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

VOLUME 4 of 4

Ardaman & Associates, Inc.

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MEMBERS:
A.S.F.E.
American Concrete Institute
American Society for Testing and Materials
Florida Institute of Consulting Engineers

APPENDIX 14

Construction Quality Assurance Laboratory Reports For Geomembrane Seam Destructive Tests

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 45-49 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-2	097375/ DT-2 Seam 4/6	F	T	Load (ppi)	71	70	74	87	88	78	8.9	99	93	94	93	95	95	2.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1096	1100	1065	1110	1082		
			B	Load (ppi)	87	76	81	80	84	82	4.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-5	097375/ DT-5 Seam 10/12	F	T	Load (ppi)	99	95	90	91	90	93	3.8	108	104	103	102	100	103	2.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								847	846	1008	980	1025		
			B	Load (ppi)	89	87	87	83	85	86	2.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/16/12

Checked By: JCW Date: 03/16/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 42-48 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-6	097375/ DT-6 Seam 12/13	F	T	Load (ppi)	97	97	96	99	94	97	1.7	99	97	100	98	96	98	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1979	1850	1933	1943	1016		
			B	Load (ppi)	92	93	93	90	91	92	1.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-8	097375/ DT-8 Seam 15/16	F	T	Load (ppi)	81	81	82	82	77	81	1.8	99	99	100	101	102	100	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								771	748	766	698	704		
			B	Load (ppi)	96	94	93	92	91	93	2.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 44-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-11	097375/ DT-11 Seam 19/20	F	T	Load (ppi)	83	78	74	75	73	77	4.1	102	102	100	98	96	100	2.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1040	1070	1849	1088	783		
			B	Load (ppi)	87	87	92	87	86	88	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-15	097375/ DT-15 Seam 24/26	F	T	Load (ppi)	83	86	85	84	89	85	2.3	104	101	101	101	102	102	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1879	1887	776	749	1856		
			B	Load (ppi)	83	82	83	88	84	84	2.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 41-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-16	097375/ DT-16 Seam 26/28	F	T	Load (ppi)	99	98	97	99	99	98	0.9	104	103	102	101	101	102	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1891	1894	1673	1798	1863		
			B	Load (ppi)	83	86	83	82	84	83	1.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-17	097375/ DT-17 Seam 27/29	F	T	Load (ppi)	98	99	101	99	99	99	1.0	101	101	101	101	101	101	0.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1846	1900	1773	1658	1846		
			B	Load (ppi)	91	88	89	91	90	90	1.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 39-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-18	097375/ DT-18 Seam 29/30	F	T	Load (ppi)	93	90	88	88	86	89	2.7	99	101	102	100	99	100	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								933	890	881	739	766		
			B	Load (ppi)	84	87	89	92	92	89	3.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-19	097375/ DT-19 Seam 30/31	F	T	Load (ppi)	106	103	100	101	101	102	2.4	111	110	109	109	109	109	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1392	1258	1804	1911	1757		
			B	Load (ppi)	101	97	99	100	100	99	1.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 40-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-20	097375/ DT-20 Seam 32/33	F	T	Load (ppi)	102	101	104	104	103	103	1.3	109	107	107	107	107	108	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1015	1044	1055	1632	1881		
			B	Load (ppi)	85	85	83	87	89	86	2.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-24	097375/ DT-24 Seam 33/35	F	T	Load (ppi)	94	101	102	103	103	101	3.6	109	109	109	108	109	109	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								825	762	767	772	1322		
			B	Load (ppi)	96	94	89	95	98	94	3.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/16/12

DATE REPORTED: 03/16/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 41-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-25	097375/ DT-25 Seam 35/36	F	T	Load (ppi)	92	90	101	102	97	96	5.4	109	109	109	108	108	109	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1030	1647	724	855	1880		
			B	Load (ppi)	93	96	96	97	94	95	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

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GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/15/12

DATE REPORTED: 03/15/12

GEOMEMBRANE TYPE: 40-mil LLDPE / 60-mil HDPE

DATE SAMPLES RECEIVED: 03/14/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 40-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-22	097375/ DT-22 P-15/Tie-In	E	T	Load (ppi)	102	110	88	87	89	95	9.9	116	112	111	105	100	109	6.5
				Mode	SE3	SE3	SE3	SE3	SE3			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								572	600	614	683	695		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-23	097375/ DT-23 P-20/Tie-In	E	T	Load (ppi)	85	89	99	82	75	86	8.7	89	96	92	102	98	95	5.2
				Mode	AD	AD-BRK	BRK2	SE3	SE3			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	100	10	0	0	0									
				Shear (%)								241	766	705	800	722		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

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ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/15/12

DATE REPORTED: 03/15/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 2.4 HOURS 72 °F 41-44 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-1	097375/ DT-1 Seam 3/4	F	T	Load (ppi)	93	91	93	94	96	93	1.9	98	96	94	94	94	95	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1837	1881	1887	1733	1927		
			B	Load (ppi)	92	90	90	87	85	89	3.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-3	097375/ DT-3 Seam 8/9	F	T	Load (ppi)	95	100	93	97	100	97	2.9	107	103	102	101	101	103	2.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1023	1067	1060	1113	1104		
			B	Load (ppi)	91	87	88	89	90	89	1.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/15/12

Checked By: JCW Date: 03/15/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/15/12

DATE REPORTED: 03/15/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.4 HOURS 72 °F 40-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	2	3	4	5	Avg.	Std. Dev.	Shear Test 1	2	3	4	5	Avg.	Std. Dev.
DT-4	097375/ DT-4 Seam 9/11	F	T	Load (ppi)	89	98	96	95	91	94	3.8	105	100	98	96	97	99	3.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1004	1012	963	1009	979		
			B	Load (ppi)	95	95	88	93	97	94	3.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-7	097375/ DT-7 Seam 13/15	F	T	Load (ppi)	89	88	87	85	91	88	2.1	99	99	98	96	96	97	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1094	1011	1033	1096	1915		
			B	Load (ppi)	93	94	94	93	88	92	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/15/12

Checked By: JCW Date: 03/15/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/15/12

DATE REPORTED: 03/15/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 4.3 HOURS 72 °F 39-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-9	097375/ DT-9 Seam 16/17	F	T	Load (ppi)	107	109	105	104	103	106	2.0	107	108	108	108	108	108	0.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								890	1867	1017	1967	1924		
			B	Load (ppi)	93	92	94	92	93	93	1.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-10	097375/ DT-10 Seam 18/19	F	T	Load (ppi)	95	88	89	93	81	89	5.4	100	99	98	99	97	98	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								967	898	1482	1723	1262		
			B	Load (ppi)	91	91	87	78	79	85	6.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/15/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/15/12

DATE REPORTED: 03/15/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.2 HOURS 72 °F 42-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-12	097375/ DT-12 Seam 21/22	F	T	Load (ppi)	104	96	97	97	99	98	3.0	102	99	99	98	98	99	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1982	1948	1912	1897	1891		
			B	Load (ppi)	86	87	81	82	82	84	2.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-13	097375/ DT-13 Seam 22/23	F	T	Load (ppi)	93	93	100	98	98	96	3.1	104	103	104	100	99	102	2.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1798	1916	1817	1083	1865		
			B	Load (ppi)	102	100	102	98	101	101	1.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/15/12

Checked By: JCW Date: 03/15/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/15/12

DATE REPORTED: 03/15/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.2 HOURS 72 °F 41-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-14	097375/ DT-14 Seam 23/24	F	T	Load (ppi)	99	99	94	96	98	97	2.3	102	101	100	101	101	101	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1007	1042	1088	1056	1920		
			B	Load (ppi)	85	84	85	87	89	86	2.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 44-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-21R1	097375/ DT-21R1 Cap-P2	E	T	Load (ppi)	74	83	90	96	94	87	9.1	94	94	93	95	95	94	0.7
				Mode	SE3	SE3	BRK2	SE3	BRK2			SE2	SE1	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1465	675	1282	1379	1387		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-26	097375/ DT-26 Seam 37/38	F	T	Load (ppi)	101	104	100	111	98	103	5.1	108	106	107	109	109	108	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								898	855	970	899	1023		
			B	Load (ppi)	90	90	85	92	90	90	2.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: RM No.: 43-01
Date 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 44-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-27	097375/ DT-27 Seam 39B/46	F	T	Load (ppi)	101	101	102	101	101	101	0.5	110	109	109	110	110	110	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								923	757	802	962	929		
			B	Load (ppi)	82	89	90	89	83	87	3.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-28	097375/ DT-28 Seam 49/53	F	T	Load (ppi)	96	97	92	84	88	91	5.3	100	91	100	97	96	97	3.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	BRK	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								796	737	811	775	787		
			B	Load (ppi)	83	84	85	84	84	84	0.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 44-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-29	097375/ DT-29 Seam 50/55	F	T	Load (ppi)	98	97	96	86	90	93	5.1	106	106	104	104	106	105	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1823	1690	1790	869	1597		
			B	Load (ppi)	85	85	80	78	80	82	3.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-30	097375/ DT-30 Seam 56/57	F	T	Load (ppi)	90	96	97	98	96	96	3.1	107	105	104	103	104	105	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								965	610	803	737	809		
			B	Load (ppi)	82	79	83	80	82	81	1.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/19/12

Checked By: JAW Date: 03/18/12

Form R-4:Rev.1

C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-2.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 42-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-31	097375/ DT-31 Seam 57/58	F	T	Load (ppi)	101	100	100	96	98	99	1.9	107	106	105	105	105	106	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1716	1805	1825	1760	665		
			B	Load (ppi)	86	92	87	92	89	89	2.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-32	097375/ DT-32 Seam 33/35 DT-24 patch	E	T	Load (ppi)	81	100	98	96	83	92	8.8	96	94	89	88	99	93	4.5
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								949	889	724	705	1469		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
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Date: 03/19/12

Checked By: JCW Date: 03/18/12

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C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-2.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 41-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-33	097375/ DT-33 Cap – S6/8	E	T	Load (ppi)	81	93	88	90	91	89	4.9	89	90	96	91	91	92	2.6
				Mode	BRK2	SE3	BRK2	BRK2	SE3			SE2	SE2	SE1	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								696	702	1597	706	540		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-34	097375/ DT-34 Cap – 15/16	E	T	Load (ppi)	100	83	82	80	69	83	11	82	99	99	84	93	92	8.3
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1031	1320	1327	905	1235		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JA No.: 43-01
Date: 03/14/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE / 60-mil HDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-35	097375/ DT-35 P47 – Tie in (60)	E	T	Load (ppi)	86	86	101	102	102	95	8.7	100	110	106	108	102	105	4.2
				Mode	SE3	SE3	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								678	687	685	740	699		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/15/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 41-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-43	097375/ DT-43 Seam 59/60	F	T	Load (ppi)	90	88	89	89	93	90	2.1	110	107	107	108	108	108	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								811	727	847	782	830		
			B	Load (ppi)	86	85	87	88	89	87	1.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/16/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72-73 °F 39-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-36	097375/ DT-36 Seam 69/70	F	T	Load (ppi)	105	104	107	101	106	105	2.4	113	111	109	108	109	110	2.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								980	940	1833	1832	1795		
			B	Load (ppi)	99	92	95	89	82	91	6.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-37	097375/ DT-37 Seam 83/84	F	T	Load (ppi)	98	80	86	88	88	88	6.5	108	108	107	105	106	107	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								646	597	668	544	1698		
			B	Load (ppi)	88	90	90	95	94	91	3.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/16/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71 °F 40-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-38	097375/ DT-38 Seam 78/80	F	T	Load (ppi)	94	89	88	81	93	89	5.2	110	109	107	107	105	107	2.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								908	932	945	955	933		
			B	Load (ppi)	86	86	86	89	89	87	1.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-39	097375/ DT-39 Seam 76/77	F	T	Load (ppi)	101	94	96	103	99	99	3.9	110	110	111	114	113	112	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	DNF	SE1	DNF		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1126	1804	>1800	1810	>1800		
			B	Load (ppi)	76	76	82	80	80	79	2.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/18/12

Checked By: JCW Date: 03/18/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/16/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71 °F 37-40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-40	097375/ DT-40 Seam 65/67	F	T	Load (ppi)	88	87	95	86	87	89	3.5	95	95	92	98	95	95	2.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								724	865	710	889	644		
			B	Load (ppi)	90	89	89	89	83	88	2.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-41	097375/ DT-41 Seam 62/63	F	T	Load (ppi)	88	87	87	86	88	87	0.8	96	99	99	96	94	97	2.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								899	848	1807	>1800	770		
			B	Load (ppi)	89	87	79	84	82	84	3.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/16/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71 °F 39-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-42	097375/ DT-42 Seam 61/62	F	T	Load (ppi)	100	99	98	99	96	98	1.3	104	102	102	102	101	102	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1774	1669	1630	1640	1480		
			B	Load (ppi)	95	90	94	89	88	91	3.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-44	097375/ DT-44 Seam 58/59	F	T	Load (ppi)	84	89	92	98	94	91	5.1	109	110	110	109	106	109	1.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								978	1452	945	1022	792		
			B	Load (ppi)	86	97	93	95	92	92	3.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TH No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/16/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 39-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	2	3	4	5	Avg.	Std. Dev.	Shear Test 1	2	3	4	5	Avg.	Std. Dev.
DT-47	097375/ DT-47 Seam 94/95	E	T	Load (ppi)	97	88	100	102	99	97	5.7	110	108	109	109	110	109	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								799	874	842	813	779		
			B	Load (ppi)	87	85	87	88	86	86	1.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-48	097375/ DT-48 Seam 95/97	E	T	Load (ppi)	93	95	97	88	86	92	4.5	109	107	106	106	107	107	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1664	1599	1348	1210	1333		
			B	Load (ppi)	98	95	85	92	88	92	5.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/18/12

Form R-4:Rev.1

C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-2.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/17/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE / 60-mil HDPE

DATE SAMPLES RECEIVED: 03/16/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71 °F 42-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-54	097375/ DT-54 P68 – Tie-in	E	T	Load (ppi)	89	85	101	94	107	95	8.8	106	104	107	110	106	106	2.2
				Mode	SE3	SE3	SE3	SE3	SE3			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								702	677	722	700	649		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

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Form R-4 Rev 1

C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-2.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/19/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/19/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 2.0 HOURS 72 °F 45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-45	097375/ DT-45 Seam 88/90	F	T	Load (ppi)	89	90	91	89	89	90	0.7	102	101	100	100	101	101	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								659	502	572	623	596		
			B	Load (ppi)	85	85	85	85	85	85	0.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-46	097375/ DT-46 Seam 91/93	F	T	Load (ppi)	97	93	90	87	98	93	4.9	103	102	103	102	103	103	0.4
				Mode	SE1	SE1	SE1	AD-BRK	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	5	0									
				Shear (%)								416	577	374	539	407		
			B	Load (ppi)	79	84	89	83	84	84	3.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: PM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/19/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/19/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/19/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 2.8 HOURS 72 °F 45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-49	097375/ DT-49 Seam 99/101	F	T	Load (ppi)	92	95	94	99	90	94	3.3	101	107	105	110	108	106	3.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	DNF		
				Peel (%)	0	0	0	0	0									
				Shear (%)								609	1330	1279	1480	>1800		
			B	Load (ppi)	85	81	81	83	85	83	1.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-50	097375/ DT-50 Seam 99/104	F	T	Load (ppi)	95	101	95	101	94	97	3.8	102	103	103	104	102	103	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	DNF	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	>1800	1772	1665	620		
			B	Load (ppi)	82	80	81	83	80	81	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum

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.

GAI-LAP
Initials: JW No.: 43-01
Date: 02/19/12

Checked By: JCW Date: 03/19/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/19/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/19/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.6 HOURS 72 °F 45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-51	097375/ DT-51 Seam 109/110	F	T	Load (ppi)	89	90	86	88	90	89	1.8	103	102	104	104	105	104	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1420	1044	935	931	962		
			B	Load (ppi)	81	82	82	82	84	82	0.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-52	097375/ DT-52 Seam 113/115	F	T	Load (ppi)	94	96	94	97	98	96	1.7	96	95	95	95	101	96	2.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	DNF	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1799	>1800	1798	>1800	1797		
			B	Load (ppi)	85	86	91	80	86	86	4.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum

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GAI-LAP
Initials: TM No: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/19/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/19/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/19/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 4.4 HOURS 72 °F 45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-53	097375/ DT-53 Seam 122/123	F	T	Load (ppi)	84	83	85	82	80	83	2.0	103	103	104	104	104	104	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1414	1627	1665	672	1640		
			B	Load (ppi)	89	86	87	85	88	87	1.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-56	097375/ DT-56 Seam 126/127	F	T	Load (ppi)	83	83	82	81	79	82	1.6	102	98	97	99	99	99	1.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1749	1749	1395	1507	597		
			B	Load (ppi)	84	86	76	77	78	80	4.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/19/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/19/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/19/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.2 HOURS 72 °F 45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-57	097375/ DT-57 Seam 128/129	F	T	Load (ppi)	96	95	95	92	93	94	1.6	99	100	100	99	99	99	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	DNF		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1749	1739	1745	1778	>1800		
			B	Load (ppi)	89	89	87	87	85	87	1.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-58	097375/ DT-58 Seam 130/131	F	T	Load (ppi)	100	99	99	100	99	99	0.7	107	107	107	106	104	106	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1586	1704	1722	1593	1612		
			B	Load (ppi)	87	85	94	94	93	91	4.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/19/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/19/12

DATE REPORTED: 03/19/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/19/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.0 HOURS 72 °F 45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-59	097375/ DT-59 Seam 131/132	F	T	Load (ppi)	98	100	103	97	99	99	2.1	106	106	108	107	105	106	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1794	1487	1552	949	930		
			B	Load (ppi)	84	86	86	85	84	85	0.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/19/12

Checked By: JCW Date: 03/19/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/21/12

DATE REPORTED: 03/21/12

GEOMEMBRANE TYPE: 40-mil LLDPE / 60-mil HDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.5 HOURS 72 °F 39-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-23R1	097375/ DT-23R1 P29 – Tie in	E	T	Load (ppi)	92	92	92	93	93	92	0.7	97	107	98	94	97	98	5.0
				Mode	BRK2	BRK2	BRK2	BRK2	SE3			SE2	SE2	SE2	BRK2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								766	710	722	749	737		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-65	097375/ DT-65 P78 – Tie in	E	T	Load (ppi)	122	120	110	107	95	111	11.0	129	129	119	112	100	118	12.4
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								674	599	642	759	645		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/21/12

Checked By: JAW Date: 03/21/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/21/12

DATE REPORTED: 03/21/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 4.0 HOURS 72 °F 39-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	2	3	4	5	Avg.	Std. Dev.	Shear Test 1	2	3	4	5	Avg.	Std. Dev.
DT-55	097375/ DT-55 P42 Patch	E	T	Load (ppi)	109	97	91	97	105	100	7.1	115	121	118	124	111	118	4.9
				Mode	SE3	SE3	SE3	SE3	SE3			SE2	SE2	SE1	SE1	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1311	1271	1212	1246	1182		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-60	097375/ DT-60 Seam 135/137	F	T	Load (ppi)	95	100	100	86	99	96	5.8	104	103	103	103	103	103	0.6
				Mode	SE1	SE1	SE1	SE1	BRK			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								948	930	932	870	982		
			B	Load (ppi)	93	91	91	88	92	91	1.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No. 43-01
Date: 03/21/12

Checked By: JCW Date: 03/21/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/21/12

DATE REPORTED: 03/21/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.1 HOURS 72 °F 39-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-61	097375/ DT-61 Seam 137/138	F	T	Load (ppi)	91	90	97	95	95	94	3.0	105	103	103	101	101	103	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	1771	1722	1452	1492		
			B	Load (ppi)	96	94	92	90	94	93	2.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-62	097375/ DT-62 Seam 141/143	F	T	Load (ppi)	99	99	93	88	92	94	4.6	106	105	104	103	104	104	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	DNF	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	>1800	1816	>1800	1815		
			B	Load (ppi)	88	96	83	83	83	87	5.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/21/12

Checked By: JCW Date: 03/21/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 16.5 HOURS 71-72 °F 43-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-63	097375/ DT-63 Seam 143/144	F	T	Load (ppi)	92	94	89	85	78	88	6.1	99	102	102	101	99	101	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								905	963	1040	767	742		
			B	Load (ppi)	91	85	83	85	89	87	3.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-64	097375/ DT-64 Seam 146/148	F	T	Load (ppi)	93	89	94	99	94	94	3.5	113	114	112	111	112	112	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								2074	2197	2191	945	2117		
			B	Load (ppi)	102	99	86	91	87	93	7.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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.

GAI-LAP
Initials: JM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 17.1 HOURS 71-72 °F 43-47 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	2	3	4	5	Avg.	Std. Dev.	Shear Test 1	2	3	4	5	Avg.	Std. Dev.
DT-66	097375/ DT-66 Seam 148/150	F	T	Load (ppi)	92	91	91	92	94	92	1.2	105	104	106	107	109	106	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								866	913	995	1912	1514		
			B	Load (ppi)	83	81	85	86	87	84	2.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-67	097375/ DT-67 Seam 150/152	F	T	Load (ppi)	93	97	96	95	96	95	1.6	106	106	105	103	103	105	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								973	1772	931	809	1606		
			B	Load (ppi)	85	82	80	80	80	81	2.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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.

GAI-LAP
Initials: JW L No: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 17.4 HOURS 72 °F 41-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-68	097375/ DT-68 Seam 150/151	F	T	Load (ppi)	98	94	100	100	98	98	2.4	104	105	107	108	107	106	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1178	1042	1225	1873	1967		
			B	Load (ppi)	81	83	83	86	86	84	2.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-69	097375/ DT-69 Seam 152/154	F	T	Load (ppi)	82	85	84	86	86	85	1.8	102	102	101	101	100	101	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1050	954	1939	826	1923		
			B	Load (ppi)	84	83	81	90	90	85	4.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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.

GAI-LAP
Initials: JW No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 17.6 HOURS 72 °F 42-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-70	097375/ DT-70 Seam 154/156	F	T	Load (ppi)	95	96	86	92	85	91	5.3	106	106	105	103	102	104	2.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1233	1172	1145	1007	948		
			B	Load (ppi)	84	85	85	85	82	84	1.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-71	097375/ DT-71 Seam 156/158	F	T	Load (ppi)	92	89	89	95	93	92	2.9	100	99	101	101	102	101	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1037	1033	1079	1014	1072		
			B	Load (ppi)	77	79	86	85	84	82	3.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 18.1 HOURS 72 °F 42-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	2	3	4	5	Avg.	Std. Dev.	Shear Test 1	2	3	4	5	Avg.	Std. Dev.
DT-72	097375/ DT-72 Seam 155/157	F	T	Load (ppi)	95	93	92	85	96	92	4.5	103	104	103	101	101	102	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								2167	833	2111	772	2038		
			B	Load (ppi)	82	83	81	81	81	81	0.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-73	097375/ DT-73 Seam 157/159	F	T	Load (ppi)	91	89	87	91	90	89	1.5	102	99	98	97	95	98	2.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								2033	1083	972	1713	1661		
			B	Load (ppi)	91	85	87	88	90	88	2.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 18.3 HOURS 72 °F 44-47 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-74	097375/ DT-74 Seam 159/160	F	T	Load (ppi)	91	81	89	81	85	85	4.6	103	103	103	102	101	102	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								812	781	873	943	805		
			B	Load (ppi)	82	83	88	87	78	84	4.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-75	097375/ DT-75 Seam 160/162	F	T	Load (ppi)	100	94	97	81	101	95	8.0	98	97	96	96	96	97	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1232	1237	1011	1288	1265		
			B	Load (ppi)	89	88	82	95	97	90	5.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: M No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 42-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-76	097375/ DT-76 Seam 160/161	F	T	Load (ppi)	73	74	85	78	80	78	4.9	99	96	98	97	97	97	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	DNF	DNF	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	>1800	>1800	1495	1033		
			B	Load (ppi)	92	101	90	92	88	93	4.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-77	097375/ DT-77 Seam 162/163	F	T	Load (ppi)	101	95	103	105	105	102	4.3	106	106	109	107	111	108	2.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	DNF	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1596	>1800	1706	>1800	799		
			B	Load (ppi)	98	96	102	101	99	99	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 38-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-78	097375/ DT-78 Seam 162/164	F	T	Load (ppi)	96	96	93	99	96	96	2.0	109	107	109	109	108	108	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1816	771	925	778	689		
			B	Load (ppi)	93	94	103	96	93	96	4.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-79	097375/ DT-64 Seam 164/166	F	T	Load (ppi)	93	85	91	88	83	88	4.4	102	99	101	100	103	101	1.6
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	SE1	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	715	722	>1800	1447		
			B	Load (ppi)	91	90	82	88	83	87	4.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev 1-6.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-80	097375/ DT-80 Seam 163/165	F	T	Load (ppi)	96	90	97	97	94	95	2.8	109	104	103	103	104	104	2.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1756	774	1799	723	825		
			B	Load (ppi)	82	80	81	82	83	82	1.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-81	097375/ DT-81 Seam 165/167	F	T	Load (ppi)	90	93	94	94	94	93	1.8	104	101	101	98	99	101	2.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								694	1664	1655	>1800	830		
			B	Load (ppi)	85	79	84	80	81	82	2.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP No. 43-01
Initials: TM
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 38-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-82	097375/ DT-82 Seam 168/169	F	T	Load (ppi)	91	101	90	83	96	92	6.7	111	108	107	104	106	107	2.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								953	925	674	919	640		
			B	Load (ppi)	101	92	95	85	86	92	6.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-83	097375/ DT-83 Seam 167/169	F	T	Load (ppi)	101	110	98	95	95	100	6.3	104	103	103	104	101	103	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								999	948	979	1832	1833		
			B	Load (ppi)	82	84	89	83	87	85	3.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 38-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-84	097375/ DT-84 Seam 169/171	F	T	Load (ppi)	98	94	98	93	91	95	3.1	104	102	102	102	103	103	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	BRK	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	1600	1809	715	1614		
			B	Load (ppi)	94	84	98	97	91	93	5.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-86	097375/ DT-86 Seam 173/174	F	T	Load (ppi)	99	99	96	98	99	98	1.2	106	103	103	102	102	103	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1774	1780	1780	1799	1827		
			B	Load (ppi)	87	91	83	84	85	86	3.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4;Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-87	097375/ DT-87 Seam 175/177	F	T	Load (ppi)	95	94	96	91	97	95	2.4	106	103	103	102	103	103	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								889	797	888	954	945		
			B	Load (ppi)	94	94	93	89	88	91	2.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-88	097375/ DT-88 Seam 178/180	F	T	Load (ppi)	107	105	104	103	106	105	1.6	109	107	109	107	108	108	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	745	1815	1792	1832		
			B	Load (ppi)	99	94	89	98	99	96	4.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

GAI-LAP

Initials: JM No.: 43-01
Date: 03/22/12

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Checked By: JCW Date: 03/22/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/22/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

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

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-89	097375/ DT-89 Seam 180/181	F	T	Load (ppi)	106	109	106	105	106	106	1.4	113	112	113	113	111	112	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	BRK	BRK	SE1	DNF		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1036	915	962	1082	>1800		
			B	Load (ppi)	101	101	99	95	87	97	5.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: W No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/22/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 37-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-97	097375/ DT-97 Seam 196/197	F	T	Load (ppi)	101	96	99	101	105	100	3.1	111	107	107	107	107	108	1.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1781	887	814	865	989		
			B	Load (ppi)	84	85	90	81	83	85	3.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-98	097375/ DT-98 Seam 197/198	F	T	Load (ppi)	93	95	95	91	91	93	2.1	111	110	111	112	110	111	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								759	739	774	1499	727		
			B	Load (ppi)	101	104	104	103	104	103	1.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 38-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-99	097375/ DT-99 Seam 198/199	F	T	Load (ppi)	89	93	96	93	95	93	2.8	109	109	109	109	107	108	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	DNF	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								989	1459	1495	>1800	1654		
			B	Load (ppi)	100	97	103	91	94	97	4.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-100	097375/ DT-100 Seam 200/201	F	T	Load (ppi)	103	102	104	103	102	103	0.8	111	110	109	110	108	109	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1061	1715	1789	1769	1744		
			B	Load (ppi)	89	90	90	89	89	89	0.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/22/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 36-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-101	097375/ DT-101 Seam 201/202	F	T	Load (ppi)	95	101	101	100	92	98	4.0	110	108	108	107	106	108	1.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	DNF		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1425	1687	1594	1720	>1800		
			B	Load (ppi)	100	101	100	103	99	100	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-102	097375/ DT-102 Seam 202/203	F	T	Load (ppi)	101	94	100	92	89	95	5.4	107	106	108	107	107	107	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1438	1547	589	569	587		
			B	Load (ppi)	86	84	98	98	96	92	6.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/22/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-103	097375/ DT-103 Seam 203/204	F	T	Load (ppi)	98	99	99	100	94	98	2.3	107	105	106	105	106	106	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								953	1580	1427	573	809		
			B	Load (ppi)	90	89	87	87	86	88	1.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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Initials: TM No.: 43-01
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C:\Documents and Settings\jan.widman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-7.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 71-72 °F 45-47 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-90	097375/ DT-90 Seam 182/184	F	T	Load (ppi)	96	95	95	95	93	95	1.3	111	110	109	108	108	109	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1492	1623	888	929	874		
			B	Load (ppi)	102	97	101	100	96	99	2.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-91	097375/ DT-91 Seam 183/185	F	T	Load (ppi)	100	96	98	96	93	97	2.7	109	108	108	107	108	108	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								693	1114	1240	1262	1404		
			B	Load (ppi)	92	91	90	90	91	91	0.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 43-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-93	097375/ DT-93 Seam 187/189	F	T	Load (ppi)	99	98	89	98	95	96	3.9	109	108	108	108	107	108	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1748	732	710	820	697		
			B	Load (ppi)	88	87	84	84	82	85	2.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-95	097375/ DT-95 Seam 191/192	F	T	Load (ppi)	106	103	104	104	102	104	1.5	113	111	112	111	110	111	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								733	928	806	682	865		
			B	Load (ppi)	94	93	90	90	89	91	2.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: [illegible] No. 743-01
Date: 03/23/12

Checked By: [illegible] Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/21/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-96	097375/ DT-96 Seam 192/194	F	T	Load (ppi)	101	100	97	101	98	99	1.9	112	111	110	109	108	110	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								698	1782	1769	699	665		
			B	Load (ppi)	90	89	87	90	89	89	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 16.0 HOURS 71-72 °F 43-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-85	097375/ DT-85 Seam 170/172	F	T	Load (ppi)	91	88	87	90	90	89	1.7	105	103	102	101	99	102	2.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1809	849	749	722	1582		
			B	Load (ppi)	86	84	82	81	77	82	3.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-92	097375/ DT-92 Seam 185/187	F	T	Load (ppi)	97	95	93	95	91	94	2.3	110	111	110	110	109	110	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								807	842	797	780	830		
			B	Load (ppi)	86	92	95	92	93	92	3.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 17.2 HOURS 71-72 °F 42-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-94	097375/ DT-94 Seam 189/190	F	T	Load (ppi)	91	92	92	89	89	91	1.6	109	102	107	106	107	106	2.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								976	1025	637	1032	572		
			B	Load (ppi)	86	90	88	89	89	89	1.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-104	097375/ DT-104 Seam 204/205	F	T	Load (ppi)	101	102	102	104	103	102	1.0	108	107	108	108	109	108	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								865	949	882	837	862		
			B	Load (ppi)	90	88	86	86	86	87	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 18.3 HOURS 72 °F 41-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-105	097375/ DT-105 Seam 206/207	F	T	Load (ppi)	109	109	108	108	107	108	0.8	111	111	112	114	112	112	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1728	1815	1007	1015	915		
			B	Load (ppi)	96	100	98	97	94	97	2.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-106	097375/ DT-106 Seam 208/209	F	T	Load (ppi)	86	85	86	88	93	88	3.2	105	106	106	105	105	105	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								808	1365	1747	1404	1478		
			B	Load (ppi)	98	98	95	96	97	97	1.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 19.4 HOURS 72 °F 42-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-107	097375/ DT-107 Seam 212/213	F	T	Load (ppi)	97	94	95	95	94	95	1.3	104	107	108	109	109	108	2.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								724	769	769	790	1365		
			B	Load (ppi)	91	95	92	93	93	93	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-108	097375/ DT-108 Seam 213/214	F	T	Load (ppi)	97	98	95	89	91	94	3.7	112	111	108	107	107	109	2.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1216	518	532	630	445		
			B	Load (ppi)	87	88	86	87	82	86	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 20.6 HOURS 72 °F 42-46 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-109	097375/ DT-109 Seam 215/216	F	T	Load (ppi)	98	99	100	97	94	98	2.3	110	109	108	108	107	108	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								963	982	944	860	987		
			B	Load (ppi)	93	95	88	90	85	90	3.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-110	097375/ DT-110 Seam 217/218	F	T	Load (ppi)	96	92	99	99	95	96	2.7	107	109	111	110	107	109	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								863	843	1390	887	1185		
			B	Load (ppi)	95	88	88	89	87	89	3.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 21.7 HOURS 72 °F 44-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-111	097375/ DT-111 Seam 220/221	F	T	Load (ppi)	104	100	92	89	93	96	6.3	111	107	105	105	105	106	2.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1789	914	1683	641	649		
			B	Load (ppi)	89	98	90	81	95	91	6.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-112	097375/ DT-112 Seam 222/223	F	T	Load (ppi)	104	103	103	102	102	103	0.8	110	110	109	107	106	108	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1131	1735	1723	1675	1739		
			B	Load (ppi)	87	87	88	89	87	88	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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BAI-LAP
Initials: TV No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/22/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 22.8 HOURS 71 °F 43-44 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-113	097375/ DT-113 Seam 224/225	F	T	Load (ppi)	106	105	105	103	104	105	1.3	112	110	109	108	108	109	1.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								929	927	932	875	935		
			B	Load (ppi)	88	90	90	88	87	89	1.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-114	097375/ DT-114 Seam 225/226	F	T	Load (ppi)	101	99	96	97	95	98	2.3	108	105	104	104	105	105	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								620	759	680	682	670		
			B	Load (ppi)	95	88	88	89	89	90	3.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE / 60-mil HDPE

DATE SAMPLES RECEIVED: 03/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.0 HOURS 72 °F 41-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-115	097375/ DT-115 P129 Tie-in	E	T	Load (ppi)	113	101	96	94	94	100	8.1	114	111	100	98	95	103	8.3
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								723	785	869	707	704		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-116	097375/ DT-116 P103 Tie-in	E	T	Load (ppi)	83	75	80	90	94	84	7.6	103	97	95	98	106	100	4.3
				Mode	SE3	SE3	SE3	SE3	SE3			SE2	BRK2	BRK2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								778	762	744	747	729		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: FM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/23/12

DATE REPORTED: 03/23/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 03/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.3 HOURS 72 °F 41-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-117	097375/ DT-117 DT-88 Patch	E	T	Load (ppi)	101	83	103	66	76	86	15.8	94	107	94	96	93	97	5.9
				Mode	SE3	BRK2	SE3	SE3	SE3			SE1	SE1	SE2	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1423	1657	782	1421	1148		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-118	097375/ DT-118 DT-79 Patch	E	T	Load (ppi)	88	92	96	105	105	97	7.9	96	95	95	95	95	95	0.4
				Mode	SE3	SE3	BRK2	BRK2	SE3			SE1	SE1	SE2	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								754	475	1060	973	929		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 03/23/12

Checked By: JCW Date: 03/23/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/30/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 1.4 HOURS 72 °F 39-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-119 (DT-1)	097375/ DT-119 (DT-1) Seam 1/2	F	T	Load (ppi)	111	113	120	116	118	116	3.6	164	162	161	161	161	162	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	BRK	SE1	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								845	590	708	767	720		
			B	Load (ppi)	125	116	119	125	115	120	4.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-120 (DT-2)	097375/ DT-120 (DT-2) Seam 3/4	F	T	Load (ppi)	119	120	117	117	118	118	1.5	171	169	167	166	165	167	2.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								784	783	700	732	587		
			B	Load (ppi)	132	134	128	132	126	130	3.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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.

LAP-LAP
Initials: JW No. 43-01
Date: 04/02/12

Checked By: [signature] Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/30/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 3.5 HOURS 72 °F 38-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-121 (DT-3)	097375/ DT-121 (DT-3) Seam 6/7	F	T	Load (ppi)	116	115	117	116	116	116	0.8	167	163	164	163	164	164	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								910	623	877	807	672		
			B	Load (ppi)	125	120	125	104	116	118	8.8							
				Mode	SE1	SE1	SE1	AD-BRK	SE1									
				Peel (%)	0	0	0	80	0									
				Shear (%)														
DT-122 (DT-4)	097375/ DT-122 (DT-4) Seam 9/10	F	T	Load (ppi)	112	108	105	116	114	111	4.6	165	160	160	164	163	162	2.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								823	632	692	700	684		
			B	Load (ppi)	116	120	118	111	107	114	5.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: JW No.: 43-01
Date: 04/02/12

Checked By: _____ Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/30/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 6.4 HOURS 72 °F 39-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-123 (DT-5)	097375/ DT-123 (DT-5) Seam 12/13	F	T	Load (ppi)	123	121	117	114	111	117	5.2	163	164	164	162	162	163	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	BRK	BRK	BRK	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								741	720	725	697	745		
			B	Load (ppi)	121	130	125	119	115	122	5.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-124 (DT-6)	097375/ DT-124 (DT-6) Seam 15/16	F	T	Load (ppi)	111	104	111	109	106	108	3.1	163	162	162	164	163	163	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	BRK	BRK	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								843	845	562	543	410		
			B	Load (ppi)	128	115	116	112	115	117	6.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: JW No.: 43-01
Date: 04/02/12

Checked By: TB Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 03/30/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 7.3 HOURS 71-72 °F 37-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-125 (DT-7)	097375/ DT-125 (DT-7) Seam 17/18	F	T	Load (ppi)	110	111	111	107	109	109	1.5	170	168	168	168	165	168	1.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								921	773	867	892	828		
			B	Load (ppi)	112	116	134	109	118	118	9.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-126 (DT-8)	097375/ DT-126 (DT-8) Seam 20/21	F	T	Load (ppi)	127	133	119	143	137	132	9.4	172	171	170	170	168	170	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								813	784	795	972	914		
			B	Load (ppi)	138	138	138	139	138	138	0.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: JW No.: 43-01
Date: 04/02/12

Checked By: [illegible] Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/02/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: >24 HOURS 72 °F 37-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-127 (DT-9)	097375/ DT-127 (DT-9) Seam 23/24	F	T	Load (ppi)	136	137	136	133	127	134	4.2	173	174	170	171	170	172	1.9
				Mode	SE1	SE1	SE1	SE1	SE1			BRK	BRK	BRK	BRK	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								781	717	837	844	615		
			B	Load (ppi)	120	114	121	123	120	119	3.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-128 (DT-10)	097375/ DT-128 (DT-10) Seam 26/27	F	T	Load (ppi)	116	115	121	116	113	116	3.2	169	170	169	168	167	169	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	BRK	BRK	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								678	675	730	847	860		
			B	Load (ppi)	113	111	110	110	111	111	1.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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Initials: JCW No.: 43-01
Date: 04/02/12

Checked By: _____ Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/02/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: >24 HOURS 72 °F 39-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-129 (DT-11)	097375/ DT-129 (DT-11) Seam 28/29	F	T	Load (ppi)	110	115	110	110	111	111	2.2	165	165	164	165	165	165	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			BRK	SE1	BRK	BRK	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								909	600	867	742	644		
			B	Load (ppi)	103	121	119	122	122	117	8.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-130 (DT-12)	097375/ DT-130 (DT-12) Seam 29/30	F	T	Load (ppi)	139	131	129	130	127	131	4.7	170	170	169	169	166	169	1.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								864	803	667	688	710		
			B	Load (ppi)	114	119	142	117	143	127	14.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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PAL-LAP

Initials: JCW No.: 43-01
Date: 04/02/12

Checked By: RO Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/02/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: >24 HOURS 72 °F 36-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-131 (DT-13)	097375/ DT-131 (DT-13) Seam 32/33	F	T	Load (ppi)	131	115	121	128	126	124	6.0	168	166	165	165	166	166	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			BRK	SE1	SE1	BRK	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								909	610	808	813	797		
			B	Load (ppi)	115	120	120	114	115	117	2.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-132 (DT-14)	097375/ DT-132 (DT-14) Seam 35/36	F	T	Load (ppi)	127	123	124	118	119	122	3.4	165	165	164	163	164	164	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			BRK	SE1	BRK	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								865	758	724	762	703		
			B	Load (ppi)	117	131	130	123	120	124	6.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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BAL-LAP
Initials: JCW No.: 43-01
Date: 04/02/12

Checked By: _____ Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/02/12

DATE REPORTED: 04/02/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 03/30/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: >24 HOURS 72 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-133 (DT-15)	097375/ DT-133 (DT-15) P-17 Tie-In	E	T	Load (ppi)	152	137	143	149	151	147	6.2	156	155	158	159	159	157	1.6
				Mode	BRK1	SE3	SE3	SE3	SE3			BRK2	BRK2	BRK2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								263	280	340	300	542		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: KW No.: 43-01
Date: 04/02/12

Checked By: [illegible] Date: 4/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/03/12

DATE REPORTED: 04/03/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 04/02/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: >24 HOURS 72 °F 38-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-135 (DT-17)	097375/ DT-135 (DT-17) P 36 Tie-In	E	T	Load (ppi)	159	158	160	160	159	159	0.8	165	161	163	172	173	167	5.6
				Mode	BRK2	BRK2	SE3	SE3	BRK2			BRK2	BRK2	BRK2	BRK2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								346	328	437	483	577		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-136 (DT-18)	097375/ DT-136 (DT-18) DT-122 patch	E	T	Load (ppi)	132	122	117	119	121	122	5.6	159	155	158	155	158	157	1.8
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	SE1	SE1	SE1	BRK1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								501	338	260	367	622		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: TM No.: 43-01
Date: 04/02/12

Checked By: JCW Date: 04/03/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/03/12

DATE REPORTED: 04/04/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/03/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 8.1 HOURS 72 °F 36-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-137	097375/ DT-137 P 85 GW Patch	E	T	Load (ppi)	81	82	83	76	78	80	2.9	89	90	94	92	95	92	2.6
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								791	1444	1477	765	730		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-138	097375/ DT-138 P 126 GW Patch	E	T	Load (ppi)	85	88	101	91	86	90	6.4	98	91	93	94	92	94	2.6
				Mode	SE3	BRK2	BRK2	BRK2	SE3			SE1	SE2	SE1	SE1	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1350	115	1382	1514	1132		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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RAI-LAP
Initials: JM No. 43-01
Date: 04/04/12

Checked By: JW Date: 04/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/03/12

DATE REPORTED: 04/04/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/03/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 8.5 HOURS 71-72 °F 35-38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-139	097375/ DT-139 P 31 Cap	F	T	Load (ppi)	85	80	84	83	80	82	2.4	90	88	89	76	89	86	5.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								753	582	629	40	1235		
			B	Load (ppi)	89	64	81	77	81	78	9.0							
				Mode	SE1	AD-BRK	SE1	SE1	SE1									
				Peel (%)	0	10	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: 1) Sample contained a vertical crease from over-heating along the top surface of the bottom weld.

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GAI-LAP
Initials: JW No: 43-01
Date: 04/04/12

Checked By: JCW Date: 04/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/04/12

DATE REPORTED: 04/04/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 04/04/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 6.3 HOURS 72 °F 36 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-121A (3A)	097375/ DT-121A (3A) Seam 6/7	F	T	Load (ppi)	117	118	117	120	116	118	1.5	163	164	163	165	166	164	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								629	588	612	643	725		
				Load (ppi)	126	126	124	125	132	127	3.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-121B (3B)	097375/ DT-121B (3B) Seam 6/7	F	T	Load (ppi)	114	116	118	117	114	116	1.6	165	162	162	163	164	163	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								784	733	705	660	745		
				Load (ppi)	118	128	114	132	128	124	7.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: JM No.: 43-01
Date: 04/10/12

Checked By: JCW Date: 04/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/05/12

DATE REPORTED: 04/05/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 04/05/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 3.6 HOURS 71 °F 38-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-142 (DT-19)	097375/ DT-142 (DT-19) DT-123 Patch	E	T	Load (ppi)	119	126	130	124	112	122	7.0	159	157	157	163	159	159	2.5
				Mode	SE3	SE3	SE3	SE3	SE3			SE2	SE2	SE2	BRK1	BRK1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								761	583	524	833	541		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-143 (DT-20)	097375/ DT-143 (DT-20) DT-121A Cap P7	E	T	Load (ppi)	133	132	135	129	128	131	2.7	165	165	163	160	162	163	2.1
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	BRK1	BRK1	BRK1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								532	340	350	350	342		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: TM No.: 43-01
Date: 04/05/12

Checked By: JCW Date: 04/05/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/05/12

DATE REPORTED: 04/05/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 04/05/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 4.3 HOURS 71-72 °F 40-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-144 (DT-21)	097375/ DT-144 (DT-21) DT 132/134 Patch	E	T	Load (ppi)	119	136	119	133	145	130	11.1	157	152	155	157	159	156	2.4
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	SE1	SE1	SE1	BRK1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								372	393	455	476	609		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: TM No.: 43-01
Date: 04/05/12

Checked By: JAW Date: 04/05/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D 6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/05/12

DATE REPORTED: 04/05/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/05/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.5 HOURS 72 °F 38-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	2	3	4	5	Avg.	Std. Dev.	Shear Test 1	2	3	4	5	Avg.	Std. Dev.
DT-140	097375/ DT-140 Seam 195/122	F	T	Load (ppi)	90	92	96	92	96	93	2.8	106	98	98	99	97	99	3.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1793	1532	1349	1600	1627		
			B	Load (ppi)	96	96	94	96	93	95	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-141	097375/ DT-141 Seam 193/106	F	T	Load (ppi)	92	90	85	87	91	89	3.0	103	107	103	96	92	100	6.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								850	891	1574	749	600		
			B	Load (ppi)	85	85	83	85	90	85	2.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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CRAZ-LAP
Initials: TM No.: 43-01
Date: 04/05/12

Checked By: JCW Date: 04/05/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/23/12

DATE REPORTED: 04/23/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 4.5 HOURS 72 °F 33-34 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-145	097375/ DT-145 Seam 134/228	F	T	Load (ppi)	98	96	93	93	105	97	5.1	105	102	101	100	98	101	2.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								399	648	1137	1340	705		
			B	Load (ppi)	81	90	87	89	91	88	4.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-146	097375/ DT-146 Seam 229/230	F	T	Load (ppi)	103	102	100	97	96	100	3.2	108	106	112	104	102	106	3.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								898	785	929	749	690		
			B	Load (ppi)	95	95	95	96	96	95	0.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 04/27/12

Checked By: JCW Date: 04/27/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/23/12

DATE REPORTED: 04/23/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.4 HOURS 72 °F 30-34 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-147	097375/ DT-147 Seam 231/232	F	T	Load (ppi)	87	90	91	93	90	90	2.0	114	114	114	112	114	113	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								716	685	749	715	727		
			B	Load (ppi)	105	101	104	107	107	105	2.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-148	097375/ DT-148 Seam 233/234	F	T	Load (ppi)	89	93	94	90	79	89	6.2	106	102	104	99	99	102	3.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1446	759	559	624	660		
			B	Load (ppi)	85	86	90	87	85	86	2.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 04/27/12

Checked By: JCW Date: 04/27/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/23/12

DATE REPORTED: 04/23/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.1 HOURS 72 °F 30-34 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-149	097375/ DT-149 Seam 235/236	F	T	Load (ppi)	108	103	104	104	105	105	1.8	113	113	112	112	110	112	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								763	720	695	754	715		
			B	Load (ppi)	97	96	95	94	96	96	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-150	097375/ DT-150 Seam 236/237	F	T	Load (ppi)	105	104	99	96	101	101	3.6	108	107	107	108	109	108	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								731	725	797	1649	1662		
			B	Load (ppi)	98	101	98	99	99	99	1.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 04/27/12

Checked By: JCW Date: 04/27/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/23/12

DATE REPORTED: 04/23/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.5 HOURS 72 °F 30-34 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-151	097375/ DT-151 Seam 238/239	F	T	Load (ppi)	103	102	102	101	99	101	1.6	108	105	107	105	104	106	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								683	704	809	727	712		
			B	Load (ppi)	98	98	97	96	96	97	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-152	097375/ DT-152 Seam 240/241	F	T	Load (ppi)	94	109	104	92	94	99	7.2	108	108	102	101	101	104	3.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								978	970	727	849	664		
			B	Load (ppi)	100	98	98	98	99	99	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/23/12

DATE REPORTED: 04/23/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 8.2 HOURS 72 °F 34-35 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-153	097375/ DT-153 Seam 241/242	F	T	Load (ppi)	100	92	98	95	97	96	3.0	105	102	103	103	105	104	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								893	774	712	688	785		
			B	Load (ppi)	88	87	91	93	90	90	2.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-154	097375/ DT-154 Seam 242/243	F	T	Load (ppi)	83	83	81	80	81	81	1.3	109	104	106	106	106	106	1.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								866	739	805	807	714		
			B	Load (ppi)	102	100	101	101	95	99	2.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/24/12

DATE REPORTED: 04/24/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 30-33 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-155	097375/ DT-155 Seam 243/244	F	T	Load (ppi)	104	100	101	101	101	101	1.5	108	108	107	108	108	108	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								958	939	892	689	660		
			B	Load (ppi)	85	88	91	93	95	90	4.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-156	097375/ DT-156 Seam 244/245	F	T	Load (ppi)	93	97	99	99	97	97	2.5	104	105	107	106	105	105	1.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								638	640	757	685	725		
			B	Load (ppi)	95	96	98	91	92	94	2.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JN No.: 43-01
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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/24/12

DATE REPORTED: 04/24/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 30-32 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-157	097375/ DT-157 Seam 245/246	F	T	Load (ppi)	99	100	100	99	97	99	1.3	106	106	108	108	105	107	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								643	687	677	732	699		
			B	Load (ppi)	88	88	80	61	85	80	11.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-158	097375/ DT-158 Seam 247/248	F	T	Load (ppi)	102	102	105	96	101	101	3.5	108	108	108	108	109	108	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1004	815	755	715	788		
			B	Load (ppi)	97	100	97	95	100	98	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-16.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/24/12

DATE REPORTED: 04/24/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 30-32 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-159	097375/ DT-159 Seam 250/251	F	T	Load (ppi)	105	103	103	102	99	102	2.0	109	109	107	108	108	108	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								752	745	704	815	680		
			B	Load (ppi)	98	96	92	90	91	93	3.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-160	097375/ DT-160 Seam 252/254	F	T	Load (ppi)	106	93	95	94	92	96	5.6	109	109	107	108	107	108	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1779	1375	1277	1402	1529		
			B	Load (ppi)	97	97	95	101	99	98	2.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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C:\Documents and Settings\jan.wildman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-16.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/24/12

DATE REPORTED: 04/24/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 32 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-161	097375/ DT-161 Seam 258/259	F	T	Load (ppi)	107	105	104	114	100	106	5.1	115	114	113	112	110	113	2.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								914	725	699	689	730		
			B	Load (ppi)	91	90	87	90	91	90	1.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-162	097375/ DT-162 Seam 260/261	F	T	Load (ppi)	105	102	105	107	107	105	2.0	107	107	108	109	110	108	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	BRK	BRK	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								999	992	1778	1809	1402		
			B	Load (ppi)	81	77	78	80	79	79	1.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

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C:\Documents and Settings\jan.widman\Documents\Projects\Branch\2009\09-36-7375\Form R-4 Rev. 1-16.docx

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/24/12

DATE REPORTED: 04/24/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/23/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 33 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-163	097375/ DT-163 Seam 262/263	F	T	Load (ppi)	102	100	101	97	100	100	1.8	101	102	112	110	105	106	4.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1430	1282	1722	1620	1159		
			B	Load (ppi)	96	96	96	95	93	95	1.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/26/12

DATE REPORTED: 04/26/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE to 60-mil HDPE

DATE SAMPLES RECEIVED: 04/26/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 1.3 HOURS 72 °F 38-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-164	097375/ DT-164 Seam 252/34	E	T	Load (ppi)	102	104	103	104	102	103	1.3	104	104	106	104	102	104	1.4
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			BRK2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								210	583	717	612	633		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-166	097375/ DT-166 Seam 261/ Ph 2 Tie-In	E	T	Load (ppi)	97	95	96	98	98	97	1.1	99	96	94	96	97	96	1.7
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								567	567	608	571	580		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 04/27/12

Checked By: JCW Date: 04/27/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/26/12

DATE REPORTED: 04/26/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE to 60-mil HDPE

DATE SAMPLES RECEIVED: 04/26/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.3 HOURS 71-72 °F 37-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-167	097375/ DT-167 Seam 231/ Tie-In	E	T	Load (ppi)	102	101	100	98	97	100	1.7	102	103	103	101	101	102	0.9
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								586	663	627	632	565		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-168	097375/ DT-168 Seam 243/ Tie-In	E	T	Load (ppi)	102	108	117	118	118	113	7.0	107	106	119	118	113	113	6.0
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								763	762	672	732	693		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 04/27/12

Checked By: JCW Date: 04/27/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/26/12

DATE REPORTED: 04/26/12 Email: 04/27/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/26/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 1.5 HOURS 72 °F 36-37 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-165	097375/ DT-165 DT-152 Patch	E	T	Load (ppi)	98	99	100	104	98	100	2.3	110	108	107	108	107	108	1.3
				Mode	SE3	BRK2	SE3	SE3	SE3			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								766	717	938	887	704		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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Initials: TM No.: 43-01
Date: 04/27/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE to 60-mil HDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.2 HOURS 72 °F 38-42 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-170	097375/ DT-170 Seam 258/ Tie-In	E	T	Load (ppi)	112	105	97	106	99	104	6.2	111	110	107	107	98	107	4.9
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								196	590	174	682	159		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JW No. 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.4 HOURS 72 °F 37-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-188	097375/ DT-188 Seam 292/294	F	T	Load (ppi)	86	88	88	87	86	87	1.0	110	107	107	111	108	108	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								940	782	804	942	1674		
			B	Load (ppi)	97	102	99	99	94	98	2.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-169	097375/ DT-169 CAP/Seam 234	F	T	Load (ppi)	86	82	77	84	82	82	3.1	86	88	87	89	89	88	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								654	885	625	749	765		
			B	Load (ppi)	92	86	87	88	84	87	2.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.5 HOURS 72 °F 36-38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-171	097375/ DT-171 Seam 250/CAP	F	T	Load (ppi)	90	88	90	88	85	88	1.9	101	99	99	96	94	98	2.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	BRK		
				Peel (%)	0	0	0	0	0									
				Shear (%)								811	649	902	846	909		
			B	Load (ppi)	91	89	88	84	86	88	2.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-173	097375/ DT-173 Seam 265/266	F	T	Load (ppi)	101	100	99	99	97	99	1.5	107	104	105	105	105	105	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1728	744	1782	1678	1765		
			B	Load (ppi)	96	96	93	93	97	95	1.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.0 HOURS 72 °F 36-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-189	097375/ DT-189 Seam 294/296	F	T	Load (ppi)	100	97	102	94	95	98	3.5	108	107	106	105	107	106	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								926	697	757	705	666		
			B	Load (ppi)	85	83	86	85	86	85	1.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-172	097375/ DT-172 Seam 286/287	F	T	Load (ppi)	113	102	104	99	99	103	5.6	108	107	107	107	106	107	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	SE1	DNF	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	1364	>1800	940	842		
			B	Load (ppi)	94	93	91	95	91	93	1.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension.

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.

GAI-LAP
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.2 HOURS 71-72 °F 35 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-174	097375/ DT-174 Seam 266/268	F	T	Load (ppi)	100	102	104	100	101	101	1.9	108	107	107	106	107	107	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	DNF	SE1	DNF		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1794	1660	>1800	1815	>1800		
			B	Load (ppi)	90	88	87	90	90	89	1.5							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-175	097375/ DT-175 Seam 269/270	F	T	Load (ppi)	94	89	88	92	93	91	2.5	113	112	111	112	112	112	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1749	909	787	832	847		
			B	Load (ppi)	105	104	102	102	93	101	4.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension.

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GAI-LAP
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.5 HOURS 72 °F 35-40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-176	097375/ DT-176 Seam 270/272	F	T	Load (ppi)	97	94	96	93	98	96	2.0	109	108	108	107	107	108	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1588	1314	1557	1437	1618		
			B	Load (ppi)	92	92	96	93	90	92	2.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-177	097375/ DT-177 Seam 272/274	F	T	Load (ppi)	103	100	100	98	100	100	1.8	107	106	105	105	105	106	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1733	1789	1799	1695	1665		
			B	Load (ppi)	89	90	90	93	94	91	2.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 7.1 HOURS 71-72 °F 34-35 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-178	097375/ DT-178 Seam 274/275	F	T	Load (ppi)	98	90	91	91	94	93	3.3	111	109	107	107	107	108	1.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								756	732	932	805	759		
			B	Load (ppi)	102	101	102	109	112	105	5.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-180	097375/ DT-180 Seam 277/279	F	T	Load (ppi)	105	104	103	101	102	103	1.5	109	108	109	109	107	108	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1003	1794	1739	1815	1049		
			B	Load (ppi)	87	93	95	95	87	91	4.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No. 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 7.2 HOURS 71 °F 34-38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-179	097375/ DT-179 Seam 276/277	F	T	Load (ppi)	99	95	102	93	99	98	4.0	112	110	111	114	117	113	2.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1816	707	1305	1714	1467		
			B	Load (ppi)	97	104	101	94	102	99	4.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-185	097375/ DT-185 Seam 287/289	F	T	Load (ppi)	95	92	92	90	91	92	2.0	108	107	107	106	107	107	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								799	843	940	754	747		
			B	Load (ppi)	97	97	95	94	96	96	1.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 7.5 HOURS 71 °F 35-39 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-181	097375/ DT-181 Seam 279/281	F	T	Load (ppi)	102	99	88	91	90	94	6.0	112	109	109	106	106	108	2.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	DNF	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1713	1792	>1800	782	745		
			B	Load (ppi)	110	107	101	101	103	105	3.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-182	097375/ DT-182 Seam 281/282	F	T	Load (ppi)	109	105	105	105	104	106	1.8	113	113	112	111	113	112	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1733	1020	1785	1732	1737		
			B	Load (ppi)	92	96	102	103	100	98	4.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension.

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GAI-LAP
Initials: TM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 04/30/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 8.2 HOURS 71 °F 35-38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-183	097375/ DT-183 Seam 282/284	F	T	Load (ppi)	112	111	107	106	116	110	3.9	116	115	114	112	112	114	1.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1816	1797	1780	1820	1819		
			B	Load (ppi)	94	94	93	93	92	93	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-184	097375/ DT-184 Seam 284/286	F	T	Load (ppi)	106	105	107	103	108	106	1.9	108	108	109	108	108	108	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								924	994	1763	1815	1816		
			B	Load (ppi)	90	93	94	92	90	92	1.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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CAL-LAB
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: ~~04/30/12~~ 05/01/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 22.4 HOURS 72 °F 41-47 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-186	097375/ DT-186 Seam 289/291	F	T	Load (ppi)	98	101	98	97	104	99	2.9	111	110	109	108	109	109	1.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								899	877	770	762	792		
			B	Load (ppi)	98	98	90	94	99	96	3.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-190	097375/ DT-190 Seam 296/298	F	T	Load (ppi)	82	84	84	83	80	83	1.6	110	109	111	110	109	110	0.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								973	937	1012	942	855		
			B	Load (ppi)	97	99	99	95	102	98	2.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JCW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: ~~04/30/12~~ 05/01/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 23.0 HOURS 72 °F 43-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-187	097375/ DT-187 Seam 291/293	F	T	Load (ppi)	97	99	99	101	97	98	1.6	111	110	108	107	104	108	2.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1606	749	792	759	729		
			B	Load (ppi)	90	88	88	88	89	89	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-191	097375/ DT-191 Seam 298/299	F	T	Load (ppi)	105	106	105	101	102	104	2.3	112	112	112	113	112	112	0.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1722	789	1640	1560	1399		
			B	Load (ppi)	93	95	94	89	87	92	3.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No. 43-01
Date: 05/04/12

Checked By: JW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: ~~04/30/12~~ 05/01/12

DATE REPORTED: 05/01/12 Email: 05/04/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 04/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: >24 HOURS 72 °F 41-44 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-192	097375/ DT-192 Seam 299/301	F	T	Load (ppi)	95	96	97	95	96	96	0.8	112	109	108	106	106	108	2.4
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1603	1642	845	925	674		
			B	Load (ppi)	94	98	99	99	100	98	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 05/04/12

Checked By: JAW Date: 05/04/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 05/01/12

DATE REPORTED: 05/01/12 Email: 05/08/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE to 60-mil HDPE

DATE SAMPLES RECEIVED: 05/01/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.5 HOURS 71 °F 38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-193	097375/ DT-193 Seam 14/294	E	T	Load (ppi)	90	97	97	86	101	94	6.0	92	88	97	88	100	93	5.2
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	BRK2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								655	547	805	612	765		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 09/07/12

Checked By: JCW Date: 05/08/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 05/01/12

DATE REPORTED: 05/01/12 Email: 05/08/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 05/01/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.0 HOURS 71-72 °F 38-43 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-194B2	097375/ DT-194B2 Seam 244/265	F	T	Load (ppi)	91	90	92	93	93	92	1.4	95	95	96	98	98	96	1.5
				Mode	SE1	SE1	SE1	SE1	AD-BRK			SE1	SE1	SE1	BRK	BRK		
				Peel (%)	0	0	0	0	40									
				Shear (%)								746	749	659	603	710		
			B	Load (ppi)	92	92	91	95	95	93	2.0							
				Mode	SE1	SE1	AD	SE1	SE1									
				Peel (%)	0	0	100	0	0									
				Shear (%)														
DT-195	097375/ DT-195 DT-192 Patch	E	T	Load (ppi)	85	88	85	90	85	86	2.2	100	90	92	91	102	95	5.6
				Mode	BRK2	SE3	BRK2	SE3	SE3			SE1	SE1	SE1	SE2	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1588	1380	1342	502	1479		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JM No.: 43-01
Date: 05/07/12

Checked By: JCW Date: 05/08/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 05/01/12

DATE REPORTED: 05/01/12 Email: 05/08/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 05/01/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.4 HOURS 71 °F 37-38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-196	097375/ DT-196 DT-187 Patch	E	T	Load (ppi)	59	66	62	75	68	66	6.2	96	93	96	89	89	93	3.4
				Mode	SE3	SE3	SE3	SE3	SE3			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								898	810	925	729	769		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-194A3	097375/ DT-194A3 Seam 239/265	F	T	Load (ppi)	74	92	77	74	94	82	10.0	114	111	112	111	110	112	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			DNF	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								>1800	763	699	745	649		
			B	Load (ppi)	105	106	100	105	103	104	2.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: DNF= did not fail, machine reached maximum extension.

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.

GAI-LAP
Initials: JM No.: 43-01
Date: 05/07/12

Checked By: JCW Date: 05/08/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 05/02/12

DATE REPORTED: 05/02/12 Email: 05/08/12 Report

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 05/02/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 3.4 HOURS 72 °F 40-45 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-197	097375/ DT-197 Seam 265/Cap	E	T	Load (ppi)	94	94	91	94	116	98	10.3	96	93	92	94	97	95	2.1
				Mode	BRK2	SE3	BRK2	BRK2	BRK2			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1045	1139	1033	1100	1458		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-198	097375/ DT-198 Seam 240/Cap	E	T	Load (ppi)	94	101	92	89	89	93	4.8	88	95	97	98	109	97	7.8
				Mode	SE3	BRK2	SE3	BRK2	SE3			SE2	SE2	SE1	SE1	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								88	1362	1413	1313	1433		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: TM No.: 43-01
Date: 05/07/12

Checked By: JCW Date: 05/08/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 05/07/12

DATE REPORTED: 05/07/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 05/07/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 1.2 HOURS 73 °F 35-37 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-199	097375/ DT-199 Seam 265/Cap	E	T	Load (ppi)	85	68	70	78	77	76	6.7	97	100	98	104	98	99	3.0
				Mode	SE3	SE3	SE1	SE1	SE3			SE2	SE2	SE2	SE1	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								856	940	874	1550	880		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-200	097375/ DT-200 Seam 245/Cap	E	T	Load (ppi)	95	90	83	81	90	88	5.6	87	84	91	81	83	85	3.7
				Mode	BRK2	BRK2	BRK2	BRK2	BRK2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								559	783	898	695	641		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments:

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GAI-LAP
Initials: JJ No.: 43-01
Date: 5/7/12

Checked By: JCW Date: 05/07/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 05/08/12

DATE REPORTED: 05/08/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 05/08/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 7.1 HOURS 73 °F 36-38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-201	097375/ DT-201 Seam 4/ with existing	E	T	Load (ppi)	134	148	146	146	141	143	5.9	154	149	148	151	157	152	3.6
				Mode	SE3	BRK2	BRK2	BRK2	AD-BRK			BRK1	SE2	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	25									
				Shear (%)								451	222	540	627	667		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
DT-202	097375/ DT-202 Seam 14/ with existing	E	T	Load (ppi)	143	127	123	123	110	125	11.6	173	177	174	179	167	174	4.7
				Mode	SE3	SE3	SE3	SE3	SE3			SE2	SE1	SE1	SE1	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								166	583	732	678	176		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: (1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: TM No. 43-01
Date: 05/08/12

Checked By: JCW Date: 05/08/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 07/30/12

DATE REPORTED: 07/31/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 07/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 4.5 HOURS 73 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-231	097375/ DT-231 P1-P302	F	T	Load (ppi)	85	89	91	90	89	89	2.0	102	102	103	100	102	102	1.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1725	1473	2067	711	772		
			B	Load (ppi)	85	88	86	86	86	86	0.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-232	097375/ DT-232 P304-P305	F	T	Load (ppi)	94	92	93	76	74	86	9.8	103	103	101	100	103	102	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								764	1817	816	650	744		
			B	Load (ppi)	93	98	88	95	99	95	4.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials JW No: 43-01
Date 07/31/12

Checked By: _____ Date: 7/31/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 07/30/12

DATE REPORTED: 07/31/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 07/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.1 HOURS 73 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-233	097375/ DT-233 P307-P309	F	T	Load (ppi)	93	89	94	94	100	94	4.0	105	104	104	102	102	103	1.8
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								593	739	704	678	667		
			B	Load (ppi)	101	81	93	91	99	93	7.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-234	097375/ DT-234 P310-P311	F	T	Load (ppi)	86	87	89	87	92	88	2.7	100	101	101	100	96	100	2.1
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1996	2033	2000	1970	642		
			B	Load (ppi)	96	95	106	107	92	99	6.9							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JCW No.: 43-01
Date: 07/31/12

Checked By: [illegible] Date: 7/31/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 07/30/12

DATE REPORTED: 07/31/12

GEOMEMBRANE TYPE: 60-mil HDPE to 40-mil LLDPE

DATE SAMPLES RECEIVED: 07/30/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.2 HOURS 73 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-235	097375/ DT-235 P307-P213 Tie-In	E	T	Load (ppi)	106	89	95	110	109	102	9.1	99	105	103	102	105	103	2.4
				Mode	SE2	SE3	SE3	SE3	SE2			SE2	SE2	SE2	SE2	SE2		
				Peel (%)	0	0	0	0	0									
				Shear (%)								764	679	499	767	633		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JAW No. 43-01
Date 07/31/12

Checked By: [illegible] Date: 7/31/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 07/31/12

DATE REPORTED: 07/31/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 07/31/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 1.5 HOURS 72 °F 38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-237	097375/ DT-237 P320-P196	F	T	Load (ppi)	98	98	97	98	92	96	2.6	103	104	103	104	104	104	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1109	1763	867	1629	1583		
			B	Load (ppi)	103	99	102	102	99	101	1.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-238	097375/ DT-238 P135-P316	F	T	Load (ppi)	88	90	90	88	88	89	1.3	105	103	102	99	97	101	3.2
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								733	1600	1929	1809	1862		
			B	Load (ppi)	100	97	96	92	83	94	6.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JAW No.: 43-01
Date: 07/31/12

Checked By: 10 Date: 7/31/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 07/31/12

DATE REPORTED: 07/31/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 07/31/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 2.1 HOURS 72 °F 38 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-239	097375/ DT-239 DT231 Patch	E	T	Load (ppi)	86	86	89	80	78	84	4.5	91	91	88	87	85	88	2.6
				Mode	SE3	SE3	BRK1	SE3	SE3			SE2	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1867	1000	716	777	592		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JCW No. 43-01
Date: 07/31/12

Checked By: _____ Date: 7/31/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 08/02/12

DATE REPORTED: 08/02/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 08/02/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.5 HOURS 73 °F 40-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-240	097375/ DT-240 P301-P324	F	T	Load (ppi)	94	88	96	100	101	96	5.2	111	108	104	107	107	107	2.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								877	1627	840	1412	1495		
			B	Load (ppi)	98	96	95	93	94	95	2.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-241	097375/ DT-241 P326-P328	F	T	Load (ppi)	102	92	99	99	101	98	4.0	106	103	103	102	103	103	1.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1709	1667	1715	917	981		
			B	Load (ppi)	91	89	91	93	96	92	2.3							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: KW No. 43-01
Date: 08/02/12

Checked By: 0 Date: 8/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 08/02/12

DATE REPORTED: 08/02/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 08/02/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 5.5 HOURS 73 °F 40-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-242	097375/ DT-242 P328-P329	F	T	Load (ppi)	93	92	91	90	89	91	1.7	110	109	110	110	110	110	0.5
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								749	1632	1612	894	1452		
			B	Load (ppi)	92	90	88	88	86	89	2.4							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-243	097375/ DT-243 P330-P331	F	T	Load (ppi)	93	95	88	90	89	91	2.9	107	105	105	107	103	106	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								644	759	739	1520	727		
			B	Load (ppi)	99	97	98	99	99	98	0.8							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JCW No.: 43-01
Date: 08/02/12

Checked By: [illegible] Date: 8/2/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 08/02/12

DATE REPORTED: 08/02/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 08/02/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.1 HOURS 73 °F 40-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-244	097375/ DT-244 P331-P333	F	T	Load (ppi)	97	98	98	98	96	97	0.6	108	104	107	106	105	106	1.3
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								747	1690	1624	1515	745		
			B	Load (ppi)	85	83	83	85	85	84	1.2							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-245	097375/ DT-245 P333-P335	F	T	Load (ppi)	97	97	101	100	99	99	1.6	106	106	105	104	104	105	0.9
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								856	799	683	730	704		
			B	Load (ppi)	92	89	88	91	90	90	1.6							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JCW No.: 43-01
Date: 08/02/12

Checked By: [illegible] Date: 8/2/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 08/02/12

DATE REPORTED: 08/02/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 08/02/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.3 HOURS 73 °F 40-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-246	097375/ DT-246 P334-P336	F	T	Load (ppi)	98	98	96	103	101	99	2.9	110	109	108	110	109	109	0.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								678	1703	1602	715	718		
			B	Load (ppi)	101	104	105	105	104	104	1.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-247	097375/ DT-247 P336-P338	F	T	Load (ppi)	104	102	103	101	100	102	1.5	107	104	106	106	105	106	1.0
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1800	1850	1843	1817	2015		
			B	Load (ppi)	89	84	88	85	88	87	2.0							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials: JCW No: 43-01
Date: 08/03/12

Checked By: [illegible] Date: 8/2/12

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 08/02/12

DATE REPORTED: 08/02/12

GEOMEMBRANE TYPE: 40-mil LLDPE

DATE SAMPLES RECEIVED: 08/02/12

CROSS-HEAD SPEED: Peel: ☐ 2 in/min ☒ 20 in/min
Shear: ☐ 2 in/min ☒ 20 in/min

CONDITIONING: 6.3 HOURS 73 °F 40-41 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-255	097375/ DT-255 DT 242 Patch	E	T	Load (ppi)	81	77	87	81	74	82	8.6	81	86	91	83	85	85	3.9
				Mode	SE3	SE3	BRK2	SE3	SE3			SE2	SE2	SE1	SE2	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								90	1505	1705	1250	950		
			B	Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld

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GAI-LAP
Initials JW No. 43-01
Date 08/02/12

Checked By: [illegible] Date: 8/2/12

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 09/06/12

DATE REPORTED: 09/06/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 09/06/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 2.3 HOURS 72 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-293 (22A)	097375/ DT-293 (22A) P1-P40	F	T	Load (ppi)	128	120	129	123	132	126	4.9	163	161	158	160	159	160	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	BRK	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								839	712	589	790	757		
			B	Load (ppi)	108	116	117	125	123	118	6.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-294 (23)	097375/ DT-294 (23) P43-P44	F	T	Load (ppi)	123	114	121	122	129	121	5.3	173	172	173	172	172	172	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1028	741	873	755	1000		
			B	Load (ppi)	132	112	130	134	133	128	9.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld
(1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: JW No. 43-01
Date: 09/06/12

Checked By: [illegible] Date: 9/6/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 09/06/12

DATE REPORTED: 09/06/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 09/06/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 2.1 HOURS 72 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-295 (24)	097375/ DT-295 (24) P42 Tie-In	E	T	Load (ppi)	136	133	125	104	107	121	15.0	148	142	146	137	156	146	7.2
				Mode	SE3	SE3	AD-BRK	SE3	SE3			SE2	SE2	SE2	SE2	BRK2		
				Peel (%)	0	0	10	0	0									
				Shear (%)								164	178	141	154	291		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld
(1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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GAI-LAP
Initials: JCW No.: 43-01
Date: 09/06/12

Checked By: [illegible] Date: 9/6/12

Form R-4:Rev.1

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Precision Geosvnthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 06/18/2012

June 18, 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 Seam sample.

PROJECT NAME: Sarasota Lf TPO Testing DATE REPORTED: **June 18, 2012**

REFERENCE PGLI JOB NO.: G120627

DATE RECEIVED: June 18, 2012

SAMPLE SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-203 P7/8	82388

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The sample was conditioned for a minimum of 2 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. ***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 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.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **18-Jun-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120627**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **18-Jun-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-203 P7/8	82388	1	186	BRK	FTB		1	59	0	DEL	FTB	
		2	191	BRK	FTB		2	61	0	DEL	FTB	
		3	196	BRK	FTB		3	54	0	DEL	FTB	
		4	189	BRK	FTB		4	57	0	DEL	FTB	
		5	186	BRK	FTB		5	56	0	DEL	FTB	
	AVG.		190			150	AVG:	57				20
	STD. DEV.		4				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic 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 Seam testing of two (2) 60 mil TPO Seam samples.

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

REFERENCE PGLI JOB NO.: G120633

DATE RECEIVED: June 19, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-204 P16/18	82433
2. DT-205 P21/22	82434

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The samples were conditioned for a minimum of 2 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 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. ***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 longer time, please advise us in writing.

2 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Jun-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120633**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Jun-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-204	82433	1	185	BRK	FTB		1	59	0	DEL	FTB	
P16/18		2	181	BRK	FTB		2	59	0	DEL	FTB	
		3	194	BRK	FTB		3	61	0	DEL	FTB	
		4	189	BRK	FTB		4	59	0	DEL	FTB	
		5	184	BRK	FTB		5	64	0	DEL	FTB	
	AVG.		187			150	AVG:	60				20
	STD. DEV.		5				STD. DEV.	2				
DT-205	82434	1	183	BRK	FTB		1	58	0	DEL	FTB	
P21/22		2	186	BRK	FTB		2	55	0	DEL	FTB	
		3	194	BRK	FTB		3	60	0	DEL	FTB	
		4	188	BRK	FTB		4	62	0	DEL	FTB	
		5	184	BRK	FTB		5	61	0	DEL	FTB	
	AVG:		187			150	AVG:	59				20
	STD. DEV.		4				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

June 20, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 06/20/2012

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 Seam testing of three (3) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **June 20, 2012**

REFERENCE PGLI JOB NO.: G120644

DATE RECEIVED: June 20, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-207 P34/35	82469
2. DT-208 P37/39	82470
3. DT-206 P32/7	82471

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The samples were conditioned for a minimum of 2 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 2.

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. ***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 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.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **20-Jun-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120644**

QC'd By: Maria Epitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **20-Jun-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-207	**82469**	1	185	BRK	FTB		1	60	0	DEL	FTB	
P34/35		2	185	BRK	FTB		2	62	0	DEL	FTB	
		3	180	BRK	FTB		3	59	0	DEL	FTB	
		4	189	BRK	FTB		4	67	0	DEL	FTB	
		5	188	BRK	FTB		5	63	0	DEL	FTB	
	AVG.		**185**			*150*	***AVG:***	**62**				*20*
	STD. DEV.		**4**				*STD. DEV.*	**3**				
DT-208	**82470**	1	185	BRK	FTB		1	67	0	DEL	FTB	
P37/39		2	188	BRK	FTB		2	61	0	DEL	FTB	
		3	191	BRK	FTB		3	61	0	DEL	FTB	
		4	186	BRK	FTB		4	59	0	DEL	FTB	
		5	184	BRK	FTB		5	63	0	DEL	FTB	
	AVG:		**187**			*150*	***AVG:***	**62**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**3**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **20-Jun-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120644**

QC'd By: Maria Epitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **20-Jun-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-206	**82471**	1	118	BRK	FTB		1	***20***	***100%***	***AD***	***NON-FTB***	
P32/7		2	116	BRK	FTB		2	***20***	***100%***	***AD***	***NON-FTB***	
		3	112	BRK	FTB		3	***15***	***100%***	***AD***	***NON-FTB***	
		4	116	BRK	FTB		4	***33***	***100%***	***AD***	***NON-FTB***	
		5	129	BRK	FTB		5	***43***	***100%***	***AD***	***NON-FTB***	
	AVG.		**118**			*150*	***AVG:***	**26**				*20*
	STD. DEV.		**7**				*STD. DEV.*	**12**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

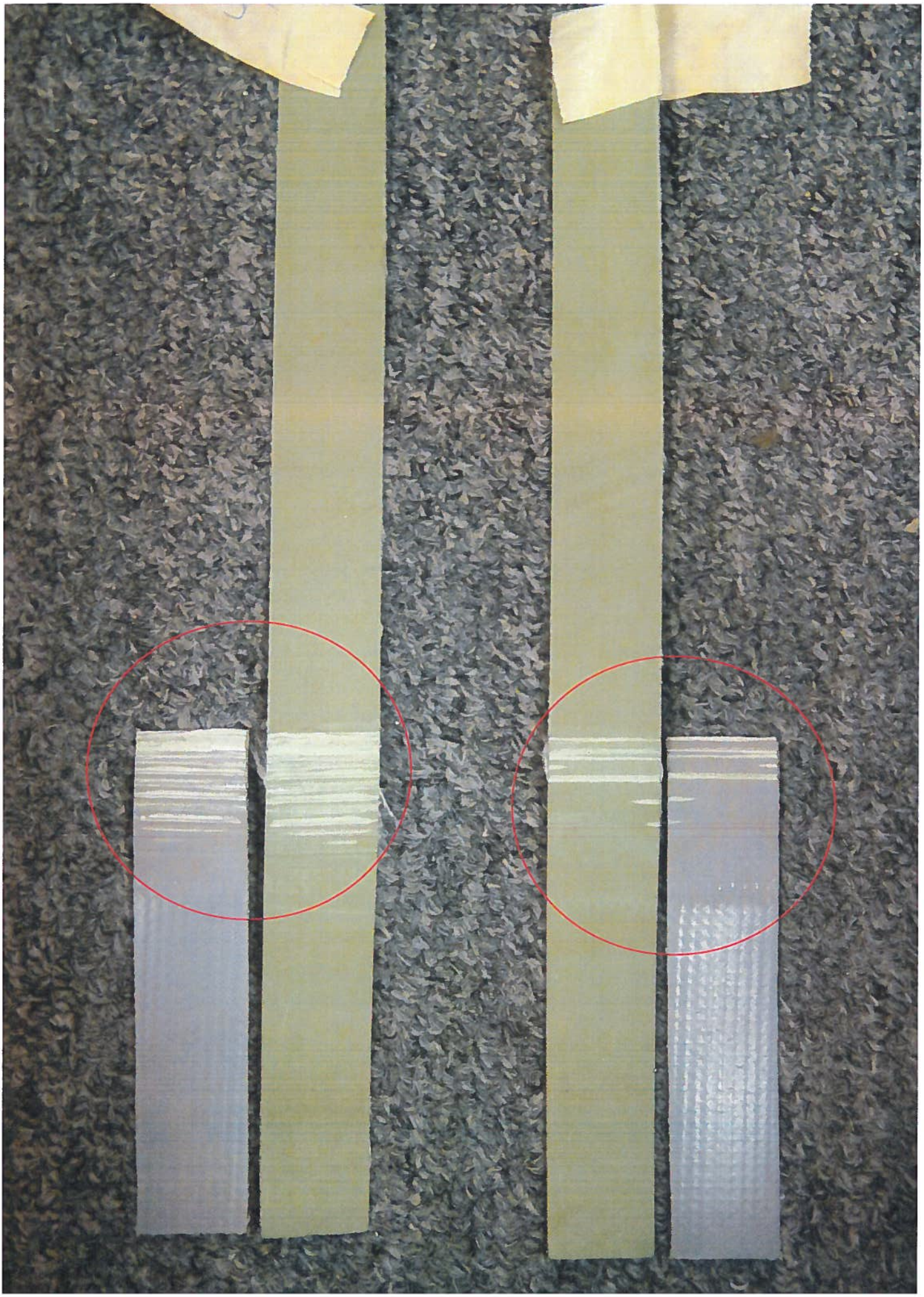
CLASSIFICATION

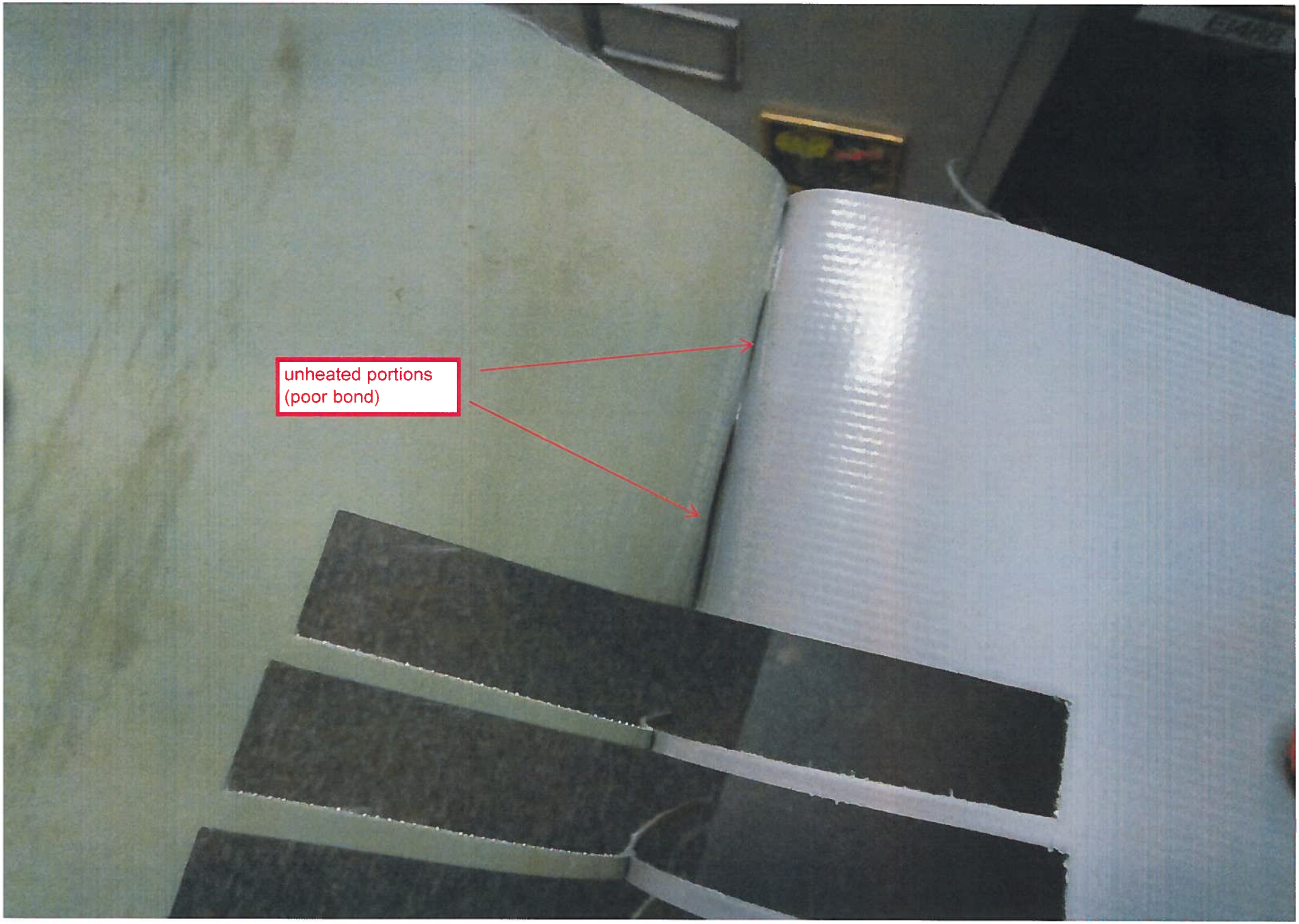
FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

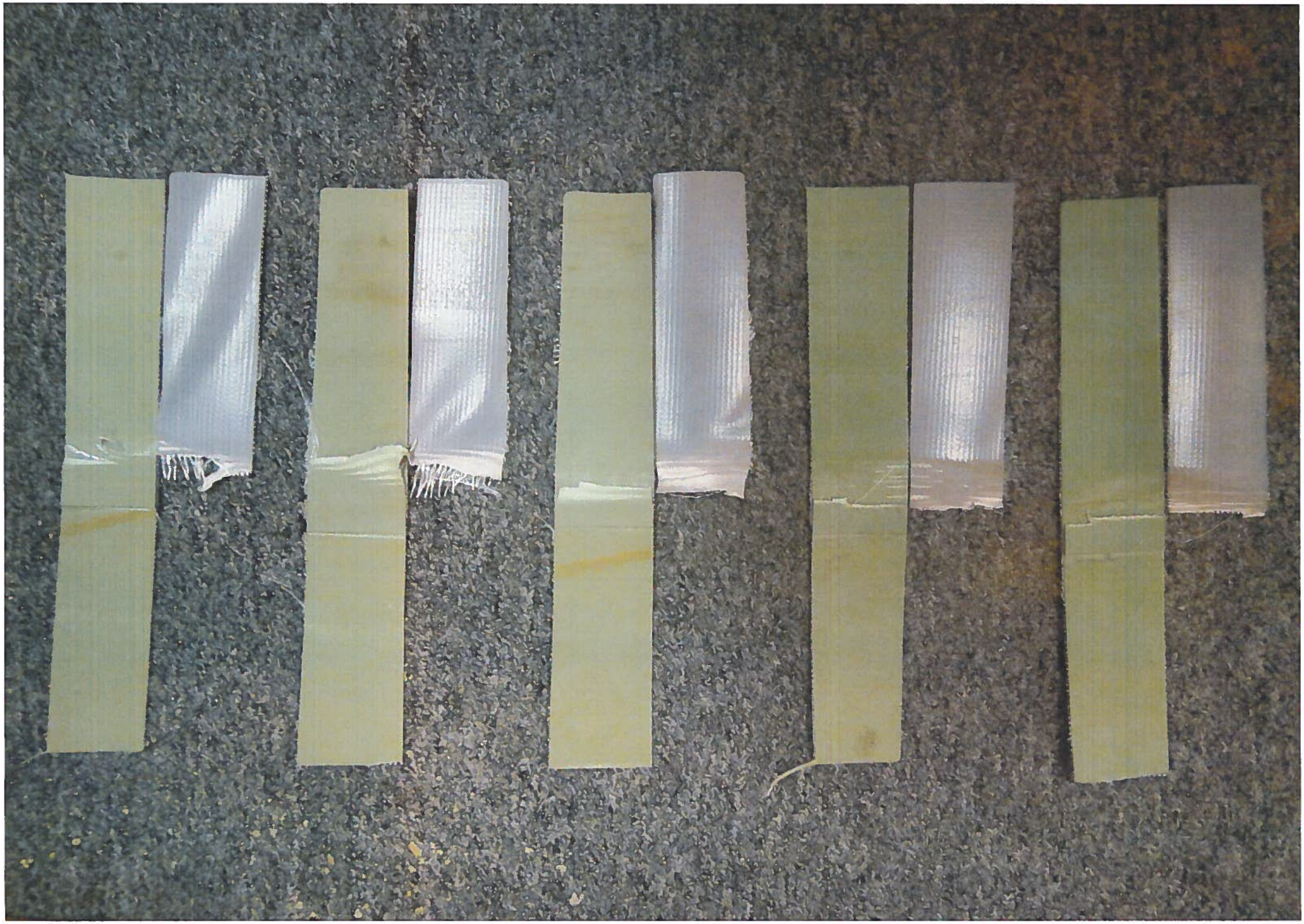
(End of Table 2)

(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.




unheated portions
(poor bond)



Precision Geosvnthetic Laboratories International
A Texas Research International Company

July 6, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 07/06/2012

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 Seam testing of three (3) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **July 6, 2012**

REFERENCE PGLI JOB NO.: G120733

DATE RECEIVED: July 6, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-209 (7) P28/79	83043
2. DT-210 (8) P83/85	83044
3. DT-211 (9) P87/88	83045

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The samples were conditioned for a minimum of 2 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 2.

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. ***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 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.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **6-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120733**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **6-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-209 (7)	83043	1	185	BRK	FTB		1	46	0	DEL	FTB	
P28/79		2	191	BRK	FTB		2	51	0	DEL	FTB	
		3	199	BRK	FTB		3	52	0	DEL	FTB	
		4	194	BRK	FTB		4	61	0	DEL	FTB	
		5	199	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		194			150	AVG:	53				20
	STD. DEV.		6				STD. DEV.	6				
DT-210 (8)	83044	1	194	BRK	FTB		1	56	0	DEL	FTB	
P83/85		2	200	BRK	FTB		2	56	0	DEL	FTB	
		3	199	BRK	FTB		3	57	0	DEL	FTB	
		4	194	BRK	FTB		4	51	0	DEL	FTB	
		5	191	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		195			150	AVG:	54				20
	STD. DEV.		4				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **6-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120733**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **6-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-211 (9) P87/88	83045	1	191	BRK	FTB		1	47	0	DEL	FTB	
		2	198	BRK	FTB		2	51	0	DEL	FTB	
		3	190	BRK	FTB		3	57	0	DEL	FTB	
		4	194	BRK	FTB		4	62	0	DEL	FTB	
		5	194	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		193			150	AVG:	54				20
	STD. DEV.		3				STD. DEV.	6				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 07/09/2012

July 9, 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 Seam testing of three (3) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **July 9, 2012**

REFERENCE PGLI JOB NO.: G120743

DATE RECEIVED: July 9, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-212 (10) P56/99	83110
2. DT-213 (11) P106/107	83111
3. DT-214 (12) P66/111	83112

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The samples were conditioned for a minimum of 2 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 2.

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. ***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 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.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120743**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-212 (10)	83110	1	184	BRK	FTB		1	59	0	DEL	FTB	
P56/99		2	186	BRK	FTB		2	61	0	DEL	FTB	
		3	189	BRK	FTB		3	56	0	DEL	FTB	
		4	194	BRK	FTB		4	56	0	DEL	FTB	
		5	185	BRK	FTB		5	56	0	DEL	FTB	
	AVG.		187			150	AVG:	58				20
	STD. DEV.		4				STD. DEV.	2				
DT-213 (11)	83111	1	191	BRK	FTB		1	50	0	DEL	FTB	
P106/107		2	181	BRK	FTB		2	52	0	DEL	FTB	
		3	199	BRK	FTB		3	53	0	DEL	FTB	
		4	194	BRK	FTB		4	56	0	DEL	FTB	
		5	189	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		191			150	AVG:	54				20
	STD. DEV.		7				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120743**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-214 (12)	83112	1	175	BRK	FTB		1	58	0	DEL	FTB	
P66/111		2	181	BRK	FTB		2	57	0	DEL	FTB	
		3	175	BRK	FTB		3	56	0	DEL	FTB	
		4	179	BRK	FTB		4	54	0	DEL	FTB	
		5	175	BRK	FTB		5	54	0	DEL	FTB	
	AVG.		177			150	AVG:	56				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

July 12, 2012

Initial: CVZ #:0.13
DATE: 07/12/2012

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 Seam testing of six (6) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **July 12, 2012**

REFERENCE PGLI JOB NO.: G120758

DATE RECEIVED: July 12, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-215 (13) P118/119	83181
2. DT-216 (14) P121/123	83182
3. DT-217 (15) P124/126	83183
4. DT-218 (16) P126/140	83184
5. DT-219 (17) P145/147	83185
6. DT-220 (18) P116/156	83186

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The samples were conditioned for a minimum of 2 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. ***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 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.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **12-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120758**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-215 (13) P118/119	83181	1	181	BRK	FTB		1	63	0	DEL	FTB	
		2	181	BRK	FTB		2	57	0	DEL	FTB	
		3	180	BRK	FTB		3	57	0	DEL	FTB	
		4	178	BRK	FTB		4	62	0	DEL	FTB	
		5	180	BRK	FTB		5	62	0	DEL	FTB	
	AVG.		180			150	AVG:	60				20
	STD. DEV.		1				STD. DEV.	3				
DT-216 (14) P121/123	83182	1	188	BRK	FTB		1	62	0	DEL	FTB	
		2	181	BRK	FTB		2	57	0	DEL	FTB	
		3	180	BRK	FTB		3	58	0	DEL	FTB	
		4	181	BRK	FTB		4	57	0	DEL	FTB	
		5	185	BRK	FTB		5	56	0	DEL	FTB	
	AVG:		183			150	AVG:	58				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	FILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **12-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120758**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **12-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-217 (15)	83183	1	178	BRK	FTB		1	61	0	DEL	FTB	
P124/126		2	180	BRK	FTB		2	57	0	DEL	FTB	
		3	179	BRK	FTB		3	58	0	DEL	FTB	
		4	180	BRK	FTB		4	55	0	DEL	FTB	
		5	181	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		179			150	AVG:	56				20
	STD. DEV.		1				STD. DEV.	4				
DT-218 (16)	83184	1	181	BRK	FTB		1	60	0	DEL	FTB	
P126/140		2	179	BRK	FTB		2	63	0	DEL	FTB	
		3	184	BRK	FTB		3	57	0	DEL	FTB	
		4	184	BRK	FTB		4	55	0	DEL	FTB	
		5	185	BRK	FTB		5	55	0	DEL	FTB	
	AVG:		182			150	AVG:	58				20
	STD. DEV.		3				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	FILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **12-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120758**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **12-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-219 (17)	**83185**	1	176	BRK	FTB		1	61	0	DEL	FTB	
P145/147		2	180	BRK	FTB		2	58	0	DEL	FTB	
		3	181	BRK	FTB		3	56	0	DEL	FTB	
		4	179	BRK	FTB		4	52	0	DEL	FTB	
		5	178	BRK	FTB		5	55	0	DEL	FTB	
	AVG.		**179**			*150*	***AVG:***	**56**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**3**				
DT-220 (18)	**83186**	1	174	BRK	FTB		1	***32***	***100%***	***AD***	***NON-FTB***	
P116/156		2	180	BRK	FTB		2	***25***	***100%***	***AD***	***NON-FTB***	
		3	179	BRK	FTB		3	***25***	***100%***	***AD***	***NON-FTB***	
		4	174	BRK	FTB		4	***20***	***100%***	***AD***	***NON-FTB***	
		5	179	BRK	FTB		5	***20***	***100%***	***AD***	***NON-FTB***	
	AVG:		**177**			*150*	***AVG:***	**24**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**5**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	FILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosynthetic Laboratories International
A Texas Research International Company

July 16, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 07/16/2012

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 Seam testing of three (3) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **July 16, 2012**

REFERENCE PGLI JOB NO.: G120769

DATE RECEIVED: July 16, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-221 (19) P158/160	83237
2. DT-222 (20) P93/180	83238
3. DT-223 (21) P197/198	83239

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST CONDITIONS: The samples were conditioned for a minimum of 2 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 2.

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. ***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 longer time, please advise us in writing.

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120769**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-221 (19)	83237	1	181	BRK	FTB		1	48	0	DEL	FTB	
P158/160		2	189	BRK	FTB		2	53	0	DEL	FTB	
		3	191	BRK	FTB		3	50	0	DEL	FTB	
		4	199	BRK	FTB		4	52	0	DEL	FTB	
		5	189	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		190			150	AVG:	51				20
	STD. DEV.		7				STD. DEV.	2				
DT-222 (20)	83238	1	185	BRK	FTB		1	37	0	DEL	FTB	
P93/180		2	184	BRK	FTB		2	44	0	DEL	FTB	
		3	190	BRK	FTB		3	55	0	DEL	FTB	
		4	196	BRK	FTB		4	50	0	DEL	FTB	
		5	195	BRK	FTB		5	41	0	DEL	FTB	
	AVG:		190			150	AVG:	45				20
	STD. DEV.		6				STD. DEV.	7				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120769**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-223 (21) P197/198	83239	1	186	BRK	FTB		1	38	0	DEL	FTB	
		2	185	BRK	FTB		2	41	0	DEL	FTB	
		3	199	BRK	FTB		3	39	0	DEL	FTB	
		4	191	BRK	FTB		4	43	0	DEL	FTB	
		5	194	BRK	FTB		5	42	0	DEL	FTB	
	AVG.		191			150	AVG:	41				20
	STD. DEV.		6				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 07/26/2012

July 26, 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 Seam testing of seven (7) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **July 26, 2012**

REFERENCE PGLI JOB NO.: G120825

DATE RECEIVED: July 26, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

	SAMPLE ID	***PGLI CONTROL NUMBER***
1.	DT-225 (23) P215/217 TOP	83553
2.	DT-225 (23) P215/217 BOTTOM	83554
3.	DT-226 (24) P219/221 TOP	83555
4.	DT-226 (24) P219/221 BOTTOM	83556
5.	DT-227 (25) P233/235	83557
6.	DT-228 (26) P240/242	83558
7.	DT-229 (27) P245/247	83559

TESTS REQUIRED / PERFORMED:

TEST METHOD	***DESCRIPTION***
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST RESULTS: The test results are summarized in Tables 1 to 4.

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. ***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 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.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **26-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120825**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **26-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-225 (23)	**83553**	1	184	BRK	FTB		1	47	0	DEL	FTB	
P215/217		2	176	BRK	FTB		2	55	0	DEL	FTB	
TOP		3	182	BRK	FTB		3	56	0	DEL	FTB	
		4	181	BRK	FTB		4	60	0	DEL	FTB	
		5	183	BRK	FTB		5	61	0	DEL	FTB	
	AVG.		**181**			*150*	***AVG:***	**56**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**6**				
DT-225 (23)	**83554**	1	199	BRK	FTB		1	52	0	DEL	FTB	
P215/217		2	196	BRK	FTB		2	50	0	DEL	FTB	
BOTTOM		3	190	BRK	FTB		3	48	0	DEL	FTB	
		4	186	BRK	FTB		4	56	0	DEL	FTB	
		5	184	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		**191**			*150*	***AVG:***	**52**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**3**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosynthetic Laboratories International

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **26-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120825**

QC'd By: Maria Cupitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **26-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-226 (24)	**83555**	1	191	BRK	FTB		1	50	0	DEL	FTB	
P219/221		2	205	BRK	FTB		2	51	0	DEL	FTB	
TOP		3	194	BRK	FTB		3	51	0	DEL	FTB	
		4	177	BRK	FTB		4	50	0	DEL	FTB	
		5	178	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		**189**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**12**				*STD. DEV.*	**1**				
DT-226 (24)	**83556**	1	175	BRK	FTB		1	55	0	DEL	FTB	
P219/221		2	179	BRK	FTB		2	56	0	DEL	FTB	
BOTTOM		3	175	BRK	FTB		3	56	0	DEL	FTB	
		4	182	BRK	FTB		4	57	0	DEL	FTB	
		5	176	BRK	FTB		5	53	0	DEL	FTB	
	AVG:		**177**			*150*	***AVG:***	**55**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **26-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120825**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **26-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-227 (25)	83557	1	174	BRK	FTB		1	55	0	DEL	FTB	
P233/235		2	179	BRK	FTB		2	51	0	DEL	FTB	
		3	175	BRK	FTB		3	50	0	DEL	FTB	
		4	176	BRK	FTB		4	55	0	DEL	FTB	
		5	181	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		177			150	AVG:	52				20
	STD. DEV.		3				STD. DEV.	3				
DT-228 (26)	83558	1	183	BRK	FTB		1	57	0	DEL	FTB	
P240/242		2	180	BRK	FTB		2	56	0	DEL	FTB	
		3	181	BRK	FTB		3	55	0	DEL	FTB	
		4	182	BRK	FTB		4	58	0	DEL	FTB	
		5	182	BRK	FTB		5	50	0	DEL	FTB	
	AVG:		181			150	AVG:	55				20
	STD. DEV.		1				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **26-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120825**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **26-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-229 (27) P245/247	83559	1	183	BRK	FTB		1	57	0	DEL	FTB	
		2	182	BRK	FTB		2	61	0	DEL	FTB	
		3	183	BRK	FTB		3	57	0	DEL	FTB	
		4	184	BRK	FTB		4	57	0	DEL	FTB	
		5	180	BRK	FTB		5	56	0	DEL	FTB	
	AVG.		182			150	AVG:	58				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

July 31, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 07/31/2012

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 Seam testing of two (2) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **July 31, 2012**

REFERENCE PGLI JOB NO.: G120846

DATE RECEIVED: July 31, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-230 (28) P251/253	83634
2. DT-236 (29) P261/263	83635

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

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 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. ***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 longer time, please advise us in writing.

2 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **31-Jul-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120846**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **31-Jul-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-230 (28)	83634	1	184	BRK	FTB		1	59	0	DEL	FTB	
P251/253		2	189	BRK	FTB		2	60	0	DEL	FTB	
		3	190	BRK	FTB		3	51	0	DEL	FTB	
		4	184	BRK	FTB		4	53	0	DEL	FTB	
		5	199	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		189			150	AVG:	55				20
	STD. DEV.		6				STD. DEV.	4				
DT-236 (29)	83635	1	194	BRK	FTB		1	57	0	DEL	FTB	
P261/263		2	189	BRK	FTB		2	56	0	DEL	FTB	
		3	191	BRK	FTB		3	57	0	DEL	FTB	
		4	199	BRK	FTB		4	58	0	DEL	FTB	
		5	191	BRK	FTB		5	54	0	DEL	FTB	
	AVG:		193			150	AVG:	56				20
	STD. DEV.		4				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

GAI-LAP

August 9, 2012

GAI-LAP
Initial: *CVZ* #:0.13
DATE: 08/09/2012

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 Seam testing of eleven (11) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf

DATE REPORTED: **August 9, 2012**

REFERENCE PGLI JOB NO.: G120889

DATE RECEIVED: August 9, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

	SAMPLE ID	***PGLI CONTROL NUMBER***
1.	DT-250 (32) P279/281 Top	83998
2.	DT-250 (32) P279/281 Bottom	83999
3.	DT-252 (34) P294/296	84000
4.	DT-253 (35) P301/302	84001
5.	DT-254 (36) P307/309	84002
6.	DT-251 (33) P289/292 Top	84003
7.	DT-251 (33) P289/292 Bottom	84004
8.	DT-248 (30) P265/267 Top	84005
9.	DT-248 (30) P265/267 Bottom	84006
10.	DT-249 (31) P274/276 Top	84007
11.	DT-249 (31) P274/276 Bottom	84008

TESTS REQUIRED / PERFORMED:

TEST METHOD	***DESCRIPTION***
1. ASTM D751	Shear
2. ASTM D413	Peel

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. ***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 longer time, please advise us in writing.

7 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120889**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-250(32)	83998	1	173	BRK	FTB		1	51	0	DEL	FTB	
P279/P281		2	195	BRK	FTB		2	51	0	DEL	FTB	
Top		3	176	BRK	FTB		3	52	0	DEL	FTB	
		4	195	BRK	FTB		4	52	0	DEL	FTB	
		5	173	BRK	FTB		5	49	0	DEL	FTB	
	AVG.		182			150	AVG:	51				20
	STD. DEV.		11				STD. DEV.	1				
DT-250(32)	83999	1	185	BRK	FTB		1	47	0	DEL	FTB	
P279/P281		2	191	BRK	FTB		2	51	0	DEL	FTB	
Bottom		3	183	BRK	FTB		3	52	0	DEL	FTB	
		4	198	BRK	FTB		4	52	0	DEL	FTB	
		5	181	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		188			150	AVG:	51				20
	STD. DEV.		7				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120889**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-252(34)	84000	1	188	BRK	FTB		1	55	0	DEL	FTB	
P294/P296		2	182	BRK	FTB		2	56	0	DEL	FTB	
		3	194	BRK	FTB		3	56	0	DEL	FTB	
		4	199	BRK	FTB		4	58	0	DEL	FTB	
		5	186	BRK	FTB		5	58	0	DEL	FTB	
	AVG.		190			150	AVG:	57				20
	STD. DEV.		7				STD. DEV.	1				
DT-253(35)	84001	1	181	BRK	FTB		1	49	0	DEL	FTB	
P301/P302		2	175	BRK	FTB		2	50	0	DEL	FTB	
		3	185	BRK	FTB		3	52	0	DEL	FTB	
		4	178	BRK	FTB		4	51	0	DEL	FTB	
		5	177	BRK	FTB		5	53	0	DEL	FTB	
	AVG:		179			150	AVG:	51				20
	STD. DEV.		4				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120889**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-254(36)	**84002**	1	178	BRK	FTB		1	47	0	DEL	FTB	
P307/P309		2	181	BRK	FTB		2	52	0	DEL	FTB	
		3	190	BRK	FTB		3	55	0	DEL	FTB	
		4	186	BRK	FTB		4	54	0	DEL	FTB	
		5	177	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		**182**			*150*	*AVG:*	**52**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**3**				
DT-251	**84003**	1	181	BRK	FTB		1	56	0	DEL	FTB	
P289/P292		2	184	BRK	FTB		2	62	0	DEL	FTB	
Top		3	181	BRK	FTB		3	51	0	DEL	FTB	
		4	183	BRK	FTB		4	53	0	DEL	FTB	
		5	178	BRK	FTB		5	56	0	DEL	FTB	
	AVG:		**181**			*150*	*AVG:*	**56**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**4**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 3)

(Sheet 1 of 1)

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TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120889**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-251	**84004**	1	184	BRK	FTB		1	44	0	DEL	FTB	
P289/P292		2	189	BRK	FTB		2	55	0	DEL	FTB	
Bottom		3	182	BRK	FTB		3	51	0	DEL	FTB	
		4	198	BRK	FTB		4	52	0	DEL	FTB	
		5	186	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		**188**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**4**				
DT-248(30)	**84005**	1	187	BRK	FTB		1	49	0	DEL	FTB	
P265/P267		2	184	BRK	FTB		2	50	0	DEL	FTB	
Top		3	176	BRK	FTB		3	51	0	DEL	FTB	
		4	187	BRK	FTB		4	51	0	DEL	FTB	
		5	186	BRK	FTB		5	53	0	DEL	FTB	
	AVG:		**184**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**5**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120889**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-248(30)	**84006**	1	195	BRK	FTB		1	56	0	DEL	FTB	
P265/P267		2	184	BRK	FTB		2	60	0	DEL	FTB	
Bottom		3	199	BRK	FTB		3	58	0	DEL	FTB	
		4	185	BRK	FTB		4	56	0	DEL	FTB	
		5	175	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		**188**			*150*	***AVG:***	**56**				*20*
	STD. DEV.		**9**				*STD. DEV.*	**3**				
DT-249(31)	**84007**	1	180	BRK	FTB		1	48	0	DEL	FTB	
P274/P276		2	184	BRK	FTB		2	52	0	DEL	FTB	
Top		3	182	BRK	FTB		3	53	0	DEL	FTB	
		4	181	BRK	FTB		4	52	0	DEL	FTB	
		5	184	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		**182**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **9-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120889**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **9-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-249(31)	**84008**	1	180	BRK	FTB		1	47	0	DEL	FTB	
P274/P276		2	193	BRK	FTB		2	52	0	DEL	FTB	
Bottom		3	182	BRK	FTB		3	53	0	DEL	FTB	
		4	180	BRK	FTB		4	52	0	DEL	FTB	
		5	187	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		**184**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

August 16, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 08/16/2012

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 Seam testing of sixteen (16) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **August 16, 2012**

REFERENCE PGLI JOB NO.: G120922

DATE RECEIVED: August 16, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*	*SAMPLE ID*	*PGLI CONTROL NUMBER*
1. DT-265 (46) P409/412	84168	9. DT-259 (40) P355/357	84176
2. DT-266 (47) P419/421	84169	10. DT-267 (48) P447/448	84177
3. DT-269 (50) P429/431	84170	11. DT-268 (49) P434/436	84178
4. DT-260 (41) P358/360	84171	12. DT-270 (51) P460/461	84179
5. DT-256 (37) P334/336 Top	84172	13. DT-258 (39) P324/348	84180
6. DT-256 (37) P334/336 Bottom	84173	14. DT-257 (38) P350/352	84181
7. DT-262 (43) P368/370	84174	15. DT-263 (44) P392/394	84182
8. DT-261 (42) P364/365	84175	16. DT-264 (45) P396/398	84183

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST RESULTS: The test results are summarized in Tables 1 to 8.

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. ***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 longer time, please advise us in writing.

9 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-265(46)	**84168**	1	175	BRK	FTB		1	50	0	DEL	FTB	
P409/412		2	175	BRK	FTB		2	51	0	DEL	FTB	
		3	185	BRK	FTB		3	52	0	DEL	FTB	
		4	176	BRK	FTB		4	47	0	DEL	FTB	
		5	174	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		**177**			*150*	***AVG:***	**50**				*20*
	STD. DEV.		**4**				*STD. DEV.*	**2**				
DT-266(47)	**84169**	1	182	BRK	FTB		1	47	0	DEL	FTB	
P419/421		2	178	BRK	FTB		2	52	0	DEL	FTB	
		3	182	BRK	FTB		3	55	0	DEL	FTB	
		4	175	BRK	FTB		4	54	0	DEL	FTB	
		5	176	BRK	FTB		5	53	0	DEL	FTB	
	AVG:		**179**			*150*	***AVG:***	**52**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**3**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 1)

(Sheet 1 of 1)

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TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-269(50)	**84170**	1	176	BRK	FTB		1	55	0	DEL	FTB	
P429/431		2	175	BRK	FTB		2	53	0	DEL	FTB	
		3	176	BRK	FTB		3	51	0	DEL	FTB	
		4	181	BRK	FTB		4	50	0	DEL	FTB	
		5	185	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		**178**			*150*	***AVG:***	**52**				*20*
	STD. DEV.		**4**				*STD. DEV.*	**2**				
DT-260(41)	**84171**	1	189	BRK	FTB		1	52	0	DEL	FTB	
P358/360		2	181	BRK	FTB		2	51	0	DEL	FTB	
		3	176	BRK	FTB		3	48	0	DEL	FTB	
		4	178	BRK	FTB		4	47	0	DEL	FTB	
		5	181	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		**181**			*150*	***AVG:***	**50**				*20*
	STD. DEV.		**5**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-256(37)	84172	1	183	BRK	FTB		1	47	0	DEL	FTB	
P334/336		2	176	BRK	FTB		2	50	0	DEL	FTB	
TOP		3	188	BRK	FTB		3	52	0	DEL	FTB	
		4	189	BRK	FTB		4	52	0	DEL	FTB	
		5	191	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		185			150	AVG:	51				20
	STD. DEV.		6				STD. DEV.	2				
DT-256(37)	84173	1	178	BRK	FTB		1	50	0	DEL	FTB	
P334/336		2	187	BRK	FTB		2	51	0	DEL	FTB	
BOTTOM		3	180	BRK	FTB		3	51	0	DEL	FTB	
		4	180	BRK	FTB		4	51	0	DEL	FTB	
		5	179	BRK	FTB		5	47	0	DEL	FTB	
	AVG:		181			150	AVG:	50				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-262(43)	**84174**	1	190	BRK	FTB		1	47	0	DEL	FTB	
P368/370		2	178	BRK	FTB		2	53	0	DEL	FTB	
		3	176	BRK	FTB		3	52	0	DEL	FTB	
		4	186	BRK	FTB		4	53	0	DEL	FTB	
		5	190	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		**184**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**7**				*STD. DEV.*	**3**				
DT-261(42)	**84175**	1	176	BRK	FTB		1	52	0	DEL	FTB	
P364/365		2	175	BRK	FTB		2	56	0	DEL	FTB	
		3	176	BRK	FTB		3	50	0	DEL	FTB	
		4	183	BRK	FTB		4	53	0	DEL	FTB	
		5	182	BRK	FTB		5	51	0	DEL	FTB	
	AVG:		**178**			*150*	***AVG:***	**52**				*20*
	STD. DEV.		**4**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Epitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-259(40)	**84176**	1	176	BRK	FTB		1	**46**	0	DEL	FTB	
P355/357		2	182	BRK	FTB		2	48	0	DEL	FTB	
		3	185	BRK	FTB		3	50	0	DEL	FTB	
		4	190	BRK	FTB		4	51	0	DEL	FTB	
		5	176	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		**182**			*150*	***AVG:***	**49**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**2**				
DT-267(48)	**84177**	1	191	BRK	FTB		1	53	0	DEL	FTB	
P447/448		2	190	BRK	FTB		2	52	0	DEL	FTB	
		3	178	BRK	FTB		3	54	0	DEL	FTB	
		4	177	BRK	FTB		4	56	0	DEL	FTB	
		5	178	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		**183**			*150*	***AVG:***	**55**				*20*
	STD. DEV.		**7**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 6.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-268(49)	**84178**	1	184	BRK	FTB		1	47	0	DEL	FTB	
P434/436		2	176	BRK	FTB		2	52	0	DEL	FTB	
		3	176	BRK	FTB		3	51	0	DEL	FTB	
		4	185	BRK	FTB		4	53	0	DEL	FTB	
		5	188	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		**182**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**2**				
DT-270(51)	**84179**	1	176	BRK	FTB		1	47	0	DEL	FTB	
P460/461		2	174	BRK	FTB		2	52	0	DEL	FTB	
		3	175	BRK	FTB		3	53	0	DEL	FTB	
		4	183	BRK	FTB		4	50	0	DEL	FTB	
		5	187	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		**179**			*150*	***AVG:***	**51**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 7.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-258(39) P324/348	84180	1	174	BRK	FTB		1	47	0	DEL	FTB	
		2	175	BRK	FTB		2	50	0	DEL	FTB	
		3	178	BRK	FTB		3	50	0	DEL	FTB	
		4	175	BRK	FTB		4	51	0	DEL	FTB	
		5	181	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		177			150	AVG:	50				20
	STD. DEV.		3				STD. DEV.	2				
DT-257(38) P350/352	84181	1	176	BRK	FTB		1	47	0	DEL	FTB	
		2	176	BRK	FTB		2	50	0	DEL	FTB	
		3	190	BRK	FTB		3	53	0	DEL	FTB	
		4	198	BRK	FTB		4	52	0	DEL	FTB	
		5	174	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		183			150	AVG:	52				20
	STD. DEV.		11				STD. DEV.	4				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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 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 8.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G120922**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-263(44)	84182	1	180	BRK	FTB		1	51	0	DEL	FTB	
P392/394		2	185	BRK	FTB		2	52	0	DEL	FTB	
		3	184	BRK	FTB		3	47	0	DEL	FTB	
		4	182	BRK	FTB		4	53	0	DEL	FTB	
		5	182	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		182			150	AVG:	51				20
	STD. DEV.		2				STD. DEV.	2				
DT-264(45)	84183	1	176	BRK	FTB		1	47	0	DEL	FTB	
P396/398		2	176	BRK	FTB		2	50	0	DEL	FTB	
		3	196	BRK	FTB		3	56	0	DEL	FTB	
		4	190	BRK	FTB		4	61	0	DEL	FTB	
		5	186	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		185			150	AVG:	53				20
	STD. DEV.		9				STD. DEV.	5				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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 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 Geosvnthetic Laboratories International
A Texas Research International Company

Initial: CVZ #:0.13
DATE: 09/05/2012

September 5, 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 Seam testing of twenty-five (25) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **September 5, 2012**

REFERENCE PGLI JOB NO.: G121015

DATE RECEIVED: September 5, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*	*SAMPLE ID*	*PGLI CONTROL NUMBER*
1. DT-287 (68) P717/718	84656	14. DT-282 (63) P69/CAP	84669
2. DT-292 (73) P518/519	84657	15. DT-281 (62) P59/CAP	84670
3. DT-293 (74) P726/727	84658	16. DT-286 (67) P157/CAP	84671
4. DT-278 (59) P642/643	84659	17. DT-280 (61) P53/CAP	84672
5. DT-291 (72) P479/480	84660	18. DT-279 (60) P21/CAP	84673
6. DT-274 (55) P560/561	84661	19. DT-285 (66) P12/CAP	84674
7. DT-271 (52) P541/542	84662	20. DT-273 (54) P583/584	84675
8. DT-275 (56) P587/588	84663	21. DT-289 (70) P666/667	84676
9. DT-290 (71) P475/476	84664	22. DT-276 (57) P603/604	84677
10. DT-224 (22) P132/199	84665	23. DT-288 (69) P682/683	84678
11. DT-284 (65) P93/CAP	84666	24. DT-277 (58) P613/614	84679
12. DT-283 (64) P74/CAP	84667	25. DT-272 (53) P528/529	84680
13. DT-220 (18) A P116/1155	84668		

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST RESULTS: The test results are summarized in Tables 1 to 13.

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. ***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 longer time, please advise us in writing.

14 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Epitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-287(68) P717/718	84656	1	172	BRK	FTB		1	61	0	DEL	FTB	
		2	176	BRK	FTB		2	57	0	DEL	FTB	
		3	184	BRK	FTB		3	57	0	DEL	FTB	
		4	177	BRK	FTB		4	58	0	DEL	FTB	
		5	182	BRK	FTB		5	55	0	DEL	FTB	
	AVG.		178			150	AVG:	58				20
	STD. DEV.		5				STD. DEV.	2				
DT-292(73) P518/519	84657	1	176	BRK	FTB		1	57	0	DEL	FTB	
		2	175	BRK	FTB		2	57	0	DEL	FTB	
		3	174	BRK	FTB		3	63	0	DEL	FTB	
		4	178	BRK	FTB		4	62	0	DEL	FTB	
		5	183	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		177			150	AVG:	59				20
	STD. DEV.		4				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-293(74) P726/727	84658	1	193	BRK	FTB		1	53	0	DEL	FTB	
		2	187	BRK	FTB		2	57	0	DEL	FTB	
		3	190	BRK	FTB		3	61	0	DEL	FTB	
		4	180	BRK	FTB		4	61	0	DEL	FTB	
		5	190	BRK	FTB		5	58	0	DEL	FTB	
	AVG.		188			150	AVG:	58				20
	STD. DEV.		5				STD. DEV.	3				
DT-278(59) P642/643	84659	1	185	BRK	FTB		1	55	0	DEL	FTB	
		2	180	BRK	FTB		2	57	0	DEL	FTB	
		3	178	BRK	FTB		3	54	0	DEL	FTB	
		4	180	BRK	FTB		4	53	0	DEL	FTB	
		5	182	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		181			150	AVG:	54				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-291(72)	84660	1	190	BRK	FTB		1	47	0	DEL	FTB	
P479/480		2	188	BRK	FTB		2	48	0	DEL	FTB	
		3	179	BRK	FTB		3	47	0	DEL	FTB	
		4	180	BRK	FTB		4	53	0	DEL	FTB	
		5	181	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		184			150	AVG:	49				20
	STD. DEV.		5				STD. DEV.	3				
DT-274(55)	84661	1	182	BRK	FTB		1	56	0	DEL	FTB	
P560/561		2	181	BRK	FTB		2	52	0	DEL	FTB	
		3	178	BRK	FTB		3	50	0	DEL	FTB	
		4	174	BRK	FTB		4	51	0	DEL	FTB	
		5	177	BRK	FTB		5	51	0	DEL	FTB	
	AVG:		178			150	AVG:	52				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Epitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-271(52)	84662	1	181	BRK	FTB		1	48	0	DEL	FTB	
P541/542		2	177	BRK	FTB		2	47	0	DEL	FTB	
		3	176	BRK	FTB		3	50	0	DEL	FTB	
		4	190	BRK	FTB		4	53	0	DEL	FTB	
		5	186	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		182			150	AVG:	50				20
	STD. DEV.		6				STD. DEV.	2				
DT-275(56)	84663	1	176	BRK	FTB		1	53	0	DEL	FTB	
P587/588		2	180	BRK	FTB		2	52	0	DEL	FTB	
		3	182	BRK	FTB		3	51	0	DEL	FTB	
		4	181	BRK	FTB		4	51	0	DEL	FTB	
		5	176	BRK	FTB		5	51	0	DEL	FTB	
	AVG:		179			150	AVG:	52				20
	STD. DEV.		3				STD. DEV.	1				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-290(71)	84664	1	179	BRK	FTB		1	47	0	DEL	FTB	
P475/476		2	176	BRK	FTB		2	50	0	DEL	FTB	
		3	174	BRK	FTB		3	50	0	DEL	FTB	
		4	179	BRK	FTB		4	51	0	DEL	FTB	
		5	178	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		177			150	AVG:	50				20
	STD. DEV.		2				STD. DEV.	2				
DT-224(22)	84665	1	177	BRK	FTB		1	57	0	DEL	FTB	
P132/199		2	174	BRK	FTB		2	60	0	DEL	FTB	
		3	173	BRK	FTB		3	61	0	DEL	FTB	
		4	177	BRK	FTB		4	60	0	DEL	FTB	
		5	177	BRK	FTB		5	61	0	DEL	FTB	
	AVG:		175			150	AVG:	60				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 6.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-284(65)	**84666**	1	175	BRK	FTB		1	53	0	DEL	FTB	
P93/CAP		2	175	BRK	FTB		2	52	0	DEL	FTB	
		3	178	BRK	FTB		3	51	0	DEL	FTB	
		4	175	BRK	FTB		4	51	0	DEL	FTB	
		5	173	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		**175**			*150*	***AVG:***	**52**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**1**				
DT-283(64)	**84667**	1	174	BRK	FTB		1	54	0	DEL	FTB	
P74/CAP		2	182	BRK	FTB		2	56	0	DEL	FTB	
		3	180	BRK	FTB		3	55	0	DEL	FTB	
		4	189	BRK	FTB		4	50	0	DEL	FTB	
		5	178	BRK	FTB		5	50	0	DEL	FTB	
	AVG:		**181**			*150*	***AVG:***	**53**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**3**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 7.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-220(18) A P116/155	84668	1	179	BRK	FTB		1	54	0	DEL	FTB	
		2	181	BRK	FTB		2	53	0	DEL	FTB	
		3	176	BRK	FTB		3	50	0	DEL	FTB	
		4	173	BRK	FTB		4	52	0	DEL	FTB	
		5	185	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		179			150	AVG:	52				20
	STD. DEV.		5				STD. DEV.	2				
DT-282(63) P69/CAP	84669	1	177	BRK	FTB		1	57	0	DEL	FTB	
		2	177	BRK	FTB		2	60	0	DEL	FTB	
		3	172	BRK	FTB		3	60	0	DEL	FTB	
		4	178	BRK	FTB		4	61	0	DEL	FTB	
		5	175	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		176			150	AVG:	59				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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 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 8.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-281(62) P59/CAP	84670	1	183	BRK	FTB		1	53	0	DEL	FTB	
		2	183	BRK	FTB		2	57	0	DEL	FTB	
		3	180	BRK	FTB		3	50	0	DEL	FTB	
		4	180	BRK	FTB		4	52	0	DEL	FTB	
		5	183	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		182			150	AVG:	53				20
	STD. DEV.		2				STD. DEV.	3				
DT-286(67) P157/CAP	84671	1	178	BRK	FTB		1	61	0	DEL	FTB	
		2	174	BRK	FTB		2	57	0	DEL	FTB	
		3	171	BRK	FTB		3	57	0	DEL	FTB	
		4	180	BRK	FTB		4	55	0	DEL	FTB	
		5	182	BRK	FTB		5	50	0	DEL	FTB	
	AVG:		177			150	AVG:	56				20
	STD. DEV.		4				STD. DEV.	4				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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 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 9.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-280(61) P53/CAP	84672	1	191	BRK	FTB		1	55	0	DEL	FTB	
		2	192	BRK	FTB		2	54	0	DEL	FTB	
		3	197	BRK	FTB		3	50	0	DEL	FTB	
		4	185	BRK	FTB		4	57	0	DEL	FTB	
		5	186	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		190			150	AVG:	55				20
	STD. DEV.		5				STD. DEV.	3				
DT-279(60) P21/CAP	84673	1	201	BRK	FTB		1	50	0	DEL	FTB	
		2	201	BRK	FTB		2	51	0	DEL	FTB	
		3	195	BRK	FTB		3	50	0	DEL	FTB	
		4	186	BRK	FTB		4	47	0	DEL	FTB	
		5	181	BRK	FTB		5	47	0	DEL	FTB	
	AVG:		193			150	AVG:	49				20
	STD. DEV.		9				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 9)

(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.

TABLE 10.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-285(66) P12/CAP	84674	1	180	BRK	FTB		1	50	0	DEL	FTB	
		2	192	BRK	FTB		2	51	0	DEL	FTB	
		3	188	BRK	FTB		3	53	0	DEL	FTB	
		4	191	BRK	FTB		4	50	0	DEL	FTB	
		5	184	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		187			150	AVG:	51				20
	STD. DEV.		5				STD. DEV.	1				
DT-273(54) P583/584	84675	1	177	BRK	FTB		1	58	0	DEL	FTB	
		2	175	BRK	FTB		2	54	0	DEL	FTB	
		3	181	BRK	FTB		3	50	0	DEL	FTB	
		4	183	BRK	FTB		4	51	0	DEL	FTB	
		5	183	BRK	FTB		5	51	0	DEL	FTB	
	AVG:		180			150	AVG:	53				20
	STD. DEV.		4				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 10)

(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.

TABLE 11.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-289(70)	84676	1	193	BRK	FTB		1	50	0	DEL	FTB	
P666/667		2	188	BRK	FTB		2	50	0	DEL	FTB	
		3	190	BRK	FTB		3	51	0	DEL	FTB	
		4	175	BRK	FTB		4	52	0	DEL	FTB	
		5	175	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		184			150	AVG:	51				20
	STD. DEV.		9				STD. DEV.	1				
DT-276(57)	84677	1	191	BRK	FTB		1	53	0	DEL	FTB	
P603/604		2	191	BRK	FTB		2	50	0	DEL	FTB	
		3	193	BRK	FTB		3	52	0	DEL	FTB	
		4	192	BRK	FTB		4	57	0	DEL	FTB	
		5	186	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		191			150	AVG:	54				20
	STD. DEV.		3				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 11)

(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.

TABLE 12.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-288(69) P682/683	84678	1	176	BRK	FTB		1	47	0	DEL	FTB	
		2	174	BRK	FTB		2	52	0	DEL	FTB	
		3	176	BRK	FTB		3	51	0	DEL	FTB	
		4	175	BRK	FTB		4	53	0	DEL	FTB	
		5	178	BRK	FTB		5	54	0	DEL	FTB	
	AVG.		176			150	AVG:	51				20
	STD. DEV.		2				STD. DEV.	3				
DT-277(58) P613/614	84679	1	174	BRK	FTB		1	56	0	DEL	FTB	
		2	175	BRK	FTB		2	54	0	DEL	FTB	
		3	176	BRK	FTB		3	50	0	DEL	FTB	
		4	175	BRK	FTB		4	54	0	DEL	FTB	
		5	174	BRK	FTB		5	60	0	DEL	FTB	
	AVG:		175			150	AVG:	55				20
	STD. DEV.		1				STD. DEV.	4				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 12)

(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.

TABLE 13.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **5-Aug-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121015**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **5-Aug-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-272(53)	84680	1	187	BRK	FTB		1	50	0	DEL	FTB	
P528/529		2	187	BRK	FTB		2	52	0	DEL	FTB	
		3	179	BRK	FTB		3	51	0	DEL	FTB	
		4	181	BRK	FTB		4	51	0	DEL	FTB	
		5	177	BRK	FTB		5	55	0	DEL	FTB	
	AVG.		182			150	AVG:	52				20
	STD. DEV.		4				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 13)

(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.

ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 09/06/12

DATE REPORTED: 09/06/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 09/06/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 2.3 HOURS 72 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-293A (22A)	097375/ DT-293 (22A) P1-P40	F	T	Load (ppi)	128	120	129	123	132	126	4.9	163	161	158	160	159	160	1.7
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	BRK	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								839	712	589	790	757		
			B	Load (ppi)	108	116	117	125	123	118	6.7							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														
DT-294 (23)	097375/ DT-294 (23) P43-P44	F	T	Load (ppi)	123	114	121	122	129	121	5.3	173	172	173	172	172	172	0.6
				Mode	SE1	SE1	SE1	SE1	SE1			SE1	SE1	SE1	SE1	SE1		
				Peel (%)	0	0	0	0	0									
				Shear (%)								1028	741	873	755	1000		
			B	Load (ppi)	132	112	130	134	133	128	9.1							
				Mode	SE1	SE1	SE1	SE1	SE1									
				Peel (%)	0	0	0	0	0									
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld
(1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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.

GAI-LAP
Initials: JCW No.: 43-01
Date: 09/06/12

Checked By: [signature] Date: 9/6/12

Form R-4:Rev.1

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ARDAMAN & ASSOCIATES, INC. GEOSYNTHETICS LABORATORY

GEOMEMBRANE FIELD SEAM DESTRUCTIVE TEST REPORT
ASTM STANDARD D6392

CLIENT: HDR, Inc.

PROJECT: Sarasota Co. Phase I Landfill

FILE NO.: 09-36-7375

DATE TESTED: 09/06/12

DATE REPORTED: 09/06/12

GEOMEMBRANE TYPE: 60-mil HDPE

DATE SAMPLES RECEIVED: 09/06/12

CROSS-HEAD SPEED: Peel: ☒ 2 in/min ☐ 20 in/min
Shear: ☒ 2 in/min ☐ 20 in/min

CONDITIONING: 2.1 HOURS 72 °F 40 %RH

Incoming Sample No.	Laboratory Identification Number	Weld Type	Weld	Item	Peel Test 1	Peel Test 2	Peel Test 3	Peel Test 4	Peel Test 5	Peel Test Avg.	Peel Test Std. Dev.	Shear Test 1	Shear Test 2	Shear Test 3	Shear Test 4	Shear Test 5	Shear Test Avg.	Shear Test Std. Dev.
DT-295 (24)	097375/ DT-295 (24) P42 Tie-In	E	T	Load (ppi)	136	133	125	104	107	121	15.0	148	142	146	137	156	146	7.2
				Mode	SE3	SE3	AD-BRK	SE3	SE3			SE2	SE2	SE2	SE2	BRK2		
				Peel (%)	0	0	10	0	0									
				Shear (%)								164	178	141	154	291		
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														
				Load (ppi)														
				Mode														
				Peel (%)														
				Shear (%)														

Comments: Weld Type: F = Double-Wedge Fusion Weld; E = Extrusion Weld
Weld: T = Top Weld; B = Bottom Weld
(1) ASTM D 6392 defines shear test completion at 50% elongation, however, shear tests were continued until break. The strain rate was changed from 2"/minute to 20"/minute after 200% elongation.

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.

GAI-LAP
Initials: JCW No.: 43-01
Date: 09/06/12

Checked By: [illegible] Date: 9/6/12

Form R-4:Rev.1

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Precision Geosvnthetic Laboratories International
A Texas Research International Company

September 11, 2012

GAI-LAP
Initial: CVZ #:0.13
DATE: 09/11/2012

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 Seam testing of eight (8) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf

DATE REPORTED: **September 11, 2012**

REFERENCE PGLI JOB NO.: G121041

DATE RECEIVED: September 11, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-297 (76) P751.P772	84799
2. DT-298 (77) P781.P782	84800
3. DT-299 (78) P764.P778	84801
4. DT-300 (79) P795.P797	84802
5. DT-301 (80) P798.P799	84803
6. DT-296 (75) P744.P765	84804
7. DT-303 (82) P827.P828	84805
8. DT-307 (86) P901.P902	84806

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST RESULTS: The test results are summarized in Tables 1 to 4.

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. ***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 longer time, please advise us in writing.

5 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121041**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-297(76)	84799	1	189	BRK	FTB		1	61	0	DEL	FTB	
P751.P772		2	191	BRK	FTB		2	57	0	DEL	FTB	
		3	189	BRK	FTB		3	58	0	DEL	FTB	
		4	192	BRK	FTB		4	59	0	DEL	FTB	
		5	184	BRK	FTB		5	55	0	DEL	FTB	
	AVG.		189			150	AVG:	58				20
	STD. DEV.		3				STD. DEV.	2				
DT-298(77)	84800	1	195	BRK	FTB		1	54	0	DEL	FTB	
P781.P782		2	189	BRK	FTB		2	50	0	DEL	FTB	
		3	184	BRK	FTB		3	58	0	DEL	FTB	
		4	194	BRK	FTB		4	58	0	DEL	FTB	
		5	193	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		191			150	AVG:	55				20
	STD. DEV.		4				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121041**

QC'd By: Maria Cepitis
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-299(78)	84801	1	184	BRK	FTB		1	54	0	DEL	FTB	
P764.P778		2	189	BRK	FTB		2	50	0	DEL	FTB	
		3	191	BRK	FTB		3	55	0	DEL	FTB	
		4	188	BRK	FTB		4	56	0	DEL	FTB	
		5	187	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		188			150	AVG:	54				20
	STD. DEV.		2				STD. DEV.	3				
DT-300(79)	84802	1	189	BRK	FTB		1	48	0	DEL	FTB	
P795.797		2	191	BRK	FTB		2	50	0	DEL	FTB	
		3	193	BRK	FTB		3	51	0	DEL	FTB	
		4	191	BRK	FTB		4	53	0	DEL	FTB	
		5	187	BRK	FTB		5	52	0	DEL	FTB	
	AVG:		190			150	AVG:	51				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121041**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-301(80)	84803	1	189	BRK	FTB		1	47	0	DEL	FTB	
P798.799		2	191	BRK	FTB		2	53	0	DEL	FTB	
		3	194	BRK	FTB		3	51	0	DEL	FTB	
		4	189	BRK	FTB		4	50	0	DEL	FTB	
		5	191	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		191			150	AVG:	50				20
	STD. DEV.		2				STD. DEV.	2				
DT-296(75)	84804	1	186	BRK	FTB		1	54	0	DEL	FTB	
P744.765		2	188	BRK	FTB		2	52	0	DEL	FTB	
		3	193	BRK	FTB		3	51	0	DEL	FTB	
		4	191	BRK	FTB		4	53	0	DEL	FTB	
		5	190	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		189			150	AVG:	53				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121041**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-303(82)	84805	1	184	BRK	FTB		1	61	0	DEL	FTB	
P827.P828		2	194	BRK	FTB		2	60	0	DEL	FTB	
		3	196	BRK	FTB		3	63	0	DEL	FTB	
		4	193	BRK	FTB		4	62	0	DEL	FTB	
		5	189	BRK	FTB		5	60	0	DEL	FTB	
	AVG.		191			150	AVG:	61				20
	STD. DEV.		5				STD. DEV.	1				
DT-307(86)	84806	1	184	BRK	FTB		1	62	0	DEL	FTB	
P901.P902		2	187	BRK	FTB		2	60	0	DEL	FTB	
		3	185	BRK	FTB		3	62	0	DEL	FTB	
		4	189	BRK	FTB		4	58	0	DEL	FTB	
		5	188	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		186			150	AVG:	60				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

September 14, 2012

Initial: CVZ #:0.13
DATE: 09/14/2012

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 Seam testing of four (4) 60 mil TPO Seam samples.

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

REFERENCE PGLI JOB NO.: G121054

DATE RECEIVED: September 14, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-302 (81) P814.P815	84882
2. DT-304 (83) P844.P845	84883
3. DT-305 (84) P864.P865	84884
4. DT-306 (85) P884.P885	84885

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

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

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. ***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 longer time, please advise us in writing.

3 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **14-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121054**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **14-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-302 (81)	84882	1	189	BRK	FTB		1	52	0	DEL	FTB	
P814-P815		2	186	BRK	FTB		2	54	0	DEL	FTB	
		3	193	BRK	FTB		3	60	0	DEL	FTB	
		4	186	BRK	FTB		4	58	0	DEL	FTB	
		5	188	BRK	FTB		5	59	0	DEL	FTB	
	AVG.		188			150	AVG:	57				20
	STD. DEV.		3				STD. DEV.	3				
DT-304 (83)	84883	1	196	BRK	FTB		1	59	0	DEL	FTB	
P844-P845		2	194	BRK	FTB		2	59	0	DEL	FTB	
		3	191	BRK	FTB		3	60	0	DEL	FTB	
		4	190	BRK	FTB		4	62	0	DEL	FTB	
		5	188	BRK	FTB		5	61	0	DEL	FTB	
	AVG:		192			150	AVG:	60				20
	STD. DEV.		3				STD. DEV.	1				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **14-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121054**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **14-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-305 (84)	84884	1	185	BRK	FTB		1	46	0	DEL	FTB	
P864-P865		2	185	BRK	FTB		2	50	0	DEL	FTB	
		3	188	BRK	FTB		3	52	0	DEL	FTB	
		4	184	BRK	FTB		4	53	0	DEL	FTB	
		5	188	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		186			150	AVG:	50				20
	STD. DEV.		2				STD. DEV.	3				
DT-306 (85)	84885	1	188	BRK	FTB		1	56	0	DEL	FTB	
P884-P885		2	184	BRK	FTB		2	57	0	DEL	FTB	
		3	186	BRK	FTB		3	55	0	DEL	FTB	
		4	186	BRK	FTB		4	54	0	DEL	FTB	
		5	185	BRK	FTB		5	51	0	DEL	FTB	
	AVG:		186			150	AVG:	55				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

September 19, 2012

Initial: CVZ #:0.13
DATE: 09/19/2012

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 Seam testing of eleven (11) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **September 19, 2012**

REFERENCE PGLI JOB NO.: G121070

DATE RECEIVED: September 19, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-321 (100) P1027-P1030	87047
2. DT-320 (99) P1024-P1025	87048
3. DT-319 (98) P1025-P1026	87049
4. DT-317 (96) P949-P950	87050
5. DT-316 (95) P1047-P1049	87051
6. DT-315 (94) P1046-P1048	87052
7. DT-314 (93) P1041-P1042	87053
8. DT-311 (90) P956-P957	87054
9. DT-310 (89) P925-P926	87055
10. DT-309 (88) P918-P919	87056
11. DT-308 (87) P919-P921	87057

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

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. ***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 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 6.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121070**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-308(87)	87057	1	187	BRK	FTB		1	53	0	DEL	FTB	
P919-P921		2	185	BRK	FTB		2	54	0	DEL	FTB	
		3	188	BRK	FTB		3	56	0	DEL	FTB	
		4	186	BRK	FTB		4	57	0	DEL	FTB	
		5	187	BRK	FTB		5	59	0	DEL	FTB	
	AVG.		186			150	AVG:	56				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121070**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-310(89)	87055	1	188	BRK	FTB		1	48	0	DEL	FTB	
P925-P926		2	184	BRK	FTB		2	52	0	DEL	FTB	
		3	186	BRK	FTB		3	56	0	DEL	FTB	
		4	187	BRK	FTB		4	53	0	DEL	FTB	
		5	188	BRK	FTB		5	58	0	DEL	FTB	
	AVG.		186			150	AVG:	53				20
	STD. DEV.		1				STD. DEV.	4				
DT-309(88)	87056	1	188	BRK	FTB		1	57	0	DEL	FTB	
P918-P919		2	186	BRK	FTB		2	52	0	DEL	FTB	
		3	188	BRK	FTB		3	58	0	DEL	FTB	
		4	190	BRK	FTB		4	60	0	DEL	FTB	
		5	191	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		188			150	AVG:	57				20
	STD. DEV.		2				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121070**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-314(93)	87053	1	188	BRK	FTB		1	55	0	DEL	FTB	
P1041-P1042		2	190	BRK	FTB		2	50	0	DEL	FTB	
		3	190	BRK	FTB		3	58	0	DEL	FTB	
		4	190	BRK	FTB		4	53	0	DEL	FTB	
		5	189	BRK	FTB		5	58	0	DEL	FTB	
	AVG.		189			150	AVG:	55				20
	STD. DEV.		1				STD. DEV.	3				
DT-311(90)	87054	1	188	BRK	FTB		1	57	0	DEL	FTB	
P956-P957		2	189	BRK	FTB		2	58	0	DEL	FTB	
		3	188	BRK	FTB		3	60	0	DEL	FTB	
		4	190	BRK	FTB		4	59	0	DEL	FTB	
		5	191	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		189			150	AVG:	58				20
	STD. DEV.		1				STD. DEV.	1				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121070**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-316(95)	87051	1	184	BRK	FTB		1	60	0	DEL	FTB	
P1047-P1049		2	185	BRK	FTB		2	57	0	DEL	FTB	
		3	188	BRK	FTB		3	57	0	DEL	FTB	
		4	188	BRK	FTB		4	56	0	DEL	FTB	
		5	186	BRK	FTB		5	55	0	DEL	FTB	
	AVG.		186			150	AVG:	57				20
	STD. DEV.		2				STD. DEV.	2				
DT-315(94)	87052	1	185	BRK	FTB		1	57	0	DEL	FTB	
P1046-P1048		2	185	BRK	FTB		2	58	0	DEL	FTB	
		3	188	BRK	FTB		3	59	0	DEL	FTB	
		4	186	BRK	FTB		4	61	0	DEL	FTB	
		5	187	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		186			150	AVG:	58				20
	STD. DEV.		1				STD. DEV.	1				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121070**

QC'd By: Maria Cepitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-319(98)	**87049**	1	185	BRK	FTB		1	53	0	DEL	FTB	
P1025-P1026		2	185	BRK	FTB		2	54	0	DEL	FTB	
		3	189	BRK	FTB		3	50	0	DEL	FTB	
		4	188	BRK	FTB		4	51	0	DEL	FTB	
		5	187	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		**187**			*150*	***AVG:***	**52**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**2**				
DT-317(96)	**87050**	1	188	BRK	FTB		1	53	0	DEL	FTB	
P949-P950		2	189	BRK	FTB		2	54	0	DEL	FTB	
		3	190	BRK	FTB		3	50	0	DEL	FTB	
		4	190	BRK	FTB		4	54	0	DEL	FTB	
		5	190	BRK	FTB		5	55	0	DEL	FTB	
	AVG:		**189**			*150*	***AVG:***	**53**				*20*
	STD. DEV.		**1**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 2)

(Sheet 1 of 1)

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TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **19-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121070**

QC'd By: Maria Cipitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **19-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-321(100)	**87047**	1	184	BRK	FTB		1	60	0	DEL	FTB	
P1027-P1030		2	188	BRK	FTB		2	59	0	DEL	FTB	
		3	185	BRK	FTB		3	61	0	DEL	FTB	
		4	186	BRK	FTB		4	62	0	DEL	FTB	
		5	188	BRK	FTB		5	61	0	DEL	FTB	
	AVG.		**186**			*150*	***AVG:***	**61**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**1**				
DT-320(99)	**87048**	1	188	BRK	FTB		1	61	0	DEL	FTB	
P1024-P1025		2	191	BRK	FTB		2	62	0	DEL	FTB	
		3	188	BRK	FTB		3	62	0	DEL	FTB	
		4	189	BRK	FTB		4	61	0	DEL	FTB	
		5	187	BRK	FTB		5	56	0	DEL	FTB	
	AVG:		**188**			*150*	***AVG:***	**60**				*20*
	STD. DEV.		**1**				*STD. DEV.*	**3**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 1)

(Sheet 1 of 1)

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Precision Geosynthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 09/21/2012

September 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 Seam testing of twelve (12) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **September 21, 2012**

REFERENCE PGLI JOB NO.: G121080

DATE RECEIVED: September 21, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-322 (101) P165-P918	87102
2. DT-323 (102) P926-P555	87103
3. DT-312 (91) P968-P969	87104
4. DT-331 (110) P314-P1026	87105
5. DT-334 (113) P1013-P1014	87106
6. DT-313 (92) P989-P990	87107
7. DT-318 (97) P946-P947	87108
8. DT-329 (108) P876-P987	87109
9. DT-330 (109) P1028-P803	87110
10. DT-327 (106) P956-P907	87111
11. DT-333 (112) P748-P835	87112
12. DT-332 (111) P947-P252	87113

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

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

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. 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. ***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 longer time, please advise us in writing.

7 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **21-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121080**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **21-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-322(101)	**87102**	1	160	BRK	FTB		1	65	0	DEL	FTB	
P165-P918		2	170	BRK	FTB		2	63	0	DEL	FTB	
		3	168	BRK	FTB		3	64	0	DEL	FTB	
		4	161	BRK	FTB		4	65	0	DEL	FTB	
		5	163	BRK	FTB		5	66	0	DEL	FTB	
	AVG.		**164**			*150*	***AVG:***	**64**				*20*
	STD. DEV.		**4**				*STD. DEV.*	**1**				
DT-323(102)	**87103**	1	155	BRK	FTB		1	61	0	DEL	FTB	
P926-P555		2	150	BRK	FTB		2	59	0	DEL	FTB	
		3	146	BRK	FTB		3	62	0	DEL	FTB	
		4	141	BRK	FTB		4	62	0	DEL	FTB	
		5	150	BRK	FTB		5	66	0	DEL	FTB	
	AVG:		**148**			*150*	***AVG:***	**62**				*20*
	STD. DEV.		**5**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 1)

(Sheet 1 of 1)

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TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **21-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121080**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **21-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-312(91)	**87104**	1	176	BRK	FTB		1	62	0	DEL	FTB	
P968-P969		2	173	BRK	FTB		2	57	0	DEL	FTB	
		3	172	BRK	FTB		3	54	0	DEL	FTB	
		4	174	BRK	FTB		4	55	0	DEL	FTB	
		5	178	BRK	FTB		5	55	0	DEL	FTB	
	AVG.		**175**			*150*	***AVG:***	**57**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**3**				
DT-331(110)	**87105**	1	131	BRK	FTB		1	***27***	***100%***	***AD***	***Non-FTB***	
P314-P1026		2	130	BRK	FTB		2	***32***	***100%***	***AD***	***Non-FTB***	
		3	128	BRK	FTB		3	***21***	***100%***	***AD***	***Non-FTB***	
		4	131	BRK	FTB		4	***18***	***100%***	***AD***	***Non-FTB***	
		5	125	BRK	FTB		5	***26***	***100%***	***AD***	***Non-FTB***	
	AVG:		**129**			*150*	***AVG:***	**25**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**6**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 2)

(Sheet 1 of 1)

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TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **21-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121080**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **21-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-334(113)	87106	1	178	BRK	FTB		1	51	0	DEL	FTB	
P1013-P1014		2	171	BRK	FTB		2	59	0	DEL	FTB	
		3	177	BRK	FTB		3	53	0	DEL	FTB	
		4	183	BRK	FTB		4	53	0	DEL	FTB	
		5	175	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		177			150	AVG:	53				20
	STD. DEV.		4				STD. DEV.	4				
DT-313(92)	87107	1	195	BRK	FTB		1	47	0	DEL	FTB	
P989-P990		2	196	BRK	FTB		2	59	0	DEL	FTB	
		3	188	BRK	FTB		3	58	0	DEL	FTB	
		4	181	BRK	FTB		4	52	0	DEL	FTB	
		5	176	BRK	FTB		5	49	0	DEL	FTB	
	AVG:		187			150	AVG:	53				20
	STD. DEV.		9				STD. DEV.	5				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 3)

(Sheet 1 of 1)

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TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **21-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121080**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **21-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-318(97)	**87108**	1	189	BRK	FTB		1	45	0	DEL	FTB	
P946-P947		2	187	BRK	FTB		2	45	0	DEL	FTB	
		3	186	BRK	FTB		3	54	0	DEL	FTB	
		4	185	BRK	FTB		4	46	0	DEL	FTB	
		5	184	BRK	FTB		5	49	0	DEL	FTB	
	AVG.		**186**			*150*	***AVG:***	**48**				*20*
	STD. DEV.		**2**				*STD. DEV.*	**4**				
DT-329(108)	**87109**	1	153	BRK	FTB		1	***53***	***100%***	***AD***	***Non-FTB***	
P876-P987		2	158	BRK	FTB		2	***44***	***100%***	***AD***	***Non-FTB***	
		3	150	BRK	FTB		3	***49***	***100%***	***AD***	***Non-FTB***	
		4	152	BRK	FTB		4	***51***	***100%***	***AD***	***Non-FTB***	
		5	155	BRK	FTB		5	***72***	***75%***	***AD-DEL***	***FTB***	
	AVG:		**154**			*150*	***AVG:***	**53**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**11**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 4)

(Sheet 1 of 1)

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TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **21-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121080**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **21-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-330(109)	87110	1	170	BRK	FTB		1	42	100%	AD	Non-FTB	
P1028-P803		2	172	BRK	FTB		2	59	50%	AD-DEL	FTB	
		3	171	BRK	FTB		3	34	100%	AD	Non-FTB	
		4	177	BRK	FTB		4	30	100%	AD	Non-FTB	
		5	187	BRK	FTB		5	60	50%	AD-DEL	FTB	
	AVG.		175			150	AVG:	45				20
	STD. DEV.		7				STD. DEV.	14				
DT-327(106)	87111	1	113	BRK	FTB		1	63	25%	AD-DEL	FTB	
P956-P907		2	114	BRK	FTB		2	60	25%	AD-DEL	FTB	
		3	116	BRK	FTB		3	56	25%	AD-DEL	FTB	
		4	116	BRK	FTB		4	42	75%	AD-DEL	FTB	
		5	116	BRK	FTB		5	56	50%	AD-DEL	FTB	
	AVG:		115			150	AVG:	55				20
	STD. DEV.		1				STD. DEV.	8				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 6.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **21-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121080**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **21-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-333(112)	**87112**	1	137	BRK	FTB		1	60	0	DEL	FTB	
P748-P835		2	149	BRK	FTB		2	59	0	DEL	FTB	
		3	139	BRK	FTB		3	62	0	DEL	FTB	
		4	141	BRK	FTB		4	61	0	DEL	FTB	
		5	152	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		**144**			*150*	***AVG:***	**60**				*20*
	STD. DEV.		**6**				*STD. DEV.*	**2**				
DT-332(111)	**87113**	1	153	BRK	FTB		1	65	0	DEL	FTB	
P947-P252		2	155	BRK	FTB		2	66	0	DEL	FTB	
		3	150	BRK	FTB		3	70	0	DEL	FTB	
		4	155	BRK	FTB		4	64	0	DEL	FTB	
		5	158	BRK	FTB		5	***68***	***75%***	***AD-DEL***	***FTB***	
	AVG:		**154**			*150*	***AVG:***	**67**				*20*
	STD. DEV.		**3**				*STD. DEV.*	**3**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

September 24, 2012

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

GAI-LAP
Initial: CVZ #:0.13
DATE: 09/24/2012

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 Seam testing of four (4) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **September 24, 2012**

REFERENCE PGLI JOB NO.: G121084

DATE RECEIVED: September 24, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*
1. DT-324 (103) P664-P599	87135
2. DT-325 (104) P522-P623	87136
3. DT-326 (105) P580-P434	87137
4. DT-328 (107) P880-P819	87138

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

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

Respectfully,

PRECISION GEOSYNTHETIC LABORATORIES INTERNATIONAL

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. 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)ob 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 longer time, please advise us in writing.

3 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **24-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121084**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **24-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-324(103)	87135	1	186	BRK	FTB		1	41	0	DEL	FTB	
P664-P599		2	184	BRK	FTB		2	51	0	DEL	FTB	
		3	191	BRK	FTB		3	53	0	DEL	FTB	
		4	189	BRK	FTB		4	51	0	DEL	FTB	
		5	188	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		187			150	AVG:	49				20
	STD. DEV.		3				STD. DEV.	5				
DT-325(104)	87136	1	185	BRK	FTB		1	55	0	DEL	FTB	
P522-P623		2	188	BRK	FTB		2	58	0	DEL	FTB	
		3	184	BRK	FTB		3	52	0	DEL	FTB	
		4	188	BRK	FTB		4	51	0	DEL	FTB	
		5	191	BRK	FTB		5	54	0	DEL	FTB	
	AVG:		187			150	AVG:	54				20
	STD. DEV.		3				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **24-Sep-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Fusion Weld**
PGL JOB #: **G121084**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **24-Sep-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL # 30000	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-326(105)	87137	1	191	BRK	FTB		1	59	0	DEL	FTB	
P580-P434		2	189	BRK	FTB		2	56	0	DEL	FTB	
		3	184	BRK	FTB		3	49	0	DEL	FTB	
		4	191	BRK	FTB		4	52	0	DEL	FTB	
		5	193	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		189			150	AVG:	53				20
	STD. DEV.		3				STD. DEV.	4				
DT-328(108)	87138	1	189	BRK	FTB		1	50	0	DEL	FTB	
P880-P819		2	192	BRK	FTB		2	51	0	DEL	FTB	
		3	194	BRK	FTB		3	53	0	DEL	FTB	
		4	185	BRK	FTB		4	50	0	DEL	FTB	
		5	188	BRK	FTB		5	48	0	DEL	FTB	
	AVG:		189			150	AVG:	50				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosynthetic Laboratories International
A Texas Research International Company

October 11, 2012

Initial: CVZ #:0.13
DATE: 10/11/2012

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 Seam testing of twenty-five (25) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf

DATE REPORTED: **October 11, 2012**

REFERENCE PGLI JOB NO.: G121142

DATE RECEIVED: October 11, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*	*SAMPLE ID*	*PGLI CONTROL NUMBER*
1. DT-331A(110A) P1026/282	87529	14. DT-344(123) P1126/1127	87542
2. DT-331B(110B) P1026/317	87530	15. DT-345(124) P1140/546	87543
3. DT-327A(106A) P955/905	87531	16. DT-346(125) P1141/587	87544
4. DT-327B(106B) P958/909	87532	17. DT-347(126) P653/1146	87545
5. DT-335(114) P207/1095	87533	18. DT-348(127) P1150/1149	87546
6. DT-336(115) P1094/1096	87534	19. DT-349(128) P508/1154	87547
7. DT-337(116) P199/1095	87535	20. DT-350(129) P1184/1155	87548
8. DT-338(117) P1097/1099	87536	21. DT-351(130) P1170/1169	87549
9. DT-339(118) P190/1098	87537	22. DT-352(131) P1174/1175	87550
10. DT-340(119) P186/1098	87538	23. DT-353(132) P1175/459	87551
11. DT-341(120) P119/1102	87539	24. DT-354(133) P1179/443	87552
12. DT-342(121) P1112/1113	87540	25. DT-355(134) P1182/1183	87553
13. DT-343(122) P1135/552	87541		

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

TEST RESULTS: The test results are summarized in Tables 1 to 13.

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. ***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 longer time, please advise us in writing.

14 Pages Total

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-327A (106A) P955/P905	87531	1	185	BRK	FTB		1	56	0	DEL	FTB	
		2	184	BRK	FTB		2	57	0	DEL	FTB	
		3	181	BRK	FTB		3	55	0	DEL	FTB	
		4	191	BRK	FTB		4	59	0	DEL	FTB	
		5	185	BRK	FTB		5	60	0	DEL	FTB	
	AVG.		185			150	AVG:	57				20
	STD. DEV.		4				STD. DEV.	2				
DT-327B (106B) P958/P909	87532	1	184	BRK	FTB		1	57	0	DEL	FTB	
		2	184	BRK	FTB		2	57	0	DEL	FTB	
		3	186	BRK	FTB		3	58	0	DEL	FTB	
		4	187	BRK	FTB		4	60	0	DEL	FTB	
		5	187	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		186			150	AVG:	58				20
	STD. DEV.		2				STD. DEV.	1				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-331A (110A) P1026/P282	87529	1	184	BRK	FTB		1	61	0	DEL	FTB	
		2	194	BRK	FTB		2	59	0	DEL	FTB	
		3	188	BRK	FTB		3	55	0	DEL	FTB	
		4	188	BRK	FTB		4	56	0	DEL	FTB	
		5	185	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		188			150	AVG:	56				20
	STD. DEV.		4				STD. DEV.	4				
DT-331B (110B) P1026/P317	87530	1	191	BRK	FTB		1	63	0	DEL	FTB	
		2	184	BRK	FTB		2	61	0	DEL	FTB	
		3	185	BRK	FTB		3	62	0	DEL	FTB	
		4	186	BRK	FTB		4	57	0	DEL	FTB	
		5	188	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		187			150	AVG:	60				20
	STD. DEV.		3				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 3.
QUALITY ASSURANCE
SEAM PEEL AND SHEAR TE

CLIENT: ***Ardaman & Associates, Inc.***
PROJECT: ***Sarasota Landfill***
DATE REC'D: ***11-Oct-12***

MATERIAL: ***TPO Seam (2***
SEAM TYPE: ***Hot Air Weld***
PGL JOB #: ***G121142***

By: Maria Espitia
D: ***ASTM D751/ D413 NSF MOD***
D: ***11-Oct-12***

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							***1" x 8" SPECIMENS, Strain Rate: 2"/ min***					
	SHEAR EVALUATION						***L EVALUATION***					
SAMPLE ID	*PGLI CONTROL #*	*SPECIMEN NUMBER*	*MAXIMUM STRENGTH (lb/in)*	*LOCUS of BREAK*	*CLASSIFICATION*	*PROJECT SPEC. (lbs)*	*SPE NUMBER*	*(lb/in width)*	*...ONSION %*	*LOCUS of BREAK*	*CLASSIFICATION*	*PROJECT SPEC. (lb/in width)*
DT-335 (114)	**87533**	1	194	BRK	FTB		1	57	0	DEL	FTB	
P207/P1095		2	194	BRK	FTB		2	57	0	DEL	FTB	
		3	191	BRK	FTB		3	56	0	DEL	FTB	
		4	190	BRK	FTB		4	55	0	DEL	FTB	
		5	185	BRK	FTB		5	54	0	DEL	FTB	
	AVG.		**190**			*150*	***AVG:***	**56**				*20*
	STD. DEV.		**4**				*STD. DEV.*	**1**				
DT-336 (115)	**87534**	1	187	BRK	FTB		1	54	0	DEL	FTB	
P1094/P1096		2	188	BRK	FTB		2	57	0	DEL	FTB	
		3	190	BRK	FTB		3	57	0	DEL	FTB	
		4	188	BRK	FTB		4	59	0	DEL	FTB	
		5	186	BRK	FTB		5	60	0	DEL	FTB	
	AVG:		**188**			*150*	***AVG:***	**57**				*20*
	STD. DEV.		**1**				*STD. DEV.*	**2**				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-337 (116)	87535	1	185	BRK	FTB		1	60	0	DEL	FTB	
P199/P1095		2	188	BRK	FTB		2	62	0	DEL	FTB	
		3	188	BRK	FTB		3	59	0	DEL	FTB	
		4	186	BRK	FTB		4	60	0	DEL	FTB	
		5	187	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		187			150	AVG:	60				20
	STD. DEV.		1				STD. DEV.	2				
DT-338 (117)	87536	1	184	BRK	FTB		1	55	0	DEL	FTB	
P1097/P1099		2	185	BRK	FTB		2	54	0	DEL	FTB	
		3	188	BRK	FTB		3	59	0	DEL	FTB	
		4	188	BRK	FTB		4	61	0	DEL	FTB	
		5	185	BRK	FTB		5	62	0	DEL	FTB	
	AVG:		186			150	AVG:	58				20
	STD. DEV.		2				STD. DEV.	4				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	'ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-339 (118)	87537	1	185	BRK	FTB		1	53	0	DEL	FTB	
P190/P1098		2	188	BRK	FTB		2	59	0	DEL	FTB	
		3	188	BRK	FTB		3	60	0	DEL	FTB	
		4	185	BRK	FTB		4	61	0	DEL	FTB	
		5	191	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		187			150	AVG:	58				20
	STD. DEV.		2				STD. DEV.	3				
DT-340 (119)	87538	1	184	BRK	FTB		1	56	0	DEL	FTB	
P186/P1098		2	185	BRK	FTB		2	58	0	DEL	FTB	
		3	187	BRK	FTB		3	59	0	DEL	FTB	
		4	186	BRK	FTB		4	59	0	DEL	FTB	
		5	185	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		185			150	AVG:	58				20
	STD. DEV.		1				STD. DEV.	1				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 6.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-341 (120)	87539	1	184	BRK	FTB		1	49	0	DEL	FTB	
P119/P1102		2	188	BRK	FTB		2	58	0	DEL	FTB	
		3	188	BRK	FTB		3	52	0	DEL	FTB	
		4	185	BRK	FTB		4	51	0	DEL	FTB	
		5	184	BRK	FTB		5	52	0	DEL	FTB	
	AVG.		186			150	AVG:	52				20
	STD. DEV.		2				STD. DEV.	3				
DT-342 (121)	87540	1	186	BRK	FTB		1	57	0	DEL	FTB	
P1112/P1113		2	188	BRK	FTB		2	56	0	DEL	FTB	
		3	188	BRK	FTB		3	57	0	DEL	FTB	
		4	186	BRK	FTB		4	58	0	DEL	FTB	
		5	190	BRK	FTB		5	53	0	DEL	FTB	
	AVG:		187			150	AVG:	56				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	'ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 7.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-343 (122)	87541	1	185	BRK	FTB		1	55	0	DEL	FTB	
P1135/P552		2	188	BRK	FTB		2	50	0	DEL	FTB	
		3	184	BRK	FTB		3	60	0	DEL	FTB	
		4	186	BRK	FTB		4	62	0	DEL	FTB	
		5	186	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		186			150	AVG:	57				20
	STD. DEV.		1				STD. DEV.	5				
DT-344 (123)	87542	1	184	BRK	FTB		1	57	0	DEL	FTB	
P1126/P1127		2	185	BRK	FTB		2	58	0	DEL	FTB	
		3	186	BRK	FTB		3	60	0	DEL	FTB	
		4	186	BRK	FTB		4	61	0	DEL	FTB	
		5	186	BRK	FTB		5	55	0	DEL	FTB	
	AVG:		185			150	AVG:	58				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 8.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-345 (124)	87543	1	184	BRK	FTB		1	49	0	DEL	FTB	
P1140/P546		2	191	BRK	FTB		2	58	0	DEL	FTB	
		3	185	BRK	FTB		3	57	0	DEL	FTB	
		4	186	BRK	FTB		4	57	0	DEL	FTB	
		5	186	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		186			150	AVG:	56				20
	STD. DEV.		3				STD. DEV.	4				
DT-346 (125)	87544	1	188	BRK	FTB		1	59	0	DEL	FTB	
P1141/P587		2	185	BRK	FTB		2	59	0	DEL	FTB	
		3	187	BRK	FTB		3	60	0	DEL	FTB	
		4	186	BRK	FTB		4	61	0	DEL	FTB	
		5	184	BRK	FTB		5	57	0	DEL	FTB	
	AVG:		186			150	AVG:	59				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 9.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-347 (126)	87545	1	182	BRK	FTB		1	57	0	DEL	FTB	
P653/P1146		2	184	BRK	FTB		2	58	0	DEL	FTB	
		3	185	BRK	FTB		3	59	0	DEL	FTB	
		4	186	BRK	FTB		4	58	0	DEL	FTB	
		5	188	BRK	FTB		5	60	0	DEL	FTB	
	AVG.		185			150	AVG:	58				20
	STD. DEV.		2				STD. DEV.	1				
DT-348 (127)	87546	1	188	BRK	FTB		1	62	0	DEL	FTB	
P1150/P1149		2	185	BRK	FTB		2	60	0	DEL	FTB	
		3	191	BRK	FTB		3	61	0	DEL	FTB	
		4	185	BRK	FTB		4	57	0	DEL	FTB	
		5	188	BRK	FTB		5	58	0	DEL	FTB	
	AVG:		187			150	AVG:	60				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 10.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-349 (128)	87547	1	183	BRK	FTB		1	59	0	DEL	FTB	
P508/P1154		2	185	BRK	FTB		2	56	0	DEL	FTB	
		3	188	BRK	FTB		3	55	0	DEL	FTB	
		4	184	BRK	FTB		4	54	0	DEL	FTB	
		5	184	BRK	FTB		5	59	0	DEL	FTB	
	AVG.		185			150	AVG:	57				20
	STD. DEV.		2				STD. DEV.	2				
DT-350 (129)	87548	1	194	BRK	FTB		1	58	0	DEL	FTB	
P1184/P1155		2	191	BRK	FTB		2	57	0	DEL	FTB	
		3	190	BRK	FTB		3	56	0	DEL	FTB	
		4	190	BRK	FTB		4	55	0	DEL	FTB	
		5	188	BRK	FTB		5	54	0	DEL	FTB	
	AVG:		190			150	AVG:	56				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 11.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Capitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-351 (130)	87549	1	188	BRK	FTB		1	63	0	DEL	FTB	
P1170/P1169		2	185	BRK	FTB		2	59	0	DEL	FTB	
		3	188	BRK	FTB		3	61	0	DEL	FTB	
		4	185	BRK	FTB		4	61	0	DEL	FTB	
		5	186	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		186			150	AVG:	60				20
	STD. DEV.		1				STD. DEV.	2				
DT-352 (131)	87550	1	184	BRK	FTB		1	57	0	DEL	FTB	
P1174/P1175		2	185	BRK	FTB		2	58	0	DEL	FTB	
		3	186	BRK	FTB		3	59	0	DEL	FTB	
		4	187	BRK	FTB		4	61	0	DEL	FTB	
		5	186	BRK	FTB		5	60	0	DEL	FTB	
	AVG:		186			150	AVG:	59				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 12.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-353 (132)	87551	1	185	BRK	FTB		1	60	0	DEL	FTB	
P1175/P459		2	188	BRK	FTB		2	56	0	DEL	FTB	
		3	186	BRK	FTB		3	57	0	DEL	FTB	
		4	187	BRK	FTB		4	58	0	DEL	FTB	
		5	184	BRK	FTB		5	59	0	DEL	FTB	
	AVG.		186			150	AVG:	58				20
	STD. DEV.		2				STD. DEV.	2				
DT-354 (133)	87552	1	184	BRK	FTB		1	61	0	DEL	FTB	
P1179/P443		2	185	BRK	FTB		2	61	0	DEL	FTB	
		3	183	BRK	FTB		3	60	0	DEL	FTB	
		4	185	BRK	FTB		4	57	0	DEL	FTB	
		5	186	BRK	FTB		5	61	0	DEL	FTB	
	AVG:		184			150	AVG:	60				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	'ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 13.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **11-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121142**

QC'd By: Maria Cepitis
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **11-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-355 (134)	87553	1	182	BRK	FTB		1	49	0	DEL	FTB	
P1182/P1183		2	185	BRK	FTB		2	50	0	DEL	FTB	
		3	184	BRK	FTB		3	53	0	DEL	FTB	
		4	184	BRK	FTB		4	50	0	DEL	FTB	
		5	181	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		183			150	AVG:	51				20
	STD. DEV.		2				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	ILM TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

Precision Geosvnthetic Laboratories International
A Texas Research International Company

GAI-LAP
Initial: CVZ #:0.13
DATE: 10/16/2012

October 16, 2012

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

Re: FINAL LABORATORY TEST 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 Seam testing of eleven (11) 60 mil TPO Seam samples.

PROJECT NAME: Sarasota Lf DATE REPORTED: **October 16, 2012**

REFERENCE PGLI JOB NO.: G121159

DATE RECEIVED: October 16, 2012

SAMPLES SENT BY: Ardaman & Associates, Inc.

SAMPLE IDENTIFICATIONS:

SAMPLE ID	*PGLI CONTROL NUMBER*	*SAMPLE ID*	*PGLI CONTROL NUMBER*
1. DT-356(135) P1188/429	87663	7. DT-362(141) P1209/1210	87669
2. DT-357(136) P1187/1188	87664	8. DT-363(142) P1213/1214	87670
3. DT-358(137) P1195/1196	87655	9. DT-364(143) P1214/363	87671
4. DT-359(138) P1203/1204	87666	10. DT-365(144) P1219/1045	87672
5. DT-360(139) P1204/300	87667	11. DT-366(145) P1219/1220	87673
6. DT-361(140) P1210/304	87668		

TESTS REQUIRED / PERFORMED:

TEST METHOD	*DESCRIPTION*
1. ASTM D751	Shear
2. ASTM D413	Peel

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. ***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 longer time, please advise us in writing.

7 Pages Total

TABLE 1.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121159**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs/in)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-356(135)	87363	1	194	BRK	FTB		1	55	0	DEL	FTB	
P1188.P429		2	195	BRK	FTB		2	55	0	DEL	FTB	
		3	190	BRK	FTB		3	48	0	DEL	FTB	
Hot Air Weld		4	192	BRK	FTB		4	50	0	DEL	FTB	
		5	191	BRK	FTB		5	51	0	DEL	FTB	
	AVG.		192			150	AVG:	52				20
	STD. DEV.		2				STD. DEV.	3				
DT-357(136)	87664	1	190	BRK	FTB		1	50	0	DEL	FTB	
P1187.P1188		2	192	BRK	FTB		2	53	0	DEL	FTB	
		3	192	BRK	FTB		3	54	0	DEL	FTB	
Hot Wedge Weld		4	190	BRK	FTB		4	50	0	DEL	FTB	
		5	191	BRK	FTB		5	50	0	DEL	FTB	
	AVG:		191			150	AVG:	51				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	.M TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 2.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Wedge Weld**
PGL JOB #: **G121159**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-358(137)	87665	1	184	BRK	FTB		1	50	0	DEL	FTB	
P1195.P1196		2	188	BRK	FTB		2	50	0	DEL	FTB	
		3	188	BRK	FTB		3	53	0	DEL	FTB	
		4	187	BRK	FTB		4	54	0	DEL	FTB	
		5	188	BRK	FTB		5	50	0	DEL	FTB	
	AVG.		187			150	AVG:	51				20
	STD. DEV.		2				STD. DEV.	2				
DT-359(138)	87666	1	185	BRK	FTB		1	47	0	DEL	FTB	
P1203.P1204		2	186	BRK	FTB		2	51	0	DEL	FTB	
		3	187	BRK	FTB		3	52	0	DEL	FTB	
		4	187	BRK	FTB		4	54	0	DEL	FTB	
		5	188	BRK	FTB		5	56	0	DEL	FTB	
	AVG:		187			150	AVG:	52				20
	STD. DEV.		1				STD. DEV.	3				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	.M TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 2)

(Sheet 1 of 1)

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TABLE 3.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121159**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-360(139) P1204.P300	87667	1	191	BRK	FTB		1	49	0	DEL	FTB	
		2	189	BRK	FTB		2	50	0	DEL	FTB	
		3	185	BRK	FTB		3	53	0	DEL	FTB	
		4	188	BRK	FTB		4	57	0	DEL	FTB	
		5	188	BRK	FTB		5	58	0	DEL	FTB	
	AVG.		188			150	AVG:	53				20
	STD. DEV.		2				STD. DEV.	4				
DT-361(140) P1210.P304	87668	1	190	BRK	FTB		1	62	0	DEL	FTB	
		2	193	BRK	FTB		2	50	0	DEL	FTB	
		3	192	BRK	FTB		3	50	0	DEL	FTB	
		4	191	BRK	FTB		4	53	0	DEL	FTB	
		5	192	BRK	FTB		5	50	0	DEL	FTB	
	AVG:		191			150	AVG:	53				20
	STD. DEV.		1				STD. DEV.	5				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	.M TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 4.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Wedge Weld**
PGL JOB #: **G121159**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-362(141)	87669	1	191	BRK	FTB		1	46	0	DEL	FTB	
P1209.P1210		2	190	BRK	FTB		2	50	0	DEL	FTB	
		3	189	BRK	FTB		3	53	0	DEL	FTB	
		4	185	BRK	FTB		4	50	0	DEL	FTB	
		5	188	BRK	FTB		5	53	0	DEL	FTB	
	AVG.		188			150	AVG:	50				20
	STD. DEV.		2				STD. DEV.	3				
DT-363(142)	87670	1	185	BRK	FTB		1	50	0	DEL	FTB	
P1213.P1214		2	188	BRK	FTB		2	51	0	DEL	FTB	
		3	186	BRK	FTB		3	50	0	DEL	FTB	
		4	193	BRK	FTB		4	47	0	DEL	FTB	
		5	190	BRK	FTB		5	53	0	DEL	FTB	
	AVG:		188			150	AVG:	50				20
	STD. DEV.		3				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	.M TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

TABLE 5.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Air Weld**
PGL JOB #: **G121159**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-364(143)	87671	1	183	BRK	FTB		1	61	0	DEL	FTB	
P1214.P363		2	189	BRK	FTB		2	57	0	DEL	FTB	
		3	191	BRK	FTB		3	57	0	DEL	FTB	
		4	190	BRK	FTB		4	55	0	DEL	FTB	
		5	186	BRK	FTB		5	49	0	DEL	FTB	
	AVG.		188			150	AVG:	56				20
	STD. DEV.		3				STD. DEV.	4				
DT-365(144)	87672	1	186	BRK	FTB		1	50	0	DEL	FTB	
P1219.P1045		2	187	BRK	FTB		2	52	0	DEL	FTB	
		3	185	BRK	FTB		3	50	0	DEL	FTB	
		4	185	BRK	FTB		4	53	0	DEL	FTB	
		5	187	BRK	FTB		5	54	0	DEL	FTB	
	AVG:		186			150	AVG:	52				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	.M TEAR BOND
NON-FTB	ADHESION FAILURE

(End of Table 5)

(Sheet 1 of 1)

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TABLE 6.
QUALITY ASSURANCE TESTING
SEAM PEEL AND SHEAR TEST RESULTS

CLIENT: **Ardaman & Associates, Inc.**
PROJECT: **Sarasota Landfill**
DATE REC'D: **16-Oct-12**

MATERIAL: **TPO Seam (2" wide)**
SEAM TYPE: **Hot Wedge Weld**
PGL JOB #: **G121159**

QC'd By: Maria Espitia
TEST METHOD: **ASTM D751/ D413 NSF MOD**
DATE REPORTED: **16-Oct-12**

ASTM D751 Using 2" x 8" SPECIMENS, Strain Rate: 12"/min							ASTM D413 NSF MOD USING 1" x 8" SPECIMENS, Strain Rate: 2"/ min					
	SHEAR EVALUATION						PEEL EVALUATION					
SAMPLE ID	PGLI CONTROL #	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in)	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lbs)	SPECIMEN NUMBER	MAXIMUM STRENGTH (lb/in width)	PEEL INCURSION %	LOCUS of BREAK	CLASSIFICATION	PROJECT SPEC. (lb/in width)
DT-366(145)	87673	1	184	BRK	FTB		1	55	0	DEL	FTB	
P1219.P1220		2	185	BRK	FTB		2	60	0	DEL	FTB	
		3	187	BRK	FTB		3	57	0	DEL	FTB	
		4	188	BRK	FTB		4	58	0	DEL	FTB	
		5	185	BRK	FTB		5	57	0	DEL	FTB	
	AVG.		186			150	AVG:	57				20
	STD. DEV.		1				STD. DEV.	2				

LOCUS OF BREAK AND CLASSIFICATION BASED ON FABRIC- REINFORCED SEAMS (NSF 54, 1993):

LOCUS OF BREAK

AD	ADHESION FAILURE RESULTING IN THE DELAMINATION IN THE PLANE OF THE BOND.
DEL	DELAMINATION IN THE PLANE OF THE SCRIM.
AD-DEL	DELAMINATION IN THE PLANE OF THE SCRIM AFTER SOME DELAMINATION IN THE PLANE OF THE BOND
BRK	BREAK IN THE SHEET THROUGH BOTH THE FABRIC AND THE PLIES OF THE POLYMER.
FP	FABRIC PULLOUT. (NO TEST).
SIP	SEPARATION IN THE PLANE OF THE SHEET.

CLASSIFICATION

FTB	.M TEAR BOND
NON-FTB	ADHESION FAILURE

(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.

APPENDIX 15

Geomembrane Installation
Daily Trial Weld Logs

Ardaman & Associates, Inc
Geotechnical, Environmental, and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P / F
307	8.18.12	8:03	MY	X8	T / T	78°	550	500	92 /	83 /	85 /	89	99	82		Y	P
308	8.18.12	9:00	CL	M43	ST / ST	78°	650	500	96 / 79	89 / 79	84 / 85	90	83	92		Y	P
309	8.21.12	11:30	MY	X8	T / T	80°	500	450	69 /	70 /	74 /	70	67	67		Y	P
310	8.21.12	11:32	RO	X18	T / T	80°	550	450	72 /	79 /	71 /	76	73	73		Y	P
311	8.31.12	2:49	RO	X18	T / T	72°	450	200	68 /	59 /	68 /	65	68	73		Y	P
312	9.1.12	12:49	RO	X18	T / T	82°	450	200	70 /	65 /	58 /	78	68	70		Y	P
313	9.6.12	11:05	RO	X18	T / T	80°	550	300	61 /	59 /	72 /	77	65	68		Y	P
314	9.7.12	7:45	RO	X18	T / T	74°	550	300	52 /	63 /	64 /	73	75	81		Y	P
315	9.8.12	10:10	CL	M43	ST / ST	82°	750	600	72 / 73	85 / 66	79 / 77	90	75	62		Y	P
316	9.8.12	10:13	CL	M43	T / T	82°	750	550	75 / 66	71 / 65	70 / 67	73	71	72		Y	P
317	9.8.12	10:20	RO	X18	T / T	82°	450	350	63 /	67 /	73 /	71	72	79		Y	P
318	9.8.12	1:35	RO	X18	T / T	82°	550	500	87 /	83 /	87 /	78	79	77		Y	P
319	9.22.12	1:55	RO	X18	T / T	82°	500	300	80 /	61 /	69 /	79	81	83		Y	P
320	9.24.12	7:25	RO	X18	T / T	68°	550	300	69 /	71 /	73 /	79	80	84		Y	P
321	10.3.12	12:59	RO	X18	T / T	72°	550	450	64 /	58 /	61 /	72	73	64		Y	P
322	10.17.12	9:05	RO	X18	T / T	70°	550	450	81 /	83 /	79 /	91	93	97		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. 60 SH	Shear Spec. SH	Shear Spec. SH	Shear Spec. SH	FTB	P / F
289	7.31.12	1:00	CL	M20	T / T	85°	750	580	68 / 69	72 / 69	67 / 71	71	66	75		Y	P
290	7.31.12	11:00	RO	X9	T / T	80°	550	200	71 /	69 /	73 /	85	78	72		Y	P
291	7.31.12	1:18	MY	X8	T / T	85°	420	220	77 /	66 /	70 /	78	77	65		Y	P
292	8.1.12	7:34	MY	X8	T / T	74°	450	250	77 /	70 /	83 /	90	87	97		Y	P
293	8.1.12	1:02	MY	X8	T / T	84°	450	250	73 /	62 /	72 /	73	66	70		Y	P
294	8.1.12	1:48	RO	X9	T / T	84°	450	250	74 /	69 /	77 /	86	77	81		Y	P
295	8.2.12	8:06	RO	X9	T / T	74°	550	450	86 /	65 /	79 /	109	78	87		Y	P
296	8.3.12	12:50	RO	X8	T / T	84°	550	450	79 /	83 /	65 /	99	85	83		Y	P
297	8.4.12	7:30	RO	X9	T / T	69°	550	250	83 /	81 /	89 /	89	95	92		Y	P
298	8.6.12	9:10	RO	X9	T / T	69°	550	250	77 /	81 /	79 /	83	89	76		Y	P
299	8.8.12	7:38	CL	M43	T / T	72°	750	550	92 / 93	83 / 84	83 / 81	98	96	97		Y	P
300	8.8.12	9:00	RO	X8	T / T	78°	450	200	72 /	75 /	78 /	101	92	101		Y	P
301	8.10.12	7:48	RO	X18	T / T	70°	450	250	61 /	73 /	81 /	107	104	109		Y	P
302	8.17.12	12:46	RO	X18	T / T	82°	450	220	61 /	55 /	68 /	80	77	80		Y	P
303	8.17.12	3:40	CL	M43	ST / ST	85°	750	650	70 / 67	73 / 60	74 / 80	94	87	92		Y	P
304	8.17.12	4:45	MY	M23	T / T	85°	750	600	66 / 73	72 / 61	85 / 80	89	86	91		Y	P
305	8.17.12	5:01	CL	M43	T / T	81°	750	550	59 / 61	63 / 71	71 / 51	77	81	69		Y	P
306	8.18.12	8:18	RO	X18	T / T	78°	500	450	65 /	59 /	65 /	75	69	75		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

40 MIL TEX LLDPE

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. 89-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
271	7.26.12	7:20	CL	M20	ST/ST	76°	750	600	82 / 84	87 / 86	83 / 87	107	100	105		Y	P
272	7.26.12	7:30	CL	M20	T/T	76°	750	550	95 / 85	95 / 89	83 / 90	97	90	97		Y	P
273	7.26.12	1:03	CL	M20	ST/ST	84°	750	650	76 / 69	79 / 75	76 / 76	84	76	85		Y	P
274	7.26.12	2:08	RO	X9	T/T	84°	550	460	84 /	72 /	77 /	75	78	75		Y	P
275	7.26.12	2:10	MY	X8	T/T	84°	420	250	73 /	72 /	81 /	75	80	89		Y	P
276	7.27.12	8:05	RO	X8	ST/T	74°	550	450	78 /	73 /	74 /	79	73	79		Y	P
277	7.27.12	8:00	RO	X8	T/T	74°	450	350	70 /	68 /	74 /	76	75	76		Y	P
278	7.27.12	7:47	CL	M20	ST/ST	74°	750	650	75 / 69	69 / 65	75 / 66	83	76	70		Y	P
279	7.27.12	7:52	CL	M20	T/T	84°	750	550	72 / 66	72 / 65	70 / 67	71	67	71		Y	P
280	7.27.12	12:33	CL	M20	ST/ST	84°	750	700	78 / 73	75 / 70	77 / 73	87	81	89		Y	P
281	7.27.12	12:38	CL	M20	T/T	84°	750	570	67 / 64	68 / 66	71 / 72	68	68	71		Y	P
282	7.28.12	8:23	RO	X9	T/T	84°	500	200	74 /	72 /	73 /	79	90	91		Y	P
283	7.31.12	7:20	MY	X9	ST/ST	74°	750	650	88 / 80	81 / 78	84 / 82	94	88	62		Y	P
284	7.31.12	7:16	CL	M20	ST/ST	74°	750	650	85 / 73	87 / 79	75 / 80	93	86	94		Y	P
285	7.31.12	7:22	MY	X9	T/T	74°	750	550	80 / 78	81 / 76	79 / 84	77	79	79		Y	P
286	7.31.12	7:23	CL	M20	T/T	74°	750	520	77 / 74	77 / 66	73 / 74	79	79	78		Y	P
287	7.31.12	8:39	JG	M23	ST/ST	74°	750	600	82 / 77	77 / 72	72 / 81	94	77	90		Y	P
288	7.31.12	1:07	JG	M23	ST/ST	85°	750	550	77 / 65	82 / 84	84 / 77	94	93	93		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL. TEX. LLDPE

FILE NO. 89-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
253	5.22.12	7:24	MY	x8	T/T	68°	450	200	61 /	60 /	67 /	76	73	73		Y	P
254	5.29.12	10:39	CL	x13	T/T	71°	450	200	62 /	59 /	65 /	71	79	73		Y	P
255	5.31.12	7:31	ML	x8	T/T	69°	450	200	62 /	59 /	63 /	72	69	71		Y	P
256	7.13.12	2:15	CL	x13	T/T	80°	400	200	64 /	59 /	67 /	67	67	72		Y	P
257	7.13.12	2:18	MY	x8	T/T	80°	420	200	10 / LOW / BREAK							N	F
258	7.13.12	2:53	MY	x8	T/T	80°	450	250	63 /	62 /	73 /	69	64	60		Y	P
259	7.14.12	7:30	MY	x8	T/T	70°	450	250	83 /	76 /	78 /	83	84	83		Y	P
260	7.14.12	7:36	CL	x13	T/T	70°	400	350	72 /	61 /	78 /	90	91	92		Y	P
261	7.18.12	10:26	CL	x8	T/T	80°	450	400	61 /	69 /	73 /	91	94	87		Y	P
262	7.19.12	7:35	CL	x8	T/T	72°	450	400	63 /	61 /	69 /	93	68	79		Y	P
263	7.19.12	11:38	MY	x9	T/T	74°	550	200	63 /	54 /	49 /	63	71	77		Y	P
264	7.19.12	1:14	CL	x8	T/T	83°	450	400	59 /	53 /	57 /	69	67	75		Y	P
265	7.20.12	12:53	MY	x8	T/T	82°	450	350	63 /	49 /	54 /	83	81	79		Y	P
266	7.21.12	8:05	MY	x8	T/T	84°	450	350	64 /	77 /	51 /	77	82	79		Y	P
267	7.24.12	3:50	MY	x8	T/T	84°	450	250	54 /	48 /	64 /	72	69	77		Y	P
268	7.25.12	8:40	CL	X9	T/T	78°	450	250	63 /	49 /	51 /	81	79	87		Y	P
269	7.26.12	7:34	MY	M43	T/T	76°	750	550	76 / 70	78 / 75	78 / 77	83	77	83		Y	P
270	7.26.12	3:36	MY	M43	ST/ST	76°	750	650	80 / 76	85 / 77	73 / 73	92	87	94		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

40 mil Tex. LLDPE

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P / F
235	5-2-12	1:20	RO	X13	T / T	85°	500	200	85 /	65 /	76 /	79	75	80		Y	P
236	5-3-12	7:32	MY	X8	T / T	64°	500	350	83 /	76 /	83 /	84	76	86		Y	P
237	5-3-12	7:37	RO	X13	T / T	64°	500	300	77 /	71 /	80 /	78	76	79		Y	P
238	5-4-12	11:41	GP	X13	T / T	79°	450	200	55 /	53 /	62 /	79	72	74		Y	P
239	5-4-12	2:05	GP	X13	T / T	81°	450	200	50 /	53 /	64 /	81	65	74		Y	P
240	5-7-12	1:05	RO	X13	T / T	77°	450	300	58 /	68 /	63 /	72	62	67		Y	P
241	5-7-12	1:25	MY	X8	T40 / T60	78°	470	300	67 /	58 /	63 /	70	62	72		Y	P
242	5-8-12	8:46	MY	X8	T40 / T60	69°	450	300	71 /	68 /	75 /	84	76	77		Y	P
243	5-8-12	8:35	RO	X13	T / T	69°	500	300	73 /	64 /	79 /	88	73	90		Y	P
244	5-9-12	1:01	MY	X8	T / T	80°	480	200	64 /	56 /	60 /	66	71	65		Y	P
245	5-10-12	7:20	MY	X8	T / T	70°	450	200	73 /	64 /	72 /	74	69	73		Y	P
246	5-11-12	7:30	MY	X8	T / T	62°	460	200	69 /	84 /	72 /	85	78	85		Y	P
247	5-12-12	10:49	MY	X8	T / T	78°	460	200	61 /	53 /	59 /	67	70	65		Y	P
248	5-21-12	7:41	MY	X8	T / T	73°	420	200	69 /	73 /	77 /	77	104	83		Y	P
249	5-21-12	7:50	CL	X9	T / T	73°	550	350	70 /	69 /	81 /	82	81	82		Y	P
250	5-21-12	1:17	CL	X13	T / T	86°	550	350	64 /	68 /	67 /	75	71	70		Y	P
251	5-21-12	1:26	MY	X8	T / T	80°	420	200	70 /	62 /	70 /	78	93	80		Y	P
252	5-22-12	7:20	MY	X13	T / T	68°	400	300	64 /	59 /	60 /	75	65	73		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

40 MIL TEX LLDPE

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P / F
217	4.27.12	7:19	MY	M43	ST / ST	59°	760	700	86 / 79	90 / 83	92 / 93	114	104	119		Y	P
218	4.27.12	7:20	AB	M23	ST / ST	59°	750	700	85 / 72	108 / 85	86 / 100	117	105	117		Y	P
219	4.27.12	7:19	JG	M20	ST / ST	59°	750	700	89 / 53	95 / 88	101 / 89	117	119	121		Y	P
220	4.27.12	7:24	JG	M20	T / T	59°	750	600	79 / 91	92 / 81	103 / 96	108	95	86		Y	P
221	4.27.12	7:23	MY	M43	T / T	59°	750	650	104 / 90	99 / 92	102 / 94	107	97	98		Y	P
222	4.27.12	9:54	RO	X8	T / T	70°	500	300	67 /	58 /	65 /	75	65	64		Y	P
223	4.27.12	12:02	MY	X13	T / T	72°	530	500	64 /	56 /	73 /	83	77	81		Y	P
224	4.28.12	7:35	MY	X9	T / T	62°	550	220	69 /	62 /	68 /	79	62	70		Y	P
225	4.28.12	7:20	MY	X9	740 / 700	62°	550	550	83 /	70 /	73 /	113	70	86		Y	P
226	4.28.12	8:00	RO	X13	T / T	62°	500	200	66 /	63 /	80 /	86	79	80		Y	P
227	4.28.12	8:10	GP	X9	T / T	62°	450	300	81 /	71 /	80 /	79	82	78		Y	P
228	4.30.12	7:30	RO	X13	T / T	62°	500	300	77 /	78 /	77 /	84	78	82		Y	P
229	4.30.12	7:30	MY	X8	T / T	62°	500	300	86 /	87 /	82 /	74	63	77		Y	P
230	4.30.12	1:10	RO	X13	T / T	90°	500	300	72 /	62 /	70 /	74	63	77		Y	P
231	4.30.12	1:11	MY	X8	T / T	90°	480	300	79 /	75 /	82 /	86	77	86		Y	P
232	5.1.12	1:05	RO	X13	T / T	90°	500	300	81 /	71 /	79 /	75	70	92		Y	P
233	5.2.12	8:30	MY	X8	T / T	65°	430	250	84 /	78 /	84 /	88	79	88		Y	P
234	5.2.12	1:22	MY	X8	T / T	85°	440	200	73 /	66 /	73 /	76	69	79		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
199	4.24.12	1:00	AB	M23	T / T	62°	750	600	80 / 72	86 / 79	81 / 86	93	86	93		Y	P
200	4.24.12	1:42	RO	X13	T40 / T60	62°	550	550	82 /	72 /	78 /	84	71	80		Y	P
201	4.24.12	1:10	MY	X8	T / T	62°	470	200	85 /	82 /	84 /	88	82	95		Y	P
202	4.25.12	8:30	RO	X13	T40 / S60	58°	550	550	86 /	79 /	83 /	92	89	92		Y	P
203	4.25.12	11:50	AB	M23	T / T	70°	750	600	80 / 73	73 / 65	76 / 83	83	77	81		Y	P
204	4.25.12	1:10	RO	X13	ST / T	70°	550	550	81 /	71 /	82 /	81	77	83		Y	P
205	4.25.12	1:28	AB	M43	T / T	70°	750	530	71 / 64	72 / 66	72 / 68	71	66	71		Y	P
206	4.26.12	7:26	AB	M23	ST / ST	56°	750	700	94 / 91	83 / 89	101 / 101	111	91	113		Y	P
207	4.26.12	7:40	JG	M20	ST / ST	56°	750	700	99 / 90	90 / 80	93 / 99	109	103	105		Y	P
208	4.26.12	7:22	MY	M43	ST / ST	56°	760	700	99 / 84	84 / 85	92 / 91	114	104	108		Y	P
209	4.26.12	7:27	MY	M43	T / T	56°	750	600	81 / 77	73 / 73	81 / 81	96	80	87		Y	P
210	4.26.12	7:50	JG	M20	T / T	60°	750	600	71 / 67	71 / 63	74 / 69	71	68	72		Y	P
211	4.26.12	12:02	MY	M43	ST / ST	71°	750	750	79 / 73	82 / 81	82 / 93	96	86	70		Y	P
212	4.26.12	12:50	JG	M20	ST / ST	71°	750	700	92 / 76	81 / 70	90 / 83	91	88	74		Y	P
213	4.26.12	12:53	AB	M23	ST / ST	71°	750	700	79 / 72	86 / 75	83 / 86	102	86	99		Y	P
214	4.26.12	12:06	MY	M43	ST / T	71°	750	700	79 / 75	81 / 71	81 / 80	87	70	79		Y	P
215	4.26.12	12:00	JG	M20	T / T	71°	750	650	78 / 94	78 / 74	74 / 72	88	78	83		Y	P
216	4.26.12	3:53	RG	X8	S60 / T60	74°	550	550	127 /	115 /	129 /	153	140	151		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

40 MIL TEX LLDPE

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F:50 x:48 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
181	4.17.12	12:48	JG	M20	ST/ST	79°	750	700	77 / 66	79 / 70	73 / 74	70	77	78		Y	P
182	4.17.12	12:54	AB	M23	ST/ST	79°	750	700	76 / 66	74 / 68	76 / 70	86	75	70		Y	P
183	4.18.12	7:18	MY	M43	ST/ST	65°	750	750	83 / 81	93 / 80	81 / 92	87	84	86		Y	P
184	4.18.12	7:24	AB	M23	ST/ST	65°	750	700	97 / 70	84 / 75	88 / 83	96	89	94		Y	P
185	4.18.12	7:23	JG	M20	ST/ST	65°	750	700	87 / 77	81 / 82	87 / 87	94	92	98		Y	P
186	4.18.12	10:16	MY	M43	T/T	72°	750	600	77 / 70	80 / 75	81 / 80	78	74	81		Y	P
187	4.18.12	12:58	AB	M23	ST/ST	80°	750	700	76 / 73	75 / 63	76 / 74	80	71	78		Y	P
188	4.18.12	12:58	MY	M43	ST/ST	80°	750	750	71 / 72	77 / 70	74 / 78	80	82	80		Y	P
189	4.19.12	7:31	MY	X8	T/T	66°	500	500	91 /	68 /	87 /	86	87	113		Y	P
190	4.19.12	7:50	RO	X13	T/T	66°	550	300	63 /	69 /	72 /	76	72	79		Y	P
191	4.19.12	7:34	MY	X8	T/T	66°	460	200	86 /	70 /	83 /	86	89	91		Y	P
192	4.19.12	1:00	MY	X8	T40/T60	78°	550	520	74 /	71 /	69 /	85	83	82		Y	P
193	4.19.12	1:05	RO	X13	T/T	78°	500	300	76 /	60 /	77 /	87	82	87		Y	P
194	4.19.12	2:06	MY	X8	T40/T60	72°	550	520	86 /	78 /	74 /	83	68	90		Y	P
195	4.23.12	10:12	RO	X13	T40/T60	65°	550	500	93 /	76 /	89 /	91	87	90		Y	P
196	4.24.12	7:41	AB	M23	T/T	60°	750	600	94 / 88	91 / 90	90 / 99	102	94	101		Y	P
197	4.24.12	7:40	MY	M43	T/T	60°	775	550	94 / 89	93 / 89	92 / 97	99	92	97		Y	P
198	4.24.12	9:07	RO	X13	T40/T60	60°	550	550	86 /	82 /	86 /	90	86	111		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F:50 X:48 In / Out		In / Out		In / Out		Shear Spec. 60 SH	SH	SH	SH	FTB	P / F
163	4.4.12	7:30	RO	X13	T/T	64°	500	300	70		63		67		74	67	73		Y	P
164	4.4.12	12:55	MY	X8	ST/T	80°	550	470	76		71		78		79	73	76		Y	P
165	4.4.12	12:59	RO	X13	T/T	80°	500	300	66		61		67		69	62	75		Y	P
166	4.4.12	1:02	MY	X8	T/T	80°	470	200	63		57		63		65	62	65		Y	P
167	4.5.12	1:39	RO	X13	T/T	78°	500	300	68		63		59		71	62	64		Y	P
168	4.5.12	1:27	MY	X8	T/T	79°	420	200	69		64		68		73	67	71		Y	P
169	4.6.12	8:50	MY	X8	T/T	70°	450	200	74		66		77		84	72	76		Y	P
170	4.9.12	9:45	MY	X8	T/T	70°	430	200	85		71		83		80	74	78		Y	P
171	4.10.12	7:55	MY	X9	T/T	68°	550	250	82		72		66		84	76	84		Y	P
172	4.11.12	1:10	MY	X9	T/T	77°	550	200	73		68		70		75	70	77		Y	P
173	4.16.12	7:35	MY	X8	T/T	60°	460	350	70		67		77		81	80	85		Y	P
174	4.17.12	7:38	MY	M43	ST/ST	62°	750	700	87	77	94	86	86	95	102	92	101		Y	P
175	4.17.12	7:39	JG	M20	ST/ST	62°	750	700	90	77	85	77	91	81	101	84	102		Y	P
176	4.17.12	7:41	AB	M23	ST/ST	62°	750	700	91	82	84	76	82	90	82	SHEAR			Y	F
177	4.17.12	8:32	AB	M23	ST/ST	62°	750	700	79	76	82	76	84		—	—	—		N	F
													100% PEEL							
178	4.17.12	9:03	AB	M23	ST/ST	62°	750	700	83	74	86	79	84	82	89	84	96		Y	P
179	4.17.12	8:39	AB	M23	T/T	62°	750	600	81	75	75	68	79	79	85	67	83		Y	P
180	4.17.12	12:31	MY	M43	ST/ST	79°	750	700	76	71	76	70	74	75	82	72	81		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: CCSWDC
CLIENT: HDR
Field Rep: Jim Kimbelman

40 MIL. TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 x: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
145	3.22.12	1:00	RO	X9	T/T	74°	550	300	76 /	70 /	80 /	80	71	74		Y	P
146	3.23.12	7:56	MY	X13	T/T	69°	480	300	74 /	70 /	73 /	79	71	83		Y	P
147	3.23.12	12:50	MY	X13	T/T	73°	480	230	65 /	63 /	70 /	74	75	79		Y	P
148	3.26.12	7:38	MY	X13	T/T	66°	450	300	85 /	77 /	84 /	88	72	83		Y	P
149	3.26.12	12:50	MY	X13	T/T	74°	480	250	81 /	75 /	63 /	84	69	80		Y	P
150	3.27.12	7:34	MY	X13	T/T	60°	480	300	71 /	65 /	78 /	94	78	90		Y	P
151	3.27.12	12:47	MY	X13	T/T	76°	480	250	62 /	61 /	67 /	72	66	71		Y	P
152	3.29.12	7:40	JL	M20	T/T	69°	750	650	75 / 65	73 / 67	67 / 72	73	66	73		Y	P
153	3.29.12	8:00	MM	X8	T/T	69°	450	250	69 /	78 /	72 /	84	80	60		Y	P
154	3.29.12	12:50	MM	X8	T/T	80°	450	250	64 /	59 /	66 /	67	63	68		Y	P
155	3.29.12	1:50	MS	X9	T/T	80°	550	300	71 /	71 /	68 /	72	68	75		Y	P
156	3.30.12	7:40	MM	X8	T/T	68°	450	250	78 /	69 /	77 /	84	74	82		Y	P
157	4.2.12	10:19	MY	X8	T/T	71°	430	200	64 /	66 /	65 /	75	68	72		Y	P
158	4.2.12	10:25	RO	X13	T/T	71°	500	250	77 /	67 /	79 /	77	70	71		Y	P
159	4.2.12	4:30	RO	X13	T/T	80°	550	350	75 /	64 /	69 /	75	70	89		Y	P
160	4.2.12	4:20	MY	X8	T/T	80°	430	200	73 /	61 /	73 /	82	61	78		Y	P
161	4.3.12	7:29	MY	X8	T/T	63°	500	300	73 /	69 /	76 /	80	76	78		Y	P
162	4.4.12	7:30	MB	M20	T/T	64°	750	650	74 / 75	72 / 71	73 / 73	77	72	78		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

40 MIL TEX LLDPE

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. 89-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 x: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
127	3.20.12	12:58	MY	M25	ST/ST	81°	750	750	71 / 76	70 / 68	79 / 74	85	74	94		Y	P
128	3.20.12	1:04	AB	M23	ST/ST	81°	750	750	74 / 77	70 / 69	79 / 78	81	76	83		Y	P
129	3.20.12	1:06	AB	M23	T/T	81°	750	650	68 / 67	63 / 63	72 / 71	75	67	73		Y	P
130	3.20.12	1:10	RO	X9	S60/T40	81°	550	550	76 /	74 /	73 /	88	77	86		Y	P
131	3.20.12	1:05	MM	X8	T/T	81°	450	250	60 /	59 /	54 /	73	68	71		Y	P
132	3.20.12	1:02	MY	M25	ST/T	81°	750	700	68 / 69	62 / 63	57 / 68	71	66	71		Y	P
133	3.21.12	7:17	MY	X13	T/T	61°	500	400	80 /	69 /	79 /	84	76	81		Y	P
134	3.21.12	7:24	AB	M23	ST/T	61°	750	650	91 / 88	80 / 77	94 / 90	99	83	97		Y	P
135	3.21.12	7:25	MM	X8	T/T	61°	450	250	73 /	62 /	73 /	86	78	89		Y	P
136	3.21.12	7:50	RO	X9	T/T	61°	550	500	92 /	77 /	87 /	90	87	90		Y	P
137	3.21.12	1:00	MY	X13	T/T	78°	500	400	67 /	60 /	72 /	74	65	70		Y	P
138	3.21.12	1:05	MM	X8	T/T	78°	450	200	76 /	69 /	76 /	81	78	83		Y	P
139	3.21.12	1:20	RO	X9	T/T	78°	400	350	80 /	67 /	72 /	79	78	84		Y	P
140	3.22.12	7:35	RO	X9	T/T	65°	550	300	82 /	72 /	81 /	83	78	79		Y	P
141	3.22.12	7:45	MY	X13	T/T	65°	550	300	85 /	72 /	79 /	83	76	81		Y	P
142	3.22.12	7:30	MM	X8	T/T	65°	450	300	83 /	75 /	80 /	84	76	83		Y	P
143	3.22.12	12:53	MY	X13	T/T	74°	500	300	67 /	63 /	67 /	73	67	77		Y	P
144	3.22.12	12:50	MM	X8	T/T	74°	450	250	74 /	64 /	71 /	76	73	69		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F:50 X:48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
109	3.19.12	3:29	MY	X3	T/T	81°	500	250	71 /	68 /	74 /	78	73	72		Y	P
110	3.19.12	7:36	AB	M23	ST/ST	60°	750	700	82 / 80	87 / 86	90 / 84	101	96	96		Y	P
111	3.19.12	7:40	MY	M25	ST/ST	60°	750	750	82 / 81	74 / 78	75 / 85	83	91	88		Y	P
112	3.19.12	8:00	RO	X9	T/T	60°	550	400	77 /	70 /	76 /	86	80	100		Y	P
113	3.19.12	7:41	AB	M23	T/T	60°	750	600	84 / 78	81 / 77	81 / 82	74	78	79		Y	P
114	3.19.12	8:11	JL	M21	ST/ST	60°	750	750	90 / 86	83 / 75	92 / 87	101	94	103		Y	P
115	3.19.12	7:44	MY	M25	T/T	60°	750	650	81 / 74	82 / 73	79 / 81	91	91	88		Y	P
116	3.19.12	8:15	JL	M21	T/T	60°	750	700	83 / 76	87 / 79	80 / 77	88	92	80		Y	P
117	3.19.12	8:42	MM	X8	T/T	60°	450	200	84 /	79 /	84 /	93	87	92		Y	P
118	3.19.12	10:49	AB	M23	ST/T	77°	750	600	68 / 72	70 / 69	69 / 76	71	71	76		Y	P
119	3.19.12	10:29	CS	M20	ST/ST	77°	750	700	80 / 75	74 / 71	75 / 78	85	81	84		Y	P
120	3.20.12	7:17	MY	M25	ST/T	60°	750	750	75 / 74	70 / 72	82 / 85	90	79	89		Y	P
121	3.20.12	7:27	MM	X8	T/T	60°	450	250	89 /	79 /	75 /	95	90	92		Y	P
122	3.20.12	7:28	AB	M23	T/T	60°	750	600	79 / 94	81 / 87	81 / 90	105	97	96		Y	P
123	3.20.12	7:45	RO	X9	S60/T40	60°	550	550	100 /	89 /	100 /	97	101	91		Y	P
124	3.20.12	7:45	MS	X13	T/T	66°	500	300	70 /	62 /	72 /	82	79	90		Y	P
125	3.20.12	7:30	AB	M23	ST/ST	60°	750	750	92 / 88	83 / 81	92 / 95	107	101	110		Y	P
126	3.20.12	7:21	MY	M25	ST/ST	60°	750	750	96 / 81	86 / 82	97 / 91	106	98	104		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 mil Tex LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. SH	Shear Spec. SH	Shear Spec. SH	Shear Spec. SH	FTB	P / F
91	3.16.12	1:05	AB	M23	ST / ST	79°	750	700	69 / 72	[illegible] / [illegible]	8 / [illegible]	[illegible]	82	[illegible]		Y	P
92	3.16.12	1:13	CS	M20	ST / ST	79°	750	730	74 / 75	[illegible] / 69	[illegible] / [illegible]	[illegible]	72	[illegible]		Y	P
93	3.16.12	1:06	MY	M25	ST / ST	79°	750	750	82 / 82	78 / 85	[illegible] / 83	82	80	[illegible]		Y	P
94	3.16.12	1:08	JL	M8	ST / ST	79°	750	750	85 / 80	78 / [illegible]	9 / [illegible]	87	78	88		Y	P
95	3.16.12	1:07	AB	M23	T /	79°	750	600	68 / 74	8 / 9	[illegible] / [illegible]	[illegible]	[illegible]	[illegible]		Y	P
96	3.16.12	1:09	MY	M25	T /	79°	750	650	76 / 73	[illegible] / 69	7 / [illegible]	[illegible]	75	68		Y	P
97	3.16.12	1:11	JL	M8	T /	79°	750	650	74 / 76	7 / [illegible]	[illegible] / [illegible]	[illegible]	[illegible]	[illegible]		Y	P
98	3.16.12	1:40	RO	X9	[illegible] /	79°	550	550	76 / 66	[illegible] / 61	[illegible] / [illegible]	[illegible]	[illegible]	[illegible]		Y	P
99	—	—	—	—	/	—	—	—	- / -	/	/					—	—
100	3.19.12	12:55	CS	M20	ST / ST	80°	750	750	72 / 79	80 / 79	79 / [illegible]	[illegible]	[illegible]	[illegible]		Y	P
101	3.19.12	12:55	MY	M25	ST / ST	80°	750	750	74 / 75	78 / 69	75 / [illegible]	73	7[illegible]	[illegible]		Y	P
102	3.19.12	12:58	JL	M21	ST / ST	80°	750	750	71 / 69	[illegible] / 7	7[illegible] / [illegible]	76	69	69		Y	P
103	3.19.12	1:09	AB	M23	ST / ST	80°	750	750	72 / 73	74 / 71	[illegible] / 7	73	7[illegible]	66		Y	P
104	3.19.12	1:08	RO	X9	T / T	80°	550	400	68 / [illegible]	[illegible] / [illegible]	7 / [illegible]	76	7	73		Y	P
105	3.19.12	1:06	MM	X8	T / T	80°	450	200	70 / [illegible]	4 / [illegible]	69 / [illegible]	78	4	8[illegible]		Y	P
106	3.19.12	1:02	JL	M21	T / T	80°	750	700	69 / 67	[illegible] / 6	7[illegible] / [illegible]	65	9	74		Y	P
107	3.19.12	12:57	MY	M25	T / T	80°	750	650	73 / 71	73 / 68	7[illegible] / 7[illegible]	72	[illegible]	4		Y	P
108	3.19.12	1:14	AB	M33	T / T	80°	500	250	71 / 65	64 / 63	69 / 78	69	[illegible]	[illegible]		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL. TEX LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F:50 X:48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
73	3-15-12	7:33	MY	M25	T/T	60°	750	650	85 / 84	81 / 79	76 / 78	89	85	86		Y	P
74	3-15-12	1:05	JL	M8	ST/ST	78°	750	750	72 / 68	65 / 62	67 / 69	72	69	70		Y	P
75	3-15-12	1:15	MY	M25	ST/ST	78°	750	750	74 / 71	73 / 68	76 / 69	79	82	72		Y	P
76	3-15-12	1:19	AB	M23	ST/ST	78°	750	700	72 / 71	67 / 68	72 / 71	79	73	74		Y	P
77	3-15-12	1:10	JL	M8	T/T	78°	750	700	63 / 60	57 / 56	58 / 54	64	64	64		Y	P
78	3-15-12	1:17	MY	M25	T/T	78°	750	650	71 / 67	64 / 63	71 / 67	70	66	70		Y	P
79	3-15-12	1:20	AB	M23	T/T	78°	750	600	68 / 63	59 / 66	70 / 63	71	70	69		Y	P
80	3-15-12	1:10	MM	X8	T/T	78°	450	200	63 /	57 /	63 /	63	63	61		Y	P
81	3-15-12	1:05	RO	X9	S60/T40	78°	550	550	65 /	62 /	63 /	71	66	61		Y	P
82	3-16-12	7:20	MY	M25	ST/ST	62°	750	750	89 / 83	84 / 71	89 / 84	94	92	90		Y	P
83	3-16-12	7:26	JL	M8	ST/ST	62°	750	750	86 / 85	84 / 77	84 / 83	98	94	99		Y	P
84	3-16-12	7:34	AB	M23	ST/ST	62°	750	700	89 / 82	75 / 71	86 / 78	106	98	99		Y	P
85	3-16-12	7:24	MY	M25	T/T	62°	750	650	78 / 71	71 / 69	74 / 70	73	72	78		Y	P
86	3-16-12	7:37	AB	M23	T/T	62°	750	600	79 / 82	74 / 72	83 / 80	81	77	83		Y	P
87	3-16-12	7:50	RO	X9	S60/T40	62°	550	550	84 /	81 /	85 /	86	79	84		Y	P
88	3-16-12	7:30	JL	M8	T/T	62°	750	650	85 / 83	82 / 79	83 / 83	84	81	87		Y	P
89	3-16-12	7:30	MM	X8	T/T	62°	450	200	78 /	73 /	80 /	83	73	80		Y	P
90	3-16-12	7:30	CS	M31	ST/ST	68°	750	700	81 / 78	72 / 69	70 / 77	90	98	88		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX LLDPE

FILE NO. 89-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F:50 x:48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
55	3-14-12	7:50	MM	X8	T/T	59°	400	200	80 /	72 /	74 /	63	79	79		Y	P
56	3-14-12	9:54	MY	M25	ST/T	70°	750	750	74 / 75	68 / 67	71 / 70	80	73	72		Y	P
57	3-14-12	1:00	JL	M8	ST/ST	81°	750	750	67 / 70	65 / 65	64 / 66	75	71	72		Y	P
58	3-14-12	1:03	MY	M25	ST/ST	81°	750	750	71 / 70	65 / 63	67 / 62	73	68	74		Y	P
59	3-14-12	1:03	AB	M23	ST/ST	81°	750	700	76 / 72	74 / 72	71 / 68	77	70	71		Y	P
60	3-14-12	1:00	AB	M23	T/T	81°	750	600	62 / 69	59 / 61	57 / 55	65	61	61		Y	P
61	3-14-12	1:06	MY	M25	T/T	81°	750	750	64 / 66	58 / 60	60 / 60	68	64	61		Y	P
62	3-14-12	1:35	RO	X9	S60/T40	81°	550	550	69 /	59 /	52 /	67	61	67		Y	P
63	3-14-12	1:20	MM	X8	T/T	81°	450	200	66 /	58 /	58 /	70	63	66		Y	P
64	3-14-12	1:02	JL	M8	T/T	81°	750	750	60 / 64	62 / 58	55 / 60	65	60	63		Y	P
65	3-14-12	2:50	MY	M25	ST/T	79°	750	700	67 / 65	63 / 57	61 / 61	67	65	61		Y	P
66	3-15-12	7:25	MY	M25	ST/ST	60°	750	750	81 / 86	82 / 73	81 / 80	96	91	91		Y	P
67	3-15-12	7:30	AB	M23	ST/ST	60°	750	700	87 / 87	83 / 87	86 / 75	99	90	92		Y	P
68	3-15-12	7:30	RO	X9	S60/T40	60°	550	550	90 /	79 /	81 /	89	82	84		Y	P
69	3-15-12	7:35	MM	X8	T/T	60°	450	200	77 /	72 /	74 /	85	81	86		Y	P
70	3-15-12	7:35	AB	M23	T/T	60°	750	600	74 / 74	62 / 68	67 / 67	77	71	70		Y	P
71	3-15-12	7:30	JL	M8	ST/ST	60°	750	750	91 / 88	83 / 84	91 / 87	97	89	88		Y	P
72	3-15-12	7:35	JL	M8	T/T	60°	750	650	80 / 79	74 / 72	78 / 77	80	72	79		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
37	3-13-12	8:10	RO	X13	S60 / T40	60°	550	400	82 /	75 /	77 /	78	77	73		Y	P
38	3-13-12	7:55	MM	X8	T / T	60°	450	200	69 /	66 /	63 /	67	69	66		Y	P
39	3-13-12	11:15	RO	X9	S60 / T40	75°	550	550	73 /	68 /	66 /	74	76	69		Y	P
40	3-13-12	1:00	JL	M8	ST / ST	79°	750	750	75 / 72	68 / 71	68 / 66	81	76	77		Y	P
41	3-13-12	1:00	MY	M25	ST / ST	79°	750	650	78 / 73	74 / 68	73 / 66	82	74	79		Y	P
42	3-13-12	1:00	AB	M23	ST / ST	79°	750	700	76 / 72	68 / 67	69 / 67	80	74	77		Y	P
43	3-13-12	1:05	JL	M8	T / T	79°	750	650	74 / 75	71 / 72	69 / 67	77	71	72		Y	P
44	3-13-12	12:49	MY	M25	T / T	79°	750	650	72 / 71	67 / 68	58 / 71	75	66	65		Y	P
45	3-13-12	1:02	AB	M23	T / T	79°	750	600	70 / 68	64 / 64	64 / 64	73	67	68		Y	P
46	3-13-12	1:00	MM	X8	T / T	79°	450	200	64 /	62 /	58 /	63	62	62		Y	P
47	3-13-12	4:00	RO	X9	S60 / T40	81°	550	550	67 /	63 /	68 /	73	65	72		Y	P
48	3-14-12	7:28	JL	M8	ST / ST	59°	750	750	88 / 90	87 / 82	82 / 82	92	92	92		Y	P
49	3-14-12	7:37	AB	M23	ST / ST	59°	750	700	87 / 90	84 / 87	85 / 75	103	98	99		Y	P
50	3-14-12	7:40	MY	M25	ST / ST	59°	750	750	80 / 68	72 / 78	81 / 81	95	90	88		Y	P
51	3-14-12	7:36	JL	M8	T / T	59°	750	650	80 / 82	80 / 72	79 / 76	87	81	90		Y	P
52	3-14-12	7:39	AB	M23	T / T	59°	750	650	89 / 85	83 / 83	82 / 81	99	92	97		Y	P
53	3-14-12	7:45	MY	M25	T / T	59°	750	650	84 / 79	80 / 78	76 / 79	91	85	85		Y	P
54	3-14-12	8:00	RO	X9	S60 / T40	59°	550	550	74 /	75 /	73 /	76	70	71		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

40 MIL TEX. LLDPE

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P/F
19	3-12-12	9:46	AB	M23	ST/ST	70°	750	700	73 / 71	73 / 72	73 / 72	80	76	73		Y	P
20	3-12-12	9:50	JL	M8	ST/ST	70°	750	750	70 / 77	71 / 69	69 / 75	81	78	78		Y	P
21	3-12-12	9:54	JL	M8	T/T	70°	750	650	75 / 72	73 / 69	75 / 71	80	75	77		Y	P
22	3-12-12	9:52	AB	M23	T/T	70°	750	680	69 / 71	69 / 70	69 / 76	79	72	69		Y	P
23	3-12-12	1:00	JL	M8	ST/ST	80°	750	750	69 / 65	69 / 64	70 / 71	81	74	71		Y	P
24	3-12-12	1:03	JL	M8	T/T	80°	750	650	69 / 57	67 / 64	68 / 69	65	68	75		Y	P
25	3-12-12	1:10	AB	M23	ST/ST	80°	750	700	70 / 71	73 / 69	72 / 70	81	61	77		Y	P
26	3-12-12	1:12	AB	M23	T/T	80°	750	600	57 / 66	67 / 73	69 / 65	70	65	76		Y	P
27	3-12-12	1:00	MY	M25	ST/ST	80°	750	750	76 / 72	52 / 68	69 / 71	76	75	78		Y	P
28	3-12-12	1:04	MY	M25	T/T	80°	750	650	68 / 62	68 / 67	65 / 66	69	67	64		Y	P
29	3-12-12	1:07	MM	X8	T/T	80°	450	200	63 /	60 /	67 /	67	65	73		Y	P
30	3-12-12	1:25	RO	X13	ST/T	80°	500	350	72 /	69 /	69 /	106	115	158		Y	P
31	3-13-12	7:47	MY	M25	ST/ST	60°	750	750	87 / 84	86 / 81	87 / 88	96	93	96		Y	P
32	3-13-12	7:50	JL	M8	ST/ST	60°	750	750	86 / 91	82 / 86	92 / 83	94	93	96		Y	P
33	3-13-12	8:05	AB	M23	ST/ST	60°	750	700	82 / 82	74 / 84	82 / 79	115	113	107		Y	P
34	3-13-12	7:49	MY	M25	T/T	60°	750	650	83 / 80	76 / 73	77 / 74	85	80	79		Y	P
35	3-13-12	8:00	JL	M8	T/T	60°	750	650	86 / 80	81 / 78	80 / 75	84	79	80		Y	P
36	3-13-12	8:07	AB	M23	T/T	60°	750	600	81 / 80	76 / 73	74 / 73	80	77	74		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

40 MIL TEX. LLDPE

PROJECT: [illegible]
CLIENT: HDR
Field Rep: Jim Kuntzmann

FILE NO. 09-36-7375

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification F: 50 X: 48 In / Out	In / Out	In / Out	Shear Spec. 60 SH	SH	SH	SH	FTB	P / F
1	3-10-12	8:16	MY	M20	ST/ST	70°	820	600	81 / 76	74 / 75	74 / 72	83	82	86		Y	P
2	3-10-12	8:17	JL	M8	ST/ST	70°	820	600	83 / 78	81 / 78	86 / 81	89	85	89		Y	P
3	3-10-12	8:18	AB	M23	ST/ST	70°	860	650	77 / 81	73 / 74	80 / 80	87	81	87		Y	P
4	3-10-12	8:37	AB	M23	T/T	70°	800	550	73 / 75	72 / 72	73 / 71	75	72	77		Y	P
5	3-10-12	8:40	MY	M20	T/T	70°	820	550	73 / 74	70 / 68	69 / 71	75	71	79		Y	P
6	3-10-12	11:30	RO	X13	T/T	76°	500	350	66 /	65 /	66 /	75	68	67		Y	P
7	3-10-12	1:30	AB	M23	ST/ST	85°	750	700	65 / 69	59 / 60	65 / 55	69	68	72		Y	P
8	3-10-12	1:42	AB	M23	T/T	85°	750	600	69 / 70	64 / 66	68 / 71	71	65	64		Y	P
9	3-10-12	2:00	JL	M8	ST/ST	85°	750	750	79 / 78	75 / 74	73 / 78	81	76	82		Y	P
10	3-10-12	1:47	MY	M20	ST/ST	85°	750	750	71 / 70	71 / 69	72 / 67	82	77	83		Y	P
11	3-10-12	2:00	MY	M20	T/T	85°	750	650	65 / 72	60 / 65	64 / 68	66	65	65		Y	P
12	3-10-12	3:20	VM	M31	ST/ST	87°	800	700	72 / 69	68 / 72	70 / 73	68	74	75		Y	P
13	3-10-12	3:25	MY	M25	ST/ST	87°	750	750	61 / 63	61 / 59	60 / 62	69	68	67		Y	P
14	3-10-12	4:10	RO	X13	T/T	87°	450	150	57 /	57 /	58 /	64	66	66		Y	P
15	3-12-12	8:00	MM	X8	T/T	64°	450	200	70 /	66 /	67 /	79	72	78		Y	P
16	3-12-12	8:50	RO	X13	560/740	64°	560	400	77 /	65 /	68 /	73	70	74		Y	P
17	3-12-12	9:36	MY	X13	ST/ST	70°	750	750	76 / 76	71 / 72	74 / 72	84	80	83		Y	P
18	3-12-12	9:42	MY	M25	T/T	70°	750	650	78 / 73	68 / 67	71 / 66	77	73	74		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: CCSUDC
CLIENT: HDR
Field Rep: Jim Kuhlmann

60 mil HDPE 1 of 2

FILE NO. 91-36-7217

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification Fv: 91 Ex: 78 In / Out	In / Out	In / Out	Shear Spec. 120 SH	SH	SH	SH	FTB	P/F
1	3.27.12	8:10	CS	M25	ST/ST	60°	860	630	105 / 114	135 / 128	130 / 135	138	145	168		Y	P
2	3.27.12	8:07	AB	M23	ST/ST	60°	860	580	120 / 107	119 / 113	118 / 109	125	157	167		Y	P
3	3.27.12	8:10	JL	M21	ST/ST	60°	850	600	121 / 91	115 / 100	117 / 108	154	120	143		Y	P
4	3.27.12	12:52	AB	M23	ST/ST	76°	860	580	117 / 107	126 / 118	117 / 125	153	144	147		Y	P
5	3.27.12	1:02	CS	M25	ST/ST	76°	860	650	113 / 114	100 / 92	103 / 107	138	121	145		Y	P
6	3.27.12	1:05	JL	M21	ST/ST	76°	850	600	124 / 133	102 / 119	103 / 123	139	144	147		Y	P
7	3.28.12	7:35	MY	X13	T/T	61°	550	550	148 /	127 /	156 /	174	159	172		Y	P
8	3.28.12	7:44	MM	X8	T/T	61°	550	550	143 /	129 /	134 /	165	166	172		Y	P
9	3.28.12	7:44	MY	X13	T/T	61°	550	550	149 /	148 /	146 /	179	185	171		Y	P
10	3.28.12	12:55	MY	X13	T/T	80°	550	500	127 /	130 /	132 /	179	140	170		Y	P
11	3.28.12	12:50	MM	X8	T/T	80°	550	550	158 /	130 /	126 /	167	177	169		Y	P
12	3.28.12	1:43	MY	X9	T/T	80°	550	550	103 /	108 /	118 /	151	133	147		Y	P
13	3.30.12	7:30	MM	X8	T/T	68°	550	550	143 /	129 /	145 /	161	153	161		Y	P
14	4.4.12	7:25	MY	X8	T/T	62°	550	550	132 /	110 /	132 /	151	160	141		Y	P
15	4.10.12	7:50	MY	X9	T/T	68°	550	500	128 /	114 /	109 /	149	137	141		Y	P
16	4.26.12	3:53	RO	X8	T/T	74°	550	550	127 /	115 /	129 /	153	140	151		Y	P
17	5.7.12	7:46	RO	X13	T/T	65°	550	550	119 /	95 /	129 /	131	129	132		Y	P
18	5.7.12	7:49	MY	X8	T/T	65°	550	550	123 /	119 /	108 /	140	132	141		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: OCSWDC
CLIENT: HDR
Field Rep: Jim Kuhlemann

60 MIL HDPE 2 OF 2

FILE NO. 91-86-1345

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification Fu: 91 EX: 78 In / Out	In / Out	In / Out	Shear Spec. 120 SH	SH	SH	SH	FTB	P / F
19	5.8.12	8:12	RO	X13	T/T	68°	550	550	104 /	91 /	107 /	136	134	146		Y	P
20	5.12.12	10:30	MY	X8	T/T	74°	550	550	133 /	121 /	130 /	138	132	138		Y	P
21	5.12.12	1:45	MY	X8	T/T	82°	550	500	119 /	110 /	119 /	126	121	147		Y	P
22	5.30.12	8:06	MY	X8	T/T	72°	550	550	128 /	118 /	118 /	148	153	139		Y	P
23	9.4.12	1:14	MY	M23	ST/ST	80°	850	600	121 / 116	102 / 95	114 / 103	131	136	125		Y	P
24	9.4.12	1:14	CL	M20	ST/ST	80°	850	600	110 / 98	110 / 91	106 / 98	150	148	146		Y	P
25	9.4.12	1:16	MY	M23	T/T	80°	850	550	117 / 123	126 / 135	117 / 118	144	132	121		Y	P
26	9.4.12	1:17	CL	M20	T/T	80°	850	550	119 / 116	130 / 118	114 / 119	144	136	144		Y	P
27	9.4.12	4:13	RO	X18	T/T	80°	550	450	119 /	122 /	124 /	123	143	122		Y	P
28	9.5.12	7:20	RO	X18	T/T	74°	550	550	126 /	136 /	138 /	177	167	149		Y	P
29	9.13.12	9:15	MY	M23	ST/ST	72°	850	650	108 / 113	101 / 105	118 / 129	142	163	130		Y	P
30	9.13.12	9:19	RO	X18	T/T	72°	550	500	85 /	99 /	116 /	129	132	139		Y	P
31	10.17.12	8:48	MY	X9	T/T	68°	500	500	129 /	138 /	152 /	141	122	143		Y	P
32	10.17.12	8:49	RO	X18	T/T	68°	550	550	121 /	139 /	123 /	140	156	162		Y	P
33	10.24.12	10:40	MY	X18	T/T	74°	650	550	129 /	114 /	129 /	134	144	147		Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

NO TENSIOMETER SHEAR CRITERIA ADVISED AT THIS TIME

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. 125 SH	SH	SH	SH	FTB	P/F
1	6.15.12	8:15	MY	M6	TPO/TPO	70°	850	650	59 /	51 /	/	127	140			Y	P
2	6.15.12	8:16	AB	M9	TPO/TPO	70°	850	650	57 /	61 /	/	143	109			Y	P
3	6.15.12	9:55	HT	MS/N	TPO/TPO	78°	620	500	51 /	39 /	/	128	114			Y	P
4	6.15.12	1:10	MY	M6	TPO/TPO	80°	850	650	44 /	58 /	/	137	133			Y	P
5	6.15.12	1:12	AB	X1	TPO/TPO	80°	620	500	23 /	33 /	/	130	120			Y	P
6	6.18.12	10:05	MY	M6	TPO/TPO	75°	850	650	71 /	72 /	/	122	105			Y	P
7	6.18.12	10:08	AB	X1	TPO/TPO	75°	620	500	21 /	12 /	/	—	—			N	F
8	6.18.12	10:39	AB	X1	TPO/TPO	75°	620	500	22 /	10 /	/	—	—			N	F
9	6.18.12	11:15	AB	X1	TPO/TPO	75°	620	450	60 /	56 /	/	133	117			Y	P
10	6.19.12	8:06	AB	X1	TPO/TPO	70°	620	450	32 /	30 /	/	98	123			Y	P
11	6.19.12	7:26	MY	M6	TPO/TPO	76°	850	600	63 /	64 /	/	107	137			Y	P
12	6.19.12	1:10	AB	X1	TPO/TPO	80°	650	450	60 /	55 /	/	108	95			Y	P
13	6.19.12	1:10	MY	M6	TPO/TPO	80°	850	600	68 /	58 /	/	138	104			Y	P
14	6.20.12	7:29	MY	M6	TPO/TPO	70°	850	600	50 /	63 /	/	139	110			Y	P
15	7.3.12	7:42	MY	M6	TPO/TPO	85°	850	650	58 /	51 /	/	98	91			Y	P
16	7.3.12	9:18	AB	X1	TPO/TPO	85°	650	400	24 /	28 /	/	118	116			Y	P
17	7.3.12	1:20	AB	X1	TPO/TPO	85°	850	650	33 /	20 /	/	144	128			Y	P
18	7.3.12	1:15	MY	M6	TPO/TPO	85°	850	650	54 /	54 /	/	79	72			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

NO TENSIOMETER SHEAR CRITERIA ADVISED @ THIS TIME

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. SH	Shear Spec. SH	Shear Spec. SH	Shear Spec. SH	FTB	P / F
19	7.4.12	7:31	MY	M6	TPO/TPO	74°	850	650	66 /	60 /	/	141	124			Y	P
20	7.4.12	7:38	AB	X1	TPO/TPO	74°	650	450	43 /	59 /	/	134	138			Y	P
21	7.5.12	7:33	MY	M6	TPO/TPO	70°	850	700	49 /	54 /	/	112	140			Y	P
22	7.5.12	7:40	AB	X1	TPO/TPO	70°	650	450	62 /	66 /	/	131	135			Y	P
23	7.5.12	1:10	AB	X1	TPO/TPO	80°	650	450	54 /	55 /	/	130	133			Y	P
24	7.5.12	1:10	MY	M6	TPO/TPO	80°	850	700	60 /	44 /	/	146	146			Y	P
25	7.5.12	1:18	CL	M9	TPO/TPO	80°	850	650	40 /	40 /	/	149	138			Y	P
26	7.6.12	8:11	AB	X1	TPO/TPO	72°	650	450	26 /	22 /	/	126	126			Y	P
27	7.6.12	8:09	MY	M6	TPO/TPO	72°	850	600	58 /	60 /	/	120	121			Y	P
28	7.6.12	1:33	MY	M6	TPO/TPO	88°	850	600	45 /	41 /	/	103	123			Y	P
29	7.6.12	2:03	AB	X1	TPO/TPO	88°	650	450	50 /	45 /	/	119	117			Y	P
30	7.7.12	7:29	MY	M6	TPO/TPO	75°	850	600	72 /	71 /	/	150	134			Y	P
31	7.7.12	12:36	MY	M9	TPO/TPO	82°	850	600	40 /	45 /	/	127	118			Y	P
32	7.7.12	12:55	AB	X1	TPO/TPO	82°	650	450	57 /	43 /	/	129	135			Y	P
33	7.9.12	7:53	MY	MY	TPO/TPO	70°	850	600	21 /	66 /	/	147	179			Y	P
34	7.9.12	1:07	MY	MY	TPO/TPO	83°	850	600	47 /	60 /	/	116	106			Y	P
35	7.9.12	1:24	AB	X1	TPO/TPO	83°	650	450	57 /	53 /	/	101	111			Y	P
36	7.10.12	1:21	AB	X1	TPO/TPO	83°	650	450	56 /	46 /	/	113	101			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 mil TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
37	7-10-12	2:00	MY	M6	TPO/TPO	83°	850	550	29 /	21 /	/	110	128			Y	P
38	7-11-12	8:05	AB	X1	TPO/TPO	60°	650	450	13 /	14 /	/	—	—			N	F
39	7-11-12	8:36	AB	X1	TPO/TPO	60°	650	450	51 /	27 /	/	141	113			Y	P
40	7-12-12	1:40	MY	M9	TPO/TPO	80°	850	550	47 /	52 /	/	126	100			Y	P
41	7-13-12	7:31	MY	M9	TPO/TPO	70°	850	550	70 /	61 /	/	137	143			Y	P
42	7-13-12	8:50	AB	X1	TPO/TPO	74°	650	450	62 /	61 /	/	124	110			Y	P
43	7-13-12	10:28	HT	X2	TPO/TPO	78°	450	350	53 /	56 /	/	134	119			Y	P
44	7-20-12	3:35	HT	M1	TPO/TPO	84°	700	650	42 /	47 /	/	139	136			Y	P
45	7-20-12	3:30	CL	M6	TPO/TPO	84°	750	650	59 /	75 /	/	121	126			Y	P
46	7-21-12	7:50	HT	M1	TPO/TPO	72°	700	650	66 /	59 /	/	141	127			Y	P
47	7-21-12	7:52	CL	M6	TPO/TPO	72°	750	650	71 /	68 /	/	136	131			Y	P
48	7-21-12	9:20	AB	X1	TPO/TPO	78°	650	450	57 /	49 /	/	111	107			Y	P
49	7-21-12	1:28	CL	M6	TPO/TPO	86°	750	650	71 /	68 /	/	101	103			Y	P
50	7-21-12	1:30	HT	M1	TPO/TPO	86°	750	650	57 /	49 /	/	93	111			Y	P
51	7-21-12	2:00	AB	X1	TPO/TPO	86°	650	450	46 /	24 /	/	87	71			Y	P
52	7-22-12	8:00	CL	M6	TPO/TPO	70°	750	650	76 /	64 /	/	149	154			Y	P
53	7-22-12	8:38	MY	M9	TPO/TPO	70°	750	650	74 /	62 /	/	149	129			Y	P
54	7-22-12	9:00	AB	X1	TPO/TPO	80°	650	450	67 /	55 /	/	138	135			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
55	7-27-12	1:21	MY	M9	TPO/TPO	82°	750	650	64 /	53 /	/	122	111			Y	P
56	7-22-12	1:27	CL	M6	TPO/TPO	82°	750	650	64 /	48 /	/	146	139			Y	P
57	7-23-12	11:57	CL	M6	TPO/TPO	78°	750	650	64 /	59 /	/	140	136			Y	P
58	7-24-12	12:56	AB	X1	TPO/TPO	86°	650	450	48 /	54 /	/	127	121			Y	P
59	7-24-12	1:10	CL	M1	TPO/TPO	82°	650	400	72 /	48 /	/	118	127			Y	P
60	7-25-12	1:25	CL	M6	TPO/TPO	82°	750	650	65 /	55 /	/	156	146			Y	P
61	7-27-12	2:49	MY	M9	TPO/TPO	84°	750	650	58 /	59 /	/	107	97			Y	P
62	7-27-12	2:30	CL	M1	TPO/TPO	84°	750	650	53 /	63 /	/	137	134			Y	P
63	7-28-12	8:17	CL	M1	TPO/TPO	78°	700	650	54 /	51 /	/	156	139			Y	P
64	7-28-12	8:14	MY	M9	TPO/TPO	78°	750	650	76 /	62 /	/	132	129			Y	P
65	7-28-12	12:52	MY	M9	TPO/TPO	84°	750	650	47 /	60 /	/	142	127			Y	P
66	7-28-12	12:54	CL	M1	TPO/TPO	84°	700	650	56 /	71 /	/	127	122			Y	P
67	7-30-12	7:30	MY	M9	TPO/TPO	74°	750	650	54 /	60 /	/	150	141			Y	P
68	7-30-12	7:32	CL	M1	TPO/TPO	74°	700	650	62 /	78 /	/	136	140			Y	P
69	7-30-12	1:05	MY	M9	TPO/TPO	84°	750	650	61 /	55 /	/	135	119			Y	P
70	7-30-12	1:17	CL	M1	TPO/TPO	84°	700	650	49 /	56 /	/	121	103			Y	P
71	7-30-12	8:17	AB	X1	TPO/TPO	84°	600	450	01 /	46 /	/	137	132			Y	P
72	8-2-12	7:39	CL	M1	TPO/TPO	72°	750	650	58 /	76 /	/	82	70			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 128 (112) SH	SH	SH	SH	FTB	P / F
73	8-2-12	7:40	MY	M6	TPO/TPO	72°	700	650	49 /	69 /	/	136	132			Y	P
74	8-2-12	1:03	CL	M1	TPO/TPO	84°	700	650	41 /	32 /	/	134	124			Y	P
75	8-2-12	1:04	MY	M6	TPO/TPO	84°	750	650	49 /	48 /	/	96	106			Y	P
76	8-2-12	1:40	AB	X1	TPO/TPO	86°	600	450	71 /	77 /	/	140	124			Y	P
77	8-3-12	11:52	MY	M6	TPO/TPO	90°	750	650	57 /	60 /	/	103	99			Y	P
78	8-3-12	11:58	CL	M1	TPO/TPO	90°	700	650	65 /	50 /	/	106	93			Y	P
79	8-3-12	1:04	AB	X1	TPO/TPO	90°	600	450	58 /	46 /	/	129	124			Y	P
80	8-4-12	7:40	CL	M1	TPO/TPO	68°	700	650	56 /	59 /	/	175	145			Y	P
81	8-4-12	7:36	MY	M6	TPO/TPO	69°	750	650	63 /	47 /	/	101	148			Y	P
82	8-4-12	12:50	CL	M1	TPO/TPO	84°	700	650	60 /	64 /	/	120	100			Y	P
83	8-4-12	12:48	MY	M6	TPO/TPO	84°	750	650	54 /	50 /	/	121	135			Y	P
84	8-6-12	1:15	CL	M6	TPO/TPO	90°	750	650	47 /	54 /	/	117	109			Y	P
85	8-6-12	1:16	MY	M9	TPO/TPO	90°	750	650	52 /	42 /	/	107	117			Y	P
86	8-6-12	11:39	AB	X1	TPO/TPO	84°	650	450	49 /	34 /	/	113	121			Y	P
87	8-8-12	9:32	MY	M9	TPO/TPO	80°	750	650	50 /	61 /	/	104	101			Y	P
88	8-8-12	11:37	CL	M1	TPO/TPO	90°	700	650	47 /	48 /	/	109	110			Y	P
89	8-8-12	4:15	CL	M1	TPO/TPO	84°	700	650	48 /	57 /	/	124	115			Y	P
90	8-8-12	4:10	MY	M9	TPO/TPO	84°	750	650	53 /	61 /	/	114	100			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification (20) In / Out	In / Out	In / Out	Shear Spec. (12) SH	SH	SH	SH	FTB	P/F
91	8.8.12	10:26	AB	X1	TPO/TPO	76°	600	450	43 /	99 /	/	111	129			Y	P
92	8.9.12	8:03	AB	X1	TPO/TPO	70°	600	450	73 /	69 /	/	118	114			Y	P
93	8.9.12	8:05	MY	M9	TPO/TPO	70°	750	650	55 /	53 /	/	152	142			Y	P
94	8.9.12	8:10	CL	M1	TPO/TPO	70°	700	650	46 /	39 /	/	148	121			Y	P
95	8.9.12	1:12	MY	M9	TPO/TPO	84°	750	650	54 /	54 /	/	100	160			Y	P
96	8.9.12	1:12	CL	M1	TPO/TPO	84°	700	650	36 /	43 /	/	130	116			Y	P
97	8.9.12	2:30	AB	X1	TPO/TPO	84°	600	450	43 /	45 /	/	123	107				
		1:17	MY	M9	TPO/TPO	70°	750	650	68 /	61 /	/	161	118				
					TPO/TPO	70°	700	650	64 /	43 /	/	146	130				
					T/	70°	600	450	57 /	51 /	/	102	116				
	2	7:28		M1	TPO/TPO	70°	700	650	50 /	35 /	/	127	130				
		8:05		M9	TPO/TPO	76°	750	650	46 /	49 /	/	161	132				
	8.11.12	1:11	AB	X1	TPO/TPO	80°	600	450	38 /	43 /	/	135	105				
	8.11.12	2:22	MY	M9	TPO/TPO	80°	750	650	71 /	3 /	/	117	140				
		2:30	CL	M1	TPO/TPO	80°	700	650	53 /	59 /	/	142	139				
		8:09	AB	X1	TPO/TPO	70°	600	450	37 /	39 /	/	119	46				
		1:13	AB	X1	TPO/TPO	80°	600	450	/	/	/	/	/				
8	1	1:17	CL	M1	TPO/TPO	80°	700	650	64 /	56 /	/	1	139				

Ardaman & Associates, Inc
Geotechnical, Environmental and
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Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (1/2) SH	SH	SH	SH	FTB	P/F
109	8·13·12	1:18	MY	M9	TPO/TPO	80°	750	650	20 /	66 /	/	127	115			Y	P
110	8·14·12	10:20	CL	M6	TPO/TPO	88°	700	650	59 /	59 /	/	116	125			Y	P
111	8·14·12	10:30	MY	M9	TPO/TPO	80°	750	650	69 /	51 /	/	157	131			Y	P
112	8·14·12	10:15	AB	X1	TPO/TPO	80°	600	450	38 /	51 /	/	107	110			Y	P
113	8·14·12	11:40	CL	X1	TPO/TPO	84°	700	650	38 /	43 /	/	117	120			Y	P
114	8·14·12	3:05	AB	X1	TPO/TPO	86°	600	450	41 /	39 /	/	110	119			Y	P
115	8·15·12	7:28	AB	X1	TPO/TPO	76°	600	450	37 /	39 /	/	121	107			Y	P
116	8·15·12	7:25	CL	M6	TPO/TPO	70°	750	650	75 /	68 /	/	147	143			Y	P
117	8·15·12	7:28	MY	M9	TPO/TPO	70°	750	650	82 /	52 /	/	128	156			Y	P
118	8·16·12	7:38	MY	M9	TPO/TPO	70°	750	650	77 /	71 /	/	125	121			Y	P
119	8·16·12	7:36	CL	M1	TPO/TPO	70°	700	650	59 /	65 /	/	150	114			Y	P
120	8·16·12	12:27	CL	M6	TPO/TPO	85°	700	650	44 /	45 /	/	118	112			Y	P
121	8·17·12	7:39	CL	M6	TPO/TPO	74°	700	650	54 /	63 /	/	120	112			Y	P
122	8·17·12	7:39	MY	M9	TPO/TPO	74°	750	650	51 /	47 /	/	147	134			Y	P
123	8·18·12	1:26	CL	M6	TPO/TPO	90°	700	650	66 /	47 /	/	115	104			Y	P
124	8·18·12	1:27	MY	M9	TPO/TPO	90°	750	650	61 /	49 /	/	113	112			Y	P
125	8·20·12	7:35	MY	M9	TPO/TPO	74°	750	650	62 /	58 /	/	112	113			Y	P
126	8·20·12	7:34	CL	M6	TPO/TPO	74°	700	650	66 /	47 /	/	106	121			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
127	8.20.12	11:20	HT	V1	TPO/TPO	80°	800	7.2	47 /	45 /	/	125	123			Y	P
128	8.22.12	8:00	AB	X1	TPO/TPO	78°	600	450	29 /	46 /	/	117	112			Y	P
129	8.22.12	8:00	AB	X1	TPO/TPO	76°	600	450	20 /	67 /	/	126	150			Y	P
130	8.22.12	10:23	CL	M6	TPO/TPO	76°	750	650	58 /	40 /	/	121	126			Y	P
131	8.22.12	10:20	MY	M9	TPO/TPO	76°	750	650	46 /	50 /	/	119	114			Y	P
132	8.22.12	12:59	AB	X1	TPO/TPO	80°	600	450	46 /	36 /	/	109	104			Y	P
133	8.22.12	1:00	CL	M6	TPO/TPO	80°	750	650	48 /	44 /	/	128	109			Y	P
134	8.22.12	1:03	MY	M9	TPO/TPO	80°	750	650	66 /	39 /	/	101	108			Y	P
135	8.23.12	7:30	MY	M9	TPO/TPO	68°	750	650	56 /	65 /	/	129	130			Y	P
136	8.23.12	7:34	CL	M6	TPO/TPO	68°	750	650	56 /	48 /	/	104	106			Y	P
137	8.23.12	7:46	AB	M1	TPO/TPO	68°	750	650	61 /	63 /	/	123	131			Y	P
138	8.23.12	11:33	CB	X1	TPO/TPO	68°	600	450	57 /	41 /	/	119	108			Y	P
139	8.23.12	1:09	MY	M9	TPO/TPO	84°	750	650	46 /	47 /	/	146	112			Y	P
140	8.23.12	1:10	AB	M1	TPO/TPO	84°	750	650	50 /	43 /	/	151	147			Y	P
141	8.23.12	1:30	CL	M6	TPO/TPO	84°	750	650	49 /	48 /	/	108	106			Y	P
142	8.24.12	7:28	MY	M9	TPO/TPO	68°	750	650	69 /	54 /	/	140	156			Y	P
143	8.24.12	7:28	CL	M6	TPO/TPO	68°	750	650	65 /	61 /	/	140	137			Y	P
144	8.24.12	7:32	AB	M1	TPO/TPO	68°	750	650	73 /	56 /	/	149	155			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
145	8.24.12	8:00	CB	X1	TPO/TPO	68°	600	450	44 /	36 /	/	119	112			Y	P
146	8.24.12	1:19	MY	M9	TPO/TPO	80°	750	650	67 /	57 /	/	101	105			Y	P
147	8.24.12	1:40	JR	V1	TPO/TPO	80°	758	7.2	47 /	45 /	/	104	134			Y	P
148	8.24.12	1:18	AB	M1	TPO/TPO	80°	750	650	46 /	51 /	/	134	129			Y	P
149	8.24.12	1:00	CB	X1	TPO/TPO	80°	600	450	54 /	56 /	/	121	119			Y	P
150	8.25.12	7:30	JR	V1	TPO/TPO	70°	842	6.8	69 /	73 /	/	143	126			Y	P
151	8.25.12	7:30	AB	X1	TPO/TPO	70°	600	450	37 /	39 /	/	101	137			Y	P
152	8.25.12	12:56	JR	V1	TPO/TPO	84°	842	6.8	57 /	59 /	/	106	120			Y	P
153	8.25.12	1:00	AB	X1	TPO/TPO	84°	600	450	31 /	23 /	/	101	119			Y	P
154	8.31.12	8:42	CB	X1	TPO/TPO	80°	600	450	48 /	48 /	/	110	116			Y	P
155	8.31.12	11:62	MY	M9	TPO/TPO	82°	750	650	36 /	63 /	/	113	105			Y	P
156	8.31.12	11:63	CL	M1	TPO/TPO	82°	700	650	53 /	50 /	/	101	109			Y	P
157	8.31.12	1:30	AB	X1	TPO/TPO	86°	600	450	42 /	28 /	/	100	109			Y	P
158	9.1.12	7:36	CL	M6	TPO/TPO	74°	750	650	48 /	64 /	/	106	101			Y	P
159	9.1.12	7:36	MY	M9	TPO/TPO	74°	750	650	59 /	54 /	/	106	113			Y	P
160	9.1.12	8:00	AB	X1	TPO/TPO	74°	600	450	39 /	43 /	/	116	109			Y	P
161	9.1.12	12:01	MY	M1	TPO/TPO	84°	750	650	48 /	37 /	/	110	100			Y	P
162	9.1.12	12:00	CL	M6	TPO/TPO	84°	750	650	70 /	55 /	/	126	123			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
163	9.1.12	12:10	AB	X1	TPO/TPO	84°	600	450	30 /	45 /	/	132	110			Y	P
164	9.3.12	9:41	AB	X1	TPO/TPO	80°	600	450	28 /	28 /	/	103	125			Y	P
165	9.3.12	9:22	MY	M1	TPO/TPO	80°	750	650	48 /	48 /	/	144	130			Y	P
166	9.3.12	9:22	CL	M6	TPO/TPO	80°	750	650	61 /	59 /	/	116	118			Y	P
167	9.3.12	9:46	MY	M1	TPO/TPO	84°	750	650	46 /	50 /	/	112	108			Y	P
168	9.3.12	1:45	CL	M6	TPO/TPO	84°	750	650	60 /	50 /	/	137	135			Y	P
169	9.3.12	1:49	AB	X1	TPO/TPO	84°	600	450	46 /	34 /	/	98	88			Y	P
170	9.5.12	8:55	MY	M1	TPO/TPO	80°	750	650	48 /	34 /	/	150	141			Y	P
171	9.5.12	9:06	CL	M6	TPO/TPO	80°	750	650	68 /	66 /	/	127	131			Y	P
172	9.5.12	3:54	AB	X1	TPO/TPO	83°	600	450	39 /	41 /	/	105	109			Y	P
173	9.5.12	3:48	JR	V1	TPO/TPO	83°	788	7.2	29 /	33 /	/	114	117			Y	P
174	9.6.12	2:19	CL	M6	TPO/TPO	80°	750	650	67 /	61 /	/	129	112			Y	P
175	9.6.12	3:38	CL	M1	TPO/TPO	79°	750	650	44 /	37 /	/	114	118			Y	P
176	9.7.12	7:45	CL	M6	TPO/TPO	80°	750	650	23 /	52 /	/	99	97			Y	P
177	9.7.12	1:07	CL	M6	TPO/TPO	80°	750	650	50 /	46 /	/	127	108			Y	P
178	9.7.12	3:10	JR	V1	TPO/TPO	80°	788	7.2	21 /	23 /	/	109	104			Y	P
179	9.8.12	7:30	JR	V1	TPO/TPO	80°	788	7.2	33 /	53 /	/	106	109			Y	P
180	9.10.12	8:05	AB	X1	TPO/TPO	82°	600	400	26 /	22 /	/	109	101			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 60 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
181	9.10.12	1:03	AB	X1	TPO/TPO	80°	600	450	33 /	26 /	/	101	116			Y	P
182	9.10.12	2:13	MY	M1	TPO/TPO	80°	750	650	43 /	44 /	/	106	107			Y	P
183	9.10.12	2:44	CL	M6	TPO/TPO	80°	750	650	59 /	42 /	/	111	121			Y	P
184	9.10.12	3:42	JR	V1	TPO/TPO	84°	788	7.2	49 /	45 /	/	107	104			Y	P
185	9.11.12	7:38	JR	V1	TPO/TPO	70°	788	7.2	16 /	5 /	/	—	—			N	F
186	9.11.12	8:15	JR	V1	TPO/TPO	70°	860	7.2	47 /	47 /	/	91	98			Y	P
187	9.11.12	10:47	CL	M6	TPO/TPO	76°	750	650	57 /	60 /	/	111	135			Y	P
188	9.11.12	9:01	AB	X1	TPO/TPO	74°	600	450	41 /	36 /	/	116	109			Y	P
189	9.11.12	1:05	AB	X1	TPO/TPO	82°	600	450	22 /	43 /	/	109	114			Y	P
190	9.11.12	1:44	CL	M6	TPO/TPO	82°	750	650	57 /	49 /	/	109	114			Y	P
191	9.11.12	1:57	MY	M1	TPO/TPO	82°	750	650	57 /	43 /	/	119	123			Y	P
192	9.12.12	8:11	CL	M6	TPO/TPO	72°	750	650	52 /	53 /	/	142	119			Y	P
193	9.12.12	8:12	MY	M1	TPO/TPO	72°	750	650	55 /	56 /	/	107	108			Y	P
194	9.12.12	1:04	CL	M6	TPO/TPO	82°	750	650	54 /	62 /	/	110	108			Y	P
195	9.12.12	1:12	MY	M1	TPO/TPO	82°	750	650	50 /	44 /	/	111	101			Y	P
196	9.12.12	10:04	AB	X1	TPO/TPO	76°	600	450	29 /	31 /	/	109	112			Y	P
197	9.12.12	3:25	JR	V1	TPO/TPO	82°	688	7.2	33 /	21 /	/	119	103			Y	P
198	9.13.12	7:42	CL	M6	TPO/TPO	70°	750	650	61 /	49 /	/	133	162			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
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Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
199	9.13.12	7:42	MY	M1	TPO/TPO	70°	750	650	50 /	31 /	/	154	133			Y	P
200	9.13.12	9:30	JR	V1	TPO/TPO	70°	680	7.2	33 /	37 /	/	124	109			Y	P
201	9.13.12	9:25	AB	X1	TPO/TPO	70°	600	450	39 /	26 /	/	110	104			Y	P
202	9.13.12	1:00	JR	V1	TPO/TPO	76°	680	7.2	53 /	68 /	/	112	106			Y	P
203	9.13.12	12:50	AB	X1	TPO/TPO	76°	600	450	45 /	20 /	/	127	118			Y	P
204	9.13.12	2:12	CL	M6	TPO/TPO	74°	750	650	50 /	48 /	/	129	131			Y	P
205	9.13.12	2:14	MY	M1	TPO/TPO	74°	750	650	53 /	54 /	/	115	115			Y	P
206	9.14.12	7:36	JR	V1	TPO/TPO	70°	780	7.2	27 /	44 /	/	148	130			Y	P
207	9.14.12	1:35	JR	V1	TPO/TPO	85°	780	7.2	45 /	36 /	/	103	107			Y	P
208	9.14.12	1:40	MY	M9	TPO/TPO	85°	750	650	58 /	57 /	/	105	102			Y	P
209	9.14.12	1:40	CL	M1	TPO/TPO	85°	750	650	48 /	41 /	/	101	108			Y	P
210	9.15.12	7:39	AB	X1	TPO/TPO	72°	600	450	37 /	39 /	/	115	113			Y	P
211	9.15.12	1:05	AB	X1	TPO/TPO	84°	600	450	43 /	39 /	/	110	121			Y	P
212	9.17.12	7:35	AB	X1	TPO/TPO	74°	600	450	37 /	31 /	/	113	117			Y	P
213	9.17.12	12:45	AB	X1	TPO/TPO	78°	600	450	41 /	43 /	/	119	116			Y	P
214	9.18.12	8:10	AB	X1	TPO/TPO	72°	600	450	39 /	26 /	/	132	149			Y	P
215	9.18.12	1:05	AB	X1	TPO/TPO	79°	600	450	21 /	32 /	/	101	119			Y	P
216	9.19.12	7:20	AB	X1	TPO/TPO	72°	600	450	33 /	21 /	/	118	119			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
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Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
217	9.19.12	10:38	JR	x1	TPO/TPO	78°	788	6.8	29 /	25 /	/	118	109			Y	P
218	9.19.12	12:47	AB	x1	TPO/TPO	80°	600	450	31 /	60 /	/	119	153			Y	P
219	9.20.12	8:10	AB	x1	TPO/TPO	72°	600	450	23 /	27 /	/	101	119			Y	P
220	9.20.12	12:43	AB	x1	TPO/TPO	80°	600	450	43 /	63 /	/	118	120			Y	P
221	9.21.12	9:40	AB	x1	TPO/TPO	74°	600	450	36 /	33 /	/	129	131			Y	P
222	9.23.12	10:10	AB	x1	TPO/TPO	73°	600	450	30 /	29 /	/	119	108			Y	P
223	9.24.12	9:01	AB	x1	TPO/TPO	72°	600	450	23 /	27 /	/	114	119			Y	P
224	9.24.12	7:59	AB	x1	TPO/TPO	70°	600	450	36 /	31 /	/	109	119			Y	P
225	9.24.12	3:13	MY	M9	TPO/TPO	76°	750	650	68 /	62 /	/	112	119			Y	P
226	9.24.12	3:12	CL	M1	TPO/TPO	76°	750	650	43 /	47 /	/	105	109			Y	P
227	9.25.12	7:47	CL	M1	TPO/TPO	72°	750	650	45 /	49 /	/	110	114			Y	P
228	9.25.12	9:30	MY	M9	TPO/TPO	72°	750	650	61 /	69 /	/	117	121			Y	P
229	9.25.12	1:24	CL	M1	TPO/TPO	78°	750	650	36 /	41 /	/	114	119			Y	P
230	9.25.12	1:26	MY	M9	TPO/TPO	78°	750	650	53 /	57 /	/	121	123			Y	P
231	9.26.12	7:30	MY	M9	TPO/TPO	70°	750	650	43 /	39 /	/	113	121			Y	P
232	9.26.12	7:33	AB	x1	TPO/TPO	70°	600	450	47 /	54 /	/	119	111			Y	P
233	9.26.12	4:30	MY	M9	TPO/TPO	80°	750	650	38 /	65 /	/	137	132			Y	P
234	9.26.12	6:05	JR	V1	TPO/TPO	76°	1040	10.4	44 /	33 /	/	115	121			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
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Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
235	9.27.12	7:30	MY	M9	TPO/TPO	66°	750	650	70 /	71 /	/	150	143			Y	P
236	9.27.12	7:28	CL	M1	TPO/TPO	66°	750	650	38 /	45 /	/	143	113			Y	P
237	9.27.12	10:05	JR	V1	TPO/TPO	79°	1040	10.4	36 /	29 /	/	112	116			Y	P
238	9.27.12	1:20	JR	V1	TPO/TPO	82°	750	650	29 /	33 /	/	112	114			Y	P
239	9.27.12	2:43	MY	M9	TPO/TPO	82°	750	650	56 /	59 /	/	129	143			Y	P
240	9.28.12	7:46	MY	M9	TPO/TPO	68°	750	650	69 /	60 /	/	115	139			Y	P
241	9.28.12	10:03	JR	V1	TPO/TPO	76°	788	6.8	33 /	35 /	/	131	122			Y	P
242	9.28.12	1:03	AB	X1	TPO/TPO	81°	600	450	39 /	25 /	/	132	134			Y	P
243	9.28.12	2:05	MY	M9	TPO/TPO	81°	750	650	69 /	56 /	/	132	139			Y	P
244	9.29.12	7:25	JR	V1	TPO/TPO	64°	788	6.8	50 /	54 /	/	144	155			Y	P
245	9.29.12	8:01	AB	X1	TPO/TPO	69°	600	450	49 /	56 /	/	136	121			Y	P
246	9.29.12	1:50	AB	X1	TPO/TPO	86°	600	450	51 /	36 /	/	121	116			Y	P
247	9.29.12	1:40	JR	V1	TPO/TPO	86°	788	6.8	54 /	50 /	/	113	121			Y	P
248	10.1.12	7:43	AB	X1	TPO/TPO	68°	600	450	63 /	62 /	/	119	118			Y	P
249	10.1.12	12:59	AB	X1	TPO/TPO	74°	600	450	58 /	43 /	/	132	120			Y	P
250	10.1.12	1:10	MY	M9	TPO/TPO	74°	750	650	61 /	56 /	/	117	135			Y	P
251	10.2.12	8:10	AB	X1	TPO/TPO	69°	600	450	21 /	32 /	/	119	117			Y	P
252	10.2.12	1:43	MY	M9	TPO/TPO	73°	750	650	36 /	54 /	/	137	143			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

60 MIL TPO

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
253	10.2.12	1:40	AD	X1	TPO/TPO	73°	600	450	36 /	31 /	/	121	113			Y	P
254	10.3.12	7:35	AB	X1	TPO/TPO	69°	600	450	39 /	55 /	/	119	121			Y	P
255	10.3.12	12:55	AB	X1	TPO/TPO	73°	600	450	33 /	29 /	/	121	146			Y	P
256	10.5.12	7:49	AB	X1	TPO/TPO	69°	600	450	39 /	49 /	/	129	139			Y	P
257	10.5.12	1:05	AB	X1	TPO/TPO	74°	600	450	54 /	54 /	/	129	131			Y	P
258	10.5.12	1:20	JR	L6	TPO/TPO	76°	930	9.0	59 /	61 /	/	146	137			Y	P
259	10.6.12	7:55	AB	X1	TPO/TPO	70°	600	450	43 /	39 /	/	119	132			Y	P
260	10.6.12	7:55	JR	L6	TPO/TPO	70°	950	65	75 /	62 /	/	123	126			Y	P
261	10.6.12	12:56	AB	X1	TPO/TPO	78°	600	450	39 /	46 /	/	121	124			Y	P
262	10.6.12	1:55	MY	m9	TPO/TPO	78°	750	650	44 /	44 /	/	119	119			Y	P
263	10.6.12	3:00	JR	V1	TPO/TPO	84°	860	6.8	50 /	44 /	/	114	124			Y	P
264	10.7.12	7:47	AB	X1	TPO/TPO	66°	600	450	41 /	60 /	/	113	119			Y	P
265	10.7.12	9:20	JR	V1	TPO/TPO	71°	860	6.8	38 /	47 /	/	120	126			Y	P
266	10.8.12	7:55	JR	V1	TPO/TPO	68°	860	6.8	64 /	48 /	/	122	118			Y	P
267	10.8.12	7:39	CL	m9	TPO/TPO	68°	750	650	45 /	45 /	/	147	151			Y	P
268	10.8.12	8:01	AB	X1	TPO/TPO	68°	600	450	39 /	37 /	/	114	118			Y	P
269	10.8.12	12:53	CL	m9	TPO/TPO	80°	750	650	50 /	45 /	/	123	132			Y	P
270	10.8.12	12:53	JR	V1	TPO/TPO	80°	860	6.8	56 /	49 /	/	116	113			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	Peel Specification In / Out	Peel Specification In / Out	Shear Spec. (25 (112) SH	Shear Spec. SH	Shear Spec. SH	Shear Spec. SH	FTB	P / F
271	10.8.12	12:59	AB	X1	TPO/TPO	80°	600	450	39 /	43 /	/	121	117			Y	P
272	10.9.12	7:20	CL	M9	TPO/TPO	66°	750	650	79 /	64 /	/	150	157			Y	P
273	10.9.12	7:23	AB	X1	TPO/TPO	66°	600	450	39 /	43 /	/	139	137			Y	P
274	10.9.12	1:06	CL	M9	TPO/TPO	80°	750	650	70 /	58 /	/	115	112			Y	P
275	10.9.12	4:00	JR	V1	TPO/TPO	80°	860	6.8	57 /	70 /	/	127	120			Y	P
276	10.10.12	7:53	AB	X1	TPO/TPO	66°	600	450	39 /	41 /	/	123	131			Y	P
277	10.10.12	8:00	JR	V1	TPO/TPO	66°	860	6.8	64 /	55 /	/	128	138			Y	P
278	10.10.12	10:23	CL	M9	TPO/TPO	74°	750	650	56 /	54 /	/	121	119			Y	P
279	10.10.12	1:00	AB	X1	TPO/TPO	78°	600	450	54 /	53 /	/	139	141			Y	P
280	10.10.12	1:02	CL	M9	TPO/TPO	78°	750	650	69 /	59 /	/	135	152			Y	P
281	10.10.12	5:05	JR	V1	TPO/TPO	80°	860	6.8	53 /	52 /	/	115	118			Y	P
282	10.11.12	8:01	JR	V1	TPO/TPO	69°	860	6.8	39 /	43 /	/	117	121			Y	P
283	10.11.12	7:57	AB	X1	TPO/TPO	69°	600	450	41 /	49 /	/	114	131			Y	P
284	10.11.12	1:00	AB	X1	TPO/TPO	80°	600	450	37 /	45 /	/	112	113			Y	P
285	10.11.12	12:38	CL	M9	TPO/TPO	82°	750	650	61 /	63 /	/	140	137			Y	P
286	10.11.12	12:43	AB	X1	TPO/TPO	86°	600	450	43 /	38 /	/	129	133			Y	P
287	10.12.12	12:49	AB	X1	TPO/TPO	78°	600	450	29 /	36 /	/	131	134			Y	P
288	10.13.12	7:59	AB	X1	TPO/TPO	82°	600	450	33 /	27 /	/	113	116			Y	P

Ardaman & Associates, Inc
Geotechnical, Environmental and
Materials Consultants

Daily Trial Weld Log

60 MIL TPO

PROJECT: [illegible]
CLIENT: HDR
Field Rep: [illegible]

FILE NO. [illegible]

Test #	Date	Time	Weld Tech	Machine Number	Type Mat.	Amb. Temp	Mach Settings Temp	Mach Settings Sp/PH	Peel Specification 20 In / Out	In / Out	In / Out	Shear Spec. 125 (112) SH	SH	SH	SH	FTB	P / F
289	10.13.12	12:38	AB	X1	TPO / TPO	79°	600	450	46 /	57 /	/	116	139			Y	P
290	10.15.12	1:10	CL	M9	TPO / TPO	82°	750	650	61 /	59 /	/	132	143			Y	P
291	10.17.12	7:50	AB	X1	TPO / TPO	66°	600	450	39 /	45 /	/	121	120			Y	P
292	10.17.12	1:01	AB	X1	TPO / TPO	81°	600	450	36 /	55 /	/	124	119			Y	P
293	10.17.12	2:50	JR	V1	TPO / TPO	81°	860	6.0	54 /	53 /	/	136	141			Y	P
294	10.18.12	10:20	JR	V1	TPO / TPO	74°	860	6.8	61 /	59 /	/	129	140			Y	P
295	10.18.12	3:50	JR	V1	TPO / TPO	82°	860	6.8	61 /	61 /	/	136	133			Y	P
296	10.18.12	5:50	AB	X1	TPO / TPO	82°	600	450	39 /	41 /	/	119	114			Y	P
297	10.20.12	12:58	CL	M1	TPO / TPO	84°	750	650	56 /	59 /	/	132	129			Y	P
298	10.20.12	1:48	JR	V1	TPO / TPO	86°	860	6.8	45 /	49 /	/	129	119			Y	P
299	10.23.12	1:05	AB	X1	TPO / TPO	83°	600	450	39 /	41 /	/	119	114			Y	P
300	10.25.12	7:30	CL	M9	TPO / TPO	66°	750	650	56 /	63 /	/	136	141			Y	P
301	10.25.12	8:20	AB	X1	TPO / TPO	72°	600	450	39 /	43 /	/	119	117			Y	P