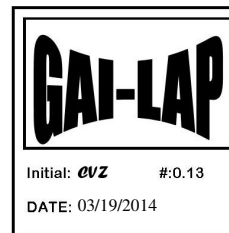




March 19, 2014

Allan Brantley
Brantley Engineering, LLC.
13933 Tree Loft Road
Milton, GA 30004



Re: FINAL LABORATORY TEST REPORT

Dear Mr. Brantley:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the conformance testing of three (3) 60mil HDPE Microspike samples.

PROJECT NAME: Jed Cell 10

DATE REPORTED: March 19, 2014

REFERENCE TRI JOB NO.: G140203

DATE RECEIVED: March 10, 2014

SAMPLES SENT BY: AGRU, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID

1. R#G14A096064 L#H8240157
2. R#G14A097073 L#H8240157
3. R#G14A097083 L#H8240157

TRI CONTROL NUMBER

- 96756
96757
96758

TESTS REQUIRED / PERFORMED:

TEST METHOD

1. ASTM D5994
2. ASTM D1505
3. ASTM D6639
4. ASTM D1603
5. ASTM D5596

DESCRIPTION

- Thickness
Density
Tensile Properties
Carbon Black Content
Carbon Black Dispersion

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

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia
Quality Assurance

Carmelo V. Zantua
Technical 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. TRI 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: Brantley Engineering, LLC.
 PROJECT: Jed Cell 10

Date Received: 3/10/2014
 Date Reported: 3/19/2014
 Client Sample ID: R#G14A096064 L#H8240157
 Material Description: 60mil HDPE Microspike Geomembrane

QC'd By: Maria Espitia
 TRI Job No.: G140203
 TRI Control No.: 96756

SPECIMENS

	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs.
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														
	62	61	61	61	63	62	63	61	62	61	62	1	61	63	60 nominal 54 min.
ASTM D1505	Density (grams/ cm. ³) 0.9437 0.9430 0.9436										0.9434	0.0004	0.9430	0.9437	.94 min.
ASTM D6693 Type IV	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i> Tensile Strength at Yield (lbs/ in.-width) <i>MD 146 141 152 154 141</i> <i>TD 161 161 152 157 147</i> Tensile Strength at Break (lbs/ in.- width) <i>MD 188 249 176 197 216</i> <i>TD 170 118 167 193 172</i> Elongation at Yield (percent, %) <i>MD 15 20 16 17 21</i> <i>TD 15 14 17 14 15</i> Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i> <i>MD 470 426 435 444 389</i> <i>TD 449 129 470 559 483</i>														
											147	6	141	154	126 min.
											156	6	147	161	
											205	29	176	249	90 min.
											164	28	118	193	
											18	3	15	21	12 min.
											15	1	14	17	
											433	30	389	470	100 min.
											418	167	129	559	
ASTM D1603	Carbon Black Content (percent, %) 2.24 2.28										2.26	0.02	2.24	2.28	2-3
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38) 1 1 1 1 1 1 1 1 1 1										10 out of 10 in Category 1				9 of 10 in Cat. 1 or 2 All in Cat. 1,2, or 3

(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 TRI Environmental, Inc. 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 TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
 MD - MACHINE DIRECTION
 TD- TRANSVERSE DIRECTION

1160 North Gilbert Street, Anaheim, CA 92801, www.precisionlabs.net
 Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.

TABLE 2.
MATERIAL PROPERTIES
 CLIENT: Brantley Engineering, LLC.
 PROJECT: Jed Cell 10

Date Received: 3/10/2014
 Date Reported: 3/19/2014
 Client Sample ID: **R#G14A097073 L#H8240157**
 Material Description: **60mil HDPE Microspike Geomembrane**

QC'd By: *Maria Espitia*
 TRI Job No.: **G140203**
 TRI Control No.: **96757**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9	10				
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>	61	62	60	63	63	62	61	62	62	62	1	60	63	60 nominal 54 min.
ASTM D1505	Density (grams/ cm. ³) 0.9422 0.9438 0.9432										0.9430	0.0008	0.9422	0.9438	.94 min.
ASTM D6693 Type IV	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>														
	Tensile Strength at Yield (lbs/ in.-width)														
	MD 158 151 161 154 153										155	4	151	161	126 min.
	TD 161 148 161 154 153										155	6	148	161	
	Tensile Strength at Break (lbs/ in.- width)														
	MD 173 207 130 174 203										177	31	130	207	90 min.
	TD 161 164 191 177 184										175	13	161	191	
	Elongation at Yield (percent, %)														
	MD 15 15 19 18 17										17	2	15	19	12 min.
	TD 14 18 13 13 16										15	2	13	18	
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>														
	MD 426 386 295 381 466										391	64	295	466	100 min.
	TD 440 456 569 515 516										499	52	440	569	
ASTM D1603	Carbon Black Content (percent, %) 2.10 2.13										2.11	0.02	2.10	2.13	2-3
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)														9 of 10 in Cat. 1 or 2
	1 1 1 1 1 1 1 1 1 1										10 out of 10 in Category 1				All in Cat. 1,2, or 3

(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 TRI Environmental, Inc. 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 TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

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 Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.

TABLE 3.
MATERIAL PROPERTIES
CLIENT: Brantley Engineering, LLC.
PROJECT: Jed Cell 10

Date Received: **3/10/2014**
Date Reported: **3/19/2014**
Client Sample ID: **R#G14A097083 L#H8240157**
Material Description: **60mil HDPE Microspike Geomembrane**

QC'd By: Maria Espitia
TRI Job No.: **G140203**
TRI Control No.: **96758**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
1	2	3	4	5	6	7	8	9	10						
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														60 nominal 54 min.
	63	60	62	63	63	64	61	62	64	63	62	1	60	64	
ASTM D1505	Density (grams/ cm. ³) 0.9437 0.9436 0.9426										0.9433	0.0006	0.9426	0.9437	.94 min.
ASTM D6693 Type IV	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i>														
	Tensile Strength at Yield (lbs/ in.-width)														126 min.
	MD	155	148	152	147	137					148	7	137	155	
	TD	161	161	161	164	153					160	4	153	164	
	Tensile Strength at Break (lbs/ in.- width)														90 min.
	MD	212	207	233	193	216					212	15	193	233	
	TD	191	207	194	197	203					198	7	191	207	
	Elongation at Yield (percent, %)														12 min.
	MD	15	15	15	17	18					16	1	15	18	
	TD	12	13	14	12	15					13	1	12	15	
	Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i>														100 min.
	MD	468	466	444	440	420					448	20	420	468	
	TD	554	589	559	576	596					575	18	554	596	
ASTM D1603	Carbon Black Content (percent, %) 2.45 2.18										2.32	0.19	2.18	2.45	2-3
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)														9 of 10 in Cat. 1 or 2
	1	1	1	1	1	1	1	1	1	1	10 out of 10 in Category 1				All in Cat. 1,2, or 3

(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 TRI Environmental, Inc. 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 TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

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