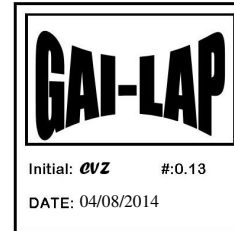




April 8, 2014

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) TN330-2-8 Double-Sided Geocomposite samples.**PROJECT NAME:** Jed Cell 10**DATE REPORTED:** April 8, 2014**REFERENCE TRI JOB NO.:** G140231**DATE RECEIVED:** March 14, 2014**SAMPLES SENT BY:** SKAPS, GA**SAMPLE IDENTIFICATIONS:****SAMPLE ID TRI CONTROL NUMBER****1. R#57871020001**

Double-Sided Geocomposite 96878

NW Geotextile- Side A 96881

NW Geotextile- Side B 96882

**2. R#57871020102**

Double-Sided Geocomposite 96879

**SAMPLE ID TRI CONTROL NUMBER**

NW Geotextile- Side A 96883

NW Geotextile- Side B 96884

**3. R#57871020204**

Double-Sided Geocomposite 96880

NW Geotextile- Side A 96885

NW Geotextile- Side B 96886

**TESTS REQUIRED / PERFORMED:****TEST METHOD****Geotextile**

1. ASTM D5261

2. ASTM D4632

3. ASTM D4533

4. ASTM D4751

5. ASTM D4991

**DS Geocomposite**

6. ASTM D4716

7. ASTM D7005

**DESCRIPTION**

Mass per Unit Area

Grab Tensile

Trapezoidal Tear Resistance

Apparent Opening Size

Permittivity

Transmissivity

Ply Adhesion

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

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.

14 Pages Total

**TABLE 1.**  
**MATERIAL PROPERTIES**  
**CLIENT: Brantley Engineering, LLC**  
**PROJECT: Jed Cell 10**

Date Received: **3/14/2014**  
Date Reported: **4/1/2014**  
Client Sample ID: **R#57871020001**  
Material Description: **TN330-2-8 Double-Sided Geocomposite**

QC'd By: *Maria Eypitia*  
TRI Job No.: **G140231**  
TRI Control No.: **96878**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.	
1	2	3	4	5	6	7	8	9	10	MARV						
METHOD	DESCRIPTION															
ASTM D4716	Transmissivity	Tested at Normal Pressure : 500 psf, Gradient: 0.02 , Seating Time: 24 hrs Temperature of Test Water: 20 <sup>0</sup> C Specimen Size: 12" x 14"														
	Transmissivity	(m. <sup>2</sup> / sec.)														
	MD	6.74E-03								6.74E-03	N/A	N/A	N/A	1.5x10 <sup>-3</sup>		
	Flow Rate	(gal/min)														
	MD	0.65								0.65	N/A	N/A	N/A			
	Transmissivity	(gal/min/ft)														
	MD	32.53								32.53	N/A	N/A	N/A			
ASTM D4716	Transmissivity	Tested at Normal Pressure : 15000 psf, Gradient: 0.02 , Seating Time: 100 hrs Temperature of Test Water: 20.3 <sup>0</sup> C Specimen Size: 12" x 14"														
	Transmissivity	(m. <sup>2</sup> / sec.)														
	MD	3.34E-03								3.34E-03	N/A	N/A	N/A	1.0x10 <sup>-3</sup>		
	Transmissivity	(gal./ min./ ft.)														
	MD	16.14								16.14	N/A	N/A	N/A			
	Flow Rate	(gal./ min)														
	MD	0.33								0.33	N/A	N/A	N/A			
	Test Set-Up:															
	Plate _____															
	Soil ooooooooo															
	Geocomposite XXXXXX															
	HDPE Microspike =====															
	Plate _____															
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	4.1	5.7	4.5	4.8					4.7	0.6	4.1	5.7	1.0	
	Side B of Composite															
	MD	3.6	3.7	4.3	3.8	4.9					4.0	0.6	3.6	4.9	1.0	

(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

**TABLE 1A.**  
**MATERIAL PROPERTIES**  
 CLIENT: Brantley Engineering, LLC  
 PROJECT: Jed Cell 10

Date Received: 3/14/2014  
 Date Reported: 3/27/2014  
 Client Sample ID: R#57871020001  
 Material Description: 8oz Non Woven Geotextile Component

QC'd By: *Maria Espitia*  
 TRI Job No.: G140231  
 TRI Control No.: 96881

**SPECIMENS**

	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
<b>METHOD DESCRIPTION</b>															
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> )															
Test Specimen Size: 4" x 8"															
	8.1	8.3	8.7	7.7	8.4						8.3	0.4	7.7	8.7	8.0
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	223	185	191	193	196	238	217	209	238	212	210	19	185	238	200
TD	217	230	205	223	215	260	189	187	211	221	216	21	187	260	
Apparent Breaking Elongation (percent)															
MD	61	39	53	56	58	61	62	43	62	58	55	8	39	62	
TD	72	74	77	77	71	72	67	68	81	79	74	5	67	81	
ASTM D4533 Trapezoid Tear Strength (lbs)															
Specimens were tested as directed in Test Method D4533, dry condition.															
MD	100	110	120	94	125	103	136	124	115	130	116	14	94	136	75
TD	149	97	89	141	125	86	116	81	132	75	109	27	75	149	
ASTM D4491 Permittivity (sec. <sup>-1</sup> )															
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.															
	1.34	1.36	1.74	1.77							1.55	0.23	1.34	1.77	0.5
Permeability (cm./ sec.)															
	0.40	0.41	0.42	0.43							0.42	0.01	0.40	0.43	
Flow Rate (gpm/ ft. <sup>2</sup> )															
	100	102	130	132							116	17	100	132	

(Continued on Next Page)

(Sheet 1 of 2)

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 1A.**  
**MATERIAL PROPERTIES**  
**CLIENT: Brantley Engineering, LLC**  
**PROJECT: Jed Cell 10**

Date Received: **3/14/2014**  
 Date Reported: **3/27/2014**  
 Client Sample ID: **R#57871020001**  
 Material Description: **8oz Non Woven Geotextile Component**

QC'd By: Maria Espitia  
 TRI Job No.: **G140231**  
 TRI Control No.: **96881**

		SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
		1	2	3	4	5	6	7	8	9	10					
<b>METHOD</b>	<b>DESCRIPTION</b>															
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
		0.147	0.147	0.148	0.149	0.149						0.148	0.001	0.147	0.149	≤ 0.21

(End of Table 1A)

(Sheet 2 of 2)

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](http://www.precisionlabs.net)  
**Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.**

**TABLE 1B.**  
**MATERIAL PROPERTIES**  
 CLIENT: Brantley Engineering, LLC  
 PROJECT: Jed Cell 10

Date Received: 3/14/2014  
 Date Reported: 3/27/2014  
 Client Sample ID: R#57871020001  
 Material Description: 8oz Non Woven Geotextile Component

QC'd By: *Maria Espitia*  
 TRI Job No.: G140231  
 TRI Control No.: 96882

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV	
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9						10
ASTM D5261	Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	8.2	8.1	9.3	8.2	7.1						8.2	0.8	7.1	9.3	8.0
ASTM D4632	Grab Tensile <i>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</i>															
	Grab Breaking Load (lbs)															
	MD	235	235	244	229	197	176	216	256	242	186	222	27	176	256	200
	TD	165	118	262	262	255	282	170	168	232	236	215	55	118	282	
	Apparent Breaking Elongation (percent)															
	MD	61	48	60	60	71	56	60	45	62	56	58	7	45	71	
	TD	93	99	80	84	73	75	91	106	76	88	86	11	73	106	
ASTM D4533	Trapezoid Tear Strength (lbs) <i>Specimens were tested as directed in Test Method D4533, dry condition.</i>															
	MD	115	140	95	136	85	108	109	103	105	95	109	17	85	140	75
	TD	89	98	130	110	95	122	135	132	110	145	117	19	89	145	
ASTM D4491	Permittivity (sec. <sup>-1</sup> )															
Constant Head	<i>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.</i>															
	<i>BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.</i>															
		1.43	1.32	1.31	1.53							1.40	0.10	1.31	1.53	0.5
	Permeability (cm./ sec.)															
		0.38	0.40	0.40	0.41							0.40	0.01	0.38	0.41	
	Flow Rate (gpm/ ft. <sup>2</sup> )															
		107	99	98	114							104	8	98	114	

(Continued on Next Page)

(Sheet 1 of 2)

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 1B.**  
**MATERIAL PROPERTIES**  
**CLIENT: Brantley Engineering, LLC**  
**PROJECT: Jed Cell 10**

Date Received: **3/14/2014**  
 Date Reported: **3/27/2014**  
 Client Sample ID: **R#57871020001**  
 Material Description: **8oz Non Woven Geotextile Component**

QC'd By: Maria Espitia  
 TRI Job No.: **G140231**  
 TRI Control No.: **96882**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
	1	2	3	4	5	6	7	8	9	10					
<b>METHOD DESCRIPTION</b>															
ASTM D4751 Apparent Opening Size (U.S. standard sieve size)															
<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
	100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751 Apparent Opening Size (mm)															
<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
	0.147	0.148	0.147	0.148	0.148						0.148	0.001	0.147	0.148	≤ 0.21

(End of Table 1B)

(Sheet 2 of 2)

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](http://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: **3/14/2014**  
 Date Reported: **4/8/2014**  
 Client Sample ID: **R#57871020102**  
 Material Description: **TN330-2-8 Double-Sided Geocomposite**

QC'd By: *Maria Eypitia*  
 TRI Job No.: **G140231**  
 TRI Control No.: **96879**

SPECIMENS											Proj. Specs. MARV					
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	
ASTM D4716	Transmissivity <i>Tested at Normal Pressure : 500 psf, Gradient: 0.02 , Seating Time: 24 hrs</i> <i>Temperature of Test Water: 21<sup>0</sup> C Specimen Size: 12" x 14"</i>  Transmissivity (m. <sup>2</sup> / sec.) <b>MD 6.27E-03</b> Flow Rate (gal/min) <b>MD 0.62</b> Transmissivity (gal/min/ft) <b>MD 30.30</b>											6.27E-03	N/A	N/A	N/A	1.5x10 <sup>-3</sup>
ASTM D4716	Transmissivity <i>Tested at Normal Pressure : 15000 psf, Gradient: 0.02 , Seating Time: 100 hrs</i> <i>Temperature of Test Water: 21.2<sup>0</sup> C Specimen Size: 12" x 14"</i>  Transmissivity (m. <sup>2</sup> / sec.) <b>MD 5.16E-03</b> Transmissivity (gal./ min./ ft.) <b>MD 24.90</b> Flow Rate (gal./ min) <b>MD 0.51</b>  <i>Test Set-Up:</i> <i>Plate</i> _____ <i>Soil</i> ooooooooo <i>Geocomposite</i> XXXXXX <i>HDPE Microspike</i> ===== <i>Plate</i> _____											5.16E-03	N/A	N/A	N/A	1.0x10 <sup>-3</sup>
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width)  <i>Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.</i> <i>Full scale force range used for testing: 100 lbs.</i> <b>Side A of Composite</b> <b>MD 5.3 4.4 6.2 6.4 7.0</b> <b>Side B of Composite</b> <b>MD 4.0 5.1 3.7 3.9 4.4</b>											5.9	1.0	4.4	7.0	1.0
												4.2	0.5	3.7	5.1	1.0

(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.

LEGENDS:  
 MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION

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

Date Received: **3/14/2014**  
 Date Reported: **3/27/2014**  
 Client Sample ID: **R#57871020102**  
 Material Description: **8oz Non Woven Geotextile Component**

QC'd By: *Maria Espitia*  
 TRI Job No.: **G140231**  
 TRI Control No.: **96883**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV	
1	2	3	4	5	6	7	8	9	10							
METHOD	DESCRIPTION															
ASTM D5261	Mass per Unit Area (oz/ yd. <sup>2</sup> )															
	Test Specimen Size: 4" x 8"															
	8.0	8.7	8.3	9.5	9.8						8.9	0.8	8.0	9.8	8.0	
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: <u>1500</u> lbs															
	Grab Breaking Load (lbs)															
MD	230	214	230	230	222	160	217	226	240	238	221	23	160	240	200	
TD	201	159	228	282	203	248	149	156	275	239	214	49	149	282		
	Apparent Breaking Elongation (percent)															
MD	57	40	57	58	65	57	54	49	56	62	56	7	40	65		
TD	77	113	78	86	68	74	85	102	81	86	85	13	68	113		
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
MD	103	134	107	122	104	97	121	122	120	106	114	12	97	134	75	
TD	123	169	129	110	124	115	108	140	150	110	128	20	108	169		

(End of Table 2A)

(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](http://www.precisionlabs.net)  
**Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.**



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

Date Received: **3/14/2014**  
 Date Reported: **3/27/2014**  
 Client Sample ID: **R#57871020102**  
 Material Description: **8oz Non Woven Geotextile Component**

QC'd By: *Maria Espitia*  
 TRI Job No.: **G140231**  
 TRI Control No.: **96884**

SPECIMENS															Proj. Specs. MARV	
	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max		
METHOD DESCRIPTION																
ASTM D5261	Mass per Unit Area (oz/ yd. <sup>2</sup> )															
	Test Specimen Size: 4" x 8"															
	9.0	9.1	6.0	9.1	8.8						8.4	1.4	6.0	9.1	8.0	
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: <u>1500 lbs</u>															
	Grab Breaking Load (lbs)															
MD	263	225	135	223	249	226	259	222	140	227	217	45	135	263	200	
TD	280	267	239	260	230	239	273	263	200	244	249	24	200	280		
	Apparent Breaking Elongation (percent)															
MD	61	58	60	58	59	54	62	61	88	58	62	10	54	88		
TD	75	71	69	74	82	75	72	71	68	71	73	4	68	82		
ASTM D4533	Trapezoid Tear Strength (lbs)															
	Specimens were tested as directed in Test Method D4533, dry condition.															
MD	92	124	83	98	124	123	107	110	123	109	109	15	83	124	75	
TD	134	135	132	136	134	140	109	125	115	104	126	13	104	140		

(End of Table 2B)

(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](http://www.precisionlabs.net)  
**Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.**

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

Date Received: **3/14/2014**  
 Date Reported: **4/8/2014**  
 Client Sample ID: **R#57871020204**  
 Material Description: **TN330-2-8 Double-Sided Geocomposite**

QC'd By: Maria Espitia  
 TRI Job No.: **G140231**  
 TRI Control No.: **96880**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9	10				
ASTM D4716	Transmissivity <i>Tested at Normal Pressure : 500 psf, Gradient: 0.02, Seating Time: 24 hrs</i> <i>Temperature of Test Water: 21.1° C Specimen Size: 12" x 14"</i>														
	Transmissivity (m. <sup>2</sup> / sec.)														
	MD <b>6.36E-03</b>											6.36E-03	N/A	N/A	1.5x10 <sup>-3</sup>
	Flow Rate (gal/min)														
	MD <b>0.63</b>											0.63	N/A	N/A	
	Transmissivity (gal/min/ft)														
	MD <b>30.73</b>											30.73	N/A	N/A	
ASTM D4716	Transmissivity <i>Tested at Normal Pressure : 15000 psf, Gradient: 0.02, Seating Time: 100 hrs</i> <i>Temperature of Test Water: 21.1° C Specimen Size: 12" x 14"</i>														
	Transmissivity (m. <sup>2</sup> / sec.)														
	MD <b>2.84E-03</b>											2.84E-03	N/A	N/A	1.0x10 <sup>-3</sup>
	Transmissivity (gal./ min./ ft.)														
	MD <b>13.72</b>											13.72	N/A	N/A	
	Flow Rate (gal./ min)														
	MD <b>0.28</b>											0.28	N/A	N/A	
	<i>Test Set-Up:</i>														
	<i>Plate</i> _____														
	<i>Soil</i> <u>oooooooo</u>														
	<i>Geocomposite</i> <u>XXXXXX</u>														
	<i>HDPE Microspike</i> <u>=====</u>														
	<i>Plate</i> _____														
ASTM D7005	Ply Bond Adhesion (lbs/ in.- width) <i>Instron Tensile Testing Machine is set for 305mm(12 in./min.) constant rate of extension with initial gauge length of 50mm.</i> <i>Full scale force range used for testing: 100 lbs.</i>														
	<b>Side A of Composite</b>														
	MD <b>7.0 2.8 5.2 5.8 6.5</b>											5.5	1.6	2.8 7.0	1.0
	<b>Side B of Composite</b>														
	MD <b>6.2 4.2 5.7 4.1 5.3</b>											5.1	0.9	4.1 6.2	1.0

(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.

LEGENDS:  
 MD - MACHINE DIRECTION  
 TD - TRANSVERSE DIRECTION

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

Date Received: 3/14/2014  
 Date Reported: 3/27/2014  
 Client Sample ID: R#57871020204  
 Material Description: 8oz Non Woven Geotextile Component

QC'd By: *Maria Espitia*  
 TRI Job No.: G140231  
 TRI Control No.: 96885

**SPECIMENS**

	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
<b>METHOD DESCRIPTION</b>															
ASTM D5261 Mass per Unit Area (oz/ yd. <sup>2</sup> )															
Test Specimen Size: 4" x 8"															
	8.5	7.5	8.6	9.2	8.6						8.5	0.6	7.5	9.2	8.0
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	248	237	227	267	218	201	184	207	221	234	224	24	184	267	200
TD	171	155	212	234	235	277	167	242	217	242	215	39	155	277	
Apparent Breaking Elongation (percent)															
MD	57	51	54	63	66	58	55	48	57	57	57	5	48	66	
TD	92	107	67	80	70	73	101	79	86	71	83	14	67	107	
ASTM D4533 Trapezoid Tear Strength (lbs)															
Specimens were tested as directed in Test Method D4533, dry condition.															
MD	118	134	103	92	109	79	105	128	117	124	111	17	79	134	75
TD	145	122	109	112	101	111	152	115	147	113	123	18	101	152	
ASTM D4491 Permittivity (sec. <sup>-1</sup> )															
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.															
	1.35	1.33	1.29	1.43							1.35	0.06	1.29	1.43	0.5
Permeability (cm./ sec.)															
	0.37	0.40	0.38	0.40							0.39	0.02	0.37	0.40	
Flow Rate (gpm/ ft. <sup>2</sup> )															
	101	100	97	107							101	4	97	107	

(Continued on Next Page)

(Sheet 1 of 2)

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

Date Received: **3/14/2014**  
 Date Reported: **3/27/2014**  
 Client Sample ID: **R#57871020204**  
 Material Description: **8oz Non Woven Geotextile Component**

QC'd By: Maria Espitia  
 TRI Job No.: **G140231**  
 TRI Control No.: **96885**

**SPECIMENS**

	1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
<b>METHOD DESCRIPTION</b>															
ASTM D4751 Apparent Opening Size (U.S. standard sieve size)															
<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
	<b>100-140</b>	<b>100-140</b>	<b>100-140</b>	<b>100-140</b>	<b>100-140</b>						<b>100-140</b>	N/A	N/A	N/A	
ASTM D4751 Apparent Opening Size (mm)															
<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
	<b>0.147</b>	<b>0.148</b>	<b>0.148</b>	<b>0.149</b>	<b>0.148</b>						<b>0.148</b>	<b>0.001</b>	<b>0.147</b>	<b>0.149</b>	<b>≤ 0.21</b>

(End of Table 3A)

(Sheet 2 of 2)

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](http://www.precisionlabs.net)  
**Precision Geosynthetic Laboratories International dba TRI Environmental, Inc.**

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

Date Received: **3/14/2014**  
Date Reported: **3/27/2014**  
Client Sample ID: **R#57871020204**  
Material Description: **8oz Non Woven Geotextile Component**

QC'd By: *Maria Espitia*  
TRI Job No.: **G140231**  
TRI Control No.: **96886**

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV	
METHOD	DESCRIPTION	1	2	3	4	5	6	7	8	9						10
ASTM D5261	Mass per Unit Area (oz/ yd. <sup>2</sup> ) <i>Test Specimen Size: 4" x 8"</i>	7.9	8.6	8.9	8.3	7.8						8.3	0.5	7.8	8.9	8.0
ASTM D4632	Grab Tensile <i>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</i>															
	Grab Breaking Load (lbs)															
	MD	226	219	249	222	205	169	162	252	208	224	213	30	162	252	200
	TD	156	153	232	300	263	238	205	186	210	267	221	48	153	300	
	Apparent Breaking Elongation (percent)															
	MD	53	40	61	56	58	55	50	51	55	60	54	6	40	61	
	TD	193	187	203	257	201	205	205	202	212	238	210	21	187	257	
ASTM D4533	Trapezoid Tear Strength (lbs) <i>Specimens were tested as directed in Test Method D4533, dry condition.</i>															
	MD	112	88	140	92	101	165	99	136	117	109	116	24	88	165	75
	TD	95	80	117	146	142	132	98	103	114	89	112	23	80	146	
ASTM D4491	Permittivity (sec. <sup>-1</sup> )															
Constant Head	<i>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.</i>															
	<i>BT Technology permittivity testing apparatus compliant to ASTM D4491 requirements was used.</i>															
		1.49	1.71	1.48	1.39							1.52	0.14	1.39	1.71	0.5
	Permeability (cm./ sec.)															
		0.43	0.43	0.41	0.43							0.43	0.01	0.41	0.43	
	Flow Rate (gpm/ ft. <sup>2</sup> )															
		112	128	110	104							114	10	104	128	

(Continued on Next Page)

(Sheet 1 of 2)

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

Date Received: 3/14/2014  
Date Reported: 3/27/2014  
Client Sample ID: R#57871020204  
Material Description: 8oz Non Woven Geotextile Component

QC'd By: Maria Espitia  
TRI Job No.: G140231  
TRI Control No.: 96886

		SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs. MARV
		1	2	3	4	5	6	7	8	9	10					
<b>METHOD</b>	<b>DESCRIPTION</b>															
ASTM D4751	Apparent Opening Size (U.S. standard sieve size)															
	<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
		100-140	100-140	100-140	100-140	100-140						100-140	N/A	N/A	N/A	
ASTM D4751	Apparent Opening Size (mm)															
	<i>Specimens were tested as directed in Test Method D4751. Type of sieve shaker used is W.S. Tyler Rotap.</i>															
		0.146	0.146	0.146	0.147	0.144						0.146	0.001	0.144	0.147	≤ 0.21

(End of Table 3B)

(Sheet 2 of 2)

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.