7-051 TEST NO. **DCEF-004**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: T VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	140.9
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	6.01	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	133.2
C	WEIGHT OF CYLINDER	(lbs)	1.36	G	PERCENT COMPACTION = F/L	(%)	95.5
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.65	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. P	(gm)	15.2	R	WT. OF WATER = P - Q	(lbs)	16.4
P	WT. OF WET SOIL & TARE	(gm)	314.5	S	WT OF DRY SOIL = Q - O	(pcf)	282.9
Q	WT. OF DRY SOIL & TARE	(gm)	298.1	T	MOISTURE CONTENT = (R/S)X100		5.8

PROCTOR TEST DATA EF-006 [L] MAXIMUM DRY UNIT WT. (pcf) 139.5 (M) OPT. MOIST. CONTENT (%) 5

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		-0.6	X	FDT MOISTURE CONTENT	(%)	6.4
V	FDT WET UNIT WT.	(pcf)	144.6	Y	FDT DRY UNIT WT.	(pcf)	135.9
W	DELTA DRY UNIT WT. = F - Y		-2.7				

COMMENTS

Low-Permeability Layer

- Field Density Tests
- Drive Cylinders

Field Density Tests

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 90 **Lift Thickness (Compacted - Loose):** 8 - 10 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** NONE

Series: 5 Phase II, LP Soil, 90% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-001	G-19	4/9/2012	10	2	LP-068	16	111	22.2	22.2	126.9	103.8	94	F	JWC	5-047	P
5-002	E-18	4/9/2012	10	2	LP-068	16	111	16.9	16.9	130.6	111.7	100	P	JWC		
5-003	F-16	4/9/2012	10	2	LP-068	16	111	14	14	137.5	120.6	100	P	JWC		
5-004	F-14	4/9/2012	10	2	LP-103	17.5	113	19.4	19.4	131.2	109.9	97	P	JWC		
5-005	E-13	4/10/2012	10	2	LP-068	16	111	16.8	16.8	128.6	110.1	99	P	DW		
5-006	E-13	4/10/2012	10	2	LP-068	16	111	16.8	16.8	129.8	111.1	100	P	DW		
5-007	E-14	4/10/2012	10	2	LP-068	16	111	19	19	132.7	111.5	100	P	DW		
5-008	E-14	4/10/2012	10	2	LP-068	16	111	17.6	17.6	126.5	107.5	97	P	DW		
5-009	E-14	4/10/2012	10	2	LP-068	16	111	15.8	15.8	129	111.4	100	P	DW		
5-010	E-15	4/10/2012	10	2	LP-068	16	111	16.3	16.3	132.1	113.6	100	P	DW		
5-011	E-15	4/10/2012	10	2	LP-068	16	111	16.7	16.7	128.6	110.2	99	P	DW		
5-012	E-16	4/10/2012	10	2	LP-068	16	111	15.2	15.2	127.5	110.7	100	P	DW		
5-013	E-16	4/10/2012	10	2	LP-068	16	111	18.2	18.2	127.4	107.8	97	P	DW		
5-014	E-17	4/10/2012	10	2	LP-068	16	111	18.1	18.1	127.5	107.9	97	P	DW		
5-015	E-17	4/10/2012	10	2	LP-068	16	111	18.6	18.6	130.7	110.2	100	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 90 *Lift Thickness (Compacted - Loose):* 8 - 10 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* NONE

Series: 5 Phase II, LP Soil, 90% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-016	E-17	4/10/2012	10	2	LP-068	16	111	18.4	18.4	131.3	110.9	100	P	DW		
5-017	E-18	4/10/2012	10	2	LP-068	16	111	11.4	11.4	134.4	120.7	100	F	DW	5-035	P
5-018	E-18	4/10/2012	10	2	LP-068	16	111	12.6	12.6	132.5	117.6	100	F	DW	5-036	P
5-019	E-19	4/10/2012	10	2	LP-068	16	111	12.1	12.1	128.6	114.7	100	F	DW	5-037	P
5-020	F-19	4/10/2012	10	2	LP-068	16	111	16.1	16.1	130.3	112.2	100	P	DW		
5-021	F-19	4/10/2012	10	2	LP-103	17.5	113	15.6	15.6	132	114.2	100	P	DW		
5-022	F-18	4/10/2012	10	2	LP-068	16	111	17.6	17.6	127	108	97	P	DW		
5-023	F-18	4/10/2012	10	2	LP-068	16	111	17.2	17.2	127.4	108.7	98	P	DW		
5-024	F-18	4/10/2012	10	2	LP-068	16	111	15	15	132	114.7	100	P	DW		
5-025	F-17	4/10/2012	10	2	LP-068	16	111	14.9	14.9	135.3	117.8	100	P	DW		
5-026	F-17	4/10/2012	10	2	LP-068	16	111	13.7	13.7	136.4	119.9	100	P	DW		
5-027	F-16	4/10/2012	10	2	LP-068	16	111	14.2	14.2	132.9	116.3	100	P	DW		
5-028	F-16	4/10/2012	10	2	LP-068	16	111	13.4	13.4	133	117.3	100	P	DW		
5-029	F-15	4/10/2012	10	2	LP-068	16	111	14.2	14.2	130	113.9	100	P	DW		
5-030	F-15	4/10/2012	10	2	LP-068	16	111	18.2	18.2	134.2	113.5	100	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 90 *Lift Thickness (Compacted - Loose):* 8 - 10 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* NONE

Series: 5 Phase II, LP Soil, 90% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-031	F-14	4/10/2012	10	2	LP-068	16	111	18.4	18.4	129.4	109.3	99	P	DW		
5-032	F-14	4/10/2012	10	2	LP-068	16	111	17.1	17.1	130.2	111.2	100	P	DW		
5-033	F-13	4/10/2012	10	2	LP-068	16	111	18	18	130.9	110.9	100	P	DW		
5-034	F-13	4/10/2012	10	2	LP-068	16	111	15.3	15.3	128.3	111.3	100	P	DW		
5-035	E-18	4/11/2012	10	2	LP-068	16	111	14.7	14.7	125	109	98	P	DW		
5-036	E-18	4/11/2012	10	2	LP-068	16	111	16.1	16.1	127.3	109.6	99	P	DW		
5-037	E-19	4/11/2012	10	2	LP-068	16	111	15.8	15.8	126.8	109.5	99	P	DW		
5-038	F-13	4/16/2012	10	3	LP-103	17.5	113	17.3	17.3	123.7	105.5	93	P	DW		
5-039	E-15	4/16/2012	10	3	LP-103	17.5	113	19.7	19.7	122.3	102.2	90	P	DW		
5-040	F-18	4/16/2012	10	3	LP-103	17.5	113	18.1	18.1	123.5	104.6	93	P	DW		
5-041	G-15	4/16/2012	10	2	LP-103	17.5	113	16.2	16.2	127.9	110.1	97	P	DW		
5-042	G-15	4/16/2012	10	2	LP-103	17.5	113	17.5	17.5	128.5	109.4	97	P	DW		
5-043	G-16	4/16/2012	10	2	LP-103	17.5	113	17.9	17.9	132.4	112.3	100	P	DW		
5-044	G-16	4/16/2012	10	2	LP-103	17.5	113	19.4	19.4	132.1	110.6	98	P	DW		
5-045	G-16	4/16/2012	10	2	LP-103	17.5	113	18.7	18.7	130.1	109.6	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA) ProjNo: GJ4706B
Location: Camillus, New York TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Proctor Type: ASTM D 698 ***Percent Compaction:*** 90 ***Lift Thickness (Compacted - Loose):*** 8 - 10 ***Moisture Range:*** -3 - 3

Soil Type: 4 LP Soil-Marcellus ***Guage Type:*** Troxler 3440 ***Correction Factor:*** NONE
Series: 5 Phase II, LP Soil, 90% Compaction ***Guage Serial No:*** 28800

ID	*Location*	*Date*	*Probe Depth*	*Lift No.*	*Lab*			*Field*						*QA ID*	*Retest No*	*Retest Result*
					Sample No	*OMC* (%)	*Max Dry Unit Wt* (PCF)	*Field MC*	*Correct MC*	*Wet Unit Wt* (PCF)	*Dry Unit Wt* (PCF)	*Percent Compact* (%)	*Result*			
5-046	G-17	4/16/2012	10	2	LP-103	17.5	113	16.5	16.5	129.5	111.2	98	P	DW		
5-047	G-17	4/16/2012	10	2	LP-103	17.5	113	17.4	17.4	131.3	111.8	99	P	DW		
5-048	H-17	4/16/2012	10	2	LP-103	17.5	113	19.7	19.7	132.1	110.4	98	P	DW		
5-049	H-17	4/16/2012	10	2	LP-103	17.5	113	19.4	19.4	133.1	111.5	99	P	DW		
5-050	H-16	4/16/2012	10	2	LP-103	17.5	113	18.1	18.1	132.6	112.3	99	P	DW		
5-051	H-16	4/16/2012	10	2	LP-103	17.5	113	19	19	130.1	109.3	97	P	DW		
5-052	H-15	4/16/2012	10	2	LP-103	17.5	113	17.8	17.8	130.3	110.6	98	P	DW		
5-053	H-15	4/16/2012	10	2	LP-103	17.5	113	17.2	17.2	130.2	111.1	98	P	DW		
5-054	G-14	4/17/2012	10	2	LP-103	17.5	113	18.6	18.6	131.3	110.7	98	P	DW		
5-055	G-14	4/17/2012	10	2	LP-103	17.5	113	18.9	18.9	129.5	108.9	96	P	DW		
5-056	H-14	4/17/2012	10	2	LP-103	17.5	113	18.9	18.9	129.7	109	97	P	DW		
5-057	H-14	4/17/2012	10	2	LP-103	17.5	113	19	19	130.3	109.5	97	P	DW		
5-058	H-14	4/17/2012	10	2	LP-103	17.5	113	17.2	17.2	128.5	109.6	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 90 **Lift Thickness (Compacted - Loose):** 8 - 10 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.6319x + 7.8666

Series: 5 Phase II, LP Soil, 90% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-059	I-14	5/7/2012	8	2	LP-103	17.5	113	18.7	19.7	129.1	107.9	96	P	DW		
5-060	I-14	5/7/2012	8	2	LP-103	17.5	113	18.4	19.5	129.4	108.3	96	P	DW		
5-061	I-14	5/7/2012	8	2	LP-103	17.5	113	16.3	18.2	130.5	110.4	98	P	DW		
5-062	I-15	5/7/2012	8	2	LP-103	17.5	113	17.2	18.7	130.2	109.7	97	P	DW		
5-063	I-15	5/7/2012	8	2	LP-103	17.5	113	18.1	19.3	129.4	108.5	96	P	DW		
5-064	I-16	5/7/2012	8	2	LP-103	17.5	113	17.5	18.9	130.1	109.4	97	P	DW		
5-065	I-16	5/7/2012	8	2	LP-103	17.5	113	18.6	19.6	129.6	108.4	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 90 **Lift Thickness (Compacted - Loose):** 8 - 10 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus
Series: 5 Phase II, LP Soil, 90% Compaction

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: y = 0.8292x + 4.5982

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-066	N-13	5/16/2012	6	2	LP-103	17.5	113	18.4	19.9	129.1	107.7	95	P	JWC		
5-067	N-14	5/16/2012	6	2	LP-103	17.5	113	20.2	21.4	128.8	106.1	94	F	JWC	5-069	P
5-068	M-14	5/16/2012	6	2	LP-103	17.5	113	18.9	20.3	129.3	107.5	95	P	JWC		
5-069	N-14	5/16/2012	6	2	LP-103	17.5	113	18.9	20.3	130.1	108.2	96	P	JWC		
5-070	M-13	5/16/2012	6	2	LP-103	17.5	113	18.5	19.9	128.9	107.5	95	P	JWC		
5-071	M-14	5/16/2012	6	2	LP-103	17.5	113	18.8	20.2	129.5	107.7	95	P	JWC		
5-072	N-14	5/16/2012	6	2	LP-103	17.5	113	18.8	20.2	130.6	108.7	96	P	JWC		
5-073	Q-13	5/18/2012	8	2	LP-128	16	115.5	16.8	18.5	132.4	111.7	97	P	JWC		
5-074	P-13	5/18/2012	8	2	LP-128	16	115.5	13.6	15.9	135.3	116.7	100	P	JWC		
5-075	O-13	5/18/2012	8	2	LP-128	16	115.5	15.7	17.6	128.7	109.4	95	P	JWC		
5-076	P-14	5/18/2012	8	2	LP-128	16	115.5	15.3	17.3	132.8	113.2	98	P	JWC		
5-077	O-14	5/18/2012	8	2	LP-128	16	115.5	16.1	17.9	131.9	111.9	97	P	JWC		
5-078	P-14	5/18/2012	8	2	LP-128	16	115.5	15.1	17.1	134.2	114.6	99	P	JWC		
5-079	Q-14	5/18/2012	8	2	LP-128	16	115.5	17.3	18.9	126.9	106.7	92	P	JWC		
5-080	J-19	5/22/2012	8	2	LP-128	16	115.5	14.7	16.8	130.3	111.6	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 90 **Lift Thickness (Compacted - Loose):** 8 - 10 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus
Series: 5 Phase II, LP Soil, 90% Compaction

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: y = 0.8292x + 4.5982

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-081	L-19	5/22/2012	8	2	LP-128	16	115.5	16.2	18	131.7	111.6	97	P	DW		
5-082	M-18	5/22/2012	8	2	LP-128	16	115.5	16.4	18.2	130.1	110.1	95	P	DW		
5-083	M-19	5/23/2012	8	2	LP-128	16	115.5	15	17	132.4	113.2	98	P	DW		
5-084	N-19	5/23/2012	8	2	LP-128	16	115.5	15.9	17.8	131.2	111.4	97	P	DW		
5-085	N-19	5/23/2012	8	2	LP-128	16	115.5	15.9	17.8	130.8	111	96	P	DW		
5-086	M-18	5/23/2012	8	2	LP-128	16	115.5	16	17.8	130.8	111	96	P	DW		
5-087	O-18	5/24/2012	8	2	LP-128	16	115.5	15.8	17.7	133.4	113.3	98	P	DW		
5-088	P-18	5/24/2012	8	2	LP-128	16	115.5	15.2	17.2	129.6	110.6	96	P	DW		
5-089	N-19	5/23/2012	8	2	LP-128	16	115.5	15.8	17.7	129.7	110.2	95	P	DW		
5-090	N-18	5/23/2012	8	2	LP-128	16	115.5	16	17.9	131	111.1	96	P	DW		
5-091	M-15	5/23/2012	8	2	LP-128	16	115.5	15.3	17.3	128.7	109.7	95	P	DW		
5-092	N-15	5/23/2012	8	2	LP-128	16	115.5	14.8	16.9	131	112.1	97	P	DW		
5-093	N-15	5/23/2012	8	2	LP-128	16	115.5	16.6	18.4	130.6	110.3	96	P	DW		
5-094	Q-14	5/25/2012	8	2	LP-128	16	115.5	15.3	17.3	128.2	109.3	94	P	DW		
5-095	R-15	5/25/2012	8	2	LP-128	16	115.5	14.5	16.6	132.2	113.4	98	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 90 **Lift Thickness (Compacted - Loose):** 8 - 10 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982

Series: 5 Phase II, LP Soil, 90% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-096	R-15	5/25/2012	8	2	LP-128	16	115.5	14.7	16.8	128.2	109.8	95	P	DW		
5-097	R-15	5/25/2012	8	2	LP-128	16	115.5	16	17.9	131	111.1	96	P	DW		
5-098	U-13	6/11/2012	8	2	LP-128	16	115.5	13.8	16	129.1	111.3	96	P	DW		
5-099	U-13	6/11/2012	8	2	LP-128	16	115.5	16.3	18.1	129.5	109.7	95	P	DW		
5-100	U-13	6/11/2012	8	3	LP-128	16	115.5	14.3	16.5	131.5	112.9	98	P	DW		
5-101	U-13	6/11/2012	8	3	LP-128	16	115.5	15.7	17.6	132.5	112.7	98	P	DW		
5-102	U-13	6/11/2012	8	4	LP-128	16	115.5	14.8	16.9	131	112.1	97	P	DW		
5-103	U-13	6/11/2012	8	4	LP-128	16	115.5	15.3	17.3	128.7	109.7	95	P	DW		
5-104	S-14	6/11/2012	8	2	LP-128	16	115.5	13.4	15.7	128.6	111.1	96	P	DW		
5-105	S-14	6/11/2012	8	2	LP-128	16	115.5	14.8	16.9	130.7	111.8	97	P	DW		
5-106	S-14	6/11/2012	8	2	LP-128	16	115.5	16.3	18.1	129.5	109.7	95	P	DW		
5-107	R-14	6/11/2012	8	2	LP-128	16	115.5	15.4	17.4	129.2	110.1	95	P	DW		
5-108	R-14	6/11/2012	8	2	LP-128	16	115.5	15	17	131.8	112.6	98	P	DW		
5-109	S-15	6/11/2012	8	2	LP-128	16	115.5	13.8	16	130.5	112.5	97	P	DW		
5-110	S-15	6/11/2012	8	2	LP-128	16	115.5	14.1	16.3	129.4	111.3	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 90 **Lift Thickness (Compacted - Loose):** 8 - 10 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982

Series: 5 Phase II, LP Soil, 90% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
5-111	S-15	6/11/2012	8	2	LP-128	16	115.5	16.4	18.2	133.4	112.9	98	P	DW		
5-112	R-16	6/11/2012	8	2	LP-128	16	115.5	16.6	18.4	130.5	110.2	95	P	DW		
5-113	R-16	6/11/2012	8	2	LP-128	16	115.5	15.7	17.6	132.3	112.5	97	P	DW		
5-114	Q-18	6/11/2012	8	2	LP-128	16	115.5	16.6	18.4	130.5	110.2	95	P	DW		
5-115	Q-18	6/11/2012	8	2	LP-128	16	115.5	16.2	18	131.7	111.6	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* NONE

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-001	E-13	4/17/2012	10	3	LP-103	17.5	113	18.8	18.8	129.6	109	97	P	DW		
6-002	E-14	4/17/2012	10	3	LP-103	17.5	113	19.4	19.4	129.6	108.5	96	P	DW		
6-003	E-13	4/17/2012	10	3	LP-103	17.5	113	19.4	19.4	129.3	108.3	96	P	DW		
6-004	E-15	4/17/2012	10	3	LP-103	17.5	113	18	18	130.3	110.4	98	P	DW		
6-005	E-16	4/17/2012	10	3	LP-103	17.5	113	17.5	17.5	128.4	109.3	97	P	DW		
6-006	E-17	4/17/2012	10	3	LP-103	17.5	113	17.8	17.8	131	111.2	98	P	DW		
6-007	E-18	4/17/2012	10	3	LP-103	17.5	113	18.8	18.8	130.3	109.7	97	P	DW		
6-008	E-19	4/17/2012	10	3	LP-103	17.5	113	19.7	19.7	129.3	108	96	P	DW		
6-009	F-18	4/18/2012	8	3	LP-103	17.5	113	17.6	17.6	127.4	108.3	96	P	DW		
6-010	F-18	4/18/2012	8	3	LP-103	17.5	113	17.8	17.8	127.3	108.1	96	P	DW		
6-011	F-17	4/18/2012	8	3	LP-103	17.5	113	17.5	17.5	128.6	109.4	97	P	DW		
6-012	F-17	4/18/2012	8	3	LP-103	17.5	113	17.8	17.8	129.4	109.9	97	P	DW		
6-013	F-16	4/18/2012	8	3	LP-103	17.5	113	18.1	18.1	128.6	108.9	96	P	DW		
6-014	F-16	4/18/2012	8	3	LP-103	17.5	113	19.2	19.2	128.5	107.8	95	P	DW		
6-015	F-16	4/18/2012	8	3	LP-103	17.5	113	17.9	17.9	128.8	109.3	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** NONE

Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-016	F-15	4/18/2012	8	3	LP-103	17.5	113	18.5	18.5	128.5	108.4	96	P	DW		
6-017	F-15	4/18/2012	8	3	LP-103	17.5	113	17.8	17.8	128.4	109	96	P	DW		
6-018	F-14	4/18/2012	8	3	LP-103	17.5	113	19.7	19.7	128.9	107.7	95	P	DW		
6-019	F-14	4/18/2012	8	3	LP-103	17.5	113	19.1	19.1	129.8	109	97	P	DW		
6-020	F-13	4/18/2012	8	3	LP-103	17.5	113	18.6	18.6	128.2	108.1	96	P	DW		
6-021	F-13	4/18/2012	8	3	LP-103	17.5	113	18.2	18.2	128.6	108.8	96	P	DW		
6-022	F-13	4/18/2012	8	3	LP-103	17.5	113	17.9	17.9	129.5	109.9	97	P	DW		
6-023	F-19	4/18/2012	8	3	LP-103	17.5	113	19	19	129.3	108.6	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.6319x + 7.8566

Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-024	G-19	4/19/2012	8	2	LP-103	17.5	113	17.5	18.9	129.5	108.9	96	P	DW		
6-025	G-18	4/19/2012	8	2	LP-103	17.5	113	18	19.2	129.1	108.4	96	P	DW		
6-026	G-18	4/19/2012	8	2	LP-103	17.5	113	18.4	19.5	128.9	107.9	96	P	DW		
6-027	G-18	4/19/2012	8	2	LP-103	17.5	113	19.6	20.3	129.4	107.6	95	P	DW		
6-028	G-17	4/19/2012	8	3	LP-103	17.5	113	17.6	19	130.4	109.6	97	P	DW		
6-029	G-17	4/19/2012	8	3	LP-103	17.5	113	18.1	19.3	129.4	108.5	96	P	DW		
6-030	G-16	4/19/2012	8	3	LP-103	17.5	113	17.9	19.2	128.5	107.8	95	P	DW		
6-031	G-16	4/19/2012	8	3	LP-103	17.5	113	18.3	19.4	128.7	107.8	95	P	DW		
6-032	G-15	4/19/2012	8	3	LP-103	17.5	113	17.6	19	129.5	108.8	96	P	DW		
6-033	G-15	4/19/2012	8	3	LP-103	17.5	113	17.5	18.9	130.1	109.4	97	P	DW		
6-034	G-14	4/19/2012	8	3	LP-103	17.5	113	17.8	19.1	128	107.5	95	P	DW		
6-035	G-14	4/19/2012	8	3	LP-103	17.5	113	18.4	19.5	129.8	108.6	96	P	DW		
6-036	G-14	4/19/2012	8	3	LP-103	17.5	113	18.9	19.8	128.8	107.5	95	P	DW		
6-037	G-13	4/19/2012	8	2	LP-103	17.5	113	18.3	19.4	129	108	96	P	DW		
6-038	G-13	4/19/2012	8	2	LP-103	17.5	113	17.6	19	130	109.2	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.6319x + 7.8666

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	*Location*	*Date*	*Probe Depth*	*Lift No.*	*Lab*			*Field*						*QA ID*	*Retest No*	*Retest Result*
					Sample No	*OMC* (%)	*Max Dry Unit Wt* (PCF)	*Field MC*	*Correct MC*	*Wet Unit Wt* (PCF)	*Dry Unit Wt* (PCF)	*Percent Compact* (%)	*Result*			
6-039	H-18	5/7/2012	8	2	LP-103	17.5	113	10.6	14.6	132.6	115.7	100	F	DW	6-050	P
6-040	H-16	5/7/2012	8	3	LP-103	17.5	113	12.4	15.7	130.4	112.7	100	P	DW		
6-041	H-14	5/7/2012	8	3	LP-103	17.5	113	11.2	14.9	131	114	100	P	DW		
6-042	E-14	5/7/2012	8	1	LP-103	17.5	113	17.1	18.7	129.3	108.9	96	P	DW		
6-043	E-16	5/7/2012	8	1	LP-103	17.5	113	16.9	18.5	127.9	107.9	95	P	DW		
6-044	E-18	5/7/2012	8	1	LP-103	17.5	113	16.2	18.1	130.3	110.3	98	P	DW		
6-045	F-19	5/7/2012	8	1	LP-103	17.5	113	16.5	18.3	129.7	109.6	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-046	H-19	5/11/2012	8	3	LP-103	17.5	113	14.6	16.7	131.7	112.9	100	P	JWC		
6-047	H-16	5/11/2012	8	3	LP-103	17.5	113	15.3	17.3	135.8	115.8	100	P	JWC		
6-048	H-14	5/11/2012	8	3	LP-103	17.5	113	14.8	16.9	132.1	113	100	P	JWC		
6-049	H-18	5/11/2012	8	2	LP-103	17.5	113	8.8	11.9	124.4	111.2	98	F	JWC	6-073	P
6-050	H-18	5/11/2012	8	2	LP-103	17.5	113	14.2	16.4	135.5	116.4	100	P	JWC		
6-051	H-17	5/11/2012	8	3	LP-103	17.5	113	12.1	14.6	135.1	117.9	100	P	JWC		
6-052	H-16	5/11/2012	8	3	LP-103	17.5	113	15.1	17.1	130.1	111.1	98	P	JWC		
6-053	H-15	5/11/2012	8	3	LP-103	17.5	113	13	15.4	132	114.4	100	P	JWC		
6-054	H-13	5/11/2012	8	2	LP-103	17.5	113	14	16.2	131.5	113.2	100	P	JWC		
6-055	I-13	5/11/2012	8	2	LP-103	17.5	113	13.8	16	133.3	114.9	100	P	JWC		
6-056	H-14	5/11/2012	8	3	LP-103	17.5	113	12.5	15	128.7	111.9	99	P	JWC		
6-057	I-14	5/11/2012	8	3	LP-103	17.5	113	10.4	13.2	133.6	118	100	F	JWC	6-082	P
6-058	H-15	5/11/2012	8	3	LP-103	17.5	113	11.6	14.2	133.5	116.9	100	F	JWC	6-081	P
6-059	I-15	5/11/2012	8	3	LP-103	17.5	113	11.9	14.5	134.4	117.4	100	P	JWC		
6-060	I-16	5/11/2012	8	3	LP-103	17.5	113	10.7	13.5	125.2	110.3	98	F	JWC	6-080	P

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-061	I-17	5/11/2012	8	2	LP-103	17.5	113	10.8	13.6	131.8	116	100	F	JWC	6-079	P
6-062	H-18	5/11/2012	8	3	LP-103	17.5	113	16.6	18.4	129.2	109.1	97	P	JWC		
6-063	I-19	5/11/2012	8	2	LP-103	17.5	113	14	16.2	124.1	106.8	95	P	JWC		
6-064	I-19	5/11/2012	8	2	LP-103	17.5	113	16	17.9	126.6	107.4	95	P	JWC		
6-065	I-18	5/11/2012	8	2	LP-103	17.5	113	14.5	16.6	129.9	111.4	99	P	JWC		
6-066	I-18	5/11/2012	8	2	LP-103	17.5	113	9.3	12.3	130.1	115.9	100	F	JWC	6-077	P
6-067	I-17	5/11/2012	8	2	LP-103	17.5	113	15.6	17.5	134	114	100	P	JWC		
6-068	I-16	5/11/2012	8	3	LP-103	17.5	113	11.9	14.5	130.3	113.8	100	P	JWC		
6-069	I-15	5/11/2012	8	3	LP-103	17.5	113	12.2	14.7	127.7	111.3	99	P	JWC		
6-070	I-14	5/11/2012	8	3	LP-103	17.5	113	11.1	13.8	129.5	113.8	100	F	JWC	6-083	P
6-071	I-13	5/11/2012	8	2	LP-103	17.5	113	10.5	13.3	130.4	115.1	100	F	JWC	6-084	P
6-072	I-13	5/11/2012	8	2	LP-103	17.5	113	11.7	14.3	130.3	114	100	F	JWC	6-085	P
6-073	H-18	5/14/2012	8	2	LP-103	17.5	113	17	18.7	128.4	108.2	96	P	JWC		
6-074	H-14	5/14/2012	8	3	LP-103	17.5	113	15.5	17.5	128.7	109.5	97	P	JWC		
6-075	I-16	5/14/2012	8	3	LP-103	17.5	113	17	18.7	129.9	109.4	97	P	JWC		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-076	H-17	5/14/2012	8	3	LP-103	17.5	113	16.4	18.2	131.1	110.9	98	P	JWC		
6-077	I-18	5/14/2012	8	2	LP-103	17.5	113	16.3	18.1	125.3	106.1	94	F	JWC	6-078	P
6-078	I-18	5/14/2012	8	2	LP-103	17.5	113	14.9	17	127.4	108.9	96	P	JWC		
6-079	I-17	5/14/2012	8	2	LP-103	17.5	113	15.5	17.5	130.9	111.4	99	P	JWC		
6-080	I-16	5/14/2012	8	3	LP-103	17.5	113	14.7	16.8	135.7	116.2	100	P	JWC		
6-081	H-15	5/14/2012	8	3	LP-103	17.5	113	15.3	17.3	134.6	114.8	100	P	JWC		
6-082	I-14	5/14/2012	8	3	LP-103	17.5	113	17	18.7	131.2	110.5	98	P	JWC		
6-083	I-14	5/14/2012	8	3	LP-103	17.5	113	13.3	15.6	135	116.8	100	P	JWC		
6-084	I-13	5/14/2012	8	2	LP-103	17.5	113	15	17	133	113.7	100	P	JWC		
6-085	I-13	5/14/2012	8	2	LP-103	17.5	113	15.3	17.3	134.9	115	100	P	JWC		
6-086	H-13	5/14/2012	8	2	LP-103	17.5	113	15.1	17.1	132.3	113	100	P	JWC		
6-087	J-13	5/16/2012	6	2	LP-103	17.5	113	14.4	16.5	130.6	112.1	99	P	JWC		
6-088	K-13	5/16/2012	6	2	LP-103	17.5	113	15.1	17.1	132.3	113	100	P	JWC		
6-089	L-13	5/16/2012	6	2	LP-103	17.5	113	15.6	17.5	131.1	111.6	99	P	JWC		
6-090	L-14	5/16/2012	6	2	LP-103	17.5	113	16.1	17.9	129.3	109.7	97	P	JWC		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-091	K-14	5/16/2012	6	2	LP-103	17.5	113	16.3	18.1	129.2	109.4	97	P	JWC		
6-092	J-14	5/16/2012	6	2	LP-103	17.5	113	16.2	18	129.4	109.7	97	P	JWC		
6-093	K-14	5/16/2012	6	2	LP-103	17.5	113	17.6	19.2	129.2	108.4	96	P	JWC		
6-094	L-14	5/16/2012	6	2	LP-103	17.5	113	16.4	18.2	129	109.1	97	P	JWC		
6-095	M-14	5/16/2012	6	3	LP-103	17.5	113	14.9	16.9	132.2	113.1	100	P	JWC		
6-096	M-14	5/16/2012	6	3	LP-103	17.5	113	17.8	19.4	129.5	108.5	96	P	JWC		
6-097	L-15	5/16/2012	6	2	LP-103	17.5	113	16.3	18.1	130.2	110.2	98	P	JWC		
6-098	K-15	5/16/2012	6	2	LP-103	17.5	113	16.2	18	131.1	111.1	98	P	JWC		
6-099	K-15	5/16/2012	6	2	LP-103	17.5	113	16.5	18.3	129.3	109.3	97	P	JWC		
6-100	L-15	5/16/2012	6	2	LP-103	17.5	113	16.1	17.9	127.9	108.5	96	P	JWC		
6-101	M-15	5/16/2012	6	3	LP-103	17.5	113	15.3	17.3	130.5	111.3	98	P	JWC		
6-102	H-19	5/17/2012	8	2	LP-103	17.5	113	15.3	17.3	132.8	113.2	100	P	JWC		
6-103	I-19	5/17/2012	8	2	LP-103	17.5	113	15.1	17.1	131.5	112.3	99	P	JWC		
6-104	J-19	5/17/2012	8	2	LP-103	17.5	113	15	17	132.8	113.5	100	P	JWC		
6-105	K-19	5/17/2012	8	2	LP-103	17.5	113	15.5	17.5	128.5	109.4	97	P	JWC		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-106	J-13	5/17/2012	8	2	LP-103	17.5	113	15.4	17.4	133.9	114.1	101	P	JWC		
6-107	J-14	5/17/2012	8	2	LP-103	17.5	113	15.4	17.4	135.8	115.7	100	P	JWC		
6-108	J-14	5/17/2012	8	2	LP-103	17.5	113	16.3	18.1	134.8	114.1	100	P	JWC		
6-109	J-15	5/17/2012	8	2	LP-103	17.5	113	15	17	137.2	117.3	100	P	JWC		
6-110	J-15	5/17/2012	8	2	LP-103	17.5	113	14.6	16.7	133.3	114.2	100	P	JWC		
6-111	J-15	5/17/2012	8	2	LP-103	17.5	113	14.1	16.3	135.5	116.5	100	P	JWC		
6-112	J-16	5/17/2012	8	2	LP-103	17.5	113	15.2	17.2	134.2	114.5	100	P	JWC		
6-113	J-16	5/17/2012	8	2	LP-103	17.5	113	15	17	135.2	115.5	100	P	JWC		
6-114	J-17	5/17/2012	8	2	LP-103	17.5	113	16.3	18.1	131.1	111	98	P	JWC		
6-115	J-17	5/17/2012	8	2	LP-103	17.5	113	16.9	18.6	133	112.1	99	P	JWC		
6-116	J-18	5/17/2012	8	2	LP-103	17.5	113	18.2	19.7	134	111.9	99	P	JWC		
6-117	J-18	5/17/2012	8	2	LP-103	17.5	113	18.5	19.9	131.5	109.7	97	P	JWC		
6-118	J-19	5/17/2012	8	3	LP-103	17.5	113	17.7	19.3	130.8	109.6	97	P	JWC		
6-119	K-13	5/21/2012	8	2	LP-128	16	115.5	15.8	17.7	134.6	114.4	99	P	DW		
6-120	K-13	5/21/2012	8	2	LP-128	16	115.5	14.5	16.6	132.1	113.3	98	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	*Location*	*Date*	*Probe Depth*	*Lift No.*	*Lab*			*Field*						*QA ID*	*Retest No*	*Retest Result*
					Sample No	*OMC* (%)	*Max Dry Unit Wt* (PCF)	*Field MC*	*Correct MC*	*Wet Unit Wt* (PCF)	*Dry Unit Wt* (PCF)	*Percent Compact* (%)	*Result*			
6-121	K-13	5/21/2012	8	2	LP-128	16	115.5	13.8	16	129.1	111.3	96	P	DW		
6-122	K-14	5/21/2012	8	2	LP-128	16	115.5	13.1	15.4	130	112.7	98	P	DW		
6-123	K-14	5/21/2012	8	2	LP-128	16	115.5	13.4	15.7	128.6	111.1	96	P	DW		
6-124	K-15	5/21/2012	8	2	LP-128	16	115.5	14.1	16.3	131.4	113	98	P	DW		
6-125	K-15	5/21/2012	8	2	LP-128	16	115.5	16.3	18.1	129.5	109.7	95	P	DW		
6-126	K-16	5/21/2012	8	2	LP-128	16	115.5	15.1	17.1	130.2	111.2	96	P	DW		
6-127	K-16	5/21/2012	8	2	LP-128	16	115.5	15.7	17.6	132.1	112.3	97	P	DW		
6-128	K-17	5/21/2012	8	2	LP-128	16	115.5	14.3	16.5	131.5	112.9	98	P	DW		
6-129	K-17	5/21/2012	8	2	LP-128	16	115.5	16.4	18.2	132.6	112.2	97	P	DW		
6-130	K-18	5/21/2012	8	2	LP-128	16	115.5	14.8	16.9	130.7	111.8	97	P	DW		
6-131	K-18	5/21/2012	8	2	LP-128	16	115.5	15.7	17.6	132.5	112.7	98	P	DW		
6-132	K-18	5/21/2012	8	2	LP-128	16	115.5	14	16.2	135.2	116.4	100	P	DW		
6-133	K-19	5/21/2012	8	2	LP-128	16	115.5	14.1	16.3	131.4	113	98	P	DW		
6-134	L-13	5/22/2012	8	2	LP-128	16	115.5	15.4	17.4	129.2	110.1	95	P	DW		
6-135	L-13	5/22/2012	8	2	LP-128	16	115.5	15	17	131.8	112.6	98	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-136	L-14	5/22/2012	8	2	LP-128	16	115.5	14.2	16.4	129.8	111.5	97	P	DW		
6-137	L-14	5/22/2012	8	2	LP-128	16	115.5	15.6	17.5	130.6	111.1	96	P	DW		
6-138	L-14	5/22/2012	8	2	LP-128	16	115.5	14.8	16.9	131	112.1	97	P	DW		
6-139	L-15	5/22/2012		2	LP-128	16	115.5	13.9	16.1	132.2	113.9	99	P	DW		
6-140	L-15	5/22/2012	8	2	LP-128	16	115.5	15	17	130.4	111.5	97	P	DW		
6-141	L-16	5/22/2012	8	2	LP-128	16	115.5	15.3	17.3	128.7	109.7	95	P	DW		
6-142	L-16	5/22/2012	8	2	LP-128	16	115.5	14.1	16.3	129.4	111.3	96	P	DW		
6-143	L-17	5/22/2012	8	2	LP-128	16	115.5	14.7	16.8	130.8	112	97	P	DW		
6-144	L-17	5/22/2012	8	2	LP-128	16	115.5	15.8	17.7	131.4	111.6	97	P	DW		
6-145	L-18	5/22/2012	8	3	LP-128	16	115.5	14.2	16.4	127.9	109.9	95	P	DW		
6-146	L-18	5/22/2012	8	3	LP-128	16	115.5	15.3	17.3	129.6	110.5	96	P	DW		
6-147	L-18	5/22/2012	8	3	LP-128	16	115.5	16.2	18	132	111.9	97	P	DW		
6-148	L-19	5/22/2012	8	3	LP-128	16	115.5	13.8	16	130.5	112.5	97	P	DW		
6-149	L-19	5/22/2012	8	2	LP-128	16	115.5	15.2	17.2	131.2	111.9	97	P	DW		
6-150	K-19	5/22/2012	8	2	LP-128	16	115.5	13.8	16	130.5	112.5	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-151	M-13	5/23/2012	8	3	LP-128	16	115.5	16.4	18.2	133.4	112.9	98	P	DW		
6-152	M-13	5/23/2012	8	3	LP-128	16	115.5	15.7	17.6	130.2	110.7	96	P	DW		
6-153	M-14	5/23/2012	8	3	LP-128	16	115.5	15.4	17.4	132.7	113	98	P	DW		
6-154	M-14	5/23/2012	8	3	LP-128	16	115.5	16.6	18.4	130.5	110.2	95	P	DW		
6-155	M-14	5/23/2012	8	3	LP-128	16	115.5	16	17.9	131	111.1	96	P	DW		
6-156	M-15	5/23/2012	8	3	LP-128	16	115.5	15	17	129.8	110.9	96	P	DW		
6-157	M-15	5/23/2012	8	3	LP-128	16	115.5	16.2	18	125.7	106.5	92	F	DW	6-167	P
6-158	M-16	5/23/2012	8	2	LP-128	16	115.5	15.8	17.7	133.4	113.3	98	P	DW		
6-159	M-16	5/23/2012	8	2	LP-128	16	115.5	15.2	17.2	129.6	110.6	96	P	DW		
6-160	M-17	5/23/2012	8	2	LP-128	16	115.5	15.7	17.6	132.3	112.5	97	P	DW		
6-161	M-17	5/23/2012	8	2	LP-128	16	115.5	16.1	17.9	134.7	114.2	99	P	DW		
6-162	M-18	5/23/2012	8	3	LP-128	16	115.5	14.7	16.8	130.8	112	97	P	DW		
6-163	M-18	5/23/2012	8	3	LP-128	16	115.5	14	16.3	133.4	114.8	99	P	DW		
6-164	M-18	5/23/2012	8	3	LP-128	16	115.5	16.1	17.9	131.8	111.8	97	P	DW		
6-165	M-19	5/23/2012	8	3	LP-128	16	115.5	15.8	17.7	129.7	110.2	95	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-166	M-19	5/23/2012	8	3	LP-128	16	115.5	17	18.7	132.4	111.5	97	P	DW		
6-167	M-15	5/23/2012	8	3	LP-128	16	115.5	15.5	17.5	129.3	110	95	P	DW		
6-168	N-13	5/29/2012	8	3	LP-128	16	115.5	16.6	18.4	130.5	110.2	95	P	DW		
6-169	N-13	5/29/2012	8	3	LP-128	16	115.5	15.7	17.6	132.3	112.5	97	P	DW		
6-170	N-13	5/29/2012	8	3	LP-128	16	115.5	15.8	17.7	129.7	110.2	95	P	DW		
6-171	N-14	5/29/2012	8	3	LP-128	16	115.5	16.4	18.2	133.4	112.9	98	P	DW		
6-172	N-14	5/29/2012	8	3	LP-128	16	115.5	16.6	18.4	130.5	110.2	95	P	DW		
6-173	N-15	5/30/2012	8	3	LP-128	16	115.5	14.8	16.9	131	112.1	97	P	DW		
6-174	N-15	5/30/2012	8	3	LP-128	16	115.5	16.2	18	131.7	111.6	97	P	DW		
6-175	N-16	5/30/2012	8	2	LP-128	16	115.5	15.2	17.2	129.6	110.6	96	P	DW		
6-176	N-16	5/30/2012	8	2	LP-128	16	115.5	15.7	17.6	132.3	112.5	97	P	DW		
6-177	N-17	5/30/2012	8	2	LP-128	16	115.5	14.1	16.3	129.4	111.3	97	P	DW		
6-178	N-17	5/30/2012	8	2	LP-128	16	115.5	15.6	17.5	130.6	111.1	96	P	DW		
6-179	N-17	5/30/2012	8	2	LP-128	16	115.5	16.2	18	132	111.9	97	P	DW		
6-180	N-18	5/30/2012	8	3	LP-128	16	115.5	15.3	17.3	128.7	109.7	95	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982
Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-181	N-18	5/30/2012	8	3	LP-128	16	115.5	15.8	17.7	129.7	110.2	95	P	DW		
6-182	N-19	5/30/2012	8	2	LP-128	16	115.5	14	16.2	133.4	114.8	100	P	DW		
6-183	N-19	5/30/2012	8	3	LP-128	16	115.5	15.4	17.4	133.7	113.9	98	P	DW		
6-184	N-19	5/30/2012	8	3	LP-128	16	115.5	15	17	130.2	111.3	96	P	DW		
6-185	O-13	5/31/2012	8	3	LP-128	16	115.5	14.8	16.9	132.6	113.4	99	P	DW		
6-186	O-13	5/31/2012	8	3	LP-128	16	115.5	15.3	17.3	129.9	110.7	96	P	DW		
6-187	O-14	5/31/2012	8	3	LP-128	16	115.5	13.6	15.9	131	113	98	P	DW		
6-188	O-14	5/31/2012	8	3	LP-128	16	115.5	13.7	16	132.2	114	99	P	DW		
6-189	O-15	5/31/2012	8	2	LP-128	16	115.5	14.3	16.5	131.7	113	98	P	DW		
6-190	O-15	5/31/2012	8	2	LP-128	16	115.5	15.5	17.5	130.3	110.9	96	P	DW		
6-191	O-15	5/31/2012	8	2	LP-128	16	115.5	13.3	15.6	129.2	111.8	97	P	DW		
6-192	O-16	5/31/2012	8	2	LP-128	16	115.5	16.8	18.5	131.4	110.9	96	P	DW		
6-193	O-16	5/31/2012	8	2	LP-128	16	115.5	16.2	18	130.7	110.8	96	P	DW		
6-194	O-17	5/31/2012	8	2	LP-128	16	115.5	15.1	17.1	128.9	110.1	95	P	DW		
6-195	O-17	5/31/2012	8	2	LP-128	16	115.5	14.7	16.8	129.8	111.1	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus
Series: 6 Phase II, LP Soil, 95% Compaction

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: y = 0.8292x + 4.5982

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-196	O-18	5/31/2012	8	3	LP-128	16	115.5	16.9	18.6	131	110.5	96	P	DW		
6-197	O-18	5/31/2012	8	3	LP-128	16	115.5	16.2	18	132.4	112.2	97	P	DW		
6-198	O-18	5/31/2012	8	3	LP-128	16	115.5	15	17	130.7	111.7	97	P	DW		
6-199	O-19	5/31/2012	8	3	LP-128	16	115.5	14.3	16.5	131.7	113	98	P	DW		
6-200	O-19	5/31/2012	8	2	LP-128	16	115.5	15.1	17.1	129.6	110.7	96	P	DW		
6-201	P-13	6/7/2012	8	3	LP-128	16	115.5	16.4	18.2	134.8	114	99	P	DW		
6-202	P-13	6/7/2012	8	3	LP-128	16	115.5	15.2	17.2	132.1	112.7	98	P	DW		
6-203	P-13	6/7/2012	8	3	LP-128	16	115.5	15.5	17.5	132.6	112.9	98	P	DW		
6-204	P-14	6/7/2012	8	3	LP-128	16	115.5	14.3	16.5	131.4	112.8	98	P	DW		
6-205	P-14	6/7/2012	8	3	LP-128	16	115.5	13	15.4	133.7	115.9	100	P	DW		
6-206	P-15	6/7/2012	8	2	LP-128	16	115.5	14.1	16.3	131	112.6	98	P	DW		
6-207	P-15	6/7/2012	8	2	LP-128	16	115.5	15.1	17.1	129.8	110.8	96	P	DW		
6-208	P-15	6/7/2012	8	2	LP-128	16	115.5	16.2	18	131.3	111.3	96	P	DW		
6-209	P-16	6/7/2012	8	2	LP-128	16	115.5	15.5	17.4	132	112.4	97	P	DW		
6-210	P-16	6/7/2012	8	2	LP-128	16	115.5	15.2	17.2	130.3	111.2	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus
Series: 6 Phase II, LP Soil, 95% Compaction

Guage Type: Troxler 3440
Guage Serial No: 28800

Correction Factor: y = 0.8292x + 4.5982

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-211	P-17	6/7/2012	8	2	LP-128	16	115.5	14.4	16.5	131	112.4	97	P	DW		
6-212	P-17	6/7/2012	8	2	LP-128	16	115.5	14.3	16.5	131.4	112.8	98	P	DW		
6-213	P-18	6/7/2012	8	3	LP-128	16	115.5	14.7	16.8	132.2	113.2	98	P	DW		
6-214	P-18	6/7/2012	8	3	LP-128	16	115.5	16.4	18.2	130.7	110.6	96	P	DW		
6-215	P-18	6/7/2012	8	3	LP-128	16	115.5	13.4	15.7	129.9	112.3	97	P	DW		
6-216	P-19	6/7/2012	8	2	LP-128	16	115.5	15	17	131.4	112.3	97	P	DW		
6-217	P-19	6/7/2012	8	2	LP-128	16	115.5	15.1	17.1	132.2	112.9	98	P	DW		
6-218	Q-13	6/11/2012	8	3	LP-128	16	115.5	15	17	130.5	111.5	97	P	DW		
6-219	Q-13	6/11/2012	8	3	LP-128	16	115.5	14.7	16.8	132.7	113.6	99	P	DW		
6-220	Q-14	6/11/2012	8	3	LP-128	16	115.5	15.6	17.5	132.4	112.7	98	P	DW		
6-221	Q-14	6/11/2012	8	3	LP-128	16	115.5	15.9	17.8	133	112.9	98	P	DW		
6-222	Q-14	6/11/2012	8	3	LP-128	16	115.5	16.5	18.3	130.5	110.3	96	P	DW		
6-223	Q-15	6/11/2012	8	2	LP-128	16	115.5	14.3	16.5	132.2	113.5	99	P	DW		
6-224	Q-15	6/11/2012	8	2	LP-128	16	115.5	15.2	17.2	131.5	112.2	97	P	DW		
6-225	Q-16	6/11/2012	8	2	LP-128	16	115.5	14.8	16.9	132.2	113.1	98	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-226	Q-16	6/11/2012	8	2	LP-128	16	115.5	16.4	18.2	129.7	109.7	95	P	DW		
6-227	Q-17	6/11/2012	8	2	LP-128	16	115.5	15.6	17.5	130.7	111.2	96	P	DW		
6-228	Q-17	6/11/2012	8	2	LP-128	16	115.5	15	17	132.7	113.4	98	P	DW		
6-229	Q-18	6/11/2012	8	2	LP-128	16	115.5	15.4	17.4	133	113.3	98	P	DW		
6-230	Q-18	6/11/2012	8	3	LP-128	16	115.5	16.2	18	134.4	113.9	99	P	DW		
6-231	Q-18	6/11/2012	8	3	LP-128	16	115.5	16	17.9	132.9	112.7	98	P	DW		
6-232	Q-19	6/11/2012	8	2	LP-128	16	115.5	14.3	16.5	129.8	111.4	97	P	DW		
6-233	Q-19	6/11/2012	8	2	LP-128	16	115.5	15.1	17.1	130.4	111.4	97	P	DW		
6-234	Q-19	6/11/2012	8	2	LP-128	16	115.5	15.6	17.5	132.1	112.4	97	P	DW		
6-235	R-13	6/14/2012	8	2	LP-128	16	115.5	16.6	18.4	132.2	111.7	97	P	DW		
6-236	R-13	6/14/2012	8	2	LP-128	16	115.5	16.5	18.3	134.3	113.5	98	P	DW		
6-237	R-13	6/14/2012	8	2	LP-128	16	115.5	15.9	17.8	131.7	111.8	97	P	DW		
6-238	R-14	6/14/2012	8	3	LP-128	16	115.5	15.5	17.5	133.9	114	99	P	DW		
6-239	R-14	6/14/2012	8	3	LP-128	16	115.5	16	17.9	131.4	111.5	96	P	DW		
6-240	R-15	6/14/2012	8	3	LP-128	16	115.5	16.5	18.3	131.7	111.3	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-241	R-15	6/14/2012	8	3	LP-128	16	115.5	16.2	18	132.6	112.4	97	P	DW		
6-242	R-16	6/14/2012	8	3	LP-128	16	115.5	15.8	17.7	130.8	111.1	96	P	DW		
6-243	R-16	6/14/2012	8	3	LP-128	16	115.5	16.2	18	132.2	112	97	P	DW		
6-244	R-16	6/14/2012	8	3	LP-128	16	115.5	16.2	18	132.7	112.5	97	P	DW		
6-245	R-17	6/14/2012	8	2	LP-128	16	115.5	15.6	17.5	130.8	111.3	96	P	DW		
6-246	R-17	6/14/2012	8	2	LP-128	16	115.5	14.7	16.8	132.9	113.8	98	P	DW		
6-247	R-18	6/14/2012	8	2	LP-128	16	115.5	15.9	17.8	134.1	113.8	99	P	DW		
6-248	R-18	6/14/2012	8	2	LP-128	16	115.5	16.3	18.1	131.6	111.4	96	P	DW		
6-249	R-19	6/14/2012	8	2	LP-128	16	115.5	14.8	16.9	133.3	114	99	P	DW		
6-250	R-19	6/14/2012	8	2	LP-128	16	115.5	15.6	17.5	131.5	111.9	97	P	DW		
6-251	S-13	6/15/2012	8	2	LP-128	16	115.5	13.3	15.6	131.8	114	99	P	DW		
6-252	S-13	6/15/2012	8	2	LP-128	16	115.5	13.9	16.1	131.4	113.2	98	P	DW		
6-253	S-14	6/15/2012	8	3	LP-128	16	115.5	14.5	16.6	132.1	113.3	98	P	DW		
6-254	S-14	6/15/2012	8	3	LP-128	16	115.5	15	17	133.2	113.8	99	P	DW		
6-255	S-14	6/15/2012	8	3	LP-128	16	115.5	14.4	16.5	129.9	111.5	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 *Percent Compaction:* 95 *Lift Thickness (Compacted - Loose):* 6 - 8 *Moisture Range:* -3 - 3

Soil Type: 4 LP Soil-Marcellus *Guage Type:* Troxler 3440 *Correction Factor:* y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction *Guage Serial No:* 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-256	S-15	6/15/2012	8	3	LP-128	16	115.5	14.6	16.7	131	112.3	97	P	DW		
6-257	S-15	6/15/2012	8	3	LP-128	16	115.5	15.2	17.2	133.1	113.6	98	P	DW		
6-258	S-16	6/15/2012	8	2	LP-128	16	115.5	15.7	17.6	131.4	111.7	97	P	DW		
6-259	S-16	6/15/2012	8	2	LP-128	16	115.5	13.9	16.1	132.7	114.3	99	P	DW		
6-260	S-16	6/15/2012	8	2	LP-128	16	115.5	14.9	16.9	132.7	113.5	98	P	DW		
6-261	S-17	6/15/2012	8	2	LP-128	16	115.5	15.4	17.4	130.5	111.2	96	P	DW		
6-262	S-17	6/15/2012	8	2	LP-128	16	115.5	14.4	16.5	131.1	112.5	97	P	DW		
6-263	S-18	6/15/2012	8	2	LP-128	16	115.5	13.6	15.9	131.6	113.5	98	P	DW		
6-264	S-18	6/15/2012	8	2	LP-128	16	115.5	14.9	17	132.7	113.4	98	P	DW		
6-265	S-19	6/15/2012	8	2	LP-128	16	115.5	14.2	16.4	132	113.4	98	P	DW		
6-266	S-19	6/15/2012	8	2	LP-128	16	115.5	14.8	16.9	130.4	111.5	97	P	DW		
6-267	S-19	6/15/2012	8	2	LP-128	16	115.5	15.2	17.2	131.1	111.9	97	P	DW		
6-268	T-13	6/18/2012	8	2	LP-128	16	115.5	15.3	17.3	132	112.5	97	P	DW		
6-269	T-13	6/18/2012	8	2	LP-128	16	115.5	14.8	16.9	132.7	113.5	98	P	DW		
6-270	T-13	6/18/2012	8	2	LP-128	16	115.5	15.6	17.5	131.2	111.7	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus **Guage Type:** Troxler 3440 **Correction Factor:** y = 0.8292x + 4.5982

Series: 6 Phase II, LP Soil, 95% Compaction **Guage Serial No:** 28800

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-271	T-14	6/18/2012	8	2	LP-128	16	115.5	14.9	17	130.4	111.5	96	P	DW		
6-272	T-14	6/18/2012	8	2	LP-128	16	115.5	15	17	130.9	111.8	97	P	DW		
6-273	T-15	6/18/2012	8	2	LP-128	16	115.5	15.7	17.6	129.9	110.5	95	P	DW		
6-274	T-15	6/18/2012	8	2	LP-128	16	115.5	16.2	18	131.3	111.3	96	P	DW		
6-275	T-16	6/18/2012	8	2	LP-128	16	115.5	15.1	17.1	132.7	113.3	98	P	DW		
6-276	T-16	6/18/2012	8	2	LP-128	16	115.5	15.4	17.4	131	111.6	97	P	DW		
6-277	T-16	6/18/2012	8	2	LP-128	16	115.5	15.7	17.6	130.2	110.7	96	P	DW		
6-278	T-17	6/18/2012	8	2	LP-128	16	115.5	15.8	17.7	133.4	113.3	98	P	DW		
6-279	T-17	6/18/2012	8	2	LP-128	16	115.5	15.1	17.1	132	112.7	98	P	DW		
6-280	T-18	6/18/2012	8	2	LP-128	16	115.5	14.7	16.8	130.8	112	97	P	DW		
6-281	T-18	6/18/2012	8	2	LP-128	16	115.5	17	18.7	132.4	111.5	97	P	DW		
6-282	T-18	6/18/2012	8	2	LP-128	16	115.5	15.6	17.5	130.6	111.1	96	P	DW		
6-283	T-19	6/18/2012	8	2	LP-128	16	115.5	14.1	16.3	129.4	111.3	96	P	DW		
6-284	T-19	6/18/2012	8	2	LP-128	16	115.5	16.2	18	132	111.9	97	P	DW		
6-285	U-13	6/19/2012	8	2	LP-128	16	115.5	13.8	16	130.5	112.5	97	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus
Series: 6 Phase II, LP Soil, 95% Compaction
Guage Type: Troxler 3440
Guage Serial No: 28800
Correction Factor: y = 0.8292x + 4.5982

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-286	U-13	6/19/2012	8	2	LP-128	16	115.5	16.2	18	131.3	111.3	96	P	DW		
6-287	U-14	6/19/2012	8	2	LP-128	16	115.5	15.6	17.5	131.2	111.7	97	P	DW		
6-288	U-14	6/19/2012	8	2	LP-128	16	115.5	16.6	18.4	130.5	110.2	95	P	DW		
6-289	U-14	6/19/2012	8	2	LP-128	16	115.5	15.8	17.7	133.4	113.3	98	P	DW		
6-290	U-15	6/19/2012	8	2	LP-128	16	115.5	16.1	17.9	134.7	114.2	99	P	DW		
6-291	U-15	6/19/2012	8	2	LP-128	16	115.5	14.7	16.8	130.8	112	97	P	DW		
6-292	U-16	6/19/2012	8	2	LP-128	16	115.5	14.8	16.9	132.7	113.5	98	P	DW		
6-293	U-16	6/19/2012	8	2	LP-128	16	115.5	15	17	130.9	111.8	97	P	DW		
6-294	U-16	6/19/2012	8	2	LP-128	16	115.5	15.4	17.4	133.9	114.1	99	P	DW		
6-295	U-17	6/19/2012	8	2	LP-128	16	115.5	14.5	16.6	132.1	113.3	98	P	DW		
6-296	U-17	6/19/2012	8	2	LP-128	16	115.5	13.4	15.7	128.6	111.1	96	P	DW		
6-297	U-17	6/19/2012	8	2	LP-128	16	115.5	14.3	16.5	131.5	112.9	98	P	DW		
6-298	U-18	6/19/2012	8	2	LP-128	16	115.5	14.8	16.9	130.7	111.8	97	P	DW		
6-299	U-18	6/19/2012	8	2	LP-128	16	115.5	15.3	17.3	132	112.5	97	P	DW		
6-300	U-18	6/19/2012	8	2	LP-128	16	115.5	14.9	17	130.4	111.5	96	P	DW		

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Field Nuclear Moisture/Density Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Proctor Type: ASTM D 698 **Percent Compaction:** 95 **Lift Thickness (Compacted - Loose):** 6 - 8 **Moisture Range:** -3 - 3

Soil Type: 4 LP Soil-Marcellus
Series: 6 Phase II, LP Soil, 95% Compaction
Guage Type: Troxler 3440
Guage Serial No: 28800
Correction Factor: y = 0.8292x + 4.5982

ID	Location	Date	Probe Depth	Lift No.	Lab			Field						QA ID	Retest No	Retest Result
					Sample No	OMC (%)	Max Dry Unit Wt (PCF)	Field MC	Correct MC	Wet Unit Wt (PCF)	Dry Unit Wt (PCF)	Percent Compact (%)	Result			
6-301	U-19	6/19/2012	8	2	LP-128	16	115.5	15.7	17.6	131.3	111.6	97	P	DW		
6-302	U-19	6/19/2012	8	2	LP-128	16	115.5	15	17	130.1	111.2	96	P	DW		
6-303	U-19	6/19/2012	8	2	LP-128	16	115.5	14.5	16.6	132	113.2	98	P	DW		

Drive Cylinders

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 10 day April month 2012 year

SOURCE: Marcellus Pit

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [ ] SUBGRADE [ ] SUBBASE [ ] CLAY [●] OTHER:

% COMPACTION: 90 MOISTURE CONTENT RANGE: +/- 3%

TEST LOCATION: 5-005 TEST NO. **DCLP-001**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: K VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	131.2
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.65	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	111.4
C	WEIGHT OF CYLINDER	(lbs)	1.32	G	PERCENT COMPACTION = F/L	(%)	100.3
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.33	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. XX	(gm)	185.2	R	WT. OF WATER = P - Q	(lbs)	31.3
P	WT. OF WET SOIL & TARE	(gm)	392.3	S	WT OF DRY SOIL = Q - O	(pcf)	175.8
Q	WT. OF DRY SOIL & TARE	(gm)	361.0	T	MOISTURE CONTENT = (R/S)X100		17.8

PROCTOR TEST DATA LP-068 [L] MAXIMUM DRY UNIT WT. (pcf) 111 (M) OPT. MOIST. CONTENT (%) 16

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		1.0	X	FDT MOISTURE CONTENT	(%)	16.8
V	FDT WET UNIT WT.	(pcf)	128.6	Y	FDT DRY UNIT WT.	(pcf)	110.1
W	DELTA DRY UNIT WT. = F - Y		1.3				

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 10 day April month 2012 year

SOURCE: Marcellus Pit

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [ ] SUBGRADE [ ] SUBBASE [ ] CLAY [●] OTHER:

% COMPACTION: 90 MOISTURE CONTENT RANGE: +/- 3%

TEST LOCATION: 5-030 TEST NO. **DCLP-002**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: K VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	128.8
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.57	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	107.3
C	WEIGHT OF CYLINDER	(lbs)	1.32	G	PERCENT COMPACTION = F/L	(%)	96.7
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.25	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. P	(gm)	184.9	R	WT. OF WATER = P - Q	(lbs)	37.8
P	WT. OF WET SOIL & TARE	(gm)	411.3	S	WT OF DRY SOIL = Q - O	(pcf)	188.6
Q	WT. OF DRY SOIL & TARE	(gm)	373.5	T	MOISTURE CONTENT = (R/S)X100		20.0

PROCTOR TEST DATA LP-068 [L] MAXIMUM DRY UNIT WT. (pcf) 111 (M) OPT. MOIST. CONTENT (%) 16

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		1.6	X	FDT MOISTURE CONTENT	(%)	18.4
V	FDT WET UNIT WT.	(pcf)	129.4	Y	FDT DRY UNIT WT.	(pcf)	109.3
W	DELTA DRY UNIT WT. = F - Y		-2.0				

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 16 day April month 2012 year

SOURCE: Marcellus Pit

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [ ] SUBGRADE [ ] SUBBASE [ ] CLAY [●] OTHER:

% COMPACTION: 90 MOISTURE CONTENT RANGE: +/- 3%

TEST LOCATION: 5-056 TEST NO. **DCLP-003**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: H VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	129.1
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.58	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	107.9
C	WEIGHT OF CYLINDER	(lbs)	1.32	G	PERCENT COMPACTION = F/L	(%)	97.2
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.26	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. XX	(gm)	185.2	R	WT. OF WATER = P - Q	(lbs)	31.8
P	WT. OF WET SOIL & TARE	(gm)	378.6	S	WT OF DRY SOIL = Q - O	(pcf)	161.6
Q	WT. OF DRY SOIL & TARE	(gm)	346.8	T	MOISTURE CONTENT = (R/S)X100		19.7

PROCTOR TEST DATA LP-068 [L] MAXIMUM DRY UNIT WT. (pcf) 111 (M) OPT. MOIST. CONTENT (%) 16

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		0.8	X	FDT MOISTURE CONTENT	(%)	18.9
V	FDT WET UNIT WT.	(pcf)	129.7	Y	FDT DRY UNIT WT.	(pcf)	109.0
W	DELTA DRY UNIT WT. = F - Y		-1.1				

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 17 day April month 2012 year

SOURCE: Marcellus Pit

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [ ] SUBGRADE [ ] SUBBASE [ ] CLAY [●] OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: + 3%

TEST LOCATION: 6-008 TEST NO. **DCLP-004**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: T VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	129.4
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.83	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	107.4
C	WEIGHT OF CYLINDER	(lbs)	1.56	G	PERCENT COMPACTION = F/L	(%)	95.1
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.27	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. XX	(gm)	185.2	R	WT. OF WATER = P - Q	(lbs)	41.3
P	WT. OF WET SOIL & TARE	(gm)	428.7	S	WT OF DRY SOIL = Q - O	(pcf)	202.2
Q	WT. OF DRY SOIL & TARE	(gm)	387.4	T	MOISTURE CONTENT = (R/S)X100		20.4

PROCTOR TEST DATA LP-103 [L] MAXIMUM DRY UNIT WT. (pcf) 113 (M) OPT. MOIST. CONTENT (%) 17.5

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		0.7	X	FDT MOISTURE CONTENT	(%)	19.7
V	FDT WET UNIT WT.	(pcf)	129.3	Y	FDT DRY UNIT WT.	(pcf)	108.0
W	DELTA DRY UNIT WT. = F - Y		-0.6				

COMMENTS

Geosyntec consultants

DETERMINATION OF DENSITY (DRIVE CYLINDER) **(ASTM D 2937)**

PROJECT: Onondaga Lake SCA Construction, Phase II

LOCATION: Camillus, New York PROJECT NO.: GJ4706B TASK NO.: 200

DESCRIPTION: CQA of SCA Construction, Phase I DATE: 17 day April month 2012 year

SOURCE: LP soil (Marcellus Pit)

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: FILL [ ] SUBGRADE [ ] SUBBASE [ ] CLAY [●] OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: + 3%

TEST LOCATION: 6-034 TEST NO. **DCLP-005**

FIELD TEST DATA -- ASTM D2937 QA ID: DW

CYL HT 1 (IN): CYL HT 2 (IN): CYL DIA 1 (IN): CYL DIA 2 (IN):

A	CYLINDER NO.: T VOLUME [1]	(cf)	0.033	E	WET UNIT WEIGHT = D/A	(lbs)	128.5
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.80	F	DRY UNIT WEIGHT = E/(1 + (T/100)	(pcf)	107.5
C	WEIGHT OF CYLINDER	(lbs)	1.56	G	PERCENT COMPACTION = F/L	(%)	95.1
D	WEIGHT OF WET SAMPLE = B - C	(lbs)	4.24	H	PASS/FAIL		P

NOTE 1. CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-IN., AND CALCULATING THE VOLUME USING AVERAGE HEIGHT AND DIAMETER

FIELD MOISTURE CONTENT -- ASTM D2216 QA ID: DW

O	WT. OF TARE NO. XX	(gm)	185.2	R	WT. OF WATER = P - Q	(lbs)	31.2
P	WT. OF WET SOIL & TARE	(gm)	375.8	S	WT OF DRY SOIL = Q - O	(pcf)	159.4
Q	WT. OF DRY SOIL & TARE	(gm)	344.6	T	MOISTURE CONTENT = (R/S)X100		19.6

PROCTOR TEST DATA LP-103 [L] MAXIMUM DRY UNIT WT. (pcf) 113 (M) OPT. MOIST. CONTENT (%) 17.5

COMPARISION WITH NUCLEAR GAUGE - ASTM D 6938 QA ID: DW

U	DELTA MOISTURE CONTENT = T - X		0.5	X	FDT MOISTURE CONTENT	(%)	19.1
V	FDT WET UNIT WT.	(pcf)	128.0	Y	FDT DRY UNIT WT.	(pcf)	107.5
W	DELTA DRY UNIT WT. = F - Y		0.0				

COMMENTS

APPENDIX F

Manufacturer's Quality Control Documentation

- Geomembrane
- Geotextile

Geomembrane

- 60-mil
- Sacrificial

60-mil

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 6 ***Manufacturer:*** Agru America ***Product Type:*** Microspike HD 60-mil

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
Accepted Rolls												
11/15/2011	7110583-443557-11	23	505	DW	11/4/2011	GM-09	P	DB	11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443558-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443559-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443560-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443561-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443562-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443563-11	23	505	DW	4/3/2012	GM-11	See note	DW	11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443565-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443566-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443567-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443568-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443569-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443570-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443673-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443674-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	7110583-443675-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443676-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443677-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443678-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	7110583-443679-11	23	505	DW					11/3/2011	11/3/2011	P	DB
4/23/2012	7120199-311449-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311450-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311451-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311452-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311453-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311454-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311455-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311556-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 6 ***Manufacturer:*** Agru America ***Product Type:*** Microspike HD 60-mil

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/23/2012	7120199-311557-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311558-12	23	505	DWH	3/29/2012	GM-13	P	DB	4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311559-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311560-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311561-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311562-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311563-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311564-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311565-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311566-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311567-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311568-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311569-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311670-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311671-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311672-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311673-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311674-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311675-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311676-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311677-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311678-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311679-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311680-12	23	505	DWH	3/29/2012	GM-14	P	DB	4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311681-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311682-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311683-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311784-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311785-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 6 ***Manufacturer:*** Agru America ***Product Type:*** Microspike HD 60-mil

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
4/23/2012	7120199-311786-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120199-311787-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311330-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311331-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311332-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311333-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311334-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311335-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311336-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311337-12	23	505	DWH	3/29/2012	GM-12	P	DB	4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311338-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311339-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311340-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311341-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311442-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311443-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311444-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311445-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311446-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311447-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	7120200-311448-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311788-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311789-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311790-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311791-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-311792-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311793-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311794-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-311795-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 6 ***Manufacturer:*** Agru America ***Product Type:*** Microspike HD 60-mil

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
4/23/2012	8110773-311796-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312101-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312102-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312103-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312104-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312105-12	23	505	DWH	4/18/2012	GM-15	P	DWH	4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312106-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312107-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312108-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312109-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312110-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312111-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312112-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312113-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312114-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312115-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312116-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312217-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312218-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312219-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312220-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312221-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312222-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312223-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	8110773-312224-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312225-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312226-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312227-12	23	505	DWH	4/18/2012	GM-16	P	DWH	4/27/2012	4/27/2012	P	DWH
4/24/2012	8110773-312228-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 6 *Manufacturer:* Agru America *Product Type:* Microspike HD 60-mil

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft.)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/23/2012	8110773-312229-12	23	505	DWH					4/27/2012	4/27/2012	P	DWH
6/28/2012	8110773-312330-12	23	505	DWH					3/23/2012	3/23/2012	P	DJB
6/28/2012	8110773-312331-12	23	505	DWH					3/23/2012	3/23/2012	P	DJB
6/28/2012	8110773-312332-12	23	505	DWH					3/23/2012	3/23/2012	P	DJB
6/28/2012	8110773-312333-12	23	505	DWM					3/23/2012	3/23/2012	P	DJB
6/28/2012	8110773-312334-12	23	505	DWM					3/23/2012	3/23/2012	P	DJB
6/28/2012	8110773-312335-12	23	505	DWM					3/23/2012	3/23/2012	P	DJB
11/14/2011	8210664-443682-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	8210664-443683-11	23	505	DW	11/4/2011	GM-10	P	DB	11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443784-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443785-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443786-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443787-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443788-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/15/2011	8210664-443789-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443790-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443791-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443792-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443793-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443796-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-443797-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-444101-11	23	505	DW					11/3/2011	11/3/2011	P	DB
11/14/2011	8210664-444102-11	23	505	DW					11/3/2011	11/3/2011	P	DB

Average Roll Width(ft.): 23 ***Average Roll Length(ft.): 505***

Total Number of Rolls: 138 ***Cumulative Area(sq.ft.): 1602870***

Total Number of Conformance Tests: 8

Comments: 7110583-443563-11:used for Interface Friction testing

Chenango Contracting Honeywell Sedim Consol doc 17645

PO# 2276

Syracuse, NY

138 rolls 60 HD micro (505)

roll #	English Dimensions wid	len	area	check weld rod qty (if ordered)			wgt		resin lot #
443557 .11	23	505	11,615.0	60HD micro	138tot	1	3898	2ft conf	7110583
443558 .11	23	505	11,615.0	60HD micro	138tot	2	3894		7110583
443559 .11	23	505	11,615.0	60HD micro	138tot	3	3894		7110583
443560 .11	23	505	11,615.0	60HD micro	138tot	4	3892		7110583
443561 .11	23	505	11,615.0	60HD micro	138tot	5	3894		7110583
443562 .11	23	505	11,615.0	60HD micro	138tot	6	3892		7110583
443563 .11	23	505	11,615.0	60HD micro	138tot	7	3894		7110583
443565 .11	23	505	11,615.0	60HD micro	138tot	8	3896		7110583
443566 .11	23	505	11,615.0	60HD micro	138tot	9	3892		7110583
443567 .11	23	505	11,615.0	60HD micro	138tot	10	3900		7110583
443568 .11	23	505	11,615.0	60HD micro	138tot	11	3804		7110583
443569 .11	23	505	11,615.0	60HD micro	138tot	12	3804		7110583
443670 .11	23	505	11,615.0	60HD micro	138tot	13	3802		7110583
443673 .11	23	505	11,615.0	60HD micro	138tot	14	3797		7110583
443674 .11	23	505	11,615.0	60HD micro	138tot	15	3794		7110583
443675 .11	23	505	11,615.0	60HD micro	138tot	16	3796		7110583
443676 .11	23	505	11,615.0	60HD micro	138tot	17	3800		7110583
443677 .11	23	505	11,615.0	60HD micro	138tot	18	3796		7110583
443678 .11	23	505	11,615.0	60HD micro	138tot	19	3794		7110583
443679 .11	23	505	11,615.0	60HD micro	138tot	20	3796		7110583
443682 .11	23	505	11,615.0	60HD micro	138tot	21	3908		8210664
443683 .11	23	505	11,615.0	60HD micro	138tot	22	3914	2ft conf	8210664
443784 .11	23	505	11,615.0	60HD micro	138tot	23	3916		8210664
443785 .11	23	505	11,615.0	60HD micro	138tot	24	3920		8210664
443786 .11	23	505	11,615.0	60HD micro	138tot	25	3916		8210664
443787 .11	23	505	11,615.0	60HD micro	138tot	26	3920		8210664
443788 .11	23	505	11,615.0	60HD micro	138tot	27	3922		8210664
443789 .11	23	505	11,615.0	60HD micro	138tot	28	3920		8210664
443790 .11	23	505	11,615.0	60HD micro	138tot	29	3910		8210664
443791 .11	23	505	11,615.0	60HD micro	138tot	30	3946		8210664
443792 .11	23	505	11,615.0	60HD micro	138tot	31	3940		8210664
443793 .11	23	505	11,615.0	60HD micro	138tot	32	3788		8210664
443796 .11	23	505	11,615.0	60HD micro	138tot	33	3788		8210664
443797 .11	23	505	11,615.0	60HD micro	138tot	34	3788		8210664
444101 .11	23	505	11,615.0	60HD micro	138tot	35			8210664
444102 .11	23	505	11,615.0	60HD micro	138tot	36			8210664

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Apr 14 2012
PARSONS

Chenango Contracting Honeywell Sedim Consol doc 17645 | PO# 2276

Syracuse, NY

138 rolls 60 HD micro (505)

roll #	English Dimensions wid	len	area	check weld rod qty (if ordered)				wgt		resin lot #
311330 .12	23	505	11,615.0	60HD	micro	138tot	37	3882		7120200
311331 .12	23	505	11,615.0	60HD	micro	138tot	38	3946		7120200
311332 .12	23	505	11,615.0	60HD	micro	138tot	39	3875		7120200
311333 .12	23	505	11,615.0	60HD	micro	138tot	40	3852		7120200
311334 .12	23	505	11,615.0	60HD	micro	138tot	41	3837		7120200
311335 .12	23	505	11,615.0	60HD	micro	138tot	42	3828		7120200
311336 .12	23	505	11,615.0	60HD	micro	138tot	43	3838		7120200
311337 .12	23	505	11,615.0	60HD	micro	138tot	44	3823	2ft conf	7120200
311338 .12	23	505	11,615.0	60HD	micro	138tot	45	3833		7120200
311339 .12	23	505	11,615.0	60HD	micro	138tot	46	3843		7120200
311340 .12	23	505	11,615.0	60HD	micro	138tot	47	3925		7120200
311341 .12	23	505	11,615.0	60HD	micro	138tot	48	3927		7120200
311442 .12	23	505	11,615.0	60HD	micro	138tot	49	3929		7120200
311443 .12	23	505	11,615.0	60HD	micro	138tot	50	3919		7120200
311444 .12	23	505	11,615.0	60HD	micro	138tot	51	3923		7120200
311445 .12	23	505	11,615.0	60HD	micro	138tot	52	3934		7120200
311446 .12	23	505	11,615.0	60HD	micro	138tot	53	3938		7120200
311447 .12	23	505	11,615.0	60HD	micro	138tot	54	3943		7120200
311448 .12	23	505	11,615.0	60HD	micro	138tot	55	3921		7120200
311449 .12	23	505	11,615.0	60HD	micro	138tot	56	3911		7120199
311450 .12	23	505	11,615.0	60HD	micro	138tot	57	3894		7120199
311451 .12	23	505	11,615.0	60HD	micro	138tot	58	3897		7120199
311452 .12	23	505	11,615.0	60HD	micro	138tot	59	3889		7120199
311453 .12	23	505	11,615.0	60HD	micro	138tot	60	3887		7120199
311454 .12	23	505	11,615.0	60HD	micro	138tot	61	3884		7120199
311455 .12	23	505	11,615.0	60HD	micro	138tot	62	3896		7120199
311556 .12	23	505	11,615.0	60HD	micro	138tot	63	3897		7120199
311557 .12	23	505	11,615.0	60HD	micro	138tot	64	3858		7120199
311558 .12	23	505	11,615.0	60HD	micro	138tot	65	3832	2ft conf	7120199
311559 .12	23	505	11,615.0	60HD	micro	138tot	66	3866		7120199
311560 .12	23	505	11,615.0	60HD	micro	138tot	67	3840		7120199
311561 .12	23	505	11,615.0	60HD	micro	138tot	68	3908		7120199
311562 .12	23	505	11,615.0	60HD	micro	138tot	69	3901		7120199
311563 .12	23	505	11,615.0	60HD	micro	138tot	70	3904		7120199
311564 .12	23	505	11,615.0	60HD	micro	138tot	71	3905		7120199
311565 .12	23	505	11,615.0	60HD	micro	138tot	72	3910		7120199
311566 .12	23	505	11,615.0	60HD	micro	138tot	73	3904		7120199
311567 .12	23	505	11,615.0	60HD	micro	138tot	74	3904		7120199
311568 .12	23	505	11,615.0	60HD	micro	138tot	75	3915		7120199
311569 .12	23	505	11,615.0	60HD	micro	138tot	76	3920		7120199
311670 .12	23	505	11,615.0	60HD	micro	138tot	77	3918		7120199
311671 .12	23	505	11,615.0	60HD	micro	138tot	78	3277		7120199
311672 .12	23	505	11,615.0	60HD	micro	138tot	79	3922		7120199
311673 .12	23	505	11,615.0	60HD	micro	138tot	80	3926		7120199
311674 .12	23	505	11,615.0	60HD	micro	138tot	81	3934		7120199
311675 .12	23	505	11,615.0	60HD	micro	138tot	82	3947		7120199
311676 .12	23	505	11,615.0	60HD	micro	138tot	83	3912		7120199
311677 .12	23	505	11,615.0	60HD	micro	138tot	84	3911		7120199
311678 .12	23	505	11,615.0	60HD	micro	138tot	85	3907		7120199
311679 .12	23	505	11,615.0	60HD	micro	138tot	86	3908		7120199
311680 .12	23	505	11,615.0	60HD	micro	138tot	87	3904	2ft conf	7120199
311681 .12	23	505	11,615.0	60HD	micro	138tot	88	3918		7120199
311682 .12	23	505	11,615.0	60HD	micro	138tot	89	3910		7120199
311683 .12	23	505	11,615.0	60HD	micro	138tot	90	3912		7120199
311784 .12	23	505	11,615.0	60HD	micro	138tot	91	3910		7120199
311785 .12	23	505	11,615.0	60HD	micro	138tot	92	3911		7120199
311786 .12	23	505	11,615.0	60HD	micro	138tot	93	3918		7120199
311787 .12	23	505	11,615.0	60HD	micro	138tot	94	4055	certs	7120199
311788 .12	23	505	11,615.0	60HD	micro	138tot	95	3956		8110773
311789 .12	23	505	11,615.0	60HD	micro	138tot	96	3897		8110773
311790 .12	23	505	11,615.0	60HD	micro	138tot	97	3923		8110773
311791 .12	23	505	11,615.0	60HD	micro	138tot	98	3924		8110773
311792 .12	23	505	11,615.0	60HD	micro	138tot	99	3911		8110773
311793 .12	23	505	11,615.0	60HD	micro	138tot	100	3842		8110773
311794 .12	23	505	11,615.0	60HD	micro	138tot	101	3836		8110773
311795 .12	23	505	11,615.0	60HD	micro	138tot	102	3855		8110773

Chenango Contracting Honeywell Sedim Consol doc 17645

PO# 2276

Syracuse, NY

138 rolls 60 HD micro (505)

English Dimensions

roll #	wid	len	area	check weld rod qty (if ordered)				wgt		resin lot #
311796 .12	23	505	11,615.0	60HD	micro	138tot	103	3856		8110773
312101 .12	23	505	11,615.0	60HD	micro	138tot	104	3851		8110773
312102 .12	23	505	11,615.0	60HD	micro	138tot	105	3929		8110773
312103 .12	23	505	11,615.0	60HD	micro	138tot	106	4001		8110773
312104 .12	23	505	11,615.0	60HD	micro	138tot	107	4011		8110773
312105 .12	23	505	11,615.0	60HD	micro	138tot	108	3912	2ft conf	8110773
312106 .12	23	505	11,615.0	60HD	micro	138tot	109	3814		8110773
312107 .12	23	505	11,615.0	60HD	micro	138tot	110	3870		8110773
312108 .12	23	505	11,615.0	60HD	micro	138tot	111	3865		8110773
312109 .12	23	505	11,615.0	60HD	micro	138tot	112	3859		8110773
312110 .12	23	505	11,615.0	60HD	micro	138tot	113	3855		8110773
312111 .12	23	505	11,615.0	60HD	micro	138tot	114	3852		8110773
312112 .12	23	505	11,615.0	60HD	micro	138tot	115	3854		8110773
312113 .12	23	505	11,615.0	60HD	micro	138tot	116	3855		8110773
312114 .12	23	505	11,615.0	60HD	micro	138tot	117	3867		8110773
312115 .12	23	505	11,615.0	60HD	micro	138tot	118	3871		8110773
312216 .12	23	505	11,615.0	60HD	micro	138tot	119	3864		8110773
312217 .12	23	505	11,615.0	60HD	micro	138tot	120	3862		8110773
312218 .12	23	505	11,615.0	60HD	micro	138tot	121	3864		8110773
312219 .12	23	505	11,615.0	60HD	micro	138tot	122	3852		8110773
312220 .12	23	505	11,615.0	60HD	micro	138tot	123	3865		8110773
312221 .12	23	505	11,615.0	60HD	micro	138tot	124	3875		8110773
312222 .12	23	505	11,615.0	60HD	micro	138tot	125	3876		8110773
312223 .12	23	505	11,615.0	60HD	micro	138tot	126	3865		8110773
312224 .12	23	505	11,615.0	60HD	micro	138tot	127	3857		8110773
312225 .12	23	505	11,615.0	60HD	micro	138tot	128	3848		8110773
312226 .12	23	505	11,615.0	60HD	micro	138tot	129	3858		8110773
312227 .12	23	505	11,615.0	60HD	micro	138tot	130	3830	2ft conf	8110773
312228 .12	23	505	11,615.0	60HD	micro	138tot	131	3850		8110773
312229 .12	23	505	11,615.0	60HD	micro	138tot	132	3856		8110773
312330 .12	23	505	11,615.0	60HD	micro	138tot	133 — 1			8110773
312331 .12	23	505	11,615.0	60HD	micro	138tot	134 — 2			8110773
312332 .12	23	505	11,615.0	60HD	micro	138tot	135 — 3			8110773
312333 .12	23	505	11,615.0	60HD	micro	138tot	136 — 4			8110773
312334 .12	23	505	11,615.0	60HD	micro	138tot	137 — 5			8110773
312335 .12	23	505	11,615.0	60HD	micro	138tot	138 — 6			8110773

delivered 28 June 2012

OK entered

Honeywell Sediment Consolid.
Syracuse, NY

Agru America will certify that the resin used to manufacture this material meets the requirements of Specification Section 02740

Paul W. Barker
Technical Director

Date: April 14, 2012

agru america

Honeywell Sediment Consolid.
Syracuse, NY

The properties of the welding rod (extrudate) supplied for this project will meet requirements set forth in these specifications.

Paul W. Barker
Technical Director

Date: April 14, 2012

Honeywell Sediment Consolid.
Syracuse, NY

Agru America, Inc. certifies that for this project we will test to ASTM D5397- Standard Test Method for evaluation of stress crack resistance of polyolefin geomembranes using notched constant tensile load test.

Paul W. Barker
Technical Director

Date: April 14, 2012

agru america, inc.

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : 8210664 MATERIAL : HDPE DATE : 10-29-11

ROLL # 443682-11 LINER TYPE 60 HD MICROSPIKE REF # :

FORMULA FOR APPLIED LOAD : Load = $\frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Weakest Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : 2,593 psi % of yield tested : 30 %

Station used: Mechanical Advantage Used: 5 CF = 77 g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,593 **x** 0.060 **x formula**

LOAD = 408 **g**

PASS @ 300 **HRS**

Specimen Thickness (mils)		Notch Depth (mils)		PASS / FAIL ?	Failure at
#1	0.0619	#1	0.0139	PASS	hours
#2	0.0618	#2	0.0138	PASS	hours
#3	0.0621	#3	0.0141	PASS	hours
#4	0.0620	#4	0.0140	PASS	hours
#5	0.0620	#5	0.0140	PASS	hours
#6	0.0620	#6	0.0140	= 356 microns	

Comments: all 5 specimens removed after 312 hours with no breaks.

Tested By: JE

Checked By: GP

Test Conditions (At Notching) **Temp:** 71 **Humidity:** 52

NCTL.FRM
REV 02
2/11/10

agru america, inc.

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : 7120200 MATERIAL : HDPE DATE 3/11/12

ROLL # 310775-12 LINER TYPE 60 HD MICROSPIKE REF # :

FORMULA FOR APPLIED LOAD : Load = $\frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Weakest Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : 2,456 psi % of yield tested : 30 %

Station used: Mechanical Advantage Used: 5 CF = 77 g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,456 **x** 0.060 **x formula**

LOAD = 386 **g**

PASS @ 300 **HRS**

Specimen Thickness (in)		Notch Depth (in)		PASS / FAIL ?	Failure at
#1	0.0665	#1	0.0185	PASS	hours
#2	0.0670	#2	0.0190	PASS	hours
#3	0.0670	#3	0.0190	PASS	hours
#4	0.0660	#4	0.0180	PASS	hours
#5	0.0660	#5	0.0180	PASS	hours
#6	0.0665	#6	0.0185	= 470	microns

Comments: All 5 specimens passed at 300 hours with no breaks.

Tested By: DF

Checked By: GP

Test Conditions (At Notching) **Temp:** 71 **Humidity:** 52

NCTL.FRM
REV 02
2/11/10

agru america, inc

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : 7120199 MATERIAL : HDPE DATE 3-15-2012

ROLL # 311449-12 LINER TYPE 60 HD MICROSPIKE REF # :

FORMULA FOR APPLIED LOAD : Load = $\frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Weakest Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : 2,478 psi % of yield tested : 30 %

Station used: Mechanical Advantage Used: 5 CF = 77 g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,478 **x** 0.060 **x formula**

LOAD = 389 **g**

PASS @ 300 **HRS**

Specimen Thickness (in)		Notch Depth (in)		PASS / FAIL ?	Failure at
#1	0.0640	#1	0.0160	PASS	hours
#2	0.0625	#2	0.0145	PASS	hours
#3	0.0635	#3	0.0155	PASS	hours
#4	0.0640	#4	0.0160	PASS	hours
#5	0.0610	#5	0.0130	PASS	hours
#6	0.0625	#6	0.0145	= 368	microns

Comments: All 5 specimens passed at 300 hours with no breaks.

Tested By: CBS

Checked By: GP

Test Conditions (At Notching) **Temp:** 71 **Humidity:** 52

NCTL.FRM
REV 02
2/11/10

agru america, inc.

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : 7120718 MATERIAL : HDPE DATE 6/17/2012

ROLL # 424683-12 LINER TYPE 60 HD MICROSPIKE REF # :

FORMULA FOR APPLIED LOAD : $\text{Load} = \frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Weakest Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : 2,570 psi % of yield tested : 30 %

Station used: Mechanical Advantage Used: 5 CF = 77 g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,570 x 0.060 x formula

LOAD = 404 g

PASS @ 300 HRS

Specimen Thickness (in)		Notch Depth (in)		PASS / FAIL ?	Failure at
#1	0.0580	#1	0.0100	PASS	hours
#2	0.0575	#2	0.0095	PASS	hours
#3	0.0575	#3	0.0095	PASS	hours
#4	0.0580	#4	0.0100	PASS	hours
#5	0.0580	#5	0.0100	PASS	hours
#6	0.0578	#6	0.0098	= 249 microns	

Comments: ALL 5 Specimens removed at 317 hours with no breaks.

Tested By: DF

Checked By: GP

Test Conditions (At Notching) Temp: 71 Humidity: 52

NCTL.FRM
REV 02
2/11/10

CoA Date: 07/28/2011

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88305479
PO #: 5844
Weight: 194700 LB
Ship Date: 07/28/2011
Package: BULK
Mode: Hopper Car
Car #: CEFX053841
Seal No: 260555

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 7110583

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.27	g/10mi
HLMI Flow Rate	ASTM D1238	22	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	24	pel/g
Production Date		05/03/2011	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4806

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ROLL # **443557-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 27/37 mil TOP / BOTTOM	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes 186		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.27	
Carbon Black Content ASTM D4218	Range	%			2.42	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi		2,511 2,650 2,581	psi
	Average Strength @ Break	34 N/mm (kN/m)	197 ppi		3,334 2,992 3,163	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.11 13.95 15.03	
Lo = 2.0" Break	Average Elongation @ Break	%			483.4 555.5 519.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	258.7 N			58.704 57.596 58.150	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	412.5 N			92.742	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	608.8 N			136.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**

Signature.....

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ROLL # **443558-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

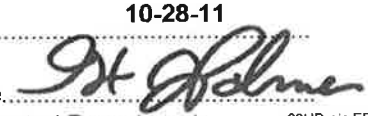
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.52** mm	**60** mil
	MAX:	**1.74** mm	**69** mil
Asperity ASTM D7466: **27/37** mil TOP / BOTTOM	AVE:	**1.59** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**186**	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		**.946**
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		**.27**
Carbon Black Content ASTM D4218	Range	%		**2.40**
Carbon Black Dispersion ASTM D5596	Category			**10 in Cat 1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**158** ppi	2,430 2,628 **2,529** psi
	Average Strength @ Break	**35** N/mm (kN/m)	**198** ppi	3,228 3,109 **3,169** psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.96 14.11 **16.04**
Lo = 2.0" Break	Average Elongation @ Break	%		478.8 571.0 **524.9**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.33**
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**262.6** N		57.981 60.095 **59.038** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**454.0** N		**102.07** lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**648.2** N		**145.72** lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**

Signature: 

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ROLL # **443559-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.77 mm	70 mil
Asperity ASTM D7466: 27/37 mil TOP / BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	186	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.27	
Carbon Black Content ASTM D4218	Range	%			2.40	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,430 2,628	2,529	psi
	Average Strength @ Break	35 N/mm (kN/m)	198 ppi	3,228 3,109	3,169	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.96 14.11	16.04	
Lo = 2.0" Break	Average Elongation @ Break	%		478.8 571.0	524.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	262.6 N		57.981 60.095	59.038	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	454.0 N			102.07	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	648.2 N			145.72	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**
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ROLL # **443560-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH				
Measurement ASTM D5994 (Modified)	MIN:	**1.43**	mm	**56**	mil	Thickness.....	**1.5 mm**	**60 mil**
	MAX:	**1.69**	mm	**67**	mil	Length.....	**153.926** m	**505.0** feet
Asperity ASTM D7466: **27/35** mil TOP / BOTTOM	AVE:	**1.56**	mm	**61**	mil	Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **186**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.27**	
Carbon Black Content ASTM D4218	Range	%			**2.40**	
Carbon Black Dispersion ASTM D5596	Category				**10 in Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**155** ppi		2,430 2,628 **2,529**	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**195** ppi		3,228 3,109 **3,169**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.96 14.11 **16.04**	
Lo = 2.0" Break	Average Elongation @ Break	%			478.8 571.0 **524.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.33**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**262.6** N			57.981 60.095 **59.038**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**454.0** N			**102.07**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**648.2** N			**145.72**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**

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ROLL # **443561-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 28/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm		60 mil
Length.....	153.926 m		505.0 feet
Width.....	7.01 m;		23.0 feet
OIT(Standard) ASTM D3895 minutes	186		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.27	
Carbon Black Content ASTM D4218	Range	%			2.40	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi		2,430 2,628 2,529	psi
	Average Strength @ Break	34 N/mm (kN/m)	196 ppi		3,228 3,109 3,169	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.96 14.11 16.04	
Lo = 2.0" Break	Average Elongation @ Break	%			478.8 571.0 524.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	262.6 N			57.981 60.095 59.038	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	454.0 N			102.07	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	648.2 N			145.72	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**
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ROLL # **443562-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

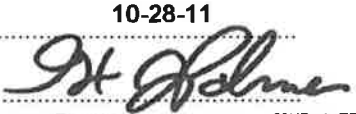
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.78 mm	70 mil
Asperity ASTM D7466: 25/35 mil TOP / BOTTOM	AVE:	1.62 mm	64 mil

Thickness.....	1.5 mm	60 mil	
Length.....	153.926 m	505.0 feet	
Width.....	7.01 m;	23.0 feet	
OIT(Standard) ASTM D3895	minutes 186		

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.27	
Carbon Black Content ASTM D4218	Range		%		2.46	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31	N/mm (kN/m)	175 ppi	2,616 2,883 **2,750**	psi
	Average Strength @ Break	39	N/mm (kN/m)	222 ppi	3,789 3,169 **3,479**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.66 13.99 **16.33**	
Lo = 2.0" Break	Average Elongation @ Break		%		499.0 548.2 **523.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.3	N		57.381 58.292 **57.837**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	424.8	N		95.506	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.9	N		136.45	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**

Signature: 

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ROLL # **443563-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.48** mm	**58** mil
	MAX:	**1.67** mm	**66** mil
Asperity ASTM D7466: **28/37** mil TOP / BOTTOM	AVE:	**1.57** mm	**62** mil

Thickness.....	**1.5** mm		**60** mil
Length.....	**153.926** m		**505.0** feet
Width.....	**7.01** m;		**23.0** feet
OIT(Standard) ASTM D3895 minutes	**186**		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.27**	
Carbon Black Content ASTM D4218	Range	%			**2.46**	
Carbon Black Dispersion ASTM D5596	Category				**10 in Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**170** ppi		2,616 2,883 **2,750**	psi
	Average Strength @ Break	**38** N/mm (kN/m)	**215** ppi		3,789 3,169 **3,479**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.66 13.99 **16.33**	
Lo = 2.0" Break	Average Elongation @ Break	%			499.0 548.2 **523.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.33**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.3** N			57.381 58.292 **57.837**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**424.8** N			**95.506**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**606.9** N			**136.45**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**

Signature: *H Holmes*

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ROLL # **443565-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

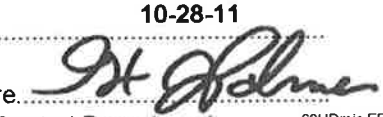
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.54** mm	**61** mil
	MAX:	**1.66** mm	**65** mil
Asperity ASTM D7466: **27/30** mil TOP / BOTTOM	AVE:	**1.60** mm	**63** mil

Thickness.....	**1.5** mm	**60** mil	
Length.....	**153.926** m	**505.0** feet	
Width.....	**7.01** m;	**23.0** feet	
OIT(Standard) ASTM D3895 minutes	**186**		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.27**	
Carbon Black Content ASTM D4218	Range	%			**2.46**	
Carbon Black Dispersion ASTM D5596	Category				**10 in Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**173** ppi		2,616 2,883 **2,750**	psi
	Average Strength @ Break	**38** N/mm (kN/m)	**219** ppi		3,789 3,169 **3,479**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.66 13.99 **16.33**	
Lo = 2.0" Break	Average Elongation @ Break	%			499.0 548.2 **523.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.33**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.3** N			57.381 58.292 **57.837**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**424.8** N			**95.506**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**606.9** N			**136.45**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-28-11**

Signature: 

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ROLL # **443566-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH			TEST RESULTS
	MIN:	1.50 mm	59 mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.67 mm	66 mil	Length.....	153.926 m	505.0 feet
Asperity ASTM D7466: 26/34 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil	Width.....	7.01 m;	23.0 feet
				OIT(Standard) ASTM D3895 minutes	186	

Specific Gravity ASTM D792	Density	g/cc			.947
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.27
Carbon Black Content ASTM D4218	Range	%			2.45
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi	2,586 2,764	2,675 psi
	Average Strength @ Break	39 N/mm (kN/m)	220 ppi	3,834 3,237	3,536 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		21.06 15.18	18.12
Lo = 2.0" Break	Average Elongation @ Break	%		504.5 569.4	537.0
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.0 N		57,412 57,716	57.564 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	443.7 N			99.756 lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	644.5 N			144.89 lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 10-29-11
Signature:
Quality Control Department

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ROLL # **443567-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.48** mm	**58** mil
	MAX:	**1.74** mm	**69** mil
Asperity ASTM D7466: **26/31** mil TOP / BOTTOM	AVE:	**1.60** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**186**	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		**.947**
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		**.27**
Carbon Black Content ASTM D4218	Range	%		**2.45**
Carbon Black Dispersion ASTM D5596	Category			**10 in Cat 1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**169** ppi	2,586 2,764 **2,675** psi
	Average Strength @ Break	**39** N/mm (kN/m)	**223** ppi	3,834 3,237 **3,536** psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		21.06 15.18 **18.12**
Lo = 2.0" Break	Average Elongation @ Break	%		504.5 569.4 **537.0**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.33**
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**256.0** N		57.412 57.716 **57.564** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**443.7** N		**99.756** lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**644.5** N		**144.89** lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**
Signature:
Quality Control Department

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ROLL # **443568-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.76	mm	69	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 28/35 mil TOP / BOTTOM	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	186	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.947
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.27
Carbon Black Content ASTM D4218	Range	%		2.45
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi	2,586 2,764 2,675 psi
	Average Strength @ Break	39 N/mm (kN/m)	220 ppi	3,834 3,237 3,536 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		21.06 15.18 18.12
Lo = 2.0" Break	Average Elongation @ Break	%		504.5 569.4 537.0
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.33
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.0 N		57.412 57.716 57.564 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	443.7 N		99.756 lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	644.5 N		144.89 lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 10-29-11
Signature:
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ROLL # **443569-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.75 mm	69 mil
Asperity ASTM D7466: 27/36 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness..... 1.5 mm 60 mil
Length..... 153.926 m 505.0 feet
Width..... 7.01 m; 23.0 feet

OIT(Standard) ASTM D3895 minutes 186

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.27	
Carbon Black Content ASTM D4218	Range	%			2.45	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi		2,586 2,764 2,675	psi
	Average Strength @ Break	38 N/mm (kN/m)	216 ppi		3,834 3,237 3,536	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			21.06 15.18 18.12	
Lo = 2.0" Break	Average Elongation @ Break	%			504.5 569.4 537.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.0 N			57.412 57.716 57.564	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	443.7 N			99.756	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	644.5 N			144.89	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**
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ROLL # **443670-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

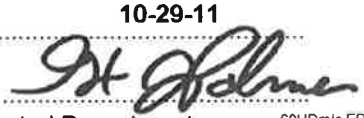
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 27/36 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	186	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.27	
Carbon Black Content ASTM D4218	Range	%			2.46	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi	2,413 2,606 **2,510**	psi	
	Average Strength @ Break	35 N/mm (kN/m)	197 ppi	3,250 3,139 **3,195**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.72 13.61 **16.17**		
Lo = 2.0" Break	Average Elongation @ Break	%		492.0 590.0 **541.0**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.4 N		55.443 55.799 **55.621**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	402.6 N			90.510	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	641.6 N			144.23	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**

Signature: 

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ROLL # **443673-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.39 mm	55 mil
	MAX:	1.64 mm	65 mil
Asperity ASTM D7466: 26/35 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	186	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.27	
Carbon Black Content ASTM D4218	Range		%		2.46	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	150 ppi		2,413 2,606 2,510	psi
	Average Strength @ Break	33 N/mm (kN/m)	191 ppi		3,250 3,139 3,195	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.72 13.61 16.17	
Lo = 2.0" Break	Average Elongation @ Break	%			492.0 590.0 541.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.4 N			55.443 55.799 55.621	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	402.6 N			90.510	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	641.6 N			144.23	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**
Signature:
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ROLL # **443674-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.39	mm	55	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	186	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.947
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.27
Carbon Black Content ASTM D4218	Range	%		2.46
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	152 ppi	2,529 2,560 **2,545** psi
	Average Strength @ Break	34 N/mm (kN/m)	191 ppi	3,287 3,110 **3,199** psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.78 15.34 **17.06**
Lo = 2.0" Break	Average Elongation @ Break	%		490.1 589.7 **539.9**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.33
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.5 N		58.010 57.793 **57.902** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	423.5 N		95.220 lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	659.4 N		148.24 lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**

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ROLL # **443675-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.46** mm	**57** mil
	MAX:	**1.67** mm	**66** mil
Asperity ASTM D7466: **26/33** mil TOP / BOTTOM	AVE:	**1.55** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**186**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.27	
Carbon Black Content ASTM D4218	Range	%			2.46	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi	2,529 2,560 **2,545**	psi	
	Average Strength @ Break	**34** N/mm (kN/m)	**195** ppi	3,287 3,110 **3,199**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.78 15.34 **17.06**		
Lo = 2.0" Break	Average Elongation @ Break	%		490.1 589.7 **539.9**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.33**		
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.5** N		58.010 57.793 **57.902**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**423.5** N		**95.220**	lbs	
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**659.4** N		**148.24**	lbs	
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**		

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**

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ROLL # **443676-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.71 mm	67 mil
Asperity ASTM D7466: 27/34 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	186	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.27	
Carbon Black Content ASTM D4218	Range	%		2.46	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,529 2,560 2,545	psi
	Average Strength @ Break	35 N/mm (kN/m)	199 ppi	3,287 3,110 3,199	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.78 15.34 17.06	
Lo = 2.0" Break	Average Elongation @ Break	%		490.1 589.7 539.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.5 N		58.010 57.793 57.902	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	423.5 N		95.220	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	659.4 N		148.24	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**
Signature:
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ROLL # **443677-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.49** mm	**59** mil
	MAX:	**1.74** mm	**69** mil
Asperity ASTM D7466: **26/31** mil TOP / BOTTOM	AVE:	**1.58** mm	**62** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **186**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.27**	
Carbon Black Content ASTM D4218	Range	%			**2.46**	
Carbon Black Dispersion ASTM D5596	Category				**10 in Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**158** ppi	2,529 2,560 **2,545**	psi	
	Average Strength @ Break	**35** N/mm (kN/m)	**199** ppi	3,287 3,110 **3,199**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.78 15.34 **17.06**		
	Average Elongation @ Break	%		490.1 589.7 **539.9**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.33**		
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.5** N		58.010 57.793 **57.902**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**423.5** N		**95.220**	lbs	
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**659.4** N		**148.24**	lbs	
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**		

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-29-11**

Signature: H Holmes

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ROLL # **443678-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.50** mm	**59** mil
	MAX:	**1.64** mm	**65** mil
Asperity ASTM D7466: **27/38** mil TOP / BOTTOM	AVE:	**1.56** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**186**	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		**.27**	
Carbon Black Content ASTM D4218	Range	%		**2.53**	
Carbon Black Dispersion ASTM D5596	Category			**10 in Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**164** ppi	2,501 2,846 **2,674**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**202** ppi	3,398 3,176 **3,287**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.06 15.02 **17.04**	
Lo = 2.0" Break	Average Elongation @ Break	%		474.1 561.4 **517.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.33**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**252.2** N		56.918 56.476 **56.697**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**375.7** N		**84.466**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**609.6** N		**137.05**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: *M Holmes*

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ROLL # **443679-11** Lot #: **7110583** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 25/36 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	186	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.27	
Carbon Black Content ASTM D4218	Range		%		2.53	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	164 ppi	2,501 2,846 2,674	psi
	Average Strength @ Break	35	N/mm (kN/m)	202 ppi	3,398 3,176 3,287	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.06 15.02 17.04	
Lo = 2.0" Break	Average Elongation @ Break		%		474.1 561.4 517.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.33	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	252.2	N		56.918 56.476 56.697	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	375.7	N		84.466	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	609.6	N		137.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: _____

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CoA Date: 02/22/2012

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88417742
PO #: 006413
Weight: 194400 LB
Ship Date: 02/22/2012
Package: BULK
Mode: Hopper Car
Car #: CHVX896605
Seal No: 282623

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 7120199

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.25	g/10mi
HLMI Flow Rate	ASTM D1238	21	g/10mi
Density	D1505 or D4883	0.938	g/cm3
Pellet Count	P02.08.03	26	pel/g
Production Date		02/12/2012	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4806

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ROLL # **311449-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.70	mm	67	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 35/32 mil TOP / BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.31	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	155 ppi	2,439 2,572 2,506 3,093	psi
	Average Strength @ Break	31	N/mm (kN/m)	179 ppi	2,706 2,900	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.64 15.14 17.89	
Lo = 2.0" Break	Average Elongation @ Break		%		450.0 483.1 466.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.2	N		61.540 58.145 59.843	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	415.2	N		93.335	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	577.9	N		129.92	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

Signature: H Holmes

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ROLL # **311450-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.60 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.31	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158 ppi	2,439 2,572 2,506 3,093	psi
	Average Strength @ Break	32	N/mm (kN/m)	183 ppi	2,706 2,900	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.64 15.14 17.89	
Lo = 2.0" Break	Average Elongation @ Break		%		450.0 483.1 466.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.2	N		61.540 58.145 59.843	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	415.2	N		93.335	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	577.9	N		129.92	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311451-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.16	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160 ppi	2,478 2,741 2,610 3,177	psi
	Average Strength @ Break	32	N/mm (kN/m)	183 ppi	2,787 2,982	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.25 15.10 17.68	
Lo = 2.0" Break	Average Elongation @ Break		%		460.6 512.4 486.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	270.0	N		62.591 58.806 60.699	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	407.5	N		91.606	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	559.9	N		125.88	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311452-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.63 mm	64 mil
Asperity ASTM D7466: 29/32 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.16	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160 ppi	2,478 2,741 2,610 3,177	psi
	Average Strength @ Break	32	N/mm (kN/m)	183 ppi	2,787 2,982	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%		20.25 15.10 17.68	
	Average Elongation @ Break		%		460.6 512.4 486.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	270.0	N		62.591 58.806 60.699	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	407.5	N		91.606	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	559.9	N		125.88	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311453-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.49** mm	**59** mil
	MAX:	**1.68** mm	**66** mil
Asperity ASTM D7466: **36/32** mil TOP / BOTTOM	AVE:	**1.58** mm	**62** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**180**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.25**	
Carbon Black Content ASTM D4218	Range	%			**2.16**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**162** ppi		2,478 2,741 **2,610** 3,177	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**185** ppi		2,787 **2,982**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			20.25 15.10 **17.68**	
Lo = 2.0" Break	Average Elongation @ Break	%			460.6 512.4 **486.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.55**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**270.0** N			62.591 58.806 **60.699**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**407.5** N			**91.606**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**559.9** N			**125.88**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311454-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil	
Length.....	153.926 m	505.0 feet	
Width.....	7.01 m;	23.0 feet	
OIT(Standard) ASTM D3895 minutes	180		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.16	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi		2,478 2,741 2,610 3,177 2,787	psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi		2,982	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			20.25 15.10 17.68	
	Average Elongation @ Break	%			460.6 512.4 486.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	270.0 N			62.591 58.806 60.699	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	407.5 N			91.606	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	559.9 N			125.88	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311455-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.56 mm	61 mil
	MAX:	1.76 mm	69 mil
Asperity ASTM D7466: 37/31 mil TOP / BOTTOM	AVE:	1.64 mm	65 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.26	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi	2,437 2,579 **2,508** 3,164	psi
	Average Strength @ Break	32 N/mm (kN/m)	182 ppi	2,465 **2,815**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.13 15.89 **17.51**	
Lo = 2.0" Break	Average Elongation @ Break	%		465.3 430.1 **447.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.7 N		59.683 55.718 **57.701**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	450.0 N		101.15	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	603.9 N		135.76	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 3/15/2012
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ROLL # **311556-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.44 mm	57 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.26	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	153 ppi	2,437 2,579 **2,508** 3,164	psi
	Average Strength @ Break	30 N/mm (kN/m)	172 ppi	2,465 **2,815**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.13 15.89 **17.51**	
Lo = 2.0" Break	Average Elongation @ Break	%		465.3 430.1 **447.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.7 N		59.683 55.718 **57.701**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	450.0 N		**101.15**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	603.9 N		**135.76**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311557-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 38/33 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.26	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi		2,437 2,579 **2,508** 3,164	psi
	Average Strength @ Break	31 N/mm (kN/m)	175 ppi		2,465 **2,815**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.13 15.89 **17.51** 466.3	
Lo = 2.0" Break	Average Elongation @ Break	%			430.1 **447.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.7 N			59.683 55.718 **57.701**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	450.0 N			101.15	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	603.9 N			135.76	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311558-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 37/31 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.26	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	154 ppi		2,437 2,579 2,508 3,164	psi
	Average Strength @ Break	30 N/mm (kN/m)	173 ppi		2,465 2,815	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.13 15.89 17.51	
Lo = 2.0" Break	Average Elongation @ Break	%			465.3 430.1 447.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	256.7 N			50.683 55.718 57.701	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	450.0 N			101.15	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	603.9 N			135.76	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**
Signature:
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ROLL # **311559-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	180	TEST RESULTS

Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.35	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi	2,526 2,683 **2,605** 3,116 2,597	psi
	Average Strength @ Break	31 N/mm (kN/m)	175 ppi	**2,857**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.65 15.25 **16.95**	
Lo = 2.0" Break	Average Elongation @ Break	%		459.7 450.8 **455.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.9 N		57.487 53.959 **55.723**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	417.7 N		93.901	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	584.3 N		131.35	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

Signature: M. Holmes

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ROLL # **311560-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.58 mm	62 mil
Asperity ASTM D7466: 38/36 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi	2,526 2,683 2,605 3,116	2,605	psi
	Average Strength @ Break	30 N/mm (kN/m)	171 ppi	2,597	2,857	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.65 15.25	16.95	
	Average Elongation @ Break	%		459.7 450.8	455.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.9 N		57.487 53.959	55.723	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	417.7 N			93.901	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	584.3 N			131.35	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

Signature:

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ROLL # **311561-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.46** mm	**57** mil
	MAX:	**1.58** mm	**62** mil
Asperity ASTM D7466: **36/33** mil TOP / BOTTOM	AVE:	**1.52** mm	**60** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **180**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.25**	
Carbon Black Content ASTM D4218	Range	%			**2.35**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**156** ppi	2,526 2,683 **2,605** 3,116	psi	
	Average Strength @ Break	**30** N/mm (kN/m)	**171** ppi	2,597 **2,857**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.65 15.25 **16.95**		
Lo = 2.0" Break	Average Elongation @ Break	%		459.7 450.8 **455.3**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-.55**		
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**247.9** N		57.487 53.959 **55.723**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**417.7** N		**93.901**	lbs	
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**584.3** N		**131.35**	lbs	
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**		

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311562-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.63 mm	64 mil
Asperity ASTM D7466: 36/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi	2,526 2,683 **2,605** 3,116		psi
	Average Strength @ Break	31 N/mm (kN/m)	177 ppi	2,597 **2,857**		psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.65 15.25 **16.95**		
Lo = 2.0" Break	Average Elongation @ Break	%		459.7 450.8 **455.3**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.9 N		57.487 53.959 **55.723**		lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	417.7 N			93.901	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	584.3 N			131.35	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311563-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.59 mm	63 mil
Asperity ASTM D7466: 35/38 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.32	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	165 ppi		2,677 2,769 **2,723** 3,083	psi
	Average Strength @ Break	32 N/mm (kN/m)	181 ppi		2,903 **2,993**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.97 15.18 **17.08**	
	Average Elongation @ Break	%			443.5 526.8 **485.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**264.0** N			60.161 58.536 **59.349**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**430.8** N			**96.85**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**591.1** N			**132.88**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311564-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 36/36 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.32	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi		2,677 2,769 **2,723** 3,083	psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi		2,903 **2,993**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.97 15.18 **17.08**	
Lo = 2.0" Break	Average Elongation @ Break	%			443.5 526.8 **485.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.0 N			60.161 58.536 **59.349**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	430.8 N			96.85	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.1 N			132.88	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

Signature:

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ROLL # **311565-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

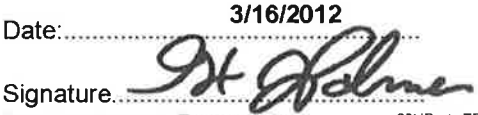
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 35/38 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil	
Length.....	153.926 m	505.0 feet	
Width.....	7.01 m;	23.0 feet	
OIT(Standard) ASTM D3895	minutes 180		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.32	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi		2,677 2,769 **2,723** 3,063	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi		2,903 **2,993**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.97 15.18 **17.08**	
Lo = 2.0" Break	Average Elongation @ Break	%			443.5 526.8 **485.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.0 N			60.161 58.536 **59.349**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	430.8 N			**96.85**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.1 N			**132.88**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

Signature: 

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ROLL # **311566-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 37/35 mil TOP / BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	180	TEST RESULTS

Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.32	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi	2,677 2,769 **2,723** 3,083	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi	2,903 **2,993**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.97 15.18 **17.08**	
Lo = 2.0" Break	Average Elongation @ Break	%		443.5 526.8 **485.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.0 N		60.161 58.536 59.349	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	430.8 N		96.85	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.1 N		132.88	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

Signature: 

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ROLL # **311567-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.63 mm	64 mil
Asperity ASTM D7466: 35/32 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi		2,517 2,494 2,506 3,237	psi
	Average Strength @ Break	33 N/mm (kN/m)	190 ppi		2,924 3,081	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.49 15.73 17.61	
Lo = 2.0" Break	Average Elongation @ Break	%			458.2 537.6 497.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	248.6 N			57.276 54.501 55.889	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	454.3 N			102.14	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.0 N			136.23	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

Signature: *H Holmes*

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ROLL # **311568-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH				
Measurement ASTM D5994 (Modified)	MIN:	1.56	mm	61	mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.67	mm	66	mil	Length.....	153.926 m	505.0 feet
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.61	mm	63	mil	Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **180**

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.947	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.35	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,517 2,494 2,506 3,237	psi
	Average Strength @ Break	34 N/mm (kN/m)	195 ppi	2,924 3,081	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.49 15.73 17.61	
Lo = 2.0" Break	Average Elongation @ Break	%		458.2 537.6 497.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	248.6 N		57.276 54.501 55.889	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	454.3 N		102.14	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.0 N		136.23	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311569-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.53 mm	60 mil
	MAX:	1.70 mm	67 mil
Asperity ASTM D7466: 38/32 mil TOP / BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **180**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	157 ppi	2,517 2,494 2,506 3,237		psi
	Average Strength @ Break	34 N/mm (kN/m)	193 ppi	2,924 3,081		psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.49 15.73 17.61 458.2		
Lo = 2.0" Break	Average Elongation @ Break	%		537.6 497.9		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	248.6 N		57.276 54.501 55.889		lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	454.3 N			102.14	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.0 N			136.23	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/16/2012**

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ROLL # **311670-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.58 mm	62 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 38/31 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness..... 1.5 mm 60 mil
Length..... 153.926 m 505.0 feet
Width..... 7.01 m; 23.0 feet

OIT(Standard) ASTM D3895 minutes 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi		2,517 2,494 **2,506** 3,237	psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi		2,924 **3,081**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.49 15.73 **17.61**	
Lo = 2.0" Break	Average Elongation @ Break	%			458.2 537.6 **497.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	248.6 N			57.276 54.501 **55.889**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	454.3 N			102.14	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.0 N			136.23	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**
Signature.....
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ROLL # **311671-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 38/31 mil TOP / BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.46	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	32 N/mm (kN/m)	181 ppi		2,786 2,983 **2,885** 3,440	psi
	Average Strength @ Break	38 N/mm (kN/m)	215 ppi		3,431 **3,436**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.28 14.70 **16.99**	
Lo = 2.0" Break	Average Elongation @ Break	%			471.5 567.8 **519.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.9 N			61.927 57.199 **59.563**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	456.0 N			102.51	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.5 N			136.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: 

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ROLL # **311672-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.45 mm	57 mil
	MAX:	1.61 mm	63 mil
Asperity ASTM D7466: 38/32 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.46	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31 N/mm (kN/m)	177 ppi		2,786 2,983 **2,885** 3,440	psi
	Average Strength @ Break	37 N/mm (kN/m)	211 ppi		3,431 **3,436**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.28 14.70 **16.99**	
Lo = 2.0" Break	Average Elongation @ Break	%			471.5 567.8 **519.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.9 N			61.927 57.199 **59.563**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	456.0 N			102.51	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.5 N			136.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

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ROLL # **311673-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 36/31 mil TOP / BOTTOM	AVE:	1.60 mm	63 mil

Thickness.....	1.5 mm		60 mil
Length.....	153.926 m		505.0 feet
Width.....	7.01 m;		23.0 feet
OIT(Standard) ASTM D3895 minutes	180		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.46	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	32 N/mm (kN/m)	182 ppi		2,786 2,983 **2,885** 3,440	psi
	Average Strength @ Break	38 N/mm (kN/m)	216 ppi		3,431 **3,436**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.28 14.70 **16.99**	
Lo = 2.0" Break	Average Elongation @ Break	%			471.5 567.8 **519.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.9 N			61.927 57.199 **59.563**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	456.0 N			102.51	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.5 N			136.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

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ROLL # **311674-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

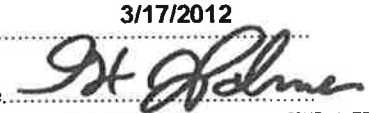
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.57 mm	62 mil
Asperity ASTM D7466: 37/34 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.46	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	173 ppi	2,786 2,983 2,885 3,440	psi
	Average Strength @ Break	36	N/mm (kN/m)	206 ppi	3,431 3,436	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.28 14.70 16.99	
Lo = 2.0" Break	Average Elongation @ Break		%		471.5 567.8 519.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.9	N		61.927 57.199 59.563	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	456.0	N		102.51	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.5	N		136.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: 

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ROLL # **311675-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.54 mm	61 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.61 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.28	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi	2,506 2,644 **2,576** 3,053	psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi	2,766 **2,910**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.51 14.97 **17.24**	
Lo = 2.0" Break	Average Elongation @ Break	%		458.0 526.5 **492.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	269.9 N		61.486 59.889 **60.688**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.0 N		103.85	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	619.2 N		139.20	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature:

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ROLL # **311676-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.63 mm	64 mil
Asperity ASTM D7466: 36/36 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	159 ppi	2,508 2,644 2,576 3,053	psi
	Average Strength @ Break	31	N/mm (kN/m)	180 ppi	2,766 2,910	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%		19.51 14.97 17.24	
	Average Elongation @ Break		%		458.0 526.5 492.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	269.9	N		61.486 59.889 60.688	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.0	N		103.85	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	619.2	N		139.20	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: H Holmes

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ROLL # **311677-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.52	mm	60	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 36/34 mil TOP / BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes 180		

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.28	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,508 2,644 2,576 3,053	psi
	Average Strength @ Break	31 N/mm (kN/m)	180 ppi	2,766 2,910	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.51 14.97 17.24 458.0	
Lo = 2.0" Break	Average Elongation @ Break	%		526.5 492.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	269.9 N		61.486 59.889 60.688	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.0 N		103.85	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	619.2 N		139.20	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: *H Holmes*

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ROLL # **311678-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.59 mm	63 mil
Asperity ASTM D7466: 36/34 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158 ppi	2,508 2,644 **2,576** 3,053	psi
	Average Strength @ Break	31	N/mm (kN/m)	179 ppi	2,766 **2,910**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%		19.51 14.97 **17.24**	
	Average Elongation @ Break		%		458.0 526.5 **492.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	269.9	N		61.486 59.889 **60.688**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.0	N		**103.85**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	619.2	N		**139.20**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: H Holmes

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ROLL # **311679-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.50	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.63	mm	64	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 37/35 mil TOP / BOTTOM	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes 180		

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.30	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi	2,625 2,609 2,617	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	3,124 2,933 3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.55 15.14 17.35	
Lo = 2.0" Break	Average Elongation @ Break	%		447.3 539.3 493.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	274.2 N		62.043 61.238 61.641	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	431.8 N		97.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	609.9 N		137.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

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ROLL # **311680-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 36/35 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.30	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	163 ppi	2,625 2,609 2,617	psi
	Average Strength @ Break	33	N/mm (kN/m)	188 ppi	3,124 2,933 3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.55 15.14 17.35	
Lo = 2.0" Break	Average Elongation @ Break		%		447.3 539.3 493.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	274.2	N		62.043 61.238 61.641	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	431.8	N		97.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	609.9	N		137.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: H Holmes

Quality Control Department

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ROLL # **311681-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.72 mm	68 mil
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.63 mm	64 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.30	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi	2,625 2,609 2,617 3,124	psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi	2,933 3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.55 15.14 17.35 447.3	
Lo = 2.0" Break	Average Elongation @ Break	%		539.3 493.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	274.2 N		62.043 61.238 61.641	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	431.8 N		97.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	609.9 N		137.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature.....

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ROLL # **311682-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 36/36 mil TOP / BOTTOM	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes 180		

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.30	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	163 ppi	2,625 2,609 2,617	psi
	Average Strength @ Break	33	N/mm (kN/m)	188 ppi	3,124 2,933 3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.55 15.14 17.35	
Lo = 2.0" Break	Average Elongation @ Break		%		447.3 539.3 493.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	274.2	N		62.043 61.238 61.641	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	431.8	N		97.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	609.9	N		137.12	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**
Signature:
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ROLL # **311683-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.60 mm	63 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.29	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	169 ppi	2,694 2,867 2,781 3,179	psi
	Average Strength @ Break	31	N/mm (kN/m)	178 ppi	2,690 2,935	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.09 14.86 16.48	
Lo = 2.0" Break	Average Elongation @ Break		%		442.0 449.2 445.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.8	N		60.150 59.802 59.976	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	420.2	N		94.469	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	582.8	N		131.02	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/17/2012**

Signature: H Holmes

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ROLL # **311784-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.64 mm	65 mil
Asperity ASTM D7466: 36/31 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness..... 1.5 mm 60 mil
Length..... 153.926 m 505.0 feet
Width..... 7.01 m; 23.0 feet

OIT(Standard) ASTM D3895 minutes 180

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	171 ppi		2,694 2,867 2,781 3,179	psi
	Average Strength @ Break	32 N/mm (kN/m)	180 ppi		2,690 2,935	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.09 14.86 16.48	
Lo = 2.0" Break	Average Elongation @ Break	%			442.0 449.2 445.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.8 N			60.150 59.802 59.976	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	420.2 N			94.469	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	582.8 N			131.02	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 3/18/2012
Signature:
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ROLL # **311785-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	172 ppi	2,694 2,867 2,781 3,179	2,690 2,935	psi
	Average Strength @ Break	32 N/mm (kN/m)	181 ppi			psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.09 14.86 16.48		
Lo = 2.0" Break	Average Elongation @ Break	%		442.0 449.2	445.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.8 N		60.150 59.802	59.976	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	420.2 N			94.469	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	582.8 N			131.02	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature: H Holmes

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ROLL # **311786-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.29	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	172 ppi	2,694 2,867 2,781 3,179	psi
	Average Strength @ Break	32 N/mm (kN/m)	181 ppi	2,690 2,935	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.09 14.86 16.48	
Lo = 2.0" Break	Average Elongation @ Break	%		442.0 449.2 445.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.8 N		60.150 59.802 59.976	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	420.2 N		94.469	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	582.8 N		131.02	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature: H Holmes

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ROLL # **311787-12** Lot #: **7120199** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.54 mm	61 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 36/34 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	180	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.33	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	163 ppi	2,539 2,688 **2,614**	psi
	Average Strength @ Break	34 N/mm (kN/m)	193 ppi	3,249 2,945 **3,097**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		20.42 14.46 **17.44**	
Lo = 2.0" Break	Average Elongation @ Break	%		429.1 544.5 **486.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.55	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	255.5 N		57.351 57.523 **57.437**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	426.9 N		**95.985**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	600.7 N		**135.04**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature.....

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CoA Date: 02/22/2012

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88417741
PO #: 006413
Weight: 193300 LB
Ship Date: 02/22/2012
Package: BULK
Mode: Hopper Car
Car #: CHVX896092
Seal No: 282624

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 7120200

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.25	g/10mi
HLMI Flow Rate	ASTM D1238	22	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	26	pel/g
Production Date		02/13/2012	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4806

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ROLL # **311330-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH				
Measurement ASTM D5994 (Modified)	MIN:	1.45	mm	57	mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.61	mm	63	mil	Length.....	153.926 m	505.0 feet
Asperity ASTM D7466: 36/31 mil TOP / BOTTOM	AVE:	1.53	mm	60	mil	Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **167**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.21	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	153 ppi		2,456 2,608 2,532 3,124	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi		3,102 3,113	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.25 14.86 16.06	
Lo = 2.0" Break	Average Elongation @ Break	%			458.6 576.5 517.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	267.8 N			60,943 59,490 60.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	410.2 N			92.224	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	612.7 N			137.74	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

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ROLL # **311331-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.27	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	153 ppi	2,371 2,521 2,446 3,193	psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi	2,936 3,065	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.91 15.27 16.09	
Lo = 2.0" Break	Average Elongation @ Break	%		452.4 528.3 490.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.7 N		57.784 53.588 55.686	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.1 N		103.89	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.4 N		142.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature: H Holmes

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ROLL # **311332-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.63 mm	64 mil
Asperity ASTM D7466: 36/31 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **167**

				TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc	.945	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g		g/10 min	.25	
Carbon Black Content ASTM D4218	Range		%	2.27	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	149 ppi	2,371 2,521 2,446	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	3,193 2,936 3,065	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%	16.91 15.27 16.09	
Lo = 2.0" Break	Average Elongation @ Break		%	452.4 528.3 490.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%	-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.7 N		57.784 53.588 55.686	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.1 N		103.89	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.4 N		142.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature: H Holmes

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ROLL # **311333-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.25	
Carbon Black Content ASTM D4218	Range	%		2.27	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	149 ppi	2,371 2,521 **2,446** 3,193	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	2,936 **3,065**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		16.91 15.27 **16.09**	
Lo = 2.0" Break	Average Elongation @ Break	%		452.4 528.3 **490.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.7 N		57.784 53.588 **55.686**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.1 N		103.89	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.4 N		142.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature.....

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ROLL # **311334-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.63 mm	64 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.27	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26	N/mm (kN/m)	148 ppi	2,371 2,521 **2,446** 3,193	psi
	Average Strength @ Break	33	N/mm (kN/m)	186 ppi	2,936 **3,065**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		16.91 15.27 **16.09**	
Lo = 2.0" Break	Average Elongation @ Break		%		452.4 528.3 **490.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.7	N		57.784 53.588 **55.686**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	462.1	N		103.89	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.4	N		142.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

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ROLL # **311335-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.61	mm	63	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 35/34 mil TOP / BOTTOM	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes 167		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi		2,481 2,751 2,616 3,129	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi		2,944 3,037	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			20.20 14.64 17.42	
Lo = 2.0" Break	Average Elongation @ Break	%			441.1 544.0 492.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.6 N			57.969 54.689 56.329	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	386.8 N			86.965	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	561.3 N			126.18	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature: H Holmes

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ROLL # **311336-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 35/34 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi		2,481 2,751 **2,616** 3,129	psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi		2,944 **3,037**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			20.20 14.64 **17.42**	
Lo = 2.0" Break	Average Elongation @ Break	%			441.1 544.0 **492.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.6 N			57.969 54.689 **56.329**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	386.8 N			86.965	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	561.3 N			126.18	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature: 

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ROLL # **311337-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.45 mm	57 mil
	MAX:	1.64 mm	65 mil
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.53 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158 ppi	2,481 2,751 **2,616** 3,129	psi
	Average Strength @ Break	32	N/mm (kN/m)	183 ppi	2,944 **3,037**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.20 14.64 **17.42**	
Lo = 2.0" Break	Average Elongation @ Break		%		441.1 544.0 **492.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.6	N		57,969 54,689 **56.329**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	386.8	N		**86.965**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	561.3	N		**126.18**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**
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ROLL # **311338-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.59 mm	63 mil
Asperity ASTM D7466: 36/35 mil TOP / BOTTOM	AVE:	1.53 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.35	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158 ppi	2,481 2,751 **2,616** 3,129	psi
	Average Strength @ Break	32	N/mm (kN/m)	183 ppi	2,944 **3,037**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.20 14.64 **17.42**	
Lo = 2.0" Break	Average Elongation @ Break		%		441.1 544.0 **492.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.6	N		57.969 54.689 **56.329**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	386.8	N		86.965	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	561.3	N		126.18	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

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ROLL # **311339-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

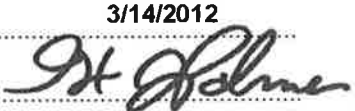
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.55 mm	61 mil
Asperity ASTM D7466: 34/32 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	151 ppi		2,434 2,624 2,529 3,196 2,583	psi
	Average Strength @ Break	30 N/mm (kN/m)	173 ppi		2,890	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			20.98 17.08 19.03	
Lo = 2.0" Break	Average Elongation @ Break	%			445.3 440.7 443.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.5 N			55.973 56.198 56.086	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	399.2 N			89.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	562.8 N			126.53	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature: 

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ROLL # **311340-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.45 mm	57 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	156 ppi	2,434 2,624 2,529 3,196	psi
	Average Strength @ Break	31	N/mm (kN/m)	179 ppi	2,583 2,890	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.98 17.08 19.03	
Lo = 2.0" Break	Average Elongation @ Break		%		445.3 440.7 443.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.5	N		55.973 56.198 56.086	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	399.2	N		89.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	562.8	N		126.53	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

Signature: 

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ROLL # **311341-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.70 mm	67 mil
Asperity ASTM D7466: 33/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi	2,434 2,624 **2,529** 3,196	psi	
	Average Strength @ Break	31 N/mm (kN/m)	179 ppi	2,583 **2,890**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		20.98 17.08 **19.03**		
Lo = 2.0" Break	Average Elongation @ Break	%		445.3 440.7 **443.0**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.5 N		55.973 56.198 **56.086**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	399.2 N			89.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	562.8 N			126.53	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/14/2012**

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ROLL # **311442-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

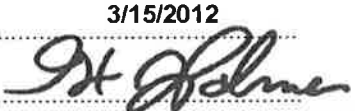
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 33/32 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	157 ppi	2,434 2,624 2,529 3,196	psi
	Average Strength @ Break	31	N/mm (kN/m)	180 ppi	2,583 2,890	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%		20.98 17.08 19.03	
	Average Elongation @ Break		%		445.3 440.7 443.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.5	N		55.973 56.198 56.086	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	399.2	N		89.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	562.8	N		126.53	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

Signature: 

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ROLL # **311443-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.60 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	166 ppi	2,558 2,718 **2,638** 3,214	psi
	Average Strength @ Break	35	N/mm (kN/m)	200 ppi	3,144 **3,179**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.48 15.13 **17.31**	
Lo = 2.0" Break	Average Elongation @ Break		%		455.5 567.8 **511.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.5	N		57.945 54.681 **56.313**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	387.3	N		87.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	598.2	N		134.48	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

Signature.....

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ROLL # **311444-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 33/33 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **167**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	163 ppi	2,558 2,718 **2,638** 3,214	psi
	Average Strength @ Break	34	N/mm (kN/m)	196 ppi	3,144 **3,179**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.48 15.13 **17.31**	
Lo = 2.0" Break	Average Elongation @ Break		%		455.5 567.8 **511.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.5	N		57.945 54.681 **56.313**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	387.3	N		**87.08**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	598.2	N		**134.48**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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Quality Control Department

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ROLL # **311445-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 34/33 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.25	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	163 ppi	2,558 2,718 **2,638** 3,214	psi
	Average Strength @ Break	34	N/mm (kN/m)	196 ppi	3,144 **3,179**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.48 15.13 **17.31**	
Lo = 2.0" Break	Average Elongation @ Break		%		455.5 567.8 **511.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.5	N		57.945 54.681 **56.313**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	387.3	N		**87.08**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	598.2	N		**134.48**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

Signature: H Holmes

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ROLL # **311446-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH				
Measurement ASTM D5994 (Modified)	MIN:	**1.50**	mm	**59**	mil	Thickness.....	**1.5** mm	**60** mil
	MAX:	**1.65**	mm	**65**	mil	Length.....	**153.926** m	**505.0** feet
Asperity ASTM D7466: **37/31** mil TOP / BOTTOM	AVE:	**1.58**	mm	**62**	mil	Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **167**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g		g/10 min		**.25**	
Carbon Black Content ASTM D4218	Range		%		**2.28**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)		**164** ppi	2,558 2,718 **2,638** 3,214	psi
	Average Strength @ Break	**35** N/mm (kN/m)		**198** ppi	3,144 **3,179**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.48 15.13 **17.31**	
Lo = 2.0" Break	Average Elongation @ Break		%		455.5 567.8 **511.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		**-.45**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**250.5** N			57.945 54.681 **56.313**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**387.3** N			**87.08**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**598.2** N			**134.48**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311447-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.44 mm	57 mil
	MAX:	1.60 mm	63 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	167	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.31	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	154 ppi		2,439 2,572 **2,506** 3,093	psi
	Average Strength @ Break	31 N/mm (kN/m)	178 ppi		2,706 **2,900**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			20.64 15.14 **17.89**	
Lo = 2.0" Break	Average Elongation @ Break	%			450.0 483.1 **466.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.2 N			61.540 58.145 **59.843**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	415.2 N			93.335	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	577.9 N			129.92	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**

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ROLL # **311448-12** Lot #: **7120200** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.50	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes 167		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.25	
Carbon Black Content ASTM D4218	Range	%			2.31	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi		2,439 2,572 2,506 3,093	psi
	Average Strength @ Break	31 N/mm (kN/m)	179 ppi		2,706 2,900	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			20.64 15.14 17.89	
Lo = 2.0" Break	Average Elongation @ Break	%			450.0 483.1 466.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.45	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.2 N			61.540 58.145 59.843	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	415.2 N			93.335	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	577.9 N			129.92	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/15/2012**
Signature:
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CoA Date: 10/31/2011

Certificate of Analysis

Shipped To: AGRU AMERICA:RAINS
MILEPOST SH317
RAINS SC 29589
USA

Recipient: PALMER
Fax:

Delivery #: 88357558
PO #: 5847
Weight: 179200 LB
Ship Date: 10/31/2011
Package: BULK
Mode: Hopper Car
Car #: PSPX002559
Seal No: 265824

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8110773

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.29	g/10mi
HLMI Flow Rate	ASTM D1238	22	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	27	pel/g
Production Date		07/01/2011	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4806

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ROLL # **311788-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.56 mm	61 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 37/34 mil TOP / BOTTOM	AVE:	1.60 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.33	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	165 ppi	2,539 2,686 2,614 3,249	psi
	Average Strength @ Break	34	N/mm (kN/m)	195 ppi	2,945 3,097	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.42 14.46 17.44	
Lo = 2.0" Break	Average Elongation @ Break		%		429.1 544.5 486.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	255.5	N		57.351 57.523 57.437	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	426.9	N		95.985	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	600.7	N		135.04	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature:

Quality Control Department

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ROLL # **311789-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 37/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.33	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi	2,539 2,688 **2,614** 3,249	psi	
	Average Strength @ Break	34 N/mm (kN/m)	191 ppi	2,945 **3,097**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		20.42 14.46 **17.44**		
Lo = 2.0" Break	Average Elongation @ Break	%		429.1 544.5 **486.8**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-.44**		
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	255.5 N		57.351 57.523 **57.437**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	426.9 N		**95.985**	lbs	
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	600.7 N		**135.04**	lbs	
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**		

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature: *H Holmes*

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ROLL # **311790-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 37/36 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.33	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)		163 ppi	2,539 2,688 **2,614** 3,249	psi
	Average Strength @ Break	34 N/mm (kN/m)		193 ppi	2,945 **3,097**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.42 14.46 **17.44**	
Lo = 2.0" Break	Average Elongation @ Break		%		429.1 544.5 **486.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	255.5 N			57.351 57.523 **57.437**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	426.9 N			**95.985**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	600.7 N			**135.04**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date:..... **3/18/2012**
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ROLL # **311791-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.60 mm	63 mil
Asperity ASTM D7466: 37/35 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	163 ppi	2,588 2,738 **2,663** 3,060		psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	3,067 **3,064**		psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.07 15.79 **17.43**		
Lo = 2.0" Break	Average Elongation @ Break	%		445.7 551.5 **498.6**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.1 N		60.226 60.316 **60.271**		lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	432.5 N			97.228	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	597.3 N			134.27	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

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ROLL # **311792-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 37/35 mil TOP / BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	167 ppi	2,588 2,738 **2,663** 3,060	psi
	Average Strength @ Break	34	N/mm (kN/m)	192 ppi	3,067 **3,064**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.07 15.79 **17.43**	
Lo = 2.0" Break	Average Elongation @ Break		%		445.7 551.5 **498.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.1	N		60.226 60.316 **60.271**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	432.5	N		97.228	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	597.3	N		134.27	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature: H Holmes

Quality Control Department

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quality certificate

ROLL # **311793-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.45 mm	57 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 37/36 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.28	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi	2,588 2,738 **2,663** 3,060	psi
	Average Strength @ Break	33 N/mm (kN/m)	186 ppi	3,067 **3,064**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.07 15.79 **17.43**	
Lo = 2.0" Break	Average Elongation @ Break	%		445.7 551.5 **498.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.1 N		60.226 60.316 **60.271**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	432.5 N		97.228	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	597.3 N		134.27	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/18/2012**

Signature.....

Quality Control Department

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quality certificate

ROLL # **311794-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.45 mm	57 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness..... 1.5 mm 60 mil
Length..... 153.926 m 505.0 feet
Width..... 7.01 m; 23.0 feet

OIT(Standard) ASTM D3895 minutes 184

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	163 ppi		2,588 2,738 **2,663** 3,060	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi		3,067 **3,064**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.07 15.79 **17.43** 445.7	
Lo = 2.0" Break	Average Elongation @ Break	%			551.5 **498.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**268.1** N			60.226 60.316 **60.271**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**432.5** N			**97.228**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**597.3** N			**134.27**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**
Signature: H. Holmes
Quality Control Department

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ROLL # **311795-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.52** mm	**60** mil
	MAX:	**1.62** mm	**64** mil
Asperity ASTM D7466: **37/33** mil TOP / BOTTOM	AVE:	**1.57** mm	**62** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**184**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range	%			**2.26**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**157** ppi	2,423 2,651 **2,537** 3,181	psi	
	Average Strength @ Break	**33** N/mm (kN/m)	**190** ppi	2,977 **3,079**	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		20.84 15.20 **18.02**		
Lo = 2.0" Break	Average Elongation @ Break	%		448.4 547.1 **497.8**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-.44**		
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**252.4** N		58.031 55.447 **56.739**	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**411.2** N		**92.457**	lbs	
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**591.5** N		**132.98**	lbs	
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**		

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: H Holmes

Quality Control Department

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ROLL # **311796-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.44 mm	57 mil
	MAX:	1.59 mm	63 mil
Asperity ASTM D7466: 37/34 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **184**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.26	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	152 ppi	2,423 2,651 **2,537** 3,181	psi
	Average Strength @ Break	32	N/mm (kN/m)	184 ppi	2,977 **3,079**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.84 15.20 **18.02**	
Lo = 2.0" Break	Average Elongation @ Break		%		448.4 547.1 **497.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	252.4	N		58.031 55.447 **56.739**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	411.2	N		92.457	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.5	N		132.98	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature.....

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ROLL # **312101-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.60 mm	63 mil
Asperity ASTM D7466: 35/33 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.26	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	154 ppi	2,423 2,651 2,537 3,181	psi
	Average Strength @ Break	33	N/mm (kN/m)	187 ppi	2,977 3,079	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.84 15.20 18.02	
Lo = 2.0" Break	Average Elongation @ Break		%		448.4 547.1 497.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	252.4	N		58.031 55.447 56.739	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	411.2	N		92.457	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.5	N		132.98	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**
Signature:
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ROLL # **312102-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 35/33 mil TOP / BOTTOM	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	184	TEST RESULTS

Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.26	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	154 ppi	2,423 2,651 2,537 3,181	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	2,977 3,079	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		20.84 15.20 18.02	
	Average Elongation @ Break	%		448.4 547.1 497.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	252.4 N		58.031 55.447 56.739	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	411.2 N		92.457	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.5 N		132.98	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: H Holmes

Quality Control Department

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ROLL # **312103-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 36/35 mil TOP / BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.27	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi		2,510 2,752 2,631 3,220	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi		2,908 3,064	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.63 14.37 17.00	
Lo = 2.0" Break	Average Elongation @ Break	%			459.6 531.5 495.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.2 N			57.873 57.757 57.815	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	422.6 N			95.001	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	579.1 N			130.19	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: H Holmes

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ROLL # **312104-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.73 mm	68 mil
Asperity ASTM D7466: 37/33 mil TOP / BOTTOM	AVE:	1.62 mm	64 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.27	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	168 ppi	2,510 2,752 **2,631** 3,220	psi
	Average Strength @ Break	34	N/mm (kN/m)	195 ppi	2,908 **3,064**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.63 14.37 **17.00**	
Lo = 2.0" Break	Average Elongation @ Break		%		459.6 531.5 **495.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.2	N		57.873 57.757 **57.815**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	422.6	N		95.001	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	579.1	N		130.19	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

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ROLL # **312105-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.54** mm	**61** mil
	MAX:	**1.70** mm	**67** mil
Asperity ASTM D7466: **37/33** mil TOP / BOTTOM	AVE:	**1.62** mm	**64** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **184**

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		**.29**	
Carbon Black Content ASTM D4218	Range	%		**2.27**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**168** ppi	2,510 2,752 **2,631** 3,220	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**195** ppi	2,908 **3,064**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.63 14.37 **17.00**	
Lo = 2.0" Break	Average Elongation @ Break	%		459.6 531.5 **495.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.2** N		57.873 57.757 **57.815**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**422.6** N		**95.001**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**579.1** N		**130.19**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature.....

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ROLL # **312106-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.60 mm	63 mil
Asperity ASTM D7466: 36/35 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **184**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.27	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi		2,510 2,752 2,631 3,220	psi
	Average Strength @ Break	33 N/mm (kN/m)	186 ppi		2,908 3,064	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.63 14.37 17.00	
Lo = 2.0" Break	Average Elongation @ Break	%			459.6 531.5 495.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.2 N			57.873 57.757 57.815	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	422.6 N			95.001	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	579.1 N			130.19	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**
Signature
Quality Control Department

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ROLL # **312107-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 37/35 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi		2,406 2,565 2,486 3,179	psi
	Average Strength @ Break	32 N/mm (kN/m)	181 ppi		2,647 2,913	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.78 14.79 17.29	
Lo = 2.0" Break	Average Elongation @ Break	%			470.9 517.0 494.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.4 N			60.474 58.430 59.452	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	433.2 N			97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.3 N			136.29	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**
Signature:
Quality Control Department

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ROLL # **312108-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.51 mm	59 mil
	MAX:	1.61 mm	63 mil
Asperity ASTM D7466: 36/35 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	153 ppi		2,406 2,565 **2,486** 3,179	psi
	Average Strength @ Break	31 N/mm (kN/m)	179 ppi		2,647 **2,913**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			19.78 14.79 **17.29**	
	Average Elongation @ Break	%			470.9 517.0 **494.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**264.4** N			60.474 58.430 **59.452**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**433.2** N			**97.389**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**606.3** N			**136.29**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: *M Holmes*

Quality Control Department

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ROLL # **312109-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 35/36 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.29	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	152 ppi	2,406 2,565 **2,486** 3,179	psi
	Average Strength @ Break	31	N/mm (kN/m)	178 ppi	2,647 **2,913**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.78 14.79 **17.29**	
Lo = 2.0" Break	Average Elongation @ Break		%		470.9 517.0 **494.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.4	N		60.474 58.430 **59.452**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	433.2	N		**97.389**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.3	N		**136.29**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: *H Holmes*

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ROLL # **312110-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

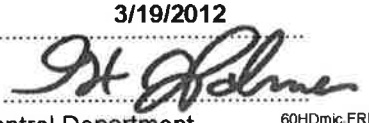
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.59 mm	63 mil
Asperity ASTM D7466: 37/36 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.29	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	151 ppi	2,406 2,565 2,486 3,179	psi
	Average Strength @ Break	31 N/mm (kN/m)	177 ppi	2,647 2,913	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.78 14.79 17.29 470.9	
Lo = 2.0" Break	Average Elongation @ Break	%		517.0 494.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	264.4 N		60.474 58.430 59.452	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	433.2 N		97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	606.3 N		136.29	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: 

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ROLL # **312111-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 38/36 mil TOP / BOTTOM	AVE:	1.53	mm	60	mil	OIT(Standard) ASTM D3895 minutes 184		

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.30	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,520 2,742 2,631 3,190	psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi	3,182 3,186	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.68 15.22 16.95	
Lo = 2.0" Break	Average Elongation @ Break	%		473.5 568.6 521.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	260.4 N		58.531 58.565 58.548	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	421.7 N		94.814	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.0 N		132.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 3/19/2012

Signature.....

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ROLL # **312112-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.43 mm	56 mil
	MAX:	1.65 mm	65 mil
Asperity ASTM D7466: 38/34 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.30	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi		2,520 2,742 2,631	psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi		3,190 3,182 3,186	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.68 15.22 16.95	
Lo = 2.0" Break	Average Elongation @ Break	%			473.5 568.6 521.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	260.4 N			58,531 58,565 58.548	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	421.7 N			94.814	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.0 N			132.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**
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ROLL # **312113-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 35/32 mil TOP / BOTTOM	AVE:	1.60 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.30	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	166 ppi	2,520 2,742 **2,631** 3,190	psi
	Average Strength @ Break	35	N/mm (kN/m)	201 ppi	3,182 **3,186**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.68 15.22 **16.95**	
Lo = 2.0" Break	Average Elongation @ Break		%		473.5 568.6 **521.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	260.4	N		58.531 58.565 **58.548**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	421.7	N		94.814	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	591.0	N		132.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

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ROLL # **312114-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.47** mm	**58** mil
	MAX:	**1.63** mm	**64** mil
Asperity ASTM D7466: **37/34** mil TOP / BOTTOM	AVE:	**1.54** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**184**	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.944**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min		**.29**	
Carbon Black Content ASTM D4218	Range	%		**2.30**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**160** ppi	2,520 2,742 **2,631** 3,190	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**193** ppi	3,182 **3,186**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.68 15.22 **16.95**	
Lo = 2.0" Break	Average Elongation @ Break	%		473.6 568.6 **521.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**260.4** N		58.531 58.565 **58.548**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**421.7** N		**94.814**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**591.0** N		**132.85**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

Signature: *H Holmes*

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ROLL # **312115-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 36/36 mil TOP / BOTTOM	AVE:	1.53 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.32	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	146 ppi	2,415 2,440 **2,428** 3,067	psi
	Average Strength @ Break	31 N/mm (kN/m)	177 ppi	2,812 **2,940**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.68 18.41 **19.05**	
Lo = 2.0" Break	Average Elongation @ Break	%		491.8 462.8 **477.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.0 N		56.927 55.016 **55.972**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	417.1 N		93.771	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	594.8 N		133.72	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/19/2012**

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ROLL # **312216-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 33/33 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.32	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26	N/mm (kN/m)	149 ppi	2,415 2,440 2,428	psi
	Average Strength @ Break	32	N/mm (kN/m)	181 ppi	3,067 2,812 2,940	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.68 18.41 19.05	
Lo = 2.0" Break	Average Elongation @ Break		%		491.8 462.8 477.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.0	N		56.927 55.016 55.972	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	417.1	N		93.771	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	594.8	N		133.72	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312217-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 37/34 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.32	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	148 ppi		2,415 2,440 **2,428** 3,067	psi
	Average Strength @ Break	31 N/mm (kN/m)	179 ppi		2,812 **2,940**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.68 18.41 **19.05** 491.8	
Lo = 2.0" Break	Average Elongation @ Break	%			462.8 **477.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	249.0 N			56.927 55.016 **55.972**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	417.1 N			93.771	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	594.8 N			133.72	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312218-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.49** mm	**59** mil
	MAX:	**1.61** mm	**63** mil
Asperity ASTM D7466: **36/33** mil TOP / BOTTOM	AVE:	**1.55** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**184**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range	%			**2.32**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm (kN/m)	**148** ppi		2,415 2,440 **2,428** 3,067	psi
	Average Strength @ Break	**31** N/mm (kN/m)	**179** ppi		2,812 **2,940**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.68 18.41 **19.05**	
Lo = 2.0" Break	Average Elongation @ Break	%			491.8 462.8 **477.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**249.0** N			56.927 55.016 **55.972**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**417.1** N			**93.771**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**594.8** N			**133.72**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

Signature:

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ROLL # **312219-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.45 mm	57 mil
	MAX:	1.64 mm	65 mil
Asperity ASTM D7466: 34/34 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **184**

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.36	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,516 2,702 **2,609** 3,091	psi
	Average Strength @ Break	33 N/mm (kN/m)	189 ppi	3,104 **3,098**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.72 14.89 **16.31**	
Lo = 2.0" Break	Average Elongation @ Break	%		457.4 567.3 **512.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	239.2 N		54.974 52.568 **53.771**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	435.1 N		97.812	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	583.5 N		131.18	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312220-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.36	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160 ppi	2,516 2,702 2,609 3,091	psi
	Average Strength @ Break	33	N/mm (kN/m)	190 ppi	3,104 3,098	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		17.72 14.89 16.31	
Lo = 2.0" Break	Average Elongation @ Break		%		457.4 567.3 512.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	239.2	N		54.974 52.568 53.771	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	435.1	N		97.812	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	583.5	N		131.18	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312221-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 37/33 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **184**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.36	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi	2,516 2,702 **2,609** 3,091		psi
	Average Strength @ Break	34 N/mm (kN/m)	193 ppi	3,104 **3,098**		psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.72 14.89 **16.31**		
Lo = 2.0" Break	Average Elongation @ Break	%		457.4 567.3 **512.3**		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	239.2 N		54.974 52.568 **53.771**		lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	435.1 N			97.812	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	583.5 N			131.18	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312222-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

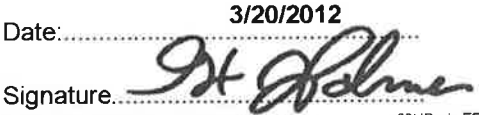
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.51** mm	**59** mil
	MAX:	**1.70** mm	**67** mil
Asperity ASTM D7466: **37/32** mil TOP / BOTTOM	AVE:	**1.61** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**184**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range	%			**2.36**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**165** ppi		2,516 2,702 **2,609** 3,091	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**196** ppi		3,104 **3,098**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.72 14.89 **16.31**	
Lo = 2.0" Break	Average Elongation @ Break	%			457.4 567.3 **512.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**239.2** N			54.974 52.568 **53.771**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**435.1** N			**97.812**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**583.5** N			**131.18**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

Signature: 

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ROLL # **312223-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.62 mm	64 mil
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.56 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	157 ppi		2,493 2,634 2,564 3,232	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi		2,803 3,018	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.82 16.11 17.47	
Lo = 2.0" Break	Average Elongation @ Break	%			491.5 495.7 493.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	241.6 N			56.284 52.327 54.305	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	419.0 N			94.191	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	614.5 N			138.14	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312224-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.52 mm	60 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 37/32 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi	2,493 2,634 2,564 3,232	2,564	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	2,803	3,018	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.82 16.11 17.47 491.5		
	Average Elongation @ Break	%		495.7	493.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	241.6 N		56.284 52.327	54.305	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	419.0 N			94.191	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	614.5 N			138.14	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312225-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.70 mm	67 mil
Asperity ASTM D7466: 35/32 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,493 2,634 2,564 3,232	psi	
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	2,803 3,018	psi	
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.82 16.11 17.47		
Lo = 2.0" Break	Average Elongation @ Break	%		491.5 495.7 493.6		
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44		
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	241.6 N		56.284 52.327 54.305	lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	419.0 N		94.191	lbs	
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	614.5 N		138.14	lbs	
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS		

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 3/20/2012
Signature:
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ROLL # **312226-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.944	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158 ppi	2,493 2,634 **2,564** 3,232	psi
	Average Strength @ Break	33	N/mm (kN/m)	187 ppi	2,803 **3,018**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.82 16.11 **17.47**	
Lo = 2.0" Break	Average Elongation @ Break		%		491.5 495.7 **493.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	241.6	N		56.284 52.327 **54.305**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	419.0	N		**94.191**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	614.5	N		**138.14**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

Signature: H Holmes

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ROLL # **312227-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH	Thickness.....	1.5 mm	60 mil
	MIN:	1.49 mm	59 mil	Length.....	153.926 m	505.0 feet
	MAX:	1.69 mm	67 mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.55 mm	61 mil	OIT(Standard) ASTM D3895 minutes	184	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.945
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29
Carbon Black Content ASTM D4218	Range	%		2.26
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi	2,492 2,608 **2,550** 3,123 2,976 psi
	Average Strength @ Break	33 N/mm (kN/m)	186 ppi	**3,050** psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.80 14.51 **16.66** 443.8 569.8
	Average Elongation @ Break	%		**506.8**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**250.3** N		57,399 55,160 **56.280** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**405.0** N		**91.063** lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**605.1** N		**136.04** lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**PASS**

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

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ROLL # **312228-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.49** mm	**59** mil
	MAX:	**1.63** mm	**64** mil
Asperity ASTM D7466: **37/35** mil TOP / BOTTOM	AVE:	**1.56** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**184**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range	%			**2.26**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**157** ppi		2,492 2,608 **2,550** 3,123 2,976	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**187** ppi		**3,050**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.80 14.51 **16.66**	
Lo = 2.0" Break	Average Elongation @ Break	%			443.8 569.8 **506.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**250.3** N			57.399 55.160 **56.280**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**405.0** N			**91.063**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**605.1** N			**136.04**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/20/2012**

Signature: H Holmes

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ROLL # **312229-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 36/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 184	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.26	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi	2,492 2,608 **2,550** 3,123	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi	2,976 **3,050**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.80 14.51 **16.66**	
Lo = 2.0" Break	Average Elongation @ Break	%		443.8 569.8 **506.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.3 N		57.399 55.160 **56.280**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	405.0 N		91.063	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.1 N		136.04	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

Signature: 

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ROLL # **312330-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.42 mm	56 mil
	MAX:	1.60 mm	63 mil
Asperity ASTM D7466: 36/33 mil TOP / BOTTOM	AVE:	1.54 mm	61 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 184	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.26	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	155 ppi	2,492 2,608 2,550 3,123	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi	2,976 3,050	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.80 14.51 16.66	
Lo = 2.0" Break	Average Elongation @ Break	%		443.8 569.8 506.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	250.3 N		57.399 55.160 56.280	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	405.0 N		91.063	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.1 N		136.04	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

Signature: H Holmes

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ROLL # **312331-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.58 mm	62 mil
Asperity ASTM D7466: 36/34 mil TOP / BOTTOM	AVE:	1.53 mm	60 mil

Thickness.....	1.5 mm		60 mil
Length.....	153.926 m		505.0 feet
Width.....	7.01 m;		23.0 feet
OIT(Standard) ASTM D3895	minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156	ppi	2,493 2,675 **2,584** 3,274	psi
	Average Strength @ Break	32 N/mm (kN/m)	182	ppi	2,785 **3,030**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.49 14.13 **16.31**	
	Average Elongation @ Break	%			459.8 502.3 **481.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**258.9** N			57.648 58.768 **58.208**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**411.0** N			**92.39**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**597.7** N			**134.38**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

Signature: *M Holmes*

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ROLL # **312332-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 35/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160 ppi	2,493 2,675 **2,584** 3,274	psi
	Average Strength @ Break	33	N/mm (kN/m)	187 ppi	2,785 **3,030**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.49 14.13 **16.31**	
Lo = 2.0" Break	Average Elongation @ Break		%		459.8 502.3 **481.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	258.9	N		57.648 58.768 **58.208**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	411.0	N		92.39	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	597.7	N		134.38	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

Signature: H Holmes

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ROLL # **312333-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.50	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 34/33 mil TOP / BOTTOM	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	184	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.38	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi		2,493 2,675 **2,584** 3,274	psi
	Average Strength @ Break	32 N/mm (kN/m)	185 ppi		2,785 **3,030**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.49 14.13 **16.31**	
Lo = 2.0" Break	Average Elongation @ Break	%			459.8 502.3 **481.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.44	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	258.9 N			57.648 58.768 **58.208**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	411.0 N			92.39	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	597.7 N			134.38	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

Signature: H Holmes

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ROLL # **312334-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.44** mm	**57** mil
	MAX:	**1.64** mm	**65** mil
Asperity ASTM D7466: **36/32** mil TOP / BOTTOM	AVE:	**1.55** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **184**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range	%			**2.38**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**158** ppi		2,493 2,675 **2,584** 3,274	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**185** ppi		2,785 **3,030**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.49 14.13 **16.31**	
Lo = 2.0" Break	Average Elongation @ Break	%			459.8 502.3 **481.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.44**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**258.9** N			57.648 58.768 **58.208**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**411.0** N			**92.39**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**597.7** N			**134.38**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

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ROLL # **312335-12** Lot #: **8110773** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 36/32 mil TOP / BOTTOM	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	184	

				TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc		.947
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.29
Carbon Black Content ASTM D4218	Range	%		2.32
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi	2,553 2,686 2,620 psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi	3,180 2,994 3,087 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		18.92 15.08 17.00
	Average Elongation @ Break	%		466.9 542.9 504.9
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-.44
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	247.6 N		57.194 54.125 55.660 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	431.6 N		97.029 lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	586.1 N		131.76 lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **3/21/2012**

Signature.....

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Chevron Phillips Chemical Company LP

CoA Date: 07/30/2011

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88305989
PO #: 5844
Weight: 185800 LB
Ship Date: 07/30/2011
Package: BULK
Mode: Hopper Car
Car #: PSPX002613
Seal No: 270868

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8210664

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.28	g/10mi
HLMI Flow Rate	ASTM D1238	22	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	26	pel/g
Production Date		05/29/2011	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4806

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ROLL # **443682-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	190	TEST RESULTS

Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.48	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi	2,593 2,784 **2,689**	psi
	Average Strength @ Break	35 N/mm (kN/m)	200 ppi	3,336 3,142 **3,239**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		19.55 15.15 **17.35**	
	Average Elongation @ Break	%		489.1 569.7 **529.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.8 N		60.625 60.257 **60.441**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	445.8 N		100.22	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	669.3 N		150.48	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 10-30-11
Signature: H Holmes
Quality Control Department

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ROLL # **443683-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 25/34 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	190	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.48	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi	2,593 2,784 2,689	psi
	Average Strength @ Break	35 N/mm (kN/m)	200 ppi	3,336 3,142 3,239	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.55 15.15 17.35	
Lo = 2.0" Break	Average Elongation @ Break	%		489.1 569.7 529.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.8 N		60.625 60.257 60.441	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	445.8 N		100.22	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	669.3 N		150.48	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**
Signature:
Quality Control Department

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ROLL # **443784-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.70 mm	67 mil
Asperity ASTM D7466: 25/32 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	190	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.28	
Carbon Black Content ASTM D4218	Range		%		2.47	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	166 ppi	2,593 2,784 2,689	psi
	Average Strength @ Break	35	N/mm (kN/m)	200 ppi	3,336 3,142 3,239	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		19.55 15.15 17.35	
Lo = 2.0" Break	Average Elongation @ Break		%		489.1 569.7 529.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.8	N		60.625 60.257 60.441	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	445.8	N		100.22	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	669.3	N		150.48	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: H Holmes

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ROLL # **443785-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.69 mm	67 mil
Asperity ASTM D7466: 25/35 mil TOP / BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 190	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.47	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi	2,593 2,784 2,689	psi
	Average Strength @ Break	35 N/mm (kN/m)	201 ppi	3,336 3,142 3,239	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.55 15.15 17.35	
Lo = 2.0" Break	Average Elongation @ Break	%		489.1 569.7 529.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.8 N		60.625 60.257 60.441	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	445.8 N		100.22	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	669.3 N		150.48	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

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ROLL # **443786-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 26/34 mil TOP / BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes 190		

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.28	
Carbon Black Content ASTM D4218	Range		%		2.48	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	168 ppi	2,682 2,802 2,742	psi
	Average Strength @ Break	38	N/mm (kN/m)	219 ppi	3,848 3,295 3,572	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.63 14.99 16.81	
Lo = 2.0" Break	Average Elongation @ Break		%		492.2 591.9 542.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	272.9	N		61.973 60.739 61.356	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	471.9	N		106.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	672.4	N		151.16	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

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ROLL # **443787-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.46	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.01 m;	23.0 feet
Asperity ASTM D7466: 25/36 mil TOP / BOTTOM	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes 190		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.28	
Carbon Black Content ASTM D4218	Range	%			2.48	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi		2,682 2,802 2,742	psi
	Average Strength @ Break	38 N/mm (kN/m)	218 ppi		3,848 3,295 3,572	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.63 14.99 16.81	
Lo = 2.0" Break	Average Elongation @ Break	%			492.2 591.9 542.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	272.9 N			61.973 60.739 61.356	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	471.9 N			106.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	672.4 N			151.16	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

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ROLL # **443788-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.68 mm	66 mil
Asperity ASTM D7466: 28/38 mil TOP / BOTTOM	AVE:	1.57 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 190	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.48	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	169 ppi	2,682 2,802 **2,742**	psi
	Average Strength @ Break	39 N/mm (kN/m)	221 ppi	3,848 3,295 **3,572**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.63 14.99 **16.81**	
Lo = 2.0" Break	Average Elongation @ Break	%		492.2 591.9 **542.1**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	272.9 N		61.973 60.739 61.356	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	471.9 N		106.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	672.4 N		151.16	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: H Holmes

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ROLL # **443789-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

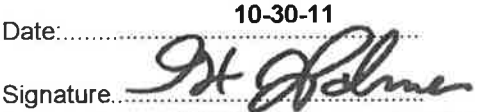
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.70 mm	67 mil
Asperity ASTM D7466: 25/37 mil TOP / BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	190	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.28	
Carbon Black Content ASTM D4218	Range		%		2.48	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	172 ppi	2,682 2,802 2,742	psi
	Average Strength @ Break	39	N/mm (kN/m)	224 ppi	3,848 3,295 3,572	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		18.63 14.99 16.81	
Lo = 2.0" Break	Average Elongation @ Break		%		492.2 591.9 542.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	272.9	N		61,973 60,739 61.356	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	471.9	N		106.08	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	672.4	N		151.16	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: 

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ROLL # **443790-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.67 mm	66 mil
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.60 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	190	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.29	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	32 N/mm (kN/m)	183 ppi	2,797 3,008 2,903	psi
	Average Strength @ Break	39 N/mm (kN/m)	221 ppi	3,742 3,282 3,512	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		20.44 14.75 17.60	
Lo = 2.0" Break	Average Elongation @ Break	%		482.2 531.8 507.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.5 N		61.032 58.811 59.921	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	437.5 N		98.370	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.9 N		142.96	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**
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ROLL # **443791-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.55	mm	61	mil
	MAX:	1.67	mm	66	mil
Asperity ASTM D7466: 23/34 mil TOP / BOTTOM	AVE:	1.63	mm	64	mil

Thickness.....	1.5 mm	60 mil	
Length.....	153.926 m	505.0	feet
Width.....	7.01 m;	23.0	feet
OIT(Standard) ASTM D3895 minutes	190		

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.28	
Carbon Black Content ASTM D4218	Range		%		2.29	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	33	N/mm (kN/m)	186 ppi	2,797 3,008 2,903	psi
	Average Strength @ Break	39	N/mm (kN/m)	225 ppi	3,742 3,282 3,512	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.44 14.75 17.60	
Lo = 2.0" Break	Average Elongation @ Break		%		482.2 531.8 507.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.5	N		61.032 58.811 59.921	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	437.5	N		98.370	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.9	N		142.96	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**
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ROLL # **443792-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.57 mm	62 mil
	MAX:	1.82 mm	72 mil
Asperity ASTM D7466: 22/30 mil TOP / BOTTOM	AVE:	1.67 mm	66 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	190	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g		g/10 min		.28	
Carbon Black Content ASTM D4218	Range		%		2.29	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	33	N/mm (kN/m)	191 ppi	2,797 3,008 2,903	psi
	Average Strength @ Break	40	N/mm (kN/m)	231 ppi	3,742 3,282 3,512	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.44 14.75 17.60	
Lo = 2.0" Break	Average Elongation @ Break		%		482.2 531.8 507.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.5	N		61.032 58.811 59.921	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	437.5	N		98.370	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.9	N		142.96	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**
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ROLL # **443793-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH				
Measurement ASTM D5994 (Modified)	MIN:	1.56	mm	61	mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.76	mm	69	mil	Length.....	153.926 m	505.0 feet
Asperity ASTM D7466: 24/30 mil TOP / BOTTOM	AVE:	1.65	mm	65	mil	Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **190**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.948	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g		g/10 min		.28	
Carbon Black Content ASTM D4218	Range		%		2.29	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	33	N/mm (kN/m)	189 ppi	2,797 3,008 2,903	psi
	Average Strength @ Break	40	N/mm (kN/m)	228 ppi	3,742 3,282 3,512	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		20.44 14.75 17.60	
Lo = 2.0" Break	Average Elongation @ Break		%		482.2 531.8 507.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	266.5	N		61.032 58.811 59.921	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	437.5	N		98.370	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	635.9	N		142.96	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: H Holmes

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ROLL # **443796-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

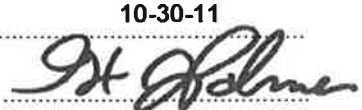
Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.38 mm	54 mil
	MAX:	1.64 mm	65 mil
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895	minutes 190	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.42	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi	2,550 2,800 **2,675**	psi
	Average Strength @ Break	35 N/mm (kN/m)	197 ppi	3,371 3,224 **3,298**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.76 12.99 **15.38**	
Lo = 2.0" Break	Average Elongation @ Break	%		468.4 589.3 **528.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.9 N		61.226 59.667 **60.447**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	410.4 N		92.277	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.3 N		136.07	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: 

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ROLL # **443797-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.42 mm	56 mil
	MAX:	1.64 mm	65 mil
Asperity ASTM D7466: 26/35 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	190	

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min		.28	
Carbon Black Content ASTM D4218	Range	%		2.42	
Carbon Black Dispersion ASTM D5596	Category			10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi	2,550 2,800 2,675	psi
	Average Strength @ Break	35 N/mm (kN/m)	197 ppi	3,371 3,224 3,298	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.76 12.99 15.38	
Lo = 2.0" Break	Average Elongation @ Break	%		468.4 589.3 528.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	268.9 N		61.226 59.667 60.447	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	410.4 N		92.277	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	605.3 N		136.07	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: **10-30-11**

Signature: 

Quality Control Department

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agru america quality control dept

quality certificate

ROLL # **444101-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.43** mm	**56** mil
	MAX:	**1.65** mm	**65** mil
Asperity ASTM D7466: **25/35** mil TOP / BOTTOM	AVE:	**1.54** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**190**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.28**	
Carbon Black Content ASTM D4218	Range	%			**2.30**	
Carbon Black Dispersion ASTM D5596	Category				**10 in Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**165** ppi		2,643 2,788 **2,716**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**201** ppi		3,383 3,240 **3,312**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.28 14.77 **17.03**	
Lo = 2.0" Break	Average Elongation @ Break	%			487.8 588.7 **538.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.39**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**259.4** N			59.289 57.356 **58.323**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**456.9** N			**102.71**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**630.1** N			**141.65**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**PASS**	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date:..... **10-31-11**
Signature.....
Quality Control Department

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quality certificate

ROLL # **444102-11** Lot #: **8210664** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.39 mm	55 mil
	MAX:	1.66 mm	65 mil
Asperity ASTM D7466: 26/34 mil TOP / BOTTOM	AVE:	1.52 mm	60 mil

Thickness..... 1.5 mm 60 mil
Length..... 153.926 m 505.0 feet
Width..... 7.01 m; 23.0 feet

OIT(Standard) ASTM D3895 minutes 190

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.28	
Carbon Black Content ASTM D4218	Range	%			2.30	
Carbon Black Dispersion ASTM D5596	Category				10 in Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	163 ppi	2,643 2,788	2,716	psi
	Average Strength @ Break	35 N/mm (kN/m)	198 ppi	3,383 3,240	3,312	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		19.28 14.77	17.03	
Lo = 2.0" Break	Average Elongation @ Break	%		487.8 588.7	538.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.39	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	259.4 N		59.289 57.356	58.323	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	456.9 N			102.71	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	630.1 N			141.65	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer: **Chenango Contracting, Inc.**
PO: **2276 Honeywell Sediment Consolidation**
Destination **Syracuse, NY**

Date: 10-31-11
Signature:
Quality Control Department

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Sacrificial

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 8 ***Manufacturer:*** Agru America ***Product Type:*** Microspike HD 60-mil Sacrificial

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
Accepted Rolls												
7/12/2012	7120718-424797-12	23	505	DWH					7/11/2012	7/11/2012	P	DWH
7/12/2012	7120718-425101-12	23	505	DWH					7/11/2012	7/11/2012	P	DWH
7/12/2012	7120718-425102-12	23	505	DWH					7/11/2012	7/11/2012	P	DWH
7/12/2012	7120718-425103-12	23	505	DWH					7/11/2012	7/11/2012	P	DWH

Average Roll Width(ft.): 23 ***Average Roll Length(ft.): 505***

Total Number of Rolls: 4 ***Cumulative Area(sq.ft.): 46460***

Total Number of Conformance Tests: 0

Comments:

cust: Chenango Contracting Inc

PO#: 2276 Honeywell Sediment

Dest: Syracuse, NY

doc 17645

138 rolls 60 HD micro (505)

4 rolls 60 HD micro (505) (added 6-25-12)

English Dimensions

roll #	wid	len	area	check weld rod qty (if ordered)	wgt	resin lot #
424797 .12	23	505	11,615.0	60HD micro add 139	4039	7120718
425101 .12	23	505	11,615.0	60HD micro add 140	4035	7120718
425102 .12	23	505	11,615.0	60HD micro add 141	4036	7120718
425103 .12	23	505	11,615.0	60HD micro add 142	4037	7120718

delivered 28 June 2012 See RFI No. 25

plus roll Nos. 312330, 312331, 312332, 312333, 312334, 312335 — see original roll list PO# 2276

CoA Date: 05/30/2012

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

Delivery #: 88466938
PO #: 6424
Weight: 193000 LB
Ship Date: 05/30/2012
Package: BULK
Mode: Hopper Car
Car #: PSPX001196
Seal No: 286851

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 7120718

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.24	g/10mi
HLMI Flow Rate	ASTM D1238	21	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	29	pel/g
Production Date		05/20/2012	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem). **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4806

Chevron Phillips Chemical Company LP

Lili Cui, Ph.D., Geomembrane Technical Service & Applications Development
Room 154 PTC ■ Bartlesville, OK 74004■
918-661-1897 ■ cuil@cpchem.com ■ Fax: 918-662-2220 ■ www.cpchem.com

June 8, 2012

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

This letter is to report the final results of oven-aging and UV-aging tests (according to GRI-GM13 and GRI-GM17) on Agru America sheet samples that you provided to us in 2011. These tests were performed by CPChem's Materials Evaluation Laboratory in Bartlesville, OK. The tests were completed April 2012.

The GRI-GM13 (HDPE) and GRI-GM17 (LLDPE) durability tests were done according to the following procedures.

Test	Exposure	Method
HP-OIT	150 °C, 500 psi oxygen	D5885
Oven Aging	90 days, 85 °C	D5721
UV Aging	1600 UV hrs (Conditions were 20 hours UVA-340 at 75 °C followed by 4 hrs dark with condensation at 60 °C. Irradiance was 0.72 W/m^2 at 340 nm.)	D7238

Oven-Aging Results

Sample	Initial HP-OIT (min)	HP-OIT Value after Oven Aging (min)	% HP-OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE Roll # 346550-11 from Marlex® 7104 Polyethylene Lot # CBC810430	659	572	**87**	60
60 mil HDPE Roll # 447108-11 from Marlex® K307 Polyethylene Lot # 71-1-1104	1136	994	**88**	80

UV-Aging Results

Sample	Initial HP-OIT (min)	HP-OIT Value after UV Aging (min)	% HP-OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE Roll # 346550-11 from Marlex® 7104 Polyethylene Lot # CBC810430	659	449	**68**	35
60 mil HDPE Roll # 447108-11 from Marlex® K307 Polyethylene Lot # 71-1-1104	1136	924	**81**	50

According to these test results, the durability requirements are met.

If you have any questions, please call me at 918-661-1897.

Sincerely,

Lili Cui

Lili Cui, Ph.D.
Geomembrane Technical Service & Applications Development

agru america quality control dept

quality certificate

ROLL # **424797-12** Lot #: **7120718** **Liner Type: Microspike™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.53 mm	60 mil
	MAX:	1.76 mm	69 mil
Asperity ASTM D7466: 26/33 mil TOP / BOTTOM	AVE:	1.64 mm	65 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	175	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.39	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	166 ppi		2,572	psi
	Average Strength @ Break	38 N/mm (kN/m)	217 ppi		3,362	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.11	
Lo = 2.0" Break	Average Elongation @ Break	%			531.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.61	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.2 N			57.825	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	440.3 N			98.995	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	637.8 N			143.39	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Chenango Contracting Inc**
PO: **2276 Honeywell Sediment**
Destination **Syracuse, NY**

Date: **6/17/2012**

Signature.....

Quality Control Department

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ROLL # **425101-12** Lot #: **7120718** **Liner Type: Microspike™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.52** mm	**60** mil
	MAX:	**1.73** mm	**68** mil
Asperity ASTM D7466: **26/32** mil TOP / BOTTOM	AVE:	**1.62** mm	**64** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**153.926** m	**505.0** feet
Width.....	**7.01** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**175**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.39**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**164** ppi		**2,572**	psi
	Average Strength @ Break	**38** N/mm (kN/m)	**214** ppi		**3,362**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.11**	
	Average Elongation @ Break	%			**531.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.61**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.2** N			**57.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**440.3** N			**98.995**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**637.8** N			**143.39**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Chenango Contracting Inc**
PO: **2276 Honeywell Sediment**
Destination **Syracuse, NY**

Date: **6/18/2012**
Signature.....
Quality Control Department

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ROLL # **425102-12** Lot #: **7120718** **Liner Type: Microspike™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.57 mm	62 mil
	MAX:	1.76 mm	69 mil
Asperity ASTM D7466: 26/26 mil TOP / BOTTOM	AVE:	1.65 mm	65 mil

Thickness.....	1.5 mm	60 mil
Length.....	153.926 m	505.0 feet
Width.....	7.01 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **175**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.945	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.39	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi		2,572	psi
	Average Strength @ Break	38 N/mm (kN/m)	218 ppi		3,362	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.11	
	Average Elongation @ Break	%			531.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-.61	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	257.2 N			57.825	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	440.3 N			98.995	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	637.8 N			143.39	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Chenango Contracting Inc**
PO: **2276 Honeywell Sediment**
Destination **Syracuse, NY**

Date: **6/18/2012**

Signature.....

Quality Control Department

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ROLL # **425103-12** Lot #: **7120718** **Liner Type: Microspike™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.55** mm	**61** mil
	MAX:	**1.83** mm	**72** mil
Asperity ASTM D7466: **26/34** mil TOP / BOTTOM	AVE:	**1.67** mm	**66** mil

Thickness..... **1.5 mm** **60 mil**
Length..... **153.926** m **505.0** feet
Width..... **7.01** m; **23.0** feet

OIT(Standard) ASTM D3895 minutes **175**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.945**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.39**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**169** ppi		**2,572**	psi
	Average Strength @ Break	**39** N/mm (kN/m)	**221** ppi		**3,362**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**17.11**	
Lo = 2.0" Break	Average Elongation @ Break	%			**531.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-.61**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**257.2** N			**57.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Average Peak Load	**440.3** N			**98.995**	lbs
Puncture Resistance ASTM D4833 (Modified)	Average Peak Load	**637.8** N			**143.39**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Chenango Contracting Inc**
PO: **2276 Honeywell Sediment**
Destination **Syracuse, NY**

Date: **6/18/2012**
Signature.....
Quality Control Department

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Geotextile

Geosyntec
consultants

Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 ***Manufacturer:*** SKAPS ***Product Type:*** GE 240-15

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
Accepted Rolls												
4/23/2012	22388-001	15	300	DWH	1/2/2012	GT-13	P	DJB	4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-002	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-003	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-004	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-005	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-006	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-007	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-008	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-009	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-010	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-011	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-012	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-013	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-014	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-015	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-016	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-017	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-018	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-019	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-020	15	300	DWH	1/2/2012	GT-14	P	DJB	4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-021	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-022	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-023	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-024	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-025	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-026	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-027	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-028	15	300	DWH					4/27/2012	4/27/2012	P	DWH

Geosyntec
consultants

Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 ***Manufacturer:*** SKAPS ***Product Type:*** GE 240-15

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
4/23/2012	22388-029	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-030	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-031	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-032	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-033	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-034	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-035	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-036	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-037	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-038	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-039	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-040	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-041	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-042	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-043	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-044	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-045	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-046	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-047	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-048	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-049	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-050	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-051	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-052	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-053	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-054	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-055	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-056	15	300	DWH	1/2/2012	GT-15	P	DJB	4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-057	15	300	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 *Manufacturer:* SKAPS *Product Type:* GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft.)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/23/2012	22388-058	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-059	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-060	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-061	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-062	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-063	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-064	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-065	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-066	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-067	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-068	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-069	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-070	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-071	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/23/2012	22388-072	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-073	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-074	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-075	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-076	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-077	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-078	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-079	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-080	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-081	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-082	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-083	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-084	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-085	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-086	15	300	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 *Manufacturer:* SKAPS *Product Type:* GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft.)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/24/2012	22388-087	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-088	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-089	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-090	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-091	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-092	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-093	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-094	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-095	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-096	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-097	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-098	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-099	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/24/2012	22388-100	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-101	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-102	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-103	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-104	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-105	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-106	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-107	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-108	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-109	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-110	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-111	15	300	DWH	1/2/2012	GT-16	P	DB	4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-112	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-113	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-114	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-115	15	300	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 *Manufacturer:* SKAPS *Product Type:* GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft.)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/25/2012	22388-116	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-117	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-118	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-119	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-120	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-121	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-122	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-123	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-124	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-125	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-126	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-127	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-128	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-129	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-130	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-131	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-132	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-133	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-134	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-135	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-136	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-137	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-138	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-139	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-140	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-141	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-142	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-143	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-144	15	300	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 **Manufacturer:** SKAPS **Product Type:** GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	Batch-Roll	Width (ft.)	Length (ft.)	QA ID	Date	Samp No	Result	QAID	Date Rec	Date Ckk	Result	QAID
4/25/2012	22388-145	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-146	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-147	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-148	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-149	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-150	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-151	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-152	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-153	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-154	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-155	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-156	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-157	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-158	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-159	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-160	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-161	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-162	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-163	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-164	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-165	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-166	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-167	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-168	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-169	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-170	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-171	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-172	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-173	15	300	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 *Manufacturer:* SKAPS *Product Type:* GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft,)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/25/2012	22388-174	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-175	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-176	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-177	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-178	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-179	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-180	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-181	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-182	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-183	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-184	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-185	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-186	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-187	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-188	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-189	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-190	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-191	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-192	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-193	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-194	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-195	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-196	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-197	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-198	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-199	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/25/2012	22388-200	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-201	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-202	15	300	DWH					4/27/2012	4/27/2012	P	DWH

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 *Manufacturer:* SKAPS *Product Type:* GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft.)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/26/2012	22388-203	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-204	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-205	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-206	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-207	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-208	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-209	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-210	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-211	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-212	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-213	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-214	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-215	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-216	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-217	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-218	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-219	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-220	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-221	15	300	DWH	1/2/2012	GT-17	P	DB	4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-222	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-223	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-224	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-225	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-226	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-227	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-228	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-229	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-230	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-231	15	300	DWH					4/27/2012	4/27/2012	P	DWH

Geosyntec consultants

Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 *Manufacturer:* SKAPS *Product Type:* GE 240-15

Inventory					Q.A. Conformance				Q.C. Documents			
Inv Date	*Batch-Roll*	*Width* (ft.)	*Length* (ft.)	*QA ID*	*Date*	*Samp No*	*Result*	*QAID*	*Date Rec*	*Date Ckk*	*Result*	*QAID*
4/26/2012	22388-232	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-233	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-234	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-235	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-236	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-237	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-238	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-239	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-240	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-241	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-242	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-243	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-244	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-245	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-246	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-247	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-248	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-249	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/26/2012	22388-250	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-251	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-252	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-253	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-254	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-255	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-256	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-257	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-258	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-259	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-260	15	300	DWH					4/27/2012	4/27/2012	P	DWH

Geosyntec
consultants

Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 7 ***Manufacturer:*** SKAPS ***Product Type:*** GE 240-15

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
4/27/2012	22388-261	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-262	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-263	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-264	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-265	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-266	15	300	DWH					4/27/2012	4/27/2012	P	DWH
4/27/2012	22388-267	15	300	DWH					4/27/2012	4/27/2012	P	DWH

Average Roll Width(ft.): 15 ***Average Roll Length(ft.): 300***

Total Number of Rolls: 267 ***Cumulative Area(sq.ft.): 1201500***

Total Number of Conformance Tests: 5

Comments:

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Material Inventory

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gt : 9 ***Manufacturer:*** GSE ***Product Type:*** GEO-240E-EBN-E-00

Inventory					*Q.A. Conformance*				*Q.C. Documents*			
Inv Date	***Batch-Roll***	***Width*** (ft.)	***Length*** (ft.)	***QA ID***	***Date***	***Samp No***	***Result***	***QAID***	***Date Rec***	***Date Ckk***	***Result***	***QAID***
Accepted Rolls												
10/3/2012	130431059	15	150	DW					10/1/2012	10/1/2012	p	DB
10/4/2012	130431060	15	150	DW					10/1/2012	10/1/2012	p	DB
10/4/2012	130431061	15	150	DW					10/1/2012	10/1/2012	p	DB
10/3/2012	130431063	15	150	DW					10/1/2012	10/1/2012	p	DB
10/4/2012	130431065	15	150	DW					10/1/2012	10/1/2012	p	DB
10/3/2012	130431066	15	150	DW					10/1/2012	10/1/2012	p	DB
10/3/2012	130431076	15	150	DW	10/5/2012	GT-18	P	JWC	10/1/2012	10/1/2012	p	DB

Average Roll Width(ft.): 15 ***Average Roll Length(ft.): 150***

Total Number of Rolls: 7 ***Cumulative Area(sq.ft.): 15750***

Total Number of Conformance Tests: 1

Comments: 130431076:Puncure = 336 lbs, mass/unit area = 26.1 oz/sy, grab strength MD = 497 lbs, XMD = 869 lbs, trap tear MD = 189 lbs, XMD = 367 lbs. Exceeds project requirements. PASS

SKAPS Industries (Nonwoven Division)
335, Athena Drive
Athens, GA 30601 (U.S.A.)
Phone (706) 354-3700 Fax (706) 354-3737
E-mail: info@skaps.com

Sales Office:
Engineered Synthetic Product Inc.
Phone: (770)564-1857
Fax: (770)564-1818

RECEIVED
Mar 22 2012
PARSONS

	NO EXCEPTIONS
	EXCEPTIONS AS NOTED
	PROCEED WITH WORK
	RESUBMIT
	SUBMIT CERTIFIED PRINTS

PARSONS
CLIENT/JOB NO. 446199
CONTRACT
BY DATE

ACTION TAKEN HEREON DOES NOT SUPERSEDE REQUIREMENTS OF APPLICABLE DESIGN DRAWINGS, SPECIFICATIONS, ORDERS, CODES OR REGULATIONS, OR RELIEVE THE CONTRACTOR OR SUPPLIER FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS.

January 26, 2012
Chenango Contracting
29 Arbutus Road
Johnson City, NY 13790
Ref : Honeywell Sediment Control
PO : 2279

Dear Sir/Madam:

This is to certify that SKAPS GE240 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric. SKAPS GE240 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GE240 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Weight	ASTM D 5261	oz/sy (g/m^2)	24.00 (814)
Grab Tensile	ASTM D 4632	lbs (kN)	230 (1.02)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	95 (0.42)
Puncture Resistance	ASTM D 4833	lbs (kN)	250 (1.11)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:
* At the time of manufacturing. Handling may change these properties.

ANURAG SHAH
QUALITY CONTROL MANAGER

Product : GE240-15

ROLL #	WEIGHT	MD TENSILE	MD ELONG	XMD TENSILE	XMD ELONG	MD TRAP	XMD TRAP	PUNCTURE
ASTM METHOD	D5261	D4632	D4632	D4632	D4632	D4533	D4533	D4833
UNITS	oz/sq yd	lbs.	%	lbs	%	lbs.	lbs	lbs.
TARGET	24.00	230	50	230	50	95	95	250
22388.001	26.30	603	66	695	76	170	181	285
22388.002	26.30	603	66	695	76	170	181	285
22388.003	26.30	603	66	695	76	170	181	285
22388.004	26.30	603	66	695	76	170	181	285
22388.005	25.59	559	61	631	74	170	181	285
22388.006	25.59	559	61	631	74	170	181	285
22388.007	25.59	559	61	631	74	170	181	285
22388.008	25.59	559	61	631	74	170	181	285
22388.009	25.59	559	61	631	74	170	181	285
22388.010	26.41	612	69	652	79	165	175	282
22388.011	26.41	612	69	652	79	165	175	282
22388.012	26.41	612	69	652	79	165	175	282
22388.013	26.41	612	69	652	79	165	175	282
22388.014	26.41	612	69	652	79	165	175	282
22388.015	25.93	584	64	625	71	165	175	282
22388.016	25.93	584	64	625	71	165	175	282
22388.017	25.93	584	64	625	71	165	175	282
22388.018	25.93	584	64	625	71	165	175	282
22388.019	25.93	584	64	625	71	165	175	282
22388.020	26.48	645	67	690	75	168	184	290
22388.021	26.48	645	67	690	75	168	184	290
22388.022	26.48	645	67	690	75	168	184	290
22388.023	26.48	645	67	690	75	168	184	290
22388.024	26.48	645	67	690	75	168	184	290
22388.025	25.71	570	60	613	73	168	184	290
22388.026	25.71	570	60	613	73	168	184	290
22388.027	25.71	570	60	613	73	168	184	290
22388.028	25.71	570	60	613	73	168	184	290
22388.029	25.71	570	60	613	73	168	184	290
22388.030	26.57	635	70	661	77	161	178	275
22388.031	26.57	635	70	661	77	161	178	275
22388.032	26.57	635	70	661	77	161	178	275
22388.033	26.57	635	70	661	77	161	178	275

*All values are MARV.

≥ 24 oz/sq yd ≥ 230 lb ≥ 95 lb ≥ 250 lb

Product : GE240-15

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 24.00	MD TENSILE D4632 lbs. 230	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 230	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 95	XMD TRAP D4533 lbs 95	PUNCTURE D4833 lbs. 250
22388.034	26.57	635	70	661	77	161	178	275
22388.035	25.79	557	62	645	74	161	178	275
22388.036	25.79	557	62	645	74	161	178	275
22388.037	25.79	557	62	645	74	161	178	275
22388.038	25.79	557	62	645	74	161	178	275
22388.039	25.79	557	62	645	74	161	178	275
22388.040	26.69	627	68	671	80	175	180	283
22388.041	26.69	627	68	671	80	175	180	283
22388.042	26.69	627	68	671	80	175	180	283
22388.043	26.69	627	68	671	80	175	180	283
22388.044	26.69	627	68	671	80	175	180	283
22388.045	25.86	581	64	615	71	175	180	283
22388.046	25.86	581	64	615	71	175	180	283
22388.047	25.86	581	64	615	71	175	180	283
22388.048	25.86	581	64	615	71	175	180	283
22388.049	25.86	581	64	615	71	175	180	283
22388.050	26.55	600	66	699	76	167	177	279
22388.051	26.55	600	66	699	76	167	177	279
22388.052	26.55	600	66	699	76	167	177	279
22388.053	26.55	600	66	699	76	167	177	279
22388.054	26.55	600	66	699	76	167	177	279
22388.055	25.91	568	61	602	74	167	177	279
22388.056	25.91	568	61	602	74	167	177	279
22388.057	25.91	568	61	602	74	167	177	279
22388.058	25.91	568	61	602	74	167	177	279
22388.059	25.91	568	61	602	74	167	177	279
22388.060	27.00	617	69	688	79	171	185	287
22388.061	27.00	617	69	688	79	171	185	287
22388.062	27.00	617	69	688	79	171	185	287
22388.063	27.00	617	69	688	79	171	185	287
22388.064	27.00	617	69	688	79	171	185	287
22388.065	25.50	556	63	612	72	171	185	287
22388.066	25.50	556	63	612	72	171	185	287

*All values are MARV.

Product : GE240-15

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 24.00	MD TENSILE D4632 lbs. 230	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 230	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 95	XMD TRAP D4533 lbs 95	PUNCTURE D4833 lbs. 250
22388.067	25.50	556	63	612	72	171	185	287
22388.068	25.50	556	63	612	72	171	185	287
22388.069	25.50	556	63	612	72	171	185	287
22388.070	26.59	626	67	644	75	160	179	276
22388.071	26.59	626	67	644	75	160	179	276
22388.072	26.59	626	67	644	75	160	179	276
22388.073	26.59	626	67	644	75	160	179	276
22388.074	26.59	626	67	644	75	160	179	276
22388.075	25.87	596	60	626	70	160	179	276
22388.076	25.87	596	60	626	70	160	179	276
22388.077	25.87	596	60	626	70	160	179	276
22388.078	25.87	596	60	626	70	160	179	276
22388.079	25.87	596	60	626	70	160	179	276
22388.080	26.25	601	70	700	80	174	183	284
22388.081	26.25	601	70	700	80	174	183	284
22388.082	26.25	601	70	700	80	174	183	284
22388.083	26.25	601	70	700	80	174	183	284
22388.084	26.25	601	70	700	80	174	183	284
22388.085	25.94	579	65	619	74	174	183	284
22388.086	25.94	579	65	619	74	174	183	284
22388.087	25.94	579	65	619	74	174	183	284
22388.088	25.94	579	65	619	74	174	183	284
22388.089	25.94	579	65	619	74	174	183	284
22388.090	26.75	613	68	673	77	164	176	281
22388.091	26.75	613	68	673	77	164	176	281
22388.092	26.75	613	68	673	77	164	176	281
22388.093	26.75	613	68	673	77	164	176	281
22388.094	26.75	613	68	673	77	164	176	281
22388.095	25.72	555	62	610	72	164	176	281
22388.096	25.72	555	62	610	72	164	176	281
22388.097	25.72	555	62	610	72	164	176	281
22388.098	25.72	555	62	610	72	164	176	281
22388.099	25.72	555	62	610	72	164	176	281

*All values are MARV.

Product : GE240-15

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 24.00	MD TENSILE D4632 lbs. 230	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 230	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 95	XMD TRAP D4533 lbs 95	PUNCTURE D4833 lbs. 250
22388.100	26.88	607	65	691	75	169	180	288
22388.101	26.88	607	65	691	75	169	180	288
22388.102	26.88	607	65	691	75	169	180	288
22388.103	26.88	607	65	691	75	169	180	288
22388.104	26.88	607	65	691	75	169	180	288
22388.105	25.95	566	60	627	70	169	180	288
22388.106	25.95	566	60	627	70	169	180	288
22388.107	25.95	566	60	627	70	169	180	288
22388.108	25.95	566	60	627	70	169	180	288
22388.109	25.95	566	60	627	70	169	180	288
22388.110	26.96	643	69	674	78	162	178	277
22388.111	26.96	643	69	674	78	162	178	277
22388.112	26.96	643	69	674	78	162	178	277
22388.113	26.96	643	69	674	78	162	178	277
22388.114	26.96	643	69	674	78	162	178	277
22388.115	25.88	599	64	649	73	162	178	277
22388.116	25.88	599	64	649	73	162	178	277
22388.117	25.88	599	64	649	73	162	178	277
22388.118	25.88	599	64	649	73	162	178	277
22388.119	25.88	599	64	649	73	162	178	277
22388.120	26.33	602	66	689	76	172	184	286
22388.121	26.33	602	66	689	76	172	184	286
22388.122	26.33	602	66	689	76	172	184	286
22388.123	26.33	602	66	689	76	172	184	286
22388.124	26.33	602	66	689	76	172	184	286
22388.125	25.74	578	61	609	71	172	184	286
22388.126	25.74	578	61	609	71	172	184	286
22388.127	25.74	578	61	609	71	172	184	286
22388.128	25.74	578	61	609	71	172	184	286
22388.129	25.74	578	61	609	71	172	184	286
22388.130	26.98	625	68	678	80	167	175	280
22388.131	26.98	625	68	678	80	167	175	280
22388.132	26.98	625	68	678	80	167	175	280

*All values are MARV.

Product : GE240-15

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 24.00	MD TENSILE D4632 lbs. 230	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 230	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 95	XMD TRAP D4533 lbs 95	PUNCTURE D4833 lbs. 250
22388.133	26.98	625	68	678	80	167	175	280
22388.134	26.98	625	68	678	80	167	175	280
22388.135	25.96	565	65	646	75	167	175	280
22388.136	25.96	565	65	646	75	167	175	280
22388.137	25.96	565	65	646	75	167	175	280
22388.138	25.96	565	65	646	75	167	175	280
22388.139	25.96	565	65	646	75	167	175	280
22388.140	26.56	605	70	698	77	175	182	289
22388.141	26.56	605	70	698	77	175	182	289
22388.142	26.56	605	70	698	77	175	182	289
22388.143	26.56	605	70	698	77	175	182	289
22388.144	26.56	605	70	698	77	175	182	289
22388.145	25.82	553	63	630	70	175	182	289
22388.146	25.82	553	63	630	70	175	182	289
22388.147	25.82	553	63	630	70	175	182	289
22388.148	25.82	553	63	630	70	175	182	289
22388.149	25.82	553	63	630	70	175	182	289
22388.150	26.31	623	68	682	79	163	180	276
22388.151	26.31	623	68	682	79	163	180	276
22388.152	26.31	623	68	682	79	163	180	276
22388.153	26.31	623	68	682	79	163	180	276
22388.154	26.31	623	68	682	79	163	180	276
22388.155	25.89	562	60	606	73	163	180	276
22388.156	25.89	562	60	606	73	163	180	276
22388.157	25.89	562	60	606	73	163	180	276
22388.158	25.89	562	60	606	73	163	180	276
22388.159	25.89	562	60	606	73	163	180	276
22388.160	26.92	633	65	693	75	168	185	287
22388.161	26.92	633	65	693	75	168	185	287
22388.162	26.92	633	65	693	75	168	185	287
22388.163	26.92	633	65	693	75	168	185	287
22388.164	26.92	633	65	693	75	168	185	287
22388.165	25.97	577	62	614	71	168	185	287

*All values are MARV.

Product : GE240-15

ROLL #	WEIGHT	MD TENSILE	MD ELONG	XMD TENSILE	XMD ELONG	MD TRAP	XMD TRAP	PUNCTURE
ASTM METHOD	D5261	D4632	D4632	D4632	D4632	D4533	D4533	D4833
UNITS	oz/sq yd	lbs.	%	lbs	%	lbs.	lbs	lbs.
TARGET	24.00	230	50	230	50	95	95	250
22388.166	25.97	577	62	614	71	168	185	287
22388.167	25.97	577	62	614	71	168	185	287
22388.168	25.97	577	62	614	71	168	185	287
22388.169	25.97	577	62	614	71	168	185	287
22388.170	26.83	606	69	679	80	160	177	279
22388.171	26.83	606	69	679	80	160	177	279
22388.172	26.83	606	69	679	80	160	177	279
22388.173	26.83	606	69	679	80	160	177	279
22388.174	26.83	606	69	679	80	160	177	279
22388.175	25.56	571	60	601	74	160	177	279
22388.176	25.56	571	60	601	74	160	177	279
22388.177	25.56	571	60	601	74	160	177	279
22388.178	25.56	571	60	601	74	160	177	279
22388.179	25.56	571	60	601	74	160	177	279
22388.180	26.99	620	65	684	76	173	181	283
22388.181	26.99	620	65	684	76	173	181	283
22388.182	26.99	620	65	684	76	173	181	283
22388.183	26.99	620	65	684	76	173	181	283
22388.184	26.99	620	65	684	76	173	181	283
22388.185	25.83	552	63	611	72	173	181	283
22388.186	25.83	552	63	611	72	173	181	283
22388.187	25.83	552	63	611	72	173	181	283
22388.188	25.83	552	63	611	72	173	181	283
22388.189	25.83	552	63	611	72	173	181	283
22388.190	26.26	611	68	692	79	166	179	281
22388.191	26.26	611	68	692	79	166	179	281
22388.192	26.26	611	68	692	79	166	179	281
22388.193	26.26	611	68	692	79	166	179	281
22388.194	26.26	611	68	692	79	166	179	281
22388.195	25.90	561	61	604	75	166	179	281
22388.196	25.90	561	61	604	75	166	179	281
22388.197	25.90	561	61	604	75	166	179	281
22388.198	25.90	561	61	604	75	166	179	281

*All values are MARV.

Product : GE240-15

ROLL # ASTM METHOD UNITS TARGET	WEIGHT D5261 oz/sq yd 24.00	MD TENSILE D4632 lbs. 230	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 230	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 95	XMD TRAP D4533 lbs 95	PUNCTURE D4833 lbs. 250
22388.199	25.90	561	61	604	75	166	179	281
22388.200	26.93	634	66	686	77	170	183	290
22388.201	26.93	634	66	686	77	170	183	290
22388.202	26.93	634	66	686	77	170	183	290
22388.203	26.93	634	66	686	77	170	183	290
22388.204	26.93	634	66	686	77	170	183	290
22388.205	25.60	572	64	633	73	170	183	290
22388.206	25.60	572	64	633	73	170	183	290
22388.207	25.60	572	64	633	73	170	183	290
22388.208	25.60	572	64	633	73	170	183	290
22388.209	25.60	572	64	633	73	170	183	290
22388.210	26.37	608	70	653	75	161	176	275
22388.211	26.37	608	70	653	75	161	176	275
22388.212	26.37	608	70	653	75	161	176	275
22388.213	26.37	608	70	653	75	161	176	275
22388.214	26.37	608	70	653	75	161	176	275
22388.215	25.84	550	62	603	70	161	176	275
22388.216	25.84	550	62	603	70	161	176	275
22388.217	25.84	550	62	603	70	161	176	275
22388.218	25.84	550	62	603	70	161	176	275
22388.219	25.84	550	62	603	70	161	176	275
22388.220	26.47	650	67	665	78	174	180	284
22388.221	26.47	650	67	665	78	174	180	284
22388.222	26.47	650	67	665	78	174	180	284
22388.223	26.47	650	67	665	78	174	180	284
22388.224	26.47	650	67	665	78	174	180	284
22388.225	25.61	574	60	621	74	174	180	284
22388.226	25.61	574	60	621	74	174	180	284
22388.227	25.61	574	60	621	74	174	180	284
22388.228	25.61	574	60	621	74	174	180	284
22388.229	25.61	574	60	621	74	174	180	284
22388.230	26.66	641	65	694	76	165	178	280
22388.231	26.66	641	65	694	76	165	178	280

*All values are MARV.

Product : GE240-15

ROLL #	WEIGHT	MD TENSILE	MD ELONG	XMD TENSILE	XMD ELONG	MD TRAP	XMD TRAP	PUNCTURE
ASTM METHOD	D5261	D4632	D4632	D4632	D4632	D4533	D4533	D4833
UNITS	oz/sq yd	lbs.	%	lbs	%	lbs.	lbs	lbs.
TARGET	24.00	230	50	230	50	95	95	250
22388.265	25.51	551	60	600	72	172	181	283
22388.266	25.51	551	60	600	72	172	181	283
22388.267	25.51	551	60	600	72	172	181	283

*All values are MARV.

GSE Roll Allocation

Order : SO-068591
Customer : Chenango Contracting
Project Name : Chenango Stock

	Roll#	Product Code	Mfg Date	Length	
10/3	130431059 ✓	GEO-240E-EBN-E-00	5/27/2012	150	
10/4	130431060 ✓	GEO-240E-EBN-E-00	5/27/2012	150	
10/4	130431061 ✓	GEO-240E-EBN-E-00	5/27/2012	150	
10/3	130431063 ✓	GEO-240E-EBN-E-00	5/27/2012	150	
10/4	130431065 ✓	GEO-240E-EBN-E-00	5/27/2012	150	
10/3	130431066 ✓	GEO-240E-EBN-E-00	5/27/2012	150	
	130431068 ×	GEO-240E-EBN-E-00	5/27/2012	150	
10/3	130431076 ✓	GEO-240E-EBN-E-00	5/27/2012	150	– GT-018

GSE
ENVIRONMENTAL™

1245 Eastland Avenue
Kingstree, SC 29556
Phone 843-382-4603
Fax 843-382-4604

Date: September 26, 2012

Project: # 68591 Chenango Stock

Ref: Ultraviolet (UV) Resistance

To Whom It May Concern:

The resistance of nonwoven needle punched geotextiles to ultraviolet light depends primarily on antioxident and carbon black package mixed with resin to prepare a formulation for fiber extrusion. As long as this formulation remains the same the UV resistance of a geotextiles does not change. Therefore, GSE performs UV testing only once per resin formulation. The testing is performed according to ASTM Test Method D 4355 and results are included on GSE geotextile specification sheet. Currently, all GSE geotextiles meet or exceed a value of 70% strength retained after 500 hours of UV exposure. GSE will meet or exceed this value for the referenced project.

Although GSE geotextiles are manufactured using one of the best available antioxident packages, we recommend covering the geotextiles within 15 days of exposure to direct Sunlight. This period does not include time during which geotextiles rolls remain on site covered in black shrink-wrap. Our recommendation is based on UV performance data published in technical literature indicating geotextile strength can decrease sharply after prolonged exposure to Sunlight.

Actual data from an independent laboratory can be supplied upon request.

Jane Allen
Laboratory Manager

GSE
ENVIRONMENTAL

19103 Gundle Road
Houston, TX 77073
800 435 2008 • 281 443 8564
281 230 8650 Fax
www.gseworld.com

November 13, 2012

Carl Burdick
Chenango Contracting, Inc.
29 Arbutus Road
Johnson City, NY

RE: Honeywell SCA

Certification of Compliance

The undersigned, being qualified and authorized to do so, hereby certifies that GSE 24 oz/yd^2 Nonwoven Geotextile produced for this project will meet or exceed the following properties or conditions:

- GSE geotextiles are composed of typically 98% virgin polypropylene or polyester staple fibers.

Sincerely,

Daniel E. Semanisin
GSE Technical Support

cc: Patty Beaubien, GSE Lining Technology, Inc.

September 10, 2008

To Whom It May Concern:

Subject: "Needle free" Statement for GSE Nonwoven Geotextiles

GSE takes intensive process and quality control measures to ensure that our nonwoven needle punched geotextiles are free from broken needles or any other metal objects. We have two metal detection systems working in series to achieve this objective.

The first metal detector is placed between the fiber supply and the card. At this point any metal in the fiber supply is detected and prevented from passing on to the production line. The second system is located after the needle looms. This industrial strength magnetic system spans the entire width of the geotextile. Should a metal piece or a broken needle be detected by the system, an alarm alerts the operator. The contaminated part of the geotextile is eliminated by the operator.

With the above in place, GSE is confident that all our nonwoven products are needle free.

Sincerely,

Dino Heathcott
Plant Manager

GSE Lining Technology, Inc. • P.O. Box 1086 • 1245 Eastland Avenue • Kingstree, SC 29556 •
866.284.9003 • 843.382.4603 • 843.382.4604 Fax • marketing@gseworld.com • www.gseworld.com

GSE Lining Technology, LLC.

GSE ENVIRONMENTAL™

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: Sep/26/2012

Sales Order No.	*Customer Name*	*Project Location*	*Product Name*	*BOL Number*
SO-068591	Chenango Contracting	Johnson City NY US	GEO-240E-EBN-E-00	

Roll Number	Mass per Unit Area ASTM D5261 (oz/yd²)	ASTM D4632 Grab Strength (lbs) MD	ASTM D4632 Grab Strength (lbs) TD	ASTM D4632 Grab Elongation (%) MD	ASTM D4632 Grab Elongation (%) TD	ASTM D4533 Trapezoidal Tear (lbs) MD	ASTM D4533 Trapezoidal Tear (lbs) TD	Puncture Resistance ASTM D4833 (lbs)
130431059	26.4	568	1012	136	119	376	409	379
130431060	26.4	568	1012	136	119	376	409	379
130431061	26.4	568	1012	136	119	376	409	379
130431063	26.4	568	1012	136	119	376	409	379
130431065	26.4	568	1012	136	119	376	409	379
130431066	26.4	568	1012	136	119	376	409	379
130431068	26.4	568	1012	136	119	376	409	379
130431076	26.4	568	1012	136	119	376	409	379

≥ 24 oz/syd ≥ 230 lb ≥ 950 ≥ 250 lb

Laboratory Manager

APPENDIX G

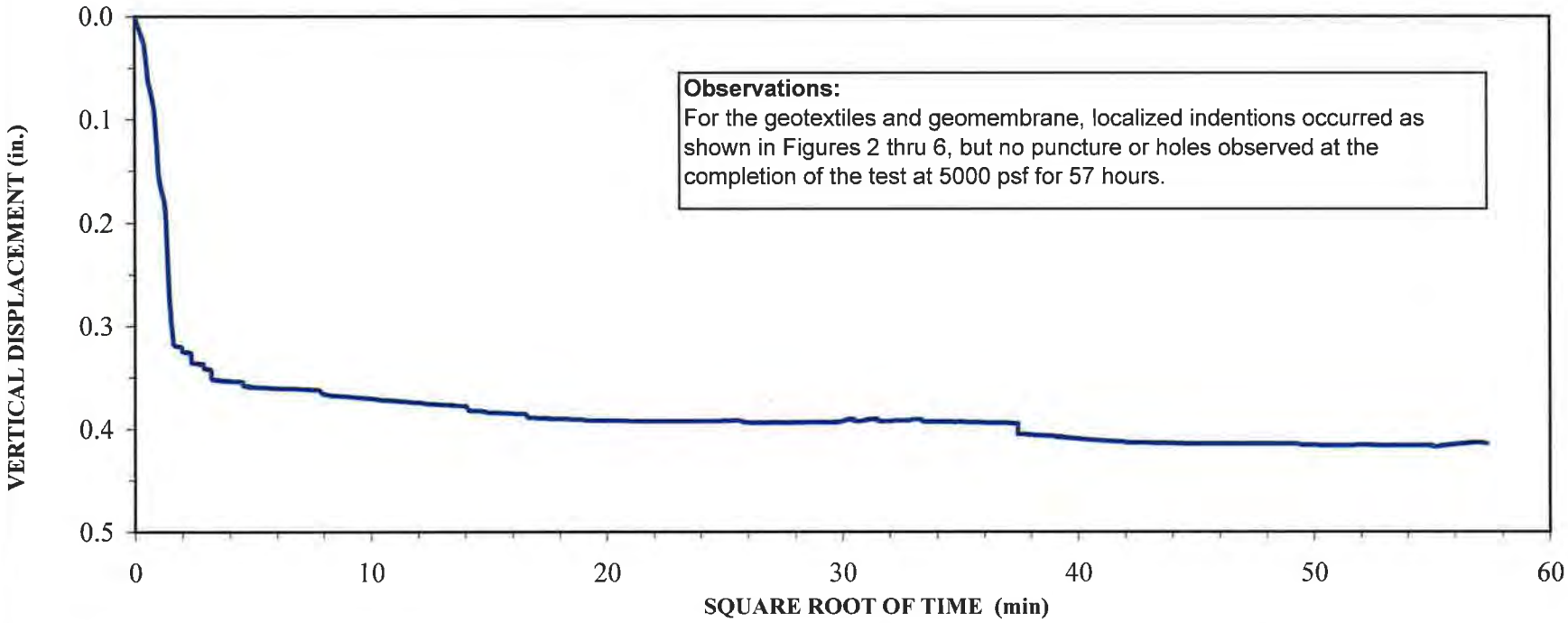
Geosynthetic Conformance Test Results

- Puncture Testing
- Interface Friction
- Geomembrane
- Geotextile

Puncture Testing

PARSONS - ONONDAGA LAKE
HYDROSTATIC PUNCTURE TESTING (ASTM D 5514 MODIFIED [1])

8" thick Granby Pit stone nominally compacted at as-received moisture content/
Exposed SKAPS GE240 NWGT deployed 25 May 12 (recovered from the project site with non heat-treated side down)/
Agru 60-mil Microspike HDPE geomembrane with long spike side down (recovered from the project site) /
3" thick subgrade soil compacted to approximately 95% of max. standard Proctor dry density at optimum moisture content



Test	Test Specimen Size				Normal Stress	Duration	Gravel			Subgrade Soil		
	Length	Width	Gravel Thickness	Subgrade Soil Thickness			γ_d	ω_i	ω_f	γ_d	ω_i	ω_f
No.	(in.)	(in.)	(in.)	(in.)	(psf)	(hours)	(pcf)	(%)	(%)	(pcf)	(%)	(%)
6	12.0	12.0	8.0	3.0	5000	58				94.4	19.2	

NOTE: *localized strains of the deformed geomembrane not calculated.*

DATE OF REPORT:	8/9/2012
FIGURE NO.	A-6
PROJECT NO.	SGI10043
DOCUMENT NO.	
FILE NO.	

SGI TESTING SERVICES, LLC

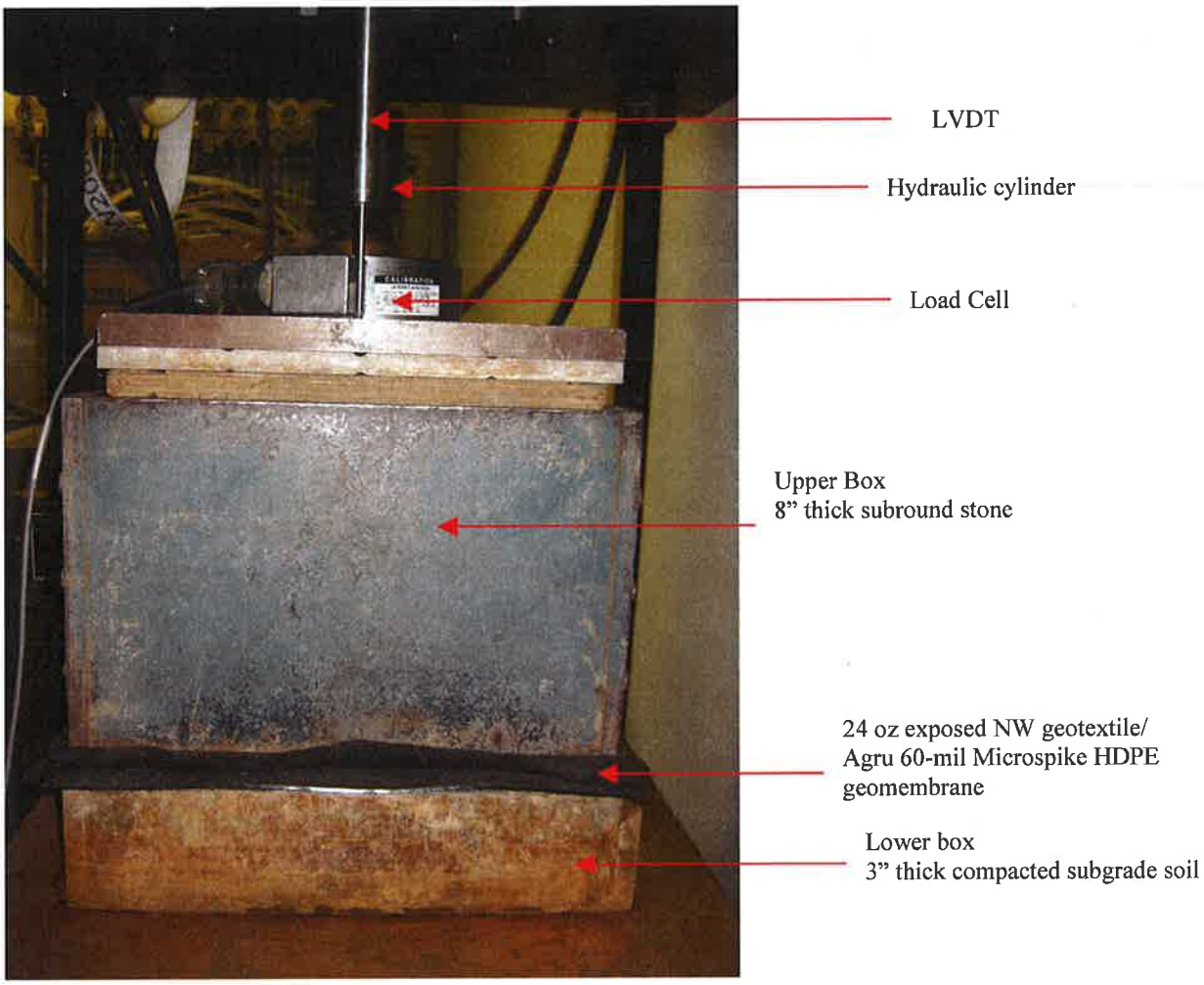


Figure 1. View of hydrostatic puncture test #6 setup.

Figure 2. View of stone in contact with the nonwoven geotextile after the completion of test.

Figure 3. "Prints" of stone on top surface of the nonwoven geotextile after the completion of test.

Figure 4. Deformed bottom surface of the geotextile.

Figure 5. Deformed top surface of the geomembrane (no punctures)

Figure 6. Deformed bottom surface of the geomembrane (no punctures)

Figure 7. Deformed top surface of subgrade soil

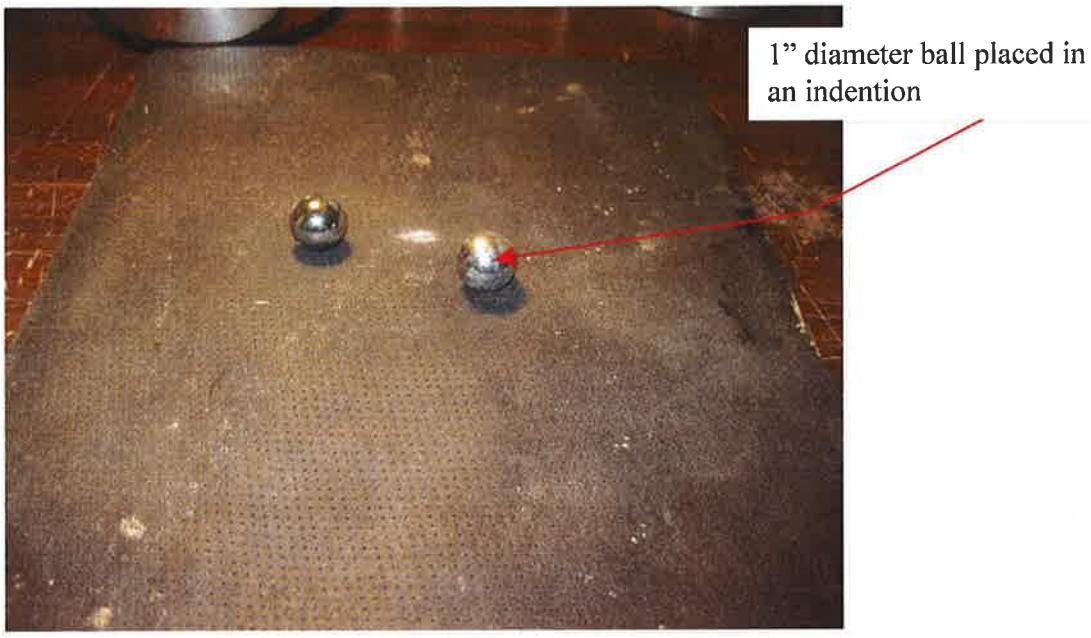
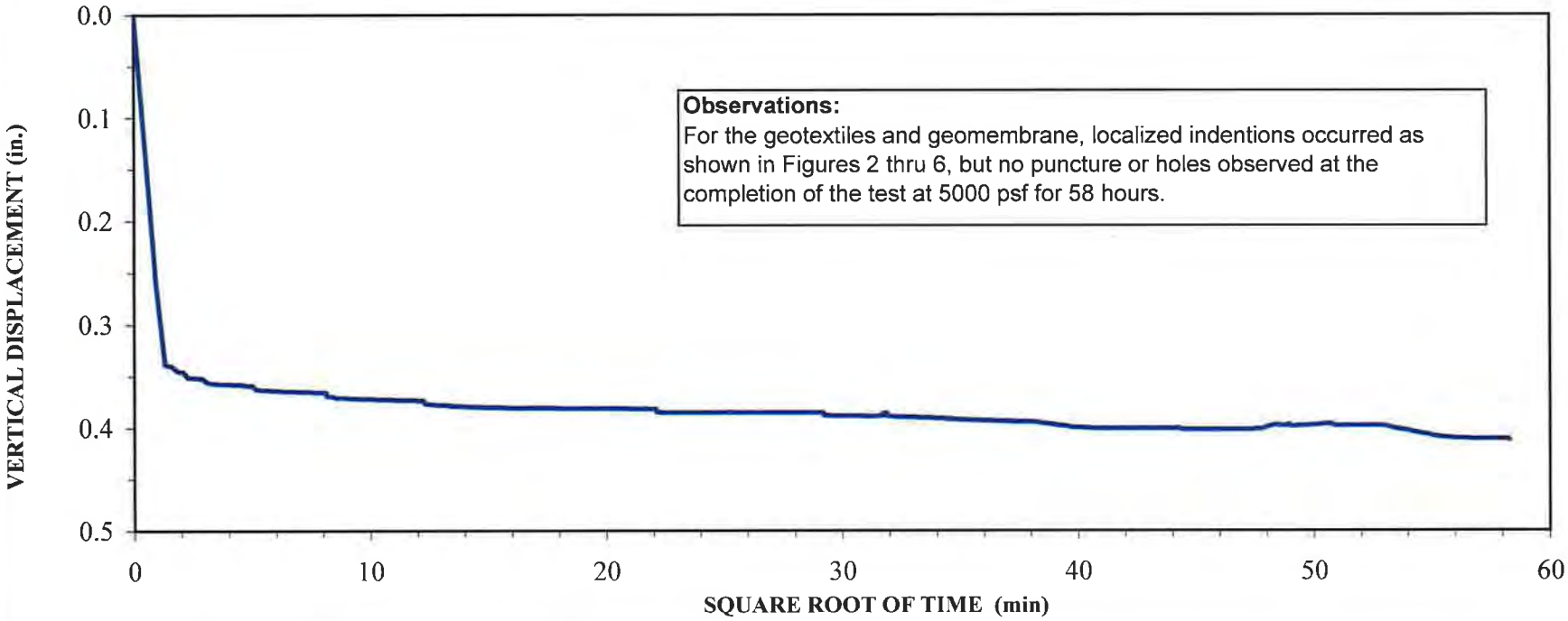


Figure 8. View of indentions on the deformed top surface of the geomembrane

PARSONS - ONONDAGA LAKE
HYDROSTATIC PUNCTURE TESTING (ASTM D 5514 MODIFIED [1])

8" thick Lake Road Pit stone nominally compacted at as-received moisture content/
Exposed SKAPS GE240 NWGT deployed 25 May 12 (recovered from the project site with non heat-treated side down)/
Agru 60-mil Microspike HDPE geomembrane with long spike side down (recovered from the project site) /
3" thick subgrade soil compacted to approximately 95% of max. standard Proctor dry density at optimum moisture content



Test	Test Specimen Size				Normal Stress	Duration	Gravel			Subgrade Soil		
	Length	Width	Gravel Thickness	Subgrade Soil Thickness			γ_d	ω_i	ω_f	γ_d	ω_i	ω_f
No.	(in.)	(in.)	(in.)	(in.)	(psf)	(hours)	(pcf)	(%)	(%)	(pcf)	(%)	(%)
7	12.0	12.0	8.0	3.0	5000	58				93.7	18.5	

NOTE: *localized strains of the deformed geomembrane not calculated.*

DATE OF REPORT: 8/9/2012

SGI TESTING SERVICES, LLC

FIGURE NO.	A-7
PROJECT NO.	SGI10043
DOCUMENT NO.	
FILE NO.	

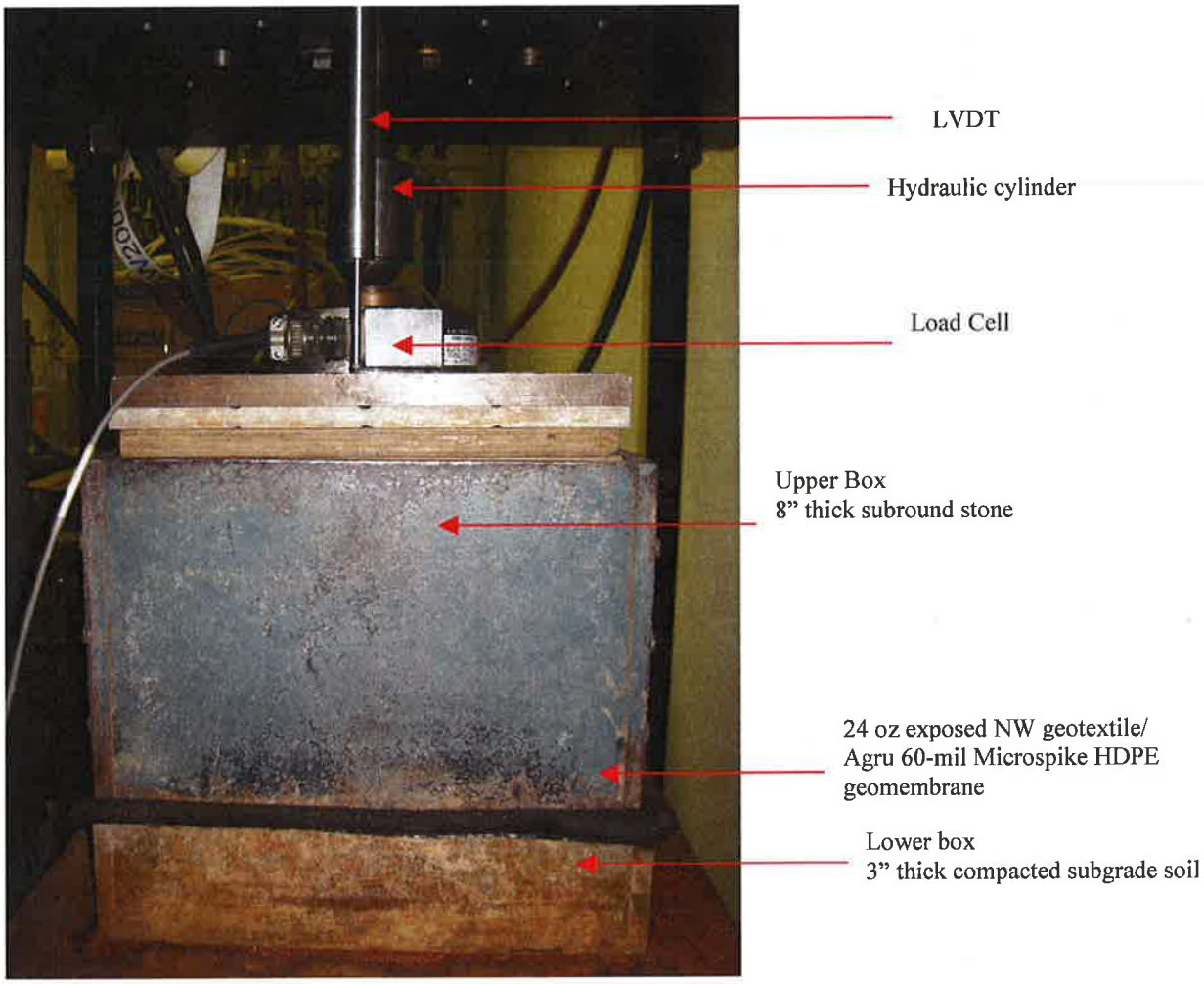


Figure 1. View of hydrostatic puncture test #6 setup.

Figure 2. View of stone in contact with the nonwoven geotextile after the completion of test.

Figure 3. "Prints" of stone on top surface of the nonwoven geotextile after the completion of test.

Figure 4. Deformed bottom surface of the geotextile.

Figure 5. Deformed top surface of the geomembrane (no punctures)

Figure 6. Deformed bottom surface of the geomembrane (no punctures)

Figure 7. Deformed top surface of subgrade soil

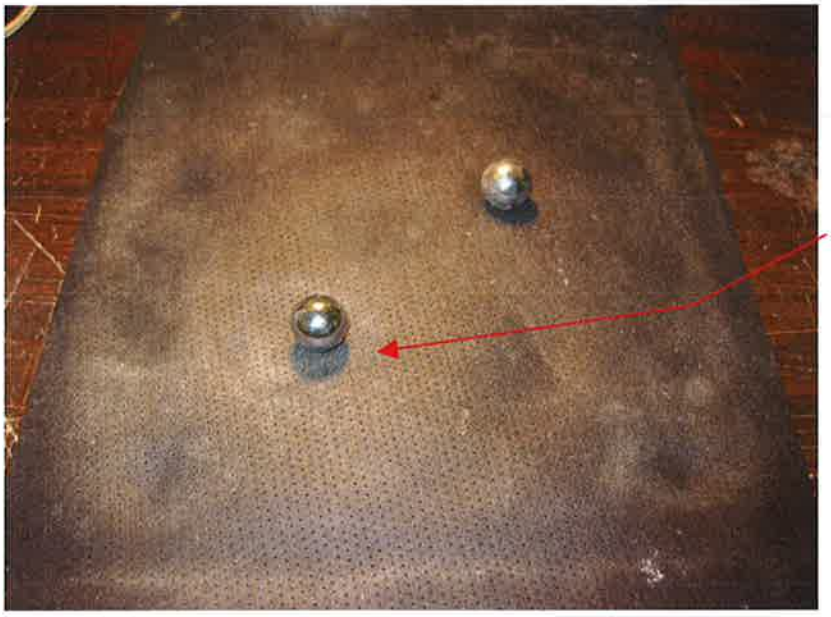


Figure 8. View of indentions on the deformed top surface of the geomembrane

Interface Friction Testing

TABLE 1

ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA
Camillus, NY

TESTED COMPONENTS	SHEAR RATE	REF TEST No.	SUMMARY OF STRESSES												SUMMARY OF RESULTS			
			PEAK						LARGE DISPLACEMENT						PEAK		RESIDUAL	
			Normal Stress (psi)						Normal Stress (psi)						Adhesion	Friction Angle	Adhesion	Friction Angle
			5	5	15	15	24	24	5	5	15	15	24	24				
			Normal Stress (psf)						Normal Stress (psf)									
			700	700	2,100	2,100	3,500	3,500	700	700	2,100	2,100	3,500	3,500				
			Shear Stress						Shear Stress									
Phase I			(psi)	(°)	(psi)	(°)	(psi)	(°)	(psi)	(°)	(psi)	(°)	(psi)	(°)	(psf)	(°)	(psf)	(°)
Gravel/24 oz Geotextile/60 mil HDPE/Mar. Clay	@ 0.04 in/min	C1	3.1	32.6	8.8	31.1	12.9	28.0	2.3	25.4	7.7	27.8	10.9	24.1	131	27	77	24
Gravel/24 oz Geotextile/60 mil HDPE/Blk Crk Clay	@ 0.04 in/min	C2	2.5	27.4	6.9	25.2	8.7	19.6	2.4	26.5	6.4	23.7	8.2	0.1	203	18	196	16
Phase II																		
Gravel/24 oz Geotextile/60 mil HDPE/Mar. Clay	@ 0.04 in/min	C-1	3.2	33.5	9.4	32.8	13.5	29.1	2.6	27.8	8.1	29.0	11.8	0.2	142	28	82	25

Notes:

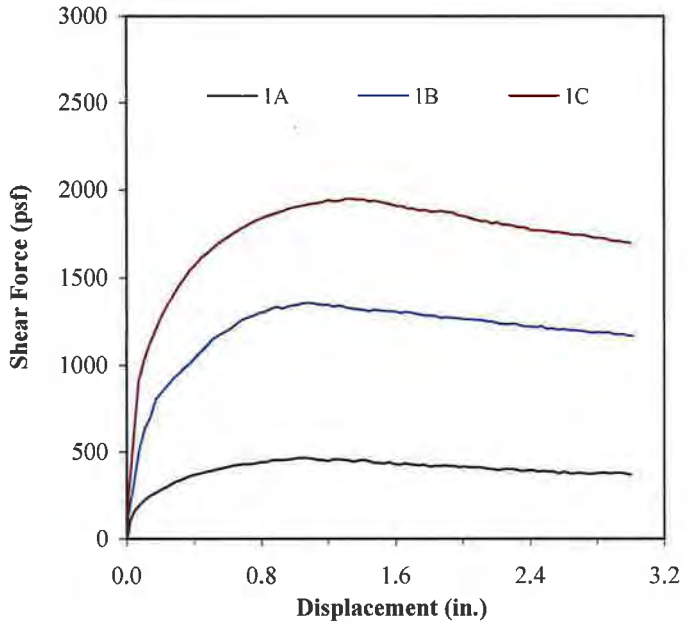
(1) Apparent friction angles are calculated by taking the arctan of shear stress /normal stress.

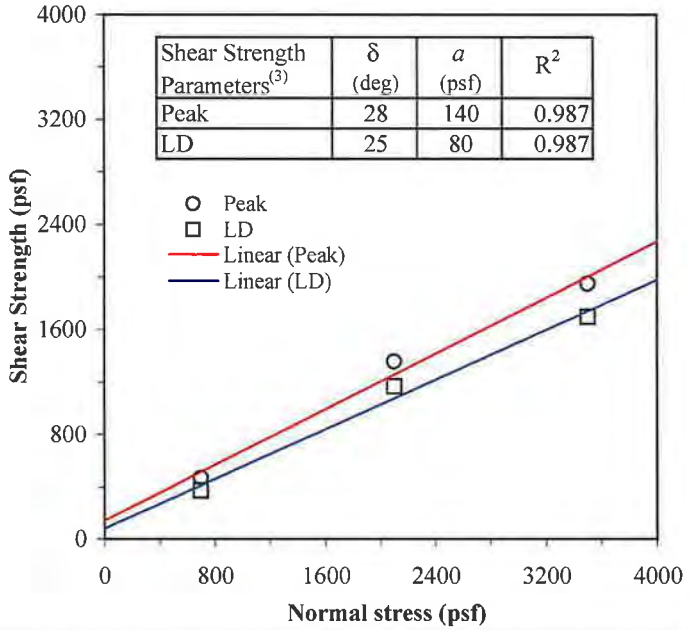
(2) Large displacement shear strength using the shear force at the end of the test.

Phase I used GSE geomembrane and non-woven geotextile with Marcellus and Black Creek low permeability soil.

GEOSYNTEC CONSULTANTS - ONONDAGA SCA PHASE 1
INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)

Upper Shear Box: Drainage gravel nominally compacted/
SKAPS GE240 (24 oz) nonwoven geotextile #22388.166 with heart-treated side up/
Agru 60-mil Microspike HDPE geomembrane # 443563-11 with dull (short spike) side up/
Lower Shear Box: Marcellus clay #LP-103 compacted to approximately 95% of max standard Proctor density at 3% wet of OMC γ_{dmax} = 113 pcf OMC = 17.5%)





Shear Strength Parameters[3]	δ (deg)	a (psf)	R^2
Peak	28	140	0.987
LD	25	80	0.987

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	Soaking Stress (psf)	Soaking Time (hour)	Consolidation Stress (psf)	Consolidation Time (hour)	Drainage Gravel γ_d (pcf)	Drainage Gravel ω_i (%)	Drainage Gravel ω_f (%)	Clay γ_d (pcf)	Clay ω_i (%)	Clay ω_f (%)	GCL ω_i (%)	GCL ω_f (%)	Shear Strength τ_P (psf)	Shear Strength τ_{LD} (psf)	Failure Mode
1A	12 x 12	700	0.004	-	-	700	24	-	-	-	107.4	20.4	-	-	-	464	369	(1)
1B	12 x 12	2100	0.004	-	-	2100	24	-	-	-	107.2	20.7	-	-	-	1355	1165	(1)
1C	12 x 12	3500	0.004	-	-	3500	24	-	-	-	107.7	20.1	-	-	-	1949	1695	(1)

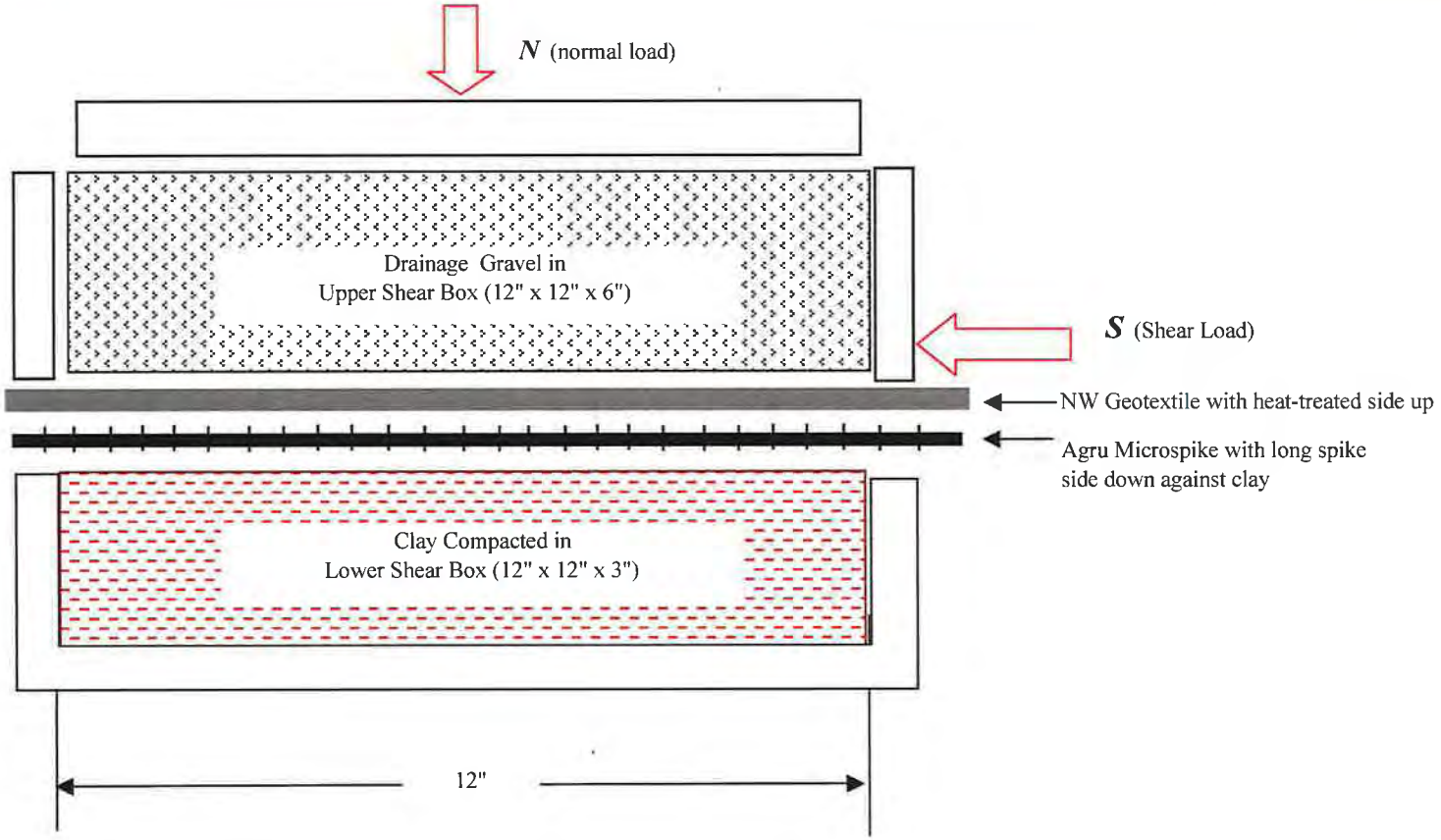
NOTES:
(1) Sliding occurred at the interface between the geomembrane and clay.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

SGI TESTING SERVICES, LLC

DATE OF REPORT:	5/3/2012
FIGURE NO.	C-1
PROJECT NO.	SGI11017
DOCUMENT NO.	
FILE NO.	

SCHEMATIC DIAGRAM
GEOSYNTEC CONSULTANTS - INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)
ONONDAGA SCA PHASE 1

The "sandwich" test, where GM and GT are not clamped, is to evaluate the shear strength of the weakest interface within the liner system. The weakest interface is the interface with the lowest PEAK shear strength within the 4-layer system.



(NOTE: NOT TO SCALE)

SGI TESTING SERVICES, LLC

DATE:	5/3/2012
FIGURE NO.	5
PROJECT NO.	SGI11017.1
DOCUMENT NO.	
FILE NO.	

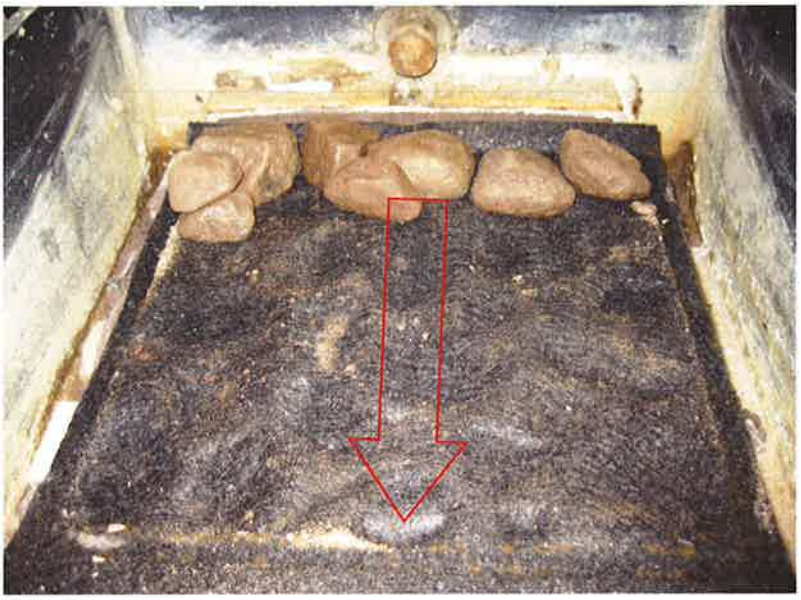


Figure 1. Drainge gravel and 24 oz nonwoven geotextile at the completion of Test #1C (3500 psf)

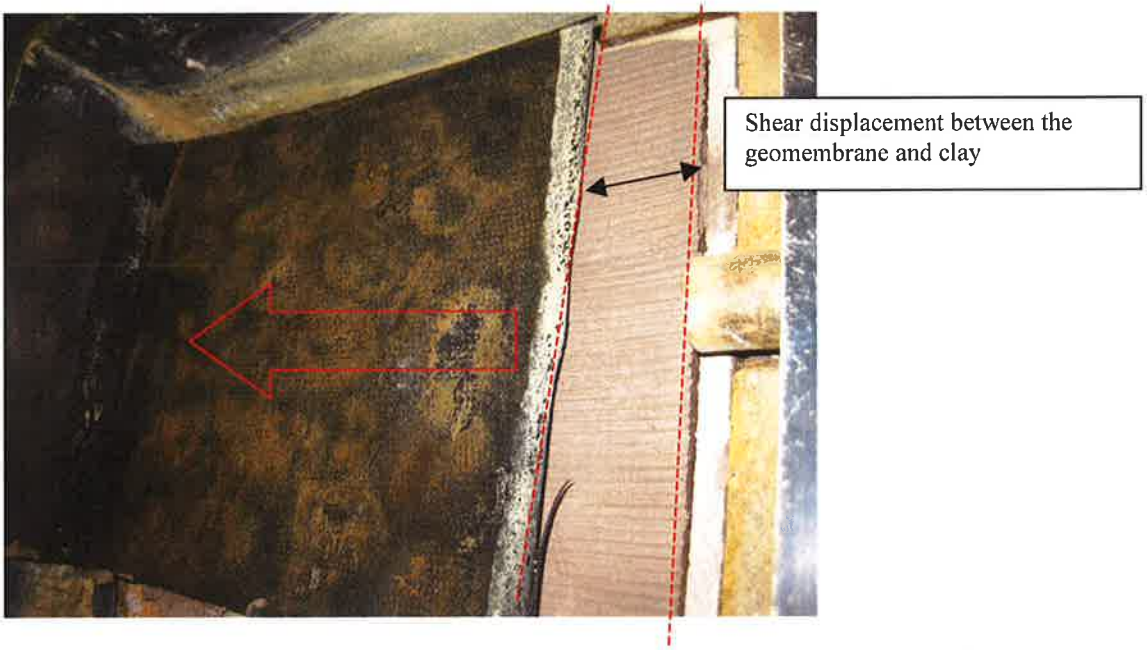


Figure 2. Shear failure (sliding between the long spike side of Agru Microspike geomembrane and clay soil at the completion of Test #1C at 3500 psf.

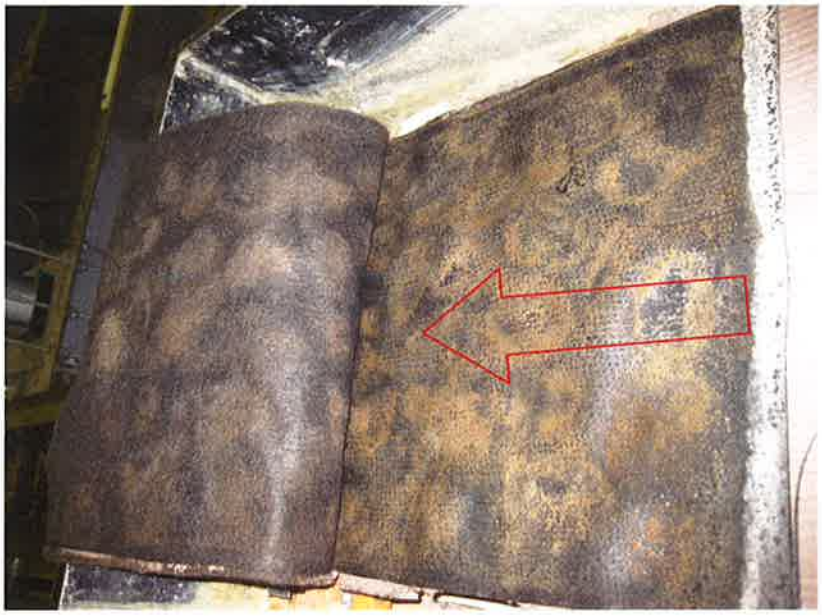


Figure 3. Contact surfaces between nonwoven geotextile and geomembrane at the completion of Test #1C at 3500 psf.

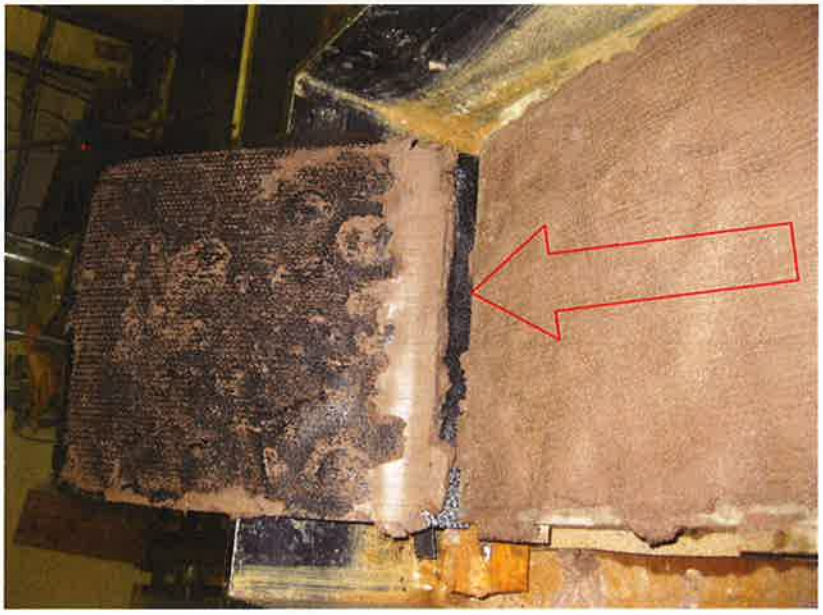


Figure 4. Deformed sgeomembrane and clay surfaces at the completion of Test #1C at 3500 psf.

Geomembrane

- 60-mil

GeoTesting EXPRESS

Client:	Parson Engineering
Project:	Geosynthetic Testing
Project Location:	Syracuse, NY
GTX Project No.:	10596
Test Date:	11/07/11
Tested By:	bfs
Checked By:	jdt

Density of Plastics by the Density-Gradient Technique by ASTM D 1505

Sample ID	Spec. #	Density, g/cm^3
Roll #443557 (GM-9)	1	0.9416
Black, 60 mil textured HDPE geomembrane	2	0.9411
	3	0.9408
	AVG.	0.9412

Sample ID	Spec. #	Density, g/cm^3
Roll #443683 (GM-10)	1	0.9418
Black, 60 mil textured HDPE geomembrane	2	0.9420
	3	0.9419
	AVG.	0.9419

Comments:

Temperature: 23°C

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parson Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: ad
Test Date:	11/06/11	Checked By: bfs

Carbon Black in Olefin Plastics by ASTM D 1603

Sample ID	Specimen Number	Carbon Black, %
Roll #443557 (GM-9) Black, 60 mil textured HDPE geomembrane	1	2.41
	2	2.42
	Average	2.42 ✓

Sample ID	Specimen Number	Carbon Black, %
Roll #443683 (GM-10) Black, 60 mil textured HDPE geomembrane	1	2.56
	2	2.50
	Average	2.53 ✓

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parson Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	11/04/11	Checked By: jdt

Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics by ASTM D 5596

Sample ID	Specimen Number	Category Rating Random Field of View R_f1	R_f2
Roll #443557 (GM-9) Black, 60 mil textured HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID	Specimen Number	Category Rating Random Field of View R_f1	R_f2
Roll #443683 (GM-10) Black, 60 mil textured HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Comments: Method of preparation: Microtome

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parson Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	cwd
Test Date:	11/07/11	Checked By:	bfs
Sample ID:	Roll #443557 (GM-9)		
Sample Description:	Black, 60 mil textured HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	71.4
2	75.7
3	65.5
4	70.5
5	67.2
6	72.4
7	70.0
8	69.6
9	65.8
10	68.0
Average	69.6
Standard Deviation	2.98
Coefficient of Variation, %	4.28

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parson Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	cwd
Test Date:	11/07/11	Checked By:	bfs
Sample ID:	Roll #443683 (GM-10)		
Sample Description:	Black, 60 mil textured HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	66.0
2	66.8
3	67.5
4	67.8
5	74.0
6	70.2
7	71.7
8	70.9
9	66.6
10	64.9
Average	68.6
Standard Deviation	2.76
Coefficient of Variation, %	4.03

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	11/07/11	Checked By:	bfs
Sample ID:	Roll #443557 (GM-9)		
Description:	Black, 60 mil textured HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature, °F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	62.9	164	2601	19	205	3259	435
	2	60.5	163	2691	18	203	3348	507
	3	65.8	165	2505	15	282	4283	491
	4	64.5	165	2561	21	237	3677	476
	5	67.5	171	2528	22	249	3689	488
	Average	64.2	165	2577	19	235	3651	479
	Standard Deviation	2.69	3.09	73.06	2.7	33.0	402.2	27.2
Cross Machine	1	60.0	182	3033	14	208	3477	600
	2	65.8	176	2668	18	179	2723	523
	3	64.7	172	2666	15	195	3010	582
	4	66.4	176	2653	15	196	2959	577
	5	66.5	184	2770	13	188	2824	529
	Average	64.7	178	2758	15	193	2999	562
	Standard Deviation	2.73	4.87	161.0	1.9	10.8	290.1	34.2

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

REVIEWED BY
M. Fountain
PASS GF
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	11/07/11	Checked By:	bfs
Sample ID:	Roll #443683 (GM-10)		
Description:	Black, 60 mil textured HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature, °F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	63.3	163	2581	21	240	3796	486
	2	62.1	163	2628	18	218	3504	461
	3	68.0	156	2301	17	211	3104	444
	4	65.5	169	2574	19	211	3225	435
	5	63.6	160	2522	15	210	3300	488
	Average	64.5	162	2521	18	218	3386	463
	Standard Deviation	2.31	4.45	128.8	2.2	12.8	271.3	24.0
Cross Machine	1	63.3	182	2869	14	194	3070	581
	2	61.0	181	2972	13	207	3390	598
	3	71.4	179	2500	13	189	2650	534
	4	68.0	169	2492	14	178	2611	525
	5	66.6	172	2585	18	180	2704	572
	Average	66.1	177	2684	14	190	2885	562
	Standard Deviation	4.06	5.50	222.2	2.1	11.8	336.1	31.3

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	11/04/11	Checked By:	bfs
Sample ID:	Roll #443557 (GM-9)		
Description:	Black, 60 mil textured HDPE geomembrane		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	149
2	133
3	160
4	160
5	148
Average	150
Standard Deviation	11.2
Coefficient of Variation, %	7.44

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: ad
Test Date:	11/04/11	Checked By: bfs
Sample ID:	Roll #443683 (GM-10)	
Description:	Black, 60 mil textured HDPE geomembrane	

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	152
2	146
3	142
4	143
5	141
Average	145
Standard Deviation	4.19
Coefficient of Variation, %	2.90

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parson Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	11/07/11	Checked By:	jdt
Sample ID:	Roll #443557 (GM-9)		
Description:	Black, 60 mil textured HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	67.7	64	69.2	65
2	63.3	60	67.4	62
3	69.0	64	73.4	61
4	72.8	63	68.1	57
5	68.8	58	69.2	57
6	70.6	59	68.8	61
7	66.6	56	67.2	58
8	68.2	64	65.1	56
9	70.1	61	70.8	62
10	72.5	64	69.0	58
Average	68.9	61	68.8	60
Standard Deviation	2.82	2.8	2.21	3.0

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parson Engineering		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	11/07/11	Checked By:	jdt
Sample ID:	Roll #443683 (GM-10)		
Description:	Black, 60 mil textured HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	67.4	64	72.2	56
2	68.9	59	68.8	62
3	65.9	57	65.1	66
4	65.7	57	68.1	55
5	67.1	63	71.1	58
6	71.2	64	75.1	56
7	66.6	62	64.2	63
8	71.1	64	75.3	62
9	72.6	63	71.2	54
10	68.2	54	68.5	59
Average	68.5	61 ✓	70.0	59 ✓
Standard Deviation	2.43	3.7	3.76	4.0

Comments:

REVIEWED BY
M. Fountain
PASS
NOV 08 2011

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering
Project:	Onondaga Lake Sediment Consolidation Area - Phase 2
Project Location:	Syracuse, NY
GTX Project No.:	11644
Test Date:	03/29/12
Tested By:	ad
Checked By:	bfs

Density of Plastics by the Density-Gradient Technique by ASTM D 1505

Sample ID	Spec. #	Density, g/cm^3
Roll #311337-12 Black, microspike 60 mil HDPE geomembrane	1	0.9417
	2	0.9419
	3	0.9419
	AVG.	0.9418

GM-12

Sample ID	Spec. #	Density, g/cm^3
Roll #311558-12 Black, microspike 60 mil HDPE geomembrane	1	0.9427
	2	0.9427
	3	0.9427
	AVG.	0.9427

GM-13

Sample ID	Spec. #	Density, g/cm^3
Roll #311680-12 Black, microspike 60 mil HDPE geomembrane	1	0.9430
	2	0.9432
	3	0.9433
	AVG.	0.9432

GM-14

Comments: Temperature: 23° C

✓

≥ 0.94 g/cm^3

DJR

30 March '12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/28/12	Checked By:	bfs

Carbon Black in Olefin Plastics by ASTM D 1603

Sample ID GM-12	Specimen Number	Carbon Black, %
Roll #311337-12 Black, microspike 60 mil HDPE geomembrane	1	2.28
	2	2.24
	Average	2.26

Sample ID GM-13	Specimen Number	Carbon Black, %
Roll #311558-12 Black, microspike 60 mil HDPE geomembrane	1	2.33
	2	2.30
	Average	2.32

Sample ID GM-14	Specimen Number	Carbon Black, %
Roll #311680-12 Black, microspike 60 mil HDPE geomembrane	1	2.32
	2	2.29
	Average	2.31

Comments:

2 to 3 %. DJB

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2	
Project Location:	Syracuse, NY	
GTX #:	11644	Tested By: bfs
Test Date:	03/28/12	Checked By: jdt

Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics by ASTM D 5596

Sample ID GM-12	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #311337-12 Black, microspike 60 mil HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID GM-13	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #311558-12 Black, microspike 60 mil HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID GM-14	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #311680-12 Black, microspike 60 mil HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Comments: Method of preparation: Microtome

9 out 10 cat 1, 2 ok

10 out 10 cat 1, 2, 3

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/27/12	Checked By:	bfs
Sample ID:	Roll #311337-12 GM-12		
Sample Description:	Black, microspike 60 mil HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	69.4
2	69.6
3	67.9
4	68.7
5	66.4
6	66.3
7	65.9
8	65.6
9	61.8
10	62.4
Average	66.4 ✓
Standard Deviation	2.55
Coefficient of Variation, %	3.84

Comments:

60 MARV

30 March '12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/27/12	Checked By:	bfs
Sample ID:	Roll #311337-12 GM-12		
Description:	Black, microspike 60 mil HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature, °F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	67.4	159	2358	19	176	2611	414
	2	67.7	158	2336	17	193	2845	419
	3	62.0	151	2437	21	191	3090	423
	4	65.5	158	2412	18	181	2759	421
	5	66.6	165	2481	15	184	2766	415
	Average	65.8	✓158	2405	✓18	✓185	2814	✓ 418
	Standard Deviation	2.33	5.00	58.71	2.2	7.08	175.9	3.85
Cross Machine	1	66.1	172	2605	15	171	2584	505
	2	67.6	167	2477	13	172	2546	503
	3	63.9	162	2543	14	166	2593	510
	4	63.5	164	2580	13	162	2556	506
	5	65.0	166	2547	13	178	2731	543
	Average	65.2	✓166	2551	✓ 14	✓170	2602	✓ 513
	Standard Deviation	1.68	3.82	48.28	0.9	5.91	74.60	16.7

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

> 90 lb/in 100% break

126 lb/in 12% yield

DRB

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/28/12	Checked By:	bfs
Sample ID:	Roll #311337-12 GM-12		
Description:	Black, microspike 60 mil HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	67.8	61	67.4	61
2	67.3	64	66.4	58
3	66.9	64	66.8	62
4	67.2	61	66.9	62
5	66.7	61	68.6	58
6	69.7	65	69.5	62
7	68.4	60	65.9	57
8	62.8	58	63.8	56
9	64.7	59	62.3	53
10	61.8	56	64.3	56
Average	66.3	61 ✓	66.2	58 ✓
Standard Deviation	2.48	3.0	2.21	3.0

Comments:

≥ 42

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/30/12	Checked By:	bfs
Sample ID:	Roll #311337-12 GM-12		
Description:	Black, microspike 60 mil HDPE geomembrane		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	138
2	137
3	150
4	141
5	136
Average	140
Standard Deviation	5.91
Coefficient of Variation, %	4.21

Comments:

>90 lb 1005

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/27/12	Checked By:	bfs
Sample ID:	Roll #311558-12 GM-13		
Sample Description:	Black, microspike 60 mil HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	67.3
2	74.1
3	70.0
4	69.1
5	66.0
6	65.4
7	60.4
8	64.4
9	63.0
10	63.6
Average	66.3
Standard Deviation	3.75
Coefficient of Variation, %	5.66

Comments:

60 Mav

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/27/12	Checked By:	bfs
Sample ID:	Roll #311558-12 GM-13		
Description:	Black, microspike 60 mil HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	70.7	168	2374	18	207	2922	461
	2	71.9	170	2364	18	206	2868	465
	3	69.4	168	2417	15	185	2670	466
	4	65.7	152	2316	19	204	3107	436
	5	63.8	146	2291	17	196	3072	430
	Average	68.3	161	2352	17	200	2928	452
	Standard Deviation	3.45	10.9	49.60	1.5	9.09	175.4	17.2
Cross Machine	1	59.9	164	2738	14	169	2817	529
	2	68.5	177	2590	13	183	2669	526
	3	65.0	179	2757	17	177	2722	494
	4	69.3	179	2578	13	214	3083	608
	5	64.4	167	2594	17	190	2956	593
	Average	65.4	173	2651	15	186	2849	550
	Standard Deviation	3.74	7.16	88.25	2.0	17.2	170.4	48.4

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

> 90 lb/in 100% break
126 lb/in 12% yield

DRS

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/28/12	Checked By:	bfs
Sample ID:	Roll #311558-12 GM-13		
Description:	Black, microspike 60 mil HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	64.2	60	62.8	59
2	66.3	58	62.5	58
3	64.0	61	66.6	60
4	65.0	60	65.9	59
5	65.9	58	65.1	56
6	66.0	61	64.2	60
7	70.1	64	70.0	62
8	70.0	64	71.2	65
9	69.9	60	67.5	62
10	69.5	67	66.1	58
Average	67.1	61	66.2	60
Standard Deviation	2.51	2.7	2.84	2.5

Comments:

≥ 42

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/30/12	Checked By:	bfs
Sample ID:	Roll #311558-12 GM-13		
Description:	Black, microspike 60 mil HDPE geomembrane		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	152
2	146
3	143
4	147
5	136
Average	145 ✓
Standard Deviation	5.99
Coefficient of Variation, %	4.13

Comments:

> 90 lbs

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/27/12	Checked By:	bfs
Sample ID:	Roll #311680-12 GM-14		
Sample Description:	Black, microspike 60 mil HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	69.3
2	67.6
3	66.5
4	64.9
5	69.6
6	71.0
7	69.1
8	69.0
9	66.6
10	64.2
Average	67.8
Standard Deviation	2.09
Coefficient of Variation, %	3.08

Comments:

60 Mil DCS

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/27/12	Checked By:	bfs
Sample ID:	Roll #311680-12 GM-14		
Description:	Black, microspike 60 mil HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	67.7	171	2527	19	196	2889	426
	2	68.0	171	2515	17	206	3027	421
	3	72.4	181	2497	18	200	2757	420
	4	68.0	164	2419	21	191	2804	408
	5	69.5	167	2398	18	194	2797	407
	Average	69.1	171	2471	19	197	2855	416
	Standard Deviation	1.97	6.25	58.48	1.5	5.73	107.7	8.44
Cross Machine	1	71.4	170	2385	13	184	2583	549
	2	71.6	182	2546	13	176	2463	481
	3	70.3	183	2603	17	186	2645	508
	4	68.9	175	2541	17	170	2476	494
	5	69.9	180	2579	15	173	2479	486
	Average	70.4	178	2531	15	178	2529	504
	Standard Deviation	1.13	5.40	85.28	2.0	6.82	80.82	27.4

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

90 lb/in 100% break
126 lb/in 12% yield
DDB

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	03/28/12	Checked By:	bfs
Sample ID:	Roll #311680-12 GM-14		
Description:	Black, microspike 60 mil HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	68.9	67	66.5	65
2	69.5	64	67.7	63
3	66.8	65	63.3	65
4	71.8	65	65.1	60
5	70.5	67	69.5	66
6	70.3	67	68.0	68
7	69.5	69	68.5	68
8	67.0	63	64.8	63
9	64.3	63	68.2	62
10	68.6	62	72.0	65 ✓
Average	68.7	65 ✓	67.3	65
Standard Deviation	2.18	2.2	2.53	2.6

Comments: ≥42

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2
Project Location:	Syracuse, NY
GTX #:	11644 Tested By: ad
Test Date:	03/30/12 Checked By: bfs
Sample ID:	Roll #311680-12 GM-14
Description:	Black, microspike 60 mil HDPE geomembrane

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	151
2	154
3	158
4	151
5	148
Average	153
Standard Deviation	4.01
Coefficient of Variation, %	2.63

Comments:

≥ 90 lbs DOS

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering
Project:	Onondaga Lake Sediment Consolidation Area - Phase 2
Project Location:	Syracuse, NY
GTX Project No.:	11644
Test Date:	04/18/12
Tested By:	bfs
Checked By:	gtt

Density of Plastics by the Density-Gradient Technique by ASTM D 1505

Sample ID GM-15	Spec. #	Density, g/cm³
Roll #312105-12 Black, microspike 60 mil HDPE geomembrane	1	0.9417
	2	0.9417
	3	0.9418
	AVG.	0.9418

Sample ID GM-16	Spec. #	Density, g/cm³
Roll #312227-12 Black, microspike 60 mil HDPE geomembrane	1	0.9420
	2	0.9421
	3	0.9419
	AVG.	0.9420

Comments: Temperature: 23° C

> 0.94 g/cm³ DWH

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2	
Project Location:	Syracuse, NY	
GTX #:	11644	Tested By: ad
Test Date:	04/18/12	Checked By: bfs

Carbon Black in Olefin Plastics by ASTM D 1603

Sample ID GM-15	Specimen Number	Carbon Black, %
Roll #312105-12 Black, microspike 60 mil HDPE geomembrane	1	2.25
	2	2.26
	Average	2.25

Sample ID GM-16	Specimen Number	Carbon Black, %
Roll #312227-12 Black, microspike 60 mil HDPE geomembrane	1	2.29
	2	2.28
	Average	2.28

Comments:

2+3%

DWT

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2	
Project Location:	Syracuse, NY	
GTX #:	11644	Tested By: bfs
Test Date:	04/18/12	Checked By: gtt

Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics by ASTM D 5596

Sample ID GM-15	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #312105-12 Black, microspike 60 mil HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID GM-16	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #312227-12 Black, microspike 60 mil HDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Comments: Method of preparation: Microtome

9 out 10 CAT 1 OR 2 ACN.Y

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/16/12	Checked By:	bfs
Sample ID:	Roll #312105-12 GM-15		
Sample Description:	Black, microspike 60 mil HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	65.6
2	66.4
3	68.5
4	66.8
5	67.4
6	69.2
7	68.1
8	68.3
9	67.3
10	64.7
Average	67.2
Standard Deviation	1.33
Coefficient of Variation, %	1.97

Comments:

60 MARV

DWF

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/16/12	Checked By:	bfs
Sample ID:	Roll #312227-12 GM-15		
Sample Description:	Black, microspike 60 mil HDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D 5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	65.3
2	67.0
3	67.6
4	66.0
5	67.5
6	66.6
7	65.0
8	65.8
9	67.2
10	66.1
Average	66.4
Standard Deviation	0.85
Coefficient of Variation, %	1.28

Comments:

60 Mil 2r Dupt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/17/12	Checked By:	bfs
Sample ID:	Roll #312105-12 GM-15		
Description:	Black, microspike 60 mil HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	64.8	151	2326	17	194	3001	443
	2	65.2	156	2398	18	193	2953	420
	3	69.0	163	2368	17	191	2773	468
	4	68.8	164	2392	18	198	2881	489
	5	65.4	153	2346	17	188	2872	425
	Average	66.6	158	2366	17	193	2896	449
	Standard Deviation	2.07	6.08	30.42	0.5	3.85	86.6	29.21
Cross Machine	1	67.5	172	2545	14	186	2756	548
	2	66.3	166	2505	13	186	2806	555
	3	66.5	177	2658	15	182	2732	522
	4	60.9	174	2863	13	191	3137	564
	5	66.7	177	2662	13	187	2812	544
	Average	65.6	173	2646	14	186	2849	547
	Standard Deviation	2.67	4.59	139.16	0.9	3.30	164.68	15.7

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

>90 180 BREAK DWH
>126 12 YIELD DWH

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/17/12	Checked By:	bfs
Sample ID:	Roll #312105-12 GM-15		
Description:	Black, microspike 60 mil HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	63.7	64	65.7	63
2	62.7	62	65.0	59
3	64.9	62	66.4	59
4	67.6	60	65.9	59
5	63.8	60	68.9	58
6	66.1	64	69.5	66
7	66.6	64	67.2	61
8	69.7	66	66.5	58
9	64.1	58	65.2	60
10	65.7	58	61.3	57
Average	65.5	62	66.2	60
Standard Deviation	2.11	2.8	2.26	2.5

Comments:

> 42 LB Both

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/16/12	Checked By:	bfs
Sample ID:	Roll #312105-12 GM-15		
Description:	Black, microspike 60 mil HDPE geomembrane		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	137
2	149
3	149
4	148
5	145
Average	146
Standard Deviation	5.03
Coefficient of Variation, %	3.46

Comments:

7 % CB DJH

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/17/12	Checked By:	bfs
Sample ID:	Roll #312227-12 GM-16		
Description:	Black, microspike 60 mil HDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation:	2.5 in.	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	65.2	156	2396	18	193	2963	423
	2	63.5	155	2441	18	185	2913	424
	3	65.9	152	2308	17	190	2887	440
	4	66.8	152	2277	17	185	2767	420
	5	68.8	159	2317	18	204	2967	462
	Average	66.0	155	2348	18	191	2899	434
	Standard Deviation	1.96	3.11	68.12	0.5	7.94	81.1	17.58
Cross Machine	1	67.2	169	2517	17	169	2515	516
	2	60.5	169	2787	13	174	2869	522
	3	68.0	167	2453	13	168	2469	533
	4	67.0	166	2474	13	170	2537	528
	5	69.8	169	2427	13	175	2508	547
	Average	66.5	168	2532	14	171	2580	529
	Standard Deviation	3.52	1.59	146.62	1.8	3.06	163.77	11.8

Comments:
yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

7 90 100 BREAK Dwt
7 126 12 YIELD Dwt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/17/12	Checked By:	bfs
Sample ID:	Roll #312227-12 GM-16		
Description:	Black, microspike 60 mil HDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	65.7	63	65.3	62
2	68.7	63	66.1	60
3	66.0	60	67.0	58
4	65.0	61	64.0	56
5	66.1	60	67.9	58
6	67.6	62	69.8	64
7	66.9	58	66.8	61
8	65.7	60	67.7	62
9	67.5	58	69.5	60
10	66.4	57	69.3	60
Average	66.5	60	67.3	60
Standard Deviation	1.13	2.1	1.89	2.3

Comments:

> 1/2 LB JWH

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering		
Project Name:	Onondaga Lake Sediment Consolidation Area - Phase 2		
Project Location:	Syracuse, NY		
GTX #:	11644	Tested By:	ad
Test Date:	04/16/12	Checked By:	bfs
Sample ID:	Roll #312227-12 GM-16		
Description:	Black, microspike 60 mil HDPE geomembrane		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	141
2	148
3	149
4	142
5	144
Average	145
Standard Deviation	3.49
Coefficient of Variation, %	2.41

Comments:

> 90 lb DWH

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Geotextile

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	01/02/12	Checked By: jdt
Sample ID:	Roll #22388.1 ~~(GT-007)~~ GT-013	
Description:	Black, nonwoven geotextile	

Mass Per Unit Area of Geotextiles by ASTM D 5261

Specimen Number	Mass Per Unit Area, oz/yd^2	Mass Per Unit Area, g/m^2
1	26.3	893
2	25.4	863
3	25.2	855
4	23.9	811
5	25.7	870
Average	25.3 ✓	858
Standard Deviation	0.89	30.2

Comments: Specimen Size, in: 4 inch x 8 inch

> 24 oz/yd^2 DJB

2/9/12 DW

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.1 (~~GT-007~~) GT-013		
Description:	Black, nonwoven geotextile		

Breaking Load and Elongation of Geotextiles (Grab Method) by ASTM D 4632

constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Obtainable Load:	2500 lb	Padding:	---
		Condition:	dry

Specimen Number	Machine Direction		Cross Machine Direction	
	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %
1	598	142	637	133
2	621	133	783	130
3	576	121	620	125
4	598	125	650	134
5	616	122	632	135
6	632	128	591	127
7	547	134	640	124
8	621	127	672	127
9	595	124	789	138
10	664	127	716	124
Average	✓ 607	128	✓ 673	130
Standard Deviation	31.9	6.40	67.9	5.03
Coefficient of Variation, %	5.26	4.98	10.1	3.88

Comments: > 230 lb DJB

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Phase II

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.1 (~~GT-007~~) GT-13		
Sample Description:	Black, nonwoven geotextile		

Index Trapezoidal Tearing Strength of Geotextiles by ASTM D 4533

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	1 in	Grips:	Curtis "Geo" Grip
Condition:	dry		

Specimen Number	Maximum Tear Strength, lb	
	Machine Direction	Cross Machine Direction
1	164	246
2	170	254
3	207	224
4	210	200
5	222	220
6	206	236
7	198	277
8	191	264
9	182	222
10	294	283
Average	205	243
Standard Deviation	36.4	26.9
Coefficient of Variation, %	17.8	11.1

Comments:

≥ 95 lbs

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: ad
Test Date:	02/02/12	Checked By: bfs
Sample ID:	Roll #22388.1 (~~GT-007~~) GT-13	
Description:	Black, nonwoven geotextile	

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	333
2	328
3	359
4	402
5	338
6	292
7	367
8	302
9	336
10	330
11	298
12	350
13	400
14	345
15	316
Average	340
Standard Deviation	32.9
Coefficient of Variation, %	9.69

Comments:

> 250 lbs

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	01/02/12	Checked By: jdt
Sample ID:	Roll #22388.20 ~~(GT-008)~~ GT-14	
Description:	Black, nonwoven geotextile	

Mass Per Unit Area of Geotextiles by ASTM D 5261

Specimen Number	Mass Per Unit Area, oz/yd^2	Mass Per Unit Area, g/m^2
1	24.6	835
2	27.9	947
3	25.2	855
4	26.6	902
5	25.1	851
Average	25.9 ✓	878
Standard Deviation	1.36	46.1

Comments: Specimen Size, in: 4 inch x 8 inch

> 24 oz/yd^2

pw 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.20 (~~GT-008~~) GT-14		
Description:	Black, nonwoven geotextile		

Breaking Load and Elongation of Geotextiles (Grab Method) by ASTM D 4632

constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Obtainable Load:	2500 lb	Padding:	---
		Condition:	dry

Specimen Number	Machine Direction		Cross Machine Direction	
	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %
1	542	140	682	124
2	604	128	703	131
3	551	129	691	120
4	593	120	714	119
5	564	124	618	124
6	560	117	686	134
7	572	121	737	115
8	669	133	645	116
9	641	128	702	115
10	615	122	617	124
Average	591	126	679	122
Standard Deviation	41.4	6.86	40.2	6.53
Coefficient of Variation, %	7.01	5.44	5.92	5.34

Comments: 230 lb DGB

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	02/02/12	Checked By:	bfs
Sample ID:	Roll #22388.20 ~~(GT-008)~~ GT-14		
Description:	Black, nonwoven geotextile		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	317
2	328
3	339
4	343
5	361
6	335
7	296
8	335
9	314
10	340
11	296
12	346
13	256
14	323
15	316
Average	323 ✓
Standard Deviation	25.8
Coefficient of Variation, %	7.98

Comments:

7250 lb

DK

PW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.20 (~~GT-008~~) GT-14		
Sample Description:	Black, nonwoven geotextile		

Index Trapezoidal Tearing Strength of Geotextiles by ASTM D 4533

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	1 in	Grips:	Curtis "Geo" Grip
Condition:	dry		

Specimen Number	Maximum Tear Strength, lb	
	Machine Direction	Cross Machine Direction
1	193	242
2	195	300
3	195	271
4	190	256
5	189	253
6	179	314
7	180	279
8	200	259
9	172	258
10	179	256
Average	~ 187	~ 269
Standard Deviation	9.15	22.6
Coefficient of Variation, %	4.89	8.42

Comments:

95 lb

DJK

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	01/02/12	Checked By: jdt
Sample ID:	Roll #22388.56 (~~GT-009~~) GT-15	
Description:	Black, nonwoven geotextile	

Mass Per Unit Area of Geotextiles by ASTM D 5261

Specimen Number	Mass Per Unit Area, oz/yd^2	Mass Per Unit Area, g/m^2
1	26.0	881
2	23.9	810
3	24.0	813
4	23.7	804
5	23.5	796
Average	24.2	821
Standard Deviation	1.00	34.0

Comments: Specimen Size, in: 4 inch x 8 inch

≥ 24 oz/sy

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.56 (~~GT-009~~) GT-15		
Description:	Black, nonwoven geotextile		

Breaking Load and Elongation of Geotextiles (Grab Method) by ASTM D 4632

constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Obtainable Load:	2500 lb	Padding:	---
		Condition:	dry

Specimen Number	Machine Direction		Cross Machine Direction	
	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %
1	643	120	587	144
2	551	120	682	129
3	586	111	636	124
4	544	123	578	144
5	603	122	605	124
6	534	116	615	148
7	531	117	668	125
8	564	124	598	117
9	552	124	631	124
10	574	120	626	130
Average	568	120	622	131
Standard Deviation	34.7	4.08	33.6	10.6
Coefficient of Variation, %	6.11	3.41	5.40	8.10

Comments: 2301b DDR pw 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	02/02/12	Checked By:	bfs
Sample ID:	Roll #22388.56 (~~GT-0097~~ GT-15)		
Description:	Black, nonwoven geotextile		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	334
2	359
3	332
4	294
5	373
6	348
7	399
8	336
9	313
10	326
11	339
12	309
13	315
14	375
15	350
Average	340
Standard Deviation	28.1
Coefficient of Variation, %	8.26

Comments:

2501b

pw 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.56 (~~GT-009~~) GT-15		
Sample Description:	Black, nonwoven geotextile		

Index Trapezoidal Tearing Strength of Geotextiles by ASTM D 4533

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	1 in	Grips:	Curtis "Geo" Grip
Condition:	dry		

Specimen Number	Maximum Tear Strength, lb	
	Machine Direction	Cross Machine Direction
1	203	334
2	205	241
3	209	241
4	187	249
5	211	290
6	204	249
7	229	258
8	213	244
9	246	290
10	245	251
Average	215	265
Standard Deviation	19.0	30.6
Coefficient of Variation, %	8.82	11.6

Comments: 95lb DW DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	01/02/12	Checked By: jdt
Sample ID:	Roll #22388.111 (~~GT-010~~) GT-K6	
Description:	Black, nonwoven geotextile	

Mass Per Unit Area of Geotextiles by ASTM D 5261

Specimen Number	Mass Per Unit Area, oz/yd^2	Mass Per Unit Area, g/m^2
1	27.0	915
2	27.9	946
3	26.5	898
4	24.9	845
5	27.6	934
Average	26.8	907
Standard Deviation	1.17	39.5

Comments: Specimen Size, in: 4 inch x 8 inch

24oz/sy'd DK

PW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.111 ~~(GT-010)~~ GT-16		
Description:	Black, nonwoven geotextile		

Breaking Load and Elongation of Geotextiles (Grab Method) by ASTM D 4632

constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Obtainable Load:	2500 lb	Padding:	---
		Condition:	dry

	Machine Direction		Cross Machine Direction	
Specimen Number	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %
1	646	124	691	117
2	614	127	747	120
3	604	126	670	117
4	590	127	697	117
5	538	124	626	127
6	560	130	636	134
7	618	128	734	123
8	587	127	727	123
9	606	127	650	120
10	640	131	660	117
Average	600	127	684	122
Standard Deviation	33.4	2.23	42.2	5.54
Coefficient of Variation, %	5.57	1.76	6.18	4.56

Comments:

230 lb

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	02/02/12	Checked By:	bfs
Sample ID:	Roll #22388.111 (~~GT-0107~~) GT-16		
Description:	Black, nonwoven geotextile		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	378
2	292
3	324
4	337
5	397
6	339
7	338
8	328
9	317
10	306
11	363
12	406
13	312
14	363
15	288
Average	339
Standard Deviation	35.9
Coefficient of Variation, %	10.6

Comments:

250 lb

DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.111 (~~GT-010~~ GT-16)		
Sample Description:	Black, nonwoven geotextile		

Index Trapezoidal Tearing Strength of Geotextiles by ASTM D 4533

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	1 in	Grips:	Curtis "Geo" Grip
Condition:	dry		

Specimen Number	Maximum Tear Strength, lb	
	Machine Direction	Cross Machine Direction
1	185	322
2	186	303
3	192	296
4	180	273
5	178	298
6	193	303
7	167	335
8	179	366
9	213	362
10	211	334
Average	188	319
Standard Deviation	14.5	30.1
Coefficient of Variation, %	7.70	9.44

Comments:

956

DDS

PW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	01/02/12	Checked By: jdt
Sample ID:	Roll #22388.221 (~~GT-011~~) GT-17	
Description:	Black, nonwoven geotextile	

Mass Per Unit Area of Geotextiles by ASTM D 5261

Specimen Number	Mass Per Unit Area, oz/yd^2	Mass Per Unit Area, g/m^2
1	24.8	841
2	24.9	843
3	23.5	796
4	24.0	813
5	23.7	804
Average	24.2	819
Standard Deviation	0.63	21.5

Comments: Specimen Size, in: 4 inch x 8 inch

24 oz/yd DQS

10W 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.121 (~~GT-011~~) GT-17		
Description:	Black, nonwoven geotextile		

Breaking Load and Elongation of Geotextiles (Grab Method) by ASTM D 4632

constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Obtainable Load:	2500 lb	Padding:	---
		Condition:	dry

	Machine Direction		Cross Machine Direction	
Specimen Number	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %
1	587	127	686	137
2	586	127	664	130
3	542	117	606	124
4	553	134	663	120
5	550	119	555	116
6	549	130	770	120
7	581	123	668	130
8	503	129	592	144
9	556	123	551	130
10	463	117	637	126
Average	547	125	639	128
Standard Deviation	38.6	5.78	66.2	8.43
Coefficient of Variation, %	7.06	4.64	10.4	6.60

Comments: 2301b

DAS
DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	ad
Test Date:	02/02/12	Checked By:	bfs
Sample ID:	Roll #22388.221 (~~GT-011~~ GT-17)		
Description:	Black, nonwoven geotextile		

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	377
2	308
3	286
4	316
5	320
6	313
7	338
8	403
9	360
10	404
11	502
12	373
13	350
14	358
15	292
Average	353
Standard Deviation	55.4
Coefficient of Variation, %	15.7

Comments:

250 lb

DQS

PW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	02/01/12	Checked By:	jdt
Sample ID:	Roll #22388.221 ~~(GT-011)~~ GT-17		
Sample Description:	Black, nonwoven geotextile		

Index Trapezoidal Tearing Strength of Geotextiles by ASTM D 4533

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	1 in	Grips:	Curtis "Geo" Grip
Condition:	dry		

Specimen Number	Maximum Tear Strength, lb	
	Machine Direction	Cross Machine Direction
1	186	284
2	205	229
3	200	251
4	218	253
5	233	247
6	162	258
7	231	250
8	183	259
9	234	299
10	197	242
Average	205	257
Standard Deviation	24.3	20.3
Coefficient of Variation, %	11.8	7.91

Comments:

95 lb DOB DW 2/9/12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	10/15/12	Checked By: jdt
Sample ID:	~~GT-014~~ Roll #130431076	GT-18
Description:	Black, nonwoven geotextile	

Index Puncture Resistance of Geomembranes and Related Products by ASTM D 4833

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Clamping Method:	Circular Clamp Attachment		

Specimen Number	Puncture Resistance, lbs
1	358
2	307
3	285
4	345
5	286
6	314
7	373
8	342
9	281
10	385
11	394
12	373
13	348
14	321
15	322
Average	336
Standard Deviation	37.0
Coefficient of Variation, %	11.0

Comments:

7250

10-25-12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science	
Project Name:	Geosynthetic Testing	
Project Location:	Syracuse, NY	
GTX #:	10596	Tested By: bfs
Test Date:	10/15/12	Checked By: jdt
Sample ID:	~~GT-014~~ Roll #130431076 GT-18	
Description:	Black, nonwoven geotextile	

Mass Per Unit Area of Geotextiles by ASTM D 5261

Specimen Number	Mass Per Unit Area, oz/yd^2	Mass Per Unit Area, g/m^2
1	24.5	832
2	27.4	928
3	24.7	839
4	26.5	898
5	27.1	920
Average	26.1	883
Standard Deviation	1.34	45.3

Comments: Specimen Size, in: 4 inch x 8 inch

JWC
10-25-12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	10/15/12	Checked By:	jdt
Sample ID:	~~GT-014~~ Roll #130431076	GT-18	
Description:	Black, nonwoven geotextile		

Breaking Load and Elongation of Geotextiles (Grab Method) by ASTM D 4632

constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Obtainable Load:	2500 lb	Padding:	---
		Condition:	dry

	Machine Direction		Cross Machine Direction	
Specimen Number	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %	Maximum Breaking Strength, lb	Apparent Breaking Elongation, %
1	503	120	1051	74
2	522	120	788	70
3	458	109	895	74
4	518	102	844	73
5	513	104	831	75
6	458	106	819	87
7	506	102	843	77
8	499	101	896	73
9	529	125	793	75
10	468	114	931	68
Average	497	110	869	75
Standard Deviation	26.4	8.83	78.8	5.1
Coefficient of Variation, %	5.32	8.01	9.07	6.8

Comments:

JWC 10-25-12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Geosynthetic Testing		
Project Location:	Syracuse, NY		
GTX #:	10596	Tested By:	bfs
Test Date:	10/15/12	Checked By:	jdt
Sample ID:	~~GT-014~~ Roll #130431076		
Sample Description:	Black, nonwoven geotextile	GT-18	

Index Trapezoidal Tearing Strength of Geotextiles by ASTM D 4533

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	1 in	Grips:	Curtis "Geo" Grip
Condition:	dry		

Specimen Number	Maximum Tear Strength, lb	
	Machine Direction	Cross Machine Direction
1	227	377
2	193	320
3	171	417
4	174	396
5	200	382
6	174	328
7	178	352
8	198	416
9	194	325
10	180	352
Average	189	367
Standard Deviation	17.0	36.4
Coefficient of Variation, %	9.00	9.93

Comments:

JWC 10-25-12

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

APPENDIX H

Installer's Certificate of Acceptance of Subgrade Surface

CERTIFICATE OF ACCEPTANCE
SUBGRADE SURFACE

INSTALLER	
NAME:	Chenango Contracting
ADDRESS:	29 Arbutus Road
	Johnson City, NY 13790
INSTALLER AUTHORIZED REPRESENTATIVE:	Bounthan Keophiphath

PROJECT	
NAME:	Phase II
LOCATION:	522 Gerelock Road
	Camillus, NY 13209
OWNER:	Honeywell / Parsons

I, The undersigned, duly authorized representative of Chenango Contractors do hereby accept the surface on which the geosynthetics will be installed and shall be responsible for maintaining the suitability of this surface, in accordance with the project specifications. (i.e., The contractor shall not install the geosynthetics until the subgrade surface is acceptable. Installation of the geosynthetics will be considered acceptance of the subgrade.)

PRIMARY: [X] SECONDARY: [ ] OTHER: _____

DATE	PANEL NOS.	SIGNATURE
5-15-2012	6-001 – 6-045	
5-16-2012	6-046 – 6-054	
5-18-2012	6-055 – 6-079	
5-24-2012	6-080 – 6-109 DOW	
6-1-2012	6-111 – 6-121	
6-8-2012	6-122 – 6-135	
6-14-2012	6-136 – 6-153	
6-18-2012	6-154 – 6-174	
6-21-2012	6-175 – 6-223	

APPENDIX I

Geomembrane Panel Placement Monitoring Logs

Geosyntec
consultants

Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary Series: 6 Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
1	7110583-443566-11	5/15/2012	8:04	Phase II	22.5	48	DWH
2	7110583-443566-11	5/15/2012	8:06	Phase II	22.5	47	DWH
3	7110583-443566-11	5/15/2012	8:09	Phase II	22.5	47	DWH
4	7110583-443566-11	5/15/2012	8:13	Phase II	22.5	47	DWH
5	7110583-443566-11	5/15/2012	8:16	Phase II	22.5	48	DWH
6	7110583-443566-11	5/15/2012	8:19	Phase II	22.5	49.5	DWH
7	7110583-443566-11	5/15/2012	8:23	Phase II	22.5	50	DWH
8	7110583-443566-11	5/15/2012	8:25	Phase II	22.5	49	DWH
9	7120199-311454-12	5/15/2012	8:42	Phase II	22.5	49.5	DWH
10	7120199-311454-12	5/15/2012	8:45	Phase II	22.5	50	DWH
11	7120199-311454-12	5/15/2012	8:49	Phase II	22.5	50	DWH
12	7120199-311454-12	5/15/2012	8:51	Phase II	22.5	50.5	DWH
13	7120199-311454-12	5/15/2012	8:53	Phase II	22.5	51	DWH
14	7120199-311454-12	5/15/2012	8:56	Phase II	22.5	51	DWH
15	7120199-311454-12	5/15/2012	8:58	Phase II	22.5	51	DWH
16	7120199-311454-12	5/15/2012	9:00	Phase II	22.5	50	DWH
17	7120199-311454-12	5/15/2012	9:04	Phase II	22.5	50	DWH
18	7120200-311340-12	5/15/2012	9:10	Phase II	22.5	49	DWH
19	7120200-311340-12	5/15/2012	9:14	Phase II	22.5	48.5	DWH
20	7120200-311340-12	5/15/2012	9:15	Phase II	22.5	48	DWH
21	7120200-311340-12	5/15/2012	9:18	Phase II	22.5	47	DWH
22	7120200-311340-12	5/15/2012	9:21	Phase II	22.5	46	DWH
23	7120200-311340-12	5/15/2012	9:23	Phase II	22.5	46	DWH
24	7120200-311340-12	5/15/2012	9:25	Phase II	22.5	45.5	DWH
25	7120200-311340-12	5/15/2012	9:27	Phase II	22.5	44	DWH
26	7120200-311340-12	5/15/2012	9:27	Phase II	22.5	43	DWH
27	7120200-311340-12	5/15/2012	9:30	Phase II	22.5	17.5	DWH
28	7120200-311444-12	5/15/2012	10:08	Phase II	22.5	31.5	DWH
29	7120200-311340-12	5/15/2012	10:12	Phase II	14	11	DWH
30	7120200-311444-12	5/15/2012	10:40	Phase II	22.5	458	DWH
31	7120199-311449-12	5/15/2012	10:50	Phase II	22.5	174.5	DWH

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Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary | Series: 6 | Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
32	7120199-311449-12	5/15/2012	11:15	Phase II	22.5	313	DWH
33	7120200-311445-12	5/15/2012	11:32	Phase II	22.5	321.5	DWH
34	7120200-311445-12	5/15/2012	13:10	Phase II	22.5	178	DWH
35	7120199-311450-12	5/15/2012	13:32	Phase II	22.5	461.5	DWH
36	7120199-311450-12	5/15/2012	13:47	Phase II	22.5	37.5	DWH
37	7120200-311447-12	5/15/2012	14:15	Phase II	22.5	510	DWH
38	8110773-312219-12	5/15/2012	14:27	Phase II	22.5	94.5	DWH
39	8110773-312219-12	5/15/2012	14:41	Phase II	22.5	407	DWH
40	7120200-311341-12	5/15/2012	14:55	Phase II	22.5	234	DWH
41	7120200-311341-12	5/15/2012	15:12	Phase II	22.5	266	DWH
42	7120200-311446-12	5/15/2012	15:30	Phase II	22.5	377	DWH
43	7120200-311446-12	5/15/2012	15:40	Phase II	22.5	123.5	DWH
44	8110773-312217-12	5/15/2012	16:00	Phase II	22.5	499.5	DWH
45	8201507-102158887	5/15/2012	16:30	Phase II	22.5	20	DWH
46	8110773-312221-12	5/16/2012	9:07	Phase II	22.5	500	DWH
47	8110773-312111-12	5/16/2012	9:19	Phase II	22.5	146	DWH
48	8110773-312111-12	5/16/2012	9:20	Phase II	22.5	347	DWH
49	8110773-312222-12	5/16/2012	9:42	Phase II	22.5	300	DWH
50	8110773-312222-12	5/16/2012	9:48	Phase II	22.5	198	DWH
51	8110773-312115-12	5/16/2012	10:03	Phase II	22.5	450.5	DWH
52	8110773-312115-12	5/16/2012	10:08	Phase II	22.5	46	DWH
53	8110773-312114-12	5/16/2012	10:25	Phase II	22.5	498	DWH
54	8110773-312112-12	5/16/2012	10:30	Phase II	22.5	102	DWH
55	8110773-312112-12	5/18/2012	8:31	Phase II	22.5	378.5	DWH
56	8110773-312104-12	5/18/2012	8:48	Phase II	22.5	275	DWH
57	8110773-312104-12	5/18/2012	8:56	Phase II	22.5	219	DWH
58	7120199-311556-12	5/18/2012	9:10	Phase II	22.5	435.5	DWH
59	7120199-311556-12	5/18/2012	9:13	Phase II	22.5	62	DWH
60	7120199-311559-12	5/18/2012	9:30	Phase II	22.5	503	DWH
61	7120199-311561-12	5/18/2012	9:38	Phase II	22.5	89	DWH
62	7120199-311561-12	5/18/2012	9:49	Phase II	22.5	414	DWH

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Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary Series: 6 Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
63	7120200-311443-12	5/18/2012	10:03	Phase II	22.5	243	DWH
64	7120200-311443-12	5/18/2012	10:14	Phase II	22.5	250	DWH
65	8110773-312229-12	5/18/2012	10:29	Phase II	22.5	403	DWH
66	8110773-312229-12	5/18/2012	10:35	Phase II	22.5	91.5	DWH
67	7120199-311452-12	5/18/2012	10:55	Phase II	22.5	498.5	DWH
68	7120200-311331-12	5/18/2012	11:06	Phase II	22.5	65	DWH
69	7120200-311331-12	5/18/2012	11:13	Phase II	22.5	439	DWH
70	7120200-311334-12	5/18/2012	11:34	Phase II	22.5	218	DWH
71	7120200-311334-12	5/18/2012	11:45	Phase II	22.5	260	DWH
72	8110773-312224-12	5/18/2012	13:05	Phase II	22.5	399	DWH
73	8110773-312224-12	5/18/2012	13:11	Phase II	22.5	97	DWH
74	7120199-311558-12	5/18/2012	13:30	Phase II	22.5	505	DWH
75	7120199-311453-12	5/18/2012	13:43	Phase II	22.5	58	DWH
76	7120199-311453-12	5/18/2012	13:50	Phase II	22.5	442	DWH
77	7120200-311339-12	5/18/2012	14:05	Phase II	22.5	217	DWH
78	7120200-311339-12	5/18/2012	14:10	Phase II	22.5	281	DWH
79	7120199-311557-12	5/18/2012	14:20	Phase II	22.5	378	DWH
80	7120199-311557-12	5/24/2012	8:17	Phase II	22.5	112.5	DWH
81	7120199-311451-12	5/24/2012	8:26	Phase II	22.5	485	DWH
82	7120199-311683-12	5/24/2012	8:33	Phase II	22.5	63	DWH
83	7120199-311683-12	5/24/2012	8:44	Phase II	22.5	430.5	DWH
84	7120200-311336-12	5/24/2012	8:54	Phase II	22.5	228.5	DWH
85	7120200-311336-12	5/24/2012	9:13	Phase II	22.5	265	DWH
86	7120199-311562-12	5/24/2012	9:23	Phase II	22.5	395	DWH
87	7120199-311562-12	5/24/2012	9:30	Phase II	22.5	93.5	DWH
88	7120200-311337-12	5/24/2012	9:45	Phase II	22.5	500	DWH
89	7120200-311335-12	5/24/2012	9:49	Phase II	22.5	65.5	DWH
90	7120200-311335-12	5/24/2012	9:57	Phase II	22.5	393	DWH
91	7120200-311332-12	5/24/2012	10:10	Phase II	22.5	228.5	DWH
92	7120200-311332-12	5/24/2012	10:22	Phase II	22.5	267	DWH
93	7120200-311330-12	5/24/2012	10:30	Phase II	22.5	392.5	DWH

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Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary | Series: 6 | Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
94	7120200-311330-12	5/24/2012	10:39	Phase II	22.5	102.5	DWH
95	7120199-311681-12	5/24/2012	10:49	Phase II	22.5	504	DWH
96	7120200-311448-12	5/24/2012	11:02	Phase II	22.5	52.5	DWH
97	7120200-311448-12	5/24/2012	11:13	Phase II	22.5	436	DWH
98	7120200-311442-12	5/24/2012	11:17	Phase II	22.5	216	DWH
99	7120200-311442-12	5/24/2012	11:27	Phase II	22.5	273	DWH
100	7120200-311338-12	5/24/2012	12:55	Phase II	22.5	286	DWH
101	7120200-311338-12	5/24/2012	13:05	Phase II	22.5	100	DWH
102	7120199-311678-12	5/24/2012	13:15	Phase II	22.5	506	DWH
103	7120199-311566-12	5/24/2012	13:30	Phase II	22.5	54	DWH
104	7120199-311566-12	5/24/2012	13:43	Phase II	22.5	451	DWH
105	7120199-311680-12	5/24/2012	13:55	Phase II	22.5	209	DWH
106	7120199-311680-12	5/24/2012	14:14	Phase II	22.5	283	DWH
107	7120199-311671-12	5/24/2012	14:30	Phase II	22.5	382	DWH
108	7120199-311671-12	5/24/2012	14:38	Phase II	22.5	116	DWH
109	7120199-311670-12	5/24/2012	14:45	Phase II	22.5	505	DWH
110	8110773-312103-12	5/24/2012	14:58	Phase II	22.5	43	DWH
111	8110773-312103-12	6/1/2012	8:40	Phase II	22.5	453.5	DWH
112	8110773-312105-12	6/1/2012	8:47	Phase II	22.5	114	DWH
113	8110773-312105-12	6/1/2012	8:52	Phase II	22.5	283	DWH
114	7120199-311674-12	6/1/2012	9:00	Phase II	22.5	381	DWH
115	7120199-311674-12	6/1/2012	9:10	Phase II	22.5	112	DWH
116	7120199-311567-12	6/1/2012	9:13	Phase II	22.5	500	DWH
117	8110773-312101-12	6/1/2012	9:15	Phase II	22.5	51	DWH
118	8110773-312101-12	6/1/2012	9:18	Phase II	22.5	448	DWH
119	7120199-311675-12	6/1/2012	9:25	Phase II	22.5	220	DWH
120	7120199-311675-12	6/1/2012	9:32	Phase II	22.5	273	DWH
121	7120199-311565-12	6/1/2012	21:45	Phase II	22.5	389	DWH
122	7120199-311565-12	6/8/2012	8:25	Phase II	22.5	104	DWH
123	8110773-312108-12	6/8/2012	8:33	Phase II	22.5	494	DWH
124	7120199-311569-12	6/8/2012	8:45	Phase II	22.5	66	DWH

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Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary | Series: 6 | Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
125	7120199-311569-12	6/8/2012	8:50	Phase II	22.5	434	DWH
126	7120199-311568-12	6/8/2012	9:14	Phase II	22.5	226	DWH
127	7120199-311568-12	6/8/2012	9:16	Phase II	22.5	252	DWH
128	8110773-312109-12	6/8/2012	9:30	Phase II	22.5	408	DWH
129	8110773-312109-12	6/8/2012	9:35	Phase II	22.5	46	DWH
130	8110773-312107-12	6/8/2012	9:40	Phase II	22.5	494	DWH
131	7120199-311676-12	6/8/2012	9:55	Phase II	22.5	127	DWH
132	7120199-311676-12	6/8/2012	10:21	Phase II	22.5	370.5	DWH
133	8110773-312106-12	6/8/2012	10:28	Phase II	22.5	291	DWH
134	8110773-312106-12	6/8/2012	10:40	Phase II	22.5	207	DWH
135	8110773-311789-12	6/8/2012	10:50	Phase II	22.5	455	DWH
136	8110773-311789-12	6/14/2012	8:33	Phase II	22.5	37	DWH
137	7120199-311679-12	6/14/2012	8:37	Phase II	22.5	500	DWH
138	7120199-311785-12	6/14/2012	8:55	Phase II	22.5	128	DWH
139	7120199-311785-12	6/14/2012	9:08	Phase II	22.5	366	DWH
140	7120199-311672-12	6/14/2012	9:19	Phase II	22.5	299	DWH
141	7120199-311672-12	6/14/2012	9:27	Phase II	22.5	192	DWH
142	7120199-311677-12	6/14/2012	9:43	Phase II	22.5	471.5	DWH
143	8110773-312228-12	6/14/2012	9:53	Phase II	22.5	500	DWH
144	8110773-311788-12	6/14/2012	10:05	Phase II	22.5	162.5	DWH
145	8110773-311788-12	6/14/2012	10:14	Phase II	22.5	336.5	DWH
146	8110773-311795-12	6/14/2012	10:38	Phase II	22.5	326	DWH
147	8110773-311795-12	6/14/2012	10:48	Phase II	22.5	172.5	DWH
148	7120199-311564-12	6/14/2012	10:55	Phase II	22.5	489	DWH
149	8110773-312223-12	6/14/2012	11:09	Phase II	22.5	500	DWH
150	8110773-312218-12	6/14/2012	11:27	Phase II	22.5	161	DWH
151	8110773-312218-12	6/14/2012	12:58	Phase II	22.5	341	DWH
152	7120199-311677-12	6/14/2012	13:05	Phase II	22.5	26	DWH
153	8110773-312226-12	6/14/2012	13:15	Phase II	22.5	294	DWH
154	8110773-312226-12	6/18/2012	7:45	Phase II	22.5	204	DWH
155	7110583-443674-11	6/18/2012	7:54	Phase II	22.5	458	DWH

Geosyntec
consultants

Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary | Series: 6 | Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
156	7110583-443674-11	6/18/2012	8:00	Phase II	22.5	36.5	DWH
157	7110583-443675-11	6/18/2012	8:25	Phase II	22.5	498	DWH
158	8110773-312116-12	6/18/2012	8:38	Phase II	22.5	26.5	DWH
159	8110773-312116-12	6/18/2012	8:48	Phase II	22.5	368.5	DWH
160	8110773-312113-12	6/18/2012	8:55	Phase II	22.5	292	DWH
161	8110773-312113-12	6/18/2012	9:15	Phase II	22.5	201	DWH
162	8210664-443791-11	6/18/2012	9:40	Phase II	22.5	459.5	DWH
163	8110773-312110-12	6/18/2012	9:50	Phase II	22.5	496	DWH
164	8210664-443791-11	6/18/2012	10:00	Phase II	22.5	38	DWH
165	7120199-311786-12	6/18/2012	10:02	Phase II	22.5	126	DWH
166	7120199-311786-12	6/18/2012	13:00	Phase II	22.5	374.5	DWH
167	8210664-443796-11	6/18/2012	13:13	Phase II	22.5	287.5	DWH
168	8210664-443796-11	6/18/2012	13:18	Phase II	22.5	108.5	DWH
169	7120199-311560-12	6/18/2012	13:42	Phase II	22.5	503.5	DWH
170	8210664-443784-11	6/18/2012	13:51	Phase II	22.5	51	DWH
171	8210664-443784-11	6/18/2012	13:53	Phase II	22.5	451	DWH
172	7120199-311673-12	6/18/2012	14:20	Phase II	22.5	212	DWH
173	7120199-311673-12	6/18/2012	14:28	Phase II	22.5	283	DWH
174	7120199-311563-12	6/18/2012	14:41	Phase II	22.5	380	DWH
175	7120199-311563-12	6/21/2012	8:11	Phase II	22.5	100	DWH
176	7120199-311455-12	6/21/2012	8:30	Phase II	22.5	506	DWH
177	8110773-311796-12	6/21/2012	8:40	Phase II	22.5	67	DWH
178	8110773-311796-12	6/21/2012	8:50	Phase II	22.5	433	DWH
179	7120199-311787-12	6/21/2012	9:00	Phase II	22.5	238	DWH
180	7120199-311787-12	6/21/2012	9:09	Phase II	22.5	259	DWH
181	8110773-312102-12	6/21/2012	9:10	Phase II	22.5	413.5	DWH
182	8110773-312102-12	6/21/2012	9:20	Phase II	22.5	83	DWH
183	7120200-311333-12	6/21/2012	9:39	Phase II	22.5	458	DWH
184	8110773-311793-12	6/21/2012	9:50	Phase II	22.5	82	DWH
185	8110773-311793-12	6/21/2012	10:00	Phase II	22.5	418.5	DWH
186	8110773-311791-12	6/21/2012	10:09	Phase II	22.5	250.5	DWH

Geosyntec
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Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary | Series: 6 | Material Type: gml

Panel	Batch-Roll	Date	Time	Placement/Location/Comments	Width (ft.)	Length (ft.)	QA ID
187	8110773-311791-12	6/21/2012	10:21	Phase II	22.5	250.5	DWH
188	7120199-311784-12	6/21/2012	10:34	Phase II	22.5	418	DWH
189	7120199-311784-12	6/21/2012	10:44	Phase II	22.5	81.5	DWH
190	8110773-311790-12	6/21/2012	10:52	Phase II	22.5	502.5	DWH
191	8110773-311794-12	6/21/2012	11:05	Phase II	22.5	84.5	DWH
192	8110773-311794-12	6/21/2012	11:30	Phase II	22.5	46	DWH
193	8110773-311794-12	6/21/2012	11:35	Phase II	22.5	46	DWH
194	8110773-311794-12	6/21/2012	12:40	Phase II	22.5	45.5	DWH
195	8110773-311794-12	6/21/2012	12:46	Phase II	22.5	44.5	DWH
196	8110773-311794-12	6/21/2012	12:49	Phase II	22.5	44.5	DWH
197	8110773-311794-12	6/21/2012	12:52	Phase II	22.5	45	DWH
198	8110773-311794-12	6/21/2012	12:55	Phase II	22.5	45	DWH
199	8110773-311794-12	6/21/2012	13:00	Phase II	22.5	44.5	DWH
200	8210664-443788-11	6/21/2012	13:11	Phase II	22.5	44	DWH
201	8210664-443788-11	6/21/2012	13:14	Phase II	22.5	44	DWH
202	8210664-443788-11	6/21/2012	13:18	Phase II	22.5	44	DWH
203	8210664-443788-11	6/21/2012	13:19	Phase II	22.5	44	DWH
204	8210664-443788-11	6/21/2012	13:25	Phase II	22.5	43.5	DWH
205	8210664-443788-11	6/21/2012	13:27	Phase II	22.5	43.5	DWH
206	8210664-443788-11	6/21/2012	13:30	Phase II	22.5	43.5	DWH
207	8210664-443788-11	6/21/2012	13:31	Phase II	22.5	42	DWH
208	8210664-443788-11	6/21/2012	13:34	Phase II	22.5	42	DWH
209	8210664-443788-11	6/21/2012	13:37	Phase II	22.5	42	DWH
210	7120199-311682-12	6/21/2012	13:50	Phase II	22.5	42	DWH
211	7120199-311682-12	6/21/2012	13:55	Phase II	22.5	42	DWH
212	7120199-311682-12	6/21/2012	13:57	Phase II	22.5	42.5	DWH
213	7120199-311682-12	6/21/2012	14:00	Phase II	22.5	43	DWH
214	7120199-311682-12	6/21/2012	14:02	Phase II	22.5	43	DWH
215	7120199-311682-12	6/21/2012	14:04	Phase II	22.5	43	DWH
216	7120199-311682-12	6/21/2012	14:09	Phase II	22.5	43	DWH
217	7120199-311682-12	6/21/2012	14:12	Phase II	22.5	43.5	DWH

Geosyntec
consultants

Panel Placement Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Primary / Secondary: Primary Series: 6 Material Type: gml

Panel	*Batch-Roll*	*Date*	*Time*	*Placement/Location/Comments*	*Width (ft.)*	*Length (ft.)*	*QA ID*
218	7120199-311682-12	6/21/2012	14:14	Phase II	22.5	44	DWH
219	7120199-311682-12	6/21/2012	14:16	Phase II	22.5	44.5	DWH
220	8201499-102158766	6/21/2012	14:33	Phase II	22	25.5	DWH
221	8201499-102158766	6/21/2012	14:47	Phase II	22	32.5	DWH
222	8201499-102158766	6/21/2012	14:54	Phase II	12	8.5	DWH
223	8201499-102158766	6/21/2012	15:00	Phase II	12	10	DWH

Number of Panels: 223 Approx. Area (sq. ft). 1087333.25

APPENDIX J

Geomembrane Trial Seam Logs

- Calibration of Field Tensiometer
- Fusion
- Extrusion

Calibration of Field Tensiometer

CalSource, Inc.
1005 West Fayette St
Suite 4D
Syracuse, NY 13204
866-895-8648
calsource.com

CERTIFICATE OF CALIBRATION

ISSUED TO		EQUIPMENT INFORMATION	
CHENANGO CONTRACTING 29 ARBUTUS ROAD JOHNSON CITY NY 13790		ASSET NUMBER	NAL-1203
		MANUFACTURER	TEMPLETON KENLY & CO
		MODEL NUMBER	AL-0102
		DESCRIPTION	TENSIOMETER
CUSTOMER PO NUMBER:	MIKE-021312	SERIAL NUMBER	NAL-1203

TEST RESULTS

CERTIFICATE NUMBER	305718	PROCEDURE	NA17-20MF-41L
AS RECEIVED	IN TOLERANCE	INTERVAL	12 MONTHS
AS RETURNED	PASS	CALIBRATION DATE	2/24/2012
LAB TEMPERATURE	68.0 F	CALIBRATION DUE DATE	2/24/2013
LAB HUMIDITY	47.0 %	TECHNICIAN	BREANNE M WENDT

COMMENTS

CALIBRATION STANDARDS

ASSET NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DESCRIPTION	CAL DATE	CAL DUE
CAL-00278	BEOWULF	N-1	124	FORCE CAL KIT	1/26/2012	1/26/2013
CAL-00490	NEWPORT	HHX-M	MEC	TEMP/HUMIDITY METER	9/15/2011	9/15/2012

CalSource certifies this instrument to have been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards. CalSources' calibration system complies to the requirements of ISO-9001, ISO/IEC 17025, ISO/TS 16949. ANSI/NCSL Z540-1-1994 and MIL-STD-45662A Unless otherwise indicated, the Test Uncertainty Ratio (TUR) for each calibrated parameter is at least 4:1. The results contained are valid only for the unit listed above.

CERTIFIED BY Breanne M Wendt 2/24/2012
BREANNE M WENDT

	NO EXCEPTIONS
	EXCEPTIONS AS NOTED
	PROCEED WITH WORK
	RESUBMIT
	SUBMIT CERTIFIED PRINTS

PARSONS
CLIENT/JOB NO. 446199
CONTRACT SC 60008
BY DATE

ACTION TAKEN HEREON DOES NOT SUPERSEDE REQUIREMENTS OF APPLICABLE DESIGN DRAWINGS, SPECIFICATIONS, ORDERS, CODES OR REGULATIONS, OR RELIEVE THE CONTRACTOR OR SUPPLIER FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS.

RECEIVED
Nov 19 2012
PARSONS

CALSOURCE
Metrology Solutions
1005 W Fayette Street
Syracuse, NY 13204
(315) 425-1151

Tensiometer

ID Number	NAL-1203
Certificate Number	305718
Technician	Breanne M Wendt
Date	February 24, 2012

Force(lbs.):

Range:	0-500 lbs.	Accuracy +/- 1% of ind.

Nominal	Minimum	As Found	As Left	Maximum
100	99	101		101
200	198	200		202
300	297	302		303
400	396	400		404
450	445	447		455

Notes:

Out of Tolerance Readings Highlighted
All Transferred Values Reviewed for Accuracy
Unless otherwise stated, As Left = As Found

Demtech Services, Inc.

Placerville, California, USA

CALIBRATION CERTIFICATE

Chenango Contracting

Tensiometer Model: Pro-Tester T-0100

Device Calibrated: S-Type load cell
Range: 0 - 750 lbs. Tension
Model No: M2405-750#
Serial No: **260610**

Calibration Apparatus:

Pro-Cal unit, model TC-0100/A

A/D Module Model No: T-029
A/D Module Serial No: **411260610**
Channel No: N/A

Dead Weight:		Reference Cell:	
W1	2	R1	2
W2	152	R2	152
W3	302	R3	302

Indicator reading with no load: 0

Offset: **2.074836** Scale: **5.125794**

Applied Force lbs.	Cell Response:	Deviation Error:
2	2	0.00
52	52	0.00
102	102	0.00
152	152	0.00
202	202	0.00
252	252	0.00
302	302	0.00

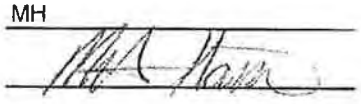
Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

MH



Date: 08/01/11

CalSource, Inc.
1005 West Fayette St
Suite 4D
Syracuse, NY 13204
866-895-8648
calsource.com

CERTIFICATE OF CALIBRATION

ISSUED TO		EQUIPMENT INFORMATION	
CHENANGO CONTRACTING 29 ARBUTUS ROAD JOHNSON CITY NY 13790		ASSET NUMBER	NAL-0802
		MANUFACTURER	PLASTIC WELDING TECHNOLOGIES
		MODEL NUMBER	AL-0102
		DESCRIPTION	DYNAMOMETER
CUSTOMER PO NUMBER:	MIKE-021312	SERIAL NUMBER	NAL-0802

TEST RESULTS

CERTIFICATE NUMBER	308845	PROCEDURE	33K6-4-1756-1
AS RECEIVED	IN TOLERANCE	INTERVAL	12 MONTHS
AS RETURNED	PASS	CALIBRATION DATE	3/16/2012
LAB TEMPERATURE	68.0 F	CALIBRATION DUE DATE	3/16/2013
LAB HUMIDITY	39.5 %	TECHNICIAN	BREANNE M WENDT

COMMENTS

CALIBRATION STANDARDS

ASSET NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DESCRIPTION	CAL DATE	CAL DUE
CAL-00056	RICE LAKE WEIGHING	N/A	125E THRU 125U	WEIGHT SET	4/19/2011	4/19/2012
CAL-00162	OMEGA	ITHX-SD	1280668	TEMP/RH LOGGER	9/15/2011	9/15/2012
CAL-00178	CDI	2000-303-0	260	50LB WEIGHT HANGER	3/29/2011	3/29/2012

CalSource certifies this instrument to have been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards. CalSources' calibration system complies to the requirements of ISO-9001, ISO/IEC 17025, ISO/TS 16949, ANSI/NCSL Z540-1-1994 and MIL-STD-45662A Unless otherwise indicated, the Test Uncertainty Ratio (TUR) for each calibrated parameter is at least 4:1. The results contained are valid only for the unit listed above.

	NO EXCEPTIONS
	EXCEPTIONS AS NOTED
	PROCEED WITH WORK
	RESUBMIT
	SUBMIT CERTIFIED PRINTS

PARSONS
CLIENT/JOB NO. 446199
CONTRACT
BY DATE

ACTION TAKEN HEREON DOES NOT SUPERSEDE REQUIREMENTS OF APPLICABLE DESIGN DRAWINGS, SPECIFICATIONS, ORDERS, CODES OR REGULATIONS, OR RELIEVE THE CONTRACTOR OR SUPPLIER FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS.

CERTIFIED BY Breanne M Wendt 3/16/2012
BREANNE M WENDT

RECEIVED
Mar 22 2012
Nhana
PARSONS

CALSOURCE
Metrology Solutions
1005 W. Fayette Street
Syracuse, NY 13204
(315) 425-1151

Tensiometer

ID Number	NAL-0802
Certificate Number	308845
Technician	Breanne M Wendt
Date	March 16, 2012

Force(lbs.):

Range:	0-500 lbs.	Accuracy +/- 1% of ind.

Nominal	Minimum	As Found	As Left	Maximum
50	50	50		51
150	149	151		152
250	248	250		253
350	347	348		354
450	445	448		455

Notes:

Out of Tolerance Readings Highlighted
All Transferred Values Reviewed for Accuracy
Unless otherwise stated, As Left = As Found

CalSource, Inc.
1095 West Fayette St
Suite 4D
Syracuse, NY 13204
866-895-3648
calsource.com

CERTIFICATE OF CALIBRATION

ISSUED TO	
CHENANGO CONTRACTING 29 ARBUTUS ROAD JOHNSON CITY NY 13790	
CUSTOMER PO NUMBER:	020413

EQUIPMENT INFORMATION	
ASSET NUMBER	NAL-0020
MANUFACTURER	COLUMBINE INTERNATIONAL
MODEL NUMBER	AL-0102
DESCRIPTION	TENSIOMETER
SERIAL NUMBER	NAL-0020

TEST RESULTS

CERTIFICATE NUMBER	350310	PROCEDURE	33K6-4-3196-1 JAN 00
AS RECEIVED	IN TOLERANCE	INTERVAL	12 MONTHS
AS RETURNED	PASS	CALIBRATION DATE	3/21/2013
LAB TEMPERATURE	68.5 F	CALIBRATION DUE DATE	3/21/2014
LAB HUMIDITY	32.0 %	TECHNICIAN	CODY W COOPER

COMMENTS

CALIBRATION STANDARDS

ASSET NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DESCRIPTION	CAL DATE	CAL DUE
CAL-00162	OMEGA	HH30-SD	1280668	TEMP/RH LOGGER	9/18/2012	9/18/2013
CAL-00275	MOREHOUSE	N-1	VARIOUS	FORCE CAL KIT	12/21/2012	12/21/2014

CalSource certifies this instrument to have been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards. CalSources' calibration system complies to the requirements of ISO-9001, ISO/IEC 17025, ISO/TS 16949, ANSI/NCSL Z540-1-1994 and MIL-STD-45662A Unless otherwise indicated, the Test Uncertainty Ratio (TUR) for each calibrated parameter is at least 4:1. The results contained are valid only for the unit listed above.

CERTIFIED BY _____ 3/21/2013
CODY W COOPER

Load Cell

Syracuse, NY 13204
(315) 425-1151

ID Number: NAL-0020
Certificate Number: 350310
Technician: Cody W. Cooper
Date: March 21, 2013

Force(lbs.):

Range: 0-500 lbs. Accuracy +/- 1% of ind.

Nominal	Minimum	As Found	As Left	Maximum
100	99	100.5		101
200	198	202.0		202
300	297	298.0		303
400	396	396.0		404
500	495	495.0		505

Notes:

Out of Tolerance Readings Highlighted
All Transferred Values Reviewed for Accuracy
Unless otherwise stated, As Left = As Found

Fusion

Geosyntec
consultants

Trial Seam Log - Fusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Tensiometer Description: NAL-0802

Material Type gml : 6 Peel Inside: 91 ppi Shear: 120 ppi
Peel Outside: 91 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Fusion		Test Results					QA ID
						Wedge ° Celsius	Speed ft./Min	Peel In	Peel Out	Shear	Unit ppi/psi	Result	
1-153	3/28/2012	8:45	W-9	VS	S/S	365	7	136-138	141-134	234-235	PPI	P	DWH
1-154	3/28/2012	8:45	W-9	VS	S/S	365	6.5	127-139	133-146	200-218	PPI	P	DWH
1-155	3/28/2012	9:00	W-5	AS	S/S	365	7	135-148	135-123	219-218	PPI	P	DWH
1-156	3/28/2012	9:00	W-5	AS	T/T	365	6	141-134	154-134	214-229	PPI	P	DWH
1-157	3/28/2012	10:00	W-10	TS	S/S	370	7	114-100	102-109	188-188	PPI	P	DWH
1-158	3/28/2012	10:00	W-10	TS	T/T	370	6	157-133	151-136	191-183	PPI	P	DWH
1-159	3/28/2012	13:20	W-9	VS	S/S	365	7	118-118	114-113	185-190	PPI	P	DWH
1-160	3/28/2012	13:20	W-9	VS	T/T	365	6.5	155-148	131-138	187-182	PPI	P	DWH
1-161	3/28/2012	14:00	W-5	AS	S/S	365	7	114-134	117-135	207-210	PPI	P	DWH
1-162	3/28/2012	14:00	W-5	AS	T/T	365	6	127-121	150-143	178-197	PPI	P	DWH
1-163	3/28/2012	15:00	W-10	TS	S/S	370	7	121-131	124-135	192-196	PPI	P	DWH
1-164	3/28/2012	15:00	W-10	TS	T/T	370	6	145-139	142-141	200-200	PPI	P	DWH
1-165	3/30/2012	13:25	W-9	VS	S/S	365	7	135-120	125-124	211-206	PPI	P	DWH
1-166	3/30/2012	13:25	W-9	VS	T/T	365	6	150-149	133-146	218-209	PPI	P	DWH
1-167	3/30/2012	13:40	W-10	TS	S/S	370	7	126-131	121-126	214-210	PPI	P	DWH
1-168	3/30/2012	13:40	W-10	TS	T/T	370	6	113-123	113-140	173-173	PPI	P	DWH
1-169	3/30/2012	13:40	W-5	AS	S/S	365	7	131-151	128-157	214-215	PPI	P	DWH
1-170	3/30/2012	13:40	W-5	AS	T/T	365	6	153-117	141-133	204-202	PPI	P	DWH
1-171	3/30/2012	13:45	W-11	KC	S/S	375	7	117-118	137-109	185-201	PPI	P	DWH
1-172	3/30/2012	13:45	W-11	KC	T/T	375	6.5	112-111	156-133	195-195	PPI	P	DWH
1-173	4/5/2012	8:45	W-9	VS	S/S	365	7	128-130	121-139	226-227	PPI	P	DWH
1-174	4/5/2012	8:45	W-9	VS	T/T	365	6	151-148	139-154	221-232	PPI	P	DWH
1-175	4/5/2012	8:50	W-10	TS	S/S	370	7	128-148	141-139	219-217	PPI	P	DWH
1-176	4/5/2012	8:50	W-10	TS	T/T	370	6	115-137	126-123	232-229	PPI	P	DWH
1-177	4/5/2012	9:00	W-11	VC	S/S	375	8.5	140-142	158-157	211-223	PPI	P	DWH
1-178	4/5/2012	9:00	W-11	VC	T/T	375	6.5	128-118	118-123	229-225	PPI	P	DWH
1-179	4/5/2012	10:30	W-9	VS	S/S	365	7	141-119	91-101	200-202	PPI	P	DWH
1-180	4/5/2012	10:30	W-10	TS	S/S	370	7	143-145	117-142	205-201	PPI	P	DWH
1-181	4/5/2012	10:30	W-11	VC	S/S	375	8.5	140-154	147-138	200-201	PPI	P	DWH
1-182	4/5/2012	11:45	W-5	AS	S/S	365	7	155-137	154-156	248-236	PPI	P	DWH
1-183	4/5/2012	11:45	W-5	AS	T/T	365	6	140-140	142-133	243-240	PPI	P	DWH
1-184	4/5/2012	12:40	W-10	TS	S/S	370	7	113-118	123-127	206-204	PPI	P	DWH
1-185	4/5/2012	12:40	W-10	TS	T/T	370	6	126-130	116-127	206-205	PPI	P	DWH
1-186	4/5/2012	12:45	W-9	VS	S/S	365	7	139-125	128-130	223-218	PPI	P	DWH

Geosyntec
consultants

Trial Seam Log - Fusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Tensiometer Description: NAL-0802

Material Type gml : 6 Peel Inside: 91 ppi Shear: 120 ppi
Peel Outside: 91 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Fusion		Test Results					QA ID
						Wedge ° Celsius	Speed ft./Min	Peel In	Peel Out	Shear	Unit ppi/psi	Result	
1-187	4/5/2012	12:45	W-9	VS	T/T	365	6	118-150	117-132	210-205	PPI	P	DWH
1-188	4/5/2012	12:55	W-11	VC	S/S	375	8.5	127-128	128-118	212-212	PPI	P	DWH
1-189	4/5/2012	12:55	W-11	VC	T/T	375	6.5	153-155	120-132	206-212	PPI	P	DWH
1-190	4/12/2012	8:25	W-10	TS	T/T	370	6	97-126	125-152	167-177	PPI	P	DWH
1-191	4/12/2012	8:35	W-5	AS	S/S	365	7	127-126	109-117	202-200	PPI	P	DWH
1-192	4/12/2012	8:35	W-5	AS	T/T	365	6	152-121	145-143	201-164	PPI	P	DWH
1-193	4/12/2012	9:00	W-9	VS	S/S	365	7	117-106	108-109	203-195	PPI	P	DWH
1-194	4/12/2012	9:00	W-9	VS	T/T	365	6	163-160	182-162	210-201	PPI	P	DWH
1-195	4/12/2012	10:10	W-11	TS	S/S	375	7	110-107	114-113	195-200	PPI	P	DWH
1-196	4/12/2012	10:10	W-11	TS	T/T	375	6	129-119	131-133	163-166	PPI	P	DWH
1-197	4/12/2012	12:10	W-9	VS	S/S	365	7	112-113	118-119	173-171	PPI	P	DWH
1-198	4/12/2012	12:10	W-9	VS	T/T	365	6	125-133	151-129	165-168	PPI	P	DWH
1-199	4/12/2012	12:44	W-5	AS	S/S	365	7	112-117	102-130	165-182	PPI	P	DWH
1-200	4/12/2012	12:44	W-5	AS	T/T	365	6	105-128	120-124	180-178	PPI	P	DWH
1-201	4/12/2012	12:44	W-5	AS	S/T	365	6	129-98	118-98	182-179	PPI	P	DWH
1-202	4/12/2012	14:10	W-11	TS	S/S	375	7	102-91	103-104	147-148	PPI	P	DWH
1-203	4/13/2012	8:50	W-9	VS	S/S	365	7	131-131	131-146	199-208	PPI	P	DWH
1-204	4/13/2012	8:50	W-9	VS	T/T	365	7	132-151	136-147	192-198	PPI	P	DWH
1-205	4/13/2012	8:50	W-5	AS	S/S	365	7	126-119	105-107	186-181	PPI	P	DWH
1-206	4/13/2012	8:50	W-5	AS	T/T	365	6	136-117	146-128	173-160	PPI	P	DWH
1-207	4/13/2012	8:50	W-5	AS	S/T	365	6	100-130	112-135	182-192	PPI	P	DWH
1-208	4/13/2012	9:10	W-14	TS	S/S	370	7	106-105	108-112	203-207	PPI	P	DWH
1-209	4/13/2012	9:10	W-14	TS	T/T	370	6	132-138	164-139	187-200	PPI	P	DWH
1-210	4/13/2012	10:30	W-9	VS	S/T	365	6.5	128-124	118-116	179-176	PPI	P	DWH
1-211	4/13/2012	13:10	W-14	TS	S/S	370	7	105-128	107-120	160-166	PPI	P	DWH
1-212	4/13/2012	13:10	W-14	TS	T/T	370	6	102-114	116-116	140-141	PPI	P	DWH
1-213	4/13/2012	13:15	W-5	AS	S/S	365	7	125-113	106-130	176-178	PPI	P	DWH
1-214	4/13/2012	13:15	W-5	AS	T/T	365	6	112-135	116-142	146-151	PPI	P	DWH
1-215	4/13/2012	13:15	W-5	AS	S/T	365	6	98-119	121-130	172-185	PPI	P	DWH
1-216	4/13/2012	13:35	W-9	VS	S/S	365	7	118-125	114-123	180-189	PPI	P	DWH
1-217	4/13/2012	13:35	W-9	VS	T/T	365	6	138-121	141-119	191-182	PPI	P	DWH
6-001	5/15/2012	8:15	W-14	VC	S/S	370	8	119-117	118-117	178-178	PPI	P	DWH
6-002	5/15/2012	8:15	W-14	VC	T/T	370	7	138-120	124-122	187-190	PPI	P	DWH
6-003	5/15/2012	8:25	W-5	AS	S/S	365	7	112-129	142-115	204-185	PPI	P	DWH

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Trial Seam Log - Fusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II
ProjNo: GJ4706B
TaskNo: 200

Tensiometer Description: NAL-0802

Material Type: gml : 6
Peel Inside: 91 ppi
Peel Outside: 91 ppi
Shear: 120 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Fusion		Test Results					QA ID
						Wedge ° Celsius	Speed ft./Min	Peel In	Peel Out	Shear	Unit ppi/psi	Result	
6-004	5/15/2012	8:25	W-5	AS	S/S	365	6	107-102	105-126	178-175	PPI	P	DWH
6-005	5/15/2012	8:35	W-11	TS	S/S	375	7	104-114	109-114	178-176	PPI	P	DWH
6-006	5/15/2012	8:35	W-11	TS	T/T	375	6	105-100	111-117	165-174	PPI	P	DWH
6-007	5/15/2012	8:45	W-9	LV	S/S	375	7.5	125-133	118-128	194-196	PPI	P	DWH
6-008	5/15/2012	8:45	W-9	LV	T/T	375	7.5	118-132	130-133	174-190	PPI	P	DWH
6-009	5/15/2012	10:30	W-5	AS	S/T	375	6.5	103-99	105-131	176-176	PPI	P	DWH
6-010	5/15/2012	12:40	W-5	AS	S/S	375	7	100-106	97-117	172-164	PPI	P	DWH
6-011	5/15/2012	12:40	W-5	AS	T/T	375	6	121-152	144-135	172-176	PPI	P	DWH
6-012	5/15/2012	12:55	W-9	LV	S/S	375	7.5	112-131	121-129	176-180	PPI	P	DWH
6-013	5/15/2012	13:05	W-11	TS	S/S	375	7	101-103	103-104	145-145	PPI	P	DWH
6-014	5/15/2012	13:05	W-11	TS	T/T	375	6	114-110	115-114	160-160	PPI	P	DWH
6-015	5/15/2012	13:10	W-14	VC	S/S	375	8	107-114	105-117	166-169	PPI	P	DWH
6-016	5/15/2012	13:10	W-14	VC	T/T	375	7	134-135	128-127	162-162	PPI	P	DWH
6-017	5/15/2012	17:20	W-9	LV	S/T	385	5.0	116-114	114-119	167-169	PPI	P	DWH
6-018	5/16/2012	8:20	W-11	TS	S/S	375	7.5	100-101	105-107	161-164	PPI	P	DWH
6-019	5/16/2012	8:20	W-11	TS	T/T	375	6.5	109-127	117-118	155-160	PPI	P	DWH
6-020	5/16/2012	8:40	W-9	LV	S/S	375	7.5	132-125	110-111	179-184	PPI	P	DWH
6-021	5/16/2012	8:40	W-9	LV	T/T	375	6.5	145-127	140-134	160-179	PPI	P	DWH
6-022	5/16/2012	8:50	W-5	VC	S/S	375	8.5	118-134	150-130	179-168	PPI	P	DWH
6-023	5/16/2012	8:50	W-5	VC	T/T	375	7.5	111-124	116-120	165-168	PPI	P	DWH
6-024	5/18/2012	8:20	W-11	TS	S/S	375	7	124-121	127-122	190-190	PPI	P	DWH
6-025	5/18/2012	8:20	W-11	TS	T/T	375	6	140-127	138-145	181-183	PPI	P	DWH
6-026	5/18/2012	8:40	W-9	LV	S/S	375	7.5	121-115	133-132	198-197	PPI	P	DWH
6-027	5/18/2012	8:40	W-9	LV	T/T	375	6.5	132-142	141-135	183-193	PPI	P	DWH
6-028	5/18/2012	8:45	W-5	AS	S/S	375	7	143-126	132-117	224-220	PPI	P	DWH
6-029	5/18/2012	8:45	W-5	AS	T/T	375	6	115-118	138-144	194-206	PPI	P	DWH
6-030	5/18/2012	9:00	W-10	KC	S/S	380	8	135-124	143-124	191-191	PPI	P	DWH
6-031	5/18/2012	9:00	W-10	KC	T/T	380	6.5	130-115	151-141	192-195	PPI	P	DWH
6-032	5/18/2012	9:10	W-8	VC	S/S	375	9	111-121	128-117	208-204	PPI	P	DWH
6-033	5/18/2012	9:10	W-8	VC	T/T	375	8	126-142	135-131	200-197	PPI	P	DWH
6-034	5/18/2012	12:30	W-5	AS	S/S	375	7	124-114	120-130	185-178	PPI	P	DWH
6-035	5/18/2012	12:30	W-5	AS	T/T	375	6	127-130	118-132	183-174	PPI	P	DWH
6-036	5/18/2012	12:35	W-10	KC	S/S	380	9	117-120	119-104	178-179	PPI	P	DWH
6-037	5/18/2012	12:35	W-10	KC	T/T	375	7	120-127	137-138	162-162	PPI	P	DWH

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Trial Seam Log - Fusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Tensiometer Description: NAL-0802

Material Type gml : 6 Peel Inside: 91 ppi Shear: 120 ppi
Peel Outside: 91 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Fusion		Test Results					QA ID
						Wedge ° Celsius	Speed ft./Min	Peel In	Peel Out	Shear	Unit ppi/psi	Result	
6-038	5/18/2012	13:15	W-9	LV	S/S	380	7.5	118-123	125-130	180-187	PPI	P	DWH
6-039	5/18/2012	13:15	W-9	LV	T/T	380	7.5	111-121	118-121	180-177	PPI	P	DWH
6-040	5/18/2012	13:30	W-11	TS	S/S	375	6.5	101-110	112-115	160-161	PPI	P	DWH
6-041	5/18/2012	13:30	W-11	TS	T/T	375	6.5	120-121	118-130	204-198	PPI	P	DWH
6-042	5/18/2012	13:35	W-8	VC	S/S	375	9	127-126	138-137	194-202	PPI	P	DWH
6-043	5/18/2012	13:35	W-8	VC	T/T	375	8	128-112	131-121	190-192	PPI	P	DWH
6-044	5/24/2012	8:00	W-11	TS	S/S	375	7.5	119-110	127-126	181-182	PPI	P	DWH
6-045	5/24/2012	8:00	W-11	TS	T/T	375	6.5	114-110	115-117	151-155	PPI	P	DWH
6-046	5/24/2012	8:15	W-8	VC	S/S	375	9	126-130	131-131	185-187	PPI	P	DWH
6-047	5/24/2012	8:15	W-8	VC	T/T	375	8	153-140	145-138	178-176	PPI	P	DWH
6-048	5/24/2012	8:30	W-5	AS	S/S	375	7	119-128	121-116	150-173	PPI	P	DWH
6-049	5/24/2012	8:30	W-5	AS	T/T	375	6	136-119	113-127	210-190	PPI	P	DWH
6-050	5/24/2012	8:40	W-10	KC	S/S	385	8.5	133-140	135-140	178-181	PPI	P	DWH
6-051	5/24/2012	8:40	W-10	KC	T/T	385	7	130-132	132-124	178-155	PPI	P	DWH
6-052	5/24/2012	12:35	W-8	VC	S/S	375	9	116-127	120-132	172-181	PPI	P	DWH
6-053	5/24/2012	12:35	W-8	VC	T/T	375	8.5	112-118	120-124	174-172	PPI	P	DWH
6-054	5/24/2012	12:42	W-5	AS	S/S	380	7	119-132	120-118	171-175	PPI	P	DWH
6-055	5/24/2012	12:42	W-5	AS	T/T	375	6	121-133	128-124	168-174	PPI	P	DWH
6-056	5/24/2012	13:10	W-11	TS	S/S	375	8.5	104-109	115-115	154-154	PPI	P	DWH
6-057	5/24/2012	13:10	W-11	TS	T/T	375	7.5	106-115	115-121	152-150	PPI	P	DWH
6-058	5/24/2012	13:25	W-10	KC	S/S	385	9	118-120	117-104	167-164	PPI	P	DWH
6-059	5/24/2012	14:05	W-9	VC	S/S	375	9	130-117	124-123	185-179	PPI	P	DWH
6-060	5/24/2012	14:05	W-9	VC	T/T	375	8	130-134	138-129	195-190	PPI	P	DWH
6-061	6/1/2012	8:10	W-9	VS	S/S	365	8	121-128	156-152	208-205	PPI	P	DWH
6-062	6/1/2012	8:15	W-5	AS	S/S	365	7	143-153	127-139	182-191	PPI	P	DWH
6-063	6/1/2012	8:15	W-5	AS	T/T	365	6	147-147	162-150	175-181	PPI	P	DWH
6-064	6/1/2012	8:30	W-11	TS	S/S	375	8	118-128	135-123	171-175	PPI	P	DWH
6-065	6/1/2012	8:30	W-11	TS	T/T	375	6.5	145-141	147-150	185-192	PPI	P	DWH
6-066	6/1/2012	8:35	W-10	KC	S/S	385	8	154-145	145-152	184-187	PPI	P	DWH
6-067	6/1/2012	8:35	W-10	KC	T/T	385	7	147-147	152-148	18 -190	PPI	P	DWH
6-068	6/1/2012	11:00	W-28	VC	T/T	450	7.5	148-120	152-140	188-190	PPI	P	DWH
6-069	6/8/2012	8:20	W-14	VS	S/S	365	8	133-128	125-135	198-197	PPI	P	DWH
6-070	6/8/2012	8:20	W-14	VS	T/T	365	7	147-146	132-133	180-179	PPI	P	DWH
6-071	6/8/2012	8:25	W-5	AS	S/S	365	7	135-143	142-138	198-188	PPI	P	DWH

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Trial Seam Log - Fusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II
ProjNo: GJ4706B
TaskNo: 200

Tensiometer Description: NAL-0802

Material Type gml : 6
Peel Inside: 91 ppi
Peel Outside: 91 ppi
Shear: 120 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Fusion		Test Results					QA ID
						Wedge ° Celsius	Speed ft./Min	Peel In	Peel Out	Shear	Unit ppi/psi	Result	
6-072	6/8/2012	8:25	W-5	AS	T/T	365	6	145-133	137-124	188-182	PPI	P	DWH
6-073	6/8/2012	8:37	W-11	TS	S/S	375	8	121-110	122-112	178-180	PPI	P	DWH
6-074	6/8/2012	8:37	W-11	TS	T/T	375	6.5	124-128	146-132	175-179	PPI	P	DWH
6-075	6/8/2012	8:45	W-10	KC	S/S	375	8.5	123-130	125-128	190-187	PPI	P	DWH
6-076	6/8/2012	8:45	W-10	KC	T/T	375	6.5	141-141	142-140	189-191	PPI	P	DWH
6-077	6/8/2012	13:10	W-11	TS	T/T	375	6	109-147	103-145	180-180	PPI	P	DWH
6-078	6/14/2012	8:15	W-11	TS	S/S	375	8	131-133	133-131	201-201	PPI	P	DWH
6-079	6/14/2012	8:15	W-11	TS	T/T	375	6.5	120-114	128-135	165-166	PPI	P	DWH
6-080	6/14/2012	8:35	W-28	VC	S/S	450	7	155-138	142-125	189-194	PPI	P	DWH
6-081	6/14/2012	8:35	W-28	VC	T/T	450	7	151-152	140-137	181-192	PPI	P	DWH
6-082	6/14/2012	8:40	W-10	KC	S/S	380	8	135-144	149-116	193-195	PPI	P	DWH
6-083	6/14/2012	8:40	W-10	KC	T/T	380	6.5	138-153	132-140	173-173	PPI	P	DWH
6-084	6/14/2012	8:45	W-5	AS	S/S	375	8	136-151	138-131	189-187	PPI	P	DWH
6-085	6/14/2012	8:45	W-5	AS	T/T	375	6.5	151-153	158-150	175-179	PPI	P	DWH
6-086	6/14/2012	12:40	W-28	VC	T/T	450	7	126-136	134-131	175-181	PPI	P	DWH
6-087	6/14/2012	13:15	W-11	TS	S/S	375	8	120-103	132-108	172-176	PPI	P	DWH
6-088	6/14/2012	13:15	W-11	TS	T/T	375	6.5	108-110	131-111	150-152	PPI	P	DWH
6-089	6/14/2012	13:30	W-10	KC	S/S	380	8	115-105	113-112	172-170	PPI	P	DWH
6-090	6/14/2012	13:30	W-10	KC	T/T	380	7	113-103	104-106	168-171	PPI	P	DWH
6-091	6/18/2012	7:45	W-11	TS	S/S	375	8	131-123	138-139	171-159	PPI	P	DWH
6-092	6/18/2012	7:45	W-11	TS	T/T	375	6.5	132-134	125-142	161-159	PPI	P	DWH
6-093	6/18/2012	7:50	W-10	KC	S/S	380	8	112-129	123-135	176-176	PPI	P	DWH
6-094	6/18/2012	7:50	W-10	KC	T/T	380	7	138-133	130-134	149-149	PPI	P	DWH
6-095	6/18/2012	8:00	W-28	VC	S/S	450	7.5	110-123	129-135	176-176	PPI	P	DWH
6-096	6/18/2012	8:00	W-28	VC	T/T	450	6.5	145-149	142-134	145-152	PPI	P	DWH
6-097	6/18/2012	12:40	W-28	VC	S/S	450	12.5	116-113	104-122	147-138	PPI	P	DWH
6-098	6/18/2012	12:40	W-28	VC	T/T	450	11.5	99-104	92-103	124-120	PPI	P	DWH
6-099	6/18/2012	12:45	W-11	TS	S/S	375	8	122-109	126-121	148-159	PPI	P	DWH
6-100	6/18/2012	12:45	W-11	TS	T/T	375	6.5	125-117	105-123	129-122	PPI	P	DWH
6-101	6/18/2012	12:50	W-10	KC	S/S	380	8	122-111	129-124	143-133	PPI	P	DWH
6-102	6/18/2012	12:50	W-10	KC	T/T	380	6.5	107-101	107-115	122-120	PPI	P	DWH
6-103	6/21/2012	7:40	W-28	VC	S/S	450	12.5	125-120	117-128	154-151	PPI	P	DWH
6-104	6/21/2012	7:40	W-28	VC	T/T	450	11.5	110-110	119-128	156-152	PPI	P	DWH
6-105	6/21/2012	7:45	W-5	BTK	S/S	375	7.5	122-114	128-115	160-163	PPI	P	DWH

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Trial Seam Log - Fusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II
ProjNo: GJ4706B
TaskNo: 200

Tensiometer Description: NAL-0802

Material Type gml : 6
Peel Inside: 91 ppi
Peel Outside: 91 ppi
Shear: 120 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Fusion		Test Results					QA ID
						Wedge ° Celsius	Speed ft./Min	Peel In	Peel Out	Shear	Unit ppi/psi	Result	
6-106	6/21/2012	7:45	W-5	BTK	T/T	375	6	113-114	113-115	143-149	PPI	P	DWH
6-107	6/21/2012	8:03	W-11	TS	S/S	375	8	123-113	125-120	164-160	PPI	P	DWH
6-108	6/21/2012	8:03	W-11	TS	T/T	375	6.5	119-136	129-137	147-136	PPI	P	DWH
6-109	6/21/2012	8:05	W-10	KC	S/S	380	8.5	117-124	126-132	165-154	PPI	P	DWH
6-110	6/21/2012	8:05	W-10	KC	T/T	380	7	127-127	119-124	131-120	PPI	P	DWH
6-111	6/21/2012	12:50	W-28	VC	S/S	450	12.5	117-118	119-128	125-120	PPI	P	DWH
6-112	6/21/2012	12:50	W-28	VC	T/T	450	11.5	120-115	124-126	120-120	PPI	P	DWH
6-113	6/21/2012	12:56	W-5	BTK	S/S	375	8	111-120	110-118	128-125	PPI	P	DWH
6-114	6/21/2012	12:56	W-5	BTK	T/T	375	6.5	119-121	116-119	120-124	PPI	P	DWH
6-115	6/21/2012	13:10	W-10	KC	S/T	380	8.5	106-112	109-120	133-127	PPI	P	DWH
6-116	6/21/2012	13:10	W-10	KC	T/T	380	7	123-127	122-120	130-132	PPI	P	DWH
6-117	6/21/2012	13:30	W-11	TS	S/S	375	8.5	102-109	119-118	135-130	PPI	P	DWH
6-118	6/21/2012	13:30	W-11	TS	T/T	375	6.5	109-108	108-109	120-120	PPI	P	DWH

Extrusion

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Trial Seam Log - Extrusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Tensiometer Description: NAL-0802

Material Type: gml : 6
Peel: 78 ppi
Shear: 120 ppi

Trial Seam No	Date	Time	Mach ID	Oper ID	Mat Desc	Extrusion		Test Results				Retest No	QA ID
						Pre heat ° Celsius	Barrel ° Celsius	Peel	Shear	Unit ppi/psi	Result P/F		
1-080	3/28/2012	13:35	MX-16	CP	T/T	450	495	145-132	168-171	PPI	P		DWH
1-081	3/30/2012	8:15	MX-16	VS	T/T	500	500	128-140	189-190	PPI	P		DWH
1-082	4/2/2012	8:30	MX-16	VS	T/T	500	500	155-154	189-216	PPI	P		DWH
1-083	4/2/2012	10:30	MX-16	VS	T/T	500	500	119-124	198-196	PPI	P		DWH
1-084	4/2/2012	12:45	MX-16	VS	T/T	500	500	142-131	185-191	PPI	P		DWH
1-085	4/3/2012	8:30	MX-16	VS	T/T	500	500	138-146	224-214	PPI	P		DWH
1-086	4/3/2012	10:00	MX-16	VS	T/T	500	500	119-121	178-191	PPI	P		DWH
1-087	4/3/2012	12:45	MX-16	VS	T/T	500	500	135-128	187-190	PPI	P		DWH
1-088	4/4/2012	9:42	MX-16	VS	T/T	500	500	147-142	203-207	PPI	P		DWH
1-089	4/6/2012	9:10	MX-16	VS	T/T	500	500	151-163	212-210	PPI	P		DWH
1-090	4/6/2012	13:40	MX-16	VS	T/T	500	500	140-136	181-176	PPI	P		DWH
1-091	4/9/2012	8:15	MX-16	VS	T/T	500	500	140-133	212-216	PPI	P		DWH
1-092	4/9/2012	10:30	MX-16	VS	T/T	500	500	150-137	191-198	PPI	P		DWH
1-093	4/9/2012	12:45	MX-16	VS	T/T	500	500	138-151	196-192	PPI	P		DWH
1-094	4/10/2012	8:30	MX-16	VS	T/T	500	500	158-165	220-209	PPI	P		DWH
1-095	4/10/2012	12:40	MX-16	VS	T/T	500	500	149-140	221-204	PPI	P		DWH
1-096	4/13/2012	9:20	MX-12	VC	T/T	500	500	126-129	188-196	PPI	P		DWH
1-097	4/13/2012	13:30	MX-18	VC	T/T	475	500	128-130	196-186	PPI	P		DWH
1-098	4/16/2012	8:00	MX-16	VS	T/T	500	500	134-122	171-178	PPI	P		DWH
1-099	4/16/2012	9:00	MX-18	LV	T/T	475	500	120-118	171-173	PPI	P		DWH
1-100	4/16/2012	13:00	MX-18	LV	T/T	475	500	130-131	156-162	PPI	P		DWH
1-101	4/16/2012	14:45	MX-16	BTK	T/T	500	450	135-123	137-138	PPI	P		DWH
1-102	4/17/2012	8:00	MX-18	LV	T/T	500	500	128-163	192-189	PPI	P		DWH
1-103	4/17/2012	12:50	MX-18	LV	T/T	500	500	115-158	141-182	PPI	P		DWH
1-104	4/18/2012	8:05	MX-16	VS	T/T	500	500	134-147	201-196	PPI	P		DWH
1-105	4/18/2012	8:05	MX-18	LV	T/T	500	500	112-136	230-230	PPI	P		DWH
1-106	4/18/2012	12:40	MX-16	VS	T/T	500	500	136-147	168-178	PPI	P		DWH
1-107	4/18/2012	12:45	MX-18	LV	T/T	500	500	120-135	208-209	PPI	P		DWH
1-108	4/19/2012	8:10	MX-16	VS	T/T	500	500	134-139	209-223	PPI	P		DWH
6-001	5/16/2012	13:20	MX-16	VC	T/T	425	475	115-119	174-169	PPI	P		DWH
6-002	5/17/2012	8:20	MX-16	VC	T/T	475	500	123-122	161-164	PPI	P		DWH
6-003	5/17/2012	9:30	MX-18	CAP	T/T	475	475	142-141	168-168	PPI	P		DWH
6-004	5/17/2012	12:40	MX-18	CAP	T/T	475	475	128-140	164-169	PPI	P		DWH
6-005	5/17/2012	12:50	MX-16	VC	T/T	475	500	130-124	165-168	PPI	P		DWH
6-006	5/21/2012	8:00	MX-16	VC	T/T	475	500	118-108	168-174	PPI	P		DWH
6-007	5/21/2012	8:15	MX-18	BTK	T/T	500	475	126-121	188-181	PPI	P		DWH

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Trial Seam Log - Extrusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Tensiometer Description: NAL-0802

Material Type gml : 6 *Peel:* 78 ppi *Shear:* 120 ppi

Trial Seam No	*Date*	*Time*	*Mach ID*	*Oper ID*	*Mat Desc*	*Extrusion*		*Test Results*				*Retest No*	*QA ID*
						Pre heat ° Celsius	*Barrel ° Celsius*	*Peel*	*Shear*	*Unit ppi/psi*	*Result P/F*		
6-008	5/21/2012	11:30	MX-18	VS	T/T	500	475	126-129	164-178	PPI	P		DWH
6-009	5/21/2012	13:20	MX-16	VC	T/T	475	500	130-138	192-190	PPI	P		DWH
6-010	5/22/2012	9:10	MX-16	VC	T/T	500	500	134-128	192-196	PPI	P		DWH
6-011	5/22/2012	12:35	MX-16	VC	T/T	500	500	132-138	198-196	PPI	P		DWH
6-012	5/23/2012	8:30	MX-16	VC	T/T	500	500	130-126	184-192	PPI	P		DWH
6-013	5/23/2012	13:00	MX-16	VC	T/T	500	500	135-123	178-181	PPI	P		DWH
6-014	5/25/2012	8:00	MX-16	JS	T/T	500	500	89-89	166-169	PPI	P		DWH
6-015	5/29/2012	8:00	MX-16	VC	T/T	500	500	128-132	165-160	PPI	P		DWH
6-016	5/29/2012	12:45	MX-16	VC	T/T	500	500	115-124	180-179	PPI	P		DWH
6-017	5/30/2012	9:35	MX-16	VC	T/T	500	500	115-120	180-174	PPI	P		DWH
6-018	5/30/2012	12:45	MX-16	VC	T/T	500	500	98-110	165-185	PPI	P		DWH
6-019	5/31/2012	8:00	MX-16	VC	T/T	500	500	104-126	184-180	PPI	P		DWH
6-020	5/31/2012	12:55	MX-16	VC	T/T	500	500	140-140	200-195	PPI	P		DWH
6-021	6/4/2012	8:10	MX-16	VC	T/T	500	500	160-142	172-181	PPI	P		DWH
6-022	6/4/2012	12:31	MX-16	VC	T/T	500	500	151-171	194-189	PPI	P		DWH
6-023	6/5/2012	8:00	MX-16	VS	T/T	500	500	154-161	191-195	PPI	P		DWH
6-024	6/5/2012	12:45	MX-16	VS	T/T	500	500	142-139	189-192	PPI	P		DWH
6-025	6/6/2012	8:00	MX-16	VS	T/T	500	500	131-146	187-193	PPI	P		DWH
6-026	6/6/2012	13:00	MX-16	VS	T/T	500	500	125-129	178-186	PPI	P		DWH
6-027	6/7/2012	7:35	MX-18	KC	T/T	475	500	156-162	179-173	PPI	P		DWH
6-028	6/7/2012	8:00	MX-16	VS	T/T	500	500	157-139	187-191	PPI	P		DWH
6-029	6/7/2012	13:00	MX-16	VS	T/T	500	500	133-131	172-182	PPI	P		DWH
6-030	6/7/2012	13:00	MX-18	KC	T/T	475	500	142-135	172-176	PPI	P		DWH
6-031	6/8/2012	13:10	MX-16	VS	T/T	500	500	123-129	171-183	PPI	P		DWH
6-032	6/11/2012	7:35	MX-16	KC	T/T	500	500	130-133	183-198	PPI	P		DWH
6-033	6/11/2012	7:40	MX-18	VC	T/T	475	500	112-118	179-185	PPI	P		DWH
6-034	6/11/2012	12:40	MX-16	KC	T/T	500	500	123-125	179-188	PPI	P		DWH
6-035	6/11/2012	12:45	MX-18	VC	T/T	500	500	120-118	181-178	PPI	P		DWH
6-036	6/13/2012	7:40	MX-16	KC	T/T	475	500	125-142	172-178	PPI	P		DWH
6-037	6/13/2012	12:40	MX-16	KC	T/T	475	500	117-128	187-179	PPI	P		DWH
6-038	6/14/2012	8:30	MX-16	VS	T/T	500	500	138-141	194-189	PPI	P		DWH
6-039	6/14/2012	13:25	MX-16	VS	T/T	500	500	159-167	185-168	PPI	P		DWH
6-040	6/15/2012	7:30	MX-16	KC	T/T	500	500	106-109	170-175	PPI	P		DWH
6-041	6/15/2012	12:40	MX-16	VS	T/T	500	500	102-107	165-172	PPI	P		DWH
6-042	6/15/2012	13:30	MX-12	BTK	T/T	400	500	139-140	160-169	PPI	P		DWH
6-043	6/20/2012	7:30	MX-16	KC	T/T	500	500	108-127	136-132	PPI	P		DWH

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Trial Seam Log - Extrusion

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Tensiometer Description: NAL-0802

Material Type gml : 6 *Peel:* 78 ppi *Shear:* 120 ppi

Trial Seam No	*Date*	*Time*	*Mach ID*	*Oper ID*	*Mat Desc*	*Extrusion*		*Test Results*				*Retest No*	*QA ID*
						Pre heat ° Celsius	*Barrel ° Celsius*	*Peel*	*Shear*	*Unit ppi/psi*	*Result P/F*		
6-044	6/20/2012	12:45	MX-16	KC	T/T	500	500	121-124	127-120	PPI	P		DWH
6-045	6/22/2012	7:30	MX-16	KC	T/T	500	450	106-110	152-142	PPI	P		DWH
6-046	6/22/2012	12:45	MX-16	KC	T/T	500	450	111-109	145-150	PPI	P		DWH
6-047	6/25/2012	7:30	MX-16	KC	T/T	500	450	109-114	189-186	PPI	P		DWH
6-048	6/25/2012	12:40	MX-16	KC	T/T	500	450	110-112	175-180	PPI	P		DWH
6-049	6/26/2012	7:35	MX-16	KC	T/T	500	450	102-101	145-149	PPI	P		DWH
6-050	6/26/2012	8:00	MX-12	BTK	T/T	550	500	134-121	160-161	PPI	P		DWH
6-051	6/26/2012	12:55	MX-16	KC	T/T	500	450	130-131	147-141	PPI	P		DWH
6-052	6/26/2012	13:00	MX-12	BTK	T/T	550	500	101-146	158-163	PPI	P		DWH
6-053	6/27/2012	8:00	MX-16	KC	T/T	500	475	113-120	172-178	PPI	P		DWH
6-054	6/27/2012	9:00	MX-12	BTK	T/T	550	500	111-123	171-170	PPI	P		DWH
6-055	6/27/2012	12:45	MX-12	BTK	T/T	550	500	115-110	158-160	PPI	P		DWH
6-056	6/27/2012	12:48	MX-16	KC	T/T	500	475	143-133	156-159	PPI	P		DWH
6-057	6/28/2012	7:30	MX-16	KC	T/T	500	475	119-120	170-175	PPI	P		DWH
6-058	6/28/2012	13:00	MX-12	BTK	T/T	550	500	123-137	141-139	PPI	P		DWH
6-059	6/28/2012	13:00	MX-16	KC	T/T	500	475	133-136	158-160	PPI	P		DWH
6-060	6/29/2012	7:40	MX-16	KC	T/T	500	475	108-126	161-161	PPI	P		DWH
6-061	6/29/2012	9:00	MX-12	BTK	T/T	550	500	118-106	144-146	PPI	P		DWH
6-062	6/29/2012	12:45	MX-12	BTK	T/T	550	500	118-110	160-170	PPI	P		DWH
6-063	6/29/2012	12:50	MX-16	KC	T/T	500	475	110-109	161-168	PPI	P		DWH
6-064	7/2/2012	8:00	MX-12	KC	T/T	500	500	117-110	170-176	ppi	P		DWH
6-065	7/2/2012	8:30	MX-16	BTK	T/T	550	500	136-139	179-175	ppi	P		DWH
6-066	7/2/2012	12:45	MX-12	KC	T/T	500	500	109-110	160-162	PPI	P		DWH
6-067	7/2/2012	12:50	MX-16	BTK	T/T	550	500	136-128	155-145	PPI	P		DWH
6-068	7/3/2012	7:35	MX-16	KC	T/T	550	500	118-122	174-179	PPI	P		DWH
6-069	7/3/2012	0:00	MX-16	KC	T/T	550	500	105-109	154-160	PPI	P		DWH
6-070	7/6/2012	10:00	MX-12	KC	T/T	550	500	110-112	167-171	PPI	P		DWH
6-071	7/13/2012	0:00	MX-16	VC	T/T	500	500	114-115	133-129	ppi	p		DWH
6-072	7/16/2012	0:00	MX-8	MBY2	T/T	475	475	110-114	139-135	ppi	p		DW
6-073	9/17/2012	0:00	MX-14	MB	T/T	500	450	111-118	141-153	ppi	p		DW
6-074	10/3/2012	0:00	MX-1	MB	T/T	500	500	102-109	152-145	ppi	p		DW
6-075	11/13/2012	0:00	X6	BTK	T/T	550	550	146-131	224-209	ppi	P		JWC
6-076	11/14/2012	0:00	X-12	BTK	T/T	550	550	114-117	189-187	ppi	P		JWC
6-077	4/3/2013	12:30	X-12	CP	T/T	450	450	117-125	212-204	ppi	p		JB

APPENDIX K

Geomembrane Production Seam and Non-Destructive Test Logs

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	8:45	W-14	VC	F	6-001-002-0-47.5	47.5	DWH	0-47.5	30-30	AS	P	AT OK	DWH
5/15/2012	8:47	W-5	AS	F	6-002-003-0-47	47	DWH	0-47	30-29	AS	P	AT OK	DWH
5/15/2012	8:58	W-14	VC	F	6-003-004-0-47	47	DWH	0-47	30-28	AS	P	AT OK	DWH
5/15/2012	8:58	W-5	AS	F	6-004-005-0-47.5	47.5	DWH	0-47.5	30-28	AS	P	AT OK	DWH
5/15/2012	9:10	W-14	VC	F	6-005-006-0-49	49	DWH	0-49	30-30	AS	P	AT OK	DWH
5/15/2012	9:12	W-5	AS	F	6-006-007-0-50	50	DWH	0-50	30-30	AS	P	AT OK	DWH
5/15/2012	9:16	W-9	LV	F	6-009-010-0-50	50	DWH	0-50	30-30	AS	P	AT OK	DWH
5/15/2012	9:16	W-11	TS	F	6-010-011-0-50	50	DWH	0-50	30-30	AS	P	AT OK	DWH
5/15/2012	9:19	W-14	VC	F	6-007-008-0-49.5	49.5	DWH	0-49.5	30-30	AS	P	AT OK	DWH
5/15/2012	9:23	W-5	AS	F	6-008-009-0-49	49	DWH	0-49	30-27	AS	P	AT OK	DWH
5/15/2012	9:35	W-11	TS	F	6-011-012-0-50	50	DWH	0-50	30-30	AS	P	AT OK	DWH
5/15/2012	9:38	W-14	VC	F	6-012-013-0-51	51	DWH	051	30-30	AS	P	AT OK	DWH
5/15/2012	9:39	W-5	AS	F	6-013-014-0-51	51	DWH	0-51	30-28	AS	P	AT OK	DWH
5/15/2012	9:45	W-14	VC	F	6-014-015-0-51	51	DWH	0-51	30-30	AS	P	AT OK	DWH
5/15/2012	9:45	W-9	LV	F	6-017-018-0-49.5	49.5	DWH	0-49.5	30-28	AS	P	AT OK	DWH
5/15/2012	9:45	W-11	TS	F	6-018-019-0-49	49	DWH	0-49	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	9:51	W-5	AS	F	6-015-016-0-50.5	50.5	DWH	0-50.5	30-30	AS	P	AT OK	DWH
5/15/2012	9:56	W-14	VC	F	6-016-017-0-50	50	DWH	0-50	30-28	AS	P	AT OK	DWH
5/15/2012	9:56	W-9	LV	F	6-019-020-0-48	48	DWH	0-48	30-30	AS	P	AT OK	DWH
5/15/2012	9:56	W-11	TS	F	6-020-021-0-48	48	DWH	0-48	30-30	AS	P	AT OK	DWH
5/15/2012	10:06	W-11	TS	F	6-021-022-0-46	46	DWH	0-46	30-30	AS	P	AT OK	DWH
5/15/2012	10:06	W-14	VC	F	6-022-023-0-46	46	DWH	0-46	30-30	AS	P	AT OK	DWH
5/15/2012	10:09	W-5	AS	F	6-023-024-0-46	46	DWH	0-46	30-28	AS	P	AT OK	DWH
5/15/2012	10:14	W-14	VC	F	6-025-026-0-43	43	DWH	0-43	30-30	AS	P	AT OK	DWH
5/15/2012	10:15	W-11	TS	F	6-024-025-0-45	45	DWH	0-45	30-30	AS	P	AT OK	DWH
5/15/2012	10:22	W-5	AS	F	6-028-029-22-0	22	DWH	0-22	30-30	AS	P	AT OK	DWH
5/15/2012	10:25	W-14	VC	F	6-027-029-0-17	17	DWH	0-17	30-29	AS	P	AT OK	DWH
5/15/2012	10:27	W-14	VC	F	6-027-028-17-34	17	DWH	17-34	30-30	AS	P	AT OK	DWH
5/15/2012	10:30	W-14	VC	F	6-026-028-30-42	12	DWH	34-42	30-28	AS	P	AT OK	DWH
5/15/2012	10:33	W-9	LV	F	6-026-027-0-34	34	DWH	0-34	30-30	AS	P	AT OK	DWH
5/15/2012	10:58	W-11	TS	F	6-030-031-0-22	22	DWH	0-22	30-30	AS	P	AT OK	DWH
5/15/2012	11:03	W-5	AS	F	6-001-030-628-605	23	DWH	605-628	30-29	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	11:07	W-5	AS	F	6-002-030-605-583	22	DWH	583-605	30-28	AS	P	AT OK	DWH
5/15/2012	11:11	W-5	AS	F	6-003-030-583-560	23	DWH	560-583	30-30	AS	P	AT OK	DWH
5/15/2012	11:14	W-5	AS	F	6-004-030-560-538	22	DWH	538-560	30-30	AS	P	AT OK	DWH
5/15/2012	11:17	W-14	VC	F	6-032-034-633-594	39	DWH	594-633	30-30	AS	P	AT OK	DWH
5/15/2012	11:19	W-5	AS	F	6-005-030-538-515	23	DWH	515-538	30-27	AS	P	AT OK	DWH
5/15/2012	11:23	W-9	LV	F	6-030-032-594-320	274	DWH	320-594	30-30	AS	P	AT OK	DWH
5/15/2012	11:24	W-5	AS	F	6-006-030-515-493	22	DWH	493-515	30-27	AS	P	AT OK	DWH
5/15/2012	11:27	W-5	AS	F	6-007-030-493-470	23	DWH	470-493	30-30	AS	P	AT OK	DWH
5/15/2012	11:30	W-5	AS	F	6-008-030-470-448	22	DWH	448-470	30-28	AS	P	AT OK	DWH
5/15/2012	11:33	W-5	AS	F	6-009-030-448-425	23	DWH	425-448	30-30	AS	P	AT OK	DWH
5/15/2012	11:37	W-5	AS	F	6-010-030-425-403	22	DWH	403-425	30-30	AS	P	AT OK	DWH
5/15/2012	11:40	W-11	TS	F	6-030-033-320-175	145	DWH	175-320	30-30	AS	P	AT OK	DWH
5/15/2012	11:41	W-5	AS	F	6-011-030-403-381	22	DWH	381-403	30-30	AS	P	AT OK	DWH
5/15/2012	11:45	W-5	AS	F	6-012-030-381-358	23	DWH	358-381	30-30	AS	P	AT OK	DWH
5/15/2012	11:49	W-5	AS	F	6-013-030-358-335	23	DWH	335-358	30-30	AS	P	AT OK	DWH
5/15/2012	11:53	W-5	AS	F	6-014-030-335-313	22	DWH	313-335	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	11:55	W-14	VC	F	6-032-033-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
5/15/2012	11:57	W-5	AS	F	6-015-030-313-290	23	DWH	290-313	30-30	AS	P	AT OK	DWH
5/15/2012	12:00	W-11	TS	F	6-031-033-175-0	175	DWH	0-175	30-30	AS	P	AT OK	DWH
5/15/2012	12:01	W-5	AS	F	6-016-030-290-267	23	DWH	267-290	30-30	AS	P	AT OK	DWH
5/15/2012	13:08	W-5	AS	F	6-017-030-265-247	22	DWH	247-265	30-28	AS	P	AT OK	DWH
5/15/2012	13:13	W-5	AS	F	6-018-030-245-222	23	DWH	222-245	30-29	AS	P	AT OK	DWH
5/15/2012	13:18	W-5	AS	F	6-019-030-222-200	22	DWH	200-222	30-30	AS	P	AT OK	DWH
5/15/2012	13:22	W-5	AS	F	6-020-030-200-177	23	DWH	177-200	30-30	AS	P	AT OK	DWH
5/15/2012	13:26	W-5	AS	F	6-021-030-177-174	3	DWH	174-177	CAPPED	AS	P	VT OK	DWH
5/15/2012	13:27	W-5	AS	F	6-021-031-174-154	20	DWH	154-174	30-30	AS	P	AT OK	DWH
5/15/2012	13:30	W-5	AS	F	6-022-031-154-131	23	DWH	131-154	30-30	AS	P	AT OK	DWH
5/15/2012	13:33	W-5	AS	F	6-023-031-131-109	22	DWH	109-131	30-30	AS	P	AT OK	DWH
5/15/2012	13:36	W-5	AS	F	6-024-031-109-86	23	DWH	86-109	30-30	AS	P	AT OK	DWH
5/15/2012	13:38	W-9	LV	F	6-032-034-639-465	204	DWH	435-639	30-28	AS	P	AT OK	DWH
5/15/2012	13:39	W-5	AS	F	6-025-031-86-63	23	DWH	63-86	30-27	AS	P	AT OK	DWH
5/15/2012	13:40	W-11	TS	F	6-033-035-323-0	323	DWH	0-323	30-28	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	13:43	W-5	AS	F	6-026-031-63-41	22	DWH	41-63	30-29	AS	P	AT OK	DWH
5/15/2012	13:48	W-5	AS	F	6-028-031-41-0	41	DWH	0-41	30-30	AS	P	AT OK	DWH
5/15/2012	13:50	W-14	VC	F	6-034-035-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	14:05	W-9	LV	F	6-032-035-465-323	142	DWH	323-465	30-30	AS	P	AT OK	DWH
5/15/2012	14:15	W-14	VC	F	6-036-037-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	14:24	W14	VC	F	6-034-036-639-598	41	DWH	598-639	30-28	AS	P	AT OK	DWH
5/15/2012	14:28	W-14	VC	F	6-034-037-598-463	135	DWH	463-598	30-30	AS	P	AT OK	DWH
5/15/2012	14:30	W-5	AS	F	6-035-037-463-92	371	DWH	92-463	30-30	AS	P	AT OK	DWH
5/15/2012	14:35	W-11	TS	F	6-037-038-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	14:46	W-9	LV	F	6-036-039-640-602	38	DWH	602-640	30-29	AS	P	AT OK	DWH
5/15/2012	14:51	W-9	LV	F	6-037-039-602-233	369	DWH	233-602	30-30	AS	P	AT OK	DWH
5/15/2012	15:00	W-11	TS	F	6-039-040-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
5/15/2012	15:09	W-11	TS	F	6-037-040-233-95	138	DWH	95-233	30-29	AS	P	AT OK	DWH
5/15/2012	15:10	W-14	VC	F	6-039-041-640-375	265	DWH	375-640	30-30	AS	P	AT OK	DWH
5/15/2012	15:15	W-5	AS	F	6-035-038-92-0	92	DWH	0-92	30-27	AS	P	AT OK	DWH
5/15/2012	15:27	W-11	TS	F	6-038-040-95-0	95	DWH	0-95	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	15:45	W-14	VC	F	6-041-042-0-10	10	DWH	0-10	CAPPED	AS	P	VT OK	DWH
5/15/2012	15:48	W-11	TS	F	6-040-042-235-0	235	DWH	0-235	30-30	AS	P	AT OK	DWH
5/15/2012	15:50	W-9	LV	F	6-039-042-375-235	140	DWH	235-375	30-30	AS	P	AT OK	DWH
5/15/2012	15:55	W-5	AS	F	6-041-042-10-22	12	DWH	10-22	30-30	AS	P	AT OK	DWH
5/15/2012	16:05	W-5	AS	F	6-041-043-639-520	119	DWH	520-639	30-30	AS	P	AT OK	DWH
5/15/2012	16:20	W-9	LV	F	6-041-044-500-337	163	DWH	337-500	30-30	AS	P	AT OK	DWH
5/15/2012	16:36	W-11	TS	F	6-042-044-337-0	337	DWH	0-337	30-30	AS	P	AT OK	DWH
5/15/2012	16:41	W-5	AS	F	6-043-045-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
5/15/2012	16:50	W-5	AS	F	6-041-045-520-500	20	DWH	500-520	30-30	AS	P	AT OK	DWH
5/15/2012	16:56	W-5	AS	F	6-044-045-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	17:13	W-9	LV	F	6-001-Phasel-0-48	48	DWH	0-48	30-30	AS	P	AT OK	DWH
5/15/2012	17:35	W-9	LV	F	6-030-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	17:41	W-9	LV	F	6-032-Phase I-0-22.5	22.5	DWH	0-22.5	30-27	AS	P	AT OK	DWH
5/15/2012	17:45	W-9	LV	F	6-034-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	17:49	W-9	LV	F	6-036-Phase I-1-22.5	21.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/15/2012	17:54	W-5	AS	F	6-039-Phase I-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/15/2012	17:58	W-5	AS	F	6-041-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	9:11	W-11	TS	F	6-044-046-499-0	499	DWH	0-499	30-27	AS	P	AT OK	DWH
5/16/2012	9:22	W-5	VC	F	6-046-047-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	9:26	W-9	LV	F	6-043-047-645-521	124	DWH	521-645	30-30	AS	P	AT OK	DWH
5/16/2012	9:31	W-5	VC	F	6-047-048-650-501	149	DWH	501-650	30-30	AS	P	AT OK	DWH
5/16/2012	9:43	W-9	LV	F	6-045-047-521-499	22	DWH	499-521	30-27	AS	P	AT OK	DWH
5/16/2012	9:44	W-5	VC	F	6-046-048-501-300	201	DWH	300-501	30-30	AS	P	AT OK	DWH
5/16/2012	9:52	W-9	LV	F	6-048-050-645-450	195	DWH	450-645	30-30	AS	P	AT OK	DWH
5/16/2012	10:10	W-5	VC	F	6-048-049-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	10:13	W-5	VC	F	6-046-049-300-0	300	DWH	0-300	30-30	AS	P	AT OK	DWH
5/16/2012	10:28	W-9	LV	F	6-050-051-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	10:30	W-9	LV	F	6-048-051-450-300	150	DWH	300-450	30-30	AS	P	AT OK	DWH
5/16/2012	10:30	W-11	TS	F	6-051-053-0-450	450	DWH	0-450	30-30	AS	P	AT OK	DWH
5/16/2012	10:55	W-9	LV	F	6-049-051-300-0	300	DWH	0-300	30-30	AS	P	AT OK	DWH
5/16/2012	10:57	W-5	VC	F	6-053-054-0-22.5	22.5	DWH	0-22.5	CAPPED	AS	P	VT OK	DWH
5/16/2012	11:08	W-5	VC	F	6-050-054-600-498	102	DWH	498-600	30-28	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/16/2012	11:23	W-5	VC	F	6-052-054-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	11:27	W-5	VC	F	6-050-052-645-600	45	DWH	600-645	30-28	AS	P	AT OK	DWH
5/16/2012	11:30	W-11	TS	F	6-050-053-450-498	48	DWH	450-498	30-27	AS	P	AT OK	DWH
5/16/2012	14:00	W-11	TS	F	6-043-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	14:04	W-11	TS	F	6-047-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	14:08	W-11	TS	F	6-048-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	14:12	W-11	TS	F	6-050-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/16/2012	14:20	W-11	TS	F	6-052-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	8:26	W-9	LV	F	6-055-057-0-219	219	DWH	0-219	30-30	AS	P	AT OK	DWH
5/18/2012	9:01	W-9	LV	F	6-055-058-219-380	161	DWH	219-380	30-30	AS	P	AT OK	DWH
5/18/2012	9:10	W-11	TS	F	6-053-055-0-377	377	DWH	0-377	30-30	AS	P	AT OK	DWH
5/18/2012	9:10	W-5	AS	F	6-055-056-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	9:18	W-5	AS	F	6-057-058-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	9:25	W-10	KC	F	6-057-060-0-219	219	DWH	0-219	30-29	AS	P	AT OK	DWH
5/18/2012	9:30	W-9	LV	F	6-056-059-380-655	275	DWH	380-655	30-30	AS	P	AT OK	DWH
5/18/2012	9:45	W-8	VC	F	6-060-061-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/18/2012	9:52	W-8	VC	F	6-059-061-0-22.5	22.5	DWH	0-22.5	30-27	AS	P	AT OK	DWH
5/18/2012	10:00	W-10	KC	F	6-058-060-219-502	283	DWH	219-502	30-29	AS	P	AT OK	DWH
5/18/2012	10:05	W-11	TS	F	6-053-056-377-502	125	DWH	307-502	30-30	AS	P	AT OK	DWH
5/18/2012	10:08	W-5	AS	F	6-060-063-0-240	240	DWH	0-240	30-29	AS	P	AT OK	DWH
5/18/2012	10:12	W-8	VC	F	6-062-063-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	10:22	W-11	TS	F	6-054-056-502-605	103	DWH	502-605	30-30	AS	P	AT OK	DWH
5/18/2012	10:37	W-11	TS	F	6-052-056-605-650	45	DWH	605-650	30-28	AS	P	AT OK	DWH
5/18/2012	10:37	W-10	KC	F	6-058-061-502-588	86	DWH	502-588	30-30	AS	P	AT OK	DWH
5/18/2012	10:42	W-10	KC	F	6-058-059-588-655	67	DWH	588-655	30-30	AS	P	AT OK	DWH
5/18/2012	10:42	W-9	LV	F	6-064-065-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	10:43	W-8	VC	F	6-062-064-244-251	7	DWH	244-251	30-30	AS	P	AT OK	DWH
5/18/2012	10:43	W-8	VC	F	6-062-065-251-650	399	DWH	251-650	30-30	AS	P	AT OK	DWH
5/18/2012	10:44	W-5	AS	F	6-060-062-240-504	264	DWH	240-504	30-30	AS	P	AT OK	DWH
5/18/2012	10:57	W-8	VC	F	6-063-064-0-244	244	DWH	0-240	30-30	AS	P	AT OK	DWH
5/18/2012	11:08	W-5	AS	F	6-061-062-504-594	90	DWH	504-594	30-30	AS	P	AT OK	DWH
5/18/2012	11:13	W-8	VC	F	6-067-068-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/18/2012	11:18	W-9	LV	F	6-064-067-0-250	250	DWH	0-250	30-30	AS	P	AT OK	DWH
5/18/2012	11:20	W-11	TS	F	6-067-070-0-218	218	DWH	0-218	30-30	AS	P	AT OK	DWH
5/18/2012	11:22	W-10	KC	F	6-066-068-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	11:26	W-8	VC	F	6-065-068-495-562	67	DWH	495-562	30-30	AS	P	AT OK	DWH
5/18/2012	11:32	W-5	AS	F	6-059-062-594-655	61	DWH	594-655	30-28	AS	P	AT OK	DWH
5/18/2012	11:32	W-10	KC	F	6-068-069-498-565	67	DWH	498-565	30-30	AS	P	AT OK	DWH
5/18/2012	11:33	W-10	KC	F	6-065-066-502-650	148	DWH	562-650	30-30	AS	P	AT OK	DWH
5/18/2012	11:40	W-10	KC	F	6-066-069-565-655	90	DWH	565-655	30-28	AS	P	AT OK	DWH
5/18/2012	11:45	W-11	TS	F	6-067-069-218-498	280	DWH	218-498	30-30	AS	P	AT OK	DWH
5/18/2012	11:48	W-5	AS	F	6-069-070-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
5/18/2012	12:00	W-9	LV	F	6-065-067-250-495	245	DWH	250-495	30-30	AS	P	AT OK	DWH
5/18/2012	12:01	W-8	VC	F	6-070-071-0-218	218	DWH	0-218	30-30	AS	P	AT OK	DWH
5/18/2012	12:28	W-8	VC	F	6-069-071-219-252	33	DWH	219-252	30-30	AS	P	AT OK	DWH
5/18/2012	13:20	W-5	AS	F	6-071-073-0-95	95	DWH	0-95	30-30	AS	P	AT OK	DWH
5/18/2012	13:22	W-10	KC	F	6-071-072-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	13:32	W-10	KC	F	6-069-072-252-650	398	DWH	252-650	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/18/2012	13:42	W-5	AS	F	6-073-075-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	13:50	W-5	AS	F	6-071-075-95-155	60	DWH	95-155	30-30	AS	P	AT OK	DWH
5/18/2012	13:53	W-8	VC	F	6-073-076-0-97	97	DWH	0-97	30-30	AS	P	AT OK	DWH
5/18/2012	13:58	W-9	LV	F	6-074-075-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	14:01	W-5	AS	F	6-071-074-155-261	106	DWH	155-261	30-28	AS	P	AT OK	DWH
5/18/2012	14:03	W-8	VC	F	6-075-076-97-155	58	DWH	97-155	30-30	AS	P	AT OK	DWH
5/18/2012	14:07	W-8	VC	F	6-074-076-155-650	495	DWH	155-650	30-30	AS	P	AT OK	DWH
5/18/2012	14:10	W-11	TS	F	6-076-077-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	14:15	W-5	AS	F	6-072-074-261-650	389	DWH	261-650	30-30	AS	P	AT OK	DWH
5/18/2012	14:27	W-11	TS	F	6-078-079-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	14:35	W-9	LV	F	6-076-079-0-374	374	DWH	0-374	30-30	AS	P	AT OK	DWH
5/18/2012	14:37	W-8	VC	F	6-074-077-443-650	207	DWH	443-650	30-27	AS	P	AT OK	DWH
5/18/2012	14:37	W-11	TS	F	6-076-078-374-442	68	DWH	374-442	30-30	AS	P	AT OK	DWH
5/18/2012	14:49	W-11	TS	F	6-077-078-442-650	108	DWH	442-650	30-30	AS	P	AT OK	DWH
5/18/2012	15:09	W-10	KC	F	6-056-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:16	W-10	KC	F	6-058-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/18/2012	15:20	W-10	KC	F	6-059-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:23	W-10	KC	F	6-062-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:26	W-10	KC	F	6-065-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:29	W-10	KC	F	6-066-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:30	W-10	KC	F	6-069-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:34	W-10	KC	F	6-072-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:39	W-10	KC	F	6-074-Phase I-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
5/18/2012	15:45	W-10	KC	F	6-077-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/18/2012	15:50	W-10	KC	F	6-078-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	8:30	W-8	VC	F	6-080-083-0-113	113	DWH	0-113	30-28	JS	P	AT OK	DWH
5/24/2012	8:35	W-11	TS	F	6-079-080-0-112	112	DWH	0-112	30-30	JS	P	AT OK	DWH
5/24/2012	8:44	W-8	VC	F	6-080-082-0-22.5	22.5	DWH	0-22.5	30-29	JS	P	AT OK	DWH
5/24/2012	8:51	W-10	KC	F	6-081-082-0-22.5	22.5	DWH	0-22.5	30-30	JS	P	AT OK	DWH
5/24/2012	8:54	W-11	TS	F	6-079-082-113-175	62	DWH	113-175	30-30	JS	P	AT OK	DWH
5/24/2012	8:58	W-5	AS	F	6-083-084-0-22.5	22.5	DWH	0-22.5	30-30	JS	P	AT OK	DWH
5/24/2012	9:02	W-11	TS	F	6-079-081-175-377	202	DWH	175-377	30-30	JS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/24/2012	9:03	W-8	VC	F	6-082-083-113-178	65	DWH	113-178	30-29	JS	P	AT OK	DWH
5/24/2012	9:10	W-8	VC	F	6-081-083-178-436	258	DWH	178-436	30-30	AS	P	AT OK	DWH
5/24/2012	9:13	W-10	KC	F	6-083-085-0-266	266	DWH	0-266	30-30	JS	P	AT OK	DWH
5/24/2012	9:26	W-5	AS	F	6-085-086-0-22.5	22.5	DWH	0-22.5	30-28	JS	P	AT OK	DWH
5/24/2012	9:30	W-11	TS	F	6-078-081-377-660	283	DWH	377-650	30-29	JS	P	AT OK	DWH
5/24/2012	9:34	W-5	AS	F	6-085-087-0-93	93	DWH	0-93	30-29	JS	P	AT OK	DWH
5/24/2012	9:35	W-10	KC	F	6-081-084-436-650	214	DWH	436-650	30-30	JS	P	AT OK	DWH
5/24/2012	9:45	W-10	KC	F	6-083-086-266-432	166	DWH	266-432	30-30	JS	P	AT OK	DWH
5/24/2012	9:53	W-5	AS	F	6-087-089-0-22.5	22.5	DWH	0-22.5	30-29	JS	P	AT OK	DWH
5/24/2012	10:07	W-5	AS	F	6-085-089-93-158	65	DWH	93-158	30-28	JS	P	AT OK	DWH
5/24/2012	10:09	W-10	KC	F	6-084-086-432-660	228	DWH	432-660	30-30	JS	P	AT OK	DWH
5/24/2012	10:15	W-5	AS	F	6-085-088-158-264	106	DWH	158-264	30-29	JS	P	AT OK	DWH
5/24/2012	10:15	W-8	VC	F	6-087-090-0-94	94	DWH	0-94	30-28	JS	P	AT OK	DWH
5/24/2012	10:26	W-11	TS	F	6-090-091-0-22.5	22.5	DWH	0-22.5	30-29	JS	P	AT OK	DWH
5/24/2012	10:27	W-8	VC	F	6-089-090-94-166	72	DWH	94-166	30-30	JS	P	AT OK	DWH
5/24/2012	10:28	W-5	AS	F	6-086-088-264-660	396	DWH	264-660	30-30	JS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/24/2012	10:32	W-8	VC	F	6-088-090-166-432	334	DWH	166-432	30-30	JS	P	AT OK	DWH
5/24/2012	10:40	W-11	TS	F	6-092-093-0-22.5	22.5	DWH	0-22.5	30-28	JS	P	AT OK	DWH
5/24/2012	10:49	W-10	KC	F	6-094-095-0-22.5	22.5	DWH	0-22.5	30-29	JS	P	AT OK	DWH
5/24/2012	10:50	W-11	TS	F	6-090-092-0-270	270	DWH	0-270	30-29	JS	P	AT OK	DWH
5/24/2012	10:58	W-8	VC	F	6-088-091-432-660	228	DWH	432-660	30-30	JS	P	AT OK	DWH
5/24/2012	11:00	W-11	TS	F	6-091-093-434-660	226	DWH	434-660	30-30	JS	P	AT OK	DWH
5/24/2012	11:00	W-10	KC	F	6-092-094-0-101	101	DWH	0-1-1	30-29	JS	P	AT OK	DWH
5/24/2012	11:11	W-10	KC	F	6-092-095-101-265	164	DWH	101-265	30-30	JS	P	AT OK	DWH
5/24/2012	11:27	W-5	AS	F	6-095-096-0-22.5	22.5	DWH	0-22.5	30-29	JS	P	AT OK	DWH
5/24/2012	11:30	W-11	TS	F	6-090-093-270-434	164	DWH	270-434	30-30	JS	P	AT OK	DWH
5/24/2012	11:32	W-8	VC	F	6-094-098-0-101	101	DWH	0-101	30-28	JS	P	AT OK	DWH
5/24/2012	11:38	W-10	KC	F	6-093-095-265-600	335	DWH	265-600	30-29	JS	P	AT OK	DWH
5/24/2012	11:43	W-8	VC	F	6-095-098-101-220	119	DWH	101-220	30-30	JS	P	AT OK	DWH
5/24/2012	11:45	W-5	AS	F	6-098-099-0-220	220	DWH	0-220	30-30	JS	P	AT OK	DWH
5/24/2012	11:55	W-8	VC	F	6-097-098-0-22.5	22.5	DWH	0-22.5	CAPPED	JS	P	VT OK	DWH
5/24/2012	12:08	W-5	AS	F	6-097-099-220-272	52	DWH	220-272	30-28	JS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/24/2012	12:46	W-8	VC	F	6-095-097-220-610	390	DWH	220-610	30-30	JS	P	AT OK	DWH
5/24/2012	13:09	W-5	AS	F	6-099-100-0-22.5	22.5	DWH	0-22.5	30-30	JS	P	AT OK	DWH
5/24/2012	13:15	W-5	AS	F	6-097-100-272-659	383	DWH	272-660	30-30	JS	P	AT OK	DWH
5/24/2012	13:30	W-8	VC	F	6-096-097-610-660	50	DWH	610-660	30-29	JS	P	AT OK	DWH
5/24/2012	13:55	W-10	KC	F	6-104-105-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	14:02	W-10	KC	F	6-101-105-0-100	100	DWH	0-100	30-30	AS	P	AT OK	DWH
5/24/2012	14:08	W-5	AS	F	6-102-103-0-22.5	22.5	DWH	0-22.5	CAPPED	AS	P	VT OK	DWH
5/24/2012	14:10	W-11	TS	F	6-099-101-0-101	101	DWH	0-101	30-27	AS	P	AT OK	DWH
5/24/2012	14:12	W-10	KC	F	6-102-105-100-209	109	DWH	100-209	30-28	AS	P	AT OK	DWH
5/24/2012	14:15	W-11	TS	F	6-099-102-101-273	172	DWH	101-273	30-30	AS	P	AT OK	DWH
5/24/2012	14:20	W-10	KC	F	6-093-096-600-660	60	DWH	600-660	30-30	JS	P	AT OK	DWH
5/24/2012	14:24	W-9	VC	F	6-105-106-0-210	210	DWH	0-210	30-27	AS	P	AT OK	DWH
5/24/2012	14:28	W-10	KC	F	6-102-104-209-606	397	DWH	209-606	30-30	AS	P	AT OK	DWH
5/24/2012	14:30	W-5	AS	F	6-106-107-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	14:30	W-5	AS	F	6-109-110-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	14:40	W-11	TS	F	6-100-102-273-606	333	DWH	273-606	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/24/2012	14:45	W-5	AS	F	6-108-109-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	14:46	W-9	VC	F	6-104-106-210-282	72	DWH	210-282	30-30	AS	P	AT OK	DWH
5/24/2012	14:50	W-10	KC	F	6-103-104-606-660	54	DWH	606-660	30-30	AS	P	AT OK	DWH
5/24/2012	14:55	W-11	TS	F	6-101-102-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	14:55	W-5	AS	F	6-106-108-0-116	116	DWH	0-116	30-29	AS	P	AT OK	DWH
5/24/2012	14:57	W-9	VC	F	6-104-107-202-650	448	DWH	202-650	30-30	AS	P	AT OK	DWH
5/24/2012	15:00	W-11	TS	F	6-100-103-606-660	54	DWH	606-660	30-30	JS	P	AT OK	DWH
5/24/2012	15:12	W-5	AS	F	6-106-109-116-283	167	DWH	116-283	30-30	AS	P	AT OK	DWH
5/24/2012	15:40	W-5	AS	F	6-107-109-283-621	338	DWH	203-621	30-30	AS	P	AT OK	DWH
5/24/2012	16:10	W-5	AS	F	6-107-110-621-660	39	DWH	621-660	30-28	AS	P	AT OK	DWH
5/24/2012	16:29	W-11	TS	F	6-081-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	16:30	W-11	TS	F	6-084-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	16:33	W-11	TS	F	6-086-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	16:37	W-11	TS	F	6-088-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	16:40	W-11	TS	F	6-096-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
5/24/2012	16:41	W-11	TS	F	6-091-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
5/24/2012	16:45	W-11	TS	F	6-093-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
5/24/2012	16:52	W-11	TS	F	6-097-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	16:55	W-11	TS	F	6-100-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	16:58	W-11	TS	F	6-103-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	17:06	W-11	TS	F	6-104-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	17:13	W-11	TS	F	6-107-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
5/24/2012	17:17	W-11	TS	F	6-110-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	8:40	W-9	VS	F	6-108-111-0-118	118	DWH	0-118	30-27	AS	P	AT OK	DWH
6/1/2012	8:40	W-5	AS	F	6-109-112-452-623	171	DWH	452-623	30-30	AS	P	AT OK	DWH
6/1/2012	8:48	W-10	KC	F	6-111-112-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	9:00	W-9	VS	F	6-109-111-118-452	334	DWH	118-452	30-28	AS	P	AT OK	DWH
6/1/2012	9:00	W-11	TS	F	6-111-113-0-280	280	DWH	0-280	30-28	AS	P	AT OK	DWH
6/1/2012	9:02	W-10	KC	F	6-113-114-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	9:10	W-10	KC	F	6-111-114-280-454	174	DWH	280-454	30-27	AS	P	AT OK	DWH
6/1/2012	9:35	W-5	AS	F	6-114-116-283-665	382	DWH	283-665	30-30	AS	P	AT OK	DWH
6/1/2012	9:40	W-5	AS	F	6-110-112-623-654	31	DWH	623-654	30-28	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/1/2012	9:43	W-10	KC	F	6-112-114-454-664	210	DWH	454-664	30-30	AS	P	AT OK	DWH
6/1/2012	9:43	W-11	TS	F	6-116-117-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	10:00	W-11	TS	F	6-115-117-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	10:05	W-9	VS	F	6-113-115-0-90	90	DWH	0-90	30-30	AS	P	AT OK	DWH
6/1/2012	10:10	W-11	TS	F	6-115-118-0-112	112	DWH	0-112	30-28	AS	P	AT OK	DWH
6/1/2012	10:20	W-11	TS	F	6-117-118-112-163	51	DWH	112-163	30-30	AS	P	AT OK	DWH
6/1/2012	10:25	W-11	TS	F	6-116-118-163-443	280	DWH	163-443	30-28	AS	P	AT OK	DWH
6/1/2012	10:35	W-5	AS	F	6-118-120-0-234	234	DWH	0-234	30-30	AS	P	AT OK	DWH
6/1/2012	10:38	W-10	KC	F	6-113-115-90-111	21	DWH	90-111	30-28	AS	P	AT OK	DWH
6/1/2012	10:38	W-5	AS	F	6-118-119-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
6/1/2012	10:45	W-10	KC	F	6-113-117-111-164	53	DWH	111-164	30-30	AS	P	AT OK	DWH
6/1/2012	11:07	W-10	KC	F	6-120-121-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	11:10	W-10	KC	F	6-113-116-164-283	119	DWH	164-283	30-30	AS	P	AT OK	DWH
6/1/2012	11:10	W-10	KC	F	6-118-121-274-443	169	DWH	274-443	30-30	AS	P	AT OK	DWH
6/1/2012	11:18	W-11	TS	F	6-116-119-443-663	220	DWH	443-663	30-30	AS	P	AT OK	DWH
6/1/2012	11:25	W-28	VC	F	6-112-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type: gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/1/2012	11:28	W-28	VC	F	6-114-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	11:32	W-28	VC	F	6-116-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	11:35	W-10	KC	F	6-119-121-443-664	221	DWH	443-664	30-30	AS	P	AT OK	DWH
6/1/2012	11:36	W-28	VC	F	6-119-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/1/2012	11:40	W-28	VC	F	6-121-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	8:53	W-14	VS	F	6-123-124-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	8:55	W-5	AS	F	6-120-123-166-273	107	DWH	166-273	30-30	AS	P	AT OK	DWH
6/8/2012	9:05	W-14	VS	F	6-122-124-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	9:06	W-11	TS	F	6-122-125-0-100	100	DWH	0-100	30-30	AS	P	AT OK	DWH
6/8/2012	9:11	W-14	VS	F	6-120-122-0-100	100	DWH	0-100	30-30	AS	P	AT OK	DWH
6/8/2012	9:12	W-5	AS	F	6-121-123-273-650	377	DWH	273-650	30-27	AS	P	AT OK	DWH
6/8/2012	9:20	W-11	TS	F	6-124-125-100-168	68	DWH	100-168	30-30	AS	P	AT OK	DWH
6/8/2012	9:24	W-14	VS	F	6-120-124-100-166	66	DWH	100-166	30-30	AS	P	AT OK	DWH
6/8/2012	9:28	W-10	KC	F	6-125-127-0-251	251	DWH	0-251	30-30	AS	P	AT OK	DWH
6/8/2012	9:29	W-11	TS	F	6-123-125-168-434	266	DWH	168-434	30-30	AS	P	AT OK	DWH
6/8/2012	9:45	W-14	VS	F	6-127-128-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/8/2012	9:50	W-10	KC	F	6-125-128-251-434	183	DWH	251-434	30-28	AS	P	AT OK	DWH
6/8/2012	9:56	W-14	VS	F	6-127-130-0-251	251	DWH	0-251	30-30	AS	P	AT OK	DWH
6/8/2012	10:10	W-11	TS	F	6-125-126-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	10:15	W-11	TS	F	6-123-126-434-650	216	DWH	434-650	30-30	AS	P	AT OK	DWH
6/8/2012	10:17	W-5	AS	F	6-130-131-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	10:23	W-10	KC	F	6-126-128-434-650	216	DWH	434-650	30-30	AS	P	AT OK	DWH
6/8/2012	10:26	W-5	AS	F	6-128-131-494-620	126	DWH	494-620	30-30	AS	P	AT OK	DWH
6/8/2012	10:30	W-14	VS	F	6-128-130-251-494	243	DWH	251-494	30-30	AS	P	AT OK	DWH
6/8/2012	10:43	W-5	AS	F	6-129-131-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	10:53	W-5	AS	F	6-128-129-620-658	38	DWH	620-658	30-27	AS	P	AT OK	DWH
6/8/2012	11:02	W-5	AS	F	6-132-133-0-22.5	22.5	DWH	0-22.5	30-27	AS	P	AT OK	DWH
6/8/2012	11:05	W-11	TS	F	6-130-132-0-370	370	DWH	0-370	30-30	AS	P	AT OK	DWH
6/8/2012	11:10	W-5	AS	F	6-130-133-370-494	124	DWH	370-494	30-30	AS	P	AT OK	DWH
6/8/2012	11:10	W-14	VS	F	6-133-135-371-658	287	DWH	371-658	30-30	AS	P	AT OK	DWH
6/8/2012	11:11	W-10	KC	F	6-134-135-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	11:23	W-10	KC	F	6-132-134-0-207	207	DWH	0-207	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/8/2012	11:25	W-5	AS	F	6-131-133-494-621	127	DWH	494-621	30-30	AS	P	AT OK	DWH
6/8/2012	11:45	W-5	AS	F	6-129-133-621-658	37	DWH	621-658	30-28	AS	P	AT OK	DWH
6/8/2012	11:45	W-10	KC	F	6-132-135-207-371	164	DWH	207-371	30-30	AS	P	AT OK	DWH
6/8/2012	13:25	W-11	TS	F	6-123-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	13:27	W-11	TS	F	6-126-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	13:30	W-11	TS	F	6-128-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	13:37	W-11	TS	F	6-129-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/8/2012	13:45	W-11	TS	F	6-133-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
6/8/2012	13:50	W-11	TS	F	6-135-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	8:51	W-11	TS	F	6-136-137-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
6/14/2012	9:00	W-11	TS	F	6-134-136-0-37	37	DWH	0-37	30-30	AS	P	AT OK	DWH
6/14/2012	9:01	W-28	VC	F	6-137-138-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
6/14/2012	9:06	W-11	TS	F	6-134-137-37-207	170	DWH	37-207	30-30	AS	P	AT OK	DWH
6/14/2012	9:06	W-28	VC	F	6-135-137-207-537	330	DWH	207-537	30-30	AS	P	AT OK	DWH
6/14/2012	9:07	W-10	KC	F	6-136-139-0-35	35	DWH	0-35	30-30	AS	P	AT OK	DWH
6/14/2012	9:15	W-10	KC	F	6-137-139-35-367	332	DWH	35-367	30-29	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/14/2012	9:21	W-5	AS	F	6-139-140-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	9:26	W-5	AS	F	6-137-140-367-538	171	DWH	367-538	30-30	AS	P	AT OK	DWH
6/14/2012	9:42	W-28	VC	F	6-135-138-537-660	123	DWH	537-660	30-28	AS	P	AT OK	DWH
6/14/2012	9:46	W-11	TS	F	6-141-142-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	9:49	W-5	AS	F	6-138-140-538-660	122	DWH	538-660	30-28	AS	P	AT OK	DWH
6/14/2012	9:57	W-11	TS	F	6-139-141-0-192	192	DWH	0-192	30-29	AS	P	AT OK	DWH
6/14/2012	10:06	W-28	VC	F	6-140-142-366-660	294	DWH	366-660	30-30	AS	P	AT OK	DWH
6/14/2012	10:11	W-10	KC	F	6-141-143-0-192	192	DWH	0-192	30-30	AS	P	AT OK	DWH
6/14/2012	10:17	W-5	AS	F	6-143-144-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	10:23	W-11	TS	F	6-139-142-192-366	174	DWH	192-366	30-30	AS	P	AT OK	DWH
6/14/2012	10:28	W-5	AS	F	6-142-143-192-500	308	DWH	192-500	30-28	AS	P	AT OK	DWH
6/14/2012	10:45	W-10	KC	F	6-143-145-0-337	337	DWH	0-337	30-30	AS	P	AT OK	DWH
6/14/2012	10:50	W-11	TS	F	6-145-146-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	10:56	W-28	VC	F	6-143-146-337-500	163	DWH	337-500	30-28	AS	P	AT OK	DWH
6/14/2012	11:00	W-11	TS	F	6-147-148-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	11:07	W-5	AS	F	6-142-144-500-660	160	DWH	500-660	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/14/2012	11:12	W-28	VC	F	6-144-146-500-663	163	DWH	500-663	30-28	AS	P	AT OK	DWH
6/14/2012	11:15	W-11	TS	F	6-145-147-0-172	172	DWH	0-172	30-30	AS	P	AT OK	DWH
6/14/2012	11:30	W-28	VC	F	6-146-148-336-660	324	DWH	336-660	30-30	AS	P	AT OK	DWH
6/14/2012	11:31	W-5	AS	F	6-149-150-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
6/14/2012	11:35	W-10	KC	F	6-147-149-0-172	172	DWH	0-172	30-30	AS	P	AT OK	DWH
6/14/2012	11:36	W-11	TS	F	6-145-148-172-336	164	DWH	172-336	30-30	AS	P	AT OK	DWH
6/14/2012	11:38	W-5	AS	F	6-148-150-500-660	160	DWH	500-660	30-30	AS	P	AT OK	DWH
6/14/2012	12:00	W-10	KC	F	6-148-149-172-500	328	DWH	172-500	30-30	AS	P	AT OK	DWH
6/14/2012	13:25	W-11	TS	F	6-149-151-0-341	341	DWH	0-341	30-28	AS	P	AT OK	DWH
6/14/2012	13:41	W-10	KC	F	6-149-153-341-500	159	DWH	341-500	30-30	AS	P	AT OK	DWH
6/14/2012	13:42	W-28	VC	F	6-138-Phase I-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
6/14/2012	13:45	W-28	VC	F	6-140-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
6/14/2012	13:48	W-28	VC	F	6-142-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	13:50	W-28	VC	F	6-144-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	AS	P	AT OK	DWH
6/14/2012	13:53	W-28	VC	F	6-148-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	13:56	W-28	VC	F	6-146-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/14/2012	14:02	W-28	VC	F	6-150-Phase I-0-22.5	22.5	DWH	0-22.5	30-28	AS	P	AT OK	DWH
6/14/2012	14:03	W-28	VC	F	6-152-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	14:05	W-10	KC	F	6-150-153-500-635	135	DWH	500-635	30-29	AS	P	AT OK	DWH
6/14/2012	14:10	W-28	VC	F	6-152-153-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	14:11	W-11	TS	F	6-151-153-0-22.5	22.5	DWH	0-22.5	30-30	AS	P	AT OK	DWH
6/14/2012	14:25	W-10	KC	F	6-150-152-635-660	25	DWH	635-660	30-30	AS	P	AT OK	DWH
6/18/2012	7:58	W-11	TS	F	6-151-154-0-204	204	DWH	0-204	30-28	BTK	P	AT OK	DWH
6/18/2012	8:05	W-28	VC	F	6-153-155-343-637	294	DWH	343-637	30-30	BTK	P	AT OK	DWH
6/18/2012	8:11	W-10	KC	F	6-154-155-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	8:15	W-11	TS	F	6-151-155-204-343	139	DWH	204-343	30-30	BTK	P	AT OK	DWH
6/18/2012	8:32	W-28	VC	F	6-152-155-637-663	26	DWH	637-663	30-30	BTK	P	AT OK	DWH
6/18/2012	8:35	W-10	KC	F	6-154-157-0-204	204	DWH	0-204	30-30	BTK	P	AT OK	DWH
6/18/2012	8:40	W-28	VC	F	6-155-157-204-498	294	DWH	204-498	30-30	BTK	P	AT OK	DWH
6/18/2012	9:00	W-11	TS	F	6-157-159-0-368	368	DWH	0-368	30-29	BTK	P	AT OK	DWH
6/18/2012	9:10	W-28	VC	F	6-157-158-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	9:13	W-28	VC	F	6-155-158-448-624	176	DWH	448-624	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/18/2012	9:13	W-10	KC	F	6-159-160-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	9:28	W-28	VC	F	6-156-158-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	9:30	W-28	VC	F	6-155-156-624-661	37	DWH	624-661	30-29	BTK	P	AT OK	DWH
6/18/2012	9:37	W-28	VC	F	6-157-160-368-499	131	DWH	368-499	30-30	BTK	P	AT OK	DWH
6/18/2012	9:48	W-28	VC	F	6-158-160-499-625	126	DWH	499-625	30-30	BTK	P	AT OK	DWH
6/18/2012	10:00	W-10	KC	F	6-161-162-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	10:01	W-28	VC	F	6-156-160-625-661	36	DWH	625-661	30-29	BTK	P	AT OK	DWH
6/18/2012	10:03	W-10	KC	F	6-159-161-0-201	201	DWH	0-201	30-30	BTK	P	AT OK	DWH
6/18/2012	10:07	W-28	VC	F	6-160-162-369-661	292	DWH	369-661	30-29	BTK	P	AT OK	DWH
6/18/2012	10:11	W-11	TS	F	6-161-163-0-201	201	DWH	0-201	30-30	BTK	P	AT OK	DWH
6/18/2012	10:30	W-10	KC	F	6-159-162-201-369	168	DWH	201-369	30-30	BTK	P	AT OK	DWH
6/18/2012	10:36	W-28	VC	F	6-164-165-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	10:41	W-28	VC	F	6-163-165-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	10:42	W-11	TS	F	6-162-163-201-495	294	DWH	201-495	30-30	BTK	P	AT OK	DWH
6/18/2012	10:51	W-28	VC	F	6-162-165-495-621	126	DWH	495-621	30-30	BTK	P	AT OK	DWH
6/18/2012	11:06	W-28	VC	F	6-162-164-621-661	40	DWH	621-661	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/18/2012	11:24	W-28	VC	F	6-155-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	BTK	P	AT OK	DWH
6/18/2012	11:28	W-28	VC	F	6-156-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	11:31	W-28	VC	F	6-160-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	11:33	W-28	VC	F	6-162-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	BTK	P	AT OK	DWH
6/18/2012	11:35	W-28	VC	F	6-164-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	13:20	W-11	TS	F	6-163-166-0-374	374	DWH	0-374	30-30	BTK	P	AT OK	DWH
6/18/2012	13:21	W-28	VC	F	6-166-167-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	13:23	W-28	VC	F	6-163-167-374-497	123	DWH	374-497	30-30	BTK	P	AT OK	DWH
6/18/2012	13:30	W-28	VC	F	6-165-167-497-623	126	DWH	497-623	30-29	BTK	P	AT OK	DWH
6/18/2012	13:50	W-28	VC	F	6-164-167-623-662	39	DWH	623-662	30-30	BTK	P	AT OK	DWH
6/18/2012	13:58	W-28	VC	F	6-167-169-374-663	289	DWH	374-663	30-30	BTK	P	AT OK	DWH
6/18/2012	14:04	W-10	KC	F	6-168-170-0-22.5	22.5	DWH	0-22.5	30-29	BTK	P	AT OK	DWH
6/18/2012	14:11	W-10	KC	F	6-169-170-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	14:16	W-10	KC	F	6-166-168-0-108	108	DWH	0-108	30-30	BTK	P	AT OK	DWH
6/18/2012	14:33	W-10	KC	F	6-166-170-108-159	51	DWH	108-159	30-30	BTK	P	AT OK	DWH
6/18/2012	14:33	W-28	VC	F	6-169-171-212-663	451	DWH	212-663	30-29	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/18/2012	14:35	W-11	TS	F	6-171-172-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	14:45	W-10	KC	F	6-166-169-159-374	215	DWH	159-374	30-30	BTK	P	AT OK	DWH
6/18/2012	14:46	W-11	TS	F	6-168-172-0-109	109	DWH	0-109	30-30	BTK	P	AT OK	DWH
6/18/2012	15:00	W-11	TS	F	6-170-172-109-160	51	DWH	109-160	30-30	BTK	P	AT OK	DWH
6/18/2012	15:08	W-11	TS	F	6-169-172-160-212	52	DWH	160-212	30-30	BTK	P	AT OK	DWH
6/18/2012	15:15	W-10	KC	F	6-173-174-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	15:20	W-10	KC	F	6-171-173-380-664	284	DWH	380-664	30-30	BTK	P	AT OK	DWH
6/18/2012	15:20	W-11	TS	F	6-172-174-0-212	212	DWH	0-212	30-29	BTK	P	AT OK	DWH
6/18/2012	15:32	W-28	VC	F	6-167-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	15:35	W-28	VC	F	6-169-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	15:42	W-28	VC	F	6-171-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/18/2012	15:45	W-11	TS	F	6-171-174-212-380	168	DWH	212-380	30-30	BTK	P	AT OK	DWH
6/18/2012	15:49	W-28	VC	F	6-173-Phase I-0-22.5	22.5	DWH	0-22.5	30-29	BTK	P	AT OK	DWH
6/21/2012	8:45	W-5	BTK	F	6-173-176-672-384	288	DWH	384-672	30-30	BTK	P	AT OK	DWH
6/21/2012	8:45	W-11	TS	F	6-174-175-98-0	98	DWH	0-98	30-30	BTK	P	AT OK	DWH
6/21/2012	8:55	W-10	KC	F	6-176-177-0-22.5	22.5	DWH	0-22.5	30-28	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	9:00	W-11	TS	F	6-175-177-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	9:15	W-11	TS	F	6-174-176-384-166	218	DWH	166-384	30-30	BTK	P	AT OK	DWH
6/21/2012	9:15	W-10	KC	F	6-178-179-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	9:20	W-10	KC	F	6-176-178-434-168	266	DWH	168-434	30-30	BTK	P	AT OK	DWH
6/21/2012	9:25	W-28	VC	F	6-176-179-671-434	237	DWH	434-671	30-28	BTK	P	AT OK	DWH
6/21/2012	9:40	W-5	BTK	F	6-179-180-669-432	237	DWH	432-669	30-30	BTK	P	AT OK	DWH
6/21/2012	9:50	W-11	TS	F	6-174-177-166-98	68	DWH	98-166	30-28	BTK	P	AT OK	DWH
6/21/2012	9:52	W-10	KC	F	6-177-178-168-100	68	DWH	100-168	30-29	BTK	P	AT OK	DWH
6/21/2012	9:54	W-28	VC	F	6-182-183-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	10:00	W-10	KC	F	6-175-178-100-0	100	DWH	0-100	30-30	BTK	P	AT OK	DWH
6/21/2012	10:00	W-11	TS	F	6-180-181-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	10:00	W-28	VC	F	6-180-182-673-590	83	DWH	590-673	30-30	BTK	P	AT OK	DWH
6/21/2012	10:04	W-10	KC	F	6-178-180-432-413	19	DWH	413-432	30-28	BTK	P	AT OK	DWH
6/21/2012	10:07	W-11	TS	F	6-178-181-413-0	413	DWH	0-413	30-30	BTK	P	AT OK	DWH
6/21/2012	10:18	W-10	KC	F	6-183-184-0-22.5	22.5	DWH	0-22.5	30-28	BTK	P	AT OK	DWH
6/21/2012	10:20	W-5	BTK	F	6-182-185-670-589	81	DWH	589-670	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	10:26	W-28	VC	F	6-180-183-590-414	176	DWH	414-590	30-30	BTK	P	AT OK	DWH
6/21/2012	10:30	W-10	KC	F	6-181-183-414-82	332	DWH	82-414	30-28	BTK	P	AT OK	DWH
6/21/2012	10:32	W-28	VC	F	6-185-187-667-418	249	DWH	418-667	30-28	BTK	P	AT OK	DWH
6/21/2012	10:40	W-5	BTK	F	6-183-185-589-250	339	DWH	250-589	30-30	BTK	P	AT OK	DWH
6/21/2012	10:58	W-28	VC	F	6-187-188-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	11:03	W-28	VC	F	6-187-189-670-588	82	DWH	588-670	30-28	BTK	P	AT OK	DWH
6/21/2012	11:07	W-11	TS	F	6-185-186-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	11:11	W-10	KC	F	6-181-184-82-0	82	DWH	0-82	30-28	BTK	P	AT OK	DWH
6/21/2012	11:11	W-11	TS	F	6-183-186-250-82	168	DWH	82-250	30-30	BTK	P	AT OK	DWH
6/21/2012	11:16	W-28	VC	F	6-189-191-0-22.5	22.5	DWH	0-22.5	30-28	BTK	P	AT OK	DWH
6/21/2012	11:20	W-28	VC	F	6-187-191-588-504	84	DWH	504-588	30-30	BTK	P	AT OK	DWH
6/21/2012	11:30	W-11	TS	F	6-184-186-82-0	82	DWH	0-82	30-30	BTK	P	AT OK	DWH
6/21/2012	11:30	W-10	KC	F	6-185-188-418-250	168	DWH	250-418	30-30	BTK	P	AT OK	DWH
6/21/2012	11:30	W-28	VC	F	6-190-191-0-22.5	22.5	DWH	0-22.5	30-28	BTK	P	AT OK	DWH
6/21/2012	11:33	W-28	VC	F	6-187-190-504-418	86	DWH	418-504	30-29	BTK	P	AT OK	DWH
6/21/2012	11:45	W-28	VC	F	6-192-193-46-0	46	DWH	0-46	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	11:48	W-11	TS	F	6-188-190-418-0	418	DWH	0-418	30-30	BTK	P	AT OK	DWH
6/21/2012	11:53	W-10	KC	F	6-186-188-250-0	250	DWH	0-250	30-30	BTK	P	AT OK	DWH
6/21/2012	13:13	W-28	VC	F	6-193-194-46-0	46	DWH	0-46	30-30	BTK	P	AT OK	DWH
6/21/2012	13:15	W-5	BTK	F	6-176-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	13:20	W-28	VC	F	6-194-195-46-0	46	DWH	0-46	30-29	BTK	P	AT OK	DWH
6/21/2012	13:23	W-5	BTK	F	6-179-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	13:28	W-28	VC	F	6-195-196-45-0	45	DWH	0-45	30-30	BTK	P	AT OK	DWH
6/21/2012	13:29	W-5	BTK	F	6-180-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	13:34	W-28	VC	F	6-196-197-45-0	45	DWH	0-45	30-28	BTK	P	AT OK	DWH
6/21/2012	13:42	W-28	VC	F	6-197-198-45-0	45	DWH	0-45	30-30	BTK	P	AT OK	DWH
6/21/2012	13:49	W-28	VC	F	6-198-199-45-0	45	DWH	0-45	30-30	BTK	P	AT OK	DWH
6/21/2012	13:54	W-10	KC	F	6-189-192-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	13:55	W-11	TS	F	6-208-209-42-0	42	DWH	0-42	30-29	BTK	P	AT OK	DWH
6/21/2012	13:58	W-10	KC	F	6-189-193-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:00	W-28	VC	F	6-199-200-44-0	44	DWH	0-44	30-30	BTK	P	AT OK	DWH
6/21/2012	14:02	W-10	KC	F	6-189-194-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	14:03	W-11	TS	F	6-209-210-42-0	42	DWH	0-42	30-29	BTK	P	AT OK	DWH
6/21/2012	14:06	W-10	KC	F	6-189-195-0-12	12	DWH	0-12	30-30	BTK	P	AT OK	DWH
6/21/2012	14:07	W-28	VC	F	6-200-201-44-0	44	DWH	0-44	30-29	BTK	P	AT OK	DWH
6/21/2012	14:08	W-10	KC	F	6-191-195-0-10	10	DWH	0-10	30-30	BTK	P	AT OK	DWH
6/21/2012	14:10	W-10	KC	F	6-191-196-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:11	W-11	TS	F	6-210-211-42-0	42	DWH	0-42	30-30	BTK	P	AT OK	DWH
6/21/2012	14:13	W-10	KC	F	6-191-197-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:14	W-28	VC	F	6-201-202-44-0	44	DWH	0-44	30-28	BTK	P	AT OK	DWH
6/21/2012	14:16	W-10	KC	F	6-191-198-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:18	W-10	KC	F	6-191-199-0-6	6	DWH	0-6	30-29	BTK	P	AT OK	DWH
6/21/2012	14:19	W-10	KC	F	6-190-199-0-16.5	16.5	DWH	0-16.5	30-28	BTK	P	AT OK	DWH
6/21/2012	14:20	W-5	BTK	F	6-182-Phase I-0-22.5	22.5	DWH	0-22.5	30-28	BTK	P	AT OK	DWH
6/21/2012	14:22	W-10	KC	F	6-190-200-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:22	W-28	VC	F	6-202-203-43-0	43	DWH	0-43	30-29	BTK	P	AT OK	DWH
6/21/2012	14:22	W-11	TS	F	6-211-212-42-0	42	DWH	0-42	30-30	BTK	P	AT OK	DWH
6/21/2012	14:24	W-5	BTK	F	6-185-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	14:24	W-10	KC	F	6-190-201-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:27	W-10	KC	F	6-190-202-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:29	W-28	VC	F	6-203-204-44-0	44	DWH	0-44	30-29	BTK	P	AT OK	DWH
6/21/2012	14:31	W-10	KC	F	6-190-203-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:31	W-11	TS	F	6-212-213-43-0	43	DWH	0-43	30-30	BTK	P	AT OK	DWH
6/21/2012	14:32	W-5	BTK	F	6-187-Phase I-0-22.5	22.5	DWH	0-22.5	30-28	BTK	P	AT OK	DWH
6/21/2012	14:35	W-28	VC	F	6-204-205-43-0	43	DWH	0-43	30-30	BTK	P	AT OK	DWH
6/21/2012	14:36	W-5	BTK	F	6-189-Phase I-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:41	W-11	TS	F	6-213-214-43-0	43	DWH	0-43	30-30	BTK	P	AT OK	DWH
6/21/2012	14:42	W-5	BTK	F	6-192 Phase I-46-0	46	DWH	0-46	30-30	BTK	P	AT OK	DWH
6/21/2012	14:42	W-28	VC	F	6-205-206-44-0	44	DWH	0-44	30-30	BTK	P	AT OK	DWH
6/21/2012	14:47	W-10	KC	F	6-190-204-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:47	W-11	TS	F	6-214-215-43-0	43	DWH	0-43	30-30	BTK	P	AT OK	DWH
6/21/2012	14:49	W-28	VC	F	6-206-207-44-0	44	DWH	0-44	30-30	BTK	P	AT OK	DWH
6/21/2012	14:50	W-10	KC	F	6-190-205-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:50	W-10	KC	F	6-190-207-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH

Geosyntec consultants

Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	14:53	W-10	KC	F	6-190-206-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	14:56	W-28	VC	F	6-207-208-42-0	42	DWH	0-42	30-30	BTK	P	AT OK	DWH
6/21/2012	14:56	W-11	TS	F	6-215-216-43-0	43	DWH	0-43	30-30	BTK	P	AT OK	DWH
6/21/2012	14:59	W-10	KC	F	6-190-208-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:03	W-10	KC	F	6-190-209-0-22.5	22.5	DWH	0-22.5	30-29	BTK	P	AT OK	DWH
6/21/2012	15:05	W-10	KC	F	6-190-210-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:05	W-11	TS	F	6-216-217-43-0	43	DWH	0-43	30-30	BTK	P	AT OK	DWH
6/21/2012	15:09	W-10	KC	F	6-190-211-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:12	W-10	KC	F	6-190-212-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:12	W-11	TS	F	6-217-218-44-0	44	DWH	0-44	30-30	BTK	P	AT OK	DWH
6/21/2012	15:15	W-10	KC	F	6-190-213-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:18	W-5	BTK	F	6-221-223-20-0	20	DWH	0-20	30-30	BTK	P	AT OK	DWH
6/21/2012	15:19	W-10	KC	F	6-190-214-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:19	W-11	TS	F	6-218-219-44-0	44	DWH	0-44	30-30	BTK	P	AT OK	DWH
6/21/2012	15:22	W-10	KC	F	6-190-215-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:25	W-10	KC	F	6-190-216-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH

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Production Seam Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Material Type gml : 6 Specifications: Seam Pressure: 25-30 PSI 3 lb loss Vacuum Box: 5 PSI 20 Sec

Primary / Secondary: Primary Series: 6

Production Seam					Location			Nondestructive Test					
Date	*Time*	*Mach. ID*	*Oper. ID*	*Ext/ Fus:*	*SeamNo* Series-Seam1-Seam2-Begin-End	*Length* (ft.)	*QA ID*	*Location*	*Detail*	*Oper.*	*Result*	*Action*	*QA ID*
6/21/2012	15:25	W-5	BTK	F	6-220-222-17-0	17	DWH	0-17	30-29	BTK	P	AT OK	DWH
6/21/2012	15:26	W-11	TS	F	6-219-221-45-0	45	DWH	0-45	30-30	BTK	P	AT OK	DWH
6/21/2012	15:28	W-10	KC	F	6-190-217-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:30	W-5	BTK	F	6-220-221-28-0	28	DWH	0-28	30-29	BTK	P	AT OK	DWH
6/21/2012	15:31	W-10	KC	F	6-190-218-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:34	W-10	KC	F	6-190-219-0-22.5	22.5	DWH	0-22.5	30-30	BTK	P	AT OK	DWH
6/21/2012	15:36	W-5	BTK	F	6-222-223-16-0	16	DWH	0-16	30-29	BTK	P	AT OK	DWH
6/21/2012	15:40	W-10	KC	F	6-190-220-34-0	34	DWH	0-34	30-30	BTK	P	AT OK	DWH

Total Length Fusion: 53286.5 Total Length Extrusion: 0

Comments:

APPENDIX L

Geomembrane Destructive Seam Test Logs and Laboratory Test Results

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							
			Location						Peel		Shear	Unit	Result	QA	Re test	Re test
Samp No	Weld Type	Track Type	Seam	Dist. (ft.)	Mach ID	Oper ID	Date Samp		Inside	Outside		ppi/psi	(P/F)	ID	1	2
6-001	F	D	20-21	24 E	W-11	TS	5/15/2012	Lab	132	132	170	PPI	P	DWH	-	-
								Field	116	117	190	PPI	P	DWH		
6-002	F	D	13-14	16 E	W-5	AS	5/15/2012	Lab	119	134	169	PPI	P	DWH	-	-
								Field	133	137	189	PPI	P	DWH		
6-003	F	D	5-6	21 E	W-14	VC	5/15/2012	Lab	147	134	177	PPI	P	DWH	-	-
								Field	126	137	182	PPI	P	DWH		
6-004	F	D	25-31	74 N	W-5	AS	5/15/2012	Lab	135	141	171	PPI	P	DWH	-	-
								Field	123	141	182	PPI	P	DWH		
6-005	F	D	31-33	140 N	W-11	TS	5/15/2012	Lab	124	137	179	PPI	P	DWH	-	-
								Field	134	132	189	PPI	P	DWH		
6-006	F	D	33-35	222 N	W-11	TS	5/15/2012	Lab	127	130	186	PPI	P	DWH	-	-
								Field	123	120	190	PPI	P	DWH		
6-007	F	D	39-40	13 E	W-11	TS	5/15/2012	Lab	155	147	165	PPI	P	DWH	-	-
								Field	142	132	182	PPI	P	DWH		
6-008	F	D	35-37	303 N	W-5	AS	5/15/2012	Lab	125	129	183	PPI	P	DWH	-	-
								Field	129	123	199	PPI	P	DWH		
6-009	F	D	37-39	413 N	W-9	LV	5/15/2012	Lab	125	119	177	PPI	P	DWH	-	-
								Field	124	114	193	PPI	P	DWH		
6-010	F	D	39-41	507 N	W-14	VC	5/15/2012	Lab	146	130	178	PPI	P	DWH	-	-
								Field	142	114	177	PPI	P	DWH		
6-011	F	D	41-43	550 N	W-5	AS	5/15/2012	Lab	136	131	177	PPI	P	DWH	-	-
								Field	121	123	172	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data								
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID	Re test 1	Re test 2
6-012	F	D	01-Tie in	20 E	W-9	LV	5/15/2012	Lab	130	143	180	PPI	P	DWH	-	-
								Field	126	132	189	PPI	P	DWH		
6-013	F	D	34-35	10 E	W-14	VC	5/15/2012	Lab	163	141	179	PPI	P	DWH	-	-
								Field	148	146	192	PPI	P	DWH		
6-014	F	D	43-47	600 N	W-9	LV	5/16/2012	Lab	133	137	181	PPI	P	DWH	-	-
								Field	128	109	180	PPI	P	DWH		
6-015	F	D	44-46	250 N	W-11	TS	5/16/2012	Lab	143	138	184	PPI	P	DWH	-	-
								Field	125	127	184	PPI	P	DWH		
6-016	F	D	47-48	550 N	W-5	VC	5/16/2012	Lab	147	142	183	PPI	P	DWH	-	-
								Field	148	126	181	PPI	P	DWH		
6-017	F	D	53-54	11 E	W-5	VC	5/16/2012	Lab	152	154	164	PPI	P	DWH	-	-
								Field	154	135	157	PPI	P	DWH		
6-018	F	D	48-51	350 N	W-9	LV	5/16/2012	Lab	131	129	192	PPI	P	DWH	-	-
								Field	113	127	185	PPI	P	DWH		
6-019	F	D	51-53	150 N	W-11	TS	5/16/2012	Lab	126	138	182	PPI	P	DWH	-	-
								Field	130	113	175	PPI	P	DWH		
6-020	F	D	53-55	100 N	W-11	TS	5/18/2012	Lab	135	141	181	PPI	P	DWH	-	-
								Field	126	115	179	PPI	P	DWH		
6-021	F	D	55-57	197 N	W-9	LV	5/18/2012	Lab	135	141	180	PPI	P	DWH	-	-
								Field	135	126	176	PPI	P	DWH		
6-022	F	D	58-60	300 N	W-10	KC	5/18/2012	Lab	135	142	181	PPI	P	DWH	-	-
								Field	109	138	175	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID	Re test 1	Re test 2
6-023	F	D	60-62	397 N	W-5	AS	5/18/2012	Lab	128	131	170	PPI	P	DWH	-	-
								Field	131	125	174	PPI	P	DWH		
6-024	F	D	62-65	504 N	W-8	VC	5/18/2012	Lab	137	137	190	PPI	P	DWH	-	-
								Field	120	120	181	PPI	P	DWH		
6-025	F	D	65-66	600 N	W-8	VC	5/18/2012	Lab	135	140	182	PPI	P	DWH	-	-
								Field	129	120	175	PPI	P	DWH		
6-026	F	D	68-69	518 N	W-10	KC	5/18/2012	Lab	126	132	178	PPI	P	DWH	-	-
								Field	140	114	174	PPI	P	DWH		
6-027	F	D	64-67	50 N	W-9	LV	5/18/2012	Lab	119	130	179	PPI	P	DWH	-	-
								Field	128	117	175	PPI	P	DWH		
6-028	F	D	67-70	150 N	W-11	TS	5/18/2012	Lab	130	138	176	PPI	P	DWH	-	-
								Field	109	120	168	PPI	P	DWH		
6-029	F	D	69-72	276 N	W-10	KC	5/18/2012	Lab	136	128	184	PPI	P	DWH	-	-
								Field	124	129	179	PPI	P	DWH		
6-030	F	D	72-74	346 N	W-5	AS	5/18/2012	Lab	135	123	185	PPI	P	DWH	-	-
								Field	120	114	179	PPI	P	DWH		
6-031	F	D	74-77	465 N	W-8	VC	5/18/2012	Lab	128	124	175	PPI	P	DWH	-	-
								Field	120	112	174	PPI	P	DWH		
6-032	F	D	77-78	550 N	W-11	TS	5/18/2012	Lab	129	123	174	PPI	P	DWH	-	-
								Field	119	118	173	PPI	P	DWH		
6-033	F	D	64-65	10 E	W-9	LV	5/18/2012	Lab	138	146	164	PPI	P	DWH	-	-
								Field	142	153	161	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data								
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID	Re test 1	Re test 2
6-034	F	D	69-Phase I	10 E	W-10	KC	5/21/2012	Lab	148	147	178	PPI	F	DWH	6-034 A	6-034 B
								Field	141	126	171	PPI	P	DWH		
6-034 A	F	D	72-Tie in	6 E	W-10	KC	5/31/2012	Lab	148	141	180	PPI	P	DWH	-	-
								Field	135	161	167	PPI	P	DWH		
6-034 B	F	D	66-Tie in	2 W	W-10	KC	5/31/2012	Lab	141	142	167	PPI	P	DWH	-	-
								Field	132	159	175	PPI	P	DWH		
6-035	F	D	57-58	9 W	W-5	AS	5/18/2012	Lab	159	159	172	PPI	P	DWH	-	-
								Field	142	153	170	PPI	P	DWH		
6-036	F	D	79-80	14 N	W-11	TS	5/24/2012	Lab	136	139	173	PPI	P	DWH	-	-
								Field	126	120	177	PPI	P	DWH		
6-037	F	D	80-83	53 N	W-8	VC	5/24/2012	Lab	137	126	178	PPI	P	DWH	-	-
								Field	115	124	176	PPI	P	DWH		
6-038	F	D	83-85	106 N	W-10	KC	5/24/2012	Lab	119	143	176	PPI	P	DWH	-	-
								Field	120	129	174	PPI	P	DWH		
6-039	F	D	85-88	167 N	W-5	AS	5/24/2012	Lab	125	130	168	PPI	P	DWH	-	-
								Field	116	111	170	PPI	P	DWH		
6-040	F	D	88-90	211 N	W-8	VC	5/24/2012	Lab	124	127	175	PPI	P	DWH	-	-
								Field	120	116	160	PPI	P	DWH		
6-041	F	D	90-91	260 N	W-11	TS	5/24/2012	Lab	121	131	171	PPI	P	DWH	-	-
								Field	124	120	167	PPI	P	DWH		
6-042	F	D	93-95	306 N	W-10	KC	5/24/2012	Lab	117	125	178	PPI	P	DWH	-	-
								Field	128	114	176	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data						Re test 1	Re test 2
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID		
6-043	F	D	95-97	350 N	W-8	VC	5/24/2012	Lab	137	121	172	PPI	P	DWH	-	-
								Field	132	113	145	PPI	P	DWH		
6-044	F	D	97-100	406 N	W-5	AS	5/24/2012	Lab	123	131	171	PPI	P	DWH	-	-
								Field	108	117	174	PPI	P	DWH		
6-045	F	D	100-102	450 N	W-11	TS	5/24/2012	Lab	126	125	181	PPI	P	DWH	-	-
								Field	117	111	184	PPI	P	DWH		
6-046	F	D	103-104	507 N	W-10	KC	5/24/2012	Lab	128	135	175	PPI	P	DWH	-	-
								Field	117	118	178	PPI	P	DWH		
6-047	F	D	104-107	559 N	W-9	VC	5/24/2012	Lab	118	130	181	PPI	P	DWH	-	-
								Field	128	124	190	PPI	P	DWH		
6-048	F	D	107-109	599 N	W-5	AS	5/24/2012	Lab	129	134	186	PPI	P	DWH	-	-
								Field	128	115	197	PPI	P	DWH		
6-049	F	D	103-Phase	10 W	W-11	TS	5/25/2012	Lab	-	-	-	-	-	-	6-049 A1	6-049 B1
								Field	120	-	-	PPI	F	DWH		
6-049 A	F	D	104-Tie in	10 E	W-11	TS	5/30/2012	Lab	126	133	167	PPI	F	DWH	6-049 A1	-
								Field	140	128	168	PPI	P	DWH		
6-049 A1	F	D	111-113	1 N	W-9	VS	6/26/2012	Lab	137	134	190	PPI	P	DWH	-	-
								Field	134	136	197	PPI	P	DWH		
6-049 B	F	D	97-Tie in	8 W	W-11	TS	5/30/2012	Lab	133	145	188	PPI	F	DWH	6-049 B1	-
								Field	128	155	165	PPI	P	DWH		
6-049 B1	F	D	100-103	655 N	W-11	TS	6/4/2012	Lab	125	127	179	PPI	P	DWH	-	-
								Field	124	124	203	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							Re test 1	Re test 2
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID			
6-049 C	E	S	93-Tie in	6 W	MX-16	VS	6/5/2012	Lab	128	-	168	PPI	P	DWH		-	-
								Field	113	-	171	PPI	P	DWH			
6-050	F	D	78-81	449 N	W-11	TS	5/25/2012	Lab	128	126	173	PPI	P	DWH		-	-
								Field	131	136	176	PPI	P	DWH			
6-051	F	D	84-86	500 N	W-10	KC	5/25/2012	Lab	121	127	175	PPI	P	DWH		-	-
								Field	119	113	175	PPI	P	DWH			
6-052	F	D	88-91	550 N	W-8	VC	5/25/2012	Lab	127	123	177	PPI	P	DWH		-	-
								Field	111	115	173	PPI	P	DWH			
6-053	F	D	106-107	7 E	W-5	AS	5/25/2012	Lab	151	149	165	PPI	P	DWH		-	-
								Field	161	148	176	PPI	P	DWH			
6-054	F	D	105-106	110 N	W-9	VC	5/24/2012	Lab	120	135	180	PPI	P	DWH		-	-
								Field	126	118	184	PPI	P	DWH			
6-055	F	D	121-122	42 N	W-14	VS	6/8/2012	Lab	-	-	-	-	-	-		6-055 A1	6-055 B1
								Field	110	-	-	PPI	F	DWH			
6-055 A	F	D	120-122	64 N	W-14	VS	6/11/2012	Lab	126	128	182	PPI	F	DWH		6-055 A1	-
								Field	126	133	155	PPI	P	DWH			
6-055 A1	F	D	120-122	85 N	W-14	VS	6/13/2012	Lab	136	139	179	PPI	P	DWH		-	-
								Field	120	105	185	PPI	P	DWH			
6-055 B	F	D	120-122	26 N	W-14	VS	6/11/2012	Lab	139	131	185	PPI	F	DWH		6-055 B1	-
								Field	121	134	162	PPI	P	DWH			
6-055 B1	F	D	122-124	6 E	W-14	VS	6/14/2012	Lab	140	150	165	PPI	P	DWH		-	-
								Field	130	129	158	PPI	P	DWH			

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data								Test Data							
			Location					Peel		Shear	Unit	Result	QA	Re test	Re test
Samp No	Weld Type	Track Type	Seam	Dist. (ft.)	Mach ID	Oper ID	Date Samp	Inside	Outside		ppi/psi	(P/F)	ID	1	2
6-056	F	D	123-125	177 N	W-11	TS	6/8/2012	Lab 126	134	189	PPI	P	DWH	-	-
								Field 123	119	169	PPI	P	DWH		
6-057	F	D	125-128	300 N	W-10	KC	6/8/2012	Lab 140	132	183	PPI	P	DWH	-	-
								Field 116	118	159	PPI	P	DWH		
6-058	F	D	128-130	400 N	W-14	VS	6/8/2012	Lab 131	145	193	PPI	P	DWH	-	-
								Field 115	132	170	PPI	P	DWH		
6-059	F	D	131-133	512 N	W-5	AS	6/8/2012	Lab 126	136	177	PPI	P	DWH	-	-
								Field 122	125	162	PPI	P	DWH		
6-060	F	D	133-135	565 N	W-14	VS	6/8/2012	Lab 145	141	186	PPI	P	DWH	-	-
								Field 128	121	158	PPI	P	DWH		
6-061	F	D	130-132	300 N	W-11	TS	6/8/2012	Lab 132	147	188	PPI	P	DWH	-	-
								Field 111	116	160	PPI	P	DWH		
6-062	F	D	132-134	190 N	W-10	KC	6/8/2012	Lab 132	129	182	PPI	P	DWH	-	-
								Field 119	120	167	PPI	P	DWH		
6-063	F	D	128-Tie in	15 E	W-11	TS	6/8/2012	Lab 144	146	169	PPI	P	DWH	-	-
								Field 136	132	147	PPI	P	DWH		
6-064	F	D	134-137	62 N	W-11	TS	6/14/2012	Lab 132	134	176	PPI	P	DWH	-	-
								Field 127	132	172	PPI	P	DWH		
6-065	F	D	137-139	150 N	W-10	KC	6/14/2012	Lab 127	132	181	PPI	P	DWH	-	-
								Field 115	130	172	PPI	P	DWH		
6-066	F	D	139-142	250 N	W-11	TS	6/14/2012	Lab 123	130	178	PPI	P	DWH	-	-
								Field 116	107	172	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA) ProjNo: GJ4706B
Location: Camillus, New York TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							Re test 1	Re test 2
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID		
6-067	F	D	142-143	300 N	W-5	AS	6/14/2012	Lab	137	132	189	PPI	P	DWH	-	-
								Field	111	135	183	PPI	P	DWH		
6-068	F	D	143-146	370 N	W-28	VC	6/14/2012	Lab	127	131	180	PPI	P	DWH	-	-
								Field	127	126	179	PPI	P	DWH		
6-069	F	D	146-148	431 N	W-28	VC	6/14/2012	Lab	127	142	191	PPI	P	DWH	-	-
								Field	120	126	176	PPI	P	DWH		
6-070	F	D	148-150	550 N	W-5	AS	6/14/2012	Lab	138	137	177	PPI	P	DWH	-	-
								Field	119	122	164	PPI	P	DWH		
6-071	F	D	135-137	500 N	W-28	VC	6/14/2012	Lab	113	125	165	PPI	P	DWH	-	-
								Field	112	124	163	PPI	P	DWH		
6-072	F	D	144-Tie in	6 W	W-28	VC	6/14/2012	Lab	128	154	166	PPI	F	DWH	6-072 A1	6-072 B
								Field	133	132	156	PPI	P	DWH		
6-072 A	F	D	146-Tie-in	8 E	W-28	VC	6/20/2012	Lab	136	144	154	PPI	F	DWH	6-072 A1	-
								Field	110	121	120	PPI	P	DWH		
6-072 A1	F	D	153-155	349 N	W-28	VC	6/26/2012	Lab	119	152	178	PPI	P	DWH	-	-
								Field	98	125	157	PPI	P	DWH		
6-072 B	F	D	152-153	5 W	W-28	VC	6/26/2012	Lab	123	140	165	PPI	P	DWH	-	-
								Field	97	116	134	PPI	P	DWH		
6-072 C	E	D	148-Tie in	6 W	MX-12	BTK	6/27/2012	Lab	139	-	178	PPI	P	DWH	-	-
								Field	103	-	147	PPI	P	DWH		
6-073	F	D	149-150	9 W	W-5	AS	6/14/2012	Lab	137	154	164	PPI	F	DWH	6-073 A	6-073 B
								Field	133	133	153	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							Re test 1	Re test 2
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID		
6-073 A	F	D	148-150	508 N	W-5	AS	6/20/2012	Lab	135	132	172	PPI	P	DWH	-	-
								Field	103	120	123	PPI	P	DWH		
6-073 B	F	D	149-150	3 E	W-5	AS	6/20/2012	Lab	147	149	158	PPI	P	DWH	-	-
								Field	123	119	126	PPI	P	DWH		
6-074	F	D	149-151	200 N	W-11	TS	6/14/2012	Lab	125	127	184	PPI	P	DWH	-	-
								Field	125	121	170	PPI	P	DWH		
6-075	F	D	149-153	450 N	W-10	KC	6/14/2012	Lab	127	144	180	PPI	P	DWH	-	-
								Field	126	124	166	PPI	P	DWH		
6-076	F	D	151-154	43 N	W-11	TS	6/20/2012	Lab	136	138	180	PPI	P	DWH	-	-
								Field	117	114	128	PPI	P	DWH		
6-077	F	D	154-157	100 N	W-10	KC	6/20/2012	Lab	113	139	162	PPI	P	DWH	-	-
								Field	102	117	124	PPI	P	DWH		
6-078	F	D	157-159	188 N	W-11	TS	6/20/2012	Lab	129	130	171	PPI	P	DWH	-	-
								Field	108	100	122	PPI	P	DWH		
6-079	F	D	159-162	322 N	W-10	KC	6/20/2012	Lab	123	131	176	PPI	P	DWH	-	-
								Field	110	110	120	PPI	P	DWH		
6-080	F	D	162-163	400 N	W-11	TS	6/20/2012	Lab	130	124	178	PPI	P	DWH	-	-
								Field	107	109	131	PPI	P	DWH		
6-081	F	D	163-167	459 N	W-28	VC	6/20/2012	Lab	120	128	166	PPI	P	DWH	-	-
								Field	98	107	120	PPI	P	DWH		
6-082	F	D	167-169	507 N	W-28	VC	6/20/2012	Lab	122	120	164	PPI	P	DWH	-	-
								Field	91	95	120	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							
			Location						Peel		Shear	Unit	Result	QA	Re test	Re test
Samp No	Weld Type	Track Type	Seam	Dist. (ft.)	Mach ID	Oper ID	Date Samp		Inside	Outside		ppi/psi	(P/F)	ID	1	2
6-083	F	D	169-171	582 N	W-28	VC	6/20/2012	Lab	109	144	176	PPI	P	DWH	-	-
								Field	91	92	131	PPI	P	DWH		
6-084	F	D	171-173	455 N	W-10	KC	6/20/2012	Lab	127	124	170	PPI	P	DWH	-	-
								Field	114	92	122	PPI	P	DWH		
6-085	F	D	173-174	5 E	W-10	KC	6/20/2012	Lab	139	148	162	PPI	P	DWH	-	-
								Field	116	109	120	PPI	P	DWH		
6-086	F	D	171-174	296 N	W-11	TS	6/20/2012	Lab	133	132	171	PPI	P	DWH	-	-
								Field	107	95	128	PPI	P	DWH		
6-087	F	D	153-155	500 N	W-28	VC	6/20/2012	Lab	127	148	175	PPI	P	DWH	-	-
								Field	95	120	131	PPI	P	DWH		
6-088	F	D	162-Tie-in	9 W	W-28	VC	6/20/2012	Lab	-	-	-	-	-	-	6-088 A1	6-088 B
								Field	110	-	-	PPI	F	DWH		
6-088 A	F	D	117 Tie in	8 E	W-28	VC	6/26/2012	Lab	149	154	178	PPI	F	DWH	6-088 A1	-
								Field	117	139	150	PPI	P	DWH		
6-088 A1	F	D	169-Tie in	7 E	W-28	VC	6/28/2012	Lab	154	158	170	PPI	P	DWH	-	-
								Field	120	126	132	PPI	P	DWH		
6-088 B	F	D	160-Tie in	3 W	W-28	VC	6/26/2012	Lab	147	152	169	PPI	P	DWH	-	-
								Field	107	140	140	PPI	P	DWH		
6-089	F	D	174-175	50 N	W-11	TS	6/22/2012	Lab	121	137	181	PPI	P	DWH	-	-
								Field	111	135	170	PPI	P	DWH		
6-090	F	D	176-178	182 N	W-10	KC	6/22/2012	Lab	133	124	183	PPI	P	DWH	-	-
								Field	118	120	174	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA) ProjNo: GJ4706B
Location: Camillus, New York TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data						Re test 1	Re test 2
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID		
6-091	F	D	178-181	273 N	W-11	TS	6/22/2012	Lab	128	130	188	PPI	P	DWH	-	-
								Field	134	131	173	PPI	P	DWH		
6-092	F	D	181-183	365 N	W-10	KC	6/22/2012	Lab	136	139	179	PPI	P	DWH	-	-
								Field	144	122	173	PPI	P	DWH		
6-093	F	D	183-185	426 N	W-5	BTK	6/22/2012	Lab	125	121	186	PPI	P	DWH	-	-
								Field	120	116	171	PPI	P	DWH		
6-094	F	D	185-187	500 N	W-28	VC	6/22/2012	Lab	116	140	191	PPI	P	DWH	-	-
								Field	97	119	178	PPI	P	DWH		
6-095	F	D	187-189	600 N	W-28	VC	6/22/2012	Lab	111	141	187	PPI	P	DWH	-	-
								Field	114	141	168	PPI	P	DWH		
6-096	F	D	173-176	592 N	W-5	BTK	6/22/2012	Lab	147	138	183	PPI	P	DWH	-	-
								Field	125	143	181	PPI	P	DWH		
6-097	F	D	182 Tie-in	10 W	W-5	BTK	6/22/2012	Lab	-	-	-	-	-	-	6-097 A	6-097 B
								Field	110	-	-	PPI	F	DWH		
6-097 A	F	D	220-222	14 N	W-5	BTK	6/28/2012	Lab	129	128	192	PPI	P	DWH	-	-
								Field	118	116	144	PPI	P	DWH		
6-097 B	F	D	183-185	254 N	W-5	BTK	6/28/2012	Lab	131	131	186	PPI	P	DWH	-	-
								Field	115	101	165	PPI	P	DWH		
6-097 C	E	D	187-Cap	10 E	MX-16	BTK	7/2/2012	Lab	148	-	176	PPI	P	DWH	-	-
								Field	105	-	163	PPI	P	DWH		
6-098	F	D	191-198	527 N	W-10	KC	6/22/2012	Lab	131	142	174	PPI	P	DWH	-	-
								Field	128	12	146	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data								
Samp No	Weld Type	Track Type	Location Seam	Location Dist. (ft.)	Mach ID	Oper ID	Date Samp		Peel Inside	Peel Outside	Shear	Unit ppi/psi	Result (P/F)	QA ID	Re test 1	Re test 2
6-099	F	D	190-212	201 N	W-10	KC	6/22/2012	Lab	124	127	170	PPI	P	DWH	-	-
								Field	116	133	160	PPI	P	DWH		
6-100	F	D	215-216	27 W	W-11	TS	6/22/2012	Lab	136	129	181	PPI	P	DWH	-	-
								Field	121	122	163	PPI	P	DWH		
6-101	F	D	209-210	28 W	W-11	TS	6/22/2012	Lab	120	120	178	PPI	P	DWH	-	-
								Field	119	123	162	PPI	P	DWH		
6-102	F	D	205-206	29 W	W-28	VC	6/22/2012	Lab	119	126	176	PPI	P	DWH	-	-
								Field	126	118	169	PPI	P	DWH		
6-103	F	D	199-200	27 W	W-28	VC	6/22/2012	Lab	127	142	179	PPI	P	DWH	-	-
								Field	111	101	163	PPI	P	DWH		
6-104	F	D	108-111	44 N	W-9	VS	6/26/2012	Lab	133	130	185	PPI	P	DWH	-	-
								Field	144	130	197	PPI	P	DWH		
6-105	F	D	111-113	150 N	W-11	TS	6/26/2012	Lab	140	141	195	PPI	P	DWH	-	-
								Field	120	131	190	PPI	P	DWH		
6-106	F	D	114-116	346 N	W-5	AS	6/26/2012	Lab	132	135	185	PPI	P	DWH	-	-
								Field	116	115	168	PPI	P	DWH		
6-107	F	D	120-121	11 E	W-10	KC	6/26/2012	Lab	143	154	181	PPI	P	DWH	-	-
								Field	135	145	168	PPI	P	DWH		
6-108	F	D	109-112	500 N	W-5	AS	6/26/2012	Lab	-	-	-	-	-	-	6-108 A1	6-108 B
								Field	110	-	-	PPI	F	DWH		
6-108 A	F	D	109-112	515	W-5	AS	6/26/2012	Lab	127	131	186	PPI	F	DWH	6-108 A1	-
								Field	121	133	175	PPI	P	DWH		

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Destructive Test Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
Description: Construction Quality Assurance for SCA Phase II

ProjNo: GJ4706B
TaskNo: 200

Test Reqs: Fusion: Peel Inside: 91 Peel Outside: 91 Shear: 120
Extrusion: Peel: 78 Shear: 120

Primary / Secondary: Primary Series: 6 MaterialType: 6

Sample Data									Test Data							
			Location						Peel		Shear	Unit	Result	QA	Re test	Re test
Samp No	Weld Type	Track Type	Seam	Dist. (ft.)	Mach ID	Oper ID	Date Samp		Inside	Outside		ppi/psi	(P/F)	ID	1	2
6-108 A1	F	D	114-116	290 N	W-5	AS	6/28/2012	Lab	140	129	187	PPI	P	DWH	-	-
								Field	103	96	114	PPI	P	DWH		
6-108 B	F	D	107-110	660 N	W-5	AS	6/26/2012	Lab	143	144	197	PPI	P	DWH	-	-
								Field	135	131	179	PPI	P	DWH		
6-108 C	E	D	109-Cap	554 N	MX-16	BTK	7/2/2012	Lab	128	-	172	PPI	P	DWH	-	-
								Field	108	-	145	PPI	P	DWH		
6-109	F	D	116-119	567 N	W-11	TS	6/26/2012	Lab	132	146	189	PPI	P	DWH	-	-
								Field	126	126	180	PPI	P	DWH		
6-110	F	D	119-121	639 N	W-10	KC	6/26/2012	Lab	127	134	184	PPI	P	DWH	-	-
								Field	115	123	168	PPI	P	DWH		
6-111	F	D	121-Tie in	4 W	W-28	VC	6/27/2012	Lab	142	151	171	PPI	P	DWH	-	-
								Field	112	124	146	PPI	P	DWH		
6-112	F	D	116-119	659 N	W-11	TS	6/27/2012	Lab	122	136	186	PPI	P	DWH	-	-
								Field	108	107	153	PPI	P	DWH		
6-113	F	D	118-120	266 N	W-5	AS	6/27/2012	Lab	141	145	189	PPI	P	DWH	-	-
								Field	123	109	145	PPI	P	DWH		
6-114	F	D	119-121	660 N	W-10	KC	6/27/2012	Lab	133	132	186	PPI	P	DWH	-	-
								Field	105	100	148	PPI	P	DWH		

Comments:

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	1 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-001	Machine ID:	W-11
Seam ID:	20/21	Welder ID:	TS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	118	---	SE1	118	---	SE1	172	>50%	both
2	135	---	SE1	112	---	SE1	173	>50%	upper
3	126	---	SE1	143	---	SE1	174	>50%	upper
4	127	---	SE1	146	---	SE1	174	>50%	upper
5	153	---	SE1	141	---	SE1	160	>50%	lower
Average	132	---	---	132	---	---	170	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	2 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-002	Machine ID:	W-5
Seam ID:	13/14	Welder ID:	AS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	122	---	SE1	130	---	SE1	180	>50%	upper
2	118	---	SE1	135	---	SE1	179	>50%	upper
3	122	---	SE1	141	---	SE1	182	>50%	upper
4	117	---	SE1	131	---	SE1	176	>50%	upper
5	117	---	SE1	134	---	SE1	129	>50%	upper
Average	119	---	---	134	---	---	169	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	3 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-003	Machine ID:	W-14
Seam ID:	5/6	Welder ID:	VC
		Date Sampled:	05/15/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	153	---	SE1	137	---	SE1	178	>50%	upper
2	156	---	SE1	135	---	SE1	177	>50%	upper
3	154	---	SE1	132	---	SE1	180	>50%	upper
4	138	---	SE1	126	---	SE1	174	>50%	upper
5	135	---	SE1	140	---	SE1	178	>50%	upper
Average	147	---	---	134	---	---	177	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	4 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-004	Machine ID:	W-5
Seam ID:	25/31	Welder ID:	AS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	129	---	SE1	138	---	SE1	165	>50%	upper
2	136	---	SE1	134	---	SE1	169	>50%	upper
3	142	---	SE1	147	---	SE1	182	>50%	upper
4	134	---	SE1	138	---	SE1	169	>50%	upper
5	135	---	SE1	149	---	SE1	170	>50%	upper
Average	135	---	---	141	---	---	171	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	5 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-005	Machine ID:	W-11
Seam ID:	31/33	Welder ID:	TS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	124	---	SE1	142	---	SE1	179	>50%	lower
2	120	---	SE1	130	---	SE1	177	>50%	lower
3	129	---	SE1	135	---	SE1	184	>50%	lower
4	125	---	SE1	136	---	SE1	175	>50%	lower
5	123	---	SE1	143	---	SE1	178	>50%	lower
Average	124	---	---	137	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	6 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-006	Machine ID:	W-11
Seam ID:	33/35	Welder ID:	TS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	119	---	SE1	131	---	SE1	187	>50%	lower
2	120	---	SE1	126	---	SE1	183	>50%	lower
3	137	---	SE1	123	---	SE1	184	>50%	lower
4	135	---	SE1	123	---	SE1	192	>50%	lower
5	124	---	SE1	146	---	SE1	186	>50%	lower
Average	127	---	---	130	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	7 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-007	Machine ID:	W-11
Seam ID:	39/40	Welder ID:	TS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	162	---	SE1	142	---	SE1	167	>50%	lower
2	157	---	SE1	154	---	SE1	161	>50%	lower
3	162	---	SE1	146	---	SE1	165	>50%	lower
4	148	---	SE1	150	---	SE1	169	>50%	lower
5	148	---	SE1	145	---	SE1	160	>50%	lower
Average	155	---	---	147	---	---	165	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	8 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-008	Machine ID:	W-5
Seam ID:	35/37	Welder ID:	AS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	128	---	SE1	128	---	SE1	185	>50%	lower
2	124	---	SE1	127	---	SE1	176	>50%	lower
3	127	---	SE1	134	---	SE1	186	>50%	lower
4	121	---	SE1	126	---	SE1	182	>50%	upper
5	123	---	SE1	132	---	SE1	187	>50%	upper
Average	125	---	---	129	---	---	183	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) Interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	9 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-009	Machine ID:	W-9
Seam ID:	37/39	Welder ID:	LV
		Date Sampled:	05/15/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	125	---	SE1	120	---	SE1	180	>50%	both
2	121	---	SE1	119	---	SE1	171	>50%	lower
3	128	---	SE1	119	---	SE1	181	>50%	lower
4	127	---	SE1	116	---	SE1	176	>50%	lower
5	123	---	SE1	121	---	SE1	178	>50%	lower
Average	125	---	---	119	---	---	177	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-010	Machine ID:	W-14
Seam ID:	39/41	Welder ID:	VC
		Date Sampled:	05/15/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	146	---	SE1	135	---	SE1	178	>50%	lower
2	145	---	SE1	128	---	SE1	179	>50%	lower
3	152	---	SE1	133	---	SE1	181	>50%	lower
4	141	---	SE1	124	---	SE1	175	>50%	lower
5	147	---	SE1	130	---	SE1	178	>50%	lower
Average	146	---	---	130	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	2 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-011	Machine ID:	W-5
Seam ID:	41/43	Welder ID:	AS
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	139	---	SE1	130	---	SE1	177	>50%	lower
2	146	---	SE1	129	---	SE1	177	>50%	lower
3	149	---	SE1	134	---	SE1	178	>50%	lower
4	116	---	SE1	128	---	SE1	177	>50%	lower
5	133	---	SE1	136	---	SE1	179	>50%	lower
Average	136	---	---	131	---	---	177	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-012	Machine ID:	W-9
Seam ID:	1/PHASE 1	Welder ID:	LV
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	120	---	SE1	141	---	SE1	178	>50%	upper
2	136	---	SE1	146	---	SE1	178	>50%	upper
3	136	---	SE1	136	---	SE1	183	>50%	upper
4	135	---	SE1	142	---	SE1	178	>50%	upper
5	122	---	SE1	147	---	SE1	181	>50%	upper
Average	130	---	---	143	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/18/12		
Tested By:	ad	Report #:	7
Checked By:	bfs	Page:	11 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-013	Machine ID:	W-14
Seam ID:	34/35	Welder ID:	VC
		Date Sampled:	05/15/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	161	---	SE1	137	---	SE1	179	>50%	both
2	157	---	SE1	132	---	SE1	178	>50%	both
3	164	---	SE1	149	---	SE1	188	>50%	lower
4	165	---	SE1	143	---	SE1	175	>50%	lower
5	167	---	SE1	144	---	SE1	179	>50%	lower
Average	163	---	---	141	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	3 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-014	Machine ID:	W-9
Seam ID:	43/47	Welder ID:	LV
		Date Sampled:	05/16/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	136	---	SE1	138	---	SE1	181	>50%	lower
2	136	---	SE1	135	---	SE1	181	>50%	lower
3	135	---	SE1	137	---	SE1	184	>50%	both
4	128	---	SE1	134	---	SE1	178	>50%	lower
5	130	---	SE1	141	---	SE1	180	>50%	lower
Average	133	---	---	137	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	4 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-015	Machine ID:	W-11
Seam ID:	44/46	Welder ID:	TS
		Date Sampled:	05/16/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	149	---	SE1	139	---	SE1	187	>50%	both
2	129	---	SE1	137	---	SE1	182	>50%	upper
3	157	---	SE1	144	---	SE1	185	>50%	upper
4	142	---	SE1	143	---	SE1	183	>50%	both
5	139	---	SE1	128	---	SE1	185	>50%	upper
Average	143	---	---	138	---	---	184	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	5 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-016	Machine ID:	W-5
Seam ID:	47/48	Welder ID:	VC
		Date Sampled:	05/16/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	152	---	SE1	140	---	SE1	180	>50%	lower
2	149	---	SE1	136	---	SE1	182	>50%	upper
3	162	---	SE1	151	---	SE1	186	>50%	upper
4	127	---	SE1	149	---	SE1	181	>50%	lower
5	144	---	SE1	135	---	SE1	185	>50%	both
Average	147	---	---	142	---	---	183	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	6 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-017	Machine ID:	W-5
Seam ID:	46/47	Welder ID:	VC
		Date Sampled:	05/17/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	153	---	SE1	158	---	SE1	161	>50%	upper
2	153	---	SE1	156	---	SE1	163	>50%	upper
3	152	---	SE1	151	---	SE1	167	>50%	upper
4	147	---	SE1	152	---	SE1	163	>50%	upper
5	154	---	SE1	153	---	SE1	163	>50%	both
Average	152	---	---	154	---	---	164	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	7 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-018	Machine ID:	W-9
Seam ID:	48/51	Welder ID:	LV
		Date Sampled:	05/16/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	137	---	SE1	138	---	SE1	192	>50%	both
2	127	---	SE1	124	---	SE1	191	>50%	both
3	132	---	SE1	127	---	SE1	195	>50%	upper
4	130	---	SE1	125	---	SE1	191	>50%	both
5	130	---	SE1	133	---	SE1	192	>50%	lower
Average	131	---	---	129	---	---	192	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	8 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-019	Machine ID:	W-11
Seam ID:	53/54	Welder ID:	TS
		Date Sampled:	05/16/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	131	---	SE1	139	---	SE1	183	>50%	lower
2	122	---	SE1	134	---	SE1	180	>50%	lower
3	133	---	SE1	137	---	SE1	184	>50%	lower
4	123	---	SE1	141	---	SE1	180	>50%	lower
5	122	---	SE1	140	---	SE1	182	>50%	lower
Average	126	---	---	138	---	---	182	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	9 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-020	Machine ID:	W-11
Seam ID:	53/55	Welder ID:	TS
		Date Sampled:	05/18/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	140	---	SE1	140	---	SE1	181	>50%	lower
2	133	---	SE1	139	---	SE1	181	>50%	lower
3	134	---	SE1	149	---	SE1	184	>50%	lower
4	138	---	SE1	138	---	SE1	179	>50%	lower
5	129	---	SE1	139	---	SE1	183	>50%	lower
Average	135	---	---	141	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-021	Machine ID:	W-9
Seam ID:	55/57	Welder ID:	LV
		Date Sampled:	05/18/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	133	---	SE1	140	---	SE1	182	>50%	lower
2	134	---	SE1	134	---	SE1	180	>50%	lower
3	139	---	SE1	139	---	SE1	182	>50%	lower
4	138	---	SE1	153	---	SE1	180	>50%	lower
5	133	---	SE1	137	---	SE1	179	>50%	lower
Average	135	---	---	141	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	11 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-022	Machine ID:	W-10
Seam ID:	58/60	Welder ID:	KC
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	140	---	SE1	139	---	SE1	180	>50%	upper
2	134	---	SE1	136	---	SE1	178	>50%	upper
3	133	---	SE1	146	---	SE1	186	>50%	upper
4	133	---	SE1	135	---	SE1	181	>50%	upper
5	133	---	SE1	157	---	SE1	181	>50%	lower
Average	135	---	---	142	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-023	Machine ID:	W-5
Seam ID:	60/62	Welder ID:	AS
		Date Sampled:	05/18/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE1	133	---	SE1	173	>50%	lower
2	127	---	SE1	128	---	SE1	173	>50%	both
3	118	---	SE1	137	---	SE1	173	>50%	lower
4	137	---	SE1	125	---	SE1	166	>50%	lower
5	124	---	SE1	131	---	SE1	167	>50%	lower
Average	128	---	---	131	---	---	170	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/23/12		
Tested By:	ad	Report #:	8
Checked By:	bfs	Page:	13 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-024	Machine ID:	W-8
Seam ID:	62/65	Welder ID:	VC
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	137	---	SE1	145	---	SE1	189	>50%	upper
2	140	---	SE1	129	---	SE1	191	>50%	upper
3	136	---	SE1	139	---	SE1	191	>50%	lower
4	131	---	SE1	135	---	SE1	184	>50%	lower
5	144	---	SE1	134	---	SE1	193	>50%	lower
Average	137	---	---	137	---	---	190	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-025	Machine ID:	W-8
Seam ID:	65/66	Welder ID:	VC
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	135	---	SE1	179	>50%	Upper
2	129	---	SE1	141	---	SE1	180	>50%	Upper
3	135	---	SE1	145	---	SE1	186	>50%	Upper
4	135	---	SE1	137	---	SE1	181	>50%	Lower
5	139	---	SE1	140	---	SE1	182	>50%	Both
Average	135	---	---	140	---	---	182	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	2 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-026	Machine ID:	W-10
Seam ID:	68/69	Welder ID:	KC
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	112	---	SE1	133	---	SE1	181	>50%	Lower
2	120	---	SE1	137	---	SE1	177	>50%	Lower
3	124	---	SE1	120	---	SE1	180	>50%	Lower
4	142	---	SE1	129	---	SE1	174	>50%	Lower
5	133	---	SE1	141	---	SE1	179	>50%	Lower
Average	126	---	---	132	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	3 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-027	Machine ID:	W-9
Seam ID:	64/67	Welder ID:	LV
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	121	---	SE1	131	---	SE1	174	>50%	Lower
2	119	---	SE1	126	---	SE1	181	>50%	Lower
3	121	---	SE1	128	---	SE1	182	>50%	Lower
4	116	---	SE1	128	---	SE1	176	>50%	Lower
5	119	---	SE1	136	---	SE1	182	>50%	Lower
Average	119	---	---	130	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	4 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-028	Machine ID:	W-11
Seam ID:	67/70	Welder ID:	TS
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	140	---	SE1	177	>50%	Lower
2	140	---	SE1	141	---	SE1	175	>50%	Lower
3	129	---	SE1	145	---	SE1	175	>50%	Lower
4	122	---	SE1	143	---	SE1	176	>50%	Lower
5	121	---	SE1	123	---	SE1	179	>50%	Lower
Average	130	---	---	138	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	5 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-029	Machine ID:	W-10
Seam ID:	69/72	Welder ID:	KC
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	131	---	SE1	128	---	SE1	184	>50%	Upper
2	139	---	SE1	127	---	SE1	182	>50%	Upper
3	136	---	SE1	131	---	SE1	184	>50%	Lower
4	136	---	SE1	123	---	SE1	181	>50%	Lower
5	136	---	SE1	130	---	SE1	186	>50%	Lower
Average	136	---	---	128	---	---	184	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	6 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-030	Machine ID:	W-5
Seam ID:	72/74	Welder ID:	AS
		Date Sampled:	05/18/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	155	---	SE1	133	---	SE1	185	>50%	Upper
2	137	---	SE1	112	---	SE1	183	>50%	Upper
3	126	---	SE1	131	---	SE1	187	>50%	Upper
4	137	---	SE1	110	---	SE1	183	>50%	Upper
5	120	---	SE1	130	---	SE1	186	>50%	Upper
Average	135	---	---	123	---	---	185	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	7 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-031	Machine ID:	W-8
Seam ID:	74/77	Welder ID:	VC
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	123	---	SE1	172	>50%	Upper
2	126	---	SE1	118	---	SE1	172	>50%	Upper
3	126	---	SE1	122	---	SE1	177	>50%	Upper
4	128	---	SE1	127	---	SE1	175	>50%	Upper
5	125	---	SE1	128	---	SE1	179	>50%	Upper
Average	128	---	---	124	---	---	175	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	8 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-032	Machine ID:	W-11
Seam ID:	77/78	Welder ID:	TS
		Date Sampled:	05/18/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	123	---	SE1	125	---	SE1	174	>50%	Upper
2	128	---	SE1	118	---	SE1	174	>50%	Upper
3	142	---	SE1	124	---	SE1	177	>50%	Upper
4	127	---	SE1	123	---	SE1	171	>50%	Upper
5	125	---	SE1	127	---	SE1	174	>50%	Lower
Average	129	---	---	123	---	---	174	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	9 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-033	Machine ID:	W-9
Seam ID:	64/65	Welder ID:	LV
		Date Sampled:	05/18/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	142	---	SE1	156	---	SE1	168	>50%	Lower
2	133	---	SE1	146	---	SE1	166	>50%	Lower
3	141	---	SE1	149	---	SE1	163	>50%	Lower
4	137	---	SE1	139	---	SE1	160	>50%	Lower
5	138	---	SE1	142	---	SE1	163	>50%	Lower
Average	138	---	---	146	---	---	164	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/01/12		
Tested By:	meo	Report #:	13
Checked By:	jdt	Page:	1 of 2

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-034A	Machine ID:	W-10
Seam ID:	Phase I/6-072	Welder ID:	TS
		Date Sampled:	05/31/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	151	---	SE1	140	---	SE1	182	>50%	upper
2	148	---	SE1	139	---	SE1	183	>50%	upper
3	150	---	SE1	137	---	SE1	179	>50%	upper
4	141	---	SE1	145	---	SE1	175	>50%	lower
5	151	---	SE1	142	---	SE1	180	>50%	upper
Average	148	---	---	141	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/01/12		
Tested By:	meo	Report #:	13
Checked By:	jdt	Page:	2 of 2

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-034B	Machine ID:	W-10
Seam ID:	Phase I/6-066	Welder ID:	TS
		Date Sampled:	05/31/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	147	---	SE1	142	---	SE1	169	>50%	upper
2	142	---	SE1	144	---	SE1	171	>50%	upper
3	140	---	SE1	139	---	SE1	161	>50%	upper
4	148	---	SE1	145	---	SE1	166	>50%	lower
5	126	---	SE1	139	---	SE1	168	>50%	upper
Average	141	---	---	142	---	---	167	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	10 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-034	Machine ID:	W-10
Seam ID:	69/PHASE 1	Welder ID:	KC
		Date Sampled:	05/21/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	154	---	SE1	147	---	SE1	185	>50%	Upper
2	148	---	SE1	145	---	SE1	180	>50%	Upper
3	134	65	AD-BRK	149	---	SE1	175	>50%	Upper
4	159	---	SE1	151	---	SE1	174	>50%	Upper
5	148	---	SE1	144	---	SE1	177	>50%	Upper
Average	148	---	---	147	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/24/12		
Tested By:	ad	Report #:	9
Checked By:	bfs	Page:	11 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-035	Machine ID:	W-5
Seam ID:	57/58	Welder ID:	AS
		Date Sampled:	05/21/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	157	---	SE1	163	---	SE1	174	>50%	Upper
2	151	---	SE1	160	---	SE1	171	>50%	Upper
3	165	---	SE1	161	---	SE1	173	>50%	Upper
4	161	---	SE1	163	---	SE1	169	>50%	Upper
5	162	---	SE1	150	---	SE1	172	>50%	Upper
Average	159	---	---	159	---	---	172	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	1 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-036	Machine ID:	W-11
Seam ID:	79/80	Welder ID:	TS
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	139	---	SE1	176	>50%	lower
2	138	---	SE1	136	---	SE1	174	>50%	lower
3	140	---	SE1	133	---	SE1	175	>50%	lower
4	136	---	SE1	147	---	SE1	168	>50%	lower
5	130	---	SE1	143	---	SE1	173	>50%	lower
Average	136	---	---	139	---	---	173	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	2 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-037	Machine ID:	W-8
Seam ID:	80/83	Welder ID:	VC
		Date Sampled:	05/24/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	131	---	SE1	135	---	SE1	179	>50%	lower
2	139	---	SE1	123	---	SE1	176	>50%	lower
3	144	---	SE1	120	---	SE1	179	>50%	lower
4	133	---	SE1	113	---	SE1	177	>50%	lower
5	137	---	SE1	137	---	SE1	179	>50%	lower
Average	137	---	---	126	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	3 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-038	Machine ID:	W-10
Seam ID:	83/85	Welder ID:	KC
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	123	---	SE1	130	---	SE1	175	>50%	lower
2	117	---	SE1	142	---	SE1	177	>50%	lower
3	121	---	SE1	150	---	SE1	179	>50%	lower
4	118	---	SE1	147	---	SE1	173	>50%	lower
5	118	---	SE1	148	---	SE1	177	>50%	lower
Average	119	---	---	143	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	4 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-039	Machine ID:	W-5
Seam ID:	85/88	Welder ID:	AS
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	121	---	SE1	167	>50%	lower
2	119	---	SE1	114	---	SE1	172	>50%	upper
3	122	---	SE1	135	---	SE1	170	>50%	upper
4	123	---	SE1	137	---	SE1	166	>50%	both
5	125	---	SE1	145	---	SE1	168	>50%	both
Average	125	---	---	130	---	---	168	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	5 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-040	Machine ID:	W-8
Seam ID:	88/90	Welder ID:	VC
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	122	---	SE1	124	---	SE1	177	>50%	both
2	123	---	SE1	145	---	SE1	174	>50%	both
3	121	---	SE1	125	---	SE1	177	>50%	both
4	123	---	SE1	106	---	SE1	170	>50%	both
5	131	---	SE1	137	---	SE1	175	>50%	both
Average	124	---	---	127	---	---	175	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	1 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-041	Machine ID:	W-11
Seam ID:	90/92	Welder ID:	TS
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	119	---	SE1	127	---	SE1	172	>50%	lower
2	121	---	SE1	136	---	SE1	171	>50%	lower
3	124	---	SE1	141	---	SE1	174	>50%	lower
4	116	---	SE1	130	---	SE1	168	>50%	lower
5	124	---	SE1	121	---	SE1	172	>50%	lower
Average	121	---	---	131	---	---	171	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	2 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-042	Machine ID:	W-10
Seam ID:	93/95	Welder ID:	KC
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	117	---	SE1	119	---	SE1	176	>50%	lower
2	113	---	SE1	139	---	SE1	176	>50%	lower
3	114	---	SE1	130	---	SE1	180	>50%	lower
4	119	---	SE1	121	---	SE1	177	>50%	lower
5	122	---	SE1	116	---	SE1	180	>50%	lower
Average	117	---	---	125	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	3 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-043	Machine ID:	W-8
Seam ID:	95/97	Welder ID:	VC
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	130	---	SE1	121	---	SE1	174	>50%	upper
2	128	---	SE1	116	---	SE1	170	>50%	upper
3	135	---	SE1	131	---	SE1	174	>50%	upper
4	149	---	SE1	121	---	SE1	170	>50%	lower
5	141	---	SE1	115	---	SE1	174	>50%	both
Average	137	---	---	121	---	---	172	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	4 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-044	Machine ID:	W-5
Seam ID:	97/100	Welder ID:	AS
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE1	121	---	SE1	170	>50%	upper
2	125	---	SE1	128	---	SE1	168	>50%	upper
3	125	---	SE1	136	---	SE1	174	>50%	upper
4	118	---	SE1	137	---	SE1	169	>50%	upper
5	117	---	SE1	133	---	SE1	173	>50%	upper
Average	123	---	---	131	---	---	171	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	5 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-045	Machine ID:	W-11
Seam ID:	100/102	Welder ID:	TS
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	123	---	SE1	179	>50%	lower
2	119	---	SE1	121	---	SE1	181	>50%	lower
3	124	---	SE1	125	---	SE1	185	>50%	lower
4	123	---	SE1	126	---	SE1	178	>50%	lower
5	136	---	SE1	129	---	SE1	182	>50%	lower
Average	126	---	---	125	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	6 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-046	Machine ID:	W-10
Seam ID:	102/104	Welder ID:	KC
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	122	---	SE1	153	---	SE1	177	>50%	upper
2	131	---	SE1	124	---	SE1	176	>50%	upper
3	142	---	SE1	126	---	SE1	178	>50%	upper
4	121	---	SE1	136	---	SE1	171	>50%	upper
5	122	---	SE1	138	---	SE1	174	>50%	upper
Average	128	---	---	135	---	---	175	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	7 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-047	Machine ID:	W-9
Seam ID:	104/107	Welder ID:	VC
		Date Sampled:	05/24/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	116	---	SE1	131	---	SE1	181	>50%	upper
2	121	---	SE1	122	---	SE1	180	>50%	upper
3	122	---	SE1	139	---	SE1	183	>50%	upper
4	117	---	SE1	134	---	SE1	180	>50%	upper
5	115	---	SE1	123	---	SE1	183	>50%	upper
Average	118	---	---	130	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	8 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-048	Machine ID:	W-5
Seam ID:	107/109	Welder ID:	AS
		Date Sampled:	05/25/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	138	---	SE1	185	>50%	lower
2	123	---	SE1	140	---	SE1	184	>50%	lower
3	120	---	SE1	135	---	SE1	190	>50%	lower
4	135	---	SE1	132	---	SE1	184	>50%	lower
5	130	---	SE1	127	---	SE1	189	>50%	lower
Average	129	---	---	134	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	1 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-049A-1	Machine ID:	---
Seam ID:	111/113	Welder ID:	TS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	136	---	SE1	189	>50%	lower
2	140	---	SE1	128	---	SE1	194	>50%	lower
3	139	---	SE1	124	---	SE1	193	>50%	lower
4	135	---	SE1	147	---	SE1	188	>50%	lower
5	133	---	SE1	137	---	SE1	188	>50%	lower
Average	137	---	---	134	---	---	190	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/31/12		
Tested By:	ad	Report #:	12
Checked By:	jdt	Page:	1 of 2

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-049A	Machine ID:	W-10
Seam ID:	Phase I/104	Welder ID:	TS
		Date Sampled:	05/30/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	50%	AD-BRK	127	---	SE1	167	>50%	upper
2	116	50%	AD-BRK	133	---	SE1	167	>50%	upper
3	132	40%	AD-BRK	142	---	SE1	170	>50%	upper
4	126	60%	AD-BRK	124	---	SE1	166	>50%	upper
5	129	60%	AD-BRK	139	---	SE1	168	>50%	upper
Average	126	---	---	133	---	---	167	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/05/12		
Tested By:	ad	Report #:	14
Checked By:	jdt	Page:	1 of 1

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-049B1	Machine ID:	W-11
Seam ID:	100/103	Welder ID:	TS
		Date Sampled:	---

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	123	---	SE1	128	---	SE1	178	>50%	both
2	122	---	SE1	127	---	SE1	179	>50%	both
3	128	---	SE1	133	---	SE1	180	>50%	upper
4	124	---	SE1	122	---	SE1	178	>50%	both
5	127	---	SE1	125	---	SE1	179	>50%	both
Average	125	---	---	127	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/31/12		
Tested By:	ad	Report #:	12
Checked By:	jdt	Page:	2 of 2

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-049B	Machine ID:	W-10
Seam ID:	Phase I/97	Welder ID:	TS
		Date Sampled:	05/30/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	146	50%	AD-BRK	145	---	SE1	187	>50%	both
2	138	60%	AD-BRK	151	10%	AD-BRK	191	>50%	upper
3	143	70%	AD-BRK	152	---	SE1	189	>50%	upper
4	123	30%	AD-BRK	150	10%	AD-BRK	185	>50%	both
5	114	70%	AD-BRK	130	10%	AD-BRK	187	>50%	both
Average	133	---	---	145	---	---	188	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	6 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-050	Machine ID:	W-11
Seam ID:	78/81	Welder ID:	TS
		Date Sampled:	05/25/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	140	---	SE1	138	---	SE1	175	>50%	both
2	123	---	SE1	140	---	SE1	172	>50%	both
3	122	---	SE1	123	---	SE1	174	>50%	both
4	124	---	SE1	116	---	SE1	171	>50%	both
5	129	---	SE1	113	---	SE1	175	>50%	both
Average	128	---	---	126	---	---	173	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/06/12		
Tested By:	ad	Report #:	15
Checked By:	jdt	Page:	1 of 1

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Filet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-049C	Machine ID:	16
Seam ID:	93/CAP	Welder ID:	VS
		Date Sampled:	06/05/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE3	---	---	---	167	>50%	both
2	122	---	SE3	---	---	---	165	>50%	both
3	130	---	SE3	---	---	---	170	>50%	both
4	131	---	SE3	---	---	---	166	>50%	both
5	126	---	SE3	---	---	---	170	>50%	both
Average	128	---	---	---	---	---	168	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	7 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-051	Machine ID:	W-10
Seam ID:	84/86	Welder ID:	KC
		Date Sampled:	05/25/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	121	---	SE1	129	---	SE1	178	>50%	both
2	117	---	SE1	127	---	SE1	175	>50%	both
3	123	---	SE1	129	---	SE1	177	>50%	both
4	123	---	SE1	126	---	SE1	171	>50%	both
5	120	---	SE1	122	---	SE1	176	>50%	both
Average	121	---	---	127	---	---	175	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/29/12		
Tested By:	ad	Report #:	10
Checked By:	bfs	Page:	8 of 8

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-052	Machine ID:	W-8
Seam ID:	88/91	Welder ID:	VC
		Date Sampled:	05/25/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	124	---	SE1	119	---	SE1	174	>50%	both
2	124	---	SE1	121	---	SE1	176	>50%	upper
3	120	---	SE1	123	---	SE1	180	>50%	upper
4	130	---	SE1	124	---	SE1	176	>50%	upper
5	136	---	SE1	130	---	SE1	178	>50%	upper
Average	127	---	---	123	---	---	177	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	9 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-053	Machine ID:	W-5
Seam ID:	106/107	Welder ID:	AS
		Date Sampled:	05/25/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	154	---	SE1	155	---	SE1	166	>50%	lower
2	154	---	SE1	146	---	SE1	167	>50%	lower
3	151	---	SE1	151	---	SE1	166	>50%	lower
4	148	---	SE1	145	---	SE1	162	>50%	lower
5	149	---	SE1	149	---	SE1	162	>50%	lower
Average	151	---	---	149	---	---	165	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	05/30/12		
Tested By:	meo	Report #:	11
Checked By:	bfs	Page:	10 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-054	Machine ID:	W-9
Seam ID:	105/106	Welder ID:	VC
		Date Sampled:	05/25/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	132	---	SE1	178	>50%	lower
2	115	---	SE1	133	---	SE1	179	>50%	lower
3	121	---	SE1	134	---	SE1	183	>50%	lower
4	118	---	SE1	135	---	SE1	179	>50%	lower
5	119	---	SE1	141	---	SE1	179	>50%	lower
Average	120	---	---	135	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/14/12		
Tested By:	meo	Report #:	18
Checked By:	bfs	Page:	1 of 1

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-055A1	Machine ID:	W-14
Seam ID:	120/122	Welder ID:	VS
		Date Sampled:	06/13/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	150	---	SE1	145	---	SE1	181	>50%	lower
2	134	---	SE1	138	---	SE1	181	>50%	lower
3	130	---	SE1	133	---	SE1	181	>50%	lower
4	136	---	SE1	131	---	SE1	176	>50%	lower
5	129	---	SE1	147	---	SE1	176	>50%	lower
Average	136	---	---	139	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	1 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-055A	Machine ID:	W-14
Seam ID:	120/122	Welder ID:	VS
		Date Sampled:	06/11/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	129	---	SE1	143	---	SE1	184	>50%	lower
2	128	---	SE1	130	70%	ADBRK	181	>50%	lower
3	127	---	SE1	147	---	SE1	183	>50%	lower
4	123	---	SE1	115	100%	AD	179	>50%	lower
5	122	---	SE1	105	100%	AD	184	>50%	lower
Average	126	---	---	128	---	---	182	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/15/12		
Tested By:	ad	Report #:	19
Checked By:	bfs	Page:	1 of 1

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-055B1	Machine ID:	W-14
Seam ID:	122/124	Welder ID:	VS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	139	---	SE1	167	>50%	Both
2	133	---	SE1	144	---	SE1	164	>50%	Both
3	142	---	SE1	157	---	SE1	166	>50%	Both
4	138	---	SE1	152	---	SE1	165	>50%	Both
5	155	---	SE1	157	---	SE1	164	>50%	Both
Average	140	---	---	150	---	---	165	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	2 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-055B	Machine ID:	W-14
Seam ID:	120/122	Welder ID:	VS
		Date Sampled:	06/11/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	142	100%	AD	142	---	SE1	187	>50%	lower
2	152	---	SE1	134	90%	ADBRK	185	>50%	lower
3	137	---	SE1	123	90%	ADBRK	187	>50%	lower
4	132	---	SE1	122	100%	AD	181	>50%	lower
5	131	---	SE1	136	---	SE1	185	>50%	lower
Average	139	---	---	131	---	---	185	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	3 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-056	Machine ID:	W-11
Seam ID:	123/125	Welder ID:	TS
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	131	---	SE1	190	>50%	both
2	123	---	SE1	132	---	SE1	187	>50%	both
3	123	---	SE1	136	---	SE1	190	>50%	both
4	133	---	SE1	140	---	SE1	185	>50%	both
5	125	---	SE1	129	---	SE1	191	>50%	both
Average	126	---	---	134	---	---	189	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	4 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-057	Machine ID:	W-10
Seam ID:	125/128	Welder ID:	KC
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	126	---	SE1	185	>50%	both
2	147	---	SE1	126	---	SE1	183	>50%	both
3	156	---	SE1	136	---	SE1	185	>50%	both
4	133	---	SE1	140	---	SE1	180	>50%	both
5	125	---	SE1	131	---	SE1	183	>50%	both
Average	140	---	---	132	---	---	183	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	5 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-058	Machine ID:	W-14
Seam ID:	128/130	Welder ID:	VS
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE1	145	---	SE1	189	>50%	both
2	133	---	SE1	134	---	SE1	192	>50%	both
3	133	---	SE1	144	---	SE1	197	>50%	both
4	130	---	SE1	149	---	SE1	192	>50%	both
5	128	---	SE1	154	---	SE1	195	>50%	both
Average	131	---	---	145	---	---	193	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	6 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-059	Machine ID:	W-5
Seam ID:	131/133	Welder ID:	AS
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	127	---	SE1	138	---	SE1	178	>50%	upper
2	125	---	SE1	141	---	SE1	175	>50%	upper
3	130	---	SE1	141	---	SE1	177	>50%	upper
4	126	---	SE1	133	---	SE1	174	>50%	upper
5	121	---	SE1	126	---	SE1	180	>50%	both
Average	126	---	---	136	---	---	177	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	7 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-060	Machine ID:	W-14
Seam ID:	133/135	Welder ID:	VS
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	144	---	SE1	141	---	SE1	187	>50%	upper
2	141	---	SE1	137	---	SE1	184	>50%	upper
3	151	---	SE1	143	---	SE1	186	>50%	upper
4	143	---	SE1	145	---	SE1	184	>50%	upper
5	148	---	SE1	139	---	SE1	189	>50%	upper
Average	145	---	---	141	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	8 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-061	Machine ID:	W-11
Seam ID:	130/132	Welder ID:	TS
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	125	---	SE1	145	---	SE1	189	>50%	both
2	123	---	SE1	147	---	SE1	188	>50%	both
3	147	---	SE1	153	---	SE1	190	>50%	both
4	130	---	SE1	145	---	SE1	186	>50%	both
5	135	---	SE1	144	---	SE1	188	>50%	both
Average	132	---	---	147	---	---	188	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-062	Machine ID:	W-10
Seam ID:	132/134	Welder ID:	KC
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	133	---	SE1	129	---	SE1	185	>50%	lower
2	135	---	SE1	129	---	SE1	186	>50%	lower
3	130	---	SE1	133	---	SE1	185	>50%	lower
4	131	---	SE1	131	---	SE1	177	>50%	lower
5	132	---	SE1	125	---	SE1	179	>50%	lower
Average	132	---	---	129	---	---	182	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/08/12		
Tested By:	ad	Report #:	17
Checked By:	bfs	Page:	10 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-6-063	Machine ID:	W-11
Seam ID:	128/PHASE 1	Welder ID:	TS
		Date Sampled:	06/08/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	145	---	SE1	145	---	SE1	168	>50%	upper
2	141	---	SE1	143	---	SE1	164	>50%	upper
3	140	---	SE1	142	---	SE1	171	>50%	upper
4	143	---	SE1	148	---	SE1	167	>50%	upper
5	149	---	SE1	150	---	SE1	174	>50%	upper
Average	144	---	---	146	---	---	169	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	1 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-064	Machine ID:	W-11
Seam ID:	134/137	Welder ID:	TS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	141	---	SE1	145	---	SE1	181	>50%	lower
2	124	---	SE1	130	---	SE1	175	>50%	lower
3	138	---	SE1	136	---	SE1	172	>50%	lower
4	126	---	SE1	144	---	SE1	177	>50%	lower
5	129	---	SE1	118	---	SE1	177	>50%	lower
Average	132	---	---	134	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	2 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-065	Machine ID:	W-10
Seam ID:	137/139	Welder ID:	KC
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	137	---	SE1	186	>50%	lower
2	123	---	SE1	129	---	SE1	185	>50%	lower
3	126	---	SE1	128	---	SE1	174	>50%	lower
4	124	---	SE1	128	---	SE1	176	>50%	lower
5	127	---	SE1	135	---	SE1	183	>50%	lower
Average	127	---	---	132	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	3 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-066	Machine ID:	W-11
Seam ID:	139/142	Welder ID:	TS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	131	---	SE1	182	>50%	lower
2	121	---	SE1	134	---	SE1	181	>50%	lower
3	118	---	SE1	125	---	SE1	173	>50%	lower
4	122	---	SE1	129	---	SE1	174	>50%	lower
5	126	---	SE1	130	---	SE1	179	>50%	lower
Average	123	---	---	130	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	4 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-067	Machine ID:	W-5
Seam ID:	142/143	Welder ID:	AS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	156	---	SE1	137	---	SE1	189	>50%	upper
2	148	---	SE1	121	---	SE1	190	>50%	upper
3	138	---	SE1	125	---	SE1	185	>50%	upper
4	121	---	SE1	139	---	SE1	188	>50%	upper
5	124	---	SE1	139	---	SE1	195	>50%	upper
Average	137	---	---	132	---	---	189	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	5 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-068	Machine ID:	W-28
Seam ID:	143/146	Welder ID:	VC
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE1	127	---	SE1	185	>50%	both
2	126	---	SE1	129	---	SE1	181	>50%	both
3	122	---	SE1	141	---	SE1	175	>50%	both
4	127	---	SE1	133	---	SE1	177	>50%	both
5	129	---	SE1	127	---	SE1	180	>50%	both
Average	127	---	---	131	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	6 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-069	Machine ID:	W-28
Seam ID:	146/148	Welder ID:	VC
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	119	---	SE1	142	---	SE1	192	>50%	upper
2	124	---	SE1	142	---	SE1	189	>50%	upper
3	123	---	SE1	144	---	SE1	186	>50%	upper
4	146	---	SE1	140	---	SE1	193	>50%	upper
5	125	---	SE1	144	---	SE1	196	>50%	upper
Average	127	---	---	142	---	---	191	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	7 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-070	Machine ID:	W-5
Seam ID:	148/150	Welder ID:	AS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	135	---	SE1	133	---	SE1	182	>50%	lower
2	137	---	SE1	121	---	SE1	176	>50%	lower
3	121	---	SE1	139	---	SE1	174	>50%	lower
4	153	---	SE1	145	---	SE1	175	>50%	lower
5	142	---	SE1	145	---	SE1	179	>50%	lower
Average	138	---	---	137	---	---	177	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	8 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-071	Machine ID:	W-28
Seam ID:	135/137	Welder ID:	VC
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	122	---	SE1	130	---	SE1	169	>50%	lower
2	107	---	SE1	120	---	SE1	166	>50%	lower
3	118	---	SE1	131	---	SE1	162	>50%	lower
4	111	---	SE1	123	---	SE1	163	>50%	lower
5	109	---	SE1	122	---	SE1	163	>50%	lower
Average	113	---	---	125	---	---	165	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	2 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-072A1	Machine ID:	W-28
Seam ID:	153/155	Welder ID:	VC
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	115	---	SE1	146	---	SE1	176	>50%	upper
2	125	---	SE1	150	---	SE1	177	>50%	upper
3	119	---	SE1	156	---	SE1	181	>50%	upper
4	119	---	SE1	156	---	SE1	172	>50%	upper
5	119	---	SE1	152	---	SE1	183	>50%	upper
Average	119	---	---	152	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	21
Checked By:	bfs	Page:	1 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-072A	Machine ID:	W-28
Seam ID:	146/PHASE I	Welder ID:	VC
		Date Sampled:	06/20/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	143	---	SE1	147	---	SE1	152	>50%	upper
2	128	---	SE1	146	---	SE1	152	>50%	upper
3	131	---	SE1	148	---	SE1	155	>50%	upper
4	132	---	SE1	125	30%	ADBRK	154	>50%	upper
5	144	---	SE1	152	---	SE1	155	>50%	upper
Average	136	---	---	144	---	---	154	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	3 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-072B	Machine ID:	W-28
Seam ID:	152/153	Welder ID:	VC
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	127	---	SE1	146	---	SE1	165	>50%	lower
2	115	---	SE1	132	---	SE1	166	>50%	upper
3	122	---	SE1	151	---	SE1	166	>50%	both
4	131	---	SE1	137	---	SE1	162	>50%	lower
5	121	---	SE1	136	---	SE1	165	>50%	upper
Average	123	---	---	140	---	---	165	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/28/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	1 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Fillet Extrustion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-072C	Machine ID:	MX-12
Seam ID:	148/CAP	Welder ID:	BTK
		Date Sampled:	06/27/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	137	---	SE1	---	---	---	182	>50%	lower
2	136	---	SE1	---	---	---	178	>50%	upper
3	152	---	SE1	---	---	---	182	>50%	lower
4	132	---	SE1	---	---	---	178	>50%	lower
5	137	---	SE1	---	---	---	170	>50%	lower
Average	139	---	---	---	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	9 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-072	Machine ID:	W-28
Seam ID:	144/PHASE I	Welder ID:	VC
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	156	---	SE1	170	>50%	upper
2	100	70%	ADBRK	147	---	SE1	167	>50%	upper
3	126	---	SE1	157	---	SE1	162	>50%	upper
4	136	---	SE1	157	---	SE1	164	>50%	upper
5	140	---	SE1	153	---	SE1	166	>50%	upper
Average	128	---	---	154	---	---	166	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	21
Checked By:	bfs	Page:	2 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-073A	Machine ID:	W-5
Seam ID:	148/150	Welder ID:	AS
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	147	---	SE1	123	---	SE1	172	>50%	lower
2	134	---	SE1	129	---	SE1	172	>50%	lower
3	122	---	SE1	137	---	SE1	173	>50%	lower
4	126	---	SE1	135	---	SE1	171	>50%	lower
5	145	---	SE1	134	---	SE1	174	>50%	lower
Average	135	---	---	132	---	---	172	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	21
Checked By:	bfs	Page:	3 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-073B	Machine ID:	W-5
Seam ID:	149/150	Welder ID:	AS
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	140	---	SE1	155	---	SE1	160	>50%	lower
2	146	---	SE1	150	---	SE1	159	>50%	lower
3	151	---	SE1	155	---	SE1	161	>50%	lower
4	145	---	SE1	153	---	SE1	155	>50%	lower
5	153	---	SE1	132	---	SE1	157	>50%	lower
Average	147	---	---	149	---	---	158	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	10 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-073	Machine ID:	W-5
Seam ID:	49/50	Welder ID:	AS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	133	---	SE1	156	---	SE1	163	>50%	upper
2	135	10%	ADBRK	153	---	SE1	161	>50%	upper
3	131	---	SE1	152	---	SE1	160	>50%	upper
4	150	---	SE1	159	---	SE1	168	>50%	upper
5	136	15%	ADBRK	150	---	SE1	168	>50%	lower
Average	137	---	---	154	---	---	164	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	11 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-074	Machine ID:	W-11
Seam ID:	149/151	Welder ID:	TS
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	133	---	SE1	187	>50%	lower
2	127	---	SE1	131	---	SE1	184	>50%	lower
3	120	---	SE1	122	---	SE1	179	>50%	lower
4	121	---	SE1	126	---	SE1	183	>50%	lower
5	132	---	SE1	122	---	SE1	187	>50%	lower
Average	125	---	---	127	---	---	184	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/18/12		
Tested By:	meo	Report #:	20
Checked By:	bfs	Page:	12 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-075	Machine ID:	W-10
Seam ID:	149/153	Welder ID:	KC
		Date Sampled:	06/14/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	116	---	SE1	181	>50%	upper
2	120	---	SE1	145	---	SE1	180	>50%	upper
3	129	---	SE1	149	---	SE1	177	>50%	lower
4	132	---	SE1	158	---	SE1	180	>50%	lower
5	128	---	SE1	151	---	SE1	181	>50%	lower
Average	127	---	---	144	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	1 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-076	Machine ID:	W-11
Seam ID:	151/154	Welder ID:	TS
		Date Sampled:	06/20/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE1	138	---	SE1	182	>50%	lower
2	140	---	SE1	140	---	SE1	179	>50%	lower
3	133	---	SE1	146	---	SE1	181	>50%	lower
4	131	---	SE1	136	---	SE1	177	>50%	lower
5	145	---	SE1	129	---	SE1	180	>50%	lower
Average	136	---	---	138	---	---	180	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	2 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-077	Machine ID:	W-10
Seam ID:	154/157	Welder ID:	KC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	119	---	SE1	137	---	SE1	158	>50%	upper
2	114	---	SE1	143	---	SE1	160	>50%	upper
3	114	---	SE1	129	---	SE1	164	>50%	upper
4	111	---	SE1	148	---	SE1	162	>50%	upper
5	109	---	SE1	136	---	SE1	165	>50%	upper
Average	113	---	---	139	---	---	162	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	3 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-078	Machine ID:	W-11
Seam ID:	157/159	Welder ID:	TS
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	132	---	SE1	131	---	SE1	171	>50%	lower
2	130	---	SE1	132	---	SE1	173	>50%	lower
3	133	---	SE1	127	---	SE1	173	>50%	lower
4	124	---	SE1	131	---	SE1	168	>50%	lower
5	125	---	SE1	129	---	SE1	169	>50%	lower
Average	129	---	---	130	---	---	171	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	4 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-079	Machine ID:	W-10
Seam ID:	159/162	Welder ID:	KC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	119	---	SE1	119	---	SE1	174	>50%	lower
2	118	---	SE1	117	---	SE1	177	>50%	upper
3	117	---	SE1	121	---	SE1	177	>50%	upper
4	145	---	SE1	149	---	SE1	177	>50%	upper
5	116	---	SE1	148	---	SE1	175	>50%	lower
Average	123	---	---	131	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	5 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-080	Machine ID:	W-11
Seam ID:	162/163	Welder ID:	TS
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	137	---	SE1	141	---	SE1	180	>50%	lower
2	121	---	SE1	121	---	SE1	178	>50%	lower
3	141	---	SE1	116	---	SE1	180	>50%	lower
4	122	---	SE1	117	---	SE1	174	>50%	lower
5	131	---	SE1	126	---	SE1	177	>50%	lower
Average	130	---	---	124	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	6 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-081	Machine ID:	W-28
Seam ID:	163/167	Welder ID:	VC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	116	---	SE1	144	---	SE1	169	>50%	upper
2	114	---	SE1	127	---	SE1	165	>50%	upper
3	118	---	SE1	129	---	SE1	166	>50%	upper
4	112	---	SE1	123	---	SE1	164	>50%	upper
5	138	---	SE1	115	---	SE1	167	>50%	upper
Average	120	---	---	128	---	---	166	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	7 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-082	Machine ID:	W-28
Seam ID:	167/169	Welder ID:	VC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	117	---	SE1	121	---	SE1	166	>50%	lower
2	115	---	SE1	117	---	SE1	162	>50%	lower
3	128	---	SE1	121	---	SE1	164	>50%	lower
4	129	---	SE1	118	---	SE1	161	>50%	lower
5	122	---	SE1	125	---	SE1	165	>50%	lower
Average	122	---	---	120	---	---	164	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	8 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-083	Machine ID:	W-28
Seam ID:	169/171	Welder ID:	VC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	112	---	SE1	144	---	SE1	179	>50%	upper
2	112	---	SE1	141	---	SE1	174	>50%	upper
3	100	---	SE1	147	---	SE1	179	>50%	upper
4	108	---	SE1	142	---	SE1	174	>50%	upper
5	114	---	SE1	144	---	SE1	176	>50%	upper
Average	109	---	---	144	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	9 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-084	Machine ID:	W-10
Seam ID:	171/173	Welder ID:	KC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	125	---	SE1	120	---	SE1	171	>50%	lower
2	128	---	SE1	120	---	SE1	168	>50%	lower
3	136	---	SE1	121	---	SE1	174	>50%	lower
4	120	---	SE1	125	---	SE1	167	>50%	lower
5	127	---	SE1	136	---	SE1	169	>50%	lower
Average	127	---	---	124	---	---	170	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-085	Machine ID:	W-10
Seam ID:	173/174	Welder ID:	KC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	146	---	SE1	136	---	SE1	167	>50%	lower
2	143	---	SE1	153	---	SE1	166	>50%	lower
3	138	---	SE1	150	---	SE1	157	>50%	lower
4	135	---	SE1	152	---	SE1	159	>50%	lower
5	134	---	SE1	151	---	SE1	159	>50%	lower
Average	139	---	---	148	---	---	162	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	22
Checked By:	bfs	Page:	11 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-086	Machine ID:	W-11
Seam ID:	171/174	Welder ID:	TS
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	145	---	SE1	135	---	SE1	171	>50%	lower
2	130	---	SE1	120	---	SE1	173	>50%	lower
3	136	---	SE1	124	---	SE1	171	>50%	lower
4	129	---	SE1	149	---	SE1	167	>50%	lower
5	127	---	SE1	133	---	SE1	171	>50%	lower
Average	133	---	---	132	---	---	171	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/21/12		
Tested By:	meo	Report #:	21
Checked By:	bfs	Page:	4 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-087	Machine ID:	W-28
Seam ID:	153/155	Welder ID:	VC
		Date Sampled:	06/20/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	124	---	SE1	150	---	SE1	177	>50%	upper
2	130	---	SE1	142	---	SE1	173	>50%	upper
3	130	---	SE1	149	---	SE1	176	>50%	upper
4	125	---	SE1	150	---	SE1	172	>50%	upper
5	126	---	SE1	147	---	SE1	177	>50%	upper
Average	127	---	---	148	---	---	175	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/29/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	1 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-088A1	Machine ID:	W-28
Seam ID:	169/PHASE I	Welder ID:	VC
		Date Sampled:	06/28/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	153	---	SE1	154	---	SE1	171	>50%	upper
2	149	---	SE1	154	---	SE1	168	>50%	upper
3	154	---	SE1	163	---	SE1	173	>50%	upper
4	162	---	SE1	161	---	SE1	168	>50%	upper
5	153	---	SE1	159	---	SE1	169	>50%	upper
Average	154	---	---	158	---	---	170	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	4 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-088A	Machine ID:	W-28
Seam ID:	167/PHASE I	Welder ID:	VC
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	131	80%	ADBRK	147	---	SE1	178	>50%	upper
2	159	---	SE1	154	---	SE1	179	>50%	upper
3	151	---	SE1	161	---	SE1	175	>50%	lower
4	155	---	SE1	151	---	SE1	178	>50%	upper
5	150	---	SE1	156	---	SE1	178	>50%	upper
Average	149	---	---	154	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	5 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-088B	Machine ID:	W-28
Seam ID:	160/PHASE I	Welder ID:	VC
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	147	---	SE1	154	---	SE1	169	>50%	upper
2	148	---	SE1	147	---	SE1	168	>50%	upper
3	142	---	SE1	154	---	SE1	169	>50%	upper
4	159	---	SE1	154	---	SE1	167	>50%	upper
5	138	---	SE1	150	---	SE1	171	>50%	upper
Average	147	---	---	152	---	---	169	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	1 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-089	Machine ID:	W-11
Seam ID:	174/175	Welder ID:	TS
		Date Sampled:	06/21/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./In	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	122	---	SE1	138	---	SE1	170	>50%	upper
2	119	---	SE1	143	---	SE1	185	>50%	upper
3	122	---	SE1	141	---	SE1	181	>50%	upper
4	124	---	SE1	136	---	SE1	183	>50%	upper
5	117	---	SE1	127	---	SE1	186	>50%	upper
Average	121	---	---	137	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	2 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-090	Machine ID:	W-10
Seam ID:	176/178	Welder ID:	KC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	122	---	SE1	182	>50%	upper
2	128	---	SE1	122	---	SE1	185	>50%	upper
3	137	---	SE1	122	---	SE1	177	>50%	upper
4	130	---	SE1	126	---	SE1	184	>50%	upper
5	134	---	SE1	126	---	SE1	188	>50%	upper
Average	133	---	---	124	---	---	183	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	3 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-091	Machine ID:	W-11
Seam ID:	178/181	Welder ID:	TS
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	128	---	SE1	129	---	SE1	192	>50%	upper
2	124	---	SE1	131	---	SE1	188	>50%	upper
3	123	---	SE1	133	---	SE1	183	>50%	upper
4	125	---	SE1	126	---	SE1	187	>50%	upper
5	138	---	SE1	132	---	SE1	192	>50%	upper
Average	128	---	---	130	---	---	188	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	4 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-092	Machine ID:	W-10
Seam ID:	181/183	Welder ID:	KC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	129	---	SE1	140	---	SE1	182	>50%	lower
2	140	---	SE1	139	---	SE1	179	>50%	lower
3	132	---	SE1	138	---	SE1	176	>50%	lower
4	134	---	SE1	142	---	SE1	176	>50%	lower
5	147	---	SE1	134	---	SE1	181	>50%	lower
Average	136	---	---	139	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	5 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-093	Machine ID:	W-5
Seam ID:	183/185	Welder ID:	BTK
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	129	---	SE1	121	---	SE1	188	>50%	lower
2	124	---	SE1	124	---	SE1	189	>50%	upper
3	126	---	SE1	127	---	SE1	181	>50%	lower
4	118	---	SE1	113	---	SE1	183	>50%	lower
5	130	---	SE1	120	---	SE1	187	>50%	lower
Average	125	---	---	121	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	6 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-094	Machine ID:	W-28
Seam ID:	185/187	Welder ID:	VC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	129	---	SE1	141	---	SE1	196	>50%	lower
2	125	---	SE1	141	---	SE1	191	>50%	upper
3	122	---	SE1	134	---	SE1	188	>50%	lower
4	100	---	SE1	144	---	SE1	188	>50%	lower
5	106	---	SE1	140	---	SE1	192	>50%	lower
Average	116	---	---	140	---	---	191	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	7 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-095	Machine ID:	W-28
Seam ID:	187/189	Welder ID:	VC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	106	---	SE1	145	---	SE1	190	>50%	lower
2	116	---	SE1	134	---	SE1	186	>50%	lower
3	113	---	SE1	138	---	SE1	184	>50%	lower
4	112	---	SE1	149	---	SE1	184	>50%	lower
5	107	---	SE1	137	---	SE1	190	>50%	lower
Average	111	---	---	141	---	---	187	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	8 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-096	Machine ID:	W-5
Seam ID:	173/176	Welder ID:	BTK
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	134	---	SE1	184	>50%	upper
2	150	---	SE1	136	---	SE1	185	>50%	upper
3	153	---	SE1	144	---	SE1	179	>50%	upper
4	138	---	SE1	135	---	SE1	181	>50%	upper
5	158	---	SE1	142	---	SE1	186	>50%	upper
Average	147	---	---	138	---	---	183	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/29/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	2 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-097A	Machine ID:	W-5
Seam ID:	220/222	Welder ID:	BTK
		Date Sampled:	06/28/12

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	128	---	SE1	120	---	SE1	194	>50%	lower
2	118	---	SE1	138	---	SE1	190	>50%	upper
3	118	---	SE1	118	---	SE1	193	>50%	lower
4	137	---	SE1	126	---	SE1	189	>50%	lower
5	143	---	SE1	139	---	SE1	193	>50%	lower
Average	129	---	---	128	---	---	192	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/29/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	3 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-097B	Machine ID:	W-5
Seam ID:	183/185	Welder ID:	BTK
		Date Sampled:	06/28/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	136	---	SE1	130	---	SE1	187	>50%	upper
2	113	---	SE1	135	---	SE1	182	>50%	upper
3	137	---	SE1	128	---	SE1	186	>50%	upper
4	141	---	SE1	128	---	SE1	185	>50%	upper
5	129	---	SE1	135	---	SE1	188	>50%	lower
Average	131	---	---	131	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	07/03/12		
Tested By:	eh	Report #:	23
Checked By:	bfs	Page:	1 of 2

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-097C	Machine ID:	MX12
Seam ID:	187/CAP	Welder ID:	BTK
		Date Sampled:	07/02/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	158	---	SE3	---	---	---	178	>50%	upper
2	151	---	SE3	---	---	---	175	>50%	upper
3	128	---	SE3	---	---	---	177	>50%	upper
4	154	---	SE3	---	---	---	171	>50%	upper
5	151	---	SE3	---	---	---	178	>50%	upper
Average	148	---	---	---	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	9 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-098	Machine ID:	W-10
Seam ID:	191/198	Welder ID:	KC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	146	---	SE1	164	---	SE1	178	>50%	lower
2	130	---	SE1	137	---	SE1	178	>50%	lower
3	137	---	SE1	136	---	SE1	181	>50%	lower
4	103	---	SE1	132	---	SE1	167	>50%	lower
5	138	---	SE1	143	---	SE1	167	>50%	lower
Average	131	---	---	142	---	---	174	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	10 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-099	Machine ID:	W-10
Seam ID:	190/212	Welder ID:	KC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	126	---	SE1	130	---	SE1	170	>50%	lower
2	121	---	SE1	121	---	SE1	176	>50%	lower
3	123	---	SE1	127	---	SE1	167	>50%	lower
4	125	---	SE1	129	---	SE1	167	>50%	lower
5	126	---	SE1	126	---	SE1	168	>50%	lower
Average	124	---	---	127	---	---	170	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	11 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-0100	Machine ID:	W-11
Seam ID:	215/216	Welder ID:	TS
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	141	---	SE1	133	---	SE1	187	>50%	lower
2	128	---	SE1	137	---	SE1	183	>50%	lower
3	122	---	SE1	126	---	SE1	177	>50%	lower
4	140	---	SE1	127	---	SE1	176	>50%	lower
5	147	---	SE1	123	---	SE1	181	>50%	lower
Average	136	---	---	129	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	12 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-0101	Machine ID:	W-11
Seam ID:	209/210	Welder ID:	TS
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	127	---	SE1	124	---	SE1	183	>50%	lower
2	119	---	SE1	118	---	SE1	178	>50%	lower
3	111	---	SE1	111	---	SE1	173	>50%	lower
4	125	---	SE1	124	---	SE1	176	>50%	lower
5	117	---	SE1	121	---	SE1	178	>50%	lower
Average	120	---	---	120	---	---	178	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	13 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-0102	Machine ID:	W-28
Seam ID:	205/206	Welder ID:	VC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	123	---	SE1	121	---	SE1	177	>50%	upper
2	121	---	SE1	118	---	SE1	176	>50%	upper
3	115	---	SE1	125	---	SE1	172	>50%	upper
4	118	---	SE1	139	---	SE1	177	>50%	upper
5	117	---	SE1	120	---	SE1	179	>50%	upper
Average	119	---	---	125	---	---	176	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/26/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	14 of 14

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-0103	Machine ID:	W-28
Seam ID:	199/200	Welder ID:	VC
		Date Sampled:	06/22/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	141	---	SE1	147	---	SE1	181	>50%	upper
2	134	---	SE1	146	---	SE1	181	>50%	upper
3	125	---	SE1	144	---	SE1	172	>50%	upper
4	121	---	SE1	148	---	SE1	179	>50%	upper
5	115	---	SE1	124	---	SE1	183	>50%	upper
Average	127	---	---	142	---	---	179	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	6 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-104	Machine ID:	W-9
Seam ID:	108/111	Welder ID:	VS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	135	---	SE1	122	---	SE1	187	>50%	lower
2	140	---	SE1	129	---	SE1	183	>50%	lower
3	130	---	SE1	132	---	SE1	187	>50%	lower
4	130	---	SE1	134	---	SE1	183	>50%	lower
5	130	---	SE1	131	---	SE1	185	>50%	lower
Average	133	---	---	130	---	---	185	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	7 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-105	Machine ID:	W-11
Seam ID:	111/113	Welder ID:	TS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	143	---	SE1	142	---	SE1	197	>50%	lower
2	138	---	SE1	140	---	SE1	198	>50%	lower
3	141	---	SE1	146	---	SE1	197	>50%	lower
4	139	---	SE1	142	---	SE1	191	>50%	lower
5	138	---	SE1	136	---	SE1	194	>50%	lower
Average	140	---	---	141	---	---	195	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	8 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-106	Machine ID:	W-5
Seam ID:	114/116	Welder ID:	AS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	130	---	SE1	137	---	SE1	185	>50%	upper
2	134	---	SE1	127	---	SE1	184	>50%	upper
3	137	---	SE1	131	---	SE1	187	>50%	upper
4	124	---	SE1	140	---	SE1	184	>50%	upper
5	135	---	SE1	141	---	SE1	187	>50%	upper
Average	132	---	---	135	---	---	185	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	9 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-107	Machine ID:	W-10
Seam ID:	120/121	Welder ID:	KC
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	149	---	SE1	163	---	SE1	182	>50%	lower
2	136	---	SE1	146	---	SE1	184	>50%	upper
3	146	---	SE1	158	---	SE1	179	>50%	lower
4	141	---	SE1	163	---	SE1	179	>50%	lower
5	145	---	SE1	138	---	SE1	180	>50%	lower
Average	143	---	---	154	---	---	181	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/29/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	4 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-108-A1	Machine ID:	W-5
Seam ID:	114/116	Welder ID:	AS
		Date Sampled:	06/28/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	142	---	SE1	146	---	SE1	185	>50%	upper
2	145	---	SE1	118	---	SE1	188	>50%	upper
3	142	---	SE1	126	---	SE1	189	>50%	upper
4	143	---	SE1	127	---	SE1	183	>50%	upper
5	126	---	SE1	129	---	SE1	189	>50%	upper
Average	140	---	---	129	---	---	187	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	10 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-108A	Machine ID:	W-5
Seam ID:	109/112	Welder ID:	AS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	139	---	SE1	140	---	SE1	184	>50%	lower
2	133	---	SE1	121	35%	ADBRK	186	>50%	lower
3	96	50%	ADBRK	132	---	SE1	189	>50%	lower
4	131	40%	ADBRK	135	---	SE1	185	>50%	lower
5	138	---	SE1	125	---	SE1	186	>50%	lower
Average	127	---	---	131	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	11 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-108B	Machine ID:	W-5
Seam ID:	107/110	Welder ID:	AS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	145	---	SE1	146	---	SE1	198	>50%	lower
2	143	---	SE1	146	---	SE1	197	>50%	lower
3	145	---	SE1	158	---	SE1	199	>50%	lower
4	142	---	SE1	139	---	SE1	195	>50%	lower
5	141	---	SE1	133	---	SE1	198	>50%	lower
Average	143	---	---	144	---	---	197	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	07/03/12		
Tested By:	eh	Report #:	23
Checked By:	bfs	Page:	2 of 2

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-0108C	Machine ID:	MX12
Seam ID:	109/CAP	Welder ID:	BTK
		Date Sampled:	07/02/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	145	---	SE3	---	---	---	175	>50%	upper
2	127	---	SE3	---	---	---	169	>50%	upper
3	90	---	SE3	---	---	---	174	>50%	lower
4	144	---	SE3	---	---	---	169	>50%	lower
5	135	---	SE3	---	---	---	173	>50%	lower
Average	128	---	---	---	---	---	172	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	12 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-109	Machine ID:	W-11
Seam ID:	116/119	Welder ID:	TS
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	138	---	SE1	144	---	SE1	191	>50%	upper
2	126	---	SE1	146	---	SE1	188	>50%	upper
3	138	---	SE1	147	---	SE1	191	>50%	lower
4	127	---	SE1	149	---	SE1	187	>50%	lower
5	132	---	SE1	143	---	SE1	189	>50%	lower
Average	132	---	---	146	---	---	189	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/27/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	13 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-110	Machine ID:	W-10
Seam ID:	119/121	Welder ID:	KC
		Date Sampled:	06/26/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	129	---	SE1	132	---	SE1	186	>50%	upper
2	128	---	SE1	130	---	SE1	185	>50%	upper
3	123	---	SE1	126	---	SE1	185	>50%	upper
4	127	---	SE1	136	---	SE1	180	>50%	upper
5	130	---	SE1	148	---	SE1	182	>50%	upper
Average	127	---	---	134	---	---	184	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/28/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	2 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-111	Machine ID:	W-28
Seam ID:	121/PHASE I	Welder ID:	VC
		Date Sampled:	06/27/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	154	---	SE1	158	---	SE1	171	>50%	upper
2	140	---	SE1	149	---	SE1	170	>50%	upper
3	150	---	SE1	146	---	SE1	175	>50%	upper
4	134	---	SE1	149	---	SE1	169	>50%	upper
5	134	---	SE1	151	---	SE1	171	>50%	upper
Average	142	---	---	151	---	---	171	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/28/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	3 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-112	Machine ID:	W-11
Seam ID:	116/119	Welder ID:	TS
		Date Sampled:	06/27/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	123	---	SE1	143	---	SE1	187	>50%	upper
2	121	---	SE1	127	---	SE1	185	>50%	upper
3	124	---	SE1	139	---	SE1	189	>50%	upper
4	119	---	SE1	133	---	SE1	184	>50%	lower
5	125	---	SE1	138	---	SE1	186	>50%	lower
Average	122	---	---	136	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/28/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	4 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-113	Machine ID:	W-5
Seam ID:	118/120	Welder ID:	AS
		Date Sampled:	06/27/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	134	---	SE1	152	---	SE1	185	>50%	lower
2	152	---	SE1	139	---	SE1	194	>50%	lower
3	135	---	SE1	153	---	SE1	194	>50%	lower
4	146	---	SE1	128	---	SE1	190	>50%	lower
5	136	---	SE1	152	---	SE1	182	>50%	lower
Average	141	---	---	145	---	---	189	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	Parsons Engineering Science		
Project Name:	Onondaga SCA Phase I & II		
Project Location:	Camillus, NY		
Installer:	---		
GTX #:	11670		
Test Date:	06/28/12		
Tested By:	meo	Report #:	23
Checked By:	bfs	Page:	5 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	60 mil AGRU microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil AGRU microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS 6-114	Machine ID:	W-10
Seam ID:	119/121	Welder ID:	KC
		Date Sampled:	06/27/12

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	135	---	SE1	135	---	SE1	188	>50%	upper
2	123	---	SE1	131	---	SE1	186	>50%	upper
•3	145	---	SE1	129	---	SE1	188	>50%	upper
4	137	---	SE1	137	---	SE1	182	>50%	upper
5	124	---	SE1	126	---	SE1	187	>50%	upper
Average	133	---	---	132	---	---	186	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

APPENDIX M

Geomembrane Repair Summary Logs

Geosyntec consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/17/2012	6-001		P	1-30-Phase I		AT T		8	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-002		P	1-30		11 S		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-003		P	1-2-30		AT T		1	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-004		P	2-3-30		AT T		3	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-005		P	3-4-30		AT T		4	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-006		P	4-5-30		AT T		2	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-007		P	5-6-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-008		P	6-7-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-009		P	7-8-30		AT T		3	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-010		P	8-9-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-011		P	9-10-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-012		P	10-11-30		AT T		3	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-013		P	11-12-30		AT T		2	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-014		P	12-13-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-015		P	13-14-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-016		P	14-15-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/17/2012	6-017		P	15-16-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-018		P	16-30		10 S		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-019		P	16-17-30		AT T		6	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-020		P	17-18-30		AT T		3	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-021		P	18-19-30		AT T		2	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-022		P	19-20-30		AT T		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-023		P	20-21-30-31		AT T		6	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-024		P	21-22-31		AT T		2	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-025		P	22-23-31		AT T		6	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-026		P	23-24-31		AT T		3	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-027		P	24-25-31		AT T		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-028	6-004	P	25-31		11 N		5	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-029		P	25-26-31		AT T		5	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-030		P	26-31		13 N		4	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-031		P	26-28-31		AT T		4	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-032		P	28-31		4 N		8	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/16/2012	6-033		P	28-29		4N		9	3		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-034		P	28-29		11 N		3	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-035		P	27-29		6 E		12	8		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-036		P	27-29		12 E		3	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-037		P	27-28-29		AT T		5	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-038		P	27-28		9 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/16/2012	6-039		P	26-27-28		AT T		9	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-040		P	26-27		1 E		3	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-041		P	25-26		2 E		3	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-042		P	25-26		31 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-043		P	23-24		1 E		3	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-044		P	22-23		38 E		3	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-045		P	22-23		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-046	6-001	P	20-21		24 E		5	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-047		P	19-20		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-048		P	16-17		3 E		7	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/17/2012	6-049		P	14-15		1 E		1	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-050	6-002	P	13-14		16 E		5	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-051		P	12-13		1 E		1	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-052		P	11-12		1 E		2	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-053		P	10-11		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-054		P	9-10		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-055		P	7-8		1 E		1	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-056		P	6-7		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-057		P	5-6		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-058	6-003	P	5-6		21 E		5	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-059		P	4-5		1 E		1	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-060		P	3-4		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-061		P	2-3		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-062		P	1-2		1 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-063		P	1-Phase I		1 E		2	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-064	6-012	P	1-Phase I		20 E		5	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
ProjNo: GJ4706B
TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary
Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/17/2012	6-065		P	30-32		611 N		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-066		P	30-32		545 N		9	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-067		P	30-32-33		AT T		3	2		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-068		P	30-31-33		AT T		3	1		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-069	6-005	P	31-33		141 N		5	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-070	6-006	P	33-35		225 N		5	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-071		P	32-33-35		AT T		3	2		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-072		P		35	456 N	9 E	1	1		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-073	6-013	P	34-35		10 E		5	2		MX-18	CAP	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-074		P	32-34-35		AT T		3	2		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-075		P	34-36-37		AT T		4	2		MX-18	CAP	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-076		P	36-37		7 E		2	1		MX-18	CAP	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-077		P	43-47-Phase I		AT T		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-078		P	34-37		502 N		4	2		MX-18	CAP	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-079		P	34-35-37		AT T		3	2		MX-18	CAP	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-080	6-008	P	35-37		303 N		5	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH

Geosyntec
consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/21/2012	6-081		P	35-37-38		AT T		2	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-082		P	35-38		I N		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-083		P	37-38-40		AT T		2	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-084		P	37-39-40		AT T		3	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-085	6-007	P	39-40		13 E		5	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-086	6-009	P	37-39		413		5	2		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-087		P	36-37-39		AT T		2	1		MX-18	CAP	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-088		P	39-41		616		5	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-089		P	39-41		606 N		1	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-090		P	39-41		578 N		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-091		P	39-41		566 N		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-092	6-010	P	39-41		507 N		5	2		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-093		P	39-41		418 N		1	1		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-094		P	39-41-42		AT T		9	2		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-095		P	39-40-42		AT T		4	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-096		P	41-42-44		AT T		4	2		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/21/2012	6-097		P	41-44-45		AT T		4	3		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-098		P	41-43-45		AT T		4	3		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-099	6-011	P	41-43		550 N		6	2		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-100		P	43-45-47		AT T		3	2		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-101		P	44-45-46-47		AT T		4	2		MX-18	BTK	DWH	5/22/2012	AS	P	VT OK	DWH
5/23/2012	6-102		P	46-49		2 N		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-103		P	46-49		194 N		6	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-104		P	46-48-49		AT T		3	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-105		P	46-47-48		AT T		2	1		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-106		P	48-50-51		AT T		2	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-107		P	48-49-51		AT T		2	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-108		P	49-51		2 N		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-109		P	50-51-53		AT T		2	1		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-110		P	50-53-54		AT T		2	1		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-111		P	50-52-54		AT T		5	1		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-112	6-014	P	43-47		600 N		5	2		MX-18	BTK	DWH	5/22/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/21/2012	6-113	6-015	P	44-46		250 N		5	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-114	6-016	P	47-48		550 N		5	2		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-115	6-017	P	46-47		13 E		5	2		MX-18	BTK	DWH	5/23/2012	AS	P	VT OK	DWH
5/21/2012	6-116	6-018	P	48-51		350 N		5	2		MX-18	VS	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-117	6-019	P	51-53		150 N		5	2		MX-18	VS	DWH	5/22/2012	LS	P	VT OK	DWH
5/17/2012	6-118		P	30-32-Phase I		AT T		7	2		MX-18	CAP	DWH	5/18/2012	BTK	P	VT OK	DWH
5/17/2012	6-119		P	32 Phase I		6 W		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-120		P	32-34-Phase I		AT T		4	2		MX-18	CAP	DWH	5/22/2012	LS	P	VT OK	DWH
5/17/2012	6-121		P	34-36-Phase I		AT T		3	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-122		P	36 Phase I		12 E		3	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-123		P	36-39-Phase I		AT T		15	2		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-124		P	39-Phase I		14 E		6	2		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-125		P	47-Phase I		12 E		2	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-126		P	39-41-Phase I		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-127		P	41-Phase I		12 E		6	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-128		P	41-43-Phase I		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/17/2012	6-129		P	43-Phase I		12 E		4	3		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-130		P	8-9		1 E		1	1		MX-16	VC	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-131		P	3-30		9 N		1	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-132		P		Phase I	29 E	12 N	1	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/17/2012	6-133		P		6	10 S	10 W	1	1		MX-18	CAP	DWH	5/22/2012	BTK	P	VT OK	DWH
5/21/2012	6-134		P	47-48-Phase I		AT T		2	2		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-135		P	48 Phase I		5 E		2	1		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-136		P	48-50 Phase I		AT T		2	1		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-137		P	50-Phase I		5 E		2	2		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-138		P	50-52-Phase I		AT T		2	2		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-139		P	52-Phase I		5 E		2	1		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-140		P	52-56-Phase I		AT T		8	2		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-141		P	52-54-56		AT T		3	1		MX-18	BTK	DWH	5/22/2012	LS	P	VT OK	DWH
5/21/2012	6-142		P	53-54-56		AT T		2	1		MX-18	BTK	DWH	5/22/2012	LS	P	VT OK	DWH
5/22/2012	6-143		P	53-55-56		AT T		2	1		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/23/2012	6-144	6-020	P	53-55		100 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/22/2012	6-145	6-021	P	55-57		197 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-146		P	55-57-58		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-147		P	55-56-58		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-148		P	58-59-61		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/30/2012	6-149		P	81-84-NTI		AT T		3	2		MX-16	JS	JMB	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-150		P	58-60-61		AT T		9	2		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/22/2012	6-151	6-022	P	58-60		300 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-152		P	57-58-60		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-153	6-035	P	57-58		9 W		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-154		P	60-63		103 N		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-155		P	60-62-63		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-156	6-023	P	60-62		398 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-157		P	60-61-62		AT T		2	1		MX-16	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/22/2012	6-158		P	59-61-62		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-159	6-024	P	62-65		AT T		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/17/2012	6-160		P	62-64-65		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
ProjNo: GJ4706B
TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary
Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/22/2012	6-161	6-033	P	64-65		9 W		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-162		P	62-63-64		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-163	6-027	P	64-67		50 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-164		P	64-65-67		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-165		P	65-67-68		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-166		P	65-66-68		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-167	6-025	P	65-66		600 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-168		P	66-68-69		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-169	6-026	P	68-69		518 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-170		P	67-68-69		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-171		P	67-69-70		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-172	6-028	P	67-70		150 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-173		P	69-70-71		AT T		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-174		P	69-71-72		AT T		4	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-175	6-029	P	69-72		275 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-176		P	69-72		525 N		4	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/22/2012	6-177		P	72-74		491 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-178	6-030	P	72-74		346 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-179		P	72-74		276 N		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-180		P	71-72-74		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-181		P	71-74		177 N		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-182		P	71-74-75		AT T		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-183		P	71-73-75		AT T		11	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-184		P	73-75-76		AT T		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-185		P	74-75-76		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-186		P	74-76-77		AT T		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-187	6-031	P	74-77		466 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-188		P		77	522 N	1 W	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-189	6-032	P	77-78		550 N		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-190		P	76-77-78		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-191		P	76-78-79		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-192		P	56-Phase I		5 E		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/22/2012	6-193		P	56-58-Phase I		AT T		3	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-194		P	58-Phase I		5 E		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-195		P	58-59-Phase I		AT T		3	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-196		P	59-Phase I		5 E		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-197		P	59-62-Phase I		AT T		3	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-198		P	62-Phase I		5 E		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-199		P	62-65-Phase I		AT T		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-200		P	65-Phase I		5 E		2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-201		P	65-66-Phase I		AT T		2	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-202		P	66-Phase I		5 E		3	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-203		P	66-69-Phase I		AT T		7	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-204	6-034	P	69-Phase I		10 W		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-205		P	69-72-Phase I		AT T		7	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-206		P	72-74-Phase I		AT T		9	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-207		P	74-77-Phase I		AT T		5	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/22/2012	6-208		P	77-78-Phase I		AT T		6	2		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

Geosyntec consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/22/2012	6-209		P	78-Phase I		12 E		3	2		MX-16	VC	DWH	5/22/2012	AS	P	VT OK	DWH
5/15/2012	6-210		C	53-54		11 E		22.5	2		MX-18	VC	DWH	5/22/2012	LS	P	VT OK	DWH
5/23/2012	6-211		P		Phase I	150 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-212		P		Phase I	154 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-213		P		Phase I	167 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-214		P		Phase I	295 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-215		P		Phase I	305 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-216		P		Phase I	310 E	1 N	3	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-217		P		Phase I	312 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-218		P		Phase I	316 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-219		P		Phase I	318 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-220		P		Phase I	320 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-221		P		Phase I	321 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-222		P		Phase I	325 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-223		P		Phase I	327 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-224		P		Phase I	330 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH

Geosyntec consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/23/2012	6-225		P		Phase I	340 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-226		P		Phase I	346 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-227		P		Phase I	344 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-228		P		Phase I	458 E	1 N	2	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-229		P		Phase I	466 E	1 N	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-230		P		Phase I	485 E	1 N	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-231		P		Phase I	487 E	1 N	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-232		P		Phase I	490 E	1 N	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-233		P		Phase I	491 E	1 N	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/23/2012	6-234		P		Phase I	494 E	1 N	1	1		MX-16	VC	DWH	5/23/2012	AS	P	VT OK	DWH
5/25/2012	6-235		P	78-81		400 N		2	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-236		P	78-79-81		AT T		2	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-237		P	79-81-82		AT T		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-238		P	79-80-82		AT T		3	3		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-239	6-036	P	79-80		13 N		5	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-240	6-037	P	80-83		55 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH

Geosyntec consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/25/2012	6-241		P	80-82-83		AT T		2	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-242		P	81-82-83		AT T		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-243		P	81-83-84		AT T		4	3		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-244		P	83-84-86		AT T		3	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	JMB
5/25/2012	6-245		P	83-85-86		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-246	6-038	P	83-85		104 N		4	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	JMB
5/25/2012	6-247		P	85-87-89		AT T		8	3		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-248		P	85-88-89		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-249	6-039	P	85-88		165 N		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-250		P	85-86-88		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-251		P	88-90-91		AT T		2	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-252	6-040	P	88-90		208 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-253		P	88-89-90		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-254		P	87-89-90		AT T		3	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	DWH
5/25/2012	6-255		P	90-92		180 N		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-256	6-041	P	90-92		260 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/25/2012	6-257		P	90-92-93		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-258		P		93	270 N	2 E	1	1		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-259		P	90-91-93		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-260		P	93-95-96		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-261	6-042	P	93-95		310 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-262		P	92-93-95		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-263		P	92-95		119 N		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-264		P	92-94-95		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-265		P	94-98		25 N		3	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	DWH
5/25/2012	6-266		P	94-95-98		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-267		C	95-97-98-99		AT T		23	4		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-268	6-043	P	95-97		350 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-269		P	95-96-97		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-270	6-044	P	97-100		405 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-271		P	97-99-100		AT T		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-272		P	98-99		4 N		8	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/30/2012	6-273		P	99-101-102		AT T		3	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-274		P	99-100-102		AT T		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/29/2012	6-275	6-045	P	100-102		450 N		5	2		MX-16	VC	DWH	5/30/2012	BTK	P	VT OK	DWH
5/29/2012	6-276		P	100-102-103		AT T		2	2		MX-16	VC	DWH	5/29/2012	BTK	P	VT OK	DWH
5/29/2012	6-277		C	102-103		0-22.5		22.5	2		MX-16	VC	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-278	6-046	P	102-104		506 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-279		P	102-104-105		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-280		P	101-102-105		AT T		10	3		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	DWH
5/25/2012	6-281		P	104-105-106		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-282		P	104-106-107		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/24/2012	6-283	6-053	P	106-107		7 E		5	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-284	6-047	P	104-107		560 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/29/2012	6-285	6-048	P	107-109		599 N		5	2		MX-16	VC	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-286		P	107-109		320 N		3	3		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-287		P	106-107-109		AT T		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-288		C	106-109		192 N		13	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	DWH

Geosyntec consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/29/2012	6-289		P	106-109		188 N		4	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/25/2012	6-290		P	106-108-109		AT T		3	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	DWH
5/25/2012	6-291	6-054	P	105-106		110 N		4	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	DWH
5/30/2012	6-292		P	78-81-Phase I		AT T		4	3		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-293	6-050	P	78-81		450 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-294		P	79-80		1 N		4	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-295	6-051	P	84-86		500 N		3	2		MX-16	JS	DWH	5/29/2012	BTK	P	VT OK	DWH
5/25/2012	6-296	6-052	P	88-91		550 N		4	2		MX-16	JS	DWH	5/30/2012	BTK	P	VT OK	JMB
5/29/2012	6-297		P	107-109-110		AT T		4	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-298		P	84-86-Phase I		AT T		3	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-299		P	86-88-Phase I		AT T		3	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-300		P	88-91-Phase I		AT T		3	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-301		P	91-93-Phase I		AT T		4	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-302		P	93-96-Phase I		AT T		4	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-303		P	96-97-Phase I		AT T		6	4		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-304		P	97-100-Phase I		AT T		4	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/30/2012	6-305		P	100-103-Phase I		AT T		4	2		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/30/2012	6-306	6-049	P	103-Phase I		9 W		5	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-307		P	103-Phase I		15 E		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-308		P	103-104-Phase I		AT T		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-309		P	104-Phase I		17 E		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-310		P	104-107-Phase I		AT T		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-311		P	107-Phase I		17 E		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-312		P	107-110-Phase I		AT T		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-313		P	110-Phase I		AT T		2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/30/2012	6-314		P	84-Phase I		10 E		3	1		MX-16	JS	JMB	5/29/2012	BTK	P	VT OK	DWH
5/31/2012	6-315	6-049 B	P	97-Phase I		13 E		5	2		MX-16	VS	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-316	6-049 A	P	104- Phase I		4 E		5	2		MX-16	VS	DWH	5/31/2012	AS	P	VT OK	DWH
6/4/2012	6-317		C	81-110-Phase I		0-292		292	2		MX-16	VS	DWH	6/5/2012	AS	P	VT OK	DWH
5/31/2012	6-318		P	91-Phase I	Phase I	10 W	1 N	1	1		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-319		P	91-Phase I	Phase I	4 W	1 N	2	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-320		P	96-Phase I	Phase I	8 E	1 N	2	1		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
5/31/2012	6-321		P	97-Phase I	Phase I	2 W	3 N	1	1		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-322		P	103-Phase I	Phase I	3 W	3 N	1	1		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-323	6-034 B	P	66-Phase I		2 W		5	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-324	6-034 A	P	72-Phase I		6 E		5	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-325		C	66-Ph I to 72-Ph I		0-40		40	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-326		P		Phase I	215 E	3 N	4	2		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
5/31/2012	6-327		P		Phase I	118 E	2 N	1	1		MX-16	VC	DWH	5/31/2012	AS	P	VT OK	DWH
6/7/2012	6-328		P	108-111		1 N		2	2		MX-18	KC	DWH	6/7/2012	TS	P	VT OK	DWH
6/7/2012	6-329		P	108-111		66 N		2	2		MX-18	KC	DWH	6/7/2012	TS	P	VT OK	DWH
6/7/2012	6-330		P	108-109-111		AT T		4	2		MX-18	KC	DWH	6/7/2012	TS	P	VT OK	DWH
6/6/2012	6-331		P	109-111		396 N		2	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-332		P	109-111-112		AT T		2	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-333		P	109-112		521 N		5	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-334		P	109-110-112		AT T		3	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
7/6/2012	6-335		P	110-112		654 N		5	2		MX-16	KC	DWH	7/6/2012	BTK	P	VT OK	DWH
6/6/2012	6-336		P	111-112-114		AT T		3	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/6/2012	6-337		P	111-114		416 N		4	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-338		P	111-114		354 N		9	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-339		P	111-113-114		AT T		8	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/4/2012	6-340		P	108-111		57 N		4	2		MX-16	VS	DWH	6/7/2012	TS	P	VT OK	DWH
6/4/2012	6-341		P	108-111		35 N		4	2		MX-16	VS	DWH	6/7/2012	TS	P	VT OK	DWH
6/6/2012	6-342		P	113-115-117		AT T		10	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-343		P	113-117		137 N		7	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-344		P	113-116-117		AT T		12	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-345		P	113-114-116		AT T		7	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-346		P	116-118-119		AT T		3	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-347		C	116-117-118		AT T		45	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-348		P	115-117-118		AT T		7	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/7/2012	6-349		P	118-120		48 N		5	2		MX-18	KC	DWH	6/7/2012	TS	P	VT OK	DWH
6/6/2012	6-350		P	118-120-121		AT T		8	3		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-351		P	118-121		298 N		5	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-352		P	118-119-121		AT T		4	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/4/2012	6-353	6-049 BI	P	100-103		657 N		5	2		MX-16	VS	DWH	6/5/2012	AS	P	VT OK	DWH
6/6/2012	6-354		P	113-115		91 N		2	2		MX-16	VS	DWH	6/7/2012	TS	P	VT OK	DWH
6/6/2012	6-355		P	113-115		104 N		4	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-356		P	116-118		233 N		2	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-357		P	116-118		290 N		3	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-358		P	114-116		381 N		3	1		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-359		C	112-114-Phase I		0-45		45	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-360		P	116-Phase I		15 E		2	1		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-361		P	116-119-Phase I		AT T		4	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-362		P	119-Phase I		13 E		4	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-363		P	119-121-Phase I		AT T		4	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/6/2012	6-364		P	121-Phase I		12 E		2	2		MX-16	VS	DWH	6/6/2012	AS	P	VT OK	DWH
6/5/2012	6-365	6-049 C	P	93-Phase I		5 W		5	2		MX-16	VS	DWH	6/5/2012	AS	P	VT OK	DWH
6/26/2012	6-366	6-104	P	108-111		44 N		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/26/2012	6-367	6-108	P	109-112		500		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/7/2012	6-368		P	119-Phase I		7 E		5	2		MX-16	KC	DWH	6/7/2012	TS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/26/2012	6-369	6-105	P	111-113		150 N		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/26/2012	6-370	6-106	P	114-116		346 N		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/26/2012	6-371	6-107	P	120-121		11 E		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/26/2012	6-372	6-109	P	116-119		567 N		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/26/2012	6-373	6-110	P	119-121		639 N		10	2		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/8/2012	6-374		P		40	128 N	6 W	1	1		MX-16	VS	DWH	6/8/2012	KC	P	VT OK	DWH
6/8/2012	6-375		P		40	122 N	5 W	1	1		MX-16	VS	DWH	6/8/2012	KC	P	VT OK	DWH
6/8/2012	6-376		P		40	128 N	13 W	2	1		MX-16	VS	DWH	6/8/2012	KC	P	VT OK	DWH
6/8/2012	6-377		P		40	122 N	11 W	4	2		MX-16	VS	DWH	6/8/2012	KC	P	VT OK	DWH
6/8/2012	6-378		P		40	122 N	17 W	1	1		MX-16	VS	DWH	6/8/2012	KC	P	VT OK	DWH
6/8/2012	6-379		P	120-122		5 N		2	1		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/6/2012	6-380	6-055	P	120-122		41 N		5	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-381		P	120-122-124		AT T		2	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-382		P	120-123-124		AT T		4	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-383		P	120-123		233 N		3	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-384		P	120-121-123		AT T		3	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/7/2012	6-385		P	121-123		376 N		2	1		MX-18	KC	DWH	6/7/2012	AS	P	VT OK	DWH
6/7/2012	6-386		P	121-123		470 N		4	2		MX-18	KC	DWH	6/7/2012	AS	P	VT OK	DWH
6/7/2012	6-387		P	121-123		481 N		3	1		MX-18	KC	DWH	6/7/2012	AS	P	VT OK	DWH
6/11/2012	6-388		P	121-123		581 N		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-389		P	121-123		660 N		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-390		P	123-126		559 N		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-391		P	123-125-126		AT T		4	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-392		P	123-125		283 N		2	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-393	6-056	P	123-125		176 N		5	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-394		P	123-124-125		AT T		2	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/8/2012	6-395		P	122-124-125		AT T		2	2		MX-16	VS	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-396		P	125-127		114 N		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-397		P	125-127-128		AT T		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-398	6-057	P	125-128		300 N		5	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-399		P	125-126-128		AT T		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-400		P	128-129-131		AT T		6	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
ProjNo: GJ4706B
TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary
Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/11/2012	6-401		P	128-131		536 N		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-402		P	128-130-131		AT T		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-403	6-058	P	128-130		400 N		5	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-404		P	127-128-130		AT T		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-405	6-061	P	130-132		300 N		5	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-406		P	130-132-133		AT T		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-407		P	130-131-133		AT T		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-408	6-059	P	131-133		512 N		5	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-409		P	129-131-133		AT T		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-410	6-060	P	133-135		565 N		5	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-411		P	132-133-135		AT T		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-412		P	132-134-135		AT T		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-413	6-062	P	132-134		190 N		5	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-414		P	121-123-Phase I		AT T		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-415		P	123-Phase I		12 E		4	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-416		P	123-126-Phase I		AT T		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
ProjNo: GJ4706B
TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary
Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/11/2012	6-417		P	126-Phase I		12 E		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-418		P	126-128-Phase I		AT T		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-419		P		Phase I	673 W	1 N	9	3		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-420	6-063	P	128-Phase I		15 E		6	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-421		P	128-129-Phase I		AT T		2	1		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-422		P	129-Phase I		12 E		3	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-423		P	129-133-Phase I		AT T		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-424		P	133-Phase I		12 E		6	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-425		P	133-135-Phase I		AT T		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-426		P	135-Phase I		12 E		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/11/2012	6-427		P	121-123		628 N		2	2		MX-16	KC	DWH	6/11/2012	AS	P	VT OK	DWH
6/15/2012	6-428		P	134-136-137		AT T		2	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-429	6-064	P	134-137		61 N		5	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-430		P	134-135-137		AT T		2	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-431		P	135-137		246 N		4	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-432		P	138-Phase I		10 E		4	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH

Geosyntec consultants

Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/15/2012	6-433		P	135-137-138		AT T		2	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-434		P	135-138		596 N		13	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-435		P	135-138		617 N		5	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-436		C	135-138-Phase I		AT T		30	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-437		P	137-138-140		AT T		3	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-438		P	137-139-140		AT T		4	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-439	6-065	P	137-139		150 N		5	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-440		P	136-137-139		AT T		2	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-441		P	139-141-142		AT T		2	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-442	6-066	P	139-142		250 N		5	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-443		P	139-140-142		AT T		2	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-444		P	142-143-144		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-445	6-067	P	142-143		300 N		5	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-446		P	141-142-143		AT T		2	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-447		P	143-145-146		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-448	6-068	P	143-146		370 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/15/2012	6-449		P	143-144-146		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-450		P	144-146		570 N		4	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-451	6-071	P	135-137		500 N		5	2		MX-12	BTK	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-452	6-069	P	146-148		431 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-453		P	146-148		356 N		6	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-454		P	145-146-148		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-455		P	145-147-148		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-456		P	147-148-149		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-457		P	148-149		269 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-458		P	148-149-150		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-459	6-070	P	148-150		550 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-460		P	150-152-153		AT T		3	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-461		P	149-150-152		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-462	6-073	P	149-150		9 W		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-463	6-075	P	149-153		450 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-464		P	149-151-153		AT T		4	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Repair Summary Log

Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/20/2012	6-465	6-074	P	149-151		200 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-466	6-055 A	P	120-122		48 N		5	2		MX-16	KC	DWH	6/15/2012	TS	P	VT OK	DWH
6/15/2012	6-467	6-055 B	P	120-122		23 N		5	2		MX-16	KC	DWH	6/15/2012	TS	P	VT OK	DWH
6/15/2012	6-468	6-055 A1	P	120-122		85 N		5	2		MX-16	KC	DWH	6/15/2012	TS	P	VT OK	DWH
6/15/2012	6-469	6-055 B1	P	122-124		3 W		5	2		MX-16	KC	DWH	6/15/2012	TS	P	VT OK	DWH
6/15/2012	6-470		C	120-122		0-100		100	2		MX-16	KC	DWH	6/15/2012	TS	P	VT OK	DWH
6/15/2012	6-471		P	138-140-Phase I		AT T		2	1		MX-12	BTK	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-472		P	140-Phase I		8 E		1	1		MX-12	BTK	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-473		P	140-142-Phase I		AT T		12	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-474		P	142-144-Phase I		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-475		P	144-Phase I		10 E		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-476	6-072	P	144-146-Phase I		6 W		8	2		MX-16	KC	DWH	6/20/2012	BTK	P	VT OK	DWH
6/15/2012	6-477		P	146-Phase I		8 E		2	1		MX-12	BTK	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-478		P	146-148-Phase I		AT T		2	1		MX-12	BTK	DWH	6/25/2012	JG	P	VT OK	DWH
6/15/2012	6-479		P	148-Phase I		8 E		2	1		MX-12	BTK	DWH	6/25/2012	BTK	P	VT OK	DWH
6/20/2012	6-480		P	148-150-Phase I		AT T		1	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/20/2012	6-481		P	150-Phase I		8 e		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-482		P	150-152-Phase I		AT T		4	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-483		P	152-Phase I		6 e		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-484		P	151-154-155		AT T		4	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-485		P	151-153-155		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-486		P	152-153-155		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-487		P	155-156-158		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-488		P	155-157-158		AT T		4	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-489		P	154-155-157		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-490		P	157-159-160		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-491		P	157-158-160		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-492		P	156-158-160		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-493		P	159-160-162		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-494		P	159-161-162		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-495		P	161-162-163		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-496		P	162-163-165		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
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Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/20/2012	6-497		P	162-164-165		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-498		P	164-165-167		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-499		P	163-165-167		AT T		3	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-500		P	163-166-167		AT T		3	2		MX-16	KC	DWH	7/2/2012	SZ	P	VT OK	DWH
6/22/2012	6-501		P	166-168-170		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-502		P	166-169-170		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-503		P	166-167-169		AT T		3	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-504		P	167-169		549 N		6	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-505		P	169-171-172		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-506		P	169-170-172		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-507		P	168-170-172		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-508		P	171-172-174		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-509		P	171-173-174		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-510	6-076	P	151-154		43 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-511	6-077	P	154-157		100 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-512	6-078	P	157-159		188 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
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Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/20/2012	6-513	6-079	P	159-162		302 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-514	6-080	P	162-163		400 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-515	6-081	P	163-167		459 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-516	6-082	P	167-169		507 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-517	6-083	P	169-171		582 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-518	6-084	P	171-173		455 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-519	6-085	P	173-174		4 E		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-520	6-086	P	171-174		296 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-521	6-087	P	153-155		500 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-522	6-088	P	162-Phase I		9 E		5	2		MX-12	BTK	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-523		P	152-155-Phase I		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-524		P	155-Phase I		6 E		6	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-525		P	155-156-Phase I		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-526		P	156-Phase I		6 E		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-527		P	156-160-Phase I		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-528		P	160-Phase I		5 E		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Location: Camillus, New York ProjNo: GJ4706B TaskNo: 200
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Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/20/2012	6-529		P	160-162-Phase I		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-530		P	162-Phase I		5 E		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-531		P	162-164-Phase I		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-532		P	164-Phase I		3 E		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-533		P	164-167-Phase I		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-534		P	167-Phase I		4 E		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-535		P	167-169-Phase I		AT T		6	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/20/2012	6-536		P	169-171-Phase I		AT T		6	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-537		P	171-173-Phase I		AT T		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/22/2012	6-538		P	173-174-176		AT T		2	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-539		P	174-176-177		AT T		8	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-540		P	174-175-177		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-541		P	175-177-178		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-542		P	176-177-178		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-543		P	176-178-179		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-544		P	179-180		562 N		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/22/2012	6-545		P	178-179-180		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-546		P	178-180-181		AT T		2	1		MX-16	KC	DWH	6/22/2012	JG	P	VT OK	DWH
6/25/2012	6-547		P	181-183-184		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-548		P	180-181-183		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-549		P	180-182-183		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-550		P	182-183-185		AT T		3	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-551		P	183-185-186		AT T		3	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-552		P	183-184-186		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-553		P	185-186-188		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-554		P	185-187-188		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-555		P	185-187		605 N		6	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-556		P	187-189-191		AT T		2	1		MX-16	KC	DWH	6/26/2012	JG	P	VT OK	DWH
6/25/2012	6-557		P	187-190-191		AT T		2	1		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-558		P	187-188-190		AT T		4	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-559		P	190-219-220-221		AT T		4	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-560		P	220-221		15 S		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH

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Project: Onondaga Lake Sediment Consolidation Area (SCA)
Location: Camillus, New York
ProjNo: GJ4706B
TaskNo: 200
Description: Construction Quality Assurance for SCA Phase II

Primary / Secondary: Primary
Series: 6

Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/25/2012	6-561		P	190-216		10 N		4	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-562		P	220-221-222-223		AT T		3	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-563		P	190-218-219		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-564		P	190-217-218		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-565		P	190-216-217		AT T		3	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-566		P	190-215-216		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-567		P	190-214-215		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-568		P	190-213-214		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-569		P	190-212-213		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-570		P	190-211-212		AT T		3	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-571		P	190-210-211		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-572		P	190-209-210		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-573		P	190-208-209		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-574		P	190-207-208		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-575		P	190-206-207		AT T		2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-576		P	190-205-206		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH

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				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/25/2012	6-577		P	190-204-205		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-578		P	190-203-204		AT T		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-579		P	190-202-203		AT T		1	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-580		P	190-201-202		AT T		2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-581		P	190-200-201		AT T		1	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-582		P	190-199-200		AT T		3	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-583		P	190-191-199		AT T		2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-584		P	191-198-199		AT T		3	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-585	6-098	P	191-197-198		AT T		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-586		P	191-196-197		AT T		1	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-587		P	191-195-196		AT T		2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-588		P	189-191-195		AT T		1	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-589		P	189-194-195		AT T		2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-590		P	189-193-194		AT T		3	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-591		P	189-192-193		AT T		2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-592		P	173-176-Phase I		AT T		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH

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				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/25/2012	6-593		P	176-179-Phase I		AT T		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-594		P	179-180-Phase I		AT T		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/22/2012	6-595		P	180-182-Phase I		AT T		4	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-596		P	182-185-Phase I		AT T		4	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-597		P	185-187-Phase I		AT T		4	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-598		P	187-189-Phase I		AT T		6	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-599		P	189-192-Phase I		AT T		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-600		P	192 Phase I		1 W		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/22/2012	6-601	6-073 A	C	148-150		505 N		10	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-602	6-073 B	P	149-150		9 W		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-603		C	149-150		0-22.5		22.5	2		MX-16	KC	DWH	7/2/2012	SZ	P	VT OK	DWH
6/22/2012	6-604	6-072 A	P	146-Phase I		8 E		5	2		MX-16	KC	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-605		C	138-152-Phase I		0-176		176	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/22/2012	6-606	6-089	P	174-175		50 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-607	6-090	P	176-178		182 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-608	6-091	P	178-181		277 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH

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				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/22/2012	6-609	6-092	P	181-183		365 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-610	6-093	P	183-185		426 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-611	6-094	P	185-187		500 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-612	6-095	P	187-189		600 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/22/2012	6-613	6-096	P	173-176		592 N		5	2		MX-16	KC	DWH	6/25/2012	JG	P	VT OK	DWH
6/25/2012	6-614	6-097	P	182-Phase I		10 W		5	2		MX-16	KC	DWH	6/27/2012	EC	P	VT OK	DWH
6/25/2012	6-615	6-099	P	190-212		201 N		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-616	6-100	P	215-216		27 W		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-617	6-101	P	209-210		28 W		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-618	6-102	P	205-206		29 W		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-619	6-103	P	199-200		27 W		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-620		P	220-222		1 N		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-621		P	222-223		1 NW		2	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/25/2012	6-622		P	189-Phase I		6 E		2	1		MX-16	KC	DWH	6/29/2012	SZ	P	VT OK	DWH
6/25/2012	6-623		P		191	529 N	6 W	2	1		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/26/2012	6-624	6-049 A1	P	111-113		1 N		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH

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Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/26/2012	6-625	6-108 A	P	109-112		516 N		5	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/26/2012	6-626		C	109-112		453-663		210	2		MX-16	BTK	DWH	6/26/2012	EC	P	VT OK	DWH
6/26/2012	6-627	6-108 B	C	107-110		653 N		10	2		MX-16	KC	DWH	6/26/2012	EC	P	VT OK	DWH
6/26/2012	6-628		P	185-Phase I		8 E		3	2		MX-12	BTK	DWH	6/26/2012	EC	P	VT OK	DWH
6/26/2012	6-629		P	180-Phase I		15 E		3	2		MX-12	BTK	DWH	6/26/2012	EC	P	VT OK	DWH
6/27/2012	6-630	6-072 B	P	152-153		5 W		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-631	6-072 A1	P	153-155		349 N		5	2		MX-12	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
6/27/2012	6-632	6-111	P	121-Phase I		4 W		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-633	6-112	P	116-119		659 N		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-634	6-113	P	118-120		266 N		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-635	6-114	P	119-121		660 N		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-636	6-072 C	P	148-Cap		6 W		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-637	6-088 B	P	160-Phase I		3 W		5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-638	6-088 A	P	167-Phase I		8 E		5	2		MX-12	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
6/27/2012	6-639		C	160-169-Phase I		0-70		70	2		MX-12	BTK	DWH	6/29/2012	EC	P	VT OK	DWH
7/2/2012	6-640	6-108 A1	C	114-116		285 N		10	2		MX-16	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH

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Repair Date	Repair ID	DS No	Repair Type	Location				Size			Welder I.D.		QA ID	Non-Destructive Testing				
				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
6/29/2012	6-641	6-088 A1	P	169-Phase I		7 E		5	2		MX-12	BTK	DWH	6/29/2012	EC	P	VT OK	DWH
7/2/2012	6-642	6-097 B	P	183-185		254 N		5	2		MX-16	BTK	DWH	7/2/2012	EC	P	VT OK	DWH
7/2/2012	6-643	6-097 A	P	220-222		14 N		5	2		MX-16	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
7/2/2012	6-644		C	221-223		0-20		20	2		MX-16	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
6/28/2012	6-645		C	176-192-Phase I		0-204		204	2		MX-12	BTK	DWH	6/29/2012	SZ	P	VT OK	DWH
6/22/2012	6-646		P	133-Phase I	Phase I	1 N	2 E	2	2		MX-16	KC	DWH	6/27/2012	EC	P	VT OK	DWH
6/22/2012	6-647		P	133-Phase I	Phase I	6 N	4 E	2	2		MX-16	KC	DWH	6/27/2012	EC	P	VT OK	DWH
6/26/2012	6-648		P	176-Phase I	Phase I	3 N	3 E	2	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
6/27/2012	6-649		P		Phase I	250 W	1 N	2	2		MX-12	BTK	DWH	6/29/2012	EC	P	VT OK	DWH
6/26/2012	6-650		P		Phase I	216 W	1 N	5	2		MX-12	BTK	DWH	6/27/2012	EC	P	VT OK	DWH
7/2/2012	6-651	6-108 C	P	109-Cap		55 N		5	2		MX-16	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
7/2/2012	6-652	6-097 C	P	187-Cap		10 E		5	2		MX-16	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
7/2/2012	6-653		P		Phase I	263 W	1 N	4	2		MX-16	BTK	DWH	7/2/2012	SZ	P	VT OK	DWH
9/17/2012	6-654		P		91	218 S	7 E			5	MX-14	MB	DW	9/17/2012	MB	p	VTOK	DW
10/3/2012	6-655		P		47	18 S	7 E			3	MX-1	MB	DW	10/3/2012	MB	p	VTOK	DW
11/13/2012	6-656		P		120	70 N	1 E	1	1		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC

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				Seam	Panel	Distance (ft.)	Offset (ft.)	Length (ft.)	Width (ft.)	Dia. (ft.)	Mach ID	Oper ID		Date	Oper ID	Result (p/f)	Action	QA ID
11/13/2012	6-657		B		137	290 N	8 W	1	1		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/13/2012	6-658		P		155	79 S	8 W	2	2		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/13/2012	6-659		P		167	90 S	8 E	1.5	1		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/13/2012	6-660		P		188	207 N	7 E	1	1		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/13/2012	6-661		P		183	197 N	3 E	1	1.5		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/13/2012	6-662		B		151	195 N	2 W	1	1		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/13/2012	6-663		P		142	25 N	3 W	1	1.5		X6	BTK	JWC	11/13/2012	AS	p	VTOK	JWC
11/14/2012	6-664		P		200	7 W	3 S	1	1		X-12	BTK	JWC	11/14/2012	AS	P	VTOK	JWC
4/3/2013	6-665		P		110	652 N	1 W			1	X-12	CP	JB	4/3/2013	CP	p	VTOK	JB

APPENDIX N

Geomembrane Leak Location Survey

Electrical Leak Testing of the 60-mil Geomembrane Liner For Phase II Honeywell Sediment Consolidation Area Camillus, New York

Prepared for:

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Syracuse, New York 13212
November 20, 2012

Prepared by:

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1.0 INTRODUCTION

The Sediment Consolidation Area (SCA) is constructed to provide containment of sediments dredged as part of the Onondaga Lake Remedy. The SCA is constructed in phases, with the second phase consisting of 25 acres of a 60-mil HDPE geomembrane on compacted clay and subsequently covered with one foot of 4" minus drainage gravel (Figure 1).

Parsons engaged THG Geophysics, Ltd. (THG) to perform a leak test of the geomembrane in accordance with ASTM Standards. The leak test is an electrical conductivity test of the geomembrane based upon the *mise-à-la-masse* geophysical survey method (ASTM D 7007 and ASTM D 7703). The *mise-à-la-masse* survey is an electrical resistivity method that has been used in the mining industry since the 1920s for delineating electrically conductive subsurface ore bodies. Within the landfill and other industrial operations that require impermeable geomenbrane liners, this test is very effective in detecting holes in the geomembrane by using water as an electrically conductive medium.

Following the passage of Sub-Title D, landfills were required to line waste cells with a geomembrane. The regulatory agencies realized the potential for the creation of liner holes and tears in the geomembrane during and post construction. THG was requested in 1991 by the Pennsylvania Department of Environmental Protection and several landfill companies to find methods to test geomembranes for holes. THG recognized that a leak test using DC current would be effective in detection of holes and tears; this method was subsequently developed into ASTM standards D 7707 and 7703, the two standards used to test the geomembrane at the SCA. Since then THG has conducted dozens of electrical leak tests totaling over 700 acres, the largest test consisting of 30 acres.

2.0 LEAK TEST INVESTIGATION

2.1 Background

A leak test of the SCA Phase II cell geomembrane was conducted from May 2012 through November 2012 (Figure 2). Two methods of liner leak investigation were used. The dipole method (ASTM D 7007) was used after drainage gravel had been installed. The water lance method (ASTM D 7703) was used in selected areas prior to gravel placement (as a preliminary check) and in areas where drainage gravel is not to be installed. Prior to geomembrane installation, a series of wires was placed under the geomembrane to ensure better communication with the ground.

2.2 Dipole Method (ASTM D 7007)

Approximately 22 acres of Phase II of the SCA are covered with drainage gravel. This area was divided into 10 roughly 300-foot by 300-foot test cells, labeled Cell A through Cell J (Figures 3 through 12). The 10 cells were tested for leaks in accordance with ASTM D 7007. The survey was conducted on the areas of the SCA that were covered in gravel at the time of the survey. Any area where the liner was exposed within the cell being tested was checked at a later date (Figures 14 through 17). After completion of the initial 10 cells, portions of Cells C,D,E,H,I and J were retested at the locations where truck access ramps existed (Figures 18 through 23).

The electrical continuity survey consists of applying an electrical potential between the geomembrane and protective cover. Cathodes were placed roughly in the center of each cell. An electrical potential of between 300 and 700 volts DC was placed into each cell between the cathode and the anode, which in this case consisted of the wires placed under the geomembrane. Note that each 300'-sq cell is a separate test and each operator judges, based upon the current gravel saturation conditions and a cell-specific sensitivity test, how much current to apply to the cell to effectively detect a leak.

The electrical potential causes electric current to flow through holes in the insulating geomembrane material. The current density around the leak is used to detect and locate the leak. The cover material at the site is a coarse gravel (4" minus) and as such the survey was conducted in the rain (when practical) to ensure electrical communication. If rain was not occurring at the time of the survey then an industrial hose was deployed to saturate the gravel.

2.2.1 Leak Detection Sensitivity

A leak sensitivity test was performed at each cell in accordance with ASTM D 7007 Annex A3 (Procedures for leak detection sensitivity test for surveys with earth material covering the geomembrane using an artificial leak) (Figure 13). An artificial leak (i.e., a small circular metal plate) was placed beneath the drainage gravel at each of the 10 cells and a series of measurements were recorded to determine the leak signal and background noise level for each of the 10 cells (Figures 2 and 13).

The background noise level (N) is the ambient noise with the current to the cell turned on but the artificial leak turned off (i.e., disconnected) and is measured as the difference between the

maximum and minimum measured potential (Figure 13). The background noise level in the 10 cells ranged from 0.02 V to 0.07 V.

The signal (S) plus noise is the current reading from the artificial leak with the current turned on and the artificial leak turned on. The signal plus noise potential ranged from 0.28 V to 0.51 V.

The data farthest from the artificial leak with an R value less than 3 determines the maximum distance to detect the artificial leak :

In all cases, the R-value was greater than 3 for the 5-foot spaced survey; consequently, the survey was conducted using a 5-foot spacing. Figure 13 shows an example of the work performed to determine the R-value from a sensitivity survey.

2.2.2 Electrical Continuity Survey

Stainless steel electrodes connected to a multi-meter probe were inserted into the drainage gravel to measure the flow of electricity at a spacing of every 5 square feet. The multimeter is connected to a datalogger (Polycorder; Omnidata, Logan, UT), and the datalogger is triggered to collect the measurement for subsequent download to a computer. Further the multimenter is integrated with a multi-test detector (Texas Research Institute, Austin Texas). Over 35,000 records were collected and a potential map of the electric field confirmed the locations of 12 anomalies (Figure 2).

Maps of the electrical potential for each cell were used to ensure no anomalies were overlooked during data collection (Figures 3 through 12 and 14 through 23). These maps show the voltage potential that exists within each cell at the time of the testing. Anomalies are those readings that show a low voltage or high voltage and are assumed to be a hole; and thus require additional testing. If the retested anomaly proved to be a false positive then the anomaly was ignored. Note that the maps are not modified after retesting. Consequently, these figures are only useful for the initial survey.

Anomalies that are detected and flagged in the field and anomalies indicated on these maps were retested by repositioning the cathode and testing each anomaly. The retesting also helped to locate the holes more precisely.

The 12 locations were exhumed, and 9 holes were repaired, and retested both electrically and with a vacuum box. All repairs tested as tight and were properly sealed.

2.3 Water Lance Method (ASTM D 7703)

The east and west berms consist of approximately 50 feet by 650 feet of exposed 60-mil geomembrane. The method used to test the exposed geomembrane on these berms was the water lance method (ASTM D 7703).

The water lance consists of a hydraulic tube with 2 detection electrodes separated by 1 meter

that are within the flow of water. Approximately 12 volts DC is applied to the water (and upstream of the detection electrodes). The water lance test uses a multi-test meter that produces an increased beeping per second, a string of lights, a volt meter, and an arrow system to show the direction of the leak. The ground is an electrode tied to the network of wires beneath the 60-mil liner.

Water is jetted through the lance to the exposed liner. Water penetrating the liner will complete the circuit and the increased electrical potential will be detected by the multi-test meter. This method has a significant advantage over other methods since the operator must look at the liner and thus the entire exposed liner is carefully inspected for dimples, cuts, poor repairs and other penetrations of the liner in addition to the electrical leak test.

One hole was detected on the east berm (Figure 2).

3.0 CONCLUSIONS

SCA Phase II consists of approximately 22 acres of drainage gravel covering HDPE geomembrane and approximately 2.5 acres of exposed geomembrane. Two methods of liner leak investigation were used. The dipole method (ASTM D 7007) was used after drainage gravel had been installed. The water lance method (ASTM D 7703) was used in selected areas prior to gravel placement (as a preliminary check) and in areas where drainage gravel is not to be installed. The portion of SCA Phase II that was covered with drainage gravel was divided into 10 cells with cathodes placed into the center of each cell and the anode (ground) was attached to wires that were placed beneath the liner. An approximately 300-volt low amperage potential field was established at each cathode; and a total of approximately 35,000 records were collected. The exposed portions of the geomembrane were tested by the water lance method. The liner leak investigation was performed by THG Geophysics crews under the direction of Peter J. Hutchinson, PhD, PG.

The leak detection survey confirmed the presence of 9 holes beneath the drainage gravel and one hole on the east berm. The holes were subsequently repaired and tested as tight.

4.0 REFERENCES

ASTM D6747-12. Standard Guide for Selection of Techniques for Electrical Detection of Leaks in Geomembranes

ASTM D7007-09. Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earth Materials

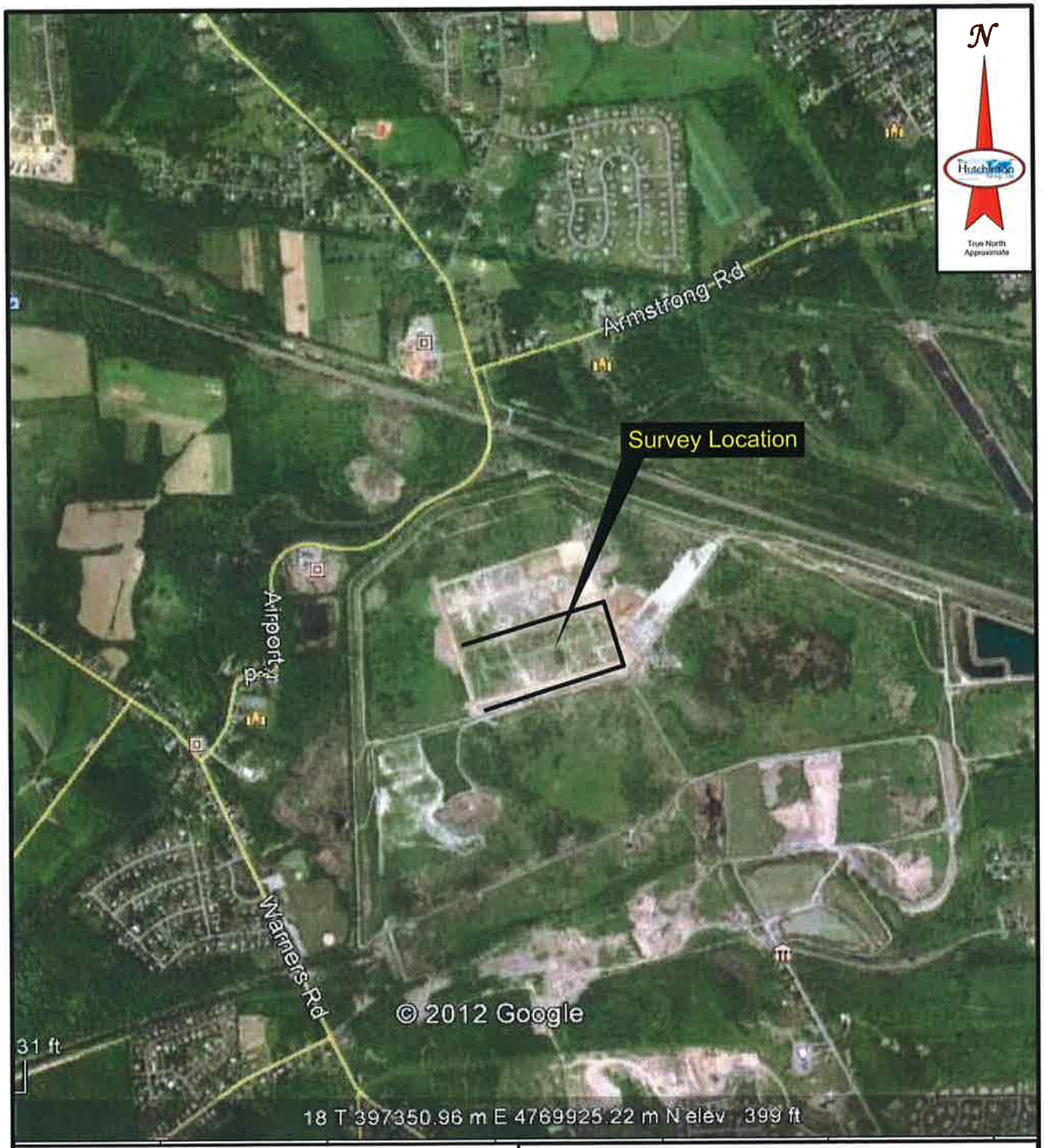
ASTM D7703-11. Standard Practice for Electrical Leak Location on Exposed Geomembranes Using the Water Lance System

Boryta, D. A., and M. N. Nabighain (1985). "Method for determining a Leak in a Pond Liner of Electrically Insulating Sheet Material." US Patent No. 4,543,525; September 24, 1985.

Boryta, D. A., and P. M. Brown (1988). "Method for Determining the Location of a Leak in a Pond Liner Formed of Electrically Insulating Material" US Patent No. 4,771,246; September 13, 1988.

Darilek, G. T. and J. O. Para (1988). The Electrical Leak Location Method for Geomembrane Liners. San Antonio, TX, Southwest Research Institute.

Fountain, L. (1988). Detection and location of leaks in geomembrane-lined liquid waste impoundments using an electrical technique. San Antonio, TX, Department of Geosciences Southwest Research Institute: 117-126.



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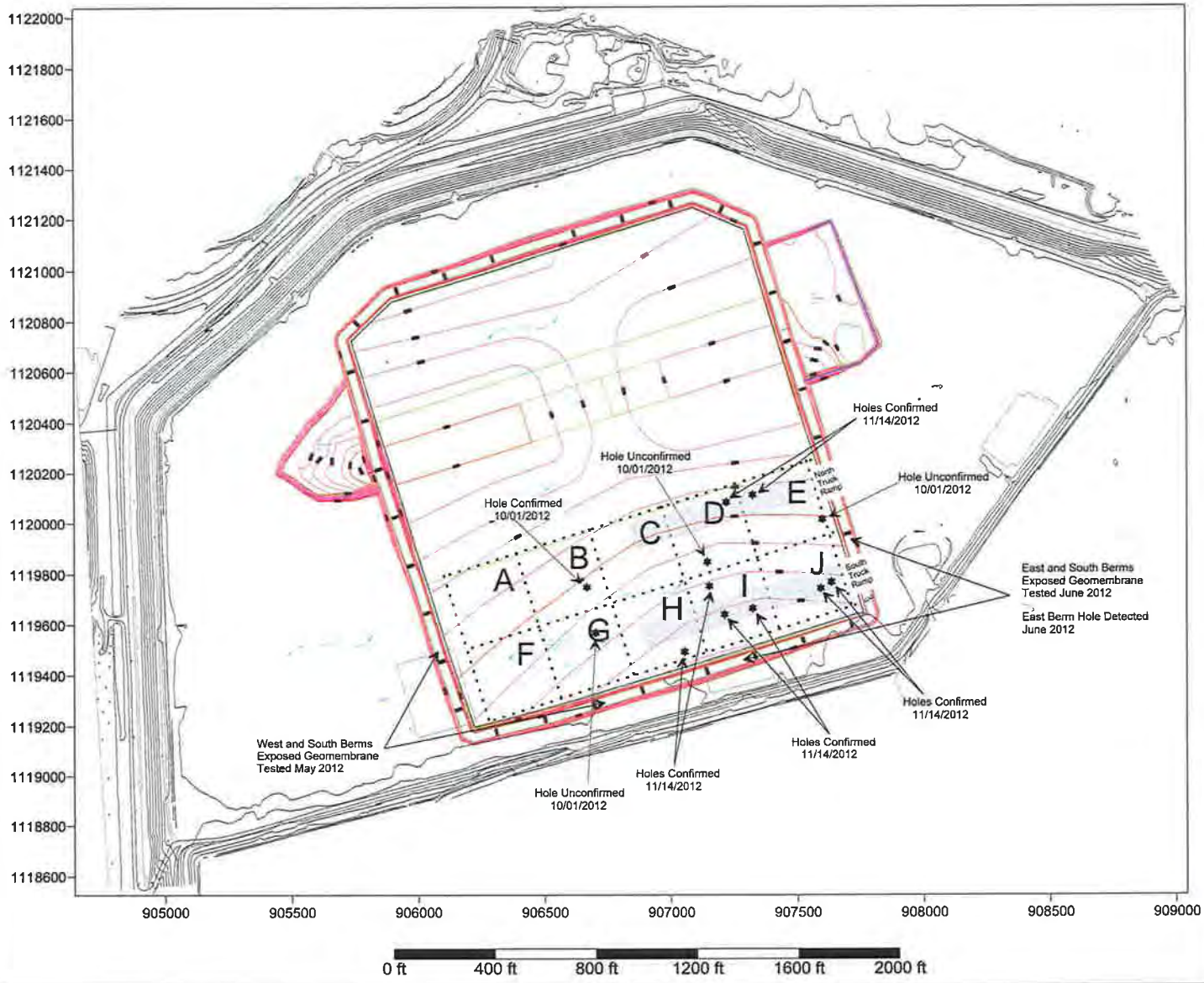
0 ft 1000 ft 2000 ft 3000 ft

Figure 1
Site Location Map

Leak Location Survey
Solvay Waste Project, Phase II
Syracuse, New York

SCALE: 1:24,000	PROJECT NO.: 322-4510	DRAWING NO.: DWG4510F1
DATE : 5/13/12		
DRAWN BY: PJH	SOURCE: 2012 Google Map Aerial Photograph	
CHECKED BY: PJH		



Notes

Geophysical survey conducted July 2012 through November 2012. Areas A and F tested the week of July 28. Areas B, C, D, E, and G tested the week of September 29 and October 13, 2012. Area H, I, and J completed the week of October 29.

The North Truck Ramp tested the week of October 1st. The South Truck Ramp was tested the week of November 12th

Locations are approximate. Map distortion may exist.

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DES	HLK	10/8/12
DRN	PJH	10/8/12
CHK	PJH	10/8/12
REV	PJH	10/8/12
PROJ MGR.	PJH	10/8/12

SCALE: 1" =400'

SOURCE: Parsons, 2012

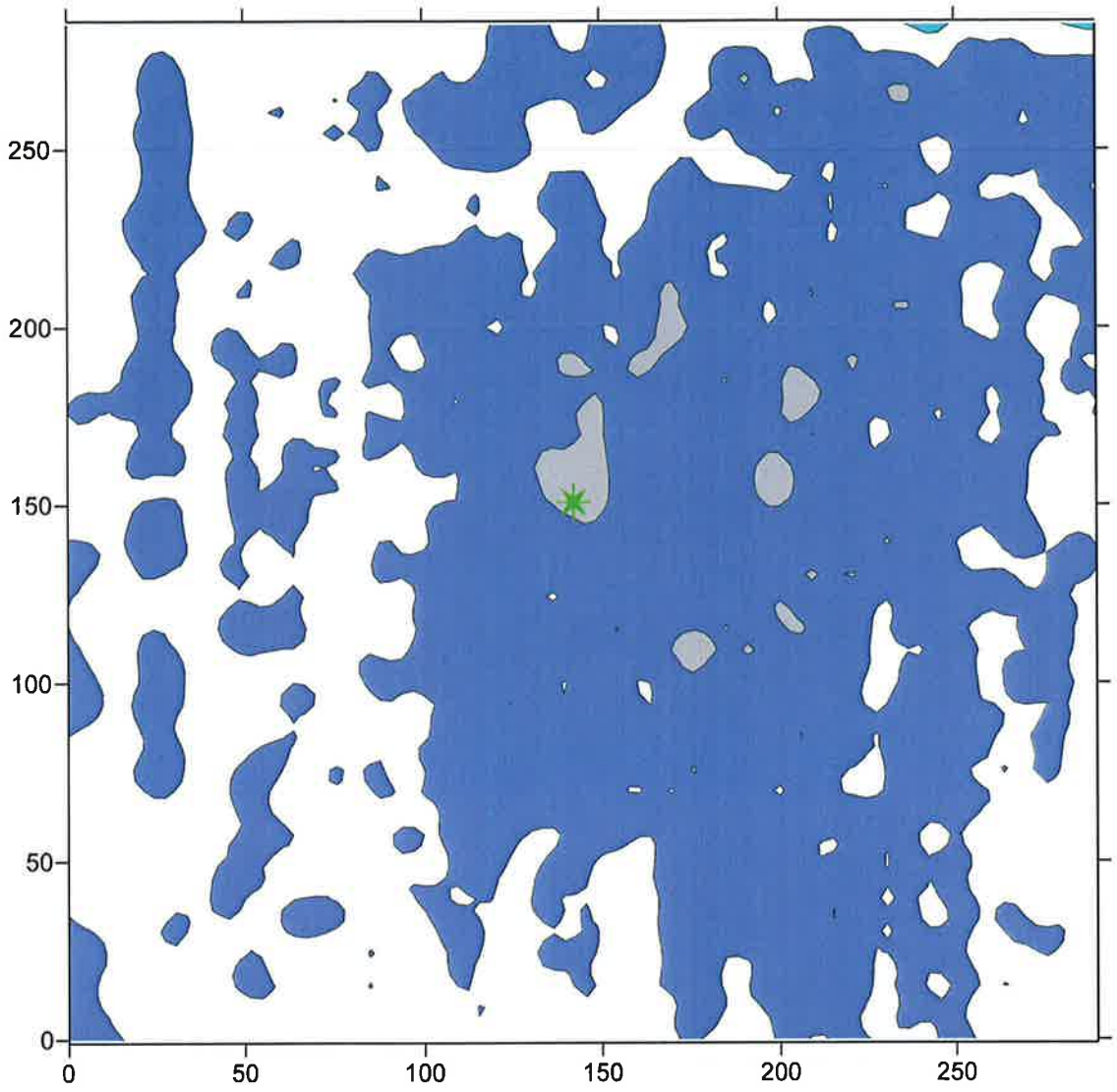
PROJECT: **Geophysical Leak Investigation Solvay Waste Project Syracuse, New York**

SHEET TITLE: **Figure 2 Liner Integrity Test Location Map**

PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

DRAWING NO.: DWG4510F2



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted July 16-18, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	7/26/12
DES	MHB	7/26/12
CHK	PJH	7/26/12
REV		
PROJ. MGR.	PJH	7/26/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

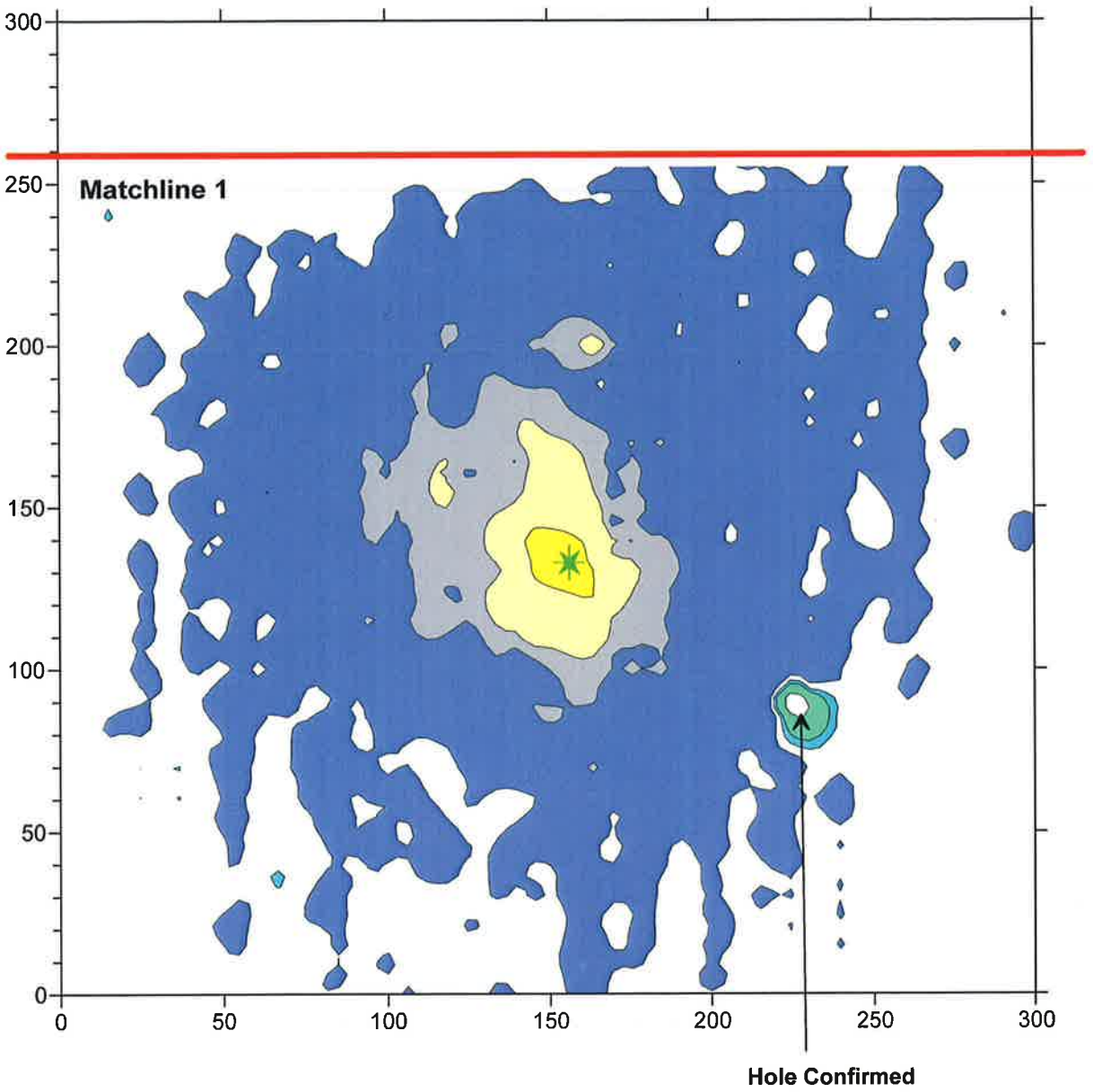
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 3
Phase II Area A

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F3



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0ft 25ft 50ft 75ft 100ft

Notes

Geophysical survey conducted September 24 through 28, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 14

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	10/1/12
DES	MHB	10/1/12
CHK	PJH	10/1/12
REV		
PROJ. MGR.	MHB	10/1/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

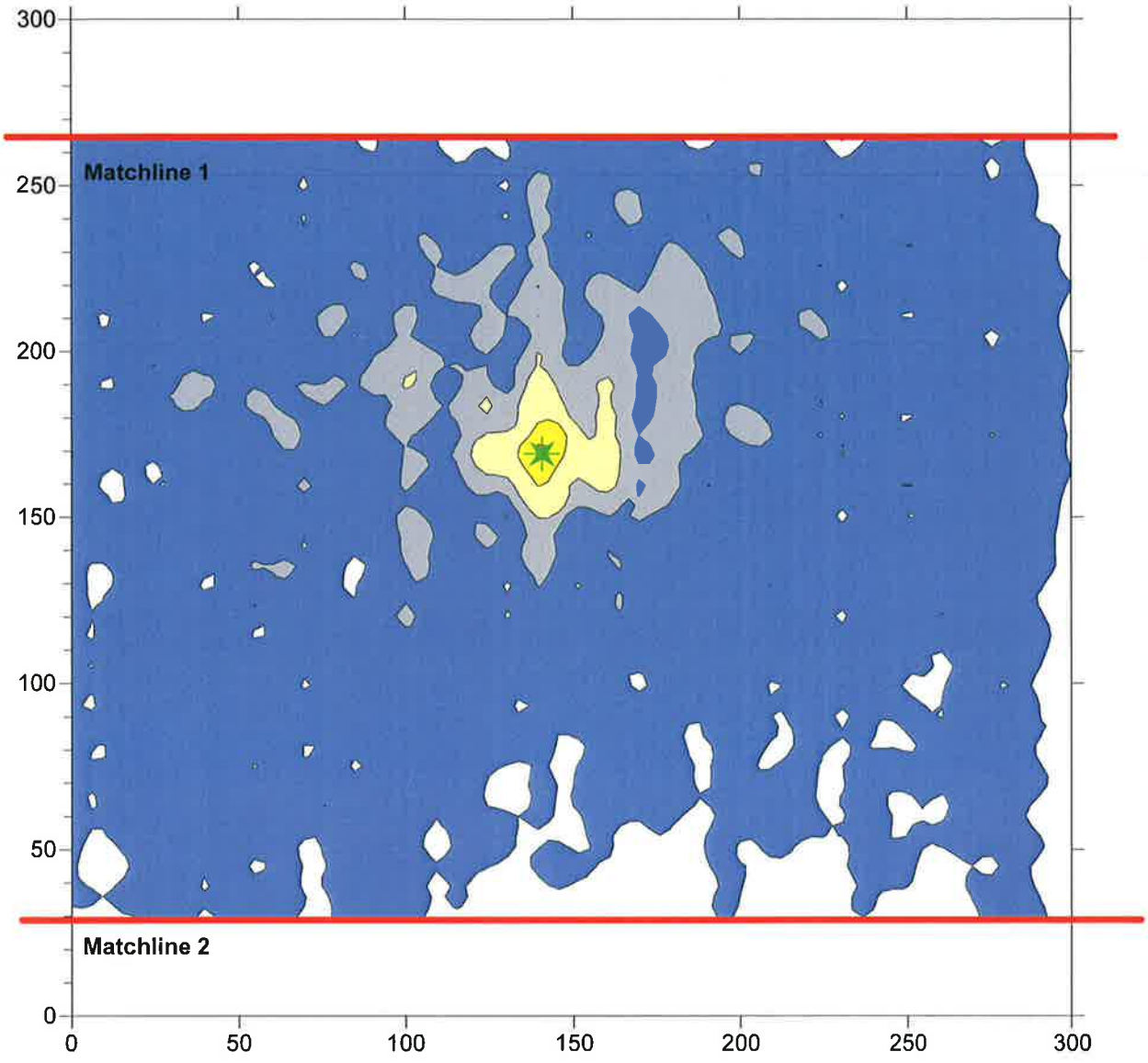
PROJECT: Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.: **Figure 4**
Phase II Area B

PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F4



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted September 24 through 28, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 15
Matchline 2 corresponds to Matchline 2 on Figure 10

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	10/1/12
DES	MHB	10/1/12
CHK	PJH	10/1/12
REV		
PROJ. MGR.	MHB	10/1/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

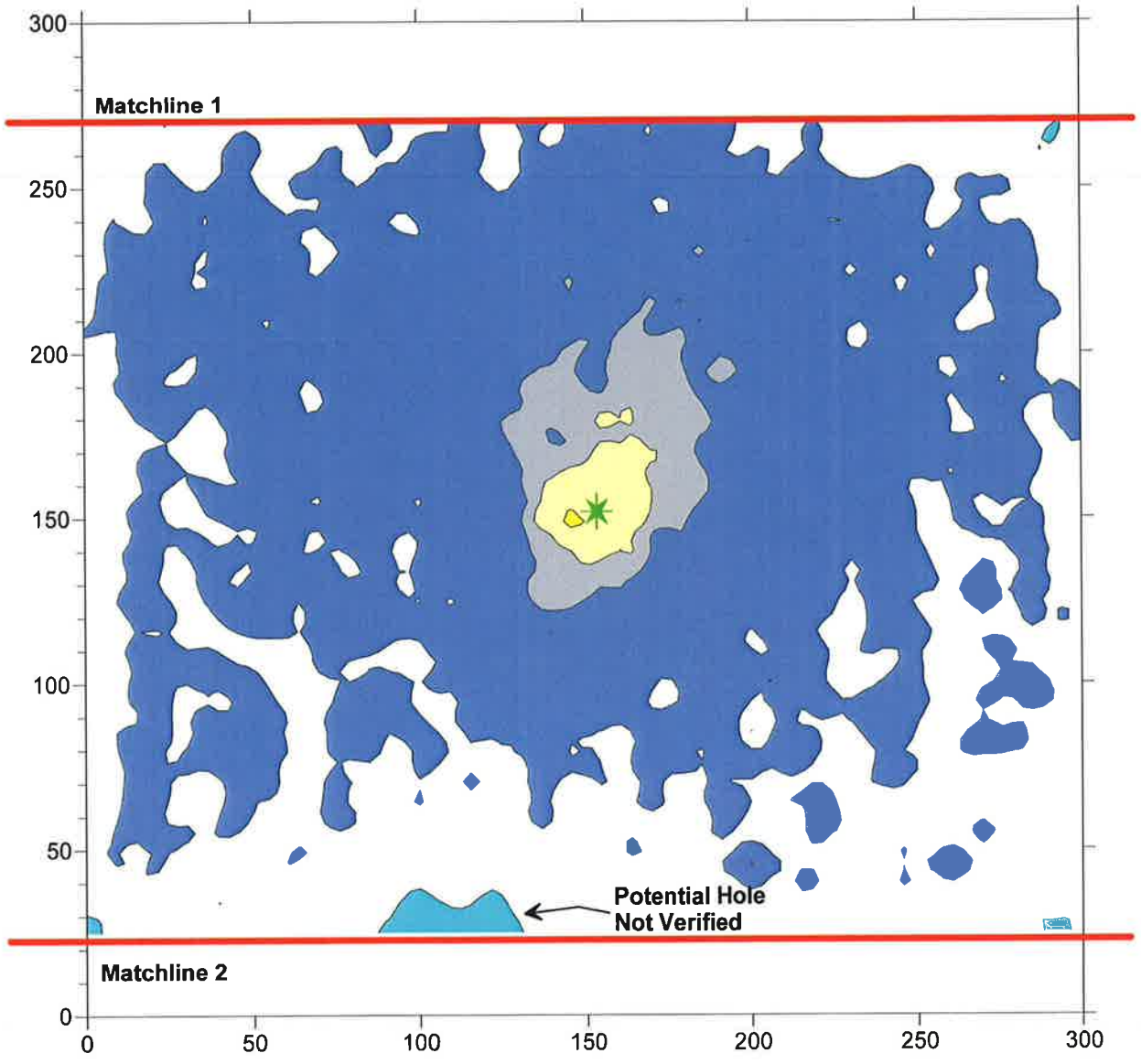
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO:
Figure 5
Phase II Area C

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F5



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted September 24 through 28, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 16
Matchline 2 corresponds to Matchline 2 on Figure 11

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	10/1/12
DES	MHB	10/1/12
CHK	PJH	10/1/12
REV		
PROJ. MGR.	MHB	10/1/12

SCALE: 1 in = 50 ft

SOURCE: On site premeasured tape and walking wheel survey

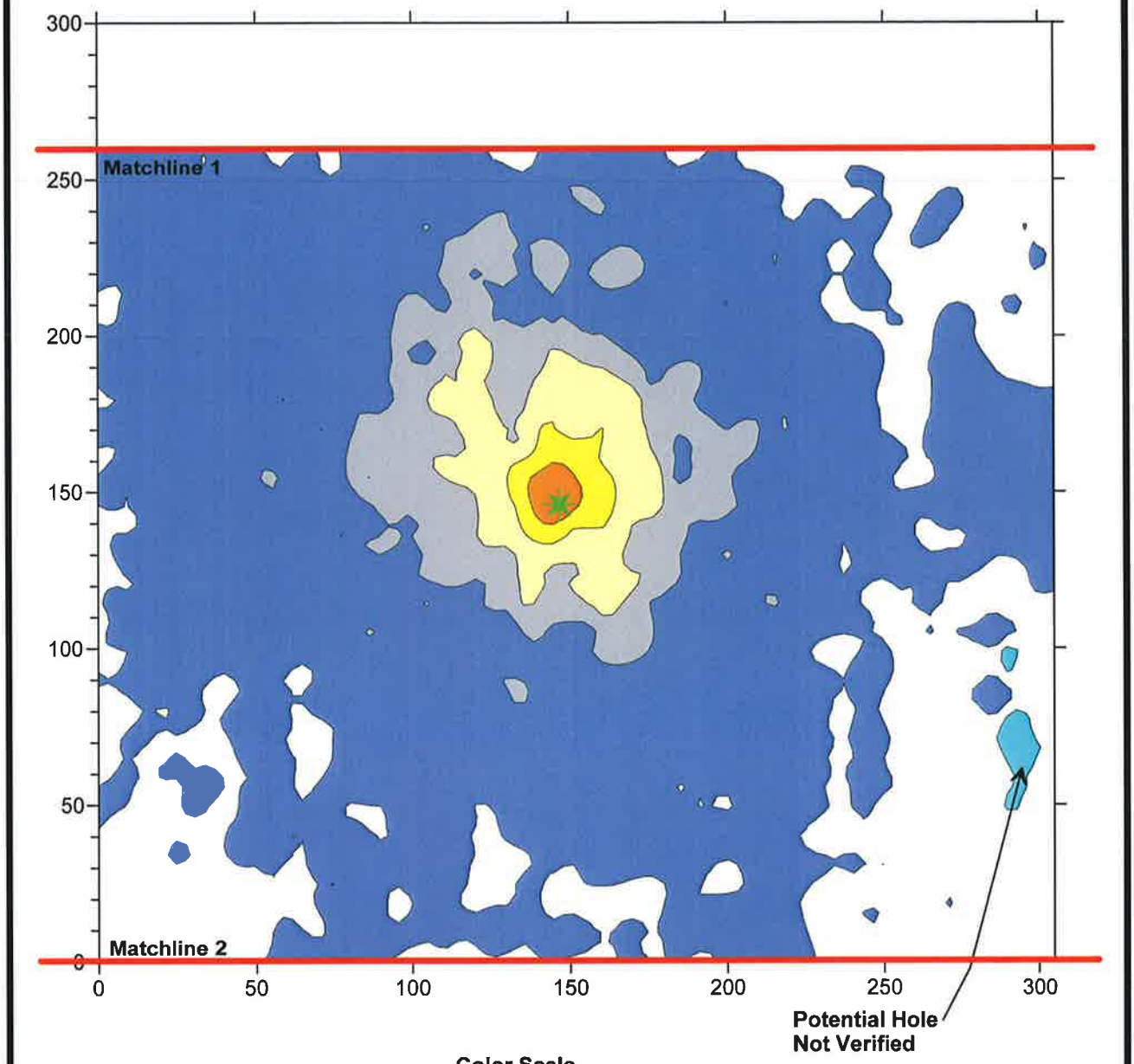
PROJECT: Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.: **Figure 6**
Phase II Area D

PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F6



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted September 24 through 28, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 17
Matchline 2 corresponds to Matchline 2 on Figure 12

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	10/1/12
DES	MHB	10/1/12
CHK	PJH	10/1/12
REV		
PROJ. MGR.	MHB	10/1/12

SCALE: 1 In = 50 ft

SOURCE: On site premeasured tape and walking wheel survey

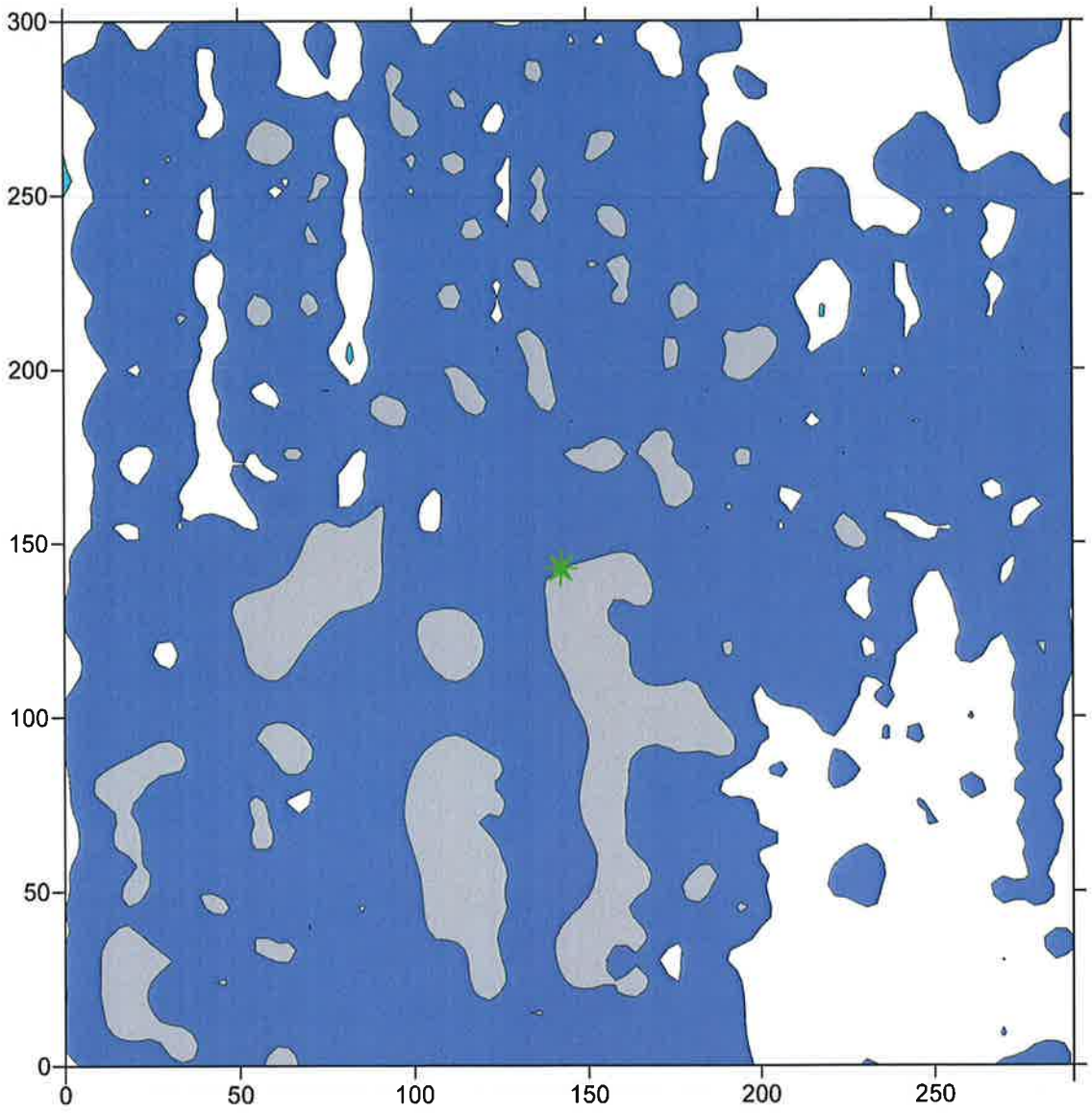
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 7
Phase II Area E

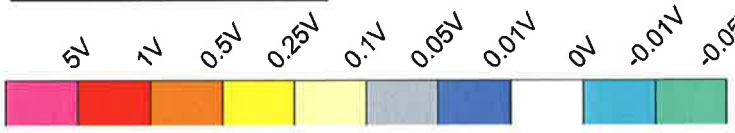
PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F7



Color Scale



Legend

Cathode Location

Notes

Geophysical survey conducted July 16-18, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	7/26/12
DES	MHB	7/26/12
CHK	PJH	7/26/12
REV		
PROJ. MGR.	PJH	7/26/12

SCALE: 1 in = 50 ft

SOURCE: On site premeasured tape and walking wheel survey

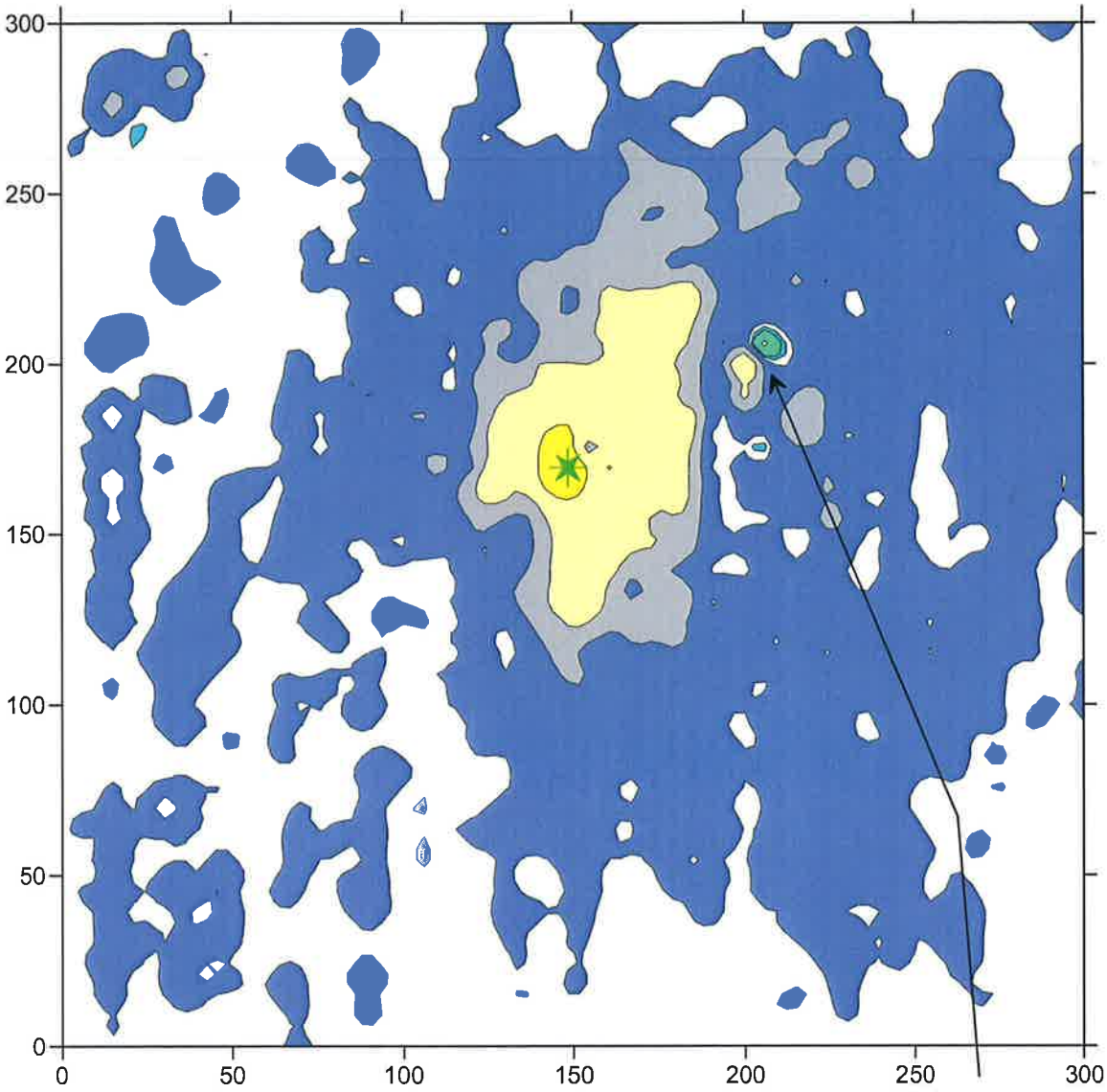
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 8
Phase II Area F

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F8



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted September 24 through 28, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	MHB	10/1/12
DES	MHB	10/1/12
CHK	PJH	10/1/12
REV		
PROJ. MGR.	MHB	10/1/12

SCALE: 1 In = 50 ft

SOURCE: On-site pre-measured tape and walking wheel survey

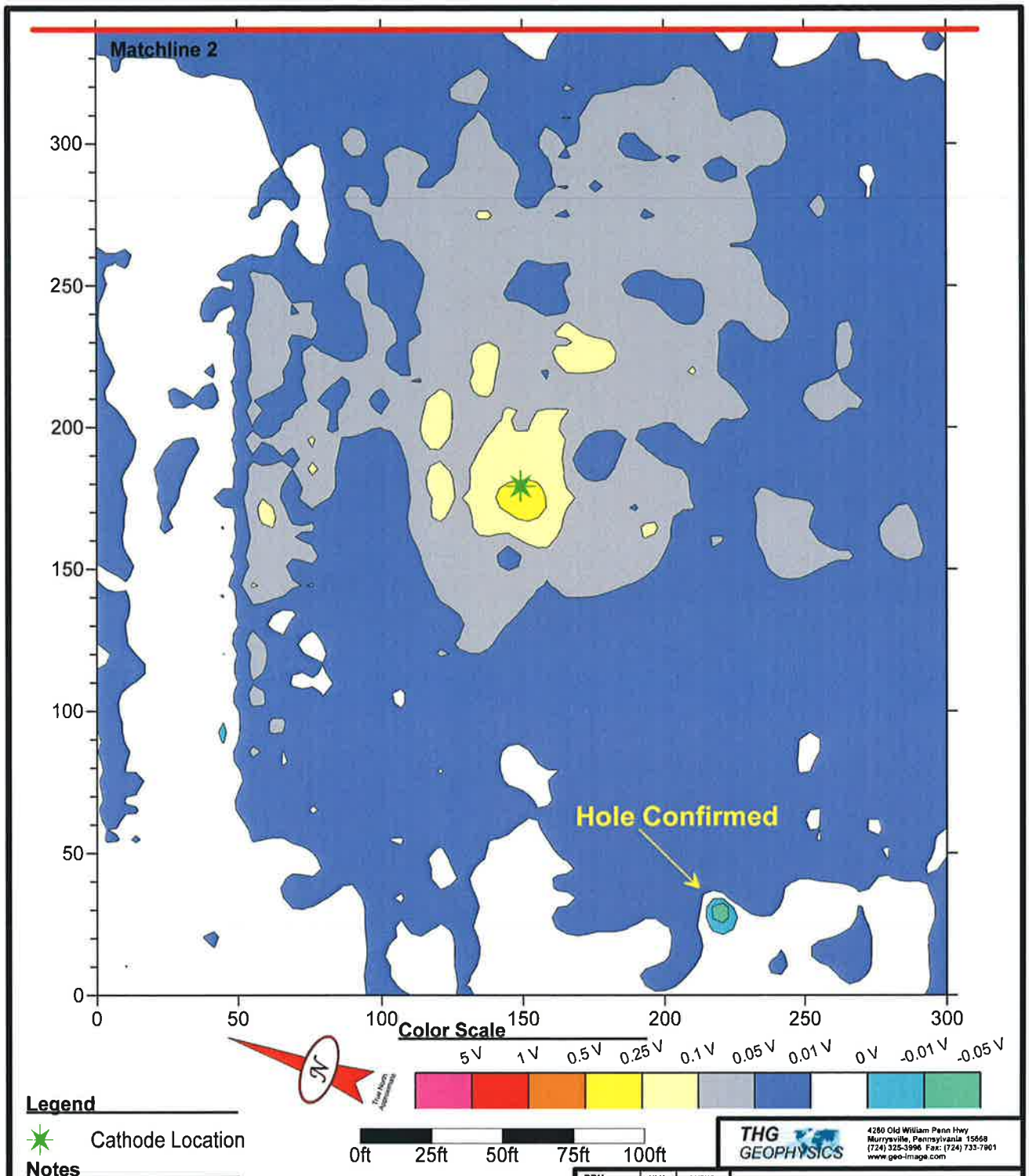
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 9
Phase II Area G

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F9



Legend

Cathode Location

Notes

Geophysical survey conducted October 29 through November 2, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 2 corresponds to Matchline 2 on Figure 5

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

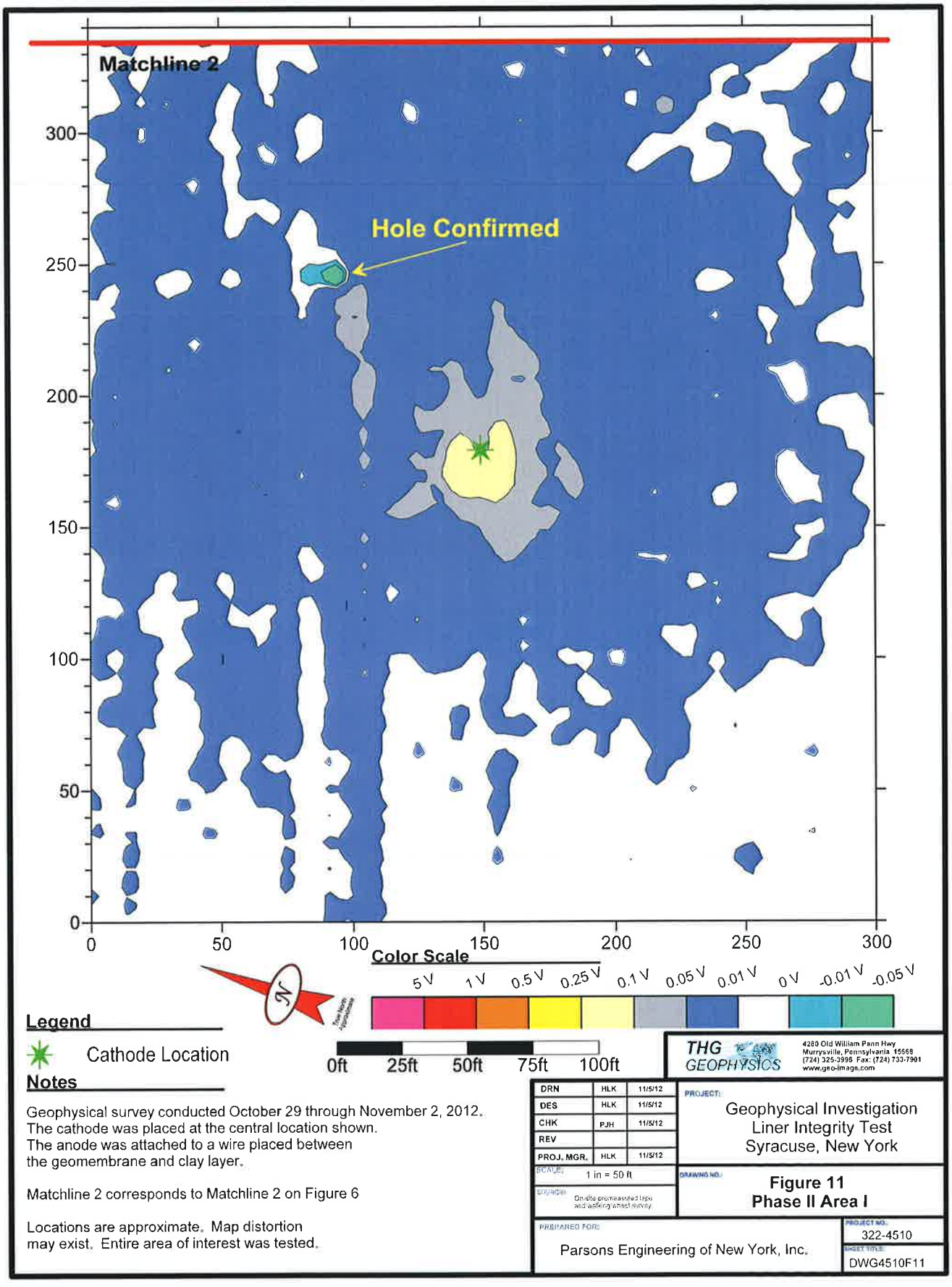
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.
Figure 10
Phase II Area H

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F10



Legend

Cathode Location

Notes

Geophysical survey conducted October 29 through November 2, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 2 corresponds to Matchline 2 on Figure 6

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
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www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

COVERAGE: On-site pre-measured lags and walking interest survey

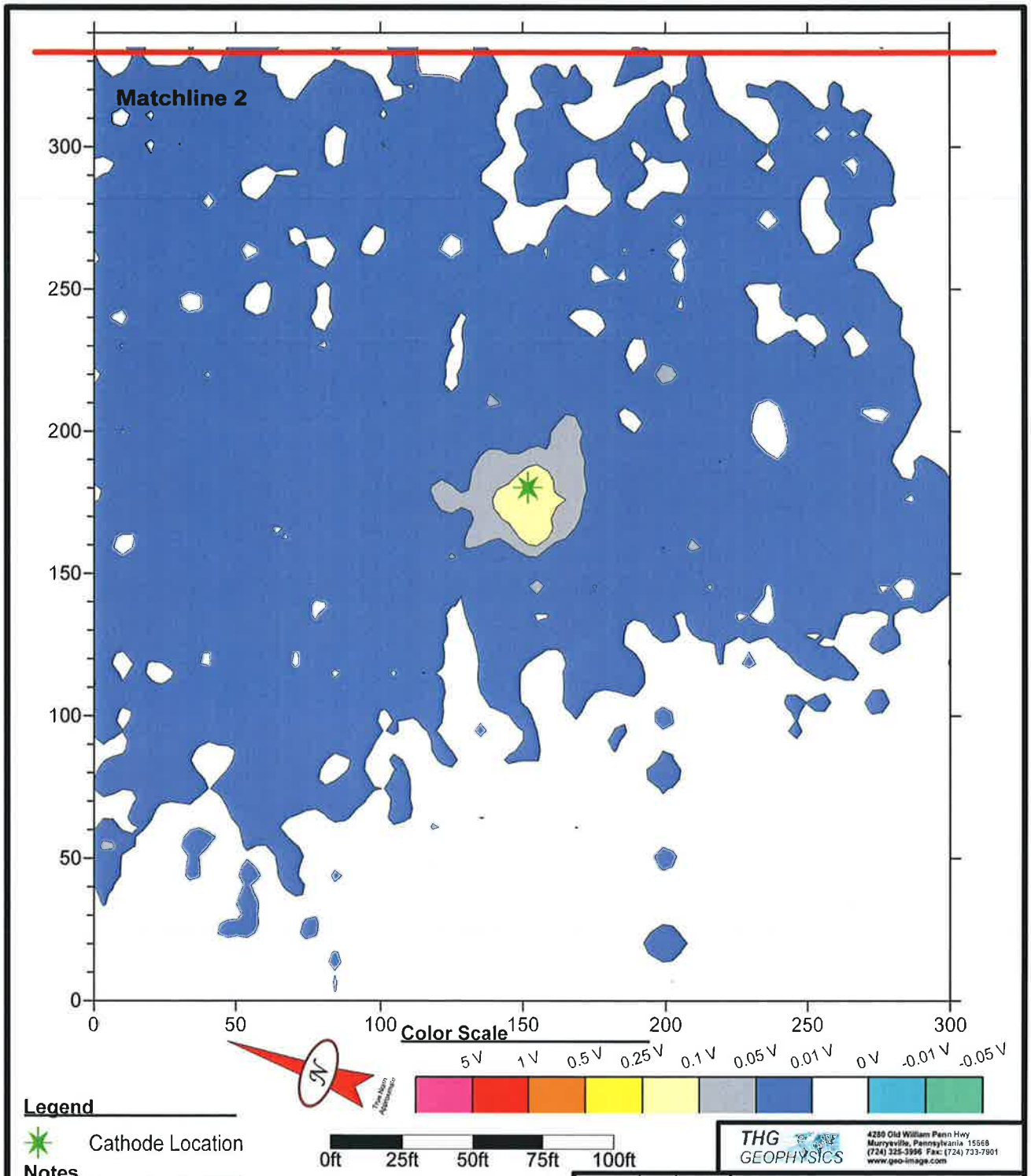
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 11
Phase II Area I

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F11



Legend

Cathode Location

Notes

Geophysical survey conducted October 29 through November 2, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 2 corresponds to Matchline 2 on Figure 7

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
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DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: Onsite preinaugural tape and walking wheel survey

PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

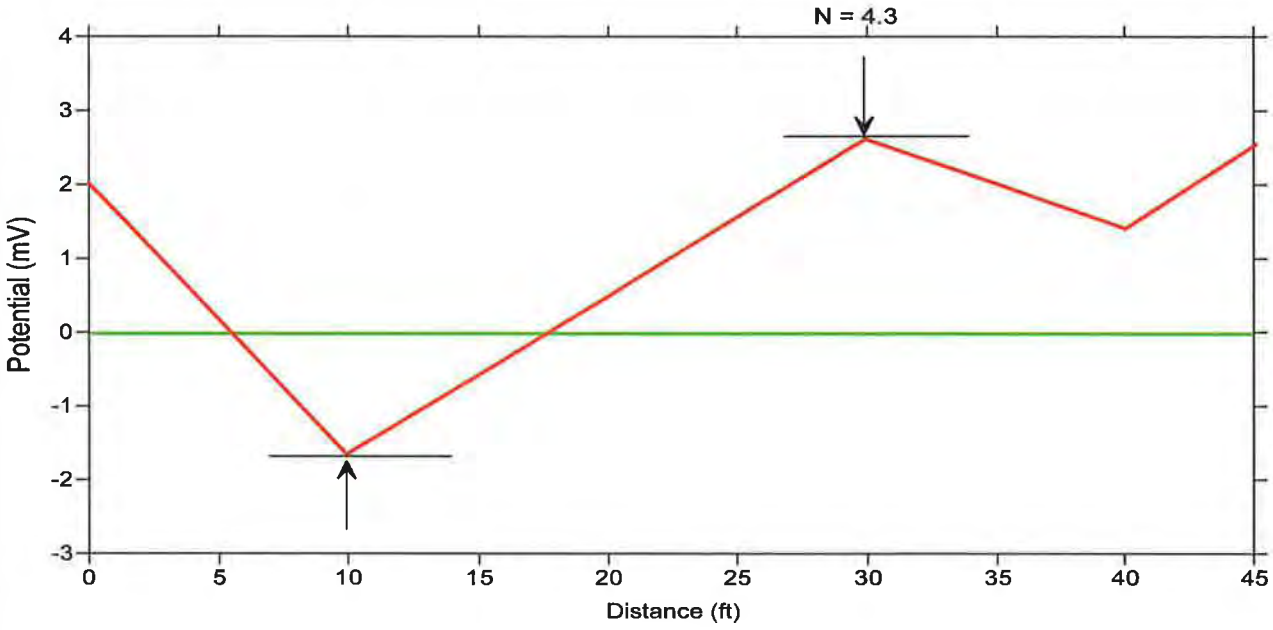
DRAWING NO.:
Figure 12
Phase II Area J

PREPARED FOR:
Parsons Engineering of New York, Inc.

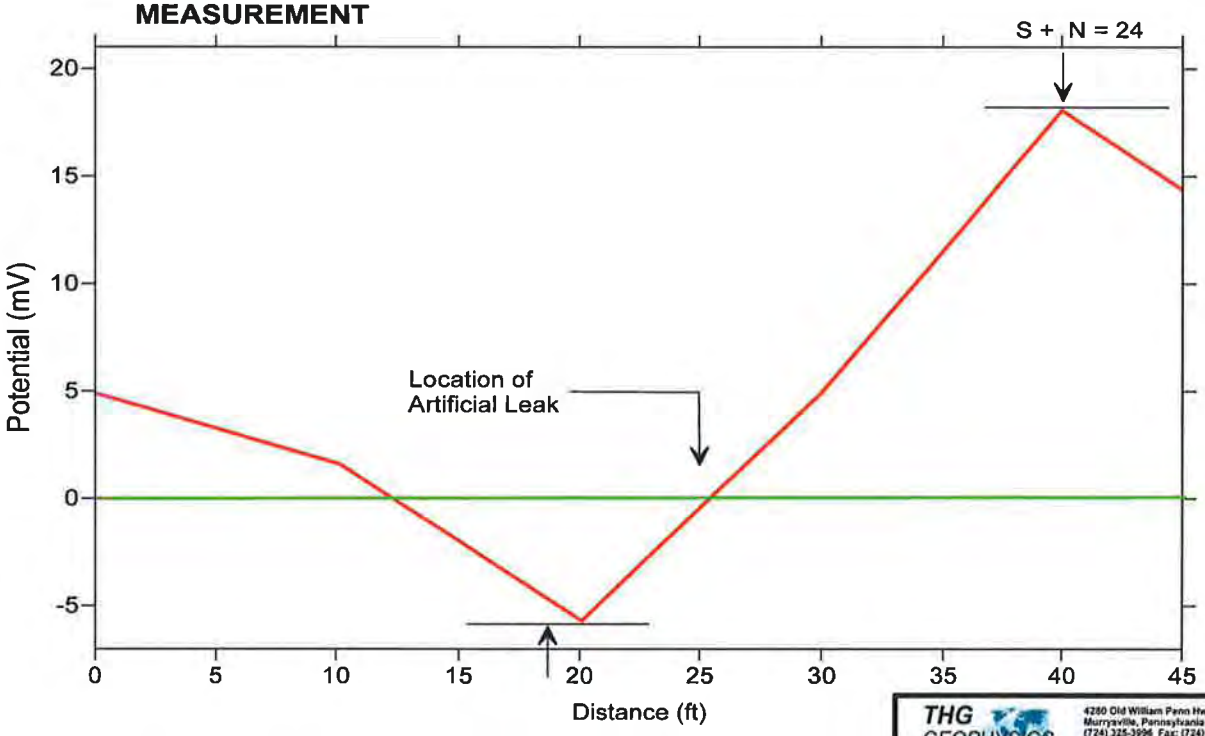
PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F12

NOISE MEASUREMENT



SIGNAL PLUS NOISE MEASUREMENT



Notes

R = (S + N) / N = 24/4.3 = 5.58

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DRN	MHB	10/2/12
DES	MHB	10/2/12
CHK	PJH	10/2/12
REV		
PROJ. MGR.	PJH	10/2/12

SCALE:

SOURCE: On-site premeasured tape and walking wheel survey

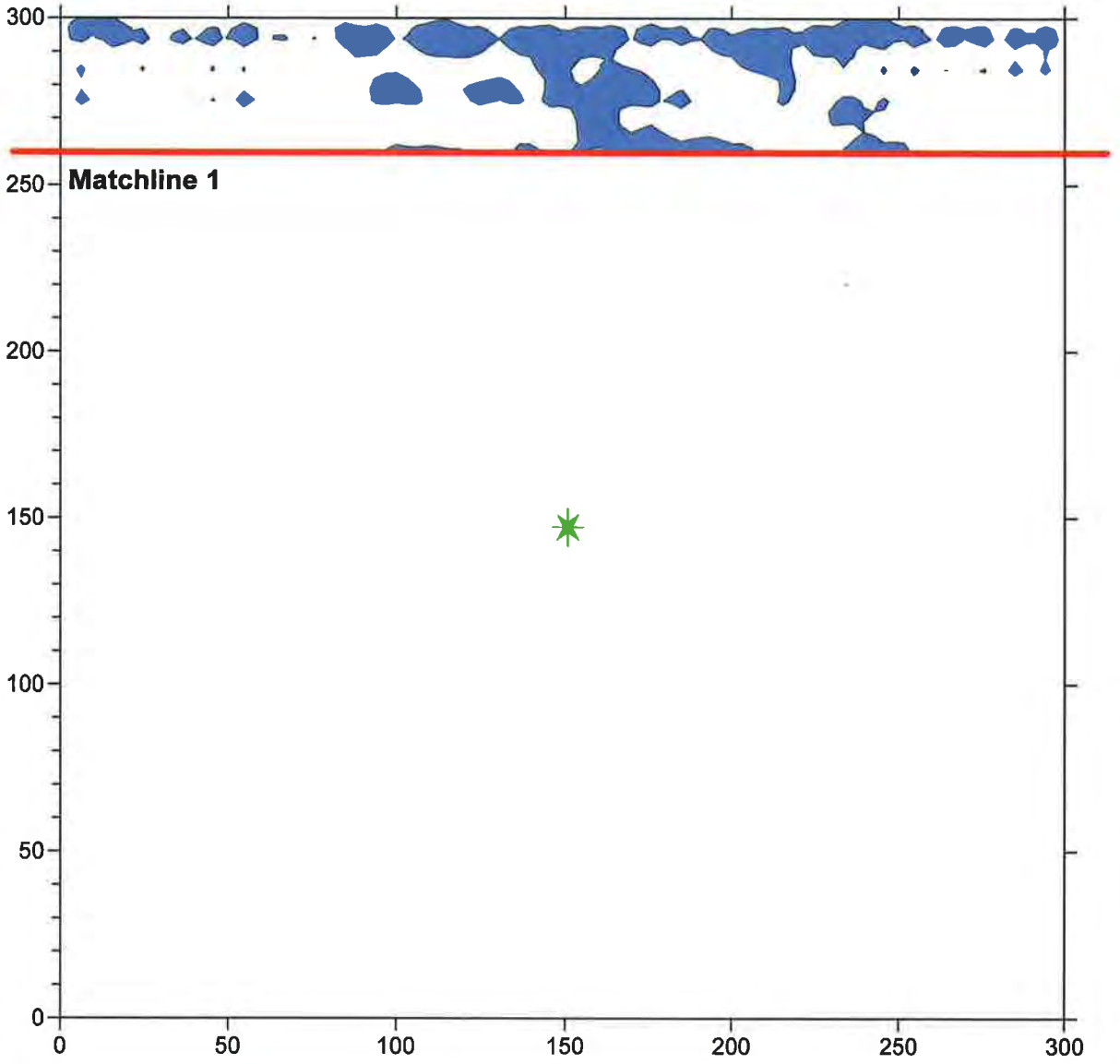
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO:
Figure 13
Sensitivity Test Cell G

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.:
322-4510

SHEET TITLE:
DWG4510F13



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0ft 25ft 50ft 75ft 100ft

Notes

Geophysical survey conducted October 1 through 4, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 4

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

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4280 Old William Penn Hwy
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DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 55 ft

SOURCE: On-site pre-measured tape and walking wheel survey.

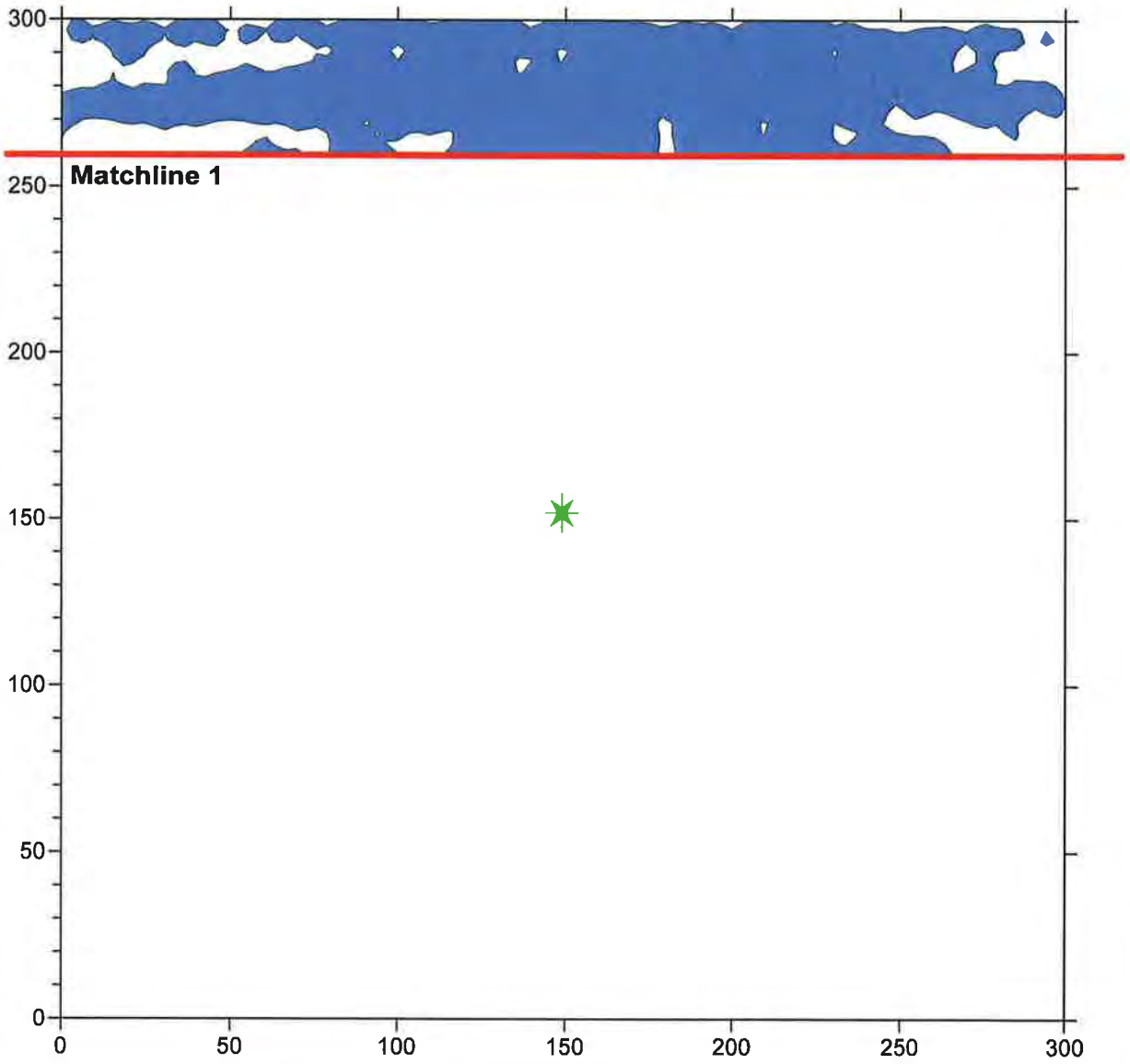
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 14
Phase II Area B (N Section)

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F14



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0ft 25ft 50ft 75ft 100ft

Notes

Geophysical survey conducted October 1 through 4, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 5

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

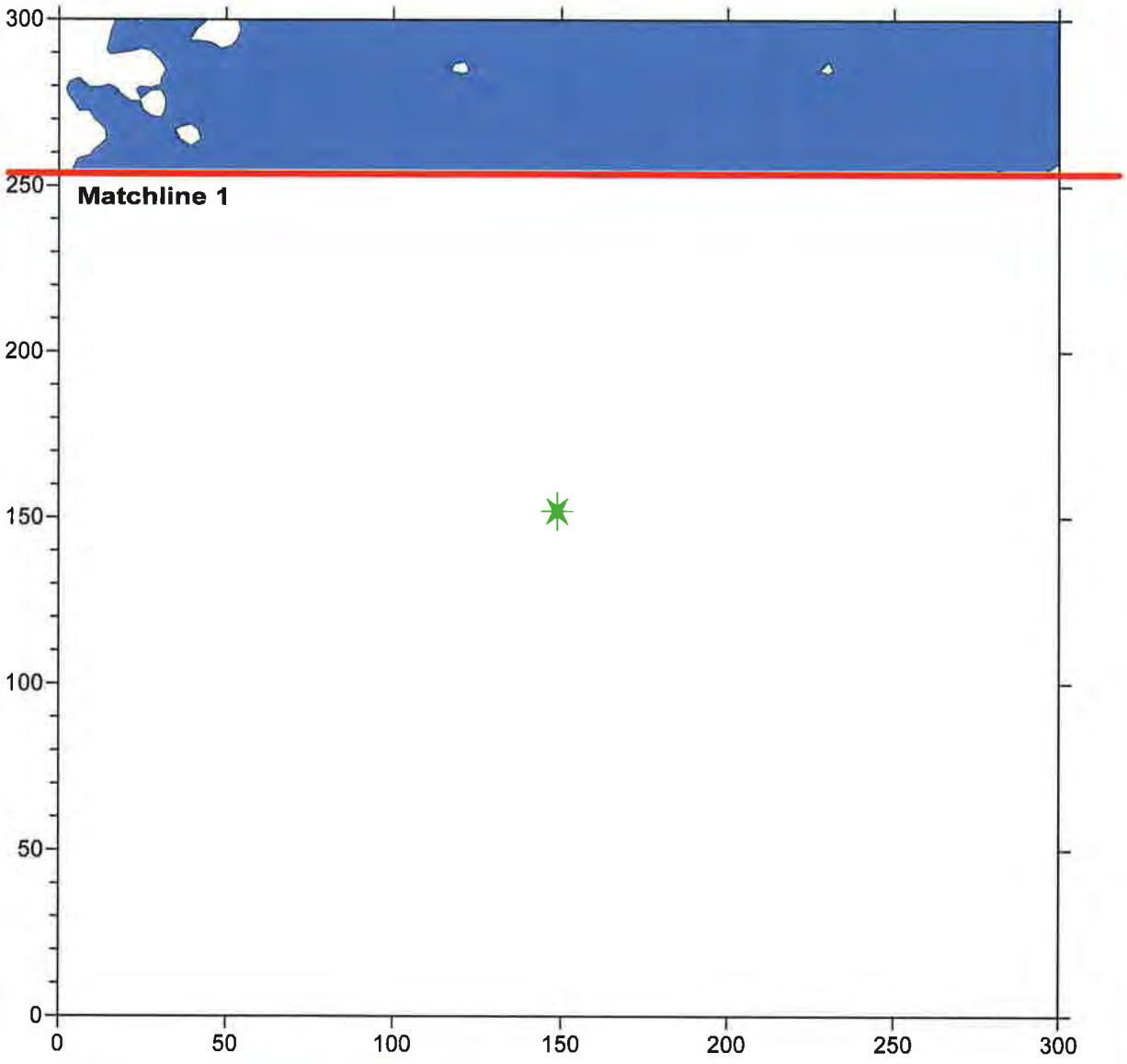
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO
Figure 15
Phase II Area C (N Section)

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F15



Color Scale

5 V 1 V 0.5 V 0.25 V 0.1 V 0.05 V 0.01 V 0 V -0.01 V -0.05 V

Legend

Cathode Location

0ft 25ft 50ft 75ft 100ft

Notes

Geophysical survey conducted October 1 through 4, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 6

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4288 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

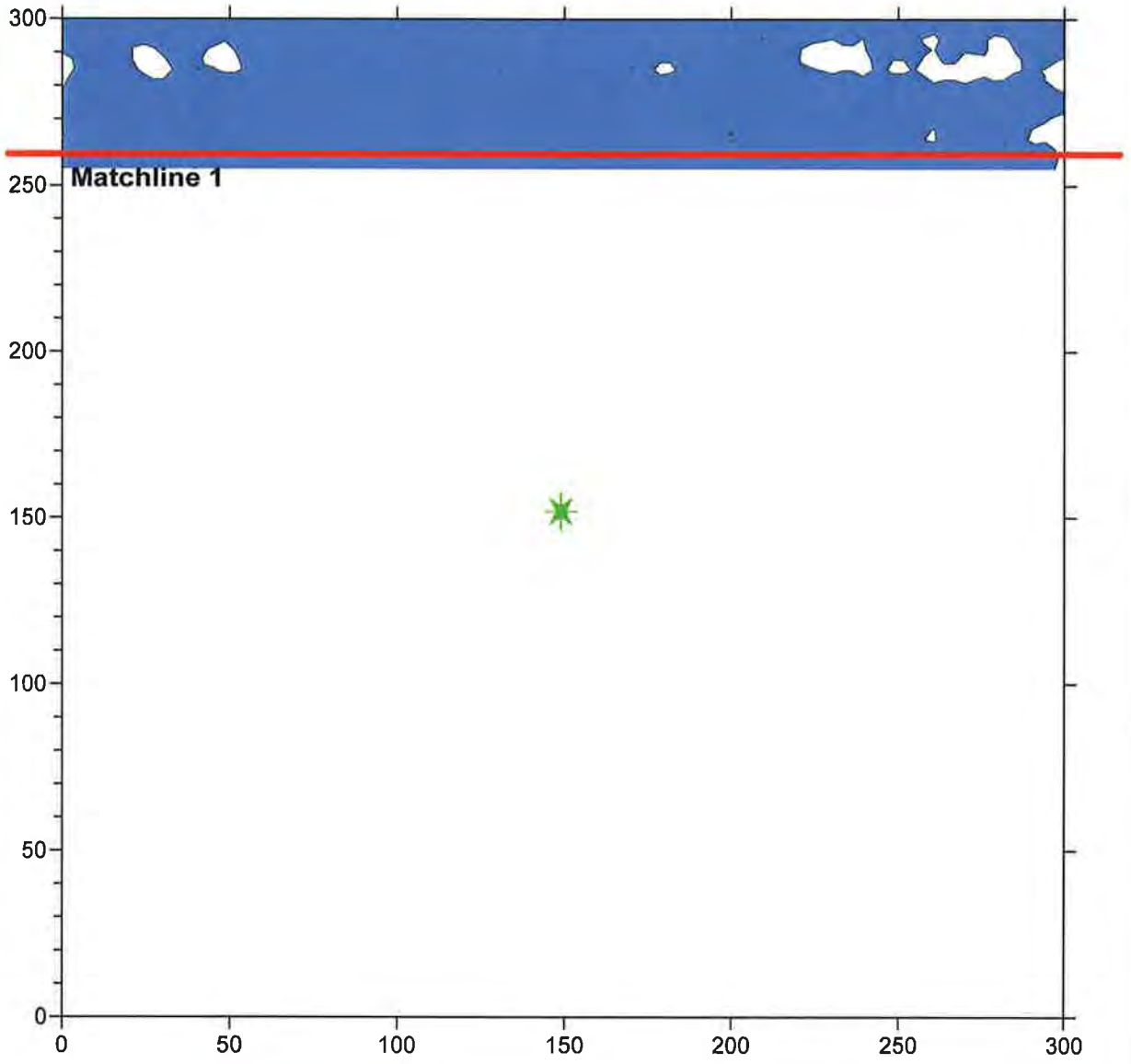
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.
Figure 16
Phase II Area D (N Section)

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F16



Color Scale

5 V 1 V 0.5 V 0.25 V 0.1 V 0.05 V 0.01 V 0 V -0.01 V -0.05 V

Legend

Cathode Location

0ft 25ft 50ft 75ft 100ft

Notes

Geophysical survey conducted October 1 through 4, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 7

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: On site premeasured tape and walking wheel survey

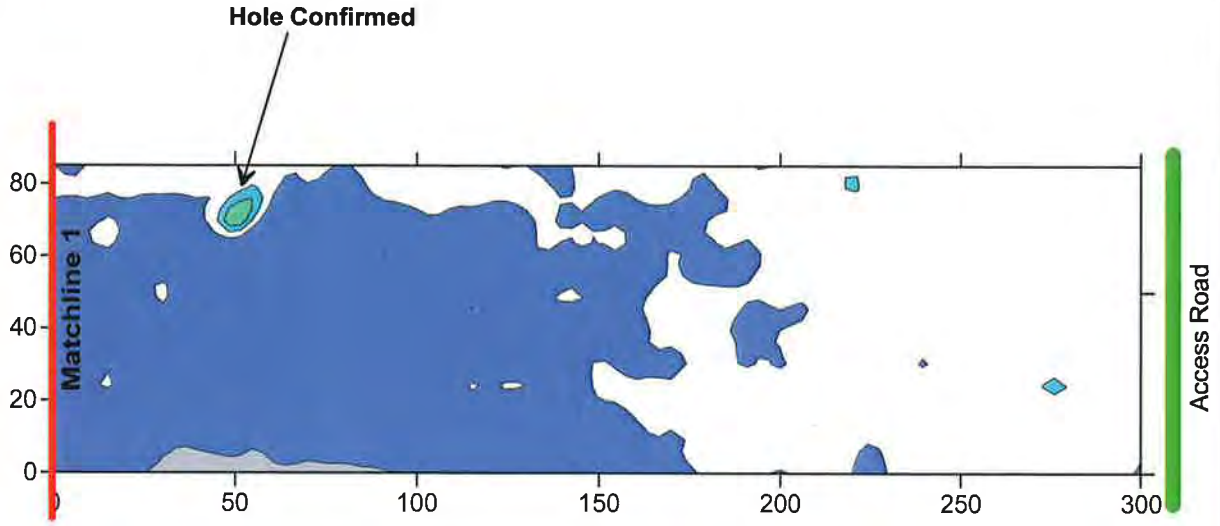
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.
Figure 17
Phase II Area E (N Section)

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F17



Color Scale

Legend

 Cathode Location

Notes

Geophysical survey conducted November 1, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 19

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 In = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

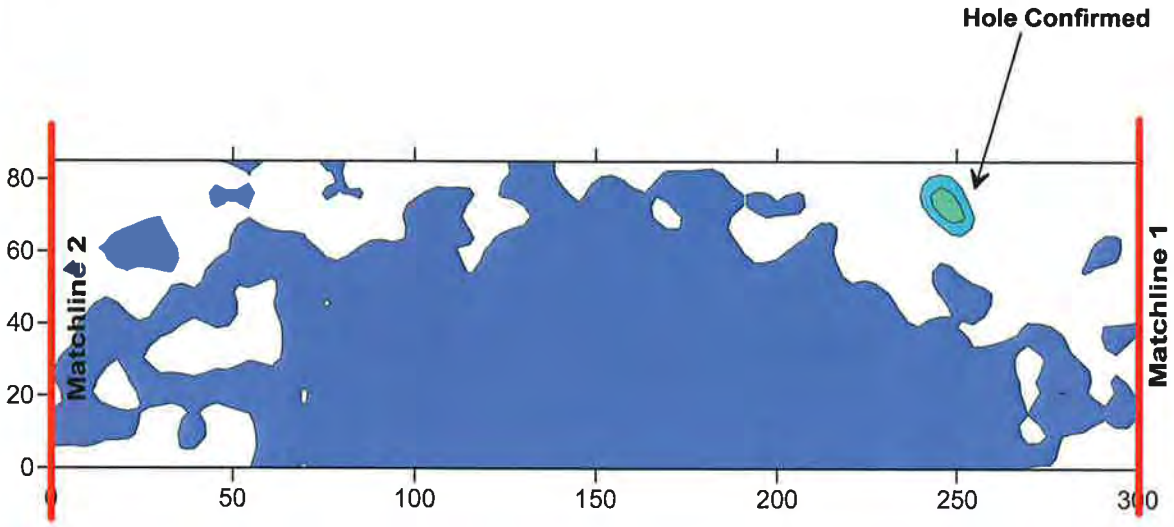
PROJECT: Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.: **Figure 18**
Phase II North Truck Ramp
0-300 ft

PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F18



Need to look up

Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted November 1, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 18
Matchline 2 corresponds to Matchline 2 on Figure 20

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey.

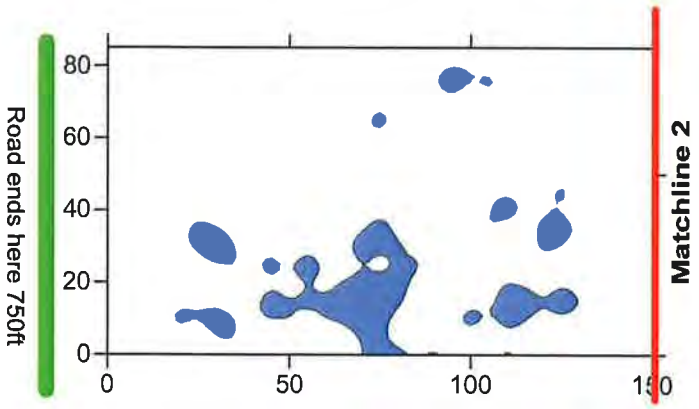
PROJECT: Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO: **Figure 19**
Phase II North Truck Ramp
300-600 ft

PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F19



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

0 ft 25 ft 50 ft 75 ft 100 ft

Legend

Cathode Location

Notes

Geophysical survey conducted November 1, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 2 corresponds to Matchline 2 on Figure 19

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/5/12
DES	HLK	11/5/12
CHK	PJH	11/5/12
REV		
PROJ. MGR.	HLK	11/5/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey.

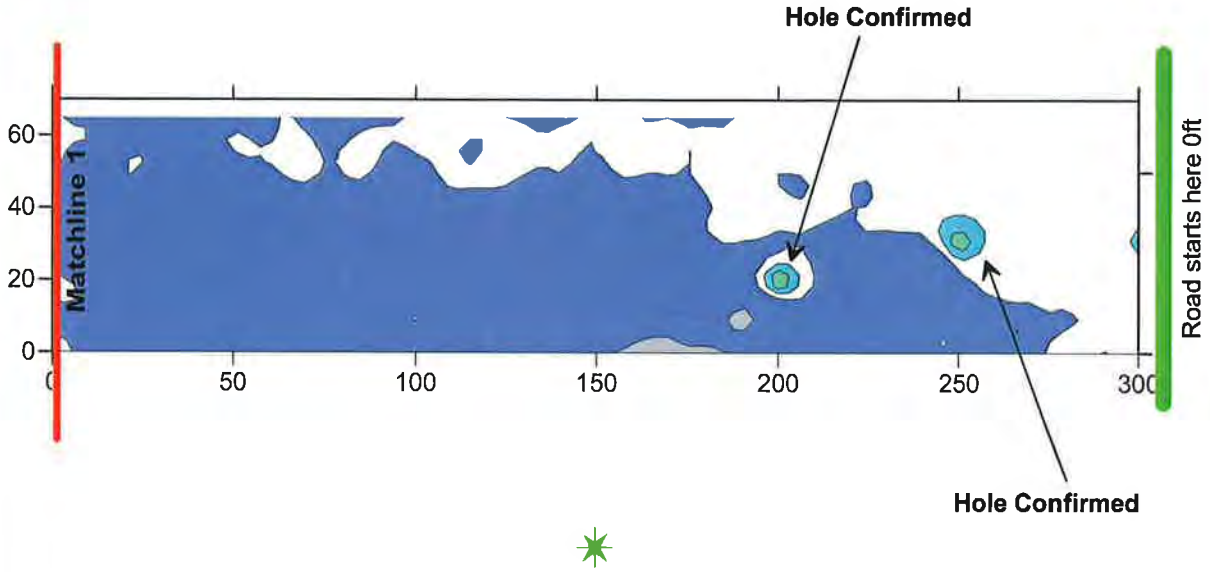
PROJECT: Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO. **Figure 20**
Phase II North Truck Ramp
600-750 ft

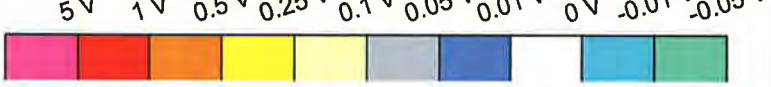
PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F20



Color Scale



Legend

Cathode Location

Notes

Geophysical survey conducted November 12 and 13, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 22

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/15/12
DES	HLK	11/15/12
CHK	PJH	11/15/12
REV		
PROJ. MGR.	HLK	11/15/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey.

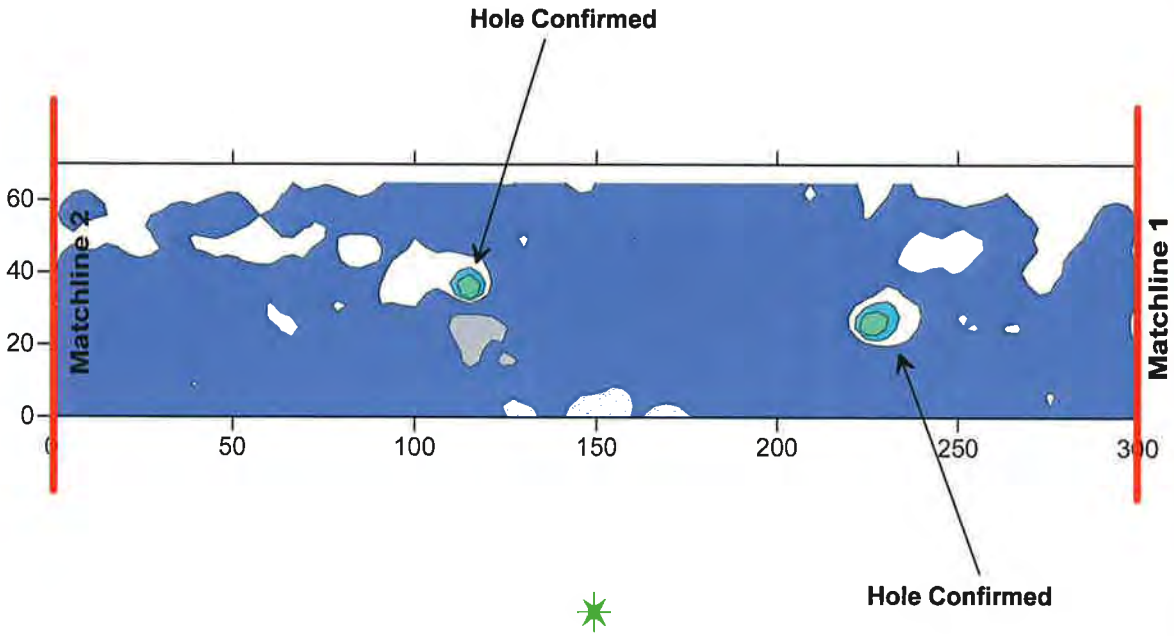
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO:
Figure 21
Phase II South Truck Ramp
0-300 ft

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F21



Color Scale

5 V 1 V 0.5 V 0.25 V 0.1 V 0.05 V 0.01 V 0 V -0.01 V -0.05 V

Legend

Cathode Location

0 ft 25 ft 50 ft 75 ft 100 ft

Notes

Geophysical survey conducted November 12 and 13, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 1 corresponds to Matchline 1 on Figure 21
Matchline 2 corresponds to Matchline 2 on Figure 23

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3998 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/15/12
DES	HLK	11/15/12
CHK	PJH	11/15/12
REV		
PROJ. MGR.	HLK	11/15/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

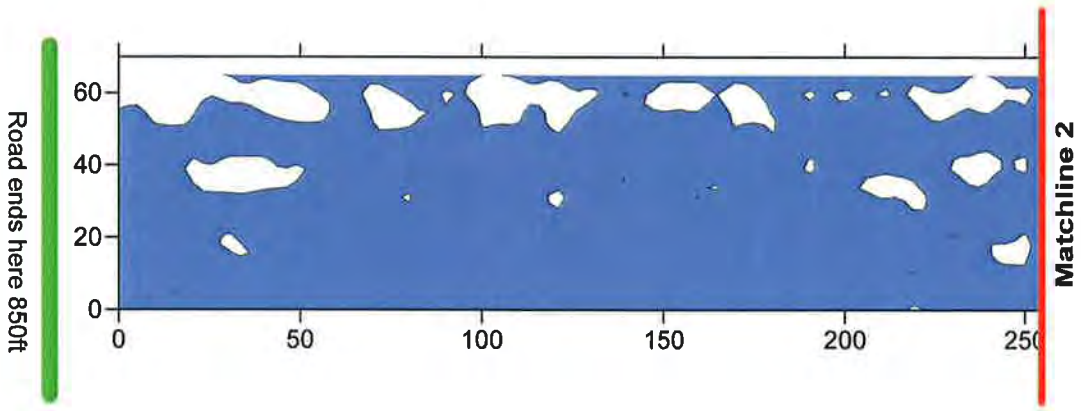
PROJECT:
Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.:
Figure 22
Phase II South Truck Ramp
300-600 ft

PREPARED FOR:
Parsons Engineering of New York, Inc.

PROJECT NO.:
322-4510

SHEET TITLE:
DWG4510F22



Color Scale

5 V | 1 V | 0.5 V | 0.25 V | 0.1 V | 0.05 V | 0.01 V | 0 V | -0.01 V | -0.05 V

0 ft 25 ft 50 ft 75 ft 100 ft

Legend

Cathode Location

Notes

Geophysical survey conducted November 12 and 13, 2012.
The cathode was placed at the central location shown.
The anode was attached to a wire placed between the geomembrane and clay layer.

Matchline 2 corresponds to Matchline 2 on Figure 22

Locations are approximate. Map distortion may exist. Entire area of interest was tested.

THG GEOPHYSICS
4280 Old William Penn Hwy
Murrysville, Pennsylvania 15668
(724) 325-3996 Fax: (724) 733-7901
www.geo-image.com

DRN	HLK	11/15/12
DES	HLK	11/15/12
CHK	PJH	11/15/12
REV		
PROJ. MGR.	HLK	11/15/12

SCALE: 1 in = 50 ft

SOURCE: On-site premeasured tape and walking wheel survey

PROJECT: Geophysical Investigation
Liner Integrity Test
Syracuse, New York

DRAWING NO.: **Figure 23**
Phase II South Truck Ramp
600-850 ft

PREPARED FOR: Parsons Engineering of New York, Inc.

PROJECT NO.: 322-4510

SHEET TITLE: DWG4510F23

APPENDIX O

Well Decommission Letter

ATLANTIC TESTING LABORATORIES

Canton
6431 U.S. Highway 11
P.O. Box 29
Canton, NY 13617
315-386-4578 (T)
315-386-1012 (F)

March 27, 2013

Parsons
301 Plainfield Road, Suite 350
Liverpool, New York 13212

Attn: Mr. William A. Mathe

Re: **Subsurface Investigation Services**
Well Abandonment Services
Inclinometer S1-G1
SCA Project – Wastebed 13
Syracuse, Onondaga County, New York
ATL No. CD3151D-02-03-13

Ladies and Gentleman:

At the request of Mr. William A. Mathe, representing Parsons, and in accordance with Task Order No. 446199.60000.09 Revision 1, dated September 1, 2010, and in accordance with our Task Order Addendum (ATL No. CD3151-10-10 Addendum 3 dated October 11, 2012), Atlantic Testing Laboratories, Limited (ATL) performed well abandonment services for the referenced project. The field services were performed on March 14, 2013. The driller's field log is attached.

Inclinometer S1-G1 was abandoned on March 14, 2013 utilizing the following procedure:

1. The inclinometer casing was tremie-grouted with cement-bentonite grout from the bottom of the casing at a depth of 67.0 feet to the ground surface.
2. The inclinometer casing was over-drilled utilizing 4¼-inch hollow stem augers to a depth of 15.0 feet below ground surface.
3. The inclinometer casing was pulled from the ground. The casing broke off at a depth of 16.0 feet below ground surface. The 16.0-foot portion of casing was removed from the borehole, while the remaining 51.0-foot portion was left in the ground.
4. The borehole was tremie-grounted with cement-bentonite grout to the ground surface.
5. The hollow stem augers were removed from the borehole. Cement-bentonite grout was added to the borehole to bring it back to level with ground surface.

It is important that the abandoned well be monitored for settlement or subsidence. This will be the responsibility of Parsons, and/or their client. ATL assumes no liability for loss or damage resulting from borehole settlement.

Please contact our office should you have any questions, or if we may be of further service. We look forward to our continued association to obtain a successful completion of the project.

Sincerely,
ATLANTIC TESTING LABORATORIES, Limited

Adrienne E. Mackey
Geologist

AEM/TJG/aem
Enclosure

ATLANTIC TESTING LABORATORIES

Subsurface Investigation Field Log

Client: Parsons
Project: SCA Project Wastebed 13
Boring: Syracuse, New York
Drill Rig: CME-850X

Job No.: CD3151
Boring No.: SI G1
Sheet: 1 of 1
Rig Unit No.: CD66-570

Sampler Hammer
Auto Safety
Weight: NA
Fall: NA
Casing Hammer
Weight: _____
Fall: _____
☐ Spun ☐ Driven

Date	Time	Casing Depth	Hole Depth	Water Depth
3-14-13		67.0	67	

Date	Drilled From	Drilled To	HSA Size	Casing Size	Air / Wet Rotary	Rock Core
3-14-13	0.0	67.0'	8 grout	all		
3-14-13	0.0	15.0	4 1/4			

Sample Number	Sampled From	Sampled To	Split Spoon Blows 0/6	6/12	12/18	18/24	Recovery	Depth of Change	Soil Type and Drilling Notes (field tests performed, loss or gain of water, well installation, drilling difficulties, cobbles, boulders)	Casing Blows
									Topsoil; Asphalt; Concrete; Other (note)	
									Grouted Inclinometer Pipe.	
									Then overdrilled pipe to 15.0' and pulled	
									out 15' of pipe. Grouted to the surface.	
									and pulled out the Augers. Topped off with	
									grout	

Boring Terminated At: _____ Caved At: grouted Finish Date: 3-14-13 Time: _____

Driller: Mark Childs
Helper: Justin Sonnier

Inspector's Signature: _____

APPENDIX P

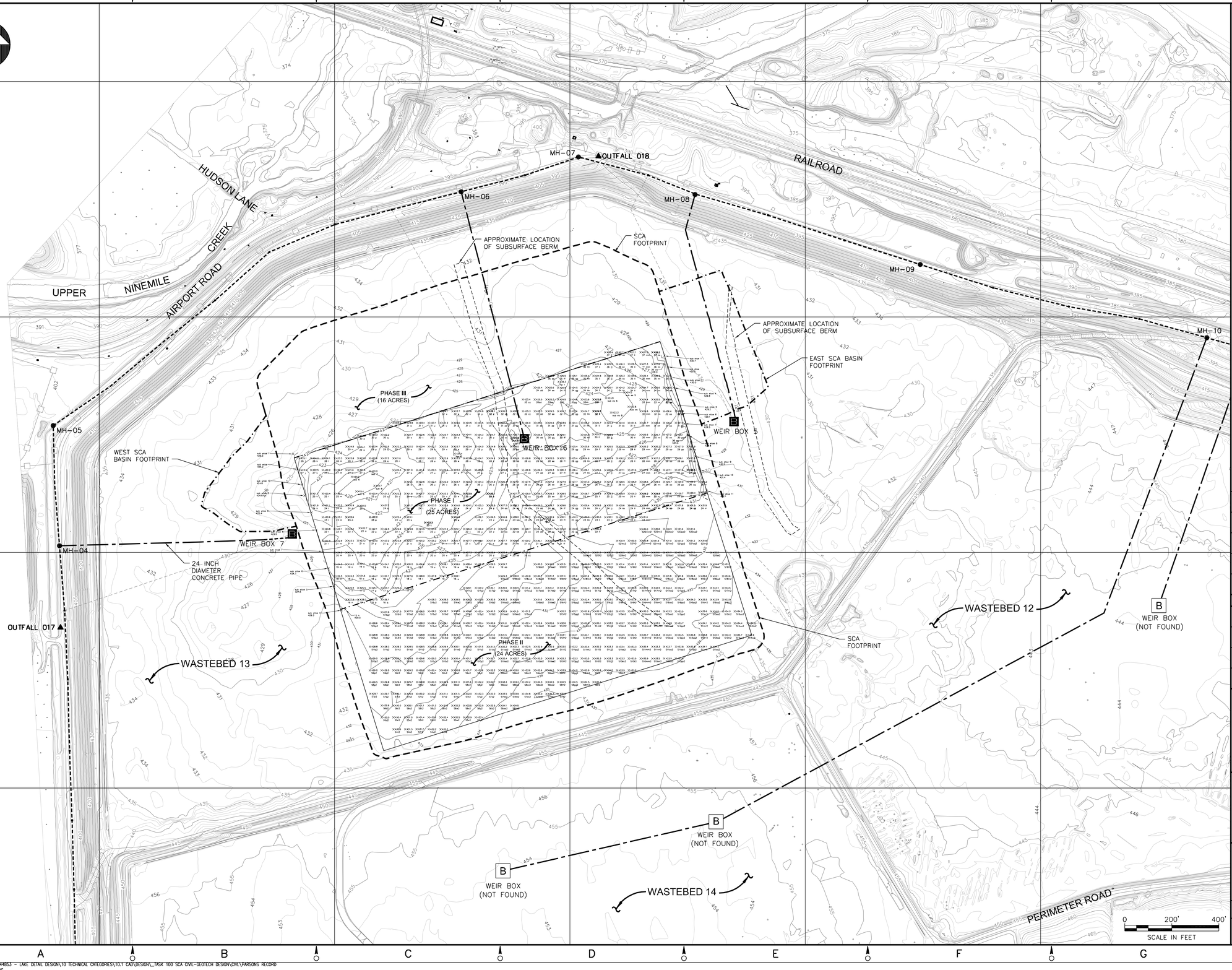
Record Drawings

- Contractor's Record Drawings
- Geomembrane Panel Layout and Seam Repair/Destructive Sample Location Drawings

Contractor's Record Drawings

- Existing Site Conditions
- Subgrade
- Low-Permeability Soil Liner
- Geotextile Panel Layout
- Gravel Drainage Layer

Existing Site Conditions



NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING OUTSIDE OF THE SCA WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.
2. COORDINATES SHOWN HEREIN ARE EXPRESSED IN U.S. SURVEY FEET AND REFERENCED TO THE NORTH AMERICAN DATUM OF 1983/1996 (NAD 83/96) – NEW YORK STATE PLANE GRID, ZONE CENTRAL. ELEVATIONS SHOWN HEREIN ARE EXPRESSED IN FEET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. THE ELEVATIONS AND TOPOGRAPHIC CONTOURS INSIDE PHASE I AND II OF THE SCA WERE OBTAINED FROM FIELD MEASUREMENTS TAKEN BY PARSONS DURING THE 2011 AND 2012 CONSTRUCTION SEASONS.
4. REMAINING PHASE II SUBGRADE ELEVATIONS TO BE MEASURED PRIOR TO LOW PERMEABILITY SOIL LAYER CONSTRUCTION.

LEGEND

- 430 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- EXISTING ROAD
- B WEIR BOX 5 — EXISTING WEIR BOX
- PERIMETER LEACHATE COLLECTION PIPE
- INTERIOR LEACHATE COLLECTION PIPE (NOTE 5)

RECORD DRAWING

THESE DRAWINGS HAVE BEEN ANNOTATED TO REFLECT MAJOR CHANGES, IF ANY, WHICH HAVE OCCURRED DURING CONSTRUCTION. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS WHO ARE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED, TO THE BEST OF OUR KNOWLEDGE, INFORMATION, AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

PER: _____ DATE: _____

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
A	RECORD DRAWING	5/2/12	JTS	DDS	

DRAWN BY	JTS	DATE 5/2/12
CHECKED BY	DDS	DATE 5/2/12
APPROVED BY		DATE
PROJECT MGR.		DATE

SEAL

PARSONS
COMMERCIAL TECHNOLOGY GROUP
OFFICE
301 PLAINFIELD ROAD
SYRACUSE, NY 13212
(315) 451-9560

JOB 444853
WBS

PROJECT TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA
ONONDAGA LAKE BOTTOM
SUBSITE REMEDIAL DESIGN

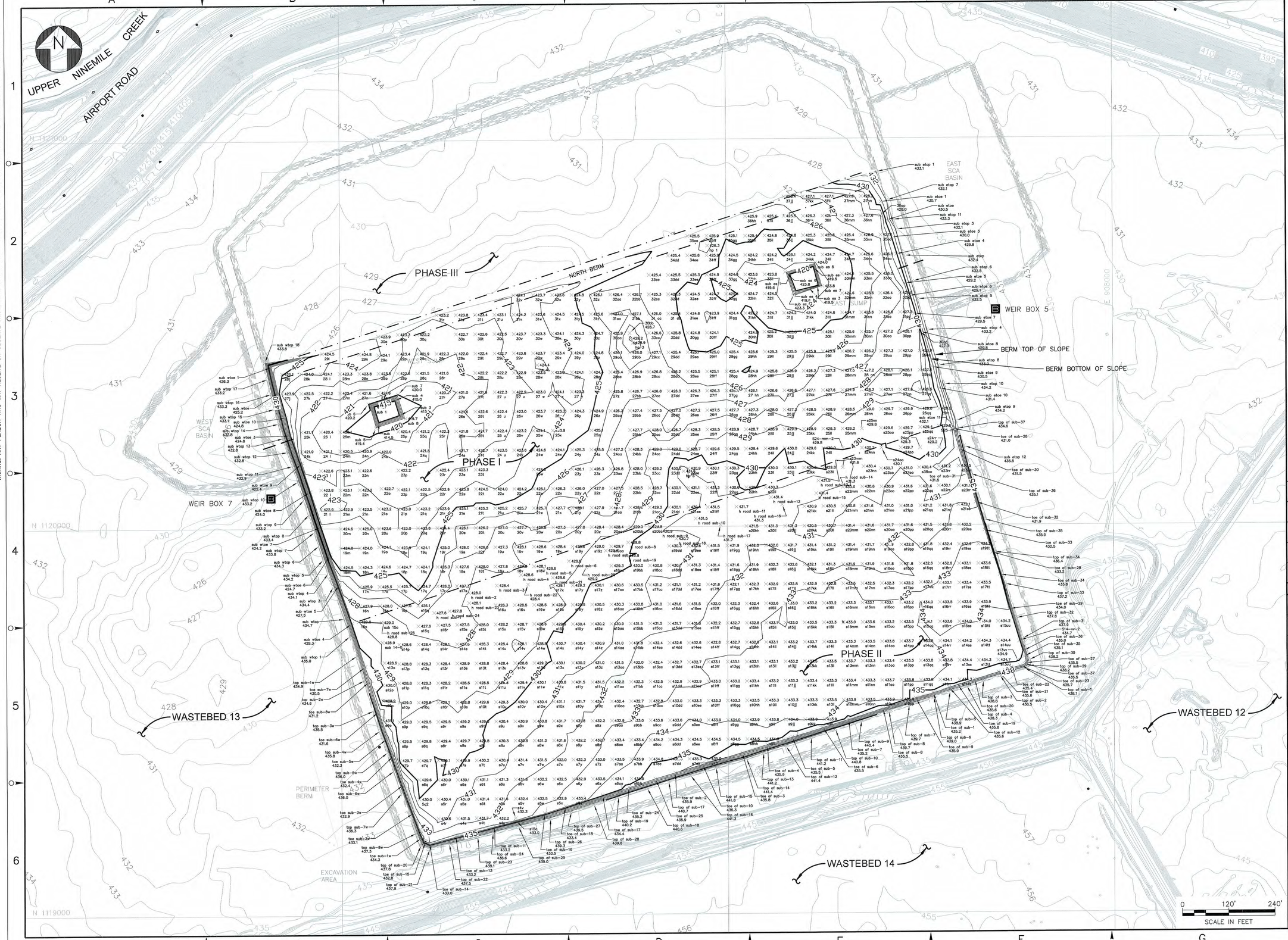
DRAWING TITLE
EXISTING SITE CONDITIONS

SCALE: SCALE: 1" = 200'
(IF PRINTED ON 22x34 SHEET)

DRAWING NO. 444853-101-C-002A
REV. A

FILE NAME: P:\HONEYWELL -SYR\444853 - LAKE DETAIL DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\DESIGN_TASK 100 SCA CIVIL-GEOTECH DESIGN\CIVIL\PARSONS RECORD DRAWINGS\444853-101-C-002A.DWG
PLOT DATE: 5/3/2012 4:17 PM PLOTTED BY: SVALIA, JACK

Subgrade



NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING OUTSIDE OF THE SCA WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.
2. COORDINATES SHOWN HEREIN ARE EXPRESSED IN U.S. SURVEY FEET AND REFERENCED TO THE NORTH AMERICAN DATUM OF 1983/1996 (NAD 83/96) – NEW YORK STATE PLANE GRID, ZONE CENTRAL. ELEVATIONS SHOWN HEREIN ARE EXPRESSED IN FEET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. THE ELEVATIONS AND TOPOGRAPHIC CONTOURS INSIDE PHASE I AND II OF THE SCA WERE OBTAINED FROM FIELD MEASUREMENTS TAKEN BY PARSONS DURING THE 2011 AND 2012 CONSTRUCTION SEASONS.
4. DESIGN GRADES FOR SCA BERMS AND BASIN BERMS ARE SHOWN FOR REFERENCE.

LEGEND

- 430 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- 440 – – – PROPOSED PERIMETER BERM
- 427 SUBGRADE 1 FT CONTOUR
- 430 SUBGRADE 5 FT CONTOUR
- EXISTING ROAD
- B WEIR BOX 5 — EXISTING WEIR BOX
- PHASE BOUNDARY

RECORD DRAWING

THESE DRAWINGS HAVE BEEN ANNOTATED TO REFLECT MAJOR CHANGES, IF ANY, WHICH HAVE OCCURRED DURING CONSTRUCTION. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS WHO ARE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED, TO THE BEST OF OUR KNOWLEDGE, INFORMATION, AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

PER: DDS DATE: 1/15/13

NO.	DESCRIPTION	DATE	DRAWN	CH'CD	APP'VD
B	RECORD DRAWING ADDED PHASE II DATA	1/8/13	JTS		
A	RECORD DRAWING	5/2/12	JTS	DDS	

DRAWN BY	JTS	DATE 1/8/13
CHECKED BY	DDS	DATE 1/8/13
APPROVED BY		DATE
PROJECT MGR.		DATE

SEAL: STATE OF NEW YORK * DAVID D. STEEL * 085220 * LICENSED PROFESSIONAL ENGINEER

PARSONS
COMMERCIAL TECHNOLOGY GROUP
OFFICE
301 PLAINFIELD ROAD
SYRACUSE, NY 13212
(315) 451-9560

JOB 444853
WBS

PROJECT TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA
ONONDAGA LAKE BOTTOM
SUBSITE REMEDIAL DESIGN

DRAWING TITLE
BERM AND SUBGRADE GRADING PLAN

SCALE: SCALE: 1" = 120'
(IF PRINTED ON 22x34 SHEET)

DRAWING NO. 444853-101-C-003A REV. B

FILE NAME: P:\HONEYWELL -SYR\444853 - LAKE DETAIL DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\DESIGN_TASK 100 SCA CIVIL-GEOTECH DESIGN\CIVIL\PARSONS RECORD DRAWINGS\XREF\X2991002.DWG
PLOT DATE: ----- PLOTTED BY: SIVALIA, JACK

Low-Permeability Soil Liner

NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING OUTSIDE OF THE SCA WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.
2. COORDINATES SHOWN HEREIN ARE EXPRESSED IN U.S. SURVEY FEET AND REFERENCED TO THE NORTH AMERICAN DATUM OF 1983/1996 (NAD 83/96) – NEW YORK STATE PLANE GRID, ZONE CENTRAL. ELEVATIONS SHOWN HEREIN ARE EXPRESSED IN FEET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. THE ELEVATIONS AND TOPOGRAPHIC CONTOURS INSIDE PHASE I AND PHASE II OF THE SCA WERE OBTAINED FROM FIELD MEASUREMENTS TAKEN BY PARSONS DURING THE 2011 AND 2012 CONSTRUCTION SEASONS.
4. DESIGN GRADES FOR SCA BERMS, BASIN BERMS AND PHASE III TOP OF LOW PERMEABILITY SOIL LAYER SHOWN FOR REFERENCE.

LEGEND

- SURVEY POINT
- 427.5 / 34kk — ELEVATION / POINT NUMBER
- 430 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- 427 — AS-BUILT TOP OF LOW PERMEABILITY LAYER 1 FT CONTOUR
- 430 — AS-BUILT TOP OF LOW PERMEABILITY LAYER 5 FT CONTOUR
- 435 — DESIGN TOP OF LOW PERMEABILITY LAYER 1 FT CONTOUR
- PERIMETER BERM
- EXISTING ROAD
- WEIR BOX 5 — EXISTING WEIR BOX
- PHASE BOUNDARY

RECORD DRAWING

THESE DRAWINGS HAVE BEEN ANNOTATED TO REFLECT MAJOR CHANGES, IF ANY, WHICH HAVE OCCURRED DURING CONSTRUCTION. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS WHO ARE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED, TO THE BEST OF OUR KNOWLEDGE, INFORMATION, AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

PER: DDS DATE: 1/9/13

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
B	RECORD DRAWING ADDED PHASE II AREA	1/8/13	JTS	DDS	
A	RECORD DRAWING	5/2/12	JTS	DDS	

DRAWN BY	JTS	DATE 1/8/13
CHECKED BY	DDS	DATE 1/8/13
APPROVED BY		DATE
PROJECT MGR.		DATE

SEAL: STATE OF NEW YORK — DAVID D. STEELE — 1/9/13 — 10.082293 — LICENSED PROFESSIONAL ENGINEER

PARSONS
COMMERCIAL TECHNOLOGY GROUP

OFFICE: 301 PLAINFIELD ROAD, SYRACUSE, NY 13212, (315) 451-9560
JOB: 444853
WBS:

PROJECT TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA
ONONDAGA LAKE BOTTOM
SUBSITE REMEDIAL DESIGN

DRAWING TITLE
TOP OF LOW PERMEABILITY SOIL LINER

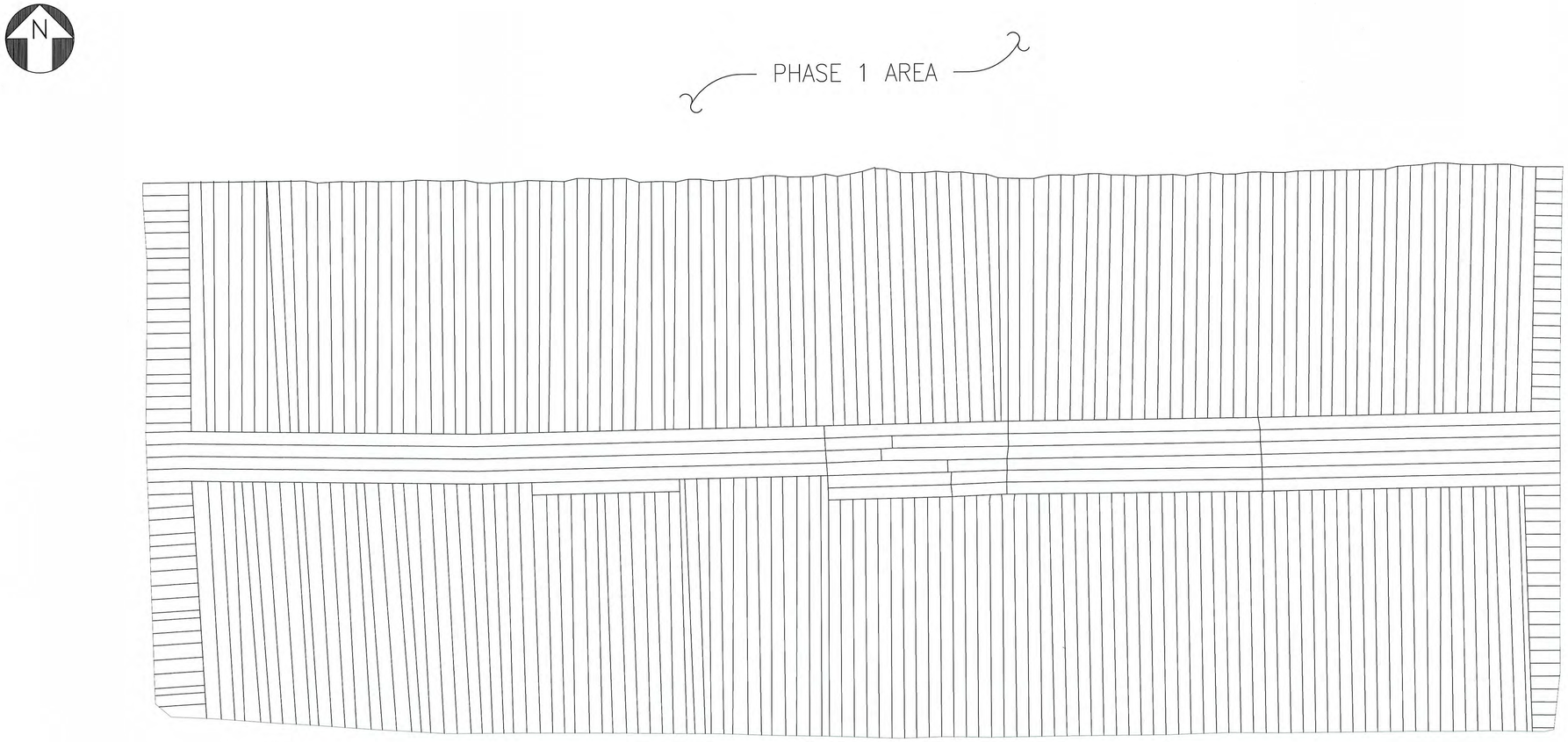
SCALE: SCALE: 1" = 120' (IF PRINTED ON 22x34 SHEET)

DRAWING NO.: 444853-101-C-004A REV.: B

0 120' 240'
SCALE IN FEET

FILE NAME: P:\HONEYWELL -SYR\444853 - LAKE DETAIL DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\DESIGN_TASK 100 SCA CIVIL-GEOTECH DESIGN\CIVIL\PARSONS RECORD DRAWINGS\XREF\429Y1002.DWG
PLOT DATE: ---- PLOTTED BY: SIVALIA, JACK

Geotextile Panel Layout



PHASE 2 SCA GEOTEXTILE FABRIC PANEL LOCATION PLAN

SCALE: 1"=80'

PANEL ORIENTATION GENERALLY EAST–WEST IN THIS AREA

PANEL ORIENTATION GENERALLY NORTH–SOUTH IN THIS AREA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE SEAL OF AN ENGINEER OR LAND SURVEYOR IS ALTERED, THE ALTERING ENGINEER OR LAND SURVEYOR SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

80 40 0 80 160

SCALE: 1"=80'

RECORD DRAWING

THESE DRAWINGS HAVE BEEN ANNOTATED TO REFLECT MAJOR CHANGES, IF ANY, WHICH HAVE OCCURRED DURING CONSTRUCTION. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS WHO ARE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED, TO THE BEST OF OUR KNOWLEDGE, INFORMATION, AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

PER: DDS DATE: 1/15/13

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
A	RECORD DRAWING	1/4/13	JHG	DDS	

DRAWN BY	JHG	DATE	1/4/13
CHECKED BY	DDS	DATE	1/4/13
APPROVED BY		DATE	
PROJECT MGR.		DATE	

SEAL: STATE OF NEW YORK · DAVID D. STEELE · LICENSED PROFESSIONAL ENGINEER · NO. 082293

PARSONS
COMMERCIAL TECHNOLOGY GROUP

OFFICE
301 PLAINFIELD ROAD
SYRACUSE, NY 13212
(315) 451–9560

JOB 444853

WBS

PROJECT TITLE

Honeywell
ONONDAGA LAKE
SCA CIVIL–GEOTECHNICAL DESIGN
SYRACUSE, NEW YORK

DRAWING TITLE

PHASE 2
SCA GEOTEXTILE INSTALLATION

SCALE: SCALE: 1" = 80'
(IF PRINTED ON 22x34 SHEET)

DRAWING NO. 444853–100–C–901

REV. A

FILE NAME: P:\HONEYWELL –SYR\444853 – LAKE DETAIL DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\DESIGN_TASK 100 SCA CIVIL–GEOTECH DESIGN\CIVIL\PARSONS RECORD DRAWINGS\SCA GEOTEXTILE\444853–100–C–903.DWG
PLOT DATE: 1/15/2013 4:17 PM PLOTTED BY: GOLDTHWAIT, JAMES

Gravel Drainage Layer

NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING OUTSIDE OF THE SCA WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.
2. COORDINATES SHOWN HEREIN ARE EXPRESSED IN U.S. SURVEY FEET AND REFERENCED TO THE NORTH AMERICAN DATUM OF 1983/1996 (NAD 83/96) – NEW YORK STATE PLANE GRID, ZONE CENTRAL. ELEVATIONS SHOWN HEREIN ARE EXPRESSED IN FEET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. THE ELEVATIONS AND TOPOGRAPHIC CONTOURS INSIDE THE SCA WERE OBTAINED FROM FIELD MEASUREMENTS TAKEN BY PARSONS BEFORE NOVEMBER 17, 2012.
4. DESIGN GRADES FOR SCA BERMS, BASIN BERMS AND PHASE III SHOWN FOR REFERENCE.

LEGEND

- SURVEY POINT
- 427.5 / 34kk — ELEVATION / POINT NUMBER
- 430 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- 427 — AS–BUILT TOP OF GRAVEL LAYER, 1 FT CONTOUR
- 430 — AS–BUILT TOP OF GRAVEL LAYER, 5 FT CONTOUR
- 435 — DESIGN TOP OF GRAVEL LAYER 1 FT CONTOUR
- EXISTING ROAD
- B WEIR BOX 5 — EXISTING WEIR BOX
- PHASE BOUNDARY

RECORD DRAWING

THESE DRAWINGS HAVE BEEN ANNOTATED TO REFLECT MAJOR CHANGES, IF ANY, WHICH HAVE OCCURRED DURING CONSTRUCTION. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS WHO ARE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED. TO THE BEST OF OUR KNOWLEDGE, INFORMATION, AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

PER: DDS DATE: 1/15/13

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
A	RECORD DRAWING	1/8/12	JTS	DDS	

DRAWN BY	JTS	DATE	1/8/12
CHECKED BY	DDS	DATE	1/8/12
APPROVED BY		DATE	
PROJECT MGR.		DATE	

SEAL: STATE OF NEW YORK — DAVID D. STEEL — 1/15/13 — No. 082223 — LICENSED PROFESSIONAL ENGINEER

PARSONS
COMMERCIAL TECHNOLOGY GROUP
OFFICE: 301 PLAINFIELD ROAD, SYRACUSE, NY 13212, (315) 451-9560

JOB: 444853
WBS:

PROJECT TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA ONONDAGA LAKE BOTTOM SUBSITE REMEDIAL DESIGN

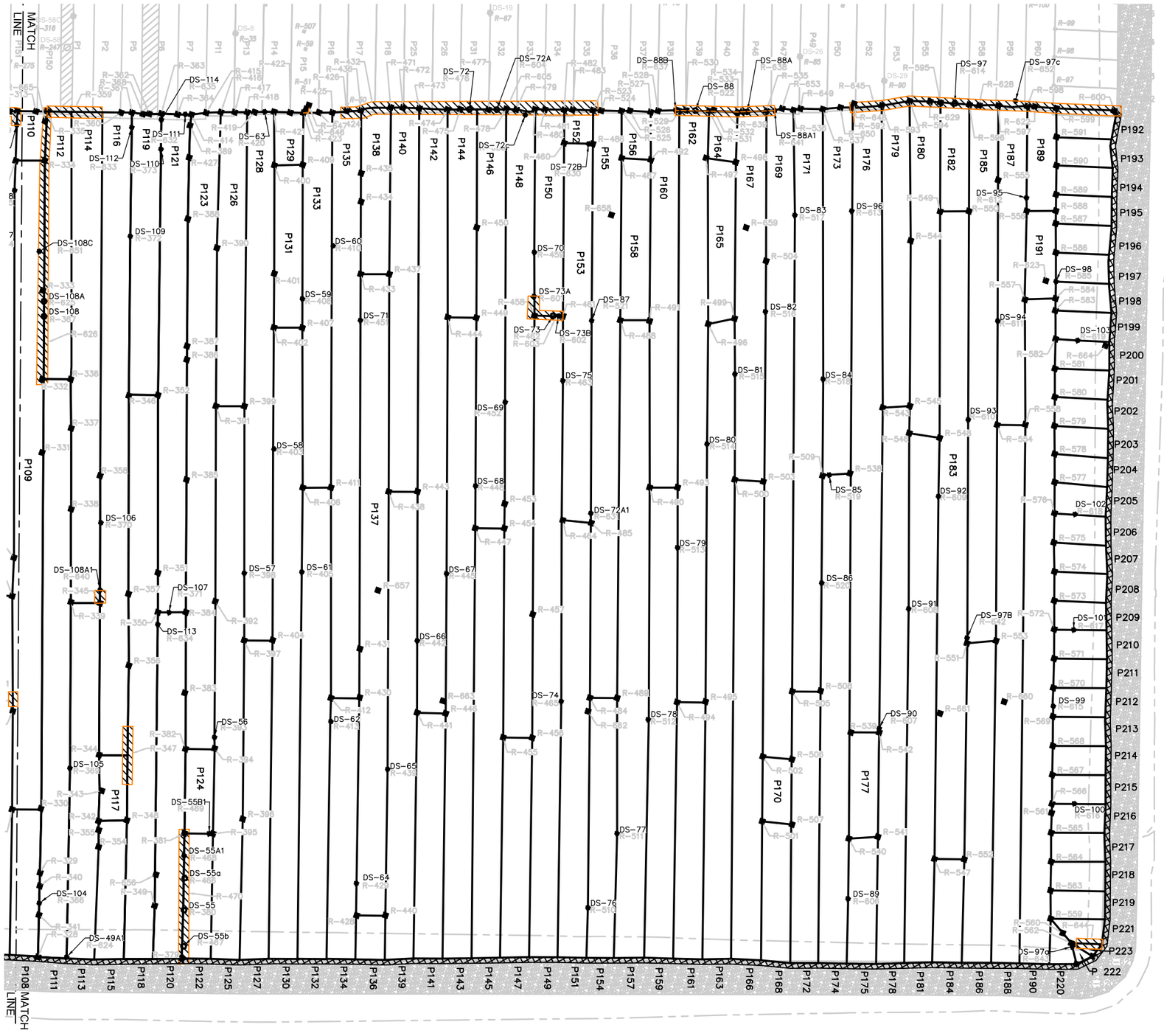
DRAWING TITLE
TOP OF GRAVEL DRAINAGE LAYER

SCALE: SCALE: 1" = 120' (IF PRINTED ON 22x34 SHEET)

DRAWING NO.: 444853-101-C-006A REV.: A

FILE NAME: P:\HONEYWELL -SYR\444853 - LAKE DETAIL DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\DESIGN_TASK 100 SCA CIVIL-GEOTECH DESIGN\CIVIL\PARSONS RECORD DRAWINGS\SCA\444853-101-C-006A\444853-101-C-006A.DWG
PLOT DATE: 1/15/2013 4:22 PM PLOTTED BY: GOLDTHWAIT, JAMES

Geomembrane Panel Layout and Seam Repair/Destructive Sample Location Drawings



LEGEND

P3	PHASE II GEOMEMBRANE PANEL
R-1	PHASE II PATCH REPAIR
DS-1	PHASE II DESTRUCTIVE SAMPLE (PASS)
DS-2	PHASE II PHASE II DESTRUCTIVE SAMPLE (FAIL)
	PHASE II CAPPED SEAM
	PHASE II LINER SEAM
	PHASE II ANCHOR TRENCH
	TOE OF SLOPE
P3	PHASE I GEOMEMBRANE PANEL
R-1	PHASE I PATCH REPAIR
DS-1	PHASE I DESTRUCTIVE SAMPLE (PASS)
DS-2	PHASE I PHASE II DESTRUCTIVE SAMPLE (FAIL)
	PHASE I CAPPED SEAM
	PHASE I LINER SEAM
	PHASE I ANCHOR TRENCH

NOTES:

1. PANEL LOCATIONS BASED ON FIELD SURVEYS CONDUCTED BY PARSONS FIELD PERSONNEL USING GLOBAL POSITIONING SYSTEM (GPS) DURING THE INSTALLATION. PANELS ARE SHOWN AS MEASURED BY THE SURVEY (I.E. TWO DIMENSIONS).
2. ALONG THE PERIMETER SLOPE, A SACRIFICIAL GEOMEMBRANE WAS INSTALLED OVER THE CUSHION GEOTEXTILE.
3. DESTRUCTIVE SEAM SAMPLES WERE REPAIRED BY EXTRUSION WELDING A CAP/PATCH. AS PART OF THE REPAIR OF FAILING DESTRUCTIVE SAMPLES (DS), (I) DS- 55 IS BOUNDED ON THE BEFORE SIDE BY DS-55B1 AND ON THE AFTER SIDE BY DS-55A1, (II) DS-72 IS BOUNDED ON THE BEFORE SIDE BY DS-72B AND ON THE AFTER SIDE BY DS-72A1, (III) DS-73 IS BOUNDED ON THE BEFORE SIDE BY BS-73B AND ON THE AFTER SIDE BY DS-73A, (IV) DS-88 IS BOUNDED ON THE BEFORE SIDE BY DS-88B AND ON THE AFTER SIDE BY DS-88A1, (V) DS-97 IS BOUNDED ON THE BEFORE SIDE BY DS-97B AND ON THE AFTER SIDE BY DS-97A, AND (VI) DS-108 IS BOUNDED ON THE BEFORE SIDE BY DS-108B (SHOWN ON SHEET 2) AND ON THE AFTER SIDE BY DS-108A1.

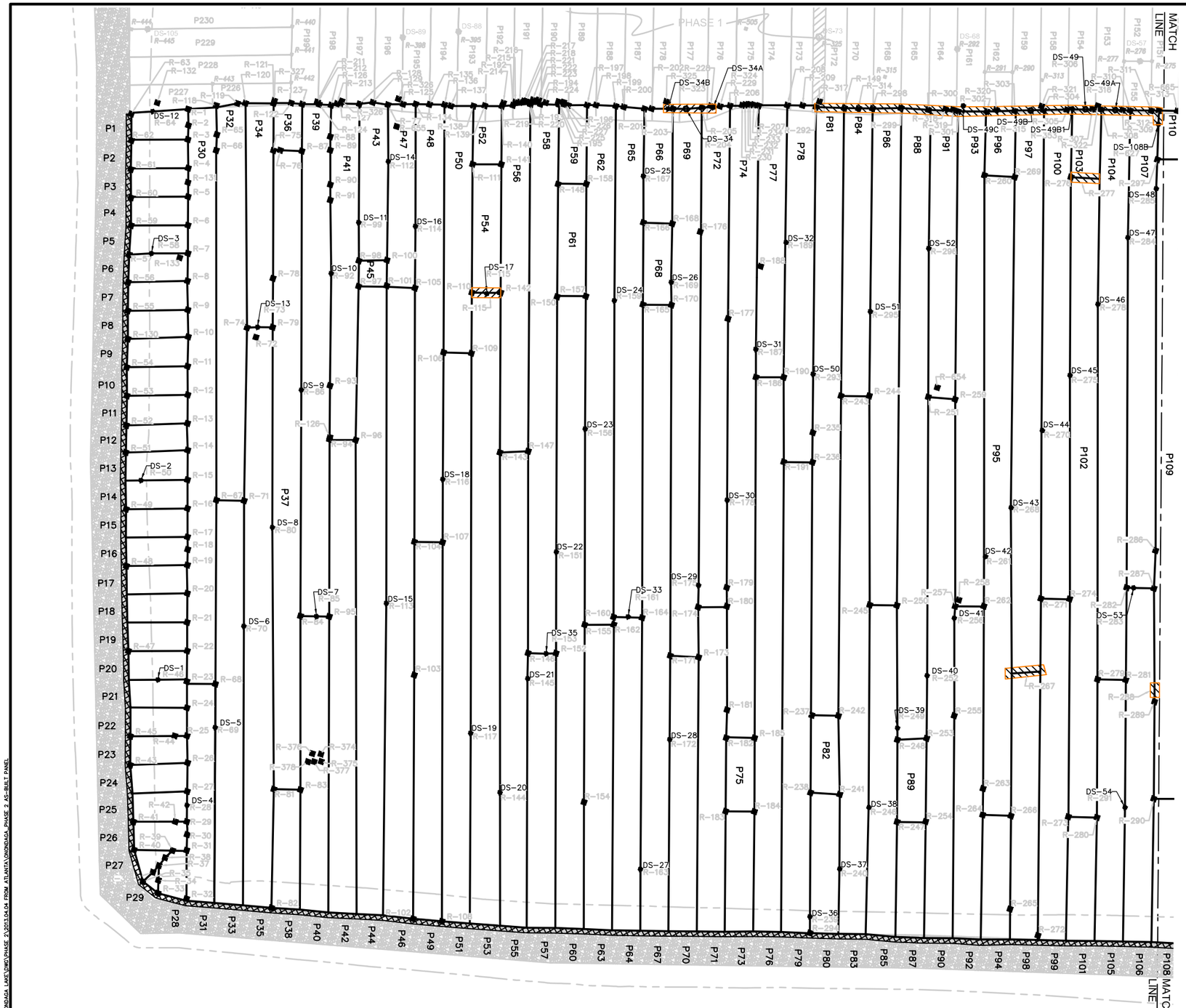
PHASE 2 GEOMEMBRANE PANEL DRAWING ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA CAMILLUS, NEW YORK

0 40' 80'
SCALE IN FEET

Geosyntec consultants — ACTON, MA

DATE:	2013 APRIL	SCALE:	AS SHOWN
PROJECT NO.	GJ4706B	FILE NO.	
DOCUMENT NO. 12	GJ4706	FIGURE NO.	1 OF 2

T:\PROJECTS_CAD\GJ\ONONDAGA LAKE\DWG\PHASE 2\2013.04.04 FROM ATLANTA\ONONDAGA_PHASE 2 AS-BUILT PANEL



LEGEND

- P3 — PHASE II GEOMEMBRANE PANEL
- R-1 — PHASE II PATCH REPAIR
- DS-1 — PHASE II DESTRUCTIVE SAMPLE (PASS)
- DS-2 — PHASE II PHASE II DESTRUCTIVE SAMPLE (FAIL)
- PHASE II CAPPED SEAM
- PHASE II LINER SEAM
- PHASE II ANCHOR TRENCH
- TOE OF SLOPE
- P3 — PHASE I GEOMEMBRANE PANEL
- R-1 — PHASE I PATCH REPAIR
- DS-1 — PHASE I DESTRUCTIVE SAMPLE (PASS)
- DS-2 — PHASE I PHASE II DESTRUCTIVE SAMPLE (FAIL)
- PHASE I CAPPED SEAM
- PHASE I LINER SEAM
- PHASE I ANCHOR TRENCH

NOTES:

1. PANEL LOCATIONS BASED ON FIELD SURVEYS CONDUCTED BY PARSONS FIELD PERSONNEL USING GLOBAL POSITIONING SYSTEM (GPS) DURING THE INSTALLATION. PANELS ARE SHOWN AS MEASURED BY THE SURVEY (I.E. TWO DIMENSIONS).
2. ALONG THE PERIMETER SLOPE, A SACRIFICIAL GEOMEMBRANE WAS INSTALLED OVER THE CUSHION GEOTEXTILE.
3. DESTRUCTIVE SEAM SAMPLES WERE REPAIRED BY EXTRUSION WELDING A CAP/PATCH. AS PART OF THE REPAIR OF FAILING DESTRUCTIVE SAMPLES (DS), (I) DS-49 IS BOUNDED ON THE BEFORE SIDE BY DS-49B1 AND ON THE AFTER SIDE BY DS-49A1, AND (II) DS-108B IS A BOUNDING REPAIR FOR DS-108 (SHOWN ON SHEET 1) ON THE BEFORE SIDE.
4. THE INDICATED LOCATION OF REPAIRS R-374 THROUGH R-378 ARE APPROXIMATE.

PHASE 2 GEOMEMBRANE PANEL DRAWING ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA CAMILLUS, NEW YORK

0 40' 80'
SCALE IN FEET

Geosyntec consultants — ACTON, MA

DATE:	2013 APRIL	SCALE:	AS SHOWN
PROJECT NO.	GJ4706B	FILE NO.	
DOCUMENT NO. 12	GJ4706	FIGURE NO.	2 OF 2

T:\PROJECTS_CADD\ONONDAGA LAKE\DWG\PHASE 2\2013.04.04 FROM ATLANTA\ONONDAGA_PHASE 2 AS-BUILT PANEL