Appendix

E

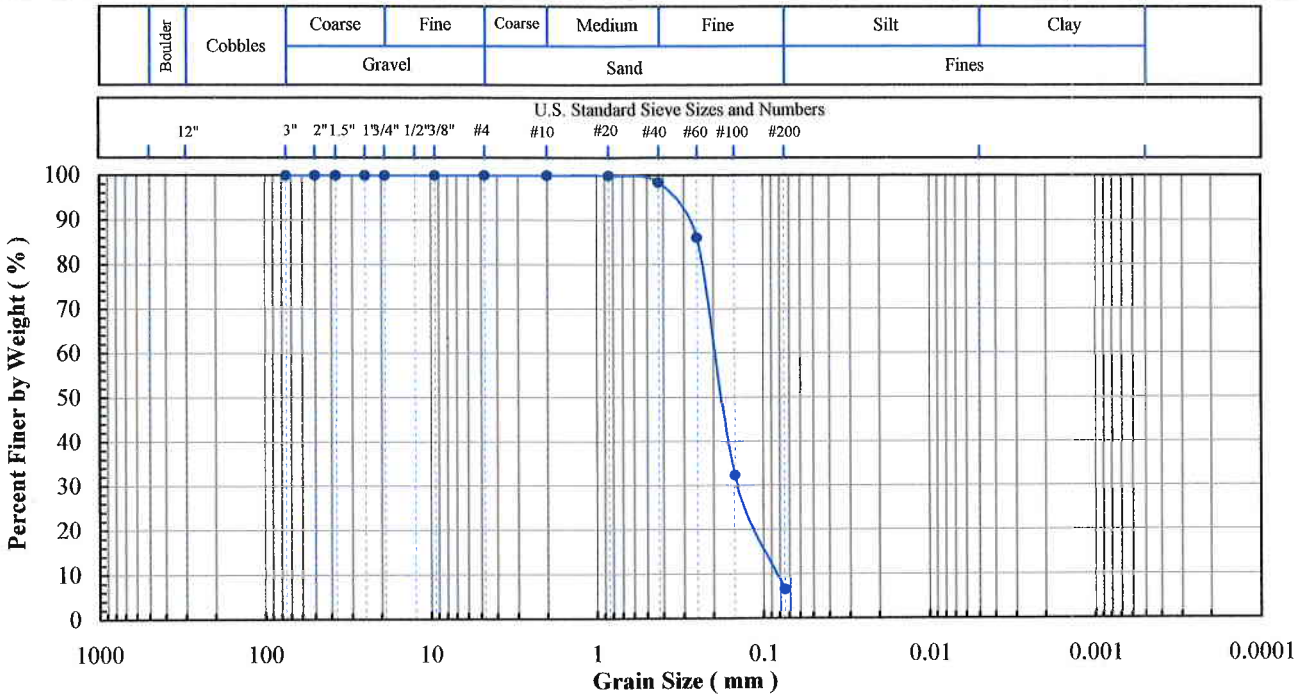
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-01
Lab Sample No:	C030

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



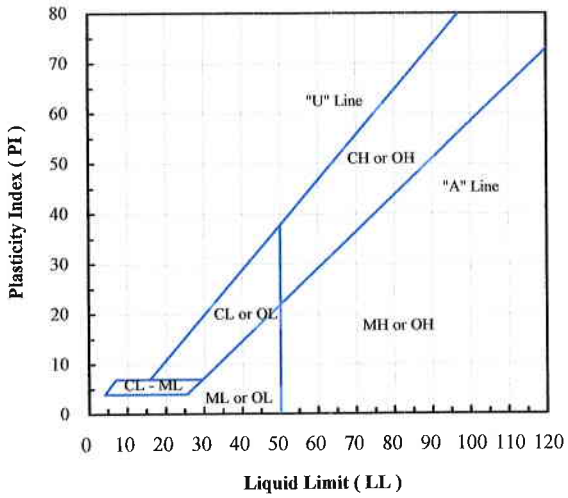
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	98.4
#60	0.250	86.1
#100	0.150	32.4
#200	0.075	6.6

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	93.4
Fines (%):	6.6
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.4
Coeff. Curv. (Cc):	1.2



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-01	C030	7.7	6.6	NP	NP	NP	SP-SM - Poorly graded sand with silt

Note(s):

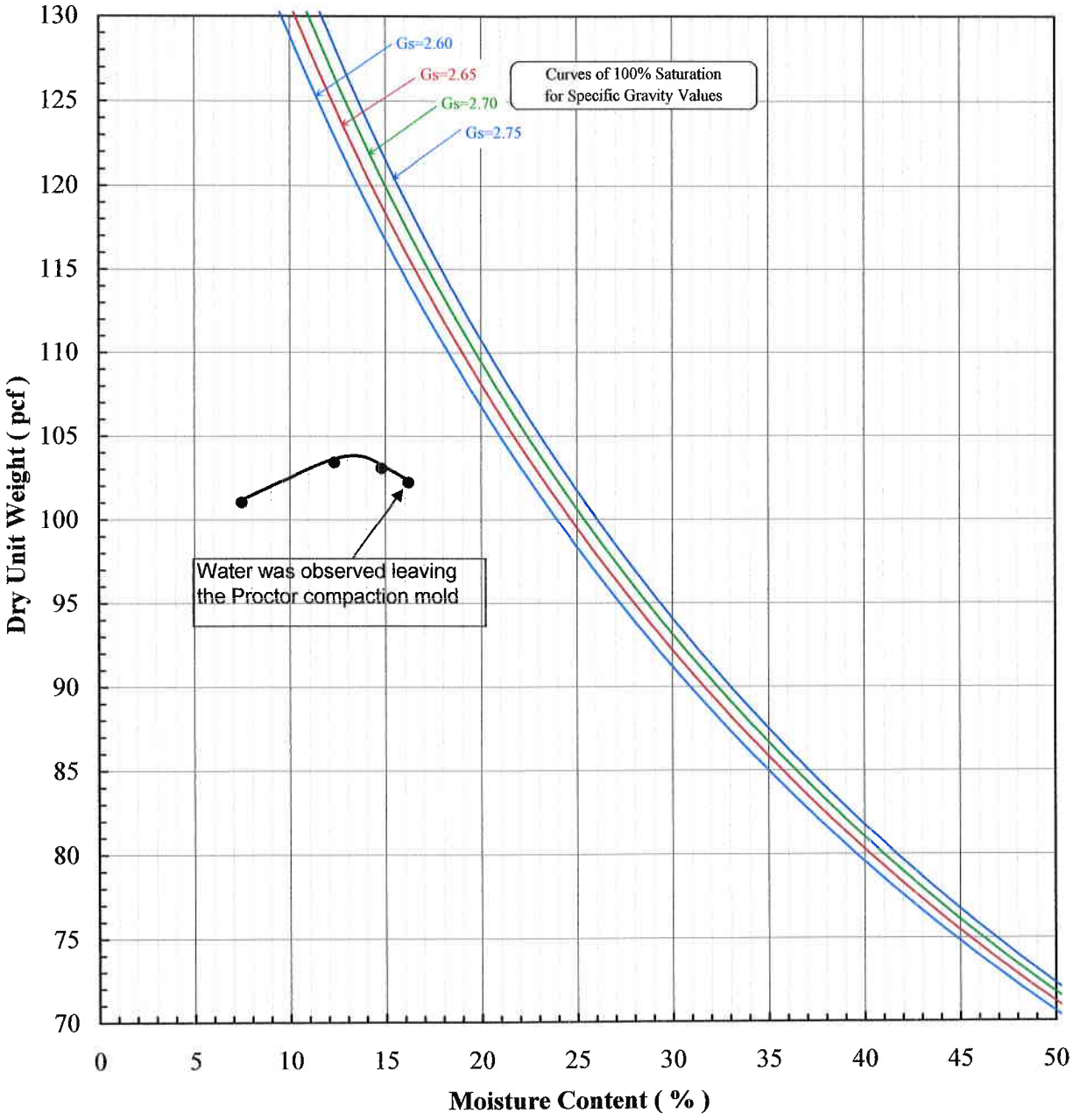
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID	GF-01
Lab Sample No:	C030

ASTM D 698

COMPACTION MOISTURE-DENSITY RELATIONSHIP

Standard - Method B



Client/Site Sample ID.	Lab Sample No:	Maximum Dry Unit Weight (pcf)	Optimum Moisture Content (%)	Remarks
GF-01	C030	103.9	13.4	

Note(s):

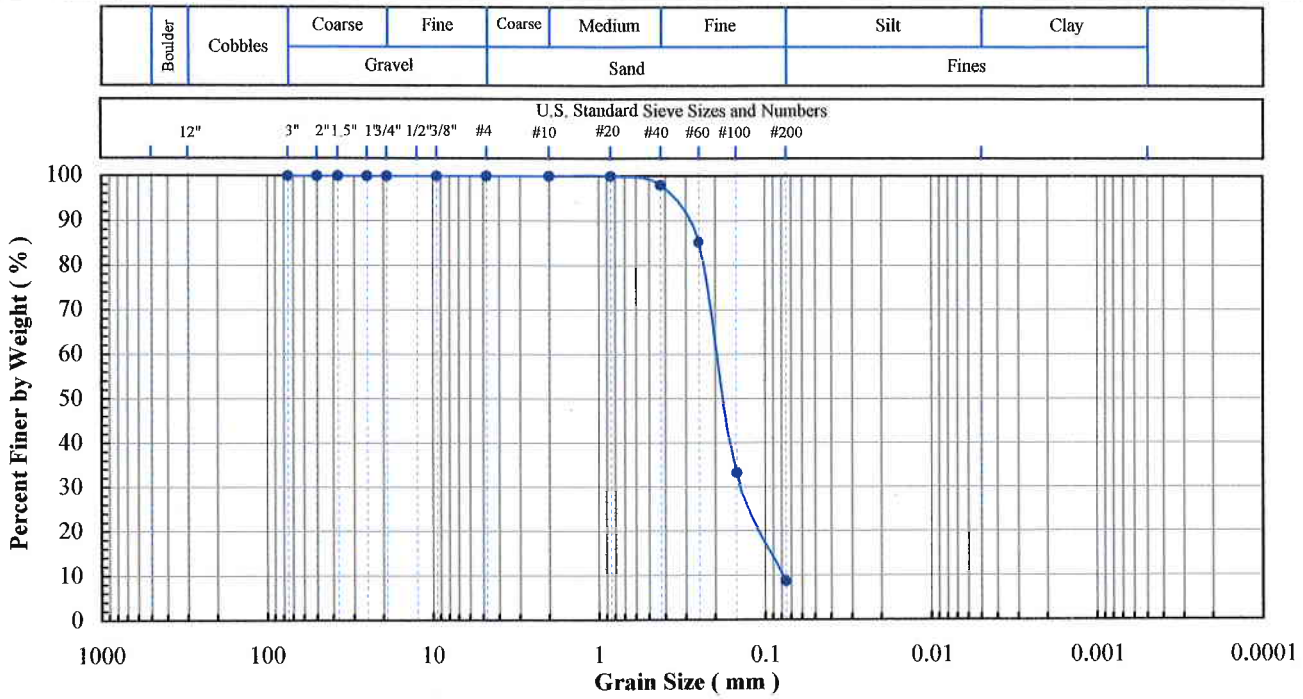
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-02
Lab Sample No:	C031

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



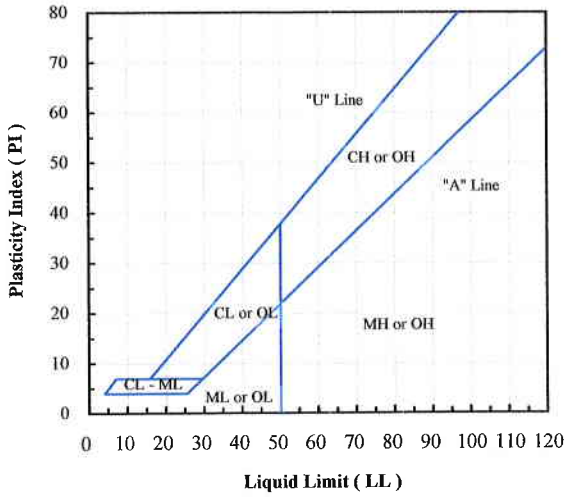
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	100.0
#40	0.425	98.0
#60	0.250	85.2
#100	0.150	33.3
#200	0.075	8.7

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	91.3
Fines (%):	8.7
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.4
Coeff. Curv. (Cc):	1.2



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-02	C031	11.0	8.7				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

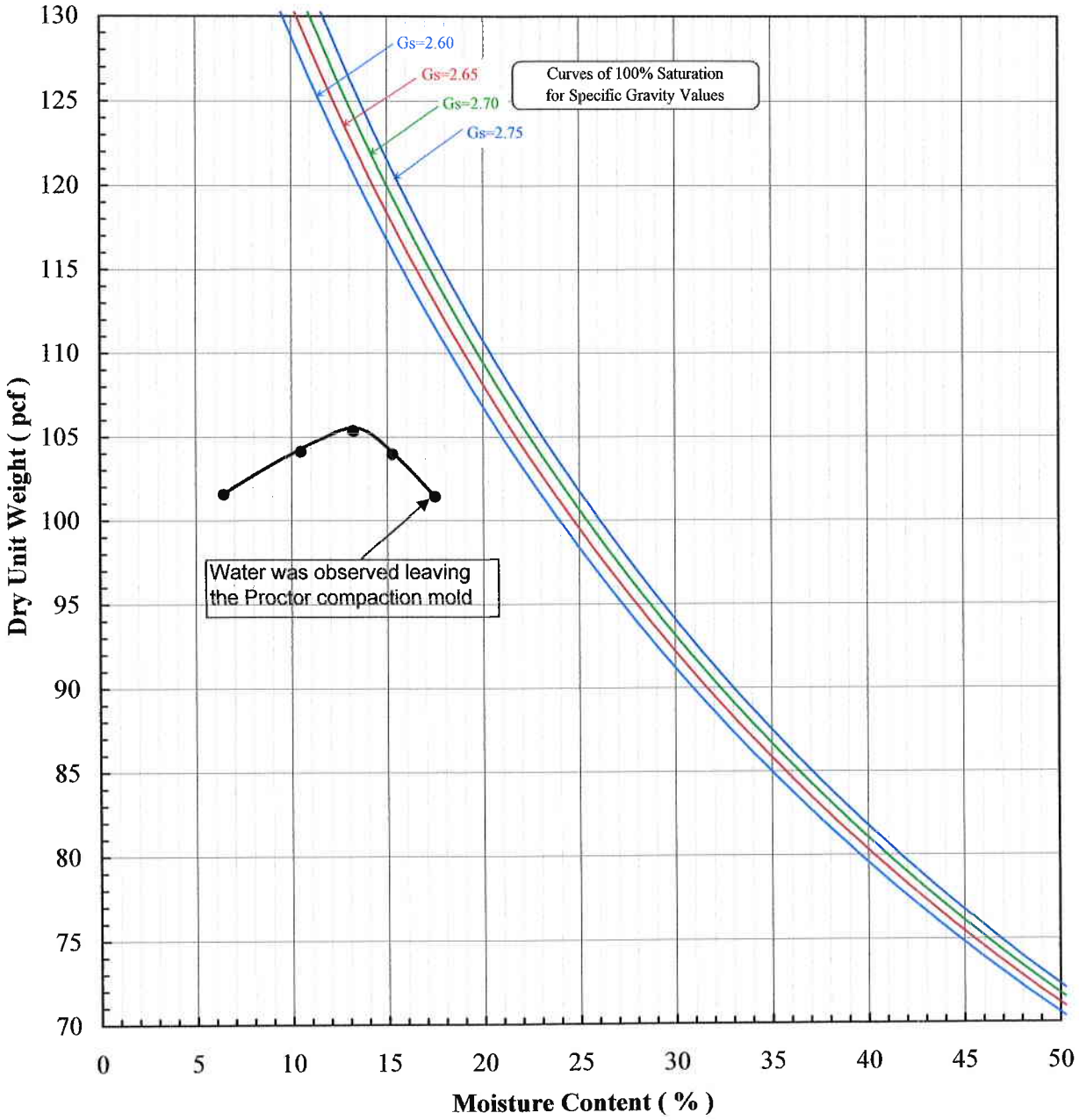
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID	GF-02
Lab Sample No:	C031

ASTM D 698

COMPACTION MOISTURE-DENSITY RELATIONSHIP

Standard - Method B



Client/Site Sample ID.	Lab Sample No:	Maximum Dry Unit Weight (pcf)	Optimum Moisture Content (%)	Remarks
GF-02	C031	105.7	13.2	

Note(s):

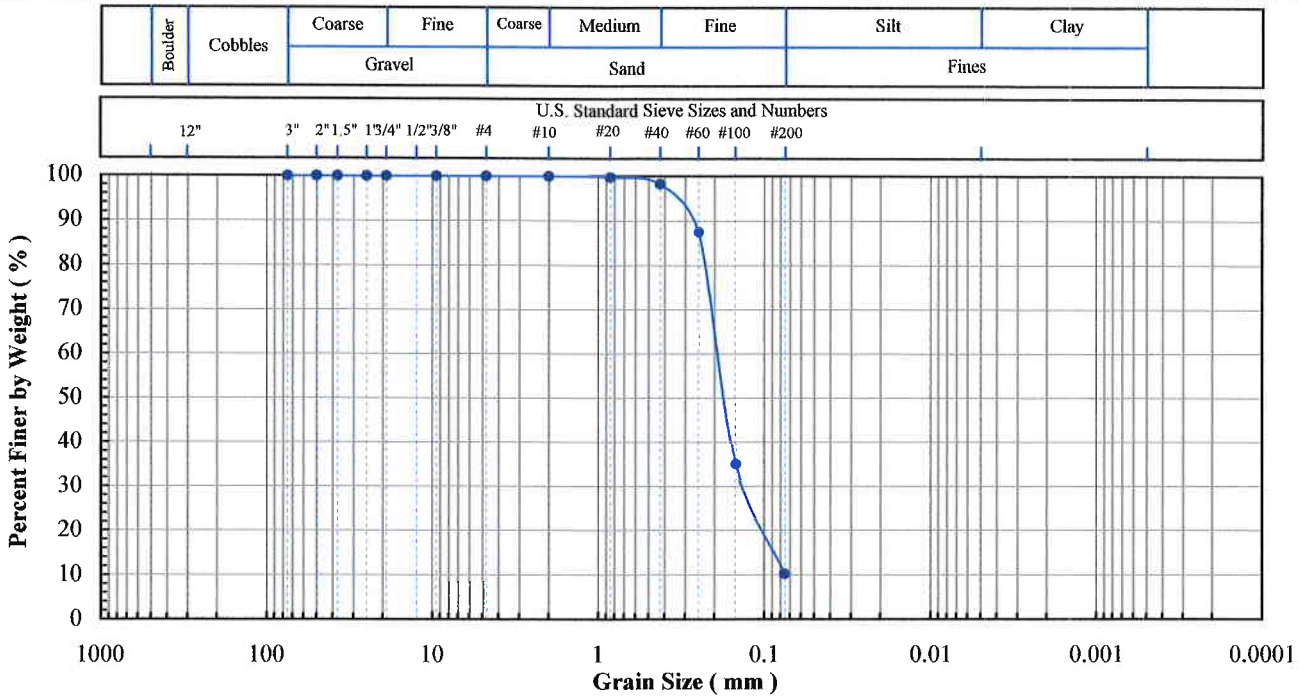
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-03
Lab Sample No:	D014

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



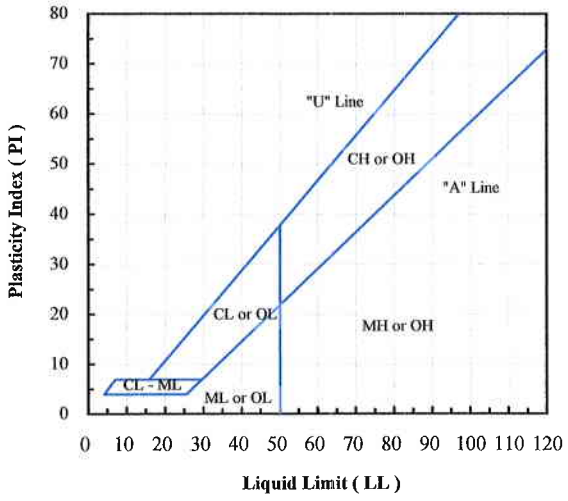
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.8
#40	0.425	98.3
#60	0.250	87.6
#100	0.150	35.2
#200	0.075	10.3

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	89.7
Fines (%):	10.3
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.9
Coeff. Curv. (Cc):	1.6



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-03	D014	17.7	10.3				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

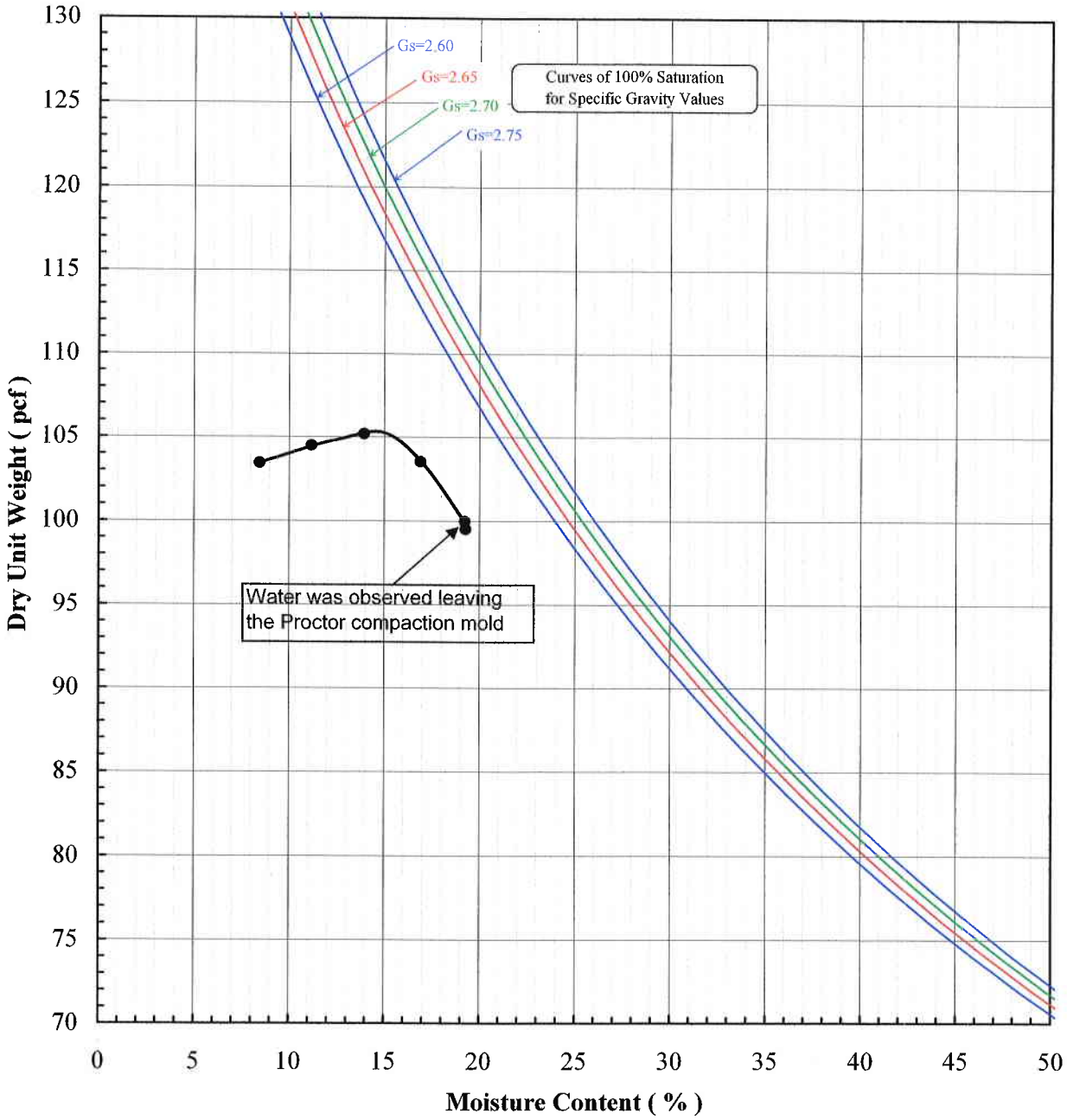
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-03
Lab Sample No:	D014

ASTM D 698

COMPACTION MOISTURE-DENSITY RELATIONSHIP

Standard - Method B



Client/Site Sample ID.	Lab Sample No:	Maximum Dry Unit Weight (pcf)	Optimum Moisture Content (%)	Remarks
GF-03	D014	105.7	13.2	

Note(s):

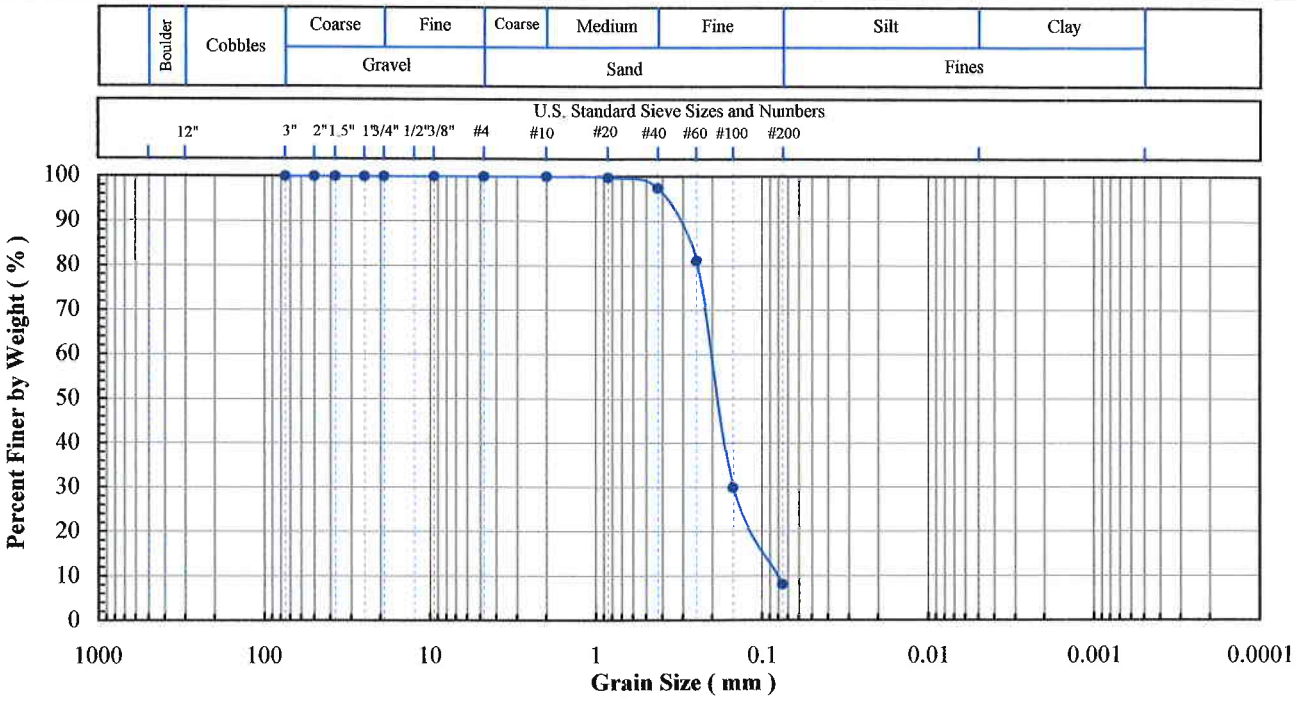
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-04
Lab Sample No:	D015

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



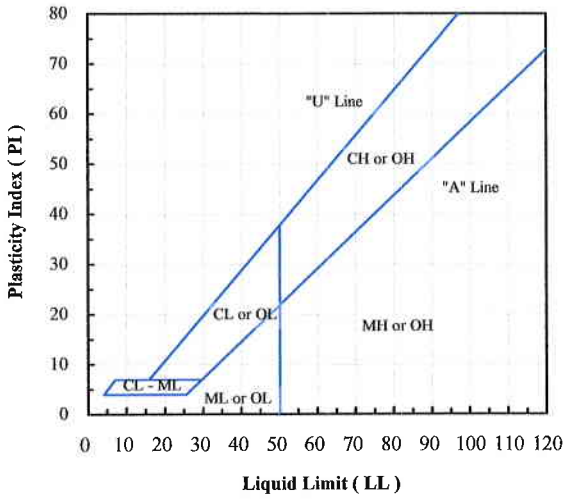
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.8
#40	0.425	97.4
#60	0.250	81.2
#100	0.150	29.9
#200	0.075	8.1

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	91.9
Fines (%):	8.1
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.4



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-04	D015	16.3	8.1				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

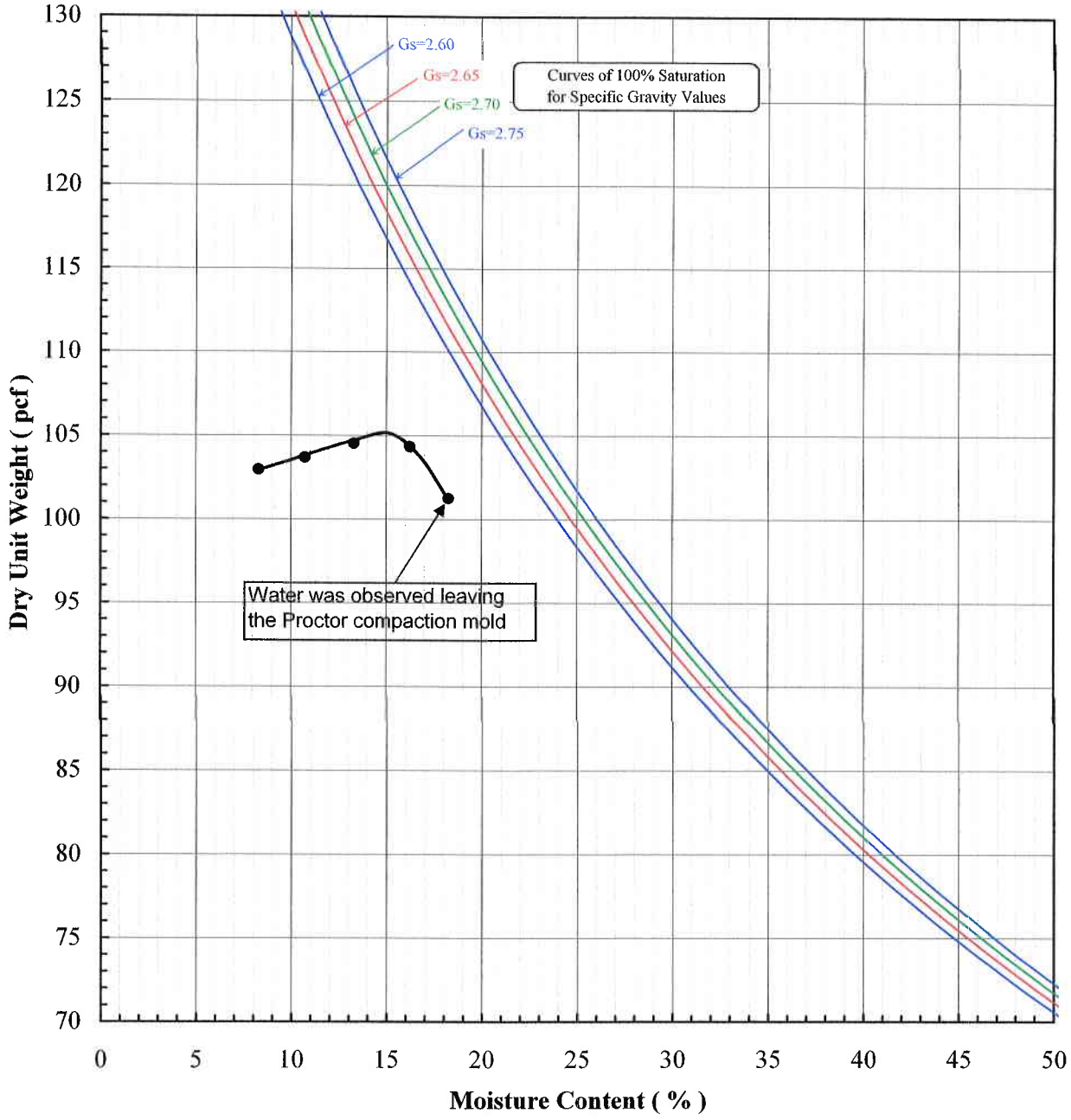
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941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-04
Lab Sample No:	D015

ASTM D 698

COMPACTION MOISTURE-DENSITY RELATIONSHIP

Standard - Method B



Client/Site Sample ID.	Lab Sample No:	Maximum Dry Unit Weight (pcf)	Optimum Moisture Content (%)	Remarks
GF-04	D015	105.3	15.3	

Note(s):

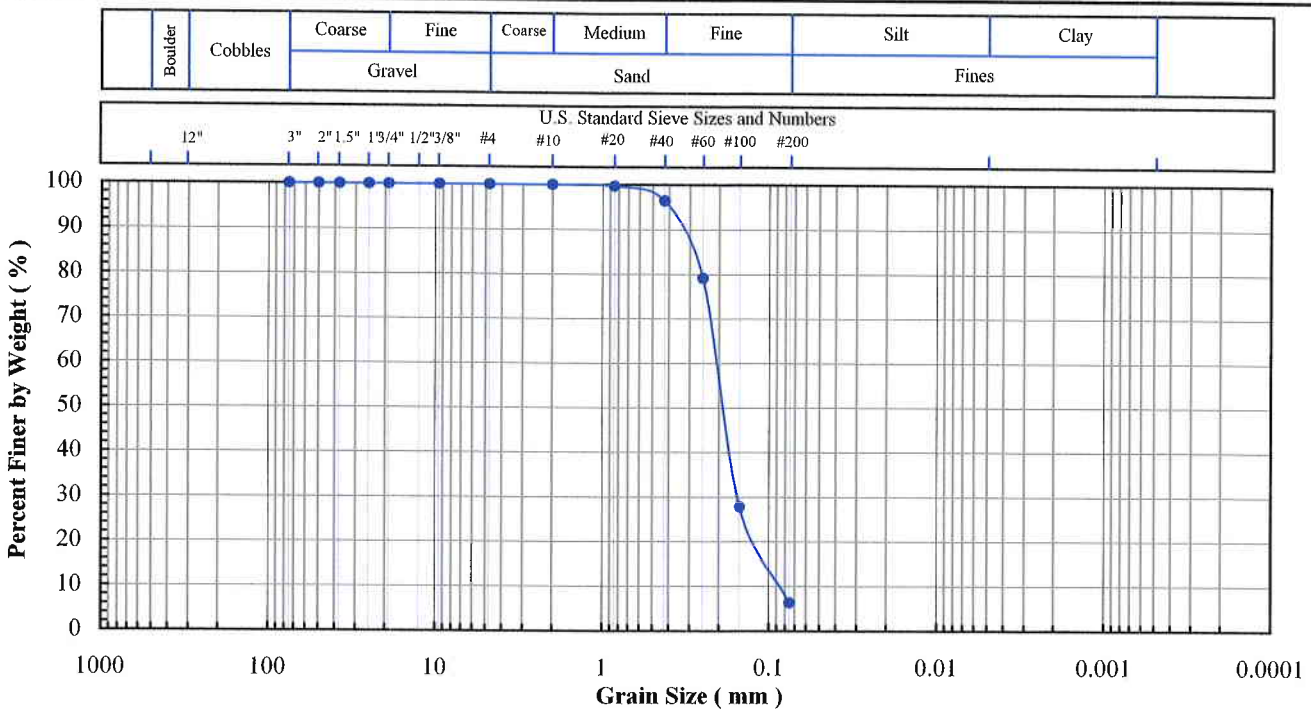
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-05
Lab Sample No:	D046

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



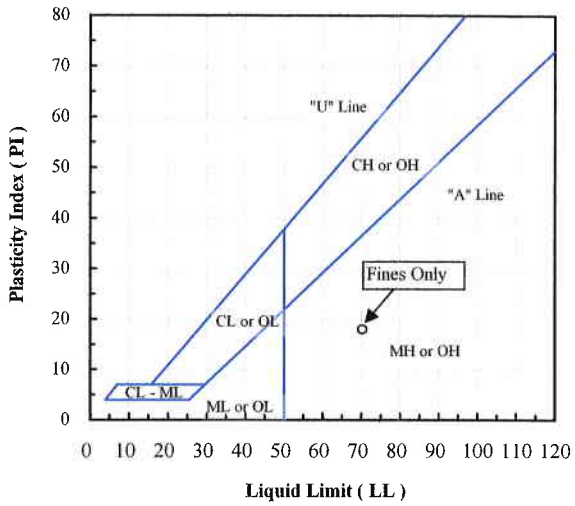
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.7
#40	0.425	96.5
#60	0.250	79.2
#100	0.150	27.9
#200	0.075	6.4

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	93.6
Fines (%):	6.4
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.3
Coeff. Curv. (Cc):	1.3



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
GF-05	D046	7.7	6.4	NP	NP	NP	SP-SM - Poorly graded sand with silt

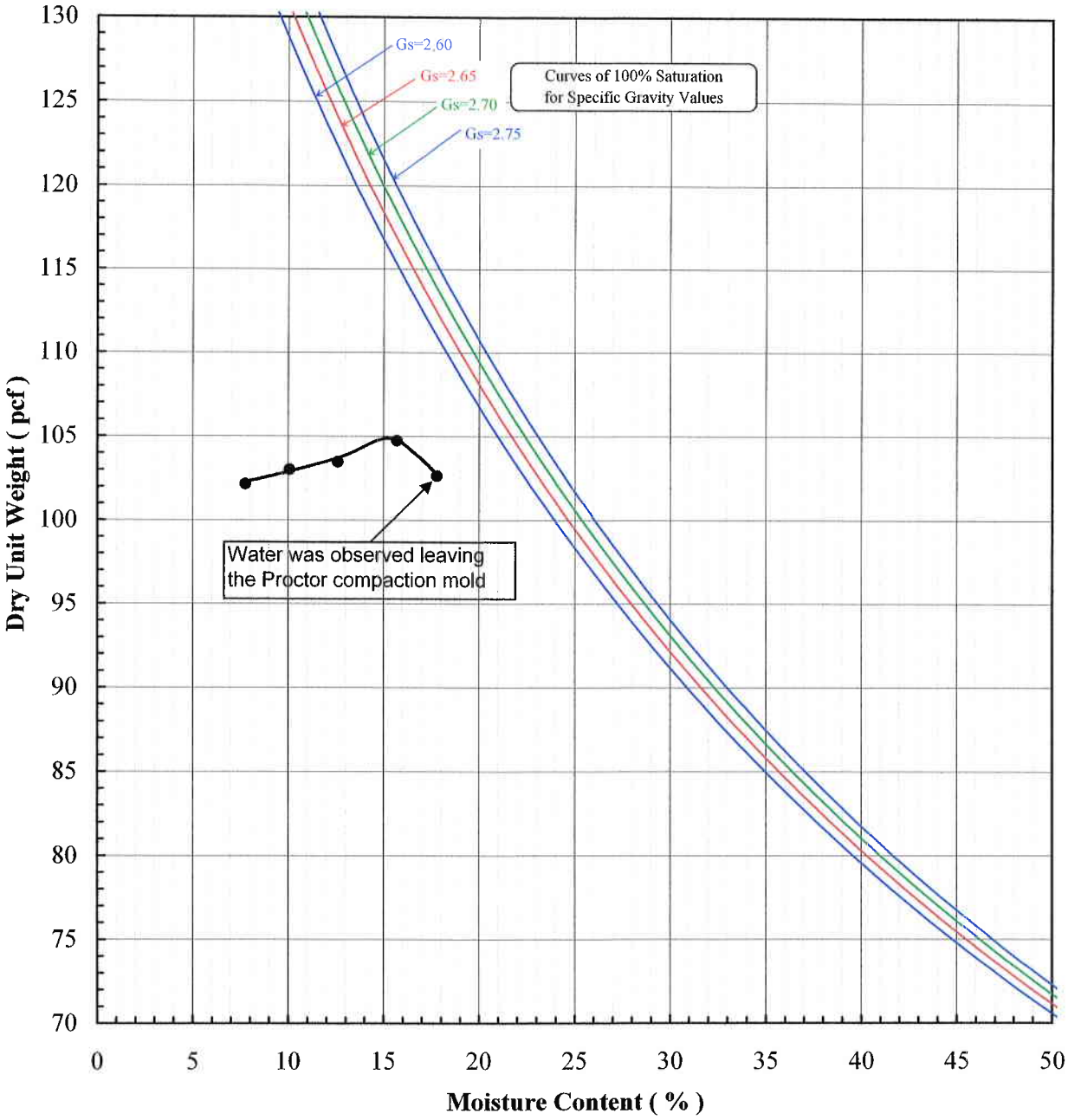
Note(s):

Atterberg test results for the fines only : LL = 70 , PL = 52 , PI = 18 (i.e., fines classify as MH).

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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-05
Lab Sample No:	D046

ASTM D 698 **COMPACTION MOISTURE-DENSITY RELATIONSHIP** **Standard - Method B**



Client/Site Sample ID.	Lab Sample No:	Maximum Dry Unit Weight (pcf)	Optimum Moisture Content (%)	Remarks
GF-05	D046	105.0	15.3	

Note(s):

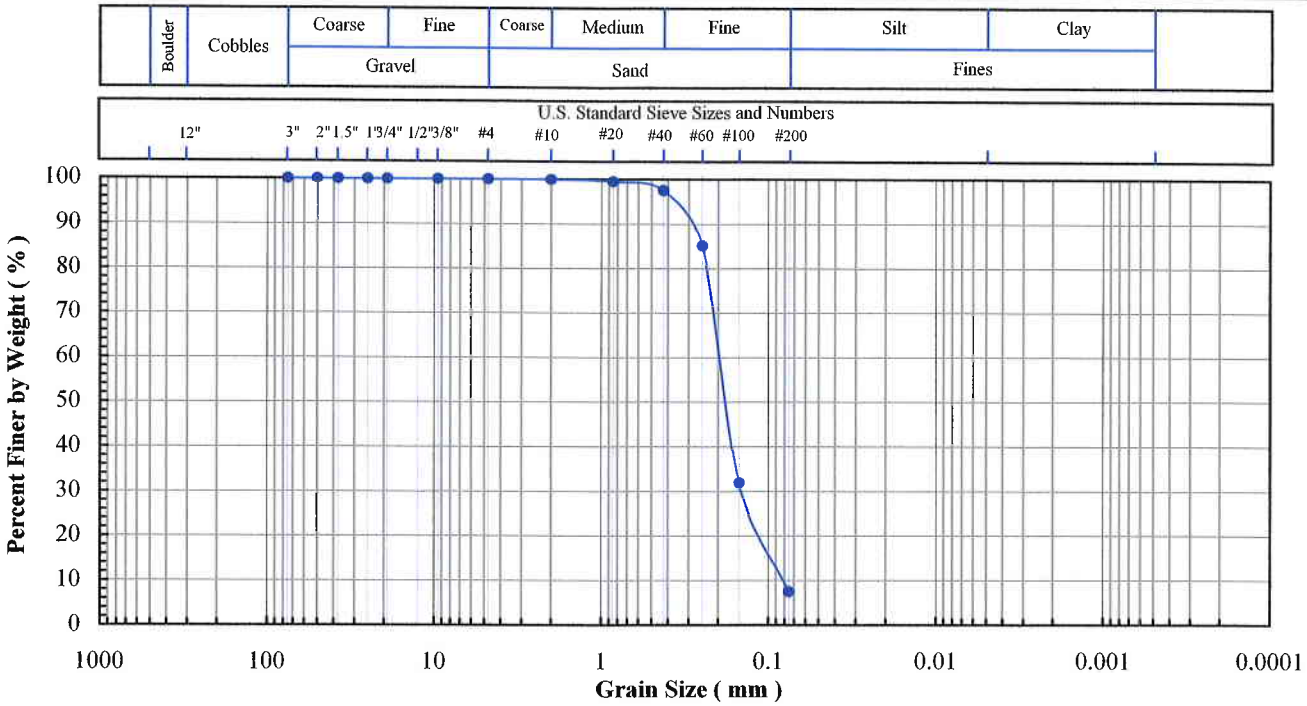
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-06
Lab Sample No:	D047

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



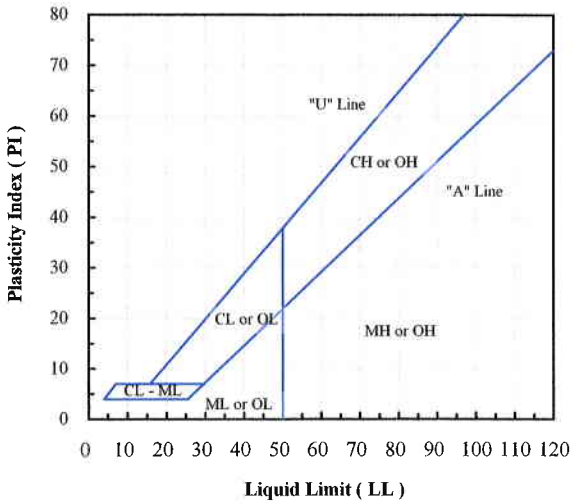
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	99.9
#20	0.850	99.5
#40	0.425	97.6
#60	0.250	85.1
#100	0.150	31.9
#200	0.075	7.5

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	92.5
Fines (%):	7.5
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.4



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-06	D047	8.3	7.5				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

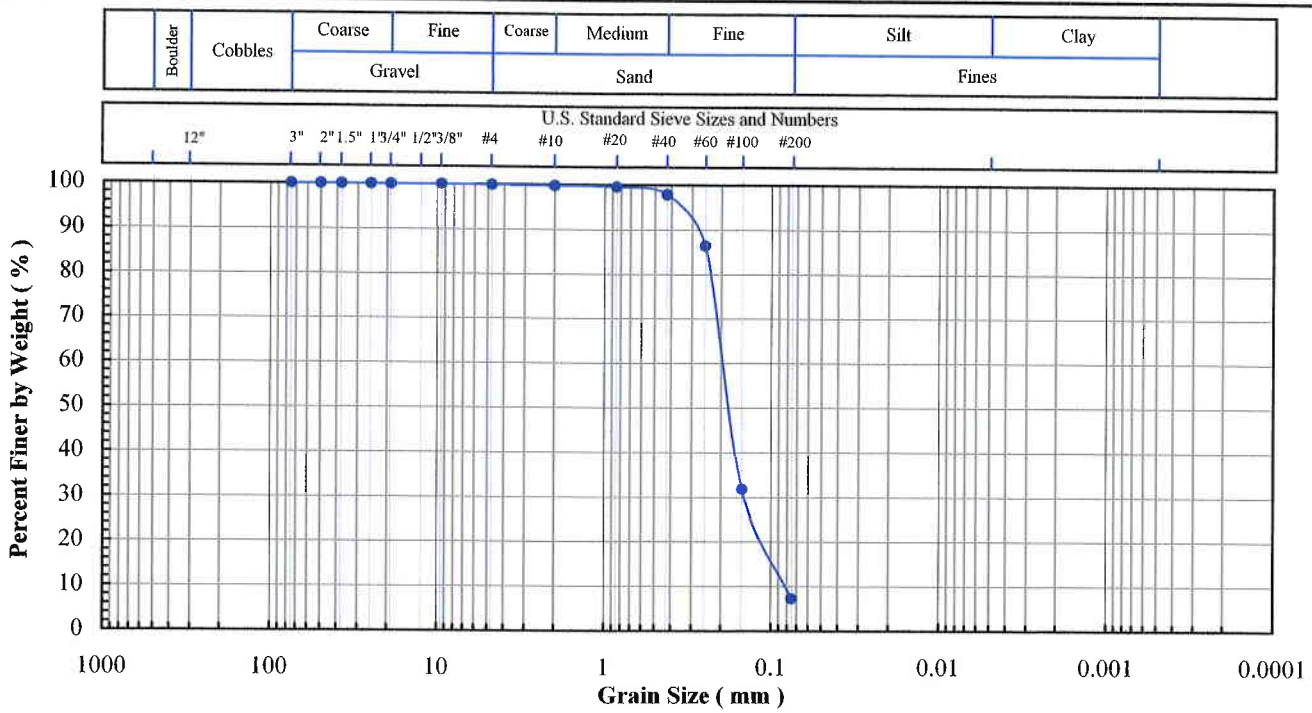
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-07
Lab Sample No:	D048

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



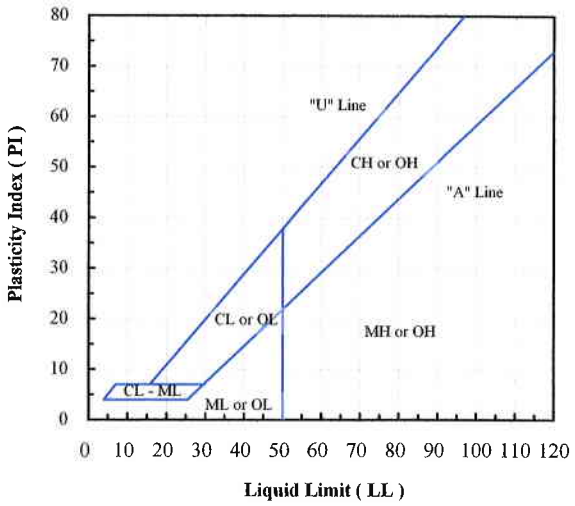
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	99.9
#10	2.00	99.8
#20	0.850	99.6
#40	0.425	97.9
#60	0.250	86.5
#100	0.150	31.9
#200	0.075	7.3

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	0.1
Sand (%):	92.6
Fines (%):	7.3
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.6
Coeff. Curv. (Cc):	1.6



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-07	D048	8.2	7.3				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

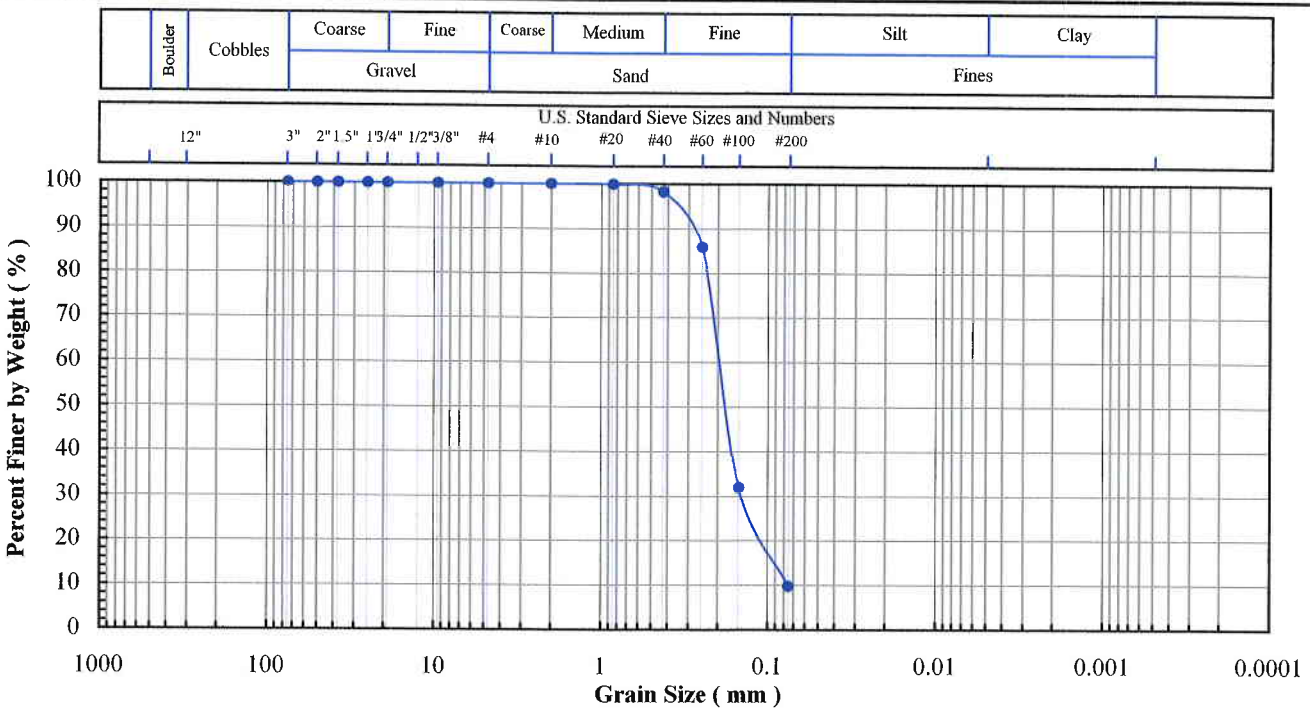
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941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-08
Lab Sample No:	D050

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



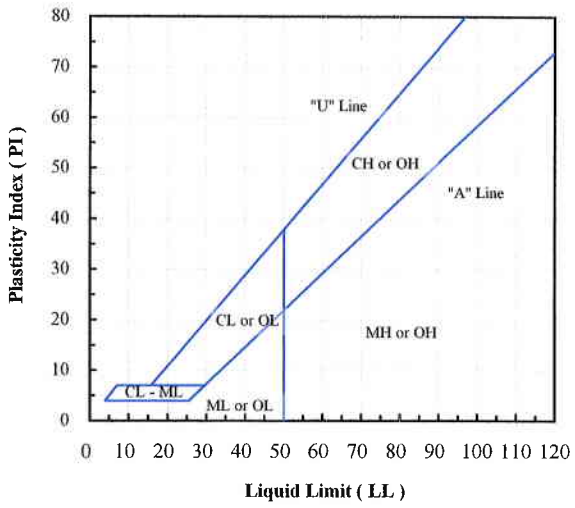
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	98.3
#60	0.250	85.9
#100	0.150	32.0
#200	0.075	9.8

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	90.2
Fines (%):	9.8
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.6
Coeff. Curv. (Cc):	1.5



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-08	D050	15.9	9.8				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

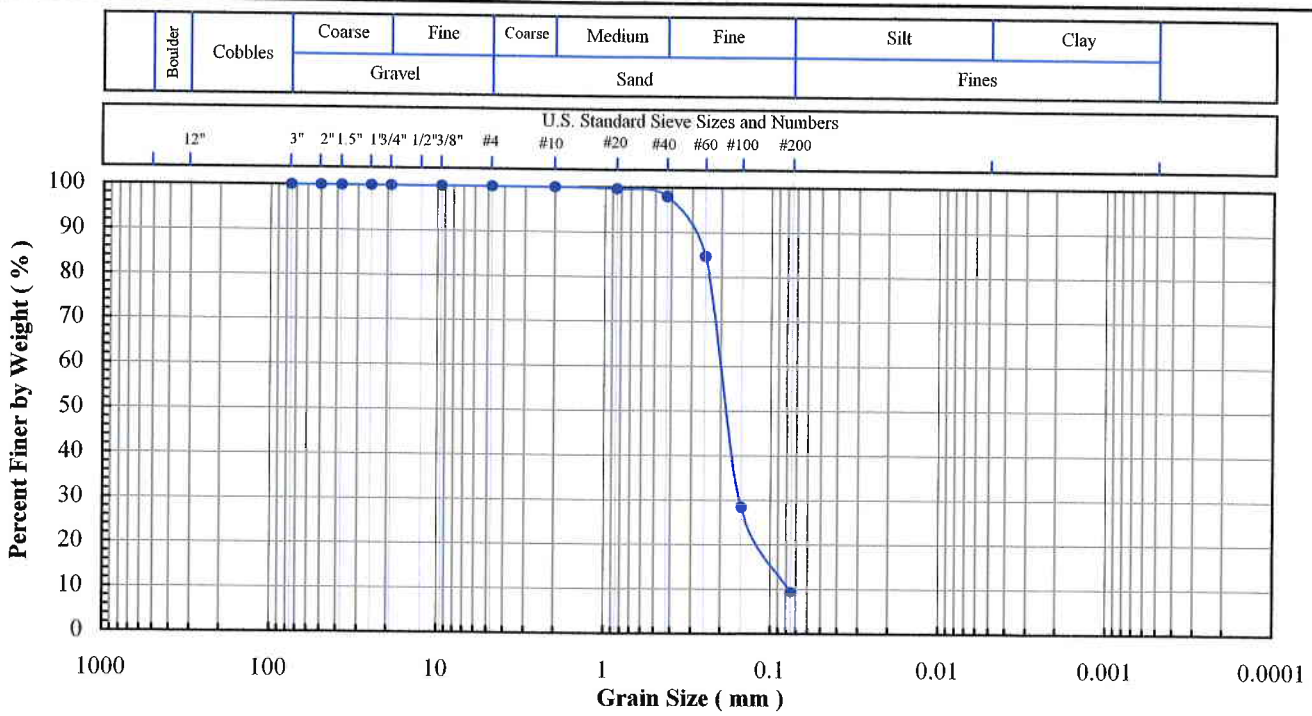
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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-09
Lab Sample No:	D051

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Atterberg Limits



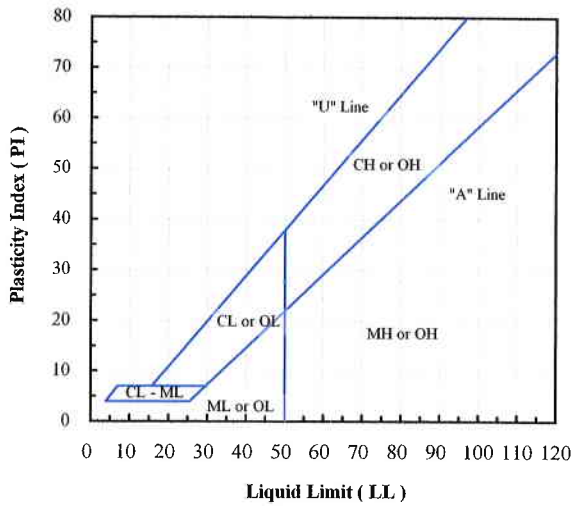
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.7
#40	0.425	98.1
#60	0.250	84.7
#100	0.150	28.5
#200	0.075	9.3

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	90.7
Fines (%):	9.3
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.7
Coeff. Curv. (Cc):	1.7



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
GF-09	D051	10.6	9.3				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

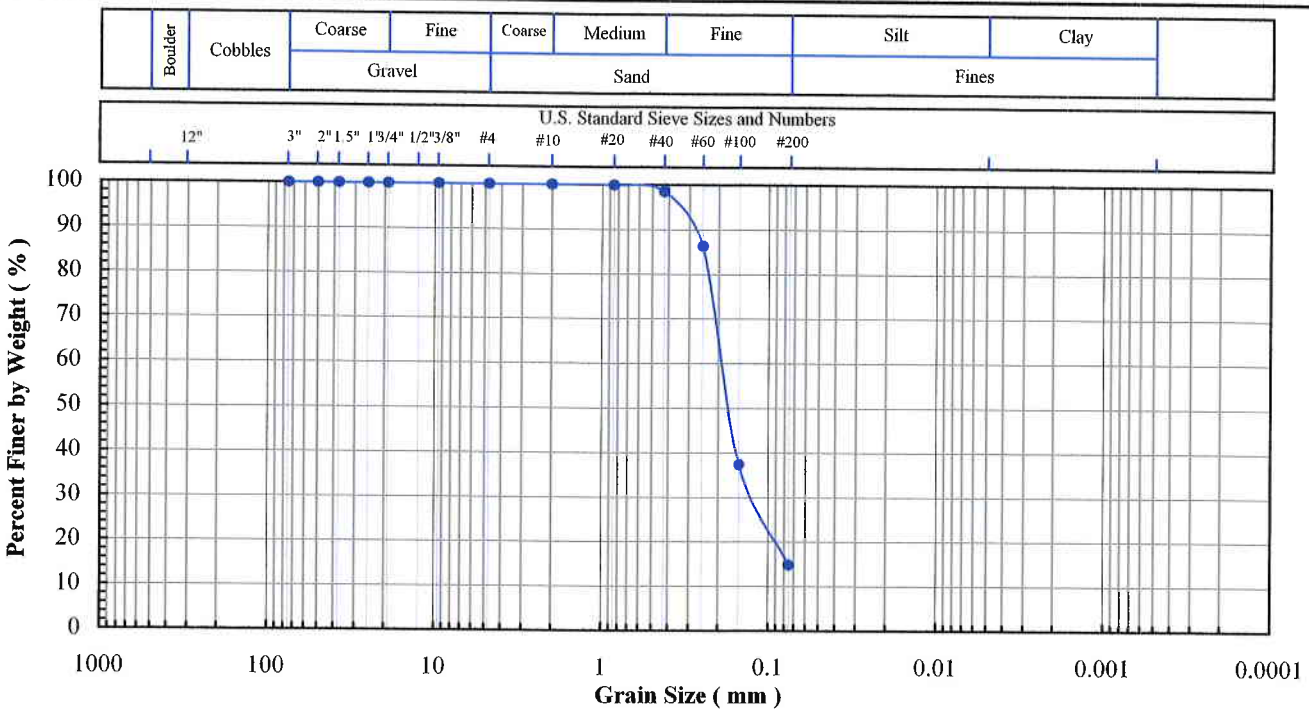
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-10
Lab Sample No:	D052

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



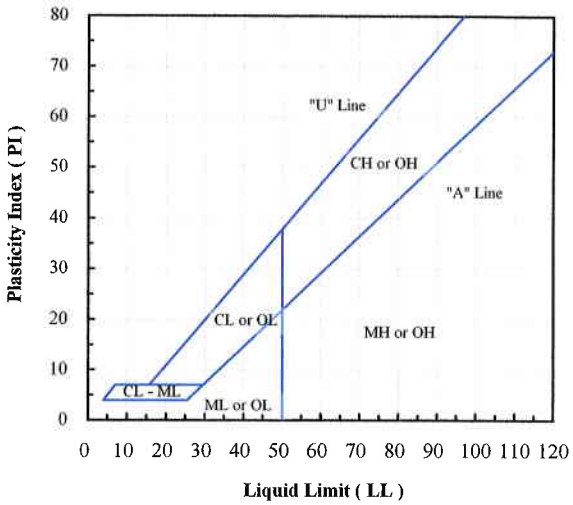
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	98.6
#60	0.250	86.4
#100	0.150	37.5
#200	0.075	14.9

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	85.1
Fines (%):	14.9
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	
Coeff. Curv. (Cc):	



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-10	D052	9.0	14.9				SM - Silty sand

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

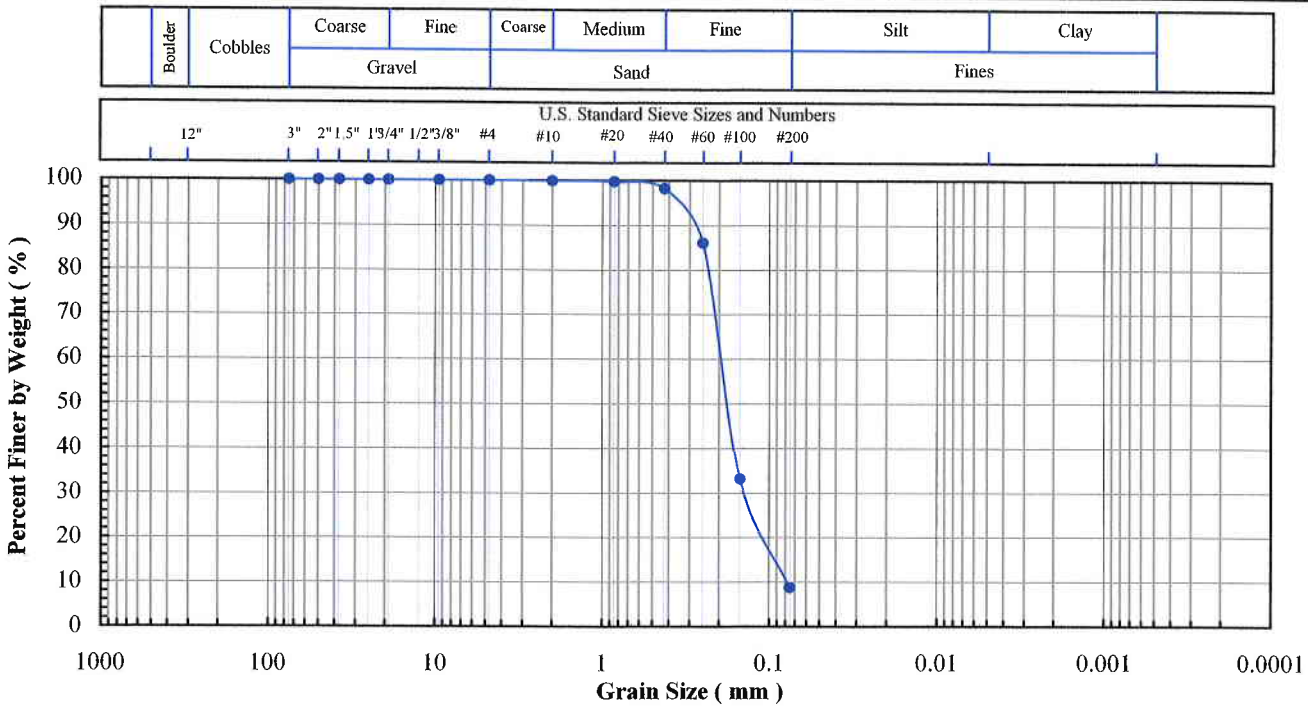
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	GF-11
Lab Sample No:	D053

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



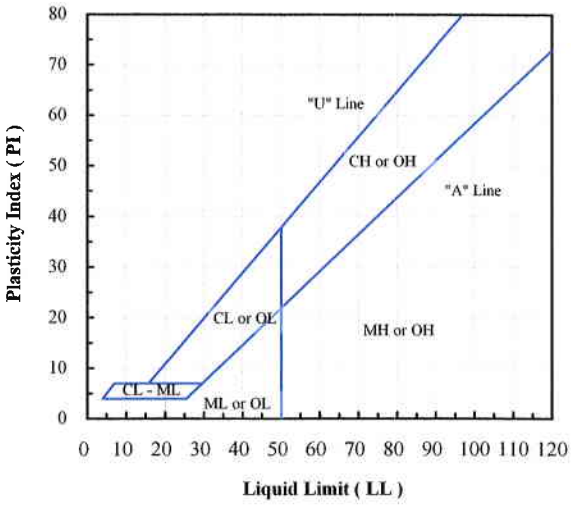
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	99.9
#20	0.850	99.8
#40	0.425	98.3
#60	0.250	86.1
#100	0.150	33.2
#200	0.075	8.8

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	91.2
Fines (%):	8.8
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.6



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
GF-11	D053	11.6	8.8				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

Appendix

F

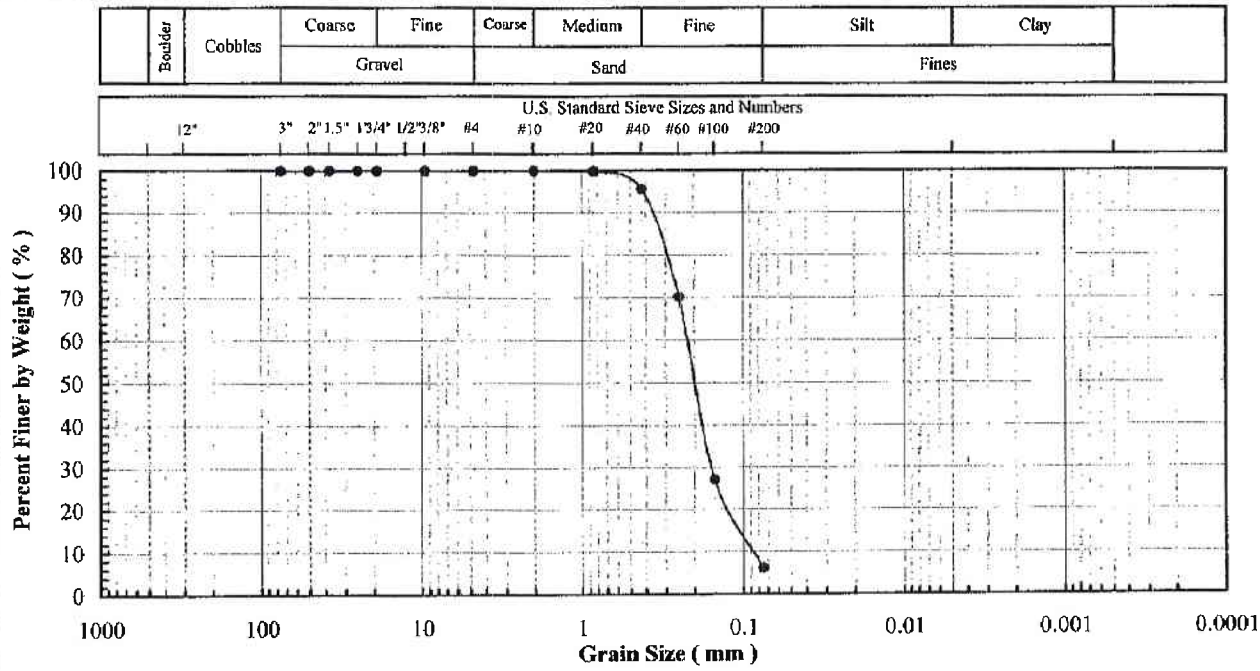
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-01
Lab Sample No:	F001

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Atterberg Limits, Eng. Classification



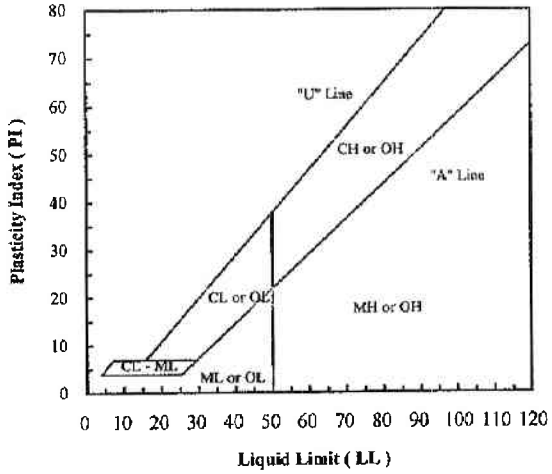
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	95.7
#60	0.250	70.3
#100	0.150	27.2
#200	0.075	6.2

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	93.8
Fines (%):	6.2
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.3



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
PC-01	F001	5.1	6.2				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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RIGID WALL PERMEABILITY TEST[1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-01
Lab Sample Number:	F001
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/02/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content[3] (%)		(-)	(cm/s)
1	R	14.1	7.6	95.7	0.0	TW	0.16 - 0.47	7.7E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

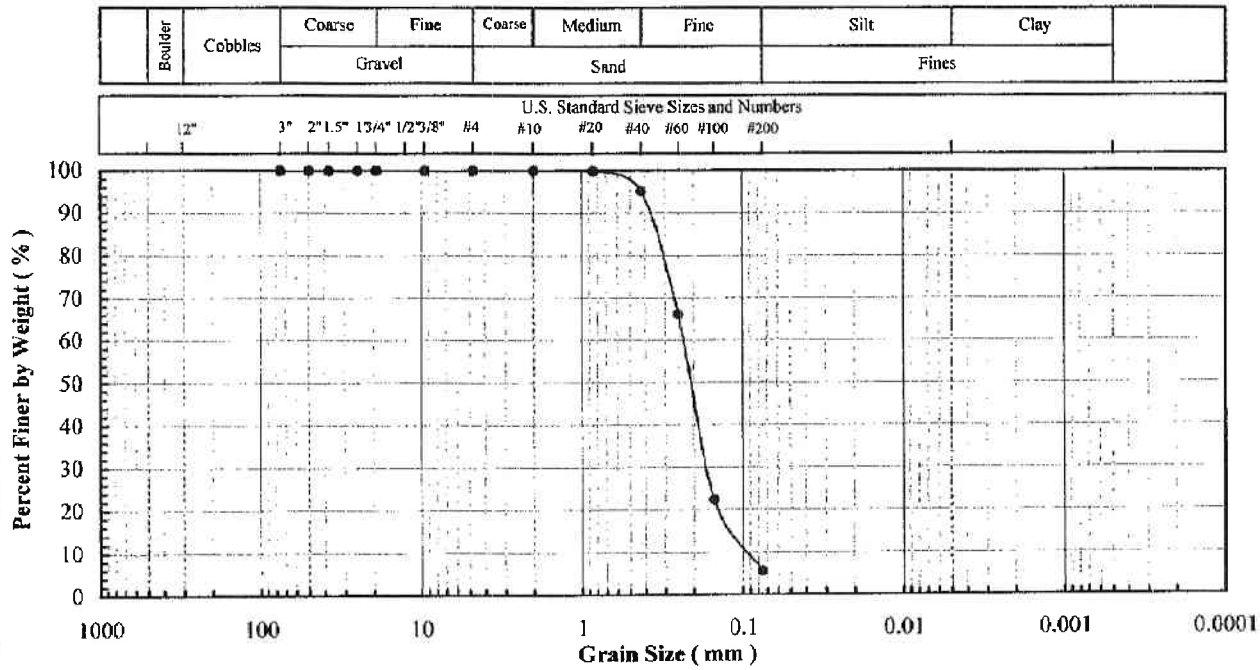
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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-02
Lab Sample No:	F002

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



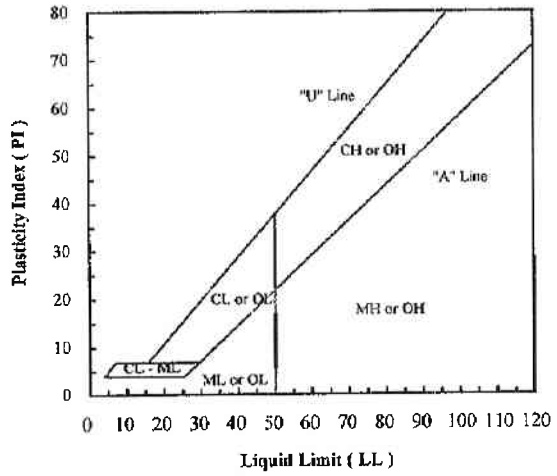
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	95.2
#60	0.250	66.2
#100	0.150	22.5
#200	0.075	5.6

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	94.4
Fines (%):	5.6
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.2



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
PC-02	F002	5.2	5.6				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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RIGID WALL PERMEABILITY TEST [1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-02
Lab Sample Number:	F002
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/02/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content [3] (%)		(-)	(cm/s)
1	R	14.2	7.6	96.9	0.0	TW	0.14 - 0.41	7.1E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:

Laboratory temperature at 22±3 °C.

Test specimen final conditions are not presented.

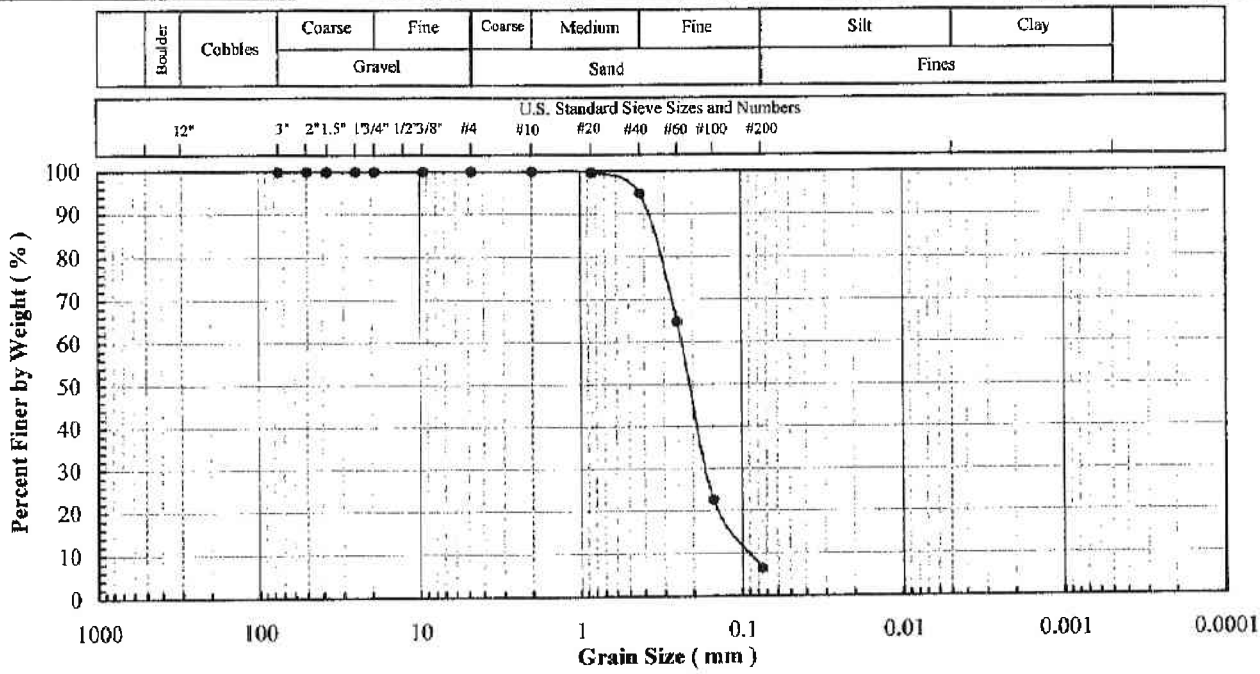
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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-03
Lab Sample No:	F003

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



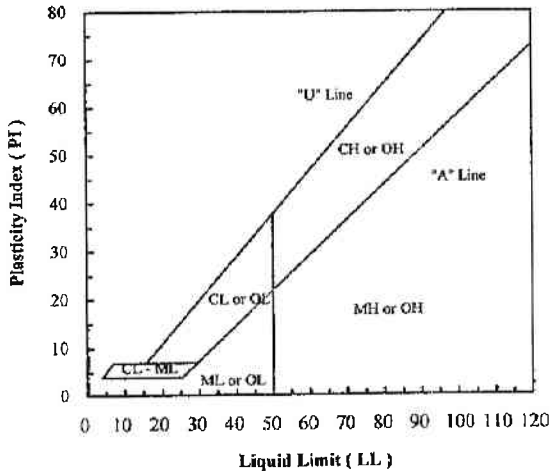
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.8
#40	0.425	94.8
#60	0.250	64.8
#100	0.150	22.7
#200	0.075	6.5

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	93.5
Fines (%):	6.5
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.6
Coeff. Curv. (Cc):	1.4



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
PC-03	F003	4.5	6.5				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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RIGID WALL PERMEABILITY TEST [1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-03
Lab Sample Number:	F003
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/05/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content [3] (%)		(-)	(cm/s)
1	R	14.3	7.6	97.1	0.0	TW	0.18 - 0.52	4.8E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:

Laboratory temperature at 22±3 °C.

Test specimen final conditions are not presented.

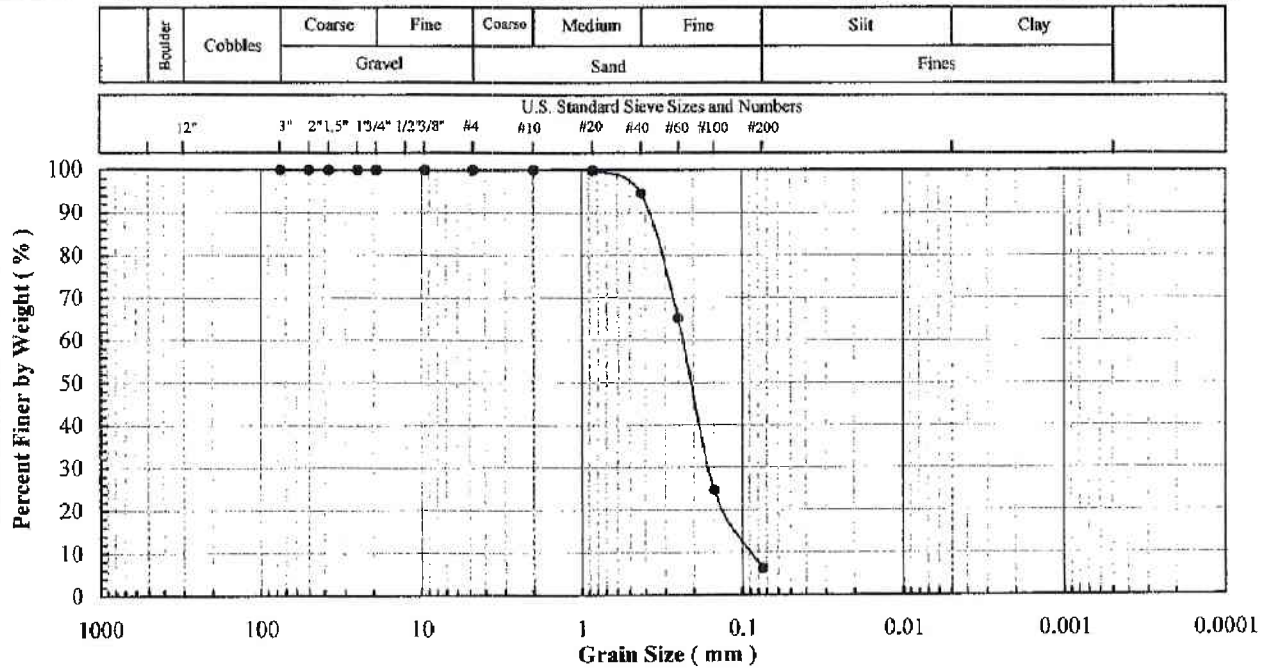
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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-04
Lab Sample No:	F004

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



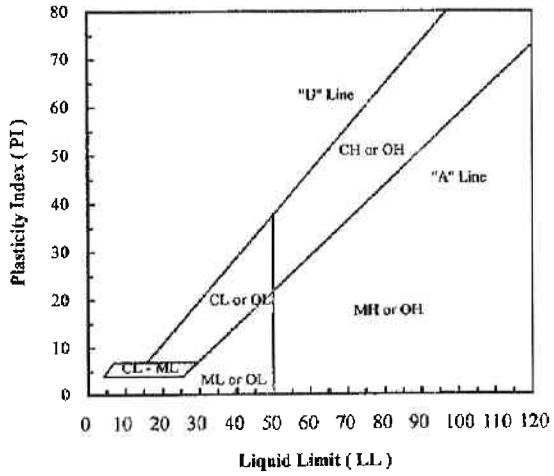
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	94.6
#60	0.250	65.3
#100	0.150	24.7
#200	0.075	6.3

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	93.7
Fines (%):	6.3
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.3



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
PC-04	F004	4.3	6.3				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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RIGID WALL PERMEABILITY TEST[1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-04
Lab Sample Number:	F004
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/03/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content[3] (%)		(-)	(cm/s)
1	R	14.3	7.6	96.9	0.0	TW	0.13 - 0.37	7.5E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

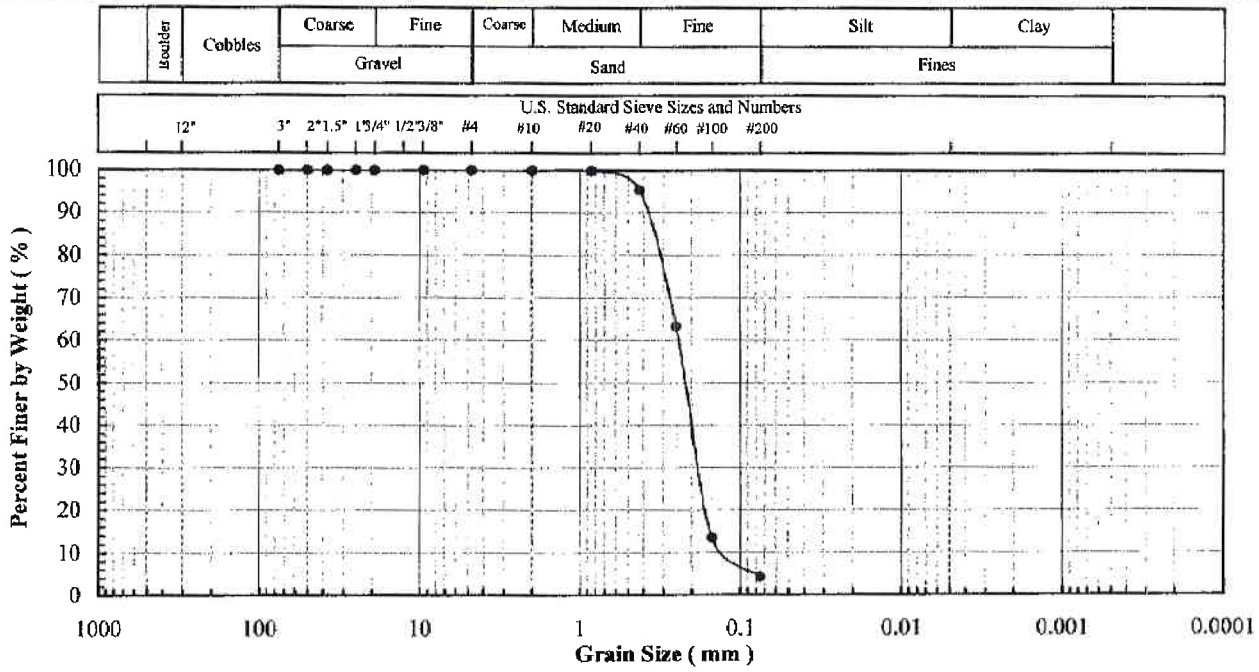
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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-05
Lab Sample No:	F005

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



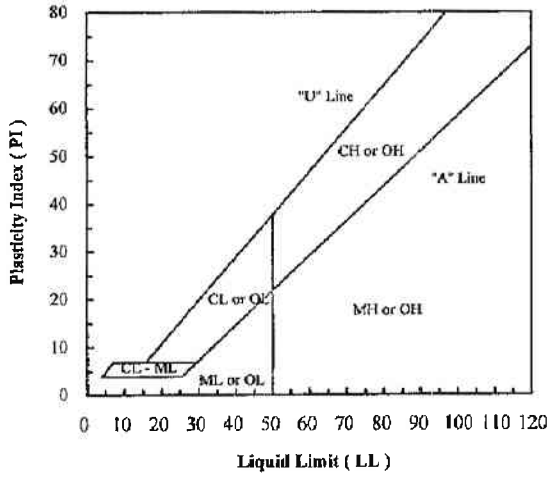
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	95.3
#60	0.250	63.3
#100	0.150	13.6
#200	0.075	4.4

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	95.6
Fines (%):	4.4
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	1.7
Coeff. Curv. (Cc):	1.1



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
PC-05	F005	4.7	4.4				SP - Poorly graded sand

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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RIGID WALL PERMEABILITY TEST [1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-05
Lab Sample Number:	F005
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/04/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content [3] (%)		(-)	(cm/s)
1	R	14.5	7.6	96.0	0.0	TW	0.12 - 0.37	1.4E-2

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

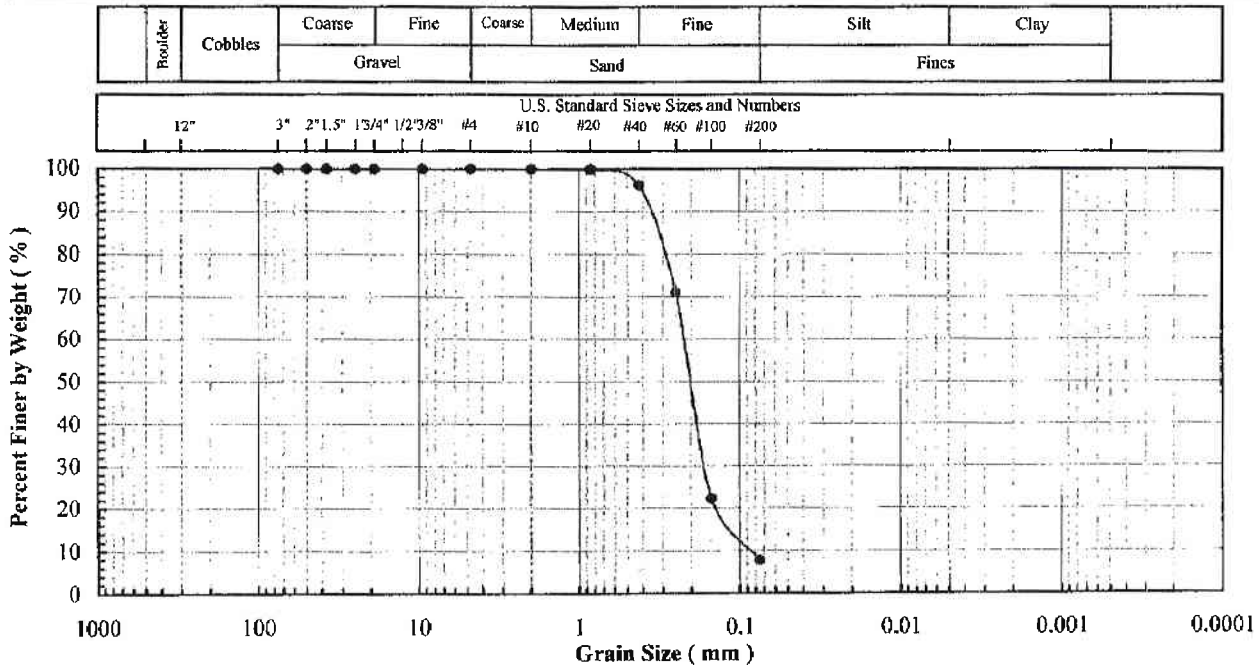
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"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-06
Lab Sample No:	F006

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



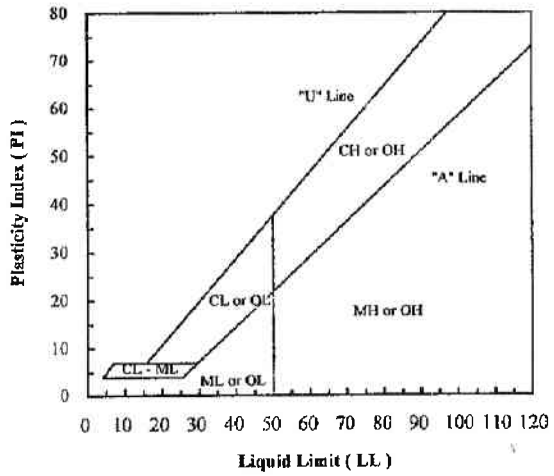
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	96.3
#60	0.250	71.1
#100	0.150	22.4
#200	0.075	7.8

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	92.2
Fines (%):	7.8
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.5
Coeff. Curv. (Cc):	1.5



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
PC-06	F006	5.2	7.8	NP	NP	NP	SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

Atterberg test results for the fines only : LL = 36 , PL = 25 , PI = 11 (i.e., fines classify as ML).

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Tel: (770) 650 1666 Fax: (770) 650 5786

RIGID WALL PERMEABILITY TEST [1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-06
Lab Sample Number:	F006
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/04/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content [3] (%)		(-)	(cm/s)
1	R	14.3	7.6	94.0	0.0	TW	0.14 - 0.39	8.2E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

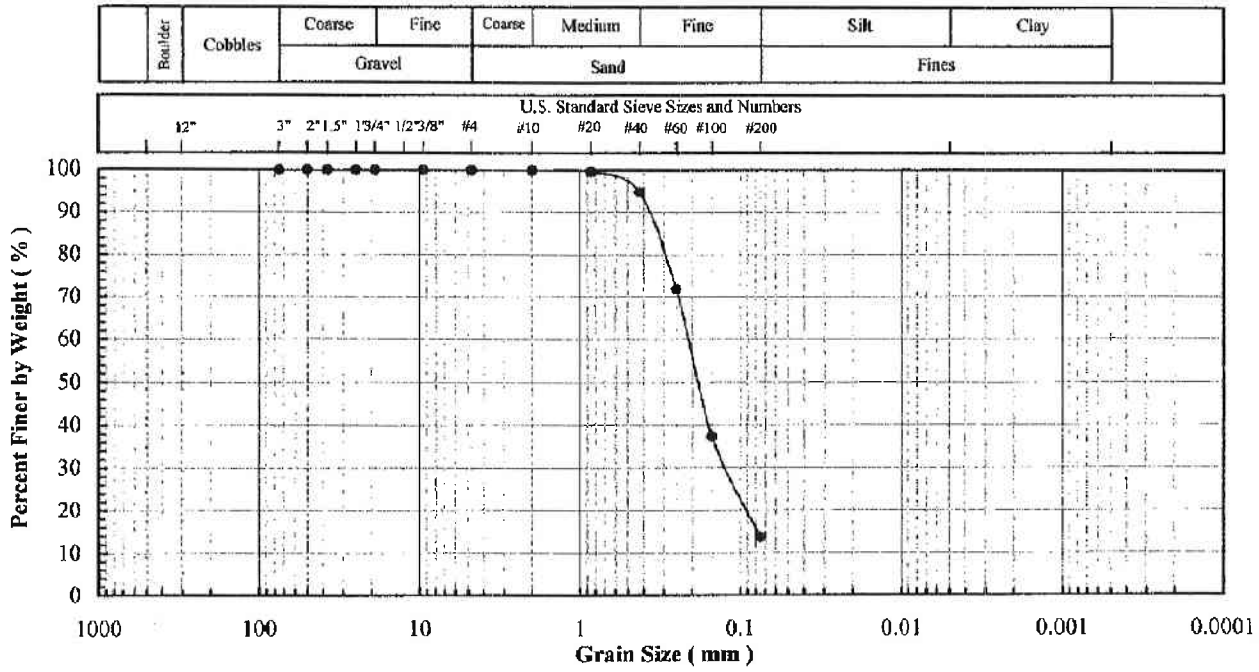
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-07
Lab Sample No:	F007

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



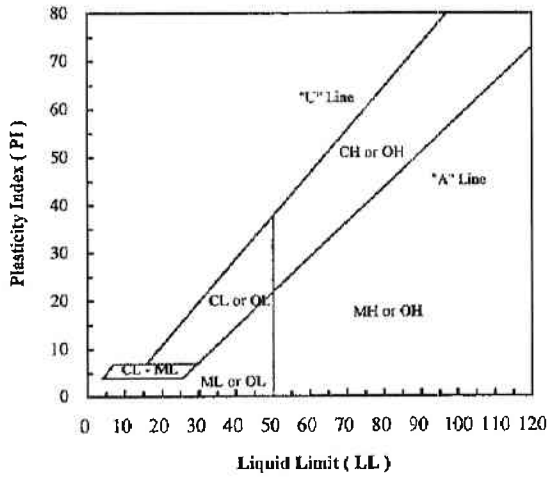
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.7
#40	0.425	94.9
#60	0.250	71.8
#100	0.150	37.4
#200	0.075	13.8

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	86.2
Fines (%):	13.8
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	
Coeff. Curv. (Cc):	



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
PC-07	F007	5.3	13.8				SM - Silty sand

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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RIGID WALL PERMEABILITY TEST (1)

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-07
Lab Sample Number:	F007
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/05/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid (4)	Gradient Range	Hydraulic Conductivity
	Spec. Prep. (2) (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content (3) (%)		(-)	(cm/s)
1	R	14.3	7.6	93.3	0.0	TW	0.18 - 0.42	4.7E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

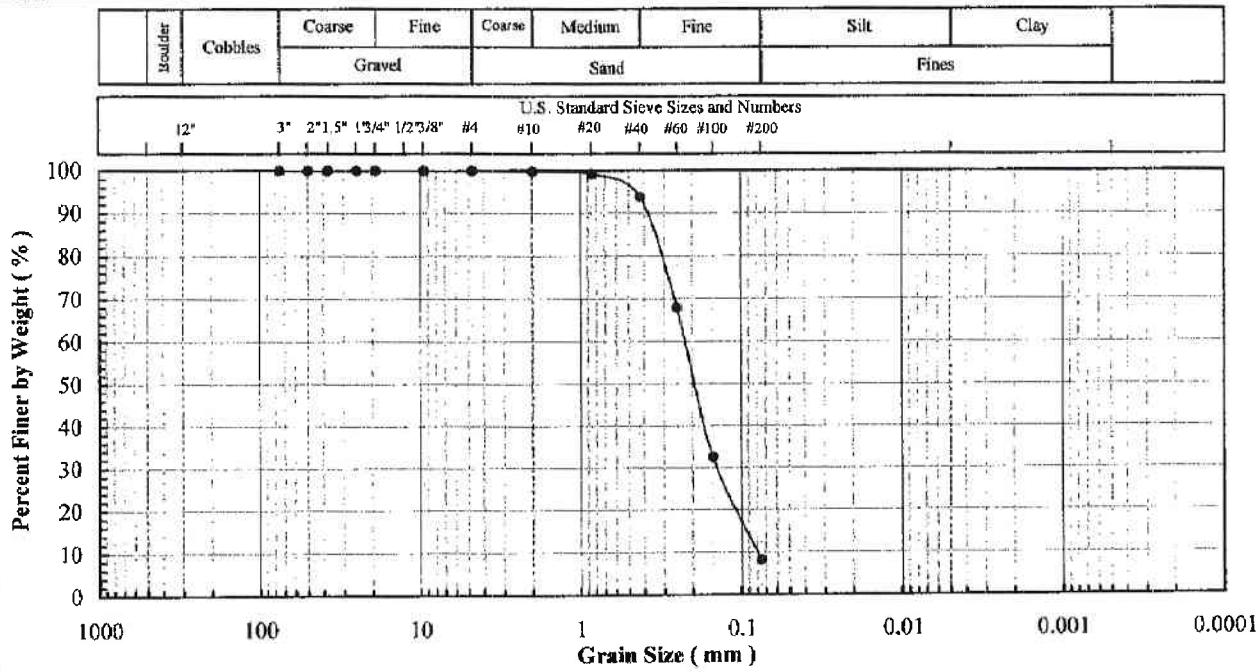
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Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-08
Lab Sample No:	F008

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



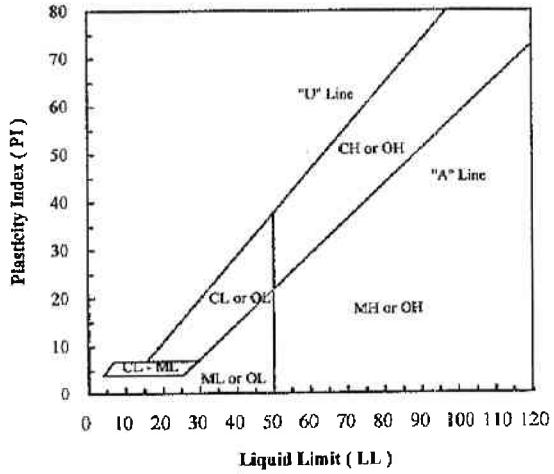
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	99.8
#20	0.850	99.3
#40	0.425	93.8
#60	0.250	67.9
#100	0.150	32.6
#200	0.075	8.2

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	91.8
Fines (%):	8.2
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.8
Coeff. Curv. (Cc):	1.2



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
PC-08	F008	5.5	8.2				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

Excel Geotechnical Testing, Inc.
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Tel: (770) 650 1666 Fax: (770) 650 5786

RIGID WALL PERMEABILITY TEST [1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-08
Lab Sample Number:	F008
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/04/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content [3] (%)		(-)	(cm/s)
1	R	14.2	7.6	93.2	0.0	TW	0.20 - 0.50	6.7E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

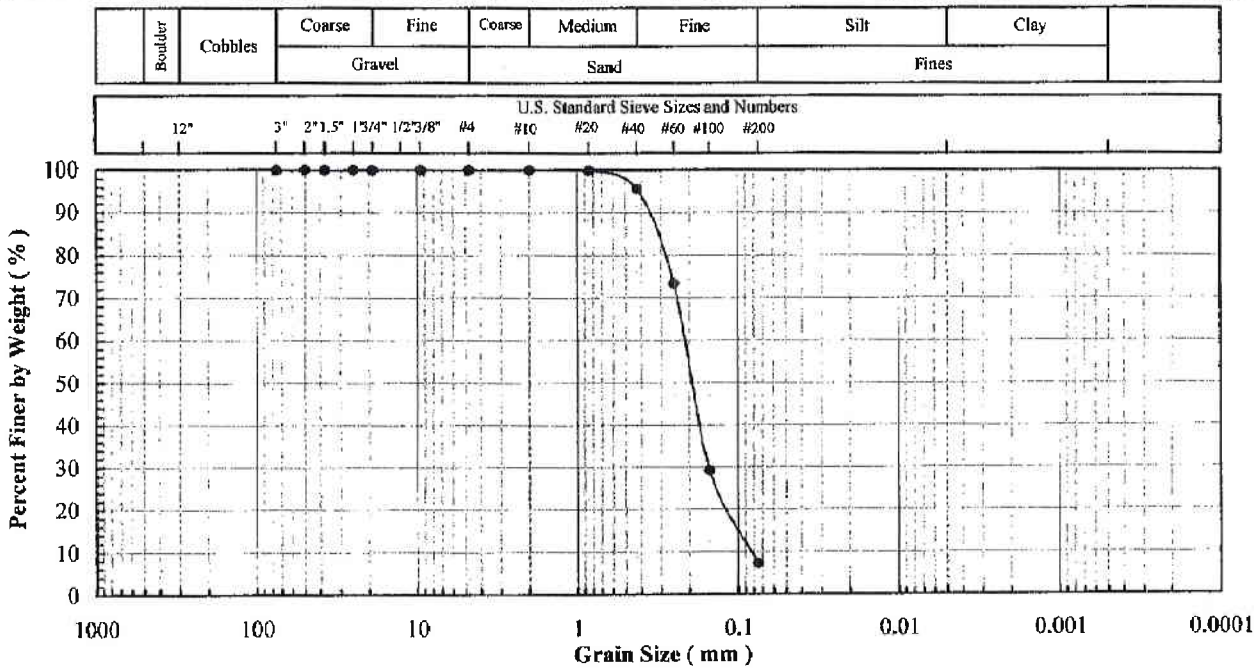
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Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	PC-09
Lab Sample No:	F009

ASTM C 136, D 422, D 854, D 1140, D2216, D 2487, D4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits



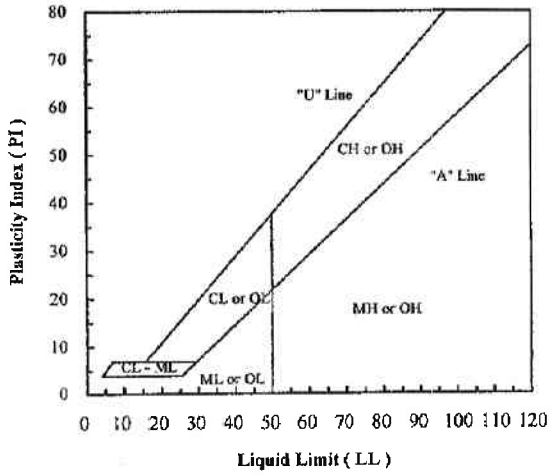
Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	95.6
#60	0.250	73.4
#100	0.150	29.3
#200	0.075	7.3

Specific Gravity (-):	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	
Sand (%):	92.7
Fines (%):	7.3
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	2.6
Coeff. Curv. (Cc):	1.4



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	PL (-)	PI (-)	Engineering Classification
PC-09	F009	5.6	7.3				SP-SM - Poorly graded sand with silt

Note(s):

Engineering classification is based on the assumption that the fines are either ML or MH.

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Tel: (770) 650 1666 Fax: (770) 650 5786

RIGID WALL PERMEABILITY TEST [1]

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	PC-09
Lab Sample Number:	F009
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	6/05/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid [4]	Gradient Range	Hydraulic Conductivity
	Spec. Prep. [2] (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content [3] (%)		(-)	(cm/s)
1	R	14.5	7.6	93.2	0.0	TW	0.14 - 0.50	6.6E-3

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 7 layers, each approximately 2.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:
Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.

Appendix G

Date: 4/19/2010
Purchase Order: JED CELL 7
ORDER NUMBERS: 026023311, 026023314, 026023315

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteservicesinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023311, 026023314, 026023315
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023311, 026023314, 026023315
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility. All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.



Melanie King
Quality Assurance Coordinator

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023311

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023314	201015CV	1463	150	15	2664	2250	1459	201015CV	00001312	00001312	2020590127	952867B
026023314	201015CV	1464	150	15	2667	2250	1459	201015CV	00001312	00001312	2020590127	952867B
026023315	201015CV	1465	150	15	2678	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023314	201015CV	1467	150	15	2676	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023314	201015CV	1468	150	15	2688	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023315	201015CV	1472	150	15	2686	2250	1459	201015CV	00001300	00001293	2020590127	952867B
026023315	201015CV	1473	150	15	2686	2250	1459	201015CV	00001300	00001293	2020590127	952867B
026023314	201015CV	1483	150	15	2672	2250	1476	201015CV	00001301	00001293	2020590127	953569A
026023314	201015CV	1485	150	15	2658	2250	1476	201015CV	00001301	00001293	2020590127	953569A
026023314	201015CV	1487	150	15	2660	2250	1476	201015CV	00001299	00001293	2020590127	953569A
026023314	201015CV	1494	150	15	2686	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023314	201015CV	1502	150	15	2638	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023315	201015CV	1503	150	15	2650	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023314	201015CV	1509	150	15	2652	2250	1493	201015CV	00001298	00001293	2020590108	953569A
026023315	201015CV	1516	150	15	2636	2250	1511	201015CV	00001328	00001320	2020590108	953569A
026023315	201015CV	1518	150	15	2628	2250	1511	201015CV	00001328	00001320	2020590120	953569A
026023314	201015CV	1519	150	15	2634	2250	1511	201015CV	00001328	00001320	2020590120	953569A
026023315	201015CV	1524	150	15	2632	2250	1511	201015CV	00001327	00001320	2020590120	953569A
026023314	201015CV	1527	150	15	2620	2250	1511	201015CV	00001327	00001320	2020590120	953569B
026023314	201015CV	1529	150	15	2606	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023311	201015CV	1546	150	15	2626	2250	1545	201014CV	00001261	00001260	2020590122	953569B
026023311	201015CV	1549	150	15	2594	2250	1545	201014CV	00001261	00001260	2020590122	953569B
026023311	201015CV	1550	150	15	2588	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023311	201015CV	1553	150	15	2598	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023314	201015CV	1560	150	15	2600	2250	1545	201015CV	00001330	00001330	2020590122	953569B
026023311	201015CV	1566	150	15	2590	2250	1562	201015CV	00001331	00001330	2020590122	953569B
026023311	201015CV	1567	150	15	2586	2250	1562	201015CV	00001331	00001330	2020590122	953569B
026023314	201015CV	1575	150	15	2598	2250	1562	201015CV	00001332	00001330	2020607862	953575A
026023314	201015CV	1576	150	15	2604	2250	1562	201015CV	00001332	00001330	2020607862	953575A
026023314	201015CV	1581	150	15	2656	2250	1579	201015CV	00001333	00001330	2020607862	953575A
026023311	201015CV	1584	150	15	2442	2250	1579	201015CV	00001333	00001330	2020607862	953575A

Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023314	201015CV	1587	150	15	2658	2250	1579	201015CV	00001333	00001330	2020607862	953575A
026023311	201015CV	1592	150	15	2668	2250	1579	201015CV	00001334	00001330	2020607862	953575A
026023315	201015CV	1594	150	15	2654	2250	1579	201015CV	00001334	00001330	2020607862	953575A
026023311	201015CV	1597	150	15	2640	2250	1597	201015CV	00001337	00001330	2020607862	953575A
026023311	201015CV	1603	150	15	2654	2250	1597	201015CV	00001357	00001357	2020517246	953575A
026023311	201015CV	1607	150	15	2620	2250	1597	201015CV	00001344	00001338	2020517246	953575A
026023315	201015CV	1610	150	15	2624	2250	1597	201015CV	00001344	00001338	2020517246	953575A
026023315	201015CV	1612	150	15	2606	2250	1597	201015CV	00001358	00001357	2020517246	953575A
026023315	201015CV	1613	150	15	2614	2250	1597	201015CV	00001358	00001357	2020517246	953575A
026023315	201015CV	1615	150	15	2602	2250	1614	201015CV	00001358	00001357	2020517246	953575A
026023311	201015CV	1623	150	15	2572	2250	1614	201015CV	00001360	00001357	2020517246	953575B
026023311	201015CV	1626	150	15	2538	2250	1614	201015CV	00001360	00001357	2020517246	953575B
026023315	201015CV	1633	150	15	2554	2250	1632	201015CV	00001339	00001338	2020514743	953575B
026023315	201015CV	1634	150	15	2550	2250	1632	201015CV	00001339	00001338	2020514743	953575B
026023315	201015CV	1636	150	15	2538	2250	1632	201015CV	00001339	00001338	2020514743	953575B
026023315	201015CV	1637	150	15	2540	2250	1632	201015CV	00001339	00001338	2020514743	953575B
026023311	201015CV	1640	150	15	2536	2250	1632	201015CV	00001362	00001357	2020514743	953575B
026023315	201015CV	1645	150	15	2538	2250	1632	201015CV	00001362	00001357	2020514743	953575B
026023315	201015CV	1646	150	15	2536	2250	1632	201015CV	00001362	00001357	2020514743	953575B
						Total sq ft: **112500**						Total Number of Rolls Certified: **50**

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023311 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1459	0.82	80.7	4.0	33.5
CV-BENTOMAT ST	201015CV	1476	0.85	89.5	3.8	33.6
CV-BENTOMAT ST	201015CV	1493	0.89	48.1	9.3	27.9
CV-BENTOMAT ST	201015CV	1511	0.85	56.8	6.3	30.2
CV-BENTOMAT ST	201015CV	1528	0.82	70.4	5.4	31.5
CV-BENTOMAT ST	201015CV	1545	0.84	78.6	3.8	29.4
CV-BENTOMAT ST	201015CV	1562	0.84	73.2	4.2	29.0
CV-BENTOMAT ST	201015CV	1579	0.84	79.6	4.7	29.7
CV-BENTOMAT ST	201015CV	1597	0.82	82.7	5.2	29.8
CV-BENTOMAT ST	201015CV	1614	0.83	80.0	3.9	30.1
CV-BENTOMAT ST	201015CV	1632	0.84	44.5	8.8	27.2

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023311

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
952867B	12.00	26.00	16.60
953575A	12.00	26.00	15.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20
953569B	12.00	25.00	16.00

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023311 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514743	3.6	151.1
PPX 82TEX	2020517246	3.3	158.0
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590120	3.4	169.0
PPX 82TEX	2020590122	3.4	169.0
PPX 82TEX	2020590127	3.5	150.9
PPX 82TEX	2020607862	3.4	165.1

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001282	6.8	26.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001302	6.5	32.9
CV-NON-WOVEN	00001312	7.2	36.8
CV-NON-WOVEN	00001320	6.4	33.2
CV-NON-WOVEN	00001330	6.4	31.5
CV-NON-WOVEN	00001338	6.5	25.8
CV-NON-WOVEN	00001357	6.5	29.5

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

Date: 4/15/2010
Purchase Order: JED CELL 7
ORDER NUMBER: 026023309

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteservicesinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBER: 026023309
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023309
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using
ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.

Melanie King
Quality Assurance Coordinator

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023309

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	**GCL Lot #**	**GCL Roll #**	**Length**	**Width**	**weight**	**sq ft**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
026023309	201015CV	1437	150	15	2665	2250	1424	201015CV	00001296	00001293	2020606585	952867B
026023309	201015CV	1441	150	15	2696	2250	1441	201015CV	00001296	00001293	2020606585	952867B
026023309	201015CV	1445	150	15	2646	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023309	201015CV	1447	150	15	2650	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023309	201015CV	1450	150	15	2628	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023309	201015CV	1451	150	15	2646	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023309	201015CV	1456	150	15	2662	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023309	201015CV	1457	150	15	2672	2250	1441	201015CV	00001312	00001312	2020606585	952867B
026023309	201015CV	1460	150	15	2660	2250	1459	201015CV	00001312	00001312	2020606585	952867B
026023309	201015CV	1462	150	15	2650	2250	1459	201015CV	00001312	00001312	2020590127	952867B
026023309	201015CV	1479	150	15	2692	2250	1476	201015CV	00001301	00001293	2020590108	953569A
026023309	201015CV	1520	150	15	2628	2250	1511	201015CV	00001328	00001320	2020590120	953569A
026023309	201015CV	1547	150	15	2600	2250	1545	201014CV	00001261	00001260	2020590122	953569B
026023309	201015CV	1548	150	15	2602	2250	1545	201014CV	00001261	00001260	2020590122	953569B
026023309	201015CV	1559	150	15	2594	2250	1545	201015CV	00001330	00001330	2020590122	953569B
026023309	201015CV	1562	150	15	2590	2250	1562	201015CV	00001330	00001330	2020590122	953569B
026023309	201015CV	1564	150	15	2596	2250	1562	201015CV	00001330	00001330	2020590122	953569B
026023309	201015CV	1671	150	15	2550	2250	1666	201015CV	00001336	00001330	2020514738	953575B
Total sq ft:						**40500**	Total Number of Rolls Certified: **18**					

CETCO®

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023309 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1424	0.87	76.0	3.7	31.0
CV-BENTOMAT ST	201015CV	1441	0.91	78.4	4.3	32.5
CV-BENTOMAT ST	201015CV	1459	0.82	80.7	4.0	33.5
CV-BENTOMAT ST	201015CV	1476	0.85	89.5	3.8	33.6
CV-BENTOMAT ST	201015CV	1511	0.85	56.8	6.3	30.2
CV-BENTOMAT ST	201015CV	1545	0.84	78.6	3.8	29.4
CV-BENTOMAT ST	201015CV	1562	0.84	73.2	4.2	29.0
CV-BENTOMAT ST	201015CV	1666	0.87	70.5	8.8	27.5

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023309

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
952867B	12.00	26.00	16.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20
953569B	12.00	25.00	16.00

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023309 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514738	3.6	151.1
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590120	3.4	169.0
PPX 82TEX	2020590122	3.4	169.0
PPX 82TEX	2020590127	3.5	150.9
PPX 82TEX	2020606585	3.5	160.8

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001312	7.2	36.8
CV-NON-WOVEN	00001320	6.4	33.2
CV-NON-WOVEN	00001330	6.4	31.5

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

Date: 4/14/2010
Purchase Order: JED CELL 7
ORDER NUMBERS: 026023308, 026023310

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteservicesinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023308, 026023310
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023308, 026023310
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility. All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.



Melanie King
Quality Assurance Coordinator

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023308

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023310	201015CV	1424	150	15	2684	2250	1424	201015CV	00001292	00001282	2020594445	952867A
026023308	201015CV	1425	150	15	2646	2250	1424	201015CV	00001292	00001282	2020594445	952867A
026023310	201015CV	1429	150	15	2634	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023310	201015CV	1430	150	15	2634	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023308	201015CV	1431	150	15	2642	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023310	201015CV	1432	150	15	2630	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023310	201015CV	1433	150	15	2636	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023310	201015CV	1436	150	15	2654	2250	1424	201015CV	00001296	00001293	2020594445	952867B
026023310	201015CV	1438	150	15	2656	2250	1424	201015CV	00001296	00001293	2020606585	952867B
026023310	201015CV	1439	150	15	2686	2250	1424	201015CV	00001296	00001293	2020606585	952867B
026023310	201015CV	1440	150	15	2668	2250	1424	201015CV	00001296	00001293	2020606585	952867B
026023308	201015CV	1442	150	15	2688	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023310	201015CV	1443	150	15	2658	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023310	201015CV	1448	150	15	2454	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023310	201015CV	1452	150	15	2636	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023310	201015CV	1454	150	15	2652	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023308	201015CV	1458	150	15	2646	2250	1441	201015CV	00001312	00001312	2020606585	952867B
026023308	201015CV	1459	150	15	2660	2250	1459	201015CV	00001312	00001312	2020606585	952867B
026023310	201015CV	1466	150	15	2680	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023308	201015CV	1470	150	15	2680	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023308	201015CV	1471	150	15	2688	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023308	201015CV	1474	150	15	2700	2250	1459	201015CV	00001300	00001293	2020590127	952867B
026023310	201015CV	1475	150	15	2750	2250	1459	201015CV	00001300	00001293	2020590127	952867B
026023310	201015CV	1481	150	15	2698	2250	1476	201015CV	00001301	00001293	2020590127	953569A
026023308	201015CV	1488	150	15	2668	2250	1476	201015CV	00001299	00001293	2020590127	953569A
026023308	201015CV	1489	150	15	2660	2250	1476	201015CV	00001299	00001293	2020590127	953569A
026023308	201015CV	1492	150	15	2668	2250	1476	201015CV	00001299	00001293	2020590108	953569A
026023308	201015CV	1495	150	15	2674	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023308	201015CV	1496	150	15	2680	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023308	201015CV	1499	150	15	2668	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023308	201015CV	1667	150	15	2504	2250	1666	201015CV	00001337	00001330	2020514738	953575B

Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023308	201015CV	1669	150	15	2544	2250	1666	201015CV	00001336	00001330	2020514738	953575B
026023308	201015CV	1670	150	15	2544	2250	1666	201015CV	00001336	00001330	2020514738	953575B
026023310	201015CV	1688	150	15	2538	2250	1683	201015CV	00001365	00001357	2020593011	953575B
						Total sq ft:	**76500**					

Total Number of Rolls Certified: **34**

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023308 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1424	0.87	76.0	3.7	31.0
CV-BENTOMAT ST	201015CV	1441	0.91	78.4	4.3	32.5
CV-BENTOMAT ST	201015CV	1459	0.82	80.7	4.0	33.5
CV-BENTOMAT ST	201015CV	1476	0.85	89.5	3.8	33.6
CV-BENTOMAT ST	201015CV	1493	0.89	48.1	9.3	27.9
CV-BENTOMAT ST	201015CV	1666	0.87	70.5	8.8	27.5
CV-BENTOMAT ST	201015CV	1683	0.84	72.7	6.6	26.7

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023308

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
952867A	12.00	26.00	16.80
952867B	12.00	26.00	16.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023308 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514738	3.6	151.1
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590127	3.5	150.9
PPX 82TEX	2020593011	3.5	200.8
PPX 82TEX	2020594445	3.6	144.8
PPX 82TEX	2020606585	3.5	160.8

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001282	6.8	26.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001312	7.2	36.8
CV-NON-WOVEN	00001320	6.4	33.2
CV-NON-WOVEN	00001330	6.4	31.5
CV-NON-WOVEN	00001357	6.5	29.5

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

Date: 4/12/2010
Purchase Order: JED CELL 7
ORDER NUMBERS: 026023304, 026023305, 026023306, 026023307

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteservicesinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023304, 026023305, 026023306, 026023307
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023304, 026023305, 026023306, 026023307
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility. All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.



Melanie King
Quality Assurance Coordinator

CETCO®

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023304

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023305	201015CV	1469	150	15	2690	2250	1459	201015CV	00001320	00001320	2020590127	952867B
026023304	201015CV	1476	150	15	2738	2250	1476	201015CV	00001300	00001293	2020590127	953569A
026023307	201015CV	1480	150	15	2698	2250	1476	201015CV	00001301	00001293	2020590127	953569A
026023307	201015CV	1484	150	15	2654	2250	1476	201015CV	00001301	00001293	2020590127	953569A
026023307	201015CV	1490	150	15	2664	2250	1476	201015CV	00001299	00001293	2020590127	953569A
026023305	201015CV	1491	150	15	2662	2250	1476	201015CV	00001299	00001293	2020590108	953569A
026023305	201015CV	1498	150	15	2670	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023307	201015CV	1500	150	15	2668	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023307	201015CV	1501	150	15	2670	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023305	201015CV	1505	150	15	2642	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023307	201015CV	1507	150	15	2640	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023307	201015CV	1512	150	15	2634	2250	1511	201015CV	00001298	00001293	2020590108	953569A
026023307	201015CV	1514	150	15	2632	2250	1511	201015CV	00001328	00001320	2020590108	953569A
026023306	201015CV	1515	150	15	2634	2250	1511	201015CV	00001328	00001320	2020590108	953569A
026023305	201015CV	1517	150	15	2632	2250	1511	201015CV	00001328	00001320	2020590108	953569A
026023307	201015CV	1521	150	15	2636	2250	1511	201015CV	00001327	00001320	2020590120	953569A
026023305	201015CV	1523	150	15	2622	2250	1511	201015CV	00001327	00001320	2020590120	953569A
026023305	201015CV	1525	150	15	2622	2250	1511	201015CV	00001327	00001320	2020590120	953569B
026023305	201015CV	1526	150	15	2616	2250	1511	201015CV	00001327	00001320	2020590120	953569B
026023305	201015CV	1528	150	15	2644	2250	1528	201015CV	00001327	00001320	2020590120	953569B
026023305	201015CV	1530	150	15	2592	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023307	201015CV	1531	150	15	2594	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023305	201015CV	1533	150	15	2594	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023305	201015CV	1542	150	15	2594	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023305	201015CV	1543	150	15	2590	2250	1528	201014CV	00001261	00001260	2020590120	953569B
026023305	201015CV	1555	150	15	2584	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023305	201015CV	1556	150	15	2594	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023307	201015CV	1557	150	15	2592	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023304	201015CV	1558	150	15	2598	2250	1545	201015CV	00001330	00001330	2020590122	953569B
026023305	201015CV	1561	150	15	2598	2250	1545	201015CV	00001330	00001330	2020590122	953569B
026023305	201015CV	1563	150	15	2590	2250	1562	201015CV	00001330	00001330	2020590122	953569B

Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023306	201015CV	1570	150	15	2586	2250	1562	201015CV	00001331	00001330	2020590122	953569B
026023307	201015CV	1573	150	15	2592	2250	1562	201015CV	00001332	00001330	2020607862	953569B
026023304	201015CV	1585	150	15	2668	2250	1579	201015CV	00001333	00001330	2020607862	953575A
026023304	201015CV	1589	150	15	2664	2250	1579	201015CV	00001334	00001330	2020607862	953575A
026023304	201015CV	1590	150	15	2660	2250	1579	201015CV	00001334	00001330	2020607862	953575A
026023306	201015CV	1624	150	15	2546	2250	1614	201015CV	00001360	00001357	2020517246	953575B
026023304	201015CV	1628	150	15	2520	2250	1614	201015CV	00001361	00001357	2020514743	953575B
026023306	201015CV	1629	150	15	2528	2250	1614	201015CV	00001361	00001357	2020514743	953575B
026023304	201015CV	1630	150	15	2552	2250	1614	201015CV	00001361	00001357	2020514743	953575B
026023304	201015CV	1631	150	15	2548	2250	1614	201015CV	00001361	00001357	2020514743	953575B
026023304	201015CV	1632	150	15	2630	2250	1632	201015CV	00001361	00001357	2020514743	953575B
026023306	201015CV	1635	150	15	2538	2250	1632	201015CV	00001339	00001338	2020514743	953575B
026023304	201015CV	1641	150	15	2540	2250	1632	201015CV	00001362	00001357	2020514743	953575B
026023304	201015CV	1648	150	15	2538	2250	1632	201015CV	00001352	00001348	2020514743	953575B
026023306	201015CV	1649	150	15	2588	2250	1649	201015CV	00001352	00001348	2020514743	953575B
026023304	201015CV	1650	150	15	2523	2250	1649	201015CV	00001352	00001348	2020514743	953575B
026023307	201015CV	1658	150	15	2538	2250	1649	201015CV	00001363	00001357	2020514738	953575B
026023306	201015CV	1661	150	15	2540	2250	1649	201015CV	00001363	00001357	2020514738	953575B
026023307	201015CV	1662	150	15	2540	2250	1649	201015CV	00001337	00001330	2020514738	953575B
026023307	201015CV	1663	150	15	2536	2250	1649	201015CV	00001337	00001330	2020514738	953575B
026023306	201015CV	1665	150	15	2536	2250	1649	201015CV	00001337	00001330	2020514738	953575B
026023307	201015CV	1666	150	15	2728	2250	1666	201015CV	00001337	00001330	2020514738	953575B
026023306	201015CV	1672	150	15	2548	2250	1666	201015CV	00001336	00001330	2020514738	953575B
026023304	201015CV	1673	150	15	2548	2250	1666	201015CV	00001336	00001330	2020514738	953575B
026023306	201015CV	1674	150	15	2552	2250	1666	201015CV	00001336	00001330	2020514738	953575B
026023304	201015CV	1675	150	15	2548	2250	1666	201015CV	00001336	00001330	2020514738	953575B
026023306	201015CV	1676	150	15	2542	2250	1666	201015CV	00001364	00001357	2020514738	953575B
026023306	201015CV	1677	150	15	2534	2250	1666	201015CV	00001364	00001357	2020514738	953575B
026023304	201015CV	1678	150	15	2530	2250	1666	201015CV	00001364	00001357	2020514738	953575B
026023306	201015CV	1679	150	15	2540	2250	1666	201015CV	00001364	00001357	2020514738	953575B
026023306	201015CV	1681	150	15	2528	2250	1666	201015CV	00001364	00001357	2020514738	953575B
026023307	201015CV	1684	150	15	2546	2250	1683	201015CV	00001364	00001357	2020514738	953575B
026023304	201015CV	1686	150	15	2538	2250	1683	201015CV	00001365	00001357	2020514738	953575B
026023306	201015CV	1689	150	15	2540	2250	1683	201015CV	00001365	00001357	2020593011	953575B
026023306	201015CV	1690	150	15	2534	2250	1683	201015CV	00001365	00001357	2020593011	953575B
026023306	201015CV	1691	150	15	2538	2250	1683	201015CV	00001335	00001330	2020593011	953575B
026023304	201015CV	1692	150	15	2542	2250	1683	201015CV	00001335	00001330	2020593011	953575B
						Total sq ft:	**153000**				Total Number of Rolls Certified:	**68**

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023304 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1459	0.82	80.7	4.0	33.5
CV-BENTOMAT ST	201015CV	1476	0.85	89.5	3.8	33.6
CV-BENTOMAT ST	201015CV	1493	0.89	48.1	9.3	27.9
CV-BENTOMAT ST	201015CV	1511	0.85	56.8	6.3	30.2
CV-BENTOMAT ST	201015CV	1528	0.82	70.4	5.4	31.5
CV-BENTOMAT ST	201015CV	1545	0.84	78.6	3.8	29.4
CV-BENTOMAT ST	201015CV	1562	0.84	73.2	4.2	29.0
CV-BENTOMAT ST	201015CV	1579	0.84	79.6	4.7	29.7
CV-BENTOMAT ST	201015CV	1614	0.83	80.0	3.9	30.1
CV-BENTOMAT ST	201015CV	1632	0.84	44.5	8.8	27.2
CV-BENTOMAT ST	201015CV	1649	0.87	58.0	5.6	27.5
CV-BENTOMAT ST	201015CV	1666	0.87	70.5	8.8	27.5
CV-BENTOMAT ST	201015CV	1683	0.84	72.7	6.6	26.7

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023304

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
952867B	12.00	26.00	16.60
953575A	12.00	26.00	15.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20
953569B	12.00	25.00	16.00

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023304 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514738	3.6	151.1
PPX 82TEX	2020514743	3.6	151.1
PPX 82TEX	2020517246	3.3	158.0
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590120	3.4	169.0
PPX 82TEX	2020590122	3.4	169.0
PPX 82TEX	2020590127	3.5	150.9
PPX 82TEX	2020593011	3.5	200.8
PPX 82TEX	2020607862	3.4	165.1

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001282	6.8	26.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001302	6.5	32.9
CV-NON-WOVEN	00001320	6.4	33.2
CV-NON-WOVEN	00001330	6.4	31.5
CV-NON-WOVEN	00001338	6.5	25.8
CV-NON-WOVEN	00001348	6.8	31.0
CV-NON-WOVEN	00001357	6.5	29.5

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

Date: 4/9/2010
Purchase Order: JED CELL 7
ORDER NUMBER: 026023302

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteservicesinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBER: 026023302
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023302
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility. All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.



Melanie King
Quality Assurance Coordinator

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023302

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	**GCL Lot #**	**GCL Roll #**	**Length**	**Width**	**weight**	**sq ft**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
026023302	201015CV	1477	150	15	2732	2250	1476	201015CV	00001300	00001293	2020590127	953569A
026023302	201015CV	1478	150	15	2696	2250	1476	201015CV	00001300	00001293	2020590127	953569A
026023302	201015CV	1482	150	15	2690	2250	1476	201015CV	00001301	00001293	2020590127	953569A
026023302	201015CV	1486	150	15	2676	2250	1476	201015CV	00001299	00001293	2020590127	953569A
026023302	201015CV	1497	150	15	2682	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023302	201015CV	1545	150	15	2622	2250	1545	201014CV	00001261	00001260	2020590120	953569B
026023302	201015CV	1579	150	15	2664	2250	1579	201015CV	00001332	00001320	2020607862	953575A
026023302	201015CV	1582	150	15	2424	2250	1579	201015CV	00001333	00001320	2020607862	953575A
026023302	201015CV	1595	150	15	2648	2250	1579	201015CV	00001334	00001320	2020607862	953575A
026023302	201015CV	1596	150	15	2648	2250	1579	201015CV	00001337	00001320	2020607862	953575A
026023302	201015CV	1601	150	15	2640	2250	1597	201015CV	00001337	00001320	2020607862	953575A
026023302	201015CV	1606	150	15	2624	2250	1597	201015CV	00001344	00001320	2020517246	953575A
026023302	201015CV	1618	150	15	2590	2250	1614	201015CV	00001358	00001320	2020517246	953575A
026023302	201015CV	1621	150	15	2666	2250	1614	201015CV	00001360	00001320	2020517246	953575A
026023302	201015CV	1638	150	15	2538	2250	1632	201015CV	00001339	00001320	2020514743	953575B
026023302	201015CV	1647	150	15	2536	2250	1632	201015CV	00001352	00001320	2020514743	953575B
026023302	201015CV	1653	150	15	2528	2250	1649	201015CV	00001352	00001320	2020514743	953575B
						Total sq ft:	**38250**				Total Number of Rolls Certified: **17**	

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023302 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1476	0.85	89.5	3.8	33.6
CV-BENTOMAT ST	201015CV	1493	0.89	48.1	9.3	27.9
CV-BENTOMAT ST	201015CV	1545	0.84	78.6	3.8	29.4
CV-BENTOMAT ST	201015CV	1579	0.84	79.6	4.7	29.7
CV-BENTOMAT ST	201015CV	1597	0.82	82.7	5.2	29.8
CV-BENTOMAT ST	201015CV	1614	0.83	80.0	3.9	30.1
CV-BENTOMAT ST	201015CV	1632	0.84	44.5	8.8	27.2
CV-BENTOMAT ST	201015CV	1649	0.87	58.0	5.6	27.5

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023302

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
953575A	12.00	26.00	15.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20
953569B	12.00	25.00	16.00

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023302 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514743	3.6	151.1
PPX 82TEX	2020517246	3.3	158.0
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590120	3.4	169.0
PPX 82TEX	2020590127	3.5	150.9
PPX 82TEX	2020607862	3.4	165.1

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001320	6.4	33.2

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

Date: 4/8/2010
Purchase Order: JED CELL 7
ORDER NUMBERS: 026023301, 026023303

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteserviceinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023301, 026023303
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023301, 026023303
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility. All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.



Melanie King
Quality Assurance Coordinator

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023301

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023301	201015CV	1493	150	15	2708	2250	1493	201015CV	00001325	00001320	2020590108	953569A
026023301	201015CV	1506	150	15	2652	2250	1493	201015CV	00001324	00001320	2020590108	953569A
026023301	201015CV	1510	150	15	2648	2250	1493	201015CV	00001298	00001293	2020590108	953569A
026023301	201015CV	1511	150	15	2662	2250	1511	201015CV	00001298	00001293	2020590108	953569A
026023301	201015CV	1513	150	15	2636	2250	1511	201015CV	00001298	00001293	2020590108	953569A
026023301	201015CV	1532	150	15	2592	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023301	201015CV	1534	150	15	2592	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023301	201015CV	1535	150	15	2606	2250	1528	201015CV	00001284	00001282	2020590120	953569B
026023301	201015CV	1536	150	15	2604	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023301	201015CV	1537	150	15	2604	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023301	201015CV	1539	150	15	2614	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023301	201015CV	1540	150	15	2600	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023301	201015CV	1541	150	15	2594	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023301	201015CV	1544	150	15	2592	2250	1528	201014CV	00001261	00001260	2020590120	953569B
026023301	201015CV	1551	150	15	2582	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023301	201015CV	1552	150	15	2596	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023301	201015CV	1578	150	15	2610	2250	1562	201015CV	00001332	00001320	2020607862	953575A
026023303	201015CV	1588	150	15	2654	2250	1579	201015CV	00001334	00001320	2020607862	953575A
026023303	201015CV	1602	150	15	2612	2250	1597	201015CV	00001337	00001320	2020517246	953575A
026023303	201015CV	1604	150	15	2652	2250	1597	201015CV	00001344	00001320	2020517246	953575A
026023303	201015CV	1605	150	15	2634	2250	1597	201015CV	00001344	00001320	2020517246	953575A
026023303	201015CV	1608	150	15	2636	2250	1597	201015CV	00001344	00001320	2020517246	953575A
026023303	201015CV	1609	150	15	2626	2250	1597	201015CV	00001344	00001320	2020517246	953575A
026023303	201015CV	1611	150	15	2624	2250	1597	201015CV	00001358	00001320	2020517246	953575A
026023303	201015CV	1616	150	15	2592	2250	1614	201015CV	00001358	00001320	2020517246	953575A
026023303	201015CV	1651	150	15	2508	2250	1649	201015CV	00001352	00001320	2020514743	953575B
026023303	201015CV	1652	150	15	2534	2250	1649	201015CV	00001363	00001320	2020514743	953575B
026023303	201015CV	1654	150	15	2526	2250	1649	201015CV	00001352	00001320	2020514743	953575B
026023303	201015CV	1655	150	15	2528	2250	1649	201015CV	00001363	00001320	2020514743	953575B
026023303	201015CV	1656	150	15	2530	2250	1649	201015CV	00001363	00001320	2020514743	953575B
026023303	201015CV	1657	150	15	2538	2250	1649	201015CV	00001363	00001320	2020514738	953575B

Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023303	201015CV	1659	150	15	2534	2250	1649	201015CV	00001363	00001320	2020514738	953575B
026023303	201015CV	1660	150	15	2532	2250	1649	201015CV	00001363	00001320	2020514738	953575B
026023303	201015CV	1682	150	15	2536	2250	1666	201015CV	00001364	00001320	2020514738	953575B
						Total sq ft:	**76500**					

Total Number of Rolls Certified: **34**

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023301 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1493	0.89	48.1	9.3	27.9
CV-BENTOMAT ST	201015CV	1511	0.85	56.8	6.3	30.2
CV-BENTOMAT ST	201015CV	1528	0.82	70.4	5.4	31.5
CV-BENTOMAT ST	201015CV	1545	0.84	78.6	3.8	29.4
CV-BENTOMAT ST	201015CV	1562	0.84	73.2	4.2	29.0
CV-BENTOMAT ST	201015CV	1579	0.84	79.6	4.7	29.7
CV-BENTOMAT ST	201015CV	1597	0.82	82.7	5.2	29.8
CV-BENTOMAT ST	201015CV	1614	0.83	80.0	3.9	30.1
CV-BENTOMAT ST	201015CV	1649	0.87	58.0	5.6	27.5
CV-BENTOMAT ST	201015CV	1666	0.87	70.5	8.8	27.5

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023301

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
953575A	12.00	26.00	15.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20
953569B	12.00	25.00	16.00

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023301 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514738	3.6	151.1
PPX 82TEX	2020514743	3.6	151.1
PPX 82TEX	2020517246	3.3	158.0
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590120	3.4	169.0
PPX 82TEX	2020590122	3.4	169.0
PPX 82TEX	2020607862	3.4	165.1

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001282	6.8	26.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001302	6.5	32.9
CV-NON-WOVEN	00001320	6.4	33.2

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/22/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1424		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.17	Final Height of Clay (in)	:	0.21
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	46.30	Final Wet Weight(Clay) (g)	:	71.40
Wet Density (pcf)	:	82.49	Wet Density (pcf)	:	102.98
Moisture Content %	:	29.30	Moisture Content %	:	99.40
Dry Density (pcf)	:	63.80	Dry Density (pcf)	:	51.65

Test Parameters

Fluid	:	De-Aired Water	**Average Effective**		
Cell Pressure (psi)	:	80.00	**Confining Pressure (psi)**	:	**4**
Head Water (psi)	:	77.00	Gradient	:	262.86
Tail Water (psi)	:	75.00	Effective Stress at Base	:	5

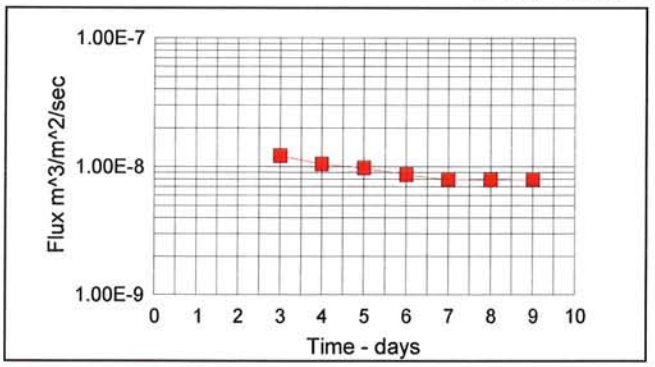
Flux and Permeability Input Data

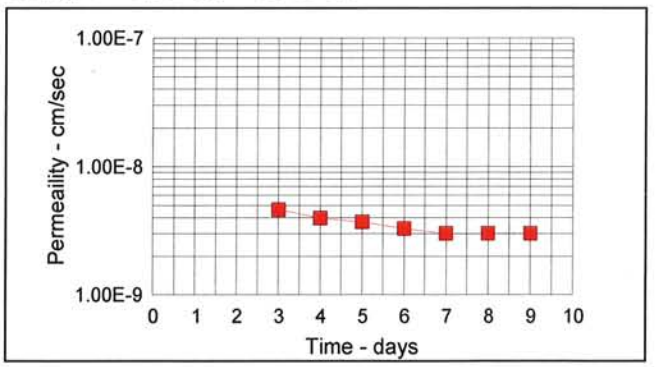
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.21 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	8.60	1441	86460	1.23E-008	4.67E-009
4	04/16/2010	7.40	1442	86520	1.06E-008	4.01E-009
5	04/17/2010	6.90	1443	86580	9.83E-009	3.74E-009
6	04/18/2010	6.10	1438	86280	8.72E-009	3.32E-009
7	04/19/2010	5.60	1439	86340	8.00E-009	3.04E-009
8	04/20/2010	5.60	1442	86520	7.98E-009	3.04E-009
9	04/21/2010	5.60	1440	86400	8.00E-009	3.04E-009

Average of Last 3 Test Readings : 7.99E-009 3.04E-009





JLT Laboratories, Inc. 938 S Central Ave, Canonsburg, Pa. 15317 Tel 724-746-4441 , Fax 724-745-4261

INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/22/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1459		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.17	Final Height of Clay (in)	:	0.21
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	44.20	Final Wet Weight(Clay) (g)	:	68.00
Wet Density (pcf)	:	78.75	Wet Density (pcf)	:	98.08
Moisture Content %	:	32.70	Moisture Content %	:	104.50
Dry Density (pcf)	:	59.34	Dry Density (pcf)	:	47.96

Test Parameters

Fluid	:	De-Aired Water	**Average Effective**		
Cell Pressure (psi)	:	80.00	**Confining Pressure (psi)**	:	**4**
Head Water (psi)	:	77.00	Gradient	:	262.86
Tail Water (psi)	:	75.00	Effective Stress at Base	:	5

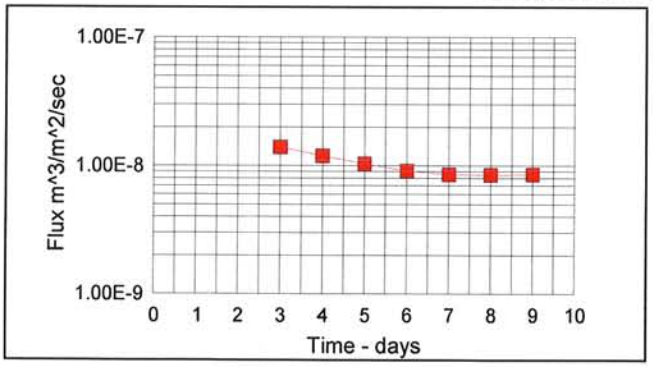
Flux and Permeability Input Data

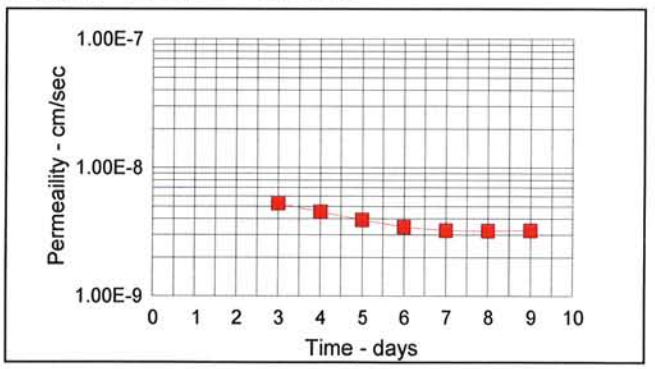
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.21 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	9.80	1441	86460	1.40E-008	5.32E-009
4	04/16/2010	8.40	1442	86520	1.20E-008	4.56E-009
5	04/17/2010	7.30	1443	86580	1.04E-008	3.96E-009
6	04/18/2010	6.40	1438	86280	9.15E-009	3.48E-009
7	04/19/2010	6.00	1439	86340	8.57E-009	3.26E-009
8	04/20/2010	6.00	1442	86520	8.55E-009	3.25E-009
9	04/21/2010	6.00	1440	86400	8.57E-009	3.26E-009

Average of Last 3 Test Readings : 8.56E-009 3.26E-009





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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/21/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1493		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.17	Final Height of Clay (in)	:	0.21
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	45.20	Final Wet Weight(Clay) (g)	:	69.80
Wet Density (pcf)	:	80.53	Wet Density (pcf)	:	100.67
Moisture Content %	:	32.20	Moisture Content %	:	104.10
Dry Density (pcf)	:	60.92	Dry Density (pcf)	:	49.33

Test Parameters

Fluid	:	De-Aired Water	**Average Effective**		
Cell Pressure (psi)	:	80.00	**Confining Pressure (psi)**	:	**4**
Head Water (psi)	:	77.00	Gradient	:	262.86
Tail Water (psi)	:	75.00	Effective Stress at Base	:	5

Flux and Permeability Input Data

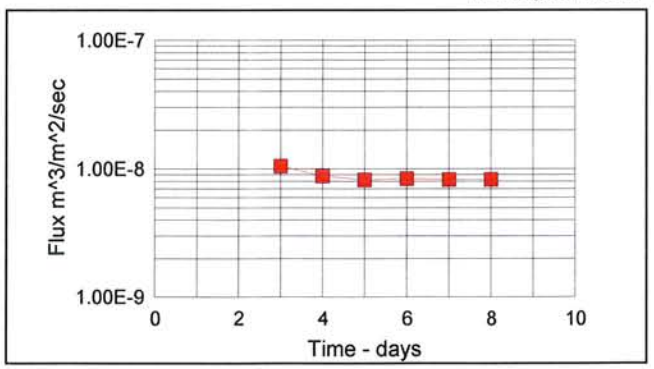
Minimum Saturation Time is 48 hours

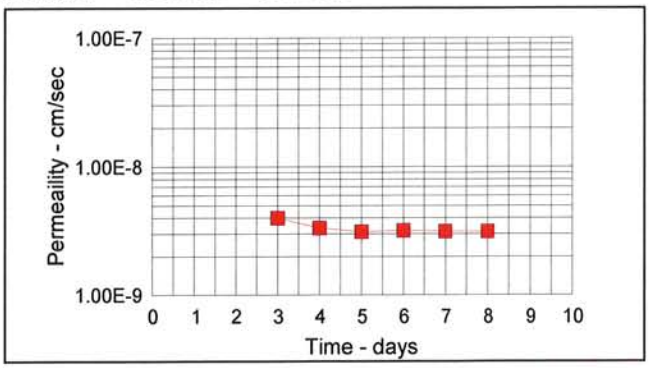
Area, A = 0.00811 m^2

Thickness, t = 0.21 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	7.40	1438	86280	1.06E-008	4.03E-009
4	04/16/2010	6.20	1441	86460	8.85E-009	3.37E-009
5	04/17/2010	5.80	1443	86580	8.26E-009	3.14E-009
6	04/18/2010	5.90	1439	86340	8.43E-009	3.21E-009
7	04/19/2010	5.80	1439	86340	8.29E-009	3.15E-009
8	04/20/2010	5.80	1441	86460	8.28E-009	3.15E-009

Average of Last 3 Test Readings : 8.33E-009 3.17E-009





JLT Laboratories, Inc. *938 S Central Ave, Canonsburg, Pa. 15317 Tel 724-746-4441 , Fax 724-745-4261*

INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/21/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1511		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.18	Final Height of Clay (in)	:	0.21
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	46.40	Final Wet Weight(Clay) (g)	:	70.90
Wet Density (pcf)	:	78.08	Wet Density (pcf)	:	102.26
Moisture Content %	:	33.70	Moisture Content %	:	104.30
Dry Density (pcf)	:	58.40	Dry Density (pcf)	:	50.05

Test Parameters

Fluid		: De-Aired Water	**Average Effective**		
Cell Pressure	(psi)	: 80.00	**Confining Pressure (psi)**	:	**4**
Head Water	(psi)	: 77.00	Gradient	:	262.86
Tail Water	(psi)	: 75.00	Effective Stress at Base	:	5

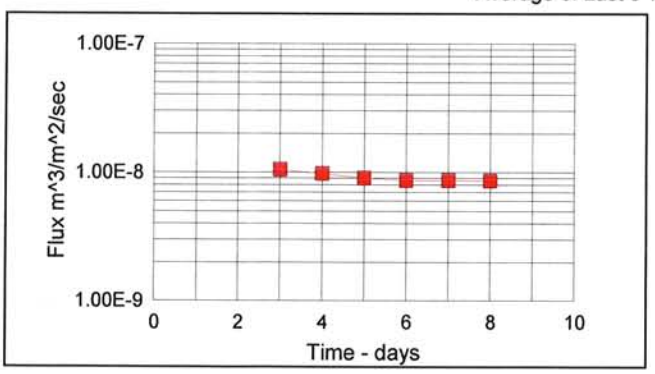
Flux and Permeability Input Data

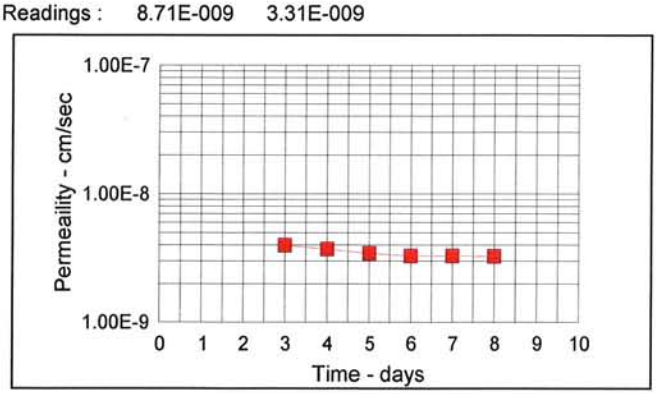
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.21 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	7.40	1438	86280	1.06E-008	4.03E-009
4	04/16/2010	6.90	1441	86460	9.84E-009	3.75E-009
5	04/17/2010	6.40	1443	86580	9.12E-009	3.47E-009
6	04/18/2010	6.10	1439	86340	8.72E-009	3.32E-009
7	04/19/2010	6.10	1439	86340	8.72E-009	3.32E-009
8	04/20/2010	6.10	1441	86460	8.70E-009	3.31E-009

Average of Last 3 Test Readings : 8.71E-009 3.31E-009





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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/21/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1528		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.16	Final Height of Clay (in)	:	0.19
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	41.60	Final Wet Weight(Clay) (g)	:	65.70
Wet Density (pcf)	:	78.75	Wet Density (pcf)	:	104.74
Moisture Content %	:	28.40	Moisture Content %	:	102.80
Dry Density (pcf)	:	61.33	Dry Density (pcf)	:	51.64

Test Parameters

Fluid		: De-Aired Water	**Average Effective**		
Cell Pressure	(psi)	: 80.00	**Confining Pressure (psi)**	:	**4**
Head Water	(psi)	: 77.00	Gradient	:	290.53
Tail Water	(psi)	: 75.00	Effective Stress at Base	:	5

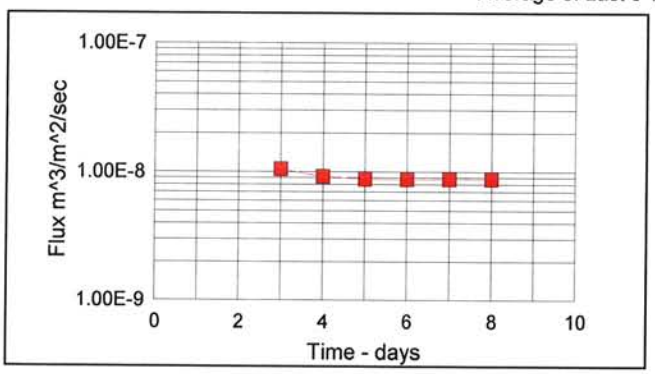
Flux and Permeability Input Data

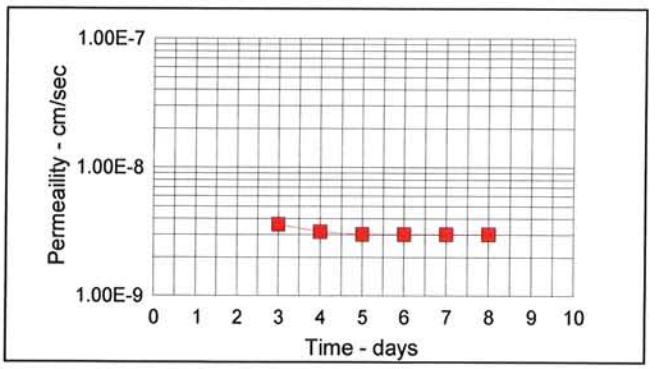
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.19 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	7.40	1438	86280	1.06E-008	3.64E-009
4	04/16/2010	6.50	1441	86460	9.27E-009	3.19E-009
5	04/17/2010	6.20	1443	86580	8.83E-009	3.04E-009
6	04/18/2010	6.20	1439	86340	8.86E-009	3.05E-009
7	04/19/2010	6.20	1439	86340	8.86E-009	3.05E-009
8	04/20/2010	6.20	1441	86460	8.85E-009	3.04E-009

Average of Last 3 Test Readings : 8.85E-009 3.05E-009





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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/21/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1562		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.17	Final Height of Clay (in)	:	0.20
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	43.40	Final Wet Weight(Clay) (g)	:	68.70
Wet Density (pcf)	:	77.33	Wet Density (pcf)	:	104.04
Moisture Content %	:	24.00	Moisture Content %	:	96.20
Dry Density (pcf)	:	62.36	Dry Density (pcf)	:	53.03

Test Parameters

Fluid		: De-Aired Water	**Average Effective**		
Cell Pressure	(psi)	: 80.00	**Confining Pressure (psi)**	:	**4**
Head Water	(psi)	: 77.00	Gradient	:	276.00
Tail Water	(psi)	: 75.00	Effective Stress at Base	:	5

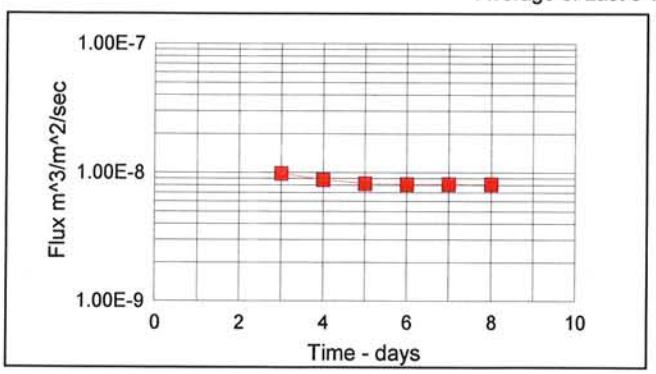
Flux and Permeability Input Data

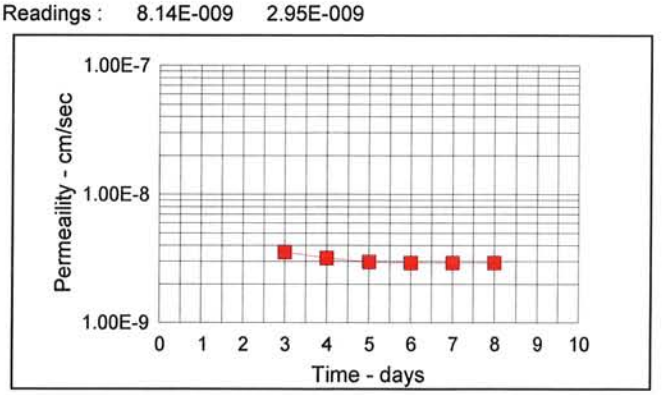
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.2 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	6.90	1438	86280	9.87E-009	3.57E-009
4	04/16/2010	6.20	1441	86460	8.85E-009	3.21E-009
5	04/17/2010	5.80	1443	86580	8.26E-009	2.99E-009
6	04/18/2010	5.70	1439	86340	8.14E-009	2.95E-009
7	04/19/2010	5.70	1439	86340	8.14E-009	2.95E-009
8	04/20/2010	5.70	1441	86460	8.13E-009	2.95E-009

Average of Last 3 Test Readings : 8.14E-009 2.95E-009





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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/21/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1597		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.17	Final Height of Clay (in)	:	0.21
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	46.30	Final Wet Weight(Clay) (g)	:	70.70
Wet Density (pcf)	:	82.49	Wet Density (pcf)	:	104.46
Moisture Content %	:	34.60	Moisture Content %	:	105.80
Dry Density (pcf)	:	61.29	Dry Density (pcf)	:	50.76

Test Parameters

Fluid	:	De-Aired Water	**Average Effective**		
Cell Pressure (psi)	:	80.00	**Confining Pressure (psi)**	:	**4**
Head Water (psi)	:	77.00	Gradient	:	269.27
Tail Water (psi)	:	75.00	Effective Stress at Base	:	5

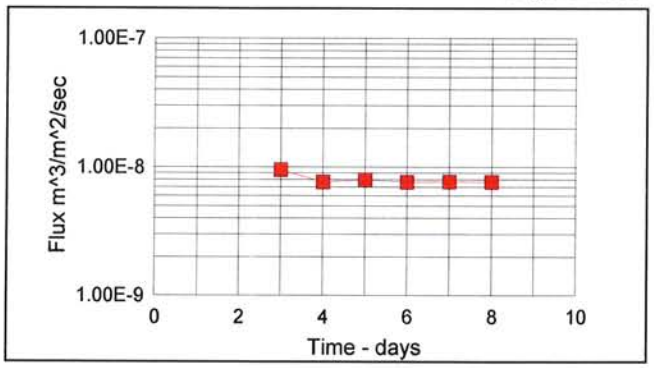
Flux and Permeability Input Data

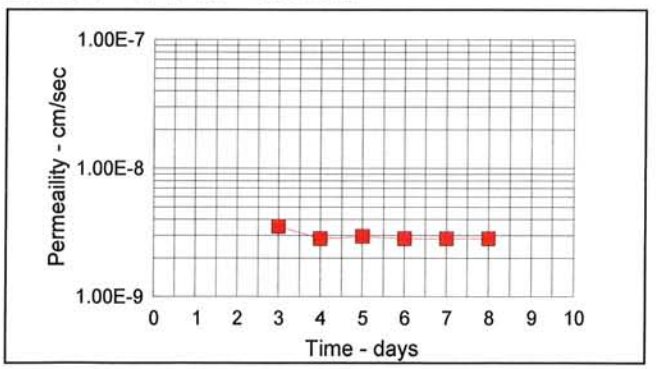
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.205 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	6.70	1439	86340	9.57E-009	3.56E-009
4	04/16/2010	5.40	1442	86520	7.70E-009	2.86E-009
5	04/17/2010	5.60	1440	86400	8.00E-009	2.97E-009
6	04/18/2010	5.40	1441	86460	7.70E-009	2.86E-009
7	04/19/2010	5.40	1438	86280	7.72E-009	2.87E-009
8	04/20/2010	5.40	1442	86520	7.70E-009	2.86E-009

Average of Last 3 Test Readings : 7.71E-009 2.86E-009





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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/21/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1632		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.16	Final Height of Clay (in)	:	0.20
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	46.90	Final Wet Weight(Clay) (g)	:	70.40
Wet Density (pcf)	:	88.78	Wet Density (pcf)	:	106.62
Moisture Content %	:	34.00	Moisture Content %	:	101.10
Dry Density (pcf)	:	66.26	Dry Density (pcf)	:	53.02

Test Parameters

Fluid		: De-Aired Water	**Average Effective**		
Cell Pressure	(psi)	: 80.00	**Confining Pressure (psi)**	:	**4**
Head Water	(psi)	: 77.00	Gradient	:	276.00
Tail Water	(psi)	: 75.00	Effective Stress at Base	:	5

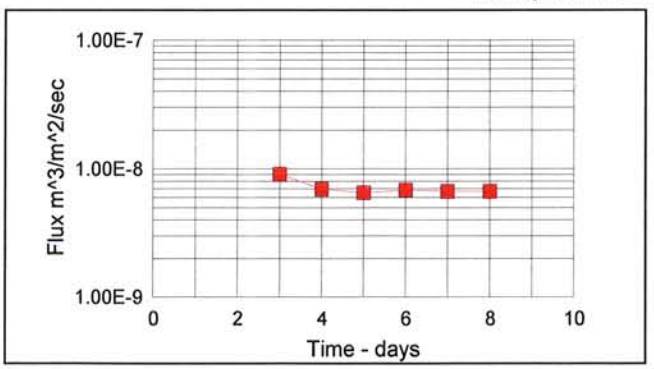
Flux and Permeability Input Data

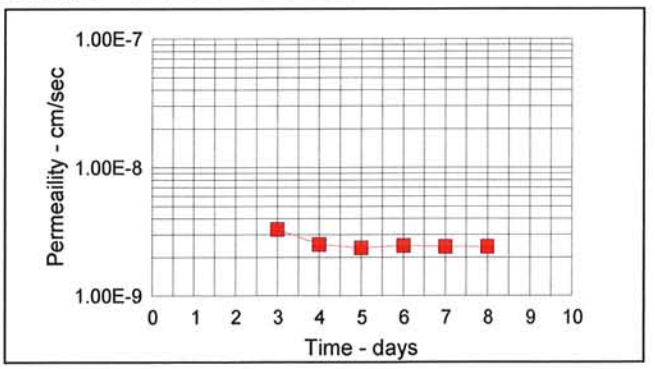
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.2 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	6.40	1439	86340	9.14E-009	3.31E-009
4	04/16/2010	4.90	1442	86520	6.99E-009	2.53E-009
5	04/17/2010	4.60	1440	86400	6.57E-009	2.38E-009
6	04/18/2010	4.80	1441	86460	6.85E-009	2.48E-009
7	04/19/2010	4.70	1438	86280	6.72E-009	2.43E-009
8	04/20/2010	4.70	1442	86520	6.70E-009	2.43E-009

Average of Last 3 Test Readings : 6.76E-009 2.45E-009





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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

Client	: CETCO		Date	:	04/22/10
Project Location	: Waste Services JED Landfill Cell 7		Job No.	:	10LG2111.01
Sample Number	: Roll 1666		Tested By	:	RL
Description	: Bentomat ST	Lot:	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.17	Final Height of Clay (in)	:	0.22
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	45.40	Final Wet Weight(Clay) (g)	:	72.10
Wet Density (pcf)	:	80.89	Wet Density (pcf)	:	99.26
Moisture Content %	:	29.90	Moisture Content %	:	104.80
Dry Density (pcf)	:	62.27	Dry Density (pcf)	:	48.47

Test Parameters

Fluid		: De-Aired Water	**Average Effective**		
Cell Pressure	(psi)	: 80.00	**Confining Pressure (psi)**	:	**4**
Head Water	(psi)	: 77.00	Gradient	:	250.91
Tail Water	(psi)	: 75.00	Effective Stress at Base	:	5

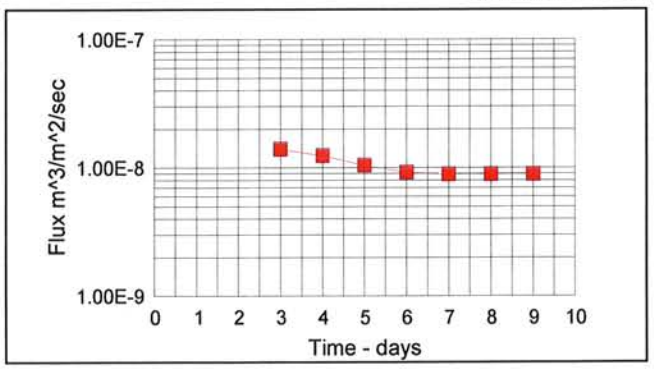
Flux and Permeability Input Data

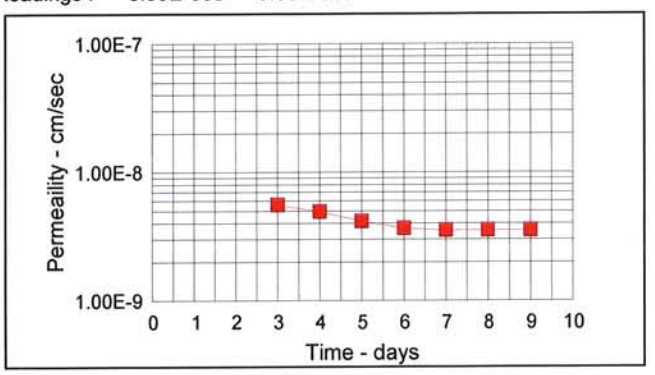
Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.22 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	04/13/2010	48 hours of hydration per ASTM				
2	04/14/2010					
3	04/15/2010	9.90	1441	86460	1.41E-008	5.63E-009
4	04/16/2010	8.80	1442	86520	1.25E-008	5.00E-009
5	04/17/2010	7.40	1443	86580	1.05E-008	4.20E-009
6	04/18/2010	6.50	1438	86280	9.29E-009	3.70E-009
7	04/19/2010	6.30	1439	86340	9.00E-009	3.59E-009
8	04/20/2010	6.30	1442	86520	8.98E-009	3.58E-009
9	04/21/2010	6.30	1440	86400	8.99E-009	3.58E-009

Average of Last 3 Test Readings : 8.99E-009 3.58E-009





JLT Laboratories, Inc. 938 S Central Ave, Canonsburg, Pa. 15317 Tel 724-746-4441 , Fax 724-745-4261

Date: 4/16/2010
Purchase Order: JED CELL 7
ORDER NUMBERS: 026023312, 026023313

Kirk Wills
Waste Services

St. Cloud, FL 34773
kwills@envplanning.com cc. mkaiser@wasteservicesinc.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Waste Services.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023312, 026023313
PREPARED FOR: Waste Services

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com

PRODUCT CERTIFICATIONS

PROJECT NAME: Waste Services/JED LF Cell 7
CUSTOMER P.O.: JED CELL 7
ORDER NUMBERS: 026023312, 026023313
PREPARED FOR: Waste Services

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ @ 200 psf normal load
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5.0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT ST

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D 5887	GCL Hydraulic Conductivity	1/100,000sf	Standard	Standard
ASTM D 4643	GCL Moisture	Standard	35% max	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using
ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.



Melanie King
Quality Assurance Coordinator

GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 026023312

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023312	201015CV	1426	150	15	2642	2250	1424	201015CV	00001292	00001282	2020594445	952867A
026023312	201015CV	1427	150	15	2632	2250	1424	201015CV	00001292	00001282	2020594445	952867B
026023312	201015CV	1428	150	15	2642	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023312	201015CV	1434	150	15	2630	2250	1424	201015CV	00001295	00001293	2020594445	952867B
026023312	201015CV	1435	150	15	2648	2250	1424	201015CV	00001296	00001293	2020594445	952867B
026023312	201015CV	1444	150	15	2668	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023312	201015CV	1446	150	15	2656	2250	1441	201015CV	00001297	00001293	2020606585	952867B
026023312	201015CV	1453	150	15	2641	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023312	201015CV	1455	150	15	2644	2250	1441	201014CV	00001263	00001260	2020606585	952867B
026023313	201015CV	1461	150	15	2648	2250	1459	201015CV	00001312	00001312	2020606585	952867B
026023313	201015CV	1508	150	15	2634	2250	1493	201015CV	00001298	00001293	2020590108	953569A
026023313	201015CV	1522	150	15	2628	2250	1511	201015CV	00001327	00001320	2020590120	953569A
026023313	201015CV	1538	150	15	2608	2250	1528	201015CV	00001329	00001320	2020590120	953569B
026023312	201015CV	1554	150	15	2594	2250	1545	201015CV	00001306	00001302	2020590122	953569B
026023312	201015CV	1565	150	15	2586	2250	1562	201015CV	00001331	00001330	2020590122	953569B
026023312	201015CV	1574	150	15	2600	2250	1562	201015CV	00001332	00001330	2020607862	953575A
026023313	201015CV	1577	150	15	2606	2250	1562	201015CV	00001332	00001330	2020607862	953575A
026023313	201015CV	1580	150	15	2632	2250	1579	201015CV	00001333	00001330	2020607862	953575A
026023313	201015CV	1586	150	15	2660	2250	1579	201015CV	00001333	00001330	2020607862	953575A
026023312	201015CV	1591	150	15	2658	2250	1579	201015CV	00001334	00001330	2020607862	953575A
026023313	201015CV	1600	150	15	2630	2250	1597	201015CV	00001337	00001330	2020607862	953575A
026023313	201015CV	1614	150	15	2688	2250	1614	201015CV	00001358	00001357	2020517246	953575A
026023312	201015CV	1617	150	15	2588	2250	1614	201015CV	00001358	00001357	2020517246	953575A
026023313	201015CV	1620	150	15	2592	2250	1614	201015CV	00001360	00001357	2020517246	953575A
026023313	201015CV	1625	150	15	2542	2250	1614	201015CV	00001360	00001357	2020517246	953575B
026023313	201015CV	1627	150	15	2566	2250	1614	201015CV	00001361	00001357	2020517246	953575B
026023312	201015CV	1639	150	15	2536	2250	1632	201015CV	00001339	00001338	2020514743	953575B
026023313	201015CV	1642	150	15	2536	2250	1632	201015CV	00001362	00001357	2020514743	953575B
026023313	201015CV	1643	150	15	2540	2250	1632	201015CV	00001362	00001357	2020514743	953575B
026023313	201015CV	1644	150	15	2543	2250	1632	201015CV	00001362	00001357	2020514743	953575B
026023312	201015CV	1664	150	15	2544	2250	1649	201015CV	00001337	00001330	2020514738	953575B

Order	GCL Lot #	GCL Roll #	Length	Width	weight	sq ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
026023313	201015CV	1680	150	15	2534	2250	1666	201015CV	00001364	00001357	2020514738	953575B
026023312	201015CV	1683	150	15	2620	2250	1683	201015CV	00001364	00001357	2020514738	953575B
026023313	201015CV	1685	150	15	2620	2250	1683	201015CV	00001365	00001357	2020514738	953575B
026023313	201015CV	1687	150	15	2536	2250	1683	201015CV	00001365	00001357	2020514738	953575B
Total sq ft:						**78750**	Total Number of Rolls Certified: **35**					

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 026023312 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496	Moisture
		ASTM Test Method:	D 5993	D 6768	D 6496	D 4643
		Required Value:	0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min	35% max
CV-BENTOMAT ST	201015CV	1424	0.87	76.0	3.7	31.0
CV-BENTOMAT ST	201015CV	1441	0.91	78.4	4.3	32.5
CV-BENTOMAT ST	201015CV	1459	0.82	80.7	4.0	33.5
CV-BENTOMAT ST	201015CV	1493	0.89	48.1	9.3	27.9
CV-BENTOMAT ST	201015CV	1511	0.85	56.8	6.3	30.2
CV-BENTOMAT ST	201015CV	1528	0.82	70.4	5.4	31.5
CV-BENTOMAT ST	201015CV	1545	0.84	78.6	3.8	29.4
CV-BENTOMAT ST	201015CV	1562	0.84	73.2	4.2	29.0
CV-BENTOMAT ST	201015CV	1579	0.84	79.6	4.7	29.7
CV-BENTOMAT ST	201015CV	1597	0.82	82.7	5.2	29.8
CV-BENTOMAT ST	201015CV	1614	0.83	80.0	3.9	30.1
CV-BENTOMAT ST	201015CV	1632	0.84	44.5	8.8	27.2
CV-BENTOMAT ST	201015CV	1649	0.87	58.0	5.6	27.5
CV-BENTOMAT ST	201015CV	1666	0.87	70.5	8.8	27.5
CV-BENTOMAT ST	201015CV	1683	0.84	72.7	6.6	26.7

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 026023312

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
952867A	12.00	26.00	16.80
952867B	12.00	26.00	16.60
953575A	12.00	26.00	15.60
953575B	12.00	24.00	15.40
953569A	12.00	24.00	16.20
953569B	12.00	25.00	16.00

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 026023312 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 82TEX	2020514738	3.6	151.1
PPX 82TEX	2020514743	3.6	151.1
PPX 82TEX	2020517246	3.3	158.0
PPX 82TEX	2020590108	9.6	152.3
PPX 82TEX	2020590120	3.4	169.0
PPX 82TEX	2020590122	3.4	169.0
PPX 82TEX	2020594445	3.6	144.8
PPX 82TEX	2020606585	3.5	160.8
PPX 82TEX	2020607862	3.4	165.1

COVER GEOTEXTILE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
CV-NON-WOVEN	00001260	6.7	75.6
CV-NON-WOVEN	00001282	6.8	26.6
CV-NON-WOVEN	00001293	6.8	30.7
CV-NON-WOVEN	00001302	6.5	32.9
CV-NON-WOVEN	00001312	7.2	36.8
CV-NON-WOVEN	00001320	6.4	33.2
CV-NON-WOVEN	00001330	6.4	31.5
CV-NON-WOVEN	00001338	6.5	25.8
CV-NON-WOVEN	00001357	6.5	29.5

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

Appendix

H

April 15, 2010

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**J.E.D. Solid Waste Management Facility, Cell 7 Construction**
TRI Job Reference Number:	E2337-32-07
Material(s) Tested:	5 Bentomat ST GCL(s)
Test(s) Requested:	Index Flux (ASTM D 5887)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

John M. Allen, P.E.
Division Director
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GCL TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: J.E.D. Solid Waste Management Facility, Cell 7 Construction

Material: Bentomat ST GCL
Sample Identification: 1424
TRI Log #: E2337-32-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Index Flux (ASTM D 5887)													
Index Flux (m^3/m^2/sec)	3.5E-09										**3.5E-09**		
Hydraulic Conductivity (cm/sec)	3.3E-09										**3.3E-09**		5.0E-09

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GCL TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: J.E.D. Solid Waste Management Facility, Cell 7 Construction

Material: Bentomat ST GCL
Sample Identification: 1511
TRI Log #: E2337-32-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Index Flux (ASTM D 5887)													
Index Flux (m^3/m^2/sec)	3.3E-09										**3.3E-09**		
Hydraulic Conductivity (cm/sec)	3.1E-09										**3.1E-09**		5.0E-09

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GCL TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: J.E.D. Solid Waste Management Facility, Cell 7 Construction

Material: Bentomat ST GCL
Sample Identification: 1562
TRI Log #: E2337-32-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Index Flux (ASTM D 5887)													
Index Flux (m^3/m^2/sec)	3.3E-09										**3.3E-09**		
Hydraulic Conductivity (cm/sec)	3.1E-09										**3.1E-09**		5.0E-09

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GCL TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: J.E.D. Solid Waste Management Facility, Cell 7 Construction

Material: Bentomat ST GCL
Sample Identification: 1597
TRI Log #: E2337-32-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Index Flux (ASTM D 5887)													
Index Flux (m^3/m^2/sec)	3.5E-09										**3.5E-09**		
Hydraulic Conductivity (cm/sec)	3.0E-09										**3.0E-09**		5.0E-09

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GCL TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: J.E.D. Solid Waste Management Facility, Cell 7 Construction

Material: Bentomat ST GCL
Sample Identification: 1683
TRI Log #: E2337-32-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Index Flux (ASTM D 5887)													
Index Flux (m^3/m^2/sec)	3.3E-09										**3.3E-09**		
Hydraulic Conductivity (cm/sec)	2.6E-09										**2.6E-09**		5.0E-09

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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Appendix

I

Technology in Plastics

Waste Services, Inc.
JED SWMF
1501 Omni Way
St. Cloud, FL 34773

Attn: Michael Kaiser, and Kirk Wills, EPS

Re: Material certifications for JED SWMF Cell 7, (Waste Svcs' PO# "Cell 7", Agru America's doc 13596

April 19, 2010

This letter certifies the following:

- **That the NCTL Stress Crack (ASTM D5397 SP-appx) testing has been completed, and the passing reports have been provided in the attached cert file.**
- **That no more than 10% reclaimed polymer was added to the resin during manufacture of the above project (if any was added), and that all reclaimed polymer added was from the same parent material (if any was added).**
- **That the geomembrane was subjected to (and passed) continuous spark testing during manufacture.**
- **That the material meets or exceeds the requirements of the GRI GM13 for Oven Aging and UV Resistance (historical results for the resin formulation used are provided in the attached cert file).**

Best Regards,



Grant Palmer
Quality Manager
Agru America

Executive Offices: 500 Garrison Road, Georgetown, SC 29440 • 843 546-0600 • 800 321-1379 • Fax 843 546-0516
Sales Office: 700 Rockmead, Suite 150, Kingwood, TX 77339 • 281 358-4741 • 800 373-2478 • Fax 281 358-5297
Email: salesmkg@agruamerica.com

High Density Polyethylene Micro Spike® Liner

Product Data

Property	Test Method	Values				
Thickness, nominal (mm)		30 (.75)	40 (1.0)	60 (1.5)	80 (2.0)	100 (2.5)
Thickness (min. ave.), mil (mm)	ASTM D5994*	29 (.71)	38 (.95)	57 (1.43)	76 (1.90)	95 (2.38)
Thickness (lowest indiv. for 8 of 10 spec.), mil (mm)	ASTM D5994*	27 (.68)	36 (.90)	54 (1.35)	72 (1.80)	90 (2.25)
Thickness (lowest indiv. for 1 of 10 spec.), mil (mm)	ASTM D5994*	26 (.64)	34 (.85)	51 (1.28)	68 (1.70)	85 (2.13)
***The thickness values may be changed due to project specifications (i.e., absolute minimum thickness)**						
Asperity Height (min. ave.), mil (mm)	GRI GM12	16 (.41)	16 (.41)	16 (.41)	16 (.41)	16 (.41)
Density, g/cc, minimum	ASTM D792, Method B	0.94	0.94	0.94	0.94	0.94
Tensile Properties (ave. both directions)	ASTM D6693, Type IV					
Strength @ Yield (min. ave.), lb/in width (N/mm)	2 in/minute	66 (11.6)	88 (15.4)	132 (23.1)	176 (30.8)	220 (38.5)
Elongation @ Yield (min. ave.), % (GL=1.3in)	5 specimens in each direction	13	13	13	13	13
Strength @ Break (min. ave.), lb/in width (N/mm)		66 (11.6)	88 (15.4)	132 (23.1)	176 (30.8)	220 (38.5)
Elongation @ Break (min. ave.), % (GL=2.0in)		350	350	350	350	350
Tear Resistance (min. ave.), lbs. (N)	ASTM D1004	23 (102)	30 (133)	45 (200)	60 (267)	72 (320)
Puncture Resistance (min. ave.), lbs. (N)	ASTM D4833	60 (267)	90 (400)	120 (534)	150 (667)	180 (801)
Carbon Black Content (range in %)	ASTM D4218	2 - 3	2 - 3	2 - 3	2 - 3	2 - 3
Carbon Black Dispersion (Category)	ASTM D5596	Only near spherical agglomerates				
		for 10 views: 9 views in Cat. 1 or 2, and 1 view in Cat. 3				
Stress Crack Resistance (Single Point NCTL), hours	ASTM D5397, Appendix	300	300	300	300	300
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O_2	≥100	≥100	≥100	≥100	≥100
Melt Flow Index, g/10 minutes	ASTM D1238, 190°C, 2.16kg	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
Oven Aging	ASTM D5721	80	80	80	80	80
with HP OIT, (% retained after 90 days)	ASTM D5885, 150°C, 500psi O_2					
UV Resistance	GRI GM11	20hr. Cycle @ 75°C/4 hr. dark condensation @ 60°C				
with HP OIT, (% retained after 1600 hours)	ASTM D5885, 150°C, 500psi O_2	50	50	50	50	50

These product specifications meet or exceed GRI's GM13

Supply Information (Standard Roll Dimensions)

Thickness		Width		Length		Area (approx.)		Weight (average)	
mil	mm	ft	m	ft	m	ft^2	m^2	lbs	kg
30	.75	23	7	600.1	182.9	13,782	1,280	3,325	1,510
40	1.0	23	7	600.1	182.9	13,782	1,280	3,325	1,510
60	1.5	23	7	410.1	125	9,419	875	3,356	1,522
80	2.0	23	7	328.1	100	7,535	700	3,306	1,500
100	2.5	23	7	246.1	75	5,651	525	3,167	1,436

Notes:

All rolls are supplied with two slings. All rolls are wound on a 6 inch core. Special roll lengths are available on request.
All roll lengths and widths have a tolerance of ±1%

All information, recommendations and suggestions appearing in this literature concerning the use of our products are based upon tests and data believed to be reliable; however, it is the users responsibility to determine the suitability for their own use of the products described herein. Since the actual use by others is beyond our control, no guarantee or warranty of any kind, expressed or implied, is made by Agru/America as to the effects of such use or the results to be obtained, nor does Agru/America assume any liability in connection herewith. Any statement made herein may not be absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations. Nothing herein is to be construed as permission or as a recommendation to infringe any patent.

500 Garrison Road, Georgetown, South Carolina 29440 843-546-0600 800-373-2478 Fax: 843-527-2738
email: salesmkg@agruamerica.com www.agruamerica.com

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microspike liner

HDPE

60 mil

WASTE SERVICES doc 13596

Jed Solid Waste Cell 7 St. Cloud, FL

100 rolls 60 HD micro(505) | 100 | left

PO# | TBG

	ENGLISH DIMENSIONS			METRIC DIMENSIONS							
roll #	wid	len	area	wid	len	area	check weld rod qty (if ordered)		wgt		lot
(X)212472 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 1	3985	sqs + 3 ft	8191301
(X)212473 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 2	3985		8191301
(X)212474 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 3	3985		8191301
(X)212475 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 4	3960		8191301
(X)212476 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 5	3960		8191301
(X)212477 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 6	3960		8191301
(X)212478 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 7	3965		8191301
(X)212479 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 8	3970		8191301
(X)212480 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 9	3970	sqs	8191301
(X)212481 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 10	3975		8191301
(X)212482 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 11	3980		8191301
(X)212483 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 12	3935		8191301
(X)212584 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 13	3830		8191301
(X)212585 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 14	3825		8191301
(X)212586 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 15	3830		8191301
(X)212587 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 16	3815		8191301
(X)212588 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 17	3810		7100247
(X)212589 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 18	3820	sqs	7100247
(X)212590 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 19	3860		7100247
(X)212591 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 20	3875		7100247
(X)212592 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 21	3885		7100247
(X)212593 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 22	3880		7100247
(X)212594 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 23	3835		7100247
(X)212598 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 24	3850		7100247
(X)212599 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 25	3850		7100247
(X)212500 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 26	3849	sqs	7100247
(X)212501 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 27	3880		7100247
(X)212502 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 28	3885		7100247
(X)212503 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 29	3888		7100247
(X)212604 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 30	3880		7100247
(X)212605 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 31	3890		7100247
(X)212606 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 32	3875		7100247
(X)212607 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 33	3880		7100247
(X)212608 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 34	3870		7100247
(X)212609 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 35	*3860*	sqs	7100247
(X)212610 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 36	3880		7100247
(X)212611 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 37	3875		7100247
(X)212612 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 38	3870		7100247
(X)212613 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 39	3890		7100247
(X)212614 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 40	3885		7100247
(X)212615 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 41	3875		7100247
(X)212616 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 42	3855		7100247
(X)212617 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 43	3860		7100247
(X)212618 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 44	3865	sqs	7100247
(X)212619 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 45	3890		7100247
(X)212620 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 46	3890		7100247
(X)212621 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 47	3899		7100247
(X)212723 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 48	3890		7100247
(X)212724 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 49	3885		7100247
(X)212725 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 50	3890		7100247
(X)212726 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot 51	3875		7100247

microspike liner

HDPE

60 mil

WASTE SERVICES doc 13596

Jed Solid Waste Cell 7 St. Cloud, FL

100 rolls 60 HD micro(505) | 100 | left

PO# | TBG

	ENGLISH DIMENSIONS			METRIC DIMENSIONS							
roll #	wid	len	area	wid	len	area	check weld rod qty (if ordered)		wgt		lot
(X)212727 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	52	3865	sqs	7100247
(X)212729 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	53	3870		7100247
(X)212730 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	54	3860		7100247
(X)212731 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	55	3840		7100247
(X)212734 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	56	3910		7100247
(X)212735 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	57	3880		7100247
(X)212736 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	58	3860		7100247
(X)212738 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	59	3835		7100247
(X)212741 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	60	3875		7100247
(X)213101 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	61	3915	sqs	7100247
(X)213102 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	62	3910		7100247
(X)213104 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	63	3830		7100247
(X)213105 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	64	3850		7100247
(X)213106 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	65	3840		7100247
(X)213107 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	66	3840		7100247
(X)213108 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	67	3835		7100247
(X)213109 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	68	3865		7100251
(X)213110 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	69	3860	sqs	7100251
(X)213111 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	70	3875		7100251
(X)213112 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	71	3900		7100251
(X)213113 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	72	3905		7100251
(X)213114 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	73	3915		7100251
(X)213115 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	74	3905		7100251
(X)213216 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	75	3920		7100251
(X)213217 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	76	3905		7100251
(X)213218 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	77	3915		7100251
(X)213219 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	78	3920	sqs	7100251
(X)213220 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	79	3925		7100251
(X)213221 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	80	3945		7100251
(X)213222 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	81	3905		7100251
(X)213223 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	82	3885		7100251
(X)213224 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	83	3885		7100251
(X)213225 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	84	3875		7100251
(X)213226 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	85	3845		7100251
(X)213227 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	86	3825		7100251
(X)213228 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	87	3825	stage sqs	7100251
(X)213229 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	88	3855		7100251
(X)213230 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	89	3870		7100251
(X)213231 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	90	3860		7100251
(X)213232 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	91	3880		7100251
(X)213233 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	92	3890		7100251
(X)213234 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	93	3880		7100251
(X)213335 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	94			7100251
(X)213336 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	95		stage sqs	7100251
(X)213337 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	96			7100251
(X)213338 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	97			7100251
(X)213339 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	98			7100251
(X)213340 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	99			7100251
(X)213341 .10	23	505	11,615.0	7	153.926	1077.5	WASTE SvcsJED LF	100tot	100			7100251

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quality certificate

ROLL # **212472-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.50**	mm	**59**	mil
	MAX:	**1.73**	mm	**68**	mil
Asperity ASTM D7466: **33/35** mil	AVE:	**1.60**	mm	**63**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**		**60 mil**
Length.....	**153.926** m		**505.0** feet
Width.....	**7.00** m;		**23.0** feet
OIT(Standard) ASTM D3895 minutes	**194**		

							TEST RESULTS	
Specific Gravity ASTM D792	Density			g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g			g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range			%			**2.46**	
Carbon Black Dispersion ASTM D5596	Category						**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30**	N/mm (kN/m)	**172**	ppi		**2,736**	psi
	Average Strength @ Break	**31**	N/mm (kN/m)	**178**	ppi		**2,820**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield			%			**17.97**	
Lo = 2.0" Break	Average Elongation @ Break			%			**445.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change			%			**-0.49**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**244.2**	N				**54.899**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**410.2**	N				**92.219**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**595.1**	N				**133.78**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs					**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs					**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

Quality Control Department

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12/23/05

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quality certificate

ROLL # **212473-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.73	mm	68	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.29	
Carbon Black Content ASTM D4218	Range		%			2.46	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	167	ppi	2,736	psi
	Average Strength @ Break	30	N/mm (kN/m)	172	ppi	2,820	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			17.97	
Lo = 2.0" Break	Average Elongation @ Break		%			445.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	244.2	N			54.899	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	410.2	N			92.219	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.1	N			133.78	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

Quality Control Department

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12/23/05

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quality certificate

ROLL # **212474-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.46	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.75	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.60	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	169 ppi	2,681	psi
	Average Strength @ Break	30	N/mm (kN/m)	171 ppi	2,719	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		16.78	
Lo = 2.0" Break	Average Elongation @ Break		%		454.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	244.2	N		54.899	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	410.2	N		92.219	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.1	N		133.78	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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quality certificate

ROLL # **212475-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.46	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.79	mm	70	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.59	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi		2,681	psi
	Average Strength @ Break	30 N/mm (kN/m)	170 ppi		2,719	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			16.78	
	Average Elongation @ Break	%			454.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	244.2 N			54.899	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	410.2 N			92.219	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.1 N			133.78	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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quality certificate

ROLL # **212476-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.52	mm	60	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.75	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/38 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.59	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	168 ppi		2,681	psi
	Average Strength @ Break	30 N/mm (kN/m)	170 ppi		2,719	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.78	
Lo = 2.0" Break	Average Elongation @ Break	%			454.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	244.2 N			54.899	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	410.2 N			92.219	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.1 N			133.78	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212477-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.42	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.77	mm	70	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/35 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	165 ppi		2,681	psi
	Average Strength @ Break	29 N/mm (kN/m)	167 ppi		2,719	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.78	
Lo = 2.0" Break	Average Elongation @ Break	%			454.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	244.2 N			54.899	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	410.2 N			92.219	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.1 N			133.78	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

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REV 03
12/23/05

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ROLL # **212478-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.76	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/35 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.60	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.28	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	169 ppi		2,681	psi
	Average Strength @ Break	30 N/mm (kN/m)	171 ppi		2,719	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			16.78	
	Average Elongation @ Break	%			454.1	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	244.2 N			54.899	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	410.2 N			92.219	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.1 N			133.78	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

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REV 03
12/23/05

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ROLL # **212479-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.70	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.59	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi		2,619	psi
	Average Strength @ Break	29 N/mm (kN/m)	167 ppi		2,673	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.91	
Lo = 2.0" Break	Average Elongation @ Break	%			442.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6 N			57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3 N			83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9 N			131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212480-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.75	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/38 mil	AVE:	1.59	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min		.29	
Carbon Black Content ASTM D4218	Range	%		2.19	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi	2,619	psi
	Average Strength @ Break	29 N/mm (kN/m)	167 ppi	2,673	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		17.91	
Lo = 2.0" Break	Average Elongation @ Break	%		442.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6 N		57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3 N		83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9 N		131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

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REV 03
12/23/05

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ROLL # **212481-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.52	mm	60	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/32 mil	AVE:	1.59	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi		2,619	psi
	Average Strength @ Break	29 N/mm (kN/m)	167 ppi		2,673	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.91	
Lo = 2.0" Break	Average Elongation @ Break	%			442.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6 N			57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3 N			83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9 N			131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

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REV 03
12/23/05

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ROLL # **212482-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.74	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 29/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.60	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	165 ppi		2,619	psi
	Average Strength @ Break	29 N/mm (kN/m)	168 ppi		2,673	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.91	
Lo = 2.0" Break	Average Elongation @ Break	%			442.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6 N			57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3 N			83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9 N			131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

Signature.....

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REV 03
12/23/05

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ROLL # **212483-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.50	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.70	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.60	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min		.29	
Carbon Black Content ASTM D4218	Range		%		2.19	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	165 ppi	2,619	psi
	Average Strength @ Break	29	N/mm (kN/m)	168 ppi	2,673	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		17.91	
Lo = 2.0" Break	Average Elongation @ Break		%		442.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6	N		57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3	N		83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9	N		131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-25-10**

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REV 03
12/23/05

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ROLL # **212584-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.41**	mm	**56**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.65**	mm	**65**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **31/34** mil	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.947**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.29**	
Carbon Black Content ASTM D4218	Range	%		**2.39**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**154** ppi	**2,502**	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**183** ppi	**2,984**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**17.93**	
Lo = 2.0" Break	Average Elongation @ Break	%		**486.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.49**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**253.6** N		**57.017**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**369.3** N		**83.022**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**582.9** N		**131.05**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212585-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.44**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.63**	mm	**64**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **32/36** mil	AVE:	**1.52**	mm	**60**	mil	OIT(Standard) ASTM D3895 minutes	**194**	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g		g/10 min			**.29**	
Carbon Black Content ASTM D4218	Range		%			**2.39**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm (kN/m)	**150**	ppi	**2,502**	psi
	Average Strength @ Break	**31**	N/mm (kN/m)	**179**	ppi	**2,984**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			**17.93**	
Lo = 2.0" Break	Average Elongation @ Break		%			**486.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			**-0.49**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**253.6**	N			**57.017**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**369.3**	N			**83.022**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**582.9**	N			**131.05**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212586-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/35 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.53	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.39	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm (kN/m)	151 ppi		2,502	psi
	Average Strength @ Break	31 N/mm (kN/m)	180 ppi		2,984	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.93	
Lo = 2.0" Break	Average Elongation @ Break	%			486.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6 N			57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3 N			83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9 N			131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212587-10** Lot #: **8191301** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.70	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.59	mm	63	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.947	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.29	
Carbon Black Content ASTM D4218	Range	%			2.53	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	157 ppi		2,502	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi		2,984	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.93	
	Average Elongation @ Break	%			486.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.49	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	253.6 N			57.017	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	369.3 N			83.022	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	582.9 N			131.05	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

Signature.....

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212588-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.45**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.67**	mm	**66**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **31/33** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.23**	
Carbon Black Content ASTM D4218	Range	%			**2.53**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**154** ppi		**2,502**	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**183** ppi		**2,984**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**17.93**	
Lo = 2.0" Break	Average Elongation @ Break	%			**486.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**253.6** N			**57.017**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**369.3** N			**83.022**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**582.9** N			**131.05**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212589-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.59	mm	63	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 31/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.53	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi		2,678	psi
	Average Strength @ Break	30 N/mm (kN/m)	172 ppi		2,873	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.72	
	Average Elongation @ Break	%			389.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	219.0 N			49.235	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	440.2 N			98.957	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	597.2 N			134.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212590-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.59	mm	63	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 36/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.53	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi		2,678	psi
	Average Strength @ Break	30 N/mm (kN/m)	172 ppi		2,873	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.72	
	Average Elongation @ Break	%			389.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	219.0 N			49.235	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	440.2 N			98.957	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	597.2 N			134.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212591-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.41**	mm	**56**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.67**	mm	**66**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **32/33** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.54**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.23**	
Carbon Black Content ASTM D4218	Range	%			**2.53**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**162** ppi		**2,678**	psi
	Average Strength @ Break	**31** N/mm (kN/m)	**174** ppi		**2,873**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.72**	
	Average Elongation @ Break	%			**389.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**219.0** N			**49.235**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**440.2** N			**98.957**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**597.2** N			**134.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212592-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/35 mil	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.23	
Carbon Black Content ASTM D4218	Range		%			2.53	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160	ppi	2,678	psi
	Average Strength @ Break	30	N/mm (kN/m)	172	ppi	2,873	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			18.72	
Lo = 2.0" Break	Average Elongation @ Break		%			389.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	219.0	N			49.235	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	440.2	N			98.957	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	597.2	N			134.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212593-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.43**	mm	**56**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.60**	mm	**63**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **30/36** mil	AVE:	**1.52**	mm	**60**	mil	OIT(Standard) ASTM D3895 minutes	**194**	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.53**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**160** ppi	**2,678**	psi
	Average Strength @ Break	**30** N/mm (kN/m)	**172** ppi	**2,873**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.72**	
Lo = 2.0" Break	Average Elongation @ Break	%		**389.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**219.0** N		**49.235**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**440.2** N		**98.957**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**597.2** N		**134.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212594-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.41	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/37 mil	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.63	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	163 ppi		2,618	psi
	Average Strength @ Break	32 N/mm (kN/m)	180 ppi		2,902	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.39	
Lo = 2.0" Break	Average Elongation @ Break	%			472.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	219.0 N			49.235	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	440.2 N			98.957	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	597.2 N			134.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212598-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 31/39 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.23	
Carbon Black Content ASTM D4218	Range		%			2.63	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	159	ppi	2,618	psi
	Average Strength @ Break	31	N/mm (kN/m)	176	ppi	2,902	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			17.39	
Lo = 2.0" Break	Average Elongation @ Break		%			472.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	219.0	N			49.235	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	440.2	N			98.957	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	597.2	N			134.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212599-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.63	mm	64	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 29/35 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.64	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi		2,668	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi		3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.82	
	Average Elongation @ Break	%			482.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1 N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4 N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3 N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212500-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/35 mil	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.23	
Carbon Black Content ASTM D4218	Range		%			2.64	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	165	ppi	2,668	psi
	Average Strength @ Break	33	N/mm (kN/m)	190	ppi	3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			17.82	
Lo = 2.0" Break	Average Elongation @ Break		%			482.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1	N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4	N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3	N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212501-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.70	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/36 mil	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.64	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi		2,668	psi
	Average Strength @ Break	33 N/mm (kN/m)	186 ppi		3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.82	
Lo = 2.0" Break	Average Elongation @ Break	%			482.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1 N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4 N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3 N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

Signature.....

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212502-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.46**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.65**	mm	**65**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **29/36** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.55**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.23**	
Carbon Black Content ASTM D4218	Range	%			**2.64**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**163** ppi		**2,668**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**187** ppi		**3,069**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**17.82**	
Lo = 2.0" Break	Average Elongation @ Break	%			**482.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**240.1** N			**53.973**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**461.4** N			**103.74**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**604.3** N			**135.86**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212503-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 29/33 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.64	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	165 ppi		2,668	psi
	Average Strength @ Break	33 N/mm (kN/m)	190 ppi		3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.82	
	Average Elongation @ Break	%			482.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1 N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4 N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3 N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212604-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.63	mm	64	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 29/32 mil	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.07	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	162 ppi		2,628	psi
	Average Strength @ Break	32 N/mm (kN/m)	181 ppi		2,936	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.84	
Lo = 2.0" Break	Average Elongation @ Break	%			480.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1 N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4 N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3 N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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12/23/05

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ROLL # **212605-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.46**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.76**	mm	**69**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **33/33** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes **194**		**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.07**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**161** ppi	**2,628**	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**180** ppi	**2,936**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**17.84**	
	Average Elongation @ Break	%		**480.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**240.1** N		**53.973**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**461.4** N		**103.74**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**604.3** N		**135.86**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212606-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.41	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/33 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.07	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi		2,628	psi
	Average Strength @ Break	31 N/mm (kN/m)	178 ppi		2,936	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.84	
	Average Elongation @ Break	%			480.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1 N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4 N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3 N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-26-10**

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REV 03
12/23/05

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ROLL # **212607-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.71	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/36 mil	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.41	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160	ppi	2,628	psi
	Average Strength @ Break	31	N/mm (kN/m)	179	ppi	2,936	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.84	
Lo = 2.0" Break	Average Elongation @ Break	%				480.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1	N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4	N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3	N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212608-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.42	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 28/34 mil	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.41	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160	ppi	2,628	psi
	Average Strength @ Break	31	N/mm (kN/m)	179	ppi	2,936	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.84	
Lo = 2.0" Break	Average Elongation @ Break	%				480.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	240.1	N			53.973	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	461.4	N			103.74	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	604.3	N			135.86	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212609-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.41	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 30/37 mil	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.60	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi		2,664	psi
	Average Strength @ Break	31 N/mm (kN/m)	178 ppi		2,969	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.50	
Lo = 2.0" Break	Average Elongation @ Break	%			450.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1 N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3 N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212610-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 29/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.60	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	159	ppi	2,664	psi
	Average Strength @ Break	31	N/mm (kN/m)	178	ppi	2,969	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.50	
Lo = 2.0" Break	Average Elongation @ Break	%				450.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1	N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3	N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212611-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 29/38 mil	AVE:	1.53	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.60	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160	ppi	2,664	psi
	Average Strength @ Break	31	N/mm (kN/m)	179	ppi	2,969	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.50	
Lo = 2.0" Break	Average Elongation @ Break	%				450.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1	N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3	N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212612-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.41	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/35 mil	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.59	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi		2,664	psi
	Average Strength @ Break	32 N/mm (kN/m)	182 ppi		2,969	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.50	
Lo = 2.0" Break	Average Elongation @ Break	%			450.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1 N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3 N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

Signature.....

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212613-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.59	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi		2,664	psi
	Average Strength @ Break	31 N/mm (kN/m)	178 ppi		2,969	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.50	
	Average Elongation @ Break	%			450.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1 N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3 N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212614-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.46	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/37 mil	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.38	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	172	ppi	2,814	psi
	Average Strength @ Break	35	N/mm (kN/m)	201	ppi	3,297	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.82	
Lo = 2.0" Break	Average Elongation @ Break	%				482.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1	N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3	N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212615-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.44**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.66**	mm	**65**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **30/37** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.54**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.38**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**171** ppi	**2,814**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**200** ppi	**3,297**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**17.82**	
	Average Elongation @ Break	%		**482.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**242.4** N		**54.501**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**423.1** N		**95.121**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**611.3** N		**137.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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12/23/05

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ROLL # **212616-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.45**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.70**	mm	**67**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **32/36** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.54**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.38**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**171** ppi	**2,814**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**200** ppi	**3,297**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**17.82**	
	Average Elongation @ Break	%		**482.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**242.4** N		**54.501**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**423.1** N		**95.121**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**611.3** N		**137.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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12/23/05

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ROLL # **212617-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/35 mil	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.62	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30	N/mm (kN/m)	171	ppi	2,814	psi
	Average Strength @ Break	35	N/mm (kN/m)	200	ppi	3,297	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.82	
Lo = 2.0" Break	Average Elongation @ Break	%				482.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4	N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1	N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3	N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212618-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 31/38 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.62	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	174 ppi		2,814	psi
	Average Strength @ Break	36 N/mm (kN/m)	204 ppi		3,297	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.82	
	Average Elongation @ Break	%			482.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	242.4 N			54.501	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	423.1 N			95.121	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	611.3 N			137.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212619-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.43**	mm	**56**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.68**	mm	**66**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **31/34** mil	AVE:	**1.55**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

ODD # : TOP EVEN #: BOTTOM

Specific Gravity ASTM D792	Density	g/cc			**.948**
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.23**
Carbon Black Content ASTM D4218	Range	%			**2.77**
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**167** ppi	**2,733**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**198** ppi	**3,252**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.59**	
Lo = 2.0" Break	Average Elongation @ Break	%		**515.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.7** N		**55.231**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**422.1** N		**94.888**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**575.0** N		**129.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212620-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.53**	mm	**60**	mil
	MAX:	**1.66**	mm	**65**	mil
Asperity ASTM D7466: **34/34** mil	AVE:	**1.59**	mm	**63**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**		**60 mil**
Length.....	**153.926** m		**505.0** feet
Width.....	**7.00** m;		**23.0** feet
OIT(Standard) ASTM D3895 minutes	**194**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g		g/10 min			**.23**	
Carbon Black Content ASTM D4218	Range		%			**2.77**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30**	N/mm (kN/m)	**171**	ppi	**2,733**	psi
	Average Strength @ Break	**36**	N/mm (kN/m)	**204**	ppi	**3,252**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			**18.59**	
Lo = 2.0" Break	Average Elongation @ Break		%			**515.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.7**	N			**55.231**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**422.1**	N			**94.888**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**575.0**	N			**129.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212621-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.69	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/37 mil	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.77	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	168	ppi	2,733	psi
	Average Strength @ Break	35	N/mm (kN/m)	200	ppi	3,252	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.59	
Lo = 2.0" Break	Average Elongation @ Break	%				515.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.7	N			55.231	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	422.1	N			94.888	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	575.0	N			129.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-27-10**

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REV 03
12/23/05

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ROLL # **212723-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.52	mm	60	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 31/34 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.59**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**169** ppi	**2,733**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**201** ppi	**3,252**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**18.59**	
	Average Elongation @ Break	%		**515.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.7** N		**55.231**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**422.1** N		**94.888**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**575.0** N		**129.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

Signature.....

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REV 03
12/23/05

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ROLL # **212724-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.69	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.67	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi		2,619	psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi		2,998	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.31	
Lo = 2.0" Break	Average Elongation @ Break	%			468.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.7 N			55.231	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	422.1 N			94.888	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	575.0 N			129.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212725-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.44**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.74**	mm	**69**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **35/35** mil	AVE:	**1.55**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.67**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**160** ppi	**2,619**	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**183** ppi	**2,998**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.31**	
Lo = 2.0" Break	Average Elongation @ Break	%		**468.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.7** N		**55.231**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**422.1** N		**94.888**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**575.0** N		**129.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **212726-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.44**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.73**	mm	**68**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **25/38** mil	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.23**	
Carbon Black Content ASTM D4218	Range	%				**2.67**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**161** ppi			**2,619**	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**184** ppi			**2,998**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**18.31**	
Lo = 2.0" Break	Average Elongation @ Break	%				**468.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.7** N				**55.231**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**422.1** N				**94.888**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**575.0** N				**129.26**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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12/23/05

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ROLL # **212727-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/38 mil	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.25	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	159 ppi		2,619	psi
	Average Strength @ Break	32 N/mm (kN/m)	182 ppi		2,998	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.31	
Lo = 2.0" Break	Average Elongation @ Break	%			468.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.7 N			55.231	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	422.1 N			94.888	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	575.0 N			129.26	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **212729-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.42	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/36 mil	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.25	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	171 ppi		2,860	psi
	Average Strength @ Break	35 N/mm (kN/m)	197 ppi		3,298	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			15.37	
Lo = 2.0" Break	Average Elongation @ Break	%			468.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.9 N			56.412	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.2 N			97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	638.4 N			143.52	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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REV 03
12/23/05

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ROLL # **212730-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.44**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.72**	mm	**68**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **35/36** mil	AVE:	**1.55**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

ODD # : TOP EVEN #: BOTTOM

Specific Gravity ASTM D792	Density	g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.23**	
Carbon Black Content ASTM D4218	Range	%			**2.25**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**31** N/mm (kN/m)	**175** ppi		**2,860**	psi
	Average Strength @ Break	**35** N/mm (kN/m)	**201** ppi		**3,298**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**15.37**	
Lo = 2.0" Break	Average Elongation @ Break	%			**468.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**250.9** N			**56.412**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**433.2** N			**97.389**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**638.4** N			**143.52**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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REV 03
12/23/05

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ROLL # **212731-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.75	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/35 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.23	
Carbon Black Content ASTM D4218	Range		%			2.25	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	31	N/mm (kN/m)	176	ppi	2,860	psi
	Average Strength @ Break	35	N/mm (kN/m)	203	ppi	3,298	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			15.37	
Lo = 2.0" Break	Average Elongation @ Break		%			468.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.9	N			56.412	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.2	N			97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	638.4	N			143.52	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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REV 03
12/23/05

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ROLL # **212734-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.42	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.70	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.46	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	167	ppi	2,799	psi
	Average Strength @ Break	33	N/mm (kN/m)	187	ppi	3,123	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.09	
Lo = 2.0" Break	Average Elongation @ Break	%				462.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.9	N			56.412	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.2	N			97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	638.4	N			143.52	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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REV 03
12/23/05

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ROLL # **212735-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 24/30 mil	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.46	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	174 ppi		2,799	psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi		3,123	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.09	
Lo = 2.0" Break	Average Elongation @ Break	%			462.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.9 N			56.412	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.2 N			97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	638.4 N			143.52	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **212736-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.45**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.68**	mm	**66**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **34/36** mil	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

ODD # : TOP EVEN #: BOTTOM

Specific Gravity ASTM D792	Density	g/cc			**.948**
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.23**
Carbon Black Content ASTM D4218	Range	%			**2.46**
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**30** N/mm (kN/m)	**172** ppi	**2,799**	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**192** ppi	**3,123**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**17.09**	
Lo = 2.0" Break	Average Elongation @ Break	%		**462.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**250.9** N		**56.412**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**433.2** N		**97.389**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**638.4** N		**143.52**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **212738-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 38/38 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.60	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	171 ppi		2,799	psi
	Average Strength @ Break	33 N/mm (kN/m)	191 ppi		3,123	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.09	
	Average Elongation @ Break	%			462.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	250.9 N			56.412	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	433.2 N			97.389	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	638.4 N			143.52	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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REV 03
12/23/05

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ROLL # **212741-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.46	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/38 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.55	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi		2,566	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi		3,047	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.91	
Lo = 2.0" Break	Average Elongation @ Break	%			486.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	237.9 N			53.476	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	449.4 N			101.03	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	629.8 N			141.59	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-28-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **213101-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	194	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.23	
Carbon Black Content ASTM D4218	Range	%			2.25	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi		2,566	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi		3,047	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.91	
	Average Elongation @ Break	%			486.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	237.9 N			53.476	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	449.4 N			101.03	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	629.8 N			141.59	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213102-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.48**	mm	**58**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.68**	mm	**66**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **36/38** mil	AVE:	**1.57**	mm	**62**	mil	OIT(Standard) ASTM D3895 minutes	**194**	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.25**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**159** ppi	**2,566**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**188** ppi	**3,047**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**17.91**	
Lo = 2.0" Break	Average Elongation @ Break	%		**486.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**237.9** N		**53.476**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**449.4** N		**101.03**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**629.8** N		**141.59**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **213104-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.47**	mm	**58**	mil
	MAX:	**1.64**	mm	**65**	mil
Asperity ASTM D7466: **32/37** mil	AVE:	**1.53**	mm	**60**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5**	**mm**	**60 mil**
Length.....	**153.926**	m	**505.0** feet
Width.....	**7.00**	m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**194**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.23**	
Carbon Black Content ASTM D4218	Range	%				**2.67**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27**	N/mm (kN/m)	**152**	ppi	**2,532**	psi
	Average Strength @ Break	**34**	N/mm (kN/m)	**192**	ppi	**3,196**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**16.57**	
	Average Elongation @ Break	%				**496.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**237.9**	N			**53.476**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**449.4**	N			**101.03**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**629.8**	N			**141.59**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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12/23/05

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ROLL # **213105-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/35 mil	AVE:	1.53	mm	60	mil	OIT(Standard) ASTM D3895 minutes	194	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.23	
Carbon Black Content ASTM D4218	Range	%				2.67	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	152	ppi	2,532	psi
	Average Strength @ Break	34	N/mm (kN/m)	192	ppi	3,196	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				16.57	
Lo = 2.0" Break	Average Elongation @ Break	%				496.9	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.65	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	237.9	N			53.476	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	449.4	N			101.03	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	629.8	N			141.59	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213106-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.45**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.61**	mm	**63**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **34/35** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.52**	mm	**60**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.67**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**151** ppi	**2,532**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**191** ppi	**3,196**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**16.57**	
	Average Elongation @ Break	%		**496.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**237.9** N		**53.476**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**449.4** N		**101.03**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**629.8** N		**141.59**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213107-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.43**	mm	**56**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.65**	mm	**65**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **32/33** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.54**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes	**194**	**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.67**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm (kN/m)	**153** ppi	**2,532**	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**194** ppi	**3,196**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**16.57**	
	Average Elongation @ Break	%		**496.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**237.9** N		**53.476**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**449.4** N		**101.03**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**629.8** N		**141.59**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213108-10** Lot #: **7100247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.46**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.59**	mm	**63**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **31/36** mil	AVE:	**1.52**	mm	**60**	mil	OIT(Standard) ASTM D3895 minutes **194**		

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.23**	
Carbon Black Content ASTM D4218	Range	%		**2.66**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**161** ppi	**2,687**	psi
	Average Strength @ Break	**32** N/mm (kN/m)	**180** ppi	**3,013**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.43**	
Lo = 2.0" Break	Average Elongation @ Break	%		**468.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.65**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.2** N		**55.118**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**437.7** N		**98.402**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**608.7** N		**136.85**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213109-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/36 mil	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.66	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi		2,687	psi
	Average Strength @ Break	32 N/mm (kN/m)	184 ppi		3,013	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.43	
Lo = 2.0" Break	Average Elongation @ Break	%			468.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.2 N			55.118	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.7 N			98.402	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	608.7 N			136.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **213110-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.46**	mm	**57**	mil
	MAX:	**1.60**	mm	**63**	mil
Asperity ASTM D7466: **33/36** mil	AVE:	**1.52**	mm	**60**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**		**60 mil**
Length.....	**153.926** m		**505.0** feet
Width.....	**7.00** m;		**23.0** feet
OIT(Standard) ASTM D3895 minutes	**199**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range	%				**2.66**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)		**161** ppi		**2,687**	psi
	Average Strength @ Break	**32** N/mm (kN/m)		**180** ppi		**3,013**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**18.43**	
Lo = 2.0" Break	Average Elongation @ Break	%				**468.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.2**	N			**55.118**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**437.7**	N			**98.402**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**608.7**	N			**136.85**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **213111-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.46**	mm	**57**	mil
	MAX:	**1.61**	mm	**63**	mil
Asperity ASTM D7466: **36/36** mil	AVE:	**1.53**	mm	**60**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**	**60 mil**	
Length.....	**153.926** m	**505.0** feet	
Width.....	**7.00** m;	**23.0** feet	
OIT(Standard) ASTM D3895 minutes	**199**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g		g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range		%			**2.59**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28**	N/mm (kN/m)	**162**	ppi	**2,687**	psi
	Average Strength @ Break	**32**	N/mm (kN/m)	**181**	ppi	**3,013**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			**18.43**	
Lo = 2.0" Break	Average Elongation @ Break		%			**468.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.2**	N			**55.118**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**437.7**	N			**98.402**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**608.7**	N			**136.85**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213112-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.50**	mm	**59**	mil
	MAX:	**1.67**	mm	**66**	mil
Asperity ASTM D7466: **34/36** mil	AVE:	**1.58**	mm	**62**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**	**60 mil**	
Length.....	**153.926** m	**505.0**	feet
Width.....	**7.00** m;	**23.0**	feet
OIT(Standard) ASTM D3895 minutes	**199**		

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.59**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**167** ppi		**2,687**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**187** ppi		**3,013**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**18.43**	
Lo = 2.0" Break	Average Elongation @ Break	%			**468.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.2** N			**55.118**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**437.7** N			**98.402**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**608.7** N			**136.85**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

Signature.....

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REV 03
12/23/05

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ROLL # **213113-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.44	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 36/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.26	
Carbon Black Content ASTM D4218	Range		%			2.61	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	157	ppi	2,588	psi
	Average Strength @ Break	33	N/mm (kN/m)	189	ppi	3,118	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			18.18	
Lo = 2.0" Break	Average Elongation @ Break		%			477.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.2	N			55.118	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.7	N			98.402	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	608.7	N			136.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213114-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 36/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.53	mm	60	mil	OIT(Standard) ASTM D3895 minutes	199	

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.26	
Carbon Black Content ASTM D4218	Range		%			2.61	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	156	ppi	2,588	psi
	Average Strength @ Break	33	N/mm (kN/m)	188	ppi	3,118	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			18.18	
Lo = 2.0" Break	Average Elongation @ Break		%			477.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.2	N			55.118	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.7	N			98.402	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	608.7	N			136.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213115-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.49**	mm	**59**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.68**	mm	**66**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **36/36** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes **199**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range	%				**2.61**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)		**159** ppi		**2,588**	psi
	Average Strength @ Break	**34** N/mm (kN/m)		**191** ppi		**3,118**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**18.18**	
Lo = 2.0" Break	Average Elongation @ Break	%				**477.6**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**245.2**	N			**55.118**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**437.7**	N			**98.402**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**608.7**	N			**136.85**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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REV 03
12/23/05

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ROLL # **213216-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.64	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi		2,588	psi
	Average Strength @ Break	34 N/mm (kN/m)	194 ppi		3,118	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.18	
Lo = 2.0" Break	Average Elongation @ Break	%			477.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.2 N			55.118	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.7 N			98.402	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	608.7 N			136.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-29-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **213217-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.64	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	160 ppi		2,588	psi
	Average Strength @ Break	34 N/mm (kN/m)	193 ppi		3,118	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.18	
Lo = 2.0" Break	Average Elongation @ Break	%			477.6	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	245.2 N			55.118	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	437.7 N			98.402	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	608.7 N			136.85	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213218-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/35 mil	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895	minutes 199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.26	
Carbon Black Content ASTM D4218	Range		%			2.57	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	152	ppi	2,536	psi
	Average Strength @ Break	32	N/mm (kN/m)	181	ppi	3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			16.68	
Lo = 2.0" Break	Average Elongation @ Break		%			482.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3	N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7	N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9	N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

Signature.....

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **213219-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.51	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.62	mm	64	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/36 mil	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.57	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158	ppi	2,536	psi
	Average Strength @ Break	33	N/mm (kN/m)	188	ppi	3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				16.68	
Lo = 2.0" Break	Average Elongation @ Break	%				482.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3	N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7	N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9	N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213220-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.64	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/38 mil	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.57	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	156	ppi	2,536	psi
	Average Strength @ Break	33	N/mm (kN/m)	186	ppi	3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				16.68	
Lo = 2.0" Break	Average Elongation @ Break	%				482.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3	N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7	N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9	N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **213221-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.50	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/35 mil	AVE:	1.58	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.57	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	158 ppi		2,536	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi		3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.68	
Lo = 2.0" Break	Average Elongation @ Break	%			482.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3 N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7 N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9 N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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60HDmic.FRM
REV 03
12/23/05

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ROLL # **213222-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.41	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.63	mm	64	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.57	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	152 ppi		2,536	psi
	Average Strength @ Break	32 N/mm (kN/m)	181 ppi		3,029	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			16.68	
	Average Elongation @ Break	%			482.4	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3 N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7 N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9 N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213223-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.47	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.57	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	167 ppi		2,698	psi
	Average Strength @ Break	35 N/mm (kN/m)	198 ppi		3,203	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			15.88	
	Average Elongation @ Break	%			474.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3 N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7 N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9 N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213224-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/38 mil	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.57	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	166	ppi	2,698	psi
	Average Strength @ Break	34	N/mm (kN/m)	197	ppi	3,203	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				15.88	
Lo = 2.0" Break	Average Elongation @ Break	%				474.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3	N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7	N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9	N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **213225-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.65	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 34/36 mil	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.57	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	166	ppi	2,698	psi
	Average Strength @ Break	34	N/mm (kN/m)	197	ppi	3,203	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				15.88	
Lo = 2.0" Break	Average Elongation @ Break	%				474.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3	N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7	N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9	N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **213226-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.66	mm	65	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 33/36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.52	mm	60	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.57	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm (kN/m)	161 ppi		2,698	psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi		3,203	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			15.88	
Lo = 2.0" Break	Average Elongation @ Break	%			474.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	235.3 N			52.895	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	401.7 N			90.314	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	601.9 N			135.31	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

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REV 03
12/23/05

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ROLL # **213227-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.45**	mm	**57**	mil
	MAX:	**1.57**	mm	**62**	mil
Asperity ASTM D7466: **32/36** mil	AVE:	**1.52**	mm	**60**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**		**60 mil**
Length.....	**153.926** m		**505.0** feet
Width.....	**7.00** m;		**23.0** feet
OIT(Standard) ASTM D3895 minutes	**199**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range	%				**2.57**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)		**161** ppi		**2,698**	psi
	Average Strength @ Break	**34** N/mm (kN/m)		**192** ppi		**3,203**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**15.88**	
Lo = 2.0" Break	Average Elongation @ Break	%				**474.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**235.3**	N			**52.895**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**401.7**	N			**90.314**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**601.9**	N			**135.31**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213228-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.46**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.63**	mm	**64**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **35/35** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.53**	mm	**60**	mil	OIT(Standard) ASTM D3895 minutes **199**		**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range	%		**2.52**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**164** ppi	**2,728**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**187** ppi	**3,113**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.22**	
Lo = 2.0" Break	Average Elongation @ Break	%		**465.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**236.7** N		**53.217**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**434.9** N		**97.764**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**558.1** N		**125.47**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213229-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.63	mm	64	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 31/37 mil	AVE:	1.54	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.52	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29	N/mm (kN/m)	165	ppi	2,728	psi
	Average Strength @ Break	33	N/mm (kN/m)	189	ppi	3,113	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.22	
Lo = 2.0" Break	Average Elongation @ Break	%				465.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	236.7	N			53.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	434.9	N			97.764	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	558.1	N			125.47	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213230-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.44**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.60**	mm	**63**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **34/35** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.52**	mm	**60**	mil	OIT(Standard) ASTM D3895 minutes **199**		**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range	%		**2.52**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**29** N/mm (kN/m)	**163** ppi	**2,728**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**186** ppi	**3,113**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.22**	
Lo = 2.0" Break	Average Elongation @ Break	%		**465.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**236.7** N		**53.217**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**434.9** N		**97.764**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**558.1** N		**125.47**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213231-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.43	mm	56	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.69	mm	67	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 37/39 mil	AVE:	1.53	mm	60	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min		.26	
Carbon Black Content ASTM D4218	Range	%		2.21	
Carbon Black Dispersion ASTM D5596	Category			10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	29 N/mm (kN/m)	164 ppi	2,728	psi
	Average Strength @ Break	33 N/mm (kN/m)	187 ppi	3,113	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		18.22	
Lo = 2.0" Break	Average Elongation @ Break	%		465.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	236.7 N		53.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	434.9 N		97.764	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	558.1 N		125.47	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213232-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.46	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.74	mm	69	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.21	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	30 N/mm (kN/m)	169 ppi		2,728	psi
	Average Strength @ Break	34 N/mm (kN/m)	192 ppi		3,113	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.22	
Lo = 2.0" Break	Average Elongation @ Break	%			465.5	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	236.7 N			53.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	434.9 N			97.764	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	558.1 N			125.47	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213233-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.45	mm	57	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/36 mil	AVE:	1.58	mm	62	mil			
ODD # : TOP EVEN #: BOTTOM						OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.16	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	156 ppi		2,512	psi
	Average Strength @ Break	33 N/mm (kN/m)	191 ppi		3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			18.98	
Lo = 2.0" Break	Average Elongation @ Break	%			485.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	236.7 N			53.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	434.9 N			97.764	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	558.1 N			125.47	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

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REV 03
12/23/05

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ROLL # **213234-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.67	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 36/37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.56	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.16	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm (kN/m)	154 ppi		2,512	psi
	Average Strength @ Break	33 N/mm (kN/m)	188 ppi		3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.98	
	Average Elongation @ Break	%			485.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	236.7 N			53.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	434.9 N			97.764	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	558.1 N			125.47	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-30-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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quality certificate

ROLL # **213335-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.49	mm	59	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 32/34 mil	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.16	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm (kN/m)	155	ppi	2,512	psi
	Average Strength @ Break	33	N/mm (kN/m)	190	ppi	3,069	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				18.98	
Lo = 2.0" Break	Average Elongation @ Break	%				485.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	236.7	N			53.217	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	434.9	N			97.764	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	558.1	N			125.47	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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ROLL # **213336-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.48**	mm	**58**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.72**	mm	**68**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **36/37** mil	AVE:	**1.59**	mm	**63**	mil	OIT(Standard) ASTM D3895 minutes	**199**	

ODD # : TOP EVEN #: BOTTOM

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range	%		**2.16**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**157** ppi	**2,512**	psi
	Average Strength @ Break	**34** N/mm (kN/m)	**192** ppi	**3,069**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**18.98**	
Lo = 2.0" Break	Average Elongation @ Break	%		**485.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**236.7** N		**53.217**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**434.9** N		**97.764**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**558.1** N		**125.47**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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ROLL # **213337-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.49**	mm	**59**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.81**	mm	**71**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **35/36** mil	AVE:	**1.61**	mm	**63**	mil	OIT(Standard) ASTM D3895 minutes	**199**	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range	%				**2.16**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)		**159** ppi		**2,512**	psi
	Average Strength @ Break	**34** N/mm (kN/m)		**194** ppi		**3,069**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**18.98**	
Lo = 2.0" Break	Average Elongation @ Break	%				**485.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**236.7**	N			**53.217**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**434.9**	N			**97.764**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**558.1**	N			**125.47**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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ROLL # **213338-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.45**	mm	**57**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.69**	mm	**67**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **35/36** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.56**	mm	**61**	mil	OIT(Standard) ASTM D3895 minutes **199**		**TEST RESULTS**

Specific Gravity ASTM D792	Density	g/cc		**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range	%		**2.09**	
Carbon Black Dispersion ASTM D5596	Category			**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)	**159** ppi	**2,584**	psi
	Average Strength @ Break	**33** N/mm (kN/m)	**187** ppi	**3,037**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**17.99**	
	Average Elongation @ Break	%		**472.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**247.2** N		**55.587**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**424.1** N		**95.357**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**595.0** N		**133.76**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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ROLL # **213339-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.61	mm	63	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 35/37 mil	AVE:	1.55	mm	61	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.09	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	158	ppi	2,584	psi
	Average Strength @ Break	32	N/mm (kN/m)	185	ppi	3,037	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				17.99	
Lo = 2.0" Break	Average Elongation @ Break	%				472.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	247.2	N			55.587	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	424.1	N			95.357	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.0	N			133.76	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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ROLL # **213340-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	**1.5 mm**	**60 mil**
	MIN:	**1.49**	mm	**59**	mil	Length.....	**153.926** m	**505.0** feet
	MAX:	**1.69**	mm	**67**	mil	Width.....	**7.00** m;	**23.0** feet
Asperity ASTM D7466: **30/34** mil	AVE:	**1.57**	mm	**62**	mil	OIT(Standard) ASTM D3895 minutes	**199**	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.948**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190ºC /2160 g	g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range	%				**2.09**	
Carbon Black Dispersion ASTM D5596	Category					**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**28** N/mm (kN/m)		**160** ppi		**2,584**	psi
	Average Strength @ Break	**33** N/mm (kN/m)		**188** ppi		**3,037**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**17.99**	
Lo = 2.0" Break	Average Elongation @ Break	%				**472.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.43**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**247.2**	N			**55.587**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**424.1**	N			**95.357**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**595.0**	N			**133.76**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

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ROLL # **213341-10** Lot #: **7100251** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH		Thickness.....	1.5 mm	60 mil
	MIN:	1.48	mm	58	mil	Length.....	153.926 m	505.0 feet
	MAX:	1.68	mm	66	mil	Width.....	7.00 m;	23.0 feet
Asperity ASTM D7466: 31/37 mil	AVE:	1.57	mm	62	mil	OIT(Standard) ASTM D3895 minutes	199	

ODD # : TOP EVEN #: BOTTOM

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.948	
MFI ASTM D1238 COND. E GRADE: K307	Melt Flow Index 190ºC /2160 g		g/10 min			.26	
Carbon Black Content ASTM D4218	Range		%			2.10	
Carbon Black Dispersion ASTM D5596	Category					10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28	N/mm (kN/m)	160	ppi	2,584	psi
	Average Strength @ Break	33	N/mm (kN/m)	188	ppi	3,037	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%			17.99	
Lo = 2.0" Break	Average Elongation @ Break		%			472.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.43	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	247.2	N			55.587	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	424.1	N			95.357	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	595.0	N			133.76	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Waste Services, Inc.**
PO: **to be given Jed Solid Waste - Cell 7**
Destination **St. Cloud, FL**

Date:..... **3-31-10**

Signature.....

Quality Control Department

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REV 03
12/23/05

CoA Date: 12/29/2009

Certificate of Analysis

Shipped To: AGRU AMERICA:RAINS
MILEPOST SH317
RAINS SC 29589
USA

Recipient: PALMER
Fax:

CPC Delivery #: 87978445
PO #: 50206
Weight: 183100 LB
Ship Date: 12/29/2009
Package: BULK
Mode: Hopper Car
Car #: CHVX891196
Seal No: 269524

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8191301

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.290	g/10mi
HLMI Flow Rate	ASTM D1238	23.00	g/10mi
Density	D1505 or D4883	0.9380	g/cm3
Pellet Count	P02.08.03	27.000	pel/g
Production Date		12/16/2009	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4637

CoA Date: 02/24/2010

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

CPC Delivery #: 88010199
PO #: 005293
Weight: 194900 LB
Ship Date: 02/24/2010
Package: BULK
Mode: Hopper Car
Car #: PSPX007152
Seal No: 275028

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 7100247

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.23	g/10mi
HLMI Flow Rate	ASTM D1238	19	g/10mi
Density	D1505 or D4883	0.938	g/cm3
Pellet Count	P02.08.03	27	pel/g
Production Date		02/21/2010	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4637

CoA Date: 02/24/2010

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

CPC Delivery #: 88010202
PO #: 005293
Weight: 195100 LB
Ship Date: 02/24/2010
Package: BULK
Mode: Hopper Car
Car #: CPCX805025
Seal No: 274848

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 7100251

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.26	g/10mi
HLMI Flow Rate	ASTM D1238	21	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	25	pel/g
Production Date		02/22/2010	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4637

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : **7100251** MATERIAL : **HDPE** DATE **3-31-10**

ROLL # : **213109-10** LINER TYPE **60 HD MICRO** REF # :

FORMULA FOR APPLIED LOAD : Load = $\frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Transverse Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : **2,412** psi % of yield tested : **30** %

Station used: Mechanical Advantage Used: **5** CF = **77** g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,412 x 0.060 x formula

LOAD = 378 g

PASS @ 300 HRS

	Specimen Thickness (mils)		Notch Depth (mils)	PASS / FAIL ?	Failure at
#1	0.0605	#1	0.0125	PASS	hours
#2	0.0605	#2	0.0125	PASS	hours
#3	0.0611	#3	0.0131	PASS	hours
#4	0.0612	#4	0.0132	PASS	hours
#5	0.0611	#5	0.0131	PASS	hours
#6	0.0602	#6	0.0122	= 310	microns

Comments: all 5 specimens removed after 310 hours with no breaks.

Tested By: JE

Checked By: GP

Test Conditions (At Notching) **Temp:** 71 **Humidity:** 52

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REV 02
2/11/10

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : **8191301** MATERIAL : **HDPE** DATE **3-23-10**

ROLL # : **212121-10** LINER TYPE **60 HD MICRO** REF # :

FORMULA FOR APPLIED LOAD : Load = $\frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Transverse Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : **2,377** psi % of yield tested : **30** %

Station used: Mechanical Advantage Used: **5** CF = **77** g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,377 x 0.060 x formula

LOAD = 373 g

PASS @ 300 HRS

	Specimen Thickness (mils)		Notch Depth (mils)		PASS / FAIL ?	Failure at
#1	0.0588	#1	0.0108		PASS	hours
#2	0.0590	#2	0.0110		PASS	hours
#3	0.0590	#3	0.0110		PASS	hours
#4	0.0585	#4	0.0105		PASS	hours
#5	0.0595	#5	0.0115		PASS	hours
#6	0.0592	#6	0.0112	=	284	microns

Comments: all 5 specimens removed after 310 hours with no breaks.

Tested By: JE

Checked By: GP

Test Conditions (At Notching) **Temp:** 71 **Humidity:** 52

NCTL.FRM
REV 02
2/11/10

SP NOTCHED CONSTANT TENSILE LOAD ASTM D 5397 APPENDIX A

LOT # : **7100247** MATERIAL : **HDPE** DATE **3-26-10**

ROLL # : **212588-10** LINER TYPE **60 HD MICRO** REF # :

FORMULA FOR APPLIED LOAD : Load = $\frac{(\text{str@yld} \times \%\text{test} \times (80\% \text{ of nom. thickness}) \times \text{width}) - CF}{MA}$

where :

str@yld = Tensile strength @ yield (Transverse Direction) from ASTM D-6693 in psi

thickness = Thickness of sample at notch point in inches

width = Width of sample in inches (.125" constant)

MA = Mechanical Advantage Used (1:1, 3:1, 4:1, or 5:1)

CF = Correction Factor for MA Stations is 77g (weight of arm with empty holder attached to other end)

Therefore, for each sample, **load = (str@yld x nom. thickness x .0300*----->([%TEST] x .8 x .125))-CF/MA**

*** This number may change due to customer specifications. Formula will be changed also.**

Strength @ yield for this roll : **2,562** psi % of yield tested : **30** %

Station used: Mechanical Advantage Used: **5** CF = **77** g

Nominal Thickness (in): 0.0600

LOAD = str@yld x nominal thickness x formula

LOAD = 2,562 x 0.060 x formula

LOAD = 403 g

PASS @ 300 HRS

Specimen Thickness (mils)		Notch Depth (mils)		PASS / FAIL ?	Failure at
#1	0.0610	#1	0.0130	PASS	hours
#2	0.0610	#2	0.0130	PASS	hours
#3	0.0605	#3	0.0125	PASS	hours
#4	0.0609	#4	0.0129	PASS	hours
#5	0.0604	#5	0.0124	PASS	hours
#6	0.0606	#6	0.0126	= 320 microns	

Comments: all 5 specimens removed after 315 hours with no breaks.

Tested By: JE

Checked By: GP

Test Conditions (At Notching) **Temp:** 71 **Humidity:** 52

NCTL.FRM
REV 02
2/11/10

Chevron Phillips Chemical Company LP

Rex L. Bobsein, Ph.D., Polyethylene Materials and Applications Development
Room 109 PTC ■ Bartlesville, OK 74004■
918-661-0089 ■ bobserl@cpchem.com ■ Fax: 918-662-2550 ■ www.cpchem.com

January 16, 2006

Grant Palmer
Agru America
500 Garrison Road
Georgetown, SC 29440

Dear Grant:

This letter is to re-report the results of oven aging and UV aging testing (according to GRI-GM13 and GRI-GM17) on Agru America sheet samples that you provided to us in 2004. A graphical summary of the results was sent to you on 4/1/2005. The testing was performed by CPChem's Evaluation Laboratory in Bartlesville, OK. Oven-aging tests were completed 12/17/2004. UV-aging tests were completed on 12/13/2004.

GRI-GM13 (HDPE) and GRI-GM17 (LLDPE) durability testing was done according to the following procedures.

Test	Exposure	Method
Std. OIT	200°C, atmospheric pressure oxygen	D3895
HP-OIT	150°C, 500 psi oxygen	D5885
Oven Aging	90 days, 85°C	D5721
UV Aging	1600 UV hrs (Conditions were 20 hours UVA-340 at 75°C followed by 4 hrs dark with condensation at 60°C. Irradiance was 0.72 W/m^2 at 340nm.)	GRI-GM11

Oven Aging Results

Sample	Initial HP-OIT (min.)	HP-OIT Value after Oven Aging (min.)	% HP-OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE tex Roll # 312588 from Marlex® 7104 Lot # CPN811170	514	396	77	60
60 mil HDPE Roll # 315103-04 from Marlex® K307 Lot # 71-3-1465	1461	1547	106	80

Sample	Initial Std. OIT (min.)	Std. OIT Value after Oven Aging (min.)	% Std. OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE tex Roll # 312588 from Marlex® 7104 Lot # CPN811170	151	58	38	35
60 mil HDPE Roll # 315103-04 from Marlex® K307 Lot # 71-3-1465	201	127	63	55

UV Aging Results

Sample	Initial HP-OIT (min.)	HP-OIT Value after UV Aging (min.)	% HP-OIT Retained	GRI-GM13 or GRI-GM17 % Retained Requirement
40 mil LLDPE tex Roll # 312588 from Marlex® 7104 Lot # CPN811170	514	460	89	35
60 mil HDPE Roll # 315103-04 from Marlex® K307 Lot # 71-3-1465	1461	1513	104	50

According to these test results, the durability requirements are met.

If you have any questions, please call me at 918-661-0089.

Sincerely,

Rex L. Bobsein

Rex L. Bobsein, Ph.D.
Polyethylene Materials and Applications Development

Any technical advice, recommendations, results, or analysis ("Information") contained herein, including, without limitation, Information as it may relate to the selection of a specific product ("Product") for your use and application, is given ***without warranty or guarantee*** *and is accepted at your sole risk. It is imperative that you test the Information (and Product, if applicable) to determine to your own satisfaction whether the Information (and Product, if applicable) are suitable for your intended use and application.* ***You expressly assume, and release Chevron Phillips Chemical Company, from all risk and liability, whether based in contract, tort or otherwise, in connection with the use of, or results obtained from, such Information (and Product, if applicable).***

Appendix

J

April 5, 2010

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7**
TRI Job Reference Number:	E2341-12-03
Material(s) Tested:	2 Agru 60 mil HDPE Microspike Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Black Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile Properties (ASTM D 6693)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification:213110.10
TRI Log #: E2341-12-03

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	67	67	62	64	62	62	62	65	66	64	**64**	2	60 avg
											62	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.947	0.947	0.947								**0.947**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.62	2.65									**2.64**	0.02	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1							9 of 10 Cat. 1 or 2	
Rating - 2nd field view	1	1	1	1	1							1 Cat 3	
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	145	162	159	158	150						**155**	7	126 min
TD Yield Strength (ppi)	154	178	163	173	161						**166**	10	126 min
MD Break Strength (ppi)	198	237	133	213	179						**192**	39	90 min
TD Break Strength (ppi)	174	184	169	173	158						**172**	9	90 min
MD Yield Elongation (%)	19	19	19	19	19						**19**	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						**16**	0	12 min
MD Break Elongation (%)	480	456	266	428	439						**414**	85	100 min
TD Break Elongation (%)	546	525	456	515	474						**503**	37	100 min

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 213219.10
TRI Log #: E2341-12-03

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	68	67	66	66	65	63	63	67	63	64	**65**	2	60 avg
											63	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.947	0.947	0.947								**0.947**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.76	2.66									**2.71**	0.07	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1							9 of 10 Cat. 1 or 2	
Rating - 2nd field view	1	1	1	1	1							1 Cat 3	
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	151	166	149	164	155						**157**	8	126 min
TD Yield Strength (ppi)	156	181	164	171	161						**167**	10	126 min
MD Break Strength (ppi)	189	228	174	181	238						**202**	29	90 min
TD Break Strength (ppi)	165	179	163	171	150						**166**	11	90 min
MD Yield Elongation (%)	20	20	20	20	20						**20**	0	12 min
TD Yield Elongation (%)	18	18	18	18	18						**18**	0	12 min
MD Break Elongation (%)	459	430	434	474	503						**460**	30	100 min
TD Break Elongation (%)	444	478	433	496	451						**460**	26	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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April 5, 2010

Mail To:

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Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7**
TRI Job Reference Number:	E2341-10-07
Material(s) Tested:	5 Agru 60 mil Microspike HDPE Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Black Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile Properties (ASTM D 6693)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212500.10
TRI Log #: E2341-10-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	67	68	63	65	62	65	60	60	66	62	**64**	3	60 avg
											60	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.947								**0.946**	0.001	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.69	2.70									**2.70**	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	139	158	163	161	150						**154**	10	126 min
TD Yield Strength (ppi)	150	176	167	168	152						**163**	11	126 min
MD Break Strength (ppi)	183	189	183	215	170						**188**	17	90 min
TD Break Strength (ppi)	175	191	175	156	165						**172**	13	90 min
MD Yield Elongation (%)	19	19	19	19	19						**19**	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						**16**	0	12 min
MD Break Elongation (%)	466	423	440	468	451						**450**	19	100 min
TD Break Elongation (%)	520	526	471	451	476						**489**	33	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212609.10
TRI Log #: E2341-10-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	65	62	62	59	59	61	63	64	68	68	**63**	3	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								**0.946**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.66	2.64									**2.65**	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	139	150	151	168	150						**152**	10	126 min
TD Yield Strength (ppi)	150	176	171	174	159						**166**	11	126 min
MD Break Strength (ppi)	169	198	191	175	177						**182**	12	90 min
TD Break Strength (ppi)	171	178	201	175	135						**172**	24	90 min
MD Yield Elongation (%)	21	21	21	21	21						**21**	0	12 min
TD Yield Elongation (%)	17	17	17	17	17						**17**	0	12 min
MD Break Elongation (%)	423	444	419	391	464						**428**	27	100 min
TD Break Elongation (%)	511	461	565	498	421						**491**	54	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212618.10
TRI Log #: E2341-10-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	65	66	61	61	58	60	62	64	65	67	**63**	3	60 avg
											58	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								**0.946**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.62	2.62									**2.62**	0.00	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	144	163	178	167	151						**161**	13	126 min
TD Yield Strength (ppi)	153	173	185	173	157						**168**	13	126 min
MD Break Strength (ppi)	202	204	221	219	183						**206**	15	90 min
TD Break Strength (ppi)	167	182	188	187	185						**182**	9	90 min
MD Yield Elongation (%)	20	20	20	20	20						**20**	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						**16**	0	12 min
MD Break Elongation (%)	483	449	453	445	461						**458**	15	100 min
TD Break Elongation (%)	509	511	518	546	576						**532**	29	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212727.10
TRI Log #: E2341-10-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	66	64	61	59	59	59	65	65	69	69	**64**	4	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								**0.946**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.27	2.26									**2.27**	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	141	161	163	154	173						**158**	12	126 min
TD Yield Strength (ppi)	149	175	186	179	152						**168**	17	126 min
MD Break Strength (ppi)	189	202	225	169	197						**196**	20	90 min
TD Break Strength (ppi)	121	191	205	186	146						**170**	35	90 min
MD Yield Elongation (%)	18	18	18	18	18						**18**	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						**16**	0	12 min
MD Break Elongation (%)	474	386	438	430	410						**428**	33	100 min
TD Break Elongation (%)	318	541	558	536	425						**476**	103	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 213101.10
TRI Log #: E2341-10-07

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	68	65	60	59	62	61	61	63	65	67	**63**	3	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.948	0.948	0.948								**0.948**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.73	2.72									**2.73**	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1							9 of 10 Cat. 1 or 2	
Rating - 2nd field view	1	1	1	1	1							1 Cat 3	
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	144	166	173	167	153						**161**	12	126 min
TD Yield Strength (ppi)	158	184	184	181	165						**174**	12	126 min
MD Break Strength (ppi)	188	234	197	228	187						**207**	23	90 min
TD Break Strength (ppi)	178	208	183	132	152						**171**	29	90 min
MD Yield Elongation (%)	18	18	18	18	18						**18**	0	12 min
TD Yield Elongation (%)	16	16	16	16	16						**16**	0	12 min
MD Break Elongation (%)	419	463	423	456	440						**440**	20	100 min
TD Break Elongation (%)	498	573	500	326	451						**470**	91	100 min

MD Machine Direction TD Transverse Direction NA Not Available

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April 5, 2010

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Willis:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7**
TRI Job Reference Number:	E2341-09-09
Material(s) Tested:	3 Agru 60 mil Microspike HDPE Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Black Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile Properties (ASTM D 6693)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212472.10
TRI Log #: E2341-09-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	59	59	60	63	69	69	67	68	61	60	**64**	4	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.945	0.945	0.945								**0.945**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.21	2.20									**2.21**	0.01	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	173	162	188	187	170						**176**	11	126 min
TD Yield Strength (ppi)	167	202	177	184	197						**185**	14	126 min
MD Break Strength (ppi)	218	167	236	231	186						**208**	30	90 min
TD Break Strength (ppi)	177	166	185	125	200						**171**	28	90 min
MD Yield Elongation (%)	23	23	25	23	23						**23**	1	12 min
TD Yield Elongation (%)	18	16	16	16	16						**16**	1	12 min
MD Break Elongation (%)	449	400	455	444	439						**437**	22	100 min
TD Break Elongation (%)	495	411	515	276	530						**446**	105	100 min

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

GeosyntheticTesting.com
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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212480.10
TRI Log #: E2341-09-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	59	62	64	64	69	68	66	63	61	60	**64**	3	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.945	0.945	0.945								**0.945**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.27	2.27									**2.27**	0.00	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	191	174	197	183	171						**183**	11	126 min
TD Yield Strength (ppi)	199	217	171	196	172						**191**	20	126 min
MD Break Strength (ppi)	234	188	231	202	152						**201**	34	90 min
TD Break Strength (ppi)	203	209	176	195	126						**182**	34	90 min
MD Yield Elongation (%)	21	21	21	21	20						**21**	0	12 min
TD Yield Elongation (%)	16	16	18	16	18						**17**	1	12 min
MD Break Elongation (%)	433	484	439	454	379						**438**	38	100 min
TD Break Elongation (%)	549	506	498	529	79						**432**	198	100 min

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 212589.10
TRI Log #: E2341-09-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	61	57	64	63	65	64	66	66	59	60	**63**	3	60 avg
											57	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.944	0.944	0.945								**0.944**	0.001	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.65	2.65									**2.65**	0.00	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								9 of 10 Cat. 1 or 2
Rating - 2nd field view	1	1	1	1	1								1 Cat 3
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	180	158	173	185	160						**171**	12	126 min
TD Yield Strength (ppi)	189	173	186	183	165						**179**	10	126 min
MD Break Strength (ppi)	212	190	219	196	167						**197**	20	90 min
TD Break Strength (ppi)	193	165	196	168	116						**168**	32	90 min
MD Yield Elongation (%)	21	21	23	21	21						**21**	1	12 min
TD Yield Elongation (%)	16	16	16	16	16						**16**	0	12 min
MD Break Elongation (%)	448	461	426	419	401						**431**	24	100 min
TD Break Elongation (%)	503	476	515	459	80						**407**	184	100 min

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

April 5, 2010

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7**
TRI Job Reference Number:	E2341-13-01
Material(s) Tested:	2 Agru 60 mil HDPE Microspike Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Black Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile Properties (ASTM D 6693)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 213228.10
TRI Log #: E2341-13-01

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	59	59	65	61	62	63	63	63	61	60	**62**	2	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.947	0.947	0.947								**0.947**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.61	2.69									**2.65**	0.06	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1							9 of 10 Cat. 1 or 2	
Rating - 2nd field view	1	1	1	1	1							1 Cat 3	
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	153	142	157	159	153						**153**	7	126 min
TD Yield Strength (ppi)	172	174	167	160	162						**167**	6	126 min
MD Break Strength (ppi)	208	185	172	232	202						**200**	23	90 min
TD Break Strength (ppi)	186	194	168	159	175						**176**	14	90 min
MD Yield Elongation (%)	20	20	20	20	20						**20**	0	12 min
TD Yield Elongation (%)	16	16	16	18	18						**17**	1	12 min
MD Break Elongation (%)	395	415	375	454	469						**422**	39	100 min
TD Break Elongation (%)	515	534	484	469	506						**502**	26	100 min

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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GEOMEMBRANE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Agru 60 mil HDPE Microspike Geomembrane
Sample Identification: 213336.10
TRI Log #: E2341-13-01

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	59	60	62	65	68	67	67	64	61	63	**64**	3	60 avg
											59	<< min	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.942	0.942	0.942								**0.942**	0.000	0.94 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.14	2.14									**2.14**	0.00	2 - 3%
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1							9 of 10 Cat. 1 or 2	
Rating - 2nd field view	1	1	1	1	1							1 Cat 3	
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	159	166	167	181	179						**170**	9	126 min
TD Yield Strength (ppi)	184	179	165	187	174						**178**	9	126 min
MD Break Strength (ppi)	182	209	224	201	249						**213**	25	90 min
TD Break Strength (ppi)	196	119	171	198	192						**175**	33	90 min
MD Yield Elongation (%)	23	23	23	23	25						**23**	1	12 min
TD Yield Elongation (%)	18	18	18	18	18						**18**	0	12 min
MD Break Elongation (%)	405	484	424	429	470						**442**	33	100 min
TD Break Elongation (%)	495	131	488	539	538						**438**	173	100 min

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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Appendix

K

(5)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101 GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-1 THROUGH S-12

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
KEVIN LESLEY		"CQA. MGR"	4-28-10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Jorge Barrantes		Superintendent	4/28/10

ATLANTIC COAST CONSULTING, INC

(3)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101 GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-13 THROUGH S-30

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Kevin Lesley		"CQA. Mgr"	4-29-10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Jorge Barrantes		Superintendent	4/29/10

ATLANTIC COAST CONSULTING, INC

(5)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101 GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-31 THROUGH S-34

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

KEVIN LESLEY		CQA SITE MGR	4-30-10
NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

JORGE BARRANTES		Superintendent	4/30/10
NAME	SIGNATURE	TITLE	DATE

ATLANTIC COAST CONSULTING, INC

(3)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101

GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida

REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO S-28, S-35, S-36,

do hereby accept the area of soil surface bound by FIELD PANEL #'s S-27 ~~THROUGH~~ & S-37

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Kevin Lesley		"CQA. mgr"	5-3-10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Jorge Barrantes		Superintendent	5/3/10

ATLANTIC COAST CONSULTING, INC

5

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101

GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida

REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-38 THROUGH S-62

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

KEVIN LESLEY		CQA MGR	5-6-10
NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

Jorge Barrantes		Superintendent	5/6/10
NAME	SIGNATURE	TITLE	DATE

ATLANTIC COAST CONSULTING, INC

(5)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101 GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-63 THROUGH S-87

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

KEVIN LESLEY		CQA "SITE MGR"	5-7-10
NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

Jorge Barrientes		Superintendent	5/7/10
NAME	SIGNATURE	TITLE	DATE

ATLANTIC COAST CONSULTING, INC

(5)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101

GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida

REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-88 THROUGH S-96

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
KEVIN LESLEY		CQA SITEMGR	5-10-10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Jorge Tavantes		Superintendent	5/10/10

ATLANTIC COAST CONSULTING, INC

(3)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101

GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida

REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'s S-97 THROUGH S-111

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
KEVIN LESLEY		CQA. MGR	5-11-10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Jorge Barrantes		Superintendent	5/11/10

ATLANTIC COAST CONSULTING, INC

(5)

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101 GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'s S-112 THROUGH S-139

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

KEVIN LESLEY		CQA. SITE MGR	5-12-10
NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

Jorge Barrantes		Superintendent	5/12/10
NAME	SIGNATURE	TITLE	DATE

ATLANTIC COAST CONSULTING, INC

Seawalls →

CERTIFICATE OF ACCEPTANCE OF SOIL SURFACE

PROJECT NUMBER: A027.101

GEOSYNTHETIC INSTALLER: COMANCO

PROJECT TITLE: J.E.D. Facility - Cell 7 Construction

PROJECT LOCATION: Saint Cloud, Florida

REVIEWED BY: _____

I, the Undersigned, the duly authorized representative of COMANCO

do hereby accept the area of soil surface bound by FIELD PANEL #'S S-140 THROUGH S-166

and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the project.

NAME	SIGNATURE	TITLE	DATE

CERTIFICATE OF ACCEPTANCE RECEIVED BY CQA REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
KEVIN LESLEY		"CQA SITEMGR"	5-15-10

CERTIFICATE OF ACCEPTANCE RECEIVED BY OWNER'S REPRESENTATIVE

NAME	SIGNATURE	TITLE	DATE
Jorge Barrantes		Superintendent	5/15/10

ATLANTIC COAST CONSULTING, INC

Appendix

L

TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-06-09

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2957**
Material(s) Tested:	(2) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

http://www.geosyntheticstesting.com
9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: Environmental Planning Specialis

Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log#: 2957

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DPX-6 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	118	129	120	118	115	**120**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	152	155	157	154	156	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DPX-7 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	171	169	179	180	166	**173**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	169	171	171	178	175	**173**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

http://www.geosyntheticstesting.com
9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-06-07

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

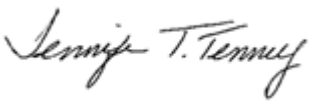
Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2940**
Material(s) Tested:	(14) Heat Fusion Weld Seam(s) (3) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

http://www.geosyntheticstesting.com
9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-47 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	132	131	131	133	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	152	155	133	150	146	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	166	163	161	163	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-48 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	125	134	131	125	126	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	144	150	155	142	144	**147**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	173	169	166	168	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-49 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	125	125	141	136	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	122	142	119	116	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	163	166	172	168	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-50 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	121	129	122	129	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	121	115	119	138	125	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	170	163	163	161	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-51 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	126	114	115	118	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	108	115	117	123	121	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	153	156	154	162	160	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-52 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	123	118	126	122	119	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	122	115	122	124	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	160	160	169	165	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-53 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	123	122	124	122	125	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	113	116	131	131	120	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	172	175	164	169	161	**168**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-54 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	115	135	126	119	123	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	121	121	128	114	112	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	161	162	164	168	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-55 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	135	136	130	138	138	**135**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	156	156	154	152	154	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	171	165	163	168	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-56 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	126	121	133	122	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	129	111	138	142	145	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	159	161	159	161	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-57 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	122	121	123	128	123	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	128	142	129	132	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	164	165	172	170	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-58 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	114	134	121	120	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	108	114	124	116	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	161	162	160	159	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-59 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	136	118	125	129	129	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	118	117	122	129	114	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	168	163	162	162	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-60 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	162	150	158	160	153	**157**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	122	123	123	129	126	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	166	162	164	168	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2940

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DPX-3 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	151	145	169	154	152	**154**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	167	172	168	172	**168**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DPX-4 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	109	159	104	125	140	**127**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	174	169	173	171	**171**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DPX-5 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	121	146	118	131	129	**129**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	164	161	163	159	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-28

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

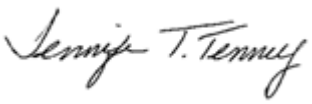
Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2893**
Material(s) Tested:	(17) Heat Fusion Weld Seam(s) (2) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-27 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	119	123	123	119	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	104	105	110	114	104	**107**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	164	162	158	161	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-30 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	105	115	116	117	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	122	119	118	121	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	162	157	161	155	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-32 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	120	120	120	125	114	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	120	118	108	108	**113**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	163	161	159	161	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-33 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	120	121	120	117	119	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	123	111	126	114	114	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	162	160	165	165	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-34 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	131	127	127	133	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	120	115	117	118	118	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	162	162	168	164	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-35 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	125	124	123	127	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	137	141	130	123	119	**130**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	173	178	168	170	169	**172**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-36 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	121	126	132	135	117	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	137	125	141	138	135	**135**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	171	168	166	171	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-37 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	125	127	124	126	122	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	134	123	129	121	126	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	162	161	165	165	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-38 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	115	126	121	118	119	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	119	113	109	114	**113**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	163	158	166	165	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-39 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	132	133	142	125	131	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	112	119	137	136	124	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	162	161	167	166	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-40 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	118	120	121	121	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	113	113	118	113	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	159	157	162	163	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-41 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	125	128	126	122	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	112	113	120	114	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	162	163	165	168	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-42 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	122	126	119	120	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	125	115	113	120	121	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	171	165	166	166	175	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-43 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	121	126	123	123	120	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	118	126	123	118	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	167	163	174	174	**168**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-44 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	150	124	124	123	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	160	160	115	159	116	**142**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	162	160	169	166	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-45 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	125	126	124	125	122	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	120	120	118	125	126	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	164	165	165	170	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-46 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	143	146	149	144	146	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	144	144	138	142	139	**141**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	158	160	158	166	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2893

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DXP-1 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	146	145	137	132	140	**140**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	164	165	173	171	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DXP-2 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	159	167	175	156	161	**164**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	157	157	158	162	**158**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-27

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2885**
Material(s) Tested:	(10) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer Tenney
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2885

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-20 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	122	122	132	125	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	116	121	123	112	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	154	156	161	157	160	**158**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-21 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	128	132	127	126	131	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	140	134	142	131	143	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	151	152	153	159	160	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2885

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-22 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	118	125	135	134	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	112	126	125	127	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	159	160	165	161	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-23 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	124	116	123	126	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	128	118	120	112	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	164	165	161	160	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2885

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-24 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	127	129	137	126	**130**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	118	124	122	138	119	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	163	156	163	158	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-25 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	123	136	125	111	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	127	116	133	124	127	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	155	167	162	162	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2885

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-26 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	131	103	105	128	125	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	118	126	118	133	122	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	164	160	161	160	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-28 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	122	103	119	111	99	**111**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	114	115	117	112	114	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	163	160	171	163	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2885

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-29 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	123	132	113	137	138	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	113	134	119	130	130	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	161	166	159	160	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-31 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	134	114	108	129	116	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	127	117	120	116	111	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	171	162	162	168	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-26

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2874**
Material(s) Tested:	(19) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	150	140	143	137	148	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	113	110	113	110	**113**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	161	157	160	166	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-2 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	132	121	126	129	124	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	113	148	132	114	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	164	161	163	158	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-3 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	130	137	133	135	137	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	133	132	132	130	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	167	166	172	174	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	130	120	117	122	114	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	123	130	129	129	128	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	163	164	170	163	**166**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-5 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	110	125	115	128	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	127	113	115	130	117	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	159	157	159	160	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	126	124	120	106	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	106	106	128	112	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	158	157	157	159	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	126	124	120	118	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	138	128	128	124	128	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	155	151	161	157	157	**156**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	120	117	116	139	103	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	122	118	106	114	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	157	160	165	161	163	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-9 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	128	131	121	131	133	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	122	113	115	118	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	153	160	156	155	**156**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-10 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	120	131	131	126	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	125	118	125	126	126	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	167	159	160	159	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-11 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	153	99	157	155	164	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	131	132	127	110	115	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	168	157	160	155	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-12 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	134	135	135	128	124	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	130	115	117	110	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	161	157	157	155	**158**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-13 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	128	127	137	133	122	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	124	129	124	124	118	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	163	157	160	160	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-14 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	117	114	126	108	108	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	122	123	119	118	117	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	156	162	156	160	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-15 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	113	125	102	130	133	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	105	108	111	120	106	**110**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	159	157	163	156	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-16 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	117	111	115	106	104	**111**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	112	116	109	112	**112**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	155	163	158	159	161	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-17 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	120	117	124	125	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	120	129	130	120	130	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	163	159	159	160	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DP-18 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	132	134	132	131	120	**130**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	114	118	117	111	110	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	160	159	163	159	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2874

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DP-19 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	131	128	138	132	128	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	122	126	116	125	138	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	161	161	171	168	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-21

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2841**
Material(s) Tested:	(1) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2841

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-44A1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	123	114	138	127	112	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	130	124	132	118	117	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	169	171	180	180	177	**175**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
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Date: 2010-05-20

Mail To:
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Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

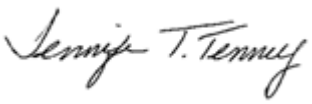
Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2837**
Material(s) Tested:	(3) Heat Fusion Weld Seam(s) (2) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Jennifer Tenney
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2837

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-58 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	124	131	127	133	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	134	146	137	132	141	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	171	171	170	175	174	**172**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-59 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	115	117	119	131	120	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	140	126	133	125	132	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	175	174	171	178	179	**175**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2837

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-60 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	110	108	125	129	129	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	100	137	136	113	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	172	177	173	176	177	**175**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: Environmental Planning Specialis

Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log#: 2837

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-12 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	114	134	124	130	121	**125**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	171	174	163	164	162	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-13 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	134	124	117	117	119	**122**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	167	168	168	176	169	**170**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-19

Mail To:
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Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2828**
Material(s) Tested:	(15) Heat Fusion Weld Seam(s) (2) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer Tenney
Project Manager
Geosynthetic Services Division
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-44A | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	114	121	135	113	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	80	83	98	79	99	**88**
Peel Incursion (%)	100	100	100	100	20	
Peel Locus Of Failure Code	AD	AD	AD	AD	AD-BRK	
Peel NSF Failure Code	NON-FTB	NON-FTB	NON-FTB	NON-FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	161	165	168	161	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-44B | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	125	108	127	112	121	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	120	127	120	114	116	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	172	174	171	179	178	**175**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-45 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	126	127	125	126	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	118	116	121	118	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	177	177	173	173	178	**176**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-46 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	117	127	124	126	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	126	118	120	115	120	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	171	171	172	173	**171**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-47 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	114	118	117	126	121	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	113	126	123	115	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	165	165	174	169	**168**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-48 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	123	122	135	116	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	139	122	140	147	124	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	167	163	161	162	170	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-49 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	133	126	117	122	125	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	113	119	122	108	113	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	173	175	172	179	177	**175**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-50 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	122	107	117	107	125	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	110	115	119	115	110	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	165	164	170	169	**166**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-51 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	123	116	125	106	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	126	120	131	128	119	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	160	162	166	166	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-52 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	113	133	113	120	108	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	120	115	127	114	117	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	167	169	176	174	**170**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-53 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	121	124	123	123	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	108	123	122	120	112	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	170	168	164	166	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-54 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	98	91	110	104	91	**99**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	114	110	110	95	109	**108**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	163	167	172	164	**166**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-55 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	113	107	124	112	126	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	112	113	112	121	119	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	162	162	170	165	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-56 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	148	156	148	167	152	**154**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	149	115	157	144	**142**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	163	165	167	168	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-57 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	123	138	128	125	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	134	122	120	145	121	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	170	171	179	174	**172**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2828

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-10 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	133	143	152	146	131	**141**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	169	166	166	165	**166**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-11 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	130	132	145	134	123	**133**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	157	164	162	167	162	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-14

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

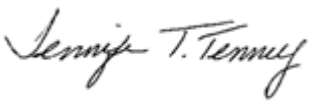
Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2799**
Material(s) Tested:	(7) Heat Fusion Weld Seam(s) (3) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2799

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-38 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	115	118	114	123	115	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	115	117	115	116	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	174	169	170	175	**171**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-39 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	114	111	111	122	124	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	126	133	132	127	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	174	190	175	187	182	**182**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2799

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-40 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	126	115	124	112	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	126	106	107	119	110	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	172	169	164	170	**167**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-41 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	112	133	121	122	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	107	114	124	111	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	170	170	174	172	**171**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2799

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-42 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	123	118	114	108	118	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	115	131	140	104	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	165	165	169	163	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-43 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	121	126	124	131	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	122	118	121	125	111	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	165	162	171	163	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2799

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-44 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	114	121	123	117	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	130	59	56	107	126	**96**
Peel Incursion (%)	<5	100	100	85	<5	
Peel Locus Of Failure Code	SE	AD	AD	AD-BRK	SE	
Peel NSF Failure Code	FTB	NON-FTB	NON-FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	165	161	164	160	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2799

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-6 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	102	119	128	151	99	**120**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	157	162	158	168	164	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-7 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	143	137	139	151	147	**143**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	166	165	167	164	164	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-9 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	139	135	122	112	117	**125**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	165	171	174	172	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-12

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2785**
Material(s) Tested:	(17) Heat Fusion Weld Seam(s) (2) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-21 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	142	144	139	149	148	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	134	145	149	149	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	156	155	155	161	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-22 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	143	149	149	157	162	**152**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	130	131	135	135	126	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	164	161	161	162	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-23 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	144	148	141	145	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	156	149	150	131	143	**146**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	160	158	164	163	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-24 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	116	119	122	121	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	108	120	97	110	116	**110**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	159	160	162	161	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-25 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	133	117	115	120	109	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	141	125	127	144	**130**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	157	160	159	161	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-26 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	114	116	123	117	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	145	163	153	153	150	**153**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	159	158	165	163	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-27 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	109	118	119	121	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	116	119	117	114	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	153	157	155	162	160	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-28 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	114	121	124	118	113	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	109	99	127	100	**111**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	158	161	158	162	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-29 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	114	128	123	126	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	125	124	123	120	123	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	160	161	165	165	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-30 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	122	125	119	142	133	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	115	124	113	115	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	154	157	159	160	157	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-31 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	135	123	95	119	119	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	118	116	119	116	110	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	157	158	162	160	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-32 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	130	128	136	134	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	108	113	114	118	103	**111**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	159	156	165	160	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-33 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	121	119	122	125	119	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	121	123	125	124	125	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	162	161	170	167	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-34 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	115	118	125	120	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	125	112	116	110	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	157	158	164	162	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-35 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	126	118	121	128	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	122	117	116	111	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	161	161	169	167	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-36 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	129	115	131	130	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	125	131	139	109	128	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	166	162	171	164	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-37 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	133	133	132	134	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	119	115	115	109	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	163	157	156	161	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60 HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2785

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-5 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	115	141	128	138	139	**132**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	168	171	172	175	175	**172**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-7 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	125	110	102	118	109	**113**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	172	164	165	168	**166**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-10

Mail To:
Kirk Will
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Will,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**2773**
Material(s) Tested:	(3) Heat Fusion Weld Seam(s) (1) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Environmental Planning Specialis
Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2773

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-18 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	117	117	115	115	114	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	115	113	114	119	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	163	166	162	163	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-19 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	130	135	126	137	131	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	131	135	126	131	127	**130**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	154	155	151	152	156	**154**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Environmental Planning Specialis

Project: JED-Solid Waste Management Facility - CELL7

Material: 60mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log#: 2773

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-20 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	137	131	139	131	137	**135**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	144	121	125	134	111	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	171	170	169	167	171	**170**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: Environmental Planning Specialis

Project: JED-Solid Waste Management Facility - CELL7

Material: 60 HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log#: 2773

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-4 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	141	145	160	155	157	**152**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	176	177	174	177	174	**176**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-04

Mail To:
KIRK WILLS
ENVIRONMENTAL PLANNING SPECIALIS
1936 BRUCE B. DOWN Blvd. NO. 328
WESLEY CAPEL , FL , 33543

Bill To:

ENVIRONMENTAL PLANNING SPECIALIS

e-mail:
kwills@envplanning.com kirkwills@verizon.net

Dear WILLS,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-SOLID WASTE MANAGEMENT FACILITY CELL7**
TRI Job Reference Number:	**2746**
Material(s) Tested:	(7) Heat Fusion Weld Seam(s) (3) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2746

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-12 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	117	120	109	107	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	147	140	150	106	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	154	163	164	161	163	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-13 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	132	129	131	135	140	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	155	156	150	152	165	**156**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	157	160	160	161	159	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2746

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-14 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	122	136	130	125	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	129	123	127	110	130	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	163	164	167	169	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-15A | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	116	116	115	112	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	117	110	106	107	**111**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	165	162	167	166	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2746

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-15B | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	114	116	123	116	125	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	108	119	124	127	118	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	168	163	160	169	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-16 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	113	132	118	113	116	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	129	128	116	121	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	162	161	165	164	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2746

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-17 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	120	116	114	106	110	**113**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	118	110	99	108	120	**111**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	162	164	167	165	**165**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60 HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2746

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DX-1 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	147	144	139	152	144	**145**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	153	153	153	158	155	**154**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-2 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	154	129	154	139	139	**143**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	155	156	157	157	157	**156**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DX-3 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	123	110	127	123	119	**120**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	155	159	158	163	162	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-05-03

Mail To:
KIRK WILLS
ENVIRONMENTAL PLANNING SPECIALIS
1936 BRUCE B. DOWN Blvd. NO. 328
WESLEY CAPEL , FL , 33543

Bill To:

ENVIRONMENTAL PLANNING SPECIALIS

e-mail:
kwills@envplanning.com kirkwills@verizon.net

Dear WILLS,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-SOLID WASTE MANAGEMENT FACILITY CELL7**
TRI Job Reference Number:	**2735**
Material(s) Tested:	(10) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

http://www.geosyntheticstesting.com
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2735

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	125	125	127	126	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	131	130	135	128	**128**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	168	170	170	166	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-2 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	130	126	128	124	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	124	121	126	121	109	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	170	168	169	164	**168**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2735

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	119	117	120	119	119	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	120	117	108	121	110	**115**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	163	167	162	158	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-5 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	152	123	126	131	124	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	141	132	132	137	124	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	174	169	168	169	172	**170**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2735

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	114	126	128	120	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	113	118	114	127	114	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	170	166	169	168	170	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	141	146	123	130	131	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	125	116	122	123	122	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	165	162	162	165	161	**163**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2735

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	123	120	123	127	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	134	140	131	130	131	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	169	168	168	171	167	**169**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-9 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	128	127	131	125	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	122	125	128	123	122	**124**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	164	163	166	166	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: ENVIRONMENTAL PLANNING SPECIALIS
Project: JED-SOLID WASTE MANAGEMENT FACILITY CELL7

Material: 60mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log#: 2735

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-10 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	126	126	123	125	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	122	120	120	130	123	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	166	164	168	166	**166**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-11 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	129	117	123	114	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	125	133	126	141	126	**130**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	161	161	166	162	**162**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI/Environmental, Inc.
A Texas Research International Company

Date: 2010-06-15

Mail To:
Kirk Wills
Environmental Planning Specialis
1936 Bruce B. Down Blvd., #328
Wesley Chapel , FL , 33543

Bill To:

Environmental Planning Specialis

e-mail:
kwills@envplanning.com kirkwills@verizon.net klesley@atlcc.net

Dear Wills,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility - CELL7**
TRI Job Reference Number:	**3014**
Material(s) Tested:	(1) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jennifer T. Tenney

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

http://www.geosyntheticstesting.com
9063 Bee Caves Road / Austin, Tx. 78733 / 512.263.2101 / fax: 512.263.2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: Environmental Planning Specialis

Project: JED-Solid Waste Management Facility - CELL7

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log#: 3014

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DPX-8 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	150	165	151	152	160	**156**
Peel Incursion (%)	<5%	<5%	<5%	<5%	<5%	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	152	150	149	161	162	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Appendix M

SKAPS Industries

Engineered Synthetic Products, Inc.

June 14, 2010
Waste Services

Ref. : JED Vertical Expansion, FL
Customer P.O. # JED-A
Transnet 330-2-8

We certify that the Transnet 330-2-8 drainage composite, meets the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Required Value	Qualifier
Geonet[4]				
Mass per Unit Area	ASTM D 5261	lbs/ft^2	0.300	Minimum
Thickness	ASTM D 5199	mil	330 $\pm$ 30	Range
Carbon Black	ASTM D 4218	%	2.0 - 3.0	Range
Tensile Strength	ASTM D 5035	lbs/in	90	Minimum
Melt Flow	ASTM D 1238[3]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm^3	0.93	Minimum
Composite				
Ply Adhesion	ASTM D 7005	lb/in	1.0	MARV[6]
Transmissivity[1]	ASTM D 4716	m^2/sec	1.5 x 10^{-3}	MARV
Transmissivity[2]	ASTM D 4716	m^2/sec	1.0 x 10^{-3}	MARV
Geotextile[4 & 5]				
Fabric Weight	ASTM D 5261	oz/yd^2	8.0	MARV
Grab Strength	ASTM D 4632	lbs	200	MARV
Tear Strength	ASTM D 4533	lbs	75	MARV
CBR Puncture	ASTM D 6241	lbs	500	MARV
Permittivity	ASTM D 4491	sec^{-1}	0.5	MARV
AOS	ASTM D 4751	US Sieve	80	MARV
UV Resistance	ASTM D 4355	%/hrs	70/500	MARV

Notes:

1 Transmissivity measured using water at 21 $\pm$ 2 ^{o}C (70 $\pm$ 4 ^{o}F) with a gradient of 0.02 and a confining pressure of 500 psf between soil & textured geomembrane after 24 hours.

2 Transmissivity measured using water at 21 $\pm$ 2 ^{o}C (70 $\pm$ 4 ^{o}F) with a gradient of 0.02 and a confining pressure of 15000 psf between soil & textured geomembrane after 100 hours.

3 Condition 190/2.16

4 Geotextile and Geonet properties are prior to lamination.

5 Geotextile data is provided by the supplier.

6 MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.

Sincerely,

Nilay Patel

Nilay Patel
QA Manager

571 Industrial Parkway, Commerce, GA 30529 **Phone**: 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	375710001	375710001 - N	3757.002	3757.001	1.32	3.24	
2	375710002	375710002 - N	3757.002	3757.001			
3	375710003	375710003 - N	3757.002	3757.001			
4	375710004	375710004 - N	3757.002	3757.001			
5	375710005	375710005 - N	3757.002	3757.001			
6	375710006	375710006 - N	3757.002	3757.001			
7	375710007	375710007 - N	3757.002	3757.001			
8	375710008	375710008 - N	3757.004	3757.003			
9	375710009	375710009 - N	3757.004	3757.003			
10	375710010	375710010 - N	3757.004	3757.003	1.26	3.11	
11	375710011	375710011 - N	3757.004	3757.003			

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby certify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
375710001 - N	CEFX53866	0.9552	0.361	318	2.75	114	
375710002 - N	CEFX53866	0.9552					
375710003 - N	CEFX53866	0.9552					
375710004 - N	CEFX53866	0.9552					
375710005 - N	CEFX53866	0.9552					
375710006 - N	CEFX53866	0.9552					
375710007 - N	CEFX53866	0.9552					
375710008 - N	CEFX53866	0.9552					
375710009 - N	CEFX53866	0.9552					
375710010 - N	CEFX53866	0.9552	0.355	315	2.61	110	
375710011 - N	CEFX53866	0.9552					

APPROVED 5 QA

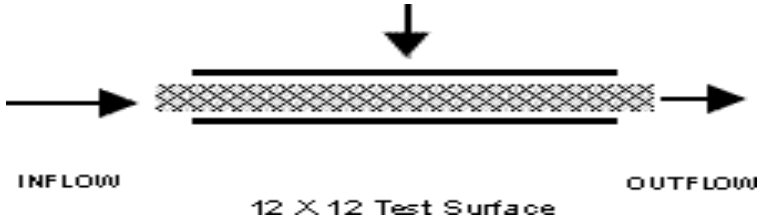
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Waste Services	**Job #**	3757
Project:	JED Vertical Expansion, FL		
Product:	TN330-2-8		
Roll #	375710001		

Test Configuration:



Test Information:

Boundary Conditions:	Soil Geocomposite Textured Geomembrane	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	500 psf 0.02 ft 24 hours MD

Test Results:

Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec
		24 hours
500	0.02	2.11×10^{-3}

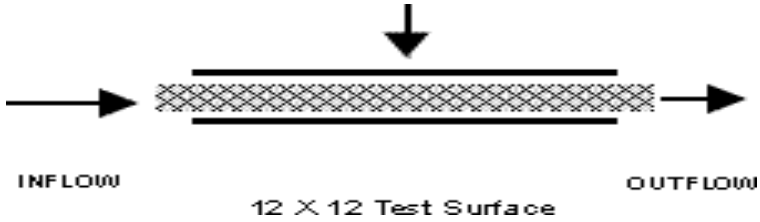
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Waste Services	**Job #**	3757
Project:	JED Vertical Expansion, FL		
Product:	TN330-2-8		
Roll #	375710001		

Test Configuration:



Test Information:

Boundary Conditions:	Soil Geocomposite Textured Geomembrane	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	15000 psf 0.02 ft 100 hours MD

Test Results:

Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec 100 hours
15000	0.02	Results Pending

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Waste Services
Project Name : JED Vertical Expansion, FL
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN330-2-8

We, the Geonet Manufacturer, hereby certify the following for the material delivered to the above referenced project:

Resin Supplier	Resin Production Plant	Resin Brand Name	Resin Lot Number	Property	Test Method	Units	Resin Supplier Value	Tested Value*
Trademark Plastics Corporation	Chevron, TX	HDPE	CEFX53866	Density	ASTM D 1505	gm/cc	0.950	0.950
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.25	0.26

(a) Condition 190/2.16
* Data from SKAPS Quality Control

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN330-2-8
Project : JED Vertical Expansion, FL

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL#	FABRIC ROLL#	WEIGHT oz/sq yd	MD TENSILE lbs.	XMD TENSILE lbs.	MD TRAP lbs.	XMD TRAP lbs.	CBR PUNCTURE lbs.	AOS us sieve	PERM-ITY sec^{-1}
375710001	3757.002	8.42	229	243	102	115	672	80	1.35
	3757.001	8.42	229	243	102	115	672	80	1.35

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SKAPS Industries

Engineered Synthetic Products, Inc.

April 8, 2010
Waste Services

Ref. : JED Vertical Expansion, FL
Customer P.O. #
Transnet 330-2-8

We certify that the Transnet 330-2-8 drainage composite, meets the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Required Value	Qualifier
Geonet[4]				
Mass per Unit Area	ASTM D 5261	lbs/ft^2	0.300	Minimum
Thickness	ASTM D 5199	mil	330 $\pm$ 30	Range
Carbon Black	ASTM D 4218	%	2.0 - 3.0	Range
Tensile Strength	ASTM D 5035	lbs/in	90	Minimum
Melt Flow	ASTM D 1238[3]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm^3	0.93	Minimum
Composite				
Ply Adhesion	ASTM D 7005	lb/in	1.0	MARV[6]
Transmissivity[1]	ASTM D 4716	m^2/sec	1.5 x 10^{-3}	MARV
Transmissivity[2]	ASTM D 4716	m^2/sec	1.0 x 10^{-3}	MARV
Geotextile[4 & 5]				
Fabric Weight	ASTM D 5261	oz/yd^2	8.0	MARV
Grab Strength	ASTM D 4632	lbs	200	MARV
Tear Strength	ASTM D 4533	lbs	75	MARV
CBR Puncture	ASTM D 6241	lbs	500	MARV
Permittivity	ASTM D 4491	sec^{-1}	0.5	MARV
AOS	ASTM D 4751	US Sieve	80	MARV
UV Resistance	ASTM D 4355	%/hrs	70/500	MARV

Notes:

1 Transmissivity measured using water at 21 $\pm$ 2 ^{o}C (70 $\pm$ 4 ^{o}F) with a gradient of 0.02 and a confining pressure of 500 psf between soil & textured geomembrane after 24 hours.

2 Transmissivity measured using water at 21 $\pm$ 2 ^{o}C (70 $\pm$ 4 ^{o}F) with a gradient of 0.02 and a confining pressure of 15000 psf between soil & textured geomembrane after 100 hours.

3 Condition 190/2.16

4 Geotextile and Geonet properties are prior to lamination.

5 Geotextile data is provided by the supplier.

6 MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.

Sincerely,

Nilay Patel

Nilay Patel
QA Manager

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Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510001	359510001 - N	3595.053	3595.011	1.27	3.09	
2	359510002	359510002 - N	3595.053	3595.011			
3	359510003	359510003 - N	3595.053	3595.011			
4	359510004	359510004 - N	3595.053	3595.011			
5	359510005	359510005 - N	3595.053	3595.011			
6	359510006	359510006 - N	3595.053	3595.011			
7	359510007	359510007 - N	3595.053	3595.011			
8	359510008	359510008 - N	3595.069	3595.081			
9	359510009	359510009 - N	3595.069	3595.081			
10	359510010	359510010 - N	3595.069	3595.081			
11	359510011	359510011 - N	3595.069	3595.081			
12	359510012	359510012 - N	3595.069	3595.081			
13	359510013	359510013 - N	3595.069	3595.081			
14	359510014	359510014 - N	3595.069	3595.081			
15	359510015	359510015 - N	3595.078	3595.072	1.29	3.26	
16	359510016	359510016 - N	3595.078	3595.072			
17	359510017	359510017 - N	3595.078	3595.072			
18	359510018	359510018 - N	3595.078	3595.072			
19	359510019	359510019 - N	3595.078	3595.072			
20	359510020	359510020 - N	3595.078	3595.072			
21	359510021	359510021 - N	3595.078	3595.072			
22	359510022	359510022 - N	3595.065	3595.077			
23	359510023	359510023 - N	3595.065	3595.077			
24	359510024	359510024 - N	3595.065	3595.077			
25	359510025	359510025 - N	3595.065	3595.077			
26	359510026	359510026 - N	3595.065	3595.077			
27	359510027	359510027 - N	3595.065	3595.077			

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Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510001 - N	PSPX002052	0.9575	0.355	313	2.27	110	
359510002 - N	PSPX002052	0.9575					
359510003 - N	PSPX002052	0.9575					
359510004 - N	PSPX002052	0.9575					
359510005 - N	PSPX002052	0.9575					
359510006 - N	PSPX002052	0.9575					
359510007 - N	PSPX002052	0.9575					
359510008 - N	PSPX002052	0.9575					
359510009 - N	PSPX002052	0.9575					
359510010 - N	PSPX002052	0.9575					
359510011 - N	PSPX002052	0.9575					
359510012 - N	PSPX002052	0.9575					
359510013 - N	PSPX002052	0.9575					
359510014 - N	PSPX002052	0.9575					
359510015 - N	PSPX002052	0.9577	0.359	317	2.55	112	
359510016 - N	PSPX002052	0.9577					
359510017 - N	PSPX002052	0.9577					
359510018 - N	PSPX002052	0.9577					
359510019 - N	PSPX002052	0.9577					
359510020 - N	PSPX002052	0.9577					
359510021 - N	PSPX002052	0.9577					
359510022 - N	PSPX002052	0.9577					
359510023 - N	PSPX002052	0.9577					
359510024 - N	PSPX002052	0.9577					
359510025 - N	PSPX002052	0.9577					
359510026 - N	PSPX002052	0.9577					
359510027 - N	PSPX002052	0.9577					

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Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510028	359510028 - N	3595.065	3595.077			
2	359510029	359510029 - N	3595.080	3595.068			
3	359510030	359510030 - N	3595.080	3595.068	1.23	3.15	
4	359510031	359510031 - N	3595.080	3595.068			
5	359510032	359510032 - N	3595.080	3595.068			
6	359510033	359510033 - N	3595.080	3595.068			
7	359510034	359510034 - N	3595.080	3595.068			
8	359510035	359510035 - N	3595.080	3595.068			
9	359510036	359510036 - N	3595.071	3595.079			
10	359510037	359510037 - N	3595.071	3595.079			
11	359510038	359510038 - N	3595.071	3595.079			
12	359510039	359510039 - N	3595.071	3595.079			
13	359510040	359510040 - N	3595.071	3595.079			
14	359510041	359510041 - N	3595.071	3595.079			
15	359510042	359510042 - N	3595.071	3595.079			
16	359510043	359510043 - N	3595.076	3595.070			
17	359510044	359510044 - N	3595.076	3595.070			
18	359510045	359510045 - N	3595.076	3595.070	1.31	3.31	
19	359510046	359510046 - N	3595.076	3595.070			
20	359510047	359510047 - N	3595.076	3595.070			
21	359510048	359510048 - N	3595.076	3595.070			
22	359510049	359510049 - N	3595.076	3595.070			
23	359510050	359510050 - N	3595.067	3595.075			
24	359510051	359510051 - N	3595.067	3595.075			
25	359510052	359510052 - N	3595.067	3595.075			
26	359510053	359510053 - N	3595.067	3595.075			
27	359510054	359510054 - N	3595.067	3595.075			



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We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510028 - N	PSPX002052	0.9577					
359510029 - N	PSPX002052	0.9577					
359510030 - N	PSPX002052	0.9573	0.357	315	2.35	108	
359510031 - N	PSPX002052	0.9573					
359510032 - N	PSPX002052	0.9573					
359510033 - N	PSPX002052	0.9573					
359510034 - N	PSPX002052	0.9573					
359510035 - N	PSPX002052	0.9573					
359510036 - N	PSPX002052	0.9573					
359510037 - N	PSPX002052	0.9573					
359510038 - N	PSPX002052	0.9573					
359510039 - N	PSPX002052	0.9573					
359510040 - N	PSPX002052	0.9573					
359510041 - N	PSPX002052	0.9573					
359510042 - N	PSPX002052	0.9573					
359510043 - N	PSPX002052	0.9573					
359510044 - N	PSPX002052	0.9573					
359510045 - N	PSPX002052	0.9579	0.361	319	2.76	114	
359510046 - N	PSPX002052	0.9579					
359510047 - N	PSPX002052	0.9579					
359510048 - N	PSPX002052	0.9579					
359510049 - N	PSPX002052	0.9579					
359510050 - N	PSPX002052	0.9579					
359510051 - N	PSPX002052	0.9579					
359510052 - N	PSPX002052	0.9579					
359510053 - N	PSPX002052	0.9579					
359510054 - N	PSPX002052	0.9579					



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We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510055	359510055 - N	3595.067	3595.075			
2	359510056	359510056 - N	3595.067	3595.075			
3	359510057	359510057 - N	3595.101	3595.085			
4	359510058	359510058 - N	3595.101	3595.085			
5	359510059	359510059 - N	3595.101	3595.085			
6	359510060	359510060 - N	3595.101	3595.085	1.25	3.07	
7	359510061	359510061 - N	3595.101	3595.085			
8	359510062	359510062 - N	3595.101	3595.085			
9	359510063	359510063 - N	3595.101	3595.085			
10	359510064	359510064 - N	3595.073	3595.104			
11	359510065	359510065 - N	3595.073	3595.104			
12	359510066	359510066 - N	3595.073	3595.104			
13	359510067	359510067 - N	3595.073	3595.104			
14	359510068	359510068 - N	3595.073	3595.104			
15	359510069	359510069 - N	3595.073	3595.104			
16	359510070	359510070 - N	3595.073	3595.104			
17	359510071	359510071 - N	3595.107	3595.074			
18	359510072	359510072 - N	3595.107	3595.074			
19	359510073	359510073 - N	3595.107	3595.074			
20	359510074	359510074 - N	3595.107	3595.074			
21	359510075	359510075 - N	3595.107	3595.074	1.28	3.24	
22	359510076	359510076 - N	3595.107	3595.074			
23	359510077	359510077 - N	3595.107	3595.074			
24	359510078	359510078 - N	3595.066	3595.100			
25	359510079	359510079 - N	3595.066	3595.100			
26	359510080	359510080 - N	3595.066	3595.100			
27	359510081	359510081 - N	3595.066	3595.100			



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We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510055 - N	PSPX002052	0.9579					
359510056 - N	PSPX002052	0.9579					
359510057 - N	PSPX002052	0.9579					
359510058 - N	PSPX002052	0.9579					
359510059 - N	PSPX002052	0.9579					
359510060 - N	PSPX002052	0.9571	0.352	310	2.43	111	
359510061 - N	PSPX002052	0.9571					
359510062 - N	PSPX002052	0.9571					
359510063 - N	PSPX002052	0.9571					
359510064 - N	PSPX002052	0.9571					
359510065 - N	PSPX002052	0.9571					
359510066 - N	PSPX002052	0.9571					
359510067 - N	PSPX002052	0.9571					
359510068 - N	PSPX002052	0.9571					
359510069 - N	PSPX002052	0.9571					
359510070 - N	PSPX002052	0.9571					
359510071 - N	PSPX002052	0.9571					
359510072 - N	PSPX002052	0.9571					
359510073 - N	PSPX002052	0.9571					
359510074 - N	PSPX002052	0.9571					
359510075 - N	PSPX002052	0.9581	0.358	316	2.66	113	
359510076 - N	PSPX002052	0.9581					
359510077 - N	PSPX002052	0.9581					
359510078 - N	PSPX002052	0.9581					
359510079 - N	PSPX002052	0.9581					
359510080 - N	PSPX002052	0.9581					
359510081 - N	PSPX002052	0.9581					

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We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510082	359510082 - N	3595.066	3595.100			
2	359510083	359510083 - N	3595.066	3595.100			
3	359510084	359510084 - N	3595.066	3595.100			
4	359510085	359510085 - N	3595.030	3595.008			
5	359510086	359510086 - N	3595.030	3595.008			
6	359510087	359510087 - N	3595.030	3595.008			
7	359510088	359510088 - N	3595.030	3595.008			
8	359510089	359510089 - N	3595.030	3595.008			
9	359510090	359510090 - N	3595.030	3595.008	1.22	3.13	
10	359510091	359510091 - N	3595.030	3595.008			
11	359510092	359510092 - N	3595.086	3595.106			
12	359510093	359510093 - N	3595.086	3595.106			
13	359510094	359510094 - N	3595.086	3595.106			
14	359510095	359510095 - N	3595.086	3595.106			
15	359510096	359510096 - N	3595.086	3595.106			
16	359510097	359510097 - N	3595.086	3595.106			
17	359510098	359510098 - N	3595.086	3595.106			
18	359510099	359510099 - N	3595.099	3595.083			
19	359510100	359510100 - N	3595.099	3595.083			
20	359510101	359510101 - N	3595.099	3595.083			
21	359510102	359510102 - N	3595.099	3595.083			
22	359510103	359510103 - N	3595.099	3595.083			
23	359510104	359510104 - N	3595.099	3595.083			
24	359510105	359510105 - N	3595.099	3595.083	1.32	3.30	
25	359510106	359510106 - N	3595.090	3595.102			
26	359510107	359510107 - N	3595.090	3595.102			
27	359510108	359510108 - N	3595.090	3595.102			

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We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510082 - N	PSPX002052	0.9581					
359510083 - N	PSPX002052	0.9581					
359510084 - N	PSPX002052	0.9581					
359510085 - N	PSPX002052	0.9581					
359510086 - N	PSPX002052	0.9581					
359510087 - N	PSPX002052	0.9581					
359510088 - N	PSPX002052	0.9581					
359510089 - N	PSPX002052	0.9581					
359510090 - N	PSPX002052	0.9576	0.354	312	2.29	109	
359510091 - N	PSPX002052	0.9576					
359510092 - N	PSPX002052	0.9576					
359510093 - N	PSPX002052	0.9576					
359510094 - N	PSPX002052	0.9576					
359510095 - N	PSPX002052	0.9576					
359510096 - N	PSPX002052	0.9576					
359510097 - N	PSPX002052	0.9576					
359510098 - N	PSPX002052	0.9576					
359510099 - N	PSPX002052	0.9576					
359510100 - N	PSPX002052	0.9576					
359510101 - N	PSPX002052	0.9576					
359510102 - N	PSPX002052	0.9576					
359510103 - N	PSPX002052	0.9576					
359510104 - N	PSPX002052	0.9576					
359510105 - N	PSPX002052	0.9578	0.363	318	2.82	115	
359510106 - N	PSPX002052	0.9578					
359510107 - N	PSPX002052	0.9578					
359510108 - N	PSPX002052	0.9578					



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Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510109	359510109 - N	3595.090	3595.102			
2	359510110	359510110 - N	3595.090	3595.102			
3	359510111	359510111 - N	3595.090	3595.102			
4	359510112	359510112 - N	3595.090	3595.102			
5	359510113	359510113 - N	3595.105	3595.087			
6	359510114	359510114 - N	3595.105	3595.087			
7	359510115	359510115 - N	3595.105	3595.087			
8	359510116	359510116 - N	3595.105	3595.087			
9	359510117	359510117 - N	3595.105	3595.087			
10	359510118	359510118 - N	3595.105	3595.087			
11	359510119	359510119 - N	3595.105	3595.087			
12	359510120	359510120 - N	3595.092	3595.098	1.26	3.05	
13	359510121	359510121 - N	3595.092	3595.098			
14	359510122	359510122 - N	3595.092	3595.098			
15	359510123	359510123 - N	3595.092	3595.098			
16	359510124	359510124 - N	3595.092	3595.098			
17	359510125	359510125 - N	3595.092	3595.098			
18	359510126	359510126 - N	3595.092	3595.098			
19	359510127	359510127 - N	3595.103	3595.093			
20	359510128	359510128 - N	3595.103	3595.093			
21	359510129	359510129 - N	3595.103	3595.093			
22	359510130	359510130 - N	3595.103	3595.093			
23	359510131	359510131 - N	3595.103	3595.093			
24	359510132	359510132 - N	3595.103	3595.093			
25	359510133	359510133 - N	3595.103	3595.093			
26	359510134	359510134 - N	3595.084	3595.108			
27	359510135	359510135 - N	3595.084	3595.108	1.30	3.28	

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571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510109 - N	PSPX002052	0.9578					
359510110 - N	PSPX002052	0.9578					
359510111 - N	PSPX002052	0.9578					
359510112 - N	PSPX002052	0.9578					
359510113 - N	PSPX002052	0.9578					
359510114 - N	PSPX002052	0.9578					
359510115 - N	PSPX002052	0.9578					
359510116 - N	PSPX002052	0.9578					
359510117 - N	PSPX002052	0.9578					
359510118 - N	PSPX002052	0.9578					
359510119 - N	PSPX002052	0.9578					
359510120 - N	PSPX002052	0.9572	0.356	314	2.37	108	
359510121 - N	PSPX002052	0.9572					
359510122 - N	PSPX002052	0.9572					
359510123 - N	PSPX002052	0.9572					
359510124 - N	PSPX002052	0.9572					
359510125 - N	PSPX002052	0.9572					
359510126 - N	PSPX002052	0.9572					
359510127 - N	PSPX002052	0.9572					
359510128 - N	PSPX002052	0.9572					
359510129 - N	PSPX002052	0.9572					
359510130 - N	PSPX002052	0.9572					
359510131 - N	PSPX002052	0.9572					
359510132 - N	PSPX002052	0.9572					
359510133 - N	PSPX002052	0.9572					
359510134 - N	PSPX002052	0.9572					
359510135 - N	PSPX002052	0.9580	0.360	320	2.57	112	



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Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510136	359510136 - N	3595.084	3595.108			
2	359510137	359510137 - N	3595.084	3595.108			
3	359510138	359510138 - N	3595.084	3595.108			
4	359510139	359510139 - N	3595.084	3595.108			
5	359510140	359510140 - N	3595.084	3595.108			
6	359510141	359510141 - N	3595.097	3595.091			
7	359510142	359510142 - N	3595.097	3595.091			
8	359510143	359510143 - N	3595.097	3595.091			
9	359510144	359510144 - N	3595.097	3595.091			
10	359510145	359510145 - N	3595.097	3595.091			
11	359510146	359510146 - N	3595.097	3595.091			
12	359510147	359510147 - N	3595.097	3595.091			
13	359510148	359510148 - N	3595.088	3595.096			
14	359510149	359510149 - N	3595.088	3595.096			
15	359510150	359510150 - N	3595.088	3595.096	1.24	3.17	
16	359510151	359510151 - N	3595.088	3595.096			
17	359510152	359510152 - N	3595.088	3595.096			
18	359510153	359510153 - N	3595.088	3595.096			
19	359510154	359510154 - N	3595.088	3595.096			
20	359510155	359510155 - N	3595.095	3595.089			
21	359510156	359510156 - N	3595.095	3595.089			
22	359510157	359510157 - N	3595.095	3595.089			
23	359510158	359510158 - N	3595.095	3595.089			
24	359510159	359510159 - N	3595.095	3595.089			
25	359510160	359510160 - N	3595.095	3595.089			
26	359510161	359510161 - N	3595.095	3595.089			
27	359510162	359510162 - N	3595.082	3595.122			



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Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510136 - N	PSPX002052	0.9580					
359510137 - N	PSPX002052	0.9580					
359510138 - N	PSPX002052	0.9580					
359510139 - N	PSPX002052	0.9580					
359510140 - N	PSPX002052	0.9580					
359510141 - N	PSPX002052	0.9580					
359510142 - N	PSPX002052	0.9580					
359510143 - N	PSPX002052	0.9580					
359510144 - N	PSPX002052	0.9580					
359510145 - N	PSPX002052	0.9580					
359510146 - N	PSPX002052	0.9580					
359510147 - N	PSPX002052	0.9580					
359510148 - N	PSPX002052	0.9580					
359510149 - N	PSPX002052	0.9580					
359510150 - N	PSPX002052	0.9574	0.353	311	2.45	110	
359510151 - N	PSPX002052	0.9574					
359510152 - N	PSPX002052	0.9574					
359510153 - N	PSPX002052	0.9574					
359510154 - N	PSPX002052	0.9574					
359510155 - N	PSPX002052	0.9574					
359510156 - N	PSPX002052	0.9574					
359510157 - N	PSPX002052	0.9574					
359510158 - N	PSPX002052	0.9574					
359510159 - N	PSPX002052	0.9574					
359510160 - N	PSPX002052	0.9574					
359510161 - N	PSPX002052	0.9574					
359510162 - N	PSPX002052	0.9574					

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Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510163	359510163 - N	3595.082	3595.122			
2	359510164	359510164 - N	3595.082	3595.122			
3	359510165	359510165 - N	3595.082	3595.122	1.33	3.23	
4	359510166	359510166 - N	3595.082	3595.122			
5	359510167	359510167 - N	3595.082	3595.122			
6	359510168	359510168 - N	3595.082	3595.122			
7	359510169	359510169 - N	3595.063	3595.023			
8	359510170	359510170 - N	3595.063	3595.023			
9	359510171	359510171 - N	3595.063	3595.023			
10	359510172	359510172 - N	3595.063	3595.023			
11	359510173	359510173 - N	3595.063	3595.023			
12	359510174	359510174 - N	3595.063	3595.023			
13	359510175	359510175 - N	3595.063	3595.023			
14	359510176	359510176 - N	3595.094	3595.126			
15	359510177	359510177 - N	3595.094	3595.126			
16	359510178	359510178 - N	3595.094	3595.126			
17	359510179	359510179 - N	3595.094	3595.126			
18	359510180	359510180 - N	3595.094	3595.126	1.21	3.08	
19	359510181	359510181 - N	3595.094	3595.126			
20	359510182	359510182 - N	3595.094	3595.126			
21	359510183	359510183 - N	3595.123	3595.113			
22	359510184	359510184 - N	3595.123	3595.113			
23	359510185	359510185 - N	3595.123	3595.113			
24	359510186	359510186 - N	3595.123	3595.113			
25	359510187	359510187 - N	3595.123	3595.113			
26	359510188	359510188 - N	3595.123	3595.113			
27	359510189	359510189 - N	3595.123	3595.113			

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Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510163 - N	PSPX002052	0.9574					
359510164 - N	PSPX002052	0.9574					
359510165 - N	PSPX002052	0.9577	0.362	316	2.78	113	
359510166 - N	PSPX002052	0.9577					
359510167 - N	PSPX002052	0.9577					
359510168 - N	PSPX002052	0.9577					
359510169 - N	PSPX002052	0.9577					
359510170 - N	PSPX002052	0.9577					
359510171 - N	PSPX002052	0.9577					
359510172 - N	PSPX002052	0.9577					
359510173 - N	PSPX002052	0.9577					
359510174 - N	PSPX002052	0.9577					
359510175 - N	PSPX002052	0.9577					
359510176 - N	PSPX002052	0.9577					
359510177 - N	PSPX002052	0.9577					
359510178 - N	PSPX002052	0.9577					
359510179 - N	PSPX002052	0.9577					
359510180 - N	PSPX002052	0.9571	0.355	313	2.39	109	
359510181 - N	PSPX002052	0.9571					
359510182 - N	PSPX002052	0.9571					
359510183 - N	PSPX002052	0.9571					
359510184 - N	PSPX002052	0.9571					
359510185 - N	PSPX002052	0.9571					
359510186 - N	PSPX002052	0.9571					
359510187 - N	PSPX002052	0.9571					
359510188 - N	PSPX002052	0.9571					
359510189 - N	PSPX002052	0.9571					



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We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510190	359510190 - N	3595.110	3595.124			
2	359510191	359510191 - N	3595.110	3595.124			
3	359510192	359510192 - N	3595.110	3595.124			
4	359510193	359510193 - N	3595.110	3595.124			
5	359510194	359510194 - N	3595.110	3595.124			
6	359510195	359510195 - N	3595.110	3595.124	1.30	3.29	
7	359510196	359510196 - N	3595.110	3595.124			
8	359510197	359510197 - N	3595.121	3595.115			
9	359510198	359510198 - N	3595.121	3595.115			
10	359510199	359510199 - N	3595.121	3595.115			
11	359510200	359510200 - N	3595.121	3595.115			
12	359510201	359510201 - N	3595.121	3595.115			
13	359510202	359510202 - N	3595.121	3595.115			
14	359510203	359510203 - N	3595.121	3595.115			
15	359510204	359510204 - N	3595.114	3595.128			
16	359510205	359510205 - N	3595.114	3595.128			
17	359510206	359510206 - N	3595.114	3595.128			
18	359510207	359510207 - N	3595.114	3595.128			
19	359510208	359510208 - N	3595.114	3595.128			
20	359510209	359510209 - N	3595.114	3595.128			
21	359510210	359510210 - N	3595.114	3595.128	1.27	3.16	
22	359510211	359510211 - N	3595.119	3595.111			
23	359510212	359510212 - N	3595.119	3595.111			
24	359510213	359510213 - N	3595.119	3595.111			
25	359510214	359510214 - N	3595.119	3595.111			
26	359510215	359510215 - N	3595.119	3595.111			
27	359510216	359510216 - N	3595.119	3595.111			



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Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510190 - N	PSPX002052	0.9571					
359510191 - N	PSPX002052	0.9571					
359510192 - N	PSPX002052	0.9571					
359510193 - N	PSPX002052	0.9571					
359510194 - N	PSPX002052	0.9571					
359510195 - N	PSPX002052	0.9579	0.359	318	2.64	115	
359510196 - N	PSPX002052	0.9579					
359510197 - N	PSPX002052	0.9579					
359510198 - N	PSPX002052	0.9579					
359510199 - N	PSPX002052	0.9579					
359510200 - N	PSPX002052	0.9579					
359510201 - N	PSPX002052	0.9579					
359510202 - N	PSPX002052	0.9579					
359510203 - N	PSPX002052	0.9579					
359510204 - N	PSPX002052	0.9579					
359510205 - N	PSPX002052	0.9579					
359510206 - N	PSPX002052	0.9579					
359510207 - N	PSPX002052	0.9579					
359510208 - N	PSPX002052	0.9579					
359510209 - N	PSPX002052	0.9579					
359510210 - N	PSPX002072	0.9575	0.357	315	2.26	111	
359510211 - N	PSPX002072	0.9575					
359510212 - N	PSPX002072	0.9575					
359510213 - N	PSPX002072	0.9575					
359510214 - N	PSPX002072	0.9575					
359510215 - N	PSPX002072	0.9575					
359510216 - N	PSPX002072	0.9575					

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Product : **TN330-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359510217	359510217 - N	3595.119	3595.111			
2	359510218	359510218 - N	3595.112	3595.118			
3	359510219	359510219 - N	3595.112	3595.118			
4	359510220	359510220 - N	3595.112	3595.118			
5	359510221	359510221 - N	3595.112	3595.118			
6	359510222	359510222 - N	3595.112	3595.118			
7	359510223	359510223 - N	3595.112	3595.118			
8	359510224	359510224 - N	3595.112	3595.118			
9	359510225	359510225 - N	3595.125	3595.109	1.32	3.22	
10	359510226	359510226 - N	3595.125	3595.109			
11	359510227	359510227 - N	3595.125	3595.109			
12	359510228	359510228 - N	3595.125	3595.109			
13	359510229	359510229 - N	3595.125	3595.109			
14	359510230	359510230 - N	3595.125	3595.109			
15	359510231	359510231 - N	3595.125	3595.109			
16	359510232	359510232 - N	3595.116	3595.120			
17	359510233	359510233 - N	3595.116	3595.120			
18	359510234	359510234 - N	3595.116	3595.120			
19	359510235	359510235 - N	3595.116	3595.120			
20	359510236	359510236 - N	3595.116	3595.120			
21	359510237	359510237 - N	3595.116	3595.120			
22	359510238	359510238 - N	3595.116	3595.120			
23	359510239	359510239 - N	3595.127	3595.117			
24	359510240	359510240 - N	3595.127	3595.117	1.23	3.06	
25	359510241	359510241 - N	3595.127	3595.117			
26	359510242	359510242 - N	3595.127	3595.117			
27	359510243	359510243 - N	3595.127	3595.117			



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Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359510217 - N	PSPX002072	0.9575					
359510218 - N	PSPX002072	0.9575					
359510219 - N	PSPX002072	0.9575					
359510220 - N	PSPX002072	0.9575					
359510221 - N	PSPX002072	0.9575					
359510222 - N	PSPX002072	0.9575					
359510223 - N	PSPX002072	0.9575					
359510224 - N	PSPX002072	0.9575					
359510225 - N	PSPX002072	0.9581	0.361	320	2.81	114	
359510226 - N	PSPX002072	0.9581					
359510227 - N	PSPX002072	0.9581					
359510228 - N	PSPX002072	0.9581					
359510229 - N	PSPX002072	0.9581					
359510230 - N	PSPX002072	0.9581					
359510231 - N	PSPX002072	0.9581					
359510232 - N	PSPX002072	0.9581					
359510233 - N	PSPX002072	0.9581					
359510234 - N	PSPX002072	0.9581					
359510235 - N	PSPX002072	0.9581					
359510236 - N	PSPX002072	0.9581					
359510237 - N	PSPX002072	0.9581					
359510238 - N	PSPX002072	0.9581					
359510239 - N	PSPX002072	0.9581					
359510240 - N	PSPX002072	0.9573	0.352	310	2.47	108	
359510241 - N	PSPX002072	0.9573					
359510242 - N	PSPX002072	0.9573					
359510243 - N	PSPX002072	0.9573					

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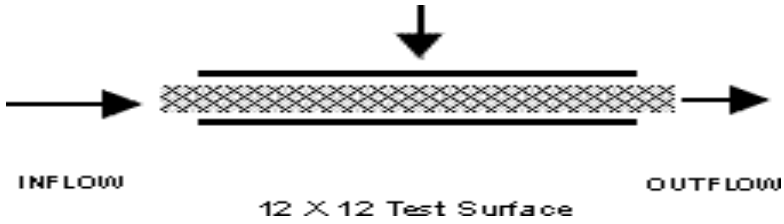
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SKAPS Industries

ASTM D 4716

Client:	Waste Services	**Job #**	3595
Project:	JED Vertical Expansion, FL		
Product:	TN330-2-8		

Test Configuration:



Test Information:

Boundary Conditions:	Soil Geocomposite Textured Geomembrane	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	500 psf 0.02 ft 24 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec 24 hours
359510001	500	0.02	2.09×10^{-3}
359510040			2.12×10^{-3}
359510080			2.07×10^{-3}
359510120			2.10×10^{-3}
359510160			2.05×10^{-3}
359510200			2.13×10^{-3}
359510240			2.03×10^{-3}

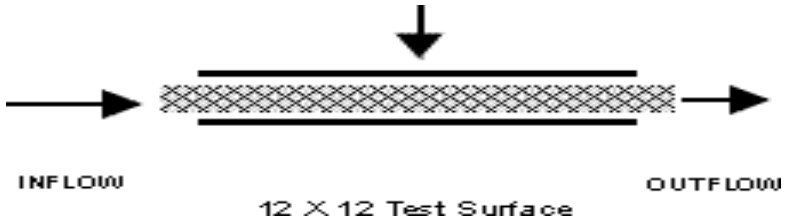
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Waste Services	**Job #**	3595
Project:	JED Vertical Expansion, FL		
Product:	TN330-2-8		

Test Configuration:



Test Information:

Boundary Conditions:	Soil Geocomposite Textured Geomembrane	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	15000 psf 0.02 ft 100 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec
			100 hours
359510001	15000	0.02	1.19×10^{-3}
359510040			1.24×10^{-3}
359510080			1.17×10^{-3}
359510120			1.26×10^{-3}
359510160			1.20×10^{-3}
359510200			1.29×10^{-3}
359510240			1.16×10^{-3}

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Waste Services
Project Name : JED Vertical Expansion, FL
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN330-2-8

We, the Geonet Manufacturer, hereby certify the following for the material delivered to the above referenced project:

Resin Supplier	Resin Production Plant	Resin Brand Name	Resin Lot Number	Property	Test Method	Units	Resin Supplier Value	Tested Value*
Chevron Phillips Chemical Company	Chevron, TX	HDPE	PSPX002052	Density	ASTM D 1505	gm/cc	0.955	0.9530
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.34	0.34
			PSPX002072	Density	ASTM D 1505	gm/cc	0.9550	0.9530
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.39	0.38

(a) Condition 190/2.16
* Data from SKAPS Quality Control

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN330-2-8
Project : JED Vertical Expansion, FL

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL #	FABRIC ROLL #	WEIGHT oz/sq yd	MD TENSILE lbs.	XMD TENSILE lbs.	MD TRAP lbs.	XMD TRAP lbs.	CBR PUNCTURE lbs.	AOS us sieve	PERM-ITY sec^{-1}
359510001	3595.053	8.29	230	237	101	120	690	80	1.37
	3595.011	8.21	225	236	102	118	677	80	1.33
359510040	3595.071	8.11	231	245	105	114	696	80	1.37
	3595.079	8.35	227	236	105	114	696	80	1.37
359510080	3595.066	8.37	225	234	97	110	671	80	1.37
	3595.100	8.27	235	241	96	107	662	80	1.31
359510120	3595.092	8.17	232	244	103	117	700	80	1.37
	3595.098	8.56	226	231	103	117	700	80	1.37
359510160	3595.095	8.56	226	231	103	117	700	80	1.37
	3595.089	8.39	229	233	99	103	656	80	1.37
359510200	3595.121	8.19	230	243	98	109	677	80	1.31
	3595.115	8.60	225	233	100	119	689	80	1.31
359510240	3595.127	8.55	227	230	98	109	677	80	1.31
	3595.117	8.60	225	233	100	119	689	80	1.31

571 Industrial Parkway, Commerce, GA 30529 Phone: 706-336-7000 Fax: 706-336-7007 Email: skaps@skaps.com

Appendix N

April 6, 2010
April 7, 2010 Updating with 24 hour transmissivity result.

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs.
TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7 Vertical Expension**
TRI Job Reference Number:	E2341-10-08
Material(s) Tested:	3, SKAPS TN 330-2-8 Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC <===Updating 24 hr Result. Peel Strength (ASTM D 7005)-GC Mass/Unit Area (ASTM D 5261)-GT Grab Tensile Properties (ASTM D 4632)-GT Trapezoidal Tear (ASTM D 4533)-GT Apparent Opening Size (ASTM D 4751)-GT Permittivity (ASTM D 4491)-GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

PARAMETER | **TEST REPLICATE NUMBER** | **MEAN** | **STD. DEV.** | **PROJ. SPEC.**

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

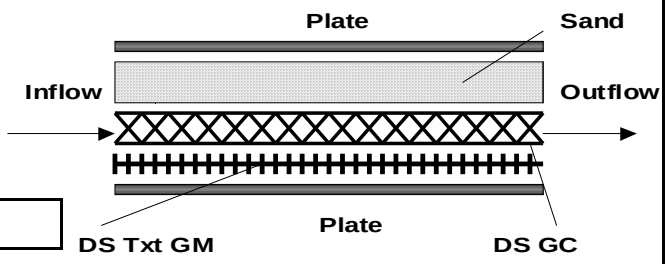


Plate / Ottowa Sand / Sample / HDPE MSGM / Plate

Seat Time (hours)		Specimen	1					
	Volume (cc)		521	521	519			
	Time (s)		16.03	16.06	16.03			
24	Flow Rate (GPM/ft width)		0.52	0.51	0.51	**0.51**	0.00	
	Transmissivity (m^2/s)		5.33E-03	5.32E-03	5.31E-03	**5.32E-03**	1.02E-05	1.5E-03
	Test Temp (C)			20.0				
	Temp. Corr. Factor			1.000				

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction: of this report, except in full, without prior approval of TRI.

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

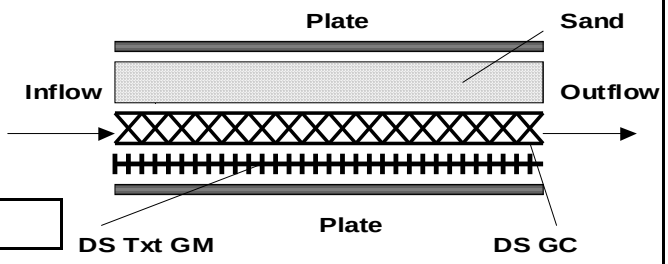


Plate / Ottowa Sand / Sample / HDPE MSGM / Plate

PARAMETER		TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
					DATA PENDING		
Seat Time (hours)		Specimen	1				
	Volume (cc)		X	X	X		
	Time (s)		X	X	X		
100	Flow Rate (GPM/ft width)		#######	#######	#######	**#VALUE!**	#VALUE!
	Transmissivity (m^2/s)		#VALUE!	#VALUE!	#VALUE!	**#VALUE!**	#VALUE! 1.0E-03
	Test Temp (C)			x			
	Temp. Corr. Factor			FALSE			

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	10.4	11.9	7.7	11.1	7.4						**9.7**	2.0	1.0 min
A - MD Average Peel Strength (g/in)	4722	5403	3496	5039	3360						**4404**	924	
B - MD Average Peel Strength (ppi)	5.7	7.4	4.6	5.6	3.9						**5.4**	1.3	1.0 min
B - MD Average Peel Strength (g/in)	2588	3360	2088	2542	1771						**2470**	601	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component-Side A**												
5" diameter circle (grams)	3.64	3.60	3.51	3.83	3.71	3.40	3.53	3.74	3.78	3.60	**3.63**	0.13	
Mass/Unit Area (oz/sq.yd)	8.47	8.37	8.16	8.91	8.63	7.91	8.21	8.70	8.79	8.37	**8.45**	0.31	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component-Side A**												
MD - Tensile Strength (lbs)	251	229	277	289	252	262	236	243	279	223	**254**	22	200 min
TD - Tensile Strength (lbs)	316	262	253	322	280	312	249	255	266	282	**280**	28	200 min
MD - Elong. @ Max. Load (%)	60	69	70	73	63	75	66	74	73	68	**69**	5	
TD - Elong. @ Max. Load (%)	87	88	96	92	96	93	92	95	89	98	**93**	4	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component-Side A**												
MD - Tear Strength (lbs)	103	112	102	117	133	118	123	97	120	116	**114**	11	75 min
TD - Tear Strength (lbs)	125	110	140	151	119	140	111	137	130	139	**130**	14	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component-Side A**												
Opening Size Diameter (mm)	0.145	0.119	0.108	0.113	0.129						**0.123**	0.014	0.21 max
Sieve No.	100	120	120	120	100						**120**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08 **Geotextile Component-Side A**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:	**1**					**2**							
Thickness (mils)	115	115	115	115	115	105	105	105	105	105			
Time (s)	17.9	17.8	17.8	18.2	17.8	15.9	16.2	15.9	16.2	16.3			
Specimen Permittivity (s-1)	1.59	1.59	1.59	1.56	1.59	1.78	1.75	1.78	1.75	1.74			
Specimen Permittivity @20°C (sec-1)	1.59	1.59	1.59	1.56	1.59	1.78	1.75	1.78	1.75	1.74			
Specimen Flow rate (GPM/ft2)	119	119	119	117	119	133	131	133	131	130			
Specimen Permeability (cm/s)	0.46	0.47	0.47	0.46	0.47	0.48	0.47	0.48	0.47	0.46			
Test Speciemn No. >:	**3**					**4**							
Thickness (mils)	95	95	95	95	95	98	98	98	98	98			
Time (s)	14.1	14.4	14.1	14.1	14.1	14.4	14.4	14.0	14.3	14.4			
Permittivity (s-1)	2.01	1.97	2.01	2.01	2.01	1.97	1.97	2.03	1.98	1.97			
Specimen Permittivity @20°C (sec-1)	2.01	1.97	2.01	2.01	2.01	1.97	1.97	2.03	1.98	1.97			
Specimen Flow rate (GPM/ft2)	151	147	151	151	151	147	147	152	148	147			
Specimen Permeability (cm/s)	0.49	0.48	0.49	0.49	0.49	0.49	0.49	0.50	0.49	0.49			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.83**	0.5 min
											Flow rate (GPM/ft2)	**137**	
											Permeability (cm/s)	**0.48**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08 **Geotextile Component-Side B**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.75	3.87	4.11	4.11	3.72	3.71	3.73	3.45	3.90	3.56	**3.79**	0.21	
Mass/Unit Area (oz/sq.yd)	8.72	9.00	9.56	9.56	8.65	8.63	8.68	8.02	9.07	8.28	**8.82**	0.50	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	228	276	248	279	258	243	280	262	276	253	**260**	18	200 min
TD - Tensile Strength (lbs)	283	290	250	271	240	298	282	311	311	291	**283**	24	200 min
MD - Elong. @ Max. Load (%)	73	77	75	80	70	73	77	81	77	78	**76**	3	
TD - Elong. @ Max. Load (%)	93	97	100	87	88	91	101	109	95	103	**96**	7	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	96	132	111	143	102	94	111	93	118	109	**111**	17	75 min
TD - Tear Strength (lbs)	94	121	122	138	119	140	136	107	125	116	**122**	14	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.144	0.125	0.128	0.141	0.142						**0.136**	0.009	0.21 max
Sieve No.	100	100	100	100	100						**100**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003 **Geotextile Component-Side B**
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:	**1**					**2**							
Thickness (mils)	97	97	97	97	97	103	103	103	103	103			
Time (s)	13.4	13.2	13.4	13.4	13.5	16.0	15.9	16.2	16.2	16.3			
Specimen Permittivity (s-1)	2.12	2.15	2.12	2.12	2.10	1.77	1.78	1.75	1.75	1.74			
Specimen Permittivity @20°C (sec-1)	2.12	2.15	2.12	2.12	2.10	1.77	1.78	1.75	1.75	1.74			
Specimen Flow rate (GPM/ft2)	158	161	158	158	157	133	133	131	131	130			
Specimen Permeability (cm/s)	0.52	0.53	0.52	0.52	0.52	0.46	0.47	0.46	0.46	0.46			
Test Speciemn No. >:	**3**					**4**							
Thickness (mils)	106	106	106	106	106	106	106	106	106	106			
Time (s)	16.6	16.5	16.6	16.6	16.6	14.4	14.4	14.4	14.4	14.4			
Permittivity (s-1)	1.71	1.72	1.71	1.71	1.71	1.97	1.97	1.97	1.97	1.97			
Specimen Permittivity @20°C (sec-1)	1.71	1.72	1.71	1.71	1.71	1.97	1.97	1.97	1.97	1.97			
Specimen Flow rate (GPM/ft2)	128	129	128	128	128	147	147	147	147	147			
Specimen Permeability (cm/s)	0.46	0.46	0.46	0.46	0.46	0.53	0.53	0.53	0.53	0.53			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.89**	0.5 min
											Flow rate (GPM/ft2)	**141**	
											Permeability (cm/s)	**0.49**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510087
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	8.4	10.6	15.8	10.8	18.1						**12.7**	4.0	1.0 min
A - MD Average Peel Strength (g/in)	3814	4812	7173	4903	8217						**5784**	1834	
B - MD Average Peel Strength (ppi)	5.7	4.5	11.1	7.5	10.7						**7.9**	2.9	1.0 min
B - MD Average Peel Strength (g/in)	2588	2043	5039	3405	4858						**3587**	1336	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component-Side A**												
5" diameter circle (grams)	3.38	4.01	3.64	3.95	3.63	3.60	3.95	3.40	3.59	3.96	**3.71**	0.24	
Mass/Unit Area (oz/sq.yd)	7.86	9.33	8.47	9.19	8.44	8.37	9.19	7.91	8.35	9.21	**8.63**	0.55	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component-Side A**												
MD - Tensile Strength (lbs)	282	302	287	265	217	299	254	263	295	204	**267**	34	200 min
TD - Tensile Strength (lbs)	305	302	278	297	249	311	313	247	318	296	**292**	26	200 min
MD - Elong. @ Max. Load (%)	78	73	81	76	75	81	68	83	77	68	**76**	5	
TD - Elong. @ Max. Load (%)	99	99	99	90	101	95	105	109	96	96	**99**	5	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component-Side A**												
MD - Tear Strength (lbs)	93	111	113	108	120	113	103	110	107	115	**109**	7	75 min
TD - Tear Strength (lbs)	100	122	90	125	123	201	143	143	132	131	**131**	30	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510087 **Geotextile Component-Side B**
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.76	3.54	3.61	3.84	3.79	3.38	3.56	3.44	4.06	3.55	**3.65**	0.21	
Mass/Unit Area (oz/sq.yd)	8.75	8.23	8.40	8.93	8.82	7.86	8.28	8.00	9.44	8.26	**8.50**	0.48	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	291	295	297	239	293	274	275	243	272	237	**271**	24	200 min
TD - Tensile Strength (lbs)	290	239	261	284	275	298	334	246	318	303	**285**	30	200 min
MD - Elong. @ Max. Load (%)	75	76	68	67	75	68	75	78	77	71	**73**	4	
TD - Elong. @ Max. Load (%)	93	92	99	95	100	94	99	104	93	104	**97**	5	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	135	149	96	99	106	141	102	147	90	132	**120**	23	75 min
TD - Tear Strength (lbs)	148	122	104	122	148	117	133	123	181	150	**135**	22	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	7.6	6.8	4.2	4.7	8.1						**6.3**	1.7	1.0 min
A - MD Average Peel Strength (g/in)	3450	3087	1907	2134	3677						**2851**	791	
B - MD Average Peel Strength (ppi)	2.9	6.1	2.6	1.1	4.6						**3.5**	1.9	1.0 min
B - MD Average Peel Strength (g/in)	1317	2769	1180	499	2088						**1571**	876	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component-Side A**												
5" diameter circle (grams)	3.64	3.83	3.30	3.67	3.95	3.60	3.73	3.22	3.62	4.06	**3.66**	0.26	
Mass/Unit Area (oz/sq.yd)	8.47	8.91	7.68	8.54	9.19	8.37	8.68	7.49	8.42	9.44	**8.52**	0.60	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component-Side A**												
MD - Tensile Strength (lbs)	274	269	230	269	269	300	288	220	335	259	**271**	33	200 min
TD - Tensile Strength (lbs)	344	269	300	305	234	320	266	270	308	257	**287**	33	200 min
MD - Elong. @ Max. Load (%)	86	80	75	81	83	81	85	81	89	81	**82**	4	
TD - Elong. @ Max. Load (%)	111	100	111	98	124	107	111	112	105	133	**111**	11	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component-Side A**												
MD - Tear Strength (lbs)	107	109	89	93	121	124	110	94	126	110	**108**	13	75 min
TD - Tear Strength (lbs)	150	129	122	173	141	153	156	117	146	143	**143**	17	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component-Side A**												
Opening Size Diameter (mm)	0.136	0.145	0.134	0.130	0.106						**0.130**	0.015	0.21 max
Sieve No.	100	100	100	100	140						**100**		

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08 **Geotextile Component-Side A**

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:	**1**					**2**							
Thickness (mils)	99	99	99	99	99	99	99	99	99	99			
Time (s)	14.1	14.1	14.0	14.0	13.7	14.4	14.1	14.4	14.4	14.3			
Specimen Permittivity (s-1)	2.01	2.01	2.03	2.03	2.07	1.97	2.01	1.97	1.97	1.98			
Specimen Permittivity @20°C (sec-1)	2.01	2.01	2.03	2.03	2.07	1.97	2.01	1.97	1.97	1.98			
Specimen Flow rate (GPM/ft2)	151	151	152	152	155	147	151	147	147	148			
Specimen Permeability (cm/s)	0.51	0.51	0.51	0.51	0.52	0.50	0.51	0.50	0.50	0.50			
Test Speciemn No. >:	**3**					**4**							
Thickness (mils)	104	104	104	104	104	108	108	108	108	108			
Time (s)	15.3	15.3	15.4	15.3	15.4	17.5	17.5	17.8	17.8	17.5			
Permittivity (s-1)	1.85	1.85	1.84	1.85	1.84	1.62	1.62	1.59	1.59	1.62			
Specimen Permittivity @20°C (sec-1)	1.85	1.85	1.84	1.85	1.84	1.62	1.62	1.59	1.59	1.62			
Specimen Flow rate (GPM/ft2)	139	139	138	139	138	121	121	119	119	121			
Specimen Permeability (cm/s)	0.49	0.49	0.49	0.49	0.49	0.44	0.44	0.44	0.44	0.44			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.87**	0.5 min
											Flow rate (GPM/ft2)	**140**	
											Permeability (cm/s)	**0.48**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08

Geotextile Component-Side B

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.51	4.09	3.66	4.22	3.80	3.31	4.19	3.52	4.15	3.77	**3.82**	0.33	
Mass/Unit Area (oz/sq.yd)	8.16	9.51	8.51	9.82	8.84	7.70	9.75	8.19	9.65	8.77	**8.89**	0.76	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	251	289	268	271	239	274	266	232	311	207	**261**	30	200 min
TD - Tensile Strength (lbs)	285	312	236	329	299	325	303	312	314	249	**296**	31	200 min
MD - Elong. @ Max. Load (%)	73	74	80	73	75	80	79	75	77	66	**75**	4	
TD - Elong. @ Max. Load (%)	101	101	102	97	97	97	104	107	96	101	**100**	4	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	100	136	104	114	101	112	109	103	127	121	**113**	12	75 min
TD - Tear Strength (lbs)	102	107	116	129	129	115	129	138	111	142	**122**	13	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.140	0.120	0.140	0.117	0.145						**0.133**	0.013	0.21 max
Sieve No.	100	120	100	120	100						**100**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expension

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174 **Geotextile Component Side B**
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:	1					2							
Thickness (mils)	106	106	106	106	106	109	109	109	109	109			
Time (s)	15.3	15.4	15.3	15.7	15.6	16.6	16.9	16.9	16.9	16.9			
Specimen Permittivity (s-1)	1.85	1.84	1.85	1.81	1.82	1.71	1.68	1.68	1.68	1.68			
Specimen Permittivity @20°C (sec-1)	1.85	1.84	1.85	1.81	1.82	1.71	1.68	1.68	1.68	1.68			
Specimen Flow rate (GPM/ft2)	139	138	139	135	136	128	126	126	126	126			
Specimen Permeability (cm/s)	0.50	0.50	0.50	0.49	0.49	0.47	0.46	0.46	0.46	0.46			
Test Speciemn No. >:	3					4							
Thickness (mils)	100	100	100	100	100	108	108	108	108	108			
Time (s)	14.4	14.1	14.4	14.4	14.4	16.6	16.6	16.9	16.6	16.6			
Permittivity (s-1)	1.97	2.01	1.97	1.97	1.97	1.71	1.71	1.68	1.71	1.71			
Specimen Permittivity @20°C (sec-1)	1.97	2.01	1.97	1.97	1.97	1.71	1.71	1.68	1.71	1.71			
Specimen Flow rate (GPM/ft2)	147	151	147	147	147	128	128	126	128	128			
Specimen Permeability (cm/s)	0.50	0.51	0.50	0.50	0.50	0.47	0.47	0.46	0.47	0.47			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.80**	0.5 min
											Flow rate (GPM/ft2)	**135**	
											Permeability (cm/s)	**0.48**	

MD Machine Direction TD Transverse Direction NA Not Available

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April 6, 2010
April 7, 2010 Updating with 24 hour transmissivity result.
April 12, 2010 Updating with 100 hour transmissivity results.
April 15, 2010 Revised with Project name
April 16, 2010 Updated with 100 hour transmissivity results for 087,174.

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

Bill To:

<= Same

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7**
TRI Job Reference Number:	E2341-10-08
Material(s) Tested:	3, SKAPS TN 330-2-8 Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC Peel Strength (ASTM D 7005)-GC Mass/Unit Area (ASTM D 5261)-GT Grab Tensile Properties (ASTM D 4632)-GT Trapezoidal Tear (ASTM D 4533)-GT Apparent Opening Size (ASTM D 4751)-GT Permittivity (ASTM D 4491)-GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

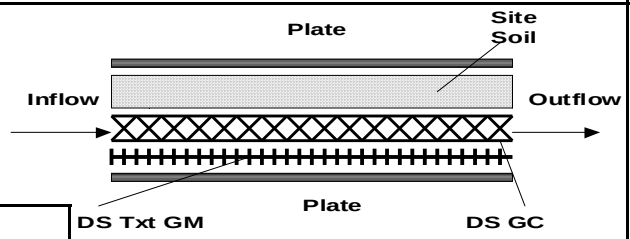


Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen	1				
	Volume (cc)	521	521	519			
	Time (s)	16.03	16.06	16.03			
24	Flow Rate (GPM/ft width)	0.52	0.51	0.51	**0.51**	0.00	
	Transmissivity (m^2/s)	5.33E-03	5.32E-03	5.31E-03	**5.32E-03**	1.02E-05	1.5E-03
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

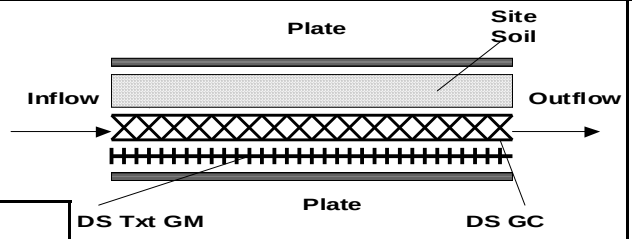


Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER		TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)		Specimen	1				
	Volume (cc)		663	668	673		
	Time (s)		45.00	45.04	45.12		
100	Flow Rate (GPM/ft width)		0.23	0.24	0.24	**0.24**	0.00	
	Transmissivity (m^2/s)		2.42E-03	2.43E-03	2.45E-03	**2.43E-03**	1.50E-05	1.0E-03
	Test Temp (C)			20.0			
	Temp. Corr. Factor			1.000			

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	10.4	11.9	7.7	11.1	7.4						**9.7**	2.0	1.0 min
A - MD Average Peel Strength (g/in)	4722	5403	3496	5039	3360						**4404**	924	
B - MD Average Peel Strength (ppi)	5.7	7.4	4.6	5.6	3.9						**5.4**	1.3	1.0 min
B - MD Average Peel Strength (g/in)	2588	3360	2088	2542	1771						**2470**	601	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component-Side A**												
5" diameter circle (grams)	3.64	3.60	3.51	3.83	3.71	3.40	3.53	3.74	3.78	3.60	**3.63**	0.13	
Mass/Unit Area (oz/sq.yd)	8.47	8.37	8.16	8.91	8.63	7.91	8.21	8.70	8.79	8.37	**8.45**	0.31	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component-Side A**												
MD - Tensile Strength (lbs)	251	229	277	289	252	262	236	243	279	223	**254**	22	200 min
TD - Tensile Strength (lbs)	316	262	253	322	280	312	249	255	266	282	**280**	28	200 min
MD - Elong. @ Max. Load (%)	60	69	70	73	63	75	66	74	73	68	**69**	5	
TD - Elong. @ Max. Load (%)	87	88	96	92	96	93	92	95	89	98	**93**	4	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component-Side A**												
MD - Tear Strength (lbs)	103	112	102	117	133	118	123	97	120	116	**114**	11	75 min
TD - Tear Strength (lbs)	125	110	140	151	119	140	111	137	130	139	**130**	14	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component-Side A**												
Opening Size Diameter (mm)	0.145	0.119	0.108	0.113	0.129						**0.123**	0.014	0.21 max
Sieve No.	100	120	120	120	100						**120**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

Geotextile Component-Side A

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			**1**					**2**					
Thickness (mils)	115	115	115	115	115	105	105	105	105	105			
Time (s)	17.9	17.8	17.8	18.2	17.8	15.9	16.2	15.9	16.2	16.3			
Specimen Permittivity (s-1)	1.59	1.59	1.59	1.56	1.59	1.78	1.75	1.78	1.75	1.74			
Specimen Permittivity @20°C (sec-1)	1.59	1.59	1.59	1.56	1.59	1.78	1.75	1.78	1.75	1.74			
Specimen Flow rate (GPM/ft2)	119	119	119	117	119	133	131	133	131	130			
Specimen Permeability (cm/s)	0.46	0.47	0.47	0.46	0.47	0.48	0.47	0.48	0.47	0.46			
Test Speciemn No. >:			**3**					**4**					
Thickness (mils)	95	95	95	95	95	98	98	98	98	98			
Time (s)	14.1	14.4	14.1	14.1	14.1	14.4	14.4	14.0	14.3	14.4			
Permittivity (s-1)	2.01	1.97	2.01	2.01	2.01	1.97	1.97	2.03	1.98	1.97			
Specimen Permittivity @20°C (sec-1)	2.01	1.97	2.01	2.01	2.01	1.97	1.97	2.03	1.98	1.97			
Specimen Flow rate (GPM/ft2)	151	147	151	151	151	147	147	152	148	147			
Specimen Permeability (cm/s)	0.49	0.48	0.49	0.49	0.49	0.49	0.49	0.50	0.49	0.49			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.83**	0.5 min
											Flow rate (GPM/ft2)	**137**	
											Permeability (cm/s)	**0.48**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003
TRI Log #: E2341-10-08

Geotextile Component-Side B

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.75	3.87	4.11	4.11	3.72	3.71	3.73	3.45	3.90	3.56	**3.79**	0.21	
Mass/Unit Area (oz/sq.yd)	8.72	9.00	9.56	9.56	8.65	8.63	8.68	8.02	9.07	8.28	**8.82**	0.50	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	228	276	248	279	258	243	280	262	276	253	**260**	18	200 min
TD - Tensile Strength (lbs)	283	290	250	271	240	298	282	311	311	291	**283**	24	200 min
MD - Elong. @ Max. Load (%)	73	77	75	80	70	73	77	81	77	78	**76**	3	
TD - Elong. @ Max. Load (%)	93	97	100	87	88	91	101	109	95	103	**96**	7	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	96	132	111	143	102	94	111	93	118	109	**111**	17	75 min
TD - Tear Strength (lbs)	94	121	122	138	119	140	136	107	125	116	**122**	14	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.144	0.125	0.128	0.141	0.142						**0.136**	0.009	0.21 max
Sieve No.	100	100	100	100	100						**100**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510003 **Geotextile Component-Side B**
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	97	97	97	97	97	103	103	103	103	103			
Time (s)	13.4	13.2	13.4	13.4	13.5	16.0	15.9	16.2	16.2	16.3			
Specimen Permittivity (s-1)	2.12	2.15	2.12	2.12	2.10	1.77	1.78	1.75	1.75	1.74			
Specimen Permittivity @20°C (sec-1)	2.12	2.15	2.12	2.12	2.10	1.77	1.78	1.75	1.75	1.74			
Specimen Flow rate (GPM/ft2)	158	161	158	158	157	133	133	131	131	130			
Specimen Permeability (cm/s)	0.52	0.53	0.52	0.52	0.52	0.46	0.47	0.46	0.46	0.46			
Test Speciemn No. >:			3					4					
Thickness (mils)	106	106	106	106	106	106	106	106	106	106			
Time (s)	16.6	16.5	16.6	16.6	16.6	14.4	14.4	14.4	14.4	14.4			
Permittivity (s-1)	1.71	1.72	1.71	1.71	1.71	1.97	1.97	1.97	1.97	1.97			
Specimen Permittivity @20°C (sec-1)	1.71	1.72	1.71	1.71	1.71	1.97	1.97	1.97	1.97	1.97			
Specimen Flow rate (GPM/ft2)	128	129	128	128	128	147	147	147	147	147			
Specimen Permeability (cm/s)	0.46	0.46	0.46	0.46	0.46	0.53	0.53	0.53	0.53	0.53			
			TEMPERATURE CORRECTED VALUES					**Permittivity (s-1)**			**1.89**		0.5 min
								Flow rate (GPM/ft2)			**141**		
								Permeability (cm/s)			**0.49**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510087
TRI Log #: E2341-10-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

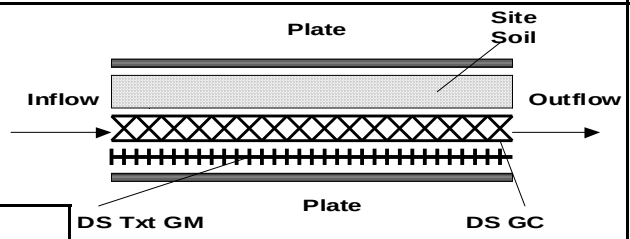


Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen	1				
	Volume (cc)	977	621	616		
	Time (s)	32.09	20.07	20.06		
24	Flow Rate (GPM/ft width)	0.48	0.49	0.49	**0.49**	0.00	
	Transmissivity (m^2/s)	4.99E-03	5.08E-03	5.04E-03	**5.04E-03**	4.07E-05	1.5E-03
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

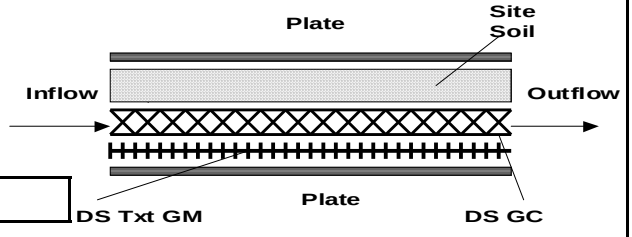


Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen	1				
	Volume (cc)	629	629	630		
	Time (s)	65.09	65.00	65.07		
100	Flow Rate (GPM/ft width)	0.15	0.15	0.15	**0.15**	0.00	
	Transmissivity (m^2/s)	1.59E-03	1.59E-03	1.59E-03	**1.59E-03**	1.56E-06	1.0E-03
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510087
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	8.4	10.6	15.8	10.8	18.1						**12.7**	4.0	1.0 min
A - MD Average Peel Strength (g/in)	3814	4812	7173	4903	8217						**5784**	1834	
B - MD Average Peel Strength (ppi)	5.7	4.5	11.1	7.5	10.7						**7.9**	2.9	1.0 min
B - MD Average Peel Strength (g/in)	2588	2043	5039	3405	4858						**3587**	1336	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component-Side A**												
5" diameter circle (grams)	3.38	4.01	3.64	3.95	3.63	3.60	3.95	3.40	3.59	3.96	**3.71**	0.24	
Mass/Unit Area (oz/sq.yd)	7.86	9.33	8.47	9.19	8.44	8.37	9.19	7.91	8.35	9.21	**8.63**	0.55	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component-Side A**												
MD - Tensile Strength (lbs)	282	302	287	265	217	299	254	263	295	204	**267**	34	200 min
TD - Tensile Strength (lbs)	305	302	278	297	249	311	313	247	318	296	**292**	26	200 min
MD - Elong. @ Max. Load (%)	78	73	81	76	75	81	68	83	77	68	**76**	5	
TD - Elong. @ Max. Load (%)	99	99	99	90	101	95	105	109	96	96	**99**	5	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component-Side A**												
MD - Tear Strength (lbs)	93	111	113	108	120	113	103	110	107	115	**109**	7	75 min
TD - Tear Strength (lbs)	100	122	90	125	123	201	143	143	132	131	**131**	30	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510087 **Geotextile Component-Side B**
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.76	3.54	3.61	3.84	3.79	3.38	3.56	3.44	4.06	3.55	**3.65**	0.21	
Mass/Unit Area (oz/sq.yd)	8.75	8.23	8.40	8.93	8.82	7.86	8.28	8.00	9.44	8.26	**8.50**	0.48	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	291	295	297	239	293	274	275	243	272	237	**271**	24	200 min
TD - Tensile Strength (lbs)	290	239	261	284	275	298	334	246	318	303	**285**	30	200 min
MD - Elong. @ Max. Load (%)	75	76	68	67	75	68	75	78	77	71	**73**	4	
TD - Elong. @ Max. Load (%)	93	92	99	95	100	94	99	104	93	104	**97**	5	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	135	149	96	99	106	141	102	147	90	132	**120**	23	75 min
TD - Tear Strength (lbs)	148	122	104	122	148	117	133	123	181	150	**135**	22	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

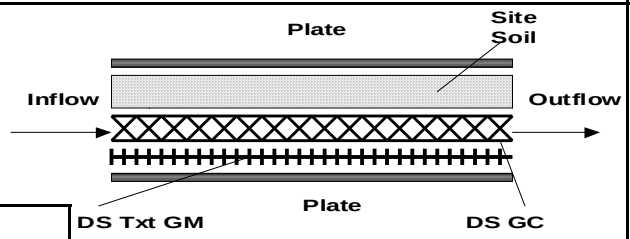


Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen	1				
	Volume (cc)	610	610	610		
	Time (s)	32.12	32.13	32.13		
24	Flow Rate (GPM/ft width)	0.30	0.30	0.30	**0.30**	0.00	
	Transmissivity (m^2/s)	3.12E-03	3.11E-03	3.11E-03	**3.11E-03**	5.60E-07	1.5E-03
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

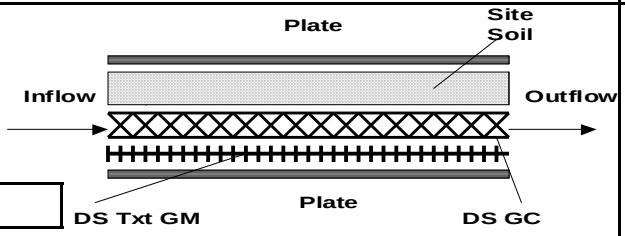


Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)	Specimen	1				
	Volume (cc)	539	537	534		
	Time (s)	65.25	65.09	65.04		
100	Flow Rate (GPM/ft width)	0.13	0.13	0.13	**0.13**	0.00	
	Transmissivity (m^2/s)	1.36E-03	1.35E-03	1.35E-03	**1.35E-03**	4.35E-06	1.0E-03
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	7.6	6.8	4.2	4.7	8.1						**6.3**	1.7	1.0 min
A - MD Average Peel Strength (g/in)	3450	3087	1907	2134	3677						**2851**	791	
B - MD Average Peel Strength (ppi)	2.9	6.1	2.6	1.1	4.6						**3.5**	1.9	1.0 min
B - MD Average Peel Strength (g/in)	1317	2769	1180	499	2088						**1571**	876	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component-Side A**												
5" diameter circle (grams)	3.64	3.83	3.30	3.67	3.95	3.60	3.73	3.22	3.62	4.06	**3.66**	0.26	
Mass/Unit Area (oz/sq.yd)	8.47	8.91	7.68	8.54	9.19	8.37	8.68	7.49	8.42	9.44	**8.52**	0.60	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component-Side A**												
MD - Tensile Strength (lbs)	274	269	230	269	269	300	288	220	335	259	**271**	33	200 min
TD - Tensile Strength (lbs)	344	269	300	305	234	320	266	270	308	257	**287**	33	200 min
MD - Elong. @ Max. Load (%)	86	80	75	81	83	81	85	81	89	81	**82**	4	
TD - Elong. @ Max. Load (%)	111	100	111	98	124	107	111	112	105	133	**111**	11	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component-Side A**												
MD - Tear Strength (lbs)	107	109	89	93	121	124	110	94	126	110	**108**	13	75 min
TD - Tear Strength (lbs)	150	129	122	173	141	153	156	117	146	143	**143**	17	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component-Side A**												
Opening Size Diameter (mm)	0.136	0.145	0.134	0.130	0.106						**0.130**	0.015	0.21 max
Sieve No.	100	100	100	100	140						**100**		

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08

Geotextile Component-Side A

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	99	99	99	99	99	99	99	99	99	99			
Time (s)	14.1	14.1	14.0	14.0	13.7	14.4	14.1	14.4	14.4	14.3			
Specimen Permittivity (s-1)	2.01	2.01	2.03	2.03	2.07	1.97	2.01	1.97	1.97	1.98			
Specimen Permittivity @20°C (sec-1)	2.01	2.01	2.03	2.03	2.07	1.97	2.01	1.97	1.97	1.98			
Specimen Flow rate (GPM/ft2)	151	151	152	152	155	147	151	147	147	148			
Specimen Permeability (cm/s)	0.51	0.51	0.51	0.51	0.52	0.50	0.51	0.50	0.50	0.50			
Test Speciemn No. >:			3					4					
Thickness (mils)	104	104	104	104	104	108	108	108	108	108			
Time (s)	15.3	15.3	15.4	15.3	15.4	17.5	17.5	17.8	17.8	17.5			
Permittivity (s-1)	1.85	1.85	1.84	1.85	1.84	1.62	1.62	1.59	1.59	1.62			
Specimen Permittivity @20°C (sec-1)	1.85	1.85	1.84	1.85	1.84	1.62	1.62	1.59	1.59	1.62			
Specimen Flow rate (GPM/ft2)	139	139	138	139	138	121	121	119	119	121			
Specimen Permeability (cm/s)	0.49	0.49	0.49	0.49	0.49	0.44	0.44	0.44	0.44	0.44			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.87**	0.5 min
											Flow rate (GPM/ft2)	**140**	
											Permeability (cm/s)	**0.48**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174
TRI Log #: E2341-10-08

Geotextile Component-Side B

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.51	4.09	3.66	4.22	3.80	3.31	4.19	3.52	4.15	3.77	**3.82**	0.33	
Mass/Unit Area (oz/sq.yd)	8.16	9.51	8.51	9.82	8.84	7.70	9.75	8.19	9.65	8.77	**8.89**	0.76	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	251	289	268	271	239	274	266	232	311	207	**261**	30	200 min
TD - Tensile Strength (lbs)	285	312	236	329	299	325	303	312	314	249	**296**	31	200 min
MD - Elong. @ Max. Load (%)	73	74	80	73	75	80	79	75	77	66	**75**	4	
TD - Elong. @ Max. Load (%)	101	101	102	97	97	97	104	107	96	101	**100**	4	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	100	136	104	114	101	112	109	103	127	121	**113**	12	75 min
TD - Tear Strength (lbs)	102	107	116	129	129	115	129	138	111	142	**122**	13	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.140	0.120	0.140	0.117	0.145						**0.133**	0.013	0.21 max
Sieve No.	100	120	100	120	100						**100**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: SKAPS TN 330-2-8 Double Sided Geocomposite
Sample Identification: 359510174 **Geotextile Component Side B**
TRI Log #: E2341-10-08

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	106	106	106	106	106	109	109	109	109	109			
Time (s)	15.3	15.4	15.3	15.7	15.6	16.6	16.9	16.9	16.9	16.9			
Specimen Permittivity (s-1)	1.85	1.84	1.85	1.81	1.82	1.71	1.68	1.68	1.68	1.68			
Specimen Permittivity @20°C (sec-1)	1.85	1.84	1.85	1.81	1.82	1.71	1.68	1.68	1.68	1.68			
Specimen Flow rate (GPM/ft2)	139	138	139	135	136	128	126	126	126	126			
Specimen Permeability (cm/s)	0.50	0.50	0.50	0.49	0.49	0.47	0.46	0.46	0.46	0.46			
Test Speciemn No. >:			3					4					
Thickness (mils)	100	100	100	100	100	108	108	108	108	108			
Time (s)	14.4	14.1	14.4	14.4	14.4	16.6	16.6	16.9	16.6	16.6			
Permittivity (s-1)	1.97	2.01	1.97	1.97	1.97	1.71	1.71	1.68	1.71	1.71			
Specimen Permittivity @20°C (sec-1)	1.97	2.01	1.97	1.97	1.97	1.71	1.71	1.68	1.71	1.71			
Specimen Flow rate (GPM/ft2)	147	151	147	147	147	128	128	126	128	128			
Specimen Permeability (cm/s)	0.50	0.51	0.50	0.50	0.50	0.47	0.47	0.46	0.47	0.47			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.80**	0.5 min
											Flow rate (GPM/ft2)	**135**	
											Permeability (cm/s)	**0.48**	

MD Machine Direction TD Transverse Direction NA Not Available

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June 22, 2010

Mail To:	**Bill To:**
Kirk Wills **Environmental Planning Specialists, Inc.** 1936 Bruce B. Downs Blvd. No. 328 Wesley Chapel, Florida 33543	**<= Same**

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Vertical Expansion**
TRI Job Reference Number:	E2341-90-04
Material(s) Tested:	1 Skaps TN 330-2-8 Double Sided Geocomposite
Test(s) Requested:	Transmissivity (ASTM D 4716) GC Peel Strength (ASTM D 7005) GC Mass/Unit Area (ASTM D 5261) GT Grab Tensile Properties (ASTM D 4632) GT Trapezoidal Tear (ASTM D 4533) GT Apparent Opening Size (ASTM D 4751) GT Permittivity (ASTM D 4491) GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

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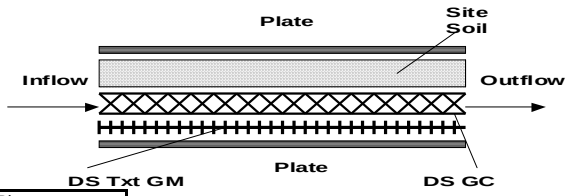
GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Vertical Expansion

Material: Skaps TN 330-2-8 Double Sided Geocomposite
Sample Identification: 375710002
TRI Log #: E2341-90-04

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3			

Hydraulic Transmissivity (ASTM D 4716)

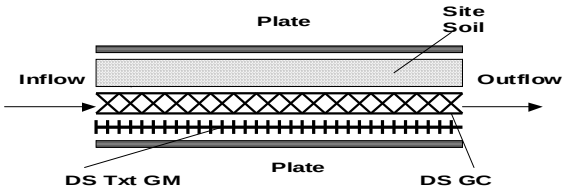


Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

Seat Time (hours)		Specimen	1					
	Volume (cc)		605	604	609			
	Time (s)		19.90	19.90	19.97			
24	Flow Rate (GPM/ft width)		0.48	0.48	0.48	**0.48**	0.00	
	Transmissivity (m^2/s)		4.99E-03	4.98E-03	5.00E-03	**4.99E-03**	1.20E-05	6.1E-04
	Test Temp (C)			20.0				
	Temp. Corr. Factor			1.000				



Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

Plate / Site Soil / GC Sample / 60 mil textured HDPE GM / Plate

Seat Time (hours)		Specimen	1					
	Volume (cc)		656	657	656			
	Time (s)		55.01	55.12	55.06			
100	Flow Rate (GPM/ft width)		0.19	0.19	0.19	**0.19**	0.00	
	Transmissivity (m^2/s)		1.96E-03	2.0E-03	2.0E-03	**1.96E-03**	8.89E-07	1.0E-04
	Test Temp (C)			20.0				
	Temp. Corr. Factor			1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Vertical Expansion

Material: Skaps TN 330-2-8 Double Sided Geocomposite
Sample Identification: 375710002
TRI Log #: E2341-90-04

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	16.4	11.9	12.4	12.8	13.6						**13.4**	1.8	1.0 min
A - MD Average Peel Strength (g/in)	7446	5403	5630	5811	6174						**6093**	807	
B - MD Average Peel Strength (ppi)	10.4	14.4	16.6	14.8	12.1						**13.7**	2.4	1.0 min
B - MD Average Peel Strength (g/in)	4722	6538	7536	6719	5493						**6202**	1102	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	3.79	3.62	4.48	3.61	3.81	4.09	3.60	3.77	3.68	3.78	**3.82**	0.27	
Mass/Unit Area (oz/sq.yd)	8.82	8.42	10.42	8.40	8.86	9.51	8.37	8.77	8.56	8.79	**8.89**	0.63	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	245	226	237	272	290	301	303	267	269	252	**266**	26	200 min
TD - Tensile Strength (lbs)	288	307	277	315	305	274	284	315	278	286	**287**	16	200 min
MD - Elong. @ Max. Load (%)	91	83	91	95	94	95	77	85	93	89	**89**	6	
TD - Elong. @ Max. Load (%)	124	113	113	129	113	109	155	108	113	109	**119**	20	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	108	119	107	105	112	112	137	115	121	113	**115**	9	75 min
TD - Tear Strength (lbs)	119	145	132	139	112	111	179	130	157	142	**136**	21	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component Side A**												
Opening Size Diameter (mm)	0.103	0.104	0.105	0.104	0.104						**0.104**	0.001	
Sieve No.	140	140	140	140	140						**140**		100 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Vertical Expansion

Material: Skaps TN 330-2-8 Double Sided Geocomposite
Sample Identification: 375710002
TRI Log #: E2341-90-04 **Geotextile Component Side A**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	21												
Correction Factor:	0.976												
Test Speciemn No. >:			1					2					
Thickness (mils)	107	107	107	107	107	108	108	108	108	108			
Time (s)	15.9	15.9	15.9	15.9	15.9	15.2	15.2	15.2	15.1	15.5			
Specimen Permittivity (s-1)	1.78	1.78	1.78	1.78	1.78	1.87	1.87	1.87	1.88	1.83			
Specimen Permittivity @20°C (sec-1)	1.74	1.74	1.74	1.74	1.74	1.82	1.82	1.82	1.83	1.79			
Specimen Flow rate (GPM/ft2)	130	130	130	130	130	136	136	136	137	134			
Specimen Permeability (cm/s)	0.47	0.47	0.47	0.47	0.47	0.50	0.50	0.50	0.50	0.49			
Test Speciemn No. >:			3					4					
Thickness (mils)	101	101	101	101	101	107	107	107	107	107			
Time (s)	13.3	12.9	12.9	13.0	13.3	15.5	15.5	15.5	15.5	15.5			
Permittivity (s-1)	2.13	2.20	2.20	2.18	2.13	1.83	1.83	1.83	1.83	1.83			
Specimen Permittivity @20°C (sec-1)	2.08	2.15	2.15	2.13	2.08	1.79	1.79	1.79	1.79	1.79			
Specimen Flow rate (GPM/ft2)	156	161	161	159	156	134	134	134	134	134			
Specimen Permeability (cm/s)	0.53	0.55	0.55	0.55	0.53	0.49	0.49	0.49	0.49	0.49			
TEMPERATURE CORRECTED VALUES										**Permittivity (s-1)**	**1.87**		0.5 min
										Flow rate (GPM/ft2)	**140**		
										Permeability (cm/s)	**0.50**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Vertical Expansion

Material: Skaps TN 330-2-8 Double Sided Geocomposite
Sample Identification: 375710002
TRI Log #: E2341-90-04 **Geotextile Component Side B**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.49	3.91	4.34	3.84	3.58	3.61	3.45	3.24	3.57	3.97	**3.70**	0.32	
Mass/Unit Area (oz/sq.yd)	8.12	9.09	10.09	8.93	8.33	8.40	8.02	7.54	8.30	9.23	**8.61**	0.74	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	266	278	240.9	272	298	269	271	274	243	235	**265**	19	200 min
TD - Tensile Strength (lbs)	312	257	237	295	332	318	244	232	324	334	**289**	41	200 min
MD - Elong. @ Max. Load (%)	92.7	103	91.3	96	95	90	89	70	81	91	**90**	9	
TD - Elong. @ Max. Load (%)	114	117	119	114	123	119	112	111	115	119	**116**	4	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	111	113	104	129	106	101	142	127	97	95	**112**	16	75 min
TD - Tear Strength (lbs)	176	146	131	140	138	149	135	115	142	127	**140**	16	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.103	0.134	0.146	0.136	0.105						**0.125**	0.019	
Sieve No.	140	100	100	100	140						**120**		100 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Vertical Expansion

Material: Skaps TN 330-2-8 Double Sided Geocomposite
Sample Identification: 375710002 **Geotextile Component Side B**
TRI Log #: E2341-90-04

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	109	109	109	109	109	111	111	111	111	111			
Time (s)	17.1	17.0	17.1	17.0	17.1	15.1	15.4	15.1	15.5	15.1			
Specimen Permittivity (s-1)	1.66	1.67	1.66	1.67	1.66	1.88	1.84	1.88	1.83	1.88			
Specimen Permittivity @20°C (sec-1)	1.66	1.67	1.66	1.67	1.66	1.88	1.84	1.88	1.83	1.88			
Specimen Flow rate (GPM/ft2)	124	125	124	125	124	141	138	141	137	141			
Specimen Permeability (cm/s)	0.46	0.46	0.46	0.46	0.46	0.53	0.52	0.53	0.52	0.53			
Test Speciemn No. >:			3					4					
Thickness (mils)	108	108	108	108	108	110	110	110	110	110			
Time (s)	15.7	15.7	15.7	15.7	15.8	15.4	15.4	15.4	15.4	15.4			
Permittivity (s-1)	1.81	1.81	1.81	1.81	1.80	1.84	1.84	1.84	1.84	1.84			
Specimen Permittivity @20°C (sec-1)	1.81	1.81	1.81	1.81	1.80	1.84	1.84	1.84	1.84	1.84			
Specimen Flow rate (GPM/ft2)	135	135	135	135	134	138	138	138	138	138			
Specimen Permeability (cm/s)	0.50	0.50	0.50	0.50	0.49	0.51	0.51	0.51	0.51	0.51			
			TEMPERATURE CORRECTED VALUES					**Permittivity (s-1)**			**1.79**		0.5 min
								Flow rate (GPM/ft2)			**134**		
								Permeability (cm/s)			**0.50**		

MD Machine Direction TD Transverse Direction NA Not Available

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Appendix O

SKAPS Industries

Engineered Synthetic Products, Inc.

April 5, 2010
Waste Services

Ref. : JED Vertical Expansion, FL
Customer P.O. #
Transnet 270-2-8

We certify that the Transnet 270-2-8 drainage composite, meets the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Required Value	Qualifier
Geonet[4]				
Mass per Unit Area	ASTM D 5261	lbs/ft^2	0.197	Minimum
Thickness	ASTM D 5199	mil	200	Minimum
Carbon Black	ASTM D 4218	%	2.0 - 3.0	Range
Tensile Strength	ASTM D 5035	lbs/in	75	Minimum
Melt Flow	ASTM D 1238[3]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm^3	0.93	Minimum
Composite				
Ply Adhesion	ASTM D 7005	lb/in	1.0	MARV[6]
Transmissivity[1]	ASTM D 4716	m^2/sec	6.1 x 10^{-4}	MARV
Transmissivity[2]	ASTM D 4716	m^2/sec	1.0 x 10^{-4}	MARV
Geotextile[4 & 5]				
Fabric Weight	ASTM D 5261	oz/yd^2	8.0	MARV
Grab Strength	ASTM D 4632	lbs	200	MARV
Tear Strength	ASTM D 4533	lbs	75	MARV
CBR Puncture	ASTM D 6241	lbs	500	MARV
Permittivity	ASTM D 4491	sec^{-1}	0.5	MARV
AOS	ASTM D 4751	US Sieve	80	MARV
UV Resistance	ASTM D 4355	%/hrs	70/500	MARV

Notes:

1 Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.02 and a confining pressure of 500 psf between textured geomembranes after 24 hours.

2 Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.02 and a confining pressure of 15000 psf between textured geomembranes after 100 hours.

3 Condition 190/2.16

4 Geotextile and Geonet properties are prior to lamination.

5 Geotextile data is provided by the supplier.

6 MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.

Sincerely,

Nilay Patel

Nilay Patel
QA Manager

571 Industrial Parkway, Commerce, GA 30529 **Phone**: 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520001	359520001 - N	3595.045	3595.035	1.29	4.09	
2	359520002	359520002 - N	3595.045	3595.035			
3	359520003	359520003 - N	3595.045	3595.035			
4	359520004	359520004 - N	3595.045	3595.035			
5	359520005	359520005 - N	3595.045	3595.035			
6	359520006	359520006 - N	3595.045	3595.035			
7	359520007	359520007 - N	3595.005	3595.021			
8	359520008	359520008 - N	3595.005	3595.021			
9	359520009	359520009 - N	3595.005	3595.021			
10	359520010	359520010 - N	3595.005	3595.021			
11	359520011	359520011 - N	3595.005	3595.021			
12	359520012	359520012 - N	3595.005	3595.021			
13	359520013	359520013 - N	3595.017	3595.006			
14	359520014	359520014 - N	3595.017	3595.006			
15	359520015	359520015 - N	3595.017	3595.006	1.85	4.18	
16	359520016	359520016 - N	3595.017	3595.006			
17	359520017	359520017 - N	3595.017	3595.006			
18	359520018	359520018 - N	3595.017	3595.006			
19	359520019	359520019 - N	3595.003	3595.024			
20	359520020	359520020 - N	3595.003	3595.024			
21	359520021	359520021 - N	3595.003	3595.024			
22	359520022	359520022 - N	3595.003	3595.024			
23	359520023	359520023 - N	3595.003	3595.024			
24	359520024	359520024 - N	3595.003	3595.024			
25	359520025	359520025 - N	3595.020	3595.010			
26	359520026	359520026 - N	3595.020	3595.010			
27	359520027	359520027 - N	3595.020	3595.010			



571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520001 - N	CCBX72741	0.9530	0.253	265	2.29	92	
359520002 - N	CCBX72741	0.9530					
359520003 - N	CCBX72741	0.9530					
359520004 - N	CCBX72741	0.9530					
359520005 - N	CCBX72741	0.9530					
359520006 - N	CCBX72741	0.9530					
359520007 - N	CCBX72741	0.9530					
359520008 - N	CCBX72741	0.9530					
359520009 - N	CCBX72741	0.9530					
359520010 - N	CCBX72741	0.9530					
359520011 - N	CCBX72741	0.9530					
359520012 - N	CCBX72741	0.9530					
359520013 - N	CCBX72741	0.9530					
359520014 - N	CCBX72741	0.9530					
359520015 - N	CCBX72741	0.9530	0.256	274	2.55	94	
359520016 - N	CCBX72741	0.9530					
359520017 - N	CCBX72741	0.9530					
359520018 - N	CCBX72741	0.9530					
359520019 - N	CCBX72741	0.9530					
359520020 - N	CCBX72741	0.9530					
359520021 - N	CCBX72741	0.9530					
359520022 - N	CCBX72741	0.9530					
359520023 - N	CCBX72741	0.9530					
359520024 - N	CCBX72741	0.9530					
359520025 - N	CCBX72741	0.9530					
359520026 - N	CCBX72741	0.9530					
359520027 - N	CCBX72741	0.9530					

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520028	359520028 - N	3595.020	3595.010			
2	359520029	359520029 - N	3595.020	3595.010			
3	359520030	359520030 - N	3595.020	3595.010	1.35	4.12	
4	359520031	359520031 - N	3595.012	3595.016			
5	359520032	359520032 - N	3595.012	3595.016			
6	359520033	359520033 - N	3595.012	3595.016			
7	359520034	359520034 - N	3595.012	3595.016			
8	359520035	359520035 - N	3595.012	3595.016			
9	359520036	359520036 - N	3595.012	3595.016			
10	359520037	359520037 - N	3595.022	3595.002			
11	359520038	359520038 - N	3595.022	3595.002			
12	359520039	359520039 - N	3595.022	3595.002			
13	359520040	359520040 - N	3595.022	3595.002			
14	359520041	359520041 - N	3595.022	3595.002			
15	359520042	359520042 - N	3595.022	3595.002			
16	359520043	359520043 - N	3595.007	3595.026			
17	359520044	359520044 - N	3595.007	3595.026			
18	359520045	359520045 - N	3595.007	3595.026	2.03	4.20	
19	359520046	359520046 - N	3595.007	3595.026			
20	359520047	359520047 - N	3595.007	3595.026			
21	359520048	359520048 - N	3595.007	3595.026			
22	359520049	359520049 - N	3595.015	3595.004			
23	359520050	359520050 - N	3595.015	3595.004			
24	359520051	359520051 - N	3595.015	3595.004			
25	359520052	359520052 - N	3595.015	3595.004			
26	359520053	359520053 - N	3595.015	3595.004			
27	359520054	359520054 - N	3595.015	3595.004			

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520028 - N	CCBX72741	0.9530					
359520029 - N	CCBX72741	0.9530					
359520030 - N	CCBX72741	0.9530	0.250	267	2.36	90	
359520031 - N	CCBX72741	0.9530					
359520032 - N	CCBX72741	0.9530					
359520033 - N	CCBX72741	0.9530					
359520034 - N	CCBX72741	0.9530					
359520035 - N	CCBX72741	0.9530					
359520036 - N	CCBX72741	0.9530					
359520037 - N	CCBX72741	0.9530					
359520038 - N	CCBX72741	0.9530					
359520039 - N	CCBX72741	0.9530					
359520040 - N	CCBX72741	0.9530					
359520041 - N	CCBX72741	0.9530					
359520042 - N	CCBX72741	0.9530					
359520043 - N	CCBX72741	0.9530					
359520044 - N	CCBX72741	0.9530					
359520045 - N	CCBX72741	0.9530	0.258	272	2.62	96	
359520046 - N	CCBX72741	0.9530					
359520047 - N	CCBX72741	0.9530					
359520048 - N	CCBX72741	0.9530					
359520049 - N	CCBX72741	0.9530					
359520050 - N	CCBX72741	0.9530					
359520051 - N	CCBX72741	0.9530					
359520052 - N	CCBX72741	0.9530					
359520053 - N	CCBX72741	0.9530					
359520054 - N	CCBX72741	0.9530					



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Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520055	359520055 - N	3595.001	3595.042			
2	359520056	359520056 - N	3595.001	3595.042			
3	359520057	359520057 - N	3595.001	3595.042			
4	359520058	359520058 - N	3595.001	3595.042			
5	359520059	359520059 - N	3595.001	3595.042			
6	359520060	359520060 - N	3595.001	3595.042	1.43	4.05	
7	359520061	359520061 - N	3595.025	3595.018			
8	359520062	359520062 - N	3595.025	3595.018			
9	359520063	359520063 - N	3595.025	3595.018			
10	359520064	359520064 - N	3595.025	3595.018			
11	359520065	359520065 - N	3595.025	3595.018			
12	359520066	359520066 - N	3595.025	3595.018			
13	359520067	359520067 - N	3595.014	3595.044			
14	359520068	359520068 - N	3595.014	3595.044			
15	359520069	359520069 - N	3595.014	3595.044			
16	359520070	359520070 - N	3595.014	3595.044			
17	359520071	359520071 - N	3595.014	3595.044			
18	359520072	359520072 - N	3595.014	3595.044			
19	359520073	359520073 - N	3595.041	3595.036			
20	359520074	359520074 - N	3595.041	3595.036			
21	359520075	359520075 - N	3595.041	3595.036	1.71	4.17	
22	359520076	359520076 - N	3595.041	3595.036			
23	359520077	359520077 - N	3595.041	3595.036			
24	359520078	359520078 - N	3595.041	3595.036			
25	359520079	359520079 - N	3595.027	3595.047			
26	359520080	359520080 - N	3595.027	3595.047			
27	359520081	359520081 - N	3595.027	3595.047			

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520055 - N	CCBX72741	0.9530					
359520056 - N	CCBX72741	0.9530					
359520057 - N	CCBX72741	0.9530					
359520058 - N	CCBX72741	0.9530					
359520059 - N	CCBX72741	0.9530					
359520060 - N	CCBX72741	0.9530	0.254	263	2.42	93	
359520061 - N	CCBX72741	0.9530					
359520062 - N	CCBX72741	0.9530					
359520063 - N	CCBX72741	0.9530					
359520064 - N	CCBX72741	0.9530					
359520065 - N	CCBX72741	0.9530					
359520066 - N	CCBX72741	0.9530					
359520067 - N	CCBX72741	0.9530					
359520068 - N	CCBX72741	0.9530					
359520069 - N	CCBX72741	0.9530					
359520070 - N	CCBX72741	0.9530					
359520071 - N	CCBX72741	0.9530					
359520072 - N	CCBX72741	0.9530					
359520073 - N	CCBX72741	0.9530					
359520074 - N	CCBX72741	0.9530					
359520075 - N	CCBX72741	0.9530	0.257	276	2.53	95	
359520076 - N	CCBX72741	0.9530					
359520077 - N	CCBX72741	0.9530					
359520078 - N	CCBX72741	0.9530					
359520079 - N	CCBX72741	0.9530					
359520080 - N	CCBX72741	0.9530					
359520081 - N	CCBX72741	0.9530					



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Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520082	359520082 - N	3595.027	3595.047			
2	359520083	359520083 - N	3595.027	3595.047			
3	359520084	359520084 - N	3595.027	3595.047			
4	359520085	359520085 - N	3595.046	3595.033			
5	359520086	359520086 - N	3595.046	3595.033			
6	359520087	359520087 - N	3595.046	3595.033			
7	359520088	359520088 - N	3595.046	3595.033			
8	359520089	359520089 - N	3595.046	3595.033			
9	359520090	359520090 - N	3595.046	3595.033	1.27	4.10	
10	359520091	359520091 - N	3595.009	3595.013			
11	359520092	359520092 - N	3595.009	3595.013			
12	359520093	359520093 - N	3595.009	3595.013			
13	359520094	359520094 - N	3595.009	3595.013			
14	359520095	359520095 - N	3595.009	3595.013			
15	359520096	359520096 - N	3595.009	3595.013			
16	359520097	359520097 - N	3595.034	3595.049			
17	359520098	359520098 - N	3595.034	3595.049			
18	359520099	359520099 - N	3595.034	3595.049			
19	359520100	359520100 - N	3595.034	3595.049			
20	359520101	359520101 - N	3595.034	3595.049			
21	359520102	359520102 - N	3595.034	3595.049			
22	359520103	359520103 - N	3595.043	3595.038			
23	359520104	359520104 - N	3595.043	3595.038			
24	359520105	359520105 - N	3595.043	3595.038	2.06	4.22	
25	359520106	359520106 - N	3595.043	3595.038			
26	359520107	359520107 - N	3595.043	3595.038			
27	359520108	359520108 - N	3595.043	3595.038			



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Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520082 - N	CCBX72741	0.9530					
359520083 - N	CCBX72741	0.9530					
359520084 - N	CCBX72741	0.9530					
359520085 - N	CCBX72741	0.9530					
359520086 - N	CCBX72741	0.9530					
359520087 - N	CCBX72741	0.9530					
359520088 - N	CCBX72741	0.9530					
359520089 - N	CCBX72741	0.9530					
359520090 - N	CCBX72741	0.9530	0.251	269	2.27	91	
359520091 - N	CCBX72741	0.9530					
359520092 - N	CCBX72741	0.9530					
359520093 - N	CCBX72741	0.9530					
359520094 - N	CCBX72741	0.9530					
359520095 - N	CCBX72741	0.9530					
359520096 - N	CCBX72741	0.9530					
359520097 - N	CCBX72741	0.9530					
359520098 - N	CCBX72741	0.9530					
359520099 - N	CCBX72741	0.9530					
359520100 - N	CCBX72741	0.9530					
359520101 - N	CCBX72741	0.9530					
359520102 - N	CCBX72741	0.9530					
359520103 - N	CCBX72741	0.9530					
359520104 - N	CCBX72741	0.9530					
359520105 - N	CCBX72741	0.9530	0.259	278	2.64	96	
359520106 - N	CCBX72741	0.9530					
359520107 - N	CCBX72741	0.9530					
359520108 - N	CCBX72741	0.9530					

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Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520109	359520109 - N	3595.032	3595.051			
2	359520110	359520110 - N	3595.032	3595.051			
3	359520111	359520111 - N	3595.032	3595.051			
4	359520112	359520112 - N	3595.032	3595.051			
5	359520113	359520113 - N	3595.032	3595.051			
6	359520114	359520114 - N	3595.032	3595.051			
7	359520115	359520115 - N	3595.050	3595.029			
8	359520116	359520116 - N	3595.050	3595.029			
9	359520117	359520117 - N	3595.050	3595.029			
10	359520118	359520118 - N	3595.050	3595.029			
11	359520119	359520119 - N	3595.050	3595.029			
12	359520120	359520120 - N	3595.050	3595.029	1.33	4.03	
13	359520121	359520121 - N	3595.039	3595.054			
14	359520122	359520122 - N	3595.039	3595.054			
15	359520123	359520123 - N	3595.039	3595.054			
16	359520124	359520124 - N	3595.039	3595.054			
17	359520125	359520125 - N	3595.039	3595.054			
18	359520126	359520126 - N	3595.039	3595.054			
19	359520127	359520127 - N	3595.048	3595.040			
20	359520128	359520128 - N	3595.048	3595.040			
21	359520129	359520129 - N	3595.048	3595.040			
22	359520130	359520130 - N	3595.048	3595.040			
23	359520131	359520131 - N	3595.048	3595.040			
24	359520132	359520132 - N	3595.048	3595.040			
25	359520133	359520133 - N	3595.028	3595.059			
26	359520134	359520134 - N	3595.028	3595.059			
27	359520135	359520135 - N	3595.028	3595.059	1.97	4.19	



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We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520109 - N	CCBX72741	0.9530					
359520110 - N	CCBX72741	0.9530					
359520111 - N	CCBX72741	0.9530					
359520112 - N	CCBX72741	0.9530					
359520113 - N	CCBX72741	0.9530					
359520114 - N	CCBX72741	0.9530					
359520115 - N	CCBX72741	0.9530					
359520116 - N	CCBX72741	0.9530					
359520117 - N	CCBX72741	0.9530					
359520118 - N	CCBX72741	0.9530					
359520119 - N	CCBX72741	0.9530					
359520120 - N	CCBX72741	0.9530	0.255	264	2.33	90	
359520121 - N	CCBX72741	0.9530					
359520122 - N	CCBX72741	0.9530					
359520123 - N	CCBX72741	0.9530					
359520124 - N	CCBX72741	0.9530					
359520125 - N	CCBX72741	0.9530					
359520126 - N	CCBX72741	0.9530					
359520127 - N	CCBX72741	0.9530					
359520128 - N	CCBX72741	0.9530					
359520129 - N	CCBX72741	0.9530					
359520130 - N	CCBX72741	0.9530					
359520131 - N	CCBX72741	0.9530					
359520132 - N	CCBX72741	0.9530					
359520133 - N	CCBX72741	0.9530					
359520134 - N	CCBX72741	0.9530					
359520135 - N	CCBX72741	0.9530	0.257	273	2.57	95	

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We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520136	359520136 - N	3595.028	3595.059			
2	359520137	359520137 - N	3595.028	3595.059			
3	359520138	359520138 - N	3595.028	3595.059			
4	359520139	359520139 - N	3595.052	3595.056			
5	359520140	359520140 - N	3595.052	3595.056			
6	359520141	359520141 - N	3595.052	3595.056			
7	359520142	359520142 - N	3595.052	3595.056			
8	359520143	359520143 - N	3595.052	3595.056			
9	359520144	359520144 - N	3595.052	3595.056			
10	359520145	359520145 - N	3595.037	3595.061			
11	359520146	359520146 - N	3595.037	3595.061			
12	359520147	359520147 - N	3595.037	3595.061			
13	359520148	359520148 - N	3595.037	3595.061			
14	359520149	359520149 - N	3595.037	3595.061			
15	359520150	359520150 - N	3595.037	3595.061	1.45	4.14	
16	359520151	359520151 - N	3595.031	3595.019			
17	359520152	359520152 - N	3595.031	3595.019			
18	359520153	359520153 - N	3595.031	3595.019			
19	359520154	359520154 - N	3595.031	3595.019			
20	359520155	359520155 - N	3595.031	3595.019			
21	359520156	359520156 - N	3595.031	3595.019			
22	359520157	359520157 - N	3595.057	3595.064			
23	359520158	359520158 - N	3595.057	3595.064			
24	359520159	359520159 - N	3595.057	3595.064			
25	359520160	359520160 - N	3595.057	3595.064			
26	359520161	359520161 - N	3595.057	3595.064			
27	359520162	359520162 - N	3595.057	3595.064			



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Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520136 - N	CCBX72741	0.9530					
359520137 - N	CCBX72741	0.9530					
359520138 - N	CCBX72741	0.9530					
359520139 - N	CCBX72741	0.9530					
359520140 - N	CCBX72741	0.9530					
359520141 - N	CCBX72741	0.9530					
359520142 - N	CCBX72741	0.9530					
359520143 - N	CCBX72741	0.9530					
359520144 - N	CCBX72741	0.9530					
359520145 - N	CCBX72741	0.9530					
359520146 - N	CCBX72741	0.9530					
359520147 - N	CCBX72741	0.9530					
359520148 - N	CCBX72741	0.9530					
359520149 - N	CCBX72741	0.9530					
359520150 - N	CCBX72741	0.9530	0.252	268	2.45	92	
359520151 - N	CCBX72741	0.9530					
359520152 - N	CCBX72741	0.9530					
359520153 - N	CCBX72741	0.9530					
359520154 - N	CCBX72741	0.9530					
359520155 - N	CCBX72741	0.9530					
359520156 - N	CCBX72741	0.9530					
359520157 - N	CCBX72741	0.9530					
359520158 - N	CCBX72741	0.9530					
359520159 - N	CCBX72741	0.9530					
359520160 - N	CCBX72741	0.9530					
359520161 - N	CCBX72741	0.9530					
359520162 - N	CCBX72741	0.9530					

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571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	359520163	359520163 - N	3595.060	3595.058			
2	359520164	359520164 - N	3595.060	3595.058			
3	359520165	359520165 - N	3595.060	3595.058	2.04	4.23	
4	359520166	359520166 - N	3595.060	3595.058			
5	359520167	359520167 - N	3595.060	3595.058			
6	359520168	359520168 - N	3595.060	3595.058			
7	359520169	359520169 - N	3595.055	3595.062			
8	359520170	359520170 - N	3595.055	3595.062			



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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-8**
Project : **JED Vertical Expansion, FL**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
359520163 - N	CCBX72741	0.9530					
359520164 - N	CCBX72741	0.9530					
359520165 - N	CCBX72741	0.9530	0.256	275	2.61	94	
359520166 - N	CCBX72741	0.9530					
359520167 - N	CCBX72741	0.9530					
359520168 - N	CCBX72741	0.9530					
359520169 - N	CCBX72741	0.9530					
359520170 - N	CCBX72741	0.9530					

APPROVED 5 QA

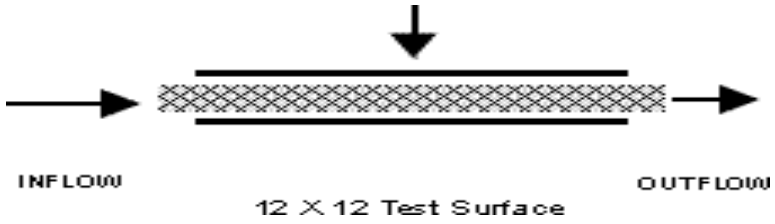
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SKAPS Industries

ASTM D 4716

Client:	Waste Services	**Job #**	3595
Project:	JED Vertical Expansion, FL		
Product:	TN270-2-8		

Test Configuration:



Test Information:

Boundary Conditions:	Textured Geomembrane Geocomposite Textured Geomembrane	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	500 psf 0.02 ft 24 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec
			24 hours
359520001	500	0.02	1.13×10^{-3}
359520035			1.23×10^{-3}
359520070			1.07×10^{-3}
359520105			1.19×10^{-3}
359520140			1.11×10^{-3}

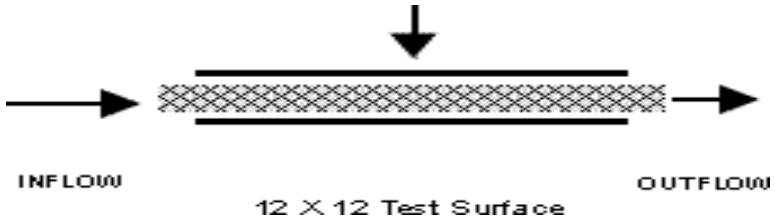
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SKAPS Industries

ASTM D 4716

Client:	Waste Services	**Job #**	3595
Project:	JED Vertical Expansion, FL		
Product:	TN270-2-8		

Test Configuration:



Test Information:

Boundary Conditions:	Textured Geomembrane Geocomposite Textured Geomembrane	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	15000 psf 0.02 ft 100 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec
			100 hours
359520001	15000	0.02	4.19×10^{-4}
359520035			4.42×10^{-4}
359520070			4.27×10^{-4}
359520105			4.44×10^{-4}
359520140			4.33×10^{-4}

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Waste Services
Project Name : JED Vertical Expansion, FL
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN270-2-8

We, the Geonet Manufacturer, hereby certify the following for the material delivered to the above referenced project:

Resin Supplier	Resin Production Plant	Resin Brand Name	Resin Lot Number	Property	Test Method	Units	Resin Supplier Value	Tested Value*
Trademark Plastics Corporation	Chevron, TX	HDPE	CCBX72741	Density	ASTM D 1505	gm/cc	0.948	0.949
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.15	0.15

(a) Condition 190/2.16
* Data from SKAPS Quality Control

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN270-2-8
Project : JED Vertical Expansion, FL

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL#	FABRIC ROLL#	WEIGHT oz/sq yd	MD TENSILE lbs.	XMD TENSILE lbs.	MD TRAP lbs.	XMD TRAP lbs.	CBR PUNCTURE lbs.	AOS us sieve	PERM-ITY sec^{-1}
359520001	3595.045	8.53	232	244	95	104	658	80	1.33
	3595.035	8.46	234	240	104	116	681	80	1.33
359520035	3595.012	8.21	225	236	102	118	677	80	1.33
	3595.016	8.42	233	245	102	118	677	80	1.33
359520070	3595.014	8.21	225	236	102	118	677	80	1.33
	3595.044	8.16	228	230	95	104	658	80	1.33
359520105	3595.043	8.16	228	230	95	104	658	80	1.33
	3595.038	8.46	234	240	104	116	681	80	1.33
359520140	3595.052	8.29	230	237	101	120	690	80	1.37
	3595.056	8.40	235	242	101	120	690	80	1.37

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

Appendix

P

April 6, 2010
April 7, 2010 Updating with 24 hour transmissivity result.
April 12, 2010 Updating with 100 hour transmissivity test results.
April 14, 2010 Updating with 24 hour transmissivity result for Roll # 359520093 and 0151.
April 15, 2010 Revised with Transmissivity Configuration Correction.
April 16, 2010 Updated with 100 hour transmissivity test results.

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Bill To:

<= Same

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs.
TRI is pleased to submit this final report for laboratory testing.

Project: **JED-Solid Waste Management Facility Cell 7**

TRI Job Reference Number: E2341-08-09

Material(s) Tested: 3 Skaps TN270-2-8 Double Sided Geocomposite(s)

Test(s) Requested:
Transmissivity (ASTM D 4716) GC <===Updating 100 hr Result.
Peel Strength (ASTM D 7005) GC
Mass/Unit Area (ASTM D 5261) GT
Grab Tensile Properties (ASTM D 4632) GT
Trapezoidal Tear (ASTM D 4533) GT
Apparent Opening Size (ASTM D 4751) GT
Permittivity (ASTM D 4491) GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

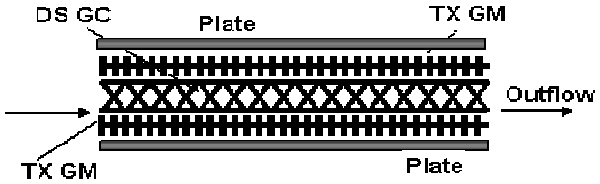


Plate / 60 mil textured HDPE GM / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER		TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
		1	2	3			
Seat Time (hours)	Specimen	1					
	Volume (cc)	590	591	587			
	Time (s)	30.00	30.03	29.93			
24	Flow Rate (GPM/ft width)	0.31	0.31	0.31	**0.31**	0.00	
	Transmissivity (m^2/s)	3.23E-03	3.23E-03	3.22E-03	**3.22E-03**	5.89E-06	6.1E-04
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction: of this report, except in full, without prior approval of TRI.

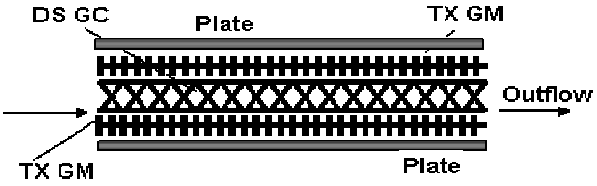
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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3			
Hydraulic Transmissivity (ASTM D 4716)						
Direction Tested: Machine Direction						
Normal Load (psf):	15,000					
Hydraulic Gradient:	0.02					
Test Length (in)	12					
Test Width (in)	12					
Plate / 60 mil textured HDPE GM / GC Sample / 60 mil textured HDPE GM / Plate						
Seat Time (hours)	Specimen	1				
	Volume (cc)	581	576	575		
	Time (s)	70.09	70.03	70.04		
100	Flow Rate (GPM/ft width)	0.13	0.13	0.13	**0.13**	0.00
	Transmissivity (m^2/s)	1.36E-03	1.35E-03	1.35E-03	**1.35E-03**	6.94E-06
	Test Temp (C)		20.0			
	Temp. Corr. Factor		1.000			



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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	4.5	5.1	4.1	4.9	2.9						**4.3**	0.9	1.0 min
A - MD Average Peel Strength (g/in)	2043	2315	1861	2225	1317						**1952**	396	
B - MD Average Peel Strength (ppi)	8.2	4.2	5.4	6.0	7.4						**6.2**	1.6	1.0 min
B - MD Average Peel Strength (g/in)	3723	1907	2452	2724	3360						**2833**	722	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	4.10	3.85	3.80	3.51	3.78	3.89	3.62	3.96	3.62	3.48	**3.76**	0.20	
Mass/Unit Area (oz/sq.yd)	9.54	8.96	8.84	8.16	8.79	9.05	8.42	9.21	8.42	8.09	**8.75**	0.47	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	209	291	296	247	276	306	269	277	313	234	**272**	33	200 min
TD - Tensile Strength (lbs)	290	329	294	303	349	298	335	310	268	300	**302**	24	200 min
MD - Elong. @ Max. Load (%)	75	88	84	83	83	88	81	80	87	80	**83**	4	
TD - Elong. @ Max. Load (%)	121	105	114	119	115	107	117	115	135	103	**115**	12	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	111	94	84	140	115	104	94	118	96	124	**108**	17	75 min
TD - Tear Strength (lbs)	143	110	122	112	129	119	110	109	105	120	**118**	12	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component Side A**												
Opening Size Diameter (mm)	0.075	0.075	0.075	0.075	0.075						**0.075**	0.000	0.21max
Sieve No.	200	200	200	200	200						**200**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09 **Geotextile Component Side A**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	96	96	96	96	96	98	98	98	98	98			
Time (s)	14.7	14.7	15.0	14.7	15.1	16.6	16.3	16.5	16.2	16.3			
Specimen Permittivity (s-1)	1.93	1.93	1.89	1.93	1.88	1.71	1.74	1.72	1.75	1.74			
Specimen Permittivity @20°C (sec-1)	1.93	1.93	1.89	1.93	1.88	1.71	1.74	1.72	1.75	1.74			
Specimen Flow rate (GPM/ft2)	144	144	141	144	141	128	130	129	131	130			
Specimen Permeability (cm/s)	0.47	0.47	0.46	0.47	0.46	0.43	0.43	0.43	0.44	0.43			
Test Speciemn No. >:			3					4					
Thickness (mils)	97	97	97	97	97	100	100	100	100	100			
Time (s)	15.7	15.9	15.6	16.0	15.9	16.9	16.9	16.9	16.9	16.9			
Permittivity (s-1)	1.81	1.78	1.82	1.77	1.78	1.68	1.68	1.68	1.68	1.68			
Specimen Permittivity @20°C (sec-1)	1.81	1.78	1.82	1.77	1.78	1.68	1.68	1.68	1.68	1.68			
Specimen Flow rate (GPM/ft2)	135	133	136	133	133	126	126	126	126	126			
Specimen Permeability (cm/s)	0.45	0.44	0.45	0.44	0.44	0.43	0.43	0.43	0.43	0.43			
			TEMPERATURE CORRECTED VALUES					**Permittivity (s-1)**			**1.78**		0.5 min
								Flow rate (GPM/ft2)			**133**		
								Permeability (cm/s)			**0.44**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09 **Geotextile Component Side B**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.58	3.73	3.63	3.91	3.62	3.87	3.87	3.82	3.67	3.21	**3.69**	0.21	
Mass/Unit Area (oz/sq.yd)	8.33	8.68	8.44	9.09	8.42	9.00	9.00	8.89	8.54	7.47	**8.59**	0.48	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	274	273	288	247	225	274	265	257	305	313	**272**	26	200 min
TD - Tensile Strength (lbs)	282	280	289	324	252	308	307	244	298	294	**288**	25	200 min
MD - Elong. @ Max. Load (%)	84	87	92	87	77	85	87	84	89	95	**87**	5	
TD - Elong. @ Max. Load (%)	94	115	115	105	109	109	101	115	103	103	**107**	7	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	107	109	102	119	111	108	106	95	100	115	**107**	7	75 min
TD - Tear Strength (lbs)	123	105	106	110	114	118	134	132	92	125	**116**	13	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.075	0.075	0.075	0.075	0.072						**0.074**	0.001	0.21max
Sieve No.	200	200	200	200	200						**200**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005 **Geotextile Component Side B**
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	99	99	99	99	99	102	102	102	102	102			
Time (s)	14.3	14.3	14.7	14.7	14.7	16.3	16.3	16.0	16.2	16.2			
Specimen Permittivity (s-1)	1.98	1.98	1.93	1.93	1.93	1.74	1.74	1.77	1.75	1.75			
Specimen Permittivity @20°C (sec-1)	1.98	1.98	1.93	1.93	1.93	1.74	1.74	1.77	1.75	1.75			
Specimen Flow rate (GPM/ft2)	148	148	144	144	144	130	130	133	131	131			
Specimen Permeability (cm/s)	0.50	0.50	0.49	0.49	0.49	0.45	0.45	0.46	0.45	0.45			
Test Speciemn No. >:			3					4					
Thickness (mils)	94	94	94	94	94	103	103	103	103	103			
Time (s)	14.4	14.4	14.4	14.4	14.4	16.9	16.6	16.6	16.9	16.9			
Permittivity (s-1)	1.97	1.97	1.97	1.97	1.97	1.68	1.71	1.71	1.68	1.68			
Specimen Permittivity @20°C (sec-1)	1.97	1.97	1.97	1.97	1.97	1.68	1.71	1.71	1.68	1.68			
Specimen Flow rate (GPM/ft2)	147	147	147	147	147	126	128	128	126	126			
Specimen Permeability (cm/s)	0.47	0.47	0.47	0.47	0.47	0.44	0.45	0.45	0.44	0.44			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.84**	0.5 min
											Flow rate (GPM/ft2)	**138**	
											Permeability (cm/s)	**0.46**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520093
TRI Log #: E2341-08-09

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

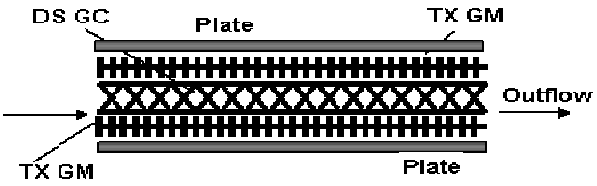


Plate / 60 mil textured HDPE GM / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER		TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
		1	2	3			
Seat Time (hours)	Specimen	1					
	Volume (cc)	765	772	772			
	Time (s)	39.95	40.01	40.04			
24	Flow Rate (GPM/ft width)	0.30	0.31	0.31	**0.31**	0.00	
	Transmissivity (m^2/s)	3.14E-03	3.17E-03	3.16E-03	**3.16E-03**	1.32E-05	6.1E-04
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520093
TRI Log #: E2341-08-09

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

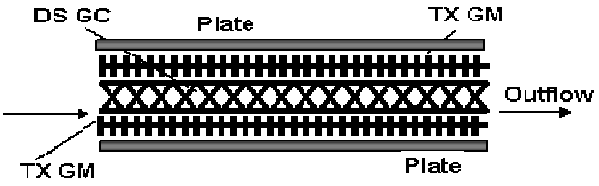


Plate / 60 mil textured HDPE GM / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER		TEST REPLICATE NUMBER	1	2	3	MEAN	STD. DEV.	PROJ. SPEC.
Seat Time (hours)		Specimen	1					
	Volume (cc)		735	535	549			
	Time (s)		185.03	135.12	140.04			
100	Flow Rate (GPM/ft width)		0.06	0.06	0.06	**0.06**	0.00	
	Transmissivity (m^2/s)		6.52E-04	6.50E-04	6.43E-04	**6.48E-04**	4.44E-06	1.0E-04
	Test Temp (C)			20.0				
	Temp. Corr. Factor			1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520093
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	4.9	7.0	5.6	4.2	4.6						**5.3**	1.1	1.0 min
A - MD Average Peel Strength (g/in)	2225	3178	2542	1907	2088						**2388**	499	
B - MD Average Peel Strength (ppi)	4.4	6.0	3.3	3.7	5.3						**4.5**	1.1	1.0 min
B - MD Average Peel Strength (g/in)	1998	2724	1498	1680	2406						**2061**	506	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	3.71	3.62	3.65	3.43	3.67	3.77	3.96	3.53	3.95	3.88	**3.72**	0.18	
Mass/Unit Area (oz/sq.yd)	8.63	8.42	8.49	7.98	8.54	8.77	9.21	8.21	9.19	9.02	**8.65**	0.41	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	250	296	244	281	328	256	290	289	290	284	**281**	25	200 min
TD - Tensile Strength (lbs)	304	260	324	243	275	266	293	244	334	345	**289**	37	200 min
MD - Elong. @ Max. Load (%)	75	89	83	80	93	84	83	85	87	83	**84**	5	
TD - Elong. @ Max. Load (%)	101	132	110	109	122	110	101	123	119	121	**115**	10	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	129	102	103	86	117	113	91	110	101	115	**106**	13	75 min
TD - Tear Strength (lbs)	103	117	110	112	137	116	140	114	97	135	**118**	15	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520093 **Geotextile Component Side B**
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.96	4.04	3.79	3.53	3.58	3.38	4.35	3.39	3.26	3.82	**3.71**	0.34	
Mass/Unit Area (oz/sq.yd)	9.21	9.40	8.82	8.21	8.33	7.86	10.12	7.89	7.58	8.89	**8.63**	0.80	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	306	281	253	288	240	304	255	286	300	281	**279**	23	200 min
TD - Tensile Strength (lbs)	296	272	221	331	270	289	349	246	283	351	**291**	43	200 min
MD - Elong. @ Max. Load (%)	83	97	87	89	77	83	79	83	81	81	**84**	6	
TD - Elong. @ Max. Load (%)	98	111	104	106	131	103	112	121	101	115	**110**	10	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	128	118	126	104	125	122	112	91	109	93	**113**	13	75 min
TD - Tear Strength (lbs)	141	138	98	114	120	135	129	122	109	131	**124**	14	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520151
TRI Log #: E2341-08-09

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

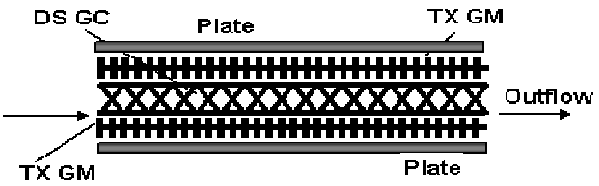


Plate / 60 mil textured HDPE GM / GC Sample / 60 mil textured HDPE GM / Plate

PARAMETER		TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
		1	2	3			
Seat Time (hours)	Specimen	1					
	Volume (cc)	636	640	647			
	Time (s)	32.10	32.13	32.18			
24	Flow Rate (GPM/ft width)	0.31	0.32	0.32	**0.32**	0.00	
	Transmissivity (m^2/s)	3.25E-03	3.27E-03	3.30E-03	**3.27E-03**	2.43E-05	6.1E-04
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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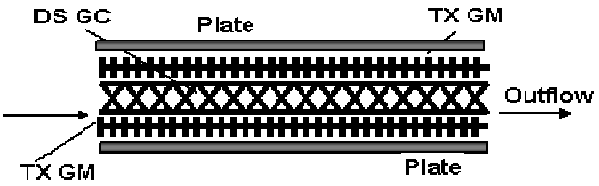
GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520151
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3			

Hydraulic Transmissivity (ASTM D 4716)



Direction Tested: Machine Direction

Normal Load (psf):	15,000
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

Plate / 60 mil textured HDPE GM / GC Sample / 60 mil textured HDPE GM / Plate

Seat Time (hours)		Specimen	1			MEAN	STD. DEV.	PROJ. SPEC.
	Volume (cc)		514	511	509			
	Time (s)		90.16	90.13	90.13			
100	Flow Rate (GPM/ft width)		0.09	0.09	0.09	**0.09**	0.00	
	Transmissivity (m^2/s)		9.35E-04	9.30E-04	9.26E-04	**9.31E-04**	4.42E-06	1.0E-04
	Test Temp (C)			20.0				
	Temp. Corr. Factor			1.000				

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520151
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	11.1	9.9	9.6	7.9	4.9						**8.7**	2.4	1.0 min
A - MD Average Peel Strength (g/in)	5039	4495	4358	3587	2225						**3941**	1091	
B - MD Average Peel Strength (ppi)	7.9	8.3	6.5	7.7	5.3						**7.1**	1.2	1.0 min
B - MD Average Peel Strength (g/in)	3587	3768	2951	3496	2406						**3242**	558	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	3.82	3.73	3.30	3.42	3.45	3.62	3.63	3.67	3.66	3.69	**3.60**	0.16	
Mass/Unit Area (oz/sq.yd)	8.89	8.68	7.68	7.95	8.02	8.42	8.44	8.54	8.51	8.58	**8.37**	0.37	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	256	306	241	285	239	316	293	341	320	278	**287**	35	200 min
TD - Tensile Strength (lbs)	305	277	242	280	258	333	342	241	331	258	**287**	38	200 min
MD - Elong. @ Max. Load (%)	83	83	80	76	83	89	77	69	83	83	**81**	6	
TD - Elong. @ Max. Load (%)	101	114	112	101	110	110	118	139	103	111	**112**	11	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	106	137	112	107	107	97	104	102	115	119	**111**	11	75 min
TD - Tear Strength (lbs)	133	109	101	122	114	114	150	134	108	108	**119**	15	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520151 **Geotextile Component Side B**
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.59	3.58	3.69	3.70	3.82	4.26	3.57	3.65	4.19	3.48	**3.75**	0.27	
Mass/Unit Area (oz/sq.yd)	8.35	8.33	8.58	8.61	8.89	9.91	8.30	8.49	9.75	8.09	**8.73**	0.62	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	267	217	247	262	266	258	305	330	279	251	**268**	31	200 min
TD - Tensile Strength (lbs)	276	327	254	290	317	335	281	248	308	337	**297**	33	200 min
MD - Elong. @ Max. Load (%)	71	71	83	75	81	77	81	73	82	85	**78**	5	
TD - Elong. @ Max. Load (%)	133	109	106	98	127	106	109	136	115	119	**116**	13	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	123	102	115	94	122	115	103	104	108	115	**110**	9	75 min
TD - Tear Strength (lbs)	139	122	92	117	129	124	127	110	103	122	**118**	14	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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April 6, 2010
April 7, 2010 Updating with 24 hour transmissivity result.

Mail To:

Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

Bill To:

<= Same

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs.
TRI is pleased to submit this final report for laboratory testing.

Project: **JED-Solid Waste Management Facility Cell 7 Vertical Expansion**

TRI Job Reference Number: E2341-08-09

Material(s) Tested: 3 Skaps TN270-2-8 Double Sided Geocomposite(s)

Test(s) Requested:

Transmissivity (ASTM D 4716) GC	<===Updating 24 hr Result.
Peel Strength (ASTM D 7005) GC	
Mass/Unit Area (ASTM D 5261) GT	
Grab Tensile Properties (ASTM D 4632) GT	
Trapezoidal Tear (ASTM D 4533) GT	
Apparent Opening Size (ASTM D 4751) GT	
Permittivity (ASTM D 4491) GT	

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,



Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

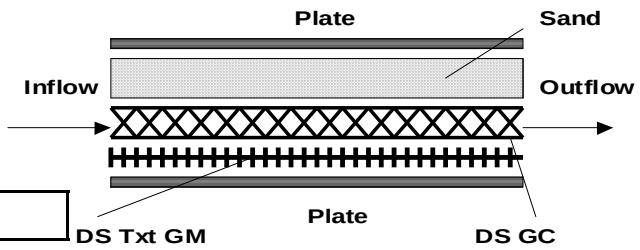
Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09

Hydraulic Transmissivity (ASTM D 4716)

Direction Tested: Machine Direction

Normal Load (psf):	500
Hydraulic Gradient:	0.02
Test Length (in)	12
Test Width (in)	12

Plate / Ottowa Sand / Sample / HDPE MSGM / Plate



PARAMETER		TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
		1	2	3			
Seat Time (hours)	Specimen		1				
24	Volume (cc)	590	591	587			
	Time (s)	30.00	30.03	29.93			
	Flow Rate (GPM/ft width)	0.31	0.31	0.31	**0.31**	0.00	
	Transmissivity (m^2/s)	3.23E-03	3.23E-03	3.22E-03	**3.22E-03**	5.89E-06	1.5E-03
	Test Temp (C)		20.0				
	Temp. Corr. Factor		1.000				

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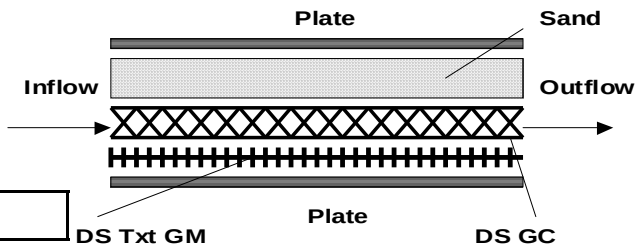
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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER			MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3			
Hydraulic Transmissivity (ASTM D 4716)						
Direction Tested: Machine Direction						
Normal Load (psf): 15,000						
Hydraulic Gradient: 0.02						
Test Length (in) 12						
Test Width (in) 12						
Plate / Ottowa Sand / Sample / HDPE MSGM / Plate						
Seat Time (hours)	Specimen	1				
Volume (cc)	x	x	x			
Time (s)	x	x	x			
100 Flow Rate (GPM/ft width)	#VALUE!	#VALUE!	#VALUE!	**#VALUE!**	#VALUE!	
Transmissivity (m^2/s)	#VALUE!	#VALUE!	#VALUE!	**#VALUE!**	#VALUE!	1.0E-03
Test Temp (C)		20.0				
Temp. Corr. Factor		1.000				



DATA PENDING

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	4.5	5.1	4.1	4.9	2.9						**4.3**	0.9	1.0 min
A - MD Average Peel Strength (g/in)	2043	2315	1861	2225	1317						**1952**	396	
B - MD Average Peel Strength (ppi)	8.2	4.2	5.4	6.0	7.4						**6.2**	1.6	1.0 min
B - MD Average Peel Strength (g/in)	3723	1907	2452	2724	3360						**2833**	722	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	4.10	3.85	3.80	3.51	3.78	3.89	3.62	3.96	3.62	3.48	**3.76**	0.20	
Mass/Unit Area (oz/sq.yd)	9.54	8.96	8.84	8.16	8.79	9.05	8.42	9.21	8.42	8.09	**8.75**	0.47	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	209	291	296	247	276	306	269	277	313	234	**272**	33	200 min
TD - Tensile Strength (lbs)	290	329	294	303	349	298	335	310	268	300	**302**	24	200 min
MD - Elong. @ Max. Load (%)	75	88	84	83	83	88	81	80	87	80	**83**	4	
TD - Elong. @ Max. Load (%)	121	105	114	119	115	107	117	115	135	103	**115**	12	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	111	94	84	140	115	104	94	118	96	124	**108**	17	75 min
TD - Tear Strength (lbs)	143	110	122	112	129	119	110	109	105	120	**118**	12	75 min
Apparent Opening Size (ASTM D 4751)	**Geotextile Component Side A**												
Opening Size Diameter (mm)	0.075	0.075	0.075	0.075	0.075						**0.075**	0.000	0.21max
Sieve No.	200	200	200	200	200						**200**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09 **Geotextile Component Side A**

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			**1**					**2**					
Thickness (mils)	96	96	96	96	96	98	98	98	98	98			
Time (s)	14.7	14.7	15.0	14.7	15.1	16.6	16.3	16.5	16.2	16.3			
Specimen Permittivity (s-1)	1.93	1.93	1.89	1.93	1.88	1.71	1.74	1.72	1.75	1.74			
Specimen Permittivity @20°C (sec-1)	1.93	1.93	1.89	1.93	1.88	1.71	1.74	1.72	1.75	1.74			
Specimen Flow rate (GPM/ft2)	144	144	141	144	141	128	130	129	131	130			
Specimen Permeability (cm/s)	0.47	0.47	0.46	0.47	0.46	0.43	0.43	0.43	0.44	0.43			
Test Speciemn No. >:			**3**					**4**					
Thickness (mils)	97	97	97	97	97	100	100	100	100	100			
Time (s)	15.7	15.9	15.6	16.0	15.9	16.9	16.9	16.9	16.9	16.9			
Permittivity (s-1)	1.81	1.78	1.82	1.77	1.78	1.68	1.68	1.68	1.68	1.68			
Specimen Permittivity @20°C (sec-1)	1.81	1.78	1.82	1.77	1.78	1.68	1.68	1.68	1.68	1.68			
Specimen Flow rate (GPM/ft2)	135	133	136	133	133	126	126	126	126	126			
Specimen Permeability (cm/s)	0.45	0.44	0.45	0.44	0.44	0.43	0.43	0.43	0.43	0.43			
TEMPERATURE CORRECTED VALUES											**Permittivity (s-1)**	**1.78**	0.5 min
											Flow rate (GPM/ft2)	**133**	
											Permeability (cm/s)	**0.44**	

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005
TRI Log #: E2341-08-09 **Geotextile Component Side B**

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.58	3.73	3.63	3.91	3.62	3.87	3.87	3.82	3.67	3.21	**3.69**	0.21	
Mass/Unit Area (oz/sq.yd)	8.33	8.68	8.44	9.09	8.42	9.00	9.00	8.89	8.54	7.47	**8.59**	0.48	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	274	273	288	247	225	274	265	257	305	313	**272**	26	200 min
TD - Tensile Strength (lbs)	282	280	289	324	252	308	307	244	298	294	**288**	25	200 min
MD - Elong. @ Max. Load (%)	84	87	92	87	77	85	87	84	89	95	**87**	5	
TD - Elong. @ Max. Load (%)	94	115	115	105	109	109	101	115	103	103	**107**	7	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	107	109	102	119	111	108	106	95	100	115	**107**	7	75 min
TD - Tear Strength (lbs)	123	105	106	110	114	118	134	132	92	125	**116**	13	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.075	0.075	0.075	0.075	0.072						**0.074**	0.001	0.21max
Sieve No.	200	200	200	200	200						**200**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520005 **Geotextile Component Side B**
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)													
Water Temp. (C):	20												
Correction Factor:	1.000												
Test Speciemn No. >:			1					2					
Thickness (mils)	99	99	99	99	99	102	102	102	102	102			
Time (s)	14.3	14.3	14.7	14.7	14.7	16.3	16.3	16.0	16.2	16.2			
Specimen Permittivity (s-1)	1.98	1.98	1.93	1.93	1.93	1.74	1.74	1.77	1.75	1.75			
Specimen Permittivity @20°C (sec-1)	1.98	1.98	1.93	1.93	1.93	1.74	1.74	1.77	1.75	1.75			
Specimen Flow rate (GPM/ft2)	148	148	144	144	144	130	130	133	131	131			
Specimen Permeability (cm/s)	0.50	0.50	0.49	0.49	0.49	0.45	0.45	0.46	0.45	0.45			
Test Speciemn No. >:			3					4					
Thickness (mils)	94	94	94	94	94	103	103	103	103	103			
Time (s)	14.4	14.4	14.4	14.4	14.4	16.9	16.6	16.6	16.9	16.9			
Permittivity (s-1)	1.97	1.97	1.97	1.97	1.97	1.68	1.71	1.71	1.68	1.68			
Specimen Permittivity @20°C (sec-1)	1.97	1.97	1.97	1.97	1.97	1.68	1.71	1.71	1.68	1.68			
Specimen Flow rate (GPM/ft2)	147	147	147	147	147	126	128	128	126	126			
Specimen Permeability (cm/s)	0.47	0.47	0.47	0.47	0.47	0.44	0.45	0.45	0.44	0.44			
			TEMPERATURE CORRECTED VALUES					**Permittivity (s-1)**			**1.84**		0.5 min
								Flow rate (GPM/ft2)			**138**		
								Permeability (cm/s)			**0.46**		

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520093
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	4.9	7.0	5.6	4.2	4.6						**5.3**	1.1	1.0 min
A - MD Average Peel Strength (g/in)	2225	3178	2542	1907	2088						**2388**	499	
B - MD Average Peel Strength (ppi)	4.4	6.0	3.3	3.7	5.3						**4.5**	1.1	1.0 min
B - MD Average Peel Strength (g/in)	1998	2724	1498	1680	2406						**2061**	506	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	3.71	3.62	3.65	3.43	3.67	3.77	3.96	3.53	3.95	3.88	**3.72**	0.18	
Mass/Unit Area (oz/sq.yd)	8.63	8.42	8.49	7.98	8.54	8.77	9.21	8.21	9.19	9.02	**8.65**	0.41	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	250	296	244	281	328	256	290	289	290	284	**281**	25	200 min
TD - Tensile Strength (lbs)	304	260	324	243	275	266	293	244	334	345	**289**	37	200 min
MD - Elong. @ Max. Load (%)	75	89	83	80	93	84	83	85	87	83	**84**	5	
TD - Elong. @ Max. Load (%)	101	132	110	109	122	110	101	123	119	121	**115**	10	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	129	102	103	86	117	113	91	110	101	115	**106**	13	75 min
TD - Tear Strength (lbs)	103	117	110	112	137	116	140	114	97	135	**118**	15	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520093 **Geotextile Component Side B**
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.96	4.04	3.79	3.53	3.58	3.38	4.35	3.39	3.26	3.82	**3.71**	0.34	
Mass/Unit Area (oz/sq.yd)	9.21	9.40	8.82	8.21	8.33	7.86	10.12	7.89	7.58	8.89	**8.63**	0.80	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	306	281	253	288	240	304	255	286	300	281	**279**	23	200 min
TD - Tensile Strength (lbs)	296	272	221	331	270	289	349	246	283	351	**291**	43	200 min
MD - Elong. @ Max. Load (%)	83	97	87	89	77	83	79	83	81	81	**84**	6	
TD - Elong. @ Max. Load (%)	98	111	104	106	131	103	112	121	101	115	**110**	10	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	128	118	126	104	125	122	112	91	109	93	**113**	13	75 min
TD - Tear Strength (lbs)	141	138	98	114	120	135	129	122	109	131	**124**	14	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520151
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Peel Strength (ASTM D 7005)													
A - MD Average Peel Strength (ppi)	11.1	9.9	9.6	7.9	4.9						**8.7**	2.4	1.0 min
A - MD Average Peel Strength (g/in)	5039	4495	4358	3587	2225						**3941**	1091	
B - MD Average Peel Strength (ppi)	7.9	8.3	6.5	7.7	5.3						**7.1**	1.2	1.0 min
B - MD Average Peel Strength (g/in)	3587	3768	2951	3496	2406						**3242**	558	
Note: A and B represent a randomly assigned top and bottom of the sample													
Mass/Unit Area (ASTM D 5261)	**Geotextile Component Side A**												
5" diameter circle (grams)	3.82	3.73	3.30	3.42	3.45	3.62	3.63	3.67	3.66	3.69	**3.60**	0.16	
Mass/Unit Area (oz/sq.yd)	8.89	8.68	7.68	7.95	8.02	8.42	8.44	8.54	8.51	8.58	**8.37**	0.37	8 min
Grab Tensile Properties (ASTM D 4632)	**Geotextile Component Side A**												
MD - Tensile Strength (lbs)	256	306	241	285	239	316	293	341	320	278	**287**	35	200 min
TD - Tensile Strength (lbs)	305	277	242	280	258	333	342	241	331	258	**287**	38	200 min
MD - Elong. @ Max. Load (%)	83	83	80	76	83	89	77	69	83	83	**81**	6	
TD - Elong. @ Max. Load (%)	101	114	112	101	110	110	118	139	103	111	**112**	11	
Trapezoidal Tear (ASTM D 4533)	**Geotextile Component Side A**												
MD - Tear Strength (lbs)	106	137	112	107	107	97	104	102	115	119	**111**	11	75 min
TD - Tear Strength (lbs)	133	109	101	122	114	114	150	134	108	108	**119**	15	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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GEOCOMPOSITE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7 Vertical Expansion

Material: Skaps TN 270-2-8 Double Sided Geocomposite
Sample Identification: 359520151 **Geotextile Component Side B**
TRI Log #: E2341-08-09

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.59	3.58	3.69	3.70	3.82	4.26	3.57	3.65	4.19	3.48	**3.75**	0.27	
Mass/Unit Area (oz/sq.yd)	8.35	8.33	8.58	8.61	8.89	9.91	8.30	8.49	9.75	8.09	**8.73**	0.62	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	267	217	247	262	266	258	305	330	279	251	**268**	31	200 min
TD - Tensile Strength (lbs)	276	327	254	290	317	335	281	248	308	337	**297**	33	200 min
MD - Elong. @ Max. Load (%)	71	71	83	75	81	77	81	73	82	85	**78**	5	
TD - Elong. @ Max. Load (%)	133	109	106	98	127	106	109	136	115	119	**116**	13	
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	123	102	115	94	122	115	103	104	108	115	**110**	9	75 min
TD - Tear Strength (lbs)	139	122	92	117	129	124	127	110	103	122	**118**	14	75 min

MD Machine Direction TD Transverse Direction NA Not Available

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Appendix

Q

SKAPS Industries (Nonwoven Division)
335, Athena Drive
Athens, GA 30601 (U.S.A.)
Phone (706) 354-3700 Fax (706) 354-3737
E-mail: info@skaps.com

Sales Office:
Engineered Synthetic Product Inc.
Phone: (770)564-1857
Fax: (770)564-1818

June 22, 2010
Waste Services, Inc.
1501 Omni Way
St. Cloud, FL 34773
PO : JED Facility
BOL : 18910

Dear Sir/Madam:

This is to certify that SKAPS GE180 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric.SKAPS GE180 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GE180 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Weight	ASTM D 5261	oz/sy (g/m^2)	8.00 (271)
Thickness*	ASTM D 5199	mils (mm)	100 (2.54)
Grab Tensile	ASTM D 4632	lbs (kN)	225 (1.00)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	90 (0.40)
Puncture Resistance	ASTM D 4833	lbs (kN)	130 (0.58)
Mullen Burst Strength	ASTM D 3786	psi (kPa)	425 (2930)
Permittivity*	ASTM D 4491	sec^{-1}	1.26
Permeability*	ASTM D 4491	cm/sec	0.30
Water Flow*	ASTM D 4491	gpm/ft^2(l/min/m^2)	100 (4074)
AOS*	ASTM D 4751	US Sieve (mm)	80 (0.18)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:
* At the time of manufacturing. Handling may change these properties.

ANURAG SHAH
QUALITY CONTROL MANAGER

Product : GE180-180

ROLL #	WEIGHT	THICKNESS	MD TENSILE	MD ELONG	XMD TENSILE	XMD ELONG	MD TRAP	XMD TRAP	PUNCTURE	MULLEN	AOS	WATER FLOW	PERMEABILITY	PERMITTIVITY
ASTM METHOD	D5261	D5199	D4632	D4632	D4632	D4632	D4533	D4533	D4833	D3786	D4751	D4491	D4491	D4491
UNITS	oz/sq yd	(mils)	lbs.	%	lbs	%	lbs.	lbs	lbs.	psi	US Sieve	gpm/ft^2	cm/sec	sec^{-1}
TARGET	8.00	100	225	50	225	50	90	90	130	425	80	100	0.30	1.26
15883.01	8.16	123	231	68	237	76	100	114	133	431	80	103	0.43	1.37
15883.02	8.16	123	231	68	237	76	100	114	133	431	80	103	0.43	1.37
15883.03	8.16	123	231	68	237	76	100	114	133	431	80	103	0.43	1.37
15883.04	8.16	123	231	68	237	76	100	114	133	431	80	103	0.43	1.37
15883.05	8.57	125	235	72	243	80	100	114	133	431	80	103	0.43	1.37
15883.06	8.57	125	235	72	243	80	100	114	133	431	80	103	0.43	1.37

*All Values are MARV.

Appendix

R

May 10, 2010

Mail To:	**Bill To:**
Kirk Wills	**<= Same**
Environmental Planning Specialists, Inc.	
1936 Bruce B. Downs Blvd. No. 328	
Wesley Chapel, Florida 33543	

email: kwills@envplanning.com
cc email: kirkwills@verizon.net

Dear Mr. Wills:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**JED-Solid Waste Management Facility Cell 7**
TRI Job Reference Number:	E2341-35-08
Material(s) Tested:	1 Skaps GE 180 Nonwoven Geotextile
Test(s) Requested:	Mass/Unit Area (ASTM D 5261) Grab Tensile (ASTM D 4632) Puncture Strength (ASTM D 4833) CBR Puncture Strength (ASTM D 6241) Trapezoidal Tear (ASTM D 4533) Apparent Opening Size (ASTM D 4751) Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOTEXTILE TEST RESULTS

TRI Client: Environmental Planning Specialists, Inc.
Project: JED-Solid Waste Management Facility Cell 7

Material: Skaps GE 180 Nonwoven Geotextile
Sample Identification: 15883.02
TRI Log #: E2341-35-08

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Mass/Unit Area (ASTM D 5261)													
5" diameter circle (grams)	3.69	4.09	3.68	3.93	4.00	4.02	3.58	3.45	3.65	3.70	**3.78**	0.21	
Mass/Unit Area (oz/sq.yd)	8.58	9.51	8.56	9.14	9.30	9.35	8.33	8.02	8.49	8.61	**8.79**	0.50	8 min
Grab Tensile Properties (ASTM D 4632)													
MD - Tensile Strength (lbs)	309	307	185	334	272	304	256	281	226	249	**272**	45	200 min
TD - Tensile Strength (lbs)	364	238	294	352	302	288	308	249	330	346	**307**	42	200 min
MD - Elong. @ Max. Load (%)	86	81	63	83	77	91	70	76	71	81	**78**	8	
TD - Elong. @ Max. Load (%)	114	121	107	107	132	118	105	108	115	113	**114**	8	
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	130	126	144	148	116	130	161	130	106	183	**137**	19	N/A
	154	146	125	122	131								
CBR Puncture Strength (ASTM D 6241)													
Puncture Resistance (lbs)	853	808	614	841	833	918	753	707	783	735	**784**	86	500 min
Trapezoidal Tear (ASTM D 4533)													
MD - Tear Strength (lbs)	117	109	102	123	122	90	111	105	108	105	**109**	10	75 min
TD - Tear Strength (lbs)	134	127	121	127	150	124	133	107	123	120	**126**	11	75 min
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.075	0.074	0.070	0.074	0.075						**0.074**	0.002	0.21 max
Sieve No.	200	200	200	200	200						**200**		

Falling Head Permittivity (ASTM D 4491, 9-in Upper Standpipe; 2 in opening)

Water Temp. (C):	20
Correction Factor:	1.000

Test Speciemn No. >:	1					2				
Thickness (mils)	110	110	110	110	110	108	108	108	108	108
Time (s)	17.5	17.5	17.8	18.2	18.1	18.4	18.4	18.4	18.6	18.8
Specimen Permittivity (s-1)	1.62	1.62	1.59	1.56	1.57	1.54	1.54	1.54	1.53	1.51
Specimen Permittivity @20°C (sec-1)	1.62	1.62	1.59	1.56	1.57	1.54	1.54	1.54	1.53	1.51
Specimen Flow rate (GPM/ft2)	121	121	119	117	117	115	115	115	114	113
Specimen Permeability (cm/s)	0.45	0.45	0.45	0.44	0.44	0.42	0.42	0.42	0.42	0.41

Test Speciemn No. >:	3					4				
Thickness (mils)	117	117	117	117	117	109	109	109	109	109
Time (s)	21.9	21.9	21.9	21.9	21.9	18.8	18.6	18.8	18.8	18.7
Permittivity (s-1)	1.30	1.30	1.30	1.30	1.30	1.51	1.53	1.51	1.51	1.52
Specimen Permittivity @20°C (sec-1)	1.30	1.30	1.30	1.30	1.30	1.51	1.53	1.51	1.51	1.52
Specimen Flow rate (GPM/ft2)	96.9	96.9	96.9	96.9	96.9	113	114	113	113	113
Specimen Permeability (cm/s)	0.39	0.39	0.39	0.39	0.39	0.42	0.42	0.42	0.42	0.42

TEMPERATURE CORRECTED VALUES		MEAN	
	Permittivity (s-1)	**1.48**	0.5 min
	Flow rate (GPM/ft2)	**111**	
	Permeability (cm/s)	**0.42**	

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

Appendix

S

SGI TESTING SERVICES
A GEORGIA LIMITED LIABILITY COMPANY

13 June 2010

Mr. Kirk Wills
Environmental Planning Specialists, Inc.
1936 Bruce B. Downs Blvd. No. 328
Wesley Chapel, Florida 33543

Subject: Laboratory Test Results Transmittal
Direct Shear Testing
JED Landfill, Cell 7

Dear Mr. Wills,

SGI Testing Services, LLC (SGI) is pleased to present the attached test results for the above-mentioned project. The note section below addresses sample preparation, sample disposal and a disclosure statement.

SGI appreciates the opportunity to provide laboratory testing services to Environmental Planning Specialists, Inc. Should you have any questions regarding the attached document(s), or if you require additional information, please do not hesitate to contact the undersigned.

Sincerely,

Zehong Yuan, Ph.D., P.E.
Laboratory Manager

Attachments

NOTES:
(1) Unless otherwise noted in the test results the sample(s)/specimen(s) were prepared in accordance with the applicable test standards or generally accepted sampling procedures.
(2) Contaminated/chemical samples and all related laboratory generated waste (i.e., test liquids, PPE, absorbents, etc.) will be returned to the client or designated representative(s), at the client's cost, within 60 days following the completion of the testing program, unless special arrangements for proper disposal are made with SGI.
(3) Materials that are not contaminated will be discarded after test specimens and archived specimens are obtained. Archived specimens will be discarded 30 days after the completion of the testing program, unless long-term storage arrangements are specifically made with SGI.
(4) The reported results apply only to the materials and test conditions used in the laboratory testing program. The results do not necessarily apply to other materials or test conditions. The test results should not be used in engineering analysis unless the test conditions model the anticipated field conditions. The testing was performed in accordance with general engineering testing standards and requirements. The reported results are submitted for the exclusive use of the client to whom they are addressed.

SGI10022.REPORT.10.01

MAIL TO: SGI TESTING SERVICES, LLC
P.O. BOX 2427
LILBURN, GA 30048-2427

FACILITY LOCATION
4405 INTERNATIONAL BLVD., SUITE B-117
NORCROSS, GA 30093

WEB SITE: WWW.INTERACTIONSPECIALISTS.COM

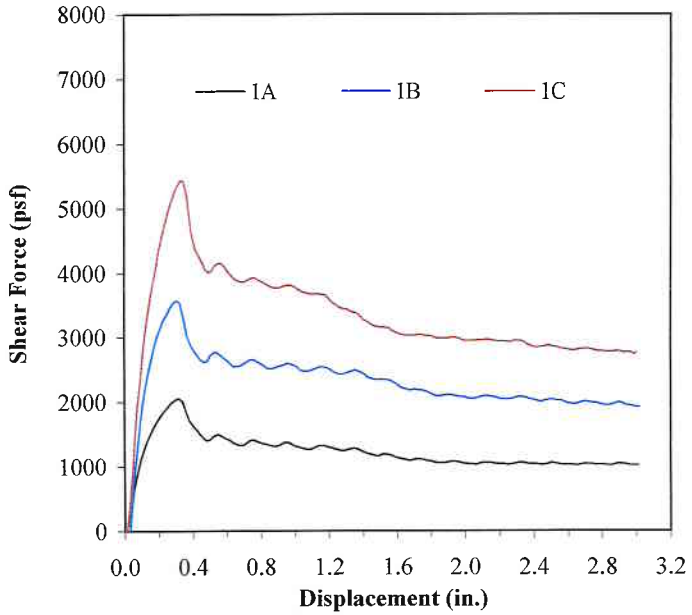
PHONE: 770.931.8222 FAX: 770.931.8240

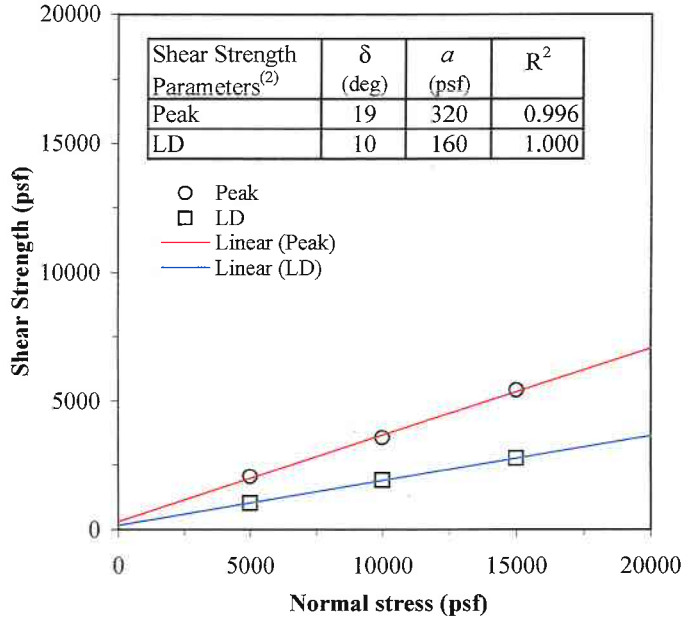
ATTACHMENT A

TEST RESULTS

ENVIRONMENTAL PLANNING SPECIALISTS, INC. - JED LANDFILL CELL 7
DIRECT SHEAR TESTING (ASTM D 5321/6243)

Upper Shear Box: Liner protective layer soil lightly compacted at as-received moisture/
Wetted SKAPS TN330-2-8 geocomposite #359510001/
Wetted Agru 60-mil Microspike HDPE geomembrane #212472-10 with long spike side down/
Wetted SKAPS TN270-2-8 geocomposite #359520001
Lower Shear Box: Concrete sand





Shear Strength Parameters[2]	δ (deg)	a (psf)	R^2
Peak	19	320	0.996
LD	10	160	1.000

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	GCL Soaking		Consolidation		Lower Soil			Upper Soil			GCL		Shear Stress		Failure Mode
				Stress (psf)	Time (hour)	Stress (psf)	Time (hour)	γ_d (pcf)	ω_i (%)	ω_f (%)	γ_d (pcf)	ω_i (%)	ω_f (%)	ω_i (%)	ω_f (%)	τ_P (psf)	τ_{LD} (psf)	
1A	12 x 12	5000	0.040	-	-	-	-	-	-	-	-	-	-	-	-	2059	1024	(1)
1B	12 x 12	10000	0.040	-	-	-	-	-	-	-	-	-	-	-	-	3566	1915	(1)
1C	12 x 12	15000	0.040	-	-	-	-	-	-	-	-	-	-	-	-	5424	2765	(1)

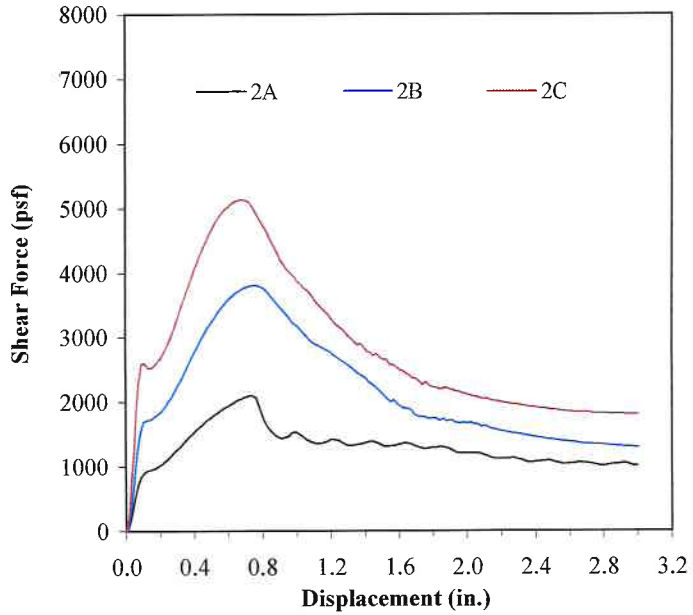
NOTES:
(1) Shear failure occurred at the interface between the lower geocomposite and long spike side of the geomembrane.
(2)The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

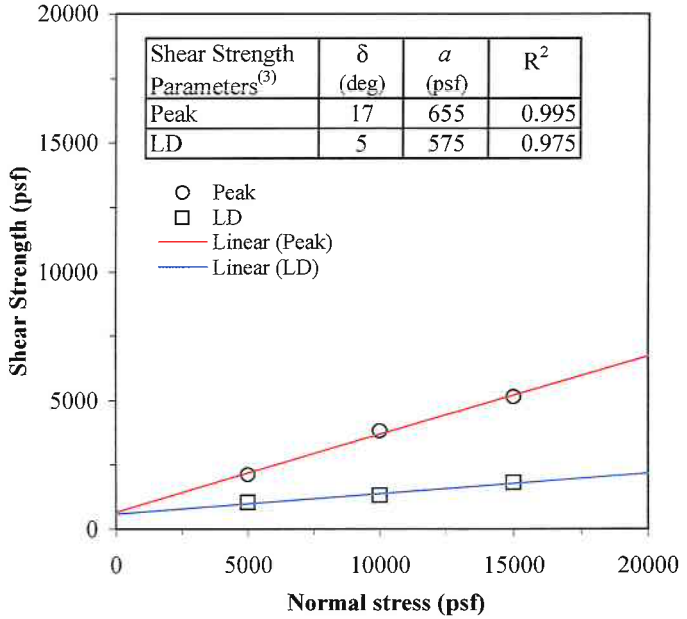
DATE OF TEST:	4/22/2010
FIGURE NO.	C-1
PROJECT NO.	SGI10022
DOCUMENT NO.	
FILE NO.	

SGI TESTING SERVICES, LLC

ENVIRONMENTAL PLANNING SPECIALISTS, INC. - JED LANDFILL CELL 7
DIRECT SHEAR TESTING (ASTM D 5321/6243)

Upper Shear Box: Concrete sand
Wetted Agru 60-mil Microspike HDPE geomembrane #212472-10 with long spike side down/
Wetted SKAPS TN270-2-8 geocomposite #359520001/
Wetted Agru 60-mil Microspike HDPE geomembrane #212472-10 with long spike side down/
Bentomat ST GCL (Lot # 201015CV/Roll # 1424) with white nonwoven geotextile down/
Lower Shear Box: Subbase soil





Shear Strength Parameters[3]	δ (deg)	a (psf)	R^2
Peak	17	655	0.995
LD	5	575	0.975

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	GCL Soaking Stress (psf)	GCL Soaking Time (hour)	Consolidation Stress (psf)	Consolidation Time (hour)	Subbase Soil γ_d (pcf)	Subbase Soil ω_i (%)	Subbase Soil ω_f (%)	Upper Soil γ_d (pcf)	Upper Soil ω_i (%)	Upper Soil ω_f (%)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress τ_P (psf)	Shear Stress τ_{LD} (psf)	Failure Mode
2A	12 x 12	5000	0.040	432	24	5000	24	104.5	15.7	-	-	-	-	-	76.3	2105	1010	(1)
2B	12 x 12	10000	0.040	432	24	10000	24	105.0	15.1	-	-	-	-	-	60.1	3806	1297	(2)
2C	12 x 12	15000	0.040	432	24	15000	24	104.9	15.2	-	-	-	-	-	52.2	5134	1805	(2)

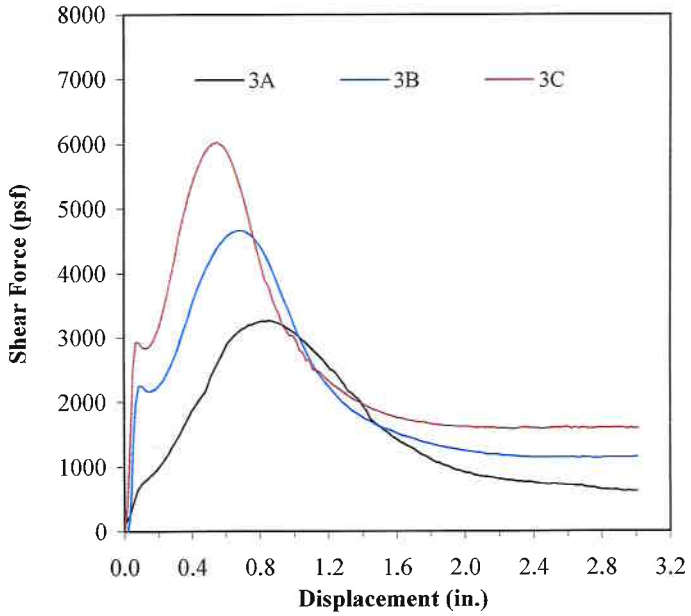
NOTES:
(1) Shear failure occurred at the upper geomembrane-geocomposite interface .
(2) Shear failure occurred within the GCL between the black woven geotextile component and bentonite layer.
(3)The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

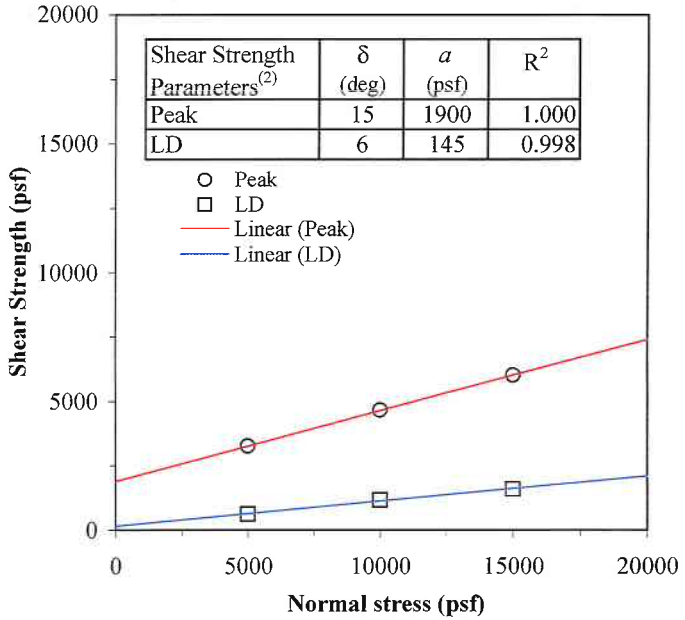
DATE OF TEST:	4/22/2010
FIGURE NO.	C-2
PROJECT NO.	SGI10022
DOCUMENT NO.	
FILE NO.	

SGI TESTING SERVICES, LLC

ENVIRONMENTAL PLANNING SPECIALISTS, INC. - JED LANDFILL CELL 7
DIRECT SHEAR TESTING (ASTM D 5321/6243)

Upper Shear Box: Steel grip
Bentomat ST GCL (Lot # 201015CV/Roll # 1424)
Lower Shear Box: Steel grip





Shear Strength Parameters[2]	δ (deg)	a (psf)	R^2
Peak	15	1900	1.000
LD	6	145	0.998

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	GCL Soaking Stress (psf)	GCL Soaking Time (hour)	Consolidation Stress (psf)	Consolidation Time (hour)	Lower Soil γ_d (pcf)	Lower Soil ω_i (%)	Lower Soil ω_f (%)	Upper Soil γ_d (pcf)	Upper Soil ω_i (%)	Upper Soil ω_f (%)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress τ_P (psf)	Shear Stress τ_{LD} (psf)	Failure Mode
3A	12 x 12	5000	0.040	432	24	5000	24	-	-	-	-	-	-	-	71.3	3269	619	(1)
3B	12 x 12	10000	0.040	432	24	10000	24	-	-	-	-	-	-	-	58.6	4661	1149	(1)
3C	12 x 12	15000	0.040	432	24	15000	24	-	-	-	-	-	-	-	51.7	6021	1595	(1)

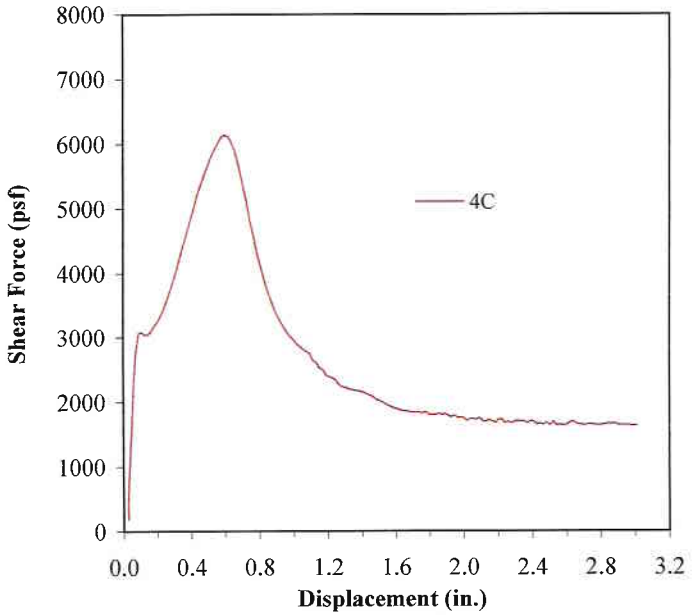
NOTES:
(1) Sliding (i.e., shear failure) occurred within the GCL between the black woven geotextile component and bentonite layer.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

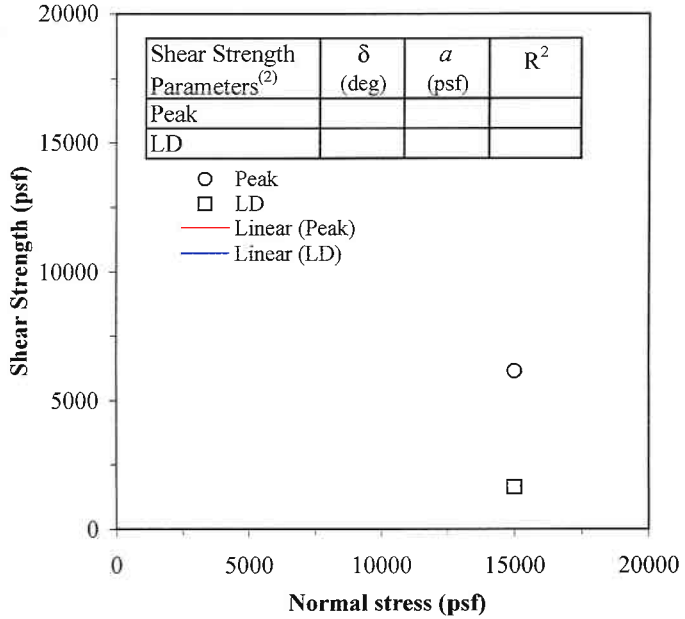
DATE OF TEST:	4/22/2010
FIGURE NO.	C-3
PROJECT NO.	SGI10022
DOCUMENT NO.	
FILE NO.	

SGI TESTING SERVICES, LLC

ENVIRONMENTAL PLANNING SPECIALISTS, INC. - JED LANDFILL CELL 7
DIRECT SHEAR TESTING (ASTM D 5321/6243)

Upper Shear Box: Steel grip
Bentomat ST GCL (Lot # 201015CV/Roll # 1424)
Lower Shear Box: Steel grip





Shear Strength Parameters[2]	δ (deg)	a (psf)	R^2
Peak			
LD			

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	GCL Soaking Stress (psf)	GCL Soaking Time (hour)	Consolidation Stress (psf)	Consolidation Time (hour)	Lower Soil γ_d (pcf)	Lower Soil ω_i (%)	Lower Soil ω_f (%)	Upper Soil γ_d (pcf)	Upper Soil ω_i (%)	Upper Soil ω_f (%)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress τ_P (psf)	Shear Stress τ_{LD} (psf)	Failure Mode
4A																		(1)
4B																		(1)
4C	12 x 12	15000	0.040	432	24	15000	48	-	-	-	-	-	-	-	49.4	6135	1636	(1)

NOTES:
(1) Sliding (i.e., shear failure) occurred within the GCL between the black woven geotextile component and bentonite layer.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

SGI TESTING SERVICES, LLC

DATE OF TEST:	5/3/2010
FIGURE NO.	C-3
PROJECT NO.	SGI10022
DOCUMENT NO.	
FILE NO.	

Appendix

T

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
VIDEO PIPELINE INSPECTION
NO DIG POINT REPAIRS
WWW.FLORIDAJETCLEAN.COM

19019 FERN MEADOW LOOP
LUTZ, FL 33558
TEL: 800-226-8013 FAX: 813-926-4616
FLORIDAJETCLEAN@TAMPABAY.RR.COM

ERC
Waste Services - JED Landfill
Cell 7 Expansion

Work Performed
July 2010

Conducted By:
Florida Jetclean
800-226-8013

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
VIDEO PIPELINE INSPECTION
NO DIG POINT REPAIRS
WWW.FLORIDAJETCLEAN.COM

19019 FERN MEADOW LOOP
LUTZ, FL 33558
TEL: 800-226-8013 FAX: 813-926-4616
FLORIDAJETCLEAN@TAMPABAY.RR.COM

DATE : 7/16/2010
TO : Jerry Pinder, Vaden Pollard – ERC
FROM : Ralph Calistri (floridajetclean@tampabay.rr.com)
SUBJECT : JED Landfill Cell 7 Expansion

Florida Jetclean completed the high-pressure water-jetting and explosion-proof video-inspection of the new Cell 7 leachate piping on 7/6/2010.

High-pressure Water-jetting:
As the below jetting log indicates, the new Cell 7 leachate piping was cleaned in its entirety via high-pressure water-jetting nozzle and were blockage free upon completion.

JED LANDFILL – CELL 7 EXPANSION
LEACHATE SYSTEM JETTING LOG
JETTING PERFORMED BY FLORIDA JETCLEAN
JULY 2010

LOCATION	ACHIEVED DISTANCE (ft)	COMMENTS
Cell 7 Collection	887'	Entire pipe cleaned.
Cell 7 Detection	887'	Entire pipe cleaned.

Explosion-proof Video-inspection:
After jetcleaning was completed the Cell 7 leachate collection piping was video-inspected using explosion-proof video-inspection equipment. All areas of the pipe viewed with the camera were in good condition with no defects noted. In any areas where the camera's lens was submerged under liquid, evidenced by orange video picture and obscured visibility, the ability of both the high-pressure water-jetting nozzle and the larger video-inspection camera to pass through those areas without resistance offers good evidence that those areas of the system are also in good working condition.

Please call us with questions or concerns.

Regards,
Ralph Calistri
Ralph Calistri - Florida Jetclean

CCTV Surveys List for ERC

Number of surveys in this list is 1 as of Tuesday, July 06, 2010 Unit of measure: ft

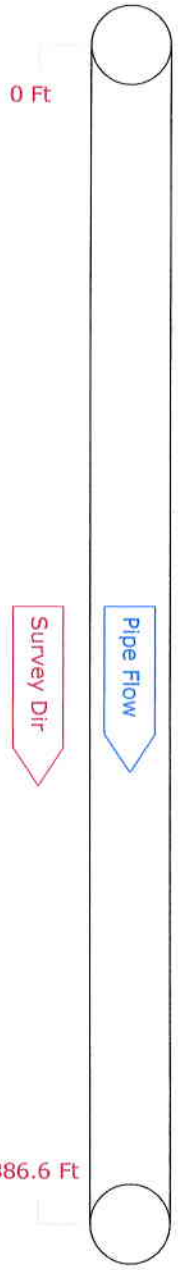
Setup	Date	Street	Start MH	Finish MH	Dir	Size inch	Pre Clean	Vid Cassette	Scheduled Length	Surveyed Length
1	7/6/2010	CELL 7	CELL 7	SUMP	D	6	Y	1	886.6	886.6
								Total Scheduled Length	886.6	
								Total Length Surveyed		886.6

Pipe Graphic Report of PLR CELL 7 A **for** ERC

Work Order	***Contract***	***Video*** 1	***Setup*** 1
Facility	***Operator*** BMN	***Van Ref*** 2	***Surveyed On*** 07/06/2010
Street Name CELL 7		***City*** JED	
Location type Berm			
Surface			
Survey purpose Other (state in comments)		***Weather*** Dry	

Pipe Use Other (state in comments)	***Schedule length*** 886.6 Ft	***From*** CELL 7 ***Depth*** Ft
Shape Circular	***Size*** 6 ***by*** ins	***To*** SUMP ***Depth*** Ft
Material Other (state in comments)	***Joint spacing*** Ft	***Direction*** Downstream
Lining	***Year laid***	***Pre-clean*** Y ***Last cleaned*** 7/6/2010

General note HDPE LEACHATE COLLECTION
Location note JETTING=867'



0.0 Ft — Start of Survey
Manhole/Node [CELL 7]
Water level 0

351.4 Ft — Camera Submerged Begin

847.1 Ft — Camera Submerged End

886.6 Ft — Manhole/Node [SUMP]
Finish of Surveys

Appendix

U

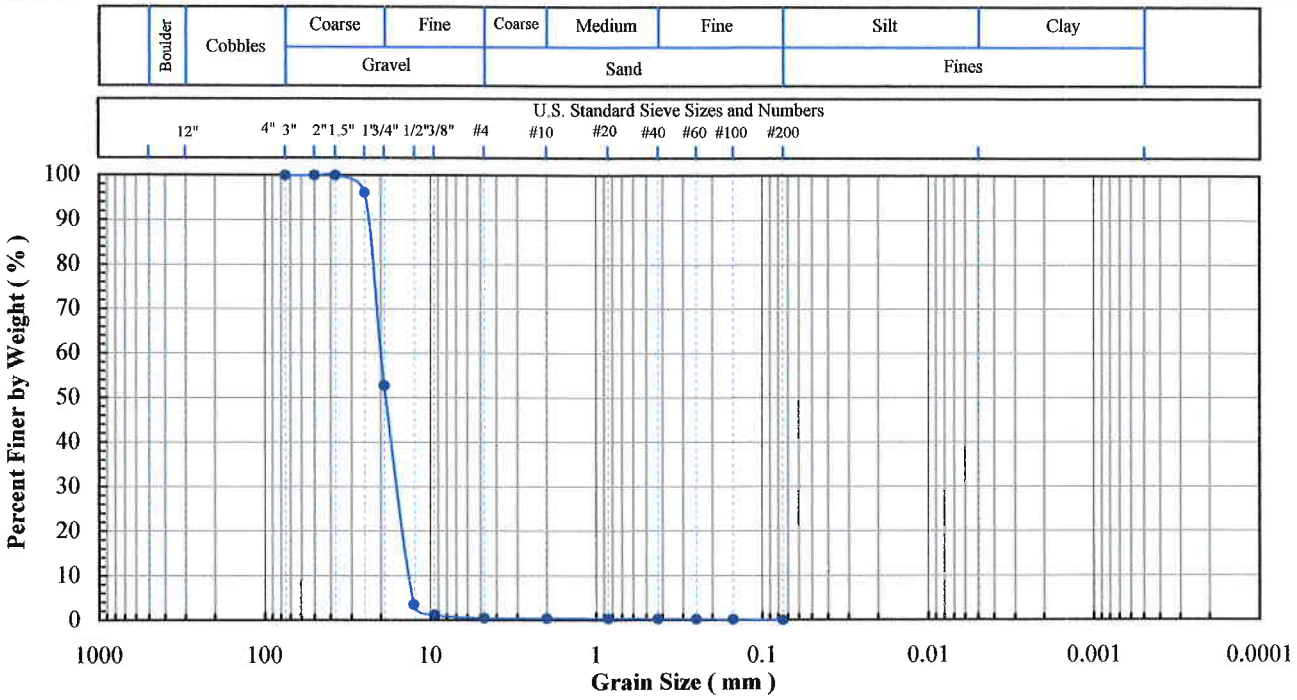
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	DG-57 stone
Lab Sample No:	E002

ASTM C 136, D 422, D 854, D 1140, D 2216, D 2487, D 4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits

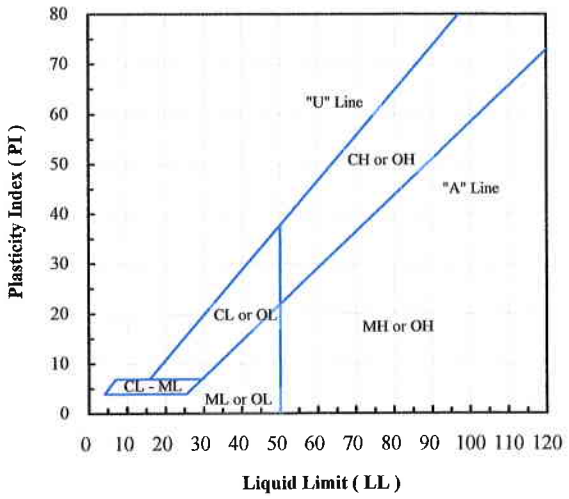


Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	100.0
1"	25	96.1
3/4"	19	52.8
1/2"	12.7	3.8
3/8"	9.5	1.3
#4	4.75	0.5
#10	2.00	0.4
#20	0.850	0.3
#40	0.425	0.3
#60	0.250	0.2
#100	0.150	0.1
#200	0.075	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	99.5
Sand (%):	0.5
Fines (%):	
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	1.4
Coeff. Curv. (Cc):	0.9



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
DG-57 stone	E002						GP - Poorly graded gravel

Note(s):

Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

RIGID WALL PERMEABILITY TEST (1)

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	DG-57stone
Lab Sample Number:	E002
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	5/04/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid (4)	Gradient Range	Hydraulic Conductivity
	Spec. Prep. (2) (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content (3) (%)		(-)	(cm/s)
1	R	32.6	23.0	96.4	0.0	TW	0.004 - 0.01	1.8E+1

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 5 layers, each approximately 6.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:

Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.
The entire sample was used (i.e., particles larger than 3/4 in. Seive, if any, were not removed).

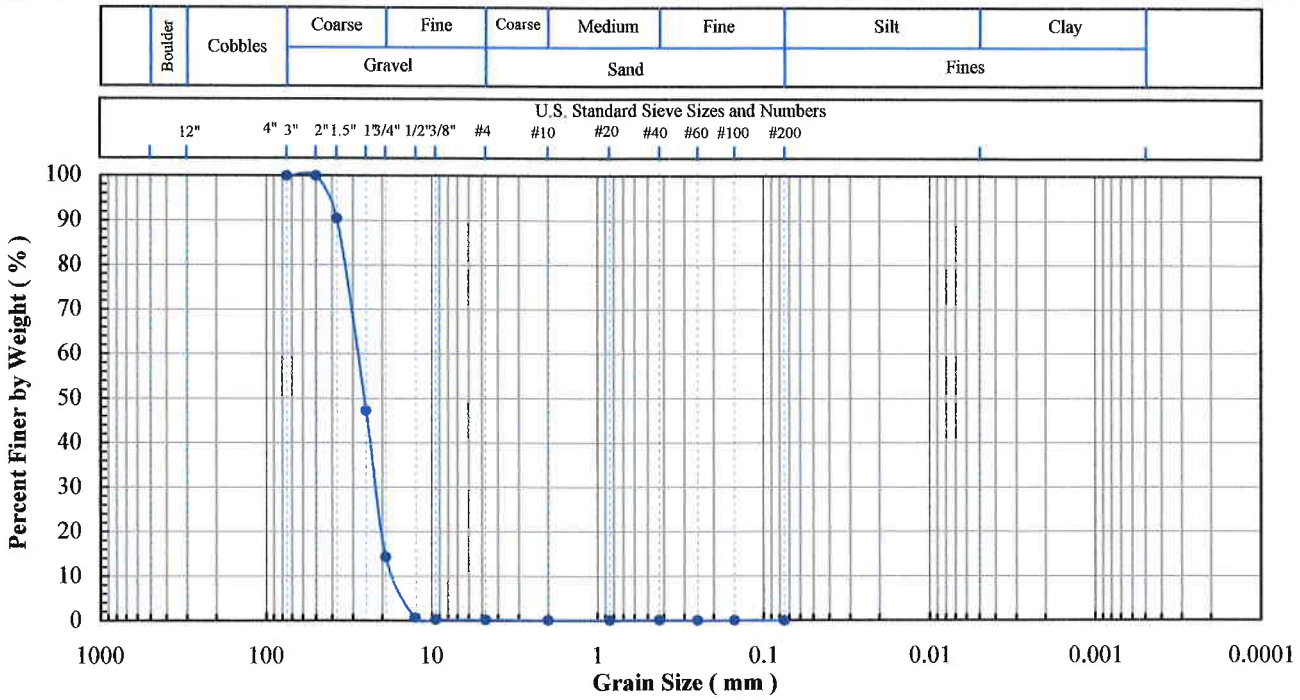
Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

Project Name:	JED SWMF Cell 7 Construction
Project No:	414
Client Sample ID:	DG-04 stone
Lab Sample No:	E001

ASTM C 136, D 422, D 854, D 1140, D 2216, D 2487, D 4318

SOIL INDEX PROPERTIES

Grain Size, Spec. Gravity, Moist. Content, Eng. Classification, Atterberg Limits

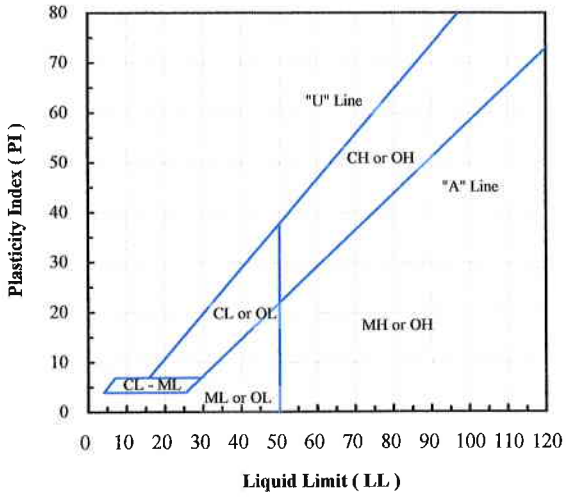


Sieve No.	Size (mm)	% Finer
3"	75	100.0
2"	50	100.0
1.5"	37.5	90.5
1"	25	47.4
3/4"	19	14.4
1/2"	12.7	0.8
3/8"	9.5	0.3
#4	4.75	0.2
#10	2.00	0.2
#20	0.850	0.2
#40	0.425	0.1
#60	0.250	0.1
#100	0.150	0.1
#200	0.075	

Hydrometer Particle Diameter (mm)	% Finer

Gravel (%):	99.8
Sand (%):	0.2
Fines (%):	
Silt (%):	
Clay (%):	

Coeff. Unif. (Cu):	1.6
Coeff. Curv. (Cc):	0.9



Client Sample ID.	Lab Sample No:	Moisture Content (%)	Fines Content < No. 200 (%)	Atterberg Limits LL (-)	Atterberg Limits PL (-)	Atterberg Limits PI (-)	Engineering Classification
DG-04 stone	E001						GP - Poorly graded gravel

Note(s):

Excel Geotechnical Testing, Inc.
"Excellence in Testing"
941 Forrest Street, Roswell, Georgia 30075
Tel: (770) 650 1666 Fax: (770) 650 5786

RIGID WALL PERMEABILITY TEST (1)

ASTM D2434 *

Project Name:	JED SWMF Cell 7 Construction
Project Number:	414
Client Name:	Environmental Planning Specialist
Site Sample ID:	DG-04stone
Lab Sample Number:	E001
Material Type:	NA
Specified Value (cm/sec):	NA
Date Tested:	5/04/2010

Specimen Number	Specimen Initial Conditions					Permeant Liquid (4)	Gradient Range	Hydraulic Conductivity
	Spec. Prep. (2) (-)	Spec. Length (cm)	Spec. Diameter (cm)	Dry Unit Weight (pcf)	Moisture Content (3) (%)		(-)	(cm/s)
1	R	32.6	23.0	97.3	0.0	TW	0.002 - 0.01	2.4E+1

Notes:

1. Constant head test procedures were followed during the testing.
2. Remolded specimen was formed by tamping the soil in 5 layers, each approximately 6.0 cm, utilizing moderate compaction energy.
3. A moisture content of 0.0% indicates that the sample was air/oven dried before being tested.
4. Type of permeant liquid: TW = Tap Water, DTW = Deaired Tap Water, DDI = Deaired Deionized Water

* Deviations:

Laboratory temperature at 22±3 °C.
Test specimen final conditions are not presented.
The entire sample was used (i.e., particles larger than 3/4 in. Seive, if any, were not removed).

CONRAD YELVINGTON
DISTRIBUTORS, INC.
An Oldcastle Materials Company

April 15th, 2010

Nestor Reyes
ERC General Contracting, Inc.
890 Carter Road, Suite 170
Winter Garden, Florida 34787

Prj: **WSI-JED Cell 7 CQA**
RE: **Material Specifications – #57 River Gravel**

Dear Mr. Reyes,

The material Conrad Yelvington Distributors, proposes to supply your project meets the following specifications;

Sampled (ASTM D 75) and Tested (ASTM C 136) in accordance with ASTM Standard Test Methods

Sieve Size	% Passing	ASTM #57 Specifications	
1 1/2"	100	100	
1"	95	95-100	
½"	*10	25-60	Out of Tolerance
#4	2	0-10	
#8	0	0-5	

- Specific Gravity ,ASTM C 127, 2.62
- Absorption, ASTM C 127, <1%
- LA Abrasion, ASTM C 535, 29
- Sodium Sulfate Soundness, ASTM C 88, < 2%
- Unit Weight, ASTM C 29, 163.5 pcf
- Hydraulic Conductivity, ASTM D 2434-68, Permeability of Granular Soils (constant head) = +300 ft/day
- Insoluble Residue in Carbonate Aggregate, ASTM D 3042-97
  = Material is classified as non-calcareous, containing less than 0.1% $CaCo_3$

Should you have any questions, please call me.

Respectfully,

Kim Thompson
Manager of Technical Services