



April 28, 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 seam testing of twenty (20) HDPE seam samples.**PROJECT NAME:** JED Cell 10**DATE REPORTED:** April 28, 2014**REFERENCE TRI JOB NO.:** G140362**DATE RECEIVED:** April 28, 2014**SAMPLES SENT BY:** Brantley Engineering**SAMPLE IDENTIFICATIONS:**

SAMPLE ID	TRI-CA CONTROL NUMBER	SAMPLE ID	TRI-CA CONTROL NUMBER
1. DS-1 9/10	97479	11. DS-11 43/46	97489
2. DS-2 3/14	97480	12. DS-12 47/50	97490
3. DS-3 15/21	97481	13. DS-13 25/27	97491
4. DS-4 19/20	97482	14. DS-14 52/53	97492
5. DS-5 23/24	97483	15. DS-15 51/54	97493
6. DS-6 31/28	97484	16. DS-16 53/56	97494
7. DS-7 37/38	97485	17. DS-17 56/58	97495
8. DS-8 41/42	97486	18. DS-18 58/60	97496
9. DS-9 46/48	97487	19. DS-19 65/63	97497
10. DS-10 28/43	97488	20. DS-20 60/61	97498

TESTS REQUIRED / PERFORMED:**TEST METHOD**

1. ASTM D6392
2. ASTM D6392

DESCRIPTION

- Shear Bond Strength
Peel Bond Adhesion

TEST RESULTS: The test results are summarized in the attached Tables 1 to 10.

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. **Failed seam samples are kept for two (2) years and good seam samples are disposed of after two (2) weeks.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.



TABLE 1.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 1 9/10	97479	163	> 50%	BRK		1 Outside	124	0	SE1	
		159	> 50%	BRK		2 Outside	130	0	SE1	
		158	> 50%	BRK		3 Outside	123	0	SE1	
		154	> 50%	BRK		4 Outside	121	0	SE1	
		156	> 50%	BRK		5 Outside	125	0	SE1	
		AVG:		125			91			
		STD. DEV.		3						
		1 Inside	122	0		SE1				
		2 Inside	126	0		SE1				
		3 Inside	120	0		SE1				
4 Inside	120	0	SE1							
AVG:		121		91						
STD. DEV.		3								
DS- 2 3/14	97480	163	> 50%	BRK		1 Outside	143	0	SE1	
		163	> 50%	BRK		2 Outside	129	0	SE1	
		167	> 50%	BRK		3 Outside	145	0	SE1	
		157	> 50%	BRK		4 Outside	153	0	SE1	
		163	> 50%	BRK		5 Outside	156	0	SE1	
		AVG:		145			91			
		STD. DEV.		11						
		1 Inside	113	0		SE1				
		2 Inside	119	0		SE1				
		3 Inside	120	0		SE1				
4 Inside	123	0	SE1							
AVG:		121		91						
STD. DEV.		6								

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1 ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.
AD2 ADHESION FAILURE.
AD-WLD BREAK THROUGH THE FILLET.
SE1 BREAK AT BOTTOM EDGE OF SEAM.
SE2 BREAK AT TOP EDGE OF SEAM.
SE3 BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BRK1 BREAK IN BOTTOM SHEETING.
BRK2 BREAK IN TOP SHEETING.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
HT BREAK AT EDGE OF HOT TACK
SIP SEPARATION IN THE PLANE OF THE SHEET.

(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.

TABLE 2.
SEAM PEEL AND SHEAR TEST RESULTSCLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 3 15/21	97481	163	> 50%	BRK		1 Outside	101	0	SE1	
		163	> 50%	BRK		2 Outside	106	0	SE1	
		162	> 50%	BRK		3 Outside	103	0	SE1	
		153	> 50%	BRK		4 Outside	107	0	SE1	
		158	> 50%	BRK		5 Outside	102	0	SE1	
		AVG:		104			91			
		STD. DEV.		3						
				1 Inside		103	0	SE1		
				2 Inside		122	0	SE1		
				3 Inside		101	0	SE1		
		4 Inside	113	0	SE1					
		5 Inside	120	0	SE1					
AVG.		160	120			AVG:	112		91	
STD. DEV.		4				STD. DEV.	10			
DS- 4 19/20	97482	163	> 50%	BRK		1 Outside	118	0	SE1	
		150	> 50%	BRK		2 Outside	126	0	SE1	
		165	> 50%	BRK		3 Outside	125	0	SE1	
		160	> 50%	BRK		4 Outside	120	0	SE1	
		155	> 50%	BRK		5 Outside	122	0	SE1	
		AVG:		122			91			
		STD. DEV.		3						
				1 Inside		125	0	SE1		
				2 Inside		121	0	SE1		
				3 Inside		120	0	SE1		
		4 Inside	119	0	SE1					
		5 Inside	126	0	SE1					
AVG:		159	120			AVG:	122		91	
STD. DEV.		6				STD. DEV.	3			

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(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.



TABLE 3.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min					
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION					
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)	
DS- 5 23/24	97483	160	> 50%	BRK		1 Outside	139	0	SE1		
		158	> 50%	BRK		2 Outside	135	0	SE1		
		161	> 50%	BRK		3 Outside	148	0	SE1		
		158	> 50%	BRK		4 Outside	153	0	SE1		
		158	> 50%	BRK		5 Outside	120	0	SE1		
		AVG:		139				91			
		STD. DEV.		13							
		1 Inside		111		0		SE1			
		2 Inside		115		0		SE1			
		3 Inside		111		0		SE1			
4 Inside		117		0		SE1					
5 Inside		118		0		SE1					
AVG:		114				91					
STD. DEV.		3									
DS- 6 31/28	97484	157	> 50%	BRK		1 Outside	148	0	SE1		
		158	> 50%	BRK		2 Outside	153	0	SE1		
		162	> 50%	BRK		3 Outside	149	0	SE1		
		158	> 50%	BRK		4 Outside	144	0	SE1		
		162	> 50%	BRK		5 Outside	144	0	SE1		
		AVG:		148				91			
		STD. DEV.		4							
		1 Inside		118		0		SE1			
		2 Inside		121		0		SE1			
		3 Inside		120		0		SE1			
4 Inside		118		0		SE1					
5 Inside		117		0		SE1					
AVG:		119				91					
STD. DEV.		2									

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(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.



TABLE 4.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 7 37/38	97485	159	> 50%	BRK		1 Outside	113	0	SE1	
		139	> 50%	BRK		2 Outside	118	0	SE1	
		161	> 50%	BRK		3 Outside	115	0	SE1	
		156	> 50%	BRK		4 Outside	106	0	SE1	
		159	> 50%	BRK		5 Outside	111	0	SE1	
		AVG:		113			91			
		STD. DEV.		5						
		1 Inside	104	0		SE1				
		2 Inside	131	0		SE1				
		3 Inside	122	0		SE1				
4 Inside	117	0	SE1							
5 Inside		132	0	SE1						
AVG:		121	91							
STD. DEV.		11								
DS- 8 41/42	97486	167	> 50%	BRK		1 Outside	107	0	SE1	
		160	> 50%	BRK		2 Outside	109	0	SE1	
		164	> 50%	BRK		3 Outside	124	0	SE1	
		158	> 50%	BRK		4 Outside	122	0	SE1	
		162	> 50%	BRK		5 Outside	116	0	SE1	
		AVG:		116			91			
		STD. DEV.		8						
		1 Inside	134	0		SE1				
		2 Inside	136	0		SE1				
		3 Inside	132	0		SE1				
4 Inside	140	0	SE1							
5 Inside		136	0	SE1						
AVG:		136	91							
STD. DEV.		3								

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(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 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.



TABLE 5.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 9 46/48	97487	163	> 50%	BRK		1 Outside	121	0	SE1	
		161	> 50%	BRK		2 Outside	125	0	SE1	
		158	> 50%	BRK		3 Outside	124	0	SE1	
		156	> 50%	BRK		4 Outside	121	0	SE1	
		155	> 50%	BRK		5 Outside	139	0	SE1	
		AVG:		126			91			
		STD. DEV.		7						
		1 Inside	113	0		SE1				
		2 Inside	130	0		SE1				
		3 Inside	117	0		SE1				
4 Inside	124	0	SE1							
5 Inside		127	0	SE1						
AVG:		122		91						
STD. DEV.		7								
DS- 10 28/43	97488	170	> 50%	BRK		1 Outside	114	0	SE1	
		163	> 50%	BRK		2 Outside	119	0	SE1	
		164	> 50%	BRK		3 Outside	116	0	SE1	
		170	> 50%	BRK		4 Outside	116	0	SE1	
		166	> 50%	BRK		5 Outside	123	0	SE1	
		AVG:		118			91			
		STD. DEV.		4						
		1 Inside	115	0		SE1				
		2 Inside	122	0		SE1				
		3 Inside	117	0		SE1				
4 Inside	117	0	SE1							
5 Inside		123	0	SE1						
AVG:		119		91						
STD. DEV.		3								

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(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 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.



TABLE 6.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min					
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION					
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)	
DS- 11 43/46	97489	158	> 50%	BRK		1 Outside	122	0	SE1		
		142	> 50%	BRK		2 Outside	125	0	SE1		
		162	> 50%	BRK		3 Outside	123	0	SE1		
		152	> 50%	BRK		4 Outside	124	0	SE1		
		156	> 50%	BRK		5 Outside	122	0	SE1		
		AVG:				123		91			
		STD. DEV.				1					
		1 Inside				104	0	SE1			
		2 Inside				110	0	SE1			
		3 Inside				105	0	SE1			
4 Inside				117	0	SE1					
5 Inside				110	0	SE1					
AVG.		154	120			AVG:	109		91		
STD. DEV.		8				STD. DEV.	5				
DS- 12 47/50	97490	162	> 50%	BRK		1 Outside	110	0	SE1		
		140	> 50%	BRK		2 Outside	112	0	SE1		
		162	> 50%	BRK		3 Outside	124	0	SE1		
		159	> 50%	BRK		4 Outside	120	0	SE1		
		159	> 50%	BRK		5 Outside	134	0	SE1		
		AVG:				120		91			
		STD. DEV.				10					
		1 Inside				113	0	SE1			
		2 Inside				136	0	SE1			
		3 Inside				124	0	SE1			
4 Inside				136	0	SE1					
5 Inside				118	0	SE1					
AVG:		156	120			AVG:	125		91		
STD. DEV.		9				STD. DEV.	10				

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(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 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.



TABLE 7.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 13 25/27	97491	164	> 50%	BRK		1 Outside	128	0	SE1	
		145	> 50%	BRK		2 Outside	128	0	SE1	
		167	> 50%	BRK		3 Outside	121	0	SE1	
		159	> 50%	BRK		4 Outside	122	0	SE1	
		163	> 50%	BRK		5 Outside	119	0	SE1	
		AVG:		124			91			
		STD. DEV.		4						
		1 Inside	105	0		SE1				
		2 Inside	125	0		SE1				
		3 Inside	123	0		SE1				
4 Inside	123	0	SE1							
AVG:		120	91							
STD. DEV.		9								
DS- 14 52/53	97492	160	> 50%	BRK		1 Outside	143	0	SE1	
		157	> 50%	BRK		2 Outside	121	0	SE1	
		161	> 50%	BRK		3 Outside	118	0	SE1	
		154	> 50%	BRK		4 Outside	110	0	SE1	
		159	> 50%	BRK		5 Outside	114	0	SE1	
		AVG:		121			91			
		STD. DEV.		13						
		1 Inside	116	0		SE1				
		2 Inside	125	0		SE1				
		3 Inside	121	0		SE1				
4 Inside	116	0	SE1							
AVG:		119	91							
STD. DEV.		4								

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(End of Table 7)

(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.



TABLE 8.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 15 51/54	97493	160	> 50%	BRK		1 Outside	120	0	SE1	
		162	> 50%	BRK		2 Outside	120	0	SE1	
		169	> 50%	BRK		3 Outside	117	0	SE1	
		159	> 50%	BRK		4 Outside	116	0	SE1	
		164	> 50%	BRK		5 Outside	119	0	SE1	
		AVG:		118				91		
		STD. DEV.		2						
		1 Inside		116		0		SE1		
		2 Inside		121		0		SE1		
		3 Inside		120		0		SE1		
4 Inside		118		0		SE1				
5 Inside		112		0		SE1				
AVG:		117				91				
STD. DEV.		4								
DS- 16 53/56	97494	173	> 50%	BRK		1 Outside	134	0	SE1	
		168	> 50%	BRK		2 Outside	158	0	SE1	
		174	> 50%	BRK		3 Outside	139	0	SE1	
		156	> 50%	BRK		4 Outside	137	0	SE1	
		169	> 50%	BRK		5 Outside	134	0	SE1	
		AVG:		140				91		
		STD. DEV.		10						
		1 Inside		127		0		SE1		
		2 Inside		118		0		SE1		
		3 Inside		117		0		SE1		
4 Inside		111		0		SE1				
5 Inside		118		0		SE1				
AVG:		118				91				
STD. DEV.		6								

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1 ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.
AD2 ADHESION FAILURE.
AD-WLD BREAK THROUGH THE FILLET.
SE1 BREAK AT BOTTOM EDGE OF SEAM.
SE2 BREAK AT TOP EDGE OF SEAM.
SE3 BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BRK1 BREAK IN BOTTOM SHEETING.
BRK2 BREAK IN TOP SHEETING.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
HT BREAK AT EDGE OF HOT TACK
SIP SEPARATION IN THE PLANE OF THE SHEET.

(End of Table 8)

(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.



TABLE 9.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espino*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min					
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION					
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)	
DS- 17 56/58	97495	183	> 50%	BRK		1 Outside	98	0	SE1		
		170	> 50%	BRK		2 Outside	116	0	SE1		
		172	> 50%	BRK		3 Outside	115	0	SE1		
		156	> 50%	BRK		4 Outside	111	0	SE1		
		178	> 50%	BRK		5 Outside	115	0	SE1		
		AVG:		111				91			
		STD. DEV.		8							
		1 Inside		105		0		SE1			
		2 Inside		107		0		SE1			
		3 Inside		108		0		SE1			
		4 Inside		110		0		SE1			
		5 Inside		113		0		SE1			
AVG:		109				91					
STD. DEV.		3									
DS- 18 58/60	97496	178	> 50%	BRK		1 Outside	138	0	SE1		
		175	> 50%	BRK		2 Outside	118	0	SE1		
		173	> 50%	BRK		3 Outside	120	0	SE1		
		171	> 50%	BRK		4 Outside	117	0	SE1		
		173	> 50%	BRK		5 Outside	127	0	SE1		
		AVG:		124				91			
		STD. DEV.		9							
		1 Inside		131		0		SE1			
		2 Inside		128		0		SE1			
		3 Inside		120		0		SE1			
		4 Inside		121		0		SE1			
		5 Inside		134		0		SE1			
AVG:		127				91					
STD. DEV.		6									

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(End of Table 9)

(Sheet 1 of 1)

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TABLE 10.
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Brantley Engineering, LLC**
PROJECT: **JED Cell 10**
DATE REC'D: **28-Apr-14**

MATERIAL: **HDPE SEAM**
SEAM TYPE: **Fusion Weld**
TRI JOB #: **G140362**

QC'd By: *Maria Espitia*
TEST METHOD: **ASTM D6392**
DATE REPORT: **28-Apr-14**

Crosshead Speed: 2 in/min						Crosshead Speed: 2 in/min				
SAMPLE ID	TRI CONTROL #	SHEAR EVALUATION				PEEL EVALUATION				
		MAXIMUM STRENGTH (lb/in width)	% Elongation	Locus of Break	PROJECT SPEC. (lb/in width)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	% INCURSION (%)	LOCUS OF BREAK	PROJECT SPEC. (lb/in width)
DS- 19 61/63	97497	181	> 50%	BRK		1 Outside	123	0	SE1	
		177	> 50%	BRK		2 Outside	130	0	SE1	
		179	> 50%	BRK		3 Outside	129	0	SE1	
		170	> 50%	BRK		4 Outside	132	0	SE1	
		175	> 50%	BRK		5 Outside	129	0	SE1	
		AVG:	129			91				
		STD. DEV.	3							
		1 Inside	134	0		SE1				
		2 Inside	142	0		SE1				
		3 Inside	124	0		SE1				
		4 Inside	126	0	SE1					
		5 Inside	128	0	SE1					
		AVG:	131		91					
		STD. DEV.	7							
		1 Outside	136	0	SE1					
		2 Outside	145	0	SE1					
		3 Outside	137	0	SE1					
		4 Outside	126	0	SE1					
		5 Outside	146	0	SE1					
		AVG:	138		91					
STD. DEV.	8									
1 Inside	107	0	SE1							
2 Inside	105	0	SE1							
3 Inside	102	0	SE1							
		4 Inside	107	0	SE1					
		5 Inside	112	0	SE1					
		AVG:	107		91					
		STD. DEV.	4							
		1 Inside	107	0	SE1					
		2 Inside	105	0	SE1					
		3 Inside	102	0	SE1					
		4 Inside	107	0	SE1					
		5 Inside	112	0	SE1					
		AVG:	107		91					
STD. DEV.	4									

BREAK DESCRIPTION (ASTM D6392 FUSION):

AD ADHESION FAILURE.
BRK BREAK IN SHEETING.
SE1 BREAK AT OUTER EDGE OF SEAM.
SE2 BREAK AT INNER EDGE OF SEAM.
AD-BRK BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
SIP SEPARATION IN THE PLANE OF THE SHEET.

EXTRUSION:

AD1
AD2
AD-WLD
SE1
SE2
SE3
BRK1
BRK2
AD-BRK
HT
SIP

ADHESION FAILURE. SPECIMENS DELAMINATED UNDER THE BEAD.

ADHESION FAILURE.
BREAK THROUGH THE FILLET.
BREAK AT BOTTOM EDGE OF SEAM.
BREAK AT TOP EDGE OF SEAM.
BREAK AT BOTTOM EDGE OF SEAM (for PEEL only)
BREAK IN BOTTOM SHEETING.
BREAK IN TOP SHEETING.
BREAK IN FIRST SEAM AFTER SOME ADHESION FAILURE.
BREAK AT EDGE OF HOT TACK
SEPARATION IN THE PLANE OF THE SHEET.

(End of Table 10)

(Sheet 1 of 1)

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