Geotechnical and Geosynthetic
Construction Quality Assurance Report
for CCSWDC, Phase I Closure
Sarasota County, Florida

VOLUME 2 of 4

Ardaman & Associates, Inc.

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APPENDIX 1

Construction Quality Assurance Test Results For LLDPE Geomembrane

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *CVZ* #:0.13

DATE: 01/31/2012

Jan Wildman
Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809

Dear Ms. Wildman:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of one (1) 40mil LLDPE Microspike and (1) 60mil HDPE Microspike Geomembrane samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120053

DATE RECEIVED: January 27, 2012 **DATE REPORTED:** January 31, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
CT-**T**-17 R#302101.12	79156
CT-**T**-21 R#203578.12	79157

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D1603	Carbon Black Content
ASTM D5596	Carbon Black Dispersion
ASTM D1505	Density
ASTM D1238	Melt Flow Index
ASTM D4833	Puncture Resistance

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 and 2.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County CCSW Phase I Class I Lf Closure

Date Received: **1/27/2012**
Date Reported: **1/31/2012**
Client Sample ID: **CT-T-17 R#302101.12**
Material Description: **40mil LLDPE Microspike Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120053**
PGL Control No.: **79156**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D1505	Density (grams/ cm.^{3})															
		0.9378	0.9378	0.9378								0.9378	0.0000	0.9378	0.9378	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended beyond the outer edges of the clamping plates.															
		90	93	92	94	100	102	97	96	97	98	96	3	90	102	
		97	98	97	95	92										
ASTM D1603	Carbon Black Content (percent, %)															
		2.38	2.31									2.35	0.05	2.31	2.38	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	
ASTM D1238 Procedure A	Melt Flow Index (grams/ 6 minutes)															
	Condition FR-190/2.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190^0 C and 2.16kg load.															
		0.2039	0.2020	0.2021								0.2027	0.0011	0.2020	0.2039	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: OVZ #:0.13

DATE: 03/02/2012

Jan Wildman
Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809

Dear Ms. Wildman:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of one (1) 40mil LLDPE Microspike Geomembrane sample.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120152

DATE RECEIVED: February 29, 2012 **DATE REPORTED:** March 2, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
CT-T-39 R#207523.12	79666

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D1603	Carbon Black Content
ASTM D5596	Carbon Black Dispersion
ASTM D1505	Density
ASTM D1238	Melt Flow Index
ASTM D4833	Puncture Resistance

TEST CONDITIONS: The sample was conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the sample tested is believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County CCSW Phase I Class I Lf Closure

Date Received: **2/29/2012**
Date Reported: **3/2/2012**
Client Sample ID: **CT-T-39 R#207523.12**
Material Description: **40mil LLDPE Microspike Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120152**
PGL Control No.: **79666**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D1505	Density (grams/ cm.^{3})															
		0.9349	0.9349	0.9349								0.9349	0.0000	0.9349	0.9349	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended beyond the outer edges of the clamping plates.															
		108	114	110	115	122	119	110	108	110	111	112	5	107	122	
		114	107	119	109	109										
ASTM D1603	Carbon Black Content (percent, %)															
		2.16	2.19									2.18	0.01	2.16	2.19	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	
ASTM D1238 Procedure A	Melt Flow Index (grams/ 6 minutes)															
	Condition FR-190/2.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190^0 C and 2.16kg load.															
		0.1690	0.1685	0.1693								0.1689	0.0004	0.1685	0.1693	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/15/12

DATE REPORTED: 01/18/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLE RECEIVED: 01/10/12

INCOMING SAMPLE NO.: Roll #301331-12 T/T

LABORATORY IDENTIFICATION NO.: 097375/CT-T-1

CONDITIONING: >24 HOURS 72 °F 20 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-	-	-	-	-	-	-	-	-
	XD		18	16	23	21	17						19	2.9	15.3
Yield Strength, lb/in	MD		76	78	79	81	78						79	3.1	3.9
	XD		83	82	80	78	82						81	1.9	2.3
Break Elongation, %	MD		453	516	530	508	418						485	48	9.9
	XD		524	584	547	503	452						522	49	9.4
Break Strength, lb/in	MD		147	139	146	169	159						152	12	7.9
	XD		116	128	131	118	104						119	11	9.2

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

The test data and all associated project information presented hereon shall be held in confidence and disclosed to other parties only with the authorization of the Client. Physical and electronic records of each project are kept for a minimum of 7 years. Test samples are kept in storage for at least 10 working days after mailing of the test report, prior to being discarded, unless a longer storage period is requested in writing and accepted by Ardaman & Associates, Inc.

Checked By: TM Date: 01/18/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/15/12

DATE REPORTED: 01/18/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLE RECEIVED: 01/10/12

INCOMING SAMPLE NO.: Roll #301433-12 T/T

LABORATORY IDENTIFICATION NO.: 097375/CT-T-2

CONDITIONING: >24 HOURS 72 °F 20 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-	-	-	-	-	-	-	-	-
	XD		17	17	22	21	19						19	2.2	11.6
Yield Strength, lb/in	MD		78	81	79	82	78						80	1.7	2.1
	XD		78	85	78	78	81						80	2.9	3.6
Break Elongation, %	MD		464	483	506	493	486						486	15	3.1
	XD		502	506	586	560	577						546	40	7.3
Break Strength, lb/in	MD		156	178	138	144	151						153	16	10.5
	XD		109	115	134	132	134						125	12	9.6

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/18/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/15/12

DATE REPORTED: 01/18/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLE RECEIVED: 01/10/12

INCOMING SAMPLE NO.: Roll #301438-12 T/T

LABORATORY IDENTIFICATION NO.: 097375/CT-T-3

CONDITIONING: >24 HOURS 72 °F 20 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-	-	-	-	-	-	-	-	-
	XD		16	17	19	19	22						19	2.3	12.1
Yield Strength, lb/in	MD		80	77	81	77	78						79	1.7	2.2
	XD		80	84	82	81	80						81	1.8	2.2
Break Elongation, %	MD		413	473	529	482	464						472	41	8.7
	XD		576	592	608	581	490						569	46	8.1
Break Strength, lb/in	MD		143	184	142	145	128						148	21	14.2
	XD		125	135	142	137	116						131	11	8.4

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TJ

Date: 01/18/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/15/12

DATE REPORTED: 01/18/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLE RECEIVED: 01/10/12

INCOMING SAMPLE NO.: Roll #301544-12 T/T

LABORATORY IDENTIFICATION NO.: 097375/CT-T-4

CONDITIONING: >24 HOURS 73 °F 20 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-	-	-	-	-	-	-	-	-
	XD		20	22	24	18	18						20	2.7	13.5
Yield Strength, lb/in	MD		79	77	76	72	71						75	3.2	4.3
	XD		77	80	75	73	71						75	3.5	4.7
Break Elongation, %	MD		506	532	515	552	502						521	21	4.0
	XD		564	638	581	547	561						578	36	6.2
Break Strength, lb/in	MD		162	146	124	148	151						146	14	9.6
	XD		128	154	136	118	118						131	15	11.5

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/18/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 301548-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-16

CONDITIONING: >24 HOURS 73 °F 37 - 39% RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	17	22	21	19						19	1.9	10.0
Yield Strength, lb/in	MD		75	75	77	81	80						78	2.7	3.5
	XD		78	80	78	81	81						79	1.7	2.2
Break Elongation, %	MD		502	480	524	543	518						513	24	4.7
	XD		608	573	553	593	618						589	27	4.6
Break Strength, lb/in	MD		169	153	138	145	163						154	13	8.4
	XD		131	126	130	140	146						135	8.1	6.0

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/19/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/16/12

INCOMING SAMPLE NO.: **Roll No. 301550-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-7

CONDITIONING: >24 HOURS 73 °F 30 - 34 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	16	24	21	18						19	3.0	15.8
Yield Strength, lb/in	MD		81	76	76	77	83						78	3.3	4.2
	XD		78	74	79	78	83						78	3.4	4.4
Break Elongation, %	MD		472	485	511	376	461						461	51	11.1
	XD		572	537	577	557	580						565	18	3.2
Break Strength, lb/in	MD		172	159	128	103	170						146	30	20.5
	XD		123	114	136	131	135						128	9.4	7.3

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/19/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/16/12

INCOMING SAMPLE NO.: **Roll No. 301655-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-8

CONDITIONING: >24 HOURS 73 °F 30 - 34 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		18	18	20	21	22						20	1.6	8.0
Yield Strength, lb/in	MD		75	75	76	76	75						76	0.4	0.5
	XD		78	73	77	76	78						76	2.0	2.6
Break Elongation, %	MD		487	480	532	530	520						510	25	4.9
	XD		560	543	555	617	563						568	29	5.1
Break Strength, lb/in	MD		150	177	140	143	158						154	15	9.7
	XD		121	120	127	145	129						128	10	7.8

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/16/12

INCOMING SAMPLE NO.: **Roll No. 301659-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-9

CONDITIONING: >24 HOURS 72 °F 33 - 35 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		16	17	20	17	21						18	2.1	11.7
Yield Strength, lb/in	MD		78	74	76	78	79						77	1.9	2.5
	XD		79	81	81	81	79						80	1.1	1.4
Break Elongation, %	MD		460	496	520	492	499						493	22	4.5
	XD		507	583	573	555	548						553	29	5.2
Break Strength, lb/in	MD		143	139	139	146	142						142	2.9	2.0
	XD		107	135	137	123	131						127	12	9.4

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/16/12

INCOMING SAMPLE NO.: **Roll No. 301763-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-10

CONDITIONING: >24 HOURS 72 °F 33 - 35 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		21	17	22	24	19						21	2.5	11.9
Yield Strength, lb/in	MD		78	73	71	77	80						75	3.9	5.2
	XD		77	76	73	78	83						77	3.6	4.7
Break Elongation, %	MD		502	475	468	488	485						483	13	2.7
	XD		560	547	488	509	486						518	34	6.6
Break Strength, lb/in	MD		150	134	122	125	170						140	20	14.3
	XD		122	118	109	119	115						117	5.0	4.3

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 301767-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-11

CONDITIONING: >24 HOURS 73 °F 36 - 37 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		16	17	21	18	20						18	2.1	11.7
Yield Strength, lb/in	MD		79	78	78	81	77						78	2.0	2.6
	XD		80	76	75	86	79						79	4.2	5.3
Break Elongation, %	MD		469	471	508	485	488						484	15	3.1
	XD		555	596	540	606	471						554	54	9.7
Break Strength, lb/in	MD		162	185	135	162	147						158	19	12.0
	XD		125	129	122	147	109						126	14	11.1

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 302101-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-17

CONDITIONING: >24 HOURS 73 °F 37 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		16	17	22	20	21						19	2.4	12.6
Yield Strength, lb/in	MD		78	77	75	81	81						79	3.1	3.9
	XD		82	82	79	87	80						82	3.2	3.9
Break Elongation, %	MD		446	483	512	508	493						488	27	5.5
	XD		587	587	555	588	500						563	38	6.8
Break Strength, lb/in	MD		155	153	129	150	159						149	12	8.1
	XD		127	131	127	143	115						129	10	7.8

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/24/12

DATE REPORTED: 01/27/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/16/12

INCOMING SAMPLE NO.: **Roll No. 302101.12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-17

CONDITIONING: >24 HOURS 73 °F 39-40 %RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Thickness, mils		ASTM D5994 ☒ ASTM D5199 ☐	38.2	37.8	38.6	39.4	40.2	41.3	40.2	42.5	42.1	40.9	40.1	1.6	4.1
Asperity Height, mils	A-side	ASTM D7466	39	35	35	39	37	36	36	35	35	37	36	1.6	4.3
	B-side		34	34	34	34	41	35	34	35	36	35	35	2.1	6.1
Tear Resistance, lb	MD	ASTM D1004	29.7	30.4	34.8	29.6	31.5	31.6	32.0	32.4	34.2	31.3	31.7	1.7	5.5
	XD		31.3	28.2	29.1	29.6	29.2	31.5	32.0	30.6	32.8	32.8	30.7	1.6	5.2
Maximum Extension, inch	MD		0.93	1.07	0.90	0.89	0.76	0.94	0.92	1.11	0.96	0.93	0.94	0.10	10.6
	XD		0.97	0.50	0.50	0.83	0.89	0.95	0.93	0.97	0.99	0.76	0.83	0.19	22.9
Tear Resistance Specimen Thickness, mils	MD	ASTM D5994 ☒ ASTM D5199 ☐	38.8	38.7	41.2	39.1	43.0	41.2	44.4	42.8	41.6	42.3	41.3	1.9	4.7
	XD		40.0	40.8	40.6	39.9	40.8	41.3	42.2	42.2	41.6	41.7	41.1	0.8	2.0

Comments:
1) ASTM D5994 - [Mitutoyo digital thickness gage; conical tips with 2.0 oz dead weight on specimen; 5 second loading time interval].
2) ASTM D1004 - [INSTRON 3345 testing machine; 1,000 lb. load cell; 2 inch/minute testing speed].
3) Thickness of tear resistance specimens measured using: Mitutoyo digital thickness gage; conical tips with 2.0 oz dead weight on specimen; 5 second loading time interval; Average value from three measurements per specimen reported.
4) ASTM D7466 - [Mahr Federal gage; tapered tip; 5 second loading time interval].

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Checked By: TM Date: 01/27/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 302106-13 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-13

CONDITIONING: >24 HOURS 73 °F 37 - 38 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	20	23	16	18						18	3.0	16.7
Yield Strength, lb/in	MD		80	74	77	80	85						79	4.6	5.8
	XD		83	76	80	85	87						82	4.5	5.5
Break Elongation, %	MD		483	499	495	518	488						497	14	2.8
	XD		423	537	526	513	618						524	70	13.4
Break Strength, lb/in	MD		174	134	123	155	181						154	25	16.2
	XD		96	119	122	119	145						120	17	14.2

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 302110-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-12

CONDITIONING: >24 HOURS 73 °F 36 - 37 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		19	18	21	22	19						20	1.6	8.0
Yield Strength, lb/in	MD		76	72	74	78	76						75	2.4	3.2
	XD		79	72	76	78	80						77	2.9	3.8
Break Elongation, %	MD		478	492	491	485	498						489	7.3	1.5
	XD		608	504	536	585	558						558	41	7.3
Break Strength, lb/in	MD		148	170	133	146	136						147	14	9.5
	XD		135	105	122	138	126						125	13	10.4

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 302213-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-14

CONDITIONING: >24 HOURS 73 °F 37 - 38 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	16	22	22	19						19	2.4	12.6
Yield Strength, lb/in	MD		79	87	84	85	87						84	3.1	3.7
	XD		83	88	85	84	89						86	2.6	3.0
Break Elongation, %	MD		510	479	481	501	472						489	16	3.3
	XD		587	495	556	558	599						559	40	7.2
Break Strength, lb/in	MD		165	175	150	144	161						159	12	7.5
	XD		136	120	139	137	149						136	10	7.4

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/20/12

DATE REPORTED: 01/20/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/016/12

INCOMING SAMPLE NO.: **Roll No. 302217-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-15

CONDITIONING: >24 HOURS 73 °F 37 - 39% RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	14	20	24	22						19	4.5	23.7
Yield Strength, lb/in	MD		80	75	79	81	73						77	3.7	4.8
	XD		77	81	79	78	73						78	2.9	3.7
Break Elongation, %	MD		461	466	525	524	532						502	35	7.0
	XD		593	530	557	534	577						558	27	4.8
Break Strength, lb/in	MD		175	162	167	141	132						156	18	11.5
	XD		126	113	133	127	133						126	8.1	6.4

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304102-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-23

CONDITIONING: >24 HOURS 72 °F 43-44 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	18	22	19	20						19	2.4	12.6
Yield Strength, lb/in	MD		74	73	83	80	73						77	4.6	6.0
	XD		78	78	84	82	73						79	4.0	5.1
Break Elongation, %	MD		447	514	516	482	486						489	29	5.9
	XD		515	542	510	494	620						536	50	9.3
Break Strength, lb/in	MD		172	147	150	168	148						157	12	7.6
	XD		106	122	126	119	138						122	12	9.8

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: DM No.: 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304206-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-24

CONDITIONING: >24 HOURS 72 °F 42 - 44 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		14	19	21	20	16						18	2.8	15.6
Yield Strength, lb/in	MD		82	78	83	78	82						81	2.4	3.0
	XD		83	75	80	84	83						81	3.6	4.4
Break Elongation, %	MD		444	462	479	476	473						467	14	3.0
	XD		528	549	524	471	528						520	29	5.6
Break Strength, lb/in	MD		180	168	132	138	175						159	22	13.8
	XD		114	122	129	114	124						121	7	5.8

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: JM No.: 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304211-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-25

CONDITIONING: >24 HOURS 72 °F 43 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	22	22	21	22						21	2.9	13.8
Yield Strength, lb/in	MD		80	70	74	75	75						75	3.6	4.8
	XD		80	69	73	74	74						74	3.7	5.0
Break Elongation, %	MD		490	528	509	514	509						510	14	2.7
	XD		552	581	601	565	568						573	19	3.3
Break Strength, lb/in	MD		194	130	142	136	158						152	26	17.1
	XD		120	127	138	133	128						129	7	5.4

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JAW Date: 02/07/12

GAI-LAP

Initials: TM No.: 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304314-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-26

CONDITIONING: >24 HOURS 72 °F 43 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		14	19	24	22	18						20	4.0	20.0
Yield Strength, lb/in	MD		80	73	76	81	80						78	3.4	4.3
	XD		85	77	77	80	81						80	3.2	4.0
Break Elongation, %	MD		456	450	472	485	488						470	17	3.6
	XD		608	554	585	600	532						576	32	5.6
Break Strength, lb/in	MD		196	120	122	129	169						147	34	23.1
	XD		134	122	140	151	122						134	12	9.0

Comments: (1) Yield elongation in the MD was not clearly defined and hence not reported. (2) Work order provided with samples listed roll 304315-12. As received sample was labeled 304314-12.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: JM No.: 43-01

Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/07/12

DATE REPORTED: 02/08/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304319-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-35

CONDITIONING: >24 HOURS 72-73°F 45 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	21	20	21	19						19	2.4	12.6
Yield Strength, lb/in	MD		78	73	78	80	79						78	2.7	3.5
	XD		81	71	75	76	78						76	3.9	5.1
Break Elongation, %	MD		458	477	541	531	519						505	36	7.1
	XD		617	589	601	574	559						588	23	3.9
Break Strength, lb/in	MD		173	132	152	157	154						154	15	9.7
	XD		134	126	138	135	132						133	5	3.8

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 02/09/12

GAI-LAP

Initials: TM No.: 43-01
Date: 02/09/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/07/12

DATE REPORTED: 02/08/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304423-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-36

CONDITIONING: >24 HOURS 72 °F 44 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		14	24	24	23	19						21	4.5	21.4
Yield Strength, lb/in	MD		82	71	78	85	82						80	5.4	6.8
	XD		86	70	78	80	80						79	5.7	7.2
Break Elongation, %	MD		487	510	506	557	499						512	27	5.3
	XD		561	486	472	424	559						501	59	11.8
Break Strength, lb/in	MD		201	133	140	148	167						158	27	17.1
	XD		127	109	117	107	134						119	12	10.1

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: TM Date: 02/08/12

GAI-LAP

Initials: TM No.: 43-01
Date: 02/08/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304428-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-27

CONDITIONING: >24 HOURS 72 °F 43 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		14	19	22	21	18						19	3.0	15.8
Yield Strength, lb/in	MD		82	81	84	83	78						81	2.2	2.7
	XD		86	73	83	80	80						80	4.5	5.6
Break Elongation, %	MD		404	425	548	512	484						475	60	12.6
	XD		526	570	588	564	544						558	24	4.3
Break Strength, lb/in	MD		163	148	153	146	165						155	9	5.8
	XD		115	124	148	143	125						131	14	10.7

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: JM No.: 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304533-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-28

CONDITIONING: >24 HOURS 72 °F 41 - 42 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	19	22	19	17						18	2.5	13.9
Yield Strength, lb/in	MD		77	70	73	76	79						75	3.5	4.7
	XD		81	74	76	82	77						78	3.1	4.0
Break Elongation, %	MD		452	485	521	520	482						492	29	5.9
	XD		549	480	576	589	549						549	42	7.7
Break Strength, lb/in	MD		185	127	136	144	181						154	27	17.5
	XD		117	104	136	142	122						124	15	12.1

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: JM No.: 43-01

Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304538-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-29

CONDITIONING: >24 HOURS 72 °F 42 - 43 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		21	17	21	19	17						19	2.0	10.5
Yield Strength, lb/in	MD		77	81	81	80	80						80	1.6	2.0
	XD		79	85	82	79	81						81	2.5	3.1
Break Elongation, %	MD		501	490	502	472	435						480	28	5.8
	XD		518	534	548	506	564						534	23	4.3
Break Strength, lb/in	MD		152	148	160	167	170						160	9	5.6
	XD		121	129	134	117	125						125	7	5.6

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: TM No. 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304644-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-30

CONDITIONING: >24 HOURS 72 °F 39 - 41 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	19	22	17	23						20	2.7	13.5
Yield Strength, lb/in	MD		82	77	78	75	74						77	3.1	4.0
	XD		85	80	78	79	74						79	4.0	5.1
Break Elongation, %	MD		489	467	494	498	462						482	16	3.3
	XD		588	459	507	575	544						534	53	9.9
Break Strength, lb/in	MD		189	146	133	150	118						147	27	18.4
	XD		139	107	120	128	123						123	12	9.8

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: JM No. 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/0612

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304651-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-31

CONDITIONING: >24 HOURS 72 °F 41 - 42% RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	17	21	18	16						18	1.9	10.6
Yield Strength, lb/in	MD		78	84	80	80	81						81	2.2	2.7
	XD		81	84	80	78	78						80	2.4	3.0
Break Elongation, %	MD		517	497	495	447	434						478	35	7.3
	XD		510	547	524	564	625						554	45	8.1
Break Strength, lb/in	MD		156	147	151	172	153						156	10	6.4
	XD		117	128	127	125	137						127	7	5.5

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: JM No.: 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304756-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-32

CONDITIONING: >24 HOURS 72 °F 42 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		19	22	24	20	16						20	3.0	15.0
Yield Strength, lb/in	MD		82	86	83	80	82						83	2.2	2.7
	XD		85	87	84	81	82						84	2.5	3.0
Break Elongation, %	MD		479	505	502	488	475						490	13	2.7
	XD		552	561	591	524	558						557	24	4.3
Break Strength, lb/in	MD		146	151	142	178	169						157	16	10.2
	XD		131	140	147	122	122						132	11	8.3

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: MM No. 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 304760-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-33

CONDITIONING: >24 HOURS 72 °F 39 - 41 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		18	20	21	18	18						19	1.6	8.4
Yield Strength, lb/in	MD		85	81	83	78	78						81	3.1	3.8
	XD		85	87	83	80	81						83	2.7	3.3
Break Elongation, %	MD		467	511	546	482	471						495	33	6.7
	XD		594	598	594	534	578						580	27	4.7
Break Strength, lb/in	MD		167	155	144	143	160						154	10	6.5
	XD		143	151	148	121	124						137	14	10.2

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JAW Date: 02/07/12

GAI-LAP

Initials: TM No.: 43-01

Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/03/12

DATE REPORTED: 02/07/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 01/31/12

INCOMING SAMPLE NO.: **Roll No. 305103-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-34

CONDITIONING: >24 HOURS 73 °F 39-41 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		18	22	21	22	16						20	2.5	12.5
Yield Strength, lb/in	MD		76	82	84	78	81						80	3.2	4.0
	XD		81	85	86	80	78						82	3.3	4.0
Break Elongation, %	MD		484	513	505	487	458						489	22	4.5
	XD		576	559	519	564	573						558	23	4.1
Break Strength, lb/in	MD		142	163	147	149	173						155	13	8.4
	XD		132	141	137	136	124						134	6	4.5

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/07/12

GAI-LAP

Initials: TM No.: 43-01
Date: 02/07/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/27/12

DATE REPORTED: 02/28/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 02/23/12

INCOMING SAMPLE NO.: **Roll No. 207412-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-37

CONDITIONING: >24 HOURS 72 °F 42 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		15	18	19	19	16						17	1.5	8.8
Yield Strength, lb/in	MD		94	88	92	87	85						89	3.6	4.0
	XD		96	94	95	89	92						93	2.8	3.0
Break Elongation, %	MD		417	431	489	531	445						463	47	10.2
	XD		542	521	548	480	561						530	32	6.0
Break Strength, lb/in	MD		156	143	138	137	146						144	7.7	5.3
	XD		131	127	136	117	127						128	7.2	5.6

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/28/12

GAI-LAP

Initials: TM No.: 43-01
Date: 02/28/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/27/12

DATE REPORTED: 02/28/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 02/23/12

INCOMING SAMPLE NO.: **Roll No. 207517-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-38

CONDITIONING: >24 HOURS 72 °F 41-42 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	18	21	21	19						19	1.6	8.4
Yield Strength, lb/in	MD		89	84	83	86	83						85	2.5	2.9
	XD		89	87	83	85	89						87	2.9	3.3
Break Elongation, %	MD		476	485	488	501	455						481	17	3.5
	XD		556	567	504	540	557						545	25	4.6
Break Strength, lb/in	MD		176	141	132	139	136						145	18	12.4
	XD		133	133	120	130	134						130	5.6	4.3

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/28/12

GAI-LAP

Initials: TM No.: 43-01

Date: 02/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/27/12

DATE REPORTED: 02/28/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 02/23/12

INCOMING SAMPLE NO.: **Roll No. 207523-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-39

CONDITIONING: >24 HOURS 72 °F 41-42 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	18	21	20	19						19	1.3	6.8
Yield Strength, lb/in	MD		86	85	83	83	84						84	1.5	1.8
	XD		93	86	83	89	91						89	3.8	4.3
Break Elongation, %	MD		435	488	514	527	531						499	40	8.0
	XD		545	525	496	494	572						526	33	6.3
Break Strength, lb/in	MD		142	165	140	137	155						148	12	8.1
	XD		131	123	117	122	139						126	8.8	7.0

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/28/12

GAI-LAP

Initials: JM No. 43-01

Date: 02/28/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/28/12

DATE REPORTED: 02/28/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 02/23/12

INCOMING SAMPLE NO.: **Roll No. 207523-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-39

CONDITIONING: >24 HOURS 72 °F 45-47 %RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Thickness, mils		ASTM D5994 ☒ ASTM D5199 ☐	41.3	42.1	42.1	41.7	42.5	41.7	40.6	42.5	42.1	42.1	41.9	0.6	1.4
Asperity Height, mils	A-side	ASTM D7466	32	33	33	33	32	33	33	32	33	32	33	0.5	1.5
	B-side		38	41	37	35	37	39	34	35	38	39	37	2.2	5.9
Tear Resistance, lb	MD	ASTM D1004	36.6	37.2	34.7	31.0	31.9	34.6	33.1	34.4	32.7	36.2	34.2	2.1	6.1
	XD		32.6	29.5	32.1	34.7	31.5	32.9	32.2	31.0	33.1	35.2	32.5	1.7	5.2
Maximum Extension, inch	MD		0.96	1.04	0.91	0.95	0.86	0.92	0.96	0.77	0.94	0.94	0.92	0.07	7.6
	XD		0.57	0.38	0.91	0.87	0.57	0.60	0.87	0.92	0.50	0.62	0.68	0.19	27.9
Tear Resistance Specimen Thickness, mils	MD	ASTM D5994 ☒ ASTM D5199 ☐	42.5	44.9	43.7	41.3	40.9	43.3	41.3	42.9	42.1	44.5	42.7	1.4	3.2
	XD		42.9	43.3	43.3	43.7	42.1	43.3	42.5	42.9	44.1	43.3	43.1	0.6	1.4

Comments:
1) ASTM D5994 - [Mitutoyo digital thickness gage; conical tips with 2.0 oz dead weight on specimen; 5 second loading time interval].
2) ASTM D1004 - [INSTRON 3345 testing machine; 1,000 lb. load cell; 2 inch/minute testing speed].
3) Thickness of tear resistance specimens measured using: Mitutoyo digital thickness gage; conical tips with 2.0 oz dead weight on specimen; 5 second loading time interval; Average value from three measurements per specimen reported.
4) ASTM D7466 - [Mahr Federal gage; tapered tip; 5 second loading time interval].

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Checked By: JCW

Date: 02/28/12

GAI-LAP
Initials: TM No.: 43-01
Date: 02/28/12

Form R-1I:Rev 2

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/27/12

DATE REPORTED: 02/28/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 02/23/12

INCOMING SAMPLE NO.: **Roll No. 207628-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-40

CONDITIONING: >24 HOURS 72 °F 42-43 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	18	17	20	16						18	1.4	7.8
Yield Strength, lb/in	MD		90	89	84	83	86						85	2.6	3.1
	XD		94	93	91	81	91						90	4.9	5.4
Break Elongation, %	MD		467	448	512	442	443						462	30	6.5
	XD		529	498	518	479	606						526	49	9.3
Break Strength, lb/in	MD		169	124	145	113	168						144	25	17.4
	XD		130	117	121	110	141						124	12	9.7

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

The test data and all associated project information presented hereon shall be held in confidence and disclosed to other parties only with the authorization of the Client. Physical and electronic records of each project are kept for a minimum of 7 years. Test samples are kept in storage for at least 10 working days after mailing of the test report, prior to being discarded, unless a longer storage period is requested in writing and accepted by Ardaman & Associates, Inc.

Checked By: JCW Date: 02/28/12

GAI-LAP

Initials: JM No. 43-01
Date: 02/28/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 02/27/12

DATE REPORTED: 02/28/12

GEOMEMBRANE TYPE: **40-mil LLDPE**

DATE SAMPLE RECEIVED: 02/23/12

INCOMING SAMPLE NO.: **Roll No. 207631-12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-41

CONDITIONING: >24 HOURS 72 °F 42-43 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	-	-	-	-	-						-	-	-
	XD		17	17	19	20	18						18	1.4	7.8
Yield Strength, lb/in	MD		88	87	86	83	88						86	2.3	2.7
	XD		93	92	87	85	94						90	4.2	4.7
Break Elongation, %	MD		469	445	458	508	514						479	31	6.5
	XD		528	542	410	505	562						509	59	11.6
Break Strength, lb/in	MD		155	167	130	131	158						148	17	11.5
	XD		124	126	104	120	136						122	11	9.0

Comments: Yield elongation in the MD was not clearly defined and hence not reported.

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Checked By: JCW Date: 02/28/12

GAI-LAP

Initials: TM No.: 43-01

Date: 02/28/12

APPENDIX 2

Construction Quality Assurance Test Results For HDPE Geomembrane

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: CVZ #:0.13

DATE: 01/31/2012

Jan Wildman
Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809

Dear Ms. Wildman:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of one (1) 40mil LLDPE Microspike and (1) 60mil HDPE Microspike Geomembrane samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120053

DATE RECEIVED: January 27, 2012 **DATE REPORTED:** January 31, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
CT-T-17 R#302101.12	79156
CT-T-21 R#203578.12	79157

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D1603	Carbon Black Content
ASTM D5596	Carbon Black Dispersion
ASTM D1505	Density
ASTM D1238	Melt Flow Index
ASTM D4833	Puncture Resistance

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 and 2.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

1160 North Gilbert Street, Anaheim, CA. 92801, www.precisionlabs.net Tel# 714-520-9631, 800-522-4599 Fax#714-520-9637

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County CCSW Phase I Class I Lf Closure

Date Received: **1/27/2012**
Date Reported: **1/31/2012**
Client Sample ID: **CT-T-21 R#203578.12**
Material Description: **60mil HDPE Microspike Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120053**
PGL Control No.: **79157**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D1505	Density (grams/ cm.^{3})															
		0.9418	0.9418	0.9418								0.9418	0.0000	0.9418	0.9418	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended beyond the outer edges of the clamping plates.															
		145	142	140	141	140	142	142	140	142	140	141	1	140	145	
		142	142	143	141	141										
ASTM D1603	Carbon Black Content (percent, %)															
		2.40	2.35									2.38	0.03	2.35	2.40	
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)															
		1	1	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	
ASTM D1238 Procedure A	Melt Flow Index (grams/ 10 minutes)															
	Condition FR-190/2.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190^0 C and 2.16kg load.															
		0.2684	0.2670	0.2676								0.2677	0.0007	0.2670	0.2684	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/24/12

DATE REPORTED: 01/25/12

GEOMEMBRANE TYPE: **60-mil HDPE**

DATE SAMPLE RECEIVED: 01/24/12

INCOMING SAMPLE NO.: **Roll No. 203565.12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-18

CONDITIONING: 3.2 HOURS 73 °F 37 - 39 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	19	22	20	23	23						21	1.8	8.6
	XD		16	15	15	15	15						15	0.3	2.0
Yield Strength, lb/in	MD		150	153	159	157	140						152	7.6	5.0
	XD		153	170	177	173	159						166	9.8	5.9
Break Elongation, %	MD		511	482	437	479	458						473	28	5.9
	XD		562	568	507	631	536						561	46	8.2
Break Strength, lb/in	MD		200	228	202	234	210						215	16	7.4
	XD		183	193	186	219	176						191	17	8.9

Comments:

The test data and all associated project information presented hereon shall be held in confidence and disclosed to other parties only with the authorization of the Client. Physical and electronic records of each project are kept for a minimum of 7 years. Test samples are kept in storage for at least 10 working days after mailing of the test report, prior to being discarded, unless a longer storage period is requested in writing and accepted by Ardaman & Associates, Inc.

Checked By: TM Date: 01/20/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

GEOMEMBRANE TYPE: **60-mil HDPE**

PROJECT: Sarasota Co. Phase I Landfill

DATE SAMPLE RECEIVED: 01/24/12

FILE NO.: 09-36-7375

INCOMING SAMPLE NO.: **Roll No. 203569.12 T/T**

DATE TESTED: 01/24/12

LABORATORY IDENTIFICATION NO.: 097375/CT-T-19

DATE REPORTED: 01/25/12

CONDITIONING: 4.5 HOURS 72 °F 37 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	19	21	22	20	21						21	1.1	5.2
	XD		15	15	15	15	15						15	0.2	1.3
Yield Strength, lb/in	MD		151	158	167	165	153						159	7.1	4.5
	XD		157	168	175	176	164						168	8.0	4.8
Break Elongation, %	MD		467	466	488	477	487						477	11	2.3
	XD		533	480	317	555	511						479	95	19.8
Break Strength, lb/in	MD		176	224	242	233	243						224	28	12.5
	XD		172	166	124	196	172						166	26	15.7

Comments:

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Checked By: TM

Date: 01/25/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/26/12

DATE REPORTED: 01/27/12

GEOMEMBRANE TYPE: **60-mil HDPE**

DATE SAMPLE RECEIVED: 01/25/12

INCOMING SAMPLE NO.: **Roll No. 203574.12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-20

CONDITIONING: 20.1 HOURS 73 °F 48 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	15	14	15	14	16						15	0.8	5.3
	XD		24	23	21	22	21						22	1.1	5.0
Yield Strength, lb/in	MD		158	178	178	171	153						168	11.5	6.8
	XD		143	161	166	162	147						156	10.0	6.4
Break Elongation, %	MD		547	565	522	597	585						563	30	5.3
	XD		461	465	490	484	503						481	17	3.5
Break Strength, lb/in	MD		179	196	187	212	188						192	13	6.8
	XD		224	230	246	242	192						227	22	9.7

Comments:

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Checked By: TM Date: 01/27/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/26/12

DATE REPORTED: 01/27/12

GEOMEMBRANE TYPE: **60-mil HDPE**

DATE SAMPLE RECEIVED: 01/25/12

INCOMING SAMPLE NO.: **Roll No. 203578.12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-21

CONDITIONING: 21.2 HOURS 73 °F 42-45 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	19	21	21	22	21						21	1.1	5.2
	XD		18	17	16	15	18						17	1.2	7.1
Yield Strength, lb/in	MD		145	160	166	160	150						156	8.3	5.3
	XD		160	172	176	177	149						167	12.2	7.3
Break Elongation, %	MD		461	508	504	479	482						487	19	3.9
	XD		589	549	603	570	596						582	22	3.8
Break Strength, lb/in	MD		167	251	243	238	199						220	35	15.9
	XD		198	192	208	209	197						201	7	3.5

Comments:

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Checked By: TM Date: 01/27/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/26/12

DATE REPORTED: 01/27/12

GEOMEMBRANE TYPE: **60-mil HDPE**

DATE SAMPLE RECEIVED: 01/25/12

INCOMING SAMPLE NO.: **Roll No. 203578.12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-21

CONDITIONING: 21 HOURS 73 °F 45 %RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Thickness, mils		ASTM D5994 ☒ ASTM D5199 ☐	59.1	62.6	65.4	65.7	66.1	66.9	66.1	60.2	59.8	62.6	63.5	2.9	4.7
Asperity Height, mils	A-side	ASTM D7466	31	31	31	32	30	29	30	30	35	31	31	1.6	5.3
	B-side		36	38	38	40	37	34	36	30	37	36	36	2.7	7.5
Tear Resistance, lb	MD	ASTM D1004	52.0	55.1	60.5	59.3	60.2	61.3	59.6	49.7	52.0	55.5	56.5	4.2	7.4
	XD		49.7	50.1	53.4	52.9	53.8	54.2	53.9	48.9	49.2	48.5	51.4	2.4	4.7
Maximum Extension, inch	MD		0.86	0.89	0.90	0.91	0.94	0.88	0.92	0.81	0.85	0.94	0.89	0.04	4.5
	XD		0.30	0.31	0.29	0.31	0.31	0.29	0.30	0.76	0.71	0.27	0.39	0.19	48.7
Tear Resistance Specimen Thickness, mils	MD	ASTM D5994 ☒ ASTM D5199 ☐	61.4	61.4	67.3	66.6	67.0	69.3	66.5	60.9	60.1	61.8	64.2	3.4	5.3
	XD		61.3	62.4	65.0	66.4	66.4	69.2	67.2	62.1	58.5	60.9	63.9	3.5	5.5

Comments:
1) ASTM D5994 - [Mitutoyo digital thickness gage; conical tips with 2.0 oz dead weight on specimen; 5 second loading time interval].
2) ASTM D1004 - [INSTRON 3345 testing machine; 1,000 lb. load cell; 2 inch/minute testing speed].
3) Thickness of tear resistance specimens measured using: Mitutoyo digital thickness gage; conical tips with 2.0 oz dead weight on specimen; 5 second loading time interval; Average value from three measurements per specimen reported.
4) ASTM D7466 - [Mahr Federal gage; tapered tip; 5 second loading time interval].

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Checked By: TM Date: 01/27/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE TEST REPORT

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 01/26/12

DATE REPORTED: 01/27/12

GEOMEMBRANE TYPE: **60-mil HDPE**

DATE SAMPLE RECEIVED: 01/25/12

INCOMING SAMPLE NO.: **Roll No. 203681.12 T/T**

LABORATORY IDENTIFICATION NO.: 097375/CT-T-22

CONDITIONING: 21.5 HOURS 73 °F 43-45 % RH

Property		Test Method	Specimen 1	2	3	4	5	6	7	8	9	10	Average	Standard Deviation	COV (%)
Yield Elongation, %	MD	ASTM D6693	22	22	23	23	19						22	1.5	6.8
	XD		15	15	14	15	17						15	0.9	6.0
Yield Strength, lb/in	MD		149	160	165	160	149						157	7.5	4.8
	XD		152	172	180	170	153						165	12.2	7.4
Break Elongation, %	MD		446	462	485	488	457						468	18	3.8
	XD		564	533	611	518	492						544	46	8.5
Break Strength, lb/in	MD		204	226	251	237	183						220	27	12.3
	XD		180	191	219	177	160						185	22	11.9

Comments:

The test data and all associated project information presented hereon shall be held in confidence and disclosed to other parties only with the authorization of the Client. Physical and electronic records of each project are kept for a minimum of 7 years. Test samples are kept in storage for at least 10 working days after mailing of the test report, prior to being discarded, unless a longer storage period is requested in writing and accepted by Ardaman & Associates, Inc.

Checked By: DM Date: 01/27/12

APPENDIX 3

Construction Quality Assurance Test Results For TPO Geomembrane

Precision Geosvnthetic Laboratories International
A Texas Research International Company

June 21, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 06/21/2012

Jerry Kuehn
ARDAMAN & ASSOCIATES, INC.
78 Sarasota Center Blvd.
Sarasota, FL, 34240

Re: FINAL LABORATORY REPORT

Dear Mr. Kuehn

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the Conformance testing of three (3) 60 mil TPO Geomembrane samples.

PROJECT NAME: Sarasota Lf TPO Testing — DATE REPORTED: **May 31, 2012**

REFERENCE PGLI JOB NO.: G120526 — **Additional testing for R#40121390501- June 21, 2012**

DATE RECEIVED: May 29, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
R#40121390501	81854
R#40121391501	81855
R#40121392101	81856

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751 NSF MOD	Thickness
2. FTMS 101c	Method 2031 Puncture Resistance
3. ASTM D5884	Tear Resistance
4. ASTM D4885	Wide Width Strip Tensile
5. ASTM D1149	Ozone Resistance
6. ASTM D751	Tongue Tear Resistance

TEST CONDITIONS: The samples were conditioned for a minimum of 24 hours in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 3.

Respectfully,

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. PGLI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

4 Pages Total

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill

Date Received: **5/29/2012**
Date Reported: **6/21/2012**
Client Sample ID: **R#40121390501**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120526**
PGL Control No.: **81854**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.57	1.55	1.58	1.58	1.57						1.57	0.01	1.55	1.58	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		311	320	306	317	317	321	316	308	318	323	316	6	306	323	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	191	193	190	187	188	189					190	2	187	193	150
	TD	165	164	167	162	163	169					165	2	162	169	150
	Elongation at Break															
	MD	34	35	36	35	37	35					35	1	34	37	30
	TD	37	34	36	34	37	36					36	1	34	37	30
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	188	177	190	189	193						187	6	177	193	
	TD	91	91	88	98	100						94	5	88	100	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	98	100	97	102	101						100	2	97	102	
	TD	71	71	64	77	74						71	5	64	77	

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill

Date Received: **5/29/2012**
Date Reported: **5/31/2012**
Client Sample ID: **R#40121391501**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120526**
PGL Control No.: **81855**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	189	189	191	187	187	190					189	2	187	191	150
	TD	165	168	171	165	170	172					169	3	165	172	150
	Elongation at Break															
	MD	35	35	35	33	33	35					34	1	33	35	30
	TD	37	37	36	36	35	36					36	1	35	37	30

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill

Date Received: **5/29/2012**
Date Reported: **5/31/2012**
Client Sample ID: **R#40121392101**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120526**
PGL Control No.: **81856**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	183	184	180	184	180	183					182	2	180	184	150
	TD	172	173	170	175	172	166					171	3	166	175	150
	Elongation at Break															
	MD	32	32	32	33	32	34					32	1	32	34	30
	TD	32	32	32	37	33	32					33	2	32	37	30

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories International

Precision Geosvnthetic Laboratories International
A Texas Research International Company

June 11, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 06/11/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL, 34240

Re: FINAL LABORATORY REPORT

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the Conformance testing of six (6) 60 mil TPO Geomembrane samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **June 11, 2012**

REFERENCE PGLI JOB NO.:G120527

DATE RECEIVED: May 29, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
R#40121392702	81857
R#40121400302	81858
R#40121400911	81859
R#40121401407	81860
R#40121401710	81861
R#40121400507	81862

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751 NSF MOD	Thickness
2. FTMS 101c	Method 2031 Puncture Resistance
3. ASTM D4885	Wide Width Strip Tensile
4. ASTM D1149	Ozone Resistance
5. ASTM D5884	Tear Resistance
6. ASTM D751	Tongue Tear Resistance

TEST CONDITIONS: The samples were conditioned for a minimum of 24 hours in the laboratory at 22 $\pm$ 2°C (71.6 $\pm$ 3.6°F) and at 60 $\pm$ 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

Respectfully,

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. PGLI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

7 Pages Total

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **5/29/2012**
Date Reported: **6/11/2012**
Client Sample ID: **R#40121392702**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120527**
PGL Control No.: **81857**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.57	1.54	1.57	1.54	1.57						1.56	0.01	1.54	1.57	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		313	307	301	308	301	298	300	308	303	304	304	5	298	313	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	174	180	182	183	175	185					180	4	174	185	150
	TD	162	159	158	161	164	163					161	3	158	164	
	Elongation at Break															
	MD	36	39	39	40	37	40					39	1	36	40	30
	TD	35	37	36	36	38	38					37	1	35	38	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	146	156	159	190	158						162	17	146	190	
	TD	72	80	74	63	58						69	9	58	80	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										**Pass**	**N/A**	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	72	71	102	91	57						79	18	57	102	
	TD	64	64	81	86	71						73	10	64	86	

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **5/29/2012**
Date Reported: **6/11/2012**
Client Sample ID: **R#40121400302**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120527**
PGL Control No.: **81858**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751 NSF Modified	Thickness (mm)															
	Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec															
		1.54	1.55	1.54	1.57	1.57						1.56	0.01	1.54	1.57	1.52
FTMS 101C Method 2031	Puncture Resistance (lbs)															
	Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min															
		290	297	301	301	295	307	315	307	297	293	300	8	290	315	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	175	176	180	178	178	177					177	2	175	180	150
	TD	163	162	174	161	159	159					163	6	159	174	
	Elongation at Break															
	MD	39	38	39	40	39	38					39	1	38	40	30
	TD	38	35	36	36	34	36					36	1	34	38	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	150	196	170	162	176						171	17	150	196	
	TD	79	87	68	74	94						80	10	68	94	
ASTM D1149* Method B	Ozone Resistance															
	Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.															
		Pass										**Pass**	**N/A**	N/A	N/A	
ASTM D751 NSF Modified	Tongue Tear Resistance (lbs)															
	Specimen size: 3"x8"															
	MD	104	111	84	110	94						100	12	84	111	
	TD	75	79	84	74	79						78	4	74	84	

(End of Table 2)

(Sheet 1 of 1)

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LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **5/29/2012**
Date Reported: **6/11/2012**
Client Sample ID: **R#40121400911**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120527**
PGL Control No.: **81859**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.55	1.54	1.54	1.56	1.57						1.55	0.01	1.54	1.57	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		303	307	306	311	298	295	306	307	315	303	305	6	295	315	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	176	176	178	179	178	180					178	1	176	180	150
	TD	160	159	159	160	160	160					160	1	159	160	
	Elongation at Break															
	MD	38	38	38	40	39	37					38	1	37	40	30
	TD	37	36	36	38	38	37					37	1	36	38	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	143	140	169	122	156						146	18	122	169	
	TD	74	75	53	56	79	79	76	62	66	76	70	10	53	79	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	93	74	78	79	89						83	8	74	93	
	TD	61	70	73	66	78						70	6	61	78	

(End of Table 3)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **5/29/2012**
Date Reported: **6/11/2012**
Client Sample ID: **R#40121401407**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120527**
PGL Control No.: **81860**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.54	1.54	1.55	1.55	1.53						1.54	0.01	1.53	1.55	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		298	292	360	311	308	300	298	297	306	308	308	19	292	360	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	184	183	182	180	181	178					181	2	178	184	150
	TD	161	161	160	160	160	160					160	1	160	161	
	Elongation at Break															
	MD	38	37	41	39	39	38					39	1	37	41	30
	TD	36	37	36	35	37	36					36	1	35	37	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	174	124	124	162	144						146	22	124	174	
	TD	70	63	76	86	60						71	10	60	86	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	78	72	101	82	86						84	11	72	101	
	TD	47	89	59	64	79						68	17	47	89	

(End of Table 4) *(Sheet 1 of 1)*

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **5/29/2012**
Date Reported: **6/11/2012**
Client Sample ID: **R#40121401710**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120527**
PGL Control No.: **81861**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.55	1.56	1.59	1.57	1.55						1.56	0.02	1.55	1.59	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		306	301	307	301	298	306	311	308	311	307	306	4	298	311	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	180	183	184	179	183	189					183	4	179	189	150
	TD	163	159	158	157	168	162					161	4	157	168	
	Elongation at Break															
	MD	37	38	39	36	36	37					37	1	36	39	30
	TD	36	35	36	37	34	35					35	1	34	37	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	143	139	136	147	137						140	5	136	147	
	TD	96	103	103	116	101						104	7	96	116	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	106	101	94	93	91						97	6	91	106	
	TD	70	76	78	80	80						77	4	70	80	

(End of Table 5) *(Sheet 1 of 1)*

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 6.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **5/29/2012**
Date Reported: **6/11/2012**
Client Sample ID: **R#40121400507**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120527**
PGL Control No.: **81862**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.55	1.59	1.56	1.54	1.57						1.56	0.02	1.54	1.59	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		314	320	317	315	300	291	310	304	315	311	310	9	291	320	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	189	175	184	185	185	183					183	5	175	189	150
	TD	160	159	158	163	158	160					160	2	158	163	
	Elongation at Break															
	MD	34	34	35	35	36	35					35	1	34	36	30
	TD	34	35	36	37	36	34					35	1	34	37	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	165	172	147	152	175						162	12	147	175	
	TD	77	72	77	57	67						70	8	57	77	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										**Pass**	**N/A**	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	98	102	93	97	98						98	3	93	102	
	TD	76	70	81	68	71						73	5	68	81	

(End of Table 6)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

Precision Geosvnthetic Laboratories International
A Texas Research International Company

June 14, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 06/14/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL, 34240

Re: FINAL LABORATORY REPORT

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the Conformance testing of five (5) 60 mil TPO Geomembrane samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **June 14, 2012**

REFERENCE PGLI JOB NO.:G120528

DATE RECEIVED: June 1, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
R#40121390702	81863
R#40121391102	81864
R#40121391407	81865
R#40121392007	81866
R#40121392410	81867

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751 NSF MOD	Thickness
2. FTMS 101c	Method 2031 Puncture Resistance
3. ASTM D4885	Wide Width Strip Tensile
4. ASTM D1149	Ozone Resistance
5. ASTM D5884	Tear Resistance
6. ASTM D751	Tongue Tear Resistance

TEST CONDITIONS: The samples were conditioned for a minimum of 24 hours in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

Respectfully,

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. PGLI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

6 Pages Total

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **6/1/2012**
Date Reported: **6/14/2012**
Client Sample ID: **R#40121390702**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120528**
PGL Control No.: **81863**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.60	1.60	1.60	1.58	1.61						1.60	0.01	1.58	1.61	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		352	342	337	348	337	337	342	320	342	330	339	9	320	352	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	189	181	183	184	188	185					185	3	181	189	150
	TD	164	163	161	160	163	164					163	2	160	164	
	Elongation at Break															
	MD	32	32	32	32	36	38					34	3	32	38	30
	TD	36	35	35	35	35	35					35	0	35	36	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	221	173	160	146	143						169	31	143	221	
	TD	81	66	63	58	76						69	9	58	81	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	91	97	101	94	98						96	4	91	101	
	TD	61	64	68	90	61						69	12	61	90	

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **6/1/2012**
Date Reported: **6/14/2012**
Client Sample ID: **R#40121391102**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120528**
PGL Control No.: **81864**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.60	1.57	1.64	1.63	1.59						1.61	0.03	1.57	1.64	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		331	320	311	308	311	308	329	321	320	317	318	8	308	331	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	179	183	181	183	181	179					181	2	179	183	150
	TD	159	164	162	163	158	159					161	3	158	164	
	Elongation at Break															
	MD	31	30	34	32	32	33					32	1	30	34	30
	TD	33	35	32	36	33	32					33	2	32	36	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	163	159	166	138	154						156	11	138	166	
	TD	65	63	60	64	57						62	3	57	65	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	104	102	98	106	110						104	5	98	110	
	TD	92	87	77	84	72						82	8	72	92	

(End of Table 2)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **6/1/2012**
Date Reported: **6/14/2012**
Client Sample ID: **R#40121391407**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120528**
PGL Control No.: **81865**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.63	1.60	1.59	1.60	1.59						1.60	0.01	1.59	1.63	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		312	306	311	306	312	306	315	302	311	306	309	4	302	315	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	179	186	184	184	180	184					183	3	179	186	150
	TD	165	165	160	163	159	163					162	3	159	165	
	Elongation at Break															
	MD	30	32	33	32	32	32					32	1	30	33	30
	TD	36	34	34	34	35	35					35	1	34	36	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	140	147	178	160	150						155	15	140	178	
	TD	68	62	61	58	68						63	4	58	68	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	97	106	102	90	97						98	6	90	106	
	TD	89	68	79	83	86						81	8	68	89	

(End of Table 3)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **6/1/2012**
Date Reported: **6/14/2012**
Client Sample ID: **R#40121392007**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Cepitia
PGL Job No.: **G120528**
PGL Control No.: **81866**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.60	1.60	1.63	1.59	1.60						1.60	0.01	1.59	1.63	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		330	342	327	330	322	320	320	331	330	329	328	6	320	342	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	182	187	178	184	179	178					181	4	178	187	150
	TD	169	168	165	166	167	163	168				167	2	163	169	
	Elongation at Break															
	MD	34	33	33	34	34	34					34	1	33	34	30
	TD	28	30	30	31	31	31	34				31	2	28	34	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	184	171	159	150	153						163	14	150	184	
	TD	67	69	63	61	61						64	4	61	69	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	98	103	104	91	97						99	5	91	104	
	TD	71	77	80	73	68						74	5	68	80	

(End of Table 4)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **6/1/2012**
Date Reported: **6/14/2012**
Client Sample ID: **R#40121392410**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120528**
PGL Control No.: **81867**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.63	1.57	1.64	1.60	1.60						1.61	0.03	1.57	1.64	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		372	362	355	358	357	371	368	355	342	347	359	10	342	372	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	176	180	183	178	180	181					179	2	176	183	150
	TD	161	160	163	162	160	161					161	1	160	163	
	Elongation at Break															
	MD	35	36	37	36	35	35					36	1	35	37	30
	TD	37	36	36	34	37	36					36	1	34	37	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	153	139	132	120	172						143	20	120	172	
	TD	57	70	61	84	92						73	15	57	92	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	93	101	90	93	91						94	4	90	101	
	TD	94	88	77	76	83						84	8	76	94	

(End of Table 5)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 06/19/2012

June 19, 2012

Jerry Kuehn
ARDAMAN & ASSOCIATES, INC.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Re: FINAL LABORATORY REPORT

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the Conformance testing of one (1) 60 mil TPO Geomembrane sample.

PROJECT NAME: Sarasota Lf TPO Testing DATE REPORTED: **June 19, 2012**

REFERENCE PGLI JOB NO.: G120529

DATE RECEIVED: June 8, 2012

SAMPLE SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
R#40121391804	81868

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751 NSF MOD	Thickness
2. FTMS 101c	Method 2031 Puncture Resistance
3. ASTM D5884	Tear Resistance
4. ASTM D4885	Wide Width Strip Tensile
5. ASTM D1149	Ozone Resistance
6. ASTM D751	Tongue Tear Resistance

TEST CONDITIONS: The sample was conditioned for a minimum of 24 hours in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Table 1.

Respectfully,

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical Director

It shall be noted that the sample tested is believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. PGLI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

2 Pages Total

TABLE 1.

MATERIAL PROPERTIES

CLIENT: ARDAMAN & ASSOCIATES, INC.

PROJECT: Sarasota Landfill TPO Testing

Date Received: **6/8/2012**
Date Reported: **6/19/2012**
Client Sample ID: **R#40121391804**
Material Description: **60 mil TPO Geomembrane**

QC'd By: Maria Espitia
PGL Job No.: **G120529**
PGL Control No.: **81868**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. Minimum
ASTM D751	Thickness (mm)															
NSF Modified	*Apparatus: Thickness gauge with 6.35+/-0.025 mm (0.250+/-0.001in) diameter, and a pressure of 50-200 kPA (7.3 -29 psi) which requires 0.16-0.64 kg (0.36-1.42 lb) weight. Loading time: 10 sec*															
		1.57	1.60	1.60	1.58	1.59						1.59	0.01	1.57	1.60	1.52
FTMS 101C	Puncture Resistance (lbs)															
Method 2031	*Test was conducted in compliance with FTMS 101C procedure. Testing machine: Tensile Testing machine with compression head. Probe used is tetrahedron point. Dimensions are on file. Rate of compression is at 12"/min*															
		300	307	308	398	307	303	295	291	297	301	311	31	291	398	265
ASTM D4885	Wide Width Strip Tensile															
	Specimens were tested as directed in Test Method D4885. Instron tensile machine equipped with 2"x8" Curtis Sure Grips was used. Grip Separation: 4.0" Rate of Separation: 1mm/min (0.04"/min) Thickness of specimen: 60 mils Width of specimen: 8"															
	Tensile Strength (lbs/in)															
	MD	186	186	182	185	185	183					185	2	182	186	150
	TD	167	168	168	162	163	164					166	3	162	168	
	Elongation at Break															
	MD	34	33	33	32	33	33					33	1	32	34	30
	TD	31	31	31	31	31	31					31	0	31	31	
ASTM D5884	Tear Resistance (lbs)															
	Specimens were tested in accordance with ASTM D5884.															
	MD	184	145	182	142	154						161	20	142	184	
	TD	73	69	80	89	76						77	8	69	89	
ASTM D751	Tongue Tear Resistance (lbs)															
NSF Modified	*Specimen size: 3"x8"*															
	MD	86	90	85	89	78						86	5	78	90	
	TD	72	64	84	80	92						78	11	64	92	
ASTM D1149*	Ozone Resistance															
Method B	*Exposure: 168 hrs. @ 100 pphm @ 104° F. Procedure: B4 (75mm mandrel). Requirement: No Craks Observations made at 7x magnification.*															
		Pass										Pass	N/A	N/A	N/A	

(End of Table 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
**-Sub out*
MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION
DC#1987 Record #268

Precision Geosynthetic Laboratories International

APPENDIX 4

Construction Quality Assurance Test Results For FabriNet UF Geocomposite and Geonet Component

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: GVZ #:0.13

DATE: 02/02/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120043

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 2, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
Fabrinet UF R#131386782 L#C111206A03	
Geocomposite	79081
Geonet	79103
Fabrinet UF R#131386800 L#C111206A03	
Geocomposite	79082
Geonet	79104
Fabrinet UF R#131386823 L#C111206A03	
Geocomposite	79083
Geonet	79105
Fabrinet UF R#131386841 L#C111206A03	
Geocomposite	79084
Geonet	79106
Fabrinet UF R#131386859 L#C111206A03	
Geocomposite	79085
Geonet	79107
Fabrinet UF R#131386876 L#C111206A03	
Geocomposite	79086
Geonet	79108

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#131386782 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120043**
PGLI Control No.: **79081**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79103**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		319	**318**	**316**	**322**	**317**	**321**	**316**	**320**	**321**	**322**	**319**	**2**	**316**	**322**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**5.6**	**7.5**	**10.1**	**6.5**	**6.8**						**7.3**	**1.7**	**5.6**	**10.1**	**1 MARV**
	Side B of Composite															
	MD	**6.8**	**5.9**	**5.8**	**7.5**	**5.8**						**6.3**	**0.8**	**5.8**	**7.5**	**1 MARV**

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#131386800 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120043**
PGLI Control No.: **79082**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79104**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	322	321	318	316	316	317	322	321	322	317	319	3	316	322	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.8	7.3	5.9	5.9	7.4						6.4	0.8	5.8	7.4	1 MARV
Side B of Composite															
MD	6.3	8.9	6.1	8.3	6.0						7.1	1.4	6.0	8.9	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#131386823 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120043**
PGLI Control No.: **79083**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79105**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	322	316	318	319	322	322	320	324	322	321	321	2	316	324	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	6.0	8.1	5.9	6.1	5.4						6.3	1.1	5.4	8.1	1 MARV
Side B of Composite															
MD	5.9	5.9	6.5	7.0	6.0						6.3	0.5	5.9	7.0	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#131386841 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120043**
PGLI Control No.: **79084**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79106**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	321	320	321	326	330	320	331	320	322	321	323	4	320	331	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.1	5.8	5.8	7.3	5.3						5.8	0.8	5.1	7.3	1 MARV
Side B of Composite															
MD	5.9	5.8	7.6	5.4	5.3						6.0	1.0	5.3	7.6	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#131386859 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120043**
PGLI Control No.: **79085**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79107**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	326	320	322	326	318	320	321	320	321	326	322	3	318	326	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.3	5.8	5.4	5.6	7.5						5.9	0.9	5.3	7.5	1 MARV
Side B of Composite															
MD	5.5	7.1	6.0	6.0	7.0						6.3	0.7	5.5	7.1	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#131386876 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Epitia
PGLI Job No.: **G120043**
PGLI Control No.: **79086**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79108**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	321	320	326	321	320	326	331	320	321	326	323	4	320	331	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	4.8	5.5	5.6	6.0	5.6						5.5	0.5	4.8	6.0	1 MARV
Side B of Composite															
MD	5.6	7.3	4.9	5.5	6.5						6.0	0.9	4.9	7.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: AVZ #:0.13

DATE: 02/06/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 300mil Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120042

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 6, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
FabriNet UF R#131386674 L#C111206A03	
Geocomposite	79075
Geonet Component	79097
FabriNet UF R#131386692 L#C111206A03	
Geocomposite	79076
Geonet Component	79098
FabriNet UF R#131386710 L#C111206A03	
Geocomposite	79077
Geonet Component	79099
FabriNet UF R#131386728 L#C111206A03	
Geocomposite	79078
Geonet Component	79100
FabriNet UF R#131386746 L#C111206A03	
Geocomposite	79079
Geonet Component	79101
FabriNet UF R#131386764 L#C111206A03	
Geocomposite	79080
Geonet Component	79102

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D4716	Transmissivity
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131386674 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120042**
PGLI Control No.: **79075**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79097**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	321	321	316	320	321	327	316	320	324	320	321	3	316	327	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.3	5.0	5.5	7.4	5.5						5.7	0.9	5.0	7.4	1 MARV
Side B of Composite															
MD	5.5	7.0	7.4	5.4	5.3						6.1	1.0	5.3	7.4	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131386692 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120042**
PGLI Control No.: **79076**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79098**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	319	320	320	320	320	321	320	317	316	319	2	316	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.1	5.6	8.0	5.6	6.4						6.2	1.1	5.1	8.0	1 MARV
Side B of Composite															
MD	5.6	6.1	6.6	5.5	6.5						6.1	0.5	5.5	6.6	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131386710 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120042**
PGLI Control No.: **79077**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79099**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		321	**320**	**327**	**325**	**319**	**320**	**318**	**319**	**320**	**321**	**321**	**3**	**318**	**327**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**6.0**	**4.3**	**6.3**	**6.1**	**7.6**						**6.1**	**1.2**	**4.3**	**7.6**	**1 MARV**
	Side B of Composite															
	MD	**7.8**	**5.6**	**5.8**	**6.9**	**5.3**						**6.3**	**1.0**	**5.3**	**7.8**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131386728 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120042**
PGLI Control No.: **79078**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79100**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	318	319	320	321	320	322	320	321	320	327	321	2	318	327	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	6.9	4.6	8.1	6.3	7.3						6.6	1.3	4.6	8.1	1 MARV
Side B of Composite															
MD	8.1	6.5	8.4	5.4	6.5						7.0	1.3	5.4	8.4	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131386746 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120042**
PGLI Control No.: **79079**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: C#79101															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	319	320	318	318	321	320	320	319	320	321	320	1	318	321	300 min
GEOCOMPOSITE:															
ASTM D4716 Transmissivity *Tested at Normal Pressure : 1,000 psf, Gradient: 0.33 , Seating Time: 100 hrs*															
Temperature of Test Water: 20.3°C Specimen Size: 12" x 14"															
Transmissivity (m.²/ sec.)															
MD 3.19E-03											3.19E-03	-	-	-	$1.3x10^{-3}$
Flow Rate (gal/min)															
MD 5.12											5.12	-	-	-	
Transmissivity (gal/min/ft)															
MD 15.41											15.41	-	-	-	
Test Set-Up:															
Plate _____															
Protective Cover Soil (C#78903) oooooooo															
FabriNet UF Geocomposite XXXXXX															
40mil LLDPE Microspike R#343519-11 ========= ***Thickness :*** 365 ***mils (Before)***															
Plate _____ ***Thickness :*** 349 ***mils (After)***															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	6.3	7.8	5.5	5.8	6.3						6.3	0.9	5.5	7.8	1 MARV
Side B of Composite															
MD	8.5	5.9	5.4	8.0	5.9						6.7	1.4	5.4	8.5	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131386764 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120042**
PGLI Control No.: **79080**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79102**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	318	320	321	320	321	320	320	320	321	318	320	1	318	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.9	7.3	5.9	7.3	5.8						6.4	0.8	5.8	7.3	1 MARV
Side B of Composite															
MD	6.0	4.9	5.8	5.8	5.5						5.6	0.4	4.9	6.0	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *OVZ* #:0.13

DATE: 02/06/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120045

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 6, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#131386988 L#C111204A03	
Geocomposite	79092
Geonet Component	79114
R#131387006 L#C111204A03	
Geocomposite	79093
Geonet Component	79115
R#131387024 L#C111204A03	
Geocomposite	79094
Geonet Component	79116
R#131386756 L#C111206A03 (Random Sample 1)	79095
R#131386920 L#C111204A03 (Random Sample 2)	79096

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131386988 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120045**
PGLI Control No.: **79092**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79114**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	313	317	320	317	317	315	320	317	321	308	316	4	308	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	3.8	5.4	7.5	5.8	6.5						5.8	1.4	3.8	7.5	1 MARV
Side B of Composite															
MD	4.8	4.8	4.9	6.6	7.3						5.7	1.2	4.8	7.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131387006 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120045**
PGLI Control No.: **79093**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79115**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	312	316	312	308	320	321	306	312	317	315	314	5	306	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	4.4	4.3	5.8	7.3	6.1						5.6	1.3	4.3	7.3	1 MARV
Side B of Composite															
MD	7.3	8.6	5.8	5.4	6.4						6.7	1.3	5.4	8.6	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131387024 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120045**
PGLI Control No.: **79094**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79116**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	317	315	316	315	315	320	321	320	320	320	318	2	315	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	4.3	5.5	3.8	5.3	6.1						5.0	1.0	3.8	6.1	1 MARV
Side B of Composite															
MD	6.6	5.6	7.1	5.9	6.4						6.3	0.6	5.6	7.1	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131386756 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120045**
PGLI Control No.: **79095**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	317	315	315	321	321	308	315	318	320	317	4	308	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.3	6.3	5.4	4.5	5.6						5.4	0.6	4.5	6.3	1 MARV
Side B of Composite															
MD	6.1	8.0	6.5	6.3	6.5						6.7	0.8	6.1	8.0	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131386920 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120045**
PGLI Control No.: **79096**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:																
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		321	311	320	321	320	315	310	312	322	321	317	5	310	322	300 min
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	5.5	6.3	6.3	4.9	5.8						5.7	0.6	4.9	6.3	1 MARV
	Side B of Composite															
	MD	5.9	7.0	6.4	7.0	6.0						6.5	0.5	5.9	7.0	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *CVZ* #:0.13

DATE: 02/07/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of three (3) Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120066

DATE RECEIVED: February 3, 2012 **DATE REPORTED:** February 7, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#131387043 L#C111204A03	
Geocomposite	79246
R#131387434 L#C111201A01	
Geocomposite	79247
R#131387461 L#C111201A01	
Geocomposite	79248

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 3.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/3/2012**
Date Reported: **2/7/2012**
Client Sample ID: **R#131387043 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120066**
PGLI Control No.: **79246**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:																
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		327	321	326	324	318	320	324	325	322	320	323	3	318	327	300 min
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	2.9	2.3	2.8	5.4	6.5						4.0	1.9	2.3	6.5	1 MARV
	Side B of Composite															
	MD	6.9	6.0	2.6	3.3	2.9						4.3	2.0	2.6	6.9	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/3/2012**
Date Reported: **2/7/2012**
Client Sample ID: **R#131387434 L#C111201A01**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120066**
PGLI Control No.: **79247**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	314	315	320	321	317	320	320	319	317	324	319	3	314	324	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.8	3.1	2.8	3.0	3.4						3.6	1.2	2.8	5.8	1 MARV
Side B of Composite															
MD	3.1	4.0	3.0	4.4	3.0						3.5	0.6	3.0	4.4	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/3/2012**
Date Reported: **2/7/2012**
Client Sample ID: **R#131387461 L#C111201A01**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120066**
PGLI Control No.: **79248**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:																
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		307	307	315	312	312	311	313	312	313	314	311	3	307	315	300 min
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	3.6	5.3	3.8	3.1	3.1						3.8	0.9	3.1	5.3	1 MARV
	Side B of Composite															
	MD	3.9	5.0	3.6	4.8	4.1						4.3	0.6	3.6	5.0	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: OVZ #:0.13

DATE: 02/09/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120044

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 9, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#131386894 L#C111206A03	
Geocomposite	79087
Geonet	79109
R#131386912 L#C111206A03	
Geocomposite	79088
Geonet	79110
R#131386934 L#C111204A03	
Geocomposite	79089
Geonet	79111
R#131386952 L#C111204A03	
Geocomposite	79090
Geonet	79112
R#131386970 L#C111204A03	
Geocomposite	79091
Geonet	79113

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D7005	Ply Adhesion
ASTM D4716	Transmissivity
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. R***etained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#131386894 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120044**
PGLI Control No.: **79087**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79109**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	312	315	315	320	321	320	317	318	316	320	317	3	312	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.8	7.1	5.5	4.6	5.9						5.8	0.9	4.6	7.1	1 MARV
Side B of Composite															
MD	5.9	5.9	5.8	5.9	7.5						6.2	0.7	5.8	7.5	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#131386912 L#C111206A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120044**
PGLI Control No.: **79088**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79110**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		320	312	316	320	317	315	316	320	321	320	318	3	312	321	300 min
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	6.4	5.1	4.3	5.6	5.5						5.4	0.8	4.3	6.4	1 MARV
	Side B of Composite															
	MD	5.6	5.6	7.5	5.5	5.3						5.9	0.9	5.3	7.5	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#131386934 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120044**
PGLI Control No.: **79089**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79111**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		315	**316**	**318**	**318**	**312**	**315**	**317**	**320**	**321**	**310**	**316**	**3**	**310**	**321**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**5.6**	**5.0**	**6.5**	**5.0**	**6.3**						**5.7**	**0.7**	**5.0**	**6.5**	**1 MARV**
	Side B of Composite															
	MD	**4.9**	**5.9**	**4.9**	**6.0**	**5.9**						**5.5**	**0.6**	**4.9**	**6.0**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/9/2012**
Client Sample ID: **R#131386952 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120044**
PGLI Control No.: **79090**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79112**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		313	320	322	321	321	321	321	315	316	317	319	3	313	322	300 min
GEOCOMPOSITE:																
ASTM D4716	Transmissivity *Tested at Normal Pressure : 1,000 psf, Gradient: 0.33 , Seating Time: 100 hrs*															
	Temperature of Test Water: 20.4 ^{0}C Specimen Size: 12" x 14"															
	Transmissivity (m.^{2}/ sec.)															
	MD **3.35E-03**											3.35E-03	-	-	-	1.3x10^{-3}
	Flow Rate (gal/min)															
	MD **5.40**											5.40	-	-	-	
	Transmissivity (gal/min/ft)															
	MD **16.20**											16.20	-	-	-	
	Test Set-Up:															
	Plate _____															
	Protective Cover Soff (C#78903) oooooooo															
	FabriNet UF Geocomposite XXXXXX															
	40mil LLDPE Microspike R#343519-11 ========= ***Thickness :*** 370 ***mils (Before)***															
	Plate _____ ***Thickness :*** 343 ***mils (After)***															
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	5.0	6.0	5.6	7.3	6.0						6.0	0.8	5.0	7.3	1 MARV
	Side B of Composite															
	MD	5.0	4.3	6.8	8.3	5.9						6.0	1.6	4.3	8.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#131386970 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120044**
PGLI Control No.: **79091**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79113**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	309	311	308	316	320	317	316	321	322	315	315	5	308	322	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.0	6.0	7.3	5.9	5.4						5.9	0.9	5.0	7.3	1 MARV
Side B of Composite															
MD	5.5	5.9	5.9	7.3	5.9						6.1	0.7	5.5	7.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *AVZ* #:0.13

DATE: 02/16/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 300mil Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120093

DATE RECEIVED: February 13, 2012 **DATE REPORTED:** February 16, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
FabriNet UF R#131387226 L# C111207A02	
Geocomposite	79369
Geonet Component	79392
FabriNet UF R#131387244 L# C111207A02	
Geocomposite	79370
Geonet Component	79393
FabriNet UF R#131387262 L# C111207A02	
Geocomposite	79371
Geonet Component	79394
FabriNet UF R#131387280 L# C111207A02	
Geocomposite	79372
Geonet Component	79395
FabriNet UF R#131387298 L# C111207A02	
Geocomposite	79373
Geonet Component	79396
FabriNet UF R#131387316 L# C111215A13	
Geocomposite	79374
Geonet Component	79397

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387226 L#C111207A02**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120093**
PGLI Control No.: **79369**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79392**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		316	**315**	**318**	**319**	**315**	**314**	**310**	**320**	**317**	**316**	**316**	**3**	**310**	**320**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**5.5**	**6.6**	**5.8**	**5.5**	**6.9**						**6.1**	**0.7**	**5.5**	**6.9**	**1 MARV**
	Side B of Composite															
	MD	**6.0**	**7.3**	**5.5**	**4.0**	**7.3**						**6.0**	**1.4**	**4.0**	**7.3**	**1 MARV**

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387244 L#C111207A02**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120093**
PGLI Control No.: **79370**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79393**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		320	**321**	**320**	**311**	**316**	**320**	**311**	**308**	**312**	**320**	**316**	**5**	**308**	**321**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**5.5**	**4.9**	**4.0**	**5.8**	**6.5**						**5.3**	**0.9**	**4.0**	**6.5**	**1 MARV**
	Side B of Composite															
	MD	**5.8**	**7.5**	**5.8**	**6.8**	**5.9**						**6.3**	**0.8**	**5.8**	**7.5**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387262 L#C111207A02**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120093**
PGLI Control No.: **79371**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79394**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	317	316	316	310	311	320	317	317	311	320	315	4	310	320	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.4	5.5	4.6	7.0	5.4						5.6	0.9	4.6	7.0	1 MARV
Side B of Composite															
MD	6.1	7.4	5.9	7.8	5.9						6.6	0.9	5.9	7.8	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387280 L#C111207A02**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120093**
PGLI Control No.: **79372**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79395**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	**317**	**315**	**314**	**315**	**316**	**320**	**321**	**317**	**316**	**317**	**2**	**314**	**321**	**300 min**
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	**4.0**	**5.8**	**6.0**	**7.3**	**6.8**						**6.0**	**1.2**	**4.0**	**7.3**	**1 MARV**
Side B of Composite															
MD	**6.0**	**7.5**	**10.4**	**6.3**	**7.1**						**7.5**	**1.7**	**6.0**	**10.4**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387298 L#C111207A02**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120093**
PGLI Control No.: **79373**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79396**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		321	**306**	**317**	**318**	**320**	**321**	**310**	**310**	**312**	**317**	**315**	**5**	**306**	**321**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**4.5**	**5.5**	**6.9**	**5.8**	**6.3**						**5.8**	**0.9**	**4.5**	**6.9**	**1 MARV**
	Side B of Composite															
	MD	**6.8**	**8.4**	**6.1**	**7.8**	**6.1**						**7.0**	**1.0**	**6.1**	**8.4**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387316 L#C111215A13**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120093**
PGLI Control No.: **79374**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79397**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	321	315	321	316	312	317	317	321	315	317	3	312	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.9	6.5	7.8	4.3	6.1						6.1	1.3	4.3	7.8	1 MARV
Side B of Composite															
MD	8.5	7.6	6.0	8.5	6.0						7.3	1.3	6.0	8.5	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: AVZ #:0.13

DATE: 02/24/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 300mil Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120092

DATE RECEIVED: February 13, 2012 **DATE REPORTED:** February 24, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
FabriNet UF R#131387110 L#C111204A03	
Geocomposite	79363
Geonet Component	79386
FabriNet UF R#131387128 L# C111204A03	
Geocomposite	79364
Geonet Component	79387
FabriNet UF R#131387146 L# C111204A03	
Geocomposite	79365
Geonet Component	79388
FabriNet UF R#131387164 L# C111204A03	
Geocomposite	79366
Geonet Component	79389
FabriNet UF R#131387182 L# C111204A03	
Geocomposite	79367
Geonet Component	79390
FabriNet UF R#131387208 L# C111207A02	
Geocomposite	79368
Geonet Component	79391

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D4716	Transmissivity
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#131387110 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120092**
PGLI Control No.: **79363**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79386**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	315	310	312	317	320	320	318	315	316	312	315	3	310	320	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.6	6.6	5.5	5.3	6.6						5.9	0.7	5.3	6.6	1 MARV
Side B of Composite															
MD	7.8	6.4	8.1	6.6	8.4						7.5	0.9	6.4	8.4	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#131387128 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120092**
PGLI Control No.: **79364**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79387**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	316	310	312	316	317	320	321	307	311	317	315	5	307	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	6.3	6.1	5.8	4.8	6.4						5.9	0.7	4.8	6.4	1 MARV
Side B of Composite															
MD	6.9	6.6	7.6	5.9	5.0						6.4	1.0	5.0	7.6	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/24/2012**
Client Sample ID: **R#131387146 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120092**
PGLI Control No.: **79365**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79388**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"	**317**	**319**	**320**	**321**	**320**	**315**	**317**	**315**	**316**	**317**	**318**	**2**	**315**	**321**	**300 min**
GEOCOMPOSITE:																
ASTM D4716	Transmissivity *Tested at Normal Pressure : 1,000 psf, Gradient: 0.33 , Seating Time: 100 hrs*															
	Temperature of Test Water: 20.3 ^{0}C Specimen Size: 12" x 14"															
	Transmissivity (m.^{2}/ sec.)															
	MD **2.98E-03**											**2.98E-03**	-	-	-	**1.3x10^{-3}**
	Flow Rate (gal/min)															
	MD **4.78**											**4.78**	-	-	-	
	Transmissivity (gal/min/ft)															
	MD **14.39**											**14.39**	-	-	-	
	Test Set-Up:															
	Plate _____															
	Protective Cover Soil (C#78903) *oooooooo*															
	FabriNet UF Geocomposite *XXXXXX*															
	40mil LLDPE Microspike R#343519-11 *========*						***Thickness :*** *360* ***mils (Before)***									
	Plate _____						***Thickness :*** *345* ***mils (After)***									
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**8.0**	**5.6**	**4.4**	**5.6**	**7.1**						**6.2**	**1.4**	**4.4**	**8.0**	**1 MARV**
	Side B of Composite															
	MD	**6.5**	**6.0**	**7.8**	**6.3**	**6.4**						**6.6**	**0.7**	**6.0**	**7.8**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#131387164 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120092**
PGLI Control No.: **79366**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79389**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	321	326	318	320	315	319	320	321	326	337	322	6	315	337	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.6	4.8	6.0	5.4	7.4						5.8	1.0	4.8	7.4	1 MARV
Side B of Composite															
MD	6.8	6.0	7.1	6.0	7.9						6.8	0.8	6.0	7.9	1 MARV

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DC#1984 Record#265

Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#131387182 L#C111204A03**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120092**
PGLI Control No.: **79367**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79390**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		325	321	320	321	315	316	317	315	317	321	319	3	315	325	300 min
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	5.9	4.9	7.0	5.8	5.3						5.8	0.8	4.9	7.0	1 MARV
	Side B of Composite															
	MD	7.9	6.5	5.6	5.6	4.9						6.1	1.1	4.9	7.9	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#131387208 L#C111207A02**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120092**
PGLI Control No.: **79368**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79391**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	315	320	317	310	312	316	318	320	317	315	316	3	310	320	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.9	6.1	5.1	6.3	6.3						5.9	0.5	5.1	6.3	1 MARV
Side B of Composite															
MD	6.6	5.5	7.3	8.4	6.3						6.8	1.1	5.5	8.4	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *OVZ* #:0.13

DATE: 02/24/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 300mil Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120094

DATE RECEIVED: February 13, 2012 **DATE REPORTED:** February 24, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
FabriNet UF R#131387338 L# C111215A13	
Geocomposite	79375
Geonet Component	79398
FabriNet UF R#131387356 L# C111215A13	
Geocomposite	79376
Geonet Component	79399
FabriNet UF R#131387375 L# C111201A01	
Geocomposite	79377
Geonet Component	79400
FabriNet UF R#131387393 L# C111201A01	
Geocomposite	79378
Geonet Component	79401
FabriNet UF R#131387411 L# C111201A01	
Geocomposite	79379
Geonet Component	79402
FabriNet UF R#131387447 L# C111201A01	
Geocomposite	79380
Geonet Component	79403

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D4716	Transmissivity
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/24/2012**
Client Sample ID: **R#131387338 R#C111215A13**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120094**
PGLI Control No.: **79375**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79398**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	317	310	315	317	317	320	327	320	321	318	4	310	327	300 min
GEOCOMPOSITE:															
ASTM D4716 Transmissivity *Tested at Normal Pressure : 1,000 psf, Gradient: 0.33 , Seating Time: 100 hrs*															
Temperature of Test Water: 20.3° C Specimen Size: 12" x 14"															
Transmissivity (m.²/ sec.)															
MD **3.24E-03**											3.24E-03	-	-	-	$1.3x10^{-3}$
Flow Rate (gal/min)															
MD **5.20**											5.20	-	-	-	
Transmissivity (gal/min/ft)															
MD **15.63**											15.63	-	-	-	

Test Set-Up:

Plate _____

Protective Cover Soil (C#78903) *oooooooo*

FabriNet UF Geocomposite *XXXXXX*

40mil LLDPE Microspike R#343519-11 *=========* ***Thickness :*** *368* ***mils (Before)***

Plate _____ ***Thickness :*** *352* ***mils (After)***

ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.3	4.3	6.4	6.9	5.5						5.7	1.0	4.3	6.9	1 MARV
Side B of Composite															
MD	7.8	5.3	7.4	5.8	8.3						6.9	1.3	5.3	8.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387356 L#C111215A13**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120094**
PGLI Control No.: **79376**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79399**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		317	322	320	320	321	320	317	321	320	317	319	2	317	322	300 min
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	6.5	6.5	4.8	5.9	7.8						6.3	1.1	4.8	7.8	1 MARV
	Side B of Composite															
	MD	6.5	5.5	8.0	5.8	5.3						6.2	1.1	5.3	8.0	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387375 L#C111201A01**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120094**
PGLI Control No.: **79377**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79400**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		321	317	316	317	311	308	317	317	315	309	315	4	308	321	300 min
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	4.5	4.9	5.6	7.0	5.8						5.6	1.0	4.5	7.0	1 MARV
	Side B of Composite															
	MD	6.3	8.3	6.0	7.0	6.3						6.8	0.9	6.0	8.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387393 L#C111201A01**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120094**
PGLI Control No.: **79378**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79401**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		317	316	320	327	321	320	321	320	317	316	320	3	316	327	300 min
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	6.0	7.0	8.3	5.0	4.5						6.2	1.5	4.5	8.3	1 MARV
	Side B of Composite															
	MD	6.1	7.4	6.0	7.5	6.0						6.6	0.8	6.0	7.5	1 MARV

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DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387411 L#C111201A01**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120094**
PGLI Control No.: **79379**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79402**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		321	321	321	307	317	320	321	321	308	311	317	6	307	321	300 min
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	5.3	4.3	5.5	5.1	4.8						5.0	0.5	4.3	5.5	1 MARV
	Side B of Composite															
	MD	5.9	7.6	6.3	5.9	7.3						6.6	0.8	5.9	7.6	1 MARV

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DC#1984 Record#265

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387447 L#C111201A01**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Epitia
PGLI Job No.: **G120094**
PGLI Control No.: **79380**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79403**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		317	317	319	320	320	315	321	316	315	310	317	3	310	321	300 min
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	6.1	7.6	8.8	5.0	6.0						6.7	1.5	5.0	8.8	1 MARV
	Side B of Composite															
	MD	6.0	7.0	8.0	5.3	5.8						6.4	1.1	5.3	8.0	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *avz* #:0.13

DATE: 02/27/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 300mil Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120095

DATE RECEIVED: February 13, 2012 **DATE REPORTED:** February 27, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
FabriNet UF R#131387465 L# C111224A04	
Geocomposite	79381
Geonet Component	79404
FabriNet UF R#131387483L# C111224A04	
Geocomposite	79382
Geonet Component	79405
FabriNet UF R#131387501 L# C111224A04	
Geocomposite	79383
Geonet Component	79406
FabriNet UF R#131387519 L# C111224A04	
Geocomposite	79384
Geonet Component	79407
FabriNet UF R#131387541 L# C111224A04	
Geocomposite	79385
Geonet Component	79408

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D4716	Transmissivity
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387465 L#C111224A04**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120095**
PGLI Control No.: **79381**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79404**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	317	318	320	321	320	316	318	317	318	318	2	316	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	4.5	3.3	5.0	6.0	5.3						4.8	1.0	3.3	6.0	1 MARV
Side B of Composite															
MD	6.0	5.8	5.8	5.5	6.8						6.0	0.5	5.5	6.8	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387483 L#C111224A04**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120095**
PGLI Control No.: **79382**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79405**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	317	317	318	318	317	320	319	321	320	321	319	2	317	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.5	4.3	5.3	6.5	5.8						5.5	0.8	4.3	6.5	1 MARV
Side B of Composite															
MD	6.0	6.8	5.0	6.0	5.5						5.9	0.7	5.0	6.8	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387501 L#C111224A04**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Capitia
PGLI Job No.: **G120095**
PGLI Control No.: **79383**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79406**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	321	319	315	315	316	320	320	321	311	310	317	4	310	321	300 min
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.8	5.0	6.3	4.8	5.8						5.5	0.6	4.8	6.3	1 MARV
Side B of Composite															
MD	6.5	6.3	5.3	5.5	8.0						6.3	1.1	5.3	8.0	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/27/2012**
Client Sample ID: **R#131387519 L#C111224A04**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120095**
PGLI Control No.: **79384**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79407**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	320	317	320	317	314	320	326	331	320	316	320	5	314	331	300 min
GEOCOMPOSITE:															
ASTM D4716 Transmissivity *Tested at Normal Pressure : 1,000 psf, Gradient: 0.33 , Seating Time: 100 hrs*															
Temperature of Test Water: 20.3° C Specimen Size: 12" x 14"															
Transmissivity (m.²/ sec.)															
MD **3.35E-03**											3.35E-03	-	-	-	$1.3x10^{-3}$
Flow Rate (gal/min)															
MD **5.38**											5.38	-	-	-	
Transmissivity (gal/min/ft)															
MD **16.19**											16.19	-	-	-	

Test Set-Up:

Plate _____
Protective Cover Soil (C#78903) *oooooooo*
FabriNet UF Geocomposite *XXXXXX*
40mil LLDPE Microspike R#343519-11 *==========* ***Thickness :*** *372* ***mils (Before)***
Plate _____ ***Thickness :*** *357* ***mils (After)***

ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)

Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.

Full scale force range used for testing: 100 lbs.

	1	2	3	4	5	Avg.	Std. Dev.	Min	Max	Proj. Specs.
Side A of Composite										
MD	5.8	4.5	6.0	4.8	5.8	5.4	0.7	4.5	6.0	1 MARV
Side B of Composite										
MD	8.3	6.8	6.3	8.3	5.3	7.0	1.3	5.3	8.3	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#131387541 L#C111224A04**
Material Description: **300mil FabriNet UF Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120095**
PGLI Control No.: **79385**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:	**C#79408**															
ASTM D5199	Thickness (mils)															
	Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
	Loading time: 5sec Specimen Size: 4" x 4"															
		319	**316**	**320**	**317**	**316**	**310**	**317**	**316**	**317**	**320**	**317**	**3**	**310**	**320**	**300 min**
GEOCOMPOSITE:																
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)															
	Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
	Full scale force range used for testing: 100 lbs.															
	Side A of Composite															
	MD	**5.5**	**6.5**	**6.0**	**5.0**	**5.8**						**5.8**	**0.6**	**5.0**	**6.5**	**1 MARV**
	Side B of Composite															
	MD	**6.8**	**8.0**	**6.3**	**6.0**	**7.8**						**7.0**	**0.9**	**6.0**	**8.0**	**1 MARV**

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MD - MACHINE DIRECTION
DC#1984 Record#265

APPENDIX 5

Construction Quality Assurance Test Results For FabriNet UF Geotextile Component

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *GVZ* #:0.13

DATE: 02/02/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120048

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 2, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130416826	79127
R#130416825	79128
R#130416811	79129
R#130416827	79130
R#130416804	79131
R#130416800	79132

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416826**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79127**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.0	7.0	6.8	6.7						6.9	0.2	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	200	211	198	190	206	208	212	206	200	198	203	7	190	212	
	TD	230	220	241	241	220	220	226	226	229	230	228	8	220	241	
	Apparent Breaking Elongation (percent)															
	MD	73	75	77	72	75	76	74	74	73	77	75	2	72	77	
	TD	104	97	107	101	87	90	94	97	94	104	97	6	87	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	126	122	121	120	126	126	132	130	127	126	4	120	132	
		125	132	129	122	126										

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416825**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79128**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	7.2	7.2	7.4	7.0						7.1	0.2	6.8	7.4	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	190	192	188	187	192	200	206	198	197	196	195	6	187	206	
	TD	230	220	221	221	238	238	240	243	230	220	230	9	220	243	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	76	77	75	76	78	76	73	76	2	73	78	
	TD	90	89	90	94	104	104	101	104	97	94	97	6	89	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		132	130	135	130	127	125	125	121	120	120	125	5	118	135	
		118	120	121	126	129										

(End of Table 2)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416811**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79129**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	6.7	6.9	7.0	6.8						6.9	0.2	6.7	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	207	206	198	197	190	188	190	192	192	197	7	188	207	
	TD	230	226	240	238	237	220	240	238	237	232	234	7	220	240	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	75	74	74	70	70	70	76	73	2	70	77	
	TD	94	90	107	102	104	94	102	101	104	90	99	6	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		126	127	131	130	129	125	126	132	129	126	128	3	121	132	
		129	121	126	129	132										

(End of Table 3)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416827**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79130**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	6.9	6.9	6.8	7.0						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	201	206	217	200	198	190	197	206	202	198	201	7	190	217	
	TD	220	236	232	220	230	231	238	220	232	220	228	7	220	238	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	75	77	72	75	74	73	75	75	2	72	77	
	TD	97	104	93	90	94	90	97	94	92	90	94	4	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	125	130	127	131	130	130	126	125	128	3	120	132	
		120	126	132	130	127										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.94	1.92	1.91	1.92							1.92	0.01	1.91	1.94	
	Permeability (cm./ sec.)															
		0.35	0.35	0.34	0.33							0.34	0.01	0.33	0.35	
	Flow Rate (gpm/ ft.^{2})															
		145	143	143	143							144	1	143	145	

(Continued on next page)

MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416827**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79130**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	**70-100**	**70-100**	**70-100**	**70-100**						**70-100**	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.208	**0.209**	**0.211**	**0.211**	**0.212**						**0.210**	**0.002**	**0.208**	**0.212**	

(End of Table 4)

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MD - MACHINE DIRECTION
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TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416804**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79131**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.1	7.0	6.9	6.8						6.9	0.1	6.8	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	201	198	190	193	206	206	211	200	198	201	7	190	211	
	TD	220	238	230	240	241	242	246	236	238	237	237	7	220	246	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	74	73	73	75	75	76	76	75	1	73	77	
	TD	95	90	99	102	104	101	104	97	97	94	98	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	126	125	120	120	135	130	120	132	129	128	5	120	135	
		132	129	126	132	129										

(End of Table 5)

(Sheet 1 of 1)

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TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416800**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120048**
PGL Control No.: **79132**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	6.9	7.0	7.0	6.8						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	201	206	198	192	192	197	206	207	207	211	202	7	192	211	
	TD	248	242	238	237	231	226	220	238	240	241	236	8	220	248	
	Apparent Breaking Elongation (percent)															
	MD	77	73	80	73	75	77	73	74	75	74	75	2	73	80	
	TD	102	104	94	90	87	90	94	101	102	104	97	6	87	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	126	125	122	126	127	125	119	126	127	126	4	119	136	
		126	132	129	129	136										

(End of Table 6)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *CVZ* #:0.13

DATE: 02/02/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120049

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 2, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130416799	79133
R#130416793	79134
R#130416797	79135
R#130416806	79136
R#130417225	79137
R#130417168	79138

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416799**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79133**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.9	7.1	6.7	7.0	7.1						6.9	0.2	6.7	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	190	192	197	206	200	201	203	200	206	211	201	6	190	211	
	TD	238	240	241	240	241	240	243	240	227	232	238	5	227	243	
	Apparent Breaking Elongation (percent)															
	MD	77	75	75	75	75	75	75	75	75	75	75	1	75	77	
	TD	97	105	101	104	104	101	105	104	90	94	100	5	90	105	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		136	129	125	120	126	125	124	129	122	126	127	4	120	136	
		126	128	132	130	127										

(End of Table 1)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416793**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79134**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	6.9	6.9	7.0	7.0						7.0	0.1	6.9	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	188	190	197	206	201	206	200	192	188	192	196	7	188	206	
	TD	230	219	220	226	242	238	239	242	241	242	234	9	219	242	
	Apparent Breaking Elongation (percent)															
	MD	77	75	75	75	77	75	75	75	75	76	75	1	75	77	
	TD	104	94	90	97	104	97	104	101	102	104	100	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	131	127	130	127	132	127	131	127	129	2	125	132	
		132	129	125	126	131										

(End of Table 2)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416797**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79135**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.1	7.0	7.1	6.7						7.0	0.2	6.7	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	190	195	206	202	200	198	191	190	192	192	196	6	190	206	
	TD	230	240	220	229	230	240	242	238	230	236	233	7	220	242	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	74	74	75	75	74	75	74	75	1	73	77	
	TD	106	104	93	94	97	101	104	94	97	94	98	5	93	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		129	132	136	129	125	125	126	131	129	120	126	5	117	136	
		120	117	120	125	126										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.97	1.95	1.95	1.95							1.95	0.01	1.95	1.97	
	Permeability (cm./ sec.)															
		0.34	0.34	0.35	0.35							0.34	0.01	0.34	0.35	
	Flow Rate (gpm/ ft.^{2})															
		148	146	146	146							146	1	146	148	

(Continued on next page)

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416797**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79135**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	**70-100**	**70-100**	**70-100**	**70-100**						**70-100**	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.210	**0.210**	**0.211**	**0.212**	**0.211**						**0.211**	**0.001**	**0.210**	**0.212**	

(End of Table 3)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130416806**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79136**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.9	6.9	6.7	6.8	7.0						6.9	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	195	196	200	201	198	188	190	192	194	190	194	4	188	201	
	TD	219	230	226	238	240	242	238	232	229	220	231	8	219	242	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	75	75	74	76	74	74	77	75	1	73	77	
	TD	97	104	97	104	101	104	97	93	90	94	98	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	126	138	130	130	130	136	130	129	138	131	5	120	138	
		136	130	131	126	131										

(End of Table 4)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130417225**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79137**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	6.9	7.0	7.0	7.0						7.0	0.0	6.9	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	196	190	192	192	188	200	212	197	206	212	198	9	188	212	
	TD	230	240	242	228	250	248	242	235	240	220	237	9	220	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	77	75	73	75	77	75	76	75	1	73	77	
	TD	104	104	104	97	104	107	102	106	104	94	102	4	94	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	121	136	127	122	121	119	120	121	120	122	5	118	136	
		127	121	119	118	122										

(End of Table 5)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/2/2012**
Client Sample ID: **R#130417168**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120049**
PGL Control No.: **79138**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	6.8	6.9	7.0	6.8						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	212	200	198	190	206	211	206	198	190	202	8	190	212	
	TD	230	220	227	220	239	240	250	242	220	236	232	11	220	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	75	77	73	74	75	75	74	75	1	73	77	
	TD	89	90	94	97	101	104	107	102	94	104	98	6	89	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		121	126	125	125	130	127	125	124	125	127	126	2	121	130	
		125	130	127	127	125										

(End of Table 6)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: CVZ #:0.13

DATE: 02/03/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120050

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 3, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417207	79139
R#130417235	79140
R#130417227	79141
R#130416829	79142
R#130417201	79143
R#130417160	79144

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417207**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79139**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	6.9	6.9	7.0	7.0						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	200	211	208	206	207	200	198	190	192	202	7	190	211	
	TD	231	221	230	232	240	241	237	240	240	241	235	7	221	241	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	75	76	77	74	76	77	75	75	1	73	77	
	TD	90	94	90	97	104	102	99	104	104	104	99	6	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		131	127	127	125	124	130	127	127	124	130	127	3	121	131	
		127	121	131	127	122										

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417235**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79140**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	7.0	7.0	6.9	6.9						7.0	0.1	6.9	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	190	192	195	206	207	208	200	207	211	208	202	8	190	211	
	TD	237	240	242	250	248	240	237	230	227	231	238	7	227	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	76	77	75	76	77	74	77	76	1	73	77	
	TD	104	102	107	104	104	104	97	87	90	97	99	7	87	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	119	117	117	119	120	121	120	121	119	121	4	117	131	
		125	125	129	131	117										

(End of Table 2)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417227**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79141**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	6.9	7.0	6.9	6.8						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	197	200	196	200	206	200	206	207	208	202	5	196	208	
	TD	238	240	242	230	227	241	242	247	240	239	239	6	227	247	
	Apparent Breaking Elongation (percent)															
	MD	77	73	80	73	77	75	76	75	77	76	76	2	73	80	
	TD	104	101	104	94	97	104	101	104	107	104	102	4	94	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	129	119	117	120	121	120	119	122	120	123	4	117	130	
		130	127	125	124	123										

(End of Table 3)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130416829**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79142**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	7.0	7.0	6.8	7.0						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	206	211	200	192	198	197	206	207	206	202	6	192	211	
	TD	230	229	242	240	237	231	229	244	240	237	236	6	229	244	
	Apparent Breaking Elongation (percent)															
	MD	77	75	80	75	76	77	75	75	76	75	76	2	75	80	
	TD	97	90	107	101	104	90	97	102	104	94	98	6	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	129	130	127	125	125	124	130	119	120	125	3	119	130	
		127	125	124	124	127										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		2.09	2.01	1.95	1.95							2.00	0.07	1.95	2.09	
	Permeability (cm./ sec.)															
		0.33	0.34	0.34	0.36							0.34	0.01	0.33	0.36	
	Flow Rate (gpm/ ft.^{2})															
		156	150	146	146							149	5	146	156	

(Continued on next page)

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130416829**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79142**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	**70-100**	**70-100**	**70-100**	**70-100**						**70-100**	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.208	**0.210**	**0.211**	**0.211**	**0.211**						**0.210**	**0.001**	**0.208**	**0.211**	

(End of Table 4)

(Sheet 2 of 2)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417201**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79143**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.0	7.0	6.8	6.9						6.9	0.1	6.8	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	192	190	197	206	207	211	208	207	207	200	203	7	190	211	
	TD	231	240	247	229	229	232	230	229	227	232	233	6	227	247	
	Apparent Breaking Elongation (percent)															
	MD	77	75	75	74	75	75	76	77	73	73	75	1	73	77	
	TD	97	101	104	90	94	90	87	90	97	94	94	5	87	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	121	119	131	120	117	120	121	130	140	124	6	117	140	
		127	127	121	120	119										

(End of Table 5)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417160**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120050**
PGL Control No.: **79144**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	7.0	7.0	6.8	6.9						6.9	0.1	6.8	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	190	189	192	200	211	206	212	208	191	202	200	9	189	212	
	TD	230	220	219	221	236	221	227	231	234	227	227	6	219	236	
	Apparent Breaking Elongation (percent)															
	MD	77	75	76	77	76	75	77	75	75	73	76	1	73	77	
	TD	94	97	94	97	104	96	94	90	97	94	95	4	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		121	119	123	126	130	131	125	125	119	120	123	4	119	131	
		121	120	121	120	122										

(End of Table 6)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *CVZ* #:0.13

DATE: 02/03/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120051

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 3, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417295	79145
R#130417288	79146
R#130416784	79147
R#130417303	79148
R#130416820	79149
R#130417291	79150

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417295**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79145**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.6	6.5	6.6	6.5						6.6	0.1	6.5	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	206	201	208	200	207	198	201	190	190	201	7	190	208	
	TD	231	248	250	241	250	238	237	242	220	237	239	9	220	250	
	Apparent Breaking Elongation (percent)															
	MD	73	71	75	75	75	75	75	77	75	76	75	2	71	77	
	TD	94	106	102	105	104	94	92	104	90	94	98	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	120	120	120	121	120	120	120	117	119	120	2	117	127	
		120	120	122	120	120										

(End of Table 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417288**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79146**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.5	6.6	6.7	6.5	6.6						6.6	0.1	6.5	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	200	211	208	200	198	190	192	192	206	199	7	190	211	
	TD	235	248	250	251	247	241	248	242	237	231	243	7	231	251	
	Apparent Breaking Elongation (percent)															
	MD	73	70	79	72	73	74	75	72	77	73	74	3	70	79	
	TD	90	104	102	107	106	107	104	102	94	90	100	7	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		119	120	121	120	120	123	124	125	125	127	125	4	119	132	
		132	130	130	127	127										

(End of Table 2)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130416784**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79147**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.4	6.7	6.7	6.7	6.5						6.6	0.1	6.4	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	207	211	198	190	201	198	192	189	206	200	8	189	211	
	TD	230	226	237	248	241	250	242	248	247	241	241	8	226	250	
	Apparent Breaking Elongation (percent)															
	MD	80	80	74	75	77	75	77	73	74	73	76	3	73	80	
	TD	94	90	99	104	101	106	107	104	105	102	101	5	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		121	120	120	117	119	120	121	120	120	117	120	2	117	127	
		117	120	120	127	121										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.92	1.95	1.98	2.00							1.96	0.04	1.92	2.00	
	Permeability (cm./ sec.)															
		0.34	0.33	0.33	0.33							0.33	0.00	0.33	0.34	
	Flow Rate (gpm/ ft.^{2})															
		143	146	148	150							147	3	143	150	

(Continued on next page)

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130416784**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79147**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	**70-100**	**70-100**	**70-100**	**70-100**						**70-100**	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.207	**0.210**	**0.211**	**0.211**	**0.210**						**0.210**	**0.002**	**0.207**	**0.211**	

(End of Table 3)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417303**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79148**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.8	6.8	7.0	6.9						6.8	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	200	198	190	188	192	199	206	211	200	207	199	8	188	211	
	TD	230	236	240	237	241	230	238	232	230	237	235	4	230	241	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	77	75	72	73	76	75	75	75	2	72	77	
	TD	97	90	104	90	104	95	97	90	94	90	95	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	120	132	130	120	120	120	120	126	125	124	4	120	132	
		130	127	127	123	122										

(End of Table 4)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130416820**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79149**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	7.1	7.2	7.2	6.7						7.1	0.2	6.7	7.2	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	201	198	190	198	200	206	207	201	198	200	5	190	207	
	TD	220	238	230	240	241	250	254	237	248	250	241	10	220	254	
	Apparent Breaking Elongation (percent)															
	MD	73	77	75	75	80	73	72	77	79	73	76	3	72	80	
	TD	93	90	99	101	104	101	102	94	106	107	100	6	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		121	121	117	115	135	126	125	125	124	130	124	5	115	135	
		127	125	127	127	121										

(End of Table 5)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130417291**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120051**
PGL Control No.: **79150**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	7.0	7.1	7.0	6.8						6.9	0.2	6.7	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	188	192	192	206	200	212	205	206	200	206	201	8	188	212	
	TD	220	238	240	241	250	247	238	237	220	231	236	10	220	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	74	74	75	77	76	77	73	75	1	73	77	
	TD	94	104	102	107	104	105	94	90	95	90	98	6	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	112	110	119	120	126	130	121	117	127	120	5	110	130	
		121	120	119	120	121										

(End of Table 6)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: OVZ #:0.13

DATE: 02/15/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120096

DATE RECEIVED: February13, 2012 **DATE REPORTED:** February 15, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417277	79409
R#130417305	79410
R#130417283	79411
R#130417289	79412
R#130417275	79413

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

1160 North Gilbert Street, Anaheim, CA. 92801, www.precisionlabs.net Tel# 714-520-9631, 800-522-4599 Fax#714-520-9637

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417277**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120096**
PGL Control No.: **79409**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.4	6.7	6.8	6.7	6.8						6.7	0.2	6.4	6.8	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	200	198	197	206	207	211	207	208	198	204	5	197	211	
	TD	231	220	236	232	230	236	240	241	232	230	233	6	220	241	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	78	73	75	77	73	73	75	75	2	73	78	
	TD	94	106	102	105	104	94	92	104	90	94	98	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	117	127	131	131	127	135	130	127	125	125	5	117	135	
		120	121	120	127	120										

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417305**
Material Description: **6oz Non-Woven Geotextile Component of FabrINet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120096**
PGL Control No.: **79410**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.7	6.9	6.7	6.6						6.7	0.1	6.6	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	189	200	198	190	197	197	198	200	206	208	198	6	189	208	
	TD	238	240	241	240	232	247	232	220	236	232	236	7	220	247	
	Apparent Breaking Elongation (percent)															
	MD	80	83	77	80	79	77	73	80	79	73	78	3	73	83	
	TD	94	104	104	106	94	104	94	94	90	94	98	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	126	120	117	120	120	121	126	124	127	123	4	117	130	
		130	127	121	118	117										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.95	1.95	1.95	2.03							1.97	0.04	1.95	2.03	
	Permeability (cm./ sec.)															
		0.34	0.35	0.33	0.33							0.33	0.01	0.33	0.35	
	Flow Rate (gpm/ ft.^{2})															
		146	145	146	152							147	3	145	152	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.210	0.210	0.211	0.212	0.210						0.211	0.001	0.210	0.212	

(End of Table 2)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417283**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120096**
PGL Control No.: **79411**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	7.1	7.0	7.0	6.9						6.9	0.1	6.8	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	201	200	198	190	193	197	200	206	211	200	6	190	211	
	TD	238	240	241	250	240	237	238	240	238	240	240	4	237	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	76	75	74	74	69	76	77	77	75	3	69	77	
	TD	90	104	104	102	104	90	94	103	94	104	99	6	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		131	127	120	117	123	126	125	120	121	119	123	4	117	131	
		123	124	126	127	120										

(End of Table 3)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417289**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120096**
PGL Control No.: **79412**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.6	6.9	6.8	6.7						6.7	0.1	6.6	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	198	197	206	207	208	207	207	198	193	206	203	6	193	208	
	TD	238	241	247	243	245	240	237	232	227	238	239	6	227	247	
	Apparent Breaking Elongation (percent)															
	MD	77	73	76	80	73	74	76	75	75	75	75	2	73	80	
	TD	94	104	102	109	110	102	94	94	90	92	99	7	90	110	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	120	120	121	120	117	118	120	121	120	121	3	117	127	
		121	127	125	120	121										

(End of Table 4)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417275**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120096**
PGL Control No.: **79413**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.7	6.7	6.6	6.7						6.7	0.1	6.6	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	207	208	200	203	206	207	201	198	197	203	4	197	208	
	TD	238	230	227	232	230	220	240	242	230	237	232	7	220	242	
	Apparent Breaking Elongation (percent)															
	MD	73	77	73	74	76	75	77	73	74	74	75	2	73	77	
	TD	94	90	92	94	90	94	102	106	94	97	95	5	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		117	126	131	129	125	125	121	120	117	120	124	4	117	131	
		122	122	126	127	130										

(End of Table 5)

(Sheet 1 of 1)

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Precision Geosynthetic Laboratories International

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GAI-LAP

Initial: *OVZ* #:0.13

DATE: 02/15/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120097

DATE RECEIVED: February13, 2012 **DATE REPORTED:** February 15, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417298	79414
R#130417015	79415
R#130416996	79416
R#130417224	79417
R#130417215	79418

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417298**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120097**
PGL Control No.: **79414**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.7	6.9	6.8	6.6						6.7	0.1	6.6	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	207	201	198	192	197	206	207	201	208	202	5	192	208	
	TD	220	228	238	248	242	240	250	245	240	235	239	9	220	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	77	73	77	79	75	75	75	76	2	73	79	
	TD	94	90	94	104	101	105	102	104	106	92	99	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		123	120	121	126	123	120	117	117	118	117	121	3	116	126	
		116	120	123	124	123										

(End of Table 1)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417015**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120097**
PGL Control No.: **79415**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.6	6.5	6.4	6.4	6.7						6.5	0.1	6.4	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	207	201	198	190	198	197	192	198	200	211	199	6	190	211	
	TD	239	240	245	240	235	221	237	235	229	231	235	7	221	245	
	Apparent Breaking Elongation (percent)															
	MD	77	75	76	75	75	74	75	75	75	76	75	1	74	77	
	TD	104	102	107	104	94	90	92	92	87	94	96	7	87	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	117	120	120	121	121	121	117	120	121	121	3	117	127	
		123	124	127	120	126										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.92	1.95	2.04	2.07							1.99	0.07	1.92	2.07	
	Permeability (cm./ sec.)															
		0.34	0.35	0.33	0.34							0.34	0.01	0.33	0.35	
	Flow Rate (gpm/ ft.^{2})															
		143	146	153	154							149	5	143	154	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.208	0.210	0.211	0.211	0.211						0.210	0.001	0.208	0.211	

(End of Table 2)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130416996**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Capitia
PGL Job No.: **G120097**
PGL Control No.: **79416**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	6.7	6.5	6.7	6.7						6.7	0.1	6.5	6.8	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	200	201	198	190	198	190	193	200	202	206	198	5	190	206	
	TD	230	227	240	242	240	237	237	248	242	240	238	6	227	248	
	Apparent Breaking Elongation (percent)															
	MD	73	74	73	76	78	74	75	75	74	75	75	1	73	78	
	TD	90	94	104	104	104	90	94	107	102	104	99	7	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	120	117	117	117	119	120	117	117	120	121	4	117	130	
		121	120	127	130	122										

(End of Table 3)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417224**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120097**
PGL Control No.: **79417**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.6	6.9	6.8	6.6	6.6						6.7	0.1	6.6	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	211	200	208	198	191	192	197	200	206	201	7	191	211	
	TD	229	232	238	240	242	240	241	250	247	242	240	6	229	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	76	77	73	80	76	75	75	76	2	73	80	
	TD	90	93	101	104	102	107	106	107	104	102	101	6	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		118	117	118	120	127	126	120	119	120	121	121	3	117	127	
		120	121	121	123	120										

(End of Table 4)

(Sheet 1 of 1)

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/15/2012**
Client Sample ID: **R#130417215**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120097**
PGL Control No.: **79418**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.5	6.6	6.7	6.7	6.7						6.6	0.1	6.5	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	188	189	197	206	207	201	203	206	200	201	200	7	188	207	
	TD	238	240	242	240	242	250	247	243	246	247	243	4	238	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	74	76	80	73	74	77	69	76	75	3	69	80	
	TD	94	103	102	104	106	107	106	107	107	104	104	4	94	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	120	121	120	117	117	120	127	128	123	5	117	130	
		120	121	127	130	117										

(End of Table 5)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: OVZ #:0.13

DATE: 02/16/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120098

DATE RECEIVED: February13, 2012 **DATE REPORTED:** February 16, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417187	79419
R#130417191	79420
R#130417190	79421
R#130417199	79422
R#130417181	79423

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417187**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120098**
PGL Control No.: **79419**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.7	6.7	6.7	6.5						6.7	0.1	6.5	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	208	209	210	201	198	196	190	207	201	203	7	190	210	
	TD	230	227	240	220	230	237	235	247	241	238	235	8	220	247	
	Apparent Breaking Elongation (percent)															
	MD	77	73	76	74	76	75	74	74	75	75	75	1	73	77	
	TD	90	94	101	94	92	90	94	106	104	100	96	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		122	127	129	132	117	115	116	117	116	117	120	5	115	132	
		117	118	120	121	120										

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417191**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120098**
PGL Control No.: **79420**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.5	6.6	6.6	6.5						6.6	0.1	6.5	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	200	206	207	198	190	192	197	197	200	206	199	6	190	207	
	TD	240	247	241	238	230	227	236	248	241	240	239	7	227	248	
	Apparent Breaking Elongation (percent)															
	MD	77	73	76	76	75	75	75	76	75	77	75	1	73	77	
	TD	104	102	107	90	92	94	90	104	105	105	99	7	90	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	125	125	129	131	129	125	124	120	121	124	4	119	131	
		121	119	119	126	125										

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MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417190**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120098**
PGL Control No.: **79421**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.6	6.5	6.4	6.4	6.4						6.5	0.1	6.4	6.6	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	207	210	203	200	198	197	196	190	200	204	201	6	190	210	
	TD	230	227	227	238	227	241	246	237	238	227	234	7	227	246	
	Apparent Breaking Elongation (percent)															
	MD	73	67	77	80	76	77	73	75	75	75	75	3	67	80	
	TD	87	90	87	94	90	104	104	95	96	96	94	6	87	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	125	125	121	119	117	118	120	117	121	4	116	130	
		116	120	121	120	121										

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MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417199**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120098**
PGL Control No.: **79422**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.9	6.6	6.7	6.6	6.8						6.7	0.1	6.6	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	200	207	200	198	193	197	191	200	207	193	199	6	191	207	
	TD	242	240	238	237	236	240	241	248	240	237	240	3	236	248	
	Apparent Breaking Elongation (percent)															
	MD	73	75	75	76	75	77	80	76	78	76	76	2	73	80	
	TD	104	102	94	90	92	104	102	104	105	94	99	6	90	105	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	127	124	123	124	120	121	125	124	123	4	117	130	
		123	120	117	117	119										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.95	1.95	1.98	2.03							1.98	0.04	1.95	2.03	
	Permeability (cm./ sec.)															
		0.34	0.33	0.33	0.33							0.33	0.00	0.33	0.34	
	Flow Rate (gpm/ ft.^{2})															
		146	146	148	152							148	3	146	152	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.210	0.211	0.211	0.211	0.210						0.210	0.001	0.210	0.211	

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MD - MACHINE DIRECTION
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TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417181**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120098**
PGL Control No.: **79423**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.5	6.5	6.6	6.5						6.5	0.1	6.5	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	208	200	203	198	193	190	185	197	196	198	7	185	208	
	TD	236	231	240	241	241	237	236	230	237	237	237	4	230	241	
	Apparent Breaking Elongation (percent)															
	MD	73	75	76	76	74	79	67	67	76	75	74	4	67	79	
	TD	90	94	104	105	101	94	90	92	94	90	95	6	90	105	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		110	111	112	117	120	118	122	127	127	119	120	6	110	130	
		127	117	123	127	130										

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Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *OVZ* #:0.13

DATE: 02/16/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120099

DATE RECEIVED: February13, 2012 **DATE REPORTED:** February 16, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417019	79424
R#130417177	79425
R#130417179	79426
R#130417178	79427
R#130417008	79428

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417019**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120099**
PGL Control No.: **79424**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.6	6.5	6.7	6.4	6.5						6.5	0.1	6.4	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	207	208	200	203	206	207	210	200	207	200	205	4	200	210	
	TD	230	237	250	250	247	241	240	241	238	237	241	6	230	250	
	Apparent Breaking Elongation (percent)															
	MD	73	75	76	77	74	74	72	74	74	77	74	2	72	77	
	TD	90	87	106	101	106	107	106	104	94	90	99	8	87	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		131	128	120	119	117	119	120	120	121	123	122	4	117	131	
		124	125	127	120	123										

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417177**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120099**
PGL Control No.: **79425**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.7	6.7	6.6	6.4						6.6	0.1	6.4	6.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	190	188	189	200	200	206	210	202	200	206	199	8	188	210	
	TD	238	240	242	240	236	240	250	251	220	237	239	9	220	251	
	Apparent Breaking Elongation (percent)															
	MD	77	73	80	73	74	74	75	76	75	75	75	2	73	80	
	TD	90	104	101	106	94	104	101	105	94	90	99	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	124	125	121	119	117	119	120	121	120	123	4	117	131	
		124	123	125	129	131										

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MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417179**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120099**
PGL Control No.: **79426**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	6.7	6.7	6.8	6.5						6.8	0.2	6.5	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	200	197	191	190	206	201	200	198	197	198	5	190	206	
	TD	237	230	227	237	231	235	240	246	247	237	237	6	227	247	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	75	76	72	73	75	70	69	73	2	69	77	
	TD	90	87	90	94	90	89	104	100	107	90	94	7	87	107	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	127	119	118	120	122	127	127	129	126	5	118	132	
		130	131	132	127	122										

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417178**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120099**
PGL Control No.: **79427**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.4	6.5	6.6	6.7	6.8						6.6	0.2	6.4	6.8	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	200	206	201	201	198	197	192	197	200	206	200	4	192	206	
	TD	237	240	242	247	242	241	235	231	241	248	240	5	231	248	
	Apparent Breaking Elongation (percent)															
	MD	77	73	72	74	73	78	73	78	76	75	75	2	72	78	
	TD	90	104	106	102	104	101	94	90	104	102	100	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		123	124	120	120	117	115	119	120	121	120	121	3	115	127	
		127	124	120	119	127										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.92	2.00	2.01	1.92							1.96	0.05	1.92	2.01	
	Permeability (cm./ sec.)															
		0.33	0.33	0.33	0.33							0.33	0.00	0.33	0.33	
	Flow Rate (gpm/ ft.^{2})															
		143	150	150	143							147	4	143	150	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.210	0.211	0.211	0.211	0.212						0.211	0.001	0.210	0.212	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

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TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/16/2012**
Client Sample ID: **R#130417008**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120099**
PGL Control No.: **79428**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.9	7.0	6.9	6.9						6.9	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	201	211	207	201	207	198	192	206	208	211	204	6	192	211	
	TD	238	240	241	230	227	232	230	238	241	237	235	5	227	241	
	Apparent Breaking Elongation (percent)															
	MD	77	75	76	76	77	75	76	75	75	75	76	1	75	77	
	TD	99	101	104	93	90	95	99	93	104	94	97	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		117	126	132	129	127	120	120	126	124	130	125	4	117	132	
		127	124	122	125	120										

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

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Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: OVZ #:0.13

DATE: 02/20/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of six (6) 6oz non-woven geotextile components of the Fabrinet UF Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120100

DATE RECEIVED: February13, 2012 **DATE REPORTED:** February 20, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417223	79429
R#130417004	79430
R#130417001	79431
R#130417272	79432
R#130417267	79433
R#130417271	79434

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 6.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/20/2012**
Client Sample ID: **R#130417223**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120100**
PGL Control No.: **79429**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.6	6.7	6.9	6.7						6.7	0.1	6.6	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	190	206	207	200	208	207	210	201	198	202	6	190	210	
	TD	247	250	251	238	240	248	240	247	242	238	244	5	238	251	
	Apparent Breaking Elongation (percent)															
	MD	73	77	70	73	72	72	73	79	70	69	73	3	69	79	
	TD	104	102	106	94	104	102	106	106	104	94	102	5	94	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		136	135	134	127	125	125	124	127	120	121	127	5	120	136	
		120	130	127	124	124										

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MD - MACHINE DIRECTION
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TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/20/2012**
Client Sample ID: **R#130417004**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120100**
PGL Control No.: **79430**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	6.5	6.6	7.1	6.9						6.7	0.2	6.5	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	203	206	189	190	182	187	200	206	200	201	196	9	182	206	
	TD	242	250	247	240	242	238	232	238	220	238	239	8	220	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	70	67	75	75	75	75	75	75	74	3	67	77	
	TD	104	102	106	106	104	94	90	94	92	93	98	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	127	125	125	125	121	119	130	127	125	127	4	119	131	
		130	130	131	130	130										

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TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/20/2012**
Client Sample ID: **R#130417001**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120100**
PGL Control No.: **79431**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.5	6.5	6.7	6.7	7.0						6.7	0.2	6.5	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	198	193	206	207	208	200	208	211	198	203	6	193	211	
	TD	230	231	227	241	246	247	242	238	237	244	238	7	227	247	
	Apparent Breaking Elongation (percent)															
	MD	77	73	78	75	74	71	75	75	77	73	75	2	71	78	
	TD	90	94	90	104	104	101	106	94	90	106	98	7	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		137	130	132	129	131	127	125	125	121	120	127	5	119	137	
		119	127	130	127	125										

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Precision Geosynthetic Laboratories International

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/20/2012**
Client Sample ID: **R#130417272**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120100**
PGL Control No.: **79432**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	7.1	6.7	6.4	6.5						6.8	0.3	6.4	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	207	201	201	200	203	198	193	193	200	206	200	5	193	207	
	TD	238	242	238	240	242	237	240	241	238	230	238	3	230	242	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	75	74	77	73	75	75	74	75	1	73	77	
	TD	94	106	94	102	104	94	104	102	94	90	98	6	90	106	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		130	130	131	130	127	125	120	120	130	132	127	4	120	132	
		129	127	131	122	120										

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Precision Geosynthetic Laboratories International

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/20/2012**
Client Sample ID: **R#130417267**
Material Description: **6oz Non-Woven Geotextile Component of FabriNet UF Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120100**
PGL Control No.: **79433**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.9	6.7	6.7	6.7	6.9						6.8	0.1	6.7	6.9	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	207	207	210	201	200	199	190	197	206	200	202	6	190	210	
	TD	237	240	241	247	245	240	250	247	237	235	242	5	235	250	
	Apparent Breaking Elongation (percent)															
	MD	73	77	73	76	77	73	80	73	77	73	75	2	73	80	
	TD	90	104	102	104	107	109	106	105	94	90	101	7	90	109	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		120	117	126	130	124	120	117	118	119	120	122	4	117	130	
		127	125	125	126	117										

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MD - MACHINE DIRECTION
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Precision Geosynthetic Laboratories International

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **2/13/2012**
Date Reported: **2/20/2012**
Client Sample ID: **R#130417271**
Material Description: **6oz Non-Woven Geotextile Component of FabrINet UF Geocomposite**

QC'd By: Maria Cepitia
PGL Job No.: **G120100**
PGL Control No.: **79434**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	7.0	6.9	6.7	6.8						6.8	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	197	206	207	210	208	200	200	206	201	203	204	4	197	210	
	TD	241	248	240	240	250	247	241	238	240	245	243	4	238	250	
	Apparent Breaking Elongation (percent)															
	MD	79	75	74	76	77	72	69	76	77	68	74	4	68	79	
	TD	106	101	104	96	107	102	104	96	94	109	102	5	94	109	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		121	131	140	127	117	119	121	127	130	117	126	7	117	140	
		120	130	127	124	138										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.90	1.96	1.96	1.95							1.94	0.03	1.90	1.96	
	Permeability (cm./ sec.)															
		0.34	0.34	0.34	0.35							0.34	0.00	0.34	0.35	
	Flow Rate (gpm/ ft.^{2})															
		142	147	147	146							145	2	142	147	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.210	0.210	0.211	0.210	0.211						0.210	0.001	0.210	0.211	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

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APPENDIX 6

Construction Quality Assurance Test Results For PermaNet UL Geocomposite and Geonet Component

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *OVZ* #:0.13

DATE: 02/.06/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of seven (7) 300mil PermaNet UL Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120041

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 6, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
PermaNet UL R#131385854 L#C111102L01	
Geocomposite	79063
Geonet	79070
PermaNet UL R#131385869 L#C111102L01	
Geocomposite	79064
Geonet	79071
PermaNet UL R#131385884 L#C111102L01	
Geocomposite	79065
Geonet	79072
PermaNet UL R#131385901 L#C111102L01	
Geocomposite	79066
Geonet	79073
PermaNet UL R#131385916 L#CB21112102	
Geocomposite	79067
Geonet	79074
PermaNet UL R#131385892 L#C111102L01 (Random sample 1)	
Geocomposite	79068
PermaNet UL R#131385913 L#CB21112102 (Random sample 2)	
Geocomposite	79069

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
Geocomposite	
ASTM D4716	Transmissivity
ASTM D7005	Ply Adhesion
Geonet Component	
ASTM D5199	Thickness

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 7.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. R***etained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131385854 L#C111102L01**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120041**
PGLI Control No.: **79063**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79070**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	340	337	338	337	341	339	343	341	338	339	339	2	337	343	
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.5	6.1	5.2	7.8	6.3						6.2	1.0	5.2	7.8	1 MARV
Side B of Composite															
MD	7.4	5.6	6.4	5.1	6.0						6.1	0.8	5.1	7.4	1 MARV

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131385869 L#C111102L01**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120041**
PGLI Control No.: **79064**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79071**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	342	340	342	348	342	340	341	348	341	340	342	3	340	348	
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	6.1	5.3	7.6	5.8	6.3						6.2	0.9	5.3	7.6	1 MARV
Side B of Composite															
MD	5.8	6.1	5.8	5.5	6.4						5.9	0.3	5.5	6.4	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/6/2012**
Client Sample ID: **R#131385884 L#C111102L01**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120041**
PGLI Control No.: **79065**

	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
METHOD DESCRIPTION															
GEONET COMPONENT: C#79072															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	347	342	340	347	341	346	350	347	342	348	345	4	340	350	
GEOCOMPOSITE:															
ASTM D4716 Transmissivity *Tested at Normal Pressure : 20,000 psf, Gradient: 0.02 , Seating Time: 100 hrs*															
Temperature of Test Water: 20.3 ^{0}C Specimen Size: 12" x 14"															
Transmissivity (m.^{2}/ sec.)															
MD	1.39E-02										1.39E-02	-	-	-	1.8x10^{-3}
Flow Rate (gal/min)															
MD	1.36										1.36	-	-	-	
Transmissivity (gal/min/ft)															
MD	67.25										67.25	-	-	-	
Test Set-Up:															
Plate _____															
Drainage Sand (C#78902) *oooooooo* ***88.6 PCF at as-received moisture content***															
PermaNet UL Geocomposite *XXXXXX*															
60 mil HDPE Microspike R#443564-11 *=========* ***Thickness :*** *415* ***mils (Before)***															
Plate _____ ***Thickness :*** *380* ***mils (After)***															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.9	7.0	5.9	5.9	5.5						6.0	0.6	5.5	7.0	1 MARV
Side B of Composite															
MD	7.4	5.6	5.8	6.0	6.3						6.2	0.7	5.6	7.4	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131385901 L#C111102L01**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120041**
PGLI Control No.: **79066**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT: **C#79073**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	350	349	350	350	347	342	340	342	340	347	346	4	340	350	
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.9	5.6	7.9	5.6	5.6						6.1	1.0	5.6	7.9	1 MARV
Side B of Composite															
MD	7.4	5.8	7.0	5.8	7.9						6.8	1.0	5.8	7.9	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131385916 L#CB21112102**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120041**
PGLI Control No.: **79067**

	SPECIMENS														Proj.
	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Specs.
METHOD DESCRIPTION															
GEONET COMPONENT: **C#79074**															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	347	341	346	345	341	346	350	347	341	346	345	3	341	350	
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.8	3.8	5.3	5.4	6.5						5.3	1.0	3.8	6.5	1 MARV
Side B of Composite															
MD	6.4	6.9	5.5	8.0	6.0						6.6	1.0	5.5	8.0	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 6.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131385892 L#C111102L01 (Random Sample 1)**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Espitia
PGLI Job No.: **G120041**
PGLI Control No.: **79068**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	341	348	341	348	341	349	350	350	351	350	347	4	341	351	
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	5.9	7.3	6.1	7.9	6.6						6.8	0.8	5.9	7.9	1 MARV
Side B of Composite															
MD	6.3	6.6	8.6	5.9	5.4						6.6	1.2	5.4	8.6	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

TABLE 7.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#131385913 L#CB21112102 (Random Sample 2)**
Material Description: **300mil PermaNet UL Double-Sided Geocomposite**

QC'd By: Maria Epitia
PGLI Job No.: **G120041**
PGLI Control No.: **79069**

METHOD DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
GEONET COMPONENT:															
ASTM D5199 Thickness (mils)															
Apparatus: Dead weight dial micrometer with 56.4mm (2.22in) dia presser foot and 509gm dead weight (equivalent pressure= 2kPA or 0.29psi).															
Loading time: 5sec Specimen Size: 4" x 4"															
	348	341	350	340	341	341	348	350	347	346	345	4	340	350	
GEOCOMPOSITE:															
ASTM D7005 Ply Bond Adhesion (lbs/ in.- width)															
Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.															
Full scale force range used for testing: 100 lbs.															
Side A of Composite															
MD	8.1	7.3	8.0	6.4	5.6						7.1	1.1	5.6	8.1	1 MARV
Side B of Composite															
MD	6.5	8.1	6.0	7.4	5.9						6.8	1.0	5.9	8.1	1 MARV

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MD - MACHINE DIRECTION
DC#1984 Record#265

APPENDIX 7

Construction Quality Assurance Test Results For PermaNet UL Geotextile Component

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: *CVZ* #:0.13

DATE: 02/03/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 6oz non-woven geotextile component of the PermaNet UL Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120046

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 3, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130414081	79117
R#130414075	79118
R#130414079	79119
R#130414072	79120
R#130414059	79121

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4533	Trapezoidal Tear Resistance
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4632	Grab Tensile

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130414081**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120046**
PGL Control No.: **79117**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.7	7.0	7.0	7.0	6.9						6.9	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	220	215	206	212	208	207	220	211	206	202	211	6	202	220	
	TD	255	260	247	255	246	238	247	250	256	260	251	7	238	260	
	Apparent Breaking Elongation (percent)															
	MD	77	75	75	75	78	76	75	75	77	73	76	1	73	78	
	TD	104	101	100	110	107	94	113	111	112	112	106	7	94	113	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		126	125	126	121	120	120	122	126	132	129	125	3	120	132	
		125	126	130	126	125										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	107	106	107	101	98	97	102	104	104	106	103	4	97	107	
	TD	142	130	130	130	131	126	122	123	129	129	129	5	122	142	

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130414075**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120046**
PGL Control No.: **79118**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.8	7.1	6.9	6.7	7.0						6.9	0.2	6.7	7.1	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		129	122	132	129	120	119	119	122	126	125	124	4	119	132	
		125	122	124	126	125										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	106	110	112	102	110	106	100	98	97	95	104	6	95	112	
	TD	132	129	125	126	130	127	120	120	120	124	125	4	120	132	

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130414079**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120046**
PGL Control No.: **79119**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.0	6.8	6.7	6.8						6.9	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	198	206	211	208	201	204	200	198	207	207	204	5	198	211	
	TD	235	246	250	251	243	230	231	248	250	243	243	8	230	251	
	Apparent Breaking Elongation (percent)															
	MD	77	75	78	76	75	78	76	75	77	74	76	1	74	78	
	TD	94	104	107	108	104	90	95	104	101	105	101	6	90	108	
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.97	1.98	2.01	2.03							2.00	0.03	1.97	2.03	
	Permeability (cm./ sec.)															
		0.32	0.34	0.32	0.32							0.32	0.01	0.32	0.34	
	Flow Rate (gpm/ ft.^{2})															
		148	148	150	152							149	2	148	152	

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TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130414072**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120046**
PGL Control No.: **79120**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.0	6.7	6.8	6.8						6.9	0.1	6.7	7.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	207	208	211	207	200	198	207	207	211	208	206	4	198	211	
	TD	237	247	244	248	248	250	243	240	237	238	243	5	237	250	
	Apparent Breaking Elongation (percent)															
	MD	77	73	80	79	75	79	79	75	75	75	77	2	73	80	
	TD	94	102	104	106	107	109	104	102	94	90	101	6	90	109	
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.92	1.91	2.00	2.03							1.96	0.06	1.91	2.03	
	Permeability (cm./ sec.)															
		0.33	0.34	0.33	0.33							0.33	0.00	0.33	0.34	
	Flow Rate (gpm/ ft.^{2})															
		143	143	150	152							147	4	143	152	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/3/2012**
Client Sample ID: **R#130414059**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120046**
PGL Control No.: **79121**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	6.8	7.0	7.1	6.9						7.0	0.1	6.8	7.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	206	207	206	198	206	200	198	197	206	208	203	4	197	208	
	TD	230	246	246	240	237	238	240	242	247	240	240	5	230	247	
	Apparent Breaking Elongation (percent)															
	MD	73	77	75	77	75	76	77	74	72	73	75	2	72	77	
	TD	93	104	104	93	90	94	98	101	104	99	98	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		117	120	136	121	120	121	120	117	118	121	123	5	117	136	
		127	131	122	122	127										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	112	108	100	98	97	95	97	102	102	107	102	6	95	112	
	TD	109	109	110	120	117	125	120	111	120	123	116	6	109	125	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 02/01/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of five (5) 6oz non-woven geotextile component of the PermaNet UL Gecomposite samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120047

DATE RECEIVED: January 26, 2012 **DATE REPORTED:** February 1, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130414062	79122
R#130414069	79123
R#130414066	79124
R#130414068	79125
R#130414074	79126

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4533	Trapezoidal Tear Resistance
ASTM D5261	Mass per Unit Area
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 5.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

1160 North Gilbert Street, Anaheim, CA. 92801, www.precisionlabs.net Tel# 714-520-9631, 800-522-4599 Fax#714-520-9637

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#130414062**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120047**
PGL Control No.: **79122**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.1	6.9	7.0	6.8	7.1						7.0	0.1	6.8	7.1	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		109	109	120	119	120	127	130	119	122	121	122	8	109	138	
		119	122	124	131	138										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	111	119	120	117	111	108	102	105	102	102	110	7	102	120	
	TD	138	129	136	127	125	127	123	124	127	131	129	5	123	138	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#130414069**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120047**
PGL Control No.: **79123**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	6.9	6.8	7.0	6.7						6.9	0.1	6.7	7.0	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.211	0.212	0.211	0.211	0.210						0.211	0.001	0.210	0.212	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#130414066**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120047**
PGL Control No.: **79124**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	**7.0**	**7.0**	**6.9**	**6.9**						**7.0**	**0.1**	**6.9**	**7.0**	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	**70-100**	**70-100**	**70-100**	**70-100**						**70-100**	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.209	**0.211**	**0.211**	**0.210**	**0.208**						**0.210**	**0.001**	**0.208**	**0.211**	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#130414068**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Capitia
PGL Job No.: **G120047**
PGL Control No.: **79125**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		7.0	7.0	6.8	6.7	6.7						6.8	0.1	6.7	7.0	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		127	125	124	117	118	122	130	130	127	123	125	4	117	130	
		125	124	125	129	129										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	106	102	110	98	97	98	102	102	102	100	102	4	97	110	
	TD	130	127	136	127	127	120	121	119	120	136	126	6	119	136	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 5.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Saratosa County CCSW Phase I Class I Lf Closure

Date Received: **1/26/2012**
Date Reported: **2/1/2012**
Client Sample ID: **R#130414074**
Material Description: **6oz Non-Woven Geotextile Component of Permanet UL Geocomposite**

QC'd By: Maria Espitia
PGL Job No.: **G120047**
PGL Control No.: **79126**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		6.9	7.1	7.2	7.0	7.0						7.0	0.1	6.9	7.2	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		110	119	120	121	119	130	131	127	125	125	123	5	110	131	
		124	119	120	121	127										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	101	98	97	100	102	102	102	99	95	97	99	2	95	102	
	TD	110	120	127	132	130	131	130	132	130	132	127	7	110	132	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

APPENDIX 8

Construction Quality Assurance Test Results For Other Geotextiles

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: CVZ #:0.13

DATE: 04/03/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn,

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of one (1) 8oz Non-Woven Geotextile sample.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120263

DATE RECEIVED: March 30, 2012 **DATE REPORTED:** April 3, 2012

SAMPLE SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130415070 8oz	80362

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The sample was conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 4.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the sample tested is believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

1160 North Gilbert Street, Anaheim, CA. 92801, www.precisionlabs.net Tel# 714-520-9631, 800-522-4599 Fax#714-520-9637

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **3/30/2012**
Date Reported: **4/3/2012**
Client Sample ID: **R#130415070**
Material Description: **8oz Non-Woven Geotextile**

QC'd By: Maria Espitia
PGL Job No.: **G120263**
PGL Control No.: **80362**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		8.4	8.5	8.6	8.7	8.5						8.5	0.1	8.4	8.7	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	238	240	247	250	270	238	249	252	256	247	249	10	238	270	
	TD	260	278	289	306	271	289	297	302	306	298	290	16	260	306	
	Apparent Breaking Elongation (percent)															
	MD	77	75	80	78	80	79	76	79	82	82	79	2	75	82	
	TD	97	95	94	104	95	90	94	101	104	94	97	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		150	148	161	156	150	147	154	148	148	158	154	6	147	163	
		163	157	156	160	160										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.64	1.72	1.78	1.73							1.72	0.06	1.64	1.78	
	Permeability (cm./ sec.)															
		0.37	0.37	0.37	0.36							0.37	0.01	0.36	0.37	
	Flow Rate (gpm/ ft.^{2})															
		122	129	133	129							128	4	122	133	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.207	0.201	0.199	0.207	0.205						0.204	0.003	0.199	0.207	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: GVZ #:0.13
DATE: 05/01/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn,

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of one (1) 8oz Non-Woven Geotextile sample.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120389

DATE RECEIVED: April 27, 2012 **DATE REPORTED:** May 1, 2012

SAMPLE SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130417022 8 oz	81076

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The sample was conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Table 1.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the sample tested is believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **4/27/2012**
Date Reported: **5/1/2012**
Client Sample ID: **R#130417022**
Material Description: **8oz Non-Woven Geotextile**

QC'd By: Maria Capitia
PGL Job No.: **G120389**
PGL Control No.: **81076**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		8.4	8.4	8.6	8.5	8.5						8.5	0.1	8.4	8.6	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	238	242	250	253	248	247	238	237	240	250	244	6	237	253	
	TD	268	270	300	302	306	298	282	288	280	290	288	13	268	306	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	77	73	79	73	81	79	80	77	3	73	81	
	TD	90	94	104	102	101	94	90	95	96	90	96	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		160	159	141	150	151	155	159	160	181	176	162	11	141	181	
		178	176	159	160	162										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.70	1.73	1.72	1.72							1.72	0.01	1.70	1.73	
	Permeability (cm./ sec.)															
		0.35	0.33	0.35	0.35							0.35	0.01	0.33	0.35	
	Flow Rate (gpm/ ft.^{2})															
		127	129	128	128							128	1	127	129	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		70-100	70-100	70-100	70-100	70-100						70-100	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.205	0.201	0.210	0.207	0.206						0.206	0.003	0.201	0.210	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosynthetic Laboratories International

Precision Geosynthetic Laboratories International

A Texas Research International Company

GAI-LAP

Initial: CVZ #:0.13

DATE: 03/22/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Dear Mr. Kuehn,

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of four (4) 16oz Non-Woven Geotextile samples.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G120230

DATE RECEIVED: March 19, 2012 **DATE REPORTED:** March 22, 2012

SAMPLED BY: PGLI at GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130424276	80216
R#130424296	80217
R#130424316	80218
R#130424336	80219

16 oz

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size

TEST CONDITIONS: The samples were conditioned for a minimum of one hour in the laboratory at 22 ± 2°C (71.6 ± 3.6°F) and at 60 ± 10% relative humidity prior to test.

TEST RESULTS: The test results are summarized in Tables 1 to 4.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **3/19/2012**
Date Reported: **3/22/2012**
Client Sample ID: **R#130424276**
Material Description: **16oz Non-Woven Geotextile**

QC'd By: Maria Espitia
PGL Job No.: **G120230**
PGL Control No.: **80216**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		17.0	16.9	16.8	17.0	16.9						16.9	0.1	16.8	17.0	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	530	511	520	512	540	530	541	530	512	506	523	13	506	541	
	TD	639	670	598	601	611	597	606	621	611	638	619	23	597	670	
	Apparent Breaking Elongation (percent)															
	MD	80	77	76	80	79	76	80	79	80	79	79	2	76	80	
	TD	101	104	94	97	95	90	94	104	94	114	99	7	90	114	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		321	311	340	297	297	301	321	311	306	320	310	12	297	340	
		312	300	301	298	307										

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 2.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **3/19/2012**
Date Reported: **3/22/2012**
Client Sample ID: **R#130424296**
Material Description: **16oz Non-Woven Geotextile**

QC'd By: Maria Capitia
PGL Job No.: **G120230**
PGL Control No.: **80217**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		16.7	16.5	16.4	16.6	16.8						16.6	0.2	16.4	16.8	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	478	530	511	530	570	620	598	478	500	571	539	49	478	620	
	TD	638	597	600	570	611	620	613	598	600	578	603	20	570	638	
	Apparent Breaking Elongation (percent)															
	MD	77	76	78	80	86	82	77	76	80	77	79	3	76	86	
	TD	104	94	90	94	97	104	97	94	90	92	96	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		306	307	311	320	313	306	297	292	299	300	309	9	292	320	
		320	317	306	320	316										
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.15	1.22	1.18	1.10							1.16	0.05	1.10	1.22	
	Permeability (cm./ sec.)															
		0.38	0.36	0.37	0.36							0.37	0.01	0.36	0.38	
	Flow Rate (gpm/ ft.^{2})															
		86	91	88	82							87	4	82	91	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.															
		0.147	0.145	0.146	0.144	0.146						0.145	0.001	0.144	0.147	

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 3.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **3/19/2012**
Date Reported: **3/22/2012**
Client Sample ID: **R#130424316**
Material Description: **16oz Non-Woven Geotextile**

QC'd By: Maria Espitia
PGL Job No.: **G120230**
PGL Control No.: **80218**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		16.9	17.2	17.3	17.1	16.4						17.0	0.4	16.4	17.3	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	520	511	530	560	527	550	511	500	501	498	521	21	498	560	
	TD	638	620	611	598	589	620	611	630	621	598	614	15	589	638	
	Apparent Breaking Elongation (percent)															
	MD	73	77	75	80	76	75	75	77	79	76	76	2	73	80	
	TD	104	86	87	90	97	104	97	104	94	90	95	7	86	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		321	311	306	298	300	307	308	321	311	306	309	7	298	321	
		311	308	299	306	317										

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

TABLE 4.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **3/19/2012**
Date Reported: **3/22/2012**
Client Sample ID: **R#130424336**
Material Description: **16oz Non-Woven Geotextile**

QC'd By: Maria Capitia
PGL Job No.: **G120230**
PGL Control No.: **80219**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		16.1	17.1	16.7	16.8	16.9						16.7	0.4	16.1	17.1	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing: 1500 lbs															
	Grab Breaking Load (lbs)															
	MD	530	511	561	601	570	530	498	512	530	541	538	31	498	601	
	TD	630	620	598	592	611	620	614	620	598	570	607	18	570	630	
	Apparent Breaking Elongation (percent)															
	MD	86	87	79	83	86	80	77	83	80	83	82	3	77	87	
	TD	101	104	87	90	94	104	97	104	94	90	96	6	87	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		311	320	316	317	300	298	300	341	311	298	309	14	280	341	
		280	306	311	306	320										

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MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

Precision Geosvnthetic Laboratories International
A Texas Research International Company

September 25, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 09/25/2012

Jerry Kuehn
Ardaman & Associates, Inc.
78 Sarasota Center Blvd.
Sarasota, FL 34240

Re: FINAL LABORATORY REPORT

Dear Mr. Kuehn:

Thank you for consulting Precision Geosynthetic Laboratories International (PGLI) for your material testing needs.

Enclosed is the ***final*** laboratory report for the conformance testing of one (1) 16oz Non-Woven Geotextile sample.

PROJECT NAME: Sarasota County CCSW Phase I Class I Landfill Closure

REFERENCE PGL JOB NO.: G121071

DATE RECEIVED: September 19, 2012

DATE REPORTED: September 21, 2012- First reported
September 25, 2012- Added ASTM D4533

SAMPLE SENT BY: GSE, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID	PGLI CONTROL NUMBER
R#130426150 16 oz	87058

TESTS REQUIRED/PERFORMED:

TEST METHOD	DESCRIPTION
ASTM D4833	Puncture Resistance
ASTM D4632	Grab Tensile
ASTM D5261	Mass per Unit Area
ASTM D4491	Permeability
ASTM D4751	Apparent Opening Size
ASTM D4533	Trapezoid Tear Strength

TEST RESULTS: The test results are summarized in Table 1.

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

Maria Espitia

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical/Laboratory Director

Signatures are on file

It shall be noted that the samples tested are believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. Precision Geosynthetic Laboratories neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is a policy of the company to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. ***Retained conformance samples are disposed of after one (1) month.*** On the other hand, should you need us to keep them at longer time, please advise us in writing.

1160 North Gilbert Street, Anaheim, CA 92801 Tel# 714-520-9631 Fax# 714-520-9637, www.precisionlabs.net

TABLE 1.

MATERIAL PROPERTIES

CLIENT: Ardaman & Associates, Inc.

PROJECT: Sarasota County - CCSW Phase 1 Class 1 Landfill Closure

Date Received: **9/19/2012**
Date Reported: **9/25/2012**
Client Sample ID: **R#130426150**
Material Description: **16oz Non-Woven Geotextile**

QC'd By: Maria Capitin
PGL Job No.: **G121071**
PGL Control No.: **87058**

METHOD	DESCRIPTION	SPECIMENS 1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
ASTM D5261	Mass per Unit Area (oz/ yd.^{2})															
	Test Specimen Size: 4" x 8"															
		17.0	17.1	17.1	17.0	17.3						17.1	0.2	17.0	17.3	
ASTM D4632	Grab Tensile															
	Test was performed as directed in D4632, dry condition. Instron Tensile Testing Machine with hydraulic action grips and 1 in x 2 in rubber faces was used. Maximum load used for testing:1500 lbs															
	Grab Breaking Load (lbs)															
	MD	430	441	450	506	492	430	444	478	498	502	467	31	430	506	
	TD	570	607	620	598	599	602	577	630	608	597	601	18	570	630	
	Apparent Breaking Elongation (percent)															
	MD	77	73	75	77	76	75	78	80	76	75	76	2	73	80	
	TD	94	104	101	99	90	104	94	103	101	104	99	5	90	104	
ASTM D4833	Puncture Resistance (lbs)															
	Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended to or beyond the outer edges of the clamping plates.															
		306	307	298	291	297	306	311	300	301	298	301	6	290	311	
		290	301	303	304	307										
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
	MD	180	171	176	178	181	190	201	200	188	178	184	10	171	201	
	TD	220	211	200	199	191	201	199	220	211	208	206	10	191	220	
ASTM D4491	Permittivity (sec.$^{-1}$)															
Constant Head	*Four specimens were tested by holding the head constant at 50 mm. The corresponding water volume passing through the specimen was collected at the discharge side and the amount and time recorded. Five readings were taken for each specimen. BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.*															
		1.13	1.10	1.13	1.10							1.12	0.02	1.10	1.13	
	Permeability (cm./ sec.)															
		0.39	0.39	0.39	0.41							0.40	0.01	0.39	0.41	
	Flow Rate (gpm/ ft.^{2})															
		85	83	84	82							83	1	82	85	
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	Specimens were tested as directed in Test Method D4751.Type of sieve shaker used is W.S. Tyler Rotap.															
		0.147	0.145	0.142	0.146	0.147						0.145	0.002	0.142	0.147	

(End of Table 1)

(Sheet 1 of 1)

By accepting the data and results presented on this report, the Client agrees to limit the liability of Precision Geosynthetic Laboratories from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless Precision Geosynthetic Laboratories from and against all liabilities in excess of the aforementioned limit.

MD - MACHINE DIRECTION
TD - TRANSVERSE DIRECTION

APPENDIX 9

Construction Quality Assurance Test Results For Concrete Cylinders

Ardaman & Associates, Inc.

ARDAMAN & ASSOCIATES INC
78 SARASOTA CENTER BOULEVARD
SARASOTA FL 34240
Phone (941) 922-3526
Fax (941) 922-6743

REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9462
DATE OF SERVICE: 08/29/2012
AUTHORIZATION: Contract
REPORT DATE: 09/26/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 4000psi @ 28 DAYS
SLUMP: 6 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: CAJD8P10
DATE OF PLACEMENT: 08/29/2012
TIME SAMPLED: 11:39 BY: Cliff Stratton
BATCH TIME: 11:15
TEMPERATURE (DegF) - AIR: 82 CONCRETE: 89
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 6.50
AIR CONTENT (%): UNIT WT (pcf)
TRUCK NO: 268 TICKET NO: 849235
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Pump station #1, slab on grade and vault and control panel slab

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
1	LAF	09/05/2012	7	4.030	12.76	42499	3330	TYPE 5	
1	LAF	09/12/2012	14	4.030	12.76	55671	4360	TYPE 2	
1	LAF	09/26/2012	28	4.040	12.82	65929	5140	TYPE 2	
1	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Cone
Type 2 | Cone Split
Type 3 | Columnar
Type 4 | Shear
Type 5 | Side Fracture
Type 6 | Top Fracture

ARDAMAN & ASSOCIATES, INC.
Cert. of Authorization 5950

Gary H. Schmidt
Vice Pres, PE #12305

Our letters and reports are for the exclusive use of the client to whom they are addressed and shall not be reproduced except in full without the approval of the testing laboratory. The use of our name must receive our written approval. Our letters and reports apply only to the sample tested and/or inspected, and are not indicative of the quantities of apparently identical or similar products.

Ardaman & Associates, Inc.

ARDAMAN & ASSOCIATES INC
78 SARASOTA CENTER BOULEVARD
SARASOTA FL 34240
Phone (941) 922-3526
Fax (941) 922-6743

REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9481
DATE OF SERVICE: 09/04/2012
AUTHORIZATION: Contract
REPORT DATE: 10/02/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 4000psi @ 28 DAYS
SLUMP: 6 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: CAJD8P10
DATE OF PLACEMENT: 09/04/2012
TIME SAMPLED: 10:19 BY: Cliff Stratton
BATCH TIME: 9:56
TEMPERATURE (DegF) - AIR: 78 CONCRETE: 90
WEATHER: Clear
MEASURED SLUMP (in.): 2.00
AIR CONTENT (%): 3.6 UNIT WT (pcf)
TRUCK NO: 267 TICKET NO: 849266
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Pump stations #3 and #4 slabs on grade

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
2	LAF	09/11/2012	7	4.060	12.95	57796	4460	TYPE 2	
2	LAF	09/18/2012	14	4.040	12.82	67832	5290	TYPE 2	
2	LAF	10/02/2012	28	4.050	12.88	77673	6030	TYPE 5	
2	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician

Report Distribution:
(1) HDR ENGINEERING, INC.

Report of Tests continued on page 2

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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Vice Pres, PE #12305

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9481
DATE OF SERVICE: 09/04/2012
AUTHORIZATION: Contract
REPORT DATE: 10/02/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 4000psi @ 28 DAYS
SLUMP: 6 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: CAJD8P10
DATE OF PLACEMENT: 09/04/2012
TIME SAMPLED: 12:37 BY: Cliff Stratton
BATCH TIME: 12:22
TEMPERATURE (DegF) - AIR: 82 CONCRETE: 92
WEATHER: Clear
MEASURED SLUMP (in.): 4.75
AIR CONTENT (%): 4.1 UNIT WT (pcf)
TRUCK NO: 1623 TICKET NO: 849268
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Pump station #5 slab on grade

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
3	LAF	09/11/2012	7	4.060	12.95	45275	3500	TYPE 3	
3	LAF	09/18/2012	14	4.040	12.82	55581	4340	TYPE 3	
3	LAF	10/02/2012	28	4.060	12.95	62528	4830	TYPE 5	
3	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9562
DATE OF SERVICE: 09/17/2012
AUTHORIZATION: Contract
REPORT DATE: 10/15/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 3000psi @ 28 DAYS
SLUMP: 9 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: 620FGF1
DATE OF PLACEMENT: 09/17/2012
TIME SAMPLED: 2:40 BY: Cliff Stratton
BATCH TIME: 2:15
TEMPERATURE (DegF) - AIR: 88 CONCRETE: 94
WEATHER: Clear
MEASURED SLUMP (in.): 9.00
AIR CONTENT (%): 4.4 UNIT WT (pcf)
TRUCK NO: 1624 TICKET NO: 849391
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Drainage terrace (above roadway), south slope

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
4	LAF	09/24/2012	7	4.040	12.82	28963	2260	TYPE 2	
4	LAF	10/01/2012	14	4.040	12.82	40323	3150	TYPE 2	
4	LAF	10/15/2012	28	4.050	12.88	52609	4080	TYPE 5	
4	LAF	Hold							

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9564
DATE OF SERVICE: 09/18/2012
AUTHORIZATION: Contract
REPORT DATE: 10/16/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 3000psi @ 28 DAYS
SLUMP: 2 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: XA68910
DATE OF PLACEMENT: 09/18/2012
TIME SAMPLED: 1:16 BY: Cliff Stratton
BATCH TIME: 11:55
TEMPERATURE (DegF) - AIR: 87 CONCRETE: 92
WEATHER: Clear
MEASURED SLUMP (in.): 2.00
AIR CONTENT (%): 4.0 UNIT WT (pcf)
TRUCK NO: 268 TICKET NO: 849403
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
South slope stormwater downdrain discharge

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
5	LAF	09/25/2012	7	4.040	12.82	38436	3000	TYPE 3	
5	LAF	10/02/2012	14	4.030	12.76	51341	4020	TYPE 5	
5	LAF	10/16/2012	28	4.040	12.82	58867	4590	TYPE 3	
5	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician

Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9610
DATE OF SERVICE: 09/19/2012
AUTHORIZATION: Contract
REPORT DATE: 10/17/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: G70F0F10
DATE OF PLACEMENT: 09/19/2012
TIME SAMPLED: 12:12 BY: Cliff Stratton
BATCH TIME: 11:26
TEMPERATURE (DegF) - AIR: 90 CONCRETE: 94
WEATHER: Clear
MEASURED SLUMP (in.): 10.00
AIR CONTENT (%): 3.6 UNIT WT (pcf)
TRUCK NO: 1623 TICKET NO: 849412
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
North side, top of ridge, fabri-form

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
6	LAF	09/26/2012	7	4.030	12.76	34630	2710	TYPE 2	
6	LAF	10/03/2012	14	4.070	13.01	48159	3700	TYPE 5	
6	LAF	10/17/2012	28	4.050	12.88	57873	4490	TYPE 5	
6	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9590
DATE OF SERVICE: 09/20/2012
AUTHORIZATION: Contract
REPORT DATE: 10/18/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 09/20/2012
TIME SAMPLED: 12:21 BY: Cliff Stratton
BATCH TIME: 11:30
TEMPERATURE (DegF) - AIR: 89 CONCRETE: 95
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.00
AIR CONTENT (%): 3.1 UNIT WT (pcf)
TRUCK NO: 266 TICKET NO: 849439
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
North side (top of ridge), east area, fabri form

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
7	LAF	09/27/2012	7	4.050	12.88	31131	2420	TYPE 5	
7	LAF	10/04/2012	14	4.030	12.76	42056	3300	TYPE 3	
7	LAF	10/18/2012	28	4.050	12.88	53844	4180	TYPE 5	
7	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9638
DATE OF SERVICE: 09/24/2012
AUTHORIZATION: Contract
REPORT DATE: 10/22/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 09/24/2012
TIME SAMPLED: 12:24 BY: Cliff Stratton
BATCH TIME: 11:14
TEMPERATURE (DegF) - AIR: 83 CONCRETE: 90
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.25
AIR CONTENT (%): 3.2 UNIT WT (pcf)
TRUCK NO: 267 TICKET NO: 849461
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, north side, on bench area / middle section

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
8	LAF	10/01/2012	7	4.040	12.82	42071	3280	TYPE 3	
8	LAF	10/08/2012	14	4.040	12.82	60310	4700	TYPE 2	
8	LAF	10/22/2012	28	4.050	12.88	71426	5540	TYPE 5	
8	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician

Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9639
DATE OF SERVICE: 09/25/2012
AUTHORIZATION: Contract
REPORT DATE: 10/23/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 09/25/2012
TIME SAMPLED: 12:11 BY: Cliff Stratton
BATCH TIME: 11:21
TEMPERATURE (DegF) - AIR: 89 CONCRETE: 994
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.50
AIR CONTENT (%): 4.3 UNIT WT (pcf)
TRUCK NO: 1585 TICKET NO: 849474
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form:
North side / on bench area / east section
East side / on bench area / north section

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
9	LAF	10/02/2012	7	4.060	12.95	30143	2330	TYPE 5	
9	LAF	10/09/2012	14	4.050	12.88	33622	2610	TYPE 5	
9	LAF	10/23/2012	28	4.050	12.88	43419	3370	TYPE 6	
9	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9649
DATE OF SERVICE: 09/26/2012
AUTHORIZATION: Contract
REPORT DATE: 10/24/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 09/26/2012
TIME SAMPLED: 12:28 BY: Cliff Stratton
BATCH TIME: 11:40
TEMPERATURE (DegF) - AIR: 87 CONCRETE: 93
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 9.50
AIR CONTENT (%): 4.0 UNIT WT (pcf)
TRUCK NO: 266 TICKET NO: 849478
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form on bench area, northeast spin section

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
10	LAF	10/03/2012	7	4.040	12.82	27997	2180	TYPE 5	
10	LAF	10/10/2012	14	4.040	12.82	37448	2920	TYPE 5	
10	LAF	10/24/2012	28	4.050	12.88	45678	3550	TYPE 5	
10	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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Gary H. Schmidt
Vice Pres, PE #12305

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Ardaman & Associates, Inc.

ARDAMAN & ASSOCIATES INC
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SARASOTA FL 34240
Phone (941) 922-3526
Fax (941) 922-6743

REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9654
DATE OF SERVICE: 09/27/2012
AUTHORIZATION: Contract
REPORT DATE: 10/25/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 09/27/2012
TIME SAMPLED: 10:40 BY: Cliff Stratton
BATCH TIME: 10:11
TEMPERATURE (DegF) - AIR: 86 CONCRETE: 92
WEATHER: Clear
MEASURED SLUMP (in.): 9.75
AIR CONTENT (%): 3.4 UNIT WT (pcf)
TRUCK NO: 264 TICKET NO: 849482
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form on bench area, east side, middle section

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
11	LAF	10/04/2012	7	4.040	12.82	21749	1700	TYPE 2	
11	LAF	10/11/2012	14	4.050	12.88	26238	2040	TYPE 5	
11	LAF	10/25/2012	28	4.050	12.88	32590	2530	TYPE 5	
11	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Cone
Type 2 | Cone Split
Type 3 | Columnar
Type 4 | Shear
Type 5 | Side Fracture
Type 6 | Top Fracture

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Vice Pres, PE #12305

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9682
DATE OF SERVICE: 10/02/2012
AUTHORIZATION: Contract
REPORT DATE: 10/30/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/02/2012
TIME SAMPLED: 10:26 BY: Cliff Stratton
BATCH TIME: 9:35
TEMPERATURE (DegF) - AIR: 87 CONCRETE: 93
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.50
AIR CONTENT (%): 4.2 UNIT WT (pcf)
TRUCK NO: 1624 TICKET NO: 849508
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, south side, top of ridge (middle area)

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
12	LAF	10/09/2012	7	4.050	12.88	31502	2450	TYPE 5	
12	LAF	10/16/2012	14	4.040	12.82	40119	3130	TYPE 5	
12	LAF	10/30/2012	28	4.070	13.01	57870	4450	TYPE 5	
12	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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Vice Pres. PE #12305

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9686
DATE OF SERVICE: 10/03/2012
AUTHORIZATION: Contract
REPORT DATE: 10/31/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/03/2012
TIME SAMPLED: 10:45 BY: Gary Kolbe
BATCH TIME: 10:26
TEMPERATURE (DegF) - AIR: 82 CONCRETE: 89
WEATHER: Cloudy
MEASURED SLUMP (in.): 10.50
AIR CONTENT (%): 4.0 UNIT WT (pcf)
TRUCK NO: 264 TICKET NO: 849523
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, south side, top of ridge (middle to west area)

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
13	LAF	10/10/2012	7	4.030	12.76	23735	1860	TYPE 5	
13	LAF	10/17/2012	14	4.050	12.88	28993	2250	TYPE 3	
13	LAF	10/31/2012	28	4.040	12.82	39732	3100	TYPE 5	
13	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Gary Kolbe, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Cone
Type 2 | Cone Split
Type 3 | Columnar
Type 4 | Shear
Type 5 | Side Fracture
Type 6 | Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9698
DATE OF SERVICE: 10/04/2012
AUTHORIZATION: Contract
REPORT DATE: 11/01/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/04/2012
TIME SAMPLED: 10:37 BY: Cliff Stratton
BATCH TIME: 9:48
TEMPERATURE (DegF) - AIR: 86 CONCRETE: 92
WEATHER: Clear
MEASURED SLUMP (in.): 10.75
AIR CONTENT (%): 3.6 UNIT WT (pcf)
TRUCK NO: 1623 TICKET NO: 849543
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, south side, top of ridge, far west area

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
14	LAF	10/11/2012	7	4.050	12.88	38463	2990	TYPE 5	
14	LAF	10/18/2012	14	4.050	12.88	48526	3770	TYPE 5	
14	LAF	11/01/2012	28	4.050	12.88	61089	4740	TYPE 5	
14	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9788
DATE OF SERVICE: 10/17/2012
AUTHORIZATION: Contract
REPORT DATE: 11/14/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/17/2012
TIME SAMPLED: 12:18 BY: Cliff Stratton
BATCH TIME: 11:46
TEMPERATURE (DegF) - AIR: 83 CONCRETE: 90
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.50
AIR CONTENT (%): 3.2 UNIT WT (pcf)
TRUCK NO: 264 TICKET NO: 849657
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, top of Phase 1 landfill, SW corner

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
15	LAF	10/24/2012	7	4.040	12.82	25529	1990	TYPE 5	
15	LAF	10/31/2012	14	4.050	12.88	31940	2480	TYPE 5	
15	LAF	11/14/2012	28	4.040	12.82	45166	3520	TYPE 5	
15	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

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Gary H. Schmidt
Vice Pres, PE #12305

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9804
DATE OF SERVICE: 10/18/2012
AUTHORIZATION: Contract
REPORT DATE: 11/15/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/18/2012
TIME SAMPLED: 12:38 BY: Cliff Stratton
BATCH TIME: 12:03
TEMPERATURE (DegF) - AIR: 87 CONCRETE: 93
WEATHER: Clear
MEASURED SLUMP (in.): 11.00
AIR CONTENT (%): 3.0 UNIT WT (pcf)
TRUCK NO: 264 TICKET NO: 849676
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, SE spine, 1/2 up from bench area to down to hard road

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
16	LAF	10/25/2012	7	4.060	12.95	26271	2030	TYPE 6	
16	LAF	11/01/2012	14	4.050	12.88	34364	2670	TYPE 5	
16	LAF	11/15/2012	28	4.050	12.88	45167	3510	TYPE 5	
16	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9805
DATE OF SERVICE: 10/19/2012
AUTHORIZATION: Contract
REPORT DATE: 11/16/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/19/2012
TIME SAMPLED: 11:09 BY: Cliff Stratton
BATCH TIME: 10:49
TEMPERATURE (DegF) - AIR: 86 CONCRETE: 92
WEATHER: Clear
MEASURED SLUMP (in.): 10.50
AIR CONTENT (%): 3.4 UNIT WT (pcf)
TRUCK NO: 1624 TICKET NO: 849683
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, east slope, very south pipe drain

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
17	LAF	10/26/2012	7	4.050	12.88	22315	1730	TYPE 5	
17	LAF	11/02/2012	14	4.050	12.88	30211	2350	TYPE 5	
17	LAF	11/16/2012	28	4.050	12.88	39150	3040	TYPE 5	
17	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

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Cert. of Authorization 5950

Gary H. Schmidt
Vice Pres, PE #12305

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9806
DATE OF SERVICE: 10/22/2012
AUTHORIZATION: Contract
REPORT DATE: 11/19/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/22/2012
TIME SAMPLED: 12:15 BY: Phil Howe
BATCH TIME: 11:20
TEMPERATURE (DegF) - AIR: 84 CONCRETE: 82
WEATHER: Clear
MEASURED SLUMP (in.): 10.00
AIR CONTENT (%): 3.2 UNIT WT (pcf)
TRUCK NO: 1624 TICKET NO: 849702
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, NE side

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
18	LAF	10/29/2012	7	4.060	12.95	27687	2140	TYPE 5	
18	LAF	11/05/2012	14	4.050	12.88	35067	2720	TYPE 5	
18	LAF	11/19/2012	28	4.050	12.88	48840	3790	TYPE 5	
18	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Phil Howe, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Cone
Type 2 | Cone Split
Type 3 | Columnar
Type 4 | Shear
Type 5 | Side Fracture
Type 6 | Top Fracture

ARDAMAN & ASSOCIATES, INC.
Cert. of Authorization 5950

Gary H. Schmidt
Vice Pres, PE #12305

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9825
DATE OF SERVICE: 10/23/2012
AUTHORIZATION: Contract
REPORT DATE: 11/20/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/23/2012
TIME SAMPLED: 12:40 BY: Gary Kolbe
BATCH TIME: 12:02
TEMPERATURE (DegF) - AIR: 80 CONCRETE: 84
WEATHER: Clear
MEASURED SLUMP (in.): 10.00
AIR CONTENT (%): UNIT WT (pcf)
TRUCK NO: 1582 TICKET NO: 849711
WATER ADDED @ SITE (gal) 5
LOCATION OF PLACEMENT
Fabri form, north side, east end, drainage chute, toe end of slope

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
19	LAF	10/30/2012	7	4.040	12.82	29635	2310	TYPE 5	
19	LAF	11/06/2012	14	4.040	12.82	36996	2890	TYPE 5	
19	LAF	11/20/2012	28	4.050	12.88	51913	4030	TYPE 5	
19	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Gary Kolbe, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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Vice Pres, PE #12305

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9826
DATE OF SERVICE: 10/24/2012
AUTHORIZATION: Contract
REPORT DATE: 11/21/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Titan Concrete
PLANT: 884
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/24/2012
TIME SAMPLED: 11:35 BY: Gary Kolbe
BATCH TIME: 10:58
TEMPERATURE (DegF) - AIR: 81 CONCRETE: 84
WEATHER: Cloudy
MEASURED SLUMP (in.): 9.50
AIR CONTENT (%): 2.5 UNIT WT (pcf)
TRUCK NO: 1558 TICKET NO: 849725
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, north slope drainage chute, west end, low road to toe/drainage ditch

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
20	LAF	10/31/2012	7	4.050	12.88	28986	2250	TYPE 5	
20	LAF	11/07/2012	14	4.040	12.82	34900	2720	TYPE 5	
20	LAF	11/21/2012	28	4.050	12.88	42159	3270	TYPE 5	
20	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Gary Kolbe, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9846
DATE OF SERVICE: 10/25/2012
AUTHORIZATION: Contract
REPORT DATE: 11/22/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/25/2012
TIME SAMPLED: 12:24 BY: Cliff Stratton
BATCH TIME: 11:40
TEMPERATURE (DegF) - AIR: 81 CONCRETE: 87
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.25
AIR CONTENT (%): 3.3 UNIT WT (pcf)
TRUCK NO: 264 TICKET NO: 849734
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, northeast spine area, lower level

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
21	LAF	11/01/2012	7	4.040	12.82	22232	1730	TYPE 5	
21	LAF	11/08/2012	14	4.050	12.88	31133	2420	TYPE 5	
21	LAF	11/22/2012	28	4.050	12.88	40247	3120	TYPE 5	
21	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Cone
Type 2 | Cone Split
Type 3 | Columnar
Type 4 | Shear
Type 5 | Side Fracture
Type 6 | Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9855
DATE OF SERVICE: 10/26/2012
AUTHORIZATION: Contract
REPORT DATE: 11/23/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 10/26/2012
TIME SAMPLED: 10:20 BY: Cliff Stratton
BATCH TIME: 9:54
TEMPERATURE (DegF) - AIR: 81 CONCRETE: 86
WEATHER: Partly cloudy
MEASURED SLUMP (in.): 10.50
AIR CONTENT (%): 3.0 UNIT WT (pcf)
TRUCK NO: 263 TICKET NO: 849740
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, southeast spine, in creekbed area

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
22	LAF	11/02/2012	7	4.040	12.82	27738	2160	TYPE 5	
22	LAF	11/09/2012	14	4.050	12.88	33831	2630	TYPE 5	
22	LAF	11/23/2012	28	4.050	12.88	43985	3410	TYPE 5	
22	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9920
DATE OF SERVICE: 11/07/2012
AUTHORIZATION: Contract
REPORT DATE: 12/05/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Test compressive strength specimens prepared by others and picked up at the project site.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Titan
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 3000psi @ 28 DAYS
SLUMP: 2.5 AIR:
METHOD OF TEST
CURING: ASTM C511
BEARING CONTACT: ASTM C1231
TESTING: ASTM C39

MIX DESIGN NUMBER: BAGD5R30
DATE OF PLACEMENT: 11/07/2012
TIME SAMPLED: BY: Specialty Curbs rep
BATCH TIME: NA
TEMPERATURE (DegF) - AIR: 70 CONCRETE:
WEATHER: Clear
MEASURED SLUMP (in.):
AIR CONTENT (%): UNIT WT (pcf)
TRUCK NO: 1651 TICKET NO: 849845
WATER ADDED @ SITE (gal) 14
LOCATION OF PLACEMENT
South side Phase I mitered ends

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
23	LAF	11/14/2012	7	4.050	12.88	34988	2720	TYPE 5	
23	LAF	11/21/2012	14	4.040	12.82	44918	3500	TYPE 5	
23	LAF	12/05/2012	28	4.050	12.88	55914	4340	TYPE 5	
23	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician:
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6
Cone | Cone Split | Columnar | Shear | Side Fracture | Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9948
DATE OF SERVICE: 11/08/2012
AUTHORIZATION: Contract
REPORT DATE: 12/06/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Tarmac
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 2500psi @ 28 DAYS
SLUMP: 10 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: GZ0F0F10
DATE OF PLACEMENT: 11/08/2012
TIME SAMPLED: 1:22 BY: Cliff Stratton
BATCH TIME: 12:40
TEMPERATURE (DegF) - AIR: 67 CONCRETE: 76
WEATHER: Clear
MEASURED SLUMP (in.): 10.00
AIR CONTENT (%): 2.9 UNIT WT (pcf)
TRUCK NO: 1651 TICKET NO: 849848
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Fabri form, SE corner of Phase I, above drain structure

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
24	LAF	11/15/2012	7	4.050	12.88	32271	2510	TYPE 5	
24	LAF	11/21/2012	13	4.040	12.82	39738	3100	TYPE 5	
24	LAF	12/06/2012	28	4.050	12.88	55727	4330	TYPE 5	
24	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC

Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Cone	Cone Split	Columnar	Shear	Side Fracture	Top Fracture

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REPORT OF CONCRETE COMPRESSIVE STRENGTH

CLIENT: HDR ENGINEERING, INC.
5426 BAY CENTER DR
STE 400
TAMPA FL 33609-3444

PROJECT NO.: 113-09-36-7375
REPORT NO.: 9950
DATE OF SERVICE: 11/08/2012
AUTHORIZATION: Contract
REPORT DATE: 12/06/2012

PROJECT: Sarasota County Landfill Cell Closure, 4000 Knights Trail Rd Nokomis, Florida

SERVICES: Sample concrete at location of placement, perform required field tests, prepare and test concrete compressive strength specimens.

PROJECT DATA

CONTRACTOR: HDR ENGINEERING, INC.
CONCRETE SUPPLIER: Titan
PLANT: 684
CLASS OF CONCRETE:
SPECIFICATION REQUIREMENTS
STRENGTH: 3000psi @ 28 DAYS
SLUMP: 4.5 AIR:

METHOD OF TEST

SAMPLING:	ASTM C-172
MOLDING & CURING:	ASTM C31
SLUMP:	ASTM C143
TEMPERATURE:	ASTM C1064
AIR CONTENT:	ASTM C231
UNIT WEIGHT:	
CAPPING/PADS	ASTM C1231
TESTING:	ASTM C39

MIX DESIGN NUMBER: BAGD5R30
DATE OF PLACEMENT: 11/08/2012
TIME SAMPLED: 4:10 BY: Cliff Stratton
BATCH TIME: 3:23
TEMPERATURE (DegF) - AIR: 73 CONCRETE: 79
WEATHER: Clear
MEASURED SLUMP (in.): 4.00
AIR CONTENT (%): 3.2 UNIT WT (pcf)
TRUCK NO: 1623 TICKET NO: 849853
WATER ADDED @ SITE (gal)
LOCATION OF PLACEMENT
Pump station vault

REPORT OF TESTS

CONCRETE COMPRESSIVE STRENGTH - 4 x 8 CYLINDERS

CYLINDER MARKED SET	CYLINDER MARKED MARK	DATE TESTED	AGE (days)	DIAMETER (in.)	AREA (sq.in.)	MAXIMUM LOAD (lbs. force)	COMPRESSIVE STRENGTH (psi)	FRACTURE TYPE	REMARKS
25	LAF	11/15/2012	7	4.050	12.88	38357	2980	TYPE 5	
25	LAF	11/21/2012	13	4.050	12.88	42555	3300	TYPE 5	
25	LAF	12/06/2012	28	4.040	12.82	54871	4280	TYPE 5	
25	LAF	Hold							

28 day compressive strength results comply with specified strength.

Technician: Cliff Stratton, Field Technician
Report Distribution:
(1) HDR ENGINEERING, INC.

Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6
Cone | Cone Split | Columnar | Shear | Side Fracture | Top Fracture

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